

HRV unit

NIBE ERS S40-400



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Important information

Safety information

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

The manual must be left with the customer.

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.

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If the supply cable is damaged, only NIBE, its service representative or similar authorised person may replace it to prevent any danger and damage.

Symbols

Explanation of symbols that may be present in this manual.



NOTE

This symbol indicates danger to person or machine.

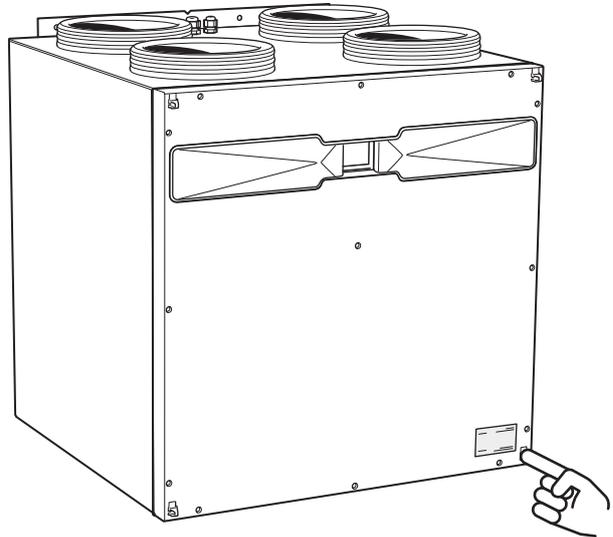


Caution

This symbol indicates important information about what you should consider when installing or servicing the installation.

Serial number

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



Caution

You need the product's serial number for servicing and support.

Recovery



Leave the disposal of the packaging to the installer who installed the product or to special waste stations.

When disposing of the product, its constituent materials and components, e.g. compressors, fans, circulation pumps and circuit boards, must be disposed of at a special waste station or dealer who provides this type of service.

To access the separate components, refer to the section that shows the construction of the product. No special tools are required for access.

Improper disposal of the product by the user results in administrative penalties in accordance with current legislation.

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. In addition, fill in the page for the installation data in the User Manual.

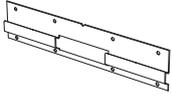
✓	Description	Notes	Signature	Date
	Electricity (page 15)			
	Connections			
	Main voltage			
	Fuses property			
	Earth circuit-breaker			

Delivery and handling

Transport and storage

ERS S40 should be transported and stored in the dry.

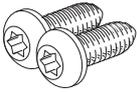
Supplied components



Rail for wall mounting



4 x feet



2 x screws

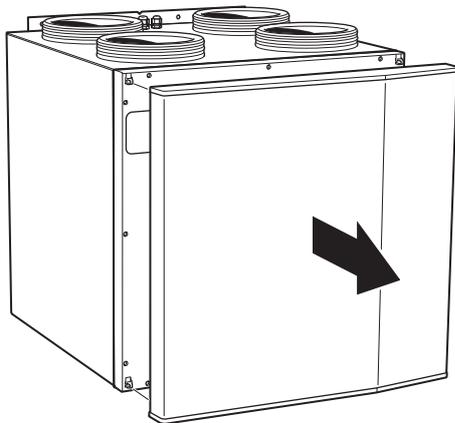
Compatible products

- S1155
- S1255
- VVM S320
- VVM S325
- SMO S40

Removing the covers

FRONT COVER

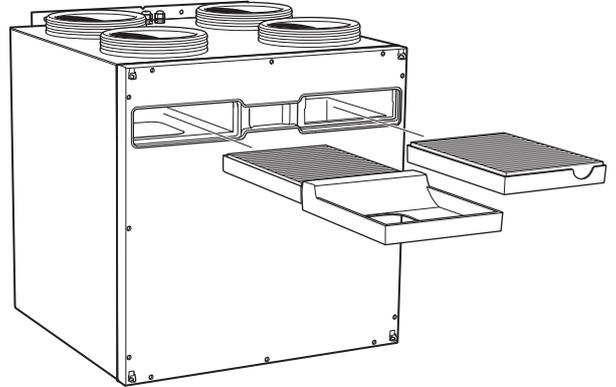
1. Pull the hatch towards yourself.



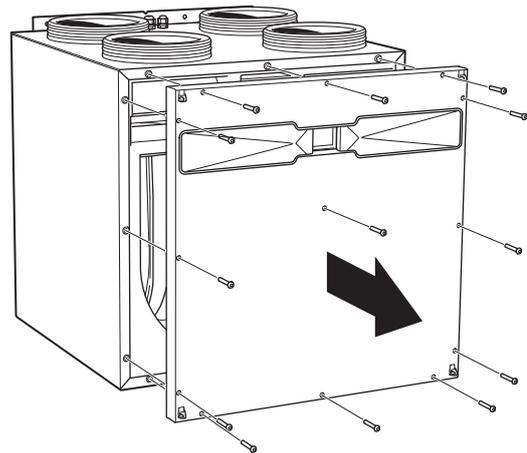
INNER FRONT COVER

The inner front cover must be removed to access the internal parts.

1. Remove the air filters.



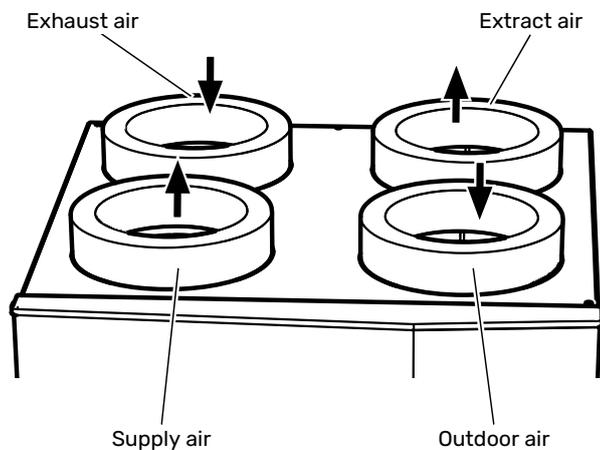
2. Loosen the screws that hold the inner front cover in place.



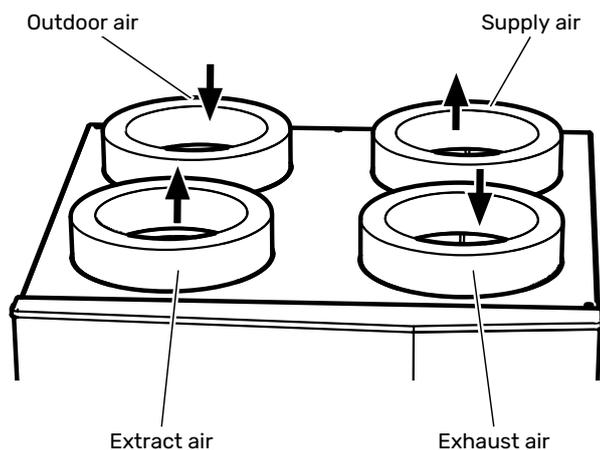
3. Pull the front cover straight out.

Physical configuration

ERS S40 is supplied with exhaust air and supply air to the left, known as the left-handed version. The images in this manual show ERS S40 in the left-handed version, unless otherwise specified.

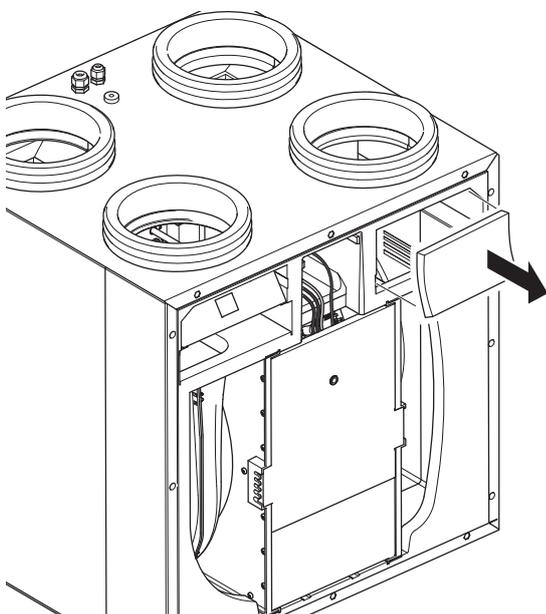


ERS S40 can be converted to a right-handed version if necessary, which means that exhaust air and supply air are connected to the right.

