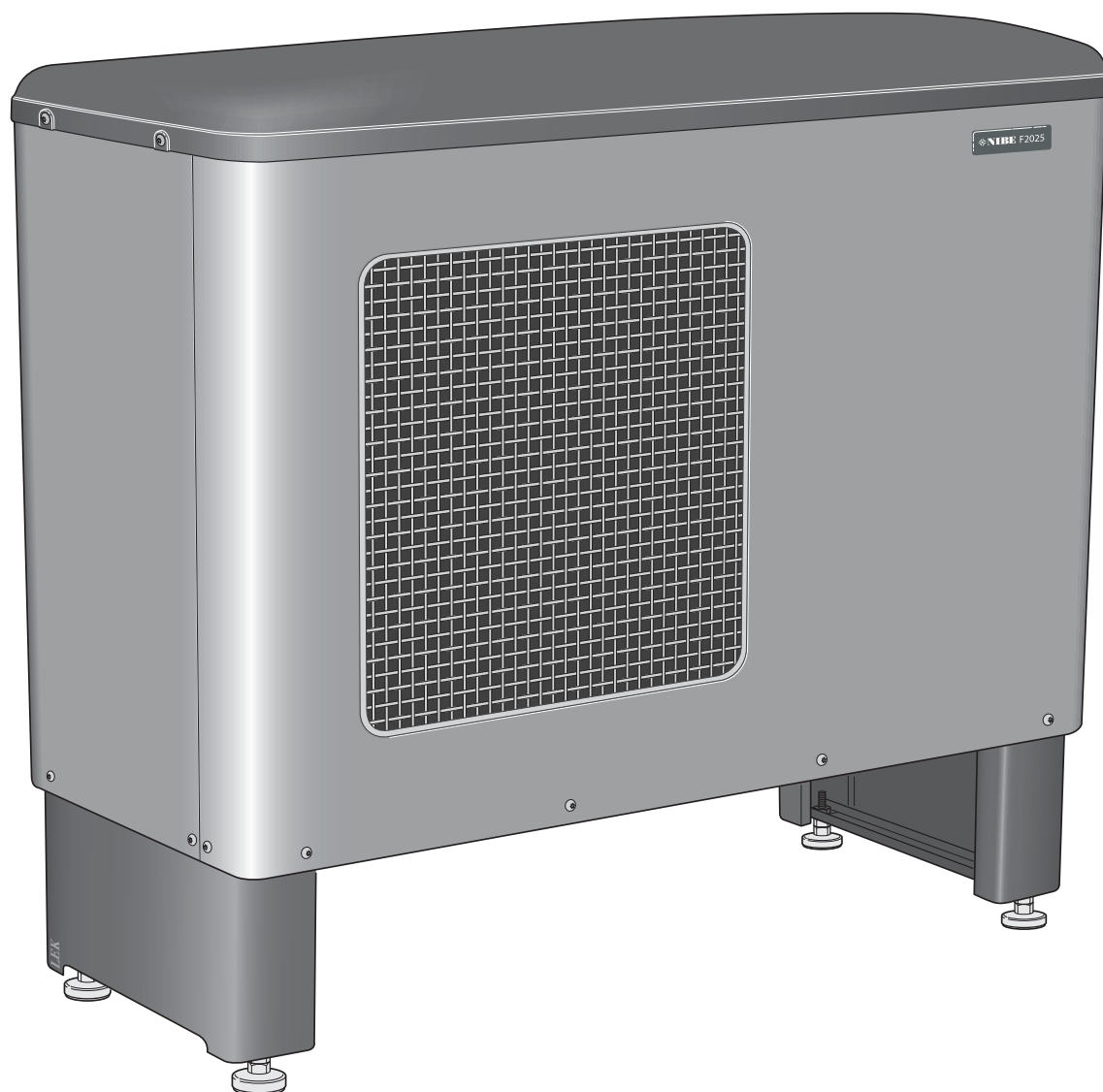


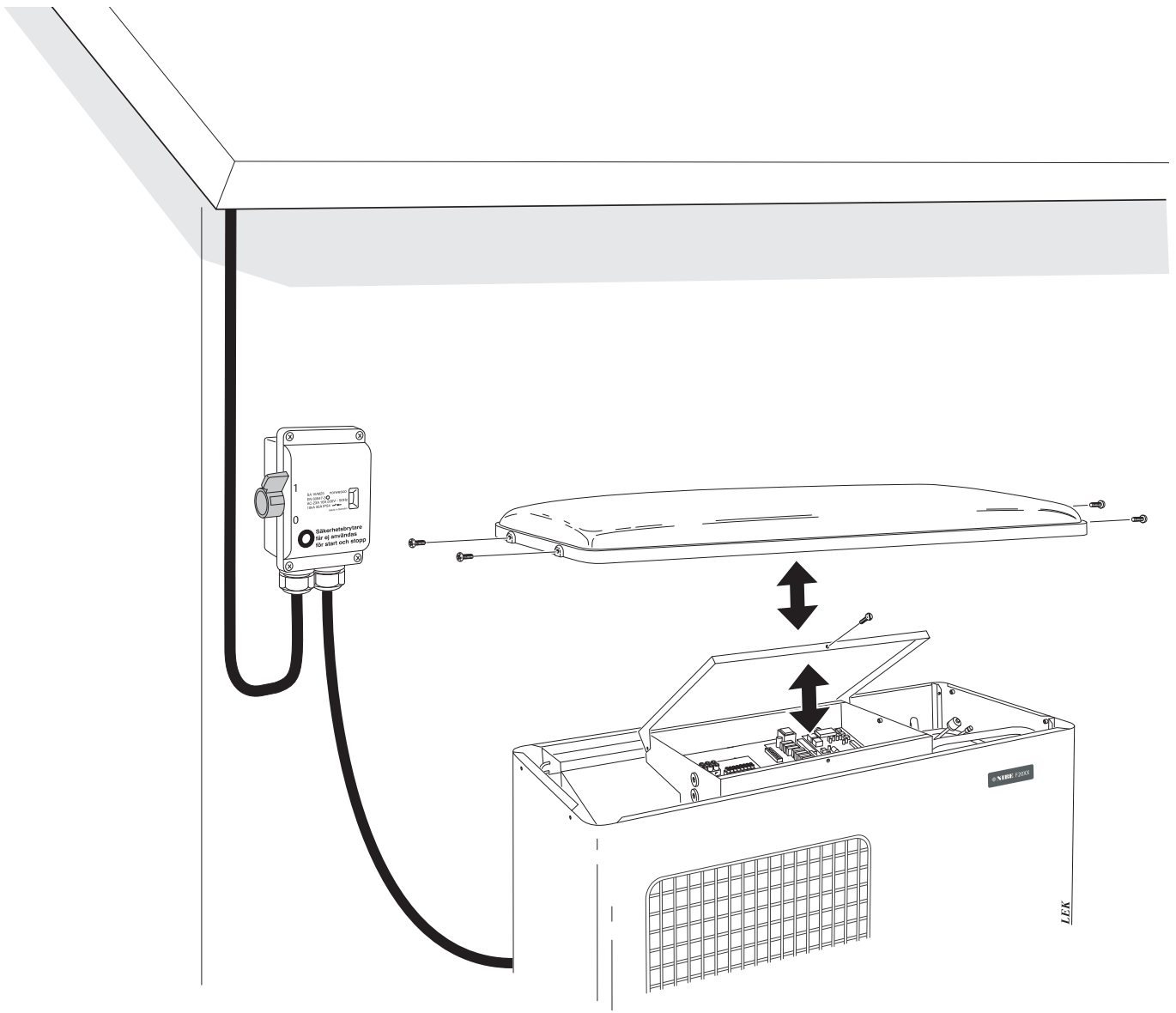


MOS GB 1035-3
F2025
031245

INSTALLATION AND MAINTENANCE INSTRUCTIONS

F2025





For Home Owners

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General

In order to get the greatest benefit from your heat pump F2025 you should read through the For Home Owners section in this Installation and Maintenance Instruction.

F2025 is a basic heat pump for heating small houses, apartment blocks and small industrial premises. Outdoor air is used as a heat source.

F2025 is a Swedish-made quality product offering a long life span and reliable operation.

Safety information

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.

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Serial number* (103), must always be stated in all correspondence with NIBE.

Installation date

Type designation

F2025-_____

Installation engineers

Setting

Channel		Factory setting
A1	Communications address	1
A2	Max return temperature	48 °C
A3	Connection diff. return temp.	4 °C
A4	Start interval compressor	20 min
A5	Balance temperature	0 °C
A6	Time delay addition relay	120 min
A7	Stop temperature	-20 °C
A8	Min. interval between defrosting	see page 26
A9	Start defrosting	1 °C
A10	Stop defrosting	+10 °C
A11	Longest defrosting	7 min

Any changes in the basic settings are noted here.

Datum _____ Sign _____

*See "Component positions" page 41 for location of the serial number.

System description

Principle of operation

F2025 is an air/water heat pump, specially designed for the Nordic climate. F2025 utilises the outside air so there is no need for bore holes or coils in the ground. F2025 has an automatic 2-stage capacity control of the fan (does not apply to F2025-6 kW, which only has one fan speed).

F2025 is designed for **water based heating systems and can be used together with most electric boilers, oil-fired boilers or equivalent. The heat pump includes an advanced control system for optimal control. F2025 is started by a start signal from another controller or thermostat.

F2025 can also be controlled by a specially designed controller, SMO 10 *. This connects and disconnects the additional

heat and controls switching between room heating and hot water heating.

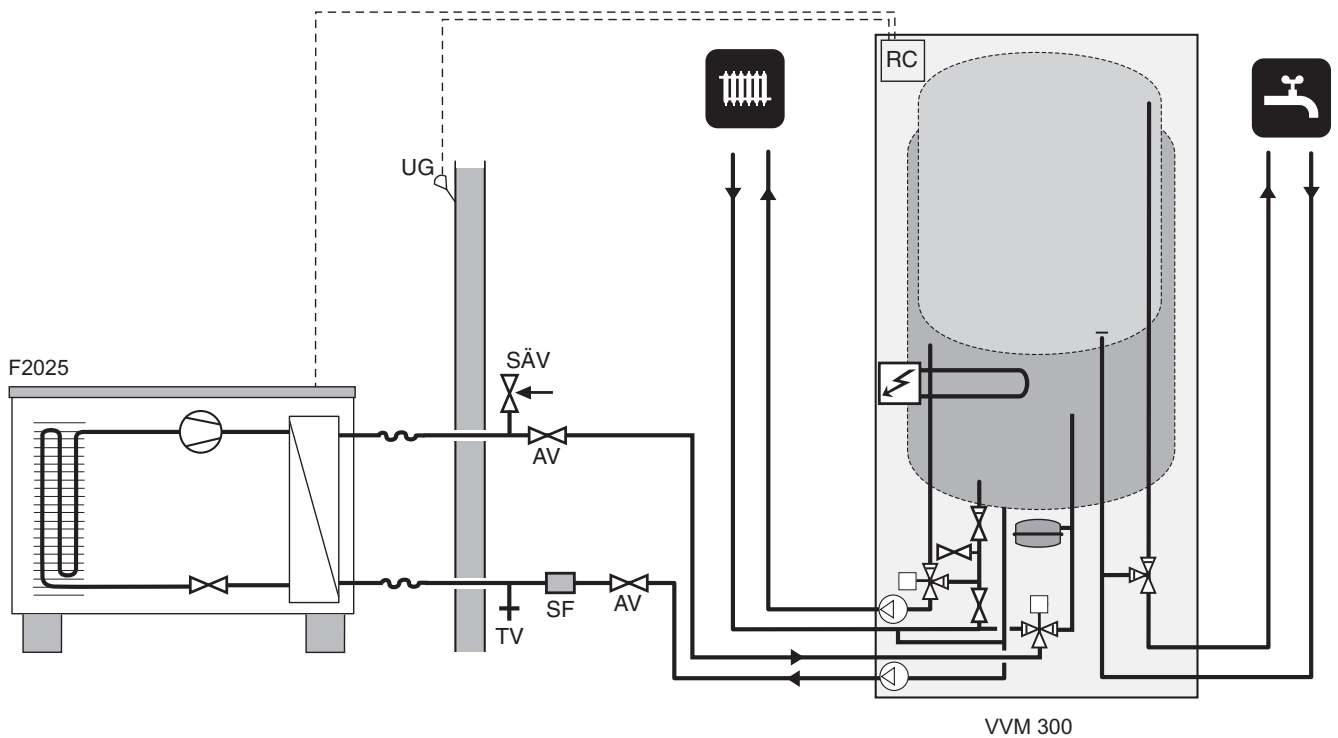
Accessories such as extra shunt group and pool control can be connected if SMO 10 is present.

F2025 can both heat hot water effectively at high outdoor temperatures and give a high output to the heating system at low outdoor temperatures.

If the outdoor temperature drops to a level below the stop temperature all heating must then occur with external additional heat.

F2025 is manufactured in four sizes: 6, 8, 10 and 14 kW.

The material has been chosen for a long service life and is designed to withstand the Nordic outdoor conditions.



* accessory for F2025

** When docking with F2025, a total water volume, incl. boiler, radiators, pipes, etc. of at least 20 litres boiler water per kW output on the heat pump is recommended.

The heating medium side and the hot water side must be fitted with the necessary safety equipment in accordance with the applicable regulations.

Maintenance routines

General

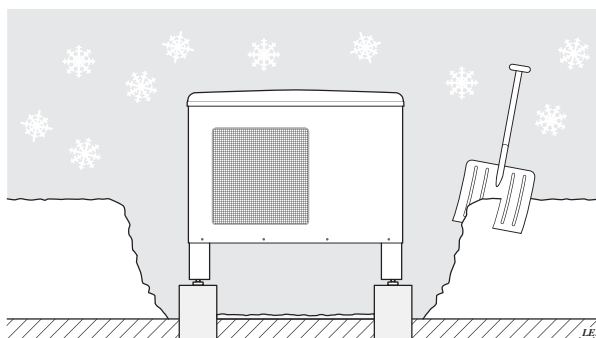
F2025 is equipped with control and monitoring equipment, however some exterior maintenance is still necessary.

Make regular checks throughout the year that the inlet grille is not clogged by leaves, snow or anything else. Check through the cold part of the year to make sure that there isn't a build up of snow and/or ice under F2025. The condensation water trough KVT 11 accessory is available for management and removal of condensation. Strong wind combined with heavy snowfall can block the intake and exhaust air grilles. Make sure that there is no snow on the grilles.

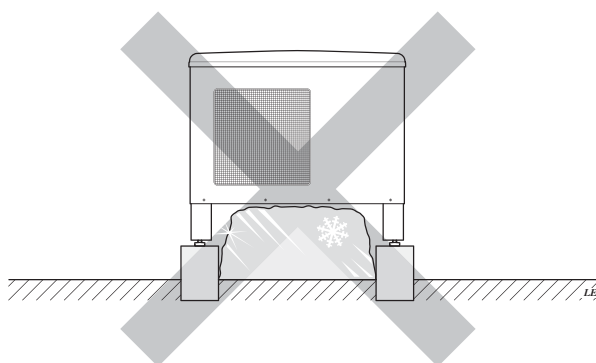
If necessary the outer casing can be cleaned using a damp cloth. Care must be exercised so that the heat pump is not scratched when cleaning. Avoid spraying water into the grilles or the sides so that water penetrates into F2025. Prevent F2025 coming into contact with alkaline cleaning agents.

WARNING!

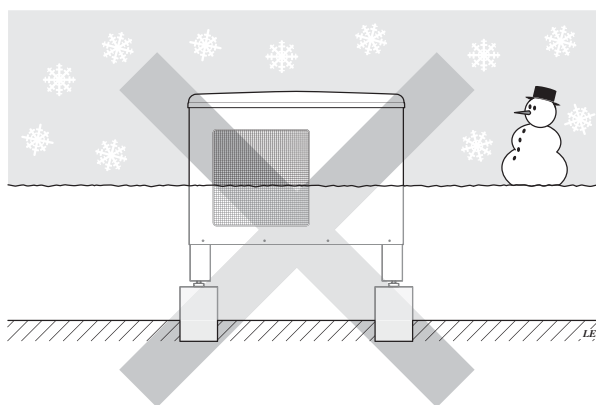
Insufficient maintenance can cause serious damage to F2025 which is not covered by the guarantee.



Keep free of snow and/or ice.



Prevent ice and/or snow building up under F2025.



Prevent snow building up and covering the grille on F2025.

General points for the installation engineer

Transport and storage

F2025 should be transported and stored vertically.

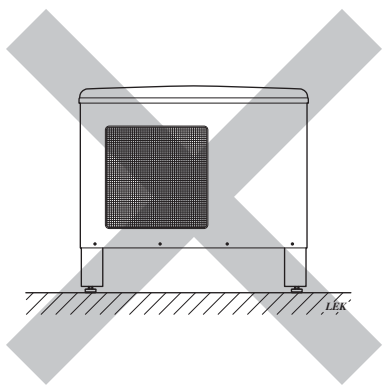
Inspection of the installation

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

If the heat pump is replaced, the installation must be inspected again.

Assembly

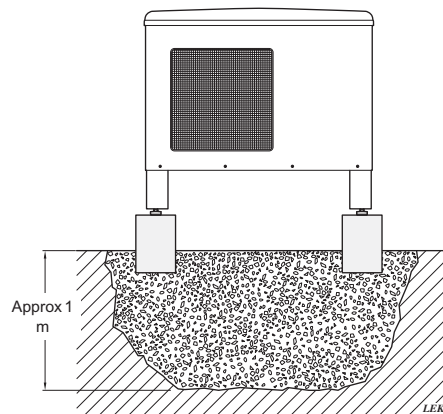
F2025 should be installed outdoors on a firm surface, preferably a concrete foundation with ground stand or wall mounting. The F2025 should not be positioned next to sensitive walls, for example, next to a bedroom. Also ensure that the placement does not inconvenience the neighbours. Care must be exercised so that the heat pump is not scratched during installation.



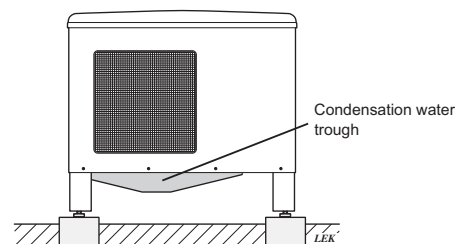
Do not place F2025 directly on the lawn or other non solid surface.

