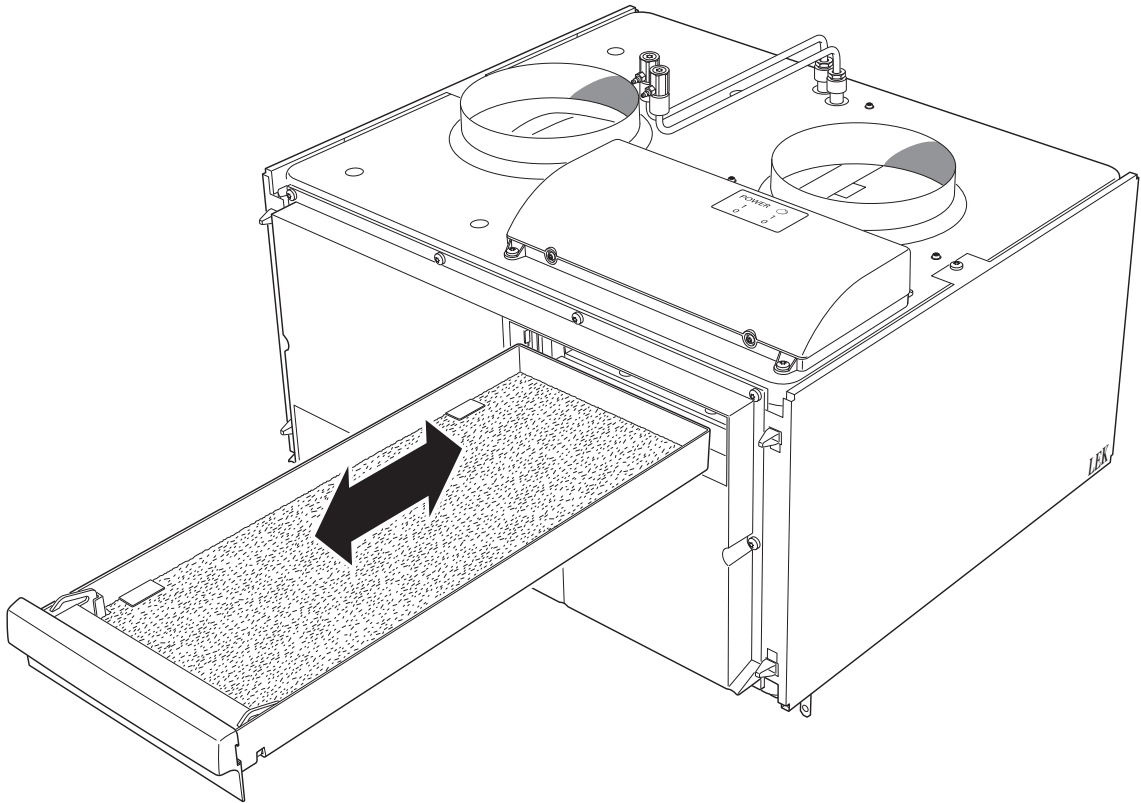
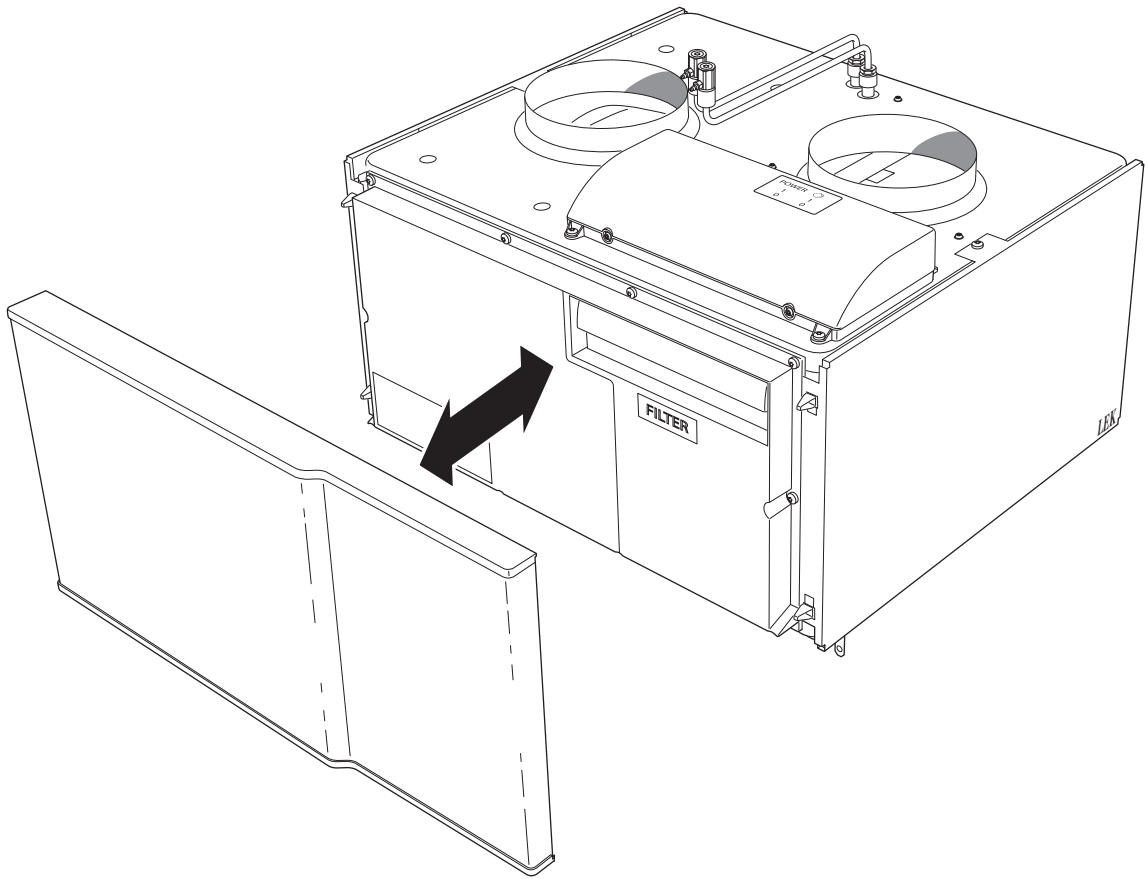


Installer manual  
**SAM 40**  
Supply air module



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# 1 Important information

## Safety information

This manual describes installation and service procedures for implementation by specialists.

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

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

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## Symbols



### NOTE

This symbol indicates danger to machine or person.



### Caution

This symbol indicates important information about what you should observe when maintaining your installation.



### TIP

This symbol indicates tips on how to facilitate using the product.

## Marking

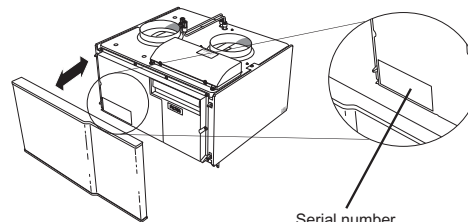
SAM 40 is CE marked and fulfils IP21.

The CE marking means that NIBE ensures that the product meets all regulations that are placed on it based on relevant EU directives. The CE mark is obligatory for most products sold in the EU, regardless where they are made.

IP21 means that the product can be touched by hand, that objects with a diameter larger than or equivalent to 12.5 mm cannot penetrate and cause damage and that the product is protected against vertically falling drops.

## Serial number

The serial number can be found at the bottom left inside the front cover.