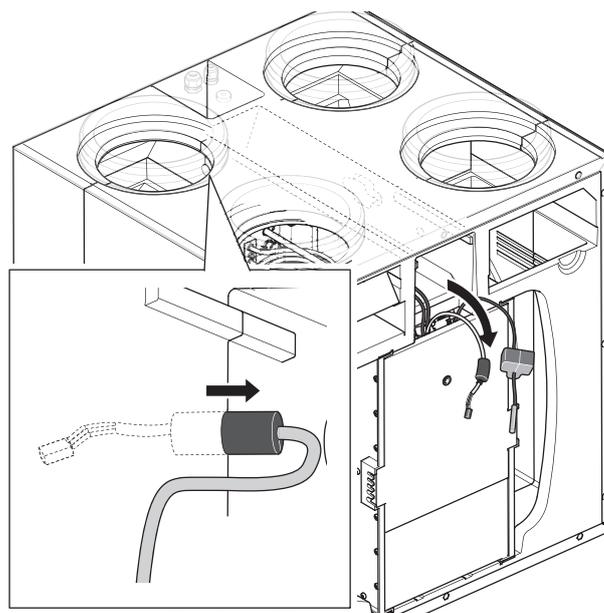


CONVERSION TO RIGHT-HANDED VERSION

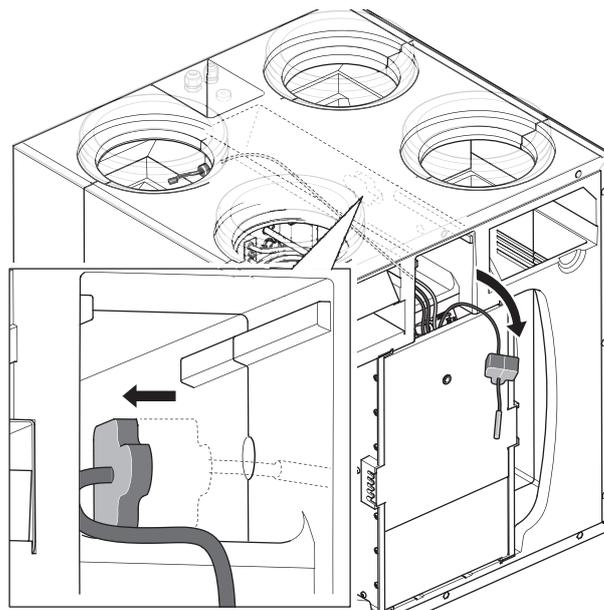
1. Remove the insulation located in the right-hand space.



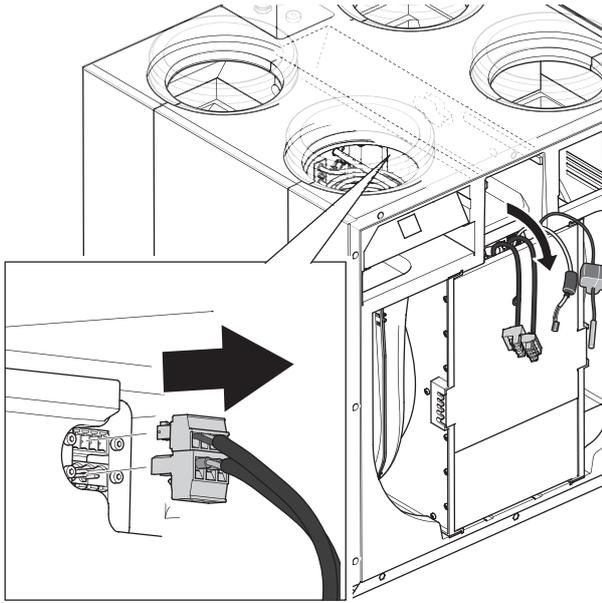
2. Remove the humidity sensor (BM20) including the insulation plug. This is located furthest in the left-hand space.



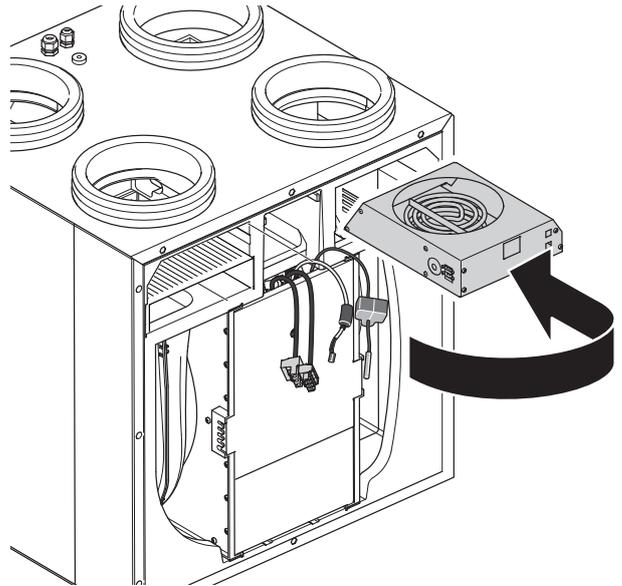
3. Remove the extract air sensor (BT21) including the insulation plug. This is located furthest in the right-hand space.



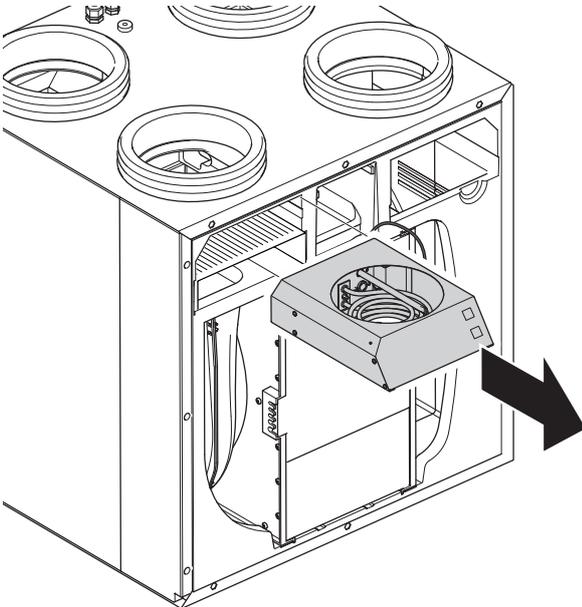
4. Disconnect the two cables located in the re-heater.



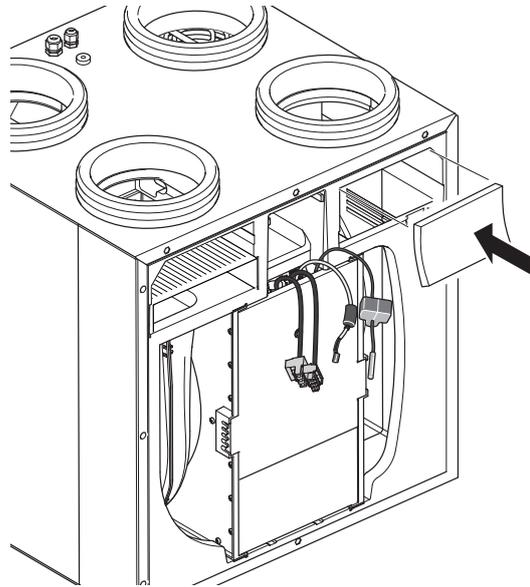
6. Install the re-heater (EB18) furthest in the right-hand space.



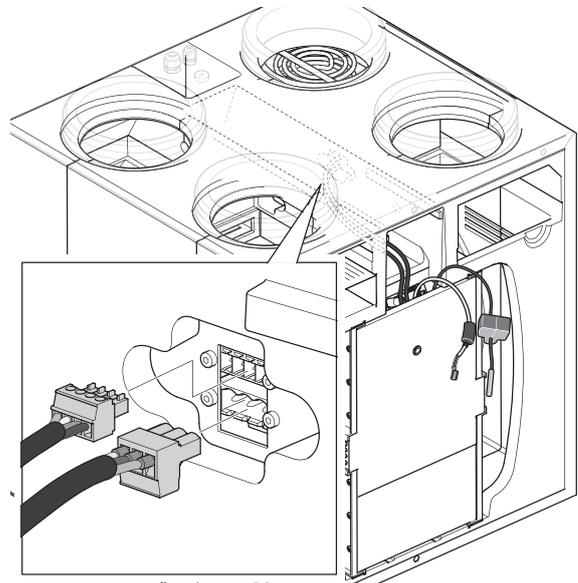
5. Remove the re-heater (EB18).



