



ProNordic S140R

ART.NR. 171200

EN

INSTALLATION AND MAINTENANCE INSTRUCTION

Air handling unit





See the following documents for further information about the product:

118076 automatic control instructions

118109 wiring diagram

For spare parts, see www.flexit.com

- This device may be used by children aged 8 and over, by people with physical, sensory or mental functional impairments and by people who lack experience or knowledge, provided that they are supervised or have been instructed in how to use the device safely and have been informed about and understand any risks.
- Children may not play with the device.
- Children may not perform cleaning and user maintenance without supervision

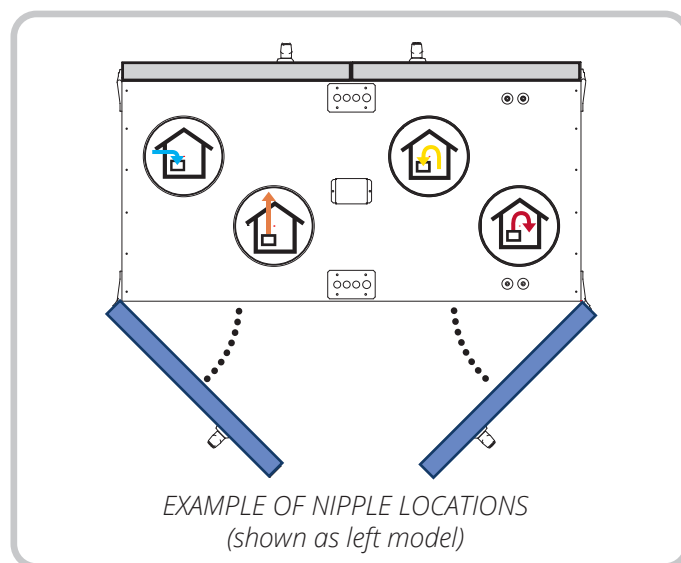
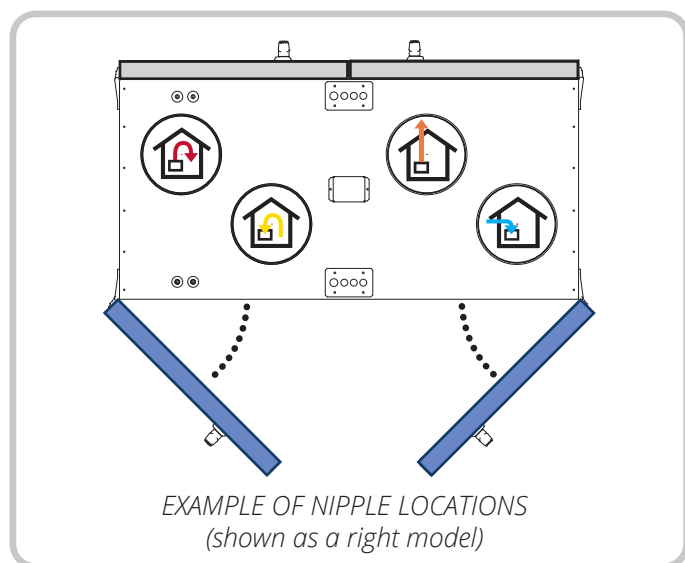
Our products are subject to continuous development and we therefore reserve the right to make changes. We also disclaim liability for any printing errors that may occur.


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Symbols used


These products bear a number of symbols used for labelling the actual product and in installation and user documentation.



 **DANGER!** When a text box is this colour, it means that a life-threatening or serious personal injury may be the consequence of not following the instructions.

 **NOTICE!** When a text box is this colour, it means that a poor utilisation ratio or product operating issues may be the consequence of not following the instructions.

 **CAUTION!** When a text box is this colour, it means that material damage may be the consequence of not following the instructions.

 **INFO!** When a text box is this colour, it means that it contains important information.



SAFETY INSTRUCTION



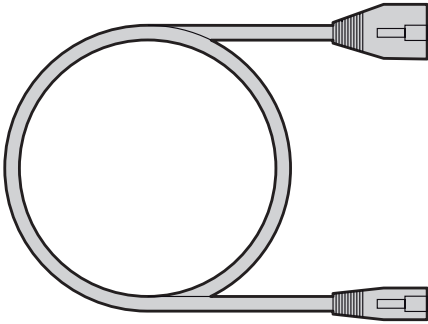
- To avoid the risk of fire, electric shock or injury, read all the safety instructions and warning texts before using the unit.
- All electrical connections must be carried out by qualified electricians.
- The unit must not be used to extract combustible or flammable gases.
- It is the installer's responsibility to carry out a full safety and function assessment of the appliance.
- All electrical power to the unit must be shut off before carrying out service or maintenance, including cleaning:
 1. Switch off the unit in the following menu on the handheld terminal:
'Start page > SERVICE SWITCH > Off'.
 2. Wait until the unit has stopped.
 3. Switch off the all-pole switch.



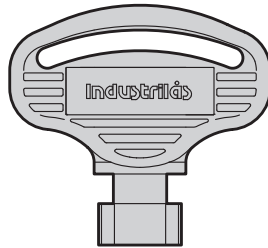
- This unit is only designed for ventilation air in homes and commercial buildings.
- To maintain a good indoor climate, comply with regulations and avoid condensation damage, the unit must never be stopped apart from during service/ maintenance or in connection with an accident.
- The unit must not be operated without the filters being in place.
- All plumbing work must be carried out by an authorised plumber.
- The location of the water battery must be approved by a plumber owing to the risk of water leaks.
- Check whether the unit's operating voltage is 400V or 230V.
- The electric battery must be configured in accordance with the operating voltage.

1. Items included

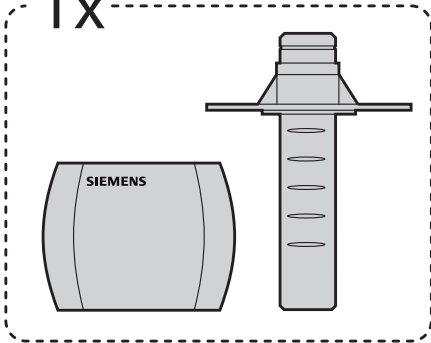
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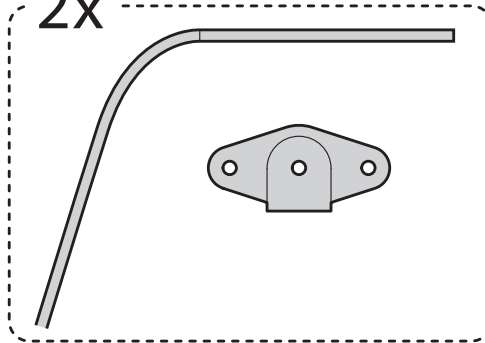
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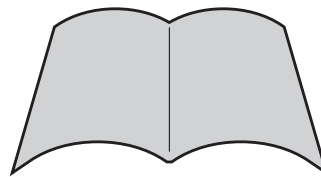
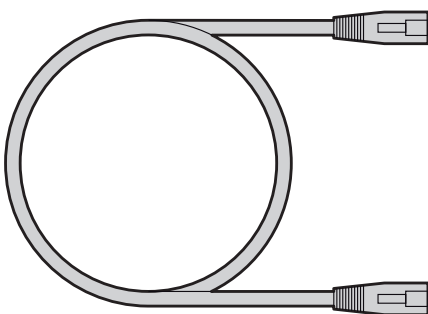
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2x



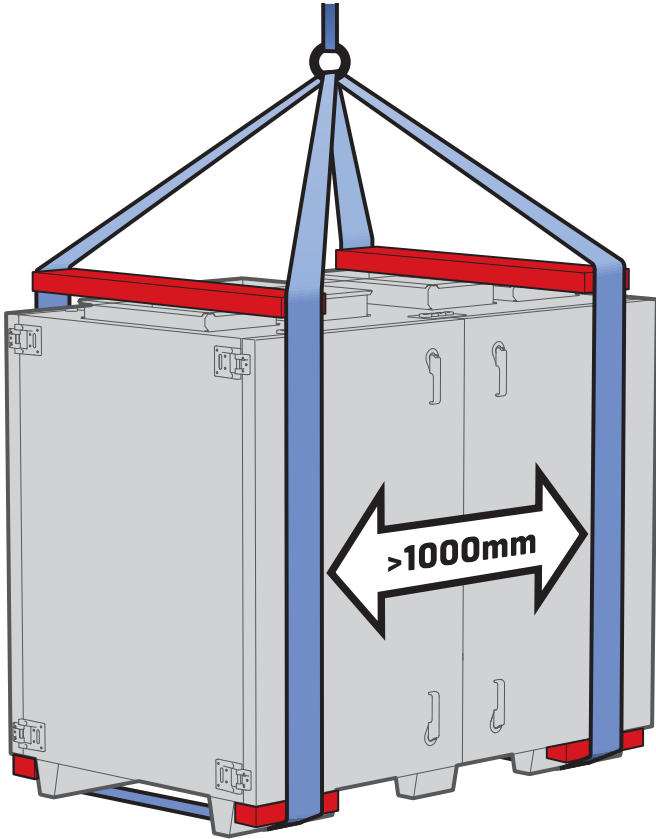
1x



118246 - installation and maintenance instructions
118076 - automatic control manual
118109 - wiring diagram

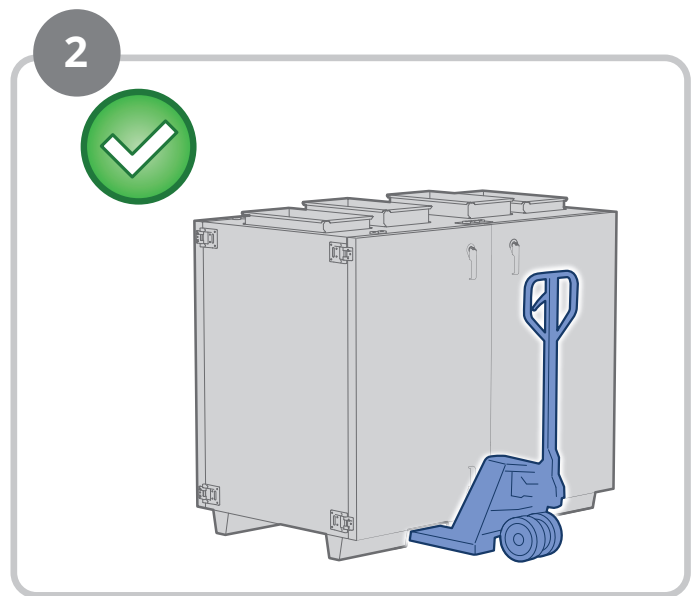
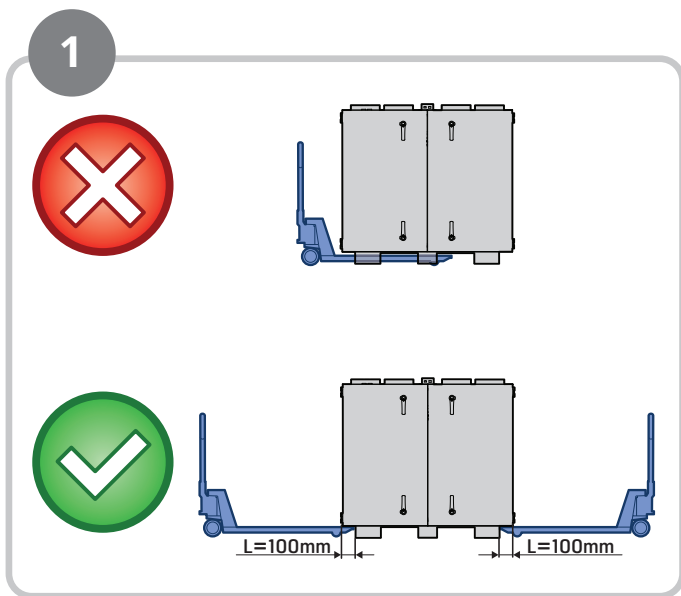
2. Inward transport

2.1. Transport using lifting straps



The unit must be stored in a dry environment to avoid damage to the electronics.

2.2. Transport using pallet truck

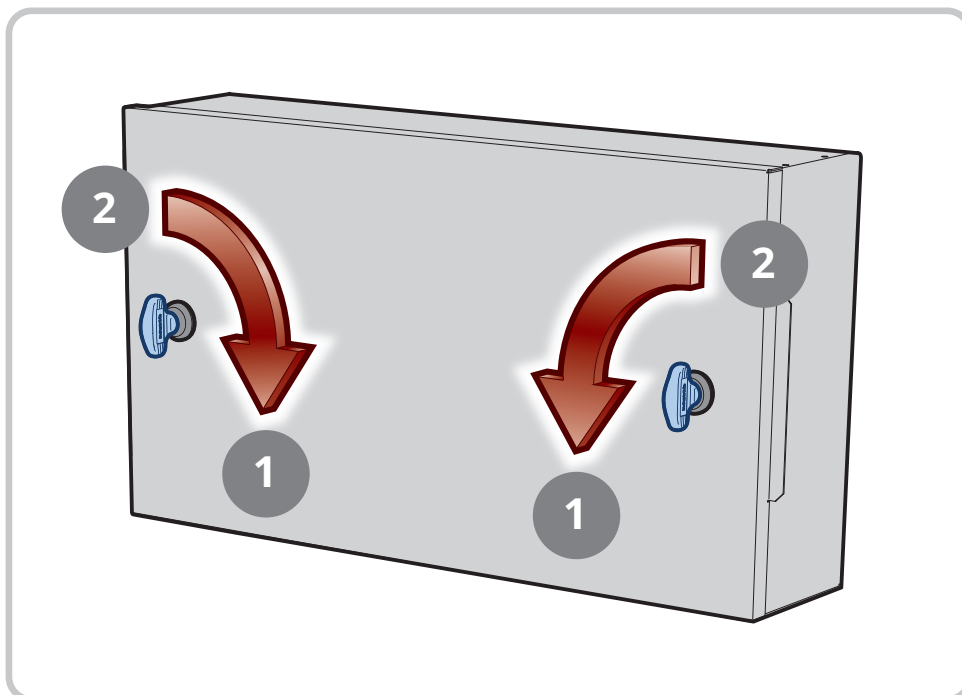
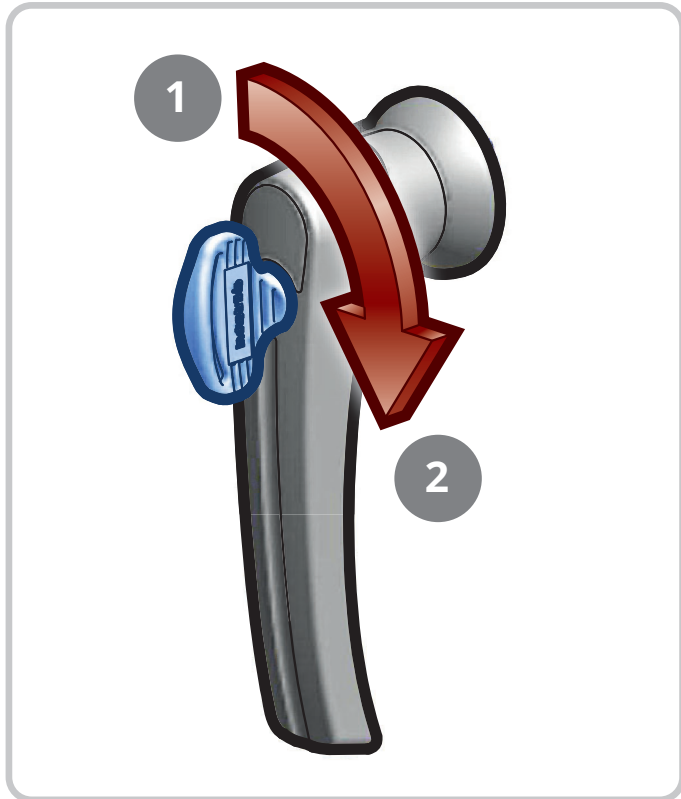


2.3. Operating the door locks

1	2
unlocked	locked



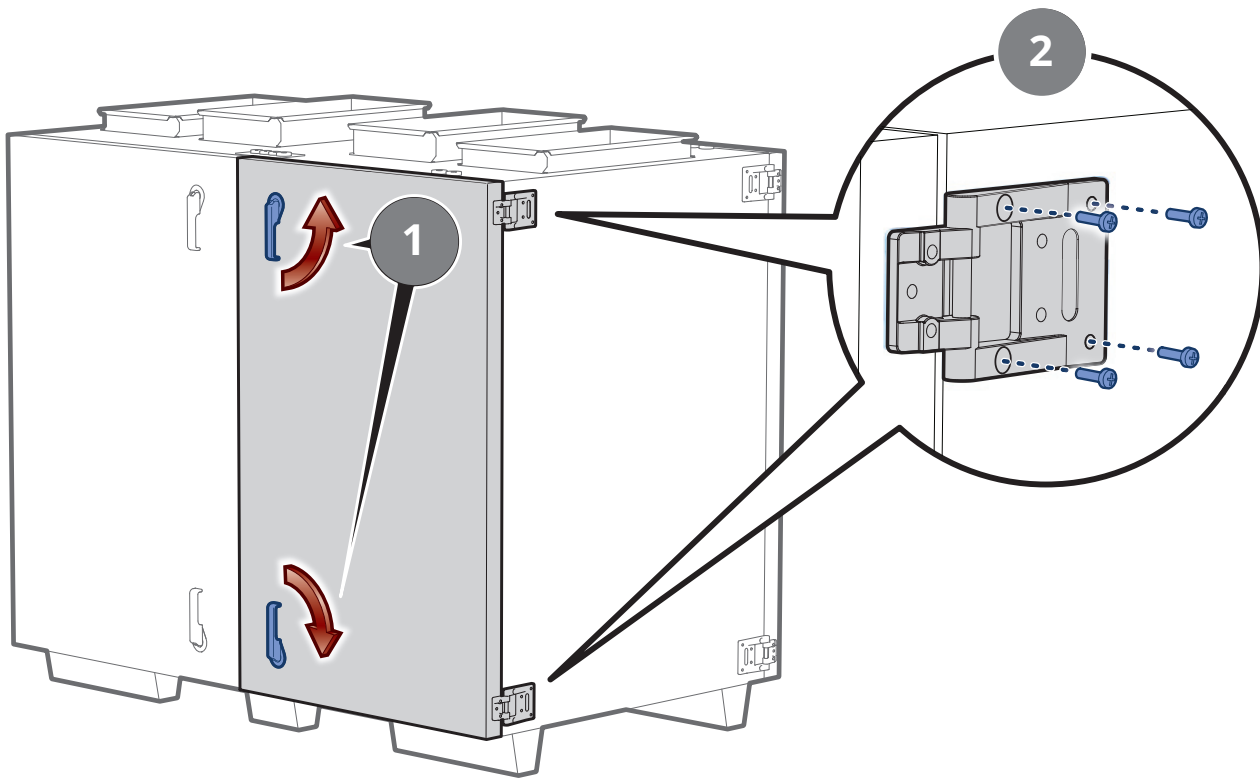
Unit and control cabinet are always to be locked.



