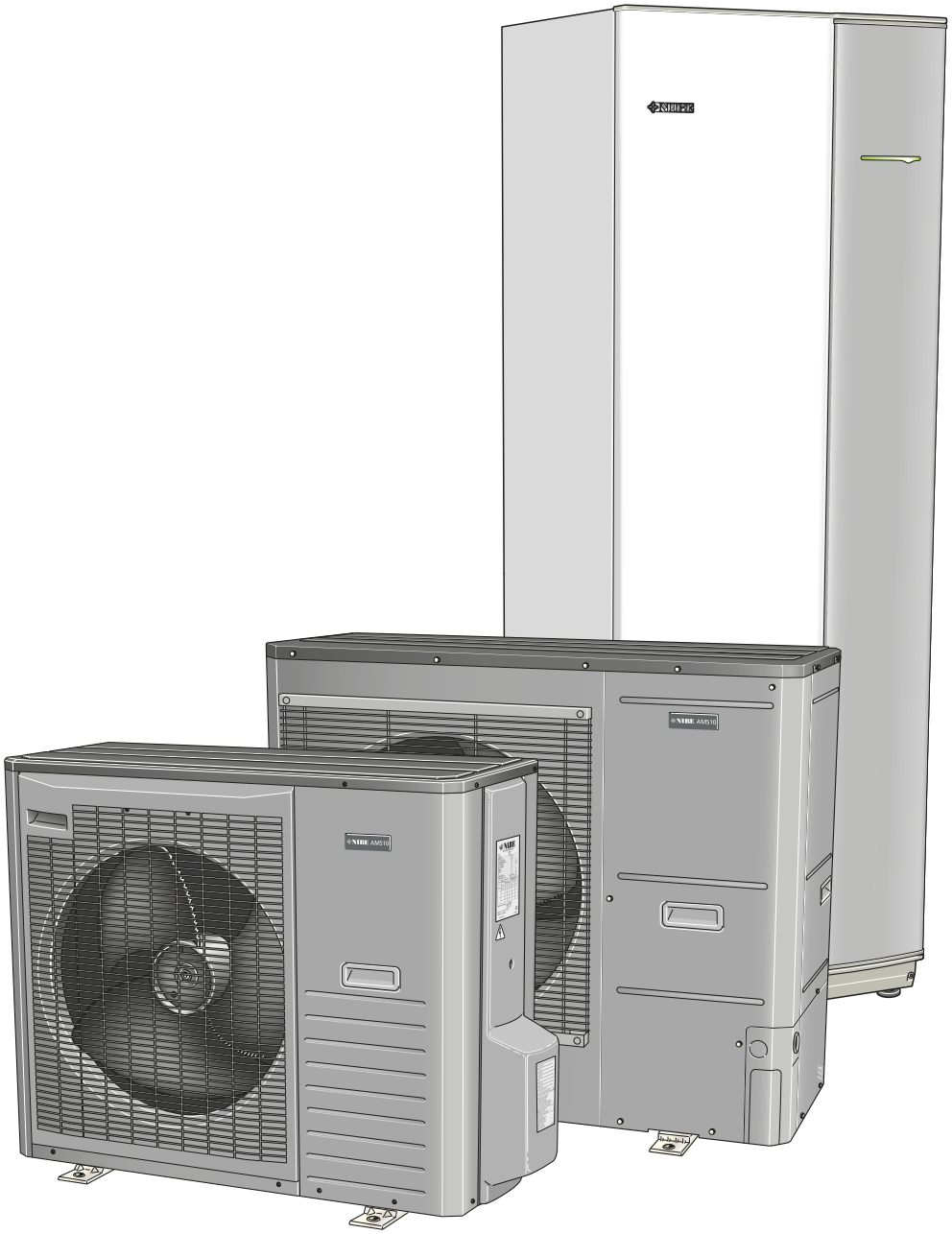
MOS GB 1337-5
NIBE™ SPLIT
431156

INSTALLATION AND MAINTENANCE INSTRUCTIONS

NIBE™ SPLIT

ACVM 270, AMS 10



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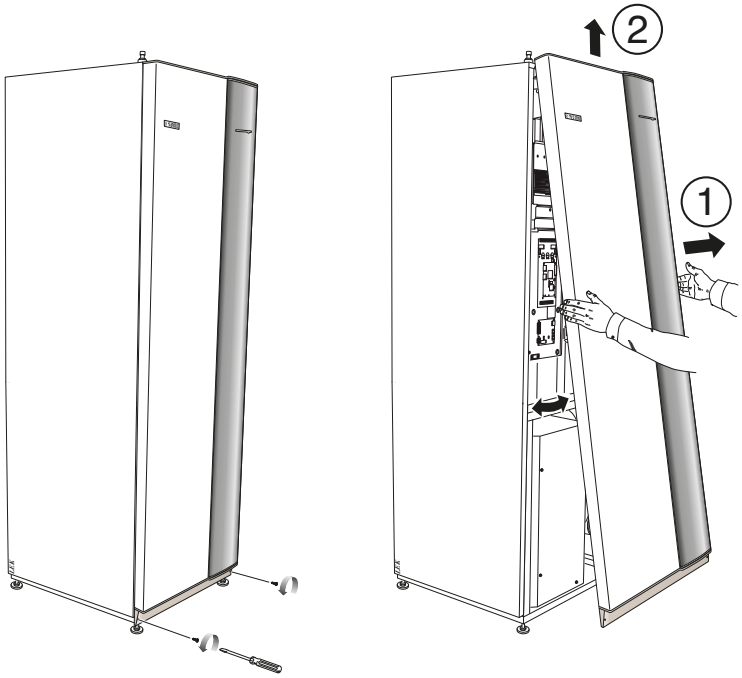
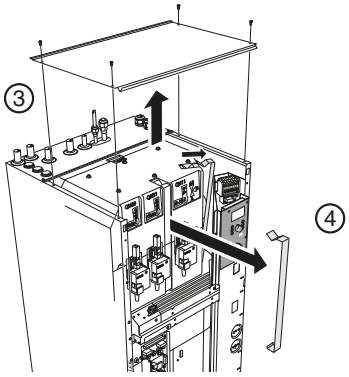
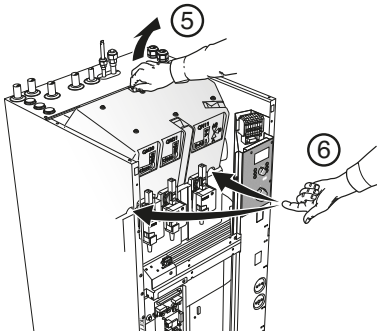
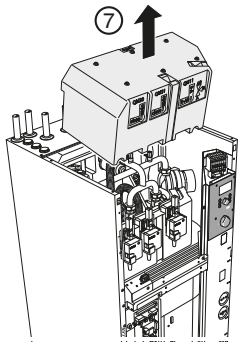
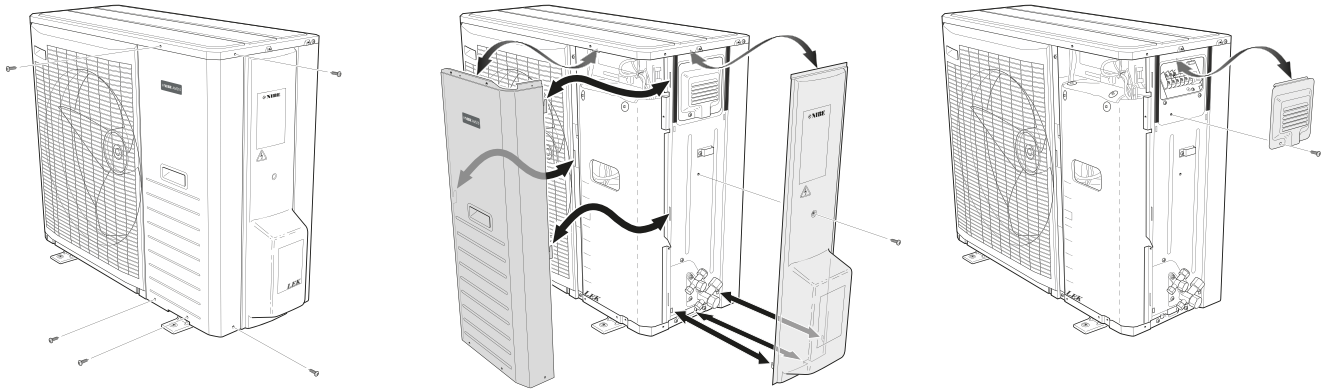




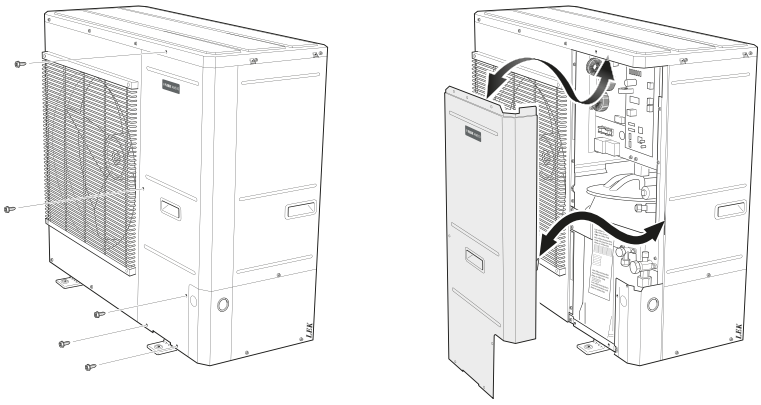




AMS 10-8



AMS 10-12



For Home Owners

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General

NIBE SPLIT is a system for heating, cooling and producing hot water for small houses. The system consists of an outdoor module (AMS 10), which utilises the energy in the outdoor air and sends it to the indoor module (ACVM 270), which takes care of the regulation and heat distribution in the house.

In order to gain the greatest benefit from the NIBE SPLIT system, please refer to the 'For Home Owners' chapter within this Installation and Maintenance Manual.

NIBE SPLIT is a quality system offering a long service life and reliable operation.

Installation data

Installation data and installation check list on page 34 must be filled in by the installer in order for the warranty to apply.

Completed by the installation engineer when the system is installed

The Serial number must always be stated in all correspondence with NIBE.			
Indoor unit:		Outdoor unit:	
Installation date:			
Check list, page 34, filled in ☐			
Installation engineers:			
Heating ☐ Radiator ☐ Floor ☐ Fan convector Cooling ☐ Other ☐ Floor ☐ Fan convector ☐ Not available External heat source ☐ Solar ☐ Gas ☐ Oil ☐ Wood ☐ Pellets ☐ Electricity Accessories ☐ KVR 10 ☐ RE 10 ☐ RG 10 ☐ ESV 22 ☐ VCC 22 ☐ ACK 22 ☐ SRB 22			
Settings Enter deviations from default settings.			
Menu	Setting	Menu	Setting
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
Date _____ Signed _____			

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

Information about the installation

Product information

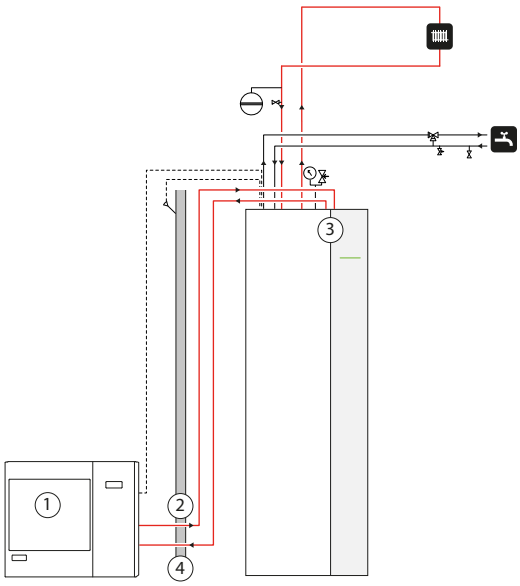
NIBE SPLIT is a complete modern heat pump system that offers effective energy saving and reduced carbon dioxide emissions. Climate control is safe and economical with integrated hot water heater, immersion heater, circulation pump and control system in the indoor module.

The heat is retrieved from the outdoor air through an outdoor module (AMS 10), where the refrigerant, which circulates in a closed system, transfers the heat from the heat source (outdoor air) to the indoor module (ACVM 270). This eliminates the need for bore holes and coils in the ground.

Features of NIBE SPLIT

- Optimal annual heating factor thanks to the inverter controlled compressor.
- Outdoor unit with compact dimensions.
- Speed controlled circulation pump.
- Optimized operating costs. The speed of the compressor is adjusted according to the demand.
- Integrated coil water heater in ACVM 270.
- Integrated clock for scheduling extra hot water and temperature lowering/increasing the flow line temperature.
- Prepared for control of two climate systems.
- Integrated active cooling function.
- Possible to connect external heat sources.

Principle of operation NIBE SPLIT



Function

NIBE SPLIT is a system that can produce heating, hot water and cooling.

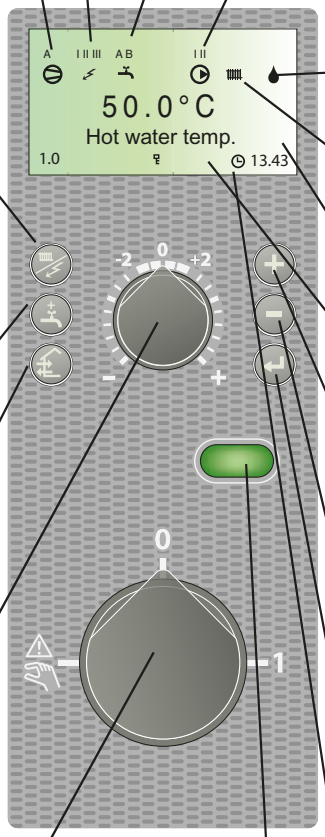
The principle during heating can be simplified as follows:

1. The refrigerant in AMS 10 retrieves heat from the outdoor air then compresses it, which increases the temperature further.
2. The hot refrigerant (now in gas state) is routed into ACVM 270.
3. The refrigerant releases the heat for further distribution in the system.
4. The refrigerant (now in liquid state) is routed back to AMS 10 and the process is repeated.

By reversing the process, thereby allowing the refrigerant in AMS 10 to retrieve the heat from the water and release it into the outdoor air, the heat pump can, if necessary, cool instead.

ACVM 270 determines when AMS 10 is to work and not to work, using the collated data from the temperature sensor. In the event of extra heat demands, ACVM 270 can connect additional heat in the form of the internal immersion heater, or any connected external addition.

Front panel, indoor module



Additional heat symbol
If the electrical addition is connected
"I" Electrical step 1
"II" Electrical step 2
"II" Electrical step 3
More than one electrical step can be connected at the same time.

Compressor symbol
- Heating or cooling demand
"A" Heating mode
"B" Cooling mode

Operating status
Pressing the button (the change does not need to be confirmed with the enter button).
-Current operating mode is shown in the display.
-Further button pressing changes operating mode.
Press the enter button to return to the normal display mode.
For information about the various operating modes, see the different sections regarding comfort settings.

Extra hot water (XHW)
The change does not need to be confirmed with the Enter button.

Menu 1.0
Pressing the button takes you directly to menu 1.0.

Offset heating curve
- Turning clockwise (+) increases the room temperature (if room sensors are not used).
When the knob is turned menu 2.0 is shown on the display and the value for the current supply temperature changes.

Switch
1 Normal mode
All control functions connected.

0 Shutdown

Emergency mode
Only the circulation pump and electrical addition (electrical step 2) are operational.

Status lamp
During normal operation, the status lamp lights green.
In the event of an alarm, it lights red.

Hot water symbol
The heat pump charges hot water.
"A" Temporary temperature increase in progress.
"B" Time based temperature increase in progress, e.g. periodic.

Circulation pump symbol
Circulation pump in operation.
With two circulation pumps (requires accessory ESV), the operating pump is also indicated.

Defrosting symbol
Defrosting in progress.

Climate system symbol
Heating/cooling in progress.

Description of current display parameter

Information symbols
1.0 Menu number
Key lock activated.

Plus button
- Scroll forward in the menu system.
- Increase the value of the selected parameter
See the section "Control – General"

Minus button
- Scroll back in the menu system.
- Reduce the value of the selected parameter
See the section "Control – General"

Enter button
- Select lower menu in the menu system.
- Parameter change activated
- Parameter change confirmed
See the section "Control – General"

Clock
Displayed with all activated scheduling.
See the section "Control – Menu 7.0"

How to use the front panel

All the most common settings are made from the panel as well as control computer instructions such as comfort etc. that you require the heat pump system to fulfil.

In order for the installation to be used optimally, certain basic settings must have been made (see page 8). In addition the installation in general must be carried out according to the instructions and manufacturer's recommendations.

Menu 1.0 (the temperature in the water heater) is normally shown on the display.

The plus and minus buttons and the enter button are used to scroll through the menu system as well as to change the set value in some menus.

Menu types

Control is divided into different menu types depending on how "deep" into the controls you need to go.

- Normal [N]: The settings you as a customer often need.
- Extended [U]: Shows all detailed menus except the service menus.
- Service [S]: Shows all menus.

Changing of menu type is done from menu 8.1.1

Quick movement

To quickly return to the main menu from a sub menu, press one of the following buttons:

Key lock

A key lock can be activated in the main menus by simultaneously pressing the plus and the minus buttons. The key symbol will then be shown on the display.

The same procedure is used to deactivate the key lock.

Comfort setting heating

General

The indoor temperature depends on several factors.

- Sunlight and heat emissions from people and household machines are normally sufficient to keep the house warm during the warmer parts of the year.
- When it gets colder outside, the climate system must be started. The colder it is outside, the warmer radiators and under floor heating systems must be.

Controlling heat production

Normally, the heat pump heats the water (heating medium) to the temperature required at a certain outdoor temperature. This occurs automatically on the basis of the collected temperature values from the outdoor temperature sensor and sensors on the lines to the climate system (flow line sensors). Extra accessories such as room temperature sensors, can influence the temperature.

However, the correct default settings must be made on the heat pump first, see the section "Default settings".

The temperature information that the outdoor sensor (mounted on an exterior wall of the house) sends to the heat pump's control computer senses variations in the outdoor temperature early on. It does not have to be cold inside the house before the control system is activated, as soon as the average outdoor temperature drops outside, the temperature of the water to the climate system (supply temp.) inside the house is increased automatically.

The heat pumps flow temperature (menu 2.0) will hover around the theoretical required value, which is in brackets on the display.

Temperature of the climate system

The temperature of the climate system in relation to the outdoor temperature can be modified by using the "Offset heating curve" knob on the heat pump's front panel.

Operating status

The "Operating mode" button is used to set the required operating mode with regard to permitting/blocking the circulation pump and additional energy.

The change does not need to be confirmed with the enter button.

The current operating mode is shown on the front panel display when the button is pressed and the mode changes when you continue to press the button.

The display returns to the normal display mode once the enter button is pressed.

The addition is only used for anti-freeze mode, if it is deactivated in the menu system. This applies to all operating modes.

The different operating modes are:

1. "Auto"
   - ACVM 270 automatically selects the operating mode by taking the outdoor temperature into account. This means that the operating mode switches between "Heating" and "Hot water". Current operating mode is shown within brackets.
   - The circulation pump is permitted to operate when there is a need.
2. "AutoK"*
   - ACVM 270 selects operating mode automatic (cooling can also be selected now) with regard to the outdoor temperature. This means that the operating mode switches between "Heating", "Cooling" and "Hot water".
   - The circulation pump is permitted to operate when there is a need.
3. "Heat" / "Heat addition"
   - Only heating and cooling produced.
   - The circulation pump is in operation the entire time.
   - If "Heat addition" is shown the addition is permitted to operate if necessary.
4. "Cooling"* / "Super cooling"
   - If addition is permitted, "Super cooling" is displayed. The compressor then only runs in cooling mode. Otherwise, the mode switches to cooling or producing hot water.
   - The circulation pump is in operation the entire time.
   - Hot water is only produced by the immersion heater.
5. "Hot water"
   - Only hot water is produced.
   - Only the compressor is operational.
6. "Add. heat only"
   - Compressor blocked. The function is activated by pressing in the "operating mode button" for 7 seconds.
7. Deactivate the function by pressing the "Operating mode" button for 7 seconds once again.

* To use the cooling functions, the system must be designed to withstand low temperatures and "Cooling" must be activated in menu 9.3.3.

Changing the room temperature manually

If you want to temporarily or permanently increase or lower the indoor temperature turn the "Offset heating curve" knob clockwise or anticlockwise. One line approximately represents a 1 degree change in room temperature.

NOTE

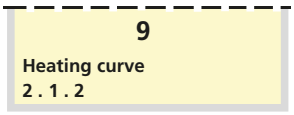
An increase in the room temperature may be inhibited by the radiator or underfloor heating thermostats, if so these must be turned up.

Default setting

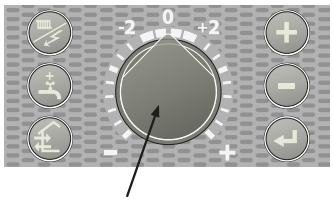
The basic heating is set using menu 2.1.2 and with the "Heating curve offset" knob.

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

If you do not know the correct settings use the basic data from the automatic heating control system diagram opposite.



Menu 2.1.2 Heating curve



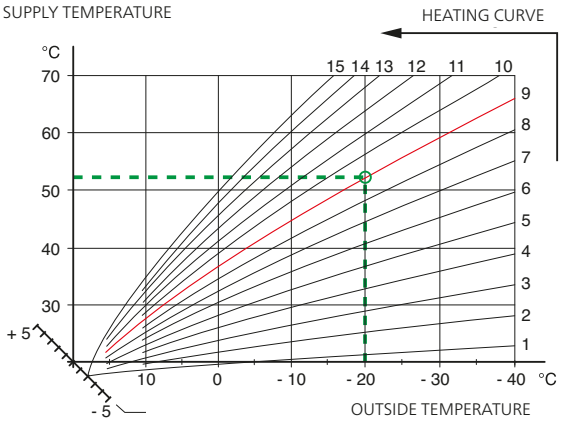
Offset heating curve

NOTE

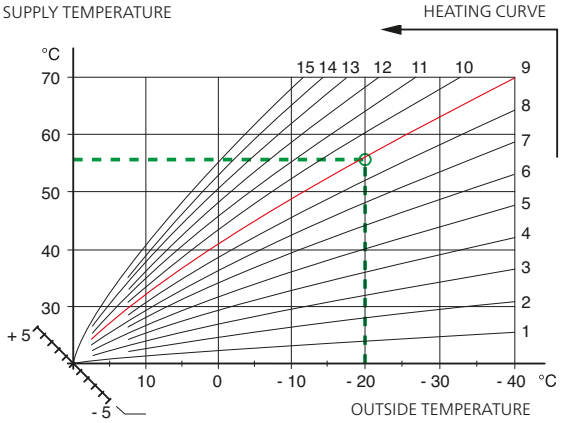
Wait one day between settings so that the temperatures have time to stabilise.

Setting with diagrams

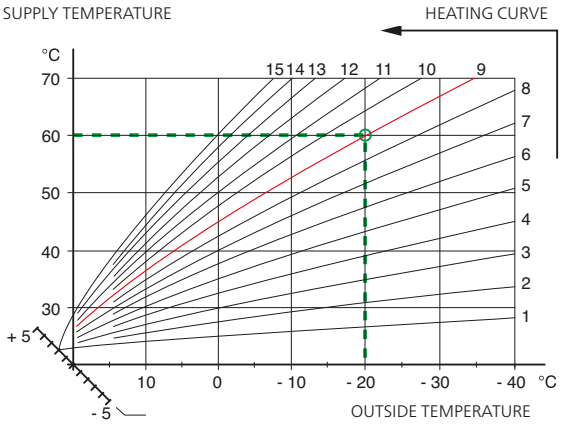
The diagram is based on the dimensioned outdoor temperature in the area and the dimensioned flow temperature of the climate system. When these two values "meet", the heating control's curve coefficient can be read. This is set under menu 2.1.2, "Heating curve". Limitations, which are not in the diagrams, are included in the control system's permitted min and max temperatures.



OFFSET HEAT CURVE -2



OFFSET HEAT CURVE 0



OFFSET HEAT CURVE +2

Readjusting the default settings

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

Cold weather conditions

- When the room temperature is too low, the "Heating curve" value is increased in menu 2.1.2 by one increment.
- When the room temperature is too high, the "Heating curve" value is decreased in menu 2.1.2 by one increment.

Warm weather conditions

- If the room temperature is low, increase the "Heating curve offset" setting by one step clockwise.
- If the room temperature is high, reduce the "Heating curve offset" setting by one step anti-clockwise.

Comfort setting cooling

General

The condition in order for cooling to be activated is that "On" is selected in menu 9.3.3 Cooling system.

NOTE

The climate system must manage cooling operation. Settings must be made by the installer when commissioning the system.

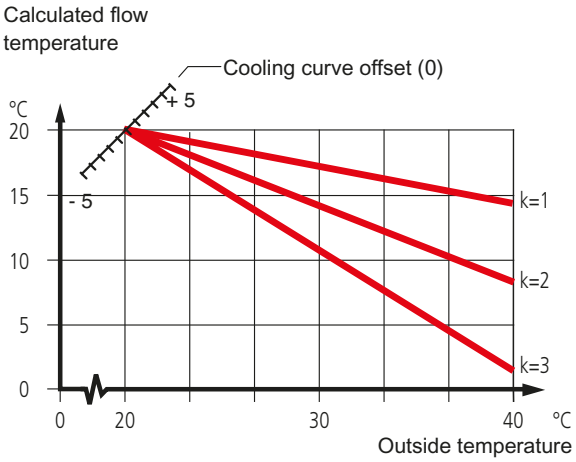
If a room sensor is connected, it starts and stops cooling together with the outdoor temperature. The lowest calculated supply temperature is set in menu 2.2.4.

Cooling operated from the outdoor sensor in operating mode AutoK

If the cooling system is set to "On" in menu 9.3.3 and the outdoor temperature is greater or equivalent to the set start temperature for cooling in menu 8.2.4, cooling starts.

Cooling stops when the outdoor temperature drops below the set value minus the set value in menu 8.2.5.

The calculated flow line temperature is determined from the selected cooling curve in menu 2.2.2 and the offset for cooling curve, menu 2.2.1. Limitations, which are not in the diagram, are included in the control system's permitted min temperature.



Controlling cooling mode using the room sensor

If RG 10 is present, the condition for cooling is that the room temperature has exceeded the set room temperature (menu 6.3) by the set value in menu 8.2.5 and that the outdoor temperature is equivalent to or exceeds the set outdoor temperature value (menu 8.2.4).

When the room temperature has dropped below the set room temperature in menu 6.3 by the set value in menu 8.2.5 or the outdoor temperature falls below the set value in menu 8.2.4 by the set value in menu 8.2.5, cooling switches off.

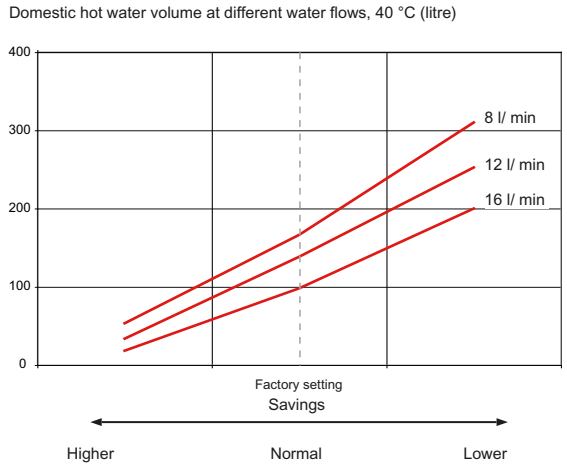
Comfort setting hot water

The integrated water heater is of coil model and is heated by circulating water, which is heated by the heat pump.

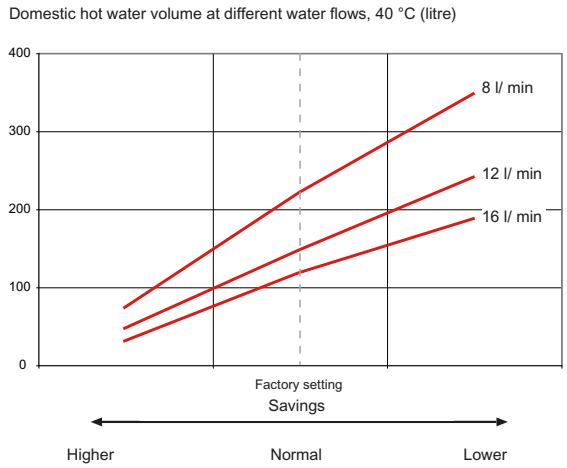
During "normal" consumption it is enough to run the heat pump's compressor to supply the different tapping points of the house with hot water. The temperature of the hot water in the water heater then varies between the set values.

Under section 1.0 [N] Hot water temp. on page 45 there is a complete description of menu settings for hot water temperatures.

Available volume (ACVM 270 with AMS 10-8)



Available volume (ACVM 270 with AMS 10-12)



Prioritizing

If the water within the water heater requires heating, the heat pump prioritises this and shifts to hot water mode with the entire heat pump output.

In this mode, there is no heating or cooling.

Prioritizing can be affected via settings in the front panel.

See "1.0 [N] Hot water temp." on page 45.

Extra Hot Water

In all "Extra hot water" functions, the temperature of the hot water increases temporarily. The temperature is first increased to an adjustable level by the compressor (menu 1.5) and then the electrical addition increases until the stop temperature is reached (menu 1.4).

Temporary "Extra hot water" is activated manually, whilst time based extra hot water is activated using the settings made in the control computer.

When:

- "A" appears above the icon, temporary extra hot water is active.
- "B" appears above the icon, time based extra hot water is active.

NOTE

"Extra hot water" usually means that the electrical addition has been activated and therefore increases the electrical consumption.