7. Refit the insulation.

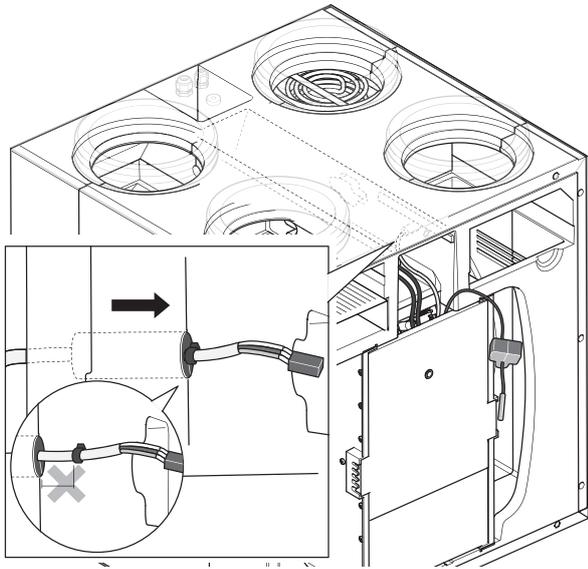


8. Connect the two cables to the re-heater.

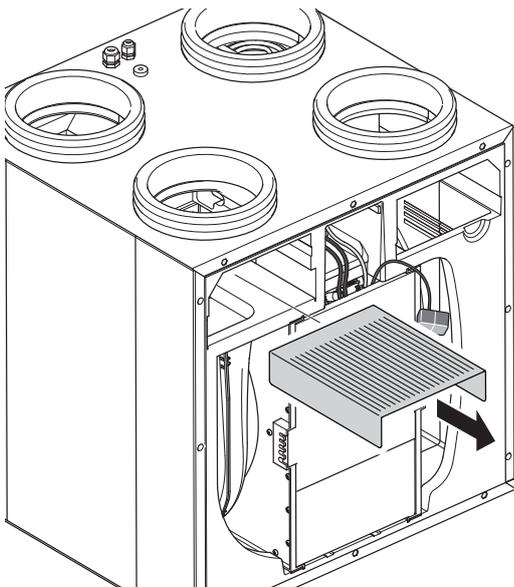


9. Install the humidity sensor (BM20) and the insulation plug in the right-hand space.

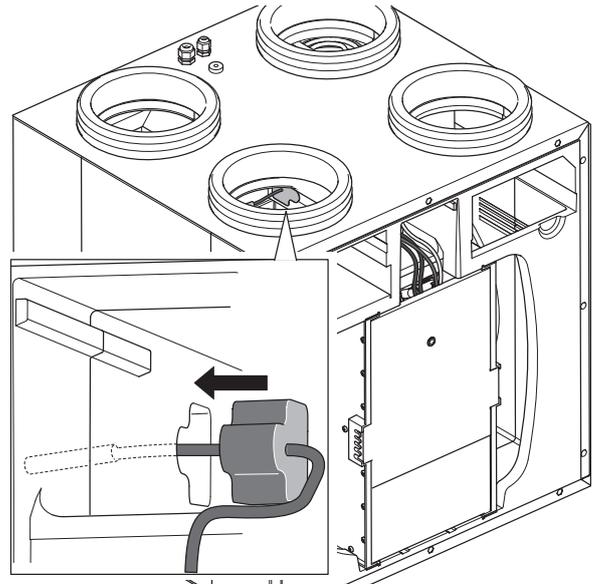
There is a cable tie on the sensor, indicating how far in the sensor has to be positioned.



10. Dismantle the grating.



11. Install the insulation plug and sensor (BT21) furthest in the left-hand section.



12. Refit the grating.
13. Switch the filters around. Filter ePM1 55% must be placed on the supply air side.
14. Fit the filter cassettes.
15. Mark the change to the air flows on the duct connection plate (PZ4) on the upper side of the product.



Caution

In order to complete the conversion, changes are required in menu 7.2.11.

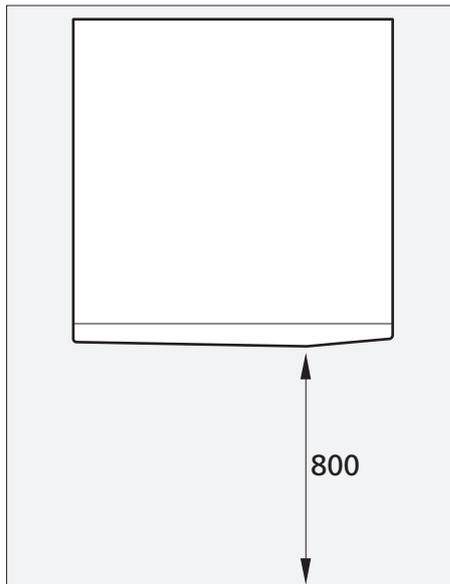
Assembly

ERS S40 can be installed on a wall or placed on a horizontal surface. For wall installation, place the enclosed rail on a solid wall. Noise from the fans might be transferred to the rail. When placing on a horizontal surface, fit the enclosed feet on the underside of ERS S40. It is important for the surface where ERS S40 is placed to be stable and to withstand the weight of the unit.

- Install with its back 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.
- The HRV unit's installation area always has to have a temperature of at least $-38\text{ }^{\circ}\text{C}$ and max. $50\text{ }^{\circ}\text{C}$.

INSTALLATION AREA

Leave a free space of 800 mm in front of the product.



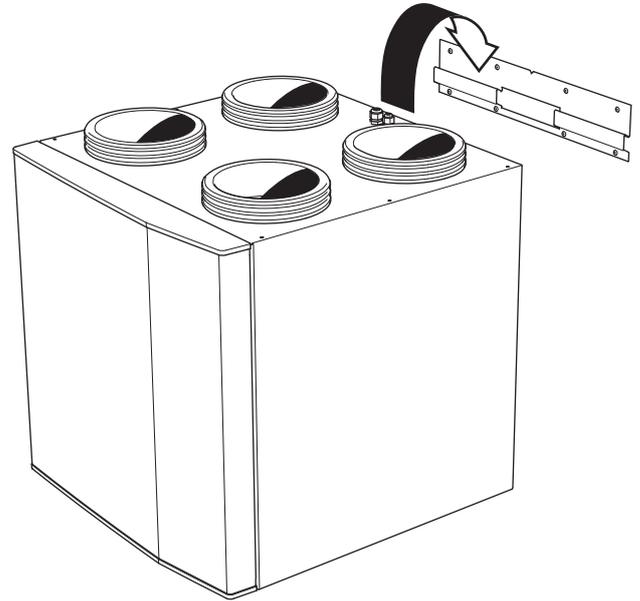
NOTE

Ensure that there is sufficient space (300 mm) for connecting ventilation ducts.

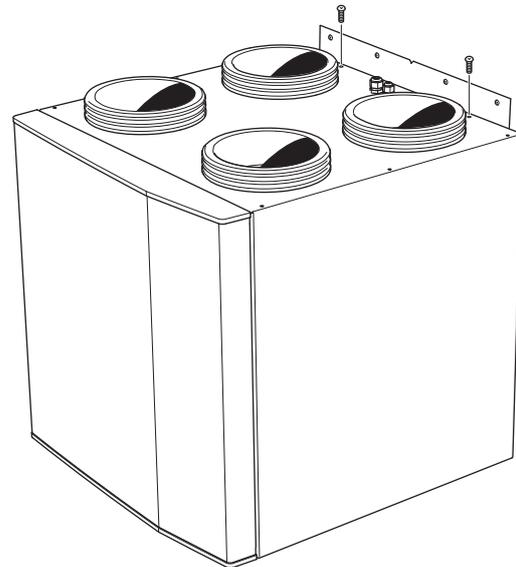
Mounting

When hanging on a wooden wall, a vibration damper is recommended to prevent vibration being transferred.