Large amounts of condensation water as well as melt water from defrosting can be produced. Provide good drainage at

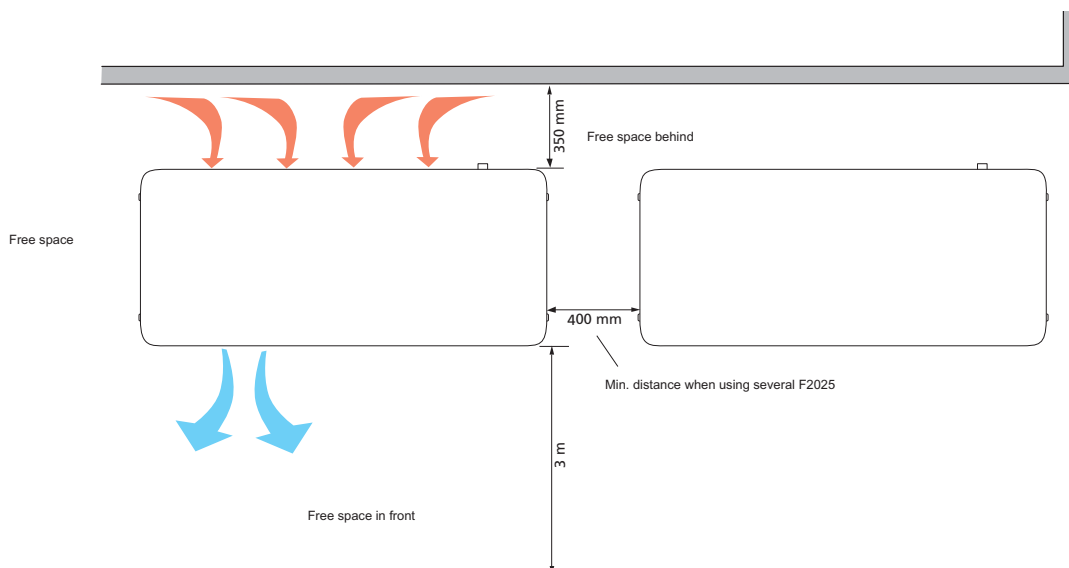
the installation area and make sure water cannot run out onto paths or the like during periods that ice can form. It is also possible to install the accessory KVT 11, which is a collecting trough for leading off condensation water. **Condensation water must be led off to a drain or similar.**



Place F2025 on concrete pillars resting on macadam or shingle for good drainage. The concrete pillars must be positioned so that the lower edge of the heat pump is at the level of the average local snow depth, although a minimum of 400 mm.



The distance between F2025 and the house wall must be at least 350 mm. Clearance in front of F2025 should be at least one metre. **F2025 must not be placed so that recirculation of outdoor air can occur. This causes lower output and impaired efficiency.**



Control

F2025 is equipped with an internal electronic controller that handles all functions necessary for heat pump operations.

Accordingly, defrosting, stop at max/min temperature, connection of the compressor heater as well as enabling the heater for the drip pan, monitoring of motor protection and pressure switches are controlled.

The number of starts and the operating time can also be read.

The integrated controller is set during installation and can be used during a service.

Under normal operation conditions the home owner does not need to have access to the controller.

F2025 has an integrated electronic return line sensor that limits the return temperature.

F2025 can also be switched on/off via signals from other control equipment or a thermostat. If F2025 is controlled from the accessory SMO 10 the control is described in the instructions supplied.

SMO 10 communicates with F2025 which means that settings and measurement values from F2025 can be adjusted and read off in SMO 10 .

Pipe connections

General

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

F2025 operates up to a return temperature of about 50 °C and an outgoing temperature of about 58 °C from the heat pump. Because F2025 is not equipped with shut off valves these must be installed outside the heat pump to facilitate any future servicing. The return temperature is limited by the return line sensor and is adjusted on channel A2.

NOTE

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

Pipe coupling heating medium circuit

F2025 can be connected to the heating system, see the "Docking" section or one of the system solutions that can be downloaded from the website www.nibe.eu.

The heat pump must be vented by the upper connection (70, HM-out) using the venting nipple on the enclosed flexible hose.

The supplied particle filter (SF) must be installed before the inlet, i.e. the lower connection (71, HM-in) on F2025. **All outdoor pipes must be thermally insulated with at least 19 mm thick pipe insulation.**

The charge pump must be operational, even if F2025 is not running, to prevent damage due to freezing.

The charge pump can also be controlled directly from F2025, terminal (11), which takes the outdoor temperature into consideration. Alternatively, the heat pump is connected to an intermediate circuit with a heat exchanger, pump and water with anti-freeze (does not apply to docking with VVM300).

Shutoff (AV) and drain valves (TV) are fitted so that F2025 can be emptied in the event of prolonged power failures.

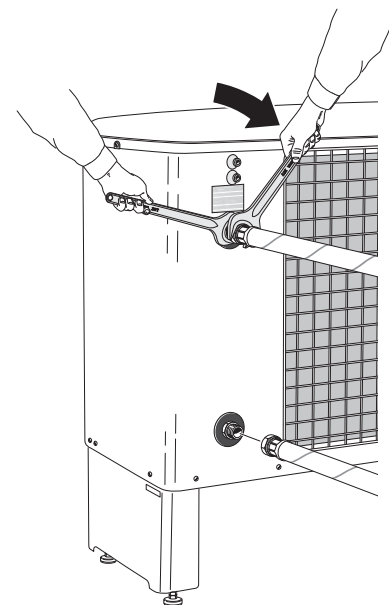
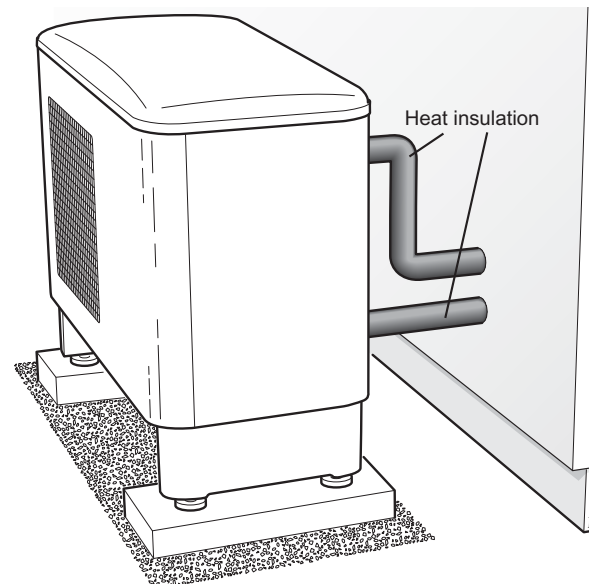
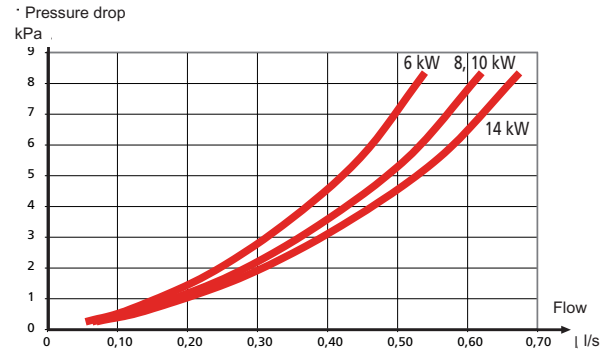
The supplied flexible hoses act as vibration dampers. The flexible hoses are fitted so a slight bend is created, thus acting as vibration damping.

Water volumes

When docking with F2025 a total water volume in the boiler and accumulator of at least 20 litres boiler water per kW output on the heat pump is recommended.

Pressure drop, heating medium side

F2025 -6, 8, 10, 14



Docking

General

F2025 can be installed in several different ways. The requisite safety equipment must be installed in accordance with current regulations for all docked options.

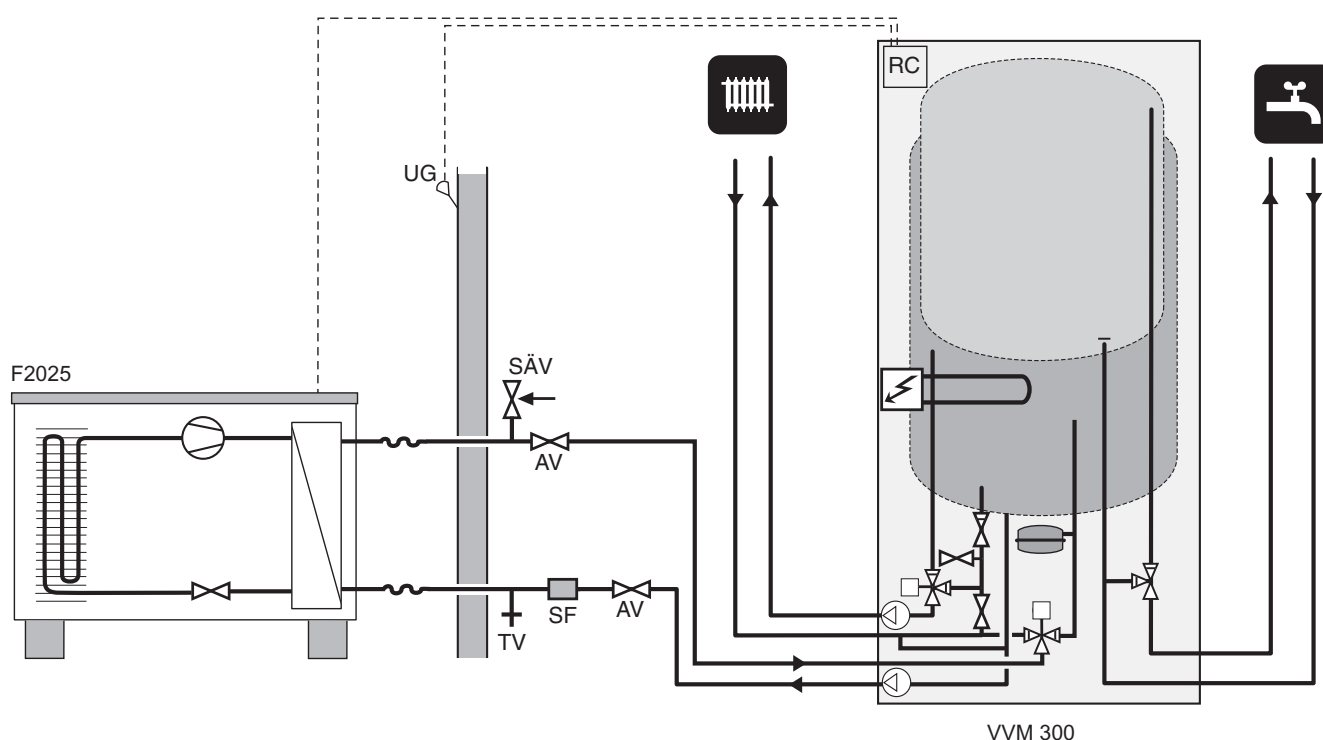
See www.nibe.eu for more docking options.

When docking with F2025, a total water volume, in the boiler and accumulator, of at least 20 litres boiler water per kW output on the heat pump is recommended.

Abbreviations

AV	Shut-off valve	
CP1	Circulation pump	
FG1	Temperature sensor, flow pipe	Included in SMO 10
HR	Auxiliary relay	
LP	Charge pump	
RG1	Return temperature sensor	Included in SMO 10
RV	Control valve	
SF	Particle filter	Included in F2025
SV	Shunt valve	
SÄV	Safety valve	
TV	Drain valve	
UG	Outside sensor	
VT	Heating thermostat	
VVG	Hot water sensor	

F2025 docked with VVM 300 (floating condensing)

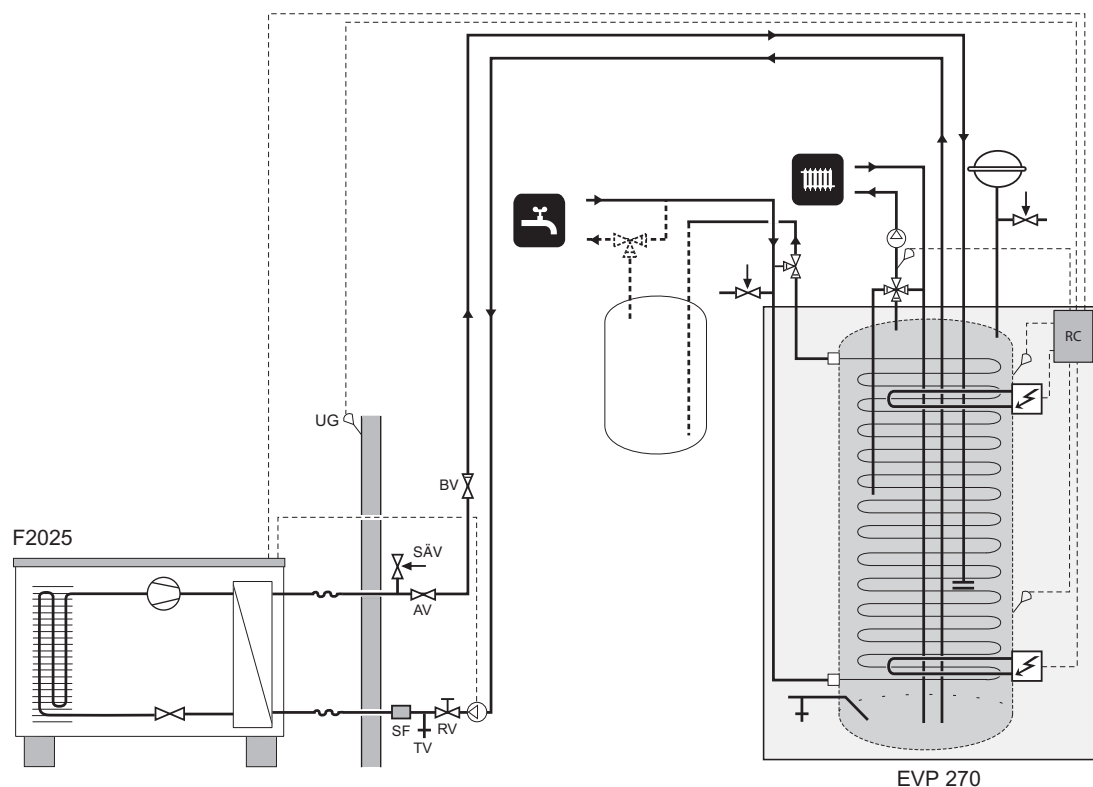


F2025 -6, -8 and -10 can be connected to VVM 300. F2025 is controlled by VVM 300. F2025 works with floating condensing against the heating system and prioritises hot water charging in VVM 300.

If F2025 cannot meet the heating requirement, additional heat is shunted in from VVM 300. If the outdoor temperature drops below the set stop temperature, VVM 300 engages and takes over heating.

NOTE

To prevent interference, sensor cables and communication cables must be separated (min 20 cm) from high voltage cables when cable routing.

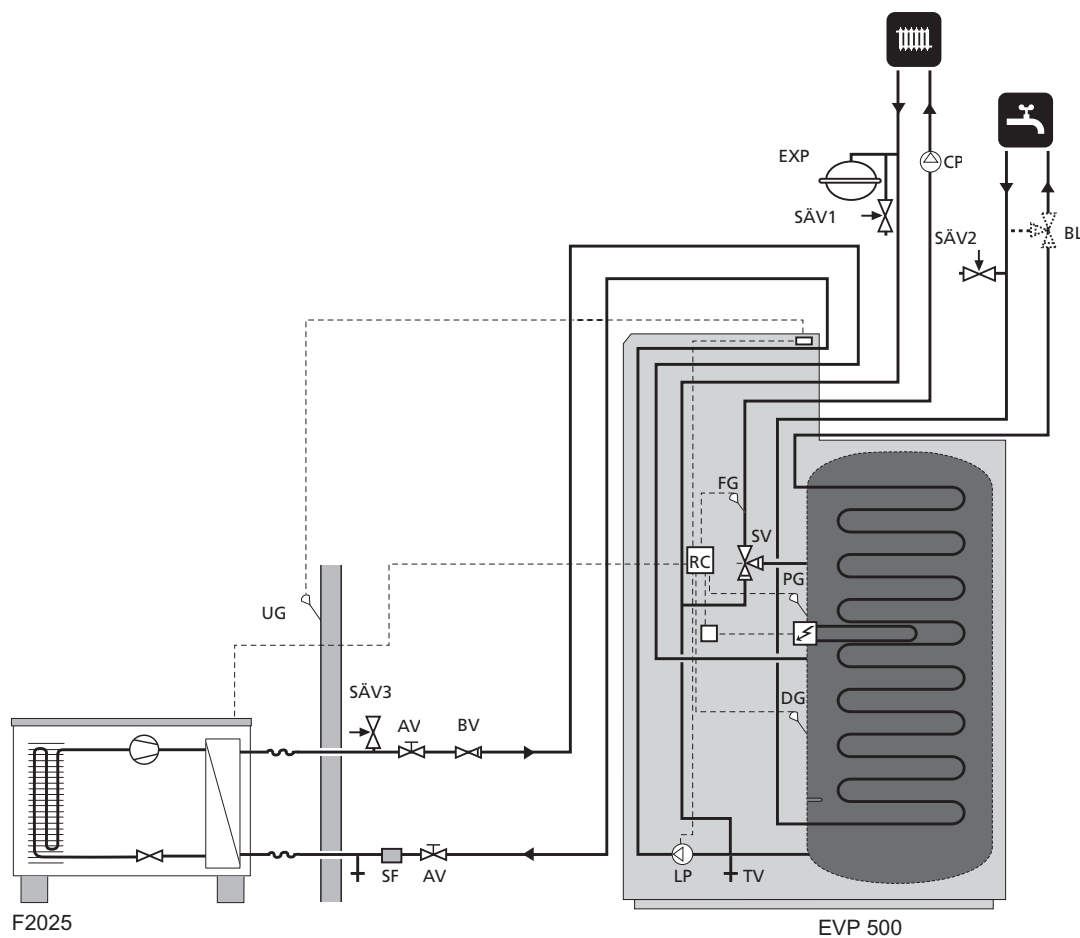
F2025 docked with EVP 270 (fixed condensing)

F2025 -6, -8 and -10 can be connected to EVP 270. F2025 works with fixed condensation to EVP 270.

