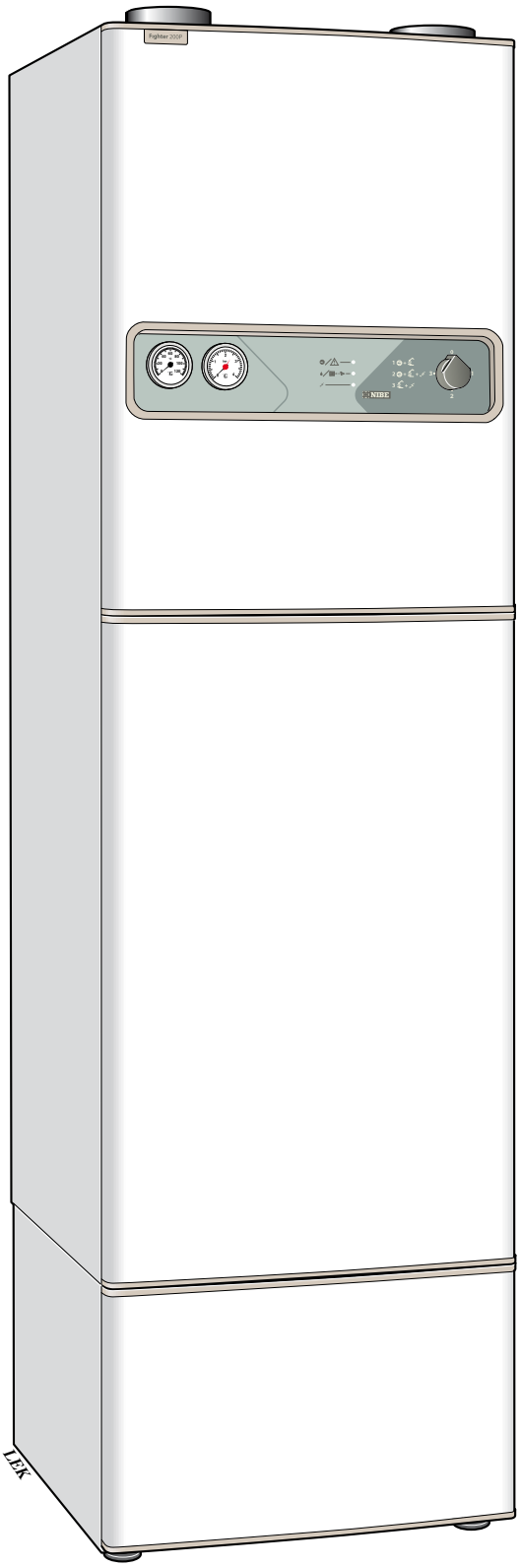
MOS GB 0846-3
FIGHTER 200P
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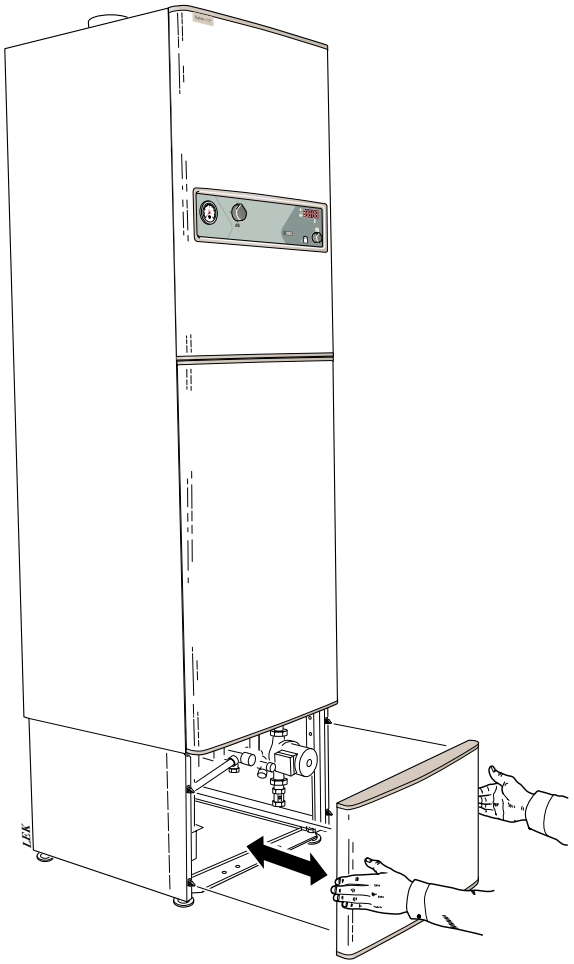
INSTALLATION AND MAINTENANCE INSTRUCTIONS

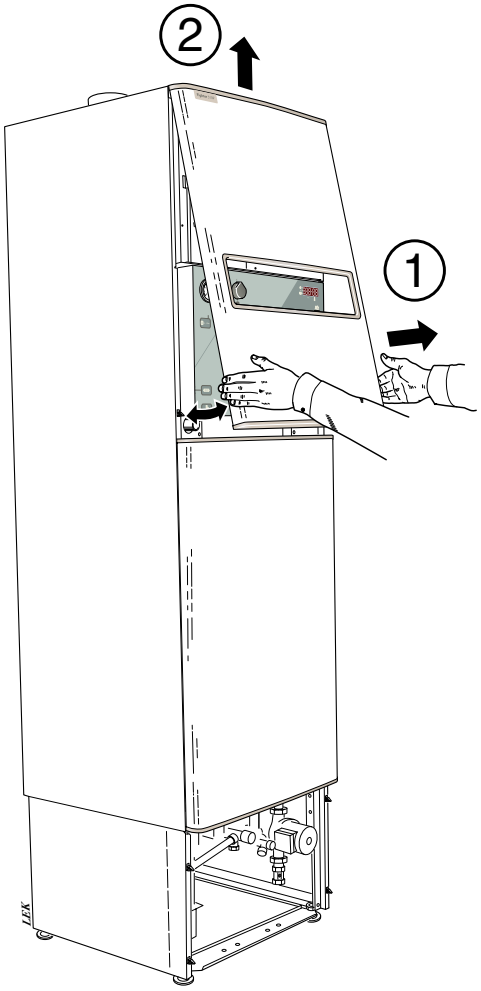
NIBE FIGHTER 200P

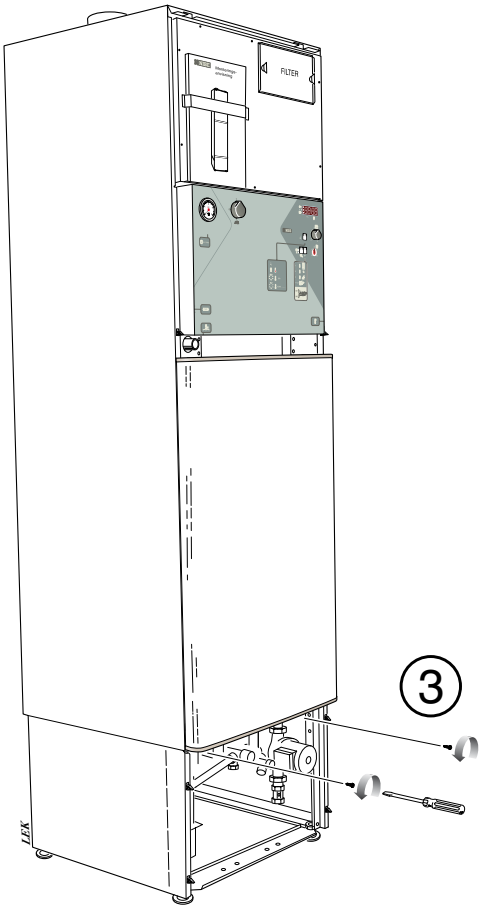
3 kW 230 V UK / DC

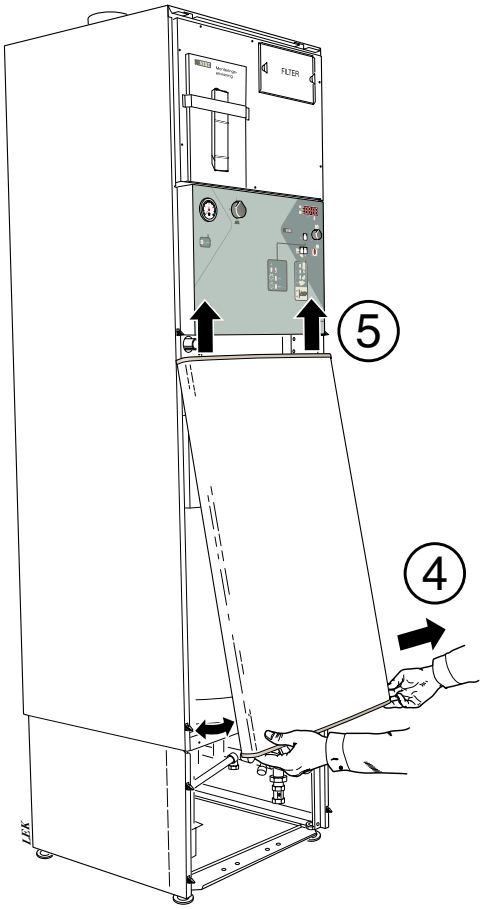


NIBE




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1


FILTER
3


FILTER
5
4

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2 General

In order to get the ultimate benefit from your heat pump FIGHTER 200P you should read through the For Home Owners section in this Installation and Maintenance Instruction.

FIGHTER 200P is an exhaust air heat pump. This means it utilises energy in ventilation air and uses this energy for hot water and heating the house. A microprocessor ensures that the heat pump always works efficiently.

For the installation engineer: Please, hand over to the home owner this manual after finalised installation.

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
Installer
Pre-pressure in the expansion vessel (0.5 bar on delivery)
Circulation pump setting
Flow water maximum temperature
Selected fan curve, normal speed (Knob “Exhaust air” B) □l/s □m³/h
Selected fan curve, reduced speed (Knob “Exhaust air” A) □l/s □m³/h
Date_____ Signed_____

Manufacter: NIBE AB Box 14 Järnvägsgatan 40 285 21 MARKARYD SWEDEN	
Maxiumum water supply pressure	16 bar
Immersion heater	R50 / 3000W / 230 V
Operating pressure, tap water	6 bar
Expansion vessel, tap water, charge pressure	3,5 bar
Expansion vessel, heating water, charge pressure	0,5 bar
Pressure reduction valve, setting	3,5 bar
Volume, water heater	170 litres
Mass, unit, filled with water	435 kg
Maximum primary working pressure (heating side)	2,5 bar
Set opening pressure of temperature and pressure valve	7 bar
Set opening pressure relief valve	6 bar
Set opening, temerature limiter, immersion heater	88 °C
Set opening, temerature limiter, compressor	88 °C
Heating up time from 15 °C to stop temperature for compressor	7 h 8 min
Re-heating time, 70 % of total volume (only compressor working)	4 h 50 min

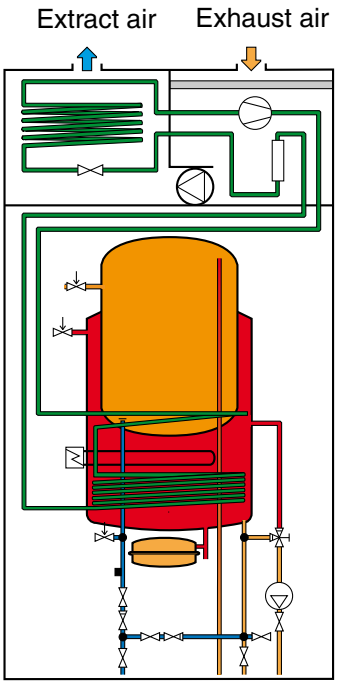
This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

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 200P consists of an electric boiler with copper lined water heater and a heat pump that recovers energy from 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. A DC fan is used in FIGHTER 200P.