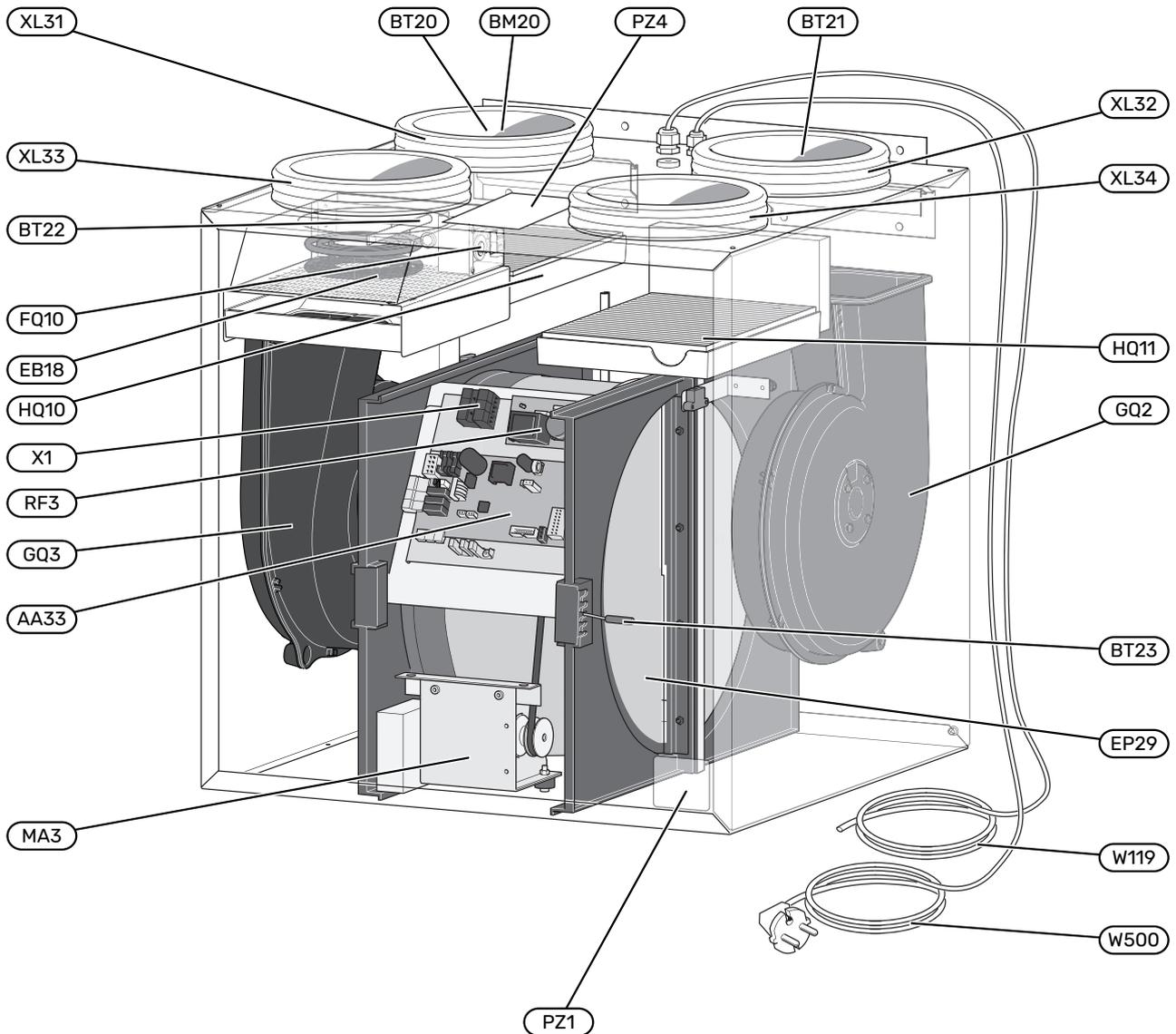
1. Install the enclosed bracket to the wall.
2. Install ERS S40 on the brackets.



3. Screw ERS S40 firmly into place on the bracket, using the enclosed screws.



Design of the HRV unit



Pipe connections

XL31	Ventilation connection, exhaust air
XL32	Ventilation connection, extract air
XL33	Ventilation connection, supply air
XL34	Ventilation connection, outdoor air

Sensors etc.

BM20	Humidity sensor, exhaust air
BT20	Temperature sensor, exhaust air
BT21	Temperature sensor, extract air
BT22	Temperature sensor, supply air
BT23	Temperature sensor, outdoor air

Electrical components

AA33	AJBboard
EB18	Re-heater
FQ10	Temperature limiter
MA3	Motor for the heat exchanger
RF3	EMC card
W119	Communication cable
W500	Cord with connection plug
X1	Terminal block, power supply

Ventilation

EP29	Rotary heat exchanger
GQ2	Exhaust air fan
GQ3	Supply air fan
HQ10	Exhaust air filter
HQ11	Supply air filter

Miscellaneous

PZ1	Type plate
PZ4	Duct connection rating plate

Designations according to standard EN 81346-2.

Ventilation connections

General ventilation connections

- Ventilation installation must be carried out in accordance with current norms and directives.
- Provision must be made for inspection and cleaning of the duct.
- The air duct system must be a minimum of air tightness class B.
- To prevent fan noise being transferred to the ventilation devices, install silencers in suitable locations in the duct system.
- The extract air and outdoor air ducts are insulated using diffusion-proof material along their entire lengths.
- Ensure that the condensation insulation is fully sealed at any joints and/or at lead-in nipples, silencers, roof cowls or similar.
- The air must be routed to the outdoor air duct through an outer wall grille in the facade. The outer wall grille must be installed so that it is protected from the weather and must be designed so that no rainwater and/or snow can penetrate the facade or follow the air into the duct.
- When positioning the outdoor air and extract air hood/grille, bear in mind that the two air flows must not short circuit to prevent the extract air from being drawn into ERS S40 again.
- A duct in a masonry chimney stack must not be used for extract air or outdoor air.



NOTE

To ensure a sealed connection to ERS S40, the supplied hose clips must be used for connecting the air ducts.

EXHAUST AIR DUCT /KITCHEN FAN

Exhaust air duct (kitchen fan) must not be connected to ERS S40.

To prevent cooking odours from being led to the ERS S40, the distance between the kitchen fan and the exhaust air valve must be taken into consideration. The distance must not be less than 1.5 m, but may vary between different installations.

Always use a kitchen fan when cooking.

Ventilation flow

Connect ERS S40 so that all the exhaust air, except kitchen duct air (kitchen fan), passes through the heat exchanger (EP29) in the product.

The ventilation flow must comply with the applicable national standards.

The supply air flow must be lower than the exhaust air flow to prevent over pressure in the house.

Set the ventilation capacity in the main product's menu system (menu 7.1.4 - "Ventilation").

Adjusting ventilation

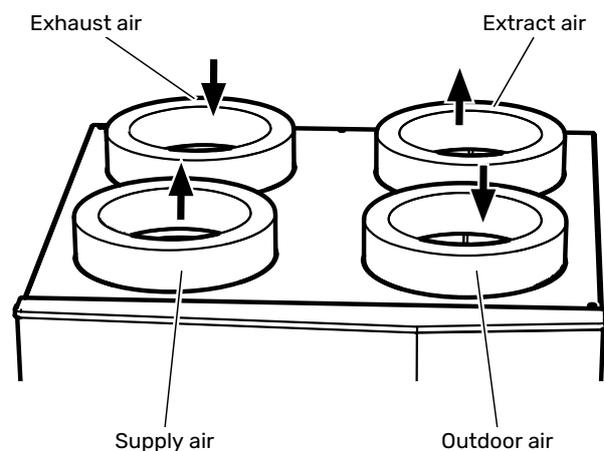
To obtain the necessary air exchange in every room of the building, the exhaust air valve and the supply air inlet as well as the fans in the HRV unit must be correctly positioned and adjusted.

Immediately after installation adjust the ventilation so that it is set according to the projected value of the house.

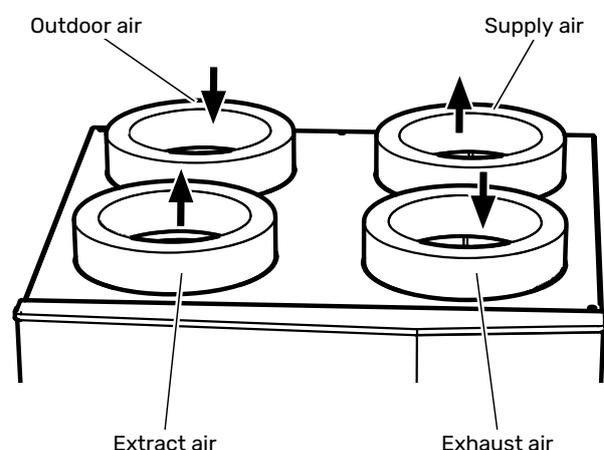
Incorrect adjustment of the ventilation may lead to reduced installation efficiency and thus poorer operating economy, a poorer indoor climate and moisture damage in the building.

Ventilation connections

LEFT-HANDED VERSION



RIGHT-HAND VERSION



Electrical connection



NOTE

All electrical connections must be carried out by an authorised electrician.