### Caution

Always give the product's serial number (14 digits) when reporting a fault.

## Country specific information

### Installer manual

This installer manual must be left with the customer.



### NOTE

At cold outdoor temperatures and when the exhaust air fan in F750 is running the accessory SAM 40 must not be deactivated or switched off using the mains plug. This creates a risk of SAM 40 freezing.

## Inspection of the installation

Current regulations require the supply air module must be inspected before it is put into service. The inspection must be carried out by a suitably qualified person.

✓	Description	Notes	Signature	Date
	Ventilation (page 14)			
	Setting ventilation flow exhaust air			
	Setting ventilation flow supply air			
	Heating medium (page 11)			
	System flushed			
	Accessories bled			
	Check against output and pressure drop diagrams			
	Connected according to outline diagram			
	Electricity (page 15)			
	Supply connected 230 V			
	Connected communication			

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For countries not mention in this list, please contact Nibe Sweden or check [www.nibe.eu](http://www.nibe.eu) for more information.

## 2 Delivery and handling

### Transport

The supply air module must be transported and stored dry.

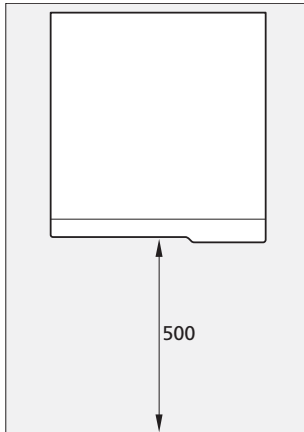
### Assembly

SAM 40 is mounted free standing on brackets, alternatively above a VPB 200 (For VPB 300/VPBS 300 installation is with the help of brackets). Noise from the fan can be transferred to the brackets.

- Install the brackets to an outside wall, ideally in a room where noise does not matter, in order to eliminate noise problems. If this is not possible, avoid placing it against a wall behind a bedroom or other room where noise may be a problem.
- Wherever the unit is located, walls to sound sensitive rooms should be fitted with sound insulation.
- Route pipes so they are not fixed to an internal wall that backs on to a bedroom or living room.

### Installation area

Leave a space of 500 mm in front of the supply air module. All service on SAM 40 can be carried out from the front.



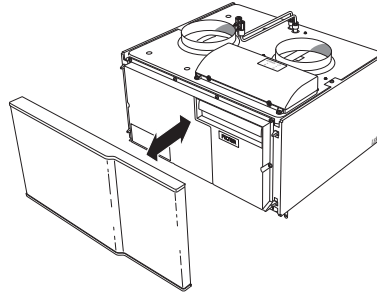
#### NOTE

Ensure that there is sufficient space (300 mm) above the supply air module for installing ventilation hoses.

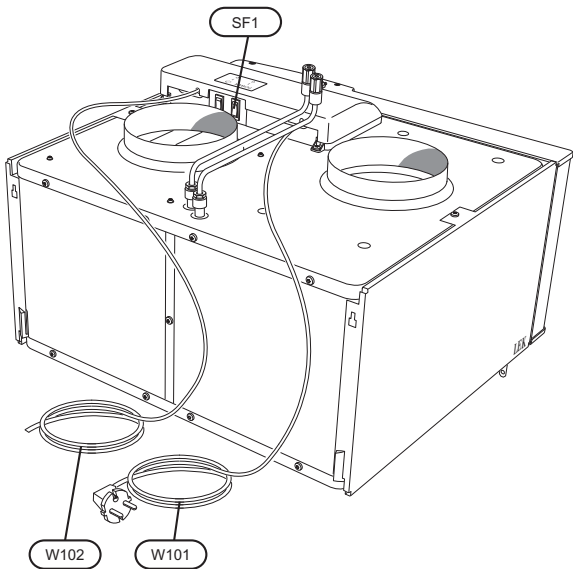
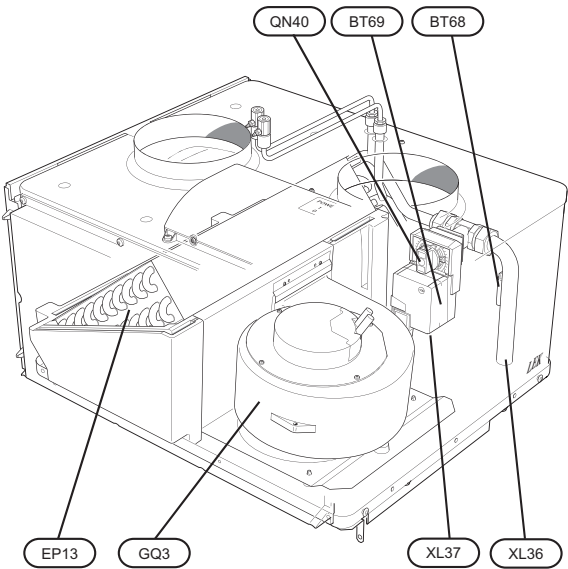
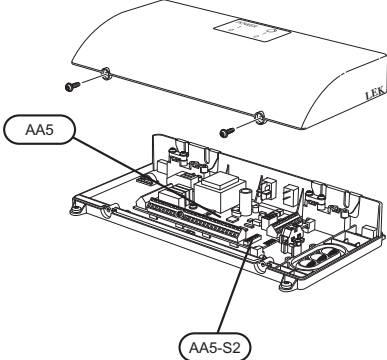
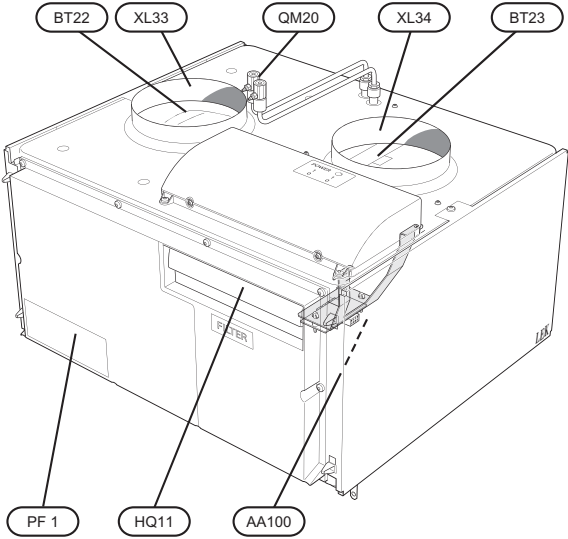
### Removing the covers

#### Front cover

1. Remove the service cover by pulling it straight out.



# 3 The design of the supply air module





## Supply air module

AZ2 SAM 40

### Pipe connections

XL33 Ventilation connection supply air, Ø 160 mm  
XL34 Ventilation connection outdoor air, Ø 160 mm  
XL36 Connection, heating medium in, compression ring Ø 22 mm  
XL37 Connection, heating medium out, compression ring Ø 22 mm\*

### HVAC components

EP13 Supply air battery  
QM20 Venting heating medium  
QN40 Control valve heating medium

### Sensors etc.

BT22 Temperature sensor, supply air  
BT23 Temperature sensor, outdoor air  
BT68 Temperature sensor, flow  
BT69 Temperature sensor, return\*

## Electrical components

AA5 Accessory card  
AA5-S2 Dip switch  
AA100 Joint card  
SF1 Switch, position 0 - 1, main switch  
W101 Cord with connection plug  
W102 Control cable

