



Installation, use
and maintenance manual

Modular L Smart

› Modular L Smart

Translation of the original instructions

Modular L Smart heat recovery units guarantee high quality indoor air at low energy costs. The range consists of six sizes, customisable by adding external modules.

Armed with an extremely flexible development, Daikin air handling units are able to satisfy all types of technical requirements.

Daikin systems guarantee respect for the environment since they are based on high levels of energy efficiency. Reduced ecological impact and low energy consumption make Daikin recovery units ideal for any type of market.

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1 Important warnings



The pictogram shows a situation of immediate danger or a dangerous situation that might cause injuries or death.



The pictogram shows that it is necessary to adopt suitable behaviour in order to avoid jeopardising staff safety and cause damages to the equipment.



The pictogram shows particularly important technical information that should be taken into consideration by the people installing or using the equipment.

Purpose of the manual

The purpose of this **manual** is to guide the installer and qualified operator in the installation, maintenance and proper and safe use of the equipment. For this reason, **it is mandatory for all personnel involved in installation, maintenance and supervision of the machine to read this manual.**

Contact the manufacturer if any points are unclear or difficult to understand.

This manual contains information regarding:

- Technical specifications of the machine.
- Instructions for transport, handling, installation and assembly.
- Use.
- Information for instructing personnel authorised for its use.
- Maintenance activities.


All information refers in general to any unit of the Modular L Smart ranges. All the units are shipped together with a **technical schematic** indicating the specific weight and size of the machine received. It must be considered an integral part of this manual and therefore it must be kept with the utmost care in all its parts.

If the manual or schematic is lost, it is important to request a copy from the manufacturer, specifying the unit's serial number and date of purchase that can be found on the invoice.

In the case of divergent information between this manual and the schematic, the schematic will prevail.

Intended use of the machine

This appliance has the function of treating the air intended to condition civil and industrial environments. Any other use is not in accordance with the intended use and therefore dangerous.

These ranges of units are designed for use in NON-explosive environments. For installation in potentially explosive environments, the manufacturer can design and manufacture suitable machines (anti-explosion) that will be identified by the mark .

If the machine is used in critical situations, by type of system or environmental context, the customer must identify and adopt the technical and operational measures to avoid damage of any kind.

Safety regulations

Skills required for the installation of the machine



Installers must perform operations according to their professional qualifications: all activities not within one's expertise (i.e. electrical connections) must be carried out by specialised and qualified staff so as not to endanger one's safety and the safety of the other operators interacting with the machine.



Transport and equipment handling operator: authorised person with recognised expertise in using transport and lifting equipment.



Technical installer: expert technician, sent or authorized by the manufacturer or its representative, with adequate skills and training to install the machine.

Assistant technician subject to care obligations while lifting and assembling the equipment. He must be suitably trained and informed about the operations to perform and the safety plans of the site/installation location.

In this manual, the technician competent to carry out each operation is specified.

Skills required for the use and maintenance of the machine



Generic operator: AUTHORISED to run the machine using commands placed on the keypad of the electrical control panel. Performs only machine control operations, power on/off.

Maintenance mechanic (qualified): AUTHORISED to carry out maintenance, adjustments, replacement and repair of mechanical parts. It must be a person competent in mechanical systems, therefore able to perform mechanical maintenance in a satisfactory and safe manner, must possess theoretical preparation and manual experience. NOT AUTHORISED to work on electrical systems.

Manufacturer's technician (qualified): AUTHORISED to perform complicated operations in every situation. Operates in accordance with the user.



Maintenance electrician (qualified): AUTHORISED to perform service of an electric nature, adjustments, maintenance and electrical repairs. AUTHORISED to operate in the presence of an active electrical connection inside the control panels and junction boxes. It must be a person competent in electronics and electrical engineering, therefore able to work on electrical systems satisfactorily and safely, must possess theoretical knowledge and proven experience. NOT AUTHORISED to work on mechanical systems.



Installers, users and maintenance staff for the machine must also:

- Be responsible and experienced adults without physical impairments, in perfect psychological and physical condition.
- Master the machine's operating cycle, therefore participate in theoretical/practical training alongside an expert machine operator, or alongside a technician of the manufacturer.

In this manual, the technician competent to carry out each operation is specified.



Read this manual carefully before machine installation and maintenance and keep it for any further future consultation by the various operators. Do not remove, tear out or rewrite any part of this manual.



All installation, assembly, electrical connections to the mains and ordinary/extraordinary maintenance must be performed **only by qualified personnel authorised by the Retailer or Manufacturer** after turning off the unit electrically and using personal protective equipment (i.e., gloves, protective goggles, etc.), in compliance with the regulations in force in the country the equipment is to be used in and the laws regarding the systems and safety in the workplace.



Installation, use or maintenance other than those specified in the manual may cause damage, injury or death, invalidate the warranty and relieve the Manufacturer of any liability.



Use protective clothing and suitable equipment while handling or installing the equipment, in order to prevent accidents and safeguard your own and other people's safety. Individuals not assigned to installation or maintenance are NOT allowed to stand or pass through the work area while the machine is assembled.



Disconnect the equipment from the mains before installing or maintaining it.



Before installing the equipment, check that the systems comply with the legal provisions in force in the country of use and meet the specifications on the serial number plate.



It is the responsibility of the user/installer to check the static and dynamic stability relative to the installation and to arrange environments so that **people who are not competent or authorised DO NOT have access to the machine or to its commands.**



It is the responsibility of the user/installer to make sure that **weather conditions** do not affect the safety of persons and property during installation, use and maintenance.



Make sure the air intake is not located near any exhausts, flue-gases or other contaminating elements.



Do not install the equipment in places exposed to strong winds, salt air, open flames or temperatures exceeding 40°C (104°F).



After installation is complete, instruct the user on the correct use of the machine.

If the equipment does not work or functional or structural alterations are noted, disconnect it from the mains and contact a service centre authorised by the Manufacturer or Retailer, without attempting to repair it on your own. For any replacements request the use of original spare parts.

Unauthorised actions, tampering or modifications that do not follow the information provided in this manual can cause damage, injuries or fatal accidents and void the warranty.

The serial number plate on the unit provides important technical information, essential in case of machine maintenance or repairs. We recommend that you do not remove, damage or modify it.

In order to ensure correct and safe conditions of use, it is recommended to have the unit maintained and checked at least annually by a service centre authorised by the manufacturer or dealer.

Failure to follow these instructions may cause damage and injuries, even fatal, voids the warranty and relieves the Manufacturer of any liability.

Residual risks

Despite having implemented and adopted all the safety measures indicated by applicable regulations, some residual risks remain. In particular, in some operations of replacement, adjustment and tooling maximum attention is always required in order to work in the best possible conditions.

List of operations with residual risks

Risks for qualified personnel (electrician and mechanic)

- Handling - during unloading and handling it is necessary to pay attention to all the steps listed in this manual regarding the points of reference
- Installation - during installation it is necessary to pay attention to all the steps listed in this manual regarding the points of reference. The installer must ensure the static and dynamic stability of the machine's site of installation.
- Maintenance - during maintenance it is necessary to pay attention to all the steps listed in this manual, and in particular to high temperatures that may be present in the heat transfer fluid lines to/from the unit.
- Cleaning - the machine must be cleaned only when it is switched off, by turning off the switch installed by the electrician and the switch located on the unit itself. The key for interrupting the power supply must be kept by the operator until the end of the cleaning operations. Internal cleaning of the machine must be carried out using the protections required by current regulations. While the inside of the machine does not contain particular hazards, it is necessary to pay the utmost attention so that accidents do not occur during cleaning. The heat exchange coils that have a potentially sharp finned pack must be cleaned using protective glasses and gloves suitable for handling metals.

During adjustment, maintenance and cleaning there are residual risks of variable entity. Being operations that must be performed with guards disabled, it is necessary to pay particular attention in order to avoid damage to persons and things.



Always pay close attention when performing the operations specified above.

Remember that these operations must always be performed by authorised personnel.

All work must be completed in accordance with the legal provisions relating to work safety.

Remember that the unit in question is an integral part of a larger system that includes other components, depending on the final characteristics of realisation and the mode of use. Therefore in the end it is the responsibility of the user and assembler to assess the residual risks and their respective preventive measures.



For more information about the possible risks, please refer to the RAD (Risk Assessment Document) available from the manufacturer.

Safety devices



The machine is equipped with safety devices to prevent risks of damage to persons and for proper operation. Always pay attention to the symbols and safety devices on the machine. It should **only** operate with the safety devices engaged and with fixed or movable guards installed correctly and in the proper position.



If during installation, use or maintenance the safety devices have been temporarily removed or disabled, the machine can be operated **exclusively** by the qualified technician who made this change. It is **mandatory** to prevent other people's access to the machine. When finished, restore the devices to their proper status as soon as possible.

2 Machine characteristics

Environmental conditions



Modular L Smart heat recovery units are designed for use in indoor environments, installed on the ceiling. The unit cannot operate in environments containing explosive material and with a high concentration of dust.



Outside air temperature	-25°C to +45°C
Operating environment temperature	+5°C to +45°C
Temperature of the environment with the machine off (e.g., storage, transport, etc.)	-40°C to +60°C



Thanks to its modularity, each machine is able to adapt to different needs in terms of air flow and thermodynamic treatments.



The optimised choice of every detail, the search for maximum efficiency in each component, the adoption of specific materials and constructive solutions transform environment friendliness and energy savings into valid and advanced technological solutions.

Environmental contamination

Depending on the installation operating environment, specific regulations must be followed and all the necessary precautions must be taken to avoid environmental issues (a system that operates in a hospital or chemical environment can have problems different from those in other sectors, even from the point of view of disposal of consumable parts, filters, etc.).

It is mandatory for the buyer to inform and train workers regarding proper procedures.

Noise



The machines have been designed and manufactured in such a way as to produce sound emissions below the threshold of **80 dB(A)**. It should be noted that every environment has its own acoustic characteristics that can greatly affect the noise perceived during operation, therefore it is necessary to consider the noise data provided as a point of reference, while it is up to the buyer to perform specific sound level measurements at the installation site and during the machine's actual use.

Ceiling and air duct specifications

The **ceiling** where you plan to install the machine **must** be:

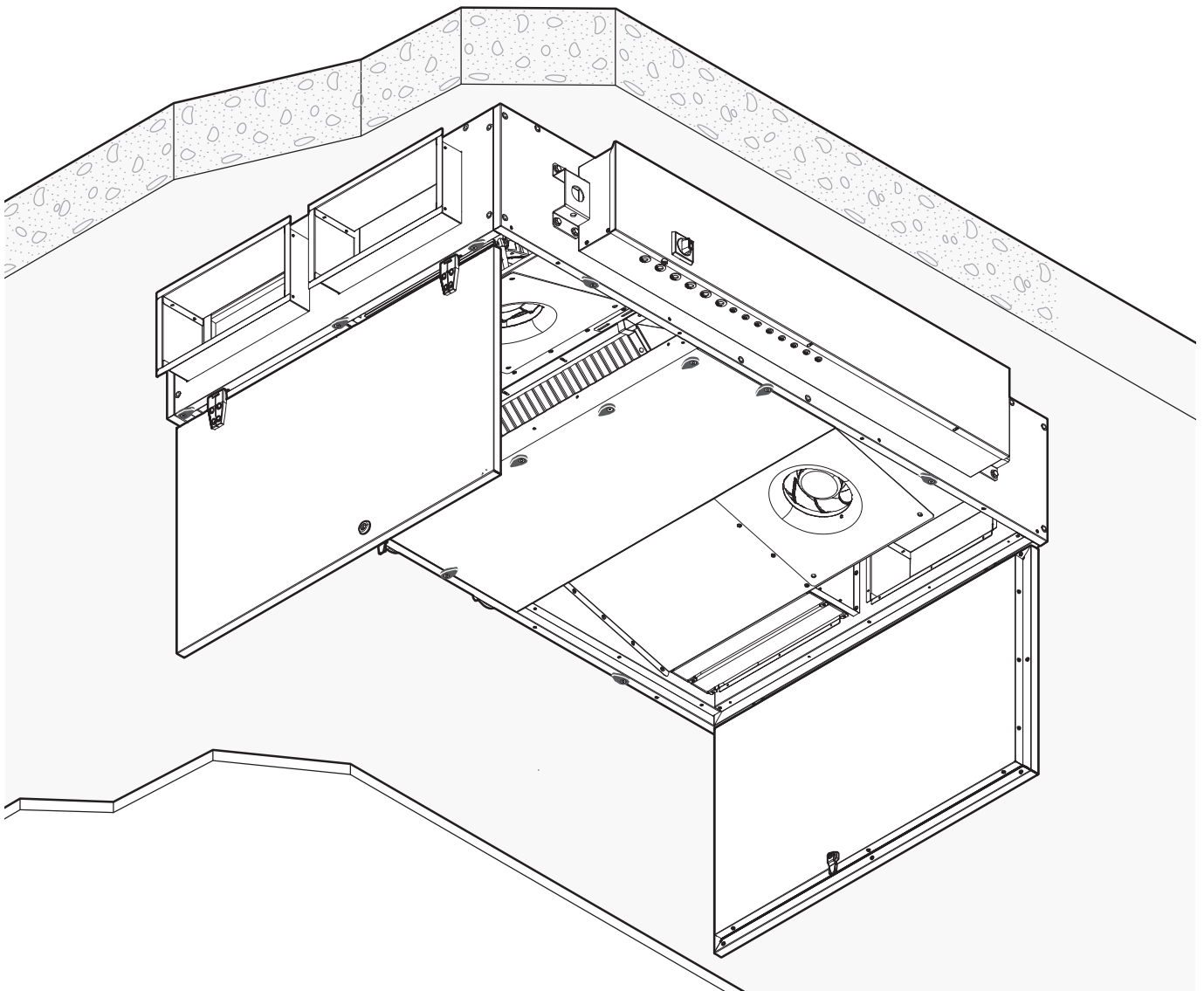
- Perfectly flat and without roughness.
- Vibration resistant.
- Able to **support the weight of the equipment considering an appropriate safety margin** (see table of technical data on page 12).

The equipment installed on the ceiling can adapt easily to the presence of a false ceiling.

In fact, without sufficient space for up-and-over door opening, the inspection door can be transformed into a panel able to slide on accessory rails (optional)

If provided, the **air ducts** must be connected directly to the machine, taking care to insert a suitable anti-vibration system between the machine itself and the duct. When assembly is completed they must not be taut, in order to avoid damage and transmission of vibrations.

To ensure the seal of the connections and the integrity of the machine, it is essential that the air ducts be supported by special brackets that do not weigh directly on the machine.



Technical data

TECHNICAL DATA TABLE	SIZE						
		2	3	4	5	6	7
Nominal air flow rate	m ³ /h	300	600	1200	1500	2300	3000
Heat efficiency	%	93	93	93	92	94	93
FLA	A	2.80	4.50	4.50	4.70	8.90	9.30
FLI	W	371	1033	1033	1033	2033	2033
Electrical connection		200-277 V, 1 ph					

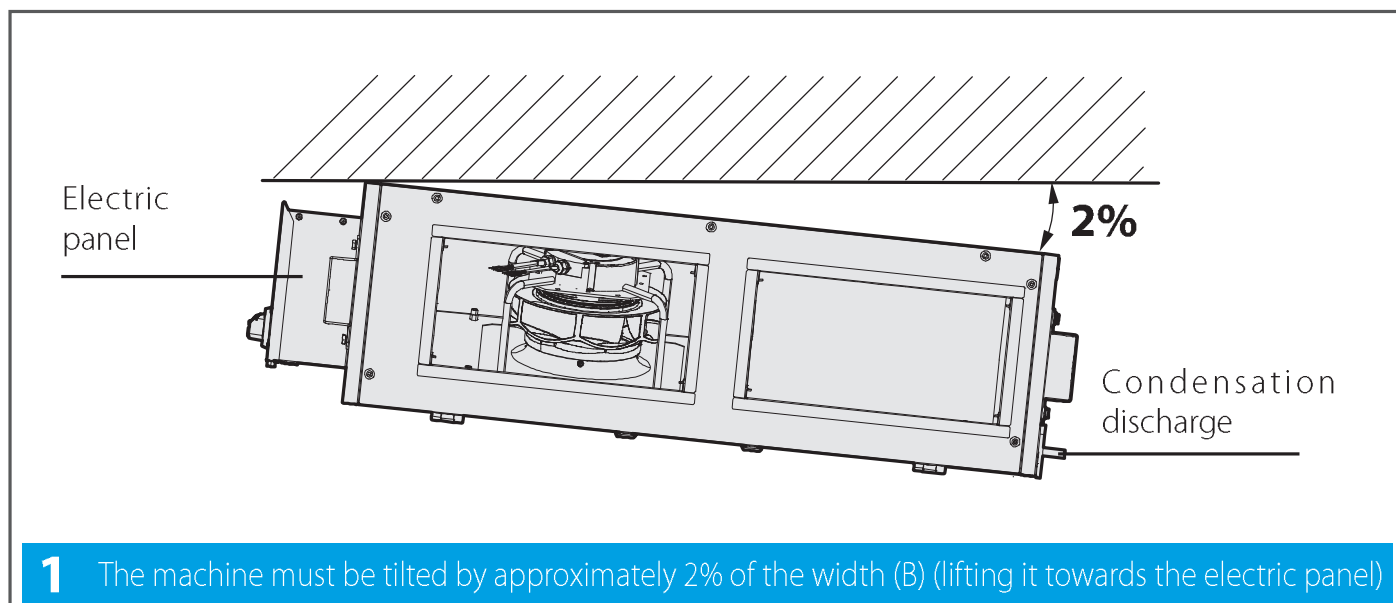
WEIGHT TABLE	SIZE						
		2	3	4	5	6	7
Gross weight with packaging	kg	135	190	285	295	370	375
Device weight	kg	125	180	270	280	355	360
Door weight	kg	2x10,0	2x12,0	2x18,0	2x18,0	2x22,0	2x22,0
Filter weight	kg	2x0,2	2x0,3	2x0,5	2x0,5	2x0,5	2x0,5
Fan weight	kg	2x2,5	2x8,5	2x8,5	2x9,0	4x8,5	4x9,0
Recuperator weight	kg	1x9,0	1x14,0	2x15,0	2x15,0	2x24,0	2x24,0
Tank panel weight	kg	1x13,0	1x16,0	1x24,0	1x24,0	1x29,0	1x29,0

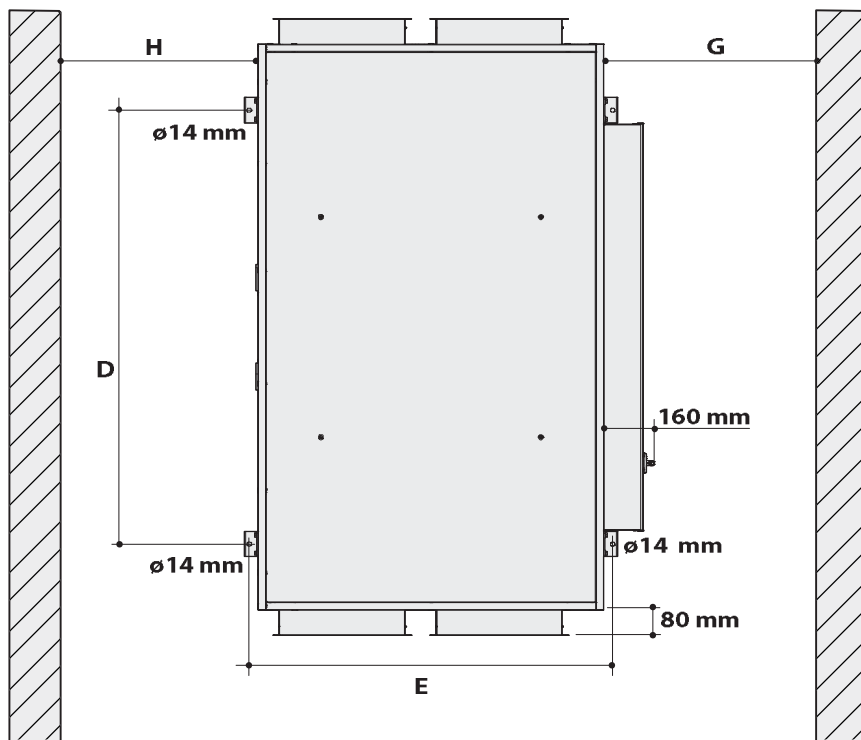
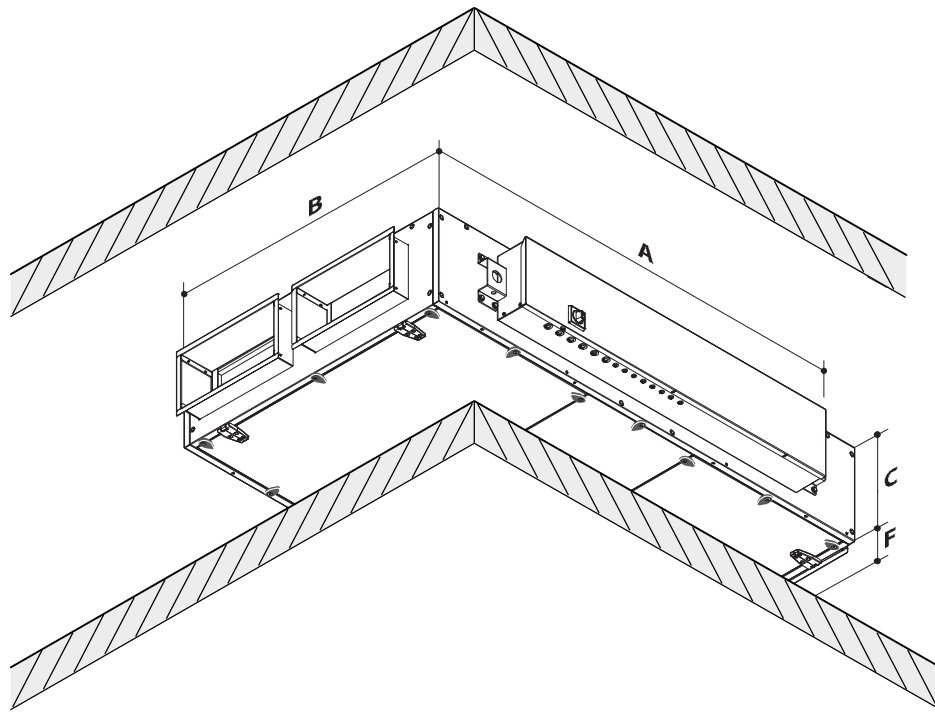
Preheating external coil

Kindly make sure that the frontal velocity through the preheating element is maintained above 1.5 m/s for safety reasons.