Electrical installation and wiring must be carried out in accordance with national provisions.

ERS S40 must not be powered during installation.



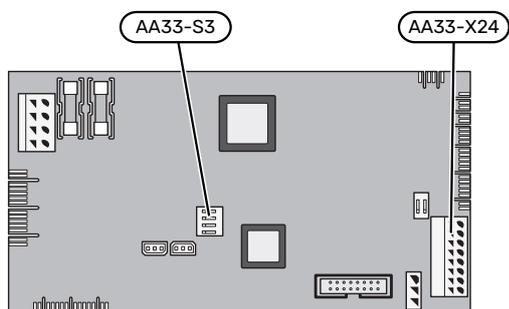
NOTE

If the supply cable is damaged, only NIBE, its service representative or similar authorised person may replace it to prevent any danger and damage.

- To prevent interference, sensor cables to external connections must not be laid close to high voltage cables.
- The minimum area of communication and sensor cables to external connections must be 0.5 mm² up to 50 m, for example EKKX, LiYY or equivalent.

For electrical wiring diagram, see page 27.

Overview, AJB board (AA33)



Supply

ERS S40 is connected to a earthed single-phase wall socket or a permanent installation. For permanent installations, ERS S40 must be preceded by a circuit breaker with at least a 3 mm breaking gap.

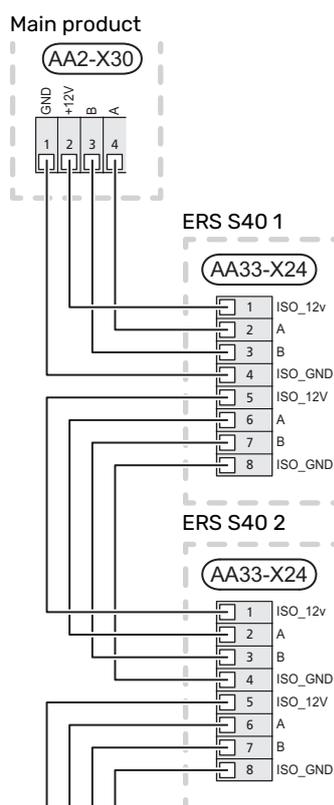
Connecting to main product

CONNECTING TO THE HEAT PUMP

ERS S40 contains an accessory board (AA33) that connects directly to the main product's input board (terminal block AA2-X30).

The communication cable (W119) is connected to the AJB board (AA33) from the factory.

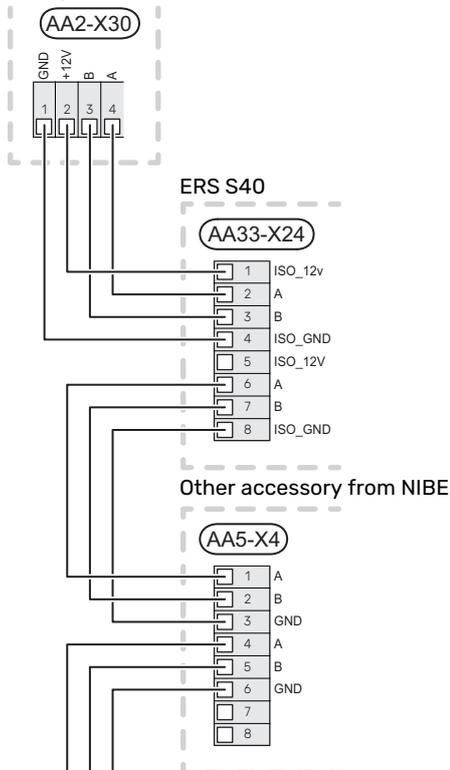
If several accessories are to be connected, or are already installed, the boards are connected in series.



ERS S40 and another accessory from NIBE

Because there can be different connections for accessories with accessory board (AA5), you should always read the instructions in the manual for the accessory that is to be installed.

Main product

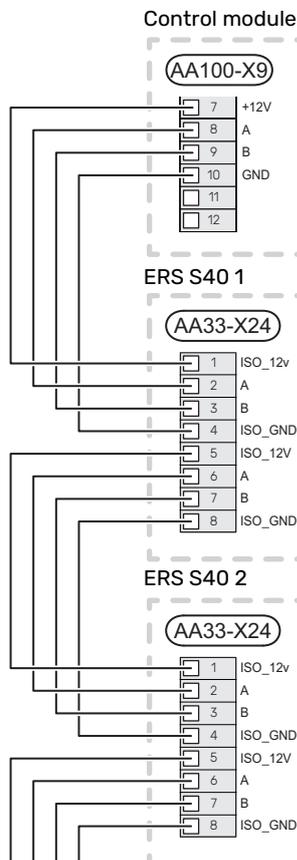


CONNECTING TO CONTROL MODULE

ERS S40 contains an accessory board (AA33) that connects directly to the main product's input board (terminal block AA100-X9).

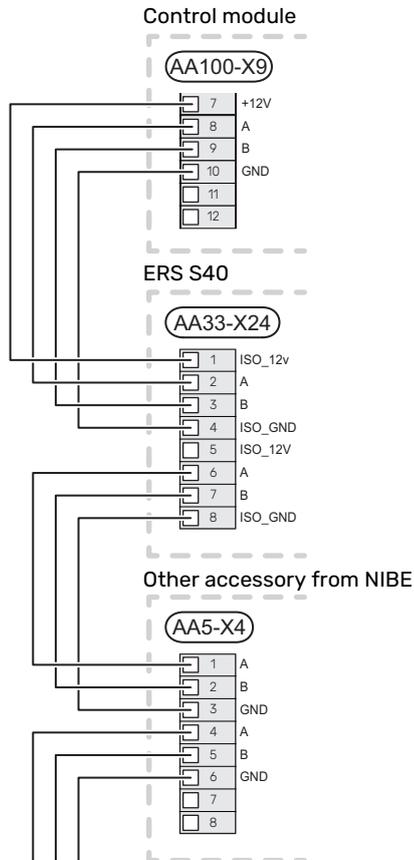
The communication cable (W119) is connected to the AJB board (AA33) from the factory.

If several accessories are to be connected, or are already installed, the boards are connected in series.



ERS S40 and another accessory from NIBE

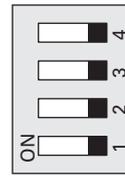
Because there can be different connections for accessories with accessory board (AA5), you should always read the instructions in the manual for the accessory that is to be installed.



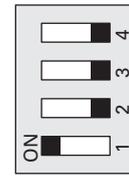
DIP SWITCH

The DIP switch (S3) on the AJB board (AA33) must be set as follows.

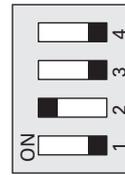
You can have up to 4 ERS S40 in the same installation, each ERS S40 is given a unique setting.



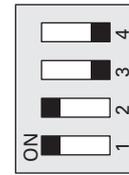
ERS S40 no. 1



ERS S40 no. 2



ERS S40 no. 3



ERS S40 no. 4

Commissioning and adjusting

Preparations

- Check that the air filters are clean, they can become dirty after installation.



Caution

ERS S40 must not be started if the temperature is below $-25\text{ }^{\circ}\text{C}$ in the installation area.

Start-up and inspection

SETTING THE VENTILATION

The ventilation must be set according to applicable standards. Adjust the supply air flow to guarantee a negative pressure.

The settings are made in menu 7.1.4.

Even if ventilation is roughly set at installation it is important that a ventilation adjustment is ordered and permitted.



Caution

An incorrectly set ventilation flow can damage the house and may also increase energy consumption.

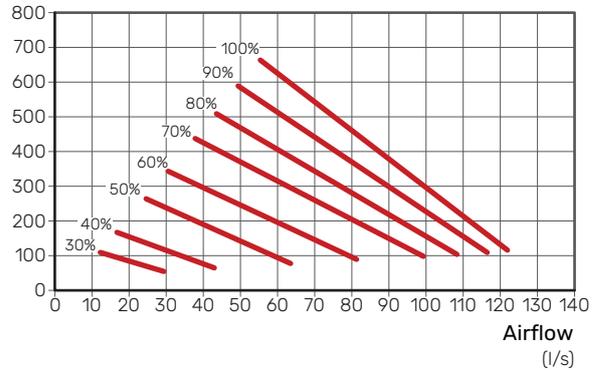


NOTE

Order a ventilation adjustment to complete the setting.