The output of the immersion heater is 3,0 kW. 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 air is transferred to the refrigerant.

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

The warm refrigerant is led to the condenser. Here the refrigerant gives off its heat to the boiler water, so that the temperature of the the refrigerant drops and its phases changes from gas to liquid. The refrigerant then goes via a filter to the expansion valve, where the pressure drops and the temperature is lowered further.

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

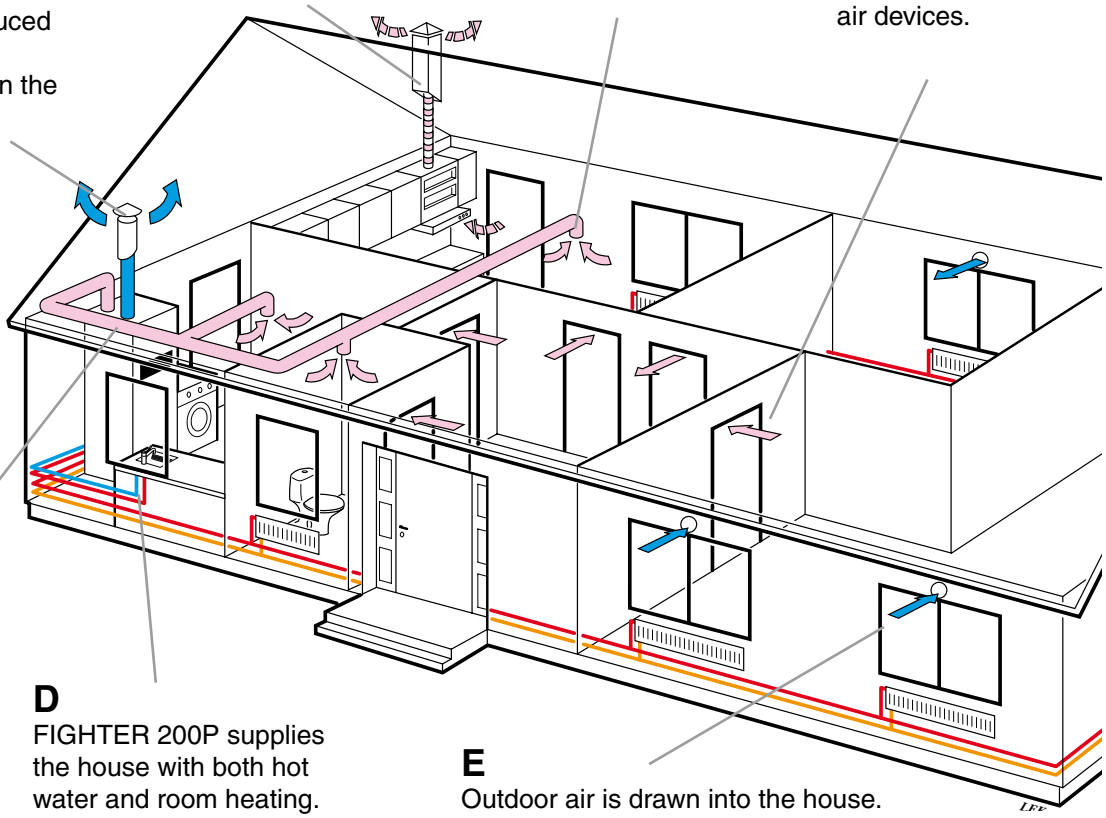
System diagram

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.



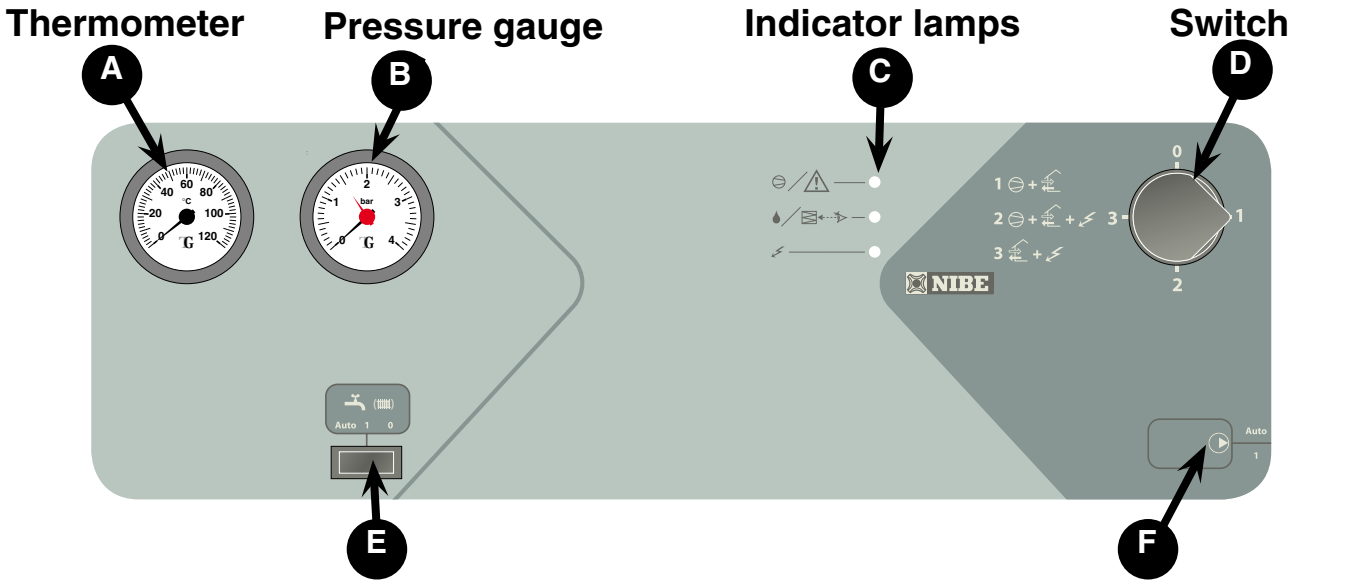
B
The warm room air is fed to FIGHTER 200P

D
FIGHTER 200P supplies the house with both hot water and room heating.

E
Outdoor air is drawn into the house.

4 Front panel

Front panel functions



Hot water priority (hidden)

Circulation pump (hidden)

A Thermometer

Here the boiler temperature is indicated . The value depends on the cut-out temperature of the immersion heater, the set value for the compressor cut-out temperature and the hot water taps.

B Pressure gauge

Here the pressure of the radiator circuit is indicated . The scale marks go from 0 - 4 bars. Normal pressure is 0,5 - 1,5 bar.

C Indicators lamps

Top lamp

Lit	Compressor is running.
Flashing	Alarming for tripped pressostates or indicating standby mode (Compressor blocked).
Not lit	Compressor is not running.

Midmost lamp

Lit	Defrosting is operational.
Flashing	Air filter to be cleaned.
Not lit	-

Lower lamp

Lit	Immersion heater is in operation.
Flashing	-
Not lit	Immersion heater is not in operation.

D Switch

with 4 positions 0 - 1 - 2 - 3:

0 Heat pump off.

1 Fan is operational. Compressor and circulation pump operational on demand.

2 Fan is operational. Compressor, immersion heater and circulation pump operational on demand.

3 Standby mode. Fan is operational. Compressor is not operational. Immersion heater and circulation pump operational on demand.

E Hot water prioritising (hidden)

with 3 positions Auto - On - Off:

Auto	Hot water prioritising operational
On	Hot water prioritising operational
Off	Hot water prioritising not operational

F Circulation pump (hidden)

with 2 positions Auto - On:

Auto	The On and Off of the circulation pump is controlled by the control system.
On	Circulation pump permanently running

Automatic heating control system

The heat emission is controlled by means of a room thermostat. On achieving the set temperature, the circulation pump inside FIGHTER 200P will stop.

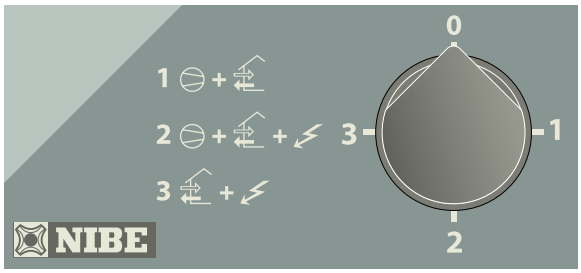
In order to set different intervals with a temperature change we recommend the enclosed clock thermostat. For time and temperature settings see section "Commissioning and adjusting" – "Operating instructions for enclosed clock thermostat".

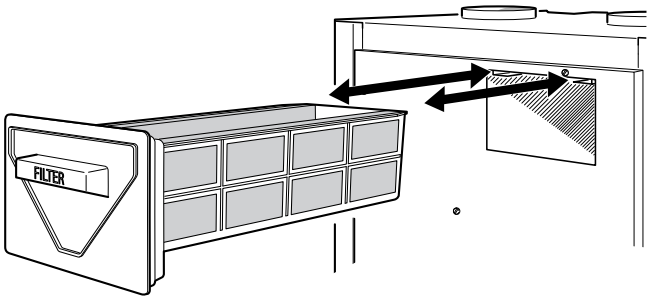
Maintenance routines 5

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 air filter (63) should be cleaned regularly, about four times a year.

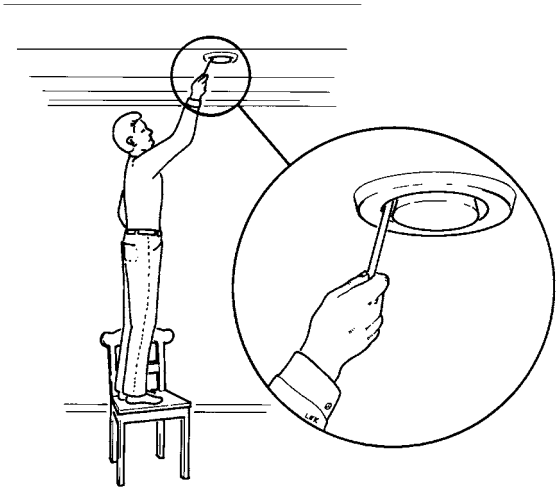
- Set the switch (8) to “**0**”.
- The upper service cover is opened by pulling the lower section outwards. The cover can then be lifted off.
- Pull out the filter cassette (78).
- Take out the filter and shake off any dirt. (When the filter is very dirty, turn it upside-down and wash it carefully with water.)

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

The cleaning time intervals vary depending on the amount of dust in the exhaust air. Each third month an indicator lamp “Midmost lamp” flashing to reminds about cleaning the air filter. Note that the time will be set to zero by setting the switch to "0".