"Extra hot water" can be activated in three different ways:

1. **Periodic time based extra hot water**
   - Interval between increases selected in menu 1.7. Menu 1.8 shows when the next increase is due.
   - The increased temperature is maintained by the electrical addition for one hour.
2. **Schedule time based extra hot water**
   - The start and stop times for the day of the week that the increase is required are set in the sub menus to menu 7.4.0.
   - The increased temperature is maintained by the electrical addition for the selected period.
3. **Temporary extra hot water**
   - The current "extra hot water" mode is shown on the display (A) when the button is pressed and when you continue to press the button the mode changes between 3 hours and standby mode.
   - The increased temperature is maintained by the electrical addition until the period of time has expired.

Maintenance

ACVM 270 and AMS 10 require minimal maintenance after commissioning.

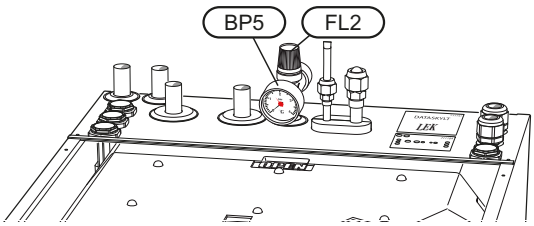
NIBE SPLIT contains many components and is why monitoring functions are integrated to help you.

If something abnormal occurs, a message appears about malfunctions in the form of different "alarm" texts in display.

Checking the safety valves in ACVM 270

ACVM 270 has been equipped with a safety valve for the water heater as well as a safety valve for the climate system by the installer.

The climate system's safety valve



The climate system's safety valve (FL2) must be completely sealed. Checks must be carried out regularly as follows:

- Open the valve.
- Check that water flows through the valve. If this does not happen, replace the safety valve.
- Close the valve again.
- The climate system may need to be refilled after checking the safety valve, see the section "Filling the climate system". Contact your installer for refilling the climate system.

Hot water heater safety valve

The water heater's safety valve sometimes releases a little water after hot water usage. This is because the cold water, which enters the heater to replace the hot water, expands when heated causing the pressure to rise and the safety valve to open.

Also check the water heater safety valve regularly. The appearance and location of the safety valve differs between different installations. Follow the cold water pipe to locate the safety valve. Contact your installer for information.

Pressure gauge in ACVM 270

The working range of the climate system is normally 0.5 – 1.5 bar when the system is closed. Check this on the pressure gauge (BP5).

Emptying the hot water heater

The water heater is of the coil type and is drained using the siphon principle. This can be done either via the drain valve on the incoming cold water pipe or by inserting a hose into the cold water connection. See page 17.

Emptying the vessel

Contact your installer if the vessel in ACVM 270 needs emptying.

Maintenance of AMS 10

AMS 10 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. During the cold months of the year, check to make sure that there isn't a build up of ice or frost under AMS 10. Strong wind combined with heavy snowfall can block the intake and exhaust air grilles. Make sure that there is no snow on the grilles.

Also check that the condensation water drain under AMS 10 is not blocked.

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 AMS 10. Prevent AMS 10 coming into contact with alkaline cleaning agents.

⚠ WARNING!

Rotating fan in AMS 10.

Saving tips

Your NIBE SPLIT installation produces heat and hot water according to your needs. It also attempts to carry out all requirements with all available "aids" from the control settings made.

The indoor temperature is naturally affected by the energy consumption. Therefore, take care not to set a temperature higher than necessary.

Other known factors that affect the energy consumption are, for example, hot water consumption and the insulation level of the house, as well as the level of comfort you require.

Also remember:

- Open the thermostat valves completely (except in the rooms that are to be kept cooler for various reasons, e.g. bedrooms).

Thermostat valves in the radiators and floor loops can negatively affect the energy consumption. They slow the flow in the climate system, which the heat pump wants to compensate with increased temperatures. It then works harder and consumes more electrical energy.

Dealing with comfort disruption

Use the following list to find and remedy any heating or hot water problems.

Symptom	Cause	Action
Low hot water temperature or a lack of hot water.	Circuit or main miniature circuit breaker (MCB) tripped.	Check and replace blown fuses.
	Heat pump and immersion heater do not heat.	Check and replace any blown circuit and main fuses.
	Possible earth circuit-breaker tripped.	Reset the earth circuit-breaker, if the earth circuit-breaker trips repeatedly, call an electrician.
	Switch (SF1) set to mode 0.	Set the switch to 1.
	Large hot water demand.	Wait a few hours and check if the hot water temperature rises.
	Too low start temperature setting on the control system.	Adjust the start temperature setting in menu 1.2.
Low room temperature.	Possible earth circuit-breaker tripped.	Reset the earth circuit-breaker, if the earth circuit-breaker trips repeatedly, call an electrician.
	Heat pump and immersion heater do not heat.	Check and replace any blown circuit and main fuses.
	Incorrect setting of "Curve slope", "Heating curve, offset" and/or "Cooling curve, offset".	Adjust the setting.
	Circuit or main miniature circuit breaker (MCB) tripped.	Check and replace blown fuses.
	Heat pump in incorrect operating mode ”Hot water” or "Cooling".	Change operating mode to ”Auto” or "AutoK".
	The current limiter has restricted the current because many power consumers are being used in the property.	Switch off one/several of the power consumers.
High room temperature.	Incorrect setting of "Curve slope", "Heating curve, offset" and/or "Cooling curve, offset".	Adjust the setting.
	Heat pump in incorrect operating mode.	Change operating mode to ”AutoK”.
	Incorrect settings for cooling.	Adjust the settings. Check menu 2.2.1, 2.2.2 and 8.2.4.
The compressor does not start.	Minimum time between compressor starts, alternatively time after power switch on not achieved.	Wait 30 minutes and check if the compressor starts.
	Alarm tripped.	See section ”Alarms”.
	Alarm cannot be reset.	Activate operating mode ”Only additional heat”.
Display not lit.		Check and replace any blown circuit and main fuses.
		Check that the circuit breaker to the indoor unit is not off.
		Check that the switch (SF1) is in normal position (1).

Operating mode "Add. heat only"

In the event of malfunctions that cause a low indoor temperature, you can normally activate "Add. heat only" in ACVM 270, which means that heating only occurs with the immersion heater.

Activate the mode by holding in the operating mode button  for 7 seconds.

Note that this is only a temporary solution, as heating with the immersion heater does not make any savings.

Deactivate the function by pressing the "Operating mode" button for 7 seconds once again.

Emergency mode

Emergency mode is activated by setting the switch to " ⚠". It is used when the control system and thereby operating mode "Add. heat only" do not function as they should. Emergency mode is activated by setting switch (SF1) to " ⚠".

The following applies in emergency mode:

- The front panel is not lit and the control computer in ACVM 270 is not connected.
- AMS 10 is off and only the circulation pump and immersion heater in ACVM 270 are active.
- An electrical step of 4 kW is connected. The immersion heater is controlled by a separate thermostat (BT30).
- The automatic heating control system is not operational, so manual shunt operation is required. Call installer.

Alarm indications

There are many monitoring functions integrated in NIBE SPLIT to alert you to any malfunctions, the control computer transmits alarm signals that can be read from the front panel display.

What happens in the event of an alarm?

- The background lighting in the display starts flashing and the status lamp lights red.
- Compressor alarms and outdoor sensor errors change the operating mode to "Anti freeze" and reduce the supply temperature to the minimum permitted temperature to notify you that something is wrong.

Different types of alarms

- Alarms with automatic reset (do not need to be acknowledged when the cause has disappeared).
- Existing alarms that require corrective action by you or the installer.
- A complete list of alarms is on page 57.

Recommended actions

1. Read off which alarm has occurred from the heat pump's display.
2. As a customer you can rectify certain alarms. See the table below for relevant actions. If the alarm is not rectified, or is not included in the table, contact your installer.

Alarm text on the display	Alarm description	Check/remedy before installers/service technicians are called
LP-LARM	Tripped low pressure pressostat.	Check that the thermostats for the radiators/under-floor heating systems are not closed (only during cooling operation).
HP-LARM	Tripped high pressure pressostat.	Check that the thermostats for the radiators/under-floor systems are not closed. If cooling is in progress: Check that the air flow to AMS 10 is not obstructed.
OU power failure / OU Com. error	Outdoor unit not powered / Communication cut	Check that any circuit breakers to the outdoor unit are not off.
Display not lit.		Check and replace any blown circuit and main fuses.
		Check that the circuit breaker to the indoor unit is not off.
		Check that the switch (SF1) is in normal position (1).

Acknowledging alarms

No harm in acknowledging an alarm. If the cause of the alarm remains, the alarm recurs.

- When an alarm has been triggered, it can be acknowledged by switching ACVM 270 off and on using the switch (SF1). Note that when the power is switched on there is a 30 minute delay before the heat pump restarts. Alternatively, the alarm can be acknowledged in menu 9.7 (service menu).
- When the alarm cannot be reset using the switch (SF1), the operating mode, "Add. heat only", can be activated to resume a normal temperature level in the house. This is most easily carried out by holding the "Operating mode" button in for 7 seconds.
- Deactivate the function by pressing the "Operating mode" button for 7 seconds once again.

NOTE

Recurring alarms mean that there is a fault in the installation.

Contact your installer!

General information for the installer

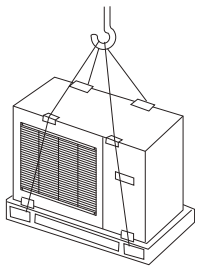
Transport and storage

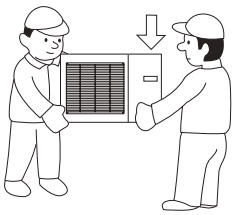
Outdoor module AMS 10

AMS 10 should be transported and stored vertically.

If the heat pump is to be lifted using lifting straps without packaging, protect as illustrated.

The right-hand side of the heat pump (seen from the front) is heavier.

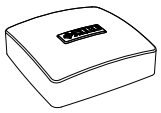




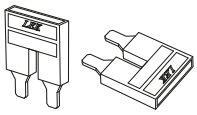
Indoor module ACVM 270

ACVM 270 can be transported either vertically or horizontally. However it must be stored vertically and in dry conditions.

Supplied components

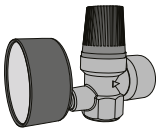


Outside sensor



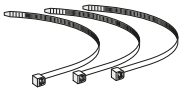
Straps for 1 phase connection

Current sensor, 3 phase



Safety valve with manometer

Straight connection to safety valve



Cable ties

The enclosed kit is located behind the front service cover in ACVM 270.

Assembly

Outdoor module AMS 10

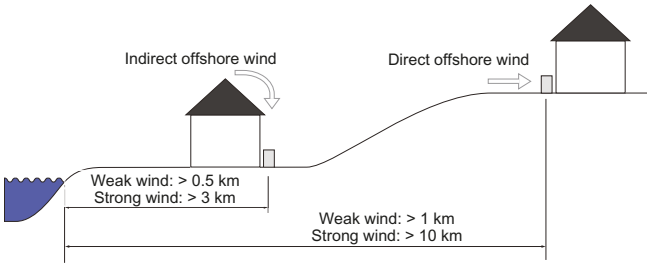
Position AMS 10 outdoors secured to a firm surface, preferably concrete foundation with ground stand near walls or wall mounting.

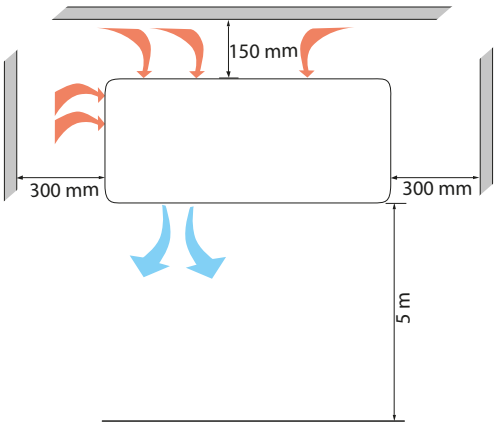
It must be positioned so that the lower edge of the evaporator is at the level of the average local snow depth, although a minimum of 200 mm. AMS 10 should not be positioned next to noise sensitive walls, for example, next to a bedroom. Also ensure that the placement does not inconvenience the neighbours. Care must be exercised so that the heat pump is not scratched during installation.

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.

The distance between AMS 10 and the house wall must be at least 150 mm. Ensure that there is at least one metre free space above AMS 10. **AMS 10 must not be placed so that recirculation of outdoor air can occur. AMS 10 must not be placed in a windy location where it is exposed to direct strong winds. This causes lower output and impaired efficiency and it also negatively affects the defrosting function.**

For wall installation, ensure that vibrations do not affect the inside of the house. Also ensure that the wall and mounting can take the weight of the heat pump.





Indoor module ACVM 270

- It is recommended that ACVM 270 is installed in a room with existing floor drainage, most suitably in a utility room or boiler room.
- The surface must be firm, preferably a concrete floor or foundation.
- Install ACVM 270 with its back to an outside wall, ideally in a room where noise does not matter. If this is not possible, avoid placing it against a wall behind a bedroom or other room where noise may be a problem.
- The unit can be aligned using the adjustable feet.
- Route pipes so they are not fixed to an internal wall that backs on to a bedroom or living room.
- Ensure that there is approx. 500 mm free space in front of and 220 mm above the product for any future service.

Dimensioning expansion vessel

Internal volume in ACVM 270 for calculating expansion vessel is 280 l. The expansion vessel's volume must be at least 5 % of the total volume.

Example table

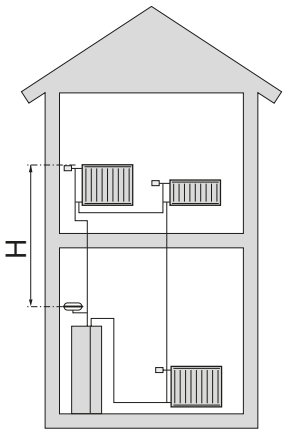
Total volume (l)	Volume Expansion vessel (l)
280	14
320	16
360	18

Initial pressure and max height difference

The initial pressure of the pressure expansion vessel must be dimensioned according to the maximum height (H) between the vessel and the highest positioned radiator, see figure. An initial pressure of 0.5 bar (5 mvp) means a maximum permitted height difference of 5 m.

If the standard initial pressure in the pressure vessel is not high enough it can be increased by filling via the valve in the expansion vessel. The expansion vessel's standard initial pressure must be entered in the check list on page 34.

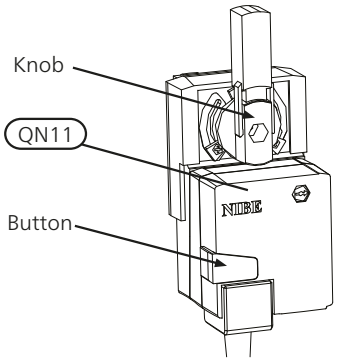
Any change in the initial pressure affects the ability of the expansion vessel to handle the expansion of the water.



Manual shunting

When ACVM 270 is set to emergency mode, the heating control system is not in operation, and manual shunt operation is required.

1. Depress and lock the button on (QN11).
2. Turn the mixing valve to the desired position by hand.



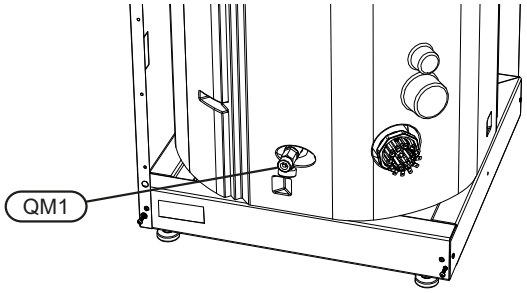
Emptying the vessel

The vessel in ACVM 270 is emptied by opening the valve (QM1) and safety valve (FL2).

NOTE

When the vessel in ACVM 270 is emptied via the valve (QM1), some water will remain in the coil and in the heat exchanger.

This means that there is a risk of the heat exchanger, pipes and valves freezing at low temperatures as well as a hygienic risk for the coil in the hot water section.



Recommended installation order

1. Connect ACVM 270 to the climate system, cold and hot water lines as well as any external heat sources. See page 18. Also see docking descriptions on page 22 and further on.
2. Install the refrigerant pipes according to the description on page 19.
3. Connect the load monitor, outdoor temperature sensor, any centralised load control and external contacts as well as the cable between ACVM 270 and AMS 10. See page 28.
4. Connect supply to ACVM 270. See page 27.
5. Follow the commissioning instructions on page 32.

Pipe installation

General

Pipe installation must be carried out in accordance with current norms and directives. ACVM 270 can work at a temperature up to 65 °C. For good savings we recommend that the climate system is dimensioned for max 55 ⁋.

ACVM 270 is not equipped with shut-off valves. These must be installed outside the indoor module to facilitate any future servicing.

ACVM 270 can be connected to the radiator system, floor heating system and/or fan convectors.

Install the supplied safety valve and manometer.

Overflow valve

NOTE

A free flow is required for all docking options, which means that an overflow valve must be installed.

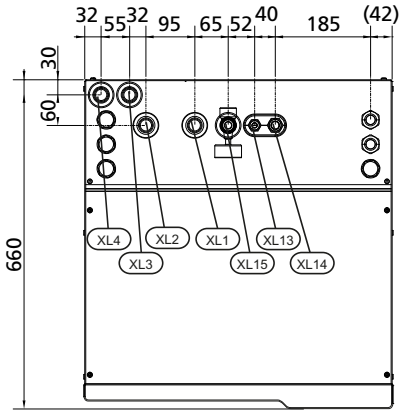
System requirements

This is required for minimum configuration:

For correct function the volume of the climate system must meet the installation requirements, see page 22. If this is not fulfilled a volume vessel needs to be installed. (NIBE UKV).

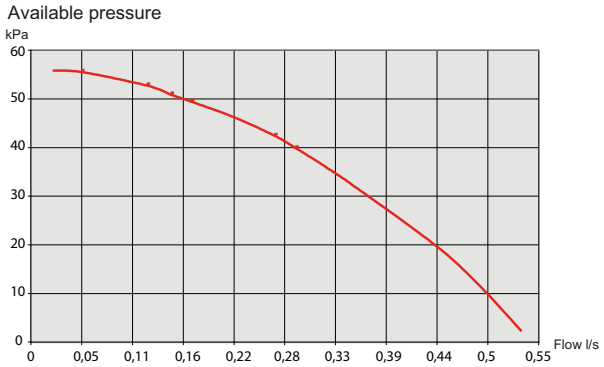
For more options, see the docking description on page 22.

Dimensions and pipe connections



XL1 Climate system, flow Ø 22 mm
XL2 Climate system, return Ø 22 mm
XL3 Cold water, Ø 22 mm
XL4 Hot water, Ø 22 mm
XL13 Liquid line refrigerant, flare 3/8''
XL14 Gas line refrigerant, flare 5/8"
XL15 Connection safety valve, manometer

Pump capacity diagram



The diagram shows max. performance. This can be restricted in menu 2.0.

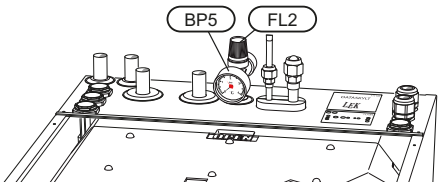
Connection of extra circulation pump

When connecting additional circulation pump GP10, to achieve a higher flow capacity, see alternative "Underfloor heating systems" on page 24. Respective maximum flows must not be exceeded.

Connecting the climate system

Pipe connections for the climate system are made at the top.

- All required safety devices and shut-off valves must be fitted as close to ACVM 270 as possible.
- Install the bleed valves where necessary.
- The safety valve (FL2) must be installed on (XL15) as illustrated. The entire length of the overflow water pipe from the safety valves must be inclined to prevent water pockets and must also be frost proof.



- When connecting to a system with thermostats on all radiators, an overflow valve must be fitted, or some of the thermostats must be removed to ensure sufficient flow.
- See section Dockings on page 22 for outline diagram.

NOTE

The term "Climate system" which is used in these installation and maintenance instructions regards heating or cooling systems that are supplied with hot or cold water from ACVM 270 for heating or cooling.

Connecting the hot water heater

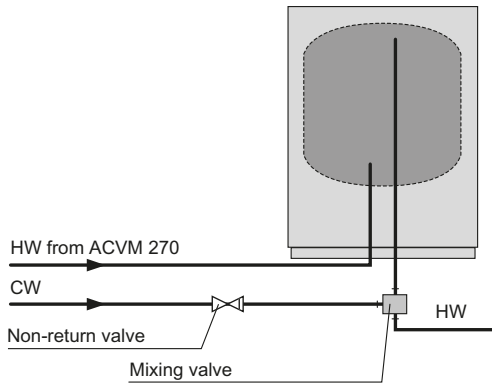
The water heater in the ACVM 270 must be supplied with necessary set of valves.

- There must be a mixing valve if the temperature exceeds 60 °C.
- The safety valve must have a maximum 10.0 bar opening pressure and be installed on the incoming domestic water line according to outline diagram. The entire length of the overflow water pipe from the safety valves must be inclined to prevent water pockets and must also be frost proof.
- See section Dockings on page 22 for outline diagram.

Extra water heater with immersion heater

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

If the heater is equipped with a valve connector Ø 15 mm this should be replaced with a corresponding Ø 22 mm.



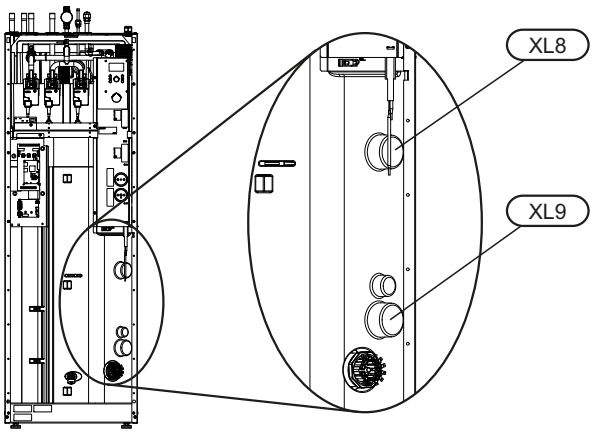
Connection of external heat source

Connect an external heat source such as gas or oil boiler to (XL8) (in) and (XL9) (out) on ACVM 270 (dimension G1 internal). To use these connections, the corresponding "Punch-out" parts in the outer panel must be removed. Also cut off the insulation above the connections.

Also see Installation requirements on page 22.

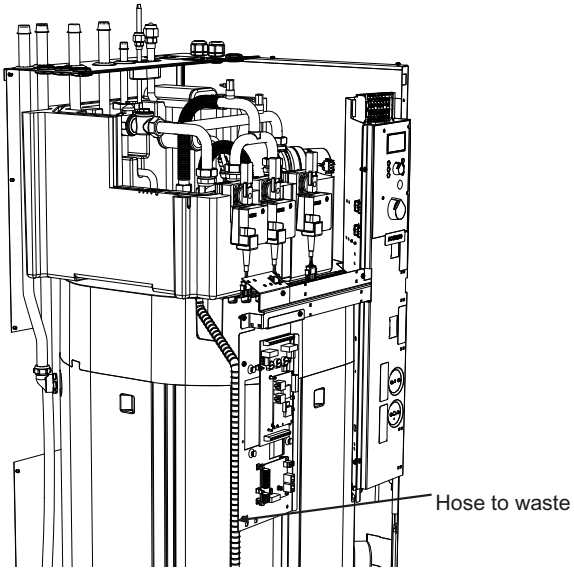
NOTE

Make connections at a 45° angle.



Waste exchanger part

ACVM 270 has a waste at the exchange section. A hose routes any waste water past the product's electronics to minimise the risk of damage. If necessary, a hose extension can be connected.



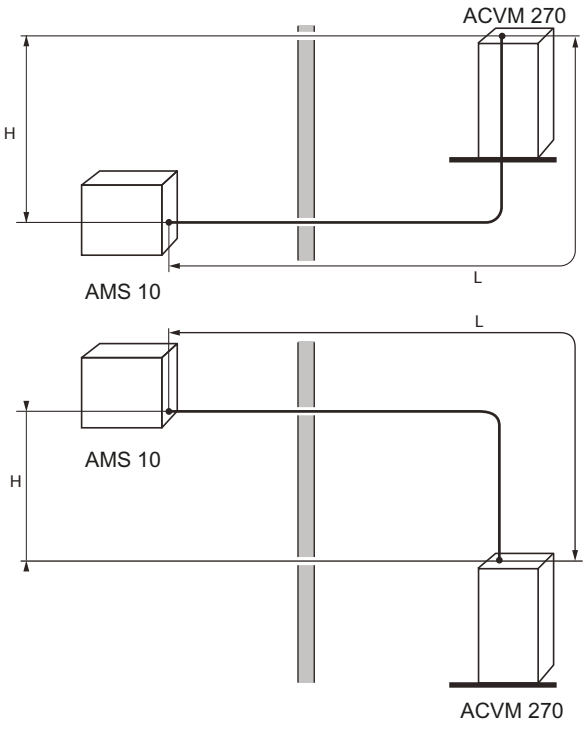
Connecting refrigerant pipes (not supplied)

Install the refrigerant pipes between the outdoor module AMS 10 and ACVM 270.

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

Limitations

- Maximum pipe length, AMS 10-8 and AMS 10-12 (L): 30m.
- Maximum height difference (H): ±7 m.



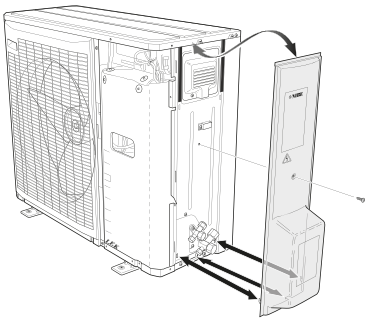
Pipe dimensions and materials

	Gas pipe	Liquid pipe
Pipe dimension	Ø15.88 mm (5/8")	Ø9.52 mm (3/8")
Connection	Flare - (5/8")	Flare - (3/8")
Material	Copper quality SS-EN 12735-1 or C1220T, JIS H3300	
Minimum material thickness	1.0 mm	0.8 mm

Pipe connection

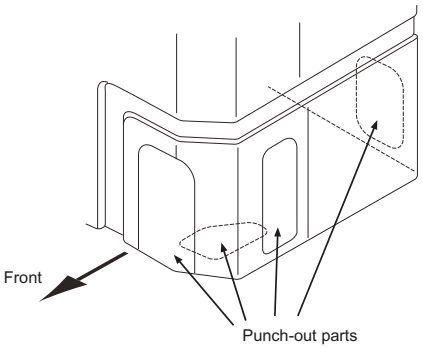
- Perform pipe installation with the service valves (QM35, QM36) closed.
- **AMS 10-8**

  Remove the side panel on AMS 10 during installation to facilitate access.



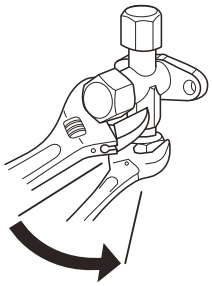
AMS 10-12

Remove a "punch-out" part from the outer panel on AMS 10, where the pipes are to be routed. The image below, shows possible pipe outlets.



- Ensure that water or dirt does not enter the pipes.
- Bend the pipes with as large a radius as possible (at least R100~R150). Do not bend a pipe repeatedly. Use a bending tool.
- Connect the flare connector and tighten to the following torque. Use the "Tightening angle" if a torque wrench is not available.

Outer diameter, copper pipe (mm)	Tightening torque (Nm)	Tightening angle (°)	Recommended tool length (mm)
Ø9.52	34~42	30~45	200
Ø15.88	68~82	15~20	300

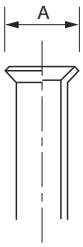


NOTE

Gas shielding must be used when soldering.

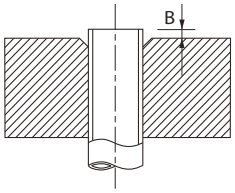
Flare connections

Expansion:



Outer diameter, copper pipe (mm)	A (mm)
Ø9.52	13.2
Ø15.88	19.7

Ejection:



Outer diameter, copper pipe (mm)	B, with an R410A tool (mm)	B, with a conventional tool (mm)
Ø9.52	0~0.5	0.7~1.3
Ø15.88		

Pressure test and leak test

Both ACVM 270 and AMS 10 are pressure tested and leak tested at the factory, but the pipe connections between the products must be checked after installation.

NOTE

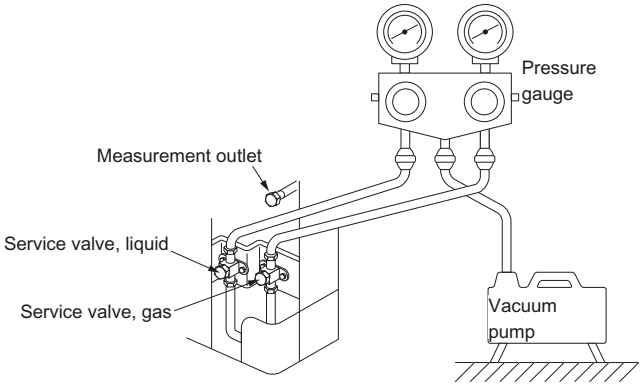
The pipe connection between the products must be pressure tested and leak tested according to the applicable regulations after installation.

Under no circumstances must a type of medium other than nitrogen be used when pressurising or flushing the system.

Vacuum pump

Use a vacuum pump to evacuate all air. Vacuum for at least one hour and end pressure after evacuation must be 1 mbar (100 Pa, 0.75 dry or 750 micron) absolute pressure.

If the system has remaining moisture or a leak, the vacuum pressure will rise after completed evacuation.



TIP

For a better end result and to quicken the evacuation, the following points must be followed.

- *The connection lines must be as large and short as possible.*
- *Evacuate the system down to 4 mbar and fill the system with dry nitrogen to atmospheric pressure to the finish the evacuation.*

Filling refrigerant

AMS 10 is delivered complete with the refrigerant required for the installation of refrigerant pipes up to 15 m in length.

If the length of the refrigerant pipes exceeds 15 m (AMS 10-8) extra refrigerant must be filled with 0.06 kg/m. This applies to part nos 064 031, 064 033, 064 034.. Does not apply to part no 064 030.

NOTE

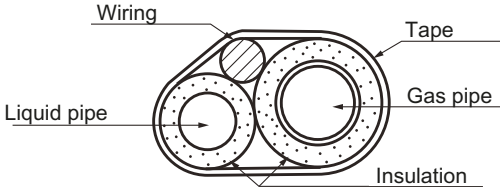
For installations with refrigerant pipes up to 15 m in length no extra refrigerant in addition to the supplied amount needs to be topped up.