Make sure to connect both drain pan outlet to the drainage circuit.

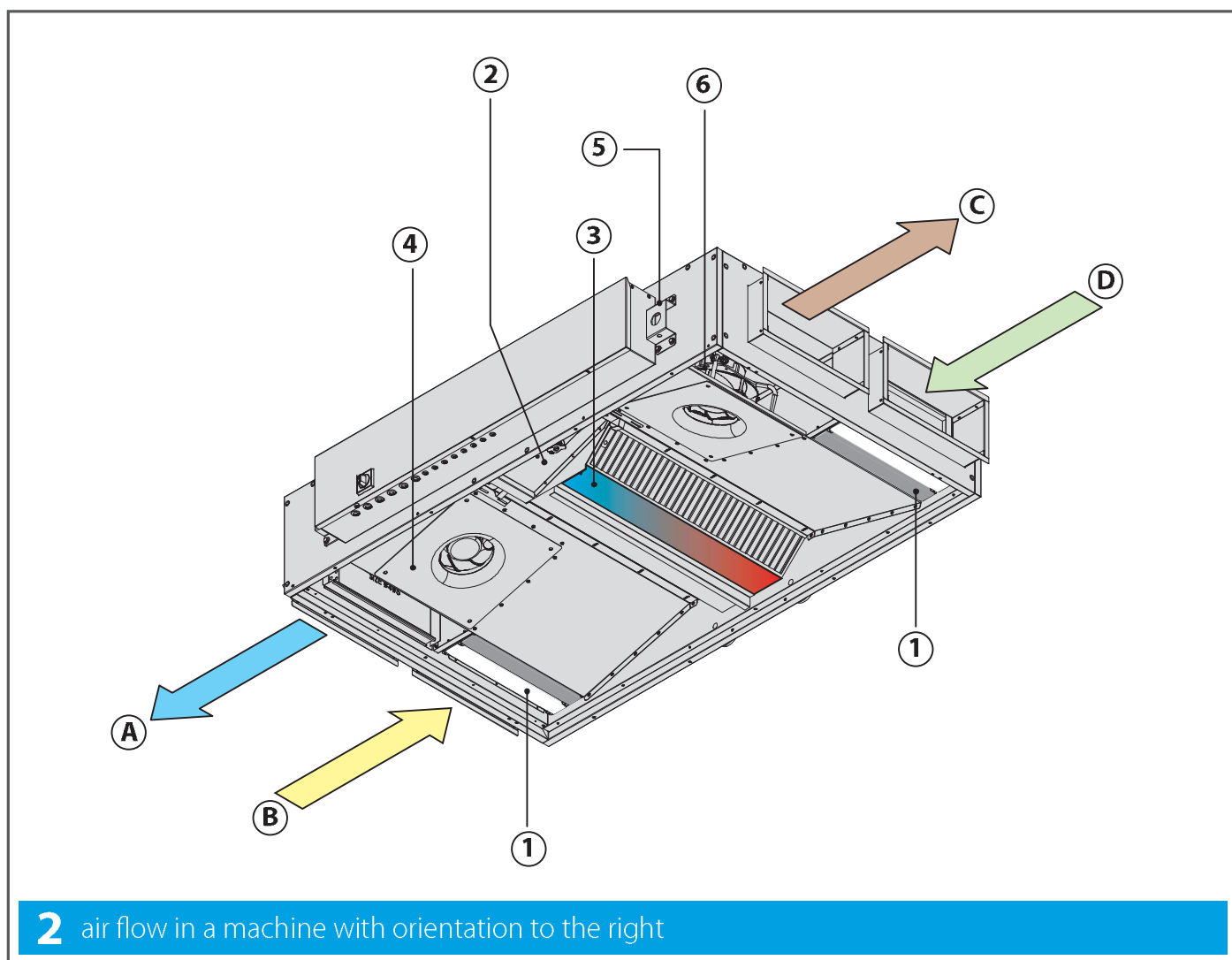
A common drainage can be used for both drain outlets.





TECHNICAL DATA TABLE	SIZE						
		2	3	4	5	6	7
Length (A)	mm	1660	1800	2000	2000	2000	2000
Width (B)	mm	920	1100	1600	1600	2000	2000
Height (C)	mm	280	350	415	415	500	500
Hole distance (D)	mm	1380					
Hole distance (E)	mm	976	1156	1656		2056	
F (up-and-over doors)	mm	630	670	675			
F (sliding doors)	mm	70					
G	mm	500					
H	mm	300					

Summary of machine operation



- ① Filter and pre-filter
- ② Exchanger by-pass
- ③ Heat exchanger
- ④ Delivery motor-driven fan group
- ⑤ Delivery motor-driven fan group
- ⑥ Intake motor-driven fan group
- Ⓐ Supply air
- Ⓑ Internal air
- Ⓒ Exhaust air
- Ⓓ Air from outside

Pos.	Component name	Construction material
1	Filter	galvanised steel frame, fibreglass filter unit
2	Bypass	aluzinc
3	Heat exchanger	aluminium
4	Fan motor assembly	size 2: composite board frame and impeller size 3,4,5,6,7: steel frame, composite board impeller
5	Brackets	galvanised steel

3 Receipt of the cartons



Handle the equipment following the Manufacturer's instructions on the packaging and in this manual. Always use personal protective equipment.

The means and method of transport must be chosen by the transport operator according to the type, weight and size of the machine. If necessary, draw up a "safety plan" to guarantee the safety of the people directly involved.



Upon receipt of the machine check the integrity of the packaging and the amount of parcels sent:

A) There is visible damage/one or more cartons is missing: **do not** install, but **promptly** notify the Manufacturer and the carrier that made the delivery.

Alternatively you can accept the shipment "subject to verification": this will make it possible to open the cartons and check if the internal components are indeed damaged. In the latter case, as noted previously, **promptly** notify the Manufacturer and the carrier that made the delivery.

Before opening the cartons, it is recommended to take good quality pictures to document the damage.

B) There is NO visible damage: move the machine to the site of installation.

4 Transport



Packages can be handled with a pallet truck of suitable capacity or with a forklift. The choice of the most suitable means and method lies with the operator.



The operating area must be perfectly free from objects or people not involved in the transport.



If transport is done using a pallet truck make sure it is suitable for the weight and size of the machine. Insert the forks into the points provided for handling (usually in a central position) so as to keep the centre of gravity of the load in balance. Move the equipment carefully, avoiding sudden movements.



5 Unpacking and verification of integrity



We recommend the equipment be unpacked after moving it to its installation location and only when it is to be installed. This operation must be performed using personal protection equipment (i.e., gloves, safety shoes, etc.).



Do not leave the packing unattended: it is potentially harmful to children and animals (suffocation hazard).



Some packing materials must be kept for future use (wooden crates, pallets, etc.), while those that cannot be reused (i.e., polystyrene, strapping, etc.) must be disposed of in compliance with the regulations in force in the country of installation: this will protect the environment!

After unpacking

After unpacking, check the received contents:

- Installation and maintenance manual (IOM)
- Wiring diagram
- Declaration of conformity

Check therefore that you have received all the components and that they are undamaged

In case of damaged or missing parts.

- **Do not move, install or repair** damaged components and the machine in general.
- **Take quality photos** to document the damage.
- **Find the serial number plate** on the machine and note the machine's serial number.
- Immediately **notify** the carrier that delivered the machine.
- **Promptly** contact the Manufacturer (keep on hand the serial number of your machine).



Please note that complaints or claims of damage reported after 10 days of receipt of the machine cannot be accepted.

AHU Codifica / Product number	D ALB07LBSNADBT00	POS Code	A83665		
Matricola / Serial number	I 18C0144	Data / Date	E 4/2018	Peso / Weight	C 373
PORTATA ARIA / AIR FLOW					
Mandata / Supply Fan	F 3000	Ripresa / Return Fan	G	m ³ /h	
Corrente / Current	H 9.3	A			
Tensione / Voltage	230V/1Ph/50-60Hz				
MESSA IN FUNZIONE All'avviamento consultare il manuale operativo e controllare: 1) senso di rotazione del ventilatore 2) l'assorbimento del motore, il quale non deve superare il valore di targa sopraindicato			START UP Before the start up read carefully the operating instruction manual and check: 1) fan rotation direction 2) the current input must not exceed the value mentioned on the above tag		
DAIKIN APPLIED EUROPE S.p.A. Via Piani di Santa Maria, 72 00040 Ariccia - (ROMA) IT MADE IN ITALY					

A: Manufacturer's name and data

B: CE markings

C: Machine weight

D: Code and POS

E: Date of manufacture

F: Supply airflow rate

G: Delivery airflow rate

H: Electrical specifications (frequency, number of phases, absorption in plate conditions)

I: Machine serial number

MANUFACTURER INFORMATION:

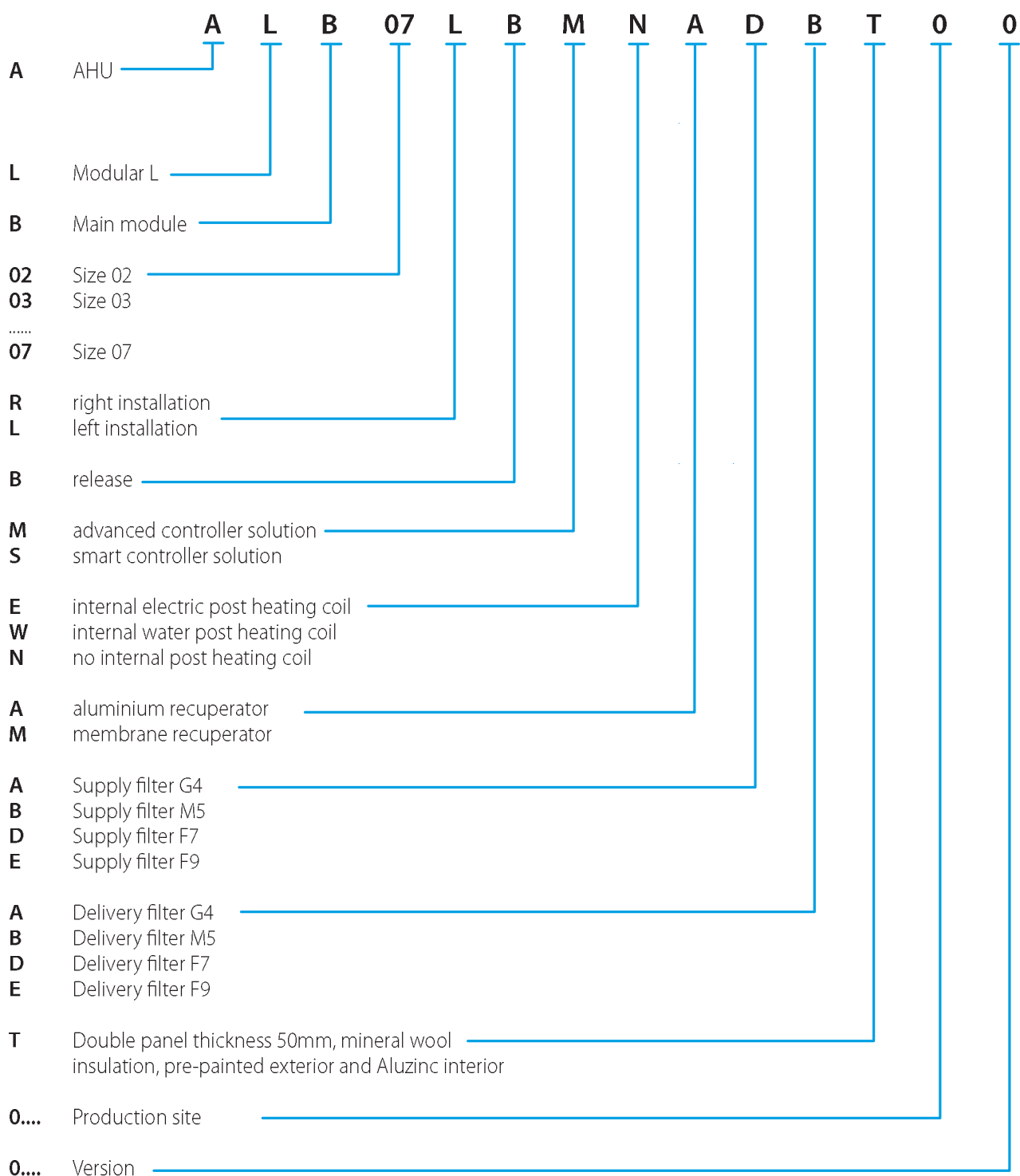
DAIKIN APPLIED EUROPE S.P.A.

Via Piani di Santa Maria, 72 - 00040 Ariccia (Roma) - Italy

Tel: (+39) 06 93 73 11 - Fax: (+39) 06 93 74 014

<http://www.daikinapplied.eu>

Product nomenclature



Modular L will be produced according to customer needs. However, we still designed a standard version indicated by only 7 digits ALB01R(L) B version. and that uniquely identifies a right/left machine, aluminium counter-current exchanger, double 50mm panel, with Smart controller, no internal post heating coil, F7 at supply, M5 at return Milan factory, version 0.

Storage waiting for installation

Waiting for the installation, the components of the machine and the relative documents must be stored in an area that:

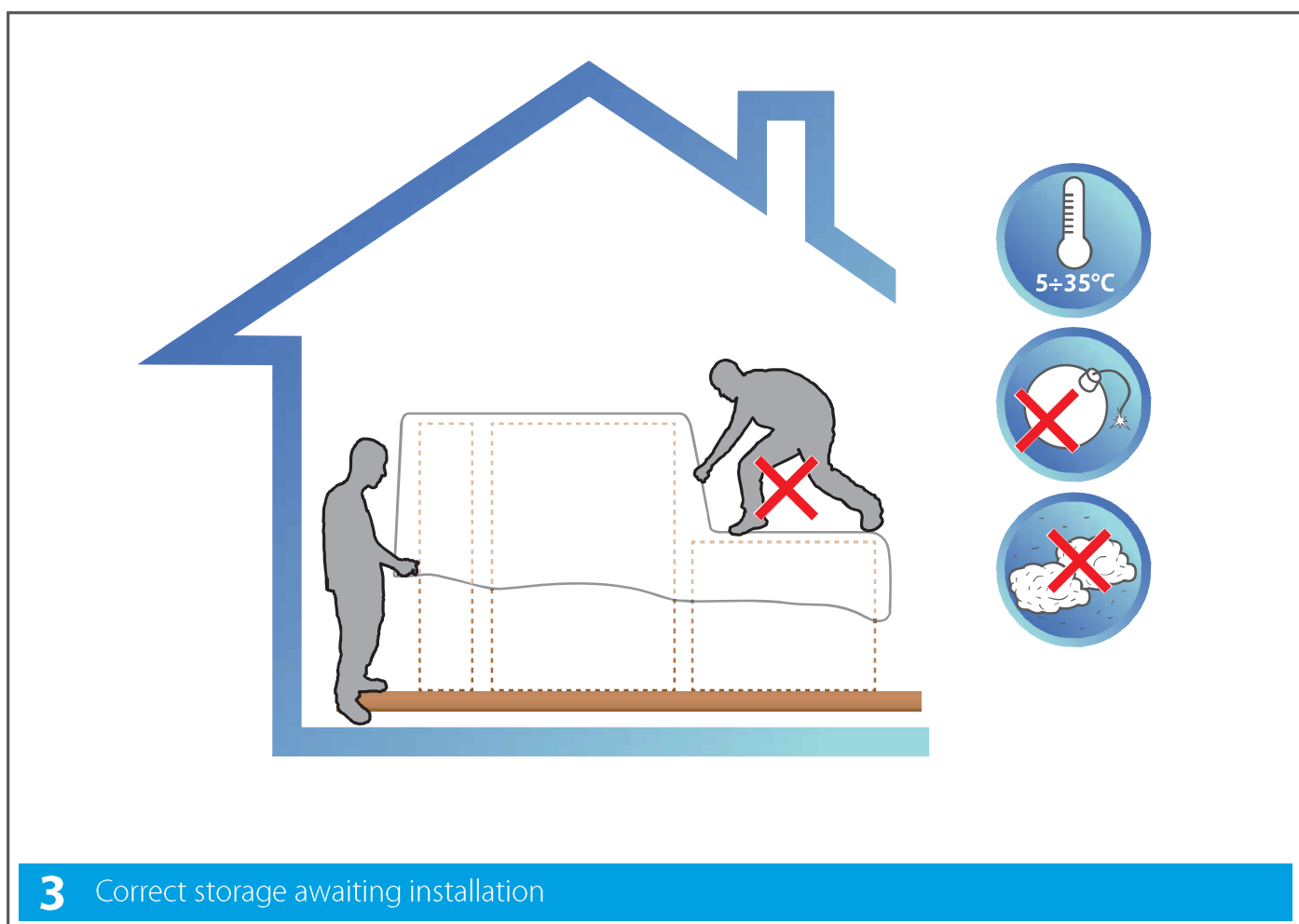
- Is dedicated exclusively to the storage of the components.
- Is covered and protected from the weather (preferably prepare a closed area), with adequate temperature and humidity.
- Is accessible only to operators tasked with the assembly.
- Can support the weight of the equipment (check the load rating) and has a stable floor.
- Is free from other components, especially if they are potentially explosive/incendiary/toxic.



If you cannot proceed with the installation straight away, check periodically that the above-mentioned conditions of the storage area are maintained and cover the machine with a canvas.



While waiting for the finale installation, always provide an insulating base (e.g., wood blocks) between the floor and the machine itself.



Any movement carried out after unpacking must be done with the doors closed. Do not move the units by pulling on the doors, if present, the uprights or other protruding parts that are not an integral part of the structure.



Do not step on the units!

6 Installation



All installation, assembly, electrical connections to the mains and extraordinary maintenance must be performed **only by qualified personnel authorised by the Retailer or Manufacturer**, in compliance with the regulations in force in the country the equipment is to be used and the standards on the systems and safety in the workplace.



During installation, the area must be free from people and objects not used for the assembly.



Before starting, make sure you have all the necessary equipment. Use only equipment that is in good condition and undamaged.



Installation procedure

Before installation, read the safety instructions on the first pages of this manual. Contact the Manufacturer if any points are unclear or not perfectly understandable. A check mark next to each step will help to confirm complete and proper installation.

<input type="checkbox"/>	Step 1: Mark the drilling points.....	page 21
<input type="checkbox"/>	Step 2: Make the connections.....	page 23
<input type="checkbox"/>	Step 3: Perform a trial run.....	page 26
<input type="checkbox"/>	Step 4: Safety signs.....	page 27

After installation store this manual and the assembly sheet that accompanied the machine in a place that is dry and clean. This way it will be accessible to operators in the future who need to consult it. Do not remove, tear out or write on any part of this manual besides the space set aside for notes:

Step 0: Lift the unit to the ceiling

Lift the unit up to the ceiling.



To facilitate the operations of lifting and to ensure the safety of the installers, we recommend the use of extensible pantograph lifts of the appropriate type and dimensions for the weight and size of the unit to be installed.

During lifting protective apparel must be worn to prevent injury, and individuals not assigned to installation or maintenance are NOT allowed to stand or pass through the work area.