If F2025 cannot meet the heating requirement, additional heat is shunted in from EVP 270. If the outdoor temperature drops below the set stop temperature, EVP 270 engages and takes over heating.

NOTE

To prevent interference, sensor cables and communication cables must be separated (min 20 cm) from high voltage cables when cable routing.

F2025 docked with EVP 500 (fixed condensing)

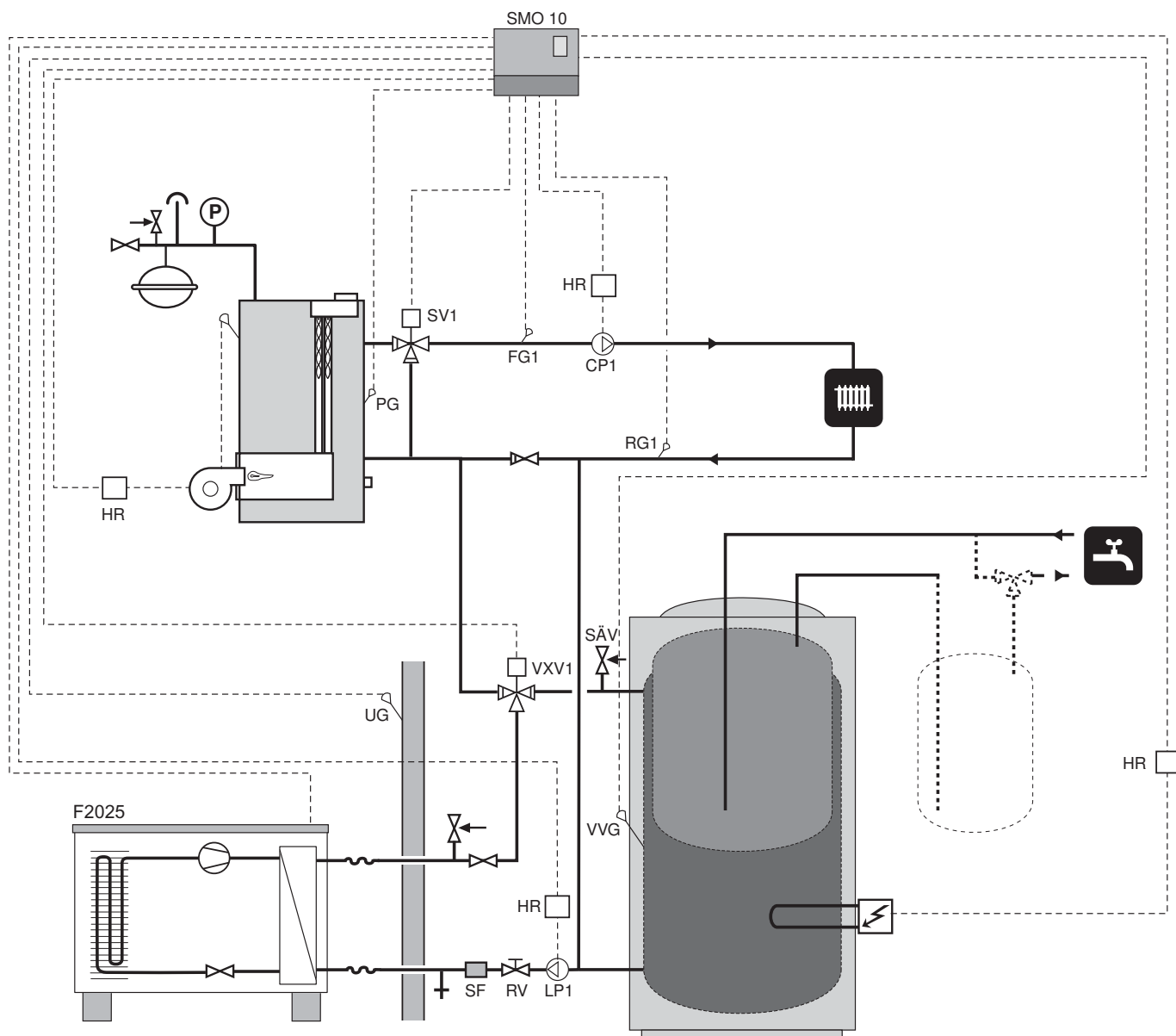
F2025 -6, -8, -10 and -14 can be connected to EVP 500. F2025 is controlled by EVP 500. F2025 works with fixed condensation to EVP 500.

If F2025 cannot meet the heating requirement, additional heat is shunted in from EVP 500. If the outdoor temperature drops below the set stop temperature, EVP 500 engages and takes over heating.

NOTE

To prevent interference, sensor cables and communication cables must be separated (min 20 cm) from high voltage cables when cable routing.

F2025 docked to the oil-fired/pellet boiler together with SMO 10 and water heater (floating condensing)



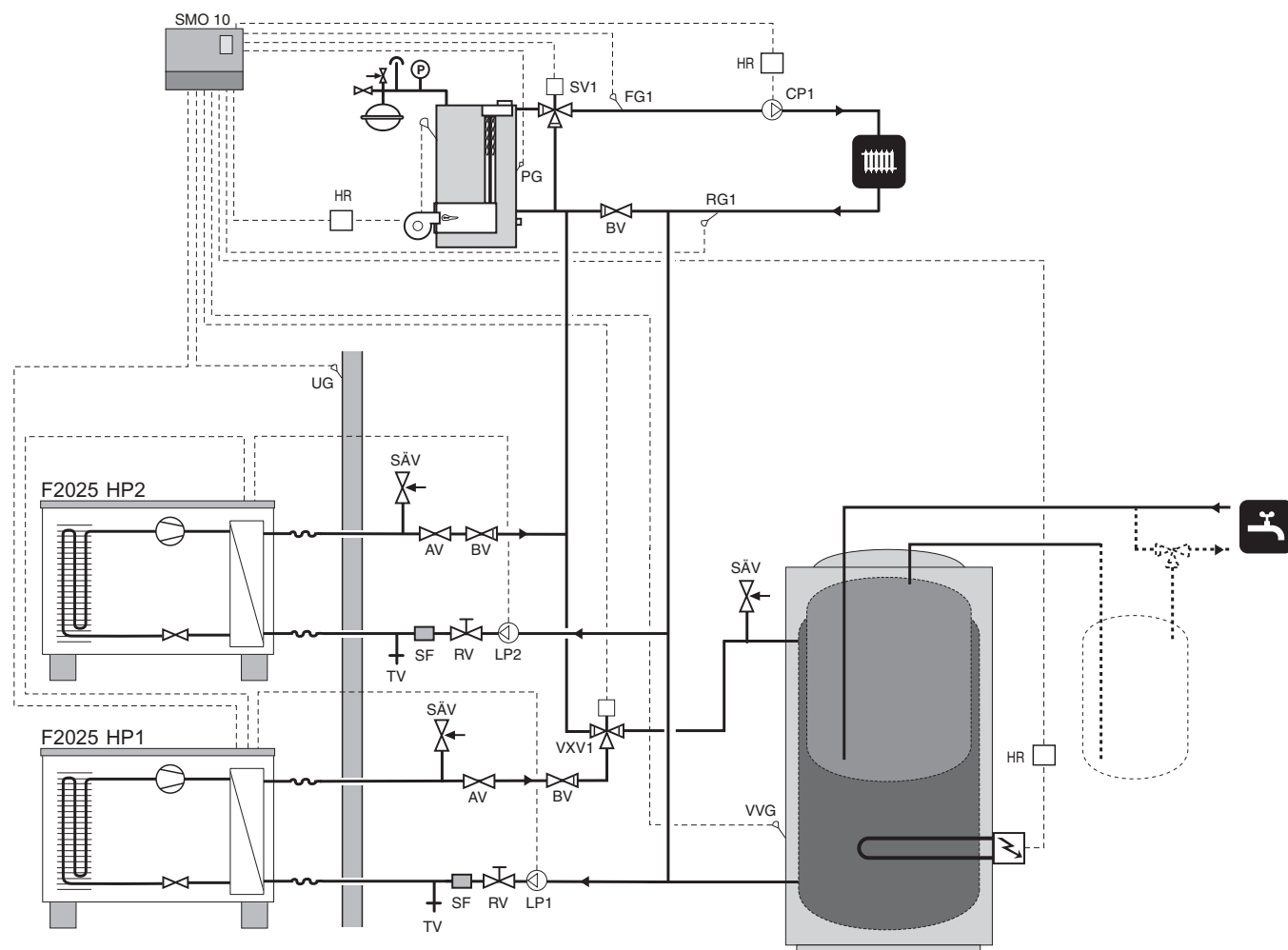
SMO 10 controls F2025, oil-fired boiler, circulation pumps, shunts, etc. F2025 works with floating condensing against the heating system and prioritises hot water charging via the three way valve (VXV1).

If F2025 cannot meet the heating requirement, the oil-fired boiler is started and additional heat is shunted in.

NOTE

To prevent interference, sensor cables and communication cables must be separated (min 20 cm) from high voltage cables when cable routing.

Several F2025 together with SMO 10 and water heater (floating condensing)



SMO 10 controls up to nine F2025 (of which max one for hot water), immersion heater, circulation pump, shunt, etc.

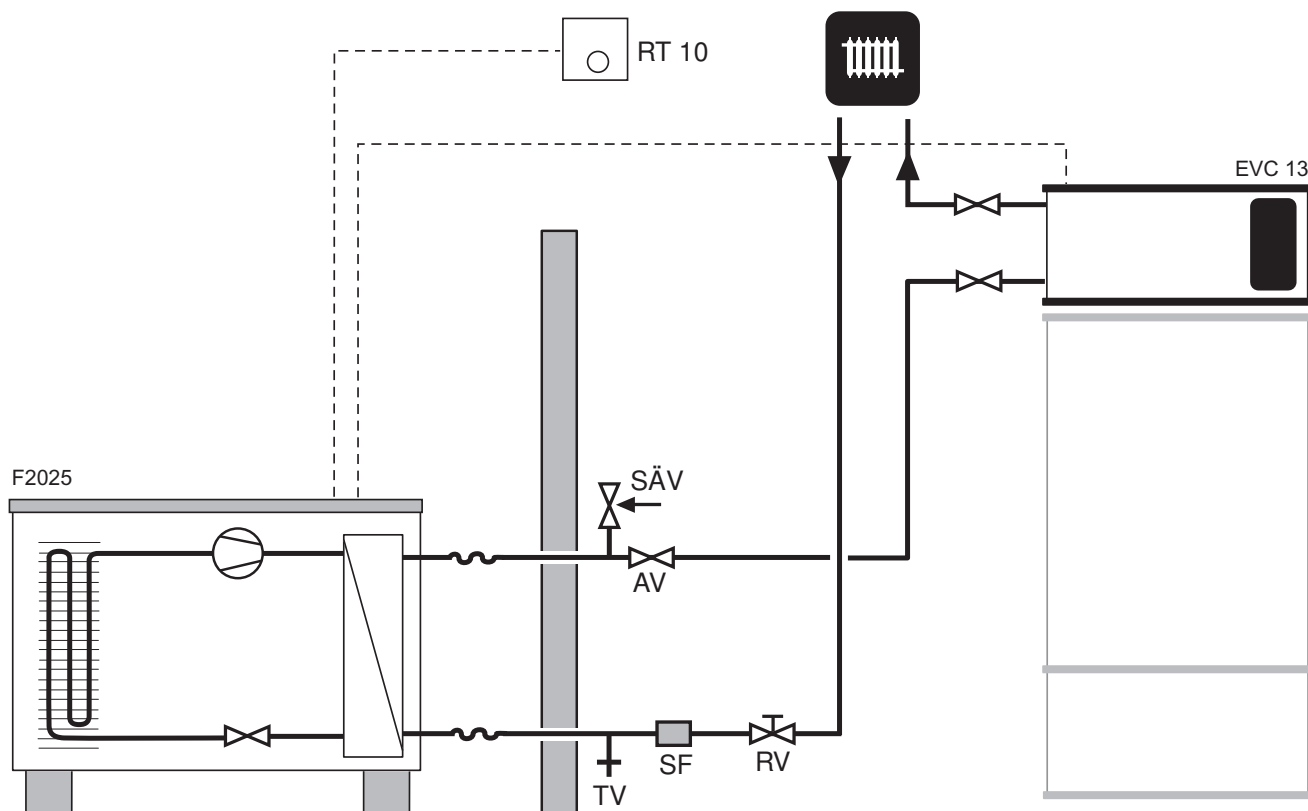
F2025 works with floating condensing against the heating system and prioritises hot water charging via three way valve VXV1. F2025 VP1 produces hot water.

If F2025 cannot meet the heating demand, additional heat is shunted in from the oil-fired boiler.

When additional heat is engaged, hot water is heated using the immersion heater in the hot water heater.

NOTE

To prevent interference, sensor cables and communication cables must be separated (min 20 cm) from high voltage cables when cable routing.

F2025 docked with EVC 13 (floating condensing)

F2025 is controlled by a room thermostat. F2025 works with floating condensing on the return from the heating system. If F2025 cannot meet the heating requirement the additional heat is shunted in using the existing control equipment from EVC 13.

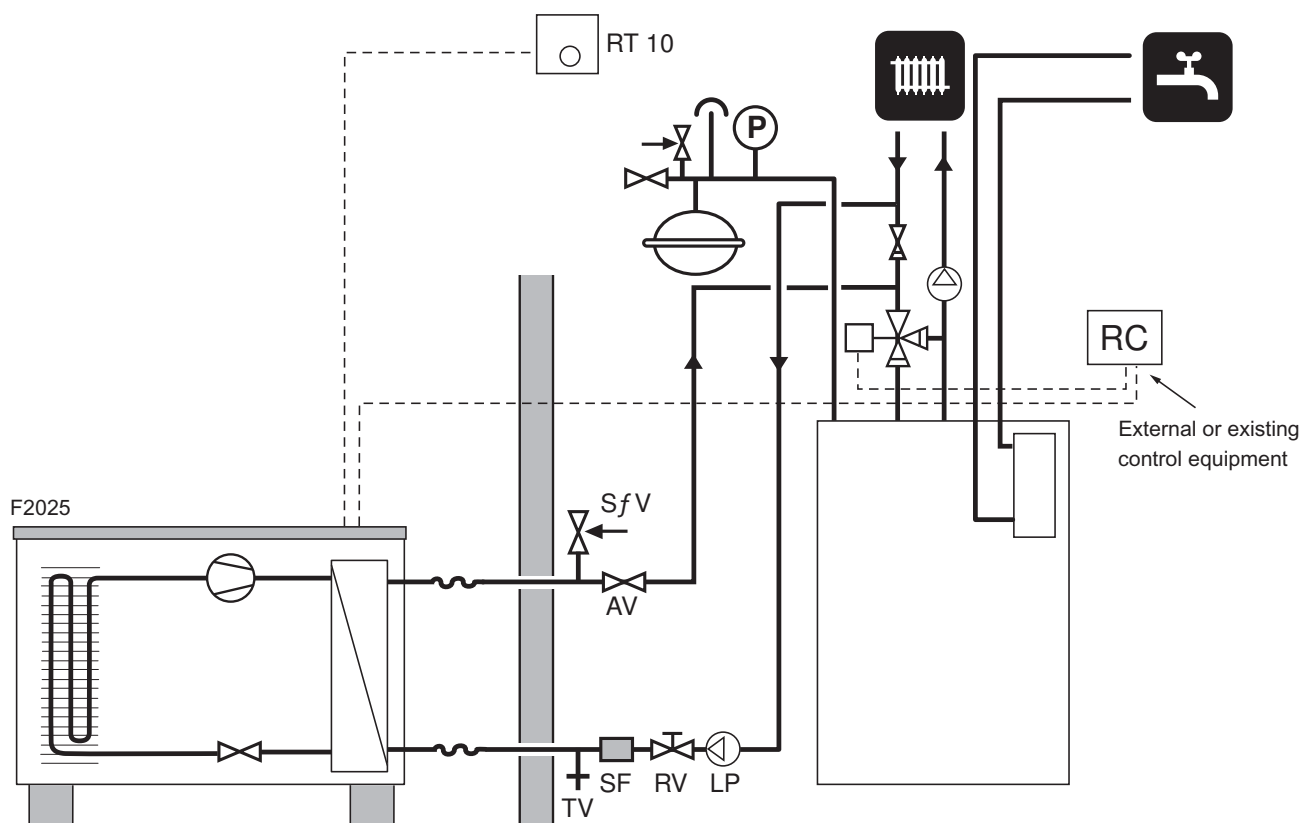
Additional heat can be blocked above the set outdoor temperature by means of the automatic control system in F2025. The heating medium also circulates through F2025 during the set stop temperature. Hot water production only takes place using the existing hot water heater.

The right curve is selected in EVC 13 so that F2025 is not disturbed.

This option requires accessory RT 10.

NOTE

To prevent interference, sensor cables and communication cables must be separated (min 20 cm) from high voltage cables when cable routing.