When carrying out pipe connections, pressure tests, leak tests and vacuuming, the service valves (QM35, QM36) can be opened, to fill the pipes and ACVM 270 with refrigerant.

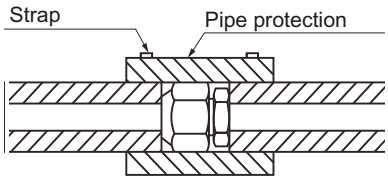
Insulating refrigerant pipes

- Insulate refrigerant pipes (both gas and liquid pipes) for heat insulation and to prevent condensation.
- Use insulation that can withstand at least 120 °C. Poorly insulated pipes can cause insulation related problems and unnecessary cable wear.

Principle:



Connections:



Dockings

General

NIBE SPLIT can be connected in several different ways, some of which are shown on the following pages. For more detailed docking descriptions, see www.nibe.eu.

Installation requirements

	AMS 10-8	AMS 10-12
Max pressure, climate system	0.25 MPa (2.5 Bar)	
Highest recommended supply/return temperature at dimensioned outdoor temperature	55/45 °C	
Max temperature in ACVM 270	+65 °C	
Max flow line temperature with compressor	+58 °C	
Min supply temperature cooling	+7 °C	
Max supply temp. cooling	+25 °C	
Min volume, climate system during heating, cooling*	50 l	80 l
Min volume, climate system during under floor cooling*	80 l	100 l
Max flow, climate system	0.38 l/s	0.57 l/s
Min flow, climate system, at 100% circulation pump speed (defrost flow)	0.19 l/s	0.29 l/s
Min flow, heating system	0.12 l/s	0.15 l/s
Min flow, cooling system	0.16 l/s	0.20 l/s

Docking external addition	ACVM 270
Output external addition	9–18 kW
Recommended docking flow	0.17–0.22 l/s
Max temperature from external heat source	+65 °C

* Regards circulating volume

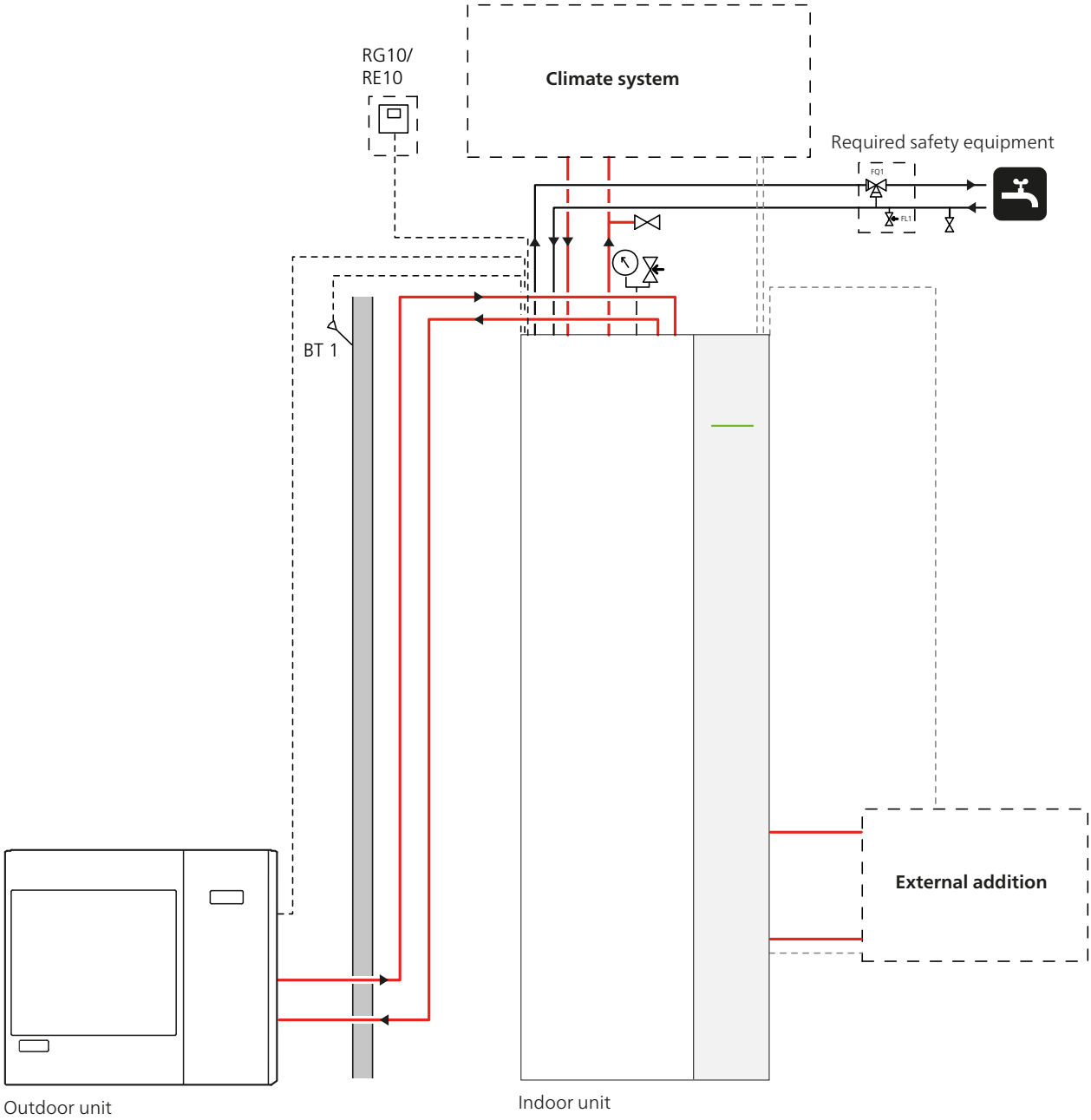
External circulation pump must be used when the pressure drop in the system is greater than the available external pressure. In such cases, a bypass line with non-return valve must be installed.

Overflow valve must be used if min. system flow cannot be guaranteed.

Symbol key

Symbol	Meaning
	Venting valve
	Shut-off valve
	Non-return valve
	Control valve
	Safety valve
	Temperature sensor
	Expansion vessel
Ⓟ	Pressure gauge
	Circulation pump
	Shunt / shuttle valve
	Fan

NIBE SPLIT with climate system and any addition

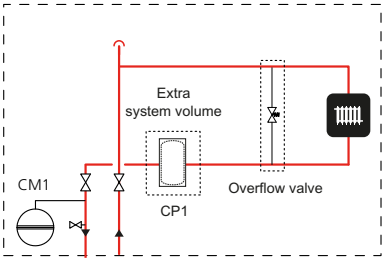


NOTE

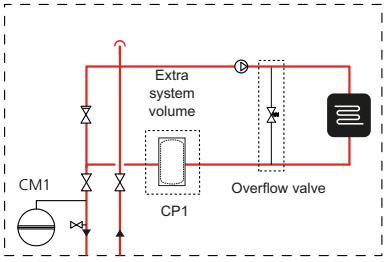
These are outline diagrams. Actual installations must be planned according to applicable standards.

Climate system

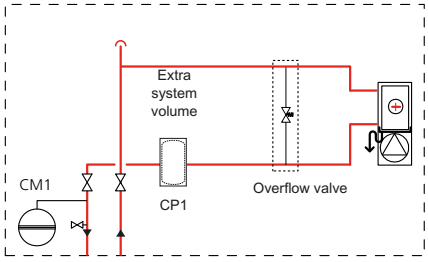
Radiator system



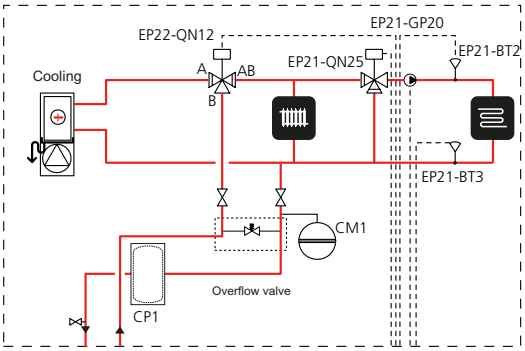
Under floor heating systems



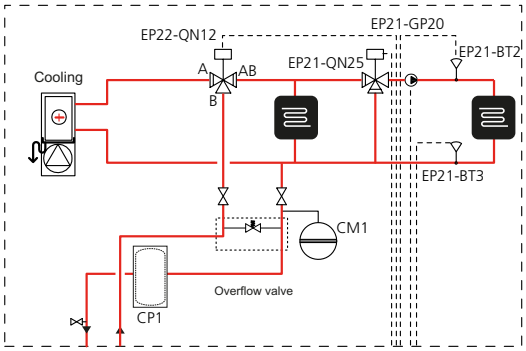
Fan convector system



Radiator and under floor heating for heating as well as fan convector system for cooling



Double under floor heating system for heating and fan convector for cooling



Explanation

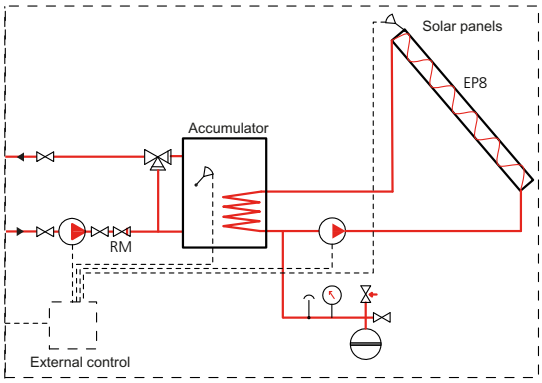
EP21 Climate system 2
BT2 Temperature sensor, flow pipe
BT3 Temperature sensor, return
GP20 Circulation pump
QN25 Shunt valve

EP22 Climate system 3
QN12 Reversing valve, cooling/heating

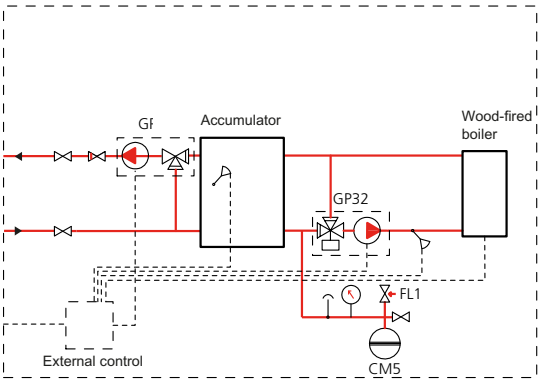
Miscellaneous
BT1 Temperature sensor, outdoor
CM1 Expansion vessel
CP1 Buffer vessel UKV
GP12 Charge pump
RM Non-return valve

External addition

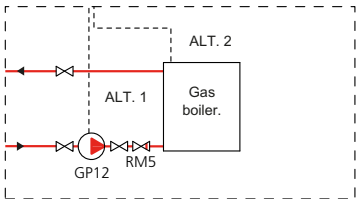
Solar panels



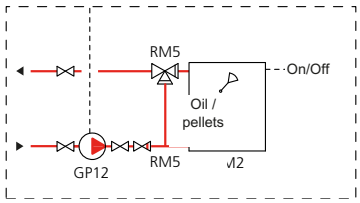
Wood boiler with accumulator



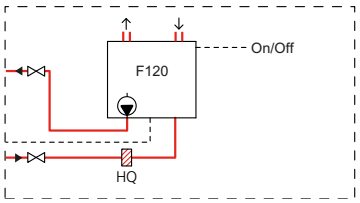
Gas boiler



Oil/pellet boiler



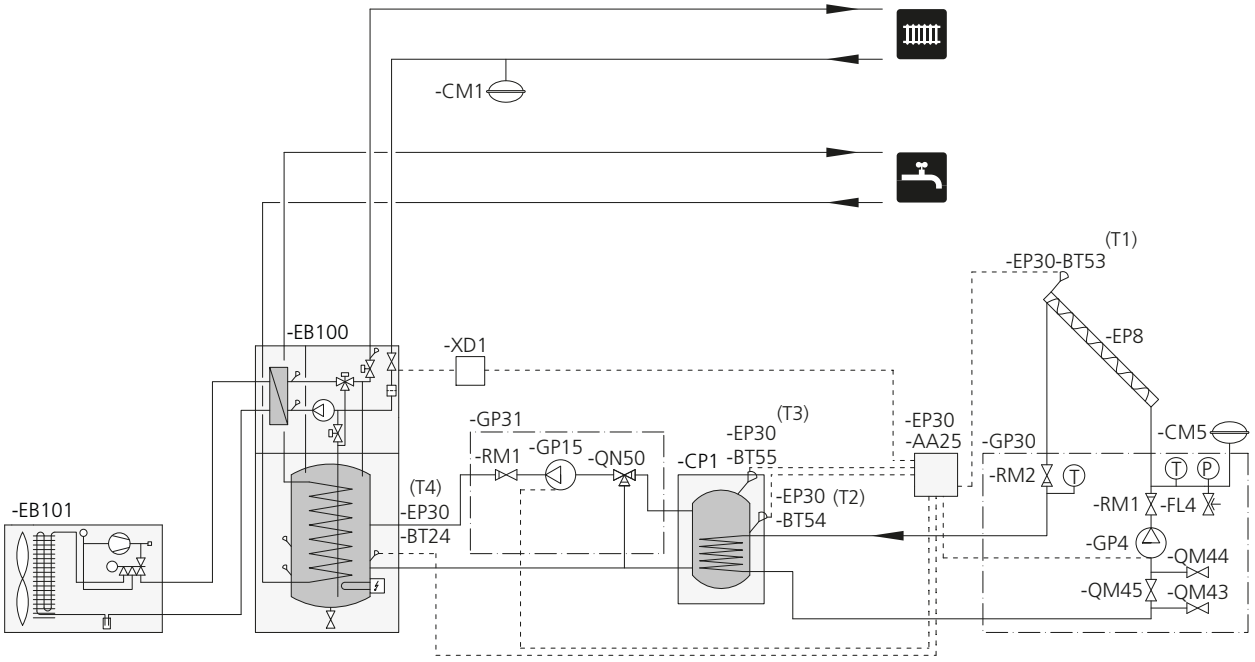
Exhaust air heat pump



Explanation

CM5 Expansion vessel
CP1 Accumulator tank
EB1 Immersion heater
EM1 Wood-fired boiler
EM2 Oil/Pellet boiler
FL1 Safety valve
GP12 Charge pump
GP31 Pump station, limits high temperature
GP32 Pump station, limits low temperature
HQ Particle filter
RM5 Non-return valve

Hydraulic principles for NIBE Solar Split FP215P/PL



Abbreviations

AA25	Control unit	
BT24	Temp.sensor, docking	(T4)
BT53	Temp.sensor, solar panel	(T1)
BT54	Temp.sensor, solar coil	(T2)
BT55	Temp.sensor, solar peak	(T3)
CM1	Expansion vessel, heating medium	
CM5	Expansion vessel, solar	
CP1	Buffer vessel solar UKVS 230	
EB100	NIBE SPLIT indoor section ACVM	
EB101	NIBE SPLIT outdoor section AMS	
EP8	Solar panel	
EP30	Solar kit SCU 10	
FL4	Safety valve, solar	
GP4	Circulation pump, solar	
GP15	Charge pump	
GP30	Pump station SPS 10, SPS 20	
GP31	Pump station MCU 10	
QM4X	Shut-off valve	
QN50	Control valve	
RMX	Non-return valve	
XD1	Connection box (SRB 22)	

Electrical installation

General

ACVM 270 must be installed via an isolator switch with a minimum breaking gap of 3mm.

Other electrical equipment, except the outdoor sensors, current sensors and outdoor module AMS 10 is already connected at the factory.

- Disconnect the indoor module ACVM 270 and outdoor module AMS 10 before insulation testing the house wiring.
- For fuse ratings, see technical data, "Fuse protection".
- If the building is equipped with an earth-fault breaker, ACVM 270 should be equipped with a separate one.
- Connection must not be carried out without the permission of the electricity supplier and under the supervision of a qualified electrician.
- 5x2.5 mm² cable must be used for connection between ACVM 270 and AMS 10.
- Cables must be routed so that they are not damaged by metal edges or trapped by panels.
- AMS 10 is equipped with a single phase compressor. This means that phase L3 is loaded with 15 A during compressor operation.

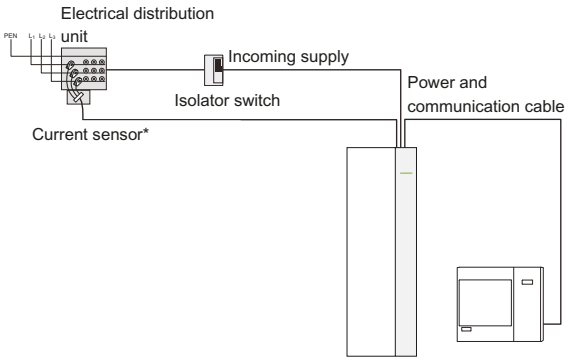
NOTE

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

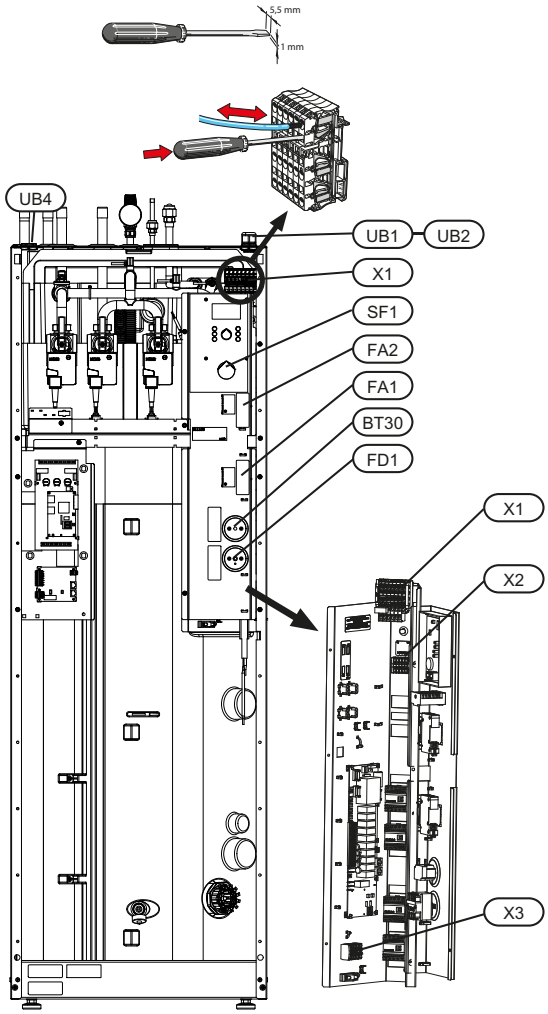
The switch (SF1) must not be moved to "1" or "⚠" until the boiler has been filled with water. The circulation pump and immersion heater may become damaged.

Principle diagram, electrical installation



* Only in a 3-phase installation.

Electrical components



Explanation

Designation	Type	Scale length of conductor (mm)
UB1,2,4	Cable gland	-
X1	Terminal block, incoming mains supply	18
X2	Terminal block, outgoing supply and communication	9
X3	Terminal block, external addition	9
SF1	Switch	-
FA1	Miniature circuit breaker, control system	-
FA2	Miniature circuit breaker, outdoor unit	-
BT30	Thermostat, standby mode	-
FD1	Temperature limiter	-

Connecting the supply

Incoming supply is connected to terminal block (X1) via cable gland (UB1). The cable must be dimensioned according to the applicable norms.

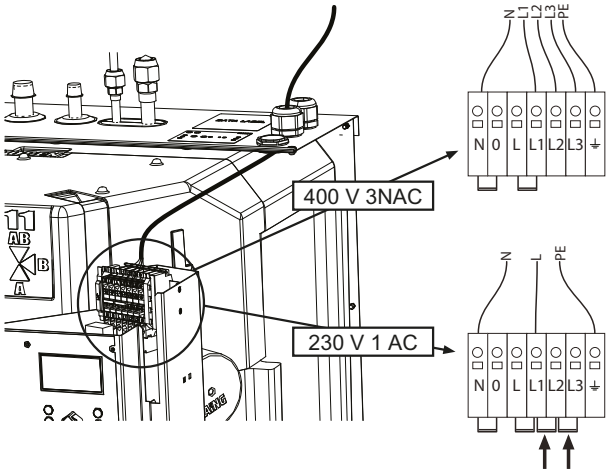
ACVM 270 can be connected with either 400 V 3NAC or 230 V 1AC.

400 V 3NAC: Connect incoming supply according to the markings on terminal (X1).

NOTE

Depending on the house main fuse and to avoid the load monitor slowing down the compressor, other loads in the house should be moved from L3 to L1 and L2.

230 V 1AC: Install the supplied straps between terminals L1 and L2 as well as between L2 and L3 on incoming terminal block (X1). Connect incoming supply according to the terminal markings.



Miniature circuit-breaker

The automatic heating control system, circulation pumps and their wiring in ACVM 270, are internally fuse protected with a miniature circuit breaker (FA1).

Outdoor module AMS 10 and equipment are internally fuse protected in ACVM 270, with a miniature circuit breaker (FA2).

Temperature limiter

The temperature limiter (FD1) cuts the current supply to the electrical addition if the temperature rises between 90 and 100°C and can be manually reset.

Resetting

The temperature limiter (FD1) is accessible behind the front cover. The temperature limiter is reset by firmly pressing in its button.

NOTE

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

Connection between ACVM 270 and AMS 10

The cable between the units must be connected between terminal block for incoming supply (TB) in AMS 10 and terminal block (X2) in ACVM 270 via cable gland (UB2).

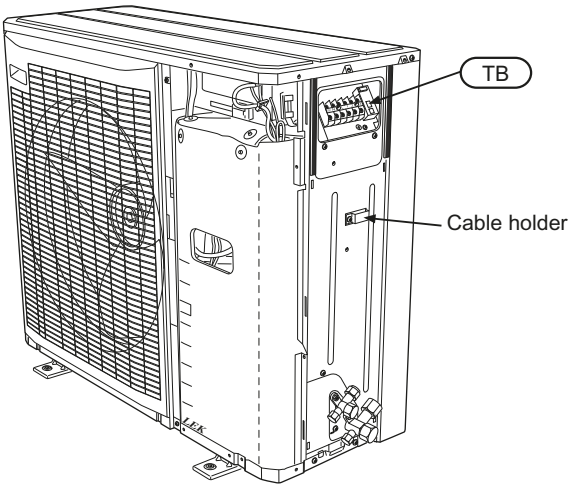
NOTE

AMS 10 must be earthed before the wiring between the units is connected.

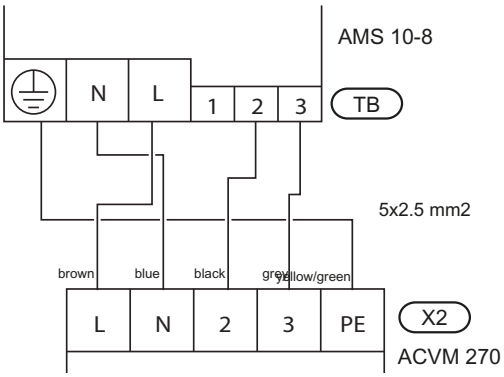
The wiring must be attached so that the terminal block is not put under stress.

Scale length of conductor is 8 mm.

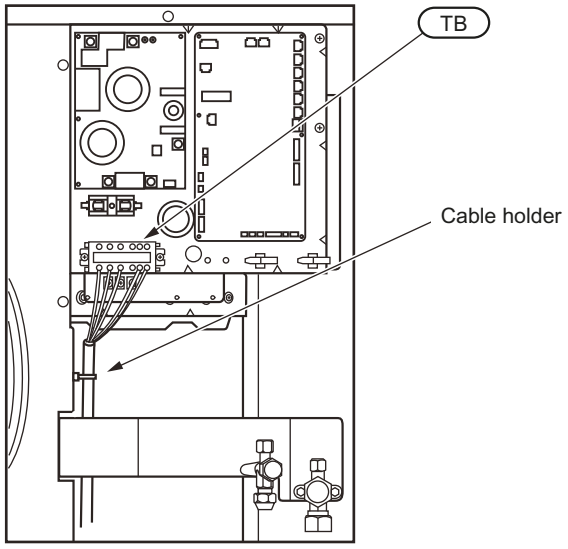
AMS 10-8



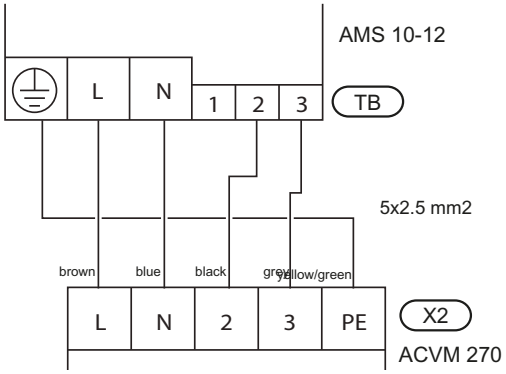
Connect phase (brown), neutral (blue), communication (black and grey) as well as earth (yellow/green) as illustrated:



AMS 10-12



Connect phase (brown), neutral (blue), communication (black and grey) as well as earth (yellow/green) as illustrated:



Setting max power, electrical addition

Setting the different maximum immersion heater outputs is performed using the knob (R25) on the current limiter board (AA22). Set value displayed in menu 8.3.2. The following table only applies when menu 9.2.8 Add. heat type is set to "Internal power 1" (factory setting).

Immersion heater, output (kW)	Knob position	Max. electric power	L1 (A)	L2 (A)	L3 (A) Compressor	
					on	off
0.0	-	0	0	0	15	0
2.0	-	1	5.3	4.3	15	0
4.0	A	2	9.7	8.7	15	0
6.0	B	3	14	13	15	0
9.0	C	4	14	13	-	13

Setting max boiler temperature

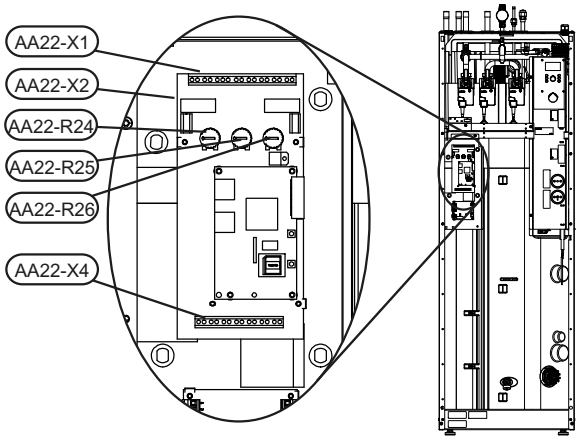
The setting of the different maximum boiler temperatures is made on the knob (R26) on the current limiter board (AA22). Set value displayed in menu 9.3.1.

Boiler temperature	Knob position
55	A
60	B
65	C
65	D
65	E
65	F

EBV board, terminal and wiring diagram

The following connections are made on the EBV board (AA22).

See page 66 for complete wiring diagram of board.



Connecting the outside sensor

Install the outside temperature sensor in the shade on a wall facing north or north-west, so it is unaffected by the morning sun. Connect the sensor to terminal block X1:1 and X1:2 on the current limiter board (AA22) via cable gland UB4. Use a 2 core cable of at least 0.5 mm^2.

If the outside sensor cable runs close to power cables, shielded cable must be used.

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

Connecting the current limiter

NOTE

Only applies to 3X400V.

When many power consumers are connected in the property at the same time as the electric addition is operating, there is a risk of the property's main fuse tripping. ACVM 270 is equipped with an integrated current limiter that controls the electrical steps and the compressor. If necessary, the electrical steps are disengaged and/or the compressor frequency is reduced.

A current sensor should be installed on each incoming phase conductor in to the distribution box to measure the

current. The distribution box is an appropriate installation point.

Connect the current sensors to a multi-core cable in an enclosure next to the distribution box. Use unscreened multi-core cable of at least 0.50 mm², from the enclosure to ACVM 270.

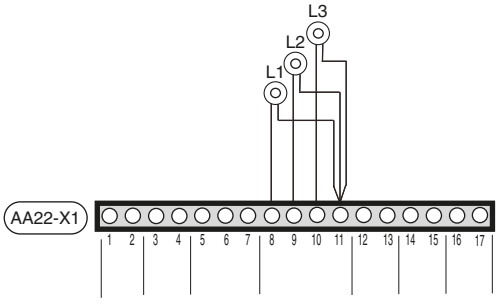
In ACVM 270 connect the cable to the current limiter board (AA22) on terminal X1:8–11.

L1 connects on X1:8 and X1:11.

L2 connects on X1:9 and X1:11.

L3 connects on X1:10 and X1:11.

X1:11 is the common terminal block for the three current sensors.



The size of the property's main fuse is set using the knob (R24) on the circuit limiter board, (AA22). The setting can be read in menu 8.3.1.

Connection of centralised load control/tariff

In those cases centralised load control or tariff control is used this can be connected to the terminal block (X1) on the EBV card (AA22), which is positioned behind the front cover.

Tariff A, the electrical addition is disconnected. Connect a potential free contact function to terminal X1:5 and X1:7.

Tariff B, the compressor in AMS 10 is disconnected. Connect a potential free contact function to terminal X1:6 and X1:7.

Tariff A and Tariff B can be combined.

A closed contact results in the electrical output being disconnected.

Connecting external contacts

RG 10, sensor for changing the room temperature

An external sensor (BT50) can be connected to ACVM 270 to change the flow temperature and with that set the room temperature, for example, a room sensor (RG 10, accessory). Connect the sensor to the terminal block from X4:1 to X4:3 on the current limiter board (AA22) according to wiring diagram.

Activated in menu 9.3.6.

The difference between the room temperature and the set room temperature affects the flow temperature. The required room temperature is set using the knob on RG 10 and is shown in menu 6.3.

Contact for changing the room temperature

Climate system 1:

An external contact function can be connected to ACVM 270 to change the flow temperature and in doing so change the room temperature, for example, a room thermostat or a timer. The contact must be potential free and non-locking and connected to terminal block X1:3 and X1:4 on the current limiter board (AA22).