### Ventilation

GQ3 Supply air fan  
HQ11 Air filter supply air

### Miscellaneous

PF1 Rating plate

\* Not visible in the image

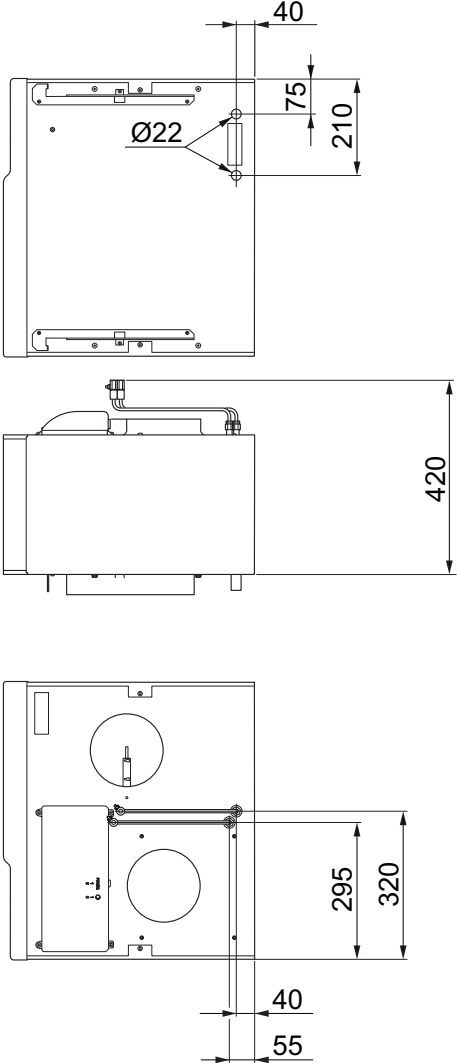
Designations in component locations according to standard IEC 81346-1 and 81346-2.

# 4 Pipe and ventilation connections











## General pipe connections

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

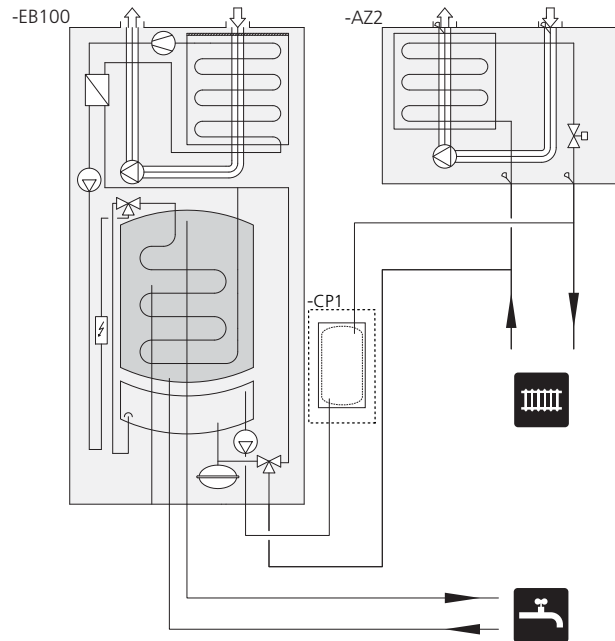
## Dimensions and pipe connections



## Symbol key

Symbol	Meaning
	Venting valve
	Control valve
	Shunt / shuttle valve
	Trim valve
	Temperature sensor
	Expansion vessel
	Circulation pump
	Fan
	Compressor
	Heat exchanger

## Outline diagram



### Caution

If the total volume of the climate system (excluding the heat pump volume) falls below 40 litres, extra system volume is connected, for example volume vessel UKV (CP1), according to outline diagram above.

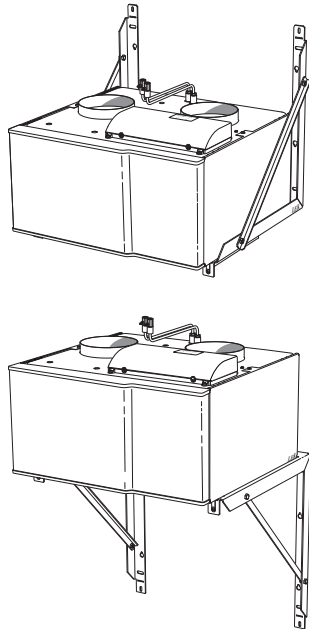


### NOTE

If several climate systems (ECS 40/ECS 41) are present, SAM 40 must be connected in parallel with climate system 1.

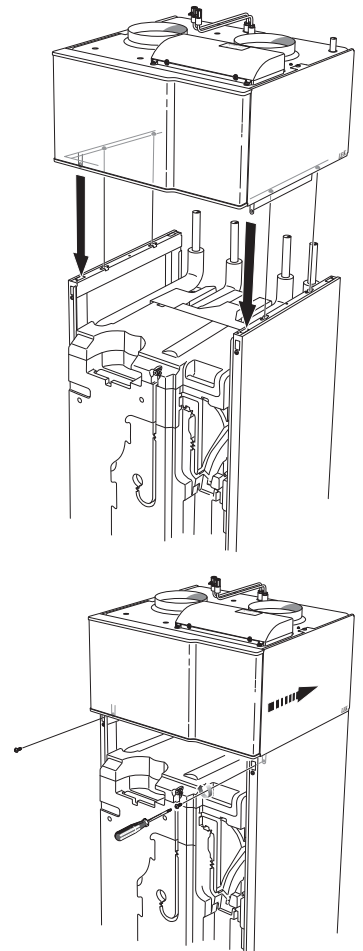
### Installing on brackets

1. Install SAM 40 on brackets.
2. Connect heating medium and ventilation pipes.



### Connecting to VPB 200

1. Remove the service cover from VPB 200.
2. Remove the top panel on VPB 200 (installed with 6 screws).
3. Install SAM 40 from the top and slide into position.
4. Secure SAM 40 with the 2 supplied screws.
5. Connect heating medium and ventilation pipes.
6. Reinstall the service cover for VPB 200.