Step 1: Mark the drilling points

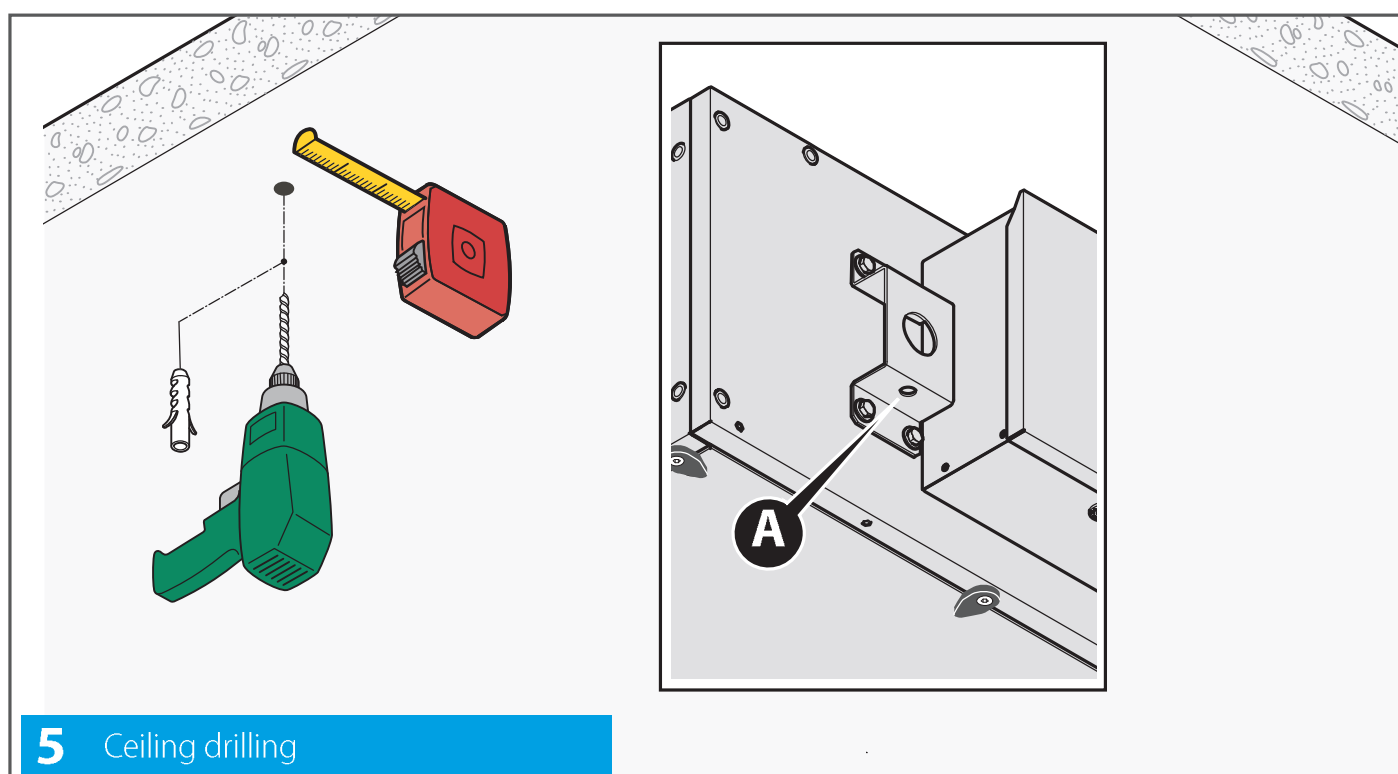
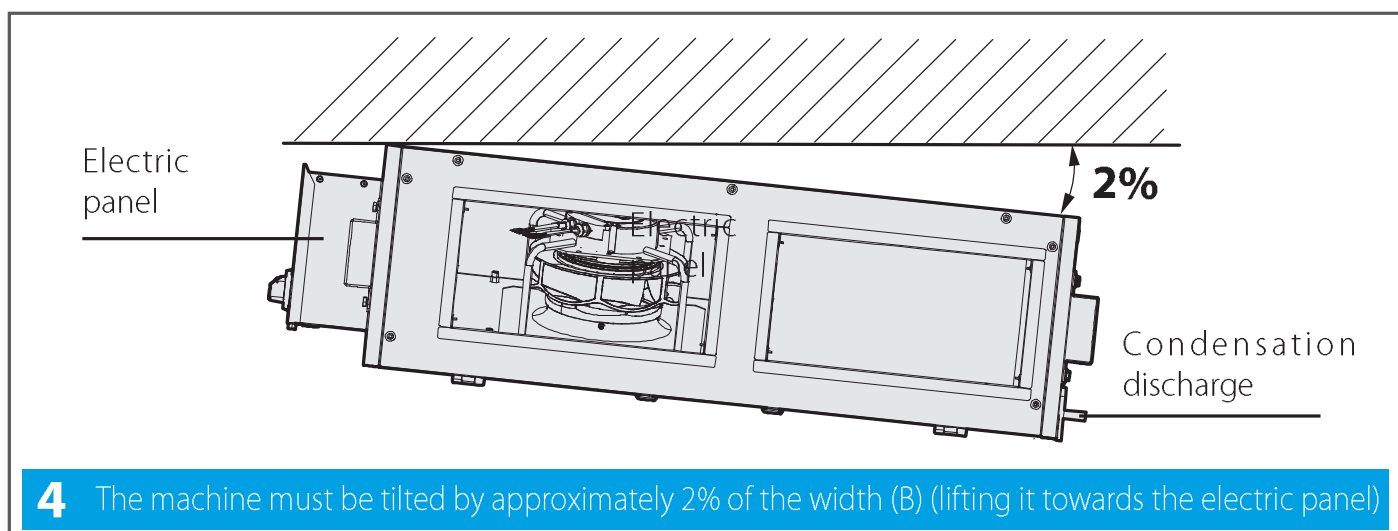
Make sure that the **ceiling** where you plan to install the machine is:

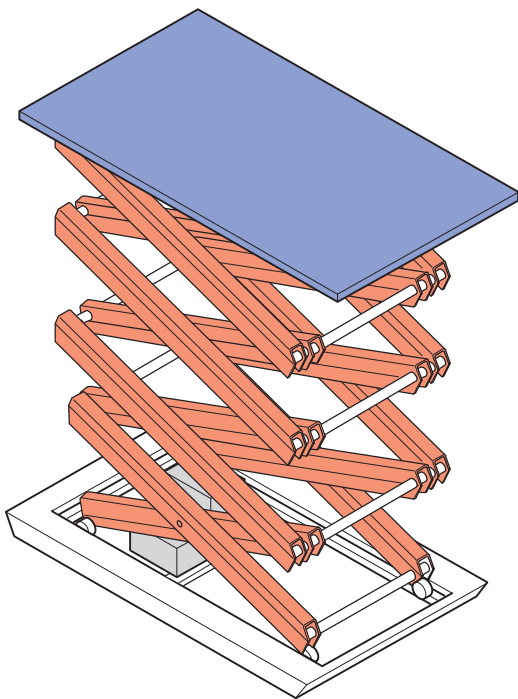
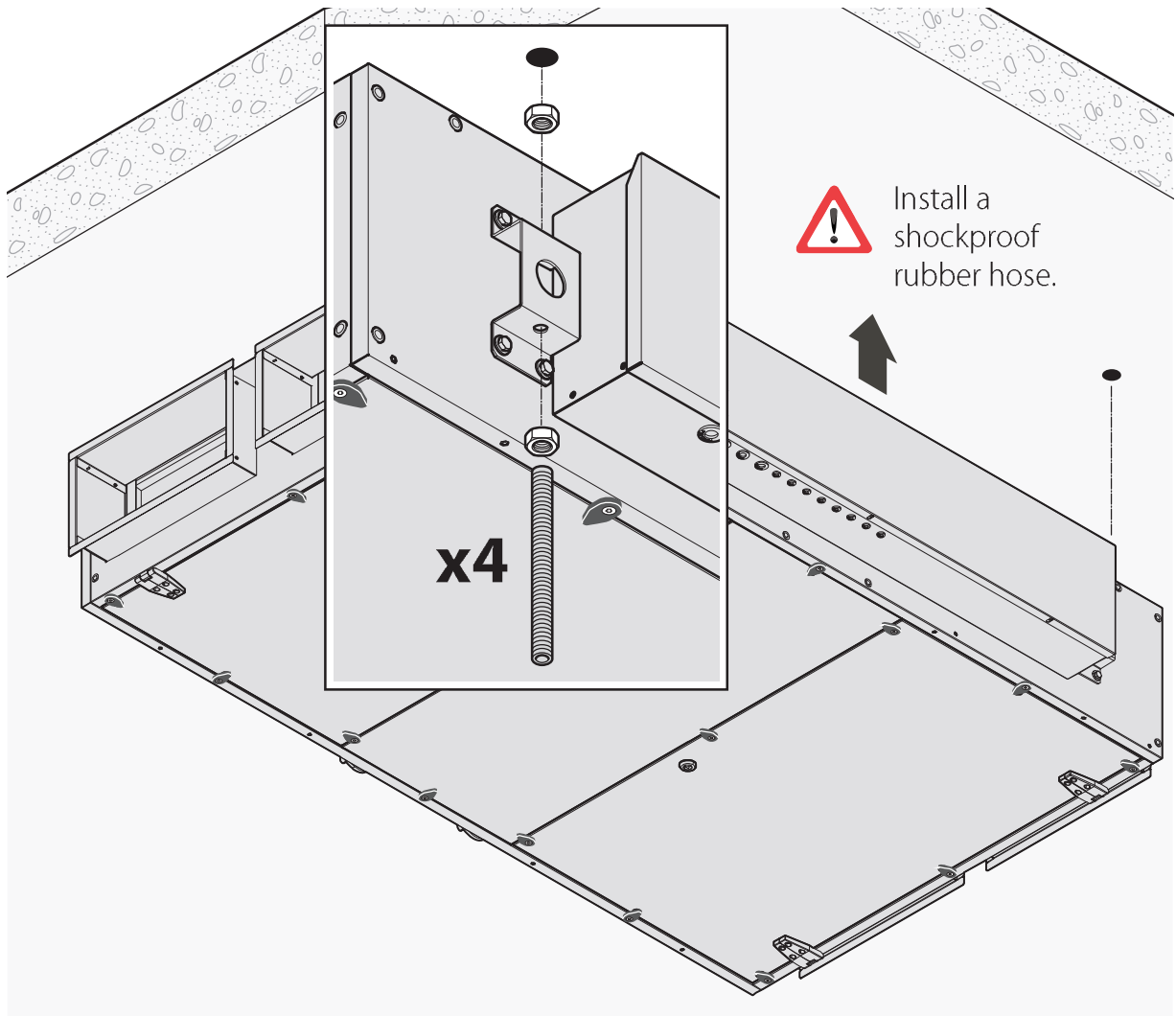
- Vibration resistant.
- Able to **support the weight of the equipment** (see table of technical data on page 12).

The installation site must also include (fig. 4):

- An **electrical system** compliant with current regulations and with specifications that meet the needs of the machine;
- a **coolant gas connection** (in the case of connection to coils supplied by gas).
- A drain pipe with **drain siphon** connected to the sewerage system.
- An **aeraulic system** (ducts for the air to be conveyed to the environments).

Drill $\varnothing 14$ mm holes at the machine anchor holes **A** (see "technical specifications" table on page 13). Insert the appropriate anchors, lift the machine and fasten it using only the brackets and screws supplied. Make sure to connect both drain pan outlet to the drainage circuit. A common drainage can be used for both drain outlets.





While lifting and fastening the unit it is **mandatory** to use protective clothing and suitable equipment, in order to prevent accidents and safeguard your own and other people's safety.

The fastening equipment should be dimensioned according to unit weight.

Individuals not assigned to the installation are NOT allowed to stand or pass through the work area during assembly.



To facilitate the operations of lifting and to ensure the safety of the installers, we recommend the use of extensible pantograph lifts of the appropriate type and dimensions for the weight and size of the unit to be installed.

6 Ceiling drilling

Step 2: Make the connections

To operate the machine requires:

- An electrical connection.
- Drain.
- A connection to the aeraulic circuit (air ducts).

Electrical connections

For the **power supply** it is necessary to connect the machine to an electrical panel in compliance with current regulations.



Always refer to the wiring diagram that is specific to the machine that you bought (it was shipped with the unit). If it is not on the machine or has been lost, contact the salesperson of reference who will send a copy (specify the machine's serial number).

Before connecting the machine make sure that:

- The voltage and frequency of the power supply correspond to the parameters of the machine.
- The electrical system being connected has sufficient capacity to supply the nominal electric power of the machine to be installed and meets current regulations.

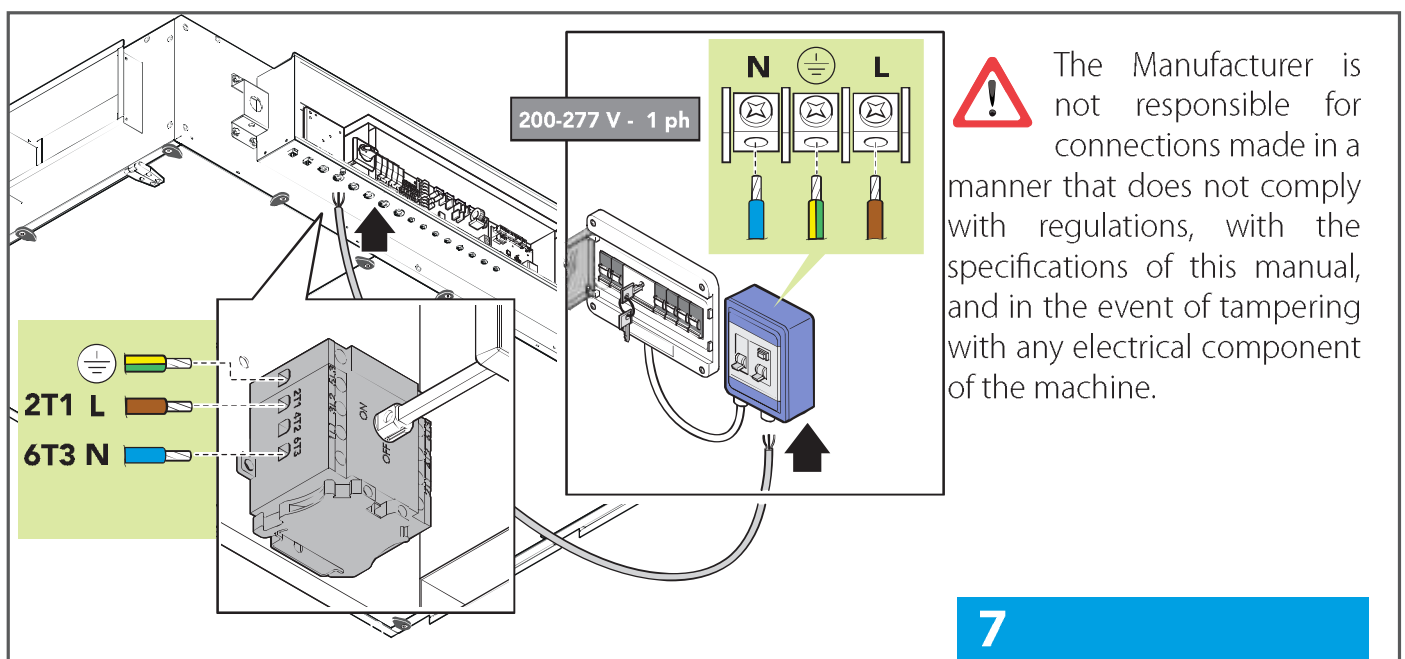


The electrical connection must be:

- Performed by qualified personnel after cutting off the facility's power supply.
- Performed in a fixed and permanent manner, without intermediate splices, in accordance with the regulations of the country of installation.
- The power supply is sufficient for the machine (see technical specifications).
- Includes a functioning grounded plug. For multiple units it is necessary to combine them all with metal ties.
- Preferably situated in a dedicated room, **locked** and protected from atmospheric agents. If there is also a key switch, the key must be removed when cutting the power supply and returned to its position only after finishing service operations.
- install a **16A circuit breaker system** or suited to machine absorption



During installation and maintenance, make sure that **no other person** besides the one who is working has access to the electrical cabinets or switches.





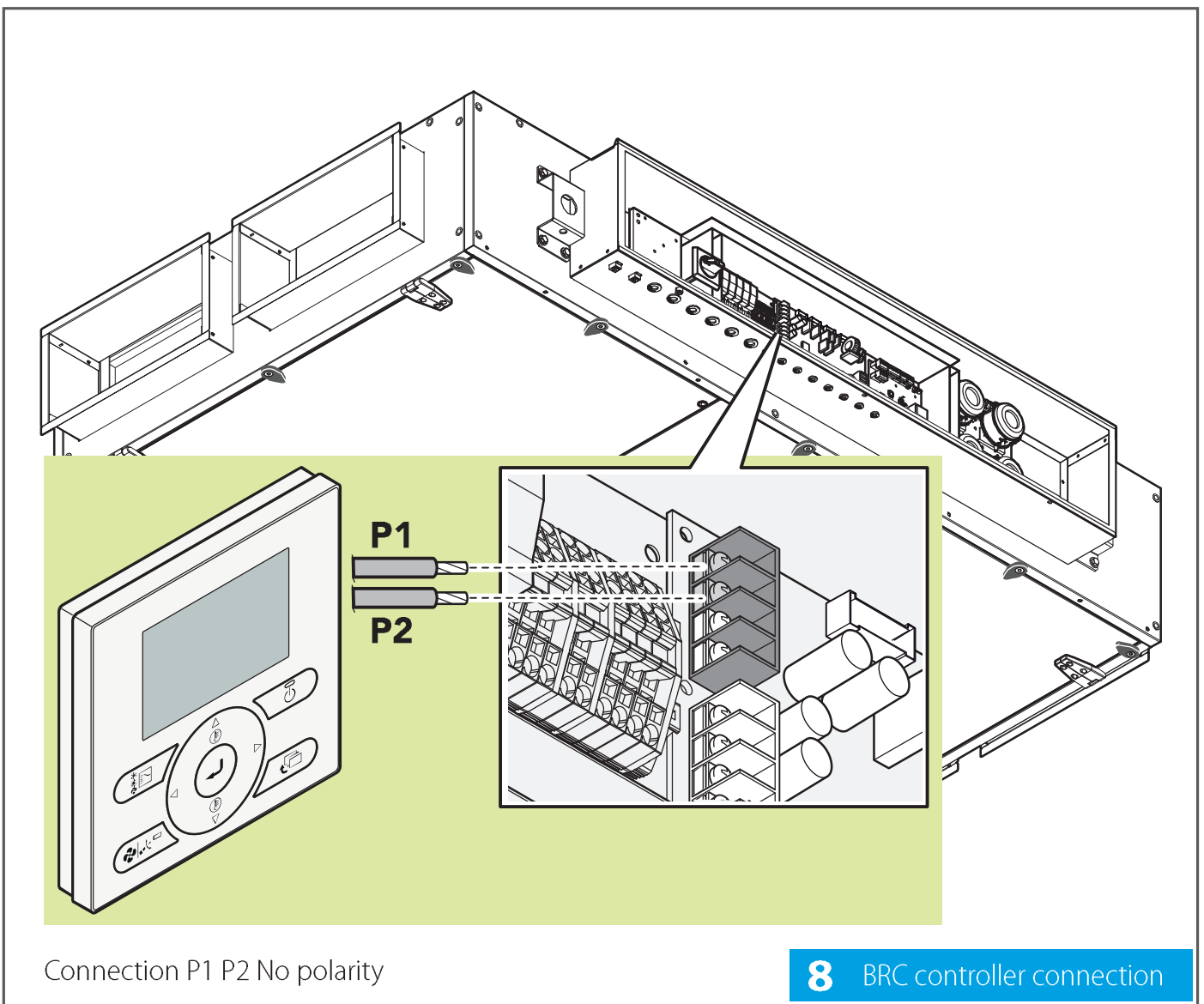
The actual supply voltage of the users **must not deviate more than 10%** from the normal voltage expected. Higher voltage differences cause damage to users and to the electrical system, malfunctioning of fans, noise. It is therefore essential to check the alignment of the actual voltage values with the nominal values.

After connecting, make sure that:

- The ground connection is sufficient (using the appropriate tool). An incorrect connection, ineffective and lacking the grounding circuit, is contrary to safety regulations and is a source of danger and can damage the components of the machine.
- the motor rotation direction is correct;
- The wiring and motor power draw are correct.