F2025 docked to an electric/oil boiler (floating condensing)

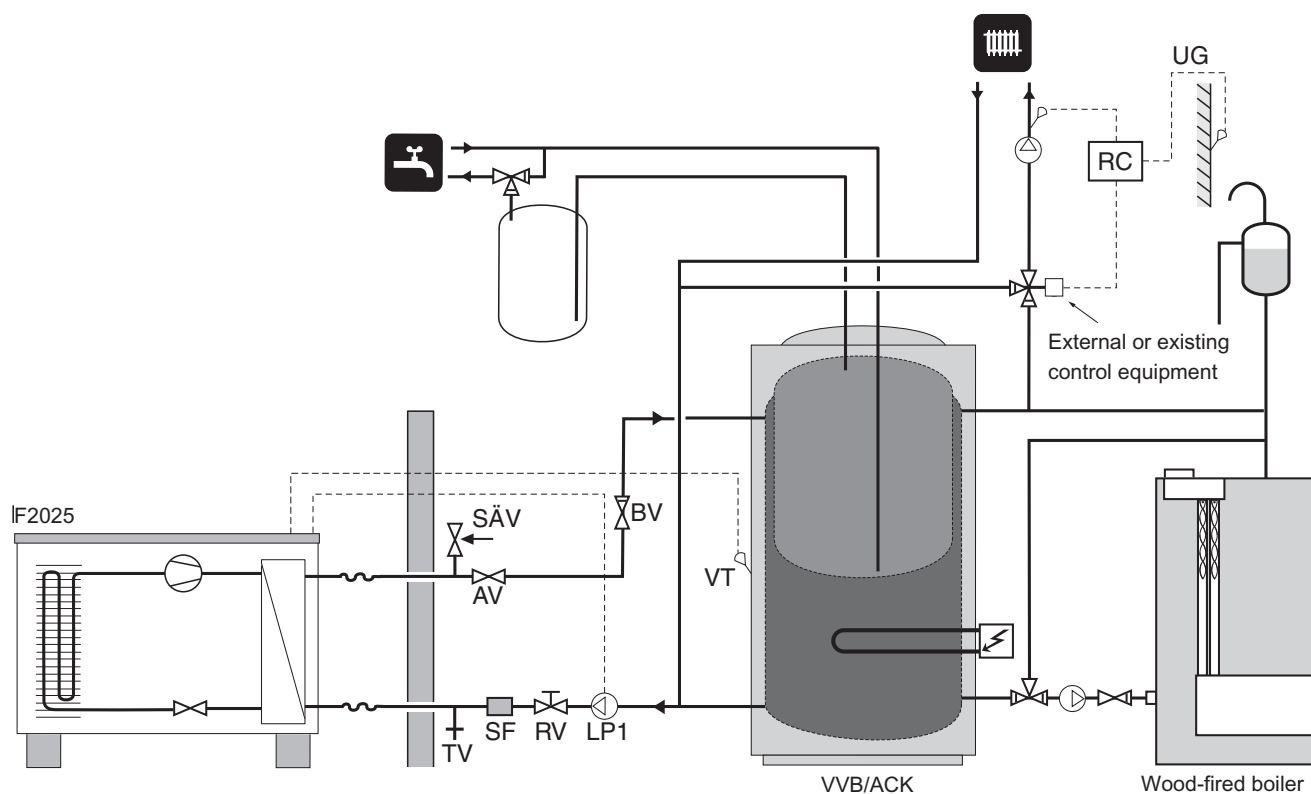
F2025 is controlled by a room thermostat. F2025 works with floating condensing on the return from the heating system.

If F2025 cannot meet the heating requirement the additional heat is shunted in using the existing control equipment.

Additional heat can be blocked above the set balance temperature by means of the automatic control system in F2025. In other cases the heat pump does not collaborate with the electric/oil fired boiler in the optimum way.

Hot water production only takes place using the existing electric/oil boiler.

This option requires accessory RT 10.

F2025 docked with wood fired boiler and hot water heater (fixed condensing)

F2025 charges the water heater/accumulator tank (VVB/ACK). When the firewood boiler is in use, the heat pump and immersion heater are disconnected when the temperature rises on the thermostat (VT) and start again when the temperature drops.

Self-circulation through the heat pump is prevented by the check valve (BV).

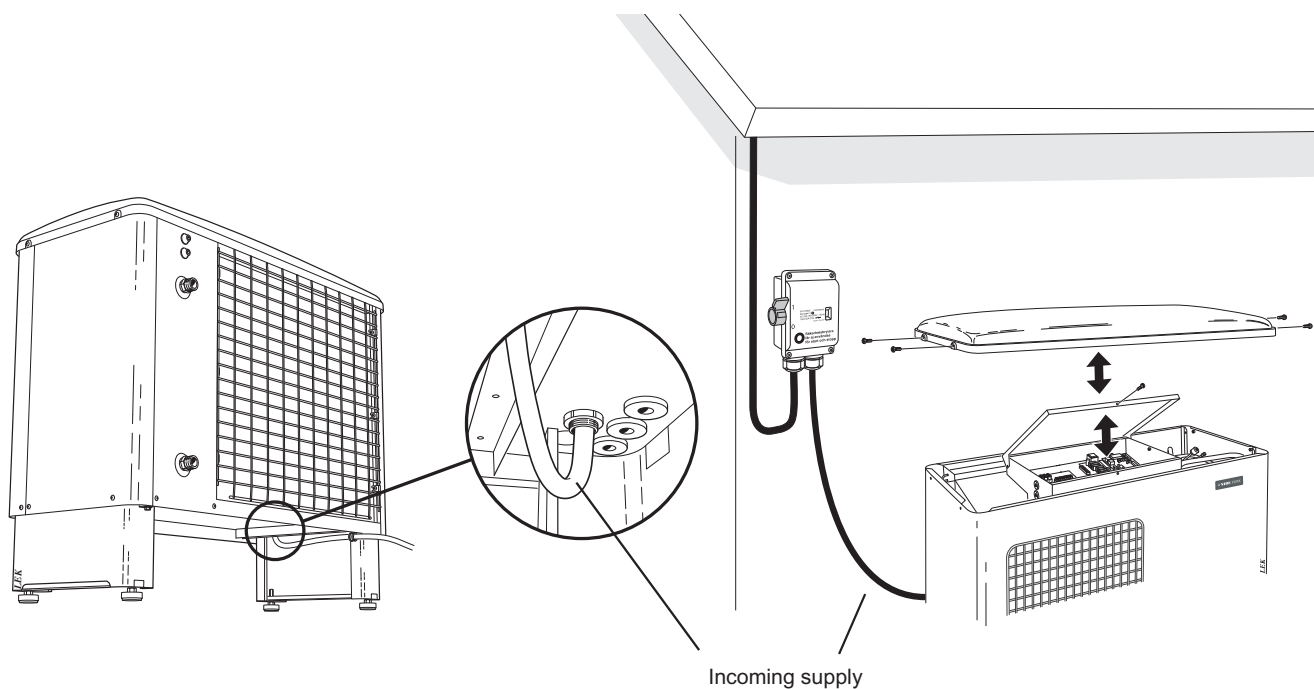
Electrical connections

NOTE

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

NOTE

The live external control must be taken into consideration when connecting.



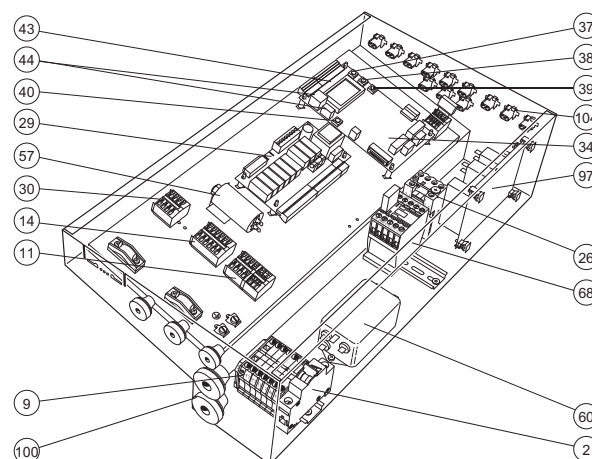
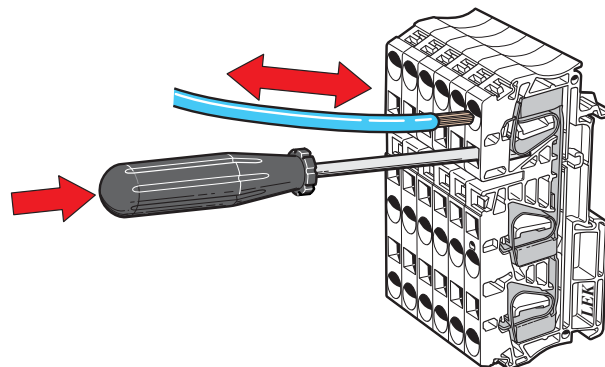
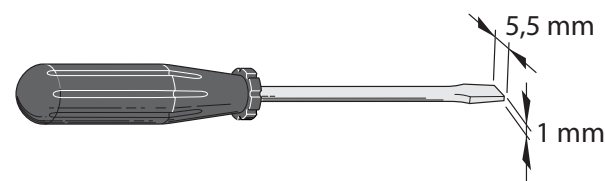
Incoming feed cable is supplied and factory connected to terminal block -X9. Approx. 1.8 m cable is accessible outside the heat pump.

General

The routing of cables for heavy current should be made out through the cable glands on the heat pump's left-hand side, seen from the front (100) and signal cables from the rear (102).

Connection

- A heat pump must not be connected without the permission of the electricity supplier and must be connected under the supervision of a qualified electrician.
- If a miniature circuit breaker (MCB) is used this should have motor characteristic "D" (compressor operation). For MCB size see "Technical Specifications".
- F2025 does not include an omnipolar circuit breaker on the incoming power supply. The heat pump's supply cable must be connected to a circuit-breaker with at least a 3 mm breaking gap. When the building is equipped with an earth-fault breaker the heat pump should be equipped with a separate one. Incoming supply must be 400 V 3NAC 50Hz via distribution boards with fuses.
- If an insulation test is to be carried out in the building, disconnect the heat pump.
- Connect control signal cable for thermostats to terminal (30). Cable type: unscreened LiYY, screened LiYCY. Cable area, at least 0.22 mm² with cable lengths less than 50 m.
- Alternatively the relevant signal cable is connected from terminal (44) on the control card (34) to SMO 10/VVM 300/EVP 500.
- Charge pump for F2025 can be connected to terminal block (11) or to separate supply.
Note! If F2025 is deenergized and the charge pump is connected to the terminal block (11) there is a risk of freezing.
- A common alarm can be connected to terminal (11).



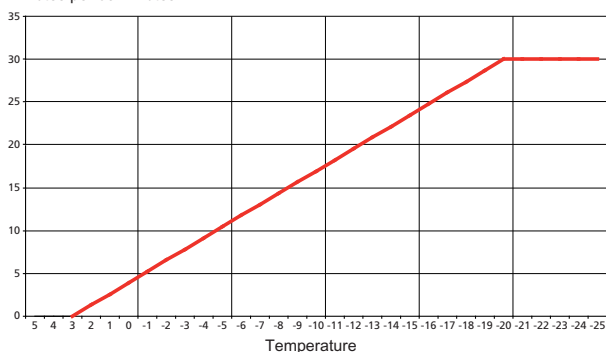
Charge pump

When the charge pump is connected to the terminal block X11 (11) terminal 3 and 4 the pump is controlled by F2025. Pump activity is dependent on the status of F2025, heating/hot water requirement and the outdoor temperature. Pump exercising is handled by F2025.

Anti-freeze function

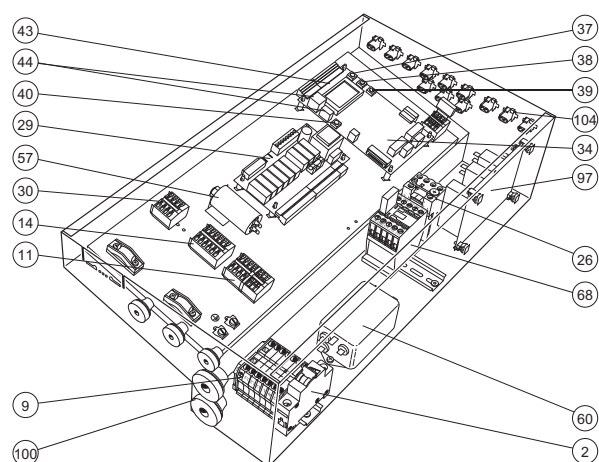
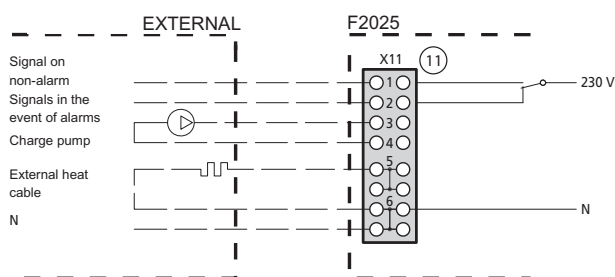
At temperatures below +2 °C, the charge pump runs periodically, and at temperatures below -20 °C it runs continually. This function applies on the condition that F2025 is powered.

Minutes per 30 minutes



NOTE

There is a risk of freezing when the charge pump is connected to terminal block X11 (11) and F2025 is deenergized.



External heat cable

F2025 is equipped with a terminal block for the Condensation water trough KVT 11 accessory. Max load is 200 W.

Outside sensor

An outdoor sensor (15) is located on the underside of F2025.

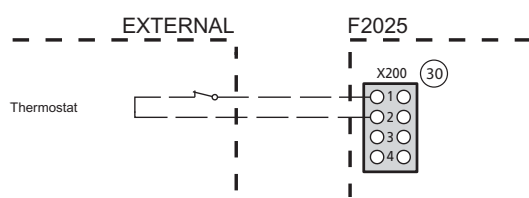
NOTE

The following pages about thermostats, additional heat, common alarms and downtime, do not apply when F2025 is controlled by SMO 10/VVM 300/EVP 500.

Thermostat control

You can use a basic thermostat or a closing potential-free contact to switch the compressor on and off. This thermostat should be of the breaking type (NC) when the set temperature has been reached. The contactor should be potential free.

Connection of the single step thermostat is made as set out in the picture below.

**Additional heat / Downtime**

F2025 is equipped with a potential free contactor intended for additional heat. Max 250V 2A.

The setting of the outdoor temperature (balance temperature) when the additional relay is activated is made on channel A5, see the section "Control - Channel description".

External additional heat: connected via the additional relay terminal X201 (14).

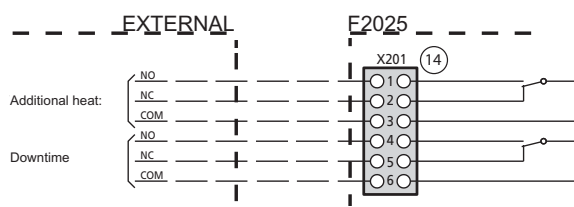
Conditions for connecting additional heat:

- the outdoor air temperature should be lower than the set balance temperature (channel A5).
- The compressor must have been operating for the minimum period that can be set in channel A6. Defrosting is included in this time.

If the outdoor air temperature drops down to a level below the set value, stop temperature (downtime), in channel A7, compressor operations are blocked and all heating must take place using the external additional heat via the downtime relay terminal X201 (14). This function is also activated when F2025 is deenergized.

If the outdoor temperature exceeds 35 °C compressor operation is blocked and downtime is activated.

The connection to the additional relay is made as set out in the picture below.



Max load across the relay contactors is 250V 2A.

During operations without the need of the additional heat or downtime the relay contactors are closed between NO and COM.

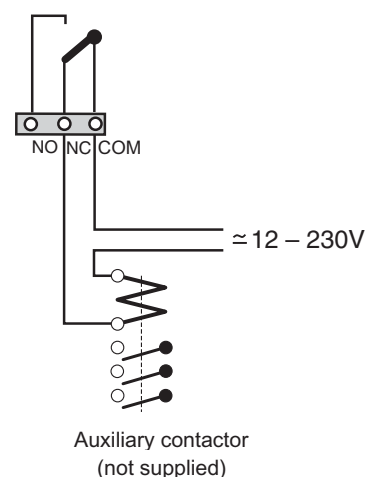
Additional heat and downtime are acquired between NC and COM.

The contactors are drawn in the deenergized state.

Additional and downtime relays are activated during normal operating conditions for F2025. Both relays are deactivated in the event of operating disruptions.

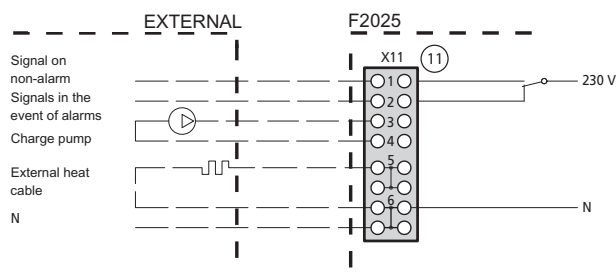
Example of addition connection

Basic electrical circuit diagram for connection of auxiliary relays for additional heat and downtime.

**External indication of main alarm**

F2025 is equipped with a contactor for external indication of common alarms. The function becomes active with all types of existing alarms. Max. load across the relay contactors is 250V 2A.

Make the connection for external indication of the main alarm as set out in the figure below:



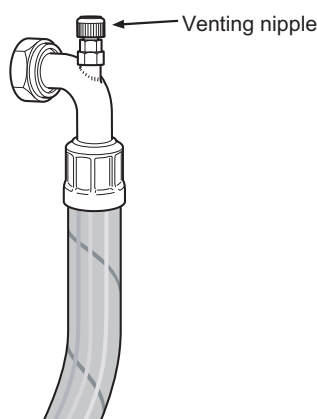
Commissioning and adjusting

Preparations

Before commissioning, check that the heating circuit is filled and well vented. Check the pipe system for leaks.

Filling and venting the heating medium system

The heating medium system is filled with water to the required pressure. Vent the system using the venting nipple on the enclosed flexible hose and possibly the circulation pump.



Balance temperature

The balance temperature is the outdoor temperature when the heat pump's stated output is equal to the building's output requirement. This means that the heat pump covers the whole building's output requirement down to this temperature. Setting of the balance temperature, additional heat, is made on channel A5.

Stop temperature

When the stop temperature (channel A7) is set between -7 and -20 °C the flow temperature is limited linearly from -7 °C / 58 °C to -20 °C / 50 °C.

Soft-start relay

F2025 is equipped with a soft-start relay (97) that limits the inrush current for the compressor.

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

Compressor heater

F2025 is equipped with a compressor heater that heats the compressor before start-up and when the compressor is cold.

The compressor heater must have been connected for 6 - 8 hours before the FIRST start, see the section "Start-up and inspection".

NOTE

The compressor heater must have been connected for 6 – 8 hours before the first start, see the section "Start-up and inspection".

Phase sequence control

When starting for the first time or after work on incoming electricity supply, phase sequence control must be carried out. This is important because the scroll compressor in F2025 can suffer damage if operated with the incorrect direction of rotation for too long. See points 10 – 11 under "Start-up and inspection".