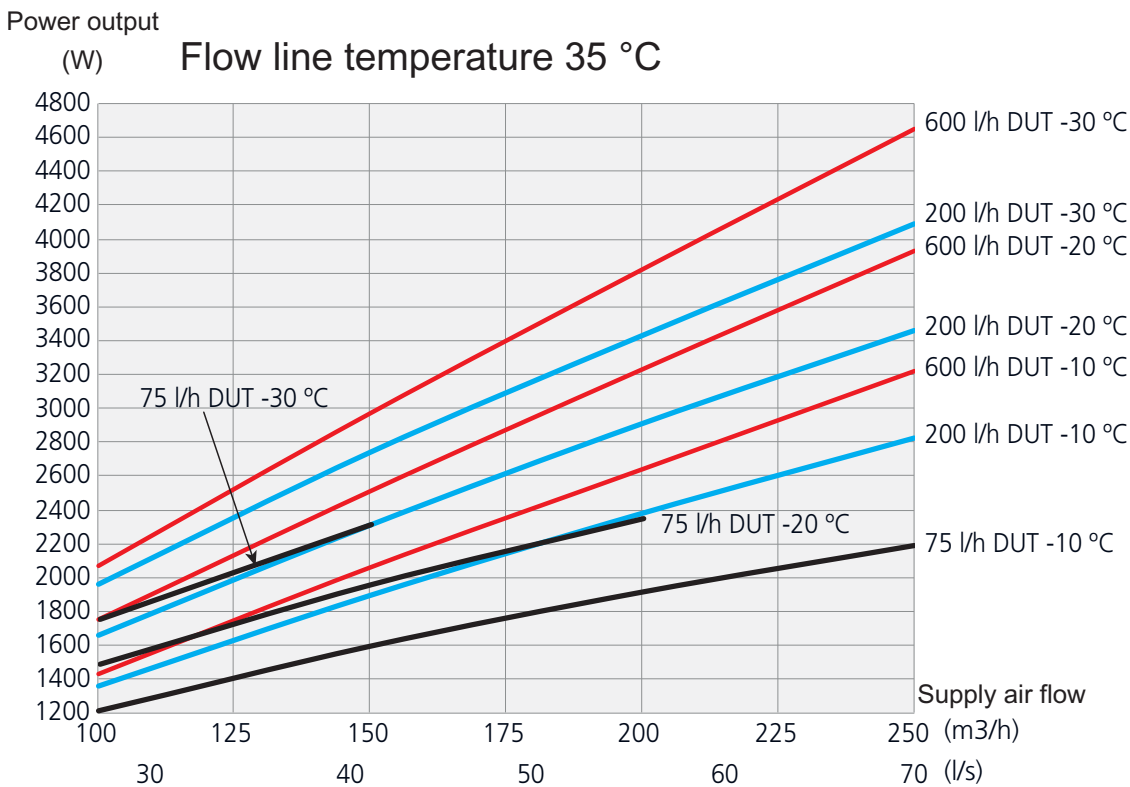
## Heating medium side

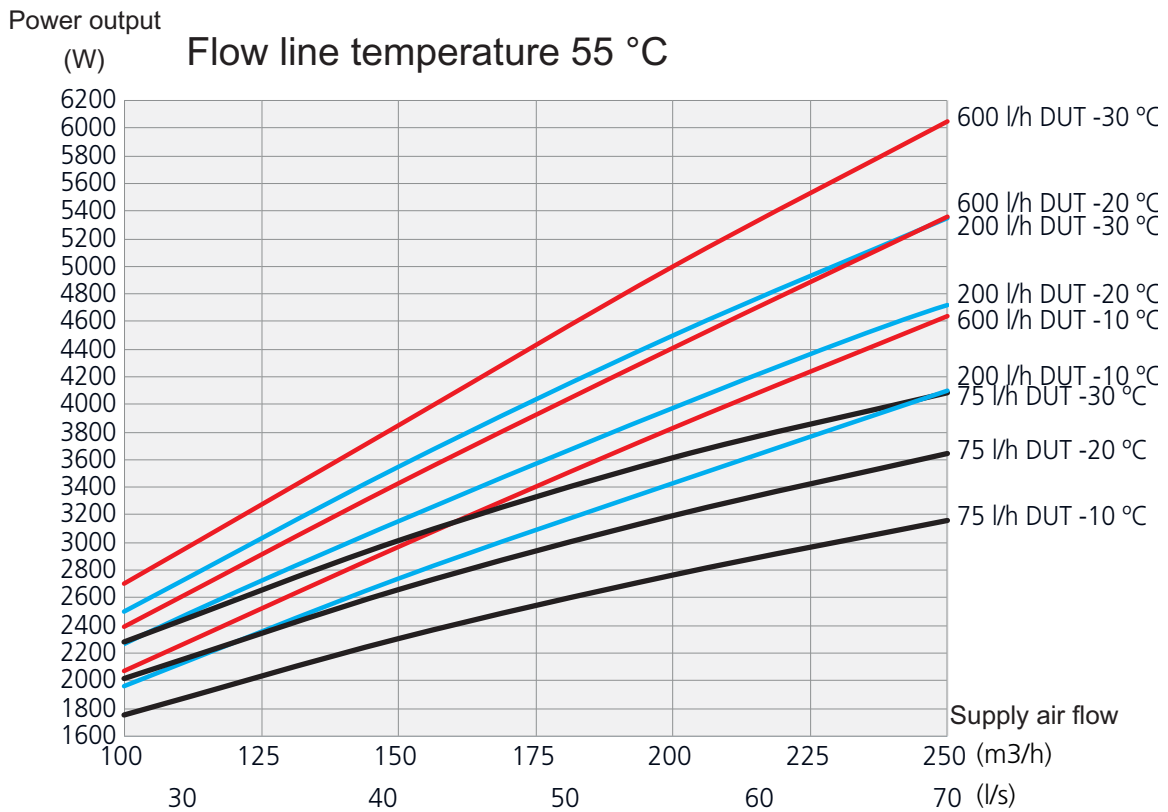
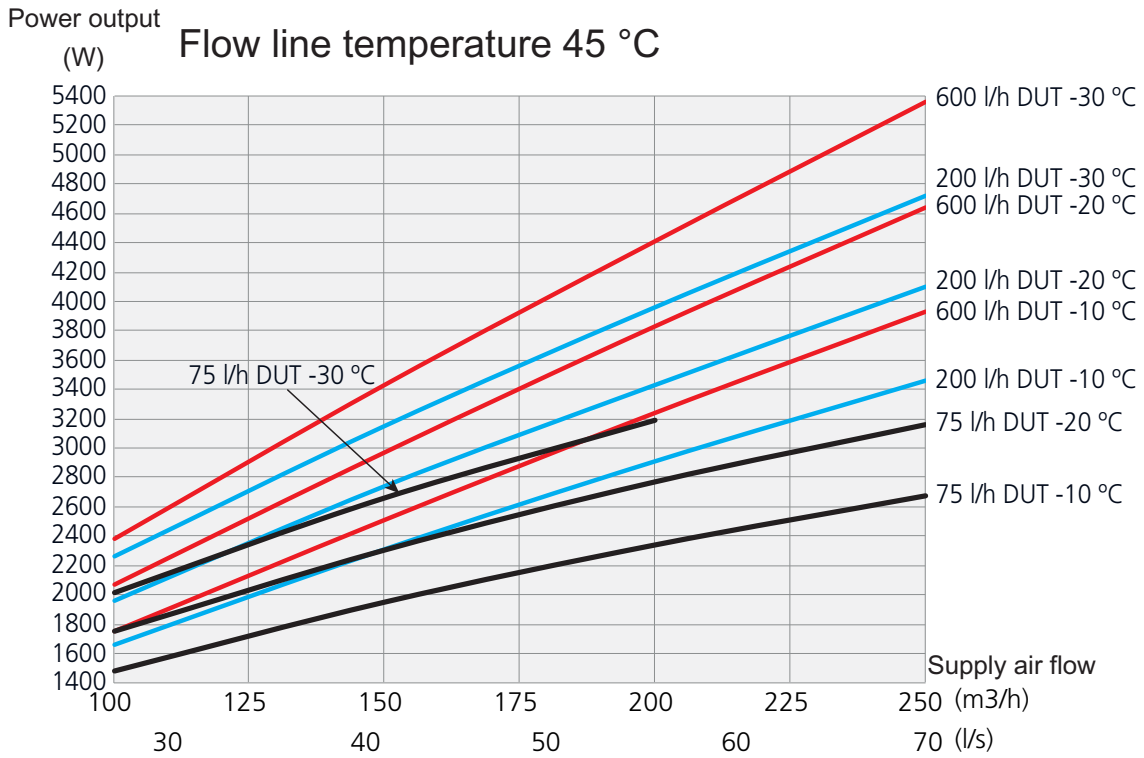
A water borne climate system with a volume of at least 20 litres must be present for installation of SAM 40 to be possible. For correct function of SAM 40 the total volume of the climate system (excluding the internal volume in F750) must exceed 40 litres. This means that if the volume of the climate system does not exceed 40 litres installation of buffer vessel (NIBE UKV) is necessary.