2.4. If a door needs to be removed



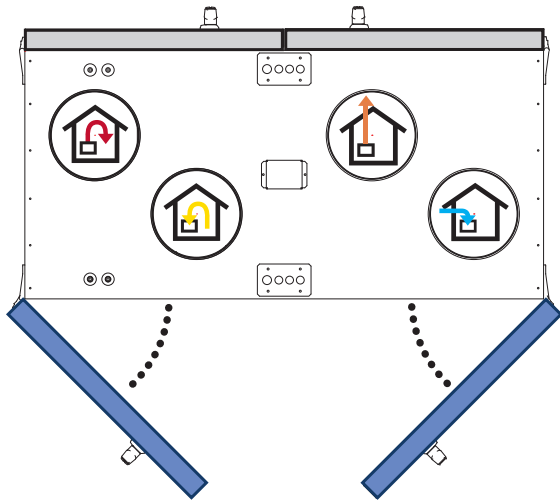
INFO! The dimensions and component weights are found in chap. 10. Reference data page 29.



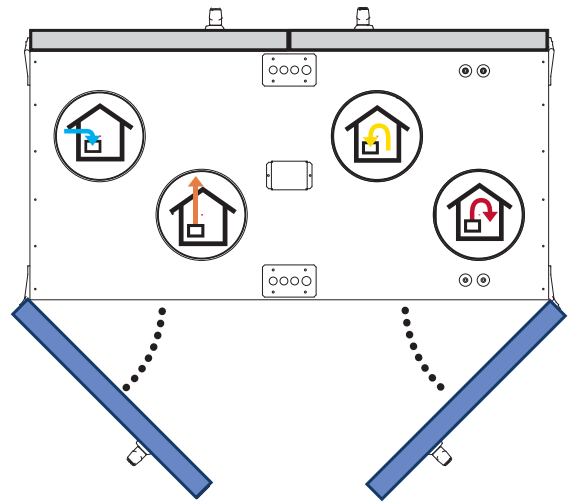
3. Rebuilding the unit models

Standard, outdoor air right →

Can be configured as left model

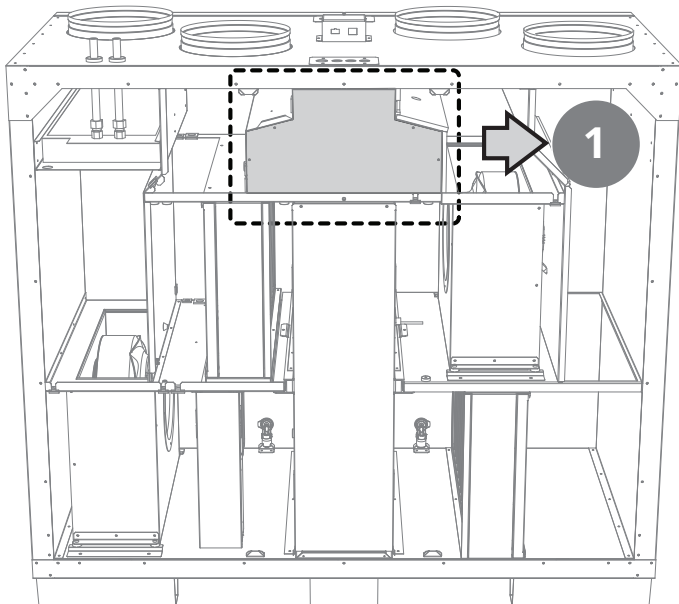


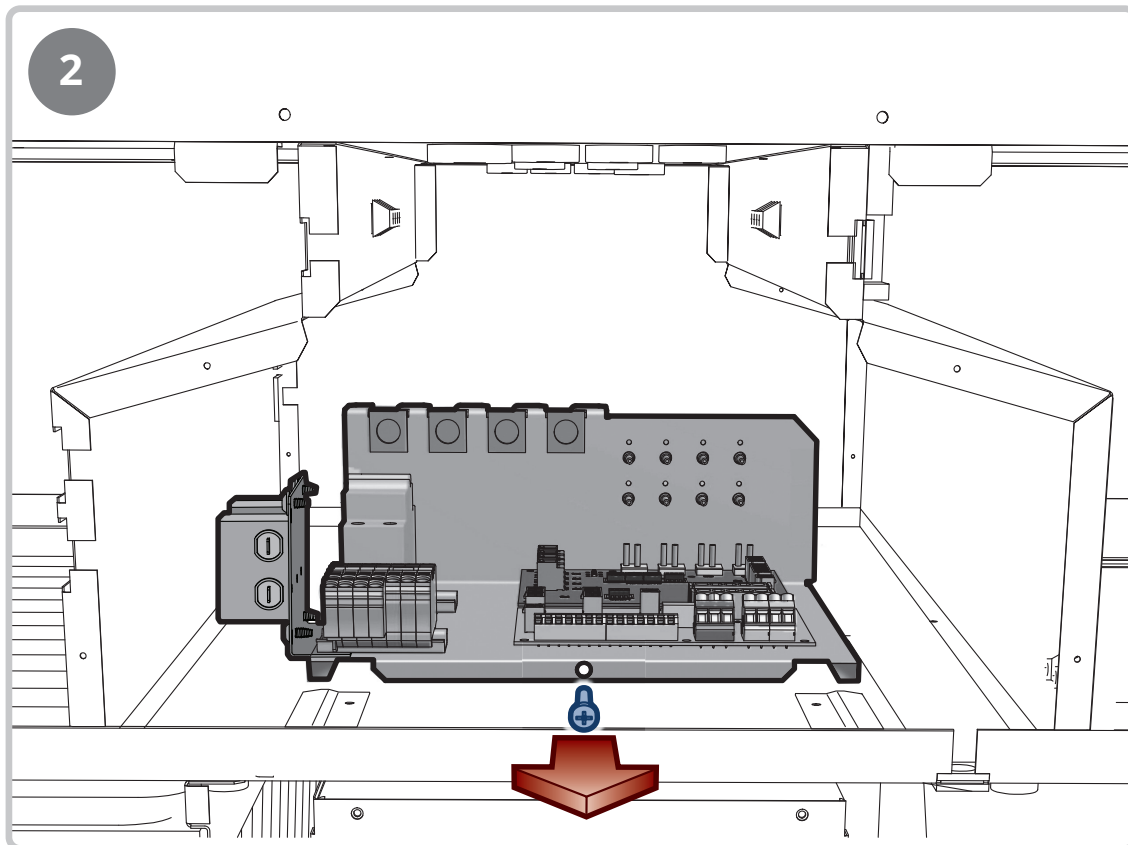
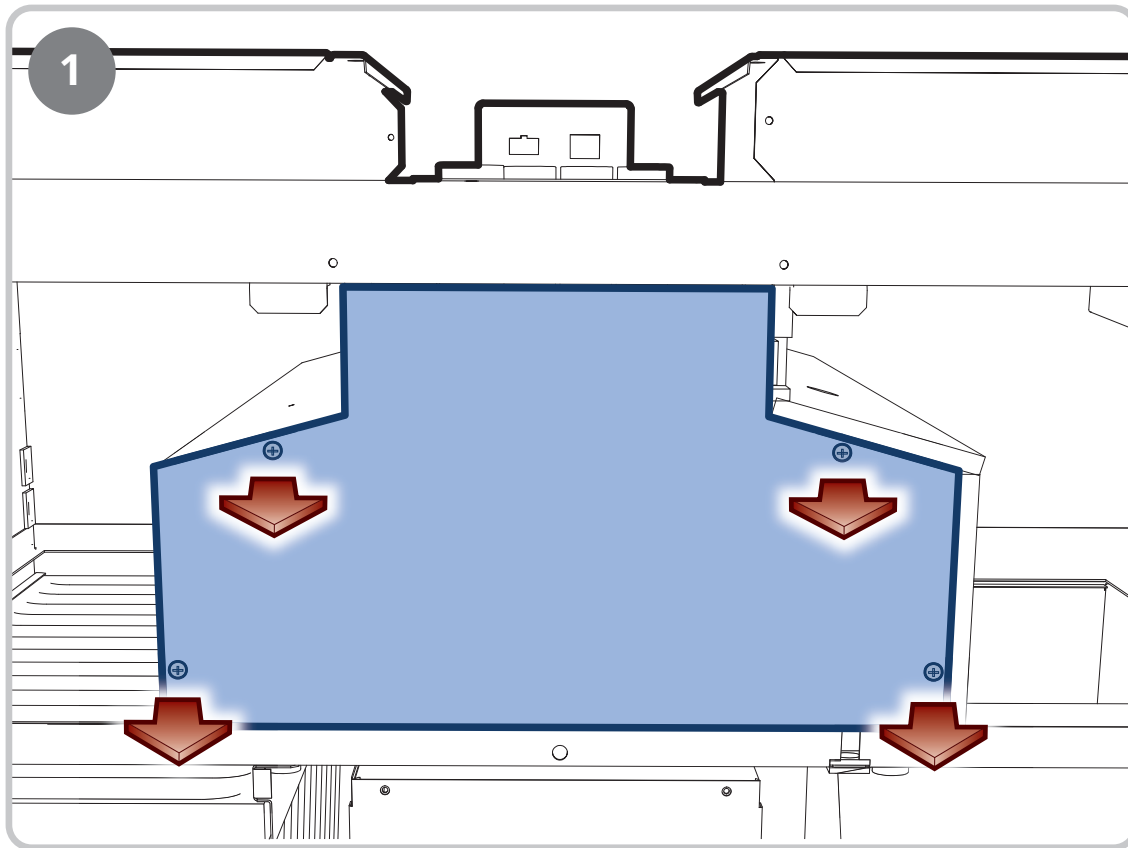
Right model

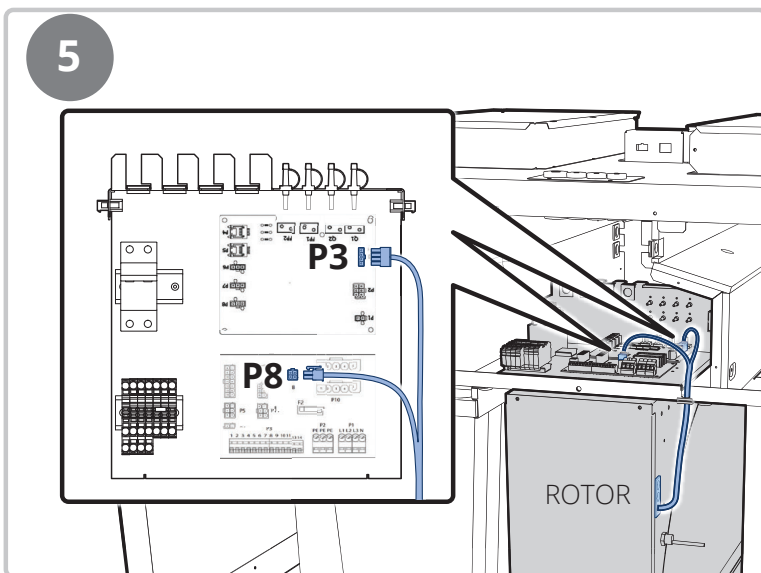
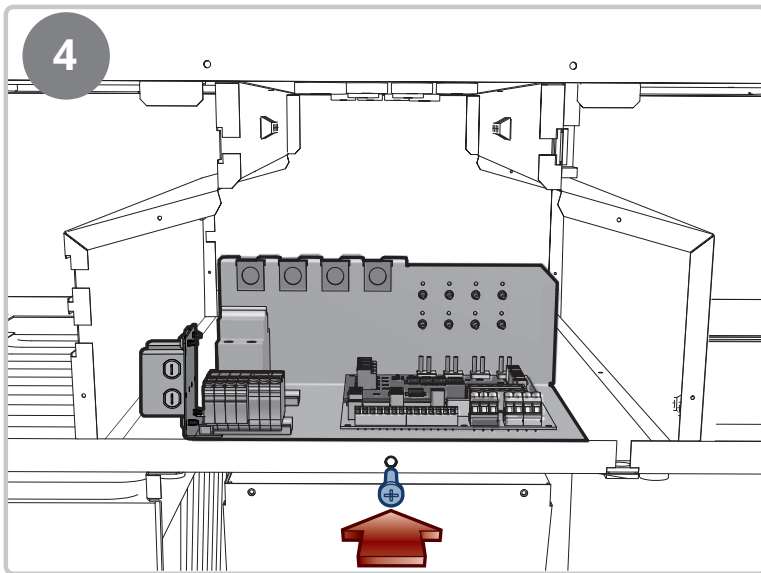
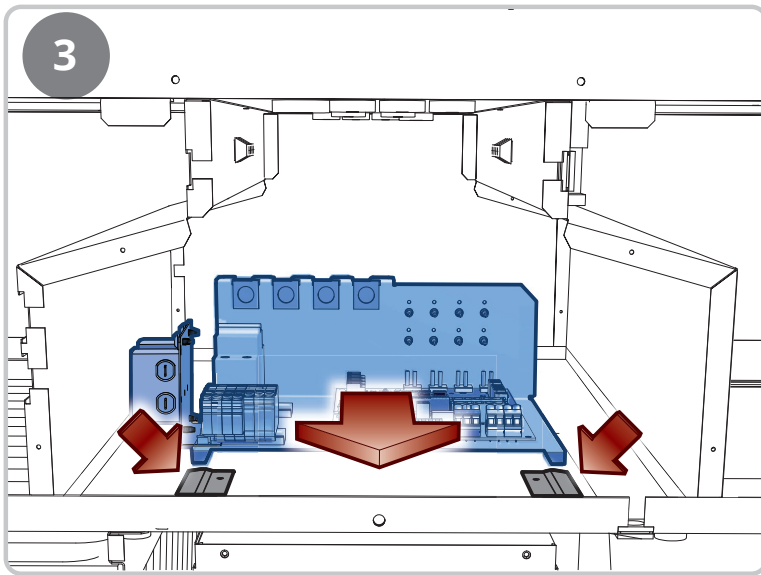