NOTE

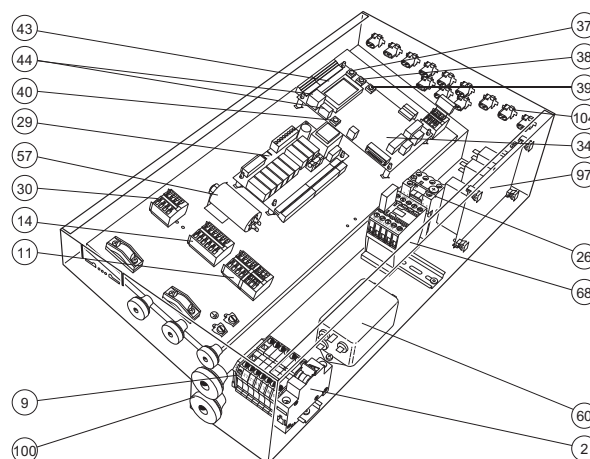
Check the phase sequence when starting!

Start-up and inspection

1. Communication cable (44) or thermostat, plinth (30) must not be connected.
2. Turn the isolator switch on.
3. Check that all incoming phases are powered.
4. Check that the miniature circuit-breaker (2) is on.
5. The compressor heater (25) must have been operational for at least 6 – 8 hours before the compressor start can be initiated. This is done by switching on the control voltage and disconnecting the communications cable or thermostat.
6. The display on the control card (34) shows C0/CC F0 H1/H3 depending on the outdoor temperature. During this period the compressor is heated to increase the service life.
7. The communication cable or external thermostat is connected after 6 – 8 hours. See the section "Electrical connection" – "Thermostat control".
8. Restart the SMO 10/VVM 300/EVP 500.
9. Once the connection is made, the compressor starts after approx. 20 minutes if needed.
10. When the compressor starts, go to channel T5 on F2025 or to menu 5.13 in SMO 10 and check that the hot gas temperature rises to at least 10 °C within 60 secs.
11. If the temperature does not rise in the hot gas sensor the direction of rotation is incorrect.
 - Stop the compressor by breaking the current using the main circuit breaker.
 - Ensure that the installation is disconnected from the power source. Swap the two incoming phases at the main circuit breakers.
 - Supply the installation with power and go back to point 8 to carry out a new phase sequence check.
12. Adjust the charge flow according to the diagram, see the section "Adjustment, charge flow"
13. Fill in the commissioning report on page 2.
14. Remove the protective film from the cover on F2025.

NOTE

The live external control must be taken into consideration when connecting.



Readjusting, heating medium side

Air is initially released from the hot water and venting may be necessary. If bubbling sounds can be heard from the heat pump, the circulation pump and radiators the entire system will require further venting. When the system is stable (correct pressure and all air eliminated) the automatic heating control system can be set as required.

Commissioning and adjusting

Adjustment, charge flow

Adjusting the temperature difference (ΔT) between the flow temperature and the return temperature during hot water charging or at high load.

This is easily done by using the temperatures measured in Channel T2 (flow temperature) less Channel T3 (return temperature), this temperature difference (ΔT) is adjusted using circulation pump and control valve. Adjustment is performed with stable operation about 5 minutes after start, or about 5 minutes after defrosting with a cold outdoor temperature.

The temperature difference must be as in the diagram below (+1- 2 K). At outdoor temperatures above 28 °C the charge flow can be increased by 30 % to obtain a lower ΔT .

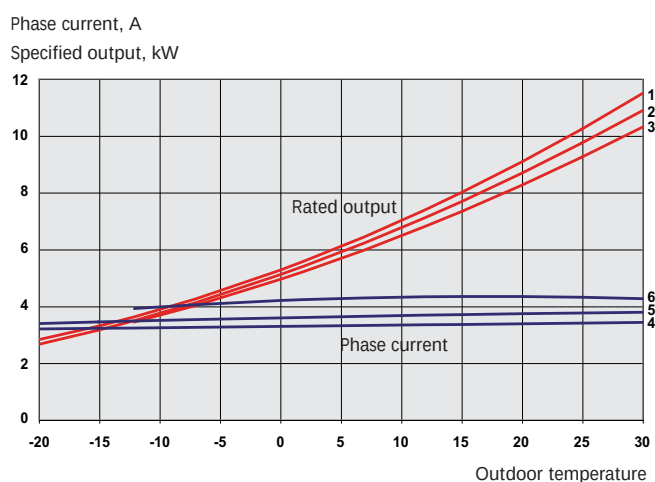
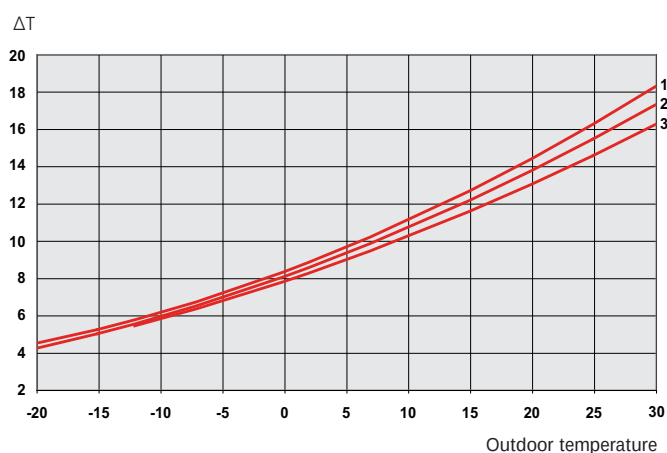
The diagrams show the heat pump with a high fan speed, at low fan speeds ΔT will be 0.5 to 1 degrees lower (does not apply to F2025-6 kW, which only has one fan speed).

1 and 4 flow temperature. 35°

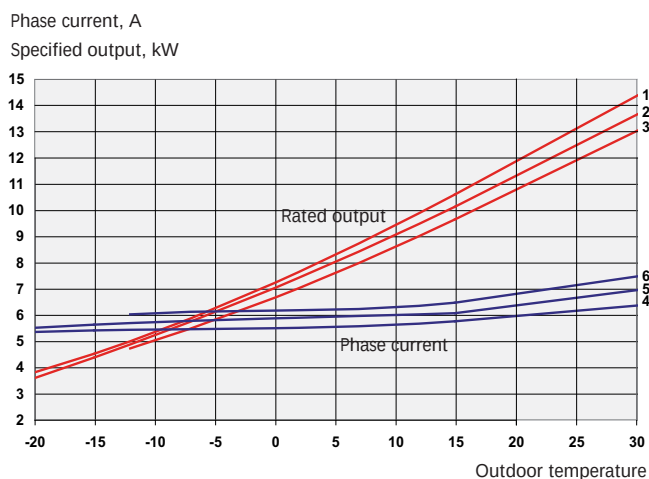
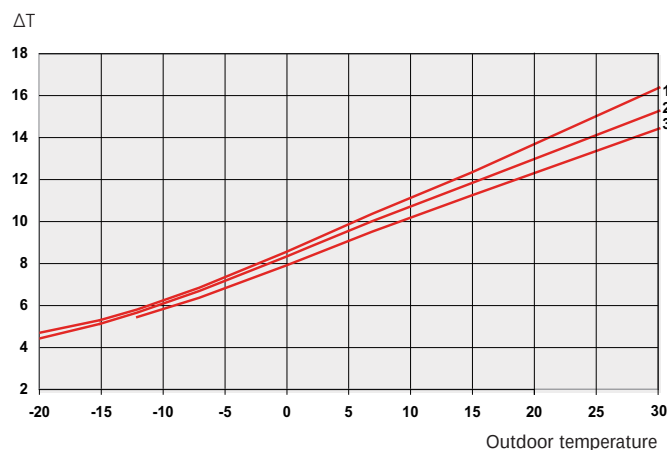
2 and 5 flow temperature. 45°

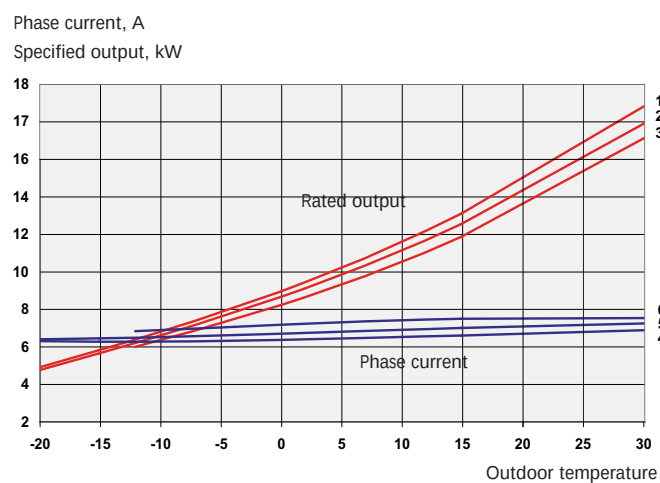
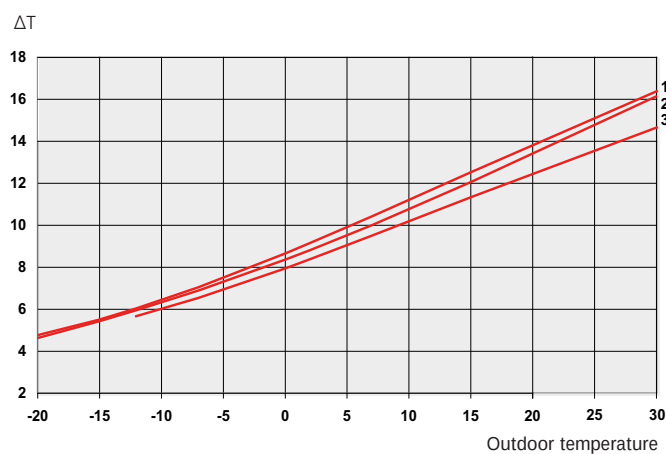
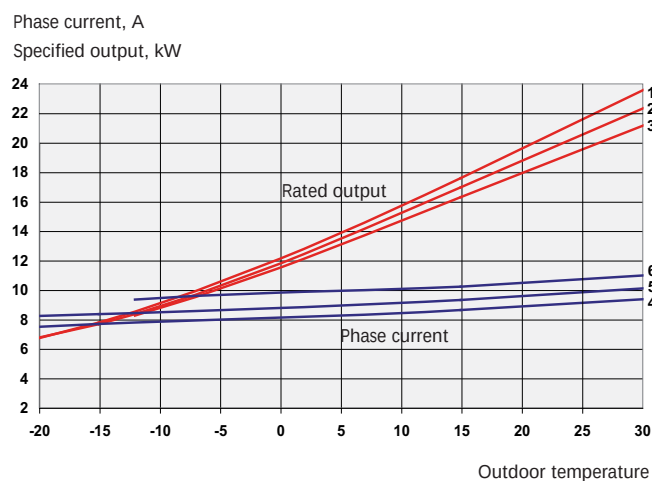
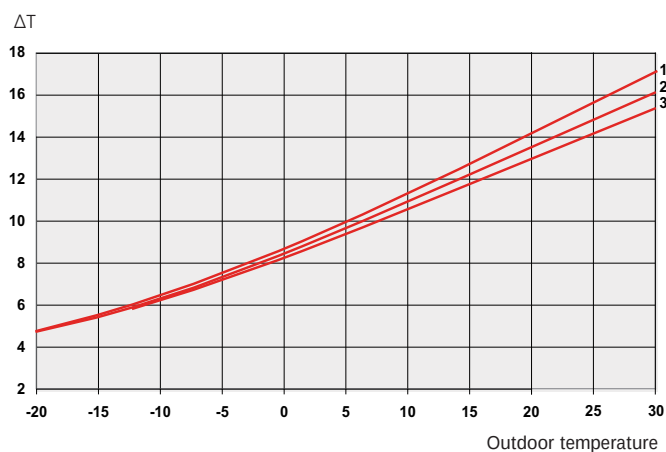
3 and 6 flow temperature. 55°

F2025-6



F2025-8



F2025-10**F2025-14**

Control

Explanation

C0	F0	H0
S1		01

Fan: F0

The fan has two speeds, high and low (does not apply to F2025-6 kW which only has one fan speed). The fan is controlled by the outdoor temperature. The lower speed is used when the outdoor temperature is too high to limit the output. The fan does not run during defrosting. At an outdoor temperature lower than the temperature in the table below the fan speed is changed to high.

Type	Outdoor temperature
8 kW	11
10 kW	13
14 kW	15

Compressor: C0

Shows the present compressor status.

Channel: S1

Shows the current channel. Change channels using the Plus button or the Minus button.

C0	F0	H1
S1		01

- C0** Compressor off, circulation pump off
C Flashes when the compressor wants to start but is prevented by the time conditions or high return temperature.
F0 Fan off
H1 Compressor heater on
 Drip tray heater off

C1	F1	H0
S1		01

- C1** Compressor on, circulation pump on
F1 Fan on, low speed
H0 Compressor heater off
 Drip tray heater off

C1	F2	H2
S1		01

- C1** Compressor on, circulation pump on
F2 Fan on, high speed

- H2** Compressor heater off
 Drip tray heater on

CD	F0	H2
S1		02

- CD** Defrosting in progress

CC	F0	H3
S1		01

- CC** Compressor off, circulation pump on
H3 Compressor heater on
 Drip tray heater on

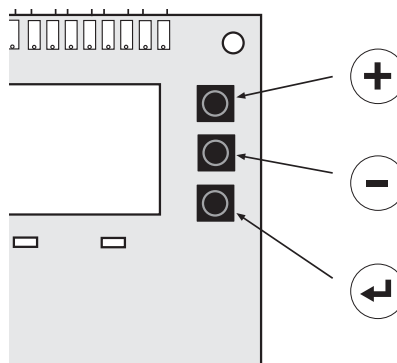
Heater: H0

The compressor heater is always active when the compressor is switched off.

The drip tray heater is connected when the outdoor temperature drops below 2 °C and is disconnected when the stop temperature is reached.

Value: 01

Shows the current value. Increase/decrease value using the plus button respective minus button.



Plus button

The plus button (37) is used to browse through the channel system (forwards) or raise the value of the selected parameter.

See the section "Control" – "Channel description"



Minus button

The minus button (38) is used to browse through the channel system (backwards) or lower the value of the selected parameter.

See the section "Control" – "Channel description"



Enter button

The Enter button (39) is used to activate and confirm value changes.

See the section "Control" – "Channel description"

Channel descriptions

You can browse back and forth through the display's channels using the Plus and Minus buttons.

To modify a value, first press the Enter button to activate modification mode, the value flashes. Adjust the value as required using the Plus button or Minus button. Holding the Plus button or Minus button in for about 3 seconds speeds up the change in value. Then confirm using the Enter button. The value will stop flashing.

The instructions are divided into three parts: status, temperatures and settable values.

Quick movement between the different types is carried out by pressing the enter button when STATUS, TEMP. or ADJUST. are displayed.

Status

These channels show the status and statistics.

Channel

S1 Shows the operating status of F2025.

Value

- 01** Normal operation.
- 02** Defrosting is run.
- 03** Cold outdoor air temperature.
- 04** High return temperature.
- 05** Low pressure pressostat has tripped.
- 06** High pressure pressostat has tripped.
- 07** Motor cut-out has tripped.
- 08** Sensor alarm. One of the temperature sensors is defective.
- 09** Communication error (only when SMO 10/VVM300 is connected).
- 10** High pressure pressostat has tripped during defrosting (resets automatically)
- 11** Not used.
- 12** Flow and return line sensors fitted incorrectly.
- 13** Hot outdoor air. Appears when the outdoor air heater temperature exceeds 35 °C.
- 14** High flow temperature.
- 15** Defrosting interrupted. Appears if defrosting is unsuccessful 3 times in a row.
- 16** Short operations times. Appears if operation time has been shorter than 2 minutes 3 times in a row.
- 17** Hot gas alarm. Appears when the hot gas exceeds 120 °C. The alarm resets automatically when the temperature falls below 60 °C. If the alarm is activated 3 times within 240 minutes it becomes continuous.
- 18** Incorrect direction of rotation. **Note!** At quick start ensure that the hot gas temperature has fallen to approx. 40 °C before start.

S2 Value

Shows the compressor status.

- 00** Compressor off.
- 01** Compressor on.
- XX** Compressor blocked due to an alarm
- nn** Compressor start in nn minutes.

S3 Shows the number of compressor starts, accumulatively.

S4 Shows the compressor's operating time in hours, accumulatively.

S5 Shows the operating hours for connected additional heat, accumulatively.

S6 Shows whether any additions are activated

Active input indicated by 1.

Deactivated input indicated by 0.

S7 Alarm input status (HP, LP and MS), 1 indicates the input is OK.

S7 1 / 1 / 1

Temp.

These channels show the current temperatures.

Channel

- T1** Measured temperature on the outdoor sensor.
- T2** Measured temperature on the flow line sensor.
- T3** Measured temperature on the return line sensor.
- T4** Measured temperature on the suction gas sensor.
- T5** Measured temperature on the hot gas sensor.
- T6** Measured temperature on the fluid pipe sensor.
- T7** Measured temperature on the evaporator sensor.

Adjust.

All setting are made on these channels.

Channel

- A1** Address for communication with SMO 10/VVM 300/EVP 500.
Address for communication with METROAIR Styring/MET-ROAIR 300/EVP 500.
When connecting to VVM/EVP 500 this channel should be on 1.
When connecting to SMO 10 this must be selected so that each F2025 in the system receives a unique address (1 – 9) for communication with SMO 10.
For example 3 x F2025 in the same system are allocated the addresses 1, 2 and 3. The F2025 that produces hot water should be set to 1.
- A2** Max return temperature. When the return temperature reaches the set value the compressor stops. The value is adjustable between 25 and 50 °C. Factory setting 48 °C.
With SMO/VVM/EVP 500 connected this menu cannot be changed, it is locked at 50 °C.
- A3** Connection difference return temperature. After the compressor is stopped for a high return temperature, the return temperature should drop by the set value in order to permit the compressor to start. The value is adjustable between 0 and 10 °C. Factory setting is 4 °C.
With SMO/VVM/EVP 500 connected this menu cannot be changed, it is locked at 2 °C.
- A4** Minimum time period in minutes between compressor starts. The value is adjustable between 20 and 60 minutes. Factory setting 20 minutes.
- A5** Balance temperature, the set outdoor air temperature when the additional relay (14) can be activated from channel A6 without affecting compressor operations. Additional heat relay (14) is activated first after the set time on channel A6. The value can be set between -20 (set stop temperature, channel A7) and +10 °C. Factory setting is 0 °C.
- A6** Continuous operating time with the compressor before additional heat is permitted. The value is adjustable between 0 and 120 minutes. Factory setting 120 minutes.