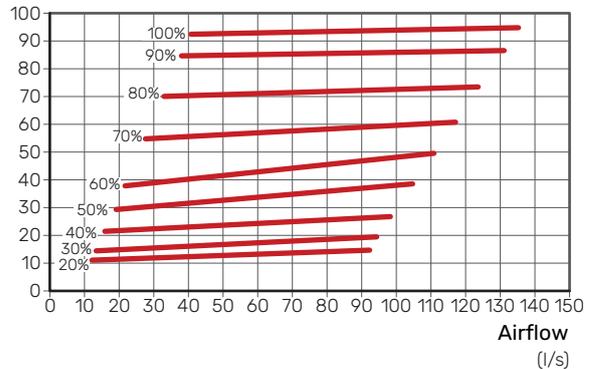
Ventilation capacity

Available pressure
(Pa)



Fan rating¹

Output
(W)



¹The diagram shows the power consumption per fan.

HUMIDITY

ERS S40 has a built-in humidity sensor (BM20) that is used when demand-controlled ventilation is required.

The speed of the rotor is regulated with respect to a set value depending on the humidity measured in the exhaust air, as well as the calculated humidity outdoors, to achieve the desired relative humidity in the home. The speed of the fans is also regulated, if necessary.

The settings for demand-controlled ventilation are made in menu 7.1.4.4.

Activating ERS S40

Activating ERS S40 can be performed via the start guide or directly in the menu system.

The main product's software must be the latest version.



Caution

Also see the Installer Manual for the main product.

Start guide

The start guide appears upon first start-up after heat pump installation, but is also found in menu 7.7.

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 7.2.1 - ADD/REMOVE ACCESSORIES

Activating/deactivating of accessories.

Select "ERS S40".

MENU 7.2.11 - VENT. HEAT EXCHANGER (ERS)

Physical configuration

Setting range: Left, Right

Allow re-heater

Setting range: on/off

Offset re-heater

Setting range: 0.0 – 5.0 °C

Desired supply air temp.

Setting range: 16.5 – 25 °C

Time between defrosts

Setting range: 1 – 8 h

Max. defrosting time

Setting range: 5 – 120 min

Temp. for end of defrosting

Setting range: -10.0 – 10.0 °C

Physical configuration: "Left" means that exhaust air and supply air are connected to the left in the product. Changing the configuration requires the conversion of ERS S40.

Allow re-heater: Here, you activate the inbuilt re-heater (EB18).

Offset re-heater: Here, you set the number of degrees the supply temperature must drop below "Desired supply air temp." before the re-heater is permitted to start.

Desired supply air temp.: Here, you set the temperature you want for the supply air when the re-heater is running. When the re-heater is not running, the supply air temperature and the exhaust air temperature will be close to each other.

Time between defrosts, Max. defrosting time, Temp. for end of defrosting: Here, you make settings for defrosting.

MENU 1.2.1 - FAN SPEED

Alternatives: normal and speed 1 – speed 4

The ventilation in the accommodation can be temporarily increased or reduced here.

When you have selected a new speed a clock starts a count down. When the time has counted down the ventilation speed returns to the normal setting.

If necessary, the different return times can be changed in menu 1.2.5.

The fan speed is shown in brackets (in percent) after each speed alternative.

MENU 1.2.2 - NIGHT COOLING

Night cooling

Setting range: on/off

Start temp exhaust air

Setting range: 20 – 30 °C

Min. diff. ind. temp. - outd. temp.

Setting range: 3 – 10 °C

Night cooling during heating

Setting range: on/off

Here, you can activate night cooling. When the temperature in the house is high, and the outdoor temperature is lower, a cooling effect can be obtained by forcing the ventilation. When night cooling is activated, the fans run at the speed 4. In this mode, ventilation recovery is stopped.

Start temp exhaust air: Here, you set the exhaust air temperature at which night cooling will start.

Min. diff. ind. temp. - outd. temp.: If the temperature difference is greater than the set value for "Min. diff. ind. temp. - outd. temp.", and the exhaust air temperature is higher than the set value for "Start temp exhaust air", the ventilation operates at speed 4 until one of these conditions is no longer valid.

Night cooling during heating: It is possible to have night cooling during the time heating is permitted.

MENU 1.2.5 - FAN RETURN TIME

speed 1 – speed 4

Setting range: 1 – 24 h

Here, you select the return time for the temporary change of ventilation speed (speed 1 – speed 4), regardless of whether the speed has been changed in menu 1.2.1 - "Fan speed", via the home screen or via myUplink.

Return time is the time it takes before the temporary ventilation speed returns to normal speed.

MENU 1.2.6 - FILTER CLEANING INTERVAL

Months between filter cleaning

Setting range: 1 – 24 months

The filters in ERS S40 are of a type that should not be cleaned; they have to be replaced instead. These must be replaced regularly, although how often depends of factors such as the amount of particles in the ventilation air. Test to find out what is most appropriate for your installation.

Set the interval for the reminder in this menu.

The menu shows the time remaining until the next reminder, and you can also reset active reminders.

MENU 1.2.7 - VENTILATION RECOVERY

Temp stop of heat recovery

Setting range: 5 – 30 °C

Min. diff. ind. temp. - outd. temp.

Setting range: 2 – 10 °C

Recovery stop during heating

Setting range: on/off

Cooling recovery

Setting range: on/off

St temp sup air cooled by exh air

Setting range: -20.0 – 41.0 °C

Min diff outd and exhaust air

Setting range: 3.0 – 10.0 °C

When there is no heating demand, and the outdoor temperature is approaching the indoor temperature, heat recovery is stopped to prevent the house from being heated further.

Caution

Only the heat recovery is stopped, not the ventilation.

Temp stop of heat recovery: Here, you set the outside temperature at which ventilation recovery is to stop.

Min. diff. ind. temp. - outd. temp.: Here, you set the temperature difference between the indoor air and the outdoor air that is required in order for ventilation recovery to start.

Recovery stop during heating: Stopping ventilation recovery during the time heating is permitted is possible.

Cooling recovery: When there is no heating demand, ventilation recovery is stopped to prevent the house from being heated further. When it is warm indoors and even warmer outdoors, ERS S40 can be used to prevent the house from heating up more than necessary. During cooling recovery, the cooler air from the house is used to cool the incoming air.

"Cooling recovery" is started when the exhaust air temperature is a certain number of degrees below the outdoor temperature and it is warm outside.

St temp sup air cooled by exh air: Here, you set the outdoor temperature at which cooling recovery will start.

Caution

"St temp sup air cooled by exh air" cannot be lower than "Stop heating" in menu 7.1.10.2 - "Auto mode setting".

Min diff outd and exhaust air: Here, you set the temperature difference between outdoor air and exhaust air that is required in order for cooling recovery to start.

MENU 7.1.4.1 - FAN SPEED, EXHAUST AIR

Fan speed

"Normal" and "Fan speed 1" – "Fan speed 4"

Setting range: 0 – 100%

Set the speed for the five different selectable speeds for the fan here.

MENU 7.1.4.2 - FAN SPEED, SUPPLY AIR

Fan speed

"Normal" and "Fan speed 1" – "Fan speed 4"

Setting range: 0 – 100%

Set the speed for the five different selectable speeds for the fan here.

MENU 7.1.4.4 - DEMAND CONTR. VENTILATION

Humidity controlled ventilation

Alternative: on/off

Highest fan speed

Setting range: 1 – 100%

Lowest fan speed

Setting range: 1 – 100%

Time interv. change of fan speed

Setting range: 1 – 60 minutes

Controlling zones

Activate zones for demand-controlled ventilation.

Here, you make settings for demand-controlled ventilation.

The speed of the fan can be changed depending on the humidity in the air.

MENU 6.2 - SCHEDULING

In this menu, you schedule repeated changes of ventilation.



Caution

A schedule repeats according to the selected setting (e.g. every Monday) until you go into the menu and switch it off.

MENU 7.4 - SELECTABLE IN/OUTPUTS

Select here whether you want to activate fan speed for the relevant AUX input.

Disturbances in comfort

In most cases, the main product notes a malfunction (a malfunction can lead to disturbance in comfort) and indicates this with alarms and shows action instructions in the display.

Troubleshooting

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

BASIC ACTIONS

Start by checking the following items:

- That the main product is running and that the supply cable to ERS S40 is connected.
- Group and main fuses of the accommodation.
- The property's earth circuit breaker.
- Temperature limiter for ERS S40 (FQ10).