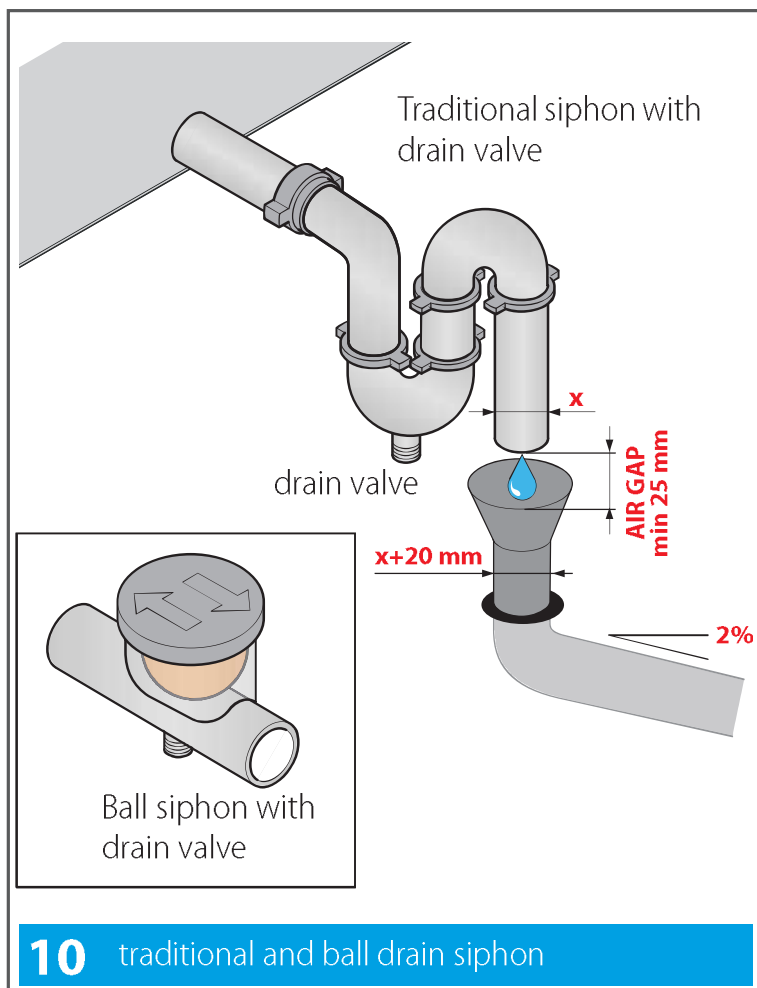
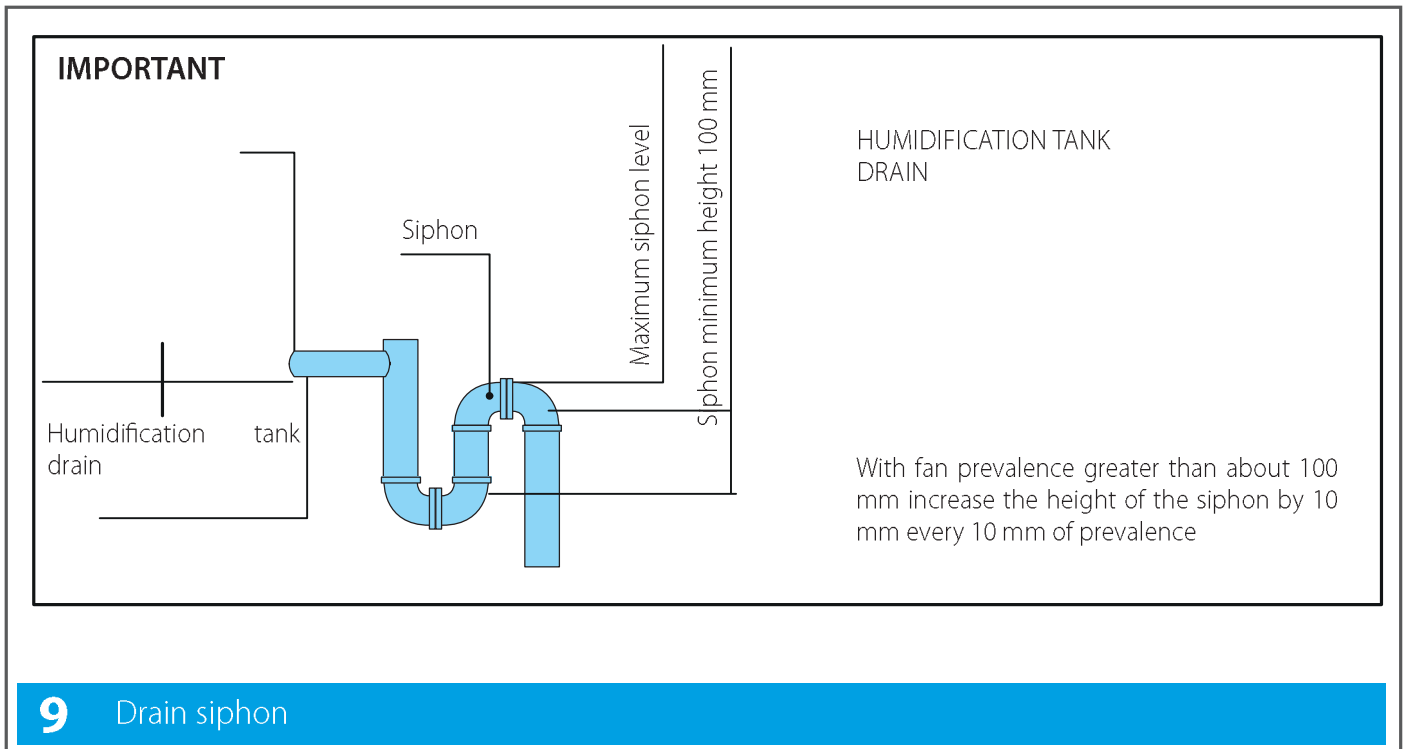
BRC controller connection

For the Modular L Smart start up connect the BRC controller (purchasable separately) to the terminals P1 and P2 as shown in the picture below.



Drain and siphon

The machines are equipped with a threaded drain (1/4" M GAS) that protrudes laterally by about 50 mm in order to allow a regular flow of water, each drain must be fitted with a properly sized SIPHON (see fig. 10).



To avoid overflows from the collection tank, the siphon must have a **purge valve** that allows the removal of impurities deposited on the bottom.

In order not to affect the operation of the drainage system, siphons operating under pressure must NOT be connected to others operating under vacuum.

The drainage pipe to the sewerage network:

- **Must not be connected directly to the siphon.** This in order to absorb returns of air or slurry and to make the correct outflow of waste water visible.
- Must have a larger diameter at the machine drain and a minimum inclination of 2% in order to ensure proper operation.

10 traditional and ball drain siphon

Aeraulic connections

Air conduits are not supplied with the machine. The installer must buy and install them separately. Coupling can occur by directly connecting the machine: we recommend installing a suitable shock absorption system between the machine and conduit.

If not using anti-vibration joints it is necessary to:

- Clean the joint surfaces between the duct and the machine/coil.
- Apply a gasket to the flange in order to prevent air infiltration.
- Carefully tighten the connecting screws.
- Use silicone on the gasket in order to optimise the seal.

If the connection is made with anti-vibration joints, when assembly is completed they should not be taut, so as to avoid damage and the transmission of vibrations.

In order to ensure the seal of the connection and the integrity of the machine's structure, it is essential to make sure that the ducts do not weigh on it, being supported by their own brackets.

Step 3: Perform a trial run

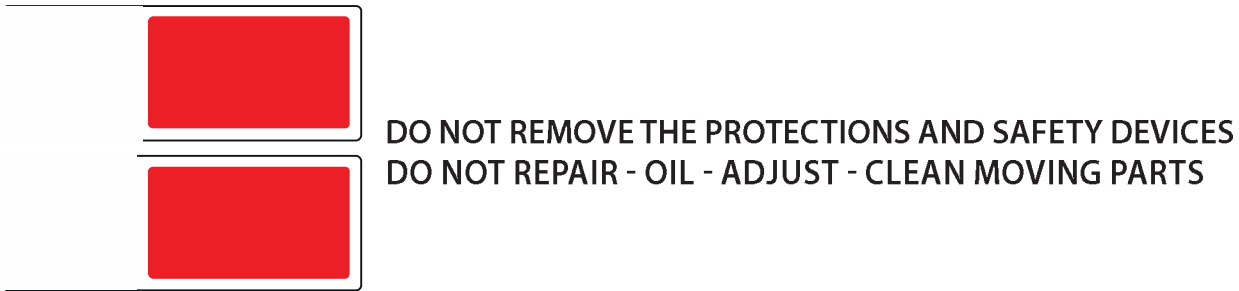
To commission the machine it is necessary (tick "✓" the operations completed):

	check accurate fluid inlet and output pipe connections to the exchange coils (if applicable)
	Check that there is a suitable siphon for all the water being drained.
	place a shock absorbing joint between the machine and conduits (optional);
	check unit integrity;
	Check the integrity of the anti-vibration supports and the various accessories.
	Remove extraneous materials (e.g., assembly sheets, tools, clips, etc.) and dirt (footprints, dust, etc.) from inside the sections.

Step 4: Safety signs

The machine is supplied with the electricity-specific signs on the access doors to the fan sections.

The buyer must position other appropriate signs in the work area:



In addition, the space where the machine is positioned must be integrated into the general signage, specific to the characteristics of the area and workplaces:

noise - movement - dangerous areas - escape route, etc.

PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment should be used when operating the machine, suitable for use in accordance with company criteria and rules.

During machine maintenance, other preventive measures are suggested in addition to the above: safety shoes, gloves, suitable clothing, always compatible with the use and according to company guidelines.

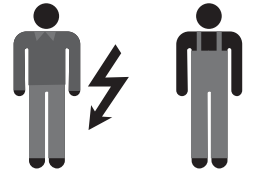
TRAINING

It is the responsibility of the machine buyer/user to provide adequate instruction and training to machine operators.

OPTIONAL

In agreed cases, additional training may be provided through the one-on-one instruction of operators by the Manufacturer's technical staff.

7 Commissioning



Configuration

The settings (format: XX(XX)-X-XX), for example 19(29)-1-02, that are used in this chapter are composed of 3 parts, divided by "-":

- Mode number: for example, 19(29), where 19 is the mode number for group settings and 29 is the mode number for individual settings
- Switch number: for example, 1
- Position number: for example, 02

Operating procedure

You can use either the user interface of the Modular L Smart or of the air conditioner to adjust the heat reclaim ventilation unit settings.

Initial settings

- Mode numbers 17, 18, and 19: group control of Modular L Smart.
- Mode numbers 27, 28, and 29: individual control

To change the settings with BRC1E53

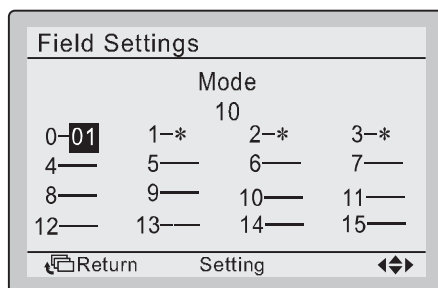
Make sure that the switch box lids on the Modular L Smart are closed.

1. Shortly press a button to turn on the screen light.
2. Press and hold the Cancel button (a) for at least 4 seconds to enter the Service Settings menu.
3. Go to Field Settings with the Up/Down buttons and press the Menu/Enter button (b).
4. Press the Left/Right buttons to highlight the number under Mode.
5. Press the Up/Down buttons to select the required mode number.
Result: Depending on the mode number that you select, starting at 20, you will also have to select a unit number, for the individual control.
6. Use the Left/Right buttons to highlight the number under Unit No.
7. Use the Up/Down buttons to select an indoor unit number. Selecting a unit number is NOT necessary when you are configuring the entire group.
8. Use the Left/Right buttons to select a position number (0 to 15) for the switch number that you want to change.

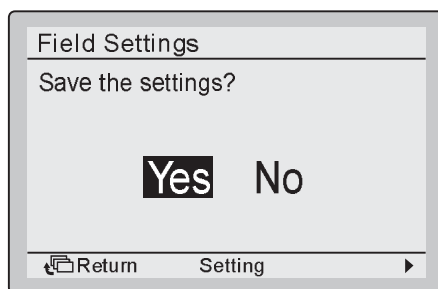
In case of individual settings:

Field Settings			
Unit No.	Mode		
0	20		
0-01	1-00	2-00	3-00
4---	5---	6---	7---
8---	9---	10---	11---
12---	13---	14---	15---
Return		Setting	↔

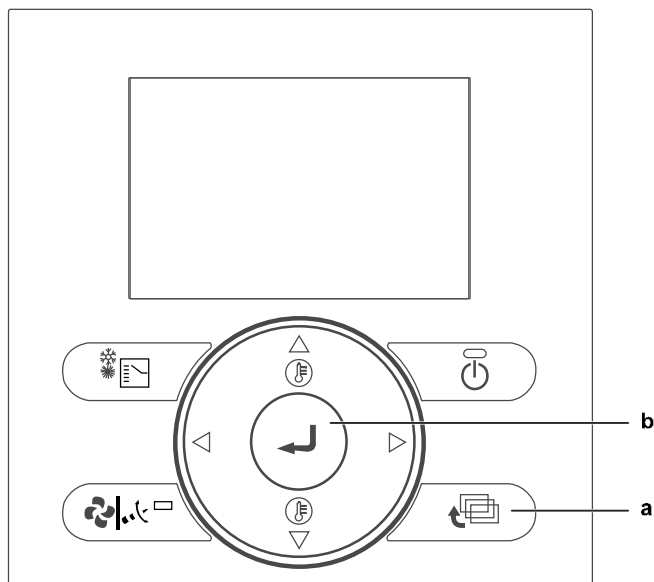
In case of group settings:



9. Use the Up/Down buttons to select the required position.
10. Press the Menu/Enter (b) button and confirm the selection with Yes.



11. After you have completed all the changes, press the Cancel button (a) twice to return to the normal mode.



List of the settings

Setting mode	Setting switch no.	Setting description	Setting position no.					Setting position no.										
			01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
19(29)	0	Filter contamination inspection setting	Filter contamination check with fan step 1-15	Filter contamination check with new fan step	Timer based check	Target detection filter with fan step 1-15	Auto ESP selection + target detection filter with new fan step											
	1	Low tap setting	Off	Run 1/15 (28 min. off/2 min. on)	Run 1/10 (27min. Off/3 min. on)	Run 1/6 (25min. Off/5 min. on)	Run 1/4 (22.5min. Off/7.5 min.on)	Run 1/3 (20min. Off/10 min.on)	Run 1/2 (15min. Off/15 min.on)	Continuous operation								
										Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	
	2	Supply fan step setting*	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10	Step 11	Step 12	Step 13	Step 14	Step 15	
	3	Exhaust fan step setting*	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10	Step 11	Step 12	Step 13	Step 14	Step 15	
	4	24 hour ventilation setting	Off	Run 1/15 (28 min. off/2 min. on)	Run 1/10 (27min. Off/3 min. on)	Run 1/6 (25min. Off/5 min. on)	Run 1/4 (22.5min. Off/7.5 min.on)	Run 1/3 (20min. Off/10 min.on)	Run 1/2 (15min. Off/15 min.on)	Continuous operation								
										Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	
	7	Reference concentration shift for ventilation flow control (ppm)	0	+200	+400	+600	-200	-400	-600									
	8	Stop ventilation by automatic ventilation air flow control	Allowed	NOT Allowed	Allowed	NOT Allowed												
Fan residual operation		Off	Off	Heater operation	Heater operation													
9	Normal ventilation tap on automatic ventilation air flow control					Control by CO ₂ sensor												
1A	0	Fresh-up operation**	Off	On														

Setting mode	Setting switch no.	Setting description	Setting position no.					Setting position no.										
			01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
17(27)	0	Filter cleaning time setting	Approx. 2500 hours	±1250 hours														
	1	Nigh-time free cooling timer (after stop)	Off	On after 2 hours	On after 4 hours	On after 6 hours	On after 8 hours											
	2	Pree-cool/pre-heat	Off	On														
	3	Pre-cool/pre-heat duration	30 minutes	45 minutes	60 minutes													
	4	Initial fan speed	High	Ultra-high														
	5	Yes/No setting for duct connection with VRV system	Without duct	With duct	Without duct	With duct												
		Setting for cold areas (fan operation when heater thermostat is off)			Stop	Low	Stop	Low										
	6	Nigh-time free cooling (fan settings)	High	Ultra-high														
	7	Target temperature for independent Nigh-time free cooling	18°C	19°C	20°C	21°C	22°C	23°C	24°C	25°C	26°C	27°C	28°C	29°C	30°C			
	8	Centralised zone interlock setting	No	Yes														
9	Pre-heat time extension setting	0 minutes	30 minutes	60 minutes	90 minutes													

Setting mode	Setting switch no.	Setting description	Setting position no.					Setting position no.													
			01	02	03	04	05	06	07	08	09	10	11	12	13	14	15				
18(28)	0	External signal JC/J2	Last command	Priority on external input	Priority on operation	Disable night-time free cooling / Forced stop		24 hours ventilation On/Off													
	1	Setting for direct Power	Off	On																	
	2	Autorestart setting	Off	On																	
	3	Output signal to external damper (X24A)			Damper output (fan operation)	Damper output (fan operation)															
	4	Indication of ventilation mode	On	Off																	
	6	Automatic ventilation air flow mode	Linear		Fixed A	Fixed B															
	7	Fresh-up mode	No indication supply	No indication supply	Indication exhaust	Indication exhaust															
	8	External input terminal function selection (between J1 and JC)	Fresh-up	Error output	Error output stop operation	Forced off	Fan forced off	Air-flow up													
	9	BRP4A50A output switching selection (between X3 and X4)	Heater output	Error output	Fan output (Low/High/Ultra-high)	Fan output (High/Ultra-high)	Fan output (Ultra-high)	Fan output (Low/High/Ultra-high)													
	11	Filter contamination check**	No action	Reset filter check	Force filter check																

How to select the optimal Ventilation Speed

The fine tuning of the Ventilation Speed can be done properly modifying the following parameters:

- Initial fan speed: High or Ultra-High
- Supply fan step setting: Step 1 to 15
- Exhaust fan step setting: Step 1 to 15

These parameters can be accessed following the procedure "The Configuration **Service Settings** → **Field Settings** page, as shown in the List of Settings paragraph.

Both Supply and Return Fans have an optimal speed value, described in term of **RPM** (Revolution per Minute), that can be retrieved directly from the DAE Unit Selection Software report, as shown below:

3) Fan Supply

Model	K3G190RD4503
Type	EC Centrifugal Fan
Material	Composite
Quantity	1x(Single Fan)
External Static Pressure	100 Pa
Internal Static Pressure	183 Pa
Total Static Pressure	283 Pa
Dynamic Pressure	10 Pa
Flow Design	300 m ³ /h
Rotation Speed Work • Max	2957 RPM • 4120 RPM
Efficiency	45.3%
Shaft Power	0.07 kW
Electrical Power Input	0.07 kW
Power Class • PMREF (EN13053)	P1 • 0.14 kW
SFPv Class • SFPv (EN13053)	SFP1 • 631 W/(m ³ /s)

3) Fan Return

Model	K3G190RD4503
Type	EC Centrifugal Fan
Material	Composite
Quantity	1x(Single Fan)
External Static Pressure	100 Pa
Internal Static Pressure	182 Pa
Total Static Pressure	282 Pa
Dynamic Pressure	10 Pa
Flow Design	300 m ³ /h
Rotation Speed Work • Max	2954 RPM • 4120 RPM
Efficiency	45.3%
Shaft Power	0.07 kW
Electrical Power Input	0.07 kW
Power Class • PMREF (EN13053)	P1 • 0.14 kW
SFPv Class • SFPv (EN13053)	SFP1 • 609 W/(m ³ /s)

Optimal RPM values for Supply and Return(Exhaust) Fans

Provided the Unit Size is known, you can proceed to set the correspondent Supply/Return Fan step on the BRC controller, according to the following Speed-selection Tables (Make sure to consider "Heat recovery operation" rpm).

If you do not have the unit selection from Daikin tool software, please check individual unit size performances from page 36 onwards.

Speed-selection tables

In order to select the correct step for the Supply and Return Fan it is necessary to:

- Choose the table whose Unit Size number equals the Unit Size provided in the DAE Unit Selection software report.
- Identify the Supply/Return Fan steps by choosing, from H(high) column, the steps whose RPM values are the closest to the Supply/Return Fan RPM provided by DAE Unit Selection software report.
- Set the selected step values on the controller by going to the path **Service Settings → Field Settings** and set the following
 - a. **19(29)-2- Selected_Step_Supply_Fan**, for the Supply Fan Step, from 01 to 15
 - b. **19(29)-3- Selected_Step_Return_Fan**, for the Return Fan Step, from 01 to 15
- If both Supply and Return Fan RPM are not present in the column H, but they appear in UH(ultra high) one, then:
 - Set the Initial Fan Speed to UltraHigh by going to the path **Service Settings → Field Settings** and modifying the default value from **17(27)-4-01(High)** to **17(27)-4-02(UltraHigh)**
 - Set the selected steps as in point 3.

Step		ML Smart Size 02											
		Supply fan						Exhaust fan					
		Heat recovery operation			Bypass operation			Heat recovery operation			Bypass operation		
		UH	H	L	UH	H	L	UH	H	L	UH	H	L
SA Fan RPM set- ting (19(29)-2- ...)	01	2813	2343	1236	2943	2376	1336	3106	2646	1667	2787	2292	1236
	02	2895	2428	1332	3020	2480	1421	3170	2723	1748	2861	2363	1310
	03	2976	2521	1429	3098	2576	1510	3238	2807	1831	2936	2440	1384
	04	3054	2606	1528	3176	2661	1591	3302	2881	1915	3010	2511	1458
	05	3132	2691	1628	3254	2758	1677	3370	2958	2002	3080	2588	1532
	06	3209	2765	1725	3335	2843	1765	3434	3019	2083	3151	2659	1606
	07	3287	2843	1825	3413	2939	1851	3502	3087	2166	3219	2736	1680
	08	3361	2917	1917	3491	3024	1936	3566	3148	2250	3290	2804	1757
EA Fan RPM set- ting (19(29)-3- ...)	09	3450	3002	2021	3579	3120	2043	3647	3222	2340	3370	2884	1851
	10	3546	3076	2125	3672	3209	2154	3734	3286	2424	3454	2961	1947
	11	3635	3139	2221	3761	3276	2254	3811	3344	2501	3531	3029	2034
	12	3728	3213	2317	3853	3350	2361	3895	3412	2585	3615	3093	2131
	13	3809	3280	2402	3942	3417	2458	3969	3470	2662	3692	3154	2218
	14	3898	3357	2495	4035	3491	2543	4046	3537	2749	3779	3219	2308
	15	3976	3420	2580	4120	3557	2621	4120	3592	2823	3853	3280	2375

This table refers to indicated values subject to tolerances.

In order to adjust the desired airflow value based on measurement at site, while increasing rpm you will obtain more air flow and while decreasing rpm, you will reduce air flow. If needed, kindly change fan speed to reach the target air flow.