Left model

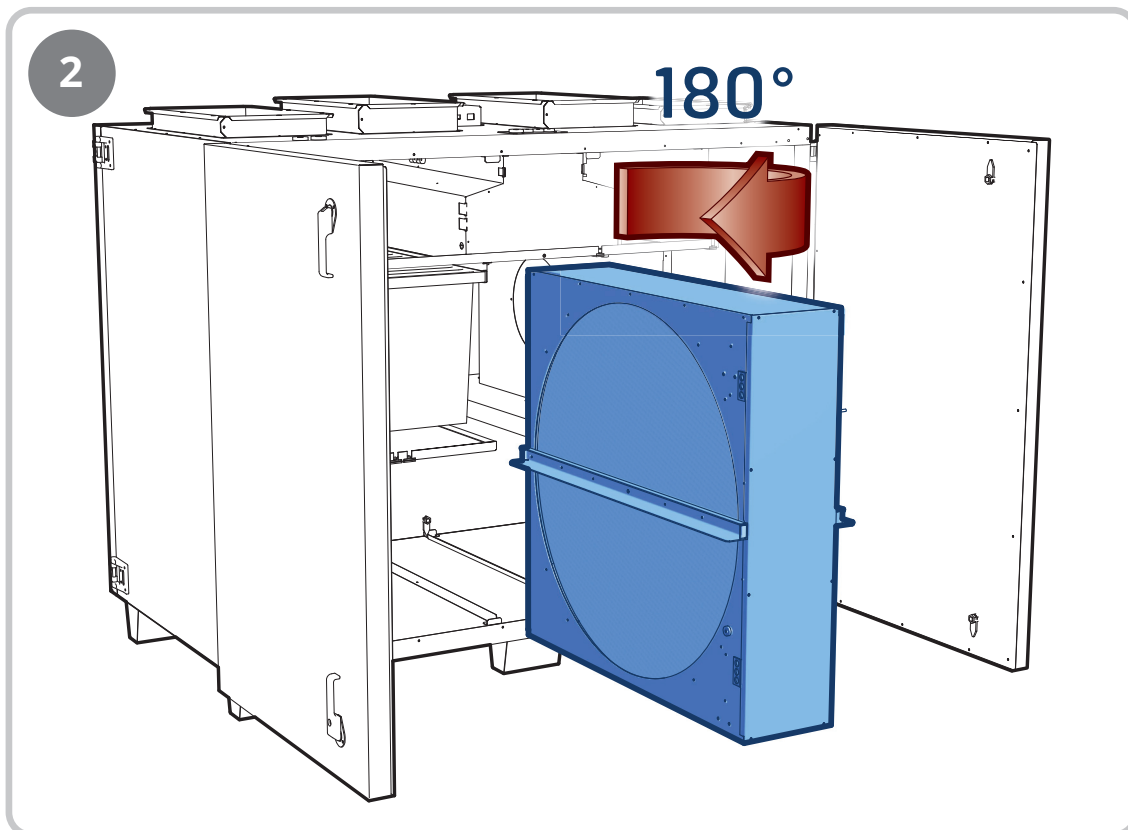
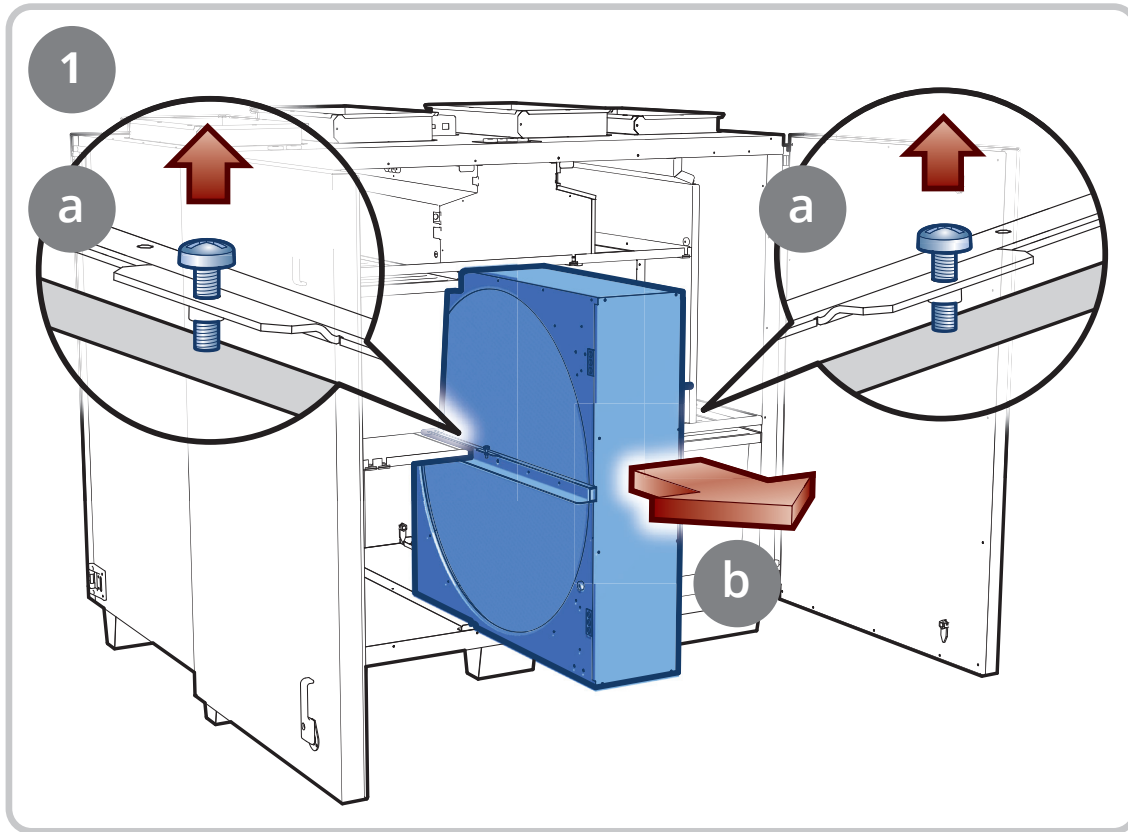
3.1. Finalization of right model

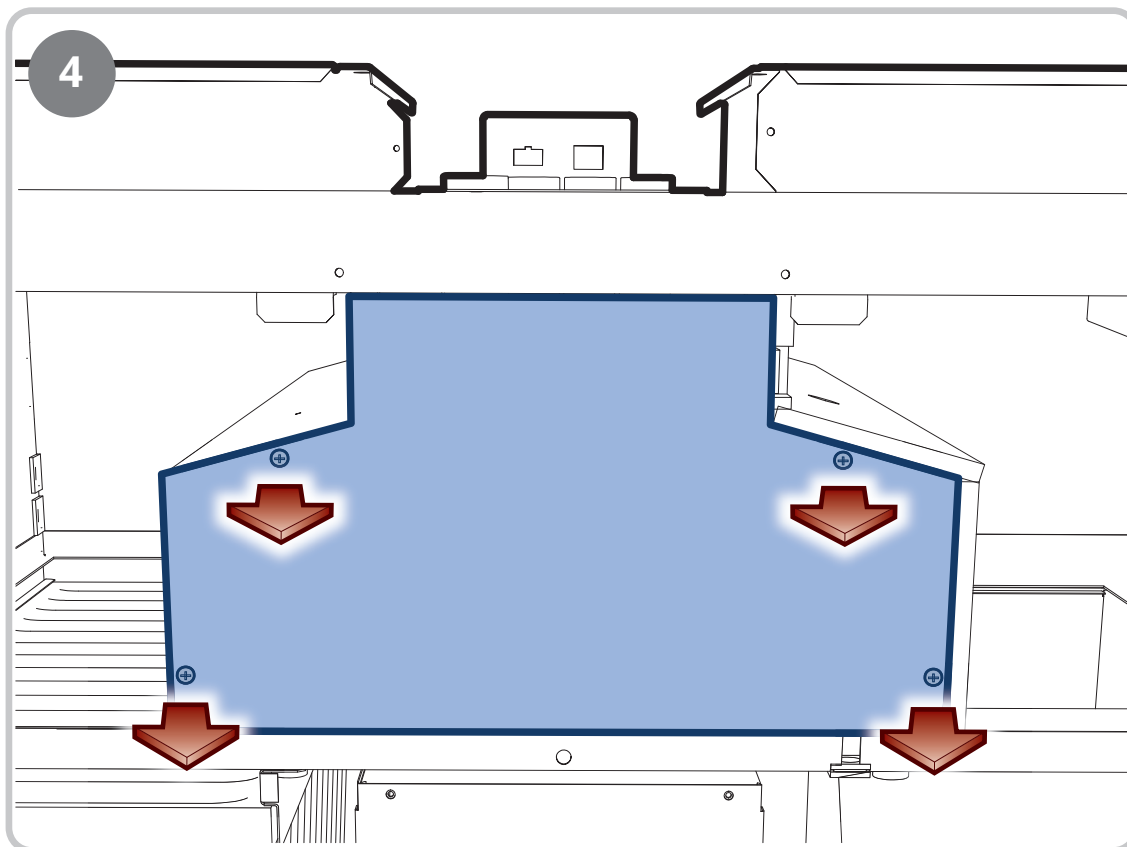
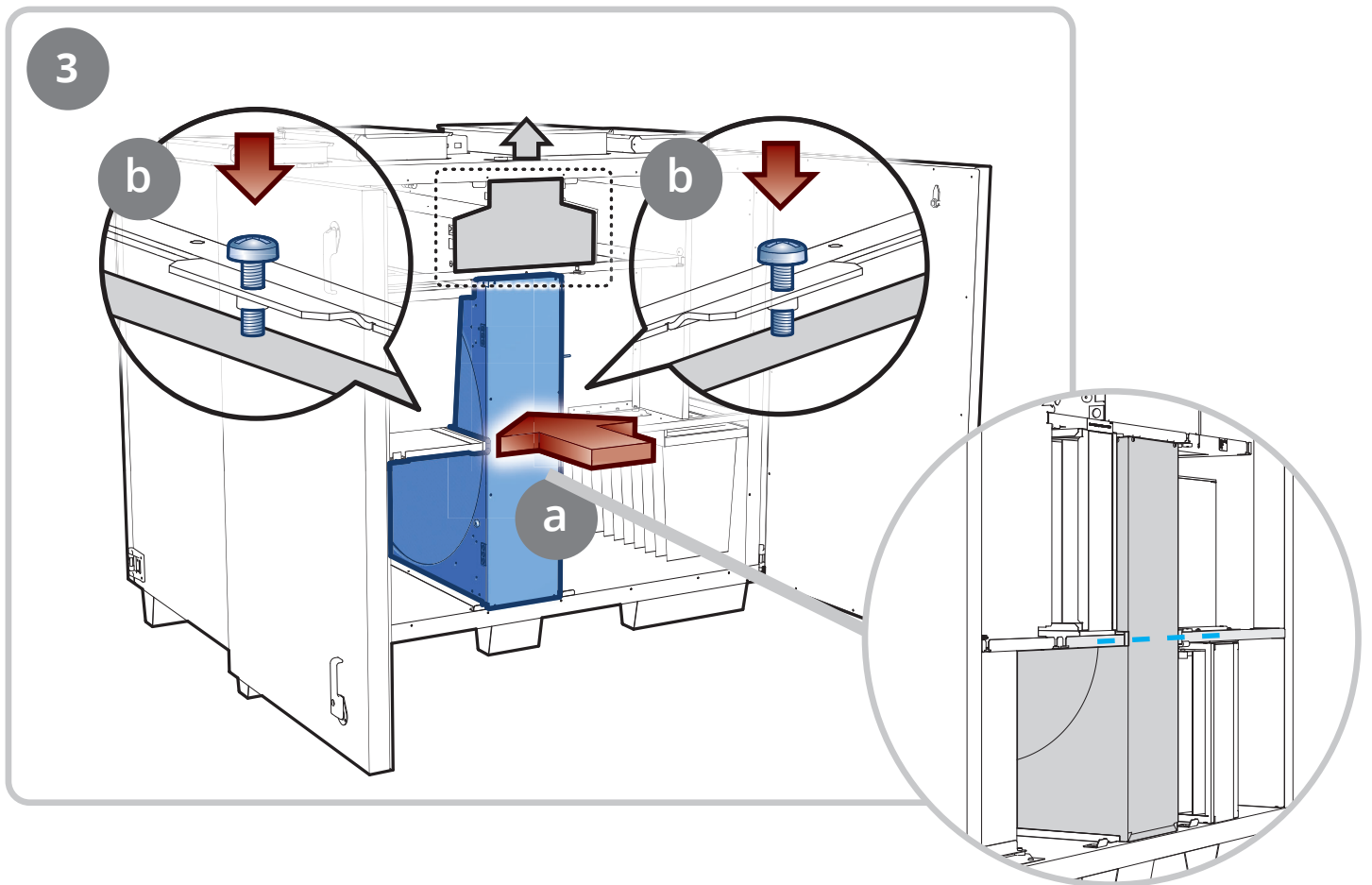


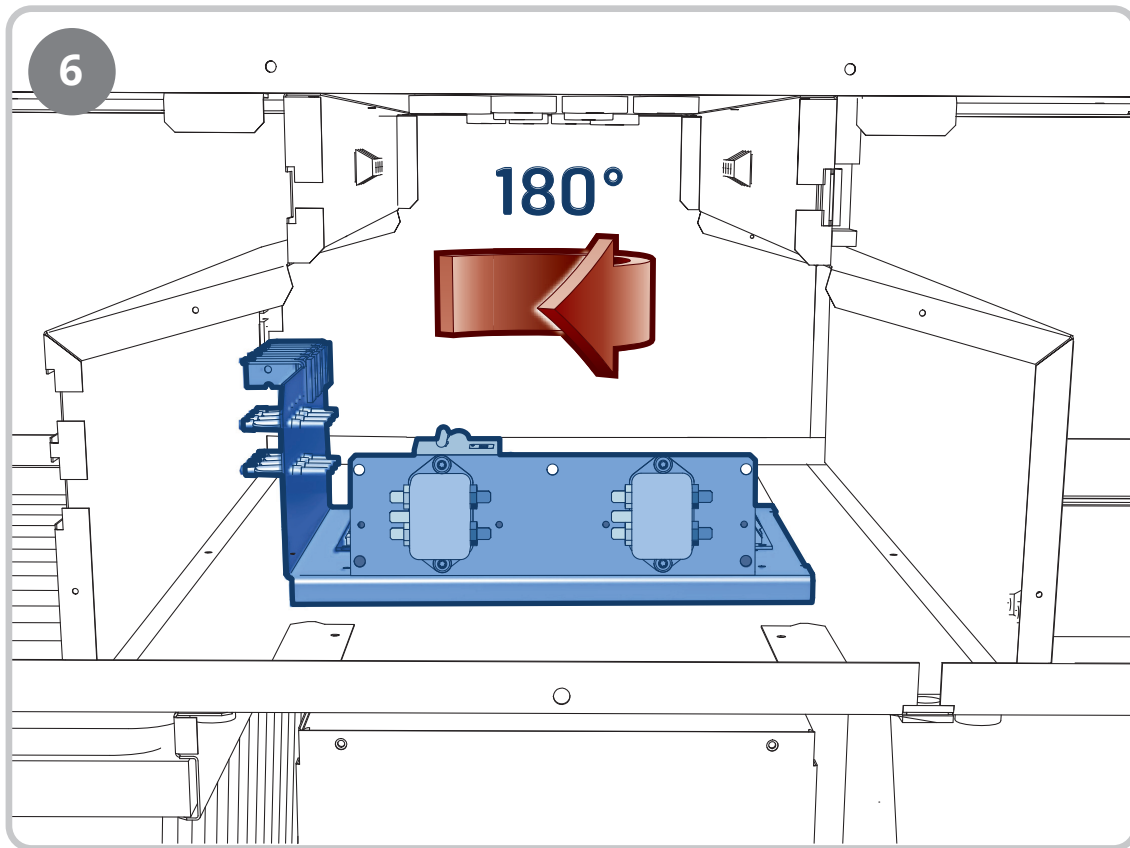
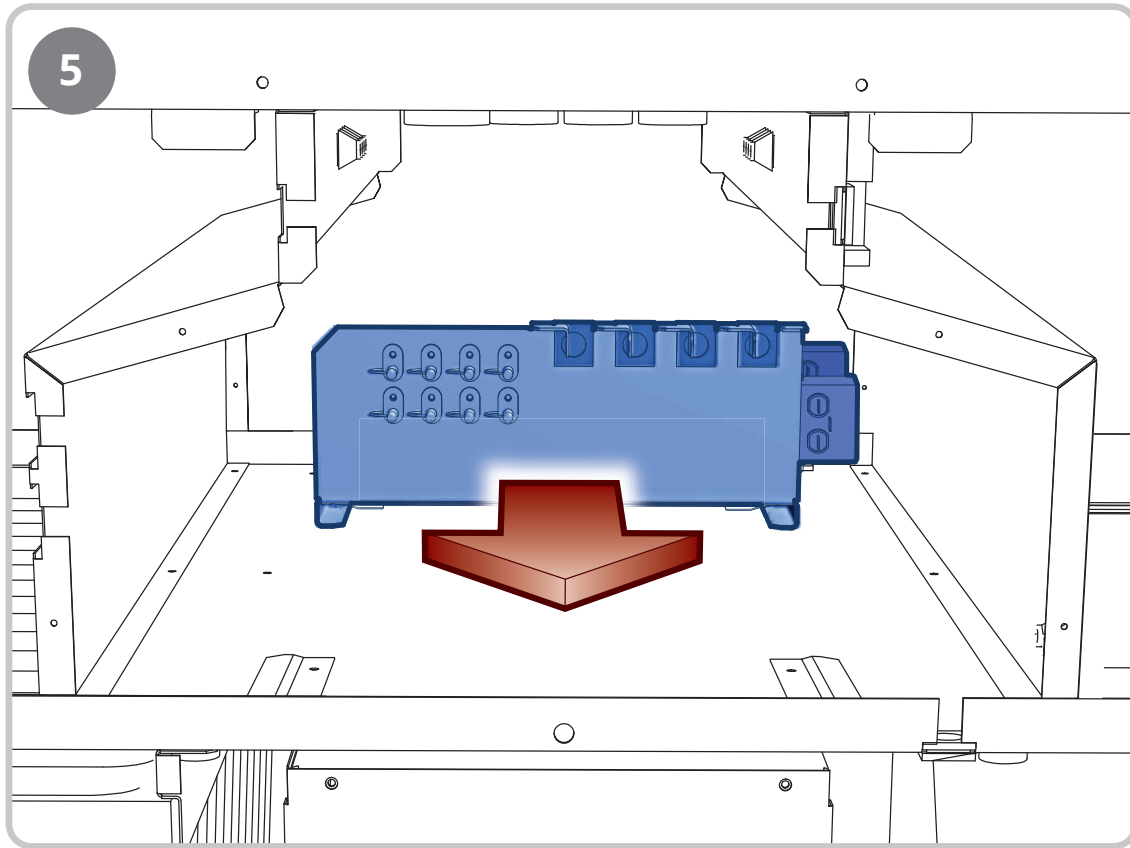