- A7** Stop temperature, the set outdoor air temperature value when the downtime relay (16) is activated, F2025 stops. When the stop temperature is set between -7 and -20 °C the flow temperature is limited linearly from -7 °C / 58 °C to -20 °C / 50 °C. Factory setting is -20 °C.

- A8** Minimum running time, heat production before new defrosting is permitted. The value is adjustable between 10 and 90 minutes. Factory setting according to the table below.

Type	Minutes
6 kW	60
8 kW	50
10 kW	45
14 kW	40

- A9** Start temperature for permitted defrosting (evaporator sensor). The value is adjustable between 1 and 5 °C. Factory setting 1 °C.
- A10** Stop temperature for defrosting (evaporator sensor). The value is adjustable between 10 and 40 °C. Factory setting 10 °C.
- A11** Longest permitted defrosting time. The value is adjustable between 5 and 12 minutes. Factory setting 7 minutes.

NOTE

In the event of any defrosting problems, the value in channel A11 can be increased to relieve the problem.

- A12** Manual activation of defrosting procedure. Change the value 0 to 1 and confirm using the Enter button.
- A13** Restore factory default settings. Change the value 0 to 1 and confirm using the Enter button.

Control conditions, cold outdoor air

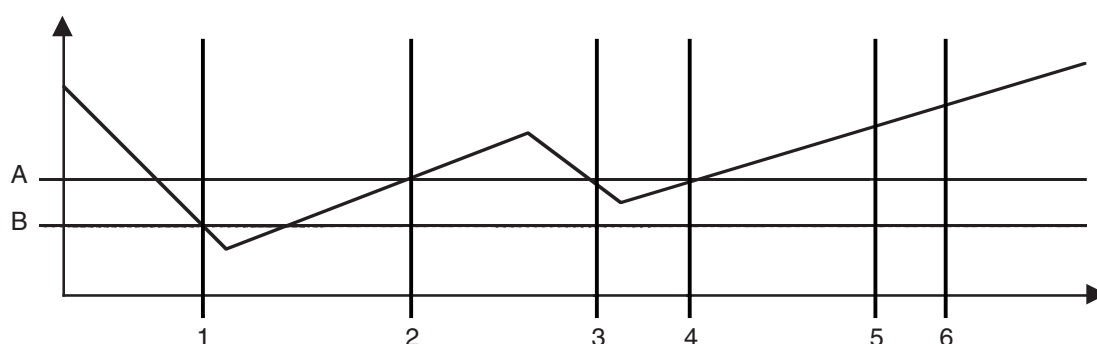
- When the outdoor air temperature (channel T1) drops below the set temperature in channel A7 the heat pump stops and indicates 03 in channel S1. Both the additional relay and the downtime relay are then activated at the same time.
- If the outdoor air sensor registers a temperature that is at least 2.1 °C higher than the set temperature in channel A7, a time counter starts.
- When the time counter has reached 45 minutes, both the additional relay and downtime relay deactivate to obtain a more comfortable temperature for the compressor to start at.
- When a further 15 minutes have passed, the compressor is permitted to start and the additional relay activates a few seconds later. However, the downtime relay is deactivated.
- If the outdoor temperature drops below channel A7 + 2.1 °C at any time during these 60 minutes, the counter is reset and does not start to count again until the temperature is sufficiently high again.

B = Set temperature for cold outdoor air (channel A7).

A = Set temperature for cold outdoor air + 2.1 °C.

1. The outdoor air temperature (channel T1) drops below the set temperature in channel A7 (B). The heat pump stops and both the relays are activated.
2. The outdoor air temperature is 2.1 °C above the set temperature in channel A7 (A). A time counter starts from 0.
3. The outdoor temperature falls below A. The timer is reset and stopped.
4. The outdoor air temperature returns to above A. The time counter starts again (from 0).
5. The time counter has counted to 45 minutes. Both relays are deactivated.
6. The time counter has counted to 60 minutes. The compressor is permitted to start again.

Outdoor temperature



Tip:

It is heat pump's outdoor sensor that applies.

If VVM 300/SMO 10 is connected it is not the value in menu 4.0 but the value in the outdoor air temperature in menu 5.9 which is used.

Control conditions defrosting

- A time counter counts up every minute if the compressor is running and the temperature of the evaporator sensor (channel T7) falls below the setting in channel A9
- If the time counter has reached the setting in channel A8, defrosting starts.

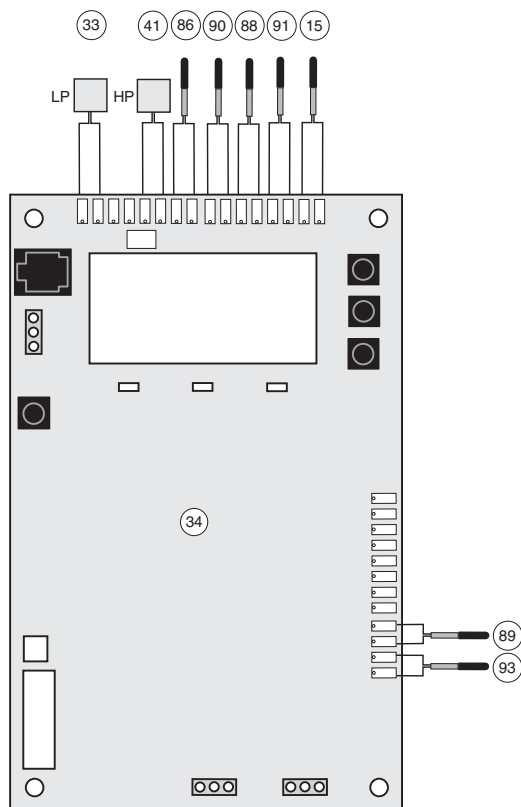
Defrosting occurs as follows:

1. The four way valve shifts to defrosting
2. The fan stops and the compressor continues to run.
3. When defrosting is complete the four way valve shifts back to heating mode and after 30 seconds the fan starts.
4. Outdoor sensors is locked and the high return temperature alarm is blocked during and for two minutes after defrosting.

There are 4 possible reasons for defrosting to finish:

1. The temperature of the evaporator sensor has reached the set temperature in channel A10. Normal stop.
 2. Defrosting has run longer than the setting in channel A11. Can be due to insufficient energy in the heat source, that the sensor on the evaporator is poorly positioned and gives too low a temperature (in the event of cold outdoor air).
 3. The temperature on the return sensor falls below 10°C.
 4. The high-pressure pressostat deploys during defrosting. Indicated as alarm 10 in channel S1. The compressor stops when this occurs and if the pressure has dropped 2 minutes later it can be started as normal, otherwise the permanent high-pressure alarm occurs (alarm 06).
- The temperature on the flow sensor falls below 4°C.

Sensor placement



- 15 Outside sensor
- 33 Low pressure pressostat
- 41 High pressure pressostat
- 86 Temperature sensor, evaporator
- 88 Temperature sensor, fluid pipe
- 89 Temperature sensor, flow pipe
- 90 Temperature sensor, suction gas
- 91 Temperature sensor, hot gas
- 93 Temperature sensor, return

Temperature sensor data

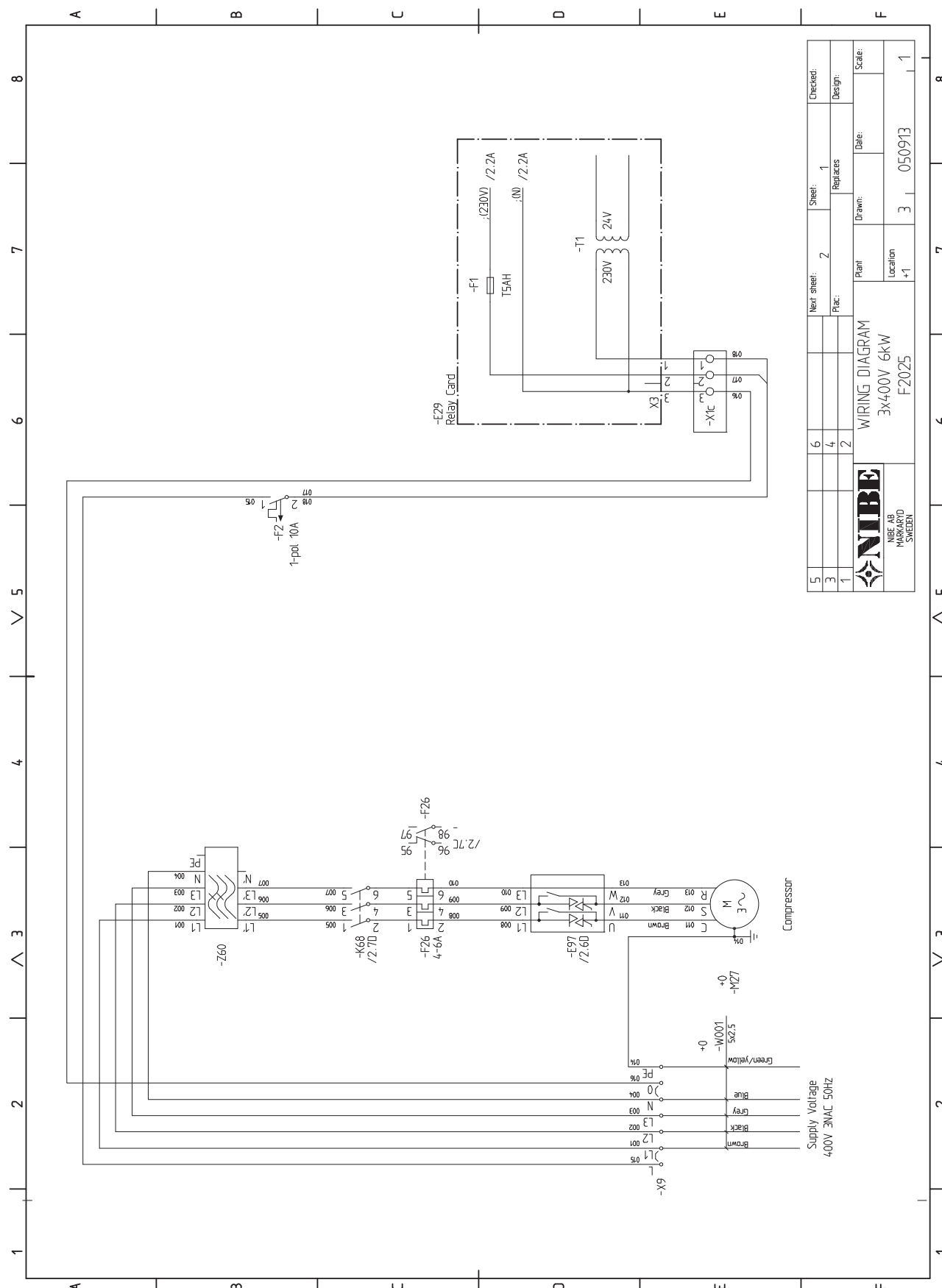
Temperature (°C)	Resistance (k Ω)	Voltage (V)
-40	102.35	4.78
-35	73.51	4.70
-30	53.44	4.60
-25	39.29	4.47
-20	29.20	4.31
-15	21.93	4.12
-10	16.62	3.90
-5	12.71	3.65
0	9.81	3.38
5	7.62	3.09
10	5.97	2.80
15	4.71	2.50
20	3.75	2.22
25	3.00	1.95
30	2.42	1.70
35	1.96	1.47
40	1.60	1.27
45	1.31	1.09
50	1.08	0.94

Data for discharge sensor

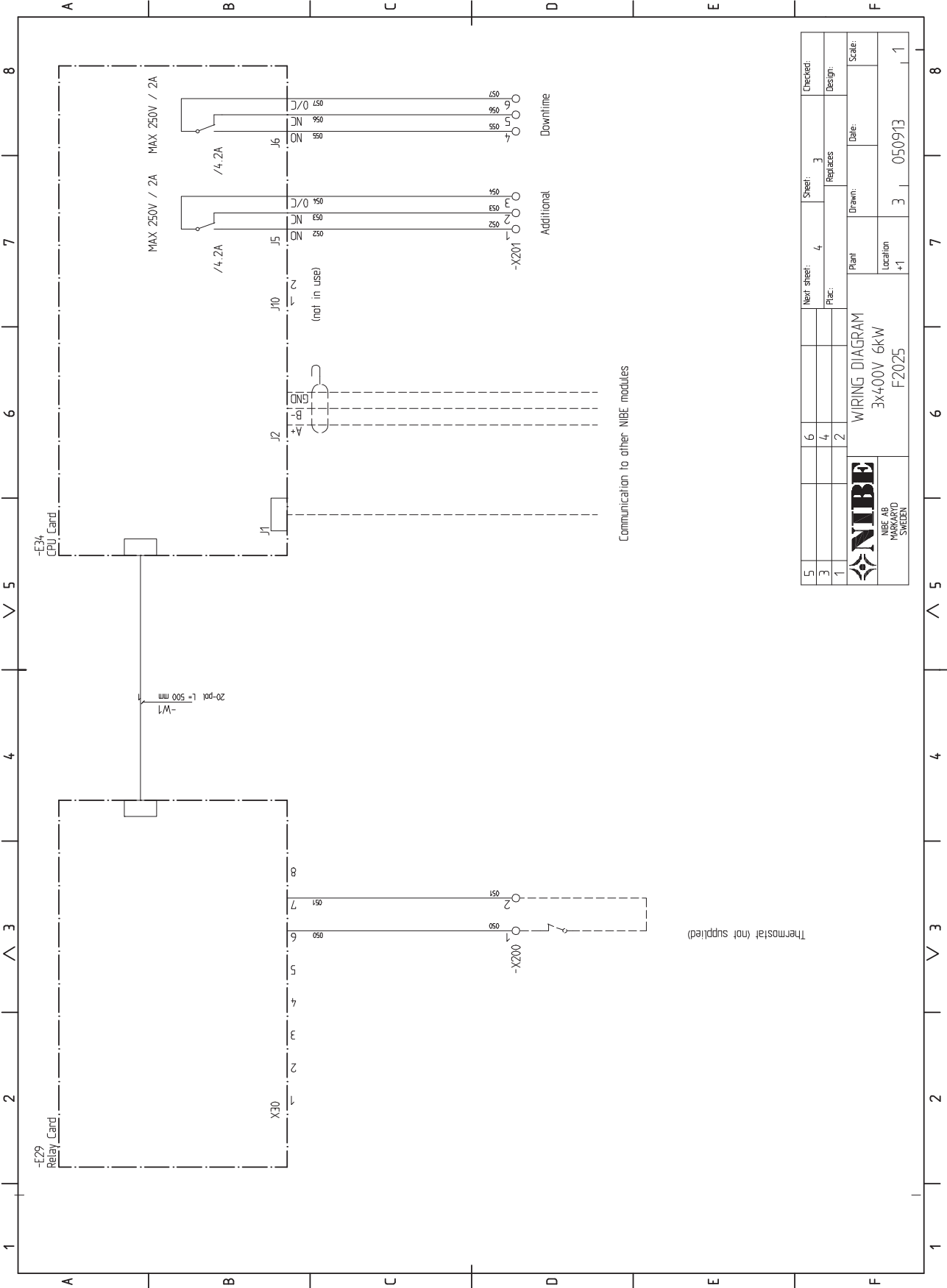
Temperature (°C)	Resistance (k Ω)	Voltage (V)
40	1.71	1.27
45	1.44	1.12
50	1.21	0.97
55	1.07	0.88
60	0.87	0.74
65	0.74	0.64
70	0.64	0.56
75	0.55	0.49
80	0.47	0.43
85	0.41	0.38
90	0.36	0.33
95	0.31	0.29
100	0.27	0.26
105	0.24	0.23
110	0.21	0.20
115	0.19	0.18
120	0.17	0.16
125	0.15	0.15
130	0.13	0.13
135	0.12	0.12
140	0.11	0.11

Electrical circuit diagram

3x400V 6 kW

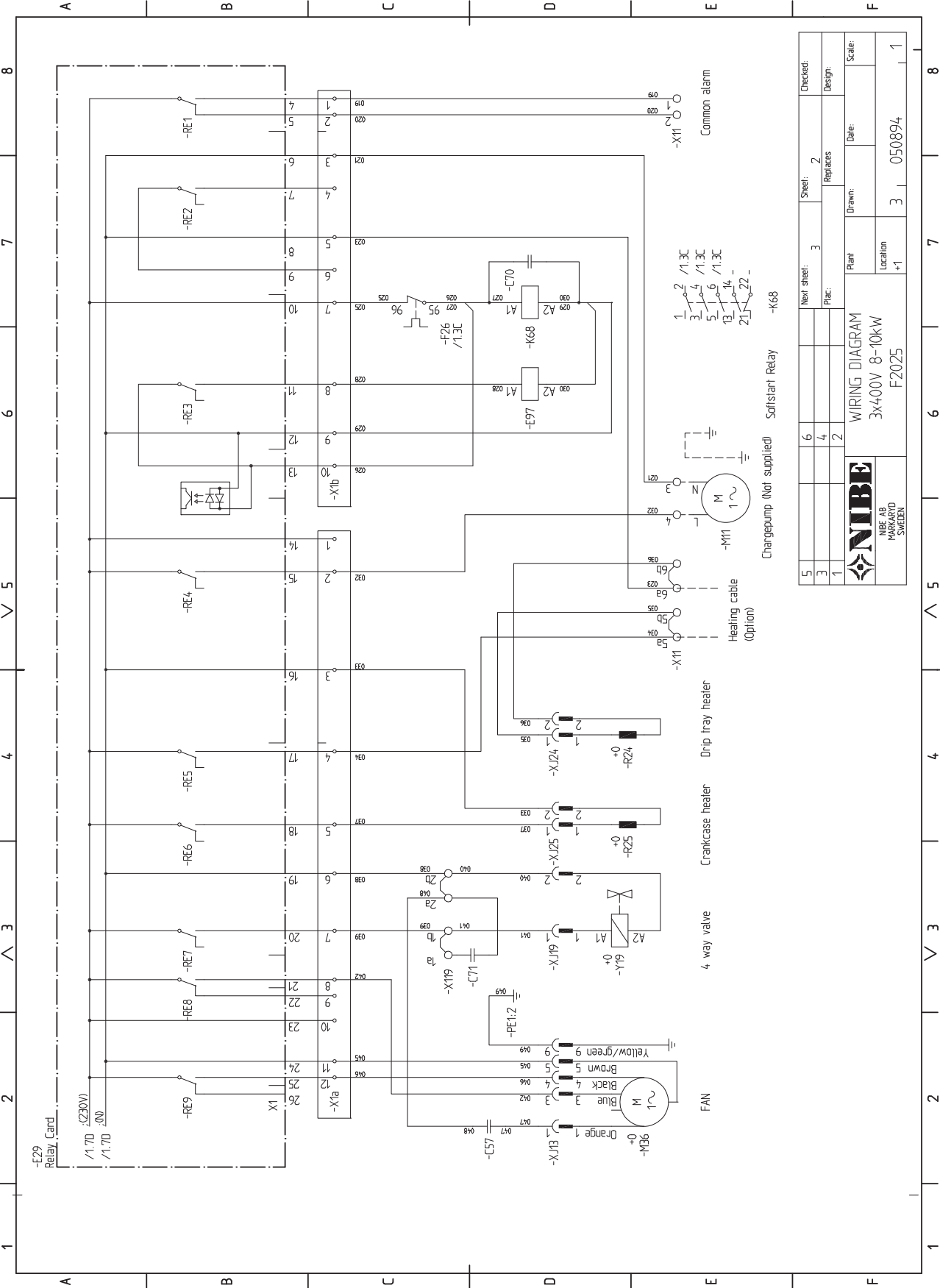








[illegible]