### Dimensioning the system

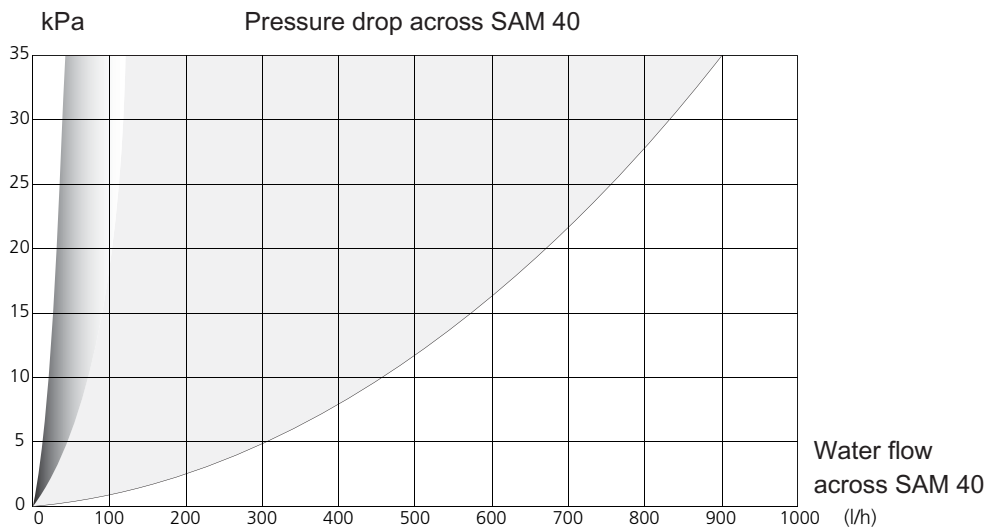
1. Work from the water temperature at DUT (DVUT).
2. Work from the current supply air flow.
3. Work from the desired supply air temperature, then calculate the output that SAM 40 must give at DUT.
4. Determine the water flow across SAM 40 from the correct output diagram. NOTE! For flow line temperatures that are not in one of the diagrams, an estimate (linear interpolation) can be carried out.
5. Work from the projected pressure drop (at the projected flow) in the water borne system, climate system 1.
6. Check in the pressure drop diagram that the working point is inside the grey working area.

### Output transfer to the supply air





## Pressure drop diagram SAM 40



The diagram shows pressure drop across SAM 40 during different water flows. Note that the pressure drop is the same as that which affects the climate system 1.

Check that the working point is inside the grey working area. If the working point is inside the darker grey area to the left of the diagram, it can give an oscillating supply air temperature.



### NOTE

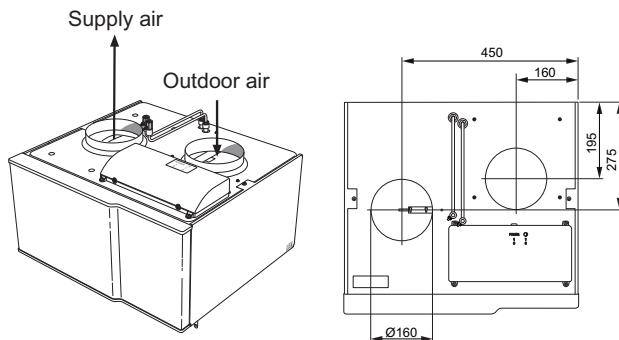
Venting may be necessary on installation and after a period of use. Vent through venting valve (QM20).

## General ventilation connection

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

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

Connections must be made via flexible hoses, which must be installed so that they are easy to replace. The outdoor air duct must be provided with diffusion-tight insulation over its entire length. Provision must be made for inspection and cleaning of the duct. Make sure that there are no reductions of cross-sectional area in the form of creases, tight bends etc, since this will reduce the ventilation capacity. The air duct system must be a minimum of air tightness class B.



## Ventilation flow

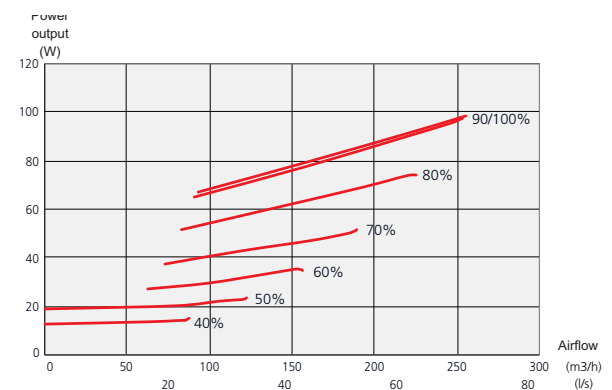
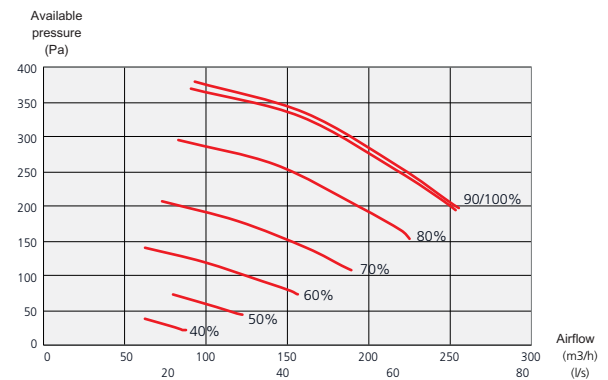
Ensure that the ventilation openings are not blocked. Set the ventilation capacity in the heat pump's menu system (menu 5.1.5).

## Adjusting ventilation

To obtain the necessary air exchange in every room of the house, the exhaust air device and the supply air device must be correctly positioned and adjusted and the fans in the heat pump and supply air module adjusted.

The factory setting for the ventilation on the supply air module is high and you should therefore adjust the ventilation immediately after installation so that it is set according to the projected value for the house.

A defective ventilation installation may lead to reduced installation efficiency and thus poorer operating economy, and may result in moisture damage to the house.





# 5 Electrical connections

## General

All electrical equipment is connected at the factory.

- Disconnect SAM 40 before insulation testing the house wiring.
- For the supply air module wiring diagram, see page 24.
- Signal cables to external connections must not be laid close to high current cables.
- If the supply cable is damaged, only NIBE, its service representative or similar authorised person may replace it to prevent any danger and damage.



### 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.

## Connections

### Connecting to F750

This section describes the electrical connection for controlling SAM 40 from NIBE F750.

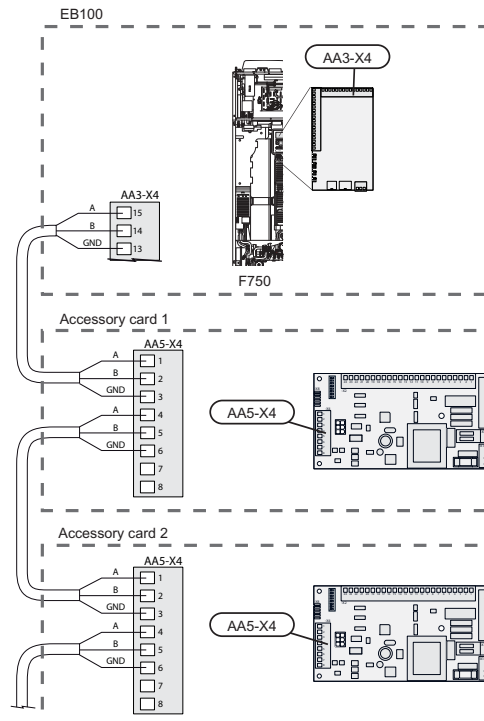
The heat pump switch must be in the "⏻" and SAM 40's switch in 0 position before commencing work.