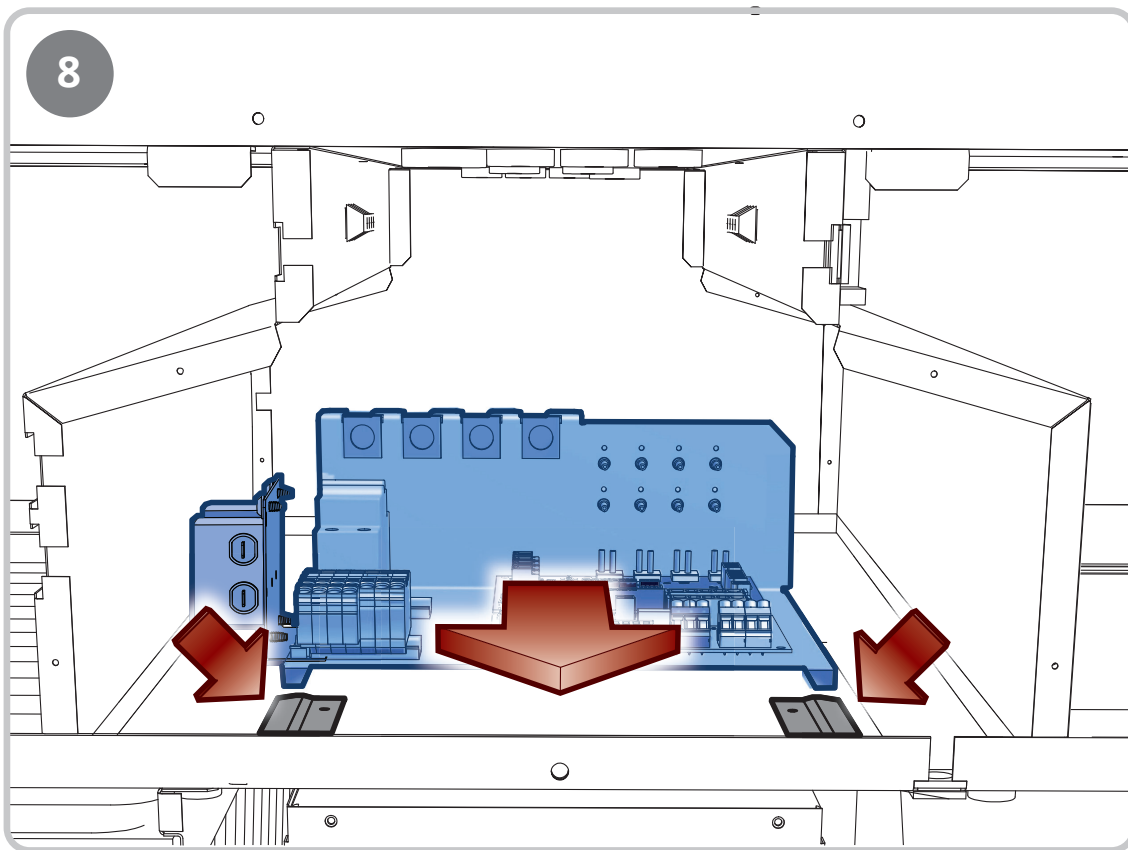
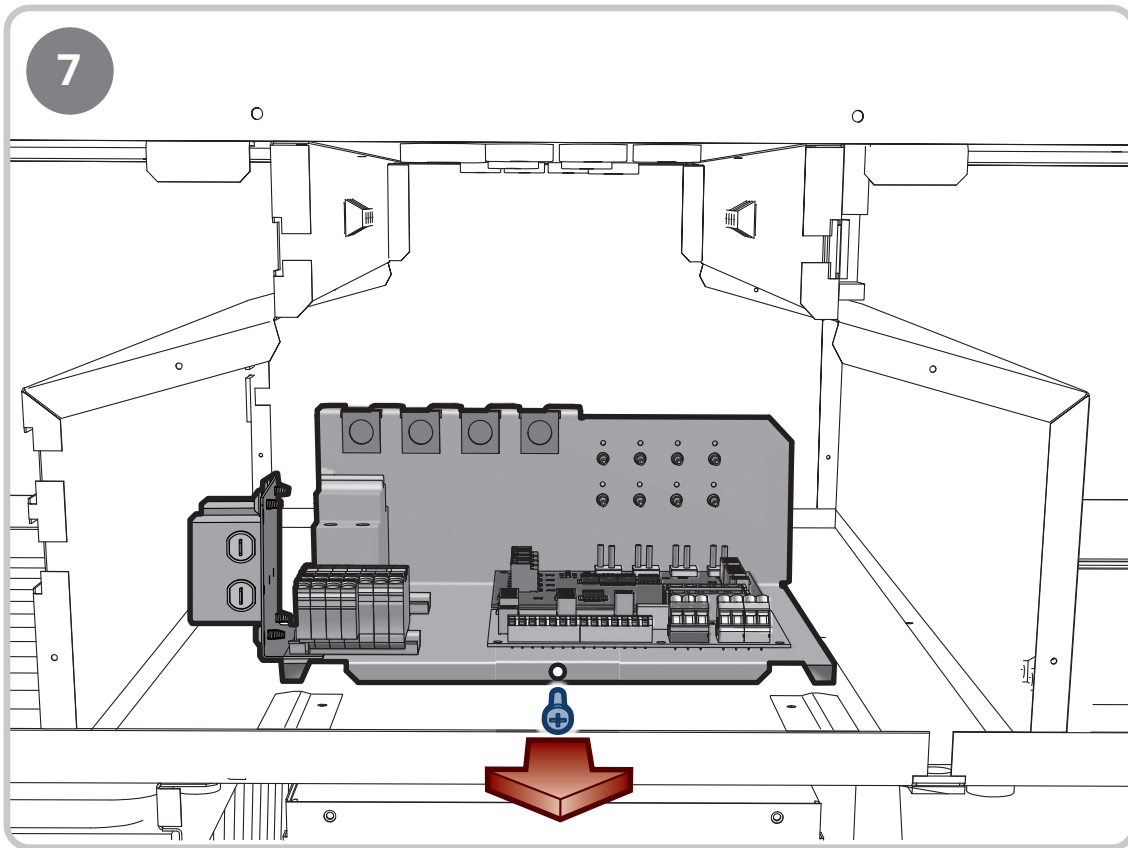


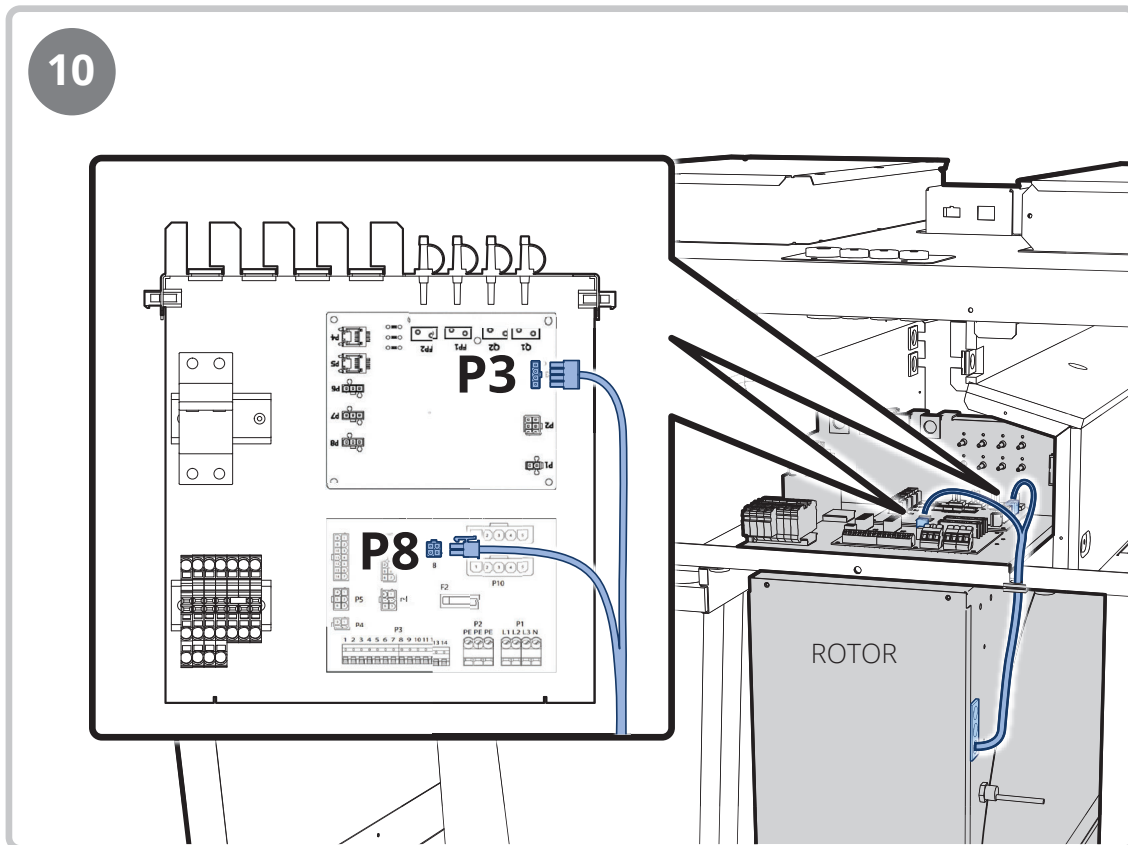
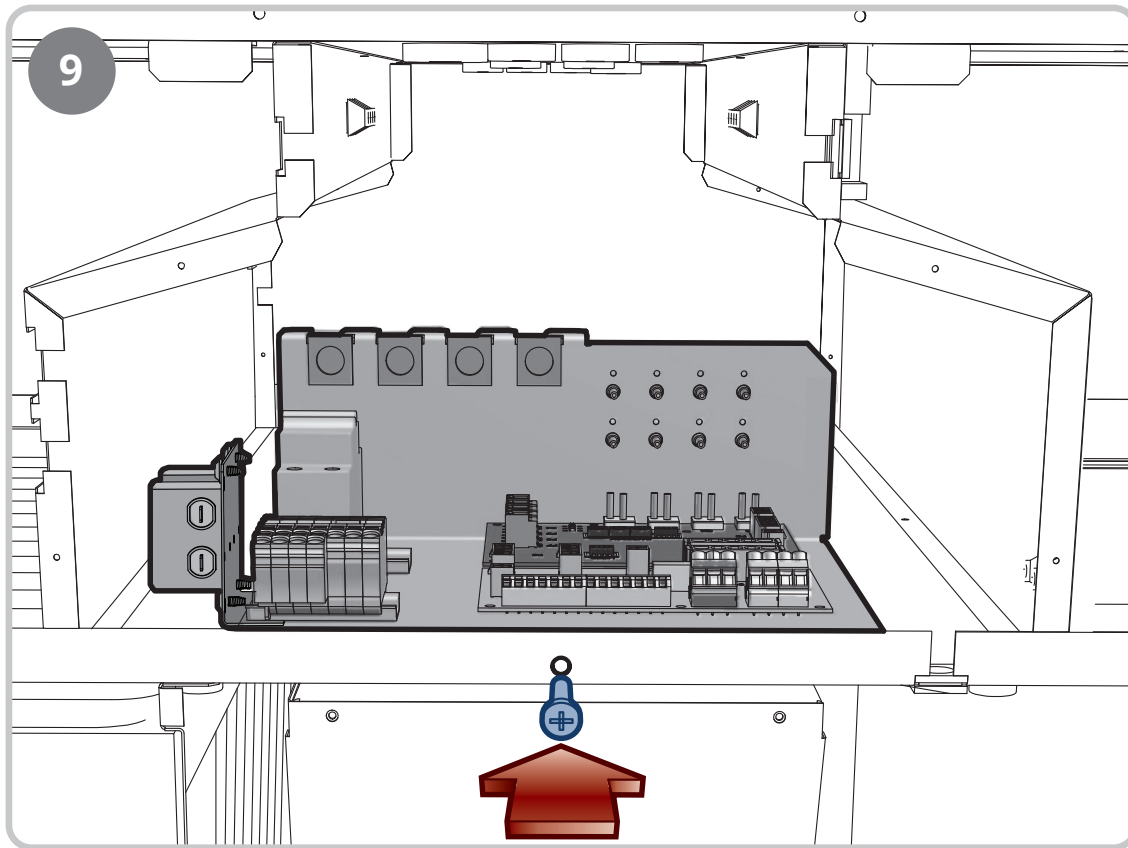
3.2. Configuration for left model