WIRING DIAGRAM

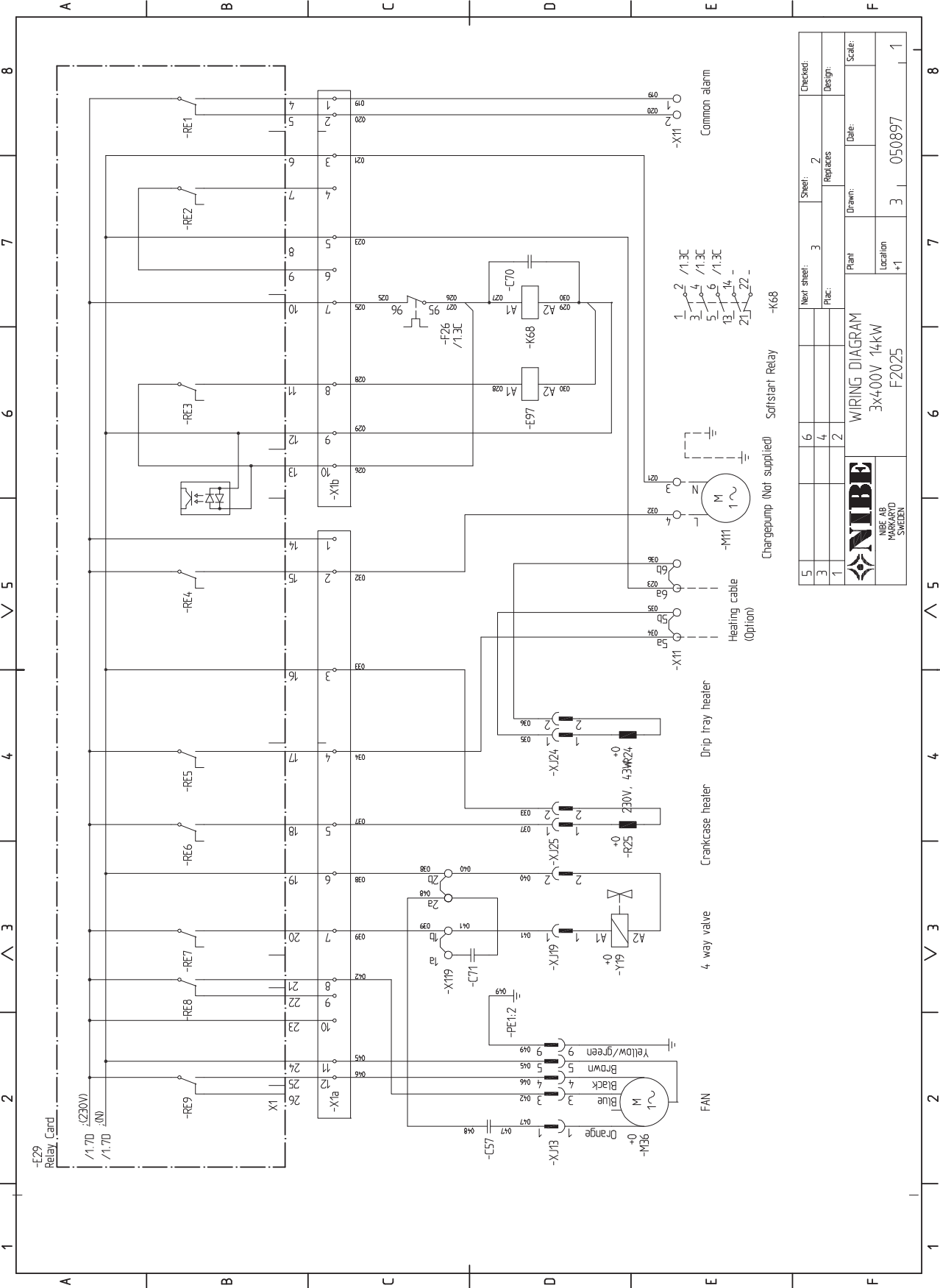
3x400V 14kW

Legend:

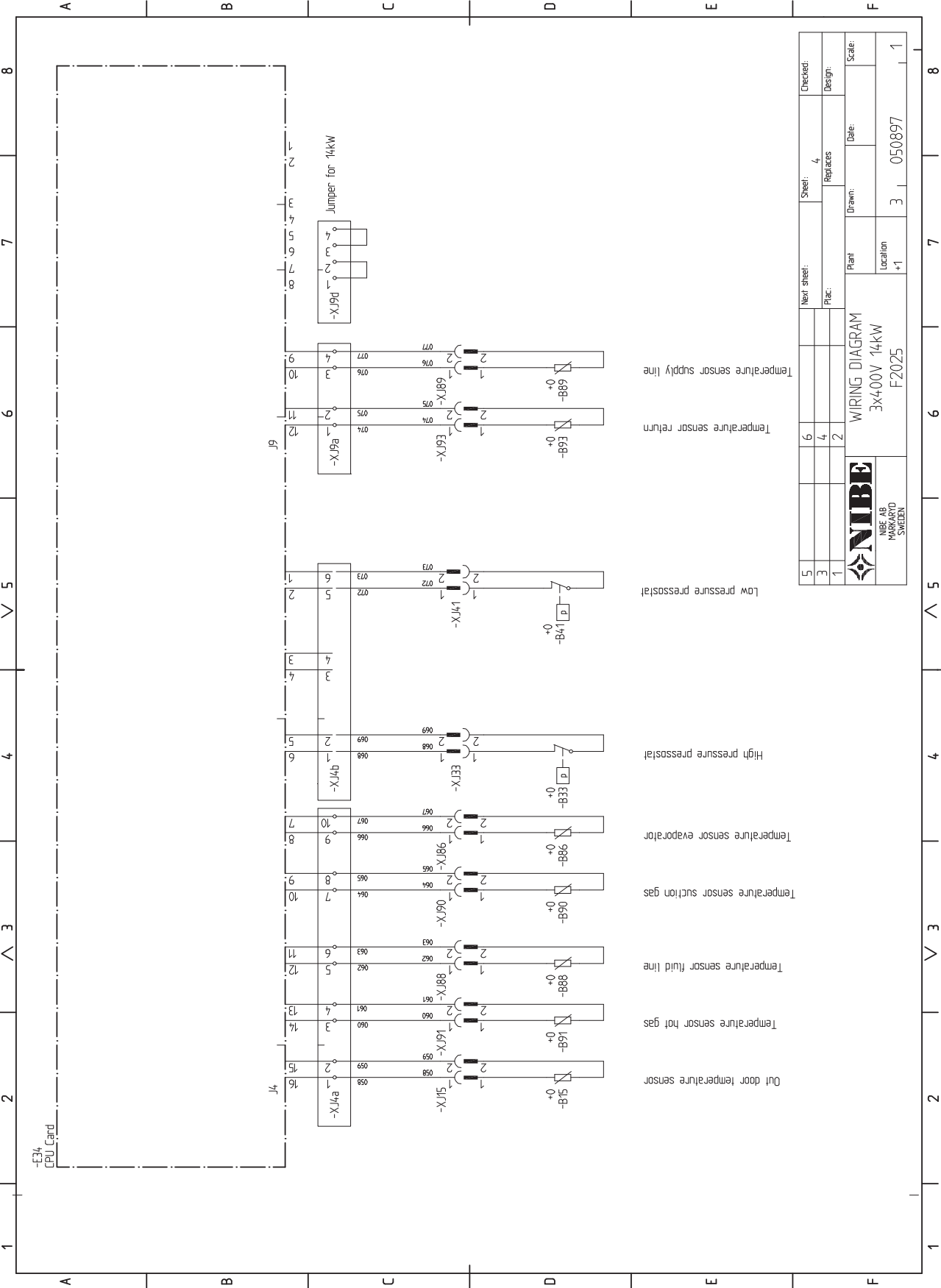
- Brown: L1
- Black: L2
- Grey: L3
- Blue: N
- Green/Yellow: PE

Components:

- Compressor (M)
- Switch (F26)
- Fuse (F26)
- 1-phase 10A supply (F2)
- 1-phase 10A supply (F2)

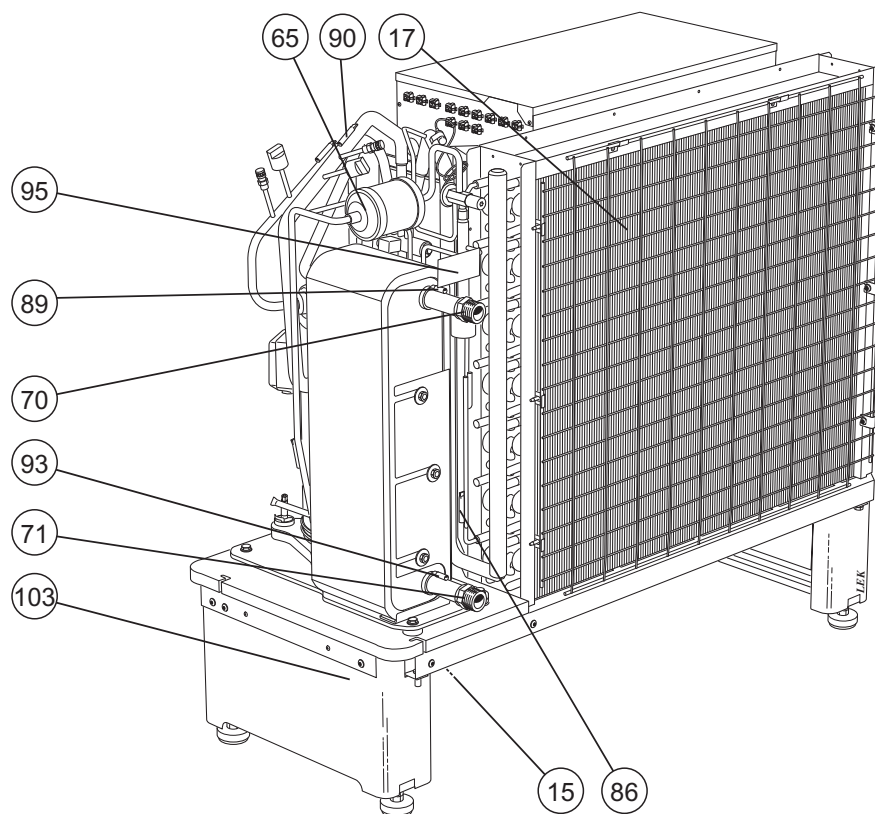
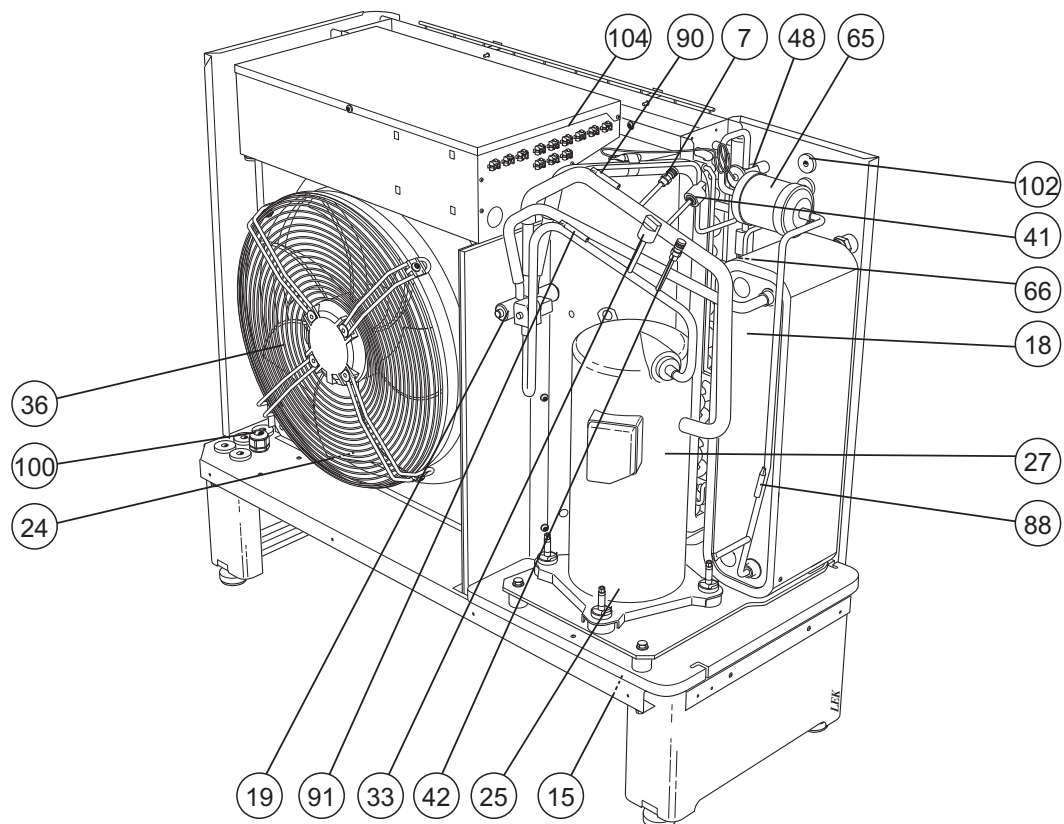




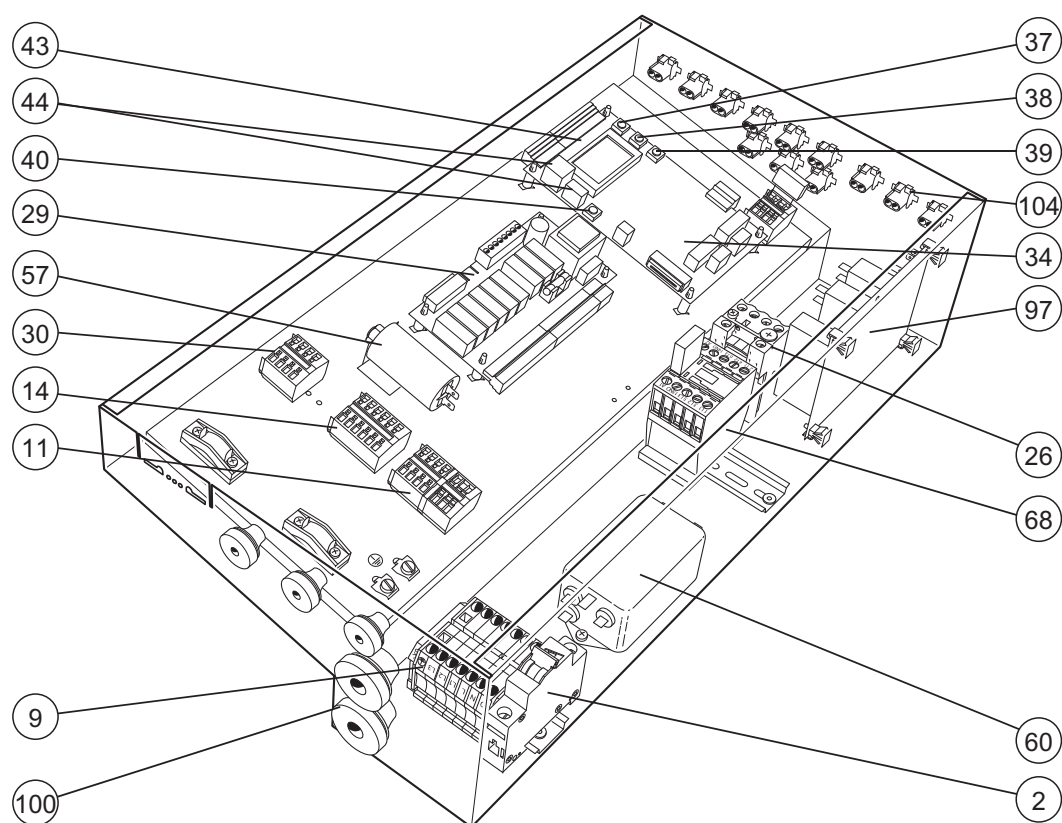


Technical specifications

Component positions



Technical specifications



List of components

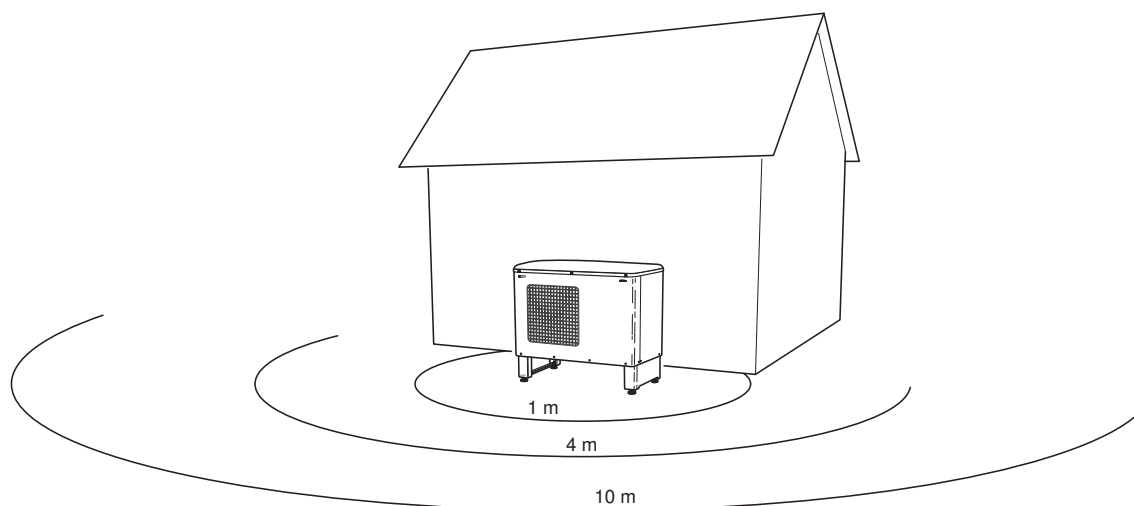
2	Miniature circuit-breaker	48	Expansion valve
7	Service connection, low pressure	57	Operating condenser, fan
9	Terminal block, incoming supply	60	Suppressor
11	Terminal block, charge pump, common alarm	63	Particle filter (supplied)
14	Terminal block, additional, downtime	65	Drying filter
15	Temperature sensor, outdoor air	66	Non-return valve
17	Evaporator	68	Contactor, compressor
18	Condenser	70	Connection, heating medium out of F2025, G1 (Ø28 mm)
19	4-way valve	71	Connection, heating medium in to F2025, G1 (Ø28 mm)
24	Drip tray heater	86	Temperature sensor, evaporator
25	Compressor heater	88	Temperature sensor, fluid pipe
26	Motor protection, including reset	89	Temperature sensor, flow pipe
27	Compressor	90	Temperature sensor, suction gas
29	Relay card with power supply unit	91	Temperature sensor, hot gas
30	Terminal block, thermostat	93	Temperature sensor, return
33	High pressure pressostat	95	Type plate
34	Control card with display	97	Soft-start relay
36	Fan	100	Cable gland, incoming supply
37	Plus button	102	Cable gland, sensor
38	Minus button	103	Serial number
39	Enter button	104	Connections sensors
40	Reset button		
41	Low pressure pressostat		
42	Service connection, high pressure		
43	Display contrast		
44	Connection, communications		