HIGH OR LOW ROOM TEMPERATURE

- The re-heater (EB18) is not activated.
 - Activate the re-heater in menu 7.2.11.

LOW OR A LACK OF VENTILATION

- The exhaust air filter (HQ10) and/or the supply air filter (HQ11) is clogged.
 - Replace the filters.
- The ventilation is not adjusted.
 - Order/implement ventilation adjustment.
- Closed, too much choke or blocked ventilation device.
 - Check and clean the ventilation devices.
- Fan speed in reduced mode.
 - Enter the main product's menu 1.2.1 and select "Normal".
- External switch for changing the fan speed activated.
 - Check any external switches.

HIGH OR DISTRACTING VENTILATION

- The exhaust air filter (HQ10) and/or the supply air filter (HQ11) is clogged.
 - Replace the filters.
- The ventilation is not adjusted.
 - Order/implement ventilation adjustment.
- Closed, too much choke or blocked ventilation device.
 - Check and clean the exhaust air devices.
- Fan speed in forced mode.
 - Enter the main product's menu 1.2.1 and select "Normal".

- External switch for changing the fan speed activated.
 - Check any external switches.
- Silencers not correctly installed.
 - Check the silencers.

Accessories

Detailed information about the accessories and complete accessories list available at nibe.eu.

TOP CABINET TOC 40

Top cabinet that conceals the ventilation ducts and reduces the sound to the installation room.

Height 245 mm

Part no. 089 756

Height 345 mm

Part no. 089 757

Height 445 mm

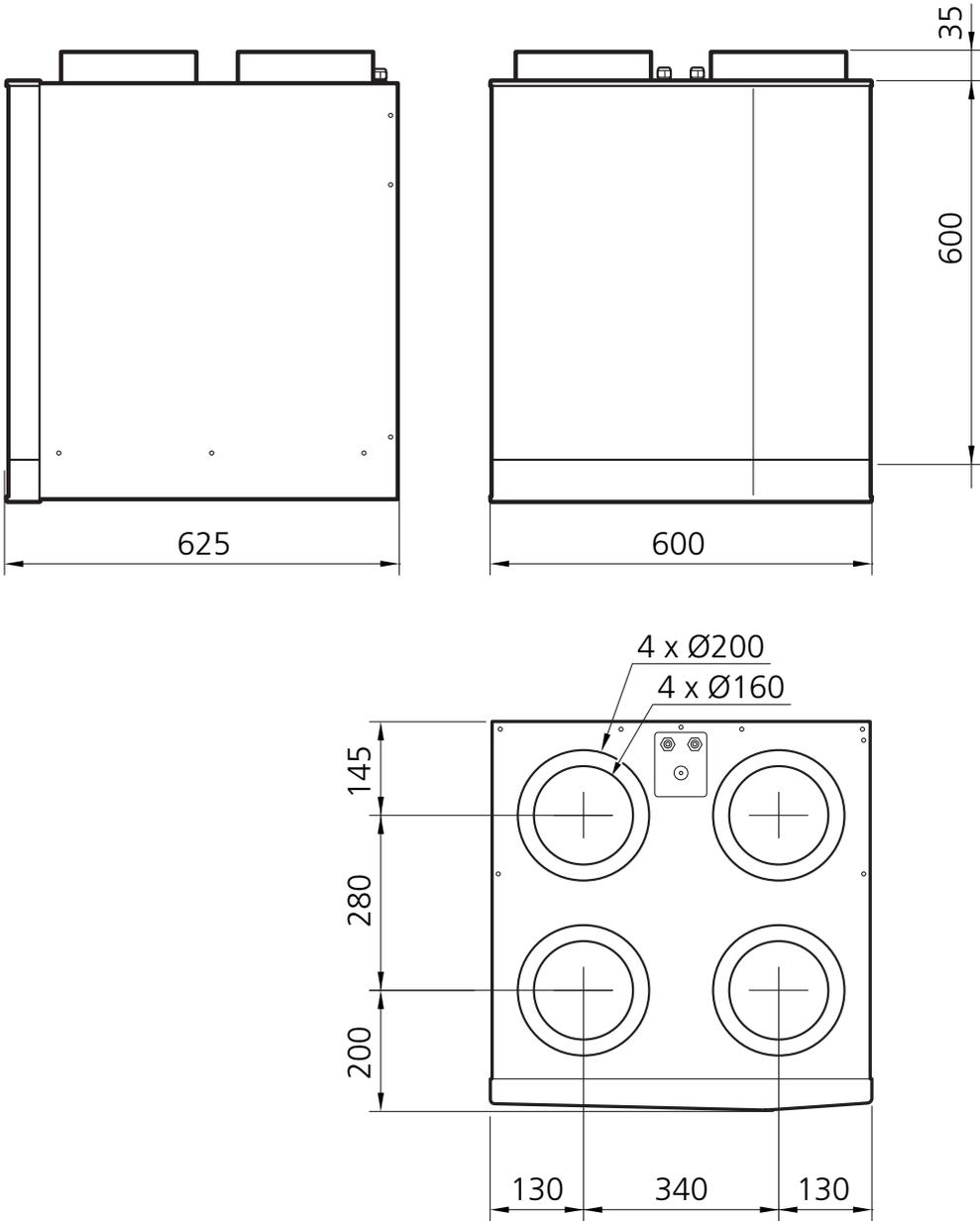
Part no. 067 522

Height 385 - 635 mm

Part no. 089 758

Technical data

Dimensions



Technical specifications

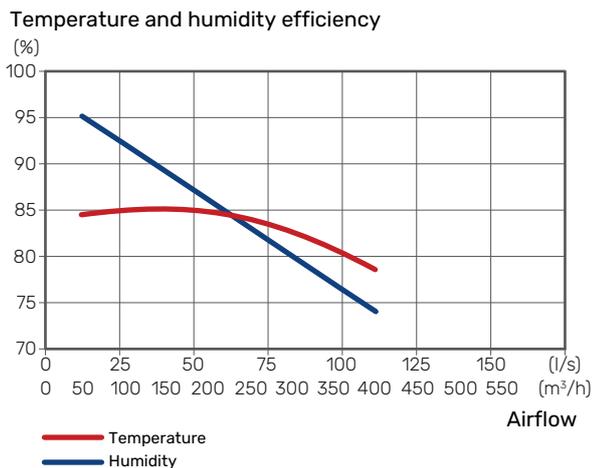
Type		ERS S40
Electrical data		
Supply voltage	V	230 V ~ 50Hz
Fuse	A	10
Power, re-heater	W	1000
Driving power fan	W	2 x 90
Enclosure class		IP X1B
Ventilation		
Filter type, exhaust air filter		Coarse 65%
Filter type, supply air filter		ePM1 55%
Noise		
Sound power level ($L_{W(A)}$) ¹	dB(A)	51
Sound pressure level ($L_{P(A)}$) at 1 m ²	dB(A)	40
Pipe connections		
Ventilation \emptyset	mm	160
Dimensions and weight		
Efficiency class ³		A
Length, supply cable	m	2.4
Length, communication cable	m	2.4
Width	mm	600
Height	mm	600
Depth	mm	620
Weight	kg	45
Part No.		066 242

¹ 89 l/s (320 m³/h) at 50 Pa

² 72 l/s (260 m³/h) at 50 Pa

³ Scale for efficiency class: A+ to G.