6 Maintenance routines

Cleaning the ventilation devices

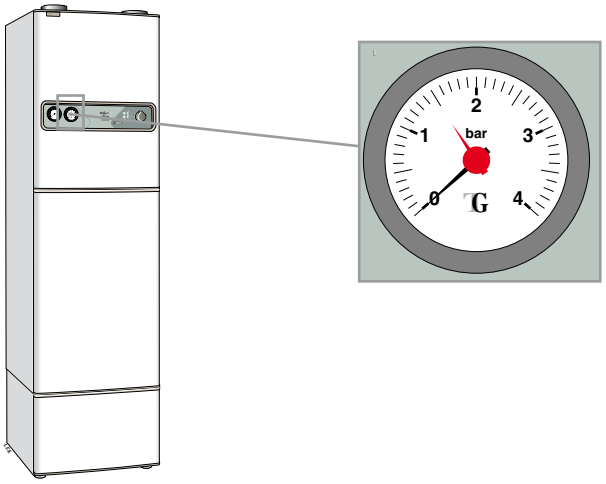


The building's ventilation devices should be cleaned regularly with a small brush to keep the correct ventilation. The device settings must not be changed.

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.

Pressure gauge



The pressure gauge reading should be between the initial pressure of the expansion vessel (normally 0.5 bar) and 1.5 bar (15 mvp). See Commissioning and adjusting.

Checking the safety valves

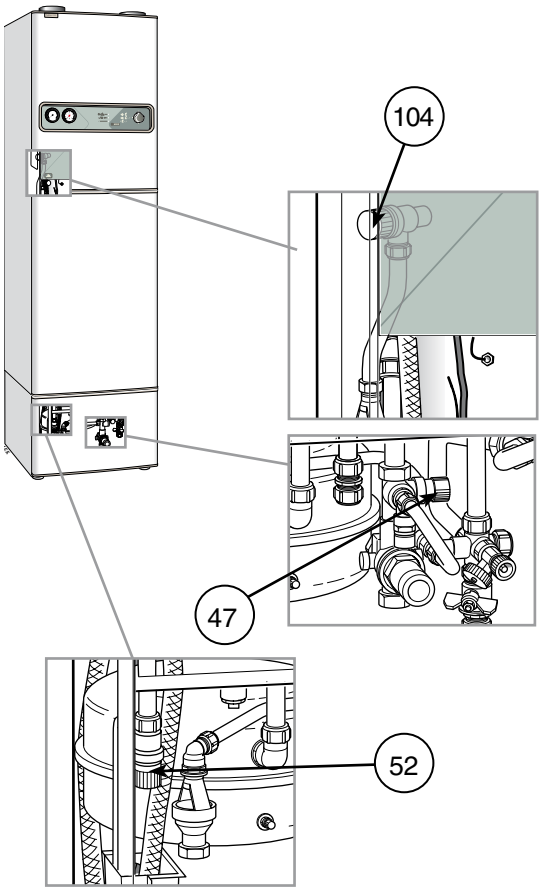
FIGHTER 200P has three safety valves, one for the heating system and two for the water heater.

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

Safety valve (104) does not normally release water.

The safety valves must be checked regularly. 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 the heating system".



Dealing with malfunctions 7

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

Low temperature or a lack of hot water

- Large amounts of hot water were used.
- Circuit or main MCB tripped.
- Possible earth circuit-breaker tripped.
- Switch (8) set to "**0**".
- Temperature limiter (6) tripped. Contact service.
- Wrong mode chosen on power switch (8).
- Thermostat (3) for immersion heater set too low.

Low or a lack of ventilation

- Defrost mode - lamp flashing - see chapter "Lamp indications".
- Filter (63) clogged (possible replace).
- Exhaust air device blocked or throttled down too much.
- Circuit or main MCB tripped.
- RCD (if fitted) tripped.
- Setting of the manual fan switch (if mounted) is incorrect.

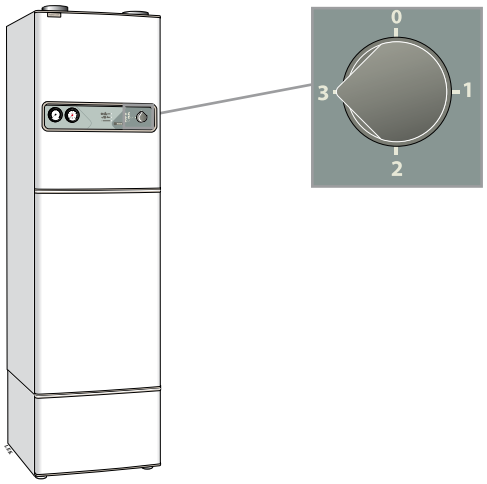
Low room temperature

- Circuit or main MCB tripped.
- RCD (if fitted) tripped.
- Temperature limiter (6) tripped. Contact service.
- Wrongly set clock thermostat.
- Circulation pump (16) stopped. See "Dealing with malfunctions" – "Starting the pump".
- Air in boiler or heating system.
- Valves (44) and (50) in the radiator circuit closed.
- Initial pressure in expansion vessel too low. This will be indicated by low pressure on the pressure gauge (42). Contact the installer.
- Thermostat (3) for immersion heater set too low.

High room temperature

- Clock thermostat setting not correct

Switch position "3"



When the switch is set to "**3**", the compressor is not operational. The fan and the immersion heater are operational. Normally the immersion heater lamp is lit in mode "3", when the immersion heater is operational.

A possible fault on the printed circuit card can cause the disappearance of the number display. However, the immersion heater is still operational, if the thermostat has not cut-out the immersion heater.

Cleaning the fan

The fan needs to be cleaned, if it is noisy. Call your installation engineer.

NOTE!

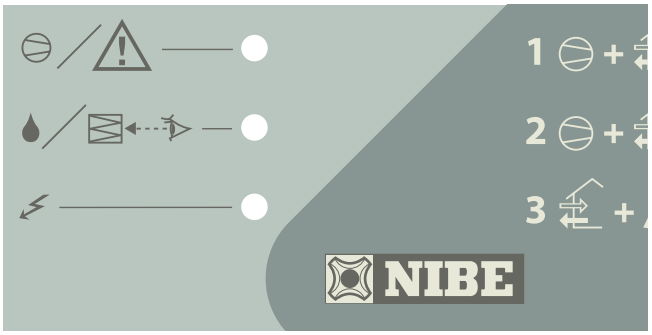
In all correspondence with NIBE state the serial number

_ _ _ _ _ _ _ _ _ _ _ _ _ _

If the operating disturbance cannot be rectified by means of the above an installation engineer should be called. If necessary set the switch to "3".

8 Dealing with malfunctions

Indications on the display



Lamp "Compressor is operational/alarm" is flashing

- A fault has occured in the cooling circuit. (One of the pressostates has cut-out).
- Mode "3" is set.

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.

Lamp "Defrosting is operational/check filter" is flashing

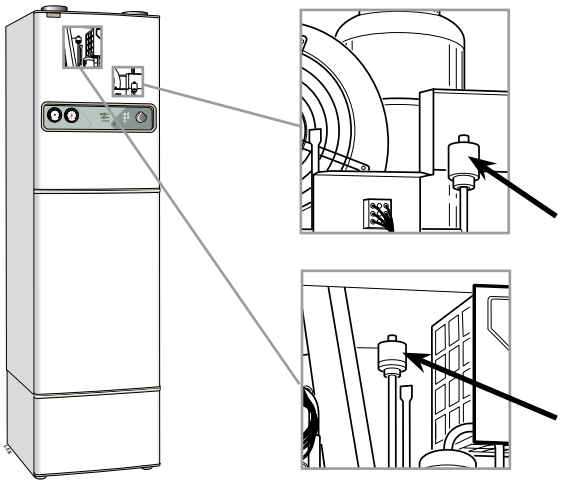
Air filter has to be cleaned (lamp flashing each third month). After cleaning the filter, the fault code must be cleared from the display by switching the heat pump off and on again.

Lamp "Defrosting is operational/check filter" is litted

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 devices or dirty filters.

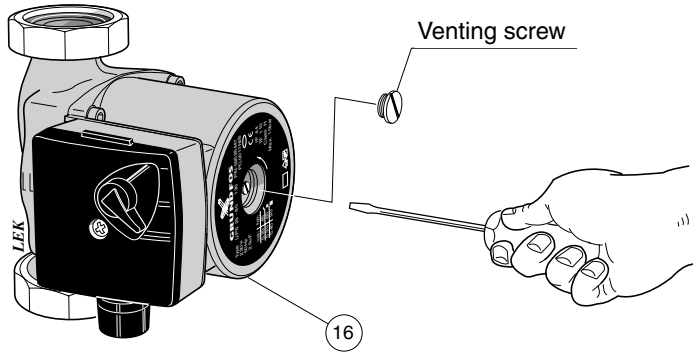
See "Maintenance routines" – "Cleaning air filters".

Resetting the pressostats



To reset a tripped pressostat, press the button on top of it; see figure. The pressostats are within reach by opening the filter box.

Helping the circulation pump to start



- Shut down FIGHTER 200P by turning the power switch (8) to "0".
- Remove the lower front cover.
- Slacken the venting screw with a screwdriver. Some water may come out, so hold a cloth over the screwdriver blade.
- Push the screwdriver in and turn the pump rotor.
- Tighten the venting screw.
- Start FIGHTER 200P and check whether the circulation pump is working.

It is often easier to start the circulation pump with the FIGHTER 200P running, and the power switch (8) set to "1". If you try to start the circulation pump with the FIGHTER 200P running, be prepared for the screwdriver to "grab" when the pump starts.

General information for the installer 9

Transport and storage

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

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.

Installation

The heat pump should preferably be erected with its back about 10 mm from an outside wall in a utility room or similar, to minimise noise nuisance. 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. **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.

An area of approximately 15 cm is required on the left side of the heat pump, at the temperature and pressure valve (104) to enable access to the valve.

NOTE! Since a waterfilled FIGHTER 200 weighs roughly 435 kilos, the floor must stand such a weight.

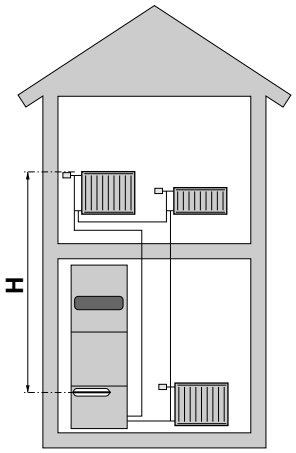
Hard water areas

Normally it is no problem to install FIGHTER 200P in hard water areas since the maxing working temperature is 60 °C.

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.

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 mwp). 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 106 litres at the above initial pressure.

10 Pipe connections

General

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

The system requires a 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.