Step		ML Smart Size 03 & Size 04 & Size 06											
		Supply fan						Exhaust fan					
		Heat recovery operation			Bypass operation			Heat recovery operation			Bypass operation		
		UH	H	L	UH	H	L	UH	H	L	UH	H	L
SA Fan RPM set- ting (19(29)-2- ...)	01	2356	1962	1035	2464	1990	1119	2601	2216	1396	2334	1919	1035
	02	2424	2033	1116	2529	2077	1190	2655	2280	1464	2396	1978	1097
	03	2492	2111	1196	2594	2157	1264	2711	2350	1534	2458	2043	1159
	04	2557	2182	1280	2659	2229	1333	2765	2412	1604	2520	2102	1221
	05	2622	2253	1364	2725	2309	1404	2822	2477	1676	2579	2167	1283
	06	2687	2315	1444	2793	2380	1478	2876	2528	1744	2639	2226	1345
	07	2752	2380	1528	2858	2461	1550	2933	2585	1814	2695	2291	1407
	08	2814	2442	1605	2923	2532	1621	2986	2636	1884	2755	2348	1472
EA Fan RPM set- ting (19(29)-3- ...)	09	2889	2514	1692	2997	2613	1711	3054	2698	1959	2822	2415	1550
	10	2969	2576	1779	3075	2687	1804	3127	2752	2030	2892	2480	1631
	11	3044	2628	1860	3149	2743	1888	3191	2800	2094	2957	2536	1703
	12	3121	2690	1940	3227	2805	1977	3261	2857	2164	3027	2590	1784
	13	3190	2746	2012	3301	2861	2058	3323	2906	2229	3092	2641	1857
	14	3264	2811	2089	3379	2923	2129	3388	2962	2302	3164	2695	1933
	15	3329	2864	2160	3450	2979	2194	3450	3008	2364	3226	2747	1989

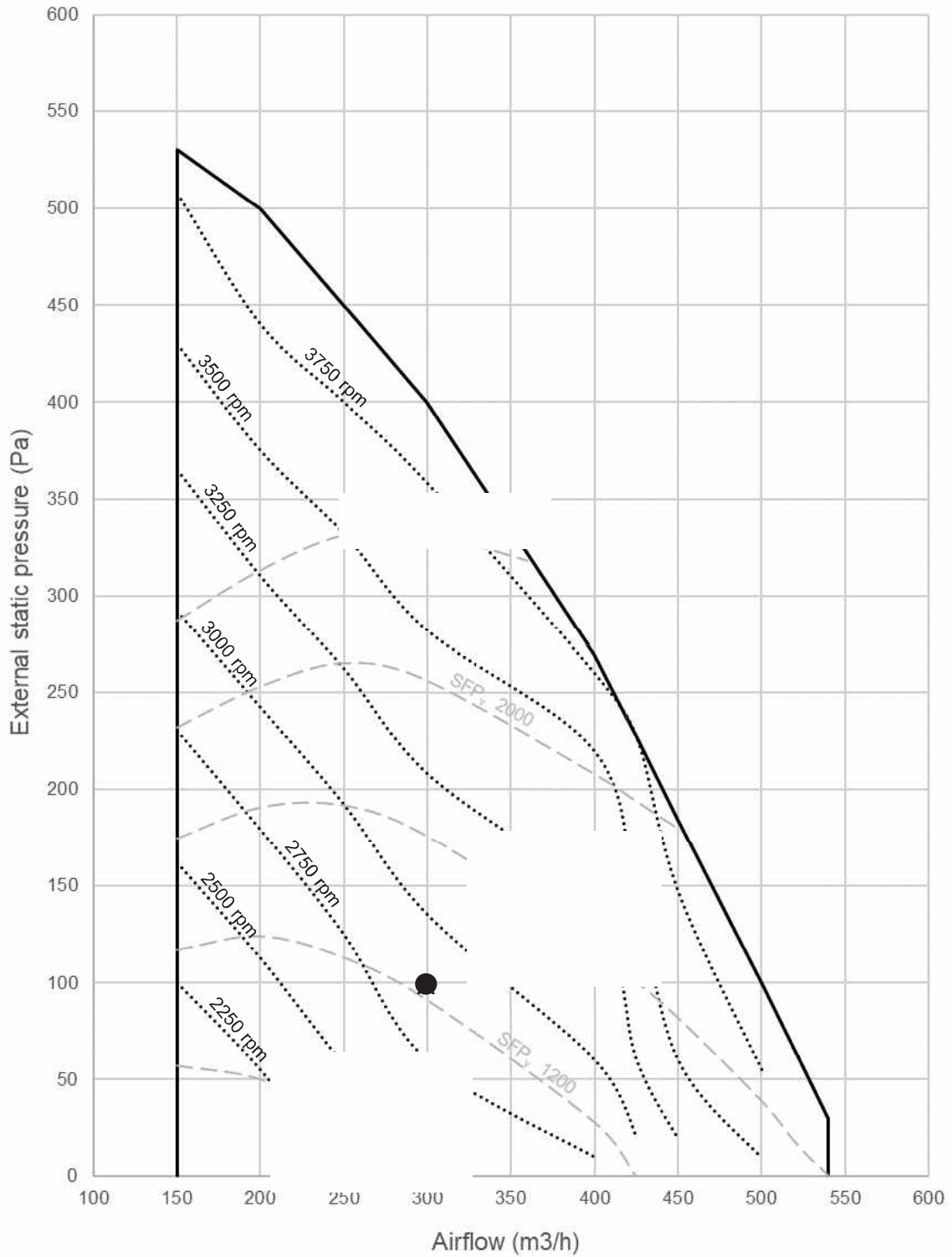
Step		ML Smart Size 05 & Size 07											
		Supply fan						Exhaust fan					
		Heat recovery operation			Bypass operation			Heat recovery operation			Bypass operation		
		UH	H	L	UH	H	L	UH	H	L	UH	H	L
SA Fan RPM set- ting (19(29)-2- ...)	01	2103	1752	924	2200	1776	999	2322	1978	1246	2084	1713	924
	02	2164	1815	996	2258	1854	1062	2370	2036	1307	2139	1766	979
	03	2225	1884	1068	2316	1926	1129	2421	2098	1369	2195	1824	1035
	04	2283	1948	1143	2374	1990	1190	2469	2154	1432	2250	1877	1090
	05	2341	2012	1217	2432	2062	1253	2519	2211	1497	2303	1935	1145
	06	2399	2067	1289	2493	2125	1320	2567	2257	1557	2356	1988	1201
	07	2457	2125	1364	2551	2197	1383	2618	2308	1619	2406	2045	1256
	08	2513	2181	1433	2609	2261	1447	2666	2353	1682	2459	2096	1314
EA Fan RPM set- ting (19(29)-3- ...)	09	2579	2244	1511	2676	2333	1527	2726	2409	1749	2519	2156	1384
	10	2651	2300	1588	2745	2399	1610	2791	2457	1812	2582	2214	1456
	11	2717	2347	1660	2812	2449	1685	2849	2500	1870	2640	2264	1521
	12	2787	2402	1732	2881	2504	1765	2912	2551	1932	2702	2312	1593
	13	2848	2452	1796	2947	2554	1837	2967	2594	1990	2760	2358	1658
	14	2914	2510	1865	3016	2609	1901	3025	2644	2055	2825	2406	1725
	15	2972	2557	1929	3080	2659	1959	3080	2685	2110	2880	2452	1776

This table refers to indicated values subject to tolerances.

In order to adjust the desired airflow value based on measurement at site, while increasing rpm you will obtain more air flow and while decreasing rpm, you will reduce air flow. If needed, kindly change fan speed to reach the target air flow.

Modular L Smart performance curves

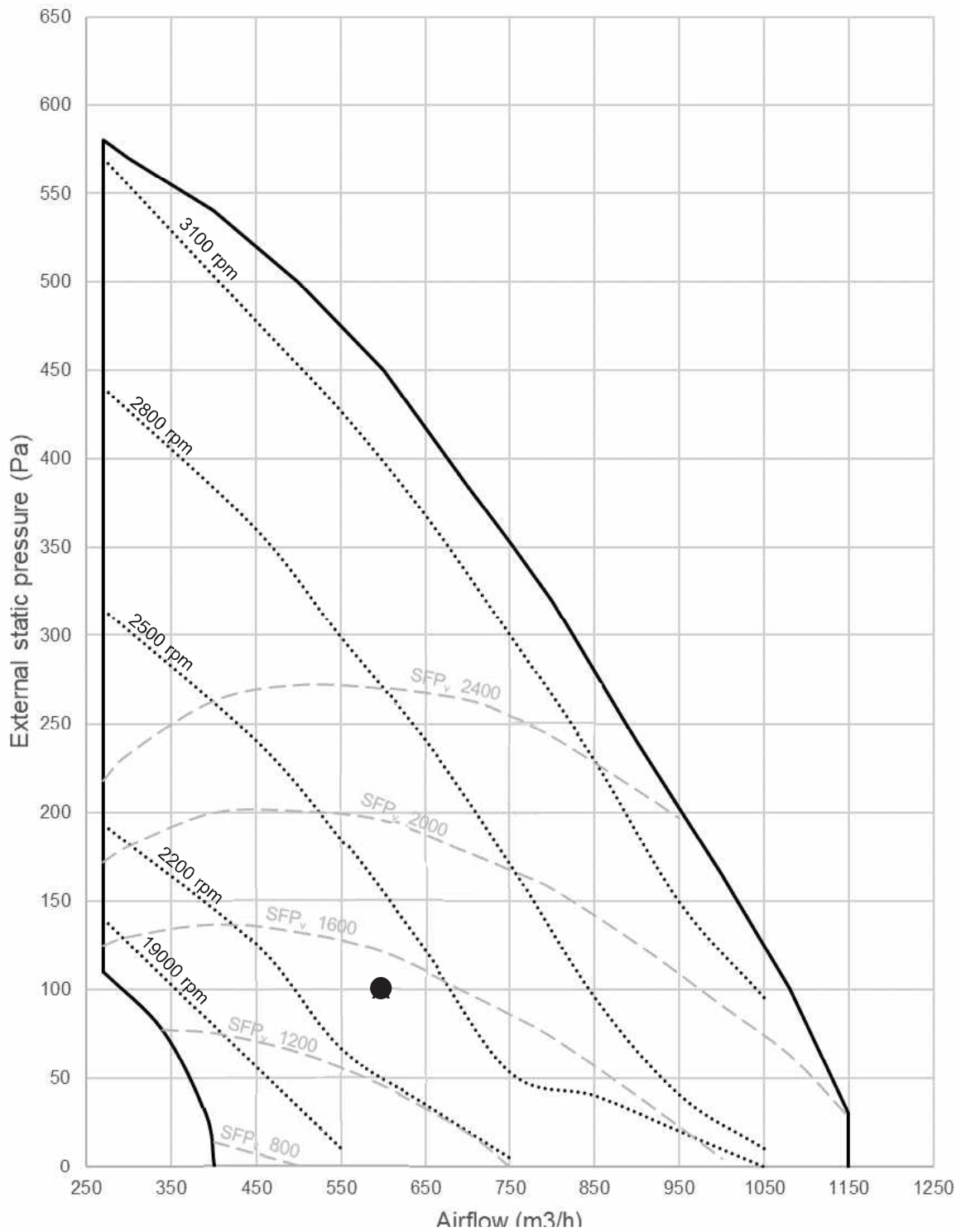
Size 2



● Nominal conditions

SFPv values are evaluated with F7 and M5 filter respectively for supply and return air side

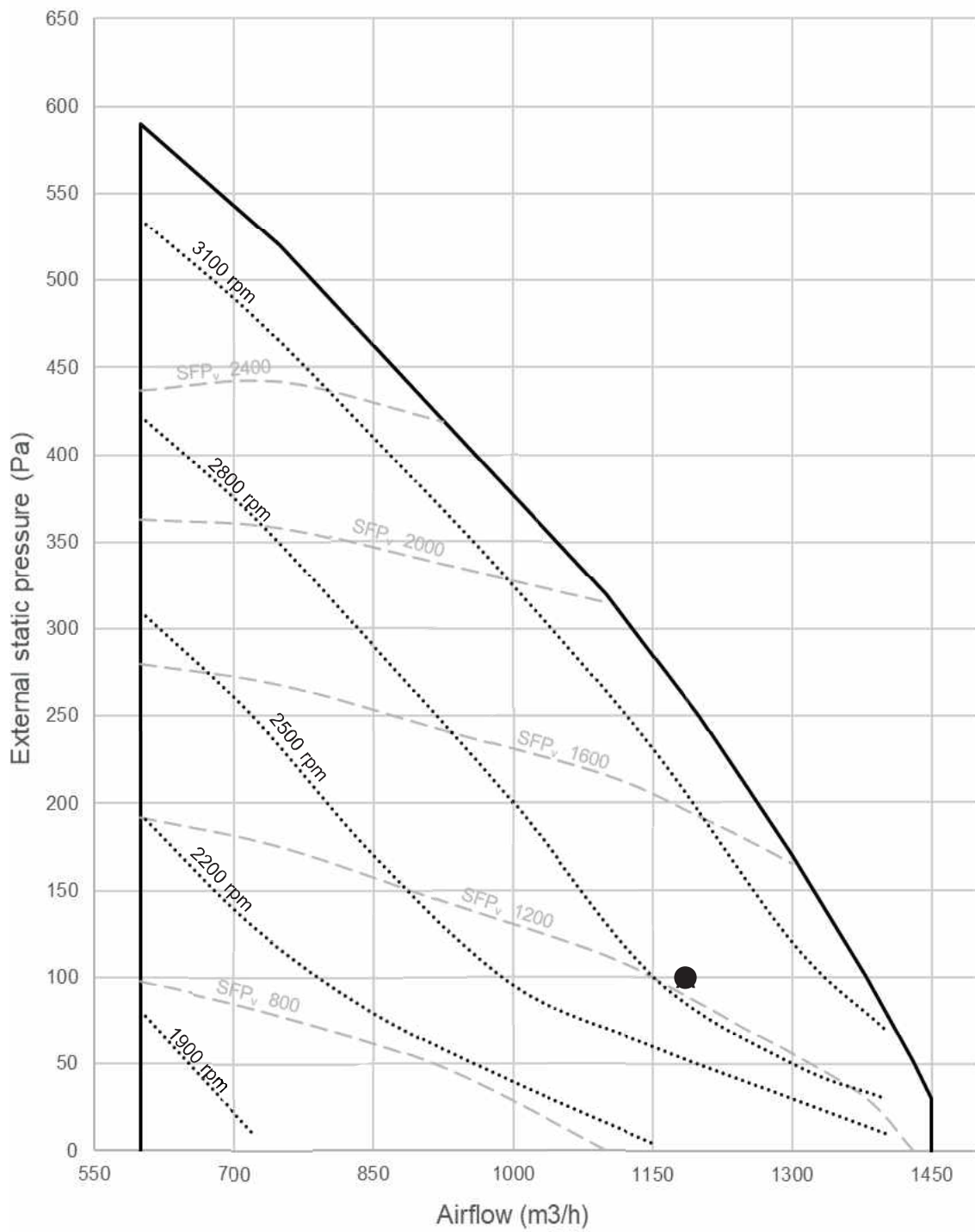
Size 3



● Nominal conditions

SFPv values are evaluated with F7 and M5 filter respectively for supply and return air side

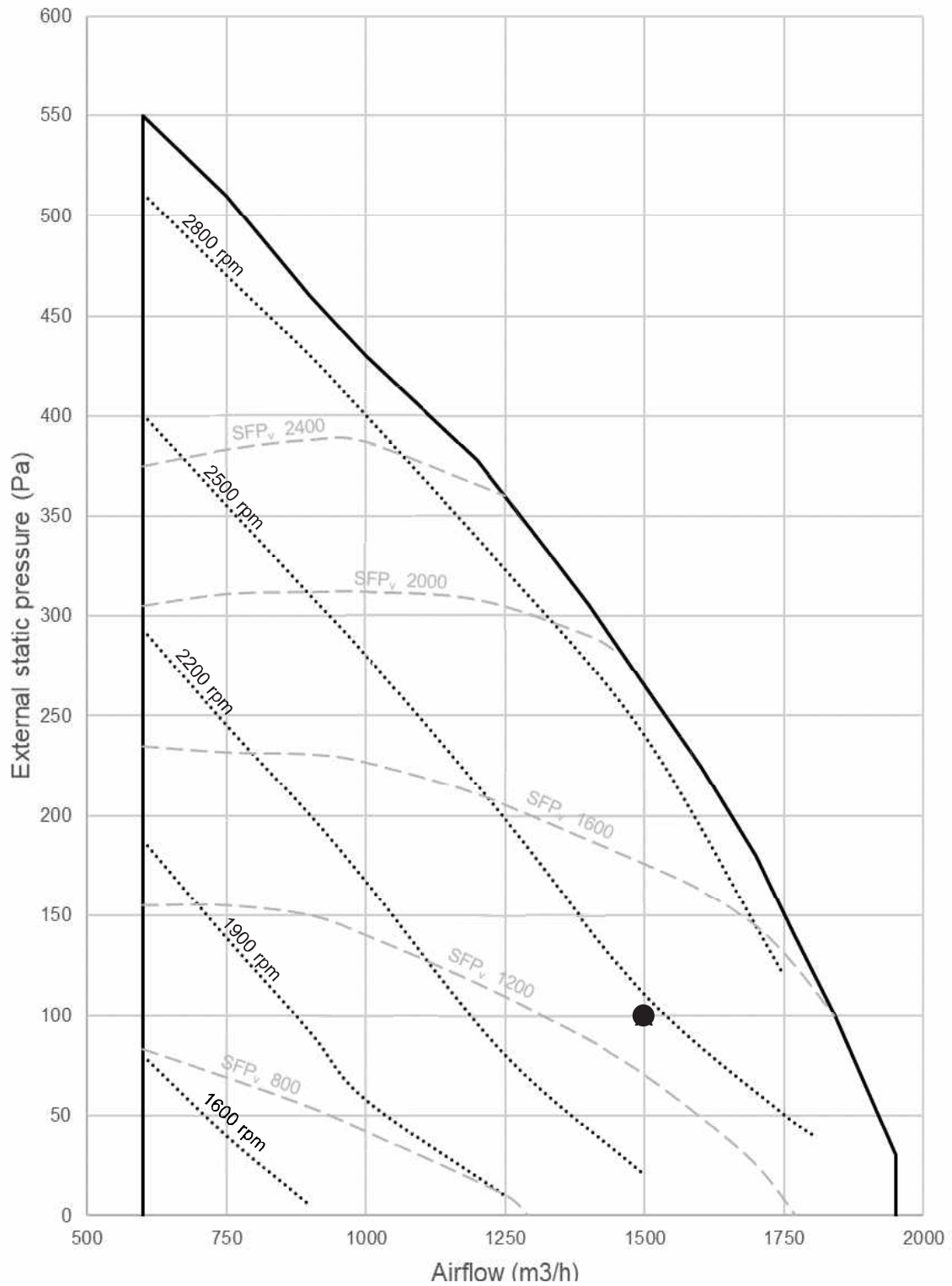
Size 4



● Nominal conditions

SFPv values are evaluated with F7 and M5 filter respectively for supply and return air side

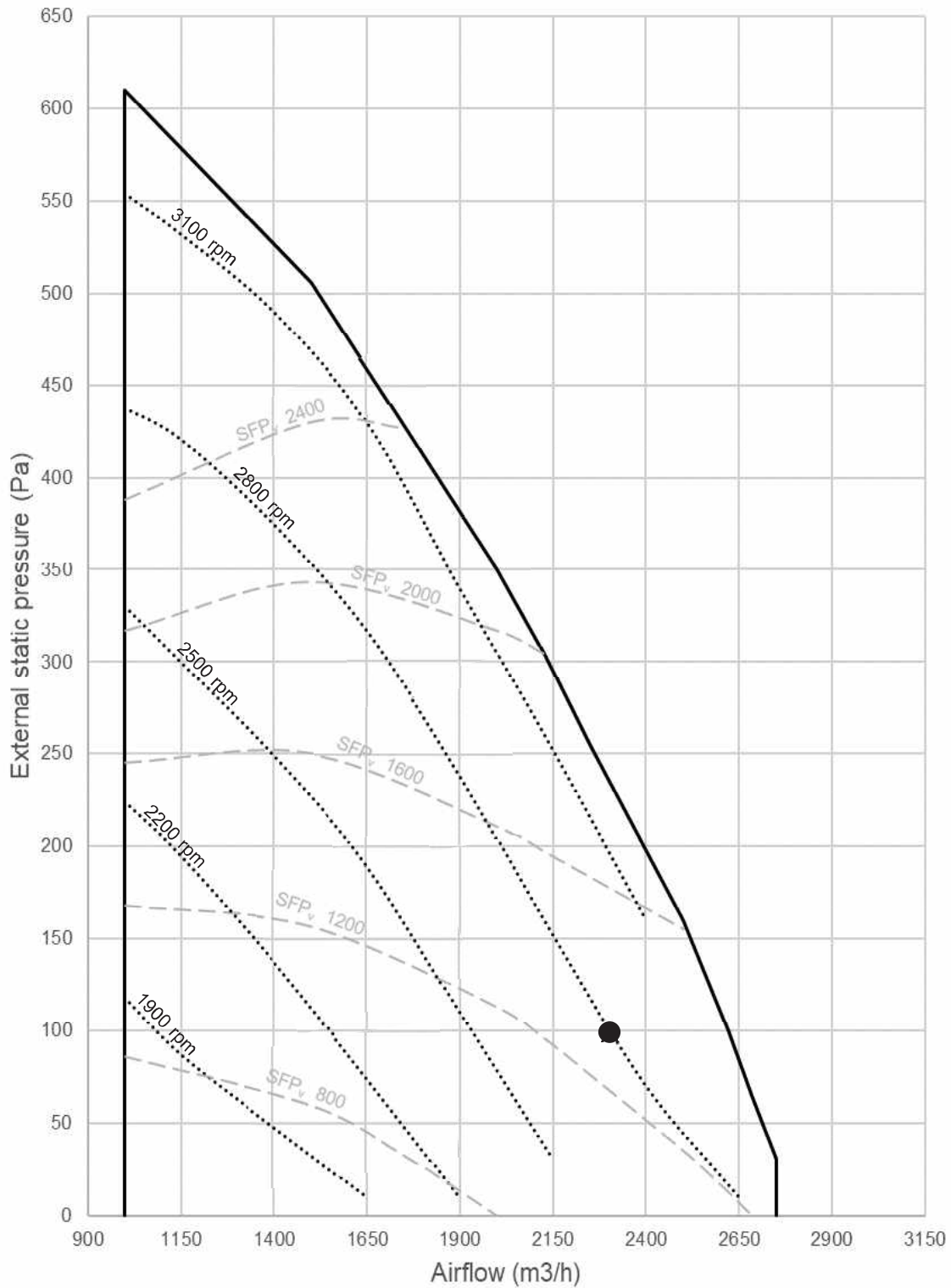
Size 5



● Nominal conditions

SFP_v values are evaluated with F7 and M5 filter respectively for supply and return air side