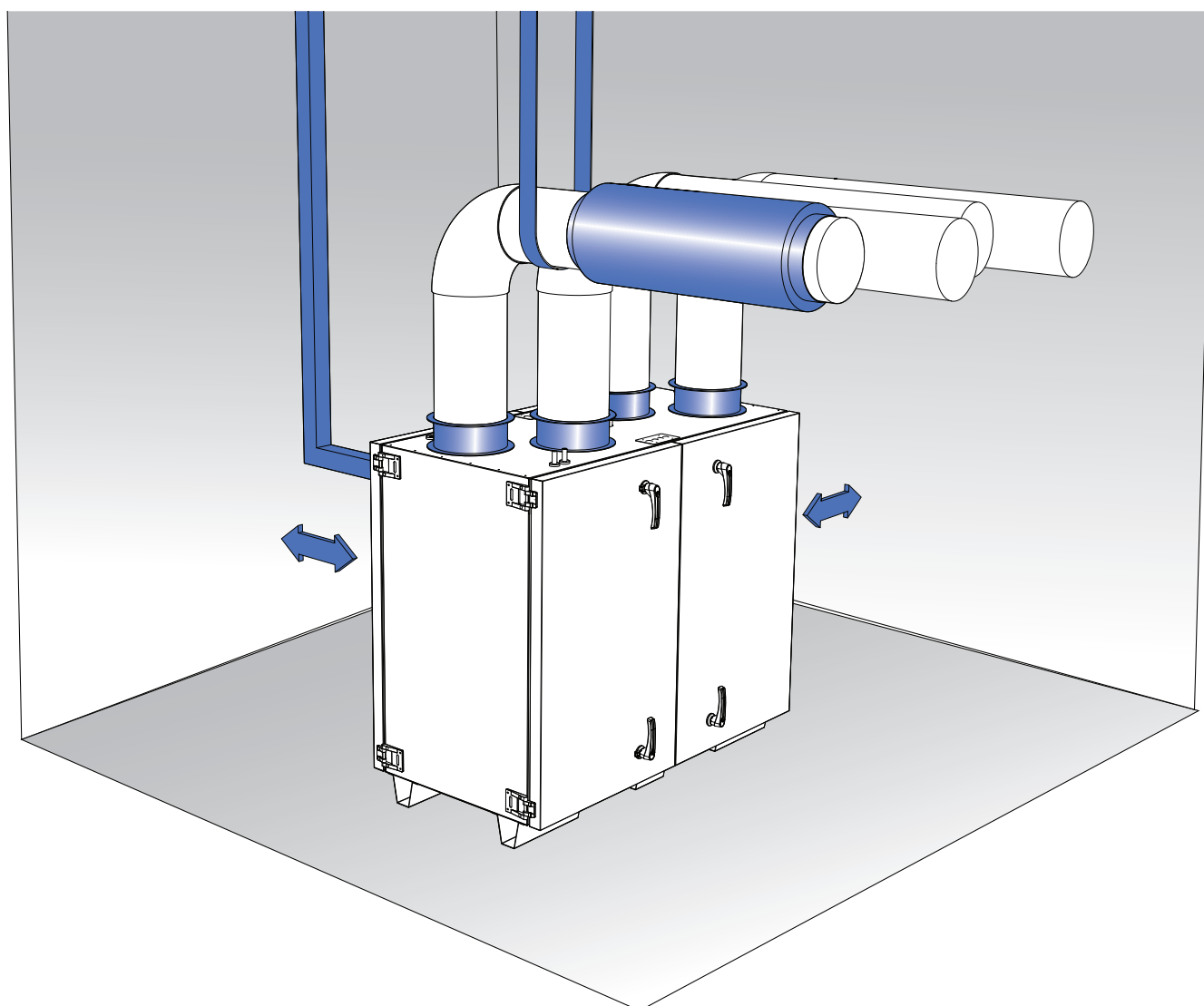
4. Assembly

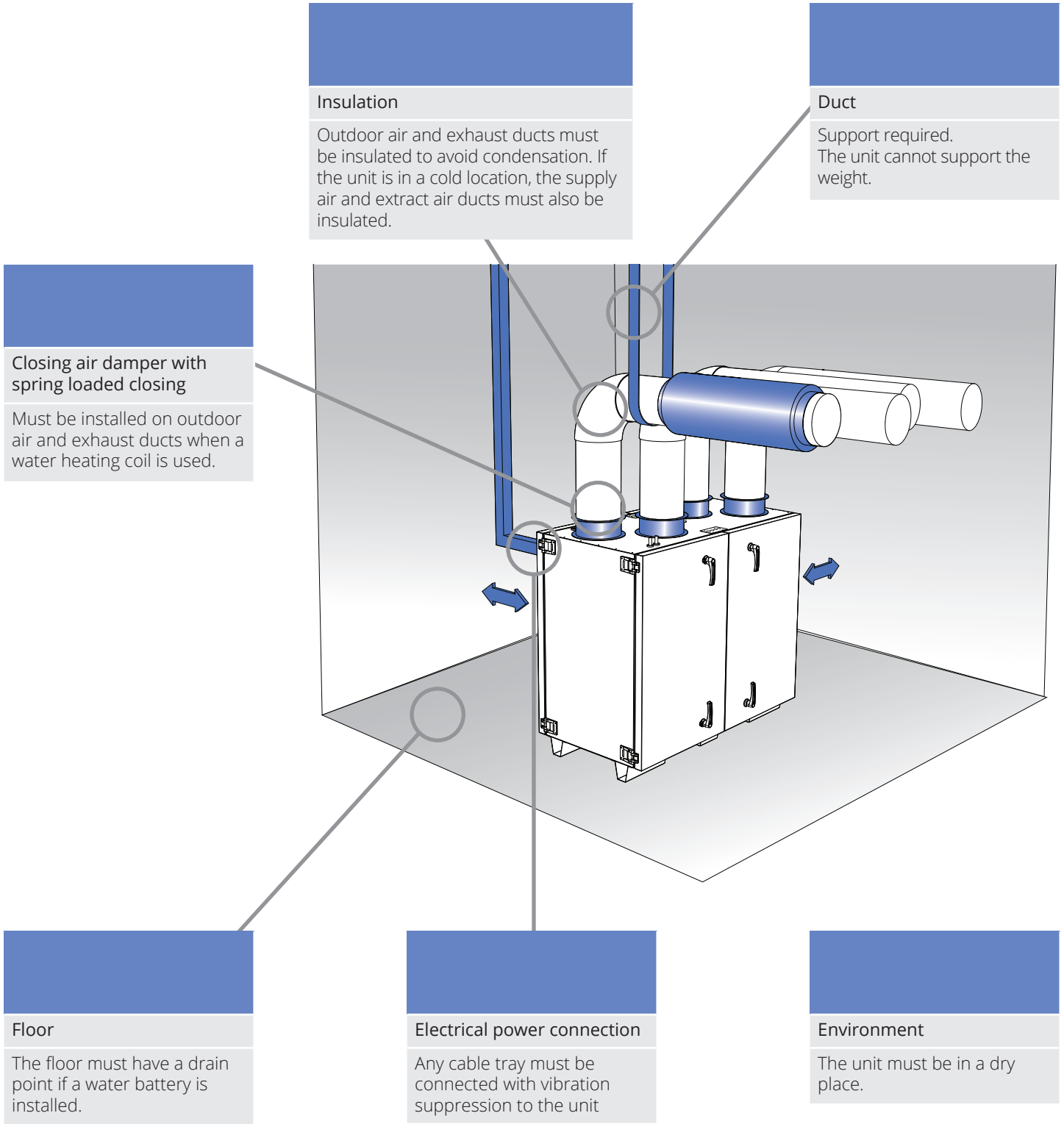
The unit must be placed in a dry location protected from the weather.



INFO! The space required for the servicing of the model is described in chap. 10.2. Space requirements page 29.

must	should
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Insulation
 Outdoor air and exhaust ducts must be insulated to avoid condensation. If the unit is in a cold location, the supply air and extract air ducts must also be insulated.

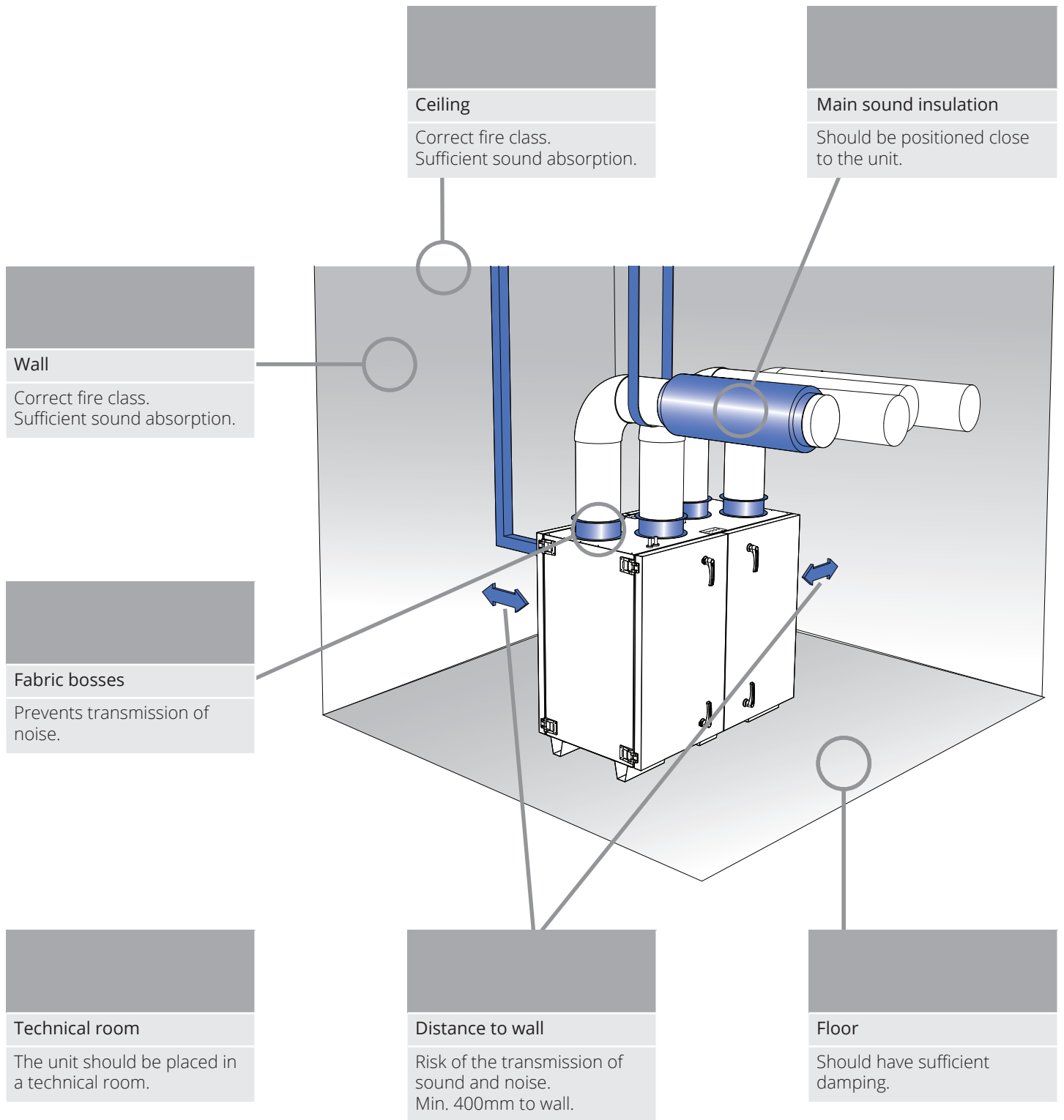
Duct
 Support required. The unit cannot support the weight.

Closing air damper with spring loaded closing
 Must be installed on outdoor air and exhaust ducts when a water heating coil is used.

Floor
 The floor must have a drain point if a water battery is installed.

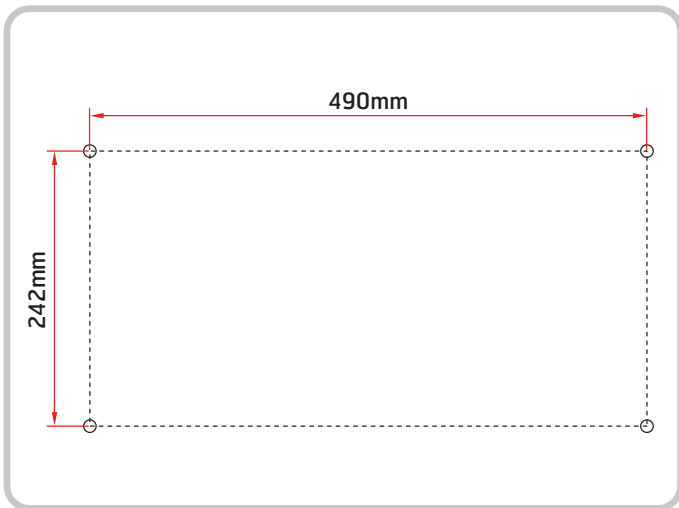
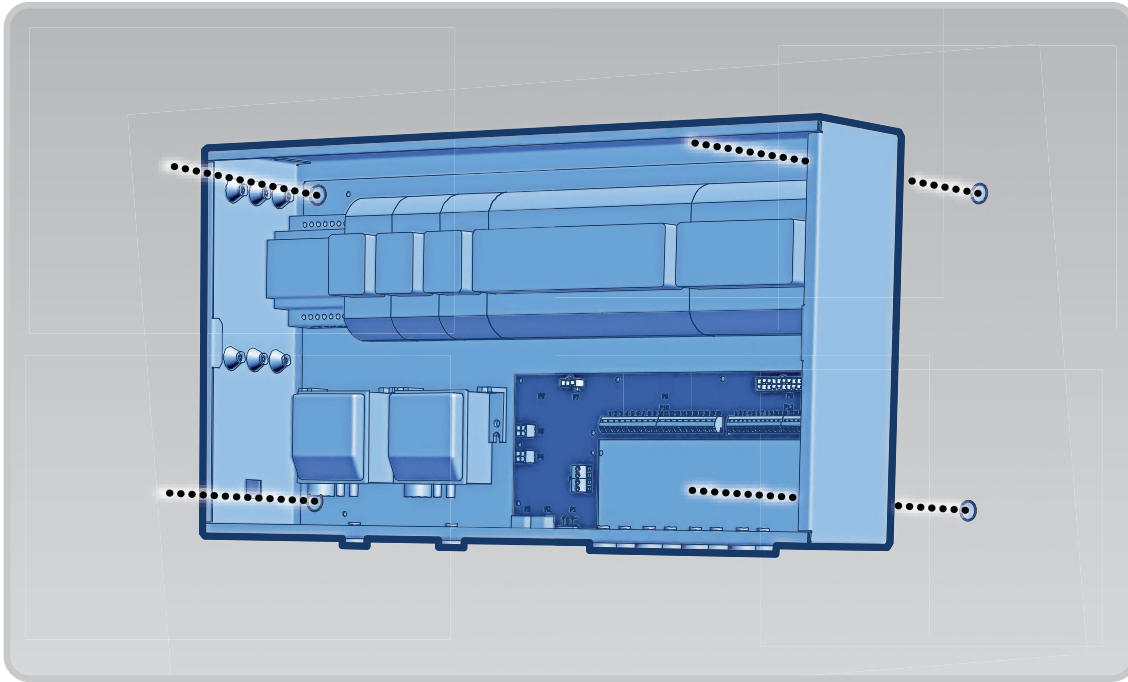
Electrical power connection
 Any cable tray must be connected with vibration suppression to the unit

Environment
 The unit must be in a dry place.

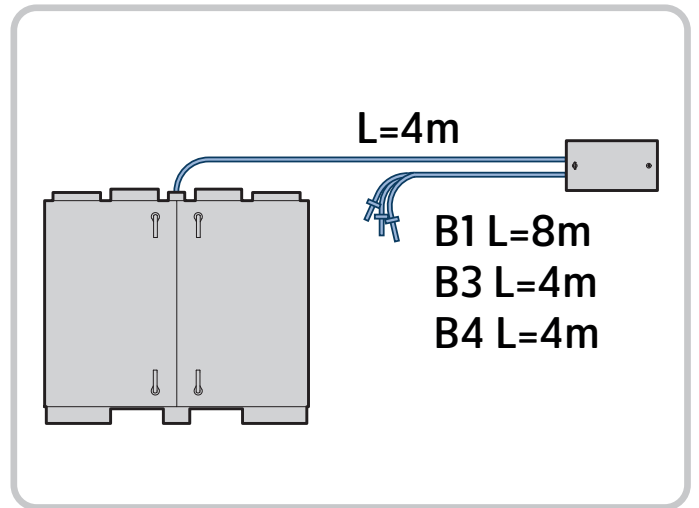


5. Control cabinet

5.1. Wall mounting



Hole positioning for attachment of cabinet

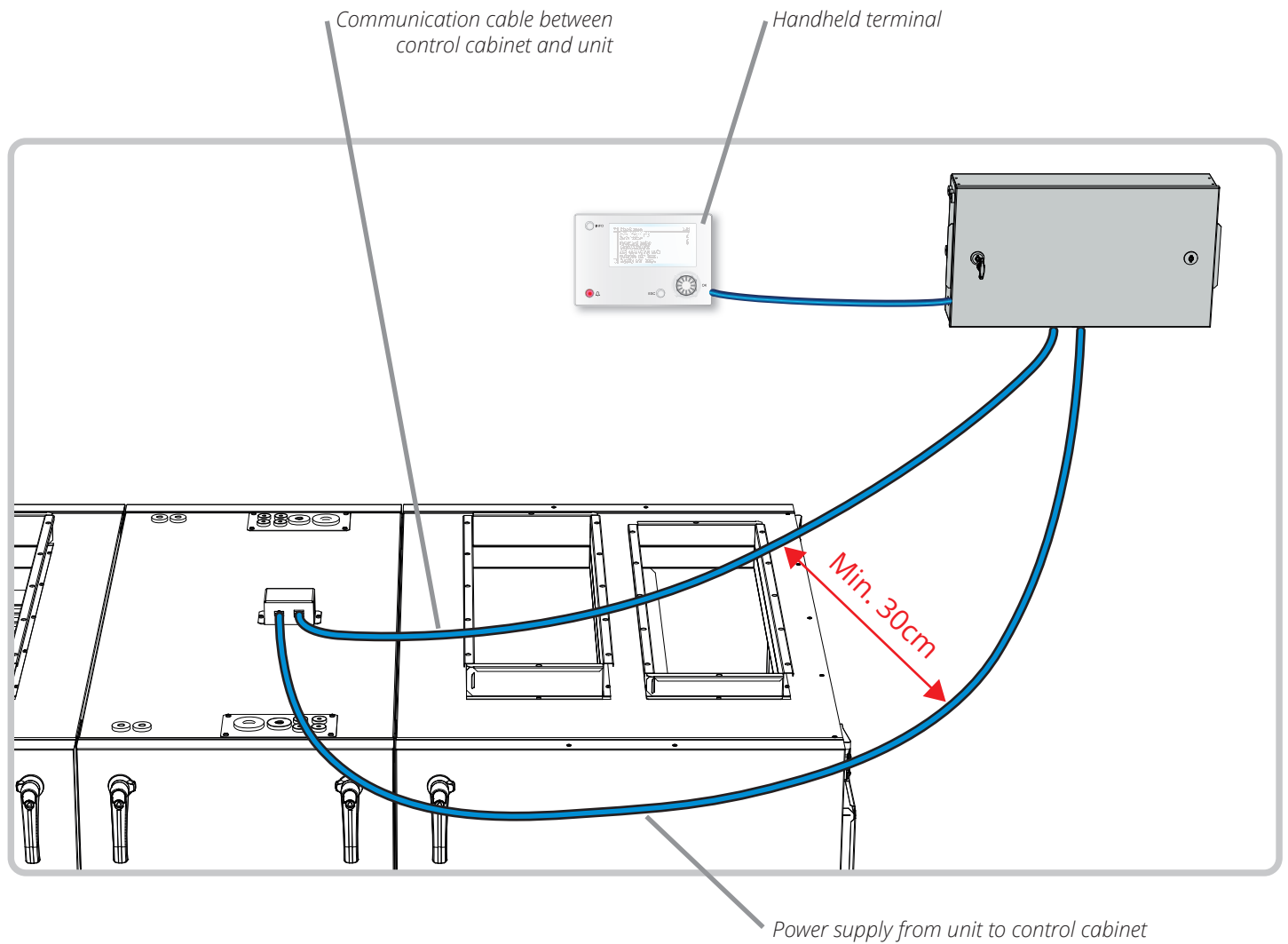


Cable length, unit - cabinet

5.2. Mounting to unit



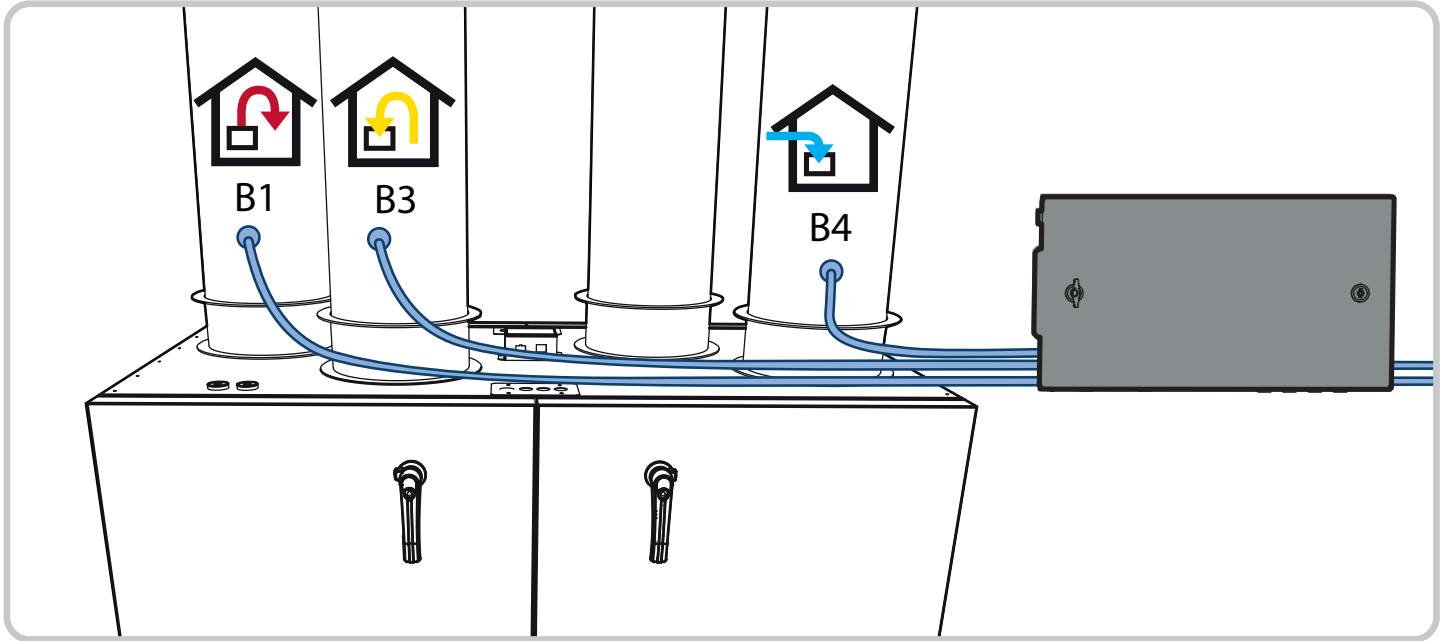
CAUTION! The communication cable and power cable must be at least 30 cm apart.