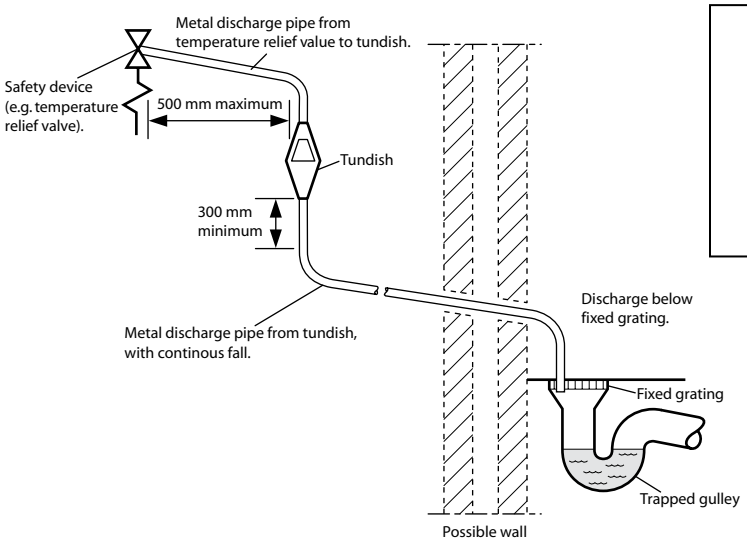
When the circulation pump is running, the flow in the radiator circuit must not be completely stopped.

The total volume is 240 litres, with 170 litres in the water heater and 70 litres in the boiler section.

The pressure vessel in the FIGHTER 200P is approved for max 9.0 bar (0.9 MPa) in the water heater and 2.5 bar (0.25 MPa) in the double shell section.

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. These non-pressurised collecting pipes shall not be used for anything else. A discharge pipe from the tundish (108) connected to the expansion reliet valve (47) (safety valve) shall also be connected to a drain in the same way.

No valve should be fitted between the pressure reduction valve (expansion valve) and the storage cylinder.



Warning to the installer!

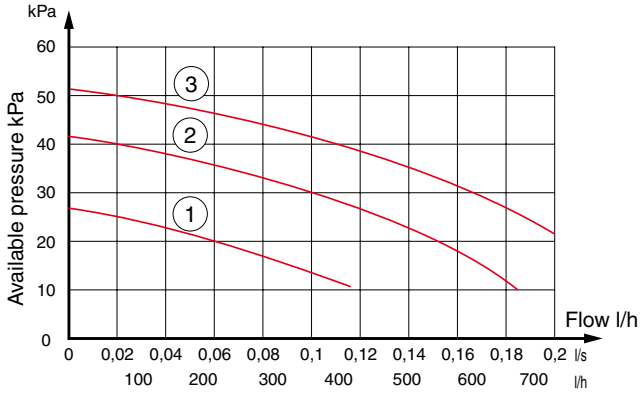
Do not use collection funnel (99) to discharge pipes from tundish (108).

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

Valve outlet size	Minimum size of discharge pipe	Minimum size of discharge pipe from tundish	Maximum resistance allowed, expressed as a lenght of straight pipe (i.e. no elbows or bends)	Resistance created by each elbow or bend
G1 / 2	15 mm	22 mm	up to 9 m	0,8 m
G1 / 2	15 mm	28 mm	up to 18 m	1,0 m
G1 / 2	15 mm	35 mm	up to 27 m	1,4 m
<G3> / 4	22 mm	28 mm	up to 9 m	1,0 m
<G3> / 4	22 mm	35 mm	up to 18 m	1,4 m
<G3> / 4	22 mm	42 mm	up to 27 m	1,7 m
G1	28 mm	35 mm	up to 9 m	1,4 m
G1	28 mm	42 mm	up to 18 m	1,7 m
G1	28 mm	54 mm	up to 27 m	2,3 m

Pipe connections

Pump and pressure drop diagram



NOTE!

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

Tap water connection

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

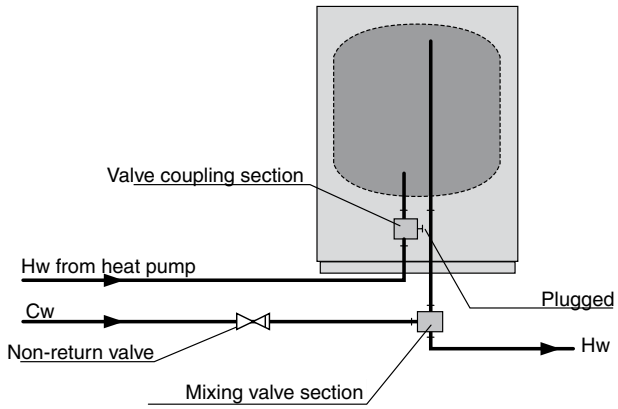
The attendant expansion vessel (107) must be connected to the hot water system.

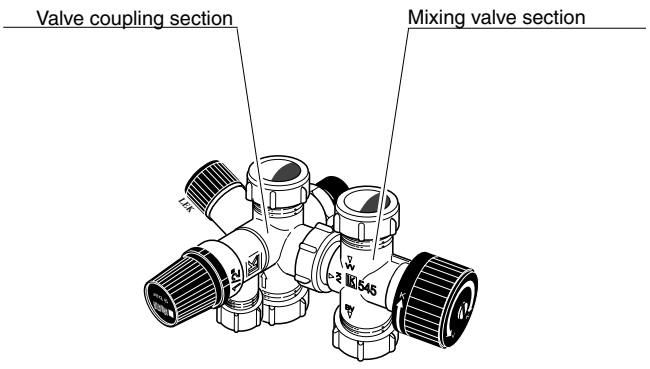
The heat pump should be supplemented with an electric water heater if a bubble pool or other significant consumer of hot water is installed.

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.





CW

12 Ventilation connection

Ventilation flow

FIGHTER 200P 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 this ventilation flow should not be less than 100 m^3/h. (28 l/s).

FIGHTER 200P 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 curve’s designation refers to the position of the knobs on the circuit board for fan speed (158).

FIGHTER 200P gives the possibility to connect a two way switch for choosing between normal ventilation and reduced ventilation. The reduced ventilation should only bee chosen when no one is at home.

Kitchen duct

The kitchen duct must not be connected to FIGHTER 200P.

Adjustment

To obtain the necessary air exchange in every room of the house, the exhaust air devices must be correctly positioned and adjusted. An incorrect 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 duct and extract air duct using the two earthing cables supplied. The cables must then be connected to the earthing studs on top of the top cover.

Duct connections should be made via flexible hoses, which must be installed so that they are easy to replace. The extract air duct is to be insulated using diffusion-proof material along its entire length. Provision must be made for inspection of the duct. The exhaust air duct should be fitted with an adjustment damper. 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.

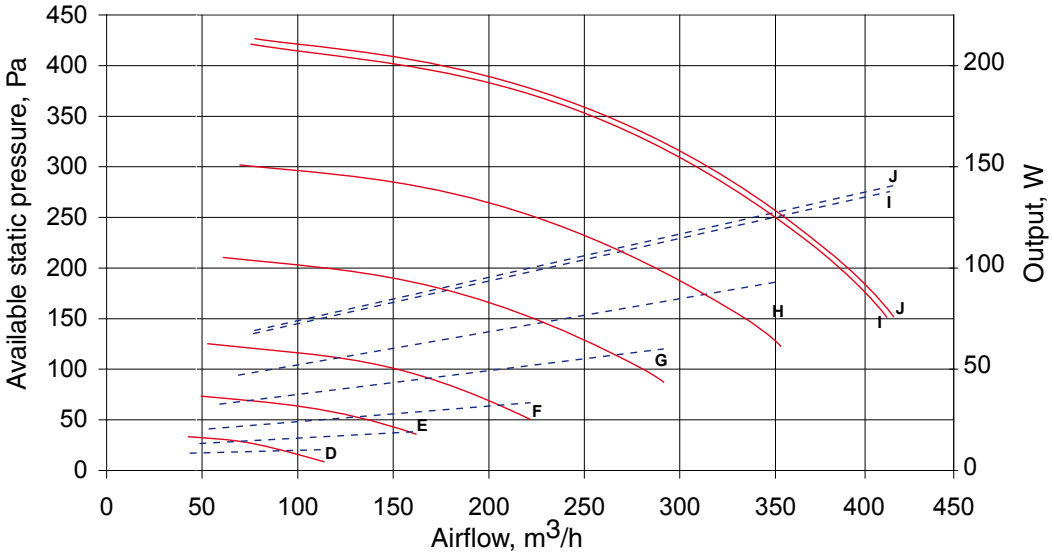
The air duct system should, at a minimum, be of air tightness class B.

NOTE!

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

Fan diagram

The diagram below shows the available ventilation capacity.



Electrical connection

Connection

Disconnect the heat pump before insulation testing the house wiring.

The supply (230 V~ 1-phase + N) for the heat pump must be connected to terminal (9) via a cable clamp.

The connection of the heat pump must be done under the supervision of a qualified electrician.

NOTE!

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

The heat pump installation implies a contact breaker.

The vinyl-pipe on the right side may be used as cable entry conduit.

The temperature limiter (6) cuts off the supply to the immersion heater if the temperature rises to 88 °C; it can be manually reset by pressing the button on the temperature limiter.

The temperature limiter (7) for the compressor cuts off the supply to the compressor if the temperature rises to 88 °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.

NOTE!

The electrical installation, wiring and any service work must be done in strict conformity to current regulations under the supervision of a qualified electrician.

Setting the fan capacity

Selection of the exhaust fan capacity is done by turning the knobs on card (158) to the required settings. See diagram "Ventilation connection" – "Fan diagram".

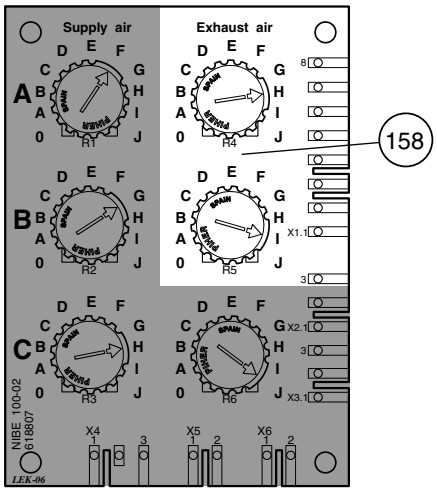
Positions as follows:

Knob A ("Exhaust air"): Reduced (if two way switch is mounted)

Knob B ("Exhaust air"): Normal

Knob C ("Exhaust air"): Not used

Knobs under "Supply air" are not used.



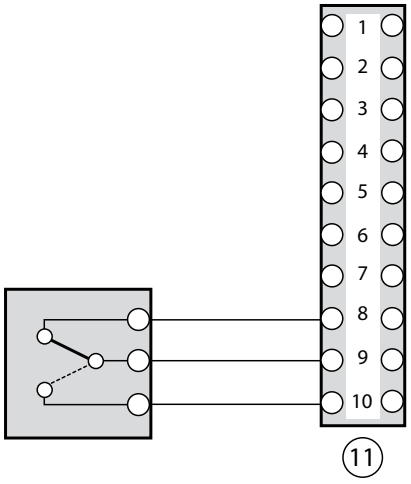
Connecting a fan switch

FIGHTER 200P gives the possibility to connect a two way switch for choosing between normal ventilation and reduced ventilation.

- Remove the strapping from terminal (11) position "8" and "9".
- Connect the fan switch on terminal (11) as illustrated.