When the contact is closed, the heating curve offset is changed by the number of steps shown here. The value is adjustable between -10 and +10. The value for the change is set in menu 2.4, "External adjustment".

Climate system 2:

An external contact function can be connected to ACVM 270 to change the flow temperature and in doing so change the room temperature, for example, a room thermostat or a timer. The contact must be potential free and non-locking and connected to terminal block X1:14 and X1:15 on the current limiter board (AA22).

When the contact is closed, the heating curve offset is changed by the number of steps shown here. The value is adjustable between -10 and +10. The value for the change is set in menu 3.5, "External adjust. 2".

Contact for activation of “Extra hot water”

An external contact function can be connected to ACVM 270 for activation of the “Temporary extra hot water” function. The contact must be potential free and non-locking and connected to terminal block X6:1 and X6:2 on the current limiter board (AA22).

When the contact is closed for at least one second, the “Temporary Extra hot water” function is activated. An automatic return to the previously set function occurs after 3 hours.

Alarm outputs

External indication of common alarms is possible through the relay function on the current limiter board (AA22), terminal block X2:1–2.

The wiring diagram on page 66 shows the relay in the alarm position.

When switch (SF1) is in the "0" or “ ⚠ ” position the relay is in the alarm position.

Docking specific connection

ACVM 270 is prepared to control an external circulation pump (GP10), external shunt (QN11), exchange valve for cooling (QN12), as well as external addition e.g. oil, gas or pellets.

External circulation pump (max 50W)

Connect external circulation pump (GP10) to terminal block X3:1 (230 V), X3:4 (N) and X3:5 (PE).

The circulation pump (GP10) is active when the circulation pump (GP1) in ACVM 270 is active.

The accessory HR 10 can be used if the connection output exceeds 50W. See section Component positions on page 69.

External shunt (accessory)

Connection and function are described in the Installation instructions for accessory ESV 22.

Shuttle valve, cooling (accessory)

Connection and function are described in the Installation instructions for accessory VCC 22.

External addition

ACVM 270 can control an external addition.

Sensor BT19 must be moved to sensor output BT24 between the docking connections XL8 and XL9 (does not apply to solar power or wood fired docking). See section Component positions on page 69.

Ext. 1 step

1. Remove the strap on terminal block X3:2 and X3:3. See section Component positions on page 69 and section Electrical circuit diagram on page 61.
2. Connect the addition's phase to terminal block X3:2 (230 V) and X3:4 (N) (max 0.2 A).
3. Use the accessory HR10 when the need for potential for signal and/or when controlling external charge pumps.
4. Set "Ext. 1 step" in menu 9.2.8.

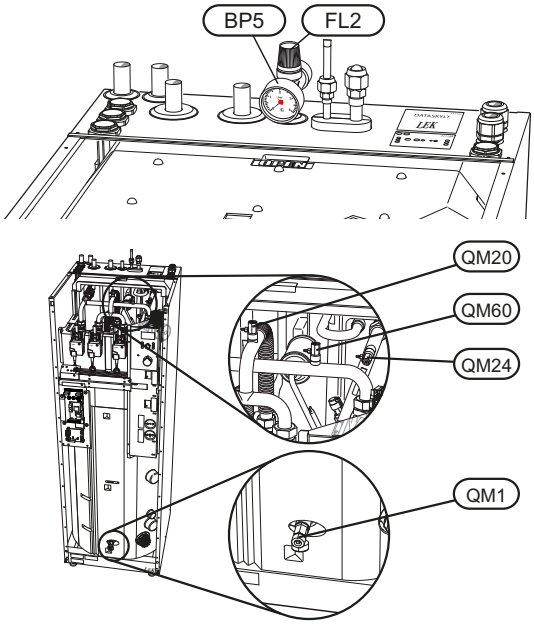
Start-up and inspection

Preparations

Connect AMS 10 to ACVM 270 (refrigerant pipe and wiring) and connect ACVM 270 to the climate system.

Filling the climate system

1. Ensure that the pressure gauge (BP5) is visible.
2. Connect a hose to the filling valve (QM1) and open the valve to fill the boiler and the radiator system.
3. After a while observe that the pressure on the pressure gauge (BP5) rises.
4. When the pressure has reached about 0.25 MPa (2.5bar) a mix of air and water starts to emerge from the safety valve (FL2). Close the filling valve (QM1).



Venting the climate system

Vent ACVM 270 through the safety valve (FL2), bleed screws (QM20, QM24 and QM60), and the rest of the climate system through the relevant bleed valves.

Keep topping up and venting until all air has been removed and the correct pressure has been obtained.

Filling the hot water coil

The hot water coil is filled by opening a hot water tap.

Commissioning

AMS 10

NOTE

Do not start AMS 10 at outdoor air temperatures of -20 °C or less.

1. Check that the miniature circuit-breaker (FA2) in ACVM 270 is on.

ACVM 270

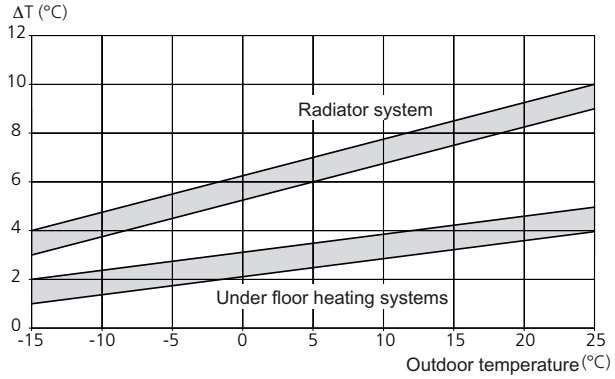
1. Check that the temperature limiter (FD1) has not tripped.
2. Switch on the main circuit breaker and check that the miniature circuit breaker (FA1) in ACVM 270 is on.
3. Set switch (SF1) to "1" (the switch should be switched on for 6 hours before the compressor can be started).

   When switch (SF1) is set to "0" - wait at least 1 minute before setting it back to "1".
4. Select operating mode "Add. heat only" by holding in the operating mode button for 7 seconds.
5. Set the date and time in menu 7.1 and 7.2.
6. Select “Service” in menu 8.1.1.
7. Select addition type in menu 9.2.8.
8. Set the fuse size on knob (R24). Check the value in menu 8.3.1.
9. Set the max immersion heater output on knob (R25). Check the value in menu 8.3.2.
10. Select the desired curve slope in menu 2.1.2 and set the parallel offset using the knob. Also see section Default setting on page 8.
11. Check that the hot water temperature in menu 1.0 exceeds 25 °C.
12. When point 11 has been carried out, select operating mode "Auto".

The heat pump starts 30 minutes after the outdoor unit is powered if there is a demand.

Setting system flow heating

1. Ensure that the heat pump produces heating for the climate system.
2. Select “On” in menu 9.6.2.
3. Select “40” in menu 9.6.1.
4. Check the supply and return line temperatures in menu 2.5. Adjust the circulation pump speed in menu 2.1.5 so that the difference between these temperatures is according to the diagram below.
5. Select “Off” in menu 9.6.2.



Setting system flow cooling

A temperature difference of dt=7 K is recommended in most cases. To achieve this, the following setting can be selected:

Dimensioned cooling output Qc	kW	3	5	7	9
Menu 2.2.5	%	60	60	70	90

The table shows the recommended output position, depending on the dimensioned cooling output. Go to menu 2.2.5 for further adjustment of pump speed.

The result should be checked and adjusted further, if necessary.

Commissioning ACVM 270 without AMS 10

ACVM 270

1. Check that the temperature limiter (FD1) has not tripped.
2. Switch on the main circuit breaker and check that the miniature circuit breaker (FA1) in ACVM 270 is on.
3. Set switch (SF1) to "1".
4. Select operating mode "Add. heat only" by holding in the operating mode button for 7 seconds.
5. Set the date and time in menu 7.1 and 7.2.
6. Select "Service" in menu 8.1.1.
7. Select addition type in menu 9.2.8.
8. Set the fuse size on knob (R24). Check the value in menu 8.3.1.
9. Set the max immersion heater output on knob (R25). Check the value in menu 8.3.2.
10. Select the desired curve slope in menu 2.1.2 and set the parallel offset using the knob. Also see section Default setting on page 8.

Checking external addition with internal immersion heater blocked

1. Select "Ext. 1 step" in menu 9.2.8.
2. Select operating mode "Add. heat only" by holding in the operating mode button for 7 seconds.
3. Ensure that the max temperature from the external addition does not exceed 65 °C.
4. Select operating mode "Auto" by pressing the operating mode button.

Checking external addition (not controlled by ACVM 270) with internal immersion heater as backup

1. Adjust the start temperature of the addition so that it starts at a higher temperature than the internal electrical addition (see set value in menu 1.2).
2. Adjust the addition's stop temperature so that the temperature in ACVM 270 does not exceed 65 °C.

Inspection of the installation

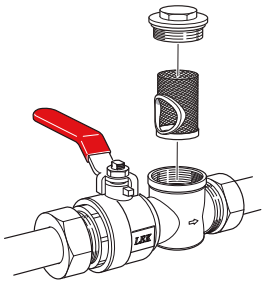
Current regulations require the heating installation to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person and should be documented. Use the check list on the following page. The above applies to closed climate systems.

Do not replace any part of the split-system without carrying out new checks.

Cleaning the particle filter

Clean the particle filter (HQ1) after installation.

1. Close valve QM31 and the valve by the particle filter (HQ1).
2. Open the safety valve (FL2) to ensure that the pressure in the tanks falls.
3. Clean the particle filter (HQ1) as illustrated.



Secondary adjustment

Air is initially released from the hot water and venting may be necessary. If gurgling sounds can be heard from ACVM 270 or from the climate system, the entire system will require additional venting.

NOTE

Use bleed valves (QM20, QM24 and QM60), any external bleed valves as well as safety valve (FL2). The latter must be operated carefully as it opens quickly. When the system is stable (correct pressure and all air eliminated) the automatic heating control system can be set as required.

See Default setting on page 8.

Checklist: Checks before commissioning

Hot water	Notes	Checked
Non-return valve		☐
Safety valve		☐
Mixing valve		☐
Shut off valves		☐

Heating	Notes	Checked
System volume		☐
Expansion vessel		☐
Safety valve		☐
Internal addition		☐
External addition		☐
		☐

Cooling	Notes	Checked
Pipe system, condensation insulation		☐
Three way valve (QN12) cooling/heating		☐
		☐

Refrigerant system	Notes	Checked
Pipe length		☐
Height difference		☐
Pressurization test		☐
Leak testing		☐
End pressure vacuum		☐
		☐

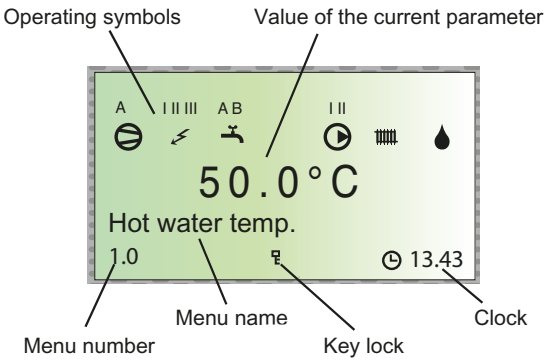
Electrical installation	Notes	Checked
Property's main fuse		☐
Group fuse		☐
Current limiter/current sensor		☐
KVR 10*		☐

Accessories	Notes	Checked
External circulation pump		☐
UKV		☐
Overflow valve		☐
Room sensor		☐
Drain pan heater		☐
Solar control		☐
KVR 10*		☐

*Requires software version 1.05 or later.

Control

Display



Menu types

Control is divided into different menu types depending on how "deep" into the controls you need to go.

- Normal [N]: The settings you as a customer often need.
- Extended [U]: Shows all detailed menus except the service menus.
- Service [S]: Shows all menus.

Changing of menu type is done from menu 8.1.1

Menu management

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

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

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

Changing parameters

- Changing a parameter (value):
- Access the required menu.
- Press the enter button, the numerical value starts to flash.
- Increase or decrease using the Plus/Minus buttons.
- Confirm by pressing the enter button.
- Menu 1.0 is automatically displayed again 30 minutes after the last button press.

Example

Changing the curve slope, menu 2.1.

- The starting point is menu 1.0.
- Press the plus button to move to menu 2.0.
- Press the enter button to move to menu 2.1.
- Press the enter button to change the value.
- Change the value by pressing the plus or minus buttons.
- Confirm the selected value by pressing the enter button.
- Press the quick movement button to access menu 1.0.

Quick movement

To quickly return to the main menu from a sub menu, press one of the following buttons:

Key lock

A key lock can be activated in the main menus by simultaneously pressing the plus and the minus buttons. The key symbol will then be shown on the display.

The same procedure is used to deactivate the key lock.

Menu tree

1.0 [N] Hot water temp.	
1.1 [N] Max HW/Period time	
1.2 [N] Start temperature HW	
1.3 [N] Stop temperature HW	
1.4 [U] Stop temperature XHW	
1.5 [U] Heat pump stop XHW	
1.6 [U] Max heat p. time XHW*	
1.7 [U] Interval XHW	
1.8 [U] Next XHW action	
1.9 [U] HW run time	
1.10.0 [S] HW charge act/set	1.10.1 [S] HW charge set temp
	1.10.2 [S] Circ-pump speed HW
	1.10.3 [S] Circ-pump manual
	1.10.4 [S] HW reg min
	1.10.10 [S] Return
1.11.0 [S] CompFreq HW settings	1.11.1 [S] CompFreq HW set
	1.11.2 [S] CompFreq manual
	1.11.3 [S] CompFreq at +20
	1.11.4 [S] CompFreq at -5
	1.11.5 [S] Return
1.12 [N] Return	

*Not used from program version 1.04 inclusive.

2.0 [N] Supply temp.		
2.1.0 [N] Heating settings	2.1.1 [N] Offset heating/Total	
	2.1.2 [N] Heating curve	
	2.1.3.0 [U] Own heating curve	2.1.3.1 [U] Supply temp.at +20
		2.1.3.2 [U] Supply temp.at -20
		2.1.3.3 [U] Buckling temperature
		2.1.3.4 [U] Supply t. at buckl.
		2.1.3.5 [U] Return
	2.1.4 [U] Min supply heating	
	2.1.5 [U] Circ-pump speed heat	
	2.1.6 [N] Return	
2.2.0 [N] Cooling settings	2.2.1 [N] Offset cooling/Total	
	2.2.2 [N] Cooling curve	
	2.2.3.0 [U] Own cooling curve	2.2.3.1 [U] Supply temp.at +20
		2.2.3.2 [U] Supply temp.at +40
		2.2.3.3 [U] Return
	2.2.4 [U] Min supply cooling	
	2.2.5 [U] Circ-pump speed cool	
	2.2.6 [N] Return	
2.3 [U] Max supply temp.		
2.4 [U] External adjustment		
2.5 [U] Supply/Return temp.		
2.6 [U] Degree minutes		
2.7 [N] Return		

3.0 [N] Supply temp. 2	
3.1 [N] Offset heating/Tot 2	
3.2 [N] Heating curve 2	
3.3 [U] Min supply temp. 2	
3.4 [U] Max supply temp. 2	
3.5 [U] External adjust. 2	
3.6.0 [U] Own heating curve 2	3.6.1 [U] Supply temp.at +20
	3.6.2 [U] Supply temp.at -20
	3.6.3 [U] Buckling temperature
	3.6.4 [U] Supply t. at buckl
	3.6.5 [U] Return
3.7 [U] Supply/Return temp 2	
3.8 [N] Return	

4.0 [N] Outdoor temp.
4.1 [N] Outdoor avg. temp.
4.2 [U] Outdoor filter time
4.3 [U] Outdoor avg. 1min.
4.4 [N] Return

5.0 [N] Heat pump	
5.1 [N] Number of starts	
5.2 [N] Run time compressor	
5.3 [U] Time to start	
5.4 [U] Outdoor temp. Tho-A	
5.5 [U] Heat Ex Tho-R1	
5.6 [U] Heat Ex Tho-R2	
5.7 [U] Suction temp. Tho-S	
5.8 [U] Hot gas Tho-D	
5.9 [U] Liquid line temp.	
5.10 [U] Condensor out / max	
5.11 [U] HP	
5.12 [U] LP LPT	
5.13 [U] Fan speed	
5.14.0 [U] CompFreq act/set	5.14.1 [U] OU current CT
	5.14.2 [U] Inverter temp Tho-IP
	5.14.3 [U] Return
5.15.0 [S] OU communication	5.15.1 [S] Com. error rate
	5.15.2 [S] Com. errors
	5.15.3 [S] Reset com. errors
	5.15.4 [S] Return
5.16 [N] Return	

6.0 [N] Room temperature*
6.1 [U] Room compensation
6.2 [U] Heating system
6.3 [N] Room temp. setpoint
6.4 [U] Room temp avg. 1min
6.5 [U] Room integrator time
6.6 [N] Return

*Requires accessory and activation in menu 9.3.6.

7.0 [N] Clock	
7.1 [N] Date	
7.2 [N] Time	
7.3.0 [U] Temp set back	7.3.1 [U] Set back time
	7.3.2 [U] Set back temp +/-
	7.3.3 [U] Heating system
	7.3.4 [U] Return
7.4.0 [U] Extra hot water	7.4.1 [U] XHW Monday
	7.4.2 [U] XHW Tuesday
	7.4.3 [U] XHW Wednesday
	7.4.4 [U] XHW Thursday
	7.4.5 [U] XHW Friday
	7.4.6 [U] XHW Saturday
	7.4.7 [U] XHW Sunday
	7.4.8 [U] Return
7.5.0 [U] Vacation set back	7.5.1 [U] Vacation begins
	7.5.2 [U] Vacation ends
	7.5.3 [U] Heating system
	7.5.4 [U] Offset heating curve
	7.5.5 [U] HW off
	7.5.6 [U] Return
7.6.0 [N] Silent mode*	7.6.1 [N] Silent mode time
	7.6.2 [N] Return
7.7 [N] Return*	

*Menu "Silent mode" available from program version 1.04 inclusive.

8.0 [N] Other adjustments	
8.1.0 [N] Display settings	8.1.1 [N] Menu type
	8.1.2 [N] Language
	8.1.3 [N] Display contrast
	8.1.4 [N] Light intensity
	8.1.5 [N] Return
8.2.0 [N] Op. mode settings	8.2.1 [N] Allow add. heat
	8.2.2 [N] Add. heat mode
	8.2.3 [U] Stop temp. heating
	8.2.4 [U] Start temp. cooling
	8.2.5 [U] Hysteresis
	8.2.6 [N] Return
8.3.0 [U] Current limiter	8.3.1 [U] Fuse size
	8.3.2 [U] Max. electric power
	8.3.3 [U] Current phase 1
	8.3.4 [U] Current phase 2
	8.3.5 [U] Current phase 3
	8.3.6 [U] Transform. ratio EBV
	8.3.7 [U] Return
8.5.0 [U] Period settings	8.5.1 [U] Period time
	8.5.2 [U] Max time for HW
	8.5.3 [U] Return
8.6 [N] Return	

9.0 [S] Service menus		
9.1.0 [S] Heat pump settings	9.1.1 [S] DM start heating	
	9.1.2 [S] DM start cooling	
	9.1.3 [S] Stop temp. heat low	
	9.1.4 [S] Stop temp. heat high	
	9.1.5 [S] Stop temp. cool low	
	9.1.6 [S] Stop temp. cool high	
	9.1.7 [S] Time bet. starts	
	9.1.8 [S] Min CompFreq act/set	
	9.1.9 [S] Max CompFreq act/set	
	9.1.10 [S] OU current heat act/max	
	9.1.11 [S] OU cur. cool act/max	
	9.1.12 [S] Tank defrost Temp.	
	9.1.13 [S] Return	
9.2.0 [S] Add. heat settings	9.2.1 [S] DM start add. heat	
	9.2.2 [S] Time factor	
	9.2.6 [S] Shunt amplification	
	9.2.7 [S] Shunt amplification2	
	9.2.8 [S] Add. heat type	
	9.2.9 [S] Return	
9.3.0 [S] Operating settings	9.3.1 [S] Max. boiler temp.	
	9.3.2 [S] Logger	
	9.3.3 [S] Cooling system	
	9.3.4 [S] Heating system 2	
	9.3.5 [S] Room unit	
	9.3.6 [S] Room sensor type	
	9.3.7.0 [S] Forced control	9.3.7.1 [S] Forced control
		9.3.7.2 [S] K1
		9.3.7.3 [S] K2
		9.3.7.4 [S] K3
		9.3.7.5 [S] K4
		9.3.7.6 [S] K5
		9.3.7.7 [S] K6
		9.3.7.8 [S] K7
		9.3.7.9 [S] K8
		9.3.7.10 [S] K9
		9.3.7.11 [S] K10
		9.3.7.12 [S] K11
		9.3.7.13 [S] K12
		9.3.7.14 [S] K13
		9.3.7.15 [S] K14
		9.3.7.16 [S] Alarm 1
		9.3.7.17 [S] Alarm 2
		9.3.7.18 [S] Return
	9.3.8 [S] Factory setting	
	9.3.9 [S] Operating state	
	9.3.10.0 [S] Floor drying setting	9.3.10.1 [S] Floor drying
		9.3.10.2 [S] Period time 1

9.0 [S] Service menus		
		9.3.10.3 [S] Temp. period 1
		9.3.10.4 [S] Period time 2
		9.3.10.5 [S] Temp. period 2
		9.3.10.6 [S] Return
	9.3.11 [S] Supply pump exer.	
	9.3.12 [S] Supply diff HP	
	9.3.13 [S] Diff HP add. heat	
	9.3.14 [S] Block HW/Heating	
	9.3.15 [S] Heat drop at alarm	
	9.3.16 [S] Type of HW sensor	
	9.3.17 [S] Freeze protection HX	
	9.3.18 [S] Return	
9.4 [S] Quick start		
9.5.0 [S] System info	9.5.1 [S] Heat pump type	
	9.5.2 [S] Cpu usage percent	
	9.5.3 [S] Com rate/1000	
	9.5.4 [S] Unit w. com. problem	
	9.5.5 [S] Run time add. heat	
	9.5.6 [S] Run time hot water	
	9.5.7 [S] Program version	
	9.5.8 [S] 106-card version	
	9.5.9 [S] Display version	
	9.5.10 [S] Relay card version	
	9.5.11 [S] Lowest supply temp.	
	9.5.12 [S] Percent runtime	
	9.5.13 [S] Period	
	9.5.14 [S] Run status	
	9.5.15 [S] Run status last	
	9.5.16 [S] Run status time	
	9.5.17 [S] Return	
9.6.0 [S] Heat reg. settings	9.6.1 [S] CompFreq	
	9.6.2 [S] Manual CompFreq	
	9.6.3 [S] Max deltaF act/set	
	9.6.4 [S] CompFreq regP	
	9.6.5 [S] Time min freq start	
	9.6.6 [S] Time min freq heat	
	9.6.7 [S] Max diff flow-cFlow	
	9.6.8 [S] CompFreq GMz	
	9.6.9 [S] Return	
9.7 [S] Reset alarm		
9.8.0 [S] Alarm log	9.8.1.0 [S] Log 1	9.8.x.1 [S] Time
		9.8.x.2 [S] Alarm type
		9.8.x.3 [S] Run status
		9.8.x.4 [S] Run status last
		9.8.x.5 [S] Run status time
		9.8.x.6 [S] Run time compressor
		9.8.x.7 [S] Outdoor avg. 1min.
		9.8.x.8 [S] Outdoor temp Tho-A

9.0 [S] Service menus		
		9.8.x.9 [S] Supply/Return temp
		9.8.x.10 [S] Condensor out
		9.8.x.11 [S] Hot water temp.
		9.8.x.12 [S] CompFreq act/set
		9.8.x.13 [S] Heat Ex Tho-R1
		9.8.x.14 [S] Heat Ex Tho-R2
		9.8.x.15 [S] Suction temp. Tho-S
		9.8.x.16 [S] Hot gas Tho-D
		9.8.x.17 [S] Liquid line temp.
		9.8.x.18 [S] HP
		9.8.x.19 [S] LP LPT
		9.8.x.20 [S] OU current CT
		9.8.x.21 [S] Inverter temp Tho-IP
		9.8.x.22 [S] Circ-pump speed
		9.8.x.23 [S] Relay status 1-8
		9.8.x.24 [S] Relay status 9-14
		9.8.x.25 [S] Program status 1-8
		9.8.x.26 [S] Program status 9-16
		9.8.x.27 [S] Return
	9.8.2.0 [S] Log 2	
	9.8.3.0 [S] Log 3	
	9.8.4.0 [S] Log 4	
	9.8.5 [S] Clear alarm log	
	9.8.6 [S] Return	
9.9 [S] Return		

Main menus

Menu 1.0 [N] Hot water temp.

The current hot water temperature in the hot water heater is shown here.

Menu 2.0 [N] Supply temp.

The current supply temperature for the climate system is shown here with the calculated supply temperature in brackets.

Menu 3.0 [N] Supply temp. 2

The current supply temperature for climate system 2 is shown here with the calculated supply temperature in brackets.

Menu 4.0 [N] Outdoor temp.

The current outdoor air temperature is displayed here.

Menu 5.0 [N] Heat pump

Readings regarding the status of the outdoor unit are shown in the sub-menus to this menu.

The following text appears in the display.

Text	Means
Off	Shown when there is no compressor demand and none of the following apply.
On	Shown during normal operation with the compressor.
Initiates	Shown while the compressor is running.
Com. problem	Shown in the event of temporary communication problems.
Defrosting	Shown during defrost.
Oil return	Shown when the compressor is rotated to be lubricated.
Protection	Shown when the compressor is in some form of protection or during a start delay of 30 minutes.
Shutdown	Shown in the event of an alarm, tariff B or Operating mode Addition only.
Stopped	Shown when the outdoor temperature is outside the compressor's working range (too high or too low temperature).

Menu 6.0 [N] Room temperature

The room temperature is shown here and the set room temperature in brackets. Settings concerning the factor for the room sensor and which climate system the sensor should control are made in the sub-menus for this menu.

Menu 7.0 [N] Clock

Settings regarding the date and time are made in the sub-menus of this menu. Different temperature reductions and increases at selected times are also set from this menu.

Menu 8.0 [N] Other adjustments

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

Menu 9.0 [S] Service menus

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

Values can be read and various settings can be made from these sub-menus.

NOTE

These settings should only be made by persons with the necessary expertise.

[N] Normal, covers the normal user's needs.

[U] Extended, shows all menus except the service menus.

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

1.0 [N] Hot water temp.

Menu 1.1 [N] Max HW/Period time

The time of the hot water period and the time for the whole period are shown here. Shown for both hot water charging and heating when necessary:

Time Heating/Max. when heating is in progress.

Time Hot water/Max. if hot water charging is in progress.

Menu 1.2 [N] Start temperature HW

The temperature when the heat pump starts hot water charging is set here.

Setting range: 25 – 55 °C

Default value: 47 °C

Menu 1.3 [N] Stop temperature HW

The temperature when the heat pump stops hot water charging is set here.

Setting range: 30 – 60 °C

Default value: 53 °C

Menu 1.4 [U] Stop temperature XHW

The desired temperature during extra hot water is set here.

Setting range: 40 – 65 °C

Default value: 65 °C

Menu 1.5 [U] Heat pump stop XHW

The desired stop temperature during extra hot water for the heat pump is set here.

Setting range: 40 – 60 °C

Default value: 58 °C

Menu 1.6 [U] Max heat p. time XHW*

Here you select the maximum amount of time the heat pump can charge hot water during extra hot water.

Setting range: 0 – 60 min

Default value: 50 min

*Not used from program version 1.04 inclusive.

Menu 1.7 [U] Interval XHW

Periodic time based extra hot water is selected here.

Extra hot water is shut off at the value "Off". Extra hot water is started when the value is confirmed.

Setting range: From - 90 days

Default value: Off

Menu 1.8 [U] Next XHW action

Next periodic increase to the "Extra hot water" level shown here.

Menu 1.9 [U] HW run time

Shows how long hot water charging with the compressor has been in progress (accumulated).

Menu 1.10.0 [S] HW charge act/set

Shows the actual and desired values for the hot water charging temperature.

Hot water charging settings are made in the sub-menus for this menu.

Menu 1.10.1 [S] HW charge set temp

Shows the actual set point value for the hot water charging temperature.

The set point value for temperatures above the stop value for hot water charging is selected within brackets.

Setting range: 0 – 10 °C

Default value: 2.0 °C

Menu 1.10.2 [S] Circ-pump speed HW

The speed of the heating medium pump during hot water charging is shown here.

Menu 1.10.3 [S] Circ-pump manual

Select "On" to manually control the HW pump.

Setting range: Off, On

Default value: Off

Menu 1.10.10 [S] Return

Return to menu 1.10.0.

Menu 1.11.0 [S] CompFreq HW settings

The compressor frequency that is used during hot water charging is shown here.

Settings can be made regarding the compressor frequency during hot water charging in the submenus to this menu.

Menu 1.11.1 [S] CompFreq HW set

The compressor frequency for hot water charging is shown here.

Here you select the compressor frequency for hot water charging during manual control.

These setting initially apply when "On" is selected in menu 1.11.2.

	AMS 10-8	AMS 10-12
Setting range	20 – 81 Hz	25 – 85 Hz
Factory setting	-	-

Menu 1.11.2 [S] CompFreq manual

Select "On" to control the compressor frequency for hot water charging manually.

Setting range: Off, On

Default value: Off

Menu 1.11.3 [S] CompFreq at +20

The compressor frequency for hot water charging at an outdoor air temperature of 20 °C is selected here.

	AMS 10-8	AMS 10-12
Setting range	20 – 81 Hz	25 – 85 Hz
Factory setting	40 Hz	

Menu 1.11.4 [S] CompFreq at -5

The compressor frequency for hot water charging at an outdoor air temperature of -5 °C is selected here.

	AMS 10-8	AMS 10-12
Setting range	20 – 81 Hz	25 – 85 Hz
Factory setting	80 Hz	

Menu 1.11.5 [S] Return

Return to menu 1.11.0.