1. Ensure that the products are completely disconnected from the power source. Remove the front hatch and protective cover to the input card on the heat pump according to the instructions in its Installer's manual.
2. Connect cable W102 to position X4 on the input card in the heat pump, according to the wiring diagram on page 24. Use the cable lead-in in the heat pump when cable routing.

If several accessories are to be connected or are already installed, the adjacent wiring diagram must be followed.

The first accessory card must be connected directly to the heat pump's terminal block AA3-X4. The following cards must be connected in series with the previous card.

3. Fix external cable routing.
4. Install the protective cover and the service cover according to the heat pump Installation manual.
5. Connect plug W101.



# 6 Commissioning and adjusting

## Preparations

1. Check that the switch (SF1) in F750 is in position "⏻".
2. Check that the filling valves (QM10) and (QM11) in the heat pump are fully closed and that the temperature limiter (FD1) has not deployed.



### Caution

Check the temperature limiter (FD1) and miniature circuit-breaker (FA1) in the heat pump. They may have tripped during transportation.

## Connecting to heating medium system

1. Connect SAM 40 according to the outline diagram on page 9.
2. Fill with water using the filler valve (QM11) in F750.
3. Vent the heating medium system with the vent valves (QM20) above SAM 40, and the vent valves in F750 and fill if necessary using the filler valve (QM11) in F750.

# Start-up and inspection

## Start-up



### NOTE

There must be water in the climate system before the switch in F750 is set to "I".



### NOTE

In low outdoor temperatures there is a risk of SAM 40 freezing.

1. Set switch (SF1) on SAM 40 in position "1".
2. Turn the heat pump's switch (SF1) to "I".
3. Follow the instructions in the start guide in the heat pump display. If the start guide does not start when you start the heat pump, start it manually in menu 5.7.

## Commissioning

The first time the heat pump is started a start guide is started. The start guide instructions state what needs to be carried out at the first start together with a run through of the heat pump's basic settings.

The start guide ensures that the start-up is carried out correctly and cannot be bypassed. The start guide can be started later in menu 5.7.



### Caution

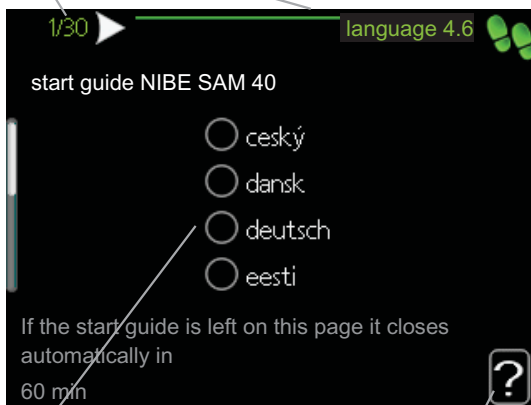
As long as the start guide is active, no function in the heat pump will start automatically.

The guide will appear at each heat pump restart until it is deselected on the last page.

## Operation in the start guide

A. Page

B. Name and menu number



C. Option / setting

D. Help menu

## A. Page

Here you can see how far you have come in the start guide.

Scroll between the pages of the start guide as follows:

1. Turn the control knob until one of the arrows in the top left corner (at the page number) has been marked.
2. Press the OK button to skip between the pages in the start guide.

## B. Name and menu number

Read what menu in the control system this page of the start guide is based on. The digits in brackets refer to the menu number in the control system.

If you want to read more about affected menus either read off in the sub-menu or in the installation manual under the chapter "Control - Menus"

## C. Option / setting

Make settings for the system here.

## D. Help menu



In many menus there is a symbol that indicates that extra help is available.

To access the help text:

1. Use the control knob to select the help symbol.
2. Press the OK button.

The help text often consists of several windows that you can scroll between using the control knob.

## Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

## Menu 5.2 -system settings

Activating/deactivating of accessories.

Select: "ext sup air md"

## Setting the supply air temperature

Set the supply air temperature in menu 5.3.9 (ext sup air md).

Note that when changing the supply air temperature, the settings for other parts of the climate system need to be adjusted.

### **outdoor temp.**

Setting range: -40 - 20 °C

Default value:

outdoor temperature T1: -15 °C

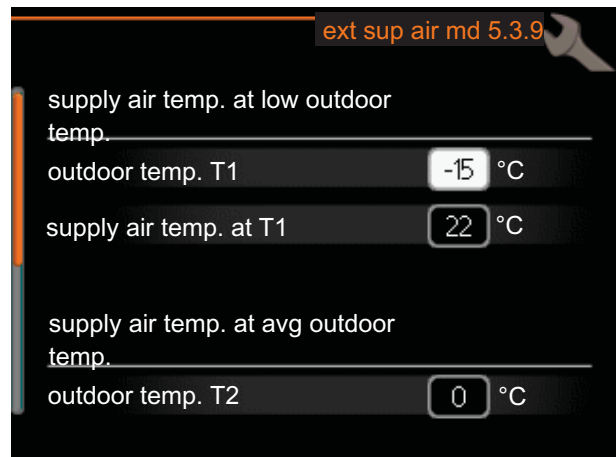
outdoor temperature T2: 0 °C

outdoor temperature T3: 15 °C

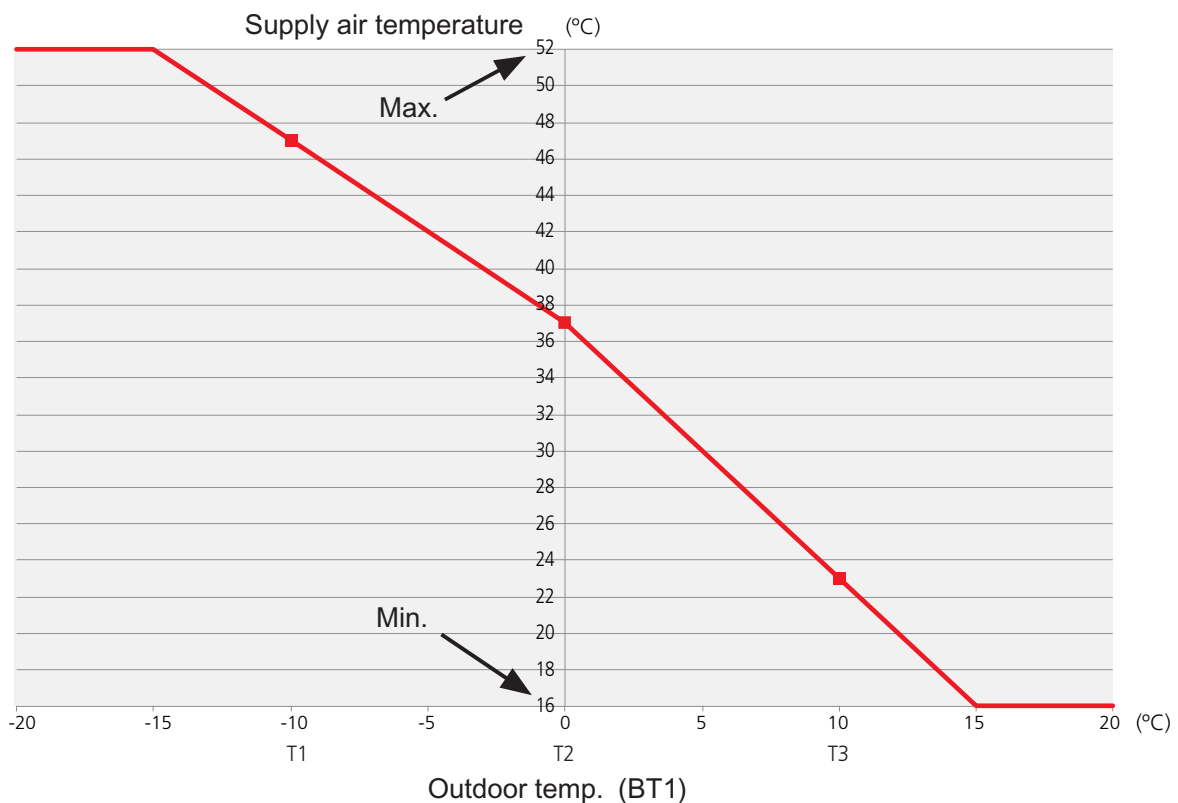
### **supply air temp. at**

Setting range: 16 - 52 °C

Default value: 22 °C



At outdoor temperatures that lie between the stated points in the diagram below, the supply air temperature can be calculated linearly. The angle of the graph continues outside the stated points.



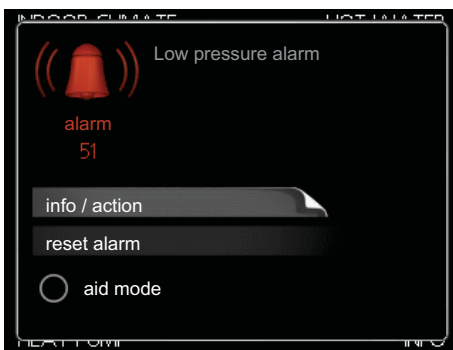
# 7 Disturbances in comfort

In most cases, the heat pump F750 notes operational interference (operational interference can lead to disturbance in comfort) and indicates this with alarms and shows action instructions in the display.

## Info-menu (F750)

All the heat pump measurement values are gathered under menu 3.1 in the heat pump menu system. Looking through the values in this menu can often simplify finding the fault source.

## Manage alarm



In the event of an alarm, some kind of malfunction has occurred, which is indicated by the status lamp changing from green continuously to red continuously. In addition, an alarm bell appears in the information window.

### Alarm

In the event of an alarm with a red status lamp a malfunction has occurred that the heat pump cannot remedy itself. In the display, by turning the control knob and pressing the OK button, you can see the type of alarm it is and reset it. You can also choose to set the heat pump to aid mode.

**info / action** Here you can read what the alarm means and receive tips on what you can do to correct the problem that caused the alarm.

**reset alarm** In most cases it is enough to select "reset alarm" to correct the problem that caused the alarm. If a green light illuminates after selecting "reset alarm" the alarm has been remedied. If a red light is still visible and a menu called "alarm" is visible in the display, the problem that caused the alarm remains. If the alarm disappears and then returns, see the troubleshooting section (page 19).

**aid mode** "aid mode" is a type of emergency mode. This means that the heat pump produces heat and/or hot water despite there being some kind of problem. This can mean that the heat pump's compressor is not running. In this case the immersion heater produces heat and/or hot water.



### Caution

Selecting "aid mode" is not the same as correcting the problem that caused the alarm. The status lamp will therefore continue to be red.

## Troubleshooting

If the operational interference is not shown in the display the following tips can be used:

### Basic actions

Start by checking the following possible fault sources:

- That the heat pump is running or that the supply cable to SAM 40 is connected.
- Group and main fuses of the accommodation.
- The property's earth circuit breaker.
- The heat pump's miniature circuit breaker (FA1).
- The heat pump's temperature limiter (FD1).
- Correctly set load monitor (if installed).

### Low hot water temperature or a lack of hot water

- The heat pump has temporarily prioritised supply air ventilation to prevent too low temperatures in the supply air coil.

### Low room temperature

- Incorrect value set in supply air automatic control system.
  - Enter menu 5.3.9 (ext sup air md) and adjust the setting for the supply air temperature.
- Air in the heating medium system.
  - Vent the heating medium system via its vent valve(QM20).

### High room temperature

- Incorrect value set in supply air automatic control system.
  - Enter menu 5.3.9 (ext sup air md) and adjust the setting for the supply air temperature.

### Low or a lack of ventilation

- Filter (HQ11) blocked.
  - Clean or replace the filter.
- Supply air device closed, blocked or throttled down too much.
  - Check and clean the supply air device.

### High or distracting ventilation

- The ventilation is not adjusted.
  - Order/implement ventilation adjustment.
- Filter (HQ11) blocked.

- Clean or replace the filter.

### **Low supply air temperature**

- Incorrect value set in supply air automatic control system.
  - Enter menu 5.3.9 (ext sup air md) and adjust the setting for the supply air temperature.
- Air in the heating medium system.
  - Vent the heating medium system via its vent valve(QM20).

### **High supply air temperature**

- Incorrect value set in supply air automatic control system.
  - Enter menu 5.3.9 (ext sup air md) and adjust the setting for the supply air temperature.

# 8 Accessories

## **Brackets**

Wall mounting of SAM 40.

Part no. 067 083

## **Buffer vessel UKV**

### ***UKV 40***

Part no. 088 470

## **Top cabinet**

Top cabinet for concealing the ventilation ducts.