A closed circuit between position "8" and "9" results in normal fan speed.

A closed circuit between position "10" and "9" results in reduced fan speed.



14 Electrical connection

Circulation pump control

Normally a room thermostat is used controlling the starts and stops of the circulation pump. When the set room temperature is reached, the circulation pump is stopped and starts again when the temperature drops. For connection see diagram "Electrical connections" – "Connecting the room thermostat".

The circulation pump can even be operated manually. No room thermostat will be connected. Instead the circulation pump is operated by the switch (18) on the front panel. The mode "Auto" does not permit any operation of the circulation pump if no room thermostat is connected. The switch in position "On" permits permanent operation of the circulation pump.

Current, fuse

The maximum current is 16,7 Ampere. Therefore a 20 Ampere fuse shall be used. **NOTE!** Relevant electrical standards must be considered.

Immersion heater

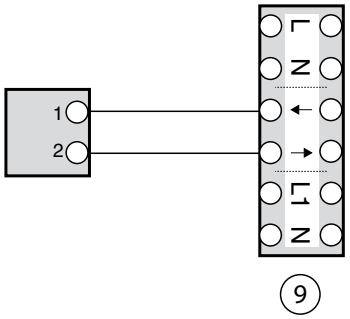
FIGHTER 200P is delivered with a 3 kW immersion heater (1). It is started and stopped via the microproessor card (34). If a failure occurs there is a temperature limiter (6) (thermal cut-out) that is stopping the immersion heater. An immersion heater without a temperature limiter is not allowed to be mounted.

Connecting the clock thermostat

The enclosed clock thermostat shall be connected on terminal (9) as illustrated.

Make sure that the switch (18) is set to position "Auto".

Adjust the clock thermostat according to "Commissioning and adjusting" – "Operating instructions for enclosed clock thermostat".



9

Commissioning and adjusting 15

Preparations

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

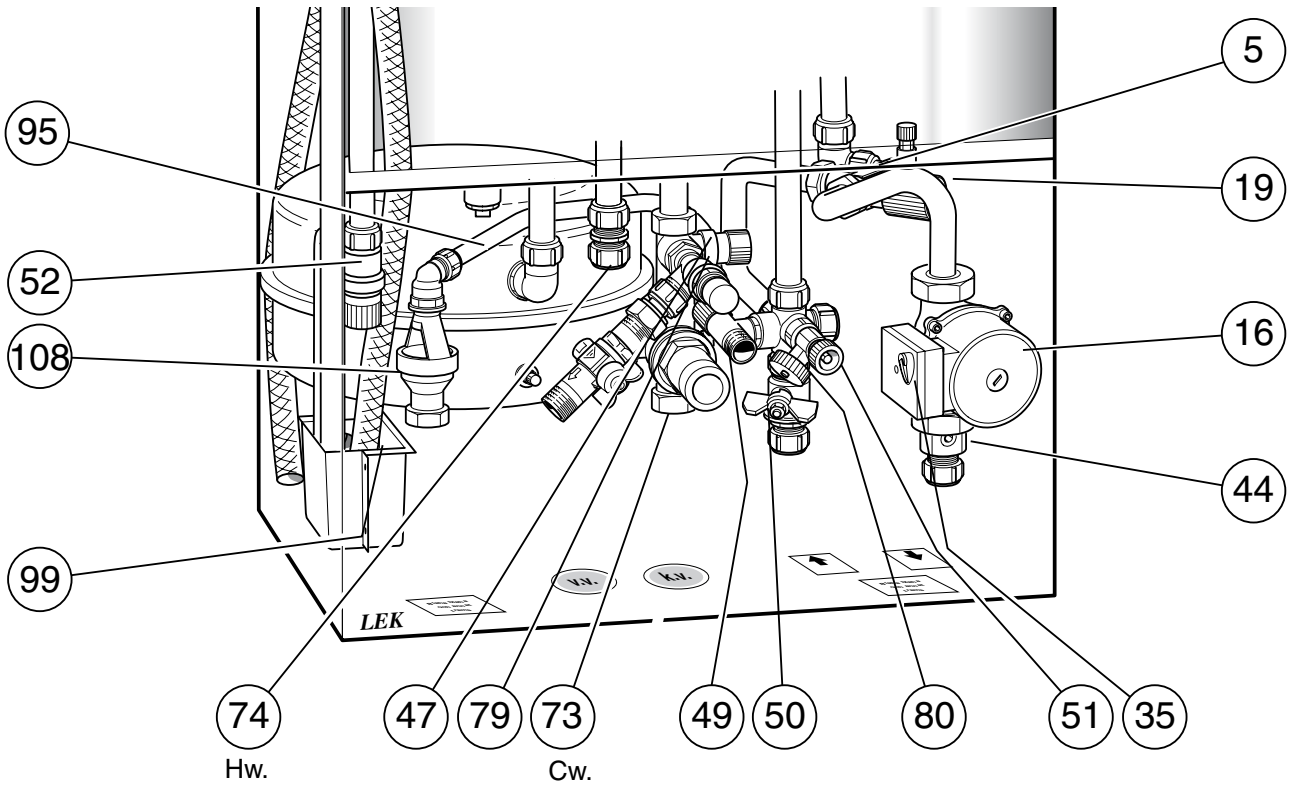
Check that valves (44) and (50) are fully open and that the temperature limiter (6) has not tripped (press firmly the knob). FIGHTER 200P is supplied with a limiting valve (5) mounted on the outlet pipe. This one allows to set a maximum outlet temperature in order to protect the floor in an existing floor heating system. This valve is adjustable between 38 and 55 °C. The ex works setting is 38 °C. Turn setting knob (19) clockwise to lower the temperature and counter-clockwise to lower the same until desired setting is reached. A quarter turn is equal to 5 °C.

Filling the water heater and the heating system

- The water heater is filled by opening a hot water tap. When water comes out of the hot water tap this can be closed.
- Connect enclosed flexible hose (147) between connection (149) and connection (150) (the hose is mounted at the unit when this is delivered). Open filling valves (151) and (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 mixture of air and water starts to emerge from the safety valve (52). The filling valves (151) and (49) are then closed.
- Turn the safety valve (52) until the boiler pressure reaches the normal working range (0.5 - 1.5 bar).
- When the filling procedure is finished the flexible hose (147) shall be removed.

Venting the heating system

- Vent the electric boiler through the safety valve (52) and the rest of the heating system through the relevant venting valves.
- Keep topping up and venting until all air has been removed and the pressure is correct.



16 Commissioning and adjusting

Starting

- Set the switch (8) to "2" in order to accelerate the-heating of the radiator system. NOTE! The compressor has a start delay of about 10 minutes in the start mode.
- Set the designed capacity on the circulation pump using its switch (35). See the section "Pipe connections" – "Pump and pressure drop diagram". Make sure that the switch is not in an intermediate position.

Setting the ventilation

Ventilation flows are given on the ventilation drawings.

- Selection of the exhaust fan capacity is done by choosing correct setting on the knobs on card (158). Se diagram "Ventilation connection" – "Fan diagram". Knob B is used for normanl vantilation. To ensure the lowest possible noise level, set the fan for the lowest possible capacity.
- Make sure that all outside air devices are fully open.
- Set correct ventilation flows on the indoor exhaust air devices.
- If an external two way switch for ventilation is mounted, knob A on card (158) is used for setting the ventilation flow in reduced stage.
  Note! The indoor exhaust air devices must not be changed.
  The ventilation flow must never be less than 100 m^3/h.

Readjustment

During the initial running period, air is given off by the heating water, and venting can be necessary. If bubbling sounds can be heard from the heat pump, the entire system requires further venting. NOTE! The safety valve (52) also acts as a manual venting valve. Operate it with care, since it opens quickly.

Draining the heating system

The hot water can be drained off through the drain valve (51) using an R15 (1/2") hose coupling. Remove the cover (80) from the valve (51). Screw on the hose coupling and open the valve (51). Open the safety valve (52) to let air into the system.

Draining the water heater

This is how to drain the water heater:

- Disconnect the overflow pipe from the drain connection 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 drain valve (47).
- Open a hot water tap to let air into the system. If this is not enough, undo the pipe coupling (74) on the hot water side and pull out the pipe.

Operating instructions for enclosed clock thermostat

GB

Operating instructions for two wire clock thermostat INSTAT 2 TYPE 525 32

ATTENTION!
The device must only be installed by a qualified electrican according to the circuit diagram in the housing cover. The applicable safety requirements of VDE and local electricity supply companies must be observed.

In order to obtain the class of protection II, appropriate installation must be taken.

1. Range of applications:

– for fan control in storage heaters
– pumps
– oil burners – gas burners
– actuators for hot water heating systems

This is an electronic control with digital display for 4 temperatures and 4 time sectors for 2 blocks of days, e.g. work days and rest days.
Temperature range: 5 to 30°C.

2. Standard program:

We have developed and stored a standard program in the memory to make it easy to start using the unit.

After inserting the battery, the correct time and day must be set and the following standard program is adopted.

	Time sector	Work days (1...5) (Mo, Tu, We, Th, Fr)		Rest days (6,7) (Sa, Su)	
		Start time	Temp.	Start time	Temp.
Start times of the 4 time sectors and accompanying temperatures	Morning	6.00	20°C	7.00	20°C
	Daytime	8.30	18°C	10.00	19°C
	Evening	17.00	21°C	17.00	21°C
	Night	22.00	15°C	23.00	15°C

Setting the day and time:

Note: modifications are only possible if the cover is mounted.

Press the MODE key, the arrow on the left then points ◴ and the day arrow flashes.

Press the (+) or (–) keys, to set the day of the week, Press the OK key. The time display will then flash. Press the (+) or (–) key to enter the correct time and then press the OK key.

From now on the start times and temperatures described above are adopted.

This means that you quickly have to complete weekly program available without the need for extensive programming.

3. Altering the start times – work days to rest days:

Press the MODE key until the arrow on the left points to the start time ◴. "Morning ☼ 6.00" will flash.

The start time can be adjusted using the (+) or (–) key, then press OK to confirm the new start time.

The start time "Daytime ☼ 8.30" will flash, use the (+) or (–) keys to alter the start time as desired, then press OK.

Continue until your reach start time ◴ work day ⚒ "Night ☾ 22.00" and then press OK.

The work day/rest day arrow ⚒/🛏 will now show rest day 🛏 on the display.

The same procedure should be used in order to enter rest day 🛏 start times.

When the desired start times have all been entered the arrow will return within one minute from work day/rest day ⚒/🛏 to work day ⚒.

4. Setting the temperatures:

Press the MODE key until the arrow on the display points to temperature 🌡.

The programmed temperature values can be altered according to the user's wishes, as described for setting start times.

If night ☾ / rest day 🛏 is entered the temperature morning ☼ / work day ⚒ (20°C) will flash.

5. Resetting work day/rest day:

Press the MODE key, the arrow will point to work day/rest day ⚒/🛏 on the display. At the same time the day arrow points to 1 (Mo) and flashes.