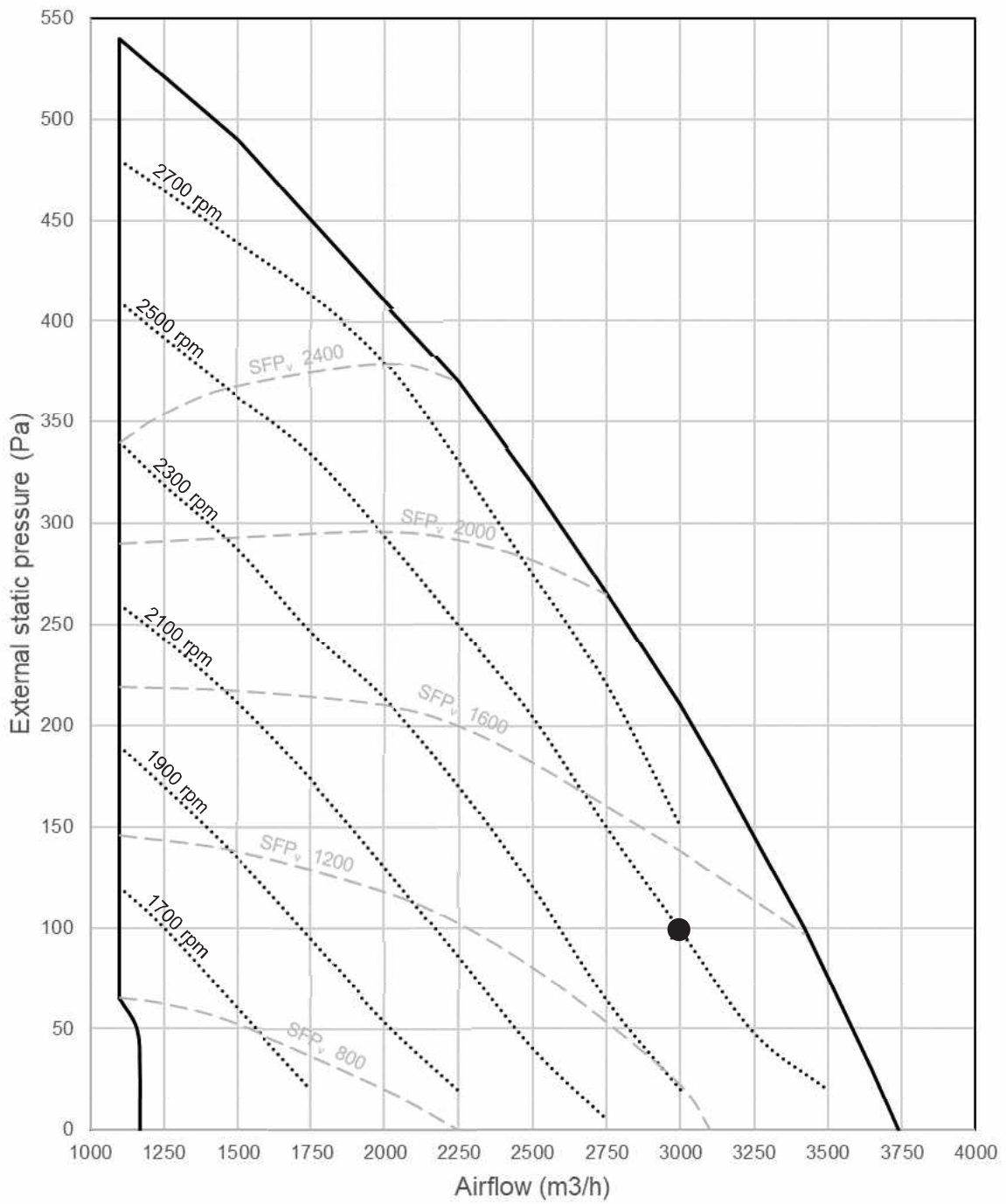
Size 6



● Nominal conditions

SFPv values are evaluated with F7 and M5 filter respectively for supply and return air side

Size 7



● Nominal conditions

SFPv values are evaluated with F7 and M5 filter respectively for supply and return air side

Factory Configuration

Size02			
Supply		Exhaust	
Volume Flow Rate	ESP	Volume Flow Rate	ESP
300	100	300	100
RPM		RPM	
2889		2853	
17(27)-4-01			
19(29)-2-07		19(29)-3-04	

Size03			
Supply		Exhaust	
Volume Flow Rate	ESP	Volume Flow Rate	ESP
600	100	600	100
RPM		RPM	
2360		2387	
17(27)-4-01			
19(29)-2-07		19(29)-3-04	

Size04			
Supply		Exhaust	
Volume Flow Rate	ESP	Volume Flow Rate	ESP
1200	100	1200	100
RPM		RPM	
2891		2913	
17(27)-4-02			
19(29)-2-09		19(29)-3-07	

Size05			
Supply		Exhaust	
Volume Flow Rate	ESP	Volume Flow Rate	ESP
1500	100	1500	100
RPM		RPM	
2479		2529	
17(27)-4-02			
19(29)-2-08		19(29)-3-06	

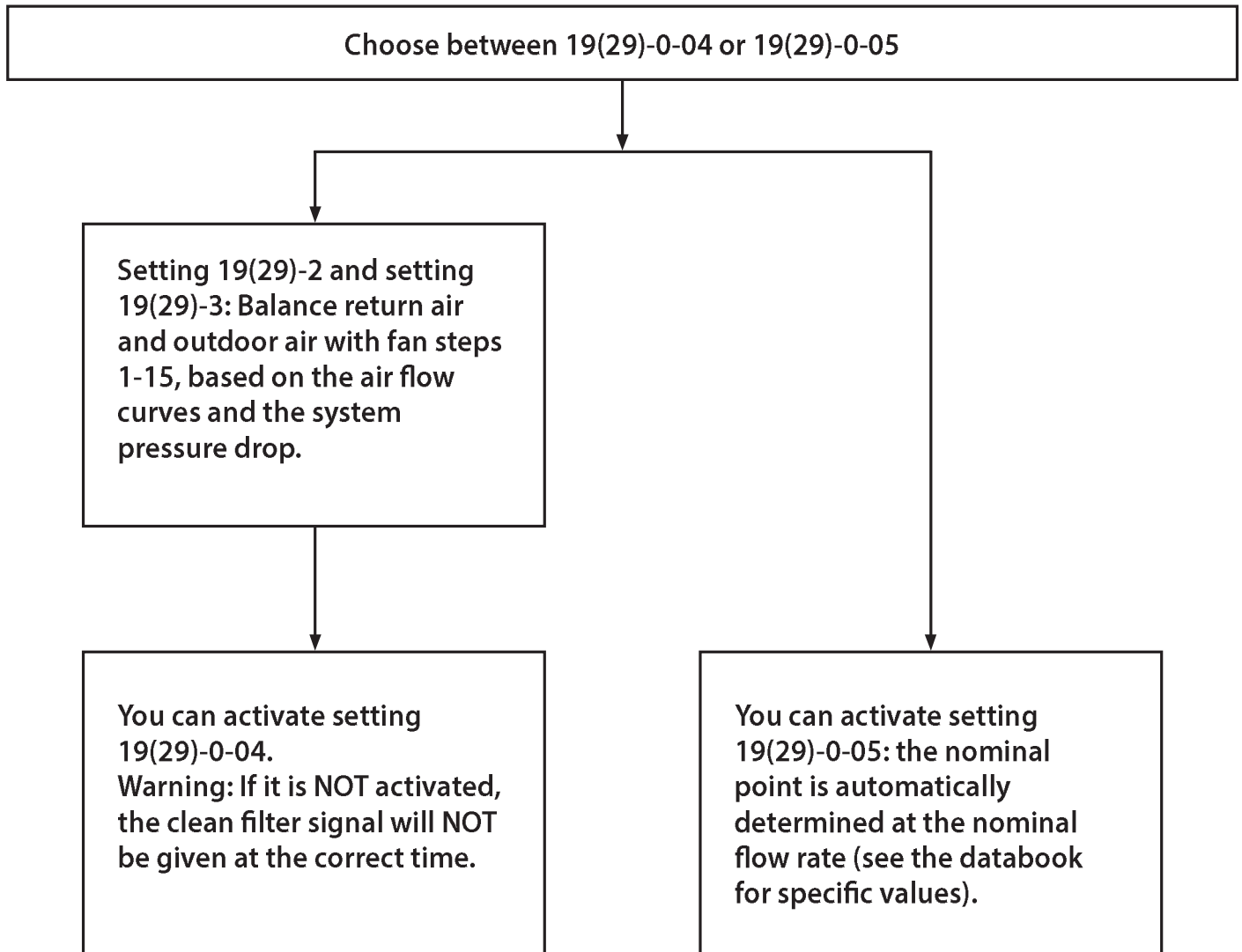
Size06			
Supply		Exhaust	
Volume Flow Rate	ESP	Volume Flow Rate	ESP
2300	100	2300	100
RPM		RPM	
2816		2933	
17(27)-4-02			
19(29)-2-09		19(29)-3-07	

Size07			
Supply		Exhaust	
Volume Flow Rate	ESP	Volume Flow Rate	ESP
3000	100	3000	100
RPM		RPM	
2504		2679	
17(27)-4-02			
19(29)-2-08		19(29)-3-09	

“Field setting without preliminary selection”: adjust fan speed according to in duct flow measurement, as explained in the previous pages.

Settings for all configuration

Setting 17(27)-4: First choose the fan speed. Set it to high or ultrahigh.

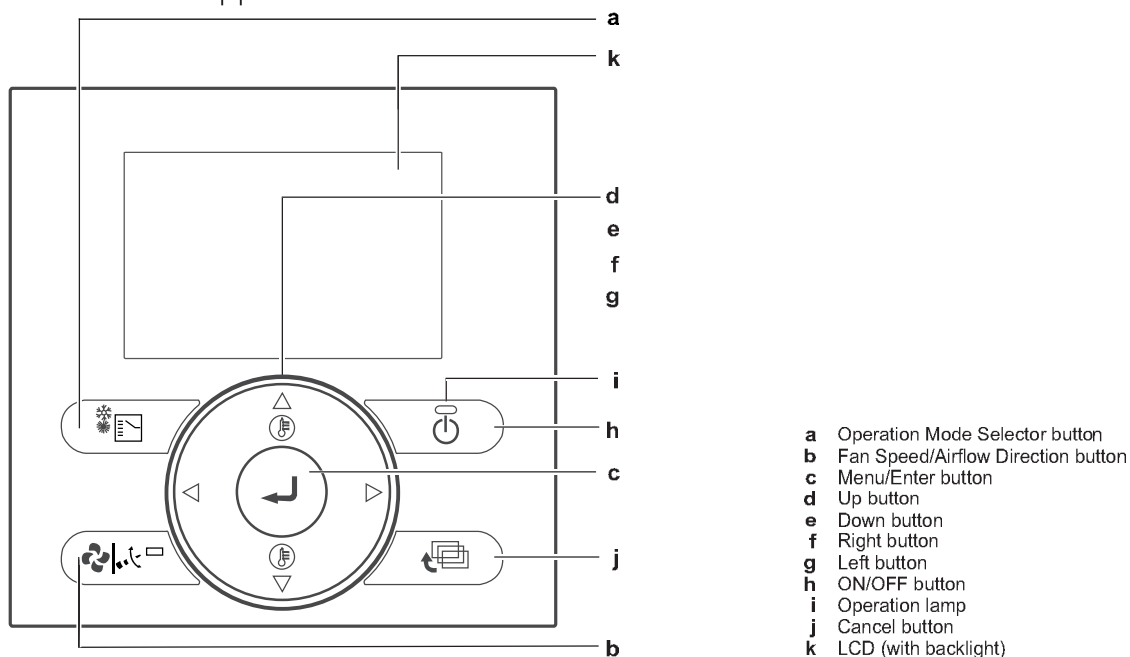


About setting 19(29)-0-04 and 19(29)-0-05

If the user interface is switched off while you are activating setting 19(29)-0-04 or 19(29)-0-05, the configuration is aborted. When you switch the user interface back on, the function starts from the beginning. Setting 19(29)-0-04 takes between 1 and 6 minutes to complete. You can check if the setting was completed successfully by checking if the field setting is changed to 0-01. Setting 19(29)-0-05 takes between 3 and 35 minutes to complete. You can check if the setting was completed successfully by checking if the field setting is changed to 0-02. You can ONLY activate these settings with clean filters. Make sure that the ducting pressure drop of the top and bottom units is balanced. The function starts as soon as it is selected and the user interface is on. Setting 19(29)-0-04 CANNOT be configured if the outside temperature is $\leq -10^{\circ}\text{C}$, which is out of the operation range. Setting 19(29)-0-05 CANNOT be configured if the outside temperature is $\leq 5^{\circ}\text{C}$. In this case error 65-03 is shown and the unit stops working. Change the setting to 19(29)-0-04. The setting CANNOT be configured if there are alerts or errors present. If booster fans are used, you can ONLY configure setting 19(29)-0-03. You can configure settings 19(29)-0-04 and 19(29)-0-05 for multiple units with 1 user interface.

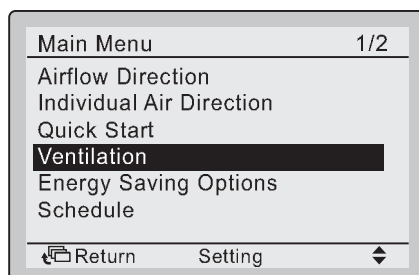
About the user interface

Please read the manual supplied with the user interface for more detailed instructions.

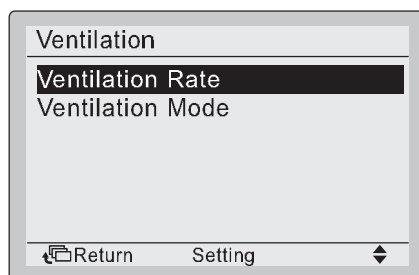


To change the ventilation rate

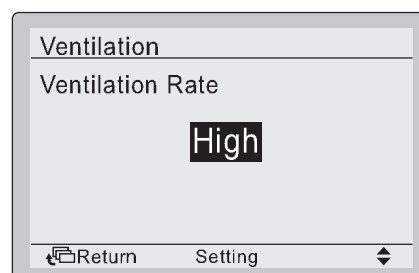
1. Press the Menu/Enter button to display the main menu.
2. Press the Up/Down buttons to select Ventilation and press the Menu/Enter button



3. Press the Up/Down buttons to select Ventilation Rate and press the Menu/Enter button to confirm



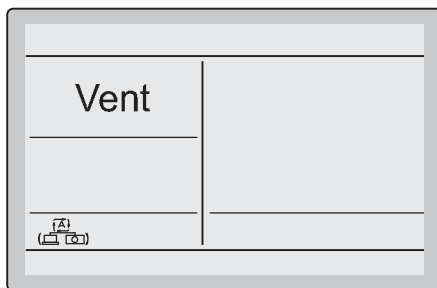
4. Press the Up/Down buttons to change the setting to Low or High and press the Menu/Enter button to confirm.



To select ventilation mode

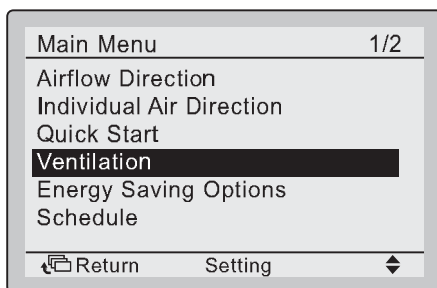
Ventilation mode is used when cooling or heating is unnecessary, so only the heat reclaim ventilation units are operating.

1. Press the Operation Mode Selector button several times, until the ventilation mode is selected list

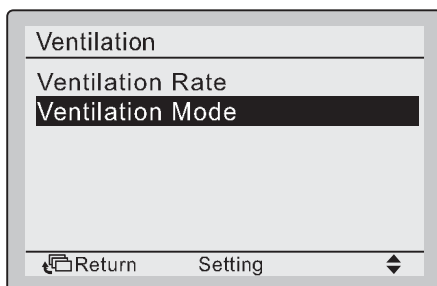


To change the ventilation mode

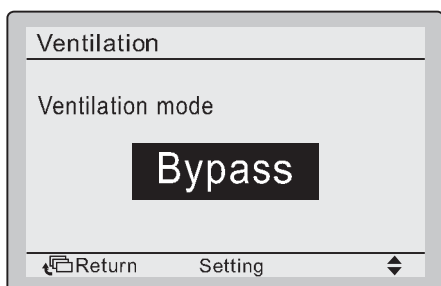
1. Press the Menu/Enter button to display the main menu.
2. Press the Up/Down buttons to select Ventilation and press the Menu/Enter button.



3. Press the Up/Down buttons to select Ventilation mode and press the Menu/Enter button.



4. Press the Up/Down buttons to select the required ventilation mode. For more information about ventilation modes, see Ventilation modes in the installer and user reference guide.



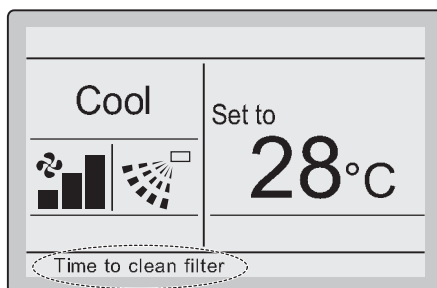
Ventilation modes

You can change the ventilation mode in the main menu

Mode	Description
Auto mode	Using information from the air conditioner (cooling, heating, fan, and set temperature) and heat reclaim ventilation unit (indoor and outdoor temperatures), this mode automatically changes between Energy Reclaim Ventilation and Bypass mode.
Energy Reclaim Ventilation mode	The outdoor air is supplied to the room after passing through a heat exchange element, where heat is exchanged with the return air.
Bypass mode	The outdoor air bypasses the heat exchange element. This means that outdoor air is supplied to the room without heat exchange with the return air.

Time to clean filter indication

When it is time to clean the filters, the following message or icon shows at the bottom of the basic screen:
Time to clean the filter.

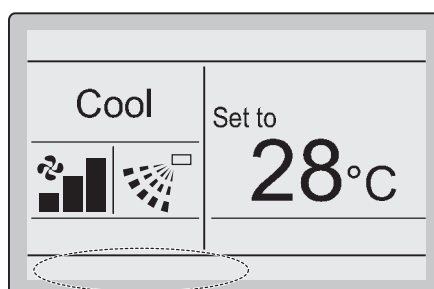
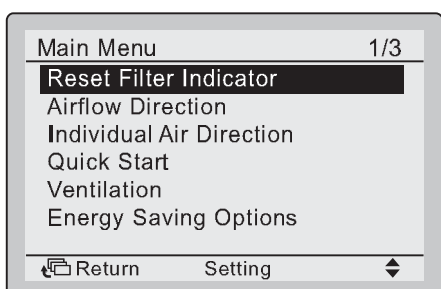


To remove time to clear filter indication

Press the Menu/Enter button

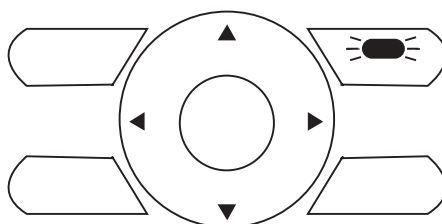
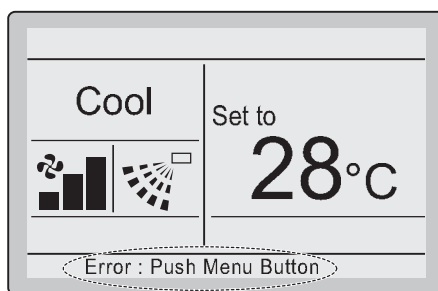
Press the Up/Down buttons to select Reset Filter Indicator.