6. Connection of sensors



The sensors must not be positioned in, or in the vicinity of a duct bend.



Shown in right configuration

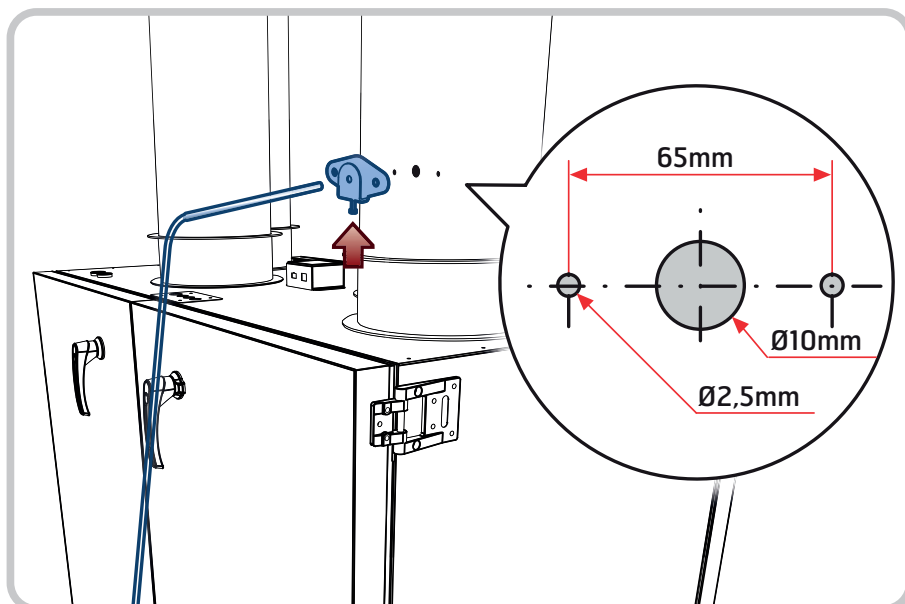
6.1. Supply air sensor (B1)



INFO! Refer to the separate connection instructions on the inside of the sensor box.



6.2. Outdoor air sensor (B4) and extract air sensor (B3)



7. Electrical work

The internal components of the unit such as electronics, fans and the rotor are protected internally with a miniature circuit breaker.
NB! Any electric heating coil is not protected by this.



All electrical installations and cabling must be installed in compliance with relevant regulations by an authorised electrician.
Ensure that the unit is disconnected from the power supply before maintenance and/or electrical works.



118076 automatic control instructions
118109 wiring diagram
See section 10 Reference data p. 29



The unit must be disconnected before an insulation test on the property.

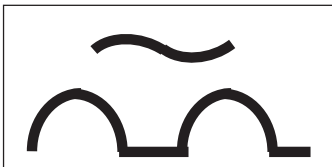


The power supply to the unit must be connected via an all-pole safety switch with at least 3 mm switching distance. This is not part of the supply from Flexit.

7.1. Main supply (mains cable)

See section 15 Technical data for dimensions of fuses and connection cables. See also section 8 Electrical connection for more information about connection to 3N~400 V versus 3~230 V.

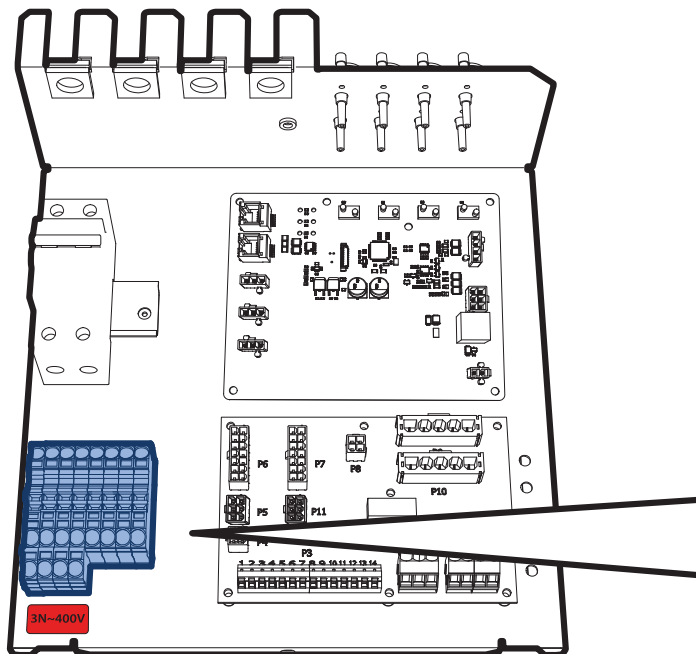
7.2. Earth-leakage circuit breaker



If the property has an earth-leak circuit breaker, the unit must be fitted with a separate earth-leak circuit breaker of type B which also works if there are DC components. See the symbol.

8. Main connection

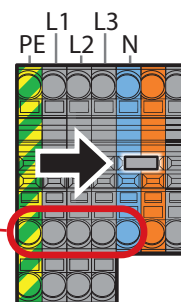
Incoming electrical cables are connected to the terminal below, which is adapted to the relevant mains network. 3 N~400 V is standard. The unit can be converted to 3~230 V. This applies only in Norway.



3N~400V

The bridge is located between the blue and orange terminal blocks.

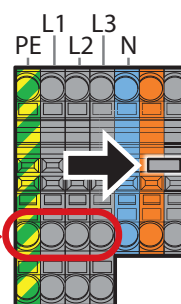
Cable connection



3~230V

Place the bridge between the orange and grey terminal blocks as shown in the figure. Place a blue label over the red label on the terminal panel.

Cable connection



9. Commissioning



The unit must not be started until all documentation has been studied and all electrical fitting and plumbing work has been performed.



Refer to guideline 118076 for more information on start up and use of the control system.

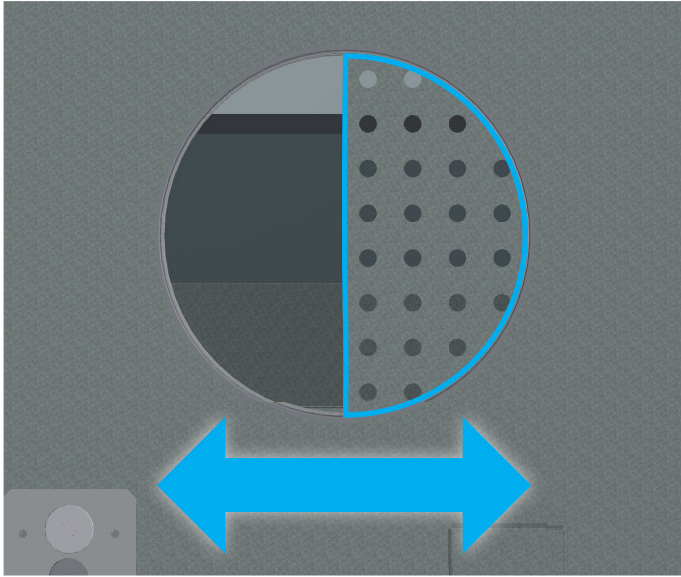
1	Familiarise yourself well with the documentation for the automatic control system
2	Check that the network settings are correct. For 230V 3~Phase, the unit and electric battery (if installed) must be switched *.
3	Start the unit as described in the documentation for the automatic control.
4	Program the various operating times and speeds (possibly including stop)
5	Check that the correct temperature regulation and temperature settings have been selected. Are the sensors located correctly?
6	Check that the fans rotate freely.
7	If outdoor air dampers and extract air dampers are installed, check that they are working. The unit must not be operated with closed air dampers!
8	Check that all doors are properly closed.
9	Check that the heat recovery system works correctly.
10	If a heating battery is installed, check that the heat control is working correctly.
11	If the unit has a water battery, you must test the frost function. Cool the frost sensor to below 5 °C. The unit should stop and the air dampers close.

* The electric battery is not preconfigured as either 230 or 400V. It must always be jumpered when it is connected.

9.1. Adjustment of throttle dampers

Adjust the pressure balance over the rotor

To set the correct pressure balance over the rotor and minimise the risk of leakage between extract air and supply air, an adjustment air damper is fitted to the extract air muff on the unit. This can be adjusted to prevent extract air from leaking over to the supply air via the rotor.



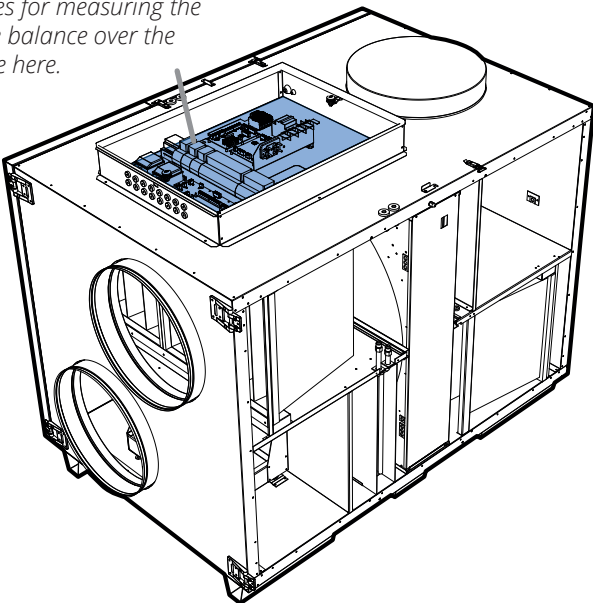
*throttle =
less leakage*

*open =
more leakage*

Hoses for pressure measurement are installed on the top of (L models) or inside (S models) the unit.

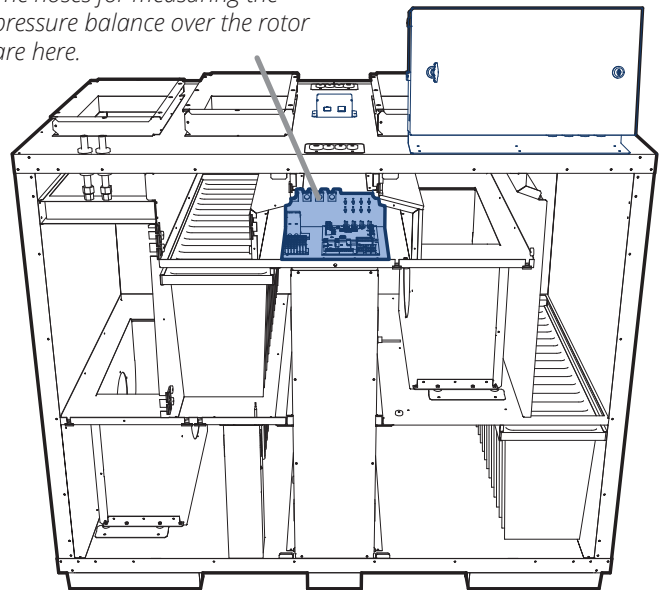
L model

The hoses for measuring the pressure balance over the rotor are here.



S model

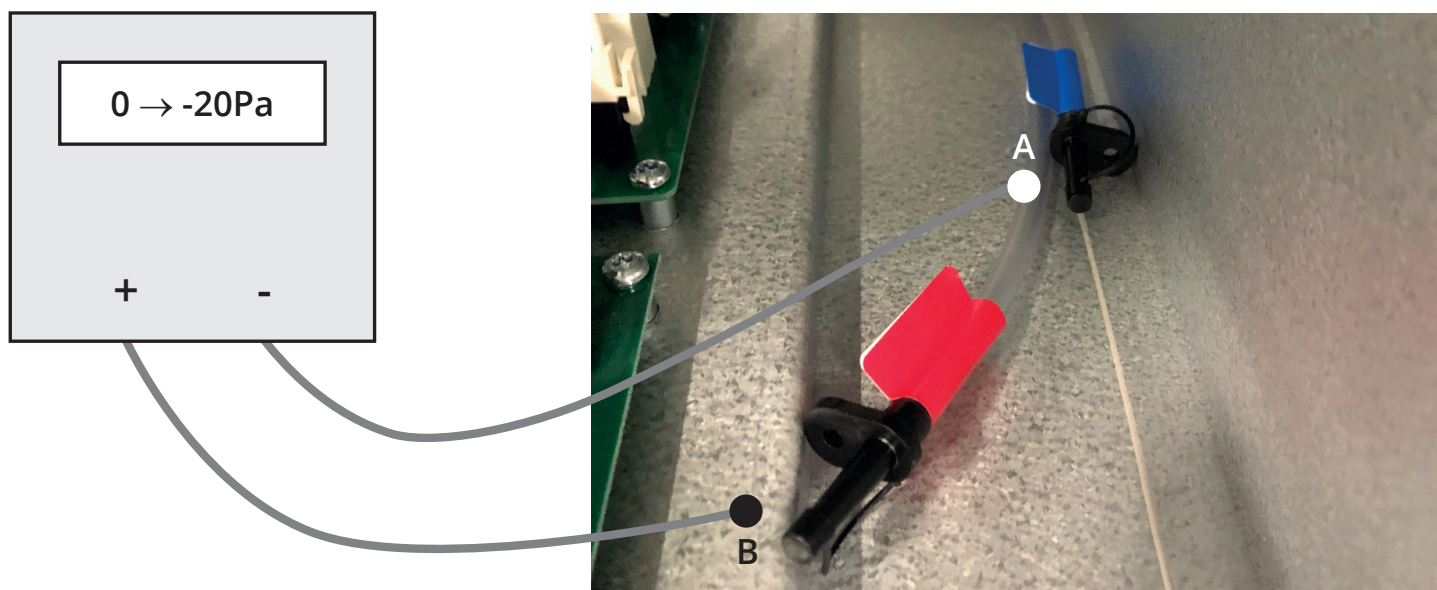
The hoses for measuring the pressure balance over the rotor are here.



NOTICE! If the damper is not to be used, it should be removed from the unit - otherwise it may decrease the amount of air from the unit.

Connect the pressure gauge with the -hose to A (blue hose in the unit) and the +hose to B (red hose in the unit). Run the unit at the correct operating point for the system in question.

The negative pressure in the extract air part must be 0–20Pa higher than in the supply air part (the instrument must display negative pressure). If it is not, adjust with air damper DA3 (on the extract air muff) until the correct pressure is reached.