### ***245 mm***

Part no. 089 756

### ***345 mm***

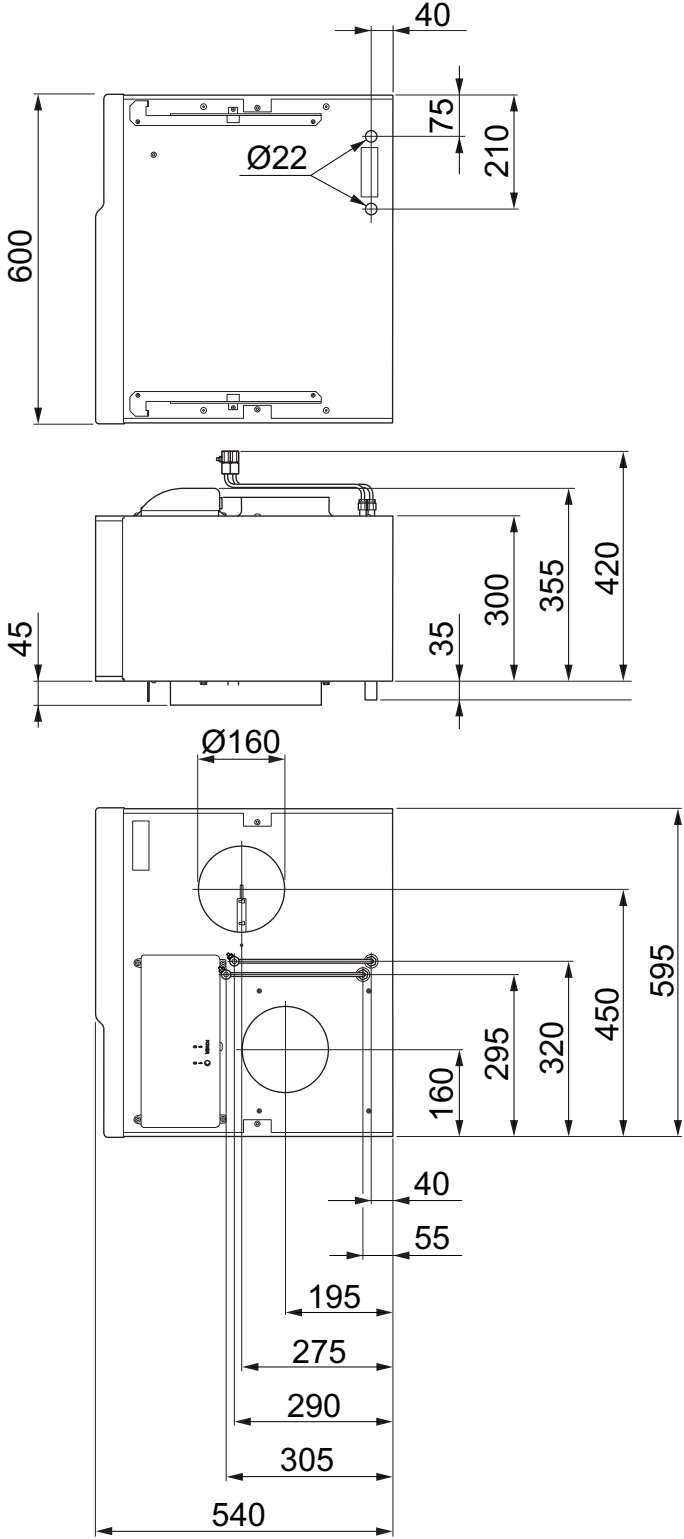
Part no. 089 757

### ***395-645 mm***

Part no. 089 758

# 9 Technical data

## Dimensions and setting-out coordinates





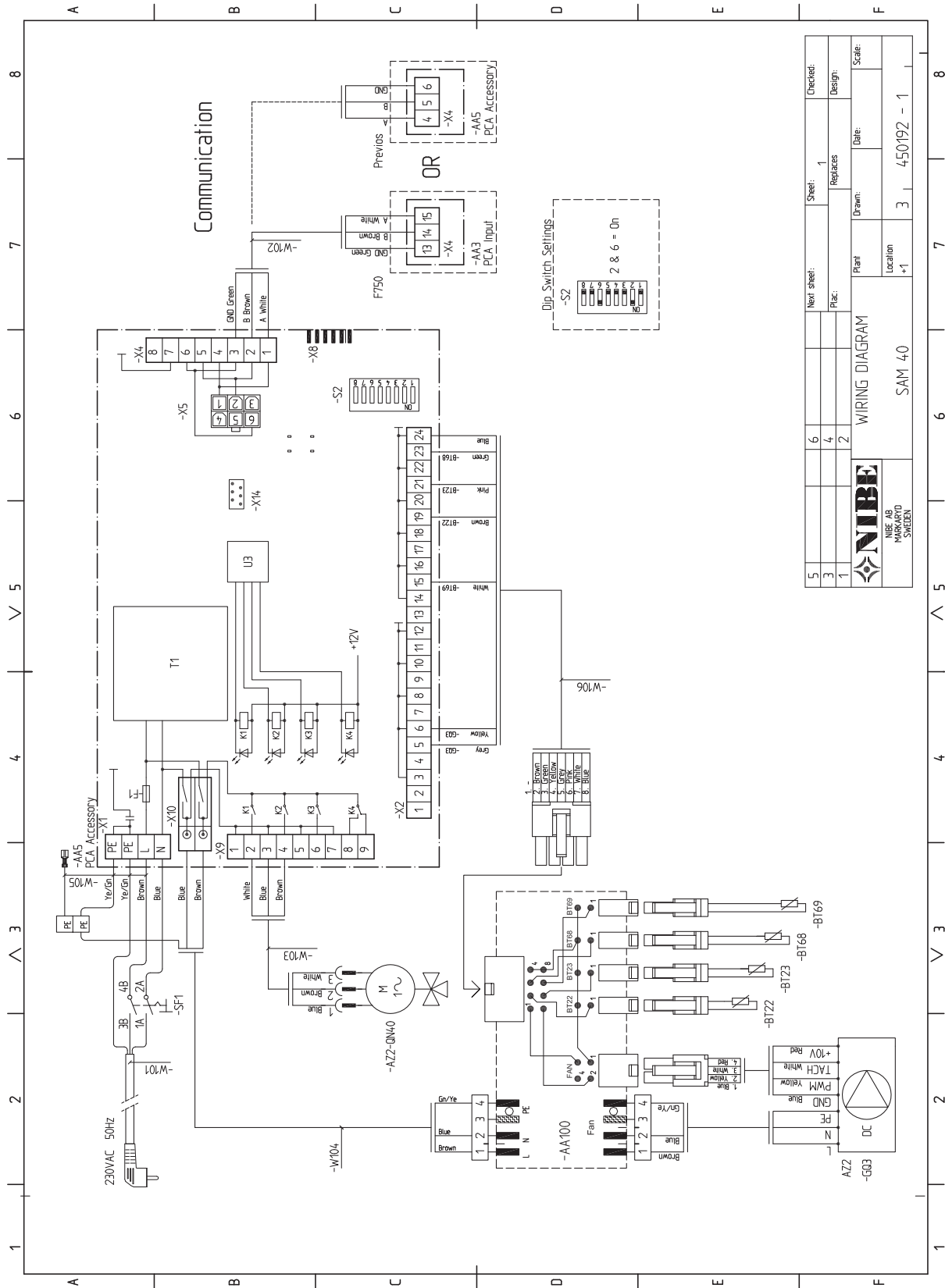
## Technical specifications

<b>Electrical data</b>		
Supply voltage	V	230 V 50 Hz
Drive output actuator motor	W	1.5
Driving power fan	W	175
Enclosure class		IP 21
<b>Heating medium circuit</b>		
Min pressure	MPa/bar	0.05/0,5
Max pressure	MPa/bar	0.25/2,5
<b>Ventilation</b>		
Max airflow	m <sup>3</sup> /h	300
<b>Sound power level according to EN 12,102</b>		
Sound power level ( $L_{w(A)}$ ) <sup>1</sup>	dB (A)	45-50
<b>Sound pressure levels</b>		
Sound pressure level in the boiler room ( $L_{p(A)}$ ) <sup>2</sup>	dB (A)	41-46
<b>Dimensions and weight</b>		
Width	mm	600
Depth	mm	556
Height	mm	396
Weight	kg	31
Part No.		067 147

<sup>1</sup> The value varies with the selected fan curve. Visit [www.nibe.eu](http://www.nibe.eu) for more extensive sound data including sound to channels.

<sup>2</sup> The value can vary with the room's damping capacity. These values apply with a damping of 4 dB.

# Electrical circuit diagram



5	Next sheet:	Sheet: 1	Checked:
3	Plac:	Replaces:	Design:
1		Drawn:	Date:
Plant		Scale:	
WIRING DIAGRAM		Location	
NIBE AB MARKADYD SWEDEN		SAM 40	
		+1 3 450192 - 1	

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## Item register

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