The (+) or (–) keys can be used to redefine the work days and rest days as desired

The preset program uses the most common division into work days and rest days, that is:

Work days Monday . . . Friday (1 . . . 5)
Rest days Saturday (6) and Sunday (7)

These days can be altered with the (+) or (–) keys. Please remember to press the OK key after making each change.

When all the alterations have been made, press the MODE key and the display again shows the current position.

6. Fixing the temperature:

This can be done for example for a party or holiday by means of the OK key. This key enables the user to fix an existing setting, i. e. during the holiday or party a temperature of e. g. 6°C can be entered using the (+) or (–) keys.

In order to fix the setting, press the OK key. ☜ appears at the bottom right of the display. As long as this symbol is visible, the MODE push-button are ineffective.

In order to cancel the setting press the OK key again, the symbol disappears and the original program takes over.

7. Changing the temperature

By pressing the + or - key, the actual room temperature will be displayed and can be modified. If blinking stops, the modification will be saved.

This modification lasts until the next switching event of the program.

Note:

If set temperature is active, the displayed temperature remains the same after stopping blinking.

8. Displaying Room- or Set-point-Temperature

In delivered condition the set-point temperature will be displayed. By pressing key ☜ for 5 seconds the mode will be changed over to display room-temperature or show set-temperature.

As indication that a change over takes place , the ☜ is blinking shortly. After this, the selected temperature (Room/Set-point) will be displayed continuously.

9. Program survey:

In order to survey the settings in the program, please carry out the following instructions:

Survey start times

Press the MODE key until the arrow on the display points to start time ◴, then press the OK key, morning ☼ / start time ◴ will flash, press the OK key again, daytime ☼ / start time ◴ will flash. Carry on until you have seen all the start times of your work and rest days.

Survey temperature settings

Press the MODE key until the arrow points to work days ⚒ / rest days 🛏, then press the OK key as shown under "survey start times" above.

When you have finished surveying the programmed values, press the MODE key to return to the starting point.

10. Indication of operation hours:

This function shows time (in hours) thermostat was energized for heat. Time starts after "reset". Push both buttons OK and then MODE for 3 seconds indicating hours of operation.

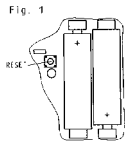
11. Changing the batteries:

The batteries delivered with the control should last for at least 2 years before it becomes necessary to change them. When the batteries are nearly empty, the 🔋 symbol appears on the display.

To change the batteries press the opening button at the right of the unit and remove the upper cover from the housing by pushing it slightly to the right.

When you have removed the cover, place 2 new alkali batteries in the battery compartment, taking care to align them correctly. It is not necessary to re-enter all the times provided it does not take longer than one minute to remove and replace the batteries.

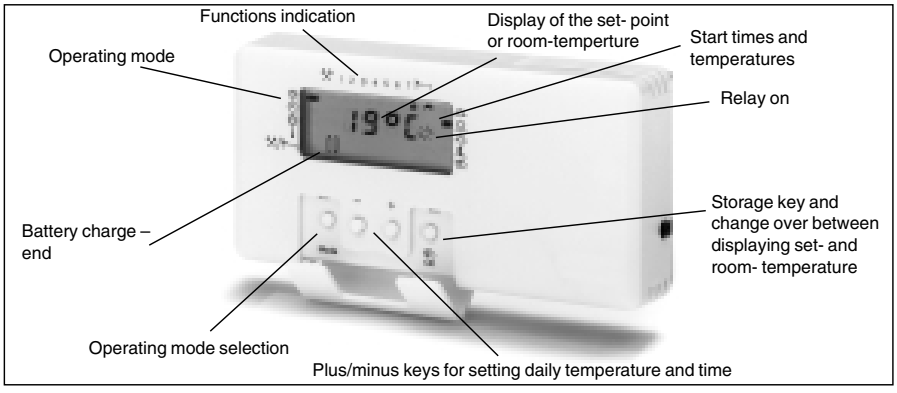
In order to ensure the device's proper functionality after a battery replacement (or after initial commissioning), please re-attach the cover to the enclosure and then press a button.



If there is no correct function after having replaced batteries, please push reset-botton (see fig. 1). Clock and program to be re-entered after having pushed "reset". Operation hours counter starts from zero again. This button also should be pushed at non-correct function of thermostat.

12. Technical data:

Order number	0525 32 641 9 . .
Operating voltage: batteries	2 x mignon 3 V–
Switching current	8 (2) A, AC 250 V
Output, relay contact c/o, voltage free	1
Temperature range	5 . . . 30°C
Switching temp. differential	0,5 K
Shortest switching time ON/OFF	10 min.
Battery life approx. years	2
Battery changing time without loss of program	⩽1 min.
Accuracy of clock	10 min./year at 20°C
Housing protection class	IP 30
Protection class	II
Weight	about 210 g
Storage temperature	–25 . . . 65°C
Ambient temperature	0 . . . 40°C
Dimensions without keys	142 x 71 x 32 mm



18 Temperature levels

Compressor

On delivery the compressor has a set working level signifying the compressor to start when the temperature drops at the compressor sensor (94) to 50° C and to stop when the temperature arrives at 53° C. It is possible to increase these temperatures by two degrees (52 and 55° C respectively) in oder to achieve a somewhat higher hot water temperature with the power switch in mode "1" (immersion heater not operational). This can be done by changing the mode of the switch for No 1 on the microprocessor board (34) to mode "On". However, be aware that this means somewhat adverse working conditions for the compressor, as this effects the economies slightly negative.

Periodical temperature increase

FIGHTER 200p is equipped with the function for periodical temperature increase. This means that the temperature will be put up to 60° C at regular intervals. This function is not set functional at factory. How-ever,this function will become operational, if the switch No 4 on the printed circuit card will be changed to mode "On" and if the hot water priority is operational. This setting allows a hot water increase once a week. Once a day will be operational, if the switch No. 3 will be set in the mode "On". Note that while this heating is operational, the circulation pump is not operational and the main part of the heating is done by only immersion heater, which effects the economies slightly negative. Also note that while this heating the immersion heater is operational, although the power switch is set to "1".

NOTE!

Periodical temperature increase is possible only if the hot water prioritising is operational.

Freezing protection and hot water prioritising

If permanent operation of the circulation pump is desired, FIGHTER 200P is even equipped with a switch (18) to alter between permanent and automatic operation, that is when the control system decides if the circulation pump has to be operational or not. See diagram "Electrical connections" -"Circulation pump control".

NOTE! If permanent operation is chosen, the hot water prioritising is not operational as desired. The periodical temperature increase should not be made active.

If hot water prioritising is operational all energy from the compressor and the immersion heater (if mode "2" is chosen on power switch) is used to heat up the hot water. This happens normally when the temperature at the immersion heater sensor (88) drops to 48° C. The circulation pump will start again when the temperature attains 51° C. These temperatures can be dropped by two degrees (that is 46 and 49° C respectively) in order to retarder the prioritising slightly. This is done by changing switch No 2 on the printed circuit card (34) to mode "On".

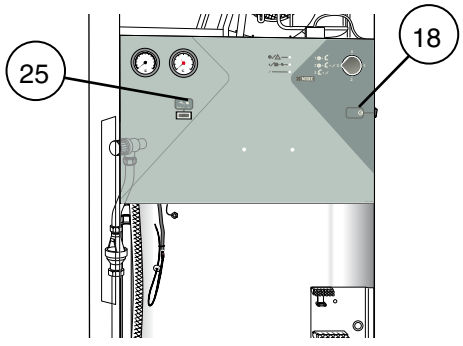
FIGHTER 200P is equipped with a three-mode-switch (25) in order to choose proper hot water operation, so-called hot water prioritising.

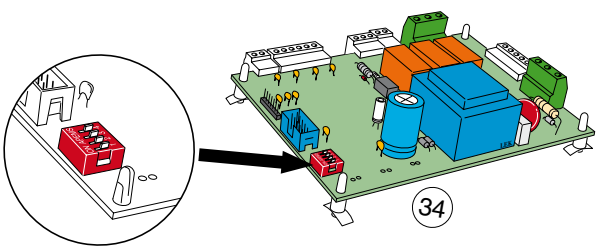
The following three modes are available:

Off This means that the hot water prioritising is not operational.

On Hot water prioritising is operational.

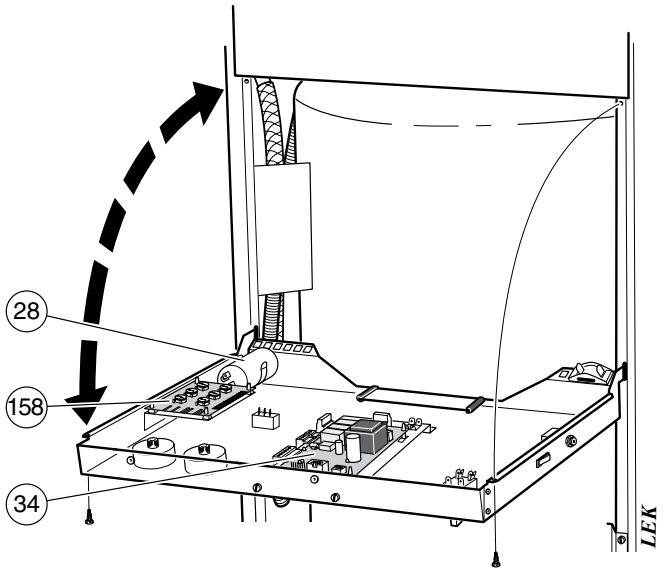
Auto Not used. Same function as mode ”On”.





Opening the cover on the distribution box

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).