Press the Menu/Enter button



About error indications

If an error occurs, there is an error icon in the basic screen and the operation lamp blinks. If a warning occurs, ONLY the error icon blinks and the operation lamp does NOT. Press the Menu/Enter button to display the error code or warning and contact information.



The error code blinks and the contact address and model name appear as shown below. In this case, notify your Daikin dealer about the error code.

Malfunction code	Particular code	Description
A1		EEPROM failure
A6		Locked rotor
A6	22	Unstable fan rpm:failure of filter contamination
A8		Power supply malfunction
AJ		Capacity setting malfunction
C0		Generic error
C1		Fan communication error
C6		Malfunction of fan motor sensor or fan control driver
CH		CO2 sensor warning
US		Transmission error between the unit and user interface
U8		Transmission error between main user interface and sub user interface
UA		Wrong user interface installed
UC		Repeated central address
UE		Transmission error between the unit and centralised controller
60		External protection device activated
64	01	Indoor air thermistor (R1T) malfunction
64	02	Indoor air thermistor (R1T) out of operation range
65	01	Outdoor air thermistor (R2T) malfunction
65	02	Outdoor air thermistor (R2T) out of operation range
65	03	Functions 19(29)-0-04/05 not possible due to low outdoor temperature operation
6A		Damper-related malfunction
6A		Damper related malfunction + thermistor

In case of malfunction with the code on grey background, the unit still operates. However, make sure to have it inspected and repaired as soon as possible

Prevent of frost the heat-exchanger

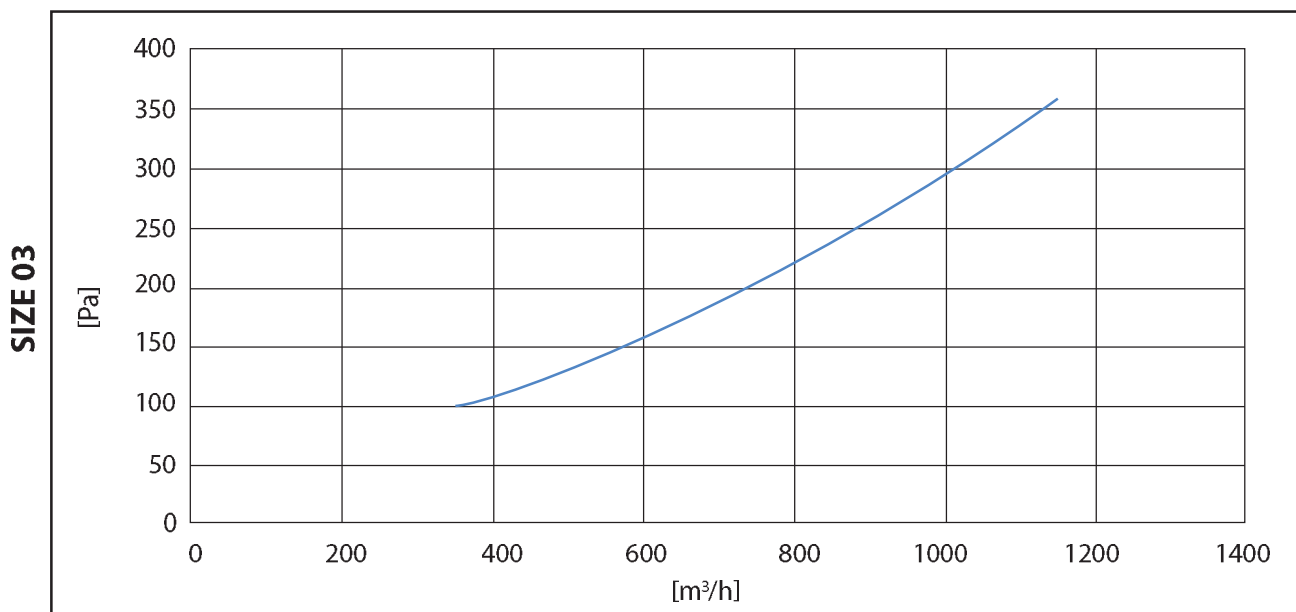
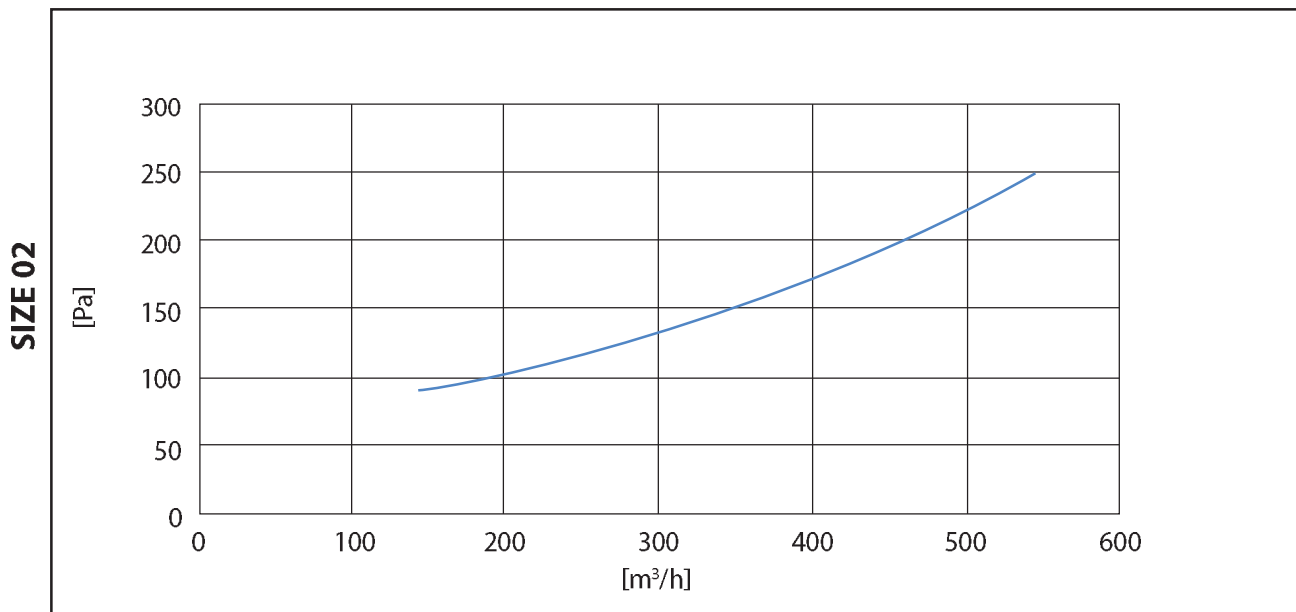
- If electrical pre-heating is present:
- electrical pre-heating coil will prevent frosting of the heat-exchanger, modulating once the freshair temperature goes below the treshold value set at 0°C, in case of heater malfunction or not sufficient flow for its startup, a differential pressure switch will shutdown the unit until the defrosting.
- If electrical pre-heating coil is not present:
- a differential pressure switch will prevent frosting of heat exchanger, shutting down the unit once the frosting starts



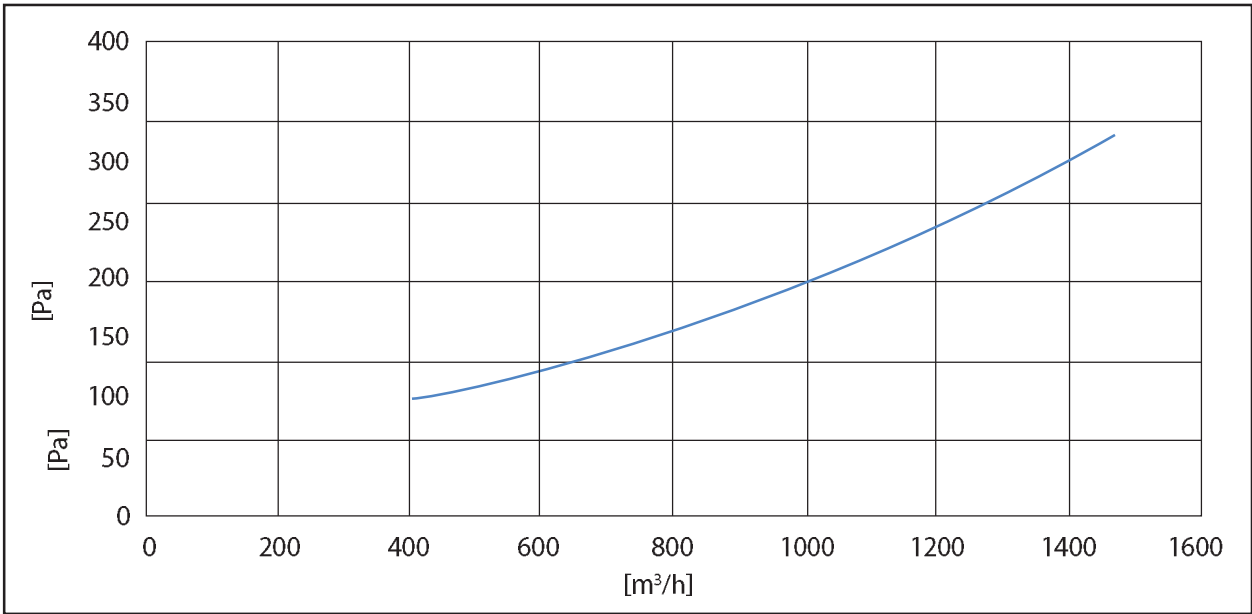
The differential pressure switch will be set according to the nominal air flow. If the Modular L Smart will operate at different condition from nominal airflow, you MUST adjust the setting according to the chart below.

Frost prevent differential pressure switch factory settings						
Size	02	03	04	05	06	07
Pa	125	150	175	225	250	325

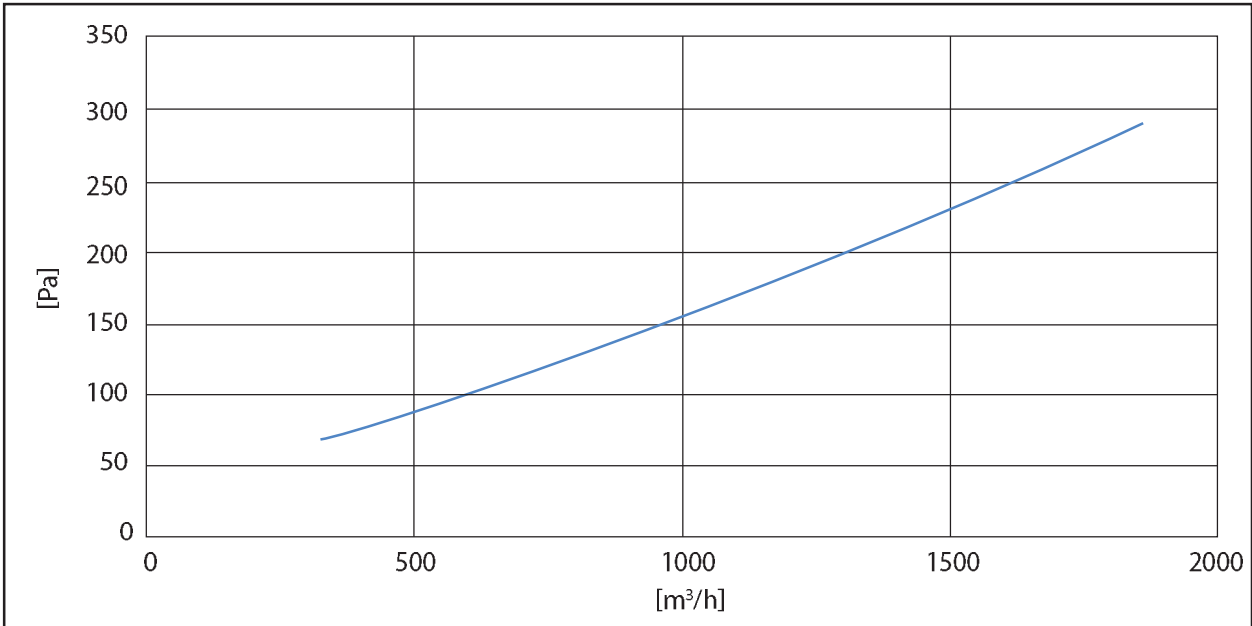
Factory settings for frost-protection Differential Pressure Switch:



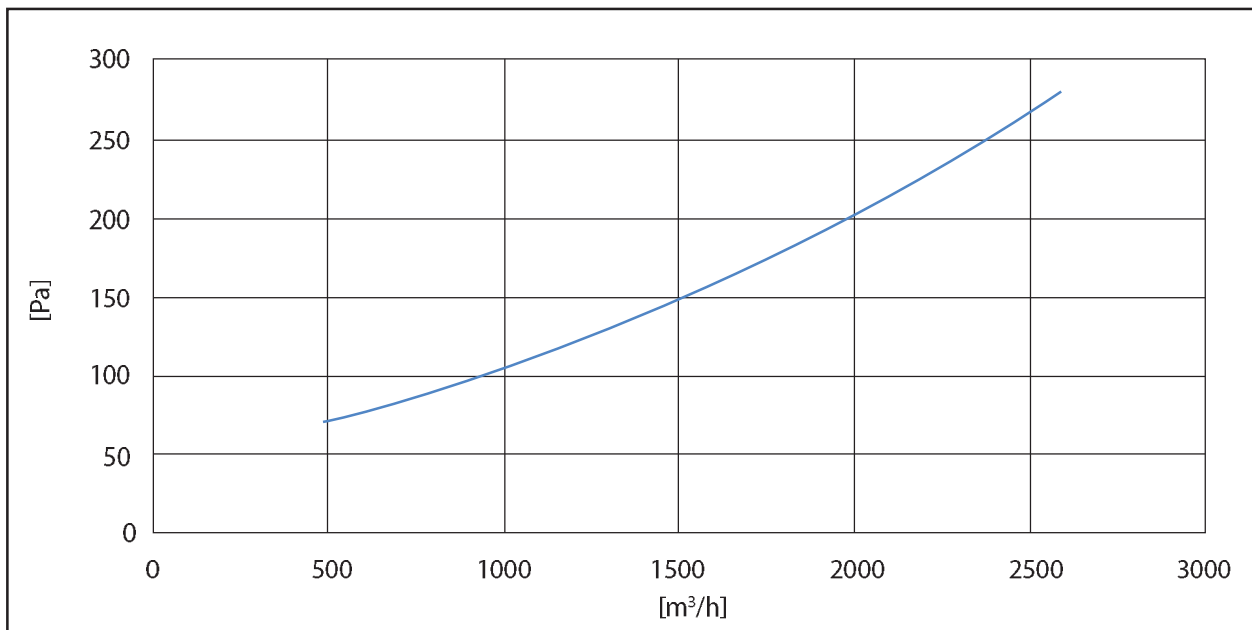
SIZE 04



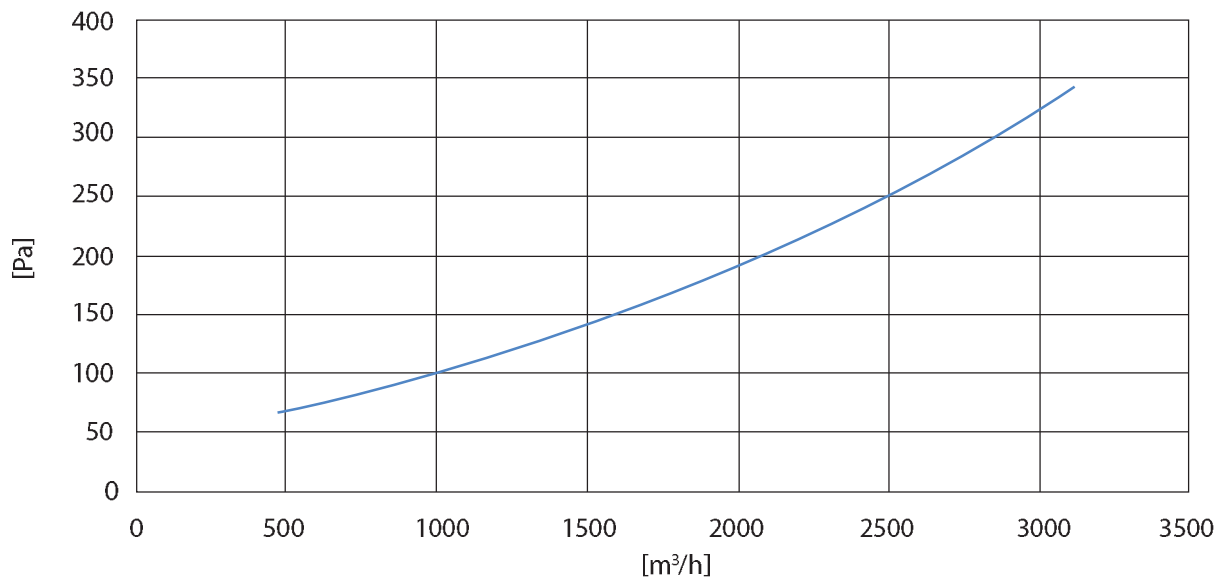
SIZE 05



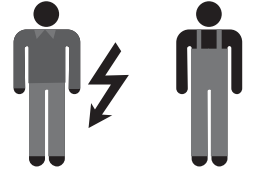
SIZE 06



SIZE 07



8 Maintenance



Safety precautions for maintenance



Ordinary and extraordinary maintenance must be carried out **solely by the operator assigned to perform maintenance** (mechanical and electrical maintenance staff) according to the regulations in force in the country of use and respecting the laws regarding systems and work safety. Remember that, by operator assigned to perform maintenance is meant the person who can work on the machine to perform ordinary and extraordinary maintenance, repairs and fine tuning. This person must be an expert operator, properly instructed and trained, given the risks involved in such operations.



Before performing any ordinary and extraordinary maintenance, the machine **must always be stopped (by disconnecting from the mains)** and **the EMERGENCY button engaged**. The switch must have a key that must be removed and held by the operator who will perform the operations until the end of the maintenance itself.



It is absolutely prohibited to remove any protections from moving parts and unit protection devices with the machine connected to the mains or operational. Adjustments made with safety devices disengaged must be performed **by a single person**, expert and authorised, and during this activity it is necessary to prevent access to the area of the machine by other people. Upon completing the adjustments with safety devices disengaged, the protections must be re-engaged as soon as possible.



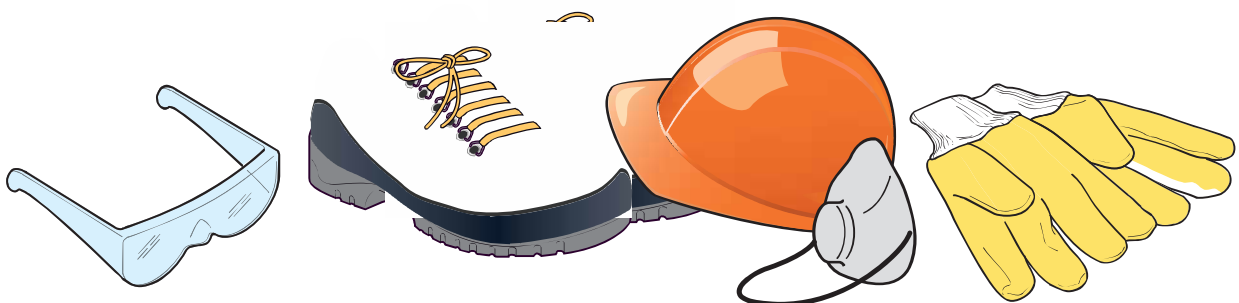
During maintenance the operational space surrounding the machine for a distance of 1.5 metres must be free of obstacles, clean and well lit. It is prohibited for unqualified people to pass through or remain in this space.



Use personal protective clothing (safety shoes, safety glasses, gloves, etc.) compliant with regulations.



Before carrying out repairs or other work on the machine, **always declare out loud** your intentions to other operators who are located in the machine area and make sure that they have heard and understood the warning.



Ordinary maintenance

Proper maintenance of the systems maintains efficiency (reducing costs) and consistent performance over time, and increase the usable life of the equipment.

ACTIVITY	FREQUENCY				
	A	B	C	D	E
General cleaning of the machine.		√			
Check and eventual disassembly and washing of filters.				√	
Replacing the filters (when they have deteriorated).	in case of alarm				
Clean the finned surfaces of the heat exchange coils (if provided) with a jet of compressed air and soft brush.	√				
Clean the exchange surfaces of of heat recuperators with a jet of compressed air and soft brush.	√				
Empty and clean the condensate collection basins.		√			
Visual inspection for corrosion, limescale, release of fibrous substances, any damage, abnormal vibrations, etc. (if possible, it is advisable to extract the components for a more thorough inspection).			√		
Check condensate drain and cleaning of siphons.		√			
In the case of water coils check for the presence of Legionella.		√			
Check the status of anti-vibration connections.	√				
Cleaning of the heat exchanger		√			
Check tightness of screws and bolts in the fan section.	√				
Check the auger, impeller and various devices, with removal of any buildup.	√				
Check the integrity of piping connected to pressure gauges and pressure switches.		√			
Check the ground connection.		√			
Power connection terminal torque	√				

A: annual / B: six months / C: quarterly / D: monthly / E: fortnightly

General information on cleaning procedures



Read the safety instructions at the beginning of this manual and page. 51



You should consult with your supplier of chemical products to choose the most suitable for cleaning the unit components.