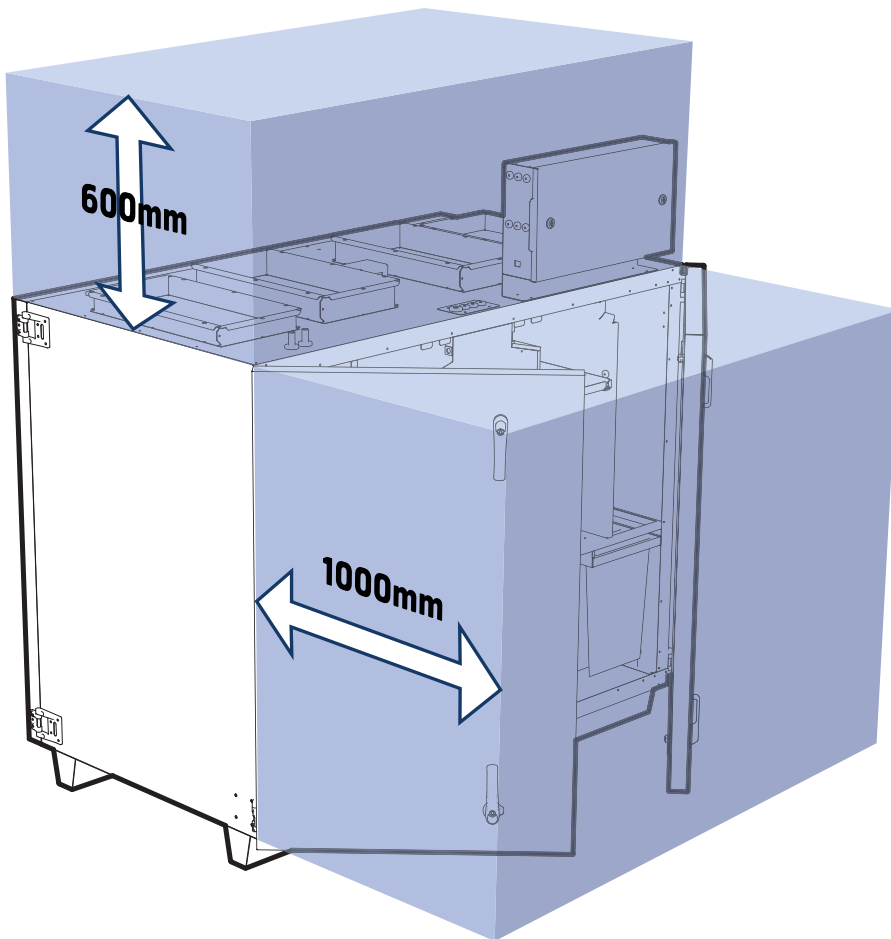
10. Reference data

10.1. Weight

Gross unit weight	Fan	Heat recovery system	Doors	Net inward transport
233 kg	2 x 11 kg	38 kg	4 x 13,5 kg	125 kg

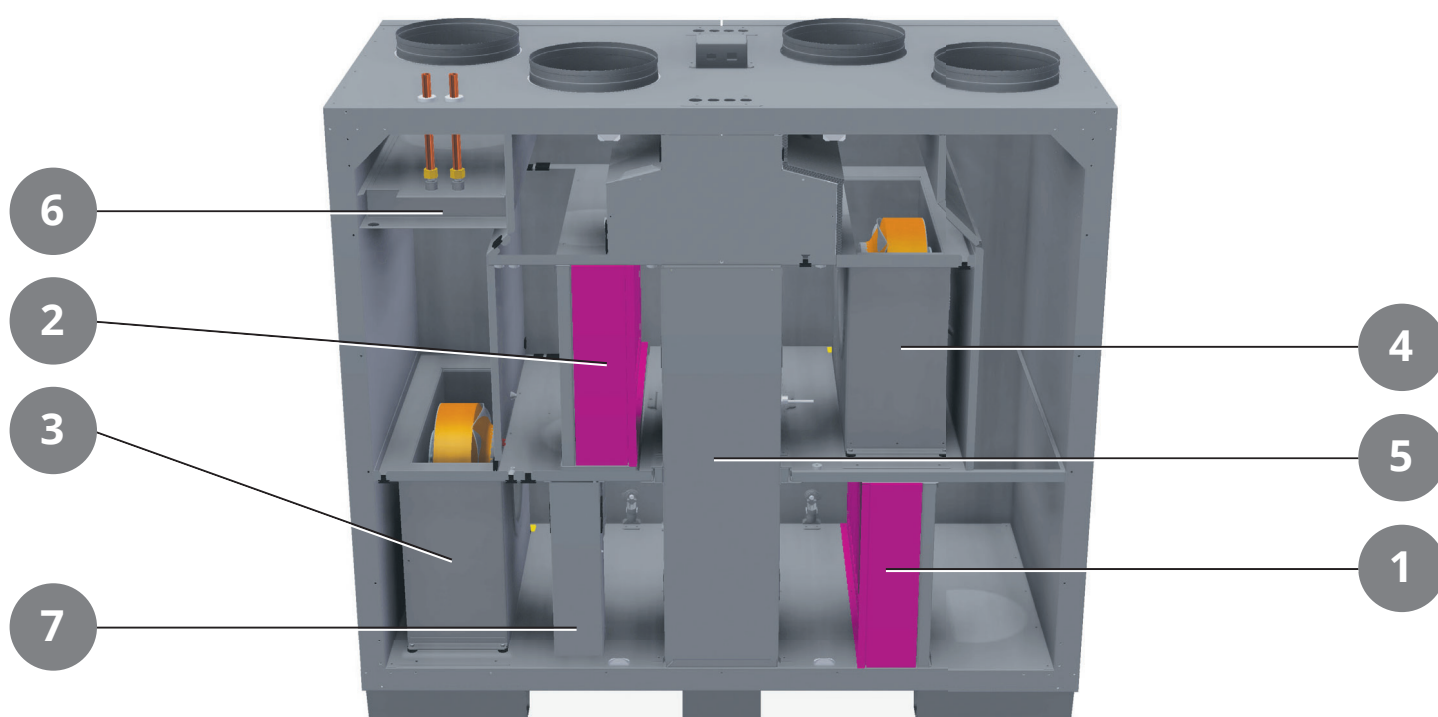
10.2. Space requirements

i This is a minimum requirement that only relates to space for service needs. Individual countries' statutory requirements for electrical safety may differ from this. Check which rules apply to your country.



11. General drawing

No.	Abbreviation	Description
1	F11	Supply air filter
2	F12	Extract air filter
3	M1	Supply air fan
4	M2	Extract air fan
5	HR-R	Rotary wheel-type heat exchanger
6	WB1	Heating battery, water
7	EB1	Heating battery, electrical



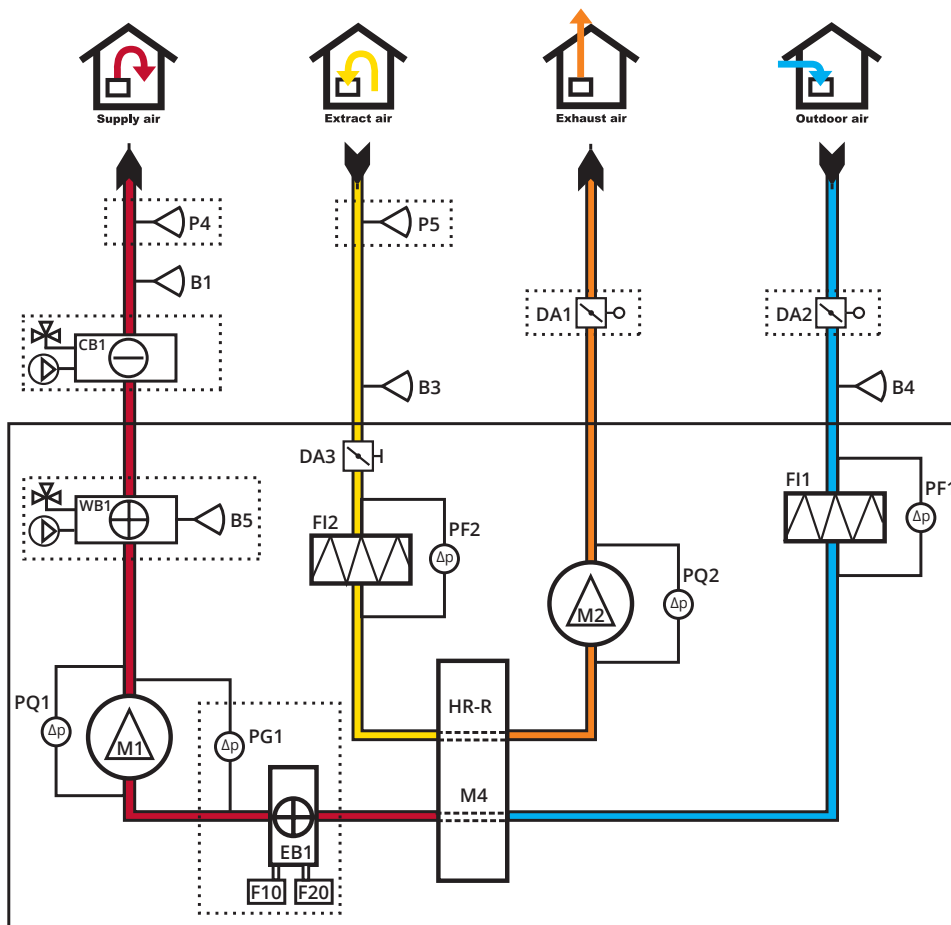
(shown in right configuration)

12. System drawing

Abbreviation	Description
M1	Supply air fan
M2	Extract air fan
M4	Rotor motor
F1	Supply air filter
F2	Extract air filter
PF1	Supply air filter relay
PF2	Extract air filter relay
PG1	Supply air fan pressure relay
P4	Supply air external pressure sensor
P5	Extract air external pressure sensor
B1	Supply air temperature sensor
B3	Extract air temperature sensor
B4	Outdoor air temperature sensor
B5**	Temperature sensor, water heating battery (frost relay)

Abbreviation	Description
F10*	Overheating thermostat, manual reset
F20*	Overheating thermostat, automatic reset
DA1***	Exhaust air damper
DA2***	Outdoor air damper
DA3	Damper, pressure equalisation
HR-R	Rotary wheel-type heat exchanger
WB1**	Heating battery, water
EB1***	Heating battery, electrical
CB1***	Cooling battery
PQ1	Supply air fan pressure sensor,
PQ2	Extract air fan pressure sensor

**On circuit board in electrical compartment
 *Only where use of electric battery
 **Only if water battery is installed
 ***Not standard*

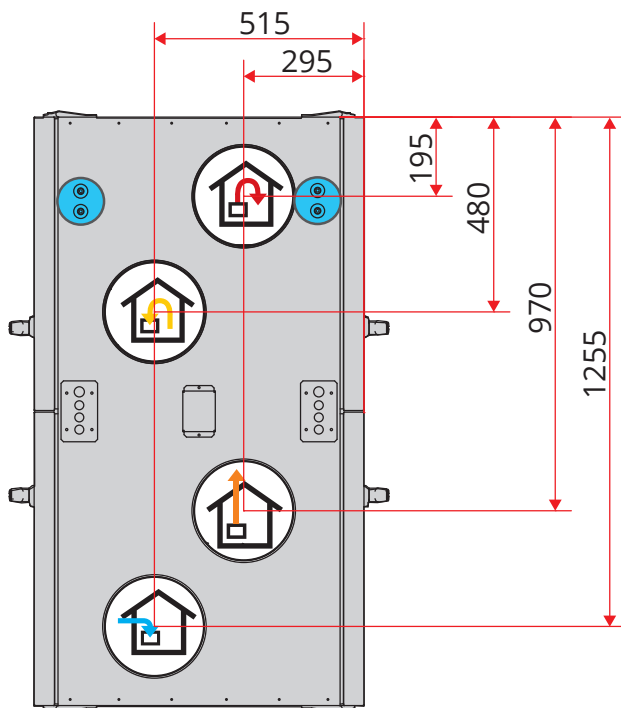
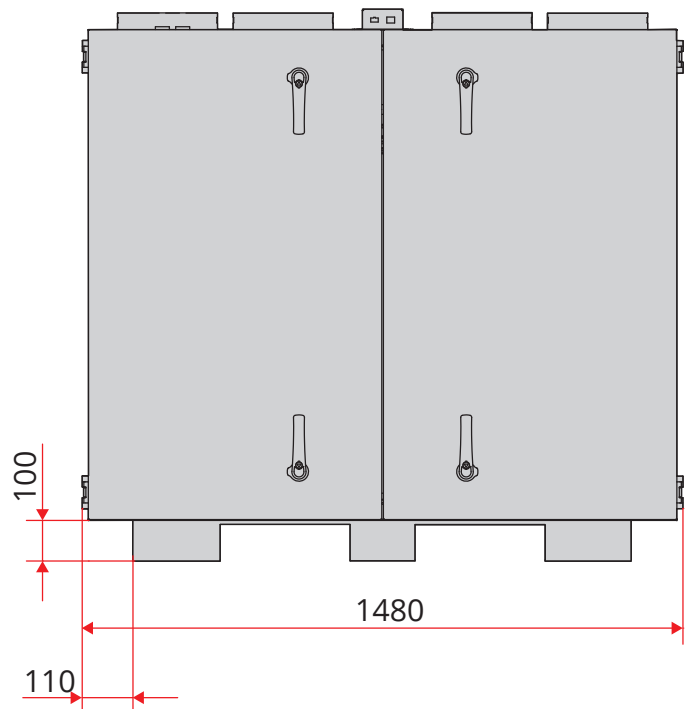
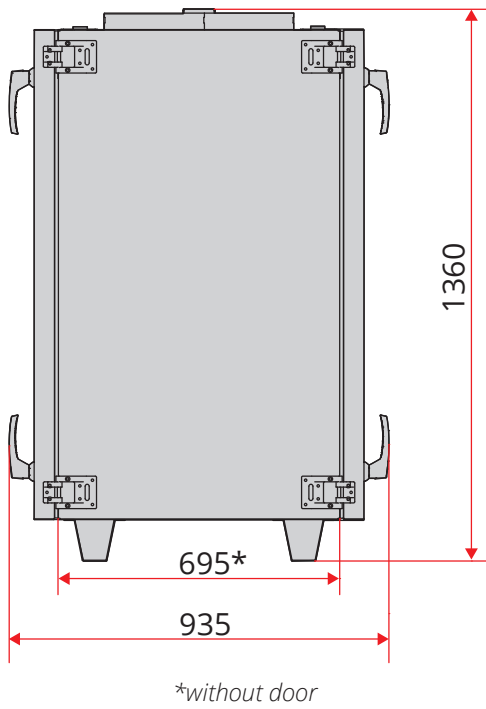


The unit can only have one heating battery - water or electric.

(shown in right configuration)

13. Dimensioned drawing

Dimensions in mm.



The dimensions are the same on both end sides.

14. Maintenance

14.1. General maintenance



All electrical power to the unit must be shut off before carrying out service or maintenance.

1. Switch off the unit in the following menu on the handheld terminal:
Start page > SERVICE SWITCH
- select OFF.
2. Wait until the unit has stopped.
3. Switch off the all-pole switch.



The system should be inspected regularly. This must be performed by qualified operating personnel.



The inspection should be performed twice a year, preferably in the spring and autumn.



If a water battery is used to heat the air, check the system for water leaks.



Listen for abnormal sounds and check for abnormal vibrations. Check at regular intervals that the air intake is free of snow and leaves.



The inspection and maintenance of fans, recovery systems, air dampers, filters and heating batteries are essential to achieve optimal performance.

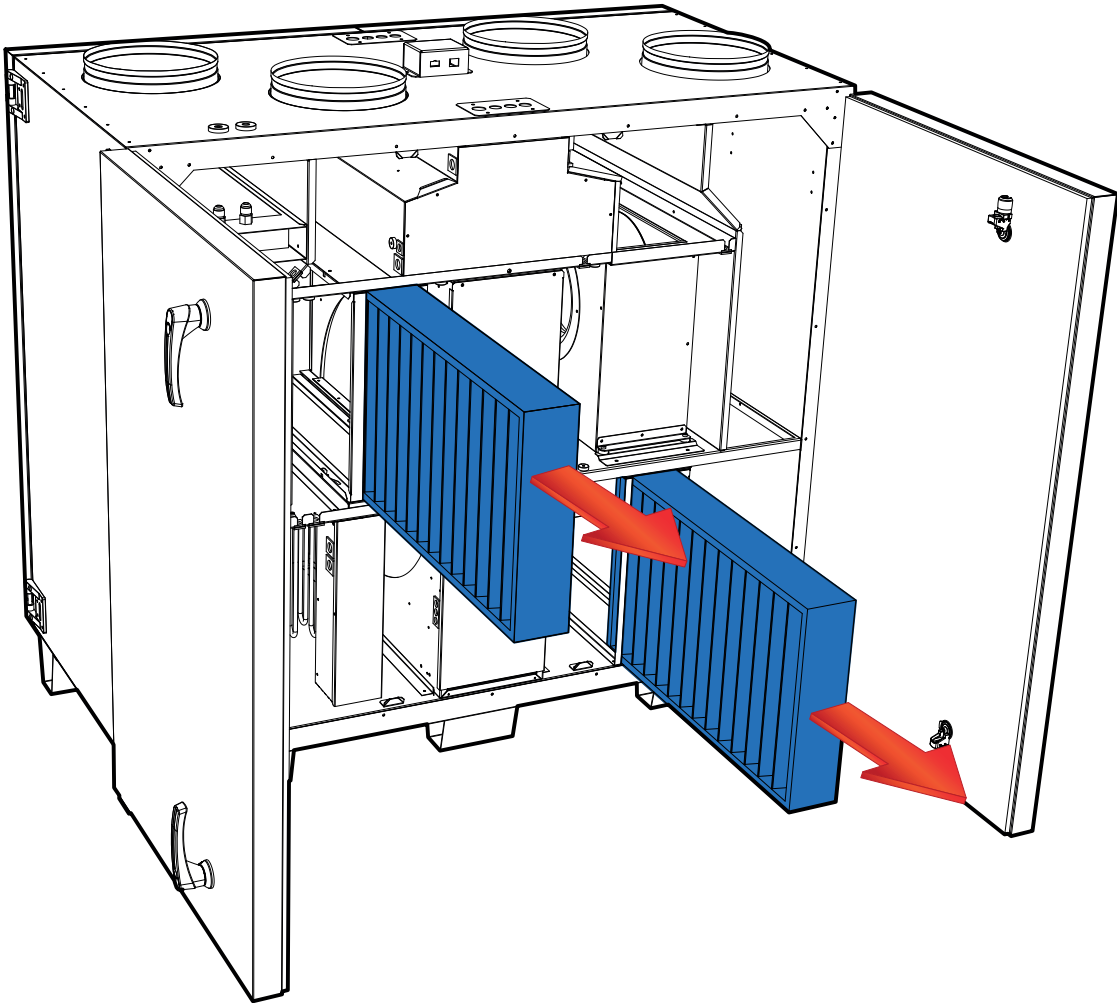


Do not use detergent that is harmful to aluminium or the environment.