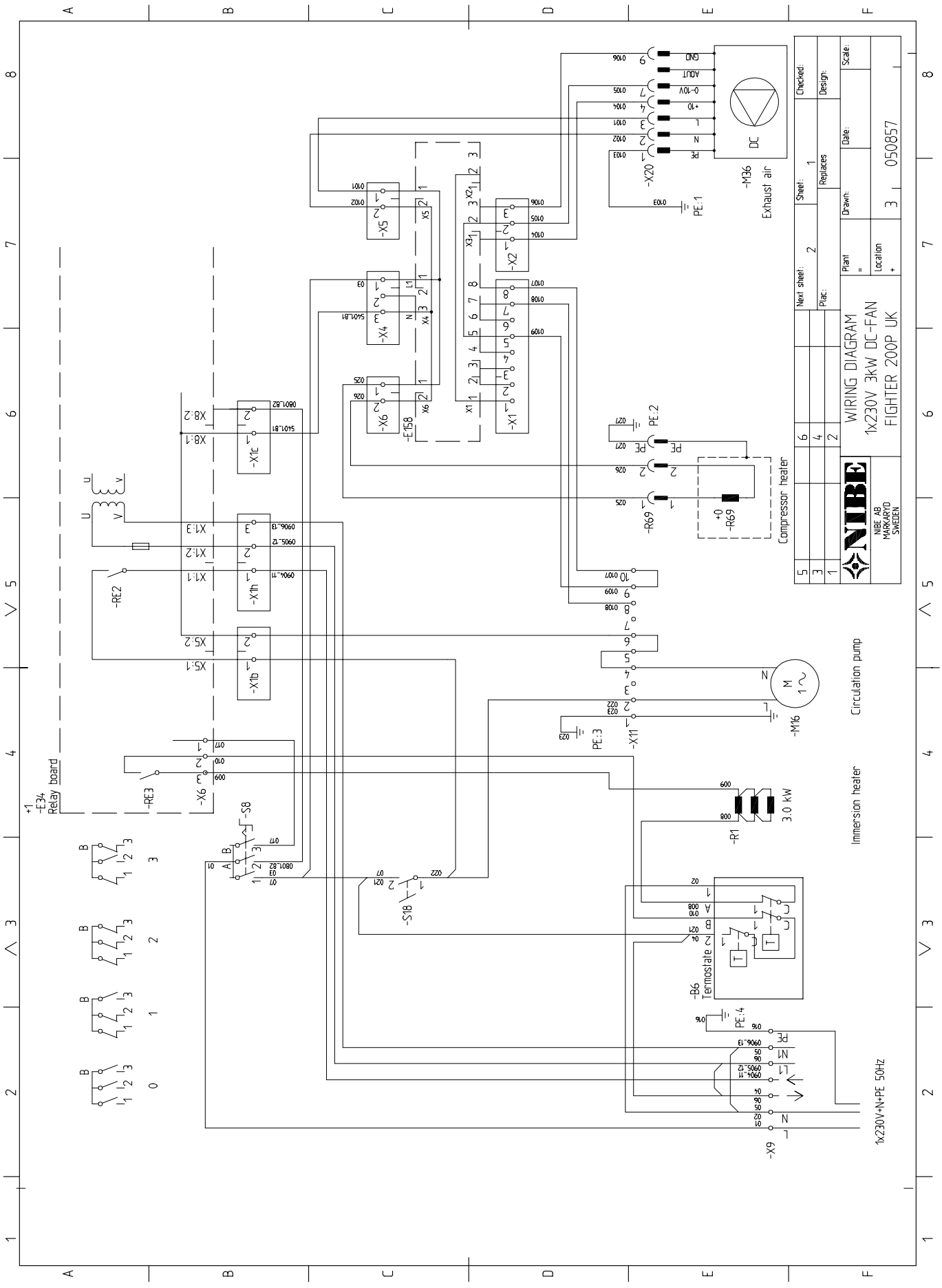


Refrigerant system

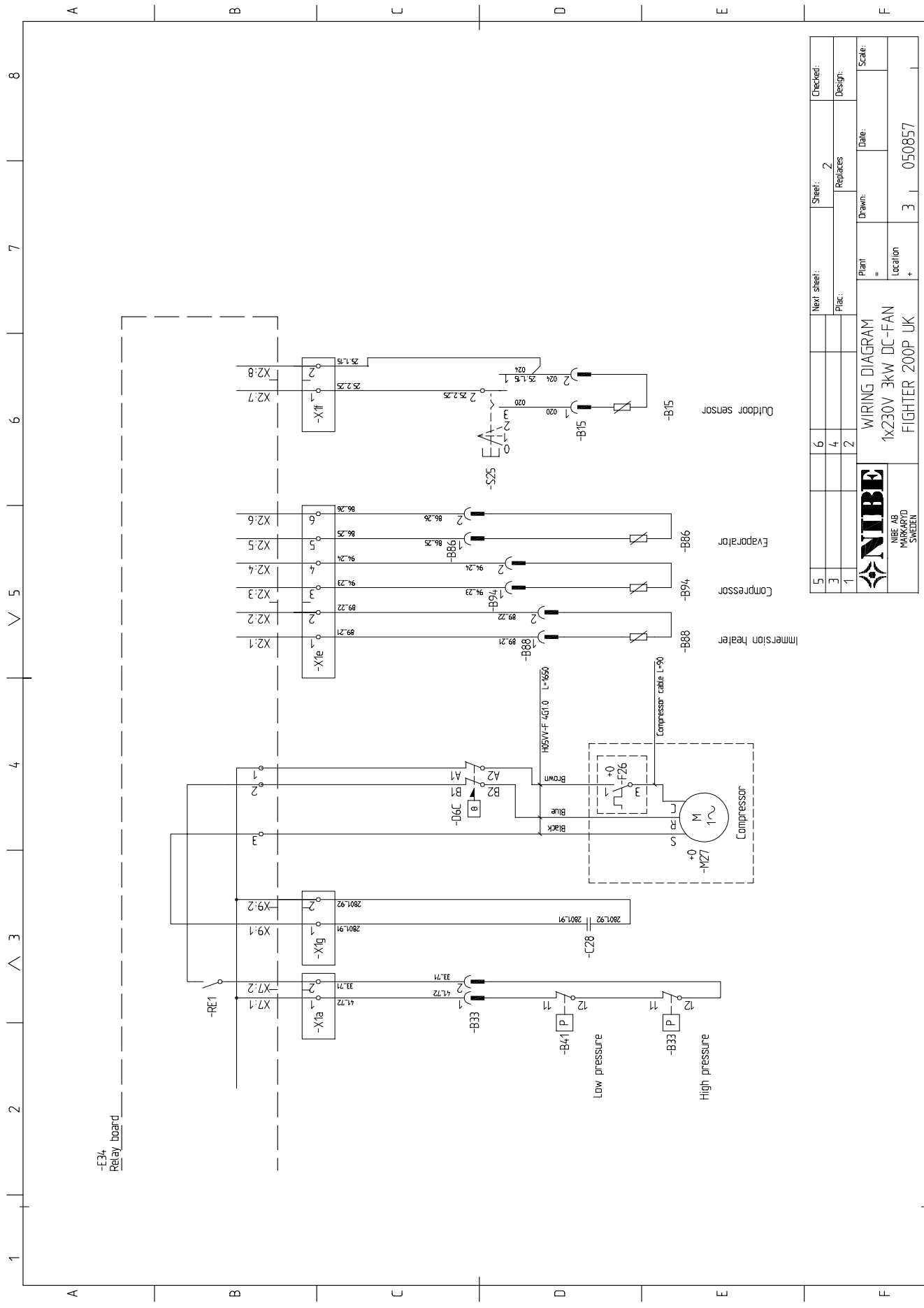


Work on the refrigerant system must be done by authorised personnel in accordance with the relevant legislation on refrigerants, supplemented by additional requirements for flammable gas, for example, product knowledge as well as service instruction on gas systems with flammable gases.