Sound pressure levels

F2025 is usually placed next to a house wall, which gives a directed sound distribution that should be considered. Accordingly, you should always attempt to find a placement on the side that faces the least sound sensitive neighbouring area.

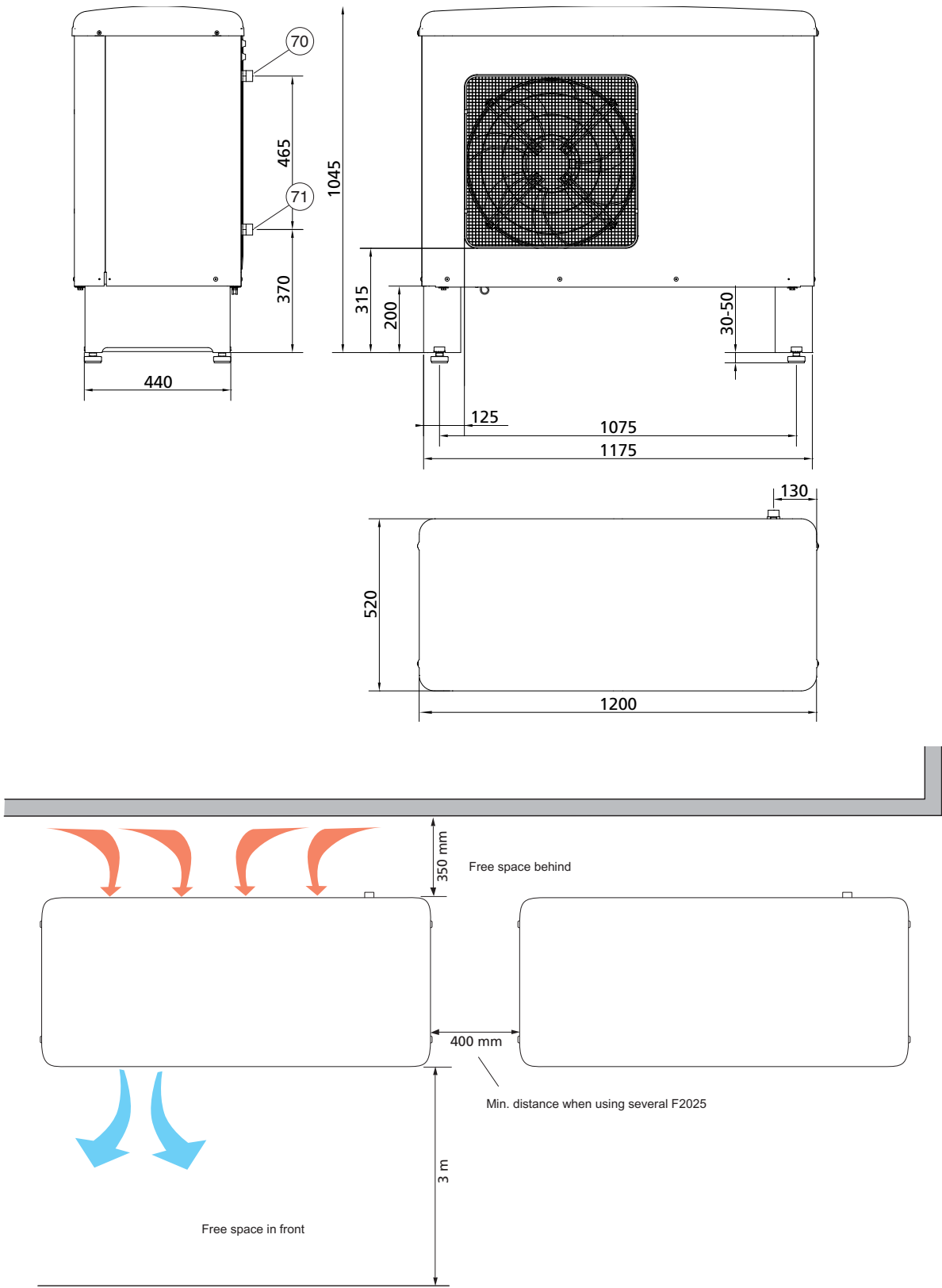
The sound pressure levels are further affected by walls, bricks, differences in ground level, etc and should therefore only be seen as guide values.

F2025 works with low fan speed or high fan speed depending on the outdoor temperature (does not apply to F2025 - 6 kW which only has one fan speed).



		F2025-6	F2025-8	F2025-10	F2025-14
Sound power level	$L_W(A)$	57	57/62	57/62	66/69
Sound pressure level at 1 m. Fan low/high	dB(A)	51	51/56	51/56	60/63
Sound pressure level at 4 m. Fan low/high	dB(A)	39	39/44	39/44	48/51
Sound pressure level at 10 m. Fan low/high	dB(A)	31	31/36	31/36	40/43

Dimensions and setting-out coordinates



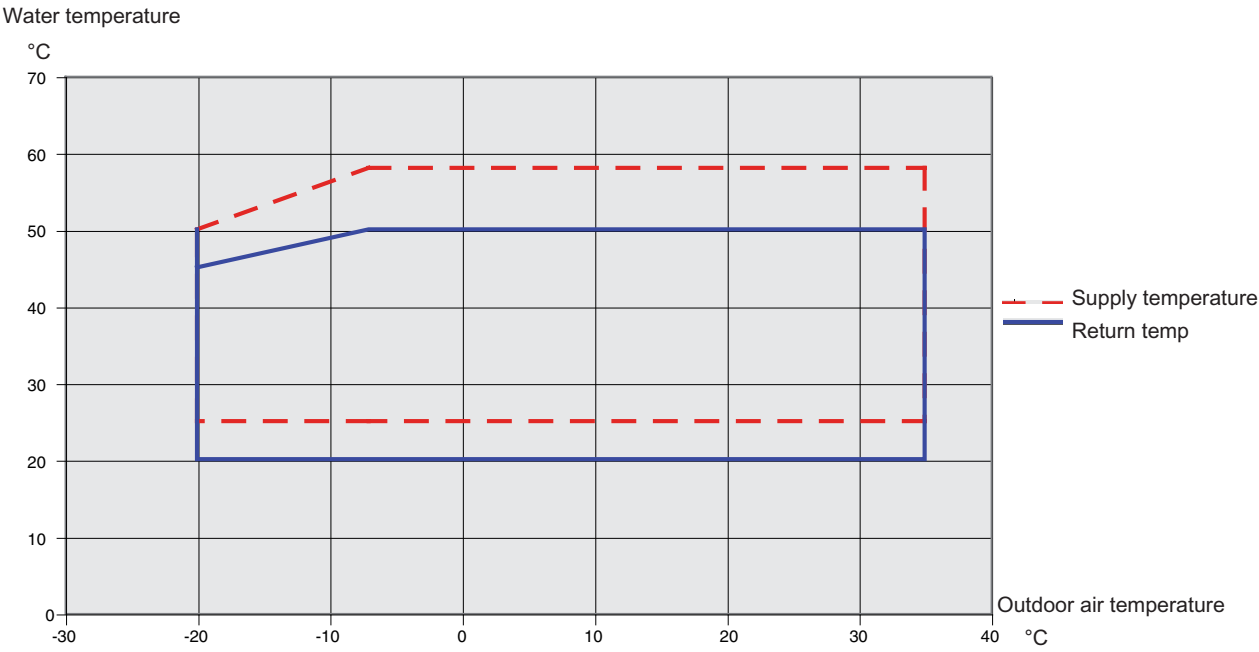
Technical specifications

Type		F2025-6	F2025-8	F2025-10	F2025-14
Delivered/supplied power* at 2/35 °C **	(kW)	5.9/1.6	8.1/2.1	9.4/2.5	12.9/3.8
Delivered/supplied power* at 7/35 °C **	(kW)	6.8/1.5	9.3/2.2	10.9/2.7	14.6/3.9
Delivered/supplied power* at -7/45 °C **	(kW)	4.3/1.8	5.8/2.3	7.1/2.7	10.0/4.1
Delivered/supplied power* at 0/45 °C **	(kW)	5.3/1.8	7.3/2.4	8.6/2.9	11.9/4.3
Delivered/supplied power* at 7/45 °C **	(kW)	6.4/1.8	8.8/2.6	10.4/3.0	14.2/4.5
Delivered/supplied power* at -7/50 °C **	(kW)	4.1/2.3	5.7/2.5	6.8/2.9	9.8/4.5
Delivered/supplied power* at 2/50 °C **	(kW)	5.4/2.0	7.4/2.7	8.9/3.2	12.4/4.8
Delivered/supplied power* at 7/50 °C **	(kW)	6.3/2.1	8.6/2.8	10.1/3.2	14.2/5.0
Delivered/supplied power* at 15/50 °C **	(kW)	7.6/2.1	10.1/2.9	11.8/3.3	16.6/5.1
Delivered/supplied power* at -20/50 °C **	(kW)	3.1/2.0	4.1/2.3	5.0/2.8	7.0/4.2
Starting current	(A)	17	19	27	30
Motor protection setting	(A)	5	7	9	11
Soft-start relay		included as standard			
Operating voltage		400 V 3NAC 50Hz			
Compressor		Scroll compressor			
Nominal flow heating medium	(l/s)	0.16	0.20	0.25	0.34
Internal pressure drop at nominal flow	(kPa)	1.3	1.5	2.2	4.4
Min-/max pressure heating medium side	(bar)	0.5/2.5			
Airflow	(m³/h)	1500	1700/2000	1700/2000	2250/3050
Nominal output, fan	(W)	70	90/130	90/130	180/230
Fuse	(A)	10	10	16	16
Enclosure class		IP 24			
Max outgoing heating medium temperature	(°C)	58	58	58	58
Refrigerant volume (R404A)	(kg)	2.0	2.2	2.2	2.3
Connection heating medium male Ø		G1 (Ø 28 mm)			
Defrosting system		hot gas defrosting			
Cut-out value pressostat HP	(bar)	29			
Cut-out value pressostat LP	(bar)	0.3			
Difference pressostat HP	(bar)	-7			
Difference pressostat LP	(bar)	+0.7			
Height with stand	(mm)	1045			
Width	(mm)	1200			
Depth	(mm)	520			
Weight	(kg)	120	126	132	140
Colour		dark grey			
Lowest operational point, outdoor air/flow line	(°C)	-20/50 (-7/58)			
Highest operational point, outdoor air/flow line	(°C)	35/58			
Part No.		064 047	064 048	064 049	064 052

* Compressor, fan and control. Flows according to EN 255.
Defrosting reduces the relationship between input/output by about 10 %.

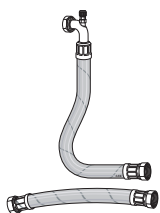
** outside temperature/Flow temperature

Working area

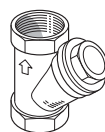


During shorter time it is allowed to have lower working temperatures on the water side, e.g. during start up.

Enclosed kit

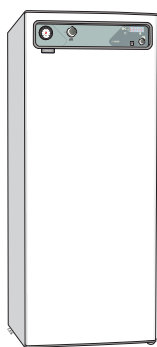


2 flexible hoses (R25) with 4 seals



Particle filter R25

Accessories



EVP 270

Indoor module (only for F2025-6, -8 and -10) Suitable for low ceiling heights.

Part no. 069 016



EVP 500

Indoor module.
Part no. 069 050



VVM 300

Indoor module (only for F2025-6, -8 and -10)

Part no. 069 010

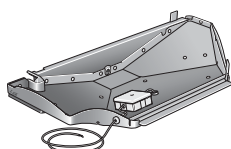


VPA

Double-jacketed hot water cylinder

VPA 300/200 Part No. 088 710

VPA 450/300 Part No. 088 660



KVT 11

Condensation water trough

Part no. 067 035



SMO 10

Control box
Part no. 089 638



HR 10

Auxiliary relay
Part no. 089 423



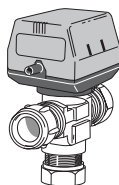
RT 10

Room thermostat
Part no. 418 366



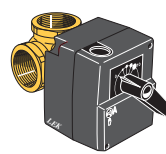
VT 10

Heating thermostat
Part no. 418 801



VST 11

Hot water control
Shuttle valve, Cu-pipe Ø28
Max recommended charge
power, 15 kW
Part no. 089 152



VST 20

Hot water control
Three way valve, DN 32 (1 1/4")
Max recommended charge
power, 40 kW
Part no. 089 388

Dealing with malfunctions

Checking the status

Scroll to channel S1 using the plus button to read off the status and any alarms. See the section “Control” – “Channel description”.

NOTE

Work behind covers secured by screws may only be carried out by or under the supervision of a qualified installation engineer

NOTE

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

NOTE

In the event of any defrosting problems, the value in channel A11 can be increased to relieve the problem.

F2025 is not operational

- Cause:

External control equipment has not given the start signal.

Action:

Check the settings on the control equipment.
- Cause:

Fuses have tripped.

Action:

Replace the fuse or reset the MCB. If the fuse trips again the installation engineer should be contacted.
- Cause:

Motor cut-out has tripped. Indicated as 07 in channel S1.

Action:

Check the fuses.
- Cause:

Cold outdoor air. Indicated as 03 in channel S1.

Action:

Wait until the outdoor air temperature is higher than the heat pump's set stop value.
- Cause:

Tripped high pressure pressostat. Indicated as 06 in channel S1.

Action:

Check that the system has been vented correctly. Check the fuses. Check that the particle filter is not blocked. Check that the circulation pump is rotating. If the fault remains contact the installation engineer.
- Cause:

Tripped low pressure pressostat. Indicated as 05 in channel S1.

Action:

Ensure that the air flow is not blocked. If the fault remains contact the installation engineer.
- Cause:

Flow and return line sensors fitted incorrectly. Indicated as 12 in channel S1.

Action:

Contact installer.
- Cause:

The heat pump does not defrost.

Action:

Check the temperature on the return line sensor (channel T3). If it is below 10 °C the heat pump will not defrost. Check the temperature on the evaporator sensor (channel T7). If it is higher than the set Start temperature, defrosting (channel A9) during compressor operation the heat pump does not defrost.
- Cause:

Time conditions do not permit start.

Action:

Wait until the set conditions have run out. (If C flashes in the display the start conditions have been given.)
- Cause:

Outdoor temperature hotter than 35 °C. Indicated as 13 in channel S1.

Action:

Wait until the outdoor temperature is colder than 33.0 °C.

Cause: High flow temperature (T2). Indicated as 14 in channel S1.

Action: Check the charge flow and the particle filter which may be partially clogged.

Cause: High return temperature (T3). Indicated as 04 in channel S1.

Action: Check the charge flow and note the compressor's limitations at low outdoor air temperatures.

Cause: Unsuccessful defrosting. Indicated as 15 in channel S1.

Action: Check the charge flow.

Cause: Short operations times Indicated as 16 in channel S1.

Action: Check the connection difference for the thermostat. Check the start temperature hot water (menu 1.1) in any SMO 10. Check the charge flow and the particle filter which may be partially clogged.

Cause: Hot gas temperature exceeds 120 °C. Indicated as 17 in channel S1.

Action: Contact installer.

Cause: Incorrect direction of rotation. Indicated as 18 in channel S1.

Action: When starting for the first time or after work in the distribution board see "Commissioning and adjusting" – "Start-up and inspection".

Cause: Fan stopped.

Action: Ensure that the air flow is not blocked. If the fault remains contact the installation engineer.

The alarm is acknowledged by the voltage to the heat pump being interrupted and then restarted.

Draining, heat medium side

In the event of prolonged power failures it is recommended that the part of the heating system located outdoors is drained. (See the section Pipe connections)

NOTE

As F2025 can be connected to a large number of external units, these should also be checked.

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









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