Component	Action	Interval
Rotor	High impermeability filters are installed in the unit. It is not therefore usually necessary to clean the rotor. If it should however be necessary, dust can be removed with a soft brush. Further cleaning is possible by removing the rotor, spraying it with a grease solvent and then blowing it clean from the opposite side. Distance approximately 60 mm and max. pressure 8.0 bar. Check the drive belt and tighten it if necessary. Check that all seals around the rotor are intact and tight.	Where required
Damper	The air damper plates are suspended in plastic bearings and do not need lubrication. The individual air damper plates are connected via an arm system that does not need lubrication either. Check every year that the air damper is tight. If the air damper is not properly tight, it can be corrected by adjusting the air damper motor or possibly adjusting the arm tension.	Check once a year
Filtre	How frequently filters need replacing depends on the dust concentration in the air that passes through the filters. It is very important to replace filters to ensure that the system works properly. Filters must be replaced when the filter replacement lamp on the control panel lights up. They must be replaced at least once a year.	1-2 times a year
Electric battery	Inspect the cables to the electric battery at least twice a year. Check for damaged cables and components. Check tighten all terminal blocks for power supply to the electric battery (elements, contactors, SSR) and other terminal blocks.	Twice a year
Water battery	The water battery will be exposed to dirt very rarely, as the system has filters fitted with a high tightness class. If cleaning still is necessary, you can use compressed air, which is blown in the opposite direction to the air flow, or a vacuum cleaner with a soft nozzle. Cleaning must be done carefully to ensure that the battery's fins are not damaged.	
Fans	The fans will be exposed to dirt very rarely, as the system has filters fitted with a high tightness class. If cleaning still is necessary, you can use compressed air, which is blown in the opposite direction to the air flow, or a vacuum cleaner with a soft nozzle. Cleaning must be done carefully to ensure that the battery's fins are not damaged.	Where required

14.2. Replacing filters

CS 2500 filter alarm
1-2 times a year



15. Technical data

		S140R with electric battery	S140R with water battery
POWER	Rated voltage (AC 50 Hz)	400 V	400 V
	Frequency	50 Hz	50 Hz
	Fuse size	3 x 16 A	3 x 10 A
	Rated current	8,3 A	3,1 A
	Rated power, total	4 810 W	1 210 W
	Rated power, max. electric battery	3 600 W	-
	Rated power, fans	2 x 500 W (230 V)	2 x 500 W (230 V)
	Rated power, rotor motor	40 W	40 W

VENTILATION			
	Fan type	B-wheel	B-wheel
	Fan motor control	ModBus	ModBus
	Fan speed, max. RPM	2 700	2 700
	Automatic control, standard	CS 2500	CS 2500
	Filter class	ePM1 55% (F7)	ePM1 55% (F7)
	Filter type (supply air/extract air)	Compact filter	Compact filter

DIMENSIONS			
	Filter dimensions (W x H x D)	695 x 405 x 100 mm	695 x 405 x 100 mm
	Gross unit weight	233 kg	233 kg
	Net unit weight inward transport	125 kg	125 kg
	Weight, fan	2 x 11 kg	2 x 11 kg
	Weight, rotor	38 kg	38 kg
	Weight, doors	4 x 13,5 kg	4 x 13,5 kg
	Duct connection	Ø 250 mm	Ø 250 mm
	Height	1 360 mm	1 360 mm
	Width	1 480 mm	1 480 mm
	Depth (with håndtage)	935 mm	935 mm
	Depth (without doors)	695 mm	695 mm

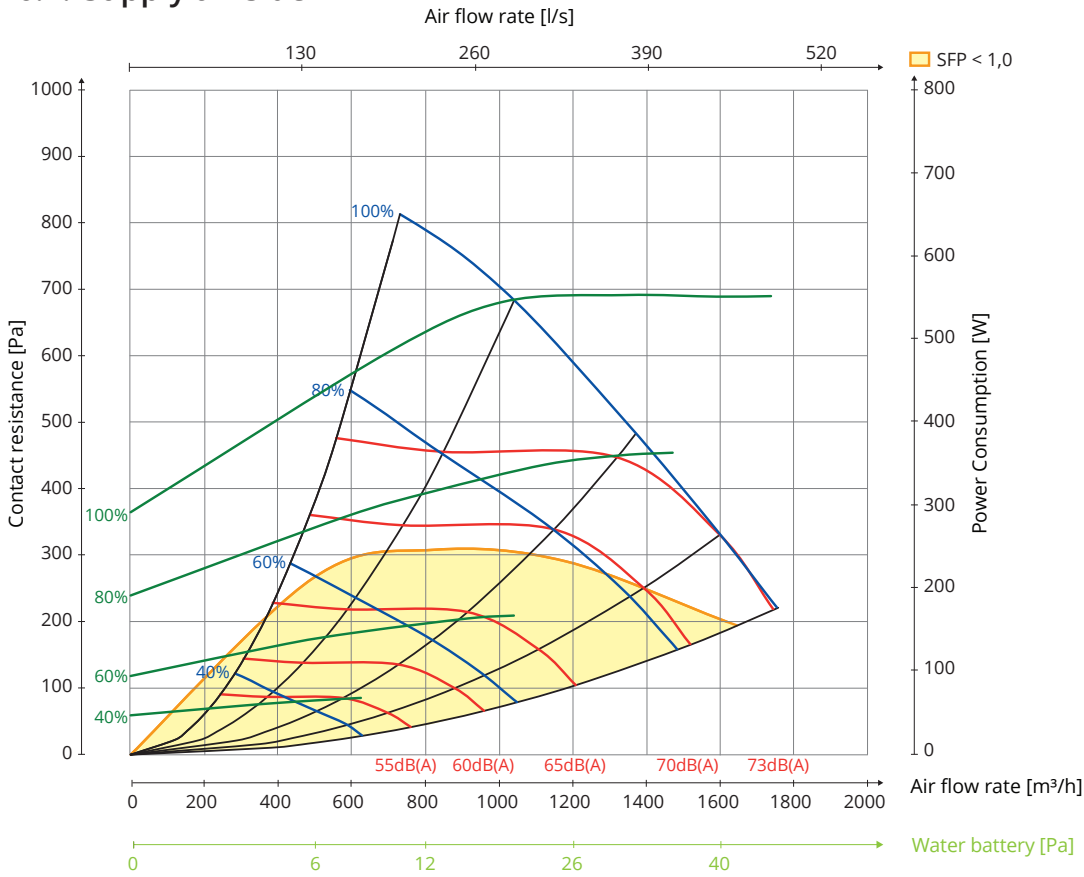
ProNordic S140R:

K factor for the fans: 74

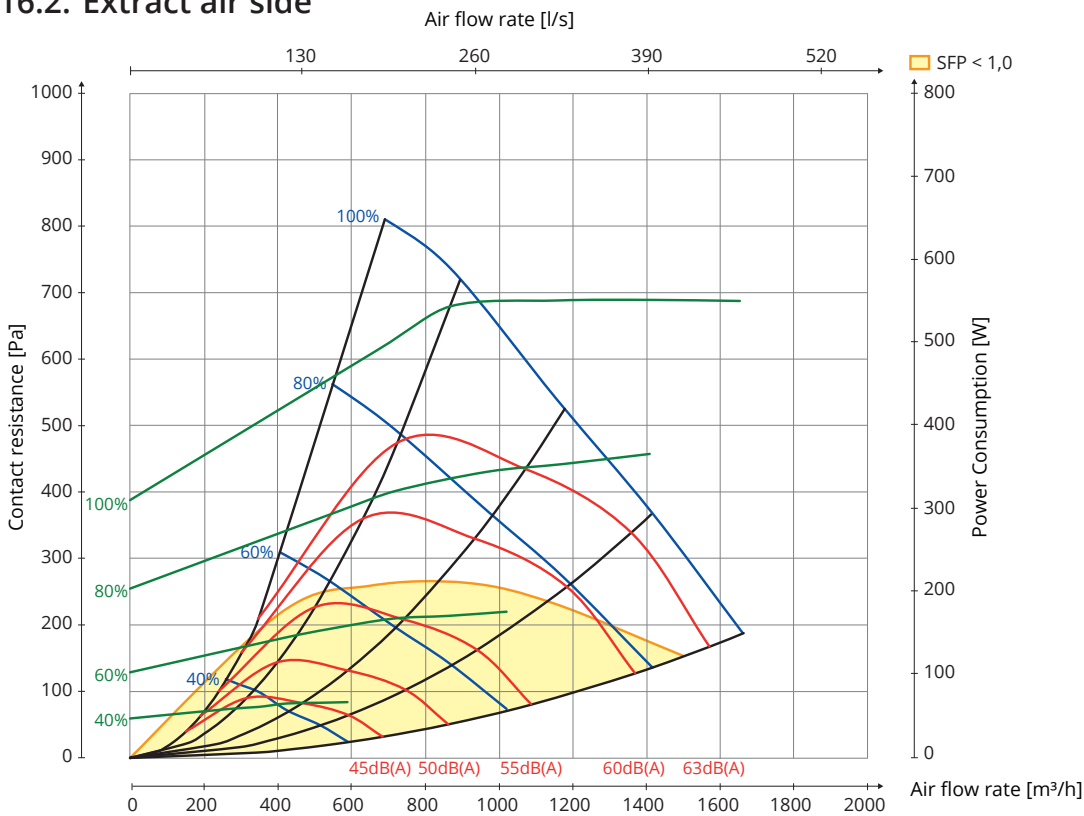
16. Capacity and sound data

For control and calculation of SFTINT and SFPLimit use FlexitSelect.

16.1. Supply air side



16.2. Extract air side



Using the capacity diagram:

A diagram consists of a number of curves and axes which allow various types of data to be read off for the unit.

1. Capacity curves (blue)

These curves show the total available pressure and the air flow rate characteristic for the unit. The available pressure is read off to the left of the diagram. The air flow rate is read off in m³/h at the bottom of the diagram and in l/s at the top of the diagram.

The various curves indicate different settings in % applied (0 – 100% = 0 – 10 V).

2. Operation curves (black)

These curves show how air flow rate and pressure change at different operating levels (fan speed).

3. Power consumption curves (green)

These curves show energy consumption for the fan at each operating level in watts. The power consumption is read off the scale to the right of the diagram. The various curves indicate different settings in % applied (0 – 100% = 0 – 10 V).

4. Sound curves (red)

These curves indicate values for the sound power level LwA of the duct at the various operating levels. To find the sound power level of the duct in the various octave bands, take the value read off in the diagram and correct it using the values in the table below the diagram for each octave. This produces the sound power level per octave.

5. Correction axes (light green)

Here you can read off the change in pressure when a water battery is used for heating. This pressure drop is deducted from the available pressure. This pressure increase is added to the available pressure.

Data for supply air is measured in accordance with ISO 5136, the "In-duct method". Radiated sound is measured in accordance with ISO 9614-2.

Bruel & Kjaer measuring equipment, type 2260.

16.3. Correction factor for Lw

Hz	63 Lw(dB)	125 Lw(dB)	250 Lw(dB)	500 Lw(dB)	1000 Lw(dB)	2000 Lw(dB)	4000 Lw(dB)	8000 Lw(dB)	LwA (dBA)
Supply air	6	6	4	-4	-7	-11	-20	-23	
Extract air	18	11	3	-13	-17	-21	-27	-32	
Radiated sound	-31	-22	-15	-24	-25	-28	-30	-37	-19

Working point 240 m³/h against 100 Pa.

> EXAMPLE 1

Sound to duct in the various octaves is stated in Lw

The working point gives 60 dBA from the capacity diagram for supply air. I am interested in what this is specifically in the 250 Hz range.

60 dBA+4=64 dB which is an Lw value (sound power level without adaptation to the ear's A band)

> EXAMPLE 2

Radiated sound in Lw per octave

If a reading of 60 dBA at the working point is taken from the supply air capacity diagram (which indicates sound to duct) in order to arrive at a subsequent Lw value for the various octaves, a deduction is then made from the value for the relevant octave for the row with radiated sound.

60 dBA-24 (for 500 Hz) = 36 dB, which is an Lw value and indicates the radiated sound from the unit in this octave.

> EXAMPLE 3

Radiated sound in total from the unit in LwA

At the bottom right of the table, a total value for radiated sound from the unit is stated in LwA. This is an aggregate value.

The values for the radiated sound for the different octaves have been totalled up and then corrected for A band.

This is used as follows:
The LwA value is read from the supply air capacity diagram, in our example 60 dBA, and this is then subtracted from the total value (this is also an LwA value). LwA 60 dBA-19 dBA = 41 dBA (which is then stated in LwA, the sound power level adapted to the ear's A band).

17. Complaints



Warranty claims will only be valid if the instructions in the manuals have been followed.

This product is covered by warranty in accordance with the current terms of sale, **provided that the product is used correctly and properly maintained.**

The warranty may be rendered invalid if the system is used incorrectly or maintenance is grossly neglected.

Complaints resulting from incorrect or defective installation must be submitted to the installation company responsible.

Filters are consumables.

Our products are subject to continuous development and we therefore reserve the right to make changes.

We also disclaim liability for any printing errors that may occur.

18. Waste handling



The symbol on the product shows that this product must not be treated as household waste.

It must be taken to a collection point for recycling electrical and electronic equipment.

By ensuring correct disposal of the equipment, you will help to prevent negative consequences for the environment and health that incorrect handling may entail.

For further information on recycling this product, please contact your local authority, your refuse collection company or the company from which you purchased it.

19. CE Declaration of Conformity

This declaration confirms that the products meet the requirements in the following Council Directives and standards:

- 2014/35/EC Low-voltage Directive (LVD)
- 2006/42/EC Machine Directive (Safety)
- 2014/30/EC Electromagnetic compatibility (EMC)
- 2011/65/EU RoHS Directive
2015/863/EU
- 2009/125/EC Ecodesign Directive

Our products have been tested in accordance with parts of:
1253/2014/EC Ecodesign Regulation

Producer: FLEXIT AS, Televeien 15, 1870 Ørje,
Norway

Type: ProNordic S140R Ventilation Unit

Compliance with valid versions of the following standards on the date on which the declaration of conformity was signed:

Machine Directive (Safety)	EN ISO 12100: 2010
Safety standard – General requirements	EN 60335-1: 2012; A1, A2, A11, A13, A14
Safety standard – Particular requirements	EN 60335-2-80: 2003; A1; A2
EMF standard	EN 62233: 2008
EMF standard – General requirements	EN 61000-6-1
EMF standard – Particular requirements	EN 61000-6-3
Acoustics – Radiated sound	EN ISO 3741: 2010
Ventilation for buildings – Rating and performance for units, components and sections	EN 13053: 2019
Ventilation for buildings – Mechanical performance	EN 1886: 2007

The product is CE-marked: 2021

FLEXIT AS 2021



Knut Skogstad
CEO

20. Product and Environmental Declaration

Materials:

Materials with which the user or treated air come into contact:

- The unit's outer walls are made of aluzink coated steel.
- The rotary wheel-type heat exchanger is made of aluminium.
- Miscellaneous electric cables with PVC insulation.
- Electric motors consisting of galvanised steel, aluminium and copper.
- Heating elements made of steel.
- Air filters of glass fibre, cardboard and melting glue.

Other materials that may occur in small quantities:

- Acrylic sealant
- Polyethylene foamed plastic
- EPDM rubber gaskets/PUR
- Miscellaneous steel screws, nuts and pop rivets, plus small quantities of copper and brass.

Materials in the unit with which service personnel may come into contact:

- Plastic-insulated electric cables
- Miscellaneous other electrical components
- Insulation of type Rockwool mat (insulation mat)

Safety:

Materials:

The materials are considered to be completely harmless to users.

Use:

The unit is an electrical appliance which must be made dead before service and inspection. The unit also contains rotating motors that must have time to stop before the inspection door is opened, plus heating elements with a high operating temperature.

The product is listed in the
database for building products
that can be used in
Nordic Swan
Ecolabelled buildings.



Flexit AS, Televeien 15, N-1870 Ørje
www.flexit.no