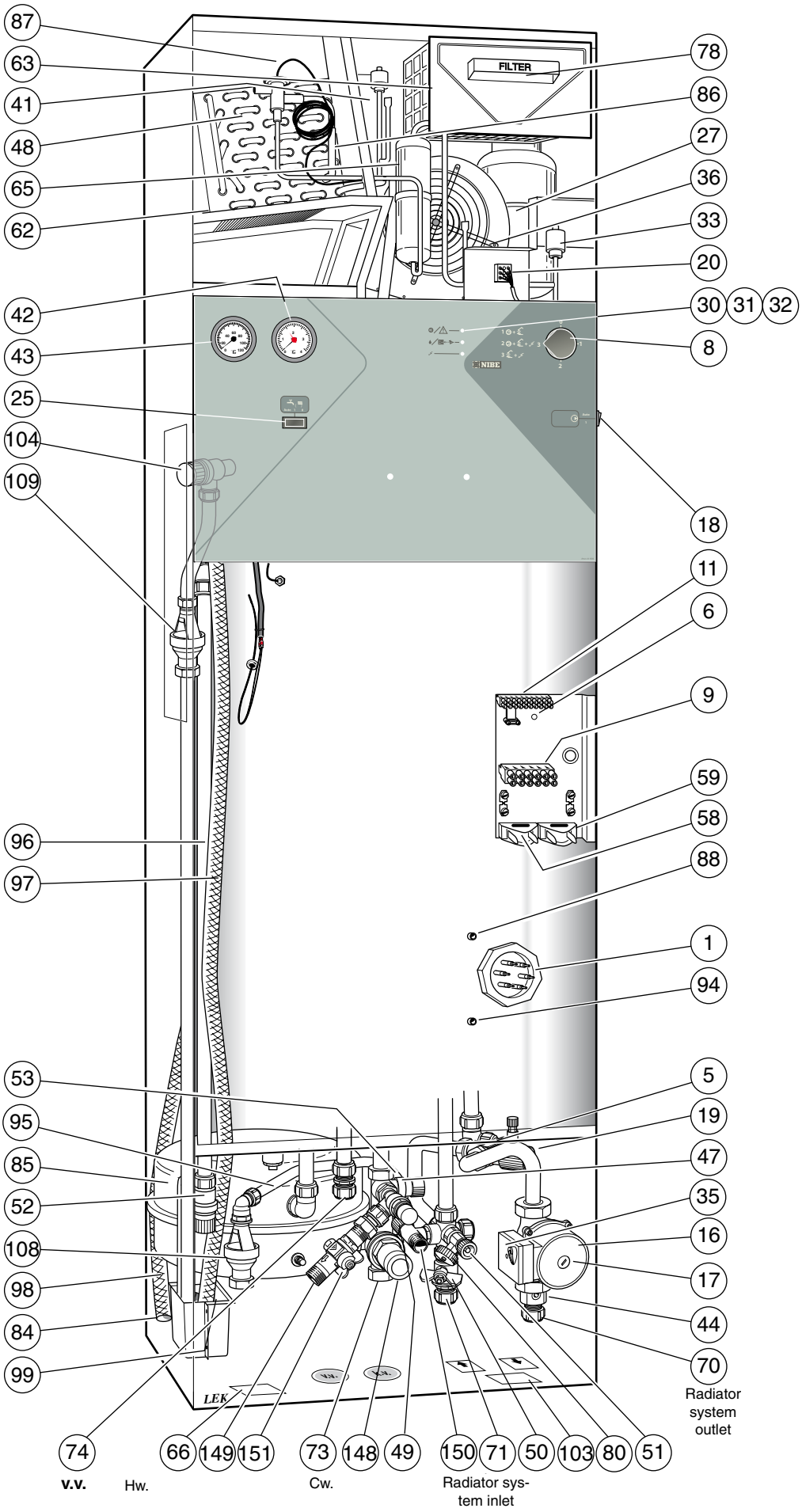
20 Wiring diagram



Wiring diagram



22 Components locations



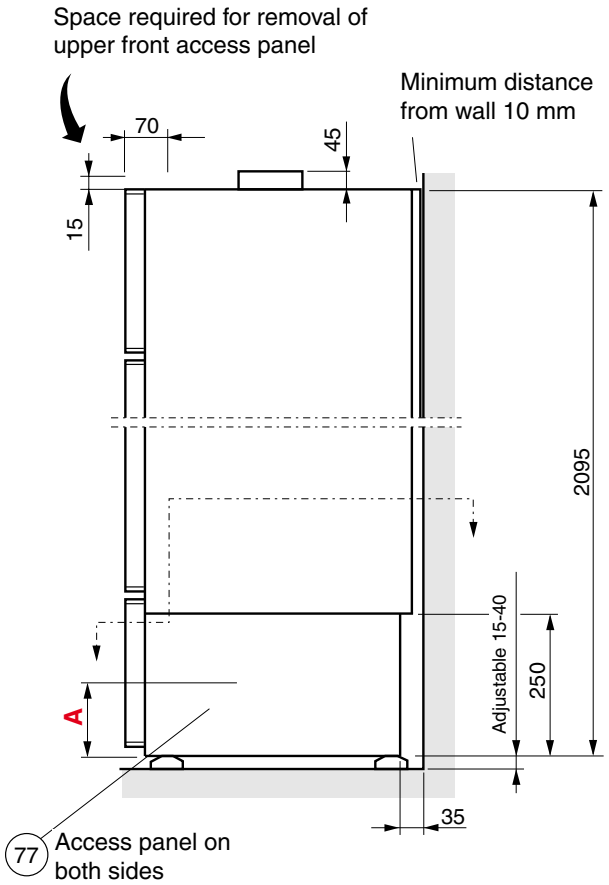
List of components

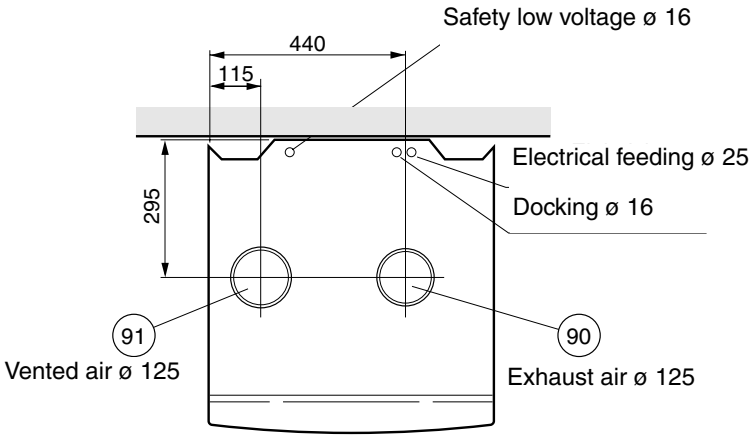
1 Immersion heater - 3,0 kW
3 Thermostat for immersion heater
5 Limiting valve, heating system
6 Temperature limiter
7 Temperature limiter, compressor
8 Power switch with mode 0 - 1 - 2 - 3
9 Feeding terminal and clock thermostat
11 Terminal block for fan switch
16 Circulation pump
17 Air screw, circulation pump
18 Pushbutton switch for circulation pump
19 Setting knob for limiting valve
20 Exhaust air connector
25 Pushbutton switch for hot water prioritising
26 Motor protection device for compressor
27 Compressor
28 Working capacitor for compressor
30 Indicator lamp "Compressor running/alarm"
31 Indicator lamp "Defrosting on/check filter"
32 Indicator lamp "Immersion heater on"
33 High pressure pressostat
34 Microprocessor card with power pack
35 Capacity setting, circulation pump
36 Exhaust air fan
41 Low pressure pressostat
42 Boiler pressure gauge
43 Boiler thermometer
44 Shutoff valve, pump and supply heating system
47 Safety valve, water heater
48 Expansion valve
49 Filling valve, heating system
50 Shutoff valve, return line heating system
51 Drain valve, heating system
52 Safety valve, heating system
53 Vacuum valve (hidden)
58 Tension load stop for feeding conductor
59 Tension load stop for room thermostat conductor
62 Evaporator
63 Air filter
65 Filter drier
66 Type plate
69 Compressor heater

		Connection	Setting-out dimensions A	B	C
70	Flow line, heating system	Compression ring Ø 22 mm	100	465	90
71	Return line, heating system	Compression ring Ø 22 mm	130	465	190
73	Cold water connection	Compression ring Ø 22 mm	180	465	290
74	Hot water outlet from water heater	Compression ring Ø 22 mm	295	465	345
77	Side access panel to valve connections				
78	Filter box (hidden)				
80	Drain connection, heating system	R 15 utv			
82	Room thermostat (accessory)				
84	Ventilation opening				
85	Expansion vessel				
86	Temperature sensor from evaporator				
88	Temperature sensor from immersion heater & hot water prioritising				
90	Ventilation connection for exhaust air	Ø 125 mm	2095	295	160
91	Ventilation connection for vented air	Ø 125 mm	2095	295	485
94	Temperature sensor for working compressor				
95	Overflow pipe, safety valve water heater				
96	Overflow pipe from heating system safety valve				
97	Condensate drain from fan box				
98	Overflow water discharge	PVC-pipe, 32 mm outer diameter			
99	Collecting funnel, waste water				
103	Serial number sign				
104	Temperature and pressure valve				
107	Expansion vessel, tap water				
108	Tundish from safety valve				
109	Tundish from pressure valve				
148	Pressure reduction valve				
149	Connection for flexible hose to CW-side				
150	Connection for flexible hose to heating-side				
151	Filling valve, heating system cw-side				
158	Circuit board for fan speed				

24 Dimensions

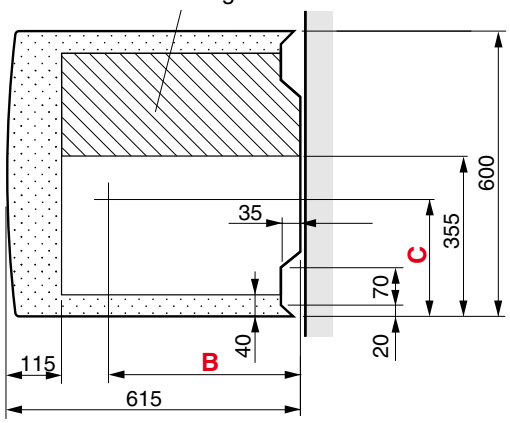
Dimensions and setting-out coordinates



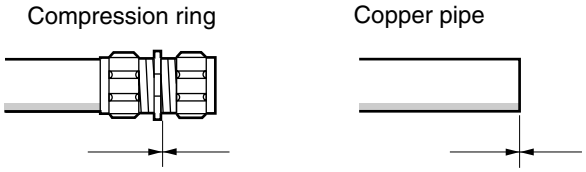


A clear space of 500 mm is needed in front of the heat pump for servicing.

When running pipes in the hatched area to facilitate servicing.



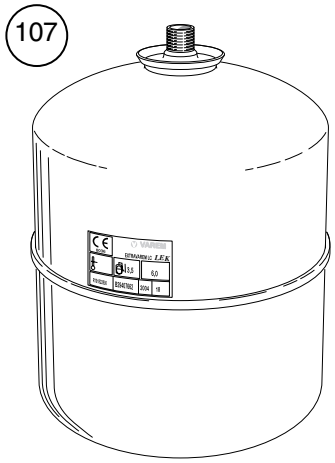
Principle of dimensioning



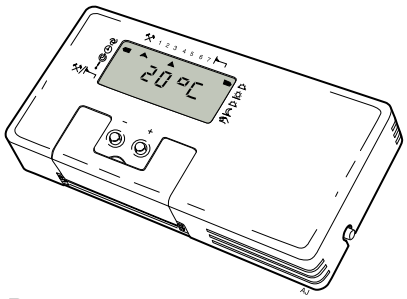
A, B and **C**: see "Connection" in "Component list". Pipes must not be run from the floor in the area indicated by dots.

Enclosed kit

Expansion vessel, tap water
(is delivered separately)

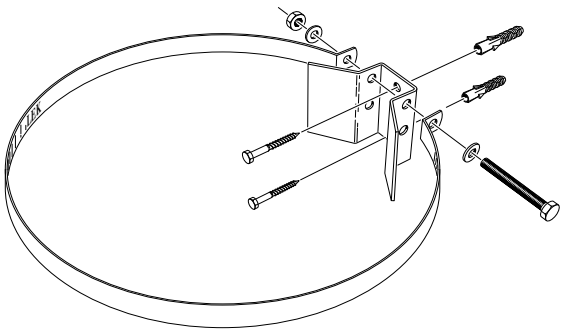


Clock thermostat

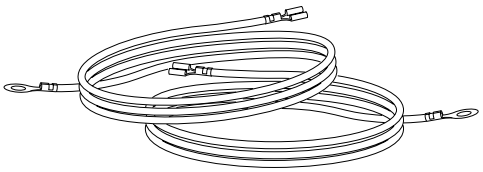


Part no 418 645

Bracket
(is delivered separately)



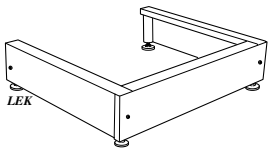
Earth cable



Part no. 418 172

Accessories

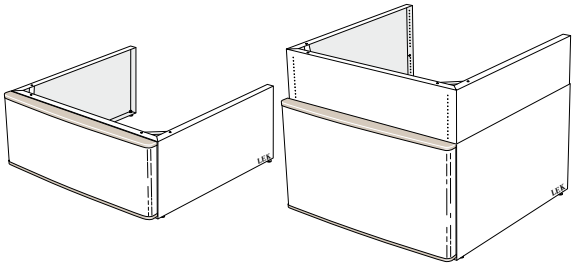
Heightening console
Height: 125 mm



Part no 089195

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

26 Technical specifications

CE IP 21

Height (excl. feet 15-40mm)	2 095	mm
Required ceiling height	2 185	mm
Width	600	mm
Depth	615	mm
Net weight	195	kg
Total volume	240	liter
Volume in double jacket	70	liter
Water heater volume	170	liter
Expansion vessel volume, heating system	12	liter
Expansion vessel volume, tap water	18	liter
Supply voltage	230	V~ 1-phase + N
Max operating current	16,7	A
Immersion heater power rating	3,0	kW
Circulation pump power rating	100	W
Exhaust air fan power consumption (DC)	25–140	W
Compressor power rating	550	W
Protection	IP 21	
Break pressure for high pressure pressostat	2,45	MPa (24,5 bar)
Break pressure for low pressure pressostat	0,15	MPa (1,5 bar)
Maximum pressure in water heater	0,9	MPa (9 bar)
Maximum pressure in double jacket vessel	0,25	MPa (2,5 bar)
Design pressure in double jacket volume	0,25	MPa (2,5 bar)
Refrigerant quantity	420	g
Refrigerant type	R290	(propane)
Cut-in temperature for compressor	50	°C * (Controlled by a separate sensor)
Cut-out temperature for compressor	53	°C *
Cut-in temperature for immersion heater	49	°C *
Cut-out temperature for immersion heater	52	°C *
Setting area for the limiting valve	38 – 55	°C
Cut-out temperature, termostat for immersion heater	70	°C
Cut-out temperature, temperature limiter for immersion heater	88	°C
Cut-out temperature, temperature limiter for compressor	88	°C
Sound power level**	46 – 50	dB(A)
Sound level in room where installed***	42 – 46	dB(A)

* Concerns settings on delivery

** A-weighted sound power level (LWA). The value varies with the selected fan curve.

*** A-weighted sound pressure level (LpA). The value varies with the damping capacity of the room. These values apply with a damping of 4 dB.

COP and heating capacity according to EN 14511-2:2004		
COP	2,60	
Heating capacity	1,35	kW
Total Power input	0,535	kW
Current	2,7	A
Rating condition		
Exhaust air:		
Air flow	150	m^3/h
Inlet dry bulb temperature	20	°C
Inlet wet bulb temperature	12	°C
Water:		
Inlet temperature	40	°C
Outlet temperature	45	°C

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