Temperature and humidity efficiency according to EN 13141-7

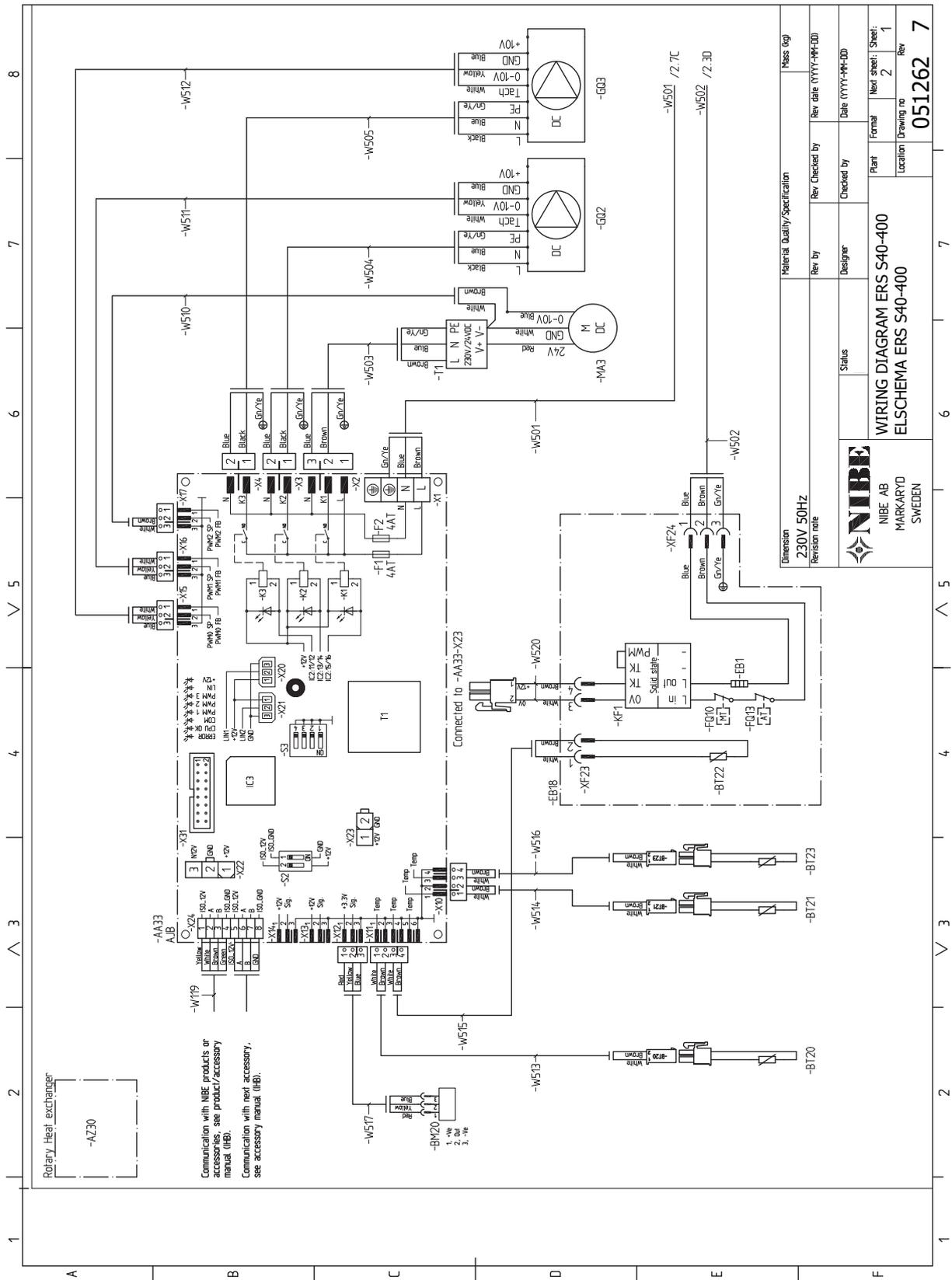


RPM: 25 Outdoor air: 7 °C RH 80% Exhaust air: 20 °C RH 38%

Energy labelling

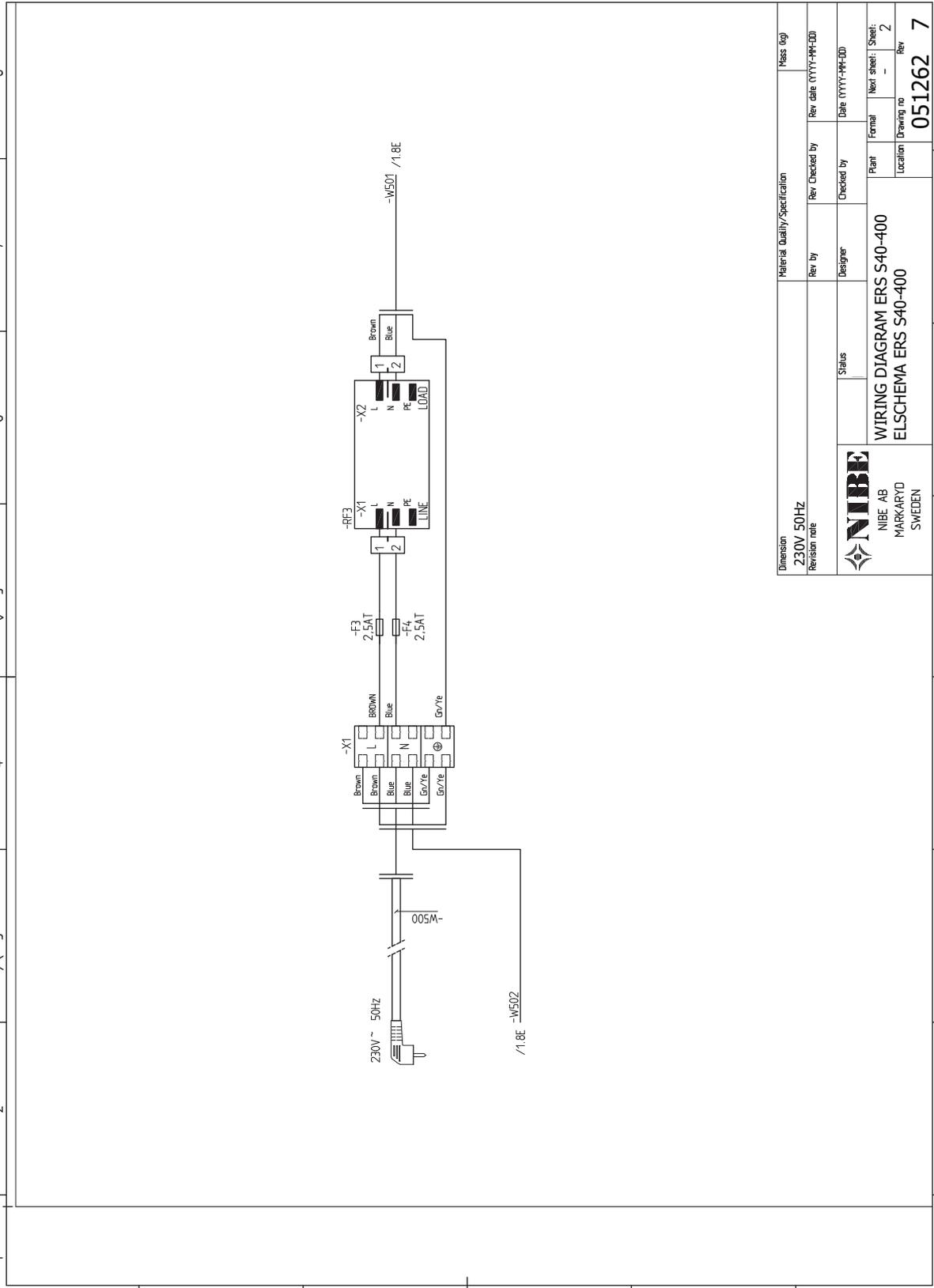
Supplier		NIBE
Model		ERS S40-400
Specific energy consumption (SEC)	kWh/(m ² year)	Average: -37.9 Cold: -74.8 Warm: -14.2
Energy efficiency class		A
Declared typology		RVU, Bidirectional
Type of drive		Variable speed drive
Type of heat recovery system		Regenerative
Thermal efficiency of heat recovery		82
Maximum air flow rate	m ³ /h	460
Electric power input of the fan drive at maximum flow rate	W	178
Sound power level (LWA)	dB	51
Reference flow rate	m ³ /s	0.089
Reference pressure difference	Pa	50
Specific power input (SPI)	W/m ³ /h	0.25
Control factor and control typology		Local demand control (0.85)
External leakage rates	%	Internal: 3.2 External: 0.6
Information about filter warning		See user manual.
Information about supply/exhaust grilles in the facade		See section General ventilation connections on page 14.
Information about pre-/disassembly		See section Recovery on page 5. This installer manual can also be accessed at nibe.eu .
The annual electricity consumption	kWh/year	275
Annual heating saved, kWh primary energy per year	kWh prim/year	Average: 4,413 Cold: 8,633 Warm: 1,996

Electrical circuit diagram



1 2 3 4 5 6 7 8

A B C D E F



Dimension		Material Quality/Specification		Mass (kg)	
230V 50Hz		Rev by		Rev date (YYYY-MM-DD)	
Revision note		Designer		Date (YYYY-MM-DD)	
Status		Checked by		Plant	
NIBE		WIRING DIAGRAM ERS S40-400		Formal	
NIBE AB		ELSCHEMA ERS S40-400		Next sheet: Sheet: 2	
MARKARYD		Location		Drawing no	
SWEDEN		051262		Rev	
		7		7	

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