Menu 1.12 [N] Return

Return to menu 1.0.

2.0 [N] Supply temp.

Menu 2.1.0 [N] Heating settings

Heating settings are made in the sub-menus for this menu.

Menu 2.1.1 [N] Offset heating/Total

The selected heating curve offset is shown here.

The total offset of the heat curve is also shown here. It includes schedule, outer compensation and any room control.

NOTE

The value is changed using the "Heating curve offset" knob.

Setting range: -10 – 10

Menu 2.1.2 [N] Heating curve

The selected curve slope (heating curve) is shown here. At value 0, the function "Own heat curve" is activated, see menu 2.1.3.0.

Setting range: 0 – 20

Default value: 9

Menu 2.1.3.0 [U] Own heating curve

Here you can select your own curve definition. This is an individual linear curve with one break point. You select a break point and the associated temperatures.

NOTE

The "Curve slope" in menu 2.1.2 must be set to 0 to activate this function.

Menu 2.1.3.1 [U] Supply temp.at +20

The supply temperature at an outdoor air temperature of +20 °C is selected here.

Setting range: 0 – 80* °C

Default value: 20 °C

Menu 2.1.3.2 [U] Supply temp.at -20

The supply temperature at an outdoor air temperature of -20 °C is selected here.

Setting range: 0 – 80* °C

Default value: 35 °C

Menu 2.1.3.3 [U] Buckling temperature

Here you select at what outside air temperature the break point shall occur.

Setting range: -15 – 15 °C

Default value: 0 °C

Menu 2.1.3.4 [U] Supply t. at buckl.

You set the required flow temperature for the break point here.

Setting range: 0 – 80* °C

Default value: 30 °C

Menu 2.1.3.5 [U] Return

Return to menu 2.1.3.0.

Menu 2.1.4 [U] Min supply heating

The set minimum level for the supply temperature to the climate system is shown here.

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

Setting range: 20 – 65 °C

Default value: 25 °C

Menu 2.1.5 [U] Circ-pump speed heat

The speed of the heating medium pump during house heating is selected here.

Setting range: 1 – 100

Default value: 60

Menu 2.1.6 [N] Return

Return to menu 2.1.0.

Menu 2.2.0 [N] Cooling settings

Cooling settings are made in the sub-menus for this menu.

Menu 2.2.1 [N] Offset cooling/Total

The selected cooling curve offset is changed here.

The total offset of the cooling curve is also shown here. It includes schedule, outer compensation and any room control.

Setting range: -10 – 10

Default value: -1

Menu 2.2.2 [N] Cooling curve

The selected curve slope (cooling curve) is shown here. At value 0, the function "Own cooling curve" is activated, see menu 2.2.3.0.

Setting range: 0 – 3

Default value: 1

Menu 2.2.3.0 [U] Own cooling curve

Here you can select your own curve definition.

NOTE

The "Curve slope" in menu 2.2.2 must be set to 0 to activate this function.

Menu 2.2.3.1 [U] Supply temp.at +20

The supply temperature at an outdoor air temperature of +20 °C is selected here.

Setting range: 0 – 25* °C

Default value: 20 °C

* Limited by menu 2.3 Max supply temp..

* Limited by menu 2.3 Max supply temp..

Menu 2.2.3.2 [U] Supply temp.at +40

The supply temperature at an outdoor air temperature of +40 °C is selected here.

Setting range: 0 – 25* °C

Default value: 10 °C

Menu 2.2.3.3 [U] Return

Return to menu 2.2.3.0.

Menu 2.2.4 [N] Min supply cooling

The set minimum level for the supply temperature to the climate system during cooling is shown here.

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

Setting range: 7 – 25 °C

Default value: 10 °C

Menu 2.2.5 [N] Circ-pump speed cool

The speed of the heating medium pump during house cooling is selected here.

Setting range: 1 – 100

Default value: 60

Menu 2.2.6 [N] Return

Return to menu 2.2.0.

Menu 2.3 [U] Max supply temp.

The set maximum level for the supply temperature to the climate system is shown here.

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

Setting range: 25 – 65 °C

Default value: 55 °C

Menu 2.4 [U] External adjustment

Connecting an external contact, for example, a room thermostat (accessory) or a timer allows you to temporarily or periodically raise or lower the room temperature. When the external contact is closed, the heating curve offset is changed by the number of steps shown here.

If room control is active there is a degree change to the set room temperature.

Setting range: -10 – 10

Default value: 0

Menu 2.5 [U] Supply/Return temp.

The current actual flow and return line temperatures are shown here.

Menu 2.6 [U] Degree minutes

Current value for number of degree-minutes. For example, this value can be changed to accelerate the start of heating production or cooling.

Setting range: -32000 – 32000

Menu 2.7 [N] Return

Return to menu 2.0.

3.0 [N] Supply temp. 2

Menu 3.1 [N] Offset heating/Tot 2

The selected heating curve offset 2 is selected here.

The total offset of heat curve 2 is also shown here. It includes schedule, outer compensation and any room control.

Setting range: -10 – 10

Default value: -1

Menu 3.2 [N] Heating curve 2

The selected curve slope (heating curve) is shown here. At value 0, the function "Own heat curve 2" is activated, see menu 3.6.0.

Setting range: 0 – 20

Default value: 6

Menu 3.3 [U] Min supply temp. 2

The set minimum level for the supply temperature for climate system 2 is shown here.

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

Setting range: 10 – 65 °C

Default value: 15 °C

Menu 3.4 [U] Max supply temp. 2

The set maximum level for the supply temperature for climate system 2 is shown here.

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

Setting range: 10 – 65 °C

Default value: 45 °C

Menu 3.5 [U] External adjust. 2

Connecting an external contact, for example, a room thermostat (accessory) or a timer allows you to temporarily or periodically raise or lower the room temperature. When the external contact is closed, the heating curve offset is changed by the number of steps shown here.

If room control is active there is a degree change to the set room temperature.

Setting range: -10 – 10

Default value: 0

Menu 3.6.0 [U] Own heating curve 2

Here you can select your own curve definition. This is an individual linear curve with one break point. You select a break point and the associated temperatures.

NOTE

The "Curve slope" in menu 3.2 must be set to 0 to activate this function.

* Limited by menu 3.4 Max supply temp. 2.

Menu 3.6.1 [U] Supply temp.at +20

The supply temperature at an outdoor air temperature of +20 °C is selected here.

Setting range: 0 – 80* °C

Default value: 20 °C

Menu 3.6.2 [U] Supply temp.at -20

The supply temperature at an outdoor air temperature of -20 °C is selected here.

Setting range: 0 – 80* °C

Default value: 35 °C

Menu 3.6.3 [U] Buckling temperature

Here you select at what outside air temperature the break point shall occur.

Setting range: -15 – 15 °C

Default value: 0

Menu 3.6.4 [U] Supply t. at buckl

You set the required flow temperature for the break point here.

Setting range: 0 – 80* °C

Default value: 30 °C

Menu 3.6.5 [U] Return

Return to menu 3.6.0.

Menu 3.7 [U] Supply/Return temp 2

The present actual flow and return line temperatures for climate system 2 are shown here.

Menu 3.8 [N] Return

Return to menu 3.0.

4.0 [N] Outdoor temp.

Menu 4.1 [N] Outdoor avg. temp.

This menu shows the average outdoor temperature according to the set value in menu 4.2 (factory setting: 24h).

Menu 4.2 [U] Outdoor filter time

Here you select during how long the average temperature in menu 4.1 is calculated.

Setting range: 1 min, 10 min, 1h, 2h, 4h, 6h, 12h, 24h

Default value: 24h

Menu 4.3 [U] Outdoor avg. 1min.

Shows the average outdoor temperature over the last minute.

Menu 4.4 [N] Return

Return to menu 4.0.

5.0 [N] Heat pump

Menu 5.1 [N] Number of starts

The accumulated number of starts with the compressor in AMS 10 is shown here.

Menu 5.2 [N] Run time compressor

The accumulated time that the compressor has been used in AMS 10 is shown here.

Menu 5.3 [U] Time to start

Time until the compressor start in the AMS 10 is shown in this menu.

Menu 5.4 [U] Outdoor temp. Tho-A

This menu shows the outdoor air temperature that the heat pump measures.

Menu 5.5 [U] Heat Ex Tho-R1

This menu shows the evaporator temperature in the heat pump at sensor Tho-R1.

Menu 5.6 [U] Heat Ex Tho-R2

This menu shows the evaporator temperature in the heat pump at sensor Tho-R2.

Menu 5.7 [U] Suction temp. Tho-S

This menu shows the suction gas temperature in the heat pump.

Menu 5.8 [U] Hot gas Tho-D

This menu shows the hotgas temperature in the heat pump.

Menu 5.9 [U] Liquid line temp.

This menu shows the liquid line temperature in the heat pump.

Menu 5.10 [U] Condensor out / max

Shows the current and max. allowed temperature after the condenser.

Menu 5.11 [U] HP

The current high pressure and corresponding temperature during heating are shown here. During cooling, the actual low pressure and corresponding temperature are shown.

Menu 5.12 [U] LP LPT

The current low pressure is shown here.

Menu 5.13 [U] Fan speed

No function.

Menu 5.14.0 [U] CompFreq act/set

The actual and set point value for the compressor frequency are shown here.

Menu 5.14.1 [U] OU current CT

The present phase current to AMS 10 is shown here.

Menu 5.14.2 [U] Inverter temp Tho-IP

The current inverter temperature is shown here.

Menu 5.14.3 [U] Return

Return to menu 5.14.0.

Menu 5.15.0 [S] OU communication

Readings regarding any communication errors can be made in the sub-menus to this menu.

Menu 5.15.1 [S] Com. error rate

Shows the percentage of incorrect communications with AMS 10 since start-up.

Menu 5.15.2 [S] Com. errors

Shows the total number of incorrect communications with AMS 10 since start-up.

Menu 5.15.3 [S] Reset com. errors

Select "Yes" here to reset the counters in menu 5.15.1 and 5.15.2. The settings returns to ”No” once the action has been carried out.

Setting range: Yes, No

Menu 5.15.4 [S] Return

Return to menu 5.15.0.

Menu 5.16 [N] Return

Return to menu 5.0.

6.0 [N] Room temperature*

Menu 6.1 [U] Room compensation

A factor is selected here that determines how much the flow temperature is affected by the difference between the room temperature and the set room temperature. A higher value gives a greater change.

Setting range: 0 – 10.0

Default value: 2.0

Menu 6.2 [U] Heating system

Select here whether the room sensor should activate climate system 1 (menu 2.0) and/or climate system 2 (menu 3.0).

Setting range: Off, System 1, System 2, System 1+2

Default value: Off

Menu 6.3 [N] Room temp. setpoint

The desired room temperature is shown here.

Setting range: 10 – 30 °C

Menu 6.4 [U] Room temp avg. 1min

Shows the average room temperature over the last minute.

Menu 6.5 [U] Room integrator time

Select the integration time for room control here.

Setting range: 0 – 120

Default value: 0

Menu 6.6 [N] Return

Return to menu 6.0.

7.0 [N] Clock

Menu 7.1 [N] Date

The current date is set here.

Menu 7.2 [N] Time

Here the current time is set.

Menu 7.3.0 [U] Temp set back

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

Menu 7.3.1 [U] Set back time

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

Menu 7.3.2 [U] Set back temp +/-

Changes to the heat curve with a day change, e.g. the night reduction is set here.

Setting range: -10 – 10

Default value: 0

Menu 7.3.3 [U] Heating system

The climate system that the day change is to affect is selected here. If shunt group 2 is present the menu can be set to ”Off”, ”System 1”, ”System 2” or ”System 1+2”. In other cases only "Off" and "System 1" can be selected.

Setting range: Off, System 1, System 2, System 1+2

Default value: Off

Menu 7.3.4 [U] Return

Return to menu 7.3.0.

Menu 7.4.0 [U] Extra hot water

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

Menu 7.4.1 – 7.4.7 [U] XHW Monday – XHW Sunday

Here you select the period for respective days when extra hot water should be activated. Hours and minutes for both start and stop are shown. Equal values mean that extra hot water is not activated. Time can be set past midnight.

Setting range: 00:00 – 23:45

Default value: 00:00 – 00:00

Menu 7.4.8 [U] Return

Return to menu 7.4.0.

Menu 7.5.0 [U] Vacation set back

Holiday settings are made in the sub-menus to this menu.

When the holiday function is active, the flow line temperature is reduced according to the setting and hot water charging can be switched off.

When the holiday function is deactivated, the heat pump heats the water for an hour, before periodic extra hot water is activated (if periodic extra hot water is activate din menu 1.7).

NOTE

The holiday setting does not deactivate cooling.

Menu 7.5.1 [U] Vacation begins

The start date for holiday changing is set here. The date is changed by pressing the enter button. The holiday change starts applying at 00:00 on the selected date.

Same date in menu 7.5.1 and 7.5.2 deactivates the holiday function.

Menu 7.5.2 [U] Vacation ends

The end date for holiday changing is set here. The date is changed by pressing the enter button. The holiday change stops applying at 23:59 on the selected date.

Same date in menu 7.5.1 and 7.5.2 deactivates the holiday function.

*Requires accessory and activation in menu 9.3.6.

Menu 7.5.3 [U] Heating system

The climate system that the vacation set back is to affect is selected here. If shunt group 2 is present the menu can be set to "Off", "System 1", "System 2" or "System 1+2". In other cases only "Off" and "System 1" can be selected.

Setting range: Off, System 1, System 2, System 1+2

Default value: Off

Menu 7.5.4 [U] Offset heating curve

How much the heating curve is to be offset during the holiday period is set here.

If the relevant climate system has a room temperature sensor, the change is given in degrees.

Setting range: -10 – 10

Default value: -5

Menu 7.5.5 [U] HW off

If the hot water charge is to be shut off during the holiday period this is set here.

Setting range: No, Yes

Default value: Yes

Menu 7.5.6 [U] Return

Return to menu 7.5.0.

Menu 7.6.0 [N] Silent mode*

The period for silent mode, where the heat pump operates at a lower noise level by limiting the compressor and fan speeds, is selected in the sub-menu.

Menu 7.6.1 [N] Silent mode time*

The time interval for silent mode is set here. The period is selectable for a maximum of 23:45 (hh:mm) with increments of 15 min. If the same time is selected for stop and start the function is off.

Default values: off

Menu 7.6.2 [N] Return*

Return to menu 7.6.0.

Menu 7.7 [N] Return*

Return to menu 7.0.

8.0 [N] Other adjustments

Menu 8.1.0 [N] Display settings

Settings concerning language and menu type are set in the sub-menus to this menu.

Menu 8.1.1 [N] Menu type

The menu type is chosen here.

[N] Normal, covers the normal user's needs.

[U] Extended, shows all menus except the service menus.

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

NOTE

Incorrect settings in the service menus can damage the property and/or heat pump.

Setting range: N, U, S

Default value: N

Menu 8.1.2 [N] Language

Language settings are made here.

Menu 8.1.3 [U] Display contrast

The display's contrast is set here.

Setting range: 0 – 31

Default value: 20

Menu 8.1.4 [U] Light intensity

The light intensity in idle mode is set here. Idle mode starts 30 minutes after the last button was pushed.

Setting range: 0=off, 1=low, 2=average.

Default value: 1

Menu 8.1.5 [N] Return

Return to menu 8.1.0.

Menu 8.2.0 [N] Op. mode settings

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

Menu 8.2.1 [N] Allow add. heat

At which operating mode the electric addition is to be permitted to produce hot water and heat when needed is selected here.

Setting range: Off, Heating, Heating + Cooling, Cooling

Default values: Heating

Menu 8.2.2 [N] Add. heat mode

Selected if electric addition is to be used to produce hot water and heat.

Setting range: Off, On

Default value: Off

Menu 8.2.3 [U] Stop temp. heating

The average outdoor air temperature at which the heat pump (in auto mode) is to stop heat production.

When the average outdoor air temperature falls below Stop temp. heating – Hysteresis (menu 8.2.5) heating starts again.

Setting range: 1 – 43 °C

Default value: 17 °C

*Menu "Silent mode" available from program version 1.04 inclusive.

Menu 8.2.4 [U] Start temp. cooling

The average outdoor air temperature at which the heat pump (in auto mode) is to start cooling.

When the average outdoor temperature switches over, Start temp. cooling (menu 8.2.5) cooling starts.

When the average outdoor air temperature falls below Start temp. cooling – Hysteresis (menu 8.2.5) cooling stops.

Setting range: 10 – 43 °C

Default value: 25 °C

Menu 8.2.5 [U] Hysteresis

See menu 8.2.3 and menu 8.2.4. Also affects control with room sensor.

Setting range: 1.0 – 10.0

Default value: 1.0

Menu 8.2.6 [N] Return

Return to menu 8.2.0.

Menu 8.3.0 [U] Current limiter

Settings and readings regarding the load monitor are set in the sub-menus to this menu.

Menu 8.3.1 [U] Fuse size

The setting selected on the EBV card (AA22) knob (R24) is shown here.

Menu 8.3.2 [U] Max. electric power

The setting selected on the EBV card (AA22) knob (R25) is shown here.

Menu 8.3.3 [U] Current phase 1

Measured current from phase 1 shown here. If the value falls below 2.8 A "low" is displayed.

Menu 8.3.4 [U] Current phase 2

Measured current from phase 2 shown here. If the value falls below 2.8 A "low" is displayed.

Menu 8.3.5 [U] Current phase 3

Measured current from phase 3 shown here. If the value falls below 2.8 A "low" is displayed.

Menu 8.3.6 [U] Transform. ratio EBV

The transfer value must be defined depending on the current sensors used for the EBV card.

Setting range: 100 – 1250

Default value: 300

Menu 8.3.7 [U] Return

Return to menu 8.3.0.

Menu 8.5.0 [U] Period settings

Time periods for heating and hot water production are set in the sub-menus for this menu.

Menu 8.5.1 [U] Period time

The length of time for production of hot water and heating is set here.

Setting range: 5 – 60 min

Default value: 60 min

Menu 8.5.2 [U] Max time for HW

Here you select how much time of the period time (menu 8.5.1) is to be used to heat the hot water when there is a need for both heating and hot water.

Setting range: 0 – 60 min

Default value: 40 min

Menu 8.5.3 [U] Return

Return to menu 8.5.0.

Menu 8.6 [N] Return

Return to menu 8.0.

9.0 [S] Service menus

Menu 9.1.0 [S] Heat pump settings

Settings for AMS 10 are made in the sub-menus to this menu.

Menu 9.1.1 [S] DM start heating

Degree minute setting for start of heat pump, heating.

Setting range: -120 – 0

Default value: -60

Menu 9.1.2 [S] DM start cooling

Degree minute setting for start of heat pump, cooling.

Setting range: 0 – 120

Default value: 60

Menu 9.1.3 [S] Stop temp. heat low

Lower parameter for the heat pump's working range during heating. It stops below this outdoor air temperature.

The heat pump is permitted to start again when the outdoor air temperature increases by two degrees over the set value.

Setting range: -25 – 43 °C

Default value: -25 °C

Menu 9.1.4 [S] Stop temp. heat high

Upper parameter for the heat pump's working range during heating. It stops above this outdoor air temperature.

The heat pump is permitted to start again when the outdoor air temperature decreases by two degrees below the set value.

Setting range: -25 – 43 °C

Default value: 43 °C

Menu 9.1.5 [S] Stop temp. cool low

Lower parameter for the heat pump's working range during cooling. It stops below this outdoor air temperature.

The heat pump is permitted to start again when the outdoor air temperature increases by two degrees over the set value.

Setting range: 10 – 43 °C

Default value: 10 °C

Menu 9.1.6 [S] Stop temp. cool high

Upper parameter for the heat pump's working range during cooling. It stops above this outdoor air temperature.

The heat pump is permitted to start again when the outdoor air temperature decreases by two degrees below the set value.

Setting range: 10 – 43 °C

Default value: 43 °C

Menu 9.1.7 [S] Time bet. starts

Minimum time interval in minutes between compressor starts in the heat pump.

Setting range: 0 – 60 min

Default value: 0 min

Menu 9.1.8 [S] Min CompFreq act/set

Select the min compressor frequency here. Display of both the current and the set.

	AMS 10-8	AMS 10-12
Setting range	20 – 81 Hz	20 – 80 Hz
Factory setting	20 Hz	

Menu 9.1.9 [S] Max CompFreq act/set

Select here the max limit for the compressor. Display of the actual and set via the display.

	AMS 10-8	AMS 10-12
Setting range	20 – 86 Hz	25 – 85 Hz
Factory setting	86 Hz	85 Hz

Menu 9.1.10 [S] OU current heat act/max

The phase current to AMS 10 and the highest permitted current that can be set during heating are shown here.

	AMS 10-8	AMS 10-12
Setting range	7 – 16	7 – 17
Factory setting	15	

Menu 9.1.11 [S] OU cur. cool act/max

The phase current to AMS 10 and the highest permitted current that can be set during cooling are shown here.

Setting range: 7 – 17

Default value: 15

	AMS 10-8	AMS 10-12
Setting range	7 – 15	7 – 17
Factory setting	14	15

Menu 9.1.12 [S] Tank defrost Temp.

If the system is colder than the set value defrosting occurs connecting to HW. If HW is colder, the electrical addition starts.

Setting range: 20 – 30 °C

Default value: 20 °C

Menu 9.1.13 [S] Return

Return to menu 9.1.0.

Menu 9.2.0 [S] Add. heat settings

Settings regarding additional heat and shunt in ACVM 270 and any extra shunt can be made in the sub-menus to this menu.

Menu 9.2.1 [S] DM start add. heat

The degree minute deficit that must be set before the additional heat supply is activated is set here.

Setting range: -1000 – -30

Default value: -400

Menu 9.2.2 [S] Time factor

The time factor of the immersion heater since first start up is shown here. The value is saved and is not reset even when the boiler is switched off using the main power switch.

Menu 9.2.6 [S] Shunt amplification

Applies to shunt 1 (QN11). E.g. 2 degrees difference and 2 in amplification gives 4 sec/min controlling the shunt.

Setting range: 0.1 – 5.0

Default value: 1.0

Menu 9.2.7 [S] Shunt amplification2

Applies to any shunt 2 (accessory required). E.g. 2 degrees difference and 2 in amplification gives 4 sec/min controlling the shunt. This function compensates for the speed variation found on different shunt motors that may be installed.

Setting range: 0.1 – 5.0

Default value: 1.0

Menu 9.2.8 [S] Add. heat type

Select the type of addition to be used.

Setting range: Internal power 1, Ext. 1 step, Ext. Lin 3, Ext. Bin 3

Default values: Internal power 1

Menu 9.2.9 [S] Return

Return to menu 9.2.0.

Menu 9.3.0 [S] Operating settings

Settings regarding accessories, additional heat operation, floor drying and a return to the factory settings can be made in the sub-menus to this menu.

Menu 9.3.1 [S] Max. boiler temp.

The setting selected on the EBV card (AA22) knob (R26) is shown here.

Menu 9.3.2 [S] Logger

NOTE

Only for service work, special accessory required.

Select "On" here if logger is installed.

Setting range: Off, On

Default value: Off

Menu 9.3.3 [S] Cooling system

Select "On" if cooling system is installed (accessory required).

Setting range: Off, On

Default value: Off

Menu 9.3.4 [S] Heating system 2

Here you select how climate system 2 is installed and if "Off" is selected in menu 9.3.3 only "Off" or "Heat" can be selected (accessory required).

Setting range: Off, Heating, Heating + Cooling, Cooling

Default value: Off

Menu 9.3.5 [S] Room unit

Here you select whether the Room unit (RE 10) is to be activated or not (accessory required).

Setting range: Off, On

Default value: Off

Menu 9.3.6 [S] Room sensor type

Room sensor type is selected here. Menu 6.0 can be accessed.

Setting range: Off, RG10, RE10

Default value: Off

Menu 9.3.7.0 [S] Forced control

Settings regarding forced control of the relays in the heat pump are made from the sub-menus in this menu.

Menu 9.3.7.1 [S] Forced control

When "On" is selected in this menu, the user temporarily takes control of the relays in the heat pump. The setting automatically returns to "Off", 30 minutes after the last button was pushed or after a restart.

Setting range: Off, On

Default value: Off

Menu 9.3.7.2 – 9.3.7.15 [S] K1 – K14

Here you can select manual control of the relays.

Setting range: Off, On, Auto

Default value: Auto

Menu 9.3.7.16 [S] Alarm 1

Here you can select select manual test of alarm relay 1.

Setting range: Off, On, Auto

Default value: Auto

Menu 9.3.7.17 [S] Alarm 2

Here you can select select manual test of alarm relay 2.

Setting range: Off, On, Auto

Default value: Auto

Menu 9.3.7.18 [S] Return

Return to menu 9.3.7.0.

Menu 9.3.8 [S] Factory setting

Here you can select to restore factory settings in ACVM 270.

When returning to the factory settings the language switches to English.

Setting range: Yes, No

Default value: No

Menu 9.3.9 [S] Operating state

Describes the operating status of ACVM 270 and AMS 10.

Shutdown: Additional heater and heat pump are shutdown due to an alarm.

Alternating: The heat pump produces heat and switches, when necessary, between hot water and climate system.

Combined Mode: Due to a great heating demand, the addition is used for hot water and the heat pump produces heat. The addition assists, when necessary, with heat production.

Cooling: The heat pump produces cooling and switches between hot water and cooling system, when necessary.

Super cooling: Only cooling. This is carried out by the heat pump. Hot water produced by addition.

Hot water: Only hot water is produced. This is carried out by the heat pump.

Addition: The heat pump is off and both hot water and heat is produced by the addition.

Menu 9.3.10.0 [S] Floor drying setting

Settings for the floor drying program are made in the sub-menus to this menu.

Menu 9.3.10.1 [S] Floor drying

"On" or "Off" is selected for the floor drying program from this sub-menu. After time period 1 a switch is made to time period 2 followed by a return to the normal settings.

Setting range: Off, On

Default value: Off

Menu 9.3.10.2 [S] Period time 1

Selection of the number of days in period 1.

Setting range: 1 – 5 days

Default value: 3 days

Menu 9.3.10.3 [S] Temp. period 1

Selection of the flow temperature in period 1.

Setting range: 15 – 50 °C

Default value: 25 °C

Menu 9.3.10.4 [S] Period time 2

Selection of the number of days in period 2.

Setting range: 1 – 5 days

Default value: 1 days

Menu 9.3.10.5 [S] Temp. period 2

Selection of the flow temperature in period 2.

Setting range: 15 – 50 °C

Default value: 40 °C

Menu 9.3.10.6 [S] Return

Return to menu 9.3.10.0.

Menu 9.3.11 [S] Supply pump exer.

Pump operation can be deactivated here. Pump is in operation for 2 minutes, 12 hours after last operation.

Setting range: Off, On

Default value: On

Menu 9.3.12 [S] Supply diff HP

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

Heating mode: If the current flow temperature exceeds the calculated flow with set value, the degree minute number is set to 1. The compressor stops when there is only a heating requirement.

If the calculated flow temperature drops below the calculated flow with set value, the degree minute number is set to the value in menu 9.1.1 minus 1. This means that the compressor will start.

Cooling mode: If the current supply temperature drops below the calculated supply with set value, the degree minute number is set to -1. The compressor stops when there is only a cooling requirement.

Setting range: 3 – 25 °C

Default value: 10 °C

Menu 9.3.13 [S] Diff HP add. heat

If additional heat is permitted (menu 8.2.1) and the current flow line temperature falls below the calculated set value plus the value from menu 9.3.12, the degree minute value is to the value in menu 9.2.1 plus 1 until the compressor has reached full speed. When the compressor has reached full speed, the degree minute value is set to the set value in menu 9.2.1 and addition is permitted. This means that the addition can cut in immediately.

Setting range: 1 – 8 °C

Default value: 3 °C

Menu 9.3.14 [S] Block HW/Heating

If heating or hot water are not required, they can be deselected here.

Operating mode Hot water or Only addition must be selected if heating is deselected.

Setting range: No HW, No heating, HW+Heating

Default value: HW+Heating

Menu 9.3.15 [S] Heat drop at alarm

Here you select whether heat production is to be reduced in the event of an alarm.

Setting range: Yes, No

Default value: Yes

Menu 9.3.16 [S] Type of HW sensor

Here you can select whether to use hot water sensors that manage higher temperatures (above 90 °C) or not.

Standard: Standard setting

High temp: Calculation for HW jacket sensor (BT6), Addition sensor (BT19) as well as supply sensor (BT2) arereplaced to suit a sensor that manages higher temperatures (up to 110 °C). Used if new sensor is installed in connection with installation of solar heating.

Setting range: Standard, High temp

Default value: Standard

Menu 9.3.17 [S] Freeze protection HX

Select here whether heat exchanger anti freeze is to be active or not.

Setting range: On, Off

Default value: On

Menu 9.3.18 [S] Return

Return to menu 9.3.0.

Menu 9.4 [S] Quick start

If "Yes" is selected, the compressor starts in the heat pump within 4 minutes if there is a demand. However, there is always a 30 minute compressor start delay if the current has been switched off.

Setting range: No, Yes

Default value: No

Menu 9.5.0 [S] System info

The sub menus to this menu contain information that is used when troubleshooting.

Only for service personnel.

Menu 9.5.1 [S] Heat pump type

The type of heat pump connected is shown here.

Menu 9.5.2 [S] Cpu usage percent

The CPU load is shown here.

Menu 9.5.3 [S] Com rate/1000

The number of communication retransmissions is shown here.

Menu 9.5.4 [S] Unit w. com. problem

Any communication problems that a unit may have are shown here as well as the relevant unit.

Menu 9.5.5 [S] Run time add. heat

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

Menu 9.5.6 [S] Run time hot water

The accumulated operating time in hours for hot water production with compressor since the first start-up is shown here.

Menu 9.5.7 [S] Program version

The current program software version in ACVM 270 is shown here

Menu 9.5.8 [S] 106-card version

The communication card version number is shown here (AA23).

Menu 9.5.9 [S] Display version

The display version number is shown here.

Menu 9.5.10 [S] Relay card version

The relay card version number is shown here.

Menu 9.5.11 [S] Lowest supply temp.

The minimum flow line temperature since start-up is shown here.

Menu 9.5.12 [S] Percent runtime

The compressor's running time percentage.

Menu 9.5.13 [S] Period

Period counter for switching between hot water and heating/cooling.

Menu 9.5.14 [S] Run status

Shows the current operating status of AMS 10

The display can show: Off, Hot water, Heating, Cooling, Defrost, Oil return or XHW.

Menu 9.5.15 [S] Run status last

Shows the previous operating status for AMS 10

The display can show: Off, Hot water, Heating, Cooling, Defrost, Oil return or XHW.

Menu 9.5.16 [S] Run status time

The time since the last operating status change.

Menu 9.5.17 [S] Return

Return to menu 9.5.0.

Menu 9.6.0 [S] Heat reg. settings

Settings regarding the heating regulator can be made in the sub-menus to this menu.

Menu 9.6.1 [S] CompFreq

The current set point value frequency to the compressor is shown here.

Setting the set point during manual control of the compressor frequency is activated in menu 9.6.2.

	AMS 10-8	AMS 10-12
Setting range	20 – 86 Hz	20 – 85 Hz

Menu 9.6.2 [S] Manual CompFreq

Select "On" to control the compressor frequency manually in menu 9.6.1.

Setting range: Off, On

Default value: Off

Menu 9.6.3 [S] Max deltaF act/set

The parameter for the heat regulator's max change of the set point is selected here.

Setting range: 1 – 10 Hz

Default value: 3 Hz

Menu 9.6.4 [S] CompFreq regP

Select P part for heat regulator.

Setting range: 1 – 60

Default value: 5

Menu 9.6.5 [S] Time min freq start

Select here the time that the compressor is to run at min speed, after start connecting to the climate system.

Setting range: 10 – 120 min

Default value: 70 min

Menu 9.6.6 [S] Time min freq heat

Select here the time that the compressor is to run at fixed frequency after shifting to heating. The compressor then runs at min frequency or at the frequency it had before hot water charging.

Setting range: 3 – 60 min

Default value: 3 min

Menu 9.6.7 [S] Max diff flow-cFlow

Select here limitation of flow when the degree minute regulator is way off the set point. Max difference between flow line front and calculated flow line.

Setting range: 2.0 – 10.0 °C

Default value: 4.0 °C

Menu 9.6.8 [S] CompFreq GMz

Here you select a value for the dynamic in the degree minute regulator.

Setting range: 95 – 127

Default value: 126

Menu 9.6.9 [S] Return

Return to menu 9.6.0.

Menu 9.7 [S] Reset alarm

Select "Yes" here to reset/acknowledge alarms in ACVM 270. The settings returns to "No" once the action has been carried out.

Setting range: Yes, No

Menu 9.8.0 [S] Alarm log

The alarm logs with the last 4 alarms are shown in the sub-menus of this menu.

Menu 9.8.1.0 – 9.8.4.0 [S] Log 1 – Log 4

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

Menu 9.8.x.1 [S] Time

Menu 9.8.x.2 [S] Alarm type

See section Alarm list on page 57 for further alarm information.

Alarm number	Cause
1	HP alarm
2	LP alarm
3	TB alarm
4	OU power failure
5	Low condenser out
6	High KF
7	Anti freeze HX
8	High HW temp.
9	High AH temp.
10	High VBF1
11	High VBF2
12	High VBR1
13	High VBR2
15	OU not compatible
16	Defrosting interrupted
30	Sensor fault UG
31	S. fault HP
32	Sensor fault KF
33	S. fault Liquid line
34	S. fault HW
35	S. fault AH
36	Sensor fault VBF1
37	Sensor fault VBF2
38	Sensor fault VBR1
39	Sensor fault VBR2
E34	OU phase error
E35	High HX temp
E36	High hotgas
E37	Sensor fault OU
E38	Sensor fault OU
E39	Sensor fault OU
E40	HP alarm
E41	Inverter error
E42	Inverter error
E45	Inverter error
E47	Inverter error
E48	Fan alarm
E49	LP alarm
E51	Inverter error
E53	Sensor fault OU
E54	LP alarm
E57	Low refrigerant
E59	Inverter error

Menu 9.8.x.3 [S] Run status

Menu 9.8.x.4 [S] Run status last

Menu 9.8.x.5 [S] Run status time

Menu 9.8.x.6 [S] Run time compressor

Menu 9.8.x.7 [S] Outdoor avg. 1min.

Menu 9.8.x.8 [S] Outdoor temp Tho-A

Menu 9.8.x.9 [S] Supply/Return temp

Menu 9.8.x.10 [S] Condensor out

Menu 9.8.x.11 [S] Hot water temp.

Menu 9.8.x.12 [S] CompFreq act/set

Menu 9.8.x.13 [S] Heat Ex Tho-R1

Menu 9.8.x.14 [S] Heat Ex Tho-R2

Menu 9.8.x.15 [S] Suction temp. Tho-S

Menu 9.8.x.16 [S] Hot gas Tho-D

Menu 9.8.x.17 [S] Liquid line temp.

Menu 9.8.x.18 [S] HP

Menu 9.8.x.19 [S] LP LPT

Menu 9.8.x.20 [S] OU current CT

Menu 9.8.x.21 [S] Inverter temp Tho-IP

Menu 9.8.x.22 [S] Circ-pump speed

Menu 9.8.x.23 [S] Relay status 1-8

Menu 9.8.x.24 [S] Relay status 9-14

Menu 9.8.x.25 [S] Program status 1-8

Menu 9.8.x.26 [S] Program status 9-16

Menu 9.8.x.27 [S] Return

Return to menu 9.8.x.0.

Menu 9.8.5 [S] Clear alarm log

Select "Yes" to erase the entire alarm log. The settings returns to "No" once the action has been carried out.

Setting range: Yes, No

Menu 9.8.6 [S] Return

Return to menu 9.8.0.

Menu 9.9 [S] Return

Return to menu 9.0.

Alarm list

Acknowledging alarms

No harm in acknowledging an alarm. If the cause of the alarm remains, the alarm recurs.

- When an alarm has been triggered, it can be acknowledged in menu 9.7 (service menu) by switching ACVM 270 off and on using the switch (SF1). Note that when the power is switched on there is a 30 minute delay before the heat pump restarts.
- When the alarm cannot be reset using the switch (SF1), the operating mode, "Add. heat only", can be activated to resume a normal temperature level in the house. This is most easily carried out by holding the "Operating mode" button in for 7 seconds.

NOTE

Recurring alarms mean that there is a fault in the installation.

Alarm with automatic reset

Alarm no.	Alarm text on the display	Triggers alarm	Resets alarm
70	Low condenser out	When condenser supply (BT12) is less than 5 °C.	- When condenser supply is greater than 14°C during cooling. - When defrost has ended. If the defrost caused the alarm (condenser supply during defrost is approx. 10 °C).
71	High KF	When condenser supply is greater than 60 C and there are more than 120 seconds since shifting to the climate system.	- When condenser out is lower than 51 °C.
72	Anti freeze HX	When the low pressure is less than 0.65 MPa (6.5 bar) in cooling mode.	- When the low pressure is greater than 0.83 MPa (8.3 bar) and condenser out is greater than 14 degrees.
73	Freeze prot	When the outdoor temperature drops below 0 °C and the operating mode does not permit heating.	- When the outdoor temperature rises above 1 °C.
75	Current limit	Too high current output from the house.	- When the current output decreases.
76	Com. alarm	Failed communication to one or more boards.	- When the fault has been corrected.
77	Defrosting interrupted	When the temperature in the water heater is too low (low pressure is less than 0.5 MPa, 5.0 bar) during defrost.	- When defrost has ended.
78	Protection	Exceeded limit value	- When defrost has ended.

Temperature limiter alarm

The following alarm blocks both AMS 10 and addition.

Alarm no.	Alarm text on the display	Description	May be due to
3	TB alarm	Temperature limiter in ACVM 270 has tripped.	- The temperature limiter has tripped during transportation - High temperature in ACVM 270 - Blown circuit fuse (L2)

ACVM 270 alarm

The following alarms block AMS 10. Addition runs at min permitted supply temperature.

Alarm no.	Alarm text on the display	Description	May be due to
4	OU power failure	No voltage to the outdoor unit from ACVM 270.	- Blown circuit fuse (L2) and (L3) - Tripped miniature circuit breaker (-FA2)
5	Low condenser out	Too low temperature out from the condenser. Occurs if alarm 70 occurs 3 times within an hour.	- Low temperature during cooling - Low flow during cooling

Alarm no.	Alarm text on the display	Description	May be due to
6	High KF	Too high temperature out from the condenser. Occurs if alarm 71 occurs 3 times within an hour.	- Low flow in heating operation - Too high set temperatures
7	Anti freeze HX	Anti-freeze of heat exchanger. Occurs if alarm 72 occurs 3 times within an hour.	- Low flow during defrost - Abnormally low temperature in the climate system
14	Defrosting interrupted	Occurs if the alarm 77 occurs 10 times in succession.	- Low flow during defrost - Abnormally low temperature in the climate system - Lack of refrigerant or leak
15	OU not compatible	Indoor unit and outdoor unit do not communicate with each other.	- Indoor unit and outdoor unit not compatible with each other.
16	Defrosting interrupted	Occurs if the alarm 78 occurs 10 times in succession.	- Low flow during defrost
31	S. fault HP	Sensor fault, high pressure (BP4).	- Open-circuit or short-circuit on sensor input - Sensor does not work
32	Sensor fault KF	Sensor fault, cond out (BT12).	- Open-circuit or short-circuit on sensor input - Sensor does not work (see "Temperature sensor" section)
33	S. fault Liquid line	Sensor fault, liquid line (BT15).	- Open-circuit or short-circuit on sensor input - Sensor does not work (see "Temperature sensor" section)

AMS 10 alarm

The following alarms block AMS 10. Addition runs at min permitted supply temperature.

Alarm no.	Alarm text on the display	Description	May be due to
E5	OU Com. error	Communication between the outdoor unit and ACVM 270 is broken. There must be 22 volt direct current (DC) in the switch CNW2 on the control board (PWB1).	- Any isolator switches for AMS 10 off - Incorrect cable routing
E35	High HX temp	Temperature deviation on the hot gas sensor (Tho-R1/R2) five times within 60 minutes or under 60 minutes.	- Sensor does not work (see "Temperature sensor" section) - Insufficient air circulation or blocked heat exchanger - Defective control board in AMS 10 - Too much refrigerant
E36	Permanent Hotgas	Temperature deviation on the hot gas sensor (Tho-D) two times within 60 minutes or under 60 minutes.	- Sensor does not work (see "Temperature sensor" section) - Insufficient air circulation or blocked heat exchanger - If the fault persists during cooling, there may be an insufficient amount of refrigerant. - Defective control board in AMS 10
E37	S. fault Tho-R	Sensor fault, heat exchanger in AMS 10 (Tho-R).	- Open-circuit or short-circuit on sensor input - Sensor does not work (see "Temperature sensor" section) - Defective control board in AMS 10

Alarm no.	Alarm text on the display	Description	May be due to
E38	S. fault Tho-A	Sensor fault, outdoor sensor in AMS 10 (Tho-A).	- Open-circuit or short-circuit on sensor input - Sensor does not work (see "Temperature sensor" section) - Defective control board in AMS 10
E39	S. fault Tho-D	Sensor fault, hot gas in AMS 10 (Tho-D).	- Open-circuit or short-circuit on sensor input - Sensor does not work (see "Temperature sensor" section) - Defective control board in AMS 10
E40	HP alarm	The high pressure pressostat (63H1) deployed 5 times within 60 minutes or under 60 minutes continuously.	- Insufficient air circulation or blocked heat exchanger - Open circuit or short circuit on input for high pressure pressostat (63H1) - Defective high pressure pressostat - Expansion valve not correctly connected - Service valve closed - Defective control board in AMS 10 - Low or no flow during heating operation - Defective circulation pump - Defective fuse, F(4A)
E41	Power transistor too hot	When IPM (Intelligent power module) displays FO-signal (Fault Output) five times during a 60-minute period.	Can occur when 15V power supply to the inverter PCB is unstable.
E42	Inverter error	Voltage from the inverter outside the parameters four times within 30 minutes.	- Incoming power supply interference - Service valve closed - Insufficient amount of refrigerant - Compressor fault - Defective circuit board for inverter in AMS 10
E45	Inverter error	Communication between circuit board for inverter and control board broken.	- Open-circuit in connection between boards - Defective circuit board for inverter in AMS 10 - Defective control board in AMS 10
E47	Inverter error	Overcurrent, Inverter A/F module	- Sudden power failure
E48	Fan alarm	Deviations in the fan speed in AMS 10.	- The fan cannot rotate freely - Defective control board in AMS 10 - Defective fan motor - Control board in AMS 10 dirty - Fuse (F2) blown
E49	LP alarm	Too low value on the low pressure transmitter 3 times within 60 minutes.	- Open circuit or short circuit on input for low pressure transmitter - Defective low pressure transmitter - Defective control board in AMS 10 - Open circuit or short circuit on input for suction gas sensor (Tho-S) - Defective suction gas sensor (Tho-S)
E51	Inverter error	Continuous deviation on power transistor for 15 minutes.	- Defective fan motor - Defective circuit board for inverter in AMS 10

Alarm no.	Alarm text on the display	Description	May be due to
E53	S. fault Tho-S	Sensor fault, suction gas in AMS 10 (Tho-S).	- Open-circuit or short-circuit on sensor input - Sensor does not work (see "Temperature sensor" section) - Defective control board in AMS 10
E54	S. fault LPT	Sensor fault, low pressure transmitter in AMS 10.	- Open-circuit or short-circuit on sensor input - Sensor does not work (see "Temperature sensor" section) - Defective control board in AMS 10 - Fault in the refrigerant circuit
E57	Insufficient refrigerant	Insufficient refrigerant is detected upon start-up in cooling mode.	- Service valve closed - Loose connection sensor (BT15, BT3) - Defective sensor (BT15, BT3) - Too little refrigerant
E59	Inverter error	Failed start for compressor	- Defective circuit board for inverter in AMS 10 - Defective control board in AMS 10 - Compressor fault

Hot water alarm

The following alarms block hot water production via AMS 10. The addition is blocked completely.

Alarm no.	Alarm text on the display	Description	May be due to
8	High HW temp.	Too high temperature (>90 °C) on hot water sensor (BT6).	- Contactor to internal electricity defective - Incorrect external addition setting
9	High AH temp.	Too high temperature (>90 °C) on immersion heater sensor (BT19).	- Contactor to internal electricity defective - Incorrect external addition setting
34	S. fault HW	Sensor fault, hot water (BT6).	- Open-circuit or short-circuit on sensor input - Sensor does not work (see "Temperature sensor" section)
35	S. fault AH	Sensor fault, immersion heater (BT19).	- Open-circuit or short-circuit on sensor input - Sensor does not work (see "Temperature sensor" section)

Supply alarm

The following alarms switch off heating/cooling. Only hot water production is permitted.

Alarm no.	Alarm text on the display	Description	May be due to
10	High VBF1	Too high temperature (>90 °C) on flow line sensor, system 1 (BT2).	- Sensor does not work (see "Temperature sensor" section)
11	High VBF2	Too high temperature (>90 °C) on flow line sensor, system 2.	- Sensor does not work (see "Temperature sensor" section)
36	Sensor fault VBF1	Sensor fault, supply, system 1 (BT2).	- Open-circuit or short-circuit on sensor input - Sensor does not work (see "Temperature sensor" section)
37	Sensor fault VBF2	Sensor fault, supply, system 2.	- Open-circuit or short-circuit on sensor input - Sensor does not work (see "Temperature sensor" section)

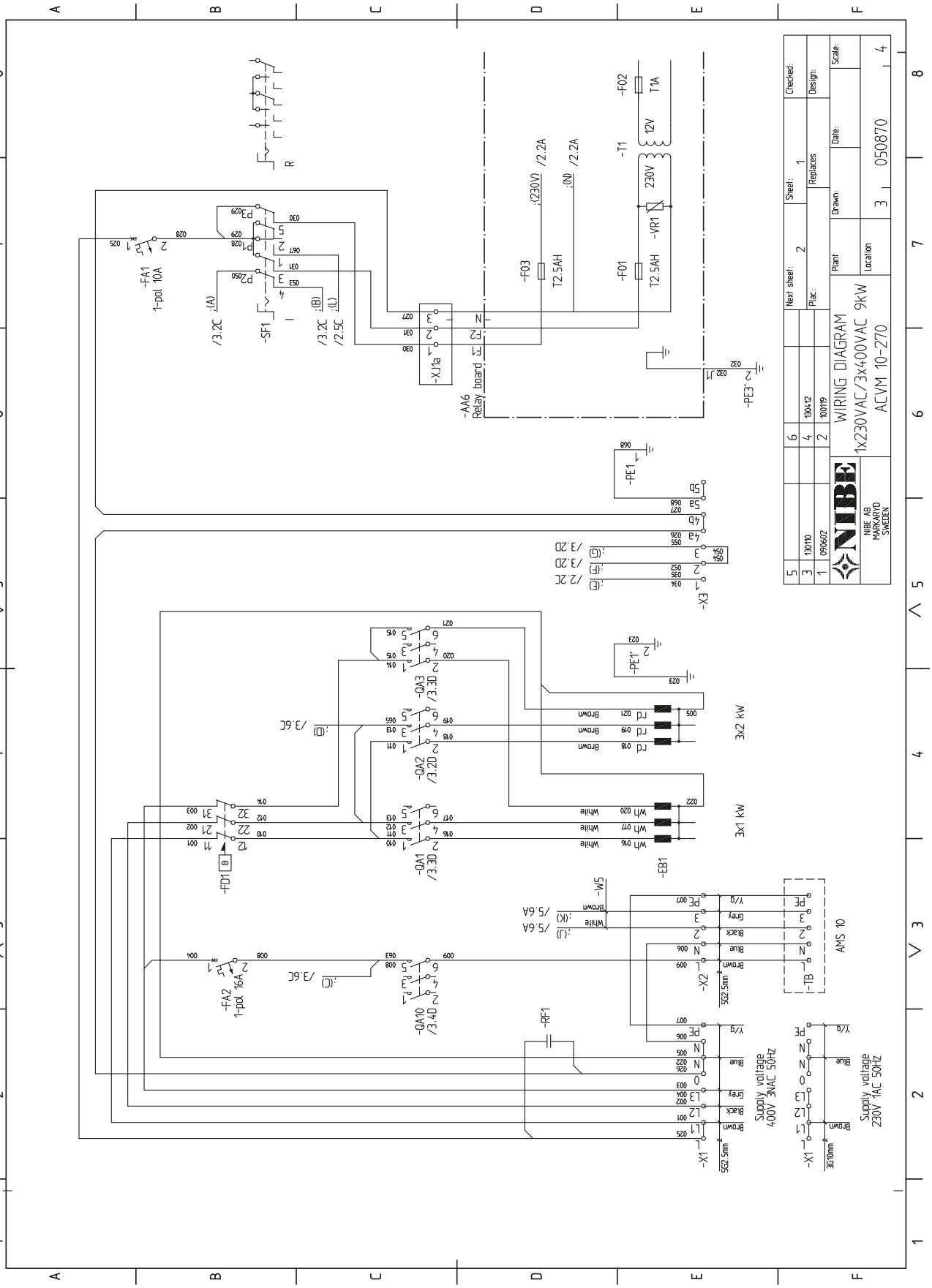
Outdoor sensor alarm

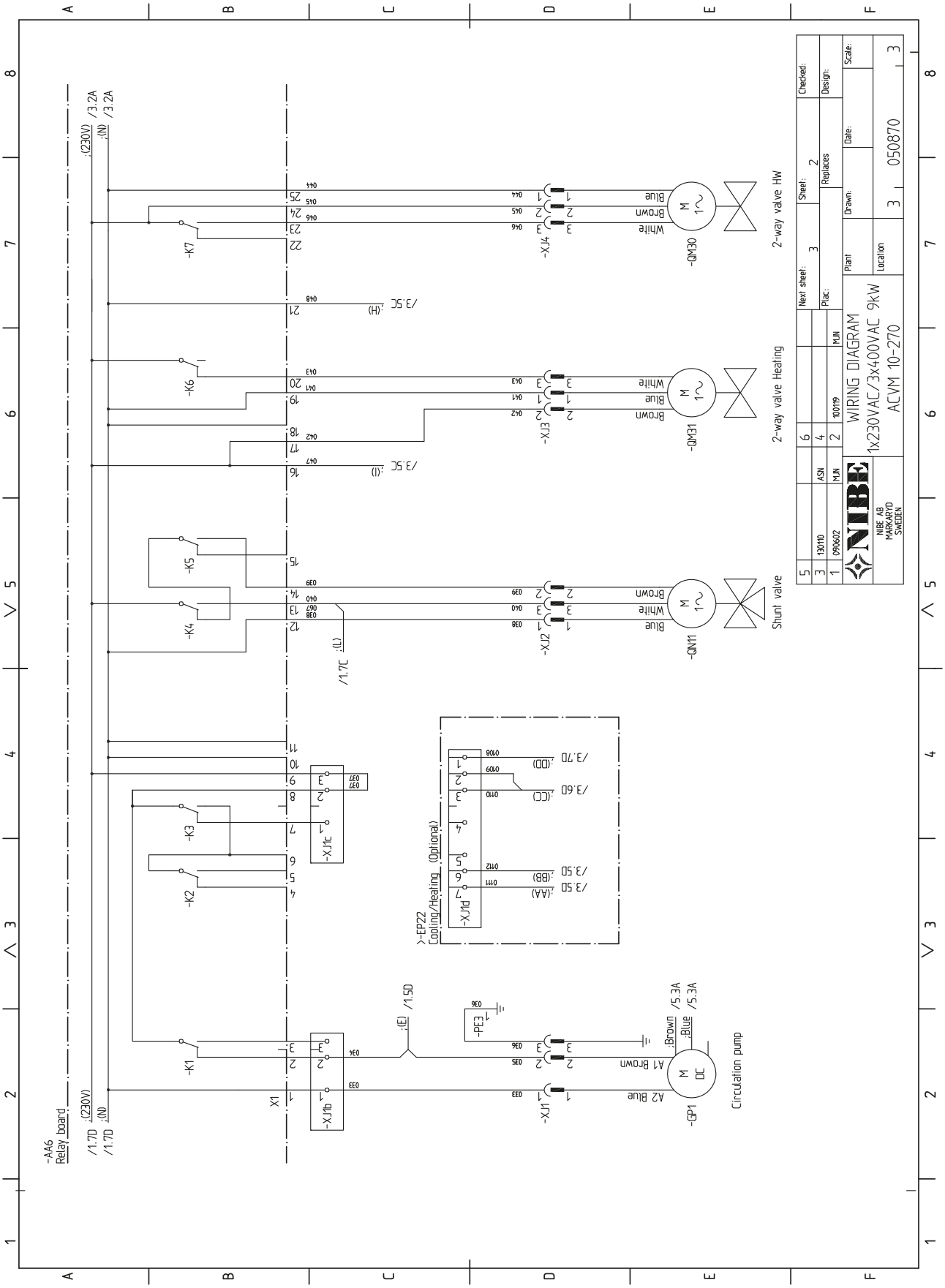
The following alarms set so that the system runs at minimum permitted supply temperature.

Alarm no.	Alarm text on the display	Description	May be due to
30	Sensor fault UG	Sensor fault, outdoor temperature (BT1).	- Open-circuit or short-circuit on sensor input - Sensor does not work (see "Temperature sensor" section)

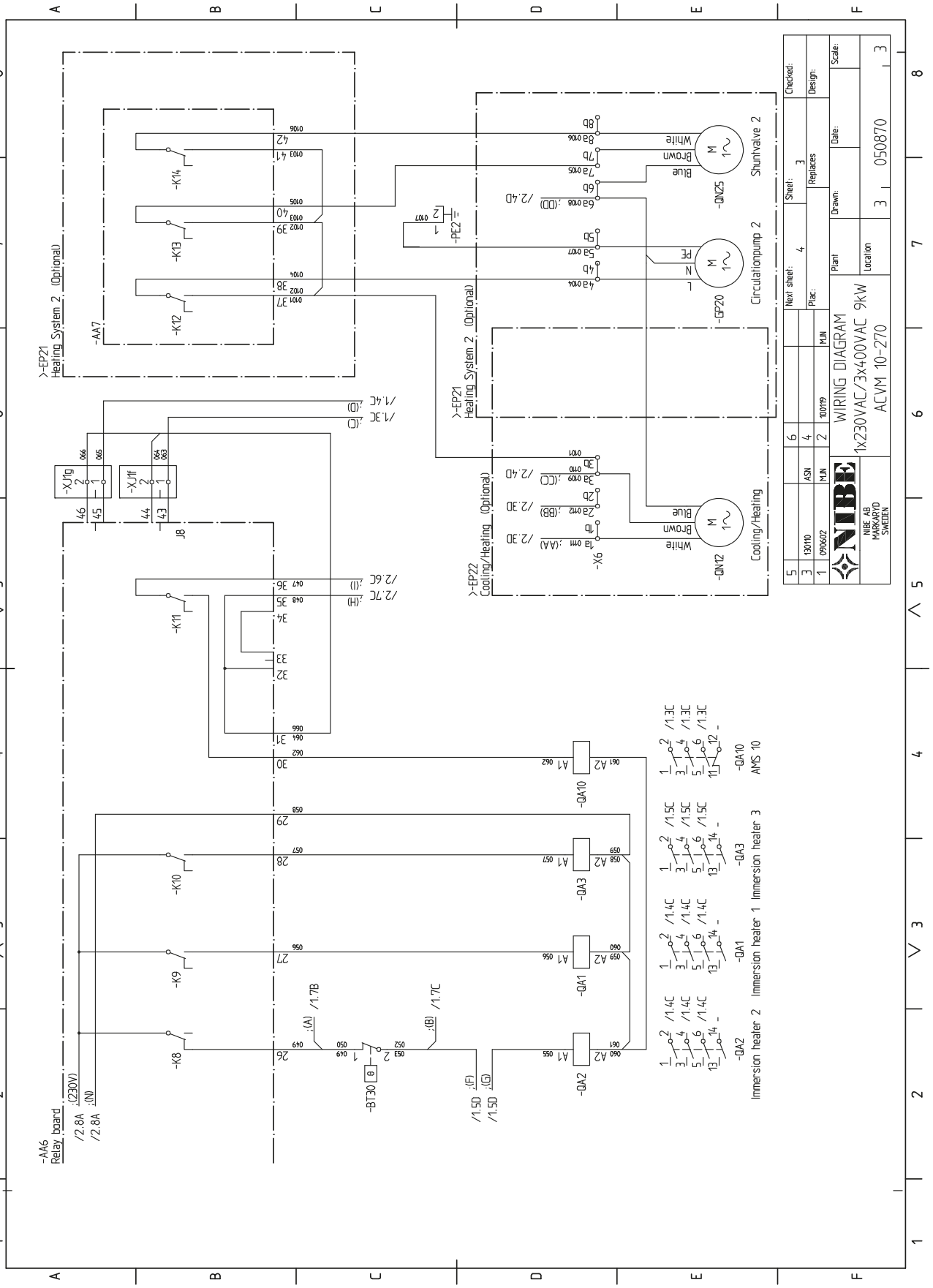
Electrical circuit diagram

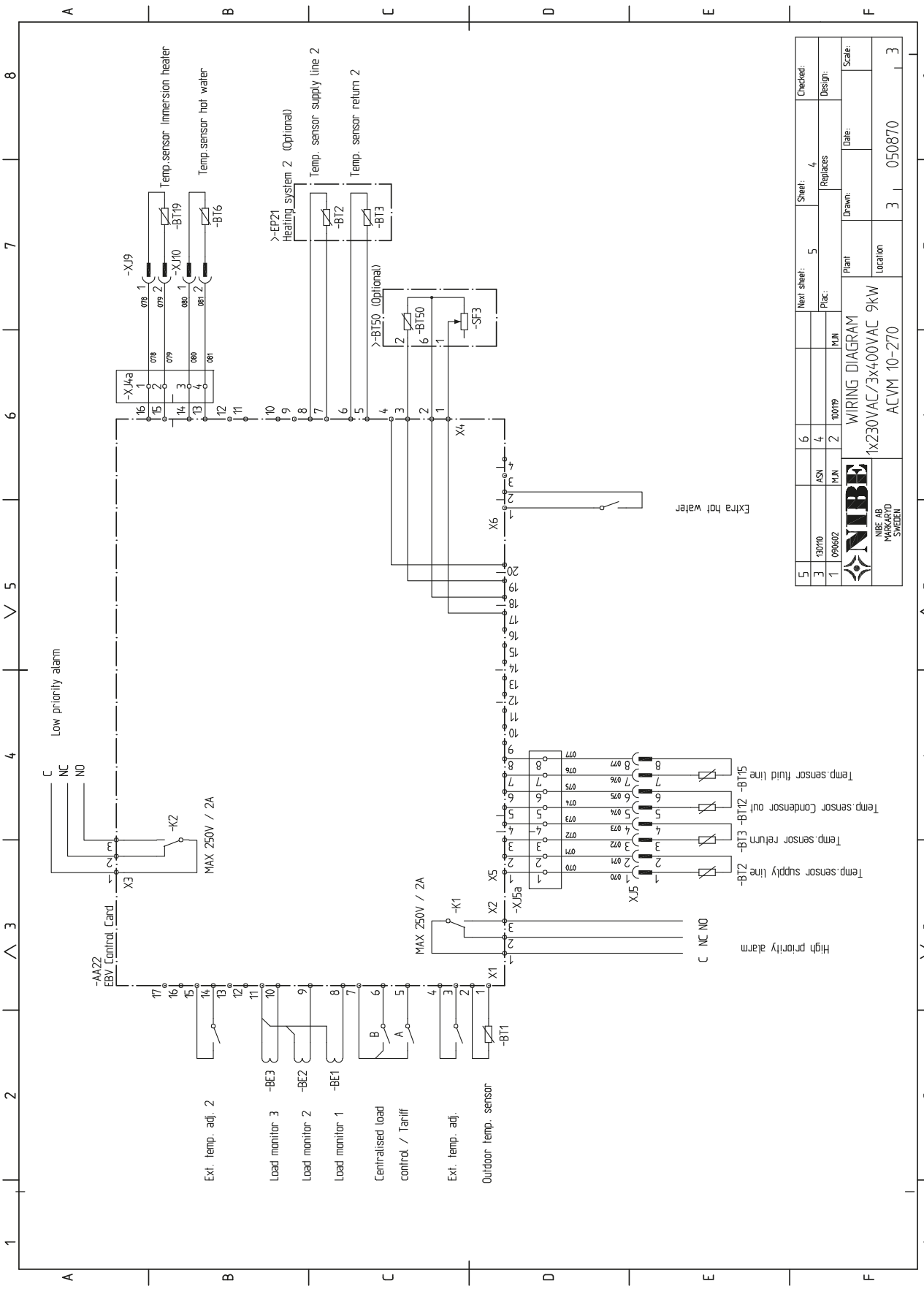
ACVM 270



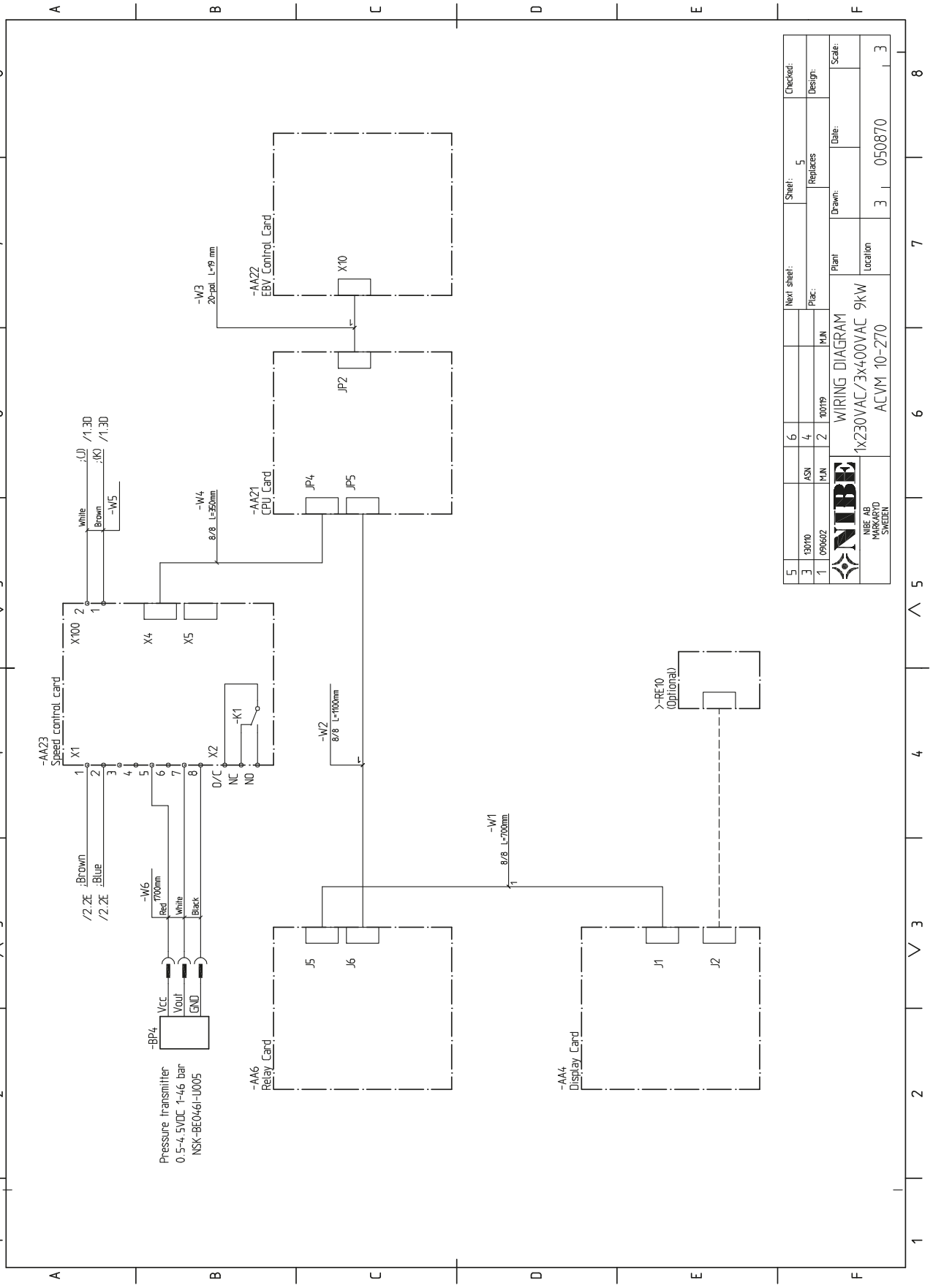

-AA6
Relay board
-K1
-K2
-K3
-K4
-K5
-K6
-K7
-XJ1C
-XJ1D
-XJ1A
-XJ1B
X1
-EP22
Cooling/Heating (Optional)
-XJ1Y
-PE3
-XJ4
-XJ3
-XJ2
-XJ1
-GM30
-GM31
-GM11
-GP1
2-way valve HW
2-way valve Heating
Shunt valve
Circulation pump
White
Blue
Brown
A1 Brown
A2 Blue
WIRING DIAGRAM
1x230VAC/3x400VAC 9kW
ACVM 10-270
NIBE AB
MARKARYD
SWEDEN
Location
Plant
Drawn:
Date:
Design:
Checked:
Scale:
Sheet:
Replaces
Next sheet:
Plac:
050870

Electrical circuit diagram



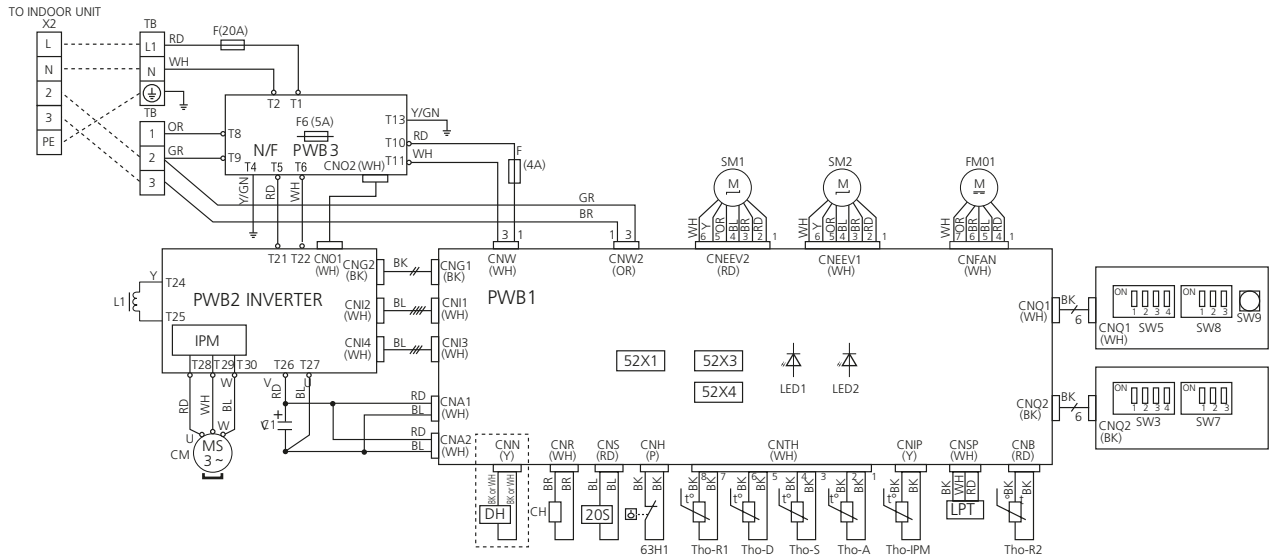

WIRING DIAGRAM
1x230VAC/3x400VAC 9kW
ACVM 10-270
NIBE AB
MARKARYD
SWEDEN
Temp.sensor Immersion heater
-BT19
Temp.sensor hot water
-BT6
Temp. sensor supply line 2
-BT2
Temp. sensor return 2
-BT3
-EP21
Heating system 2 (Optional)
-BT50 (Optional)
-SF3
Extra hot water
Low priority alarm
MAX 250V / 2A
-K2
-AA22
EBV Control Card
-K1
High priority alarm
Temp.sensor fluid line -BT15
Temp.sensor Condensor out -BT12
Temp.sensor return -BT3
Temp.sensor supply line -BT2
Ext. temp. adj. 2
Load monitor 3 -BE3
Load monitor 2 -BE2
Load monitor 1 -BE1
Centralised load control / Tariff
Ext. temp. adj.
Outdoor temp. sensor -BT1

Electrical circuit diagram



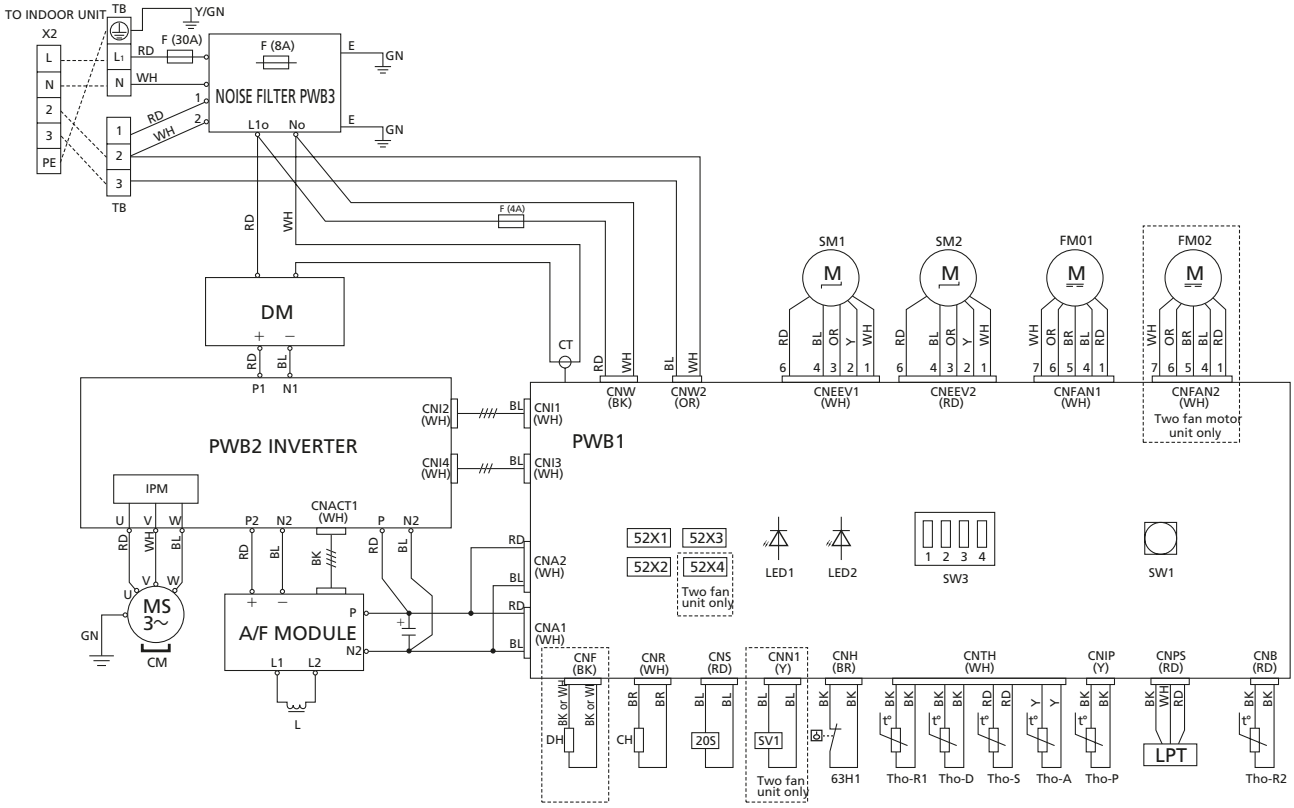
AMS 10-8

POWER SOURCE
230V 50Hz



AMS 10-12

POWER SOURCE 1 ~ 230V



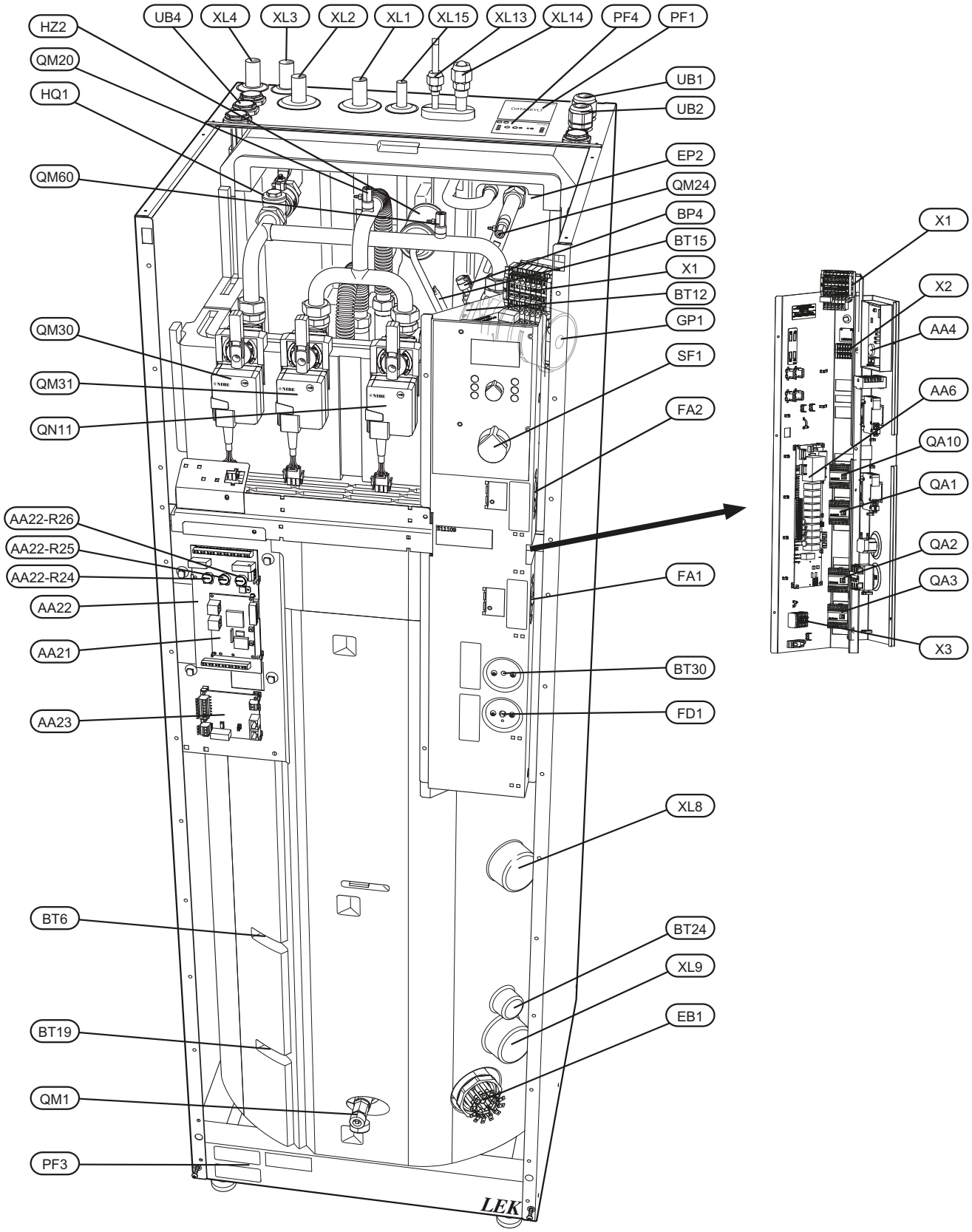
Electrical circuit diagram

Designation	Description
20S	Solenoid for 4-way valve
52X1	Auxiliary relay (for CH)
52X3	Auxiliary relay (for 20S)
52X4	Auxiliary relay (for DH)
63H1	High pressure pressostat
C1	Capacitor
CH	Compressor heater
CM	Compressor motor
CnA~Z	Terminal block
CT	Current sensor
DH	Drain pan heater
DM	Diode module
F	Fuse
FM01	Fan motor
IPM	Intelligent power module
L/L1	Induction coil
LED1	Indicator lamp (green for AMS 10-8, red for AMS 10-12)
LED2	Indicator lamp (red for AMS 10-8, green for AMS 10-12)
LPT	Low pressure transmitter
SM1	Expansion valve for cooling
SM2	Expansion valve for heating
SW1, 9	Pump down
SW3, 5, 7, 8	Local settings
TB	Terminal block
Tho-A	Temperature sensor, outdoor air
Tho-D	Temperature sensor, hot gas
Tho-IPM	Temperature sensor, IPM
Tho-R1	Temperature sensor, heat exchanger out
Tho-R2	Temperature sensor, heat exchanger, in
Tho-S	Temperature sensor, suction gas

Component positions

Indoor unit

Component image



List of components

Pipe connections

XL1 Climate system supply
XL2 Climate system return
XL3 Cold water
XL4 Hot water
XL8 Docking in
XL9 Docking out
XL13 Liquid line refrigerant
XL14 Gas line refrigerant
XL15 Connection safety valve, manometer

Valves etc.

EP2 Heat exchanger
GP1 Circulation pump, climate system
HQ1 Particle filter
HZ2 Drying filter
QM1 Valve, draining/filling climate system
QM20 Venting valve
QM24 Venting valve
QM60 Venting valve
QM30 Actuator, shuttle valve, hot water
QM31 Actuator shuttle valve, climate system
QN11 Actuator, mixing valve

Electrical components

X1 Terminal block, incoming mains supply
X2 Terminal block, outgoing supply and communication
X3 Terminal block, external addition
SF1 Switch
FA1 Miniature circuit breaker, control system
FA2 Miniature circuit breaker, outdoor unit
EB1 Immersion heater
AA4 Display unit
AA6 Relay card
AA21 CPU card
AA22 EBV card
- R24 Setting, fuse size
- R25 Setting, max power, electrical addition
- R26 Setting, max boiler temperature

AA23 Communication board
QA1 Contactor
QA2 Contactor
QA3 Contactor
QA10 Contactor

Sensor, thermostats

BP4 Pressure sensor, high pressure
BT6 Temperature sensor, HW charging
BT12 Temperature sensor, condenser out
BT15 Temperature sensor, fluid pipe
BT19 Temperature sensor, immersion heater
BT24 Temperature sensor, docking
BT30 Thermostat, standby mode
FD1 Temperature limiter

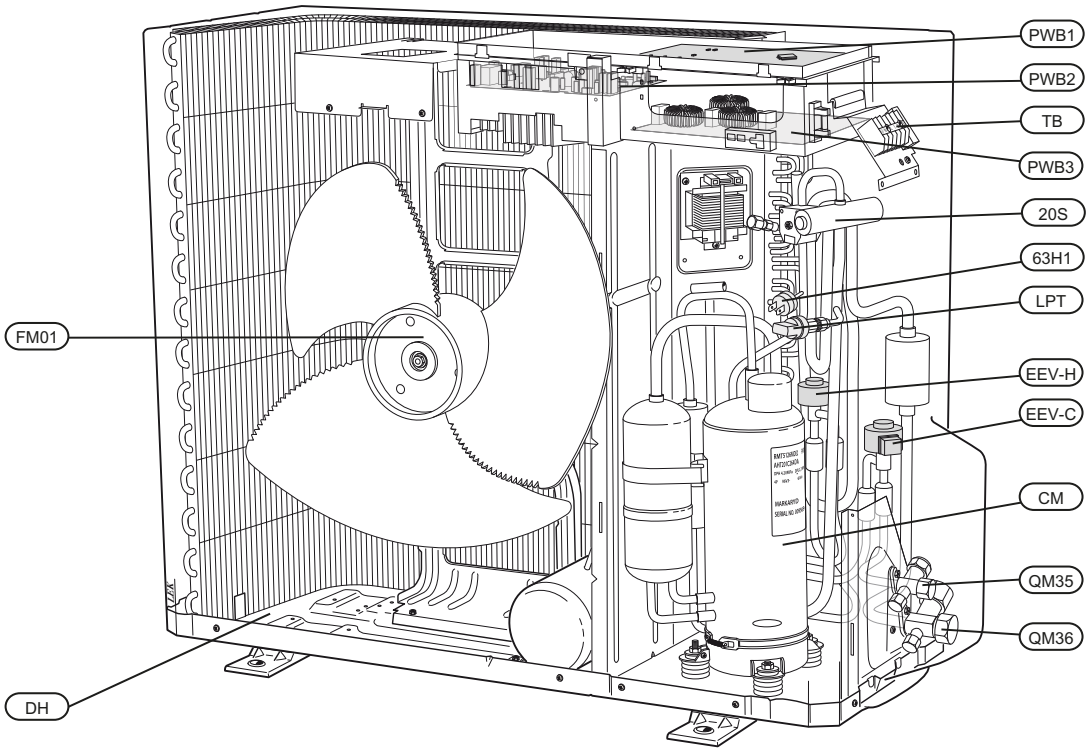
Miscellaneous

UB1 Cable gland
UB2 Cable gland
UB4 Cable gland
PF1 Rating plate
PF3 Serial number plate
PF4 Sign, pipe connections

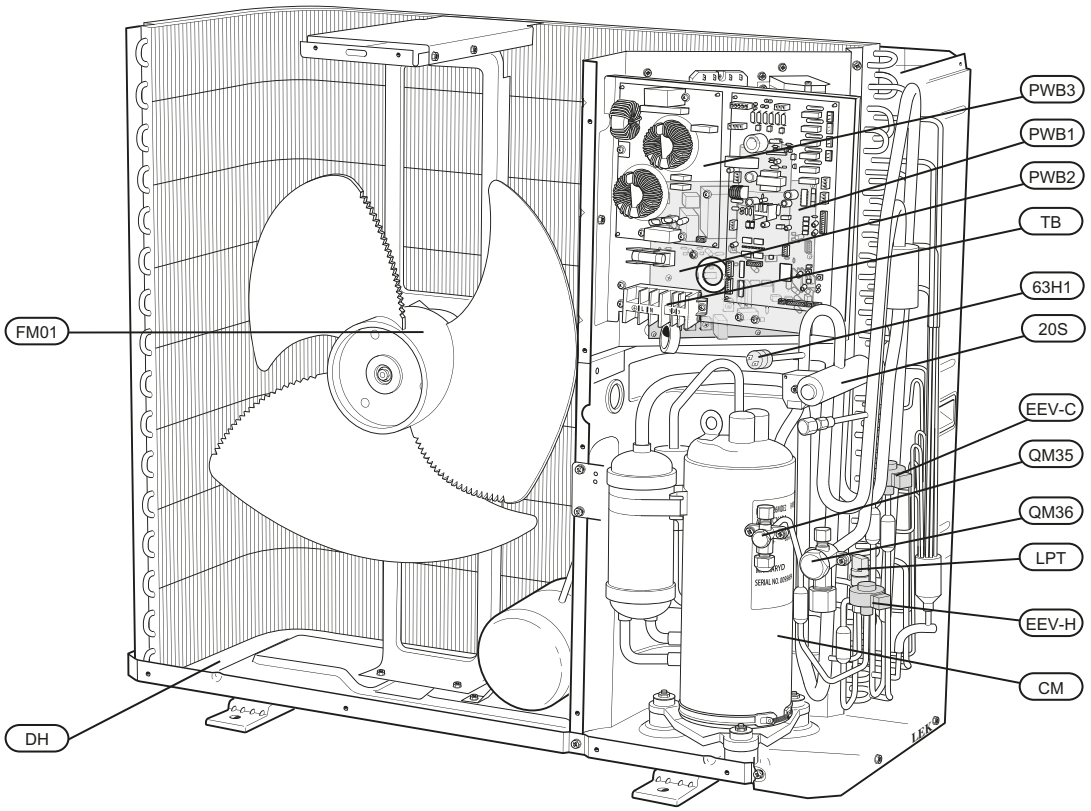
Component location according to IEC 62400.

Outdoor unit

Component image, AMS 10-8



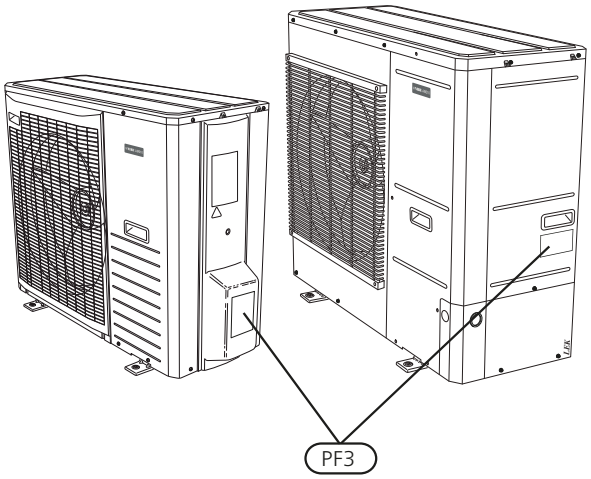
Component image, AMS 10-12



Component positions

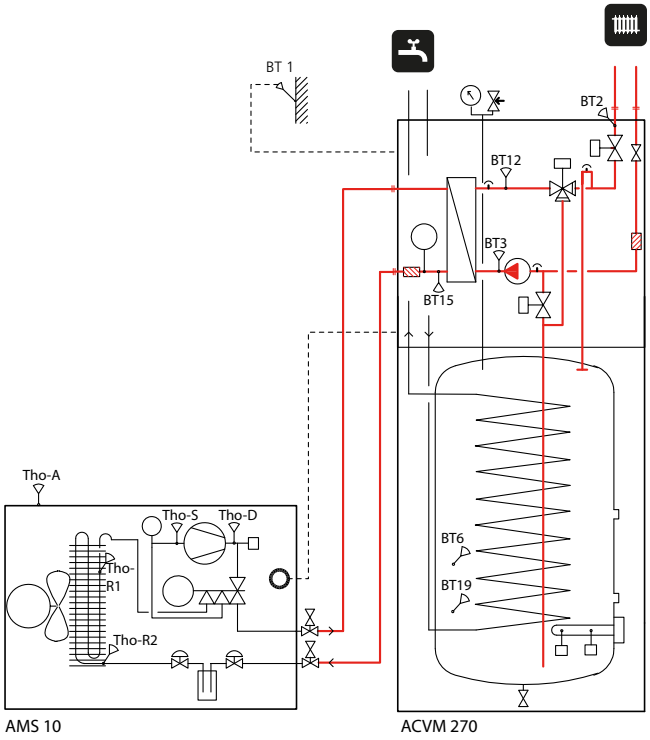
List of components

63H1	High pressure pressostat
LPT	Low pressure transmitter
FM01	Fan
20S	4-way valve
CM	Compressor
PWB1	Control board
PWB2	Inverter board
PWB3	Filter board
QM35	Service valve, liquid side
QM36	Service valve, gas side
EEV-H	Expansion valve, heating
EEV-C	Expansion valve, cooling
TB	Terminal block, incoming supply and communication
PF3	Serial number plate
DH	Drain pan heater



Temperature sensor

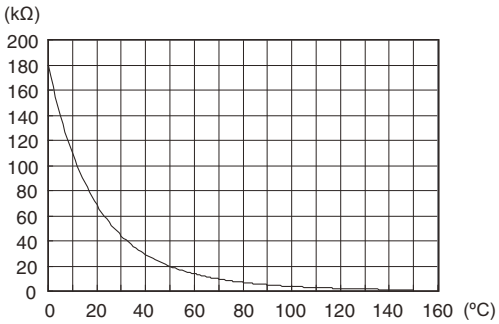
Sensor placement



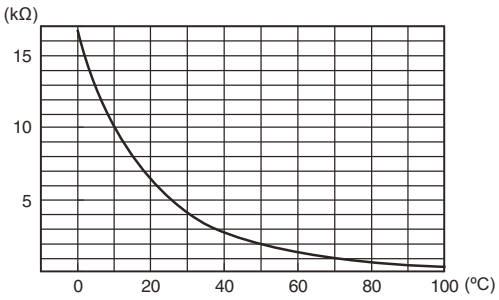
BT1	Temperature sensor, outdoor (external)
BT2	Temperature sensor, flow pipe
BT3	Temperature sensor, return
BT6	Temperature sensor, hot water
BT12	Temperature sensor, condenser out
BT15	Temperature sensor, fluid pipe
BT19	Temperature sensor, immersion heater
Tho-A	Temperature sensor, outdoor air
Tho-D	Temperature sensor, hot gas
Tho-R1	Temperature sensor, heat exchanger out
Tho-R2	Temperature sensor, heat exchanger, in
Tho-S	Temperature sensor, suction gas

Data for sensor in AMS 10

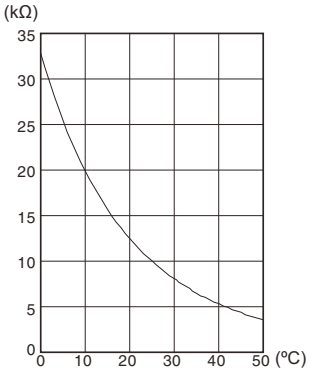
Tho-D



Tho-S, Tho-R1, Tho-R2



Tho-A

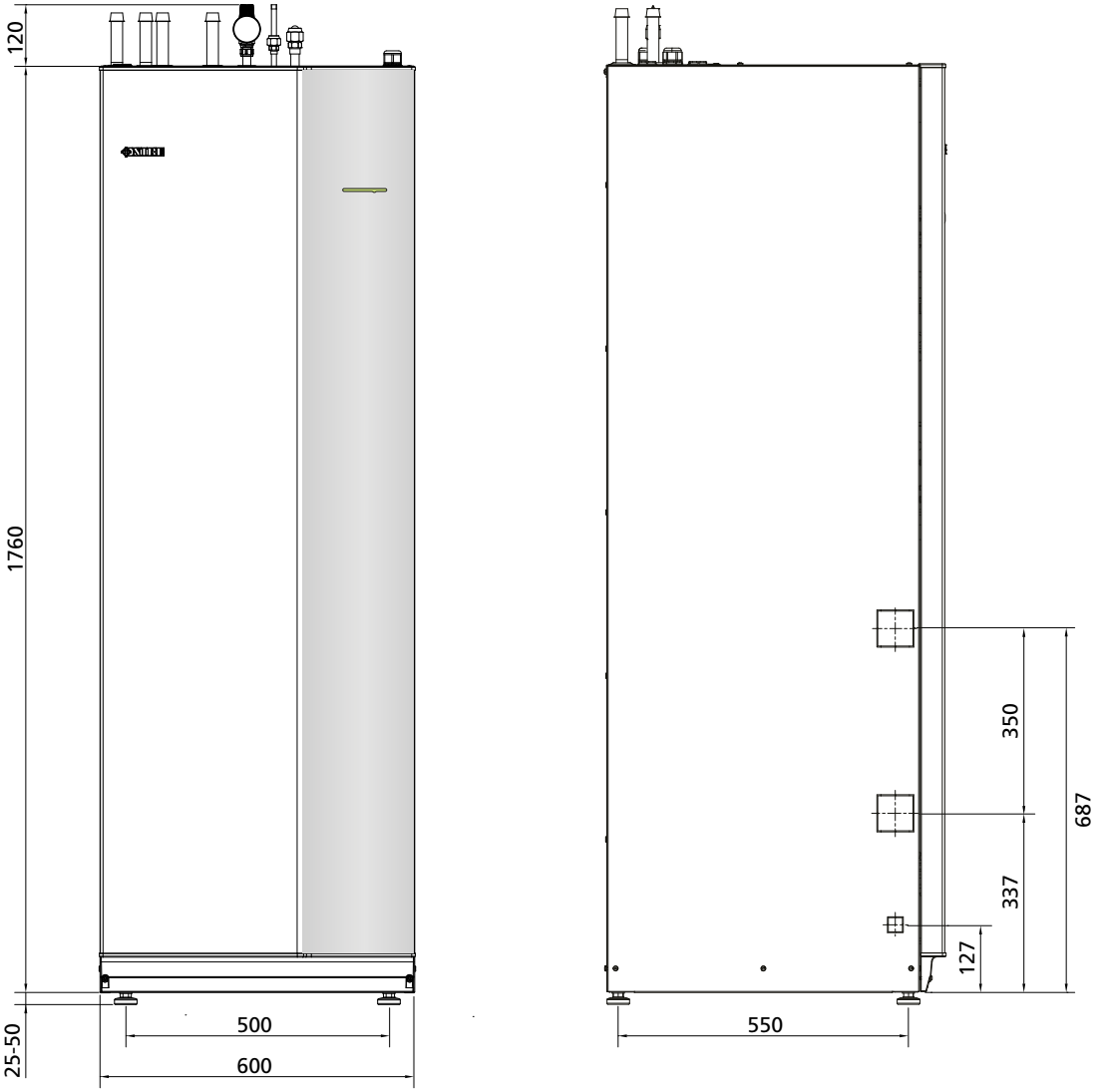


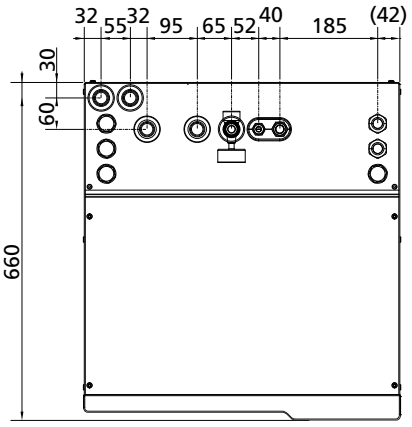
Data for sensor in ACVM 270

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
60	0.746	0.70
70	0.525	0.51

Dimensions

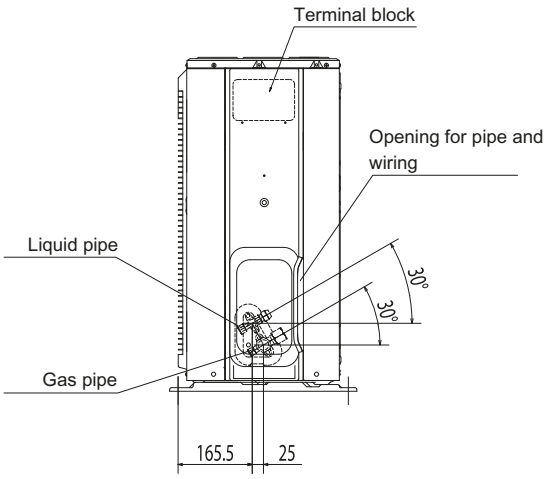
Indoor unit ACVM 270



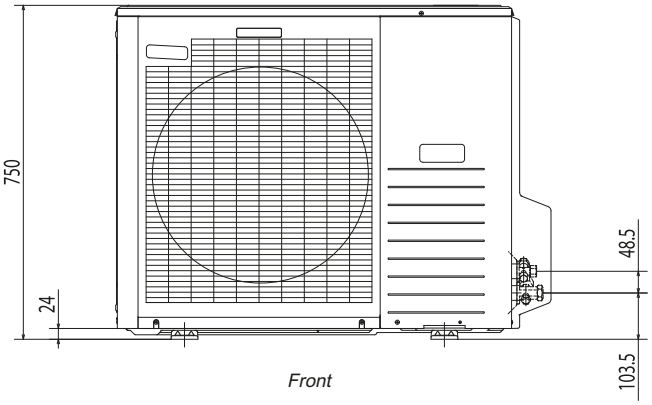


Outdoor unit

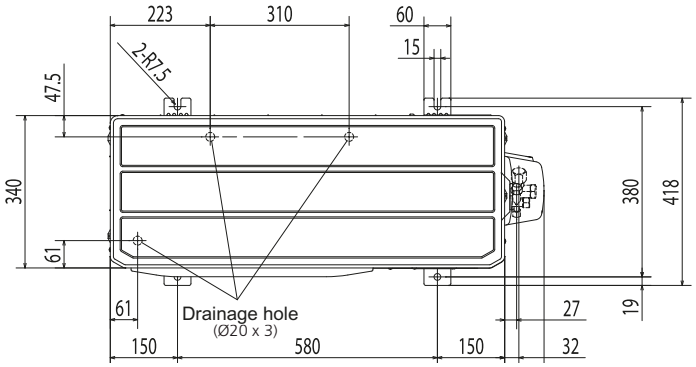
AMS 10-8



Right



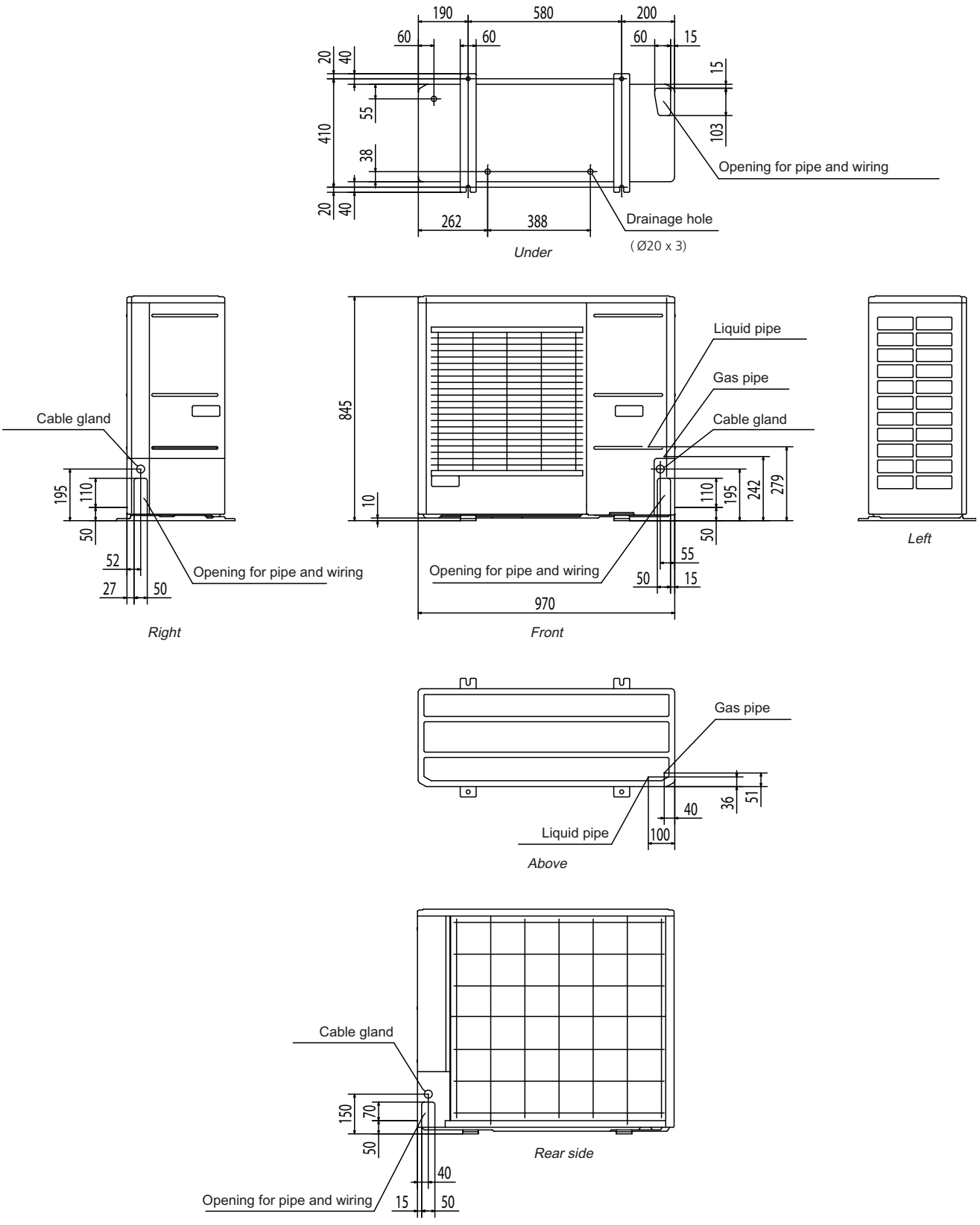
Front



Above

Dimensions

AMS 10-12



Technical specifications

Technical specifications

NIBE SPLIT	1 x 230 V	3 x 400 V
Working range during heating with compressor (ambient temperature)	-20 – +43 °C	
Working range during cooling (ambient temperature)	+15 – +43 °C	
Max temperature flow line	65 °C	
Max temperature flow line, only compressor	58 °C	
Max temperature return line	65 °C	
Min temperature flow line during heating with compressor and continuous operation	25 °C	
Min temperature flow line during cooling	7 °C	
Maximum temperature supply during cooling and continuous operation	25 °C	
Max. current	44 A	16 A
Recommended fuse rating	50 A	16 A
Starting current	5 A	5 A
Incoming supply, deviation	-15 – +10 %	
Dimensions, refrigerant pipe	Gas pipe: OD15.88 (5/8") Liquid pipe: OD9.52 (3/8")	
Pipe connections	Flare	

ACVM 270		
Immersion heater	Max 9 kW	
Possible electrical step	4 (2, 4, 6, 9 kW)	
Circulation pump, output	9–80 W (variable speed)	
Circulation pump, max available pressure	57 kPa (external)	
Circulation pump, max flow	0.54 l/s	
Circulation pump, flow at 20 kPa external pressure drop	0.45 l/s	
	AMS 10-8	**AMS 10-12**
Min/max system flow, heating operation	0.12 /0.38 l/s	0.15 /0.57 l/s
Min/max system flow, cooling operation	0.15 /0.38 l/s	0.20 /0.57 l/s
Min flow, climate system, at 100% circulation pump speed (defrost flow)	0.19 l/s	0.29 l/s
Emergency mode thermostat	35–45 °C (factory setting 35 °C)	
Temperature limiter	98 (-8) °C	
Safety valve, climate system	0.25 MPa (2.5 bar)	
Enclosure class	IP 21	
Volume, total	270 l ±5 %	
Volume, hot water coil	14 l	
Material, hot water coil	Stainless steel (AISI316L/AISI316 DIN 1.4404/1.4401)	
Max pressure, vessel	0.25 MPa (2.5 bar)	
Max pressure, hot water coil	1.0 MPa (10 bar)	
Max pressure, cooling system	4.5 MPa	
The water quality, domestic hot water and climate system	≤ EU directive no. 98/83/EF	
Max operating temperature, vessel	65 °C	
Ambient temperature, indoor module	5–35 °C, max relative humidity 95 %	
Connection, cold water, domestic hot water	Compression ring 22 mm	
Connection, climate system	Compression ring 22 mm	
Connection, docking	ISO 228/1 G1 internal	
Height	1760 mm (+25-50 mm, adjustable feet)	
Required ceiling height	2050 mm	

Technical specifications

ACVM 270	
Width	600 mm
Depth	660 mm
Weight	140 kg
Electrical connections	230 V 1AC 50 Hz or 400 V 3NAC 50 Hz
Part no.	069 040 / 069 041

AMS 10	8	12
Compressor	Twin Rotary	
Speed, heating	20–81 Hz (rps)	25–85 Hz (rps)
Speed, cooling	20–86 Hz (rps)	20-80 Hz (rps)
Max fan flow (heating, nominal)	3000 m^3/h	4380 m^3/h
Fan rating	86 W	
Defrosting	Reversing	
Drain pan heater	integrated 100 W	integrated 120 W
Breaking value high pressure	4.15 MPa (41.5 bar)	
Cut-out value low pressure (15 s)	0.079 MPa (0.79 bar)	
Height	750 mm	845 mm
Width	780 mm (+67 mm valve protection)	970 mm
Depth	340 mm (+ 110 mm with foot rail)	370 mm (+ 80 mm with foot rail)
Weight	60 kg	74 kg
Colour (two coats powder coating)	Dark gray	
Power and communication connection from indoor module	5 core 2.5 mm^2	
Refrigerant quantity (R410A)	2.55 kg	2.90 kg
Max. length, refrigerant pipe, one way	30 m*	
Pipe connection option	Right-hand side	Bottom / right-hand side / rear side
Part no.	064 033	064 034/064 110

*If the length of the refrigerant pipes exceeds 15 m extra refrigerant must be filled at 0.06 kg/m.

Performance, ACVM 270 and AMS 10-8

Heating	Outd. temp: / Supply temp.	Min	Nominal	Max
EN14511 **ΔT5K** Output/input/COP	7/35 °C (floor)	1.75/0.50/3.50	6.19/1.41/4.40	8.12/1.93/4.22
	2/35 °C (floor)	1.49/0.48/3.12	5.48/1.51/3.63	5.68/1.70/3.34
	-7/35 °C (floor)	1.04/0.45/2.31	4.04/1.45/2.79	5.17/1.84/2.81
	-15/35 °C (floor)	1.25/0.59/2.10	2.74/1.18/2.32	3.92/1.69/2.32
	7/45 °C	2.64/0.81/3.27	6.00/1.72/3.50	7.72/2.30/3.35
	2/45 °C	2.14/0.79/2.71	4.80/1.77/2.72	6.64/2.54/2.61
	-7/45 °C	1.46/0.75/1.95	3.74/1.64/2.28	5.17/2.35/2.20
	-15/45 °C	0.92/0.69/1.33	2.68/1.40/1.91	3.83/2.08/1.84
	7/55 °C	3.08/1.26/2.45	6.09/2.22/2.75	7.10/2.73/2.60
	-7/55 °C	1.88/1.14/1.65	3.33/2.00/1.66	4.25/2.44/1.74

Cooling	Outd. temp: / Supply temp.	Min	Nominal	Max
EN14511 ΔT5K Output/input/EER	27/7 °C	2.06/0.38/5.38	5.48/1.69/3.24	7.52/2.37/3.17
	27/18 °C	2.71/0.34/7.88	8.16/2.28/3.57	11.20/3.20/3.50
	35/7 °C	2.10/0.55/3.82	5.17/1.89/2.73	7.10/2.65/2.68
	35/18 °C	2.67/0.71/3.76	7.79/2.28/3.42	10.7/3.19/3.35

Performance, ACVM 270 and AMS 10-12

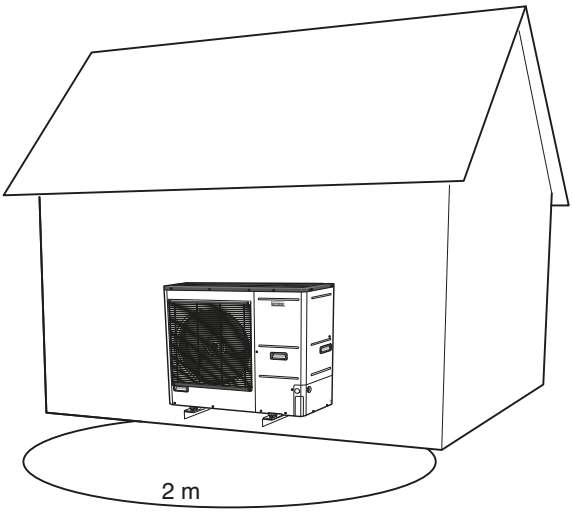
Heating	Outd. temp: / Supply temp.	Min	Nominal	Max
EN14511 ΔT5K Output/input/COP	7/35 °C (floor)	3.54/0.86/4.14	9.27/2.12/4.40	11.21/2.80/4.01
	2/35 °C (floor)	3.11/0.82/3.83	7.21/1.99/3.66	8.25/2.47/3.35
	-7/35 °C (floor)	3.29/1.07/3.09	6.24/2.07/3.05	7.46/2.58/2.90
	-15/35 °C (floor)	3.23/1.32/2.47	4.51/1.89/2.42	6.62/2.69/2.46
	7/45 °C	3.45/0.96/3.61	9.08/2.58/3.55	11.13/3.38/3.29
	2/45 °C	3.11/1.03/3.04	7.05/2.43/2.93	8.73/3.20/2.73
	-7/45 °C	3.14/1.40/2.25	5.84/2.42/2.44	7.22/3.26/2.21
	-15/45 °C	3.19/1.72/1.86	4.24/2.19/1.96	5.95/3.35/1.78
	7/55 °C	4.45/1.64/2.72	8.41/3.08/2.75	8.97/3.49/2.57
	-7/55 °C	3.50/1.99/1.77	4.93/2.80/1.78	5.64/3.52/1.60

Cooling	Outd. temp: / Supply temp.	Min	Nominal	Max
EN14511 ΔT5K Output/input/EER	27/7 °C	2.06/0.63/3.28	8.75/1.86/4.72	9.87/3.16/3.13
	27/18 °C	3.41/0.55/6.17	10.82/2.21/4.91	11.7/3.32/3.52
	35/7 °C	1.81/0.70/2.59	6.98/2.54/2.75	9.45/3.41/2.77
	35/18 °C	3.10/0.69/4.48	9.37/2.64/3.56	11.2/3.58/3.12

Sound pressure levels

AMS 10 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.

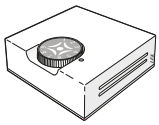
The sound pressure levels are further affected by walls, bricks, differences in ground level, etc and should therefore only be seen as guide values.



Noise, AMS 10-8		
Sound power level, according to EN12102 at 7/45°C (nominal)	L_W(A)	64
Sound pressure level at 2 m free standing (nominal)	dB(A)	50

Noise, AMS 10-12		
Sound power level, according to EN12102 at 7/45°C (nominal)	L_W(A)	64.5
Sound pressure level at 2 m free standing (nominal)	dB(A)	50.5

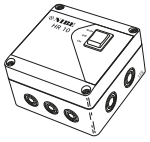
Accessories



RG 10

Room sensor.

Part no. 018 433



HR 10

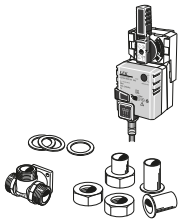
Auxiliary relay

Part no. 067 309

SRB 22

Relay box for solar power control

Part no. 067 109



VCC 22

Reversing valve, cooling.

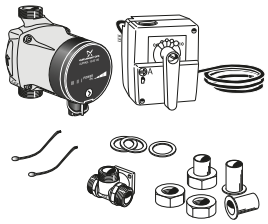
For separate cooling and heating systems.

Part no. 067 048

RE 10

Room unit

Part no. 067 004



ESV 22

Extra mixing valve group.

Part no. 067 291

UKV

Buffer vessel/operating tank in steel.

UKV 40:

Heating/cooling

Part no. 088 470

UKV 100:

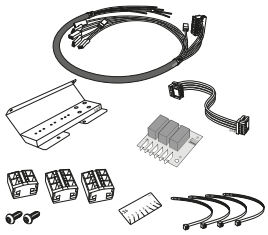
Heating/cooling

Part no. 088 207

UKV 102:

Cooling/heating

Part no. 080 310

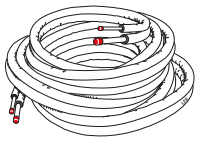


ACK 22

Cable kit if ESV 22 or VCC 22 is used.

Part no. 067 049

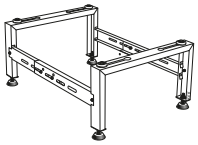
Accessories



Refrigerant pipe kit 12 m

Insulated

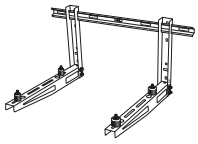
Part no. 067 032



Ground stand

For AMS 10

Part no. 067 033



Wall bracket

For AMS 10

Part no. 067 034

KVR 10

Condensation water pipe, different lengths.

KVR 10-10 ACVM, 1 m

Part no. 067 239

KVR 10-30 ACVM, 3 m

Part no. 067 241

KVR 10-60 ACVM, 6 m

Part no. 067 243

Safety precautions

Caution

The installation must be carried out by a qualified installer.
If you install the system yourself, serious problems may occur, for example water leaks, refrigerant leaks, electric shocks, fire and personal injury, as a result of a system malfunction.

Install the system in full accordance with this installation manual.
Incorrect installation can cause bursts, personal injury, water leaks, refrigerant leaks, electric shocks and fire.

Observe the measurement values before working on the cooling system, especially when installing in small rooms, so that the limit for the refrigerant's density is not exceeded.
Consult an expert to interpret the measurement values. If the refrigerant density exceeds the limit, lack of oxygen can occur in the event of any leak, which can cause serious accidents.

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Consult an expert to interpret the measurement values. If the refrigerant density exceeds the limit, lack of oxygen can occur in the event of any leak, which can cause serious accidents.

Use original accessories and the stated components for the installation.
If parts other than those stated by us are used, water leaks, electric shocks, fire and personal injury may occur as the unit may not work properly.

Ventilate the working area well – refrigerant leakage may occur during service work.
If the refrigerant comes into contact with naked flames, poisonous gas is created.

Ventilate the working area well – refrigerant leakage may occur during installation work.
If the refrigerant comes into contact with naked flames, poisonous gas is created.

Install the unit in a location with good support.
Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury. Installation without sufficient support can also cause vibrations and noise.

Ensure that the unit is stable when installed, so that it can withstand earthquakes and strong winds.
Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.

Ensure that no air enters the process circuit when the heat pump is installed or removed.
If air enters the process circuit, the pressure becomes too high, which can cause bursts and personal injury.

The electrical installation must be carried out by a qualified electrician and the system must be connected as a separate circuit.
Power supply with insufficient capacity and incorrect function can cause electric shocks and fire.

Use the stated cables for the electrical connection, tighten the cables securely in the terminal blocks and relieve the wiring correctly to prevent overloading the terminal blocks.
Loose connections or cable mountings can cause abnormal heat production or fire.

Arrange the wiring in the control box so that it cannot be pushed up further into the box by mistake. Install the service panel's cover correctly.
Incorrect installation can result in overheating and fire.

Check, after completed installation or service, that no refrigerant leaks from the system in gas form.
If refrigerant gas leaks into the house and comes into contact with an aerotemp, an oven or other hot surface, poisonous gases are produced.

Check, after completed installation, that no refrigerant leaks from the system in gas form.
If refrigerant gas leaks into the house and comes into contact with an aerotemp, an oven or other hot surface, poisonous gases are produced.

For R410A use the stated pipe type and cap nuts and for R410A use the stated tool.
Using existing parts (for R22) can cause breakdowns and serious accidents due to process circuit bursts.

Tighten the cap nut as stated using a torque wrench.
Tighten to the correct torque. Overtightening of the cap nut can lead to breaks and refrigerant leaks.

Connect the cooling circuit pipe and complete the pipe installation before running the compressor.
If the compressor is run when the service valve is not open and the pipe is not connected, the system may burst causing personal injury, due to abnormally high pressure in the system.

Switch off the compressor before disconnecting the pipe from the pump.
If the pipe is disconnected whilst the compressor is running and the service valve is open, air is mixed into the process circuit. This causes unusually high pressure in the process circuit, which can cause bursts and personal injury.

Only use original accessories. The installation must be carried out by a qualified installer.
If you install the system yourself, water leaks, electric shock and fire can occur.

Do not perform any repairs yourself. Consult the dealer if the system requires repair.
Incorrectly performed repairs can cause water leakage, refrigerant leakage, electric shocks or fire.

Consult the dealer or an expert regarding removal of the heat pump.
Incorrect installation can cause water leakage, refrigerant leaks, electric shocks or fire.

Switch off the power supply in the event of a service or inspection.
If the power supply is not shut off, there is a risk of electric shocks and damage due to the rotating fan.

Do not run the unit with removed panels or protection.
Touching rotating equipment, hot surfaces or high voltage parts can cause personal injury due to entrapment, burns or electric shocks.

Cut the power before starting electrical work.
Failure to cut the power can cause electric shocks, damage and incorrect function of the equipment.

Care

Carry out the electrical installation with care.
Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting.

Use main switch with sufficient breaking capacity.
If the switch does not have sufficient breaking capacity, malfunctions and fire can occur.

Always use a fuse with the correct rating in the locations where fuses are to be used.
Connecting the unit with copper wire or other metal thread can cause unit breakdown and fire.

Cables must be routed so that they are not damaged by metal edges or trapped by panels.
Incorrect installation can cause electric shocks, heat generation and fire.

Do not install the indoor unit in close proximity to locations where leakage of combustible gases can occur.
If leaking gases collect around the unit, fire may occur.

Do not install the unit where corrosive gas (for example nitrous fumes) or combustible gas or steam (for example thinner and petroleum gases) can build up or collect, or where volatile combustible substances are handled.
Corrosive gas can cause corrosion to the heat exchanger, breaks in plastic parts etc. and combustible gas or steam can cause fire.

Do not use the indoor section where water splashes may occur, for example in laundries.
The indoor section is not waterproof and electric shocks and fire can therefore occur.

Do not use the indoor section for storing food, cooling precision instruments, freeze-conservation of animals, plants or art.
This can damage the items.

Do not install and use the system close to equipment that generates electromagnetic fields or high frequency harmonics.

Equipment such as inverters, standby sets, medical high frequency equipment and telecommunications equipment can affect the air conditioning unit and cause malfunctions and breakdowns. The air conditioning unit can also affect medical equipment and telecommunications equipment, so that it functions incorrectly or not at all.

Do not install the outdoor unit in the locations stated below.
- Locations where leakage of combustible gas can occur.
- Locations where carbon fibre, metal powder or other powder that can enter the air.
- Locations where substances that can affect the air conditioning unit, for example, sulphide gas, chlorine, acid or alkaline substances can occur.
- Locations with direct exposure to oil mist or steam.
- Vehicles and ships.
- Locations where machines that generate high frequency harmonics are used.
- Locations where cosmetic or special sprays are often used.
- Locations that can be subjected to direct salty atmospheres. In this case, the outdoor unit must be protected against direct intakes of salty air.
- Locations where large amounts of snow occur.
- Locations where the system is exposed to chimney smoke.

If the bottom frame of the outdoor section is corroded, or in any other way damaged, due to long periods of operation, it must not be used.
Using an old and damaged frame can cause the unit to fall and cause personal injury.

If soldering near the unit, ensure that solder residue does not damage the drip tray.
If solder residue enters the unit during soldering, small holes can appear in the tray resulting in water leakage. To prevent damage, keep the indoor unit in its packing or cover it.

Do not allow the drainage pipe to exit into channels where poisonous gases, containing sulphides for example, can occur.
If the pipe exits into such a channel, any poisonous gases will flow into the room and seriously affect the user's health and safety.

Insulate the cooler unit's connection pipes so that the ambient air moisture does not condense on them.
Insufficient insulation can cause condensation, which can lead to moisture damage on the roof, floor, furniture and valuable personal property.

Do not install the outdoor unit in a location where insects and small animals can inhabit.
Insects and small animals can enter the electronic parts and cause damage and fire. Instruct the user to keep the surrounding equipment clean.

Take care when carrying the unit by hand.
If the unit weights more than 20 kg, it must be carried by two people. Do not carry by the plastic strap, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts from the aluminium flanges.

Dispose of any packaging material correctly.
Any remaining packaging material can cause personal injury as it contains nails and wood.

Do not touch any buttons with wet hands.
This can cause electric shocks.

Do not touch any refrigerant pipes with your hands when the system is in operation.
During operation the pipes become extremely hot or extremely cold, depending on the method of operation. This can cause burn injuries or frost injuries.

Do not shut off the power supply immediately after operation has start.
Wait at least 5 minutes, otherwise there is a risk of water leakage or breakdown.

Do not control the system with the main switch.
This can cause fire or water leakage. In addition, the fan can start unexpectedly, which can cause personal injury.

Especially for units intended for R410A

- Only use R410A refrigerant. R410A means that the pressure is about 1.6 times as high as conventional refrigerants.

- The service valve's filling connection and control output on the indoor unit in the system for R410A are different sizes, to prevent the system being filled with the incorrect refrigerant by mistake. The machined dimension on the refrigerant pipe's collared part as well as the cap nut's parallel side dimension has been changed to increase the system's overpressure durability.

- Therefore, installers and service technicians must ensure that only tools approved for working with R410A are used.

- Do not use charging bottles. These types of bottles change the composition of the refrigerant, which makes the performance of the system worse.

- When filling refrigerant, the refrigerant must always leave the bottle in liquid form.

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