For the cleaning method refer to the instructions of the detergent manufacturer and carefully read the safety data sheet (SDS).

As general guidelines, refer to the following rules:

- Always use personal protection (safety shoes, safety glasses, gloves, etc.).
- Use mild products (pH between 8 and 9) for washing and disinfecting, in normal concentrations. Detergents must not be toxic, corrosive, flammable or abrasive.
- Use a soft cloth or bristle brushes that do not damage the stainless steel surfaces.
- If water jets are used, pressure must be under 1.5 bar and the temperature should not exceed 60°C;
- For cleaning components like motors, damper motors, bearings, pitot tubes, filters and electronic sensors (if applicable), do not spray water directly on them.
- After cleaning make sure that you have not damaged the electrical parts and the seals.
- Cleaning operations should not involve the lubricated parts, like rotation shafts, because this could affect their good operation and create problems with durability.
- For the cleaning of finned components or dampers use an industrial vacuum cleaner and/or a compressor. Attention, the compressed air flow must run opposite to the direction of airflow through the unit.

Cleaning lamellar components

Remove the dust and fibres with a soft bristle brush or a vacuum cleaner.



Be careful when cleaning with compressed air because the exchanger package can be damaged. CLEANING with pressure jets is allowed if the maximum water pressure is 3 bar and a flat nozzle is used (40° - WEG 40/04 type).

Oils, solvents, etc. can be removed with water or hot grease solvents, by washing or immersion. Periodically clean the condensate drain tray and fill the drain siphon with water.

Vents

Periodically check that there are no new sources of contamination near the air intake. Each component must be checked periodically for the presence of contamination, damage and corrosion. The seal can be protected with glycerine-based lubricants or replaced with a new one, if worn.

Exchange coils

The coils must be cleaned at the slightest sign of contamination.

The coil should be cleaned and washed gently to avoid damaging the fins.

For cleaning using a **mild detergent** suitable for the purpose. Do not use alkaline, acidic or chlorine-based solutions.

THE coils can be washed with a slightly pressurised water jet (max. 1.5 bar). The jet must NOT contain chemicals or microorganisms. Also the water must be sprayed in the opposite direction to the air flow.

For the direct expansion system, all the coolant in the coils must be collected in the receiver before washing the coil with water. This makes it possible to avoid the increase of the pressure and damage to various parts of the pipe, keeping the airflow clean.

For pertinent accessories, refer to the enclosed documentation.

Fans

The fans can be cleaned with compressed air or by brushing them with soap and water or with a mild detergent.

Finish the cleaning by rotating the fan by hand to verify the absence of abnormal noises.

Cleaning filters



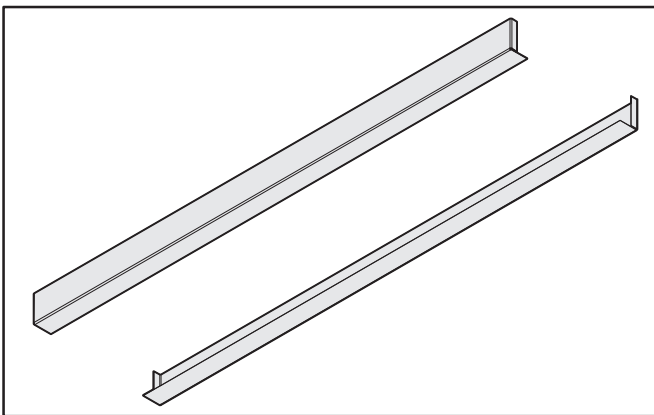
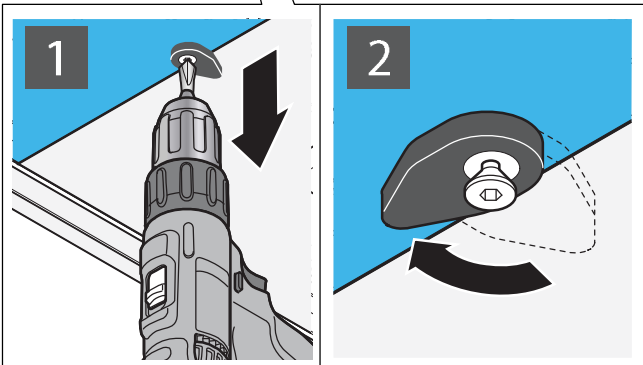
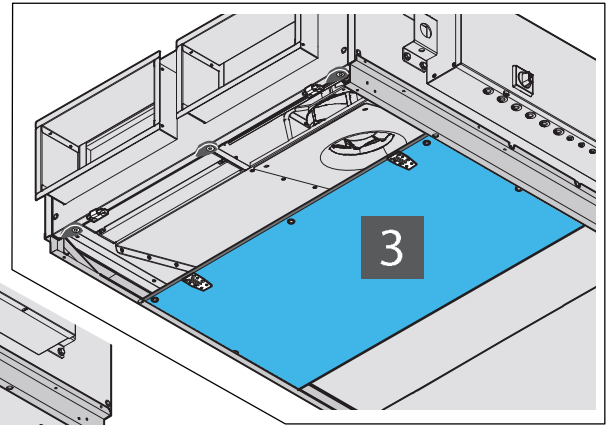
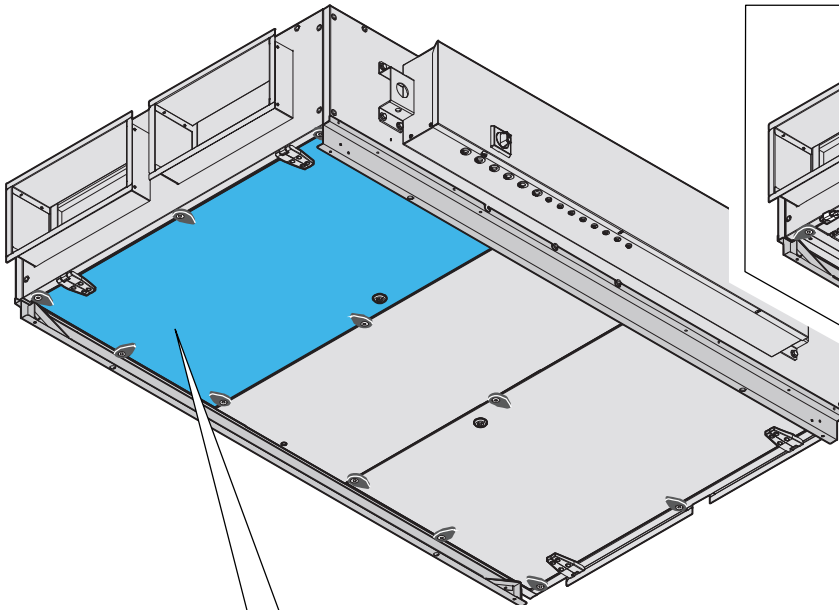
The machine must NOT be running when the filters are removed to avoid drawing in outside air that might be contaminated.

The filters must be cleaned often and carefully to prevent dust and microbial buildup. Usually, compact filters can be cleaned **two** or **three times** before they are replaced. As a general rule, replacement is required after 500-2000 hours of operation (it varies depending on the type of filter, refer to the directions of the manufacturer), but may need to be replaced much sooner if required.

Compact filters can be cleaned using a vacuum cleaner or by blowing with compressed air or hot water (not under pressure).

Only for versions with up-and-over doors: if the opening of the doors was difficult because of the narrowness of the available space, it is possible to remove them by unscrewing the screws that hold the hinges.

At the end of cleaning, it is mandatory to remount the doors.



In the absence of sufficient space for the opening of the up-and-over doors it is possible to remove them and transform the inspection door into a removable panel that can slide on accessory guides (optional).

11 Panel removable

Correct filter and pre-filter installation (in the event of replacement)

Verify proper installation of the prefilters located on special counter-frames with safety springs or guides. After removing the filters from the packing (that they are placed in to prevent deterioration during transport and at the installation site), insert them into the containment section, paying attention to ensure a rigid assembly and a perfect seal of the gaskets.

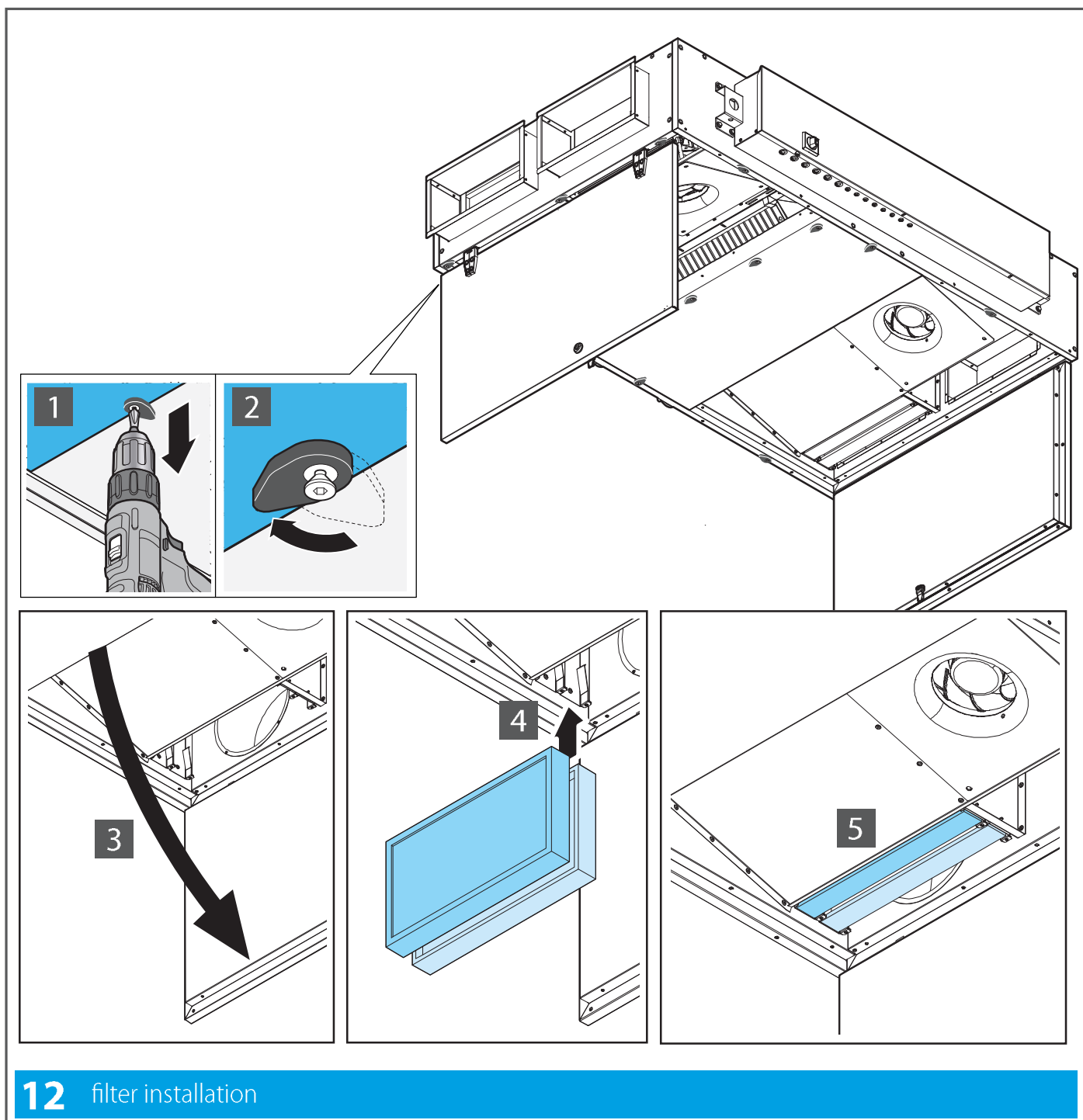


Remove the filters from their packaging only when ready to install them to avoid getting them dirty and contaminating them.



Make sure that the inside of the filter is not contaminated by external agents.

This operation should be carried out about one hour after the first start-up of the machine, the period during which the ducts are cleaned of dust and various debris. Proceeding in this way preserves the filtering sections that cannot be regenerated.



Extraordinary maintenance

One can not predict extraordinary maintenance as it is normally due to effects of wear or fatigue caused by the incorrect operation of the machine.

Replacement of parts



The replacement of parts should be performed by expert personnel:

- Qualified maintenance mechanic
- Qualified maintenance electrician
- Manufacturer technician

The machine is designed to be able to perform all the servicing necessary to maintain good efficiency of the components. However, it sometimes happens that a component fails due to malfunction or wear, so for replacement refer to the executive schematic.

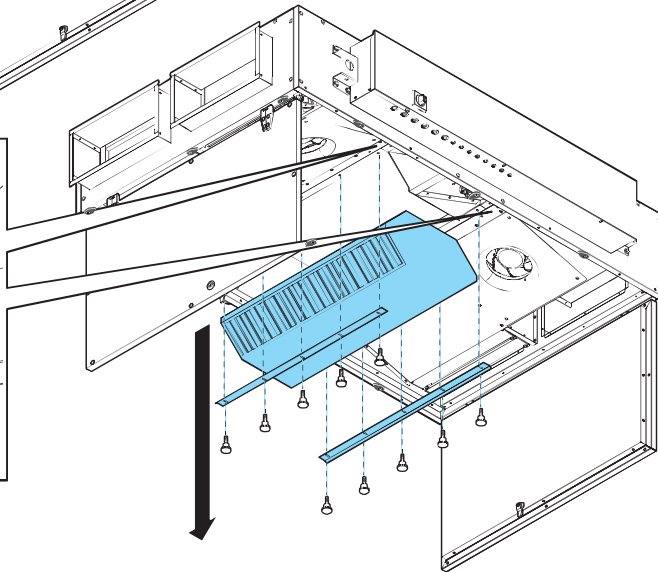
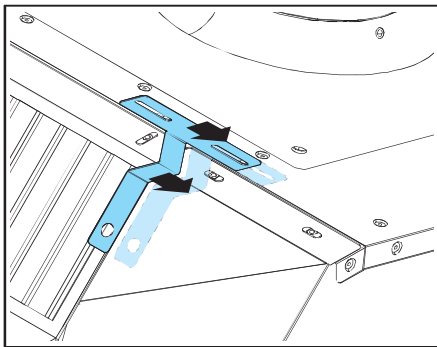
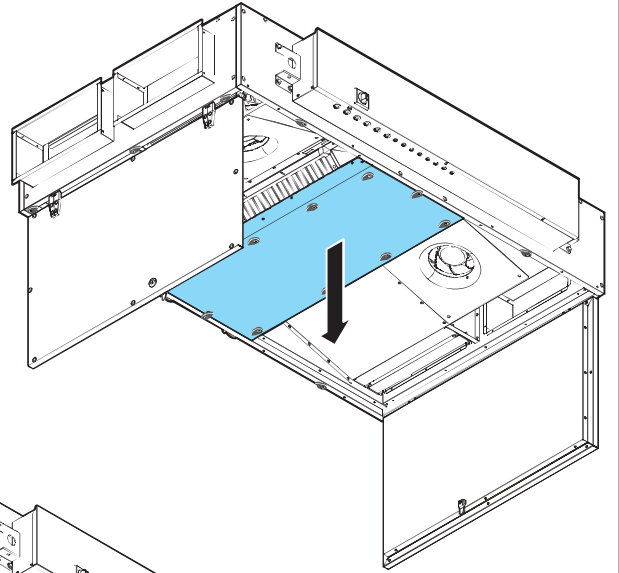
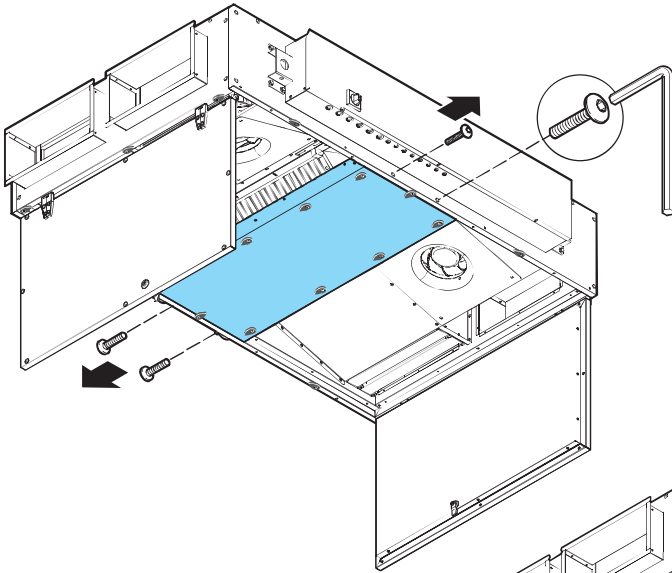
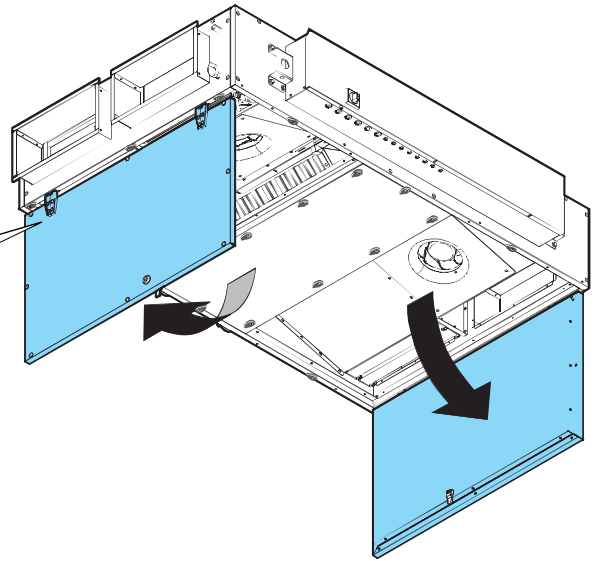
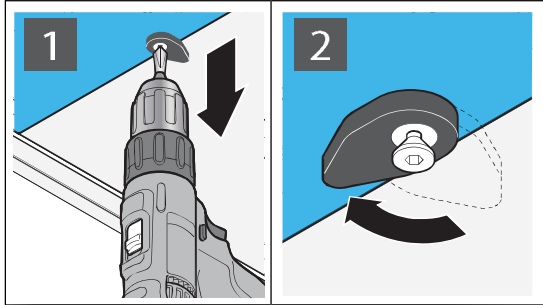
These are the components that may need replacement:

- Filters ▶ see fig. 12
- Recovery/heating/cooling heat exchange coil ▶ see fig. 13
- Fans
- by-pass

For some of these operations of a general nature we will not enter into detail as these are operations that fall within the abilities and professional expertise of the staff assigned to perform them.

Consumable components - Spare parts

During the operation of the machine there are particular mechanical and electrical components that are most subject to wear. These parts must be monitored in order to carry out their replacement or repair before they cause problems to the correct operation of the machine with consequent downtime.



13 Exchanger disassembly

DEFINITION OF WASTE

Waste is any substance and object deriving from human activities or natural cycles that is abandoned or destined to be abandoned.

SPECIAL WASTE

Special waste includes:

- Residues from industrial, agricultural, artisanal, commercial and service processes that in quality or quantity are considered different from municipal waste.
- Deteriorated or obsolete machinery and equipment.
- Motor vehicles and their parts that can no longer be used.

HARMFUL TOXIC WASTE

Harmful toxic waste is all waste containing or contaminated by substances listed in the annex to the Italian Presidential Decree 915/52 implementing directives 75/442/EEC, 76/442/EEC, 76/403/EEC, 768/319/EEC. Following are described the types of waste that may be generated during the lifetime of an air handling unit:

- Cell filters from the suction unit.
- Waste oils and greases from lubricating the fan motor assembly.
- Rags or paper soaked with substances used for the cleaning of the various parts of the machine.
- Residues from cleaning the panelling.
- Drive belts.
- TUV germicidal lamps, which must be disposed of according to current legislation.



Waste from the cell filters are to be handled as special waste or harmful toxic depending on their use, the sector and the environment in which they are used.

Waste and scraps may cause irreparable damage if dispersed in the environment.

ELECTRICAL/ELECTRONIC WASTE

Under art. 13 of Italian Legislative Decree no. 49 of 2014 "Implementation of the WEEE Directive 2012/19/EU on electrical and electronic equipment waste.



The logo with the crossed-out bin specifies that the product has been placed on the market after 13 August 2005 and that at the end of its useful life it should not be disposed of with other waste but rather must be collected separately. All equipment is made from recyclable metallic materials (stainless steel, iron, aluminium, galvanised steel, copper, etc.) in a percentage higher than 90% by weight. Before disposal make the equipment unusable by removing the power cord and closing any devices for closing compartments or cavities (where present). It is necessary to pay attention to the management of this product at the end of its life by reducing its negative impact on the environment and improving the effective use of resources, applying the principles of "he who pollutes pays", prevention, preparation for reuse, recycling and recovery. Remember that the illegal or improper disposal of the product may result in the application of sanctions provided for by current provisions of law.

Disposal in Italy

In Italy WEEE equipment must be delivered:

- To Collection Centres (also called ecological islands or ecological platforms).
- To the dealer from whom the new equipment was purchased, which is required to collect it free of charge ("one to one" withdrawal).

Disposal in countries of the European Union

The EU Directive on WEEE equipment has been implemented differently by each country, so to dispose of this equipment we suggest contacting local authorities or the dealer to ask for the correct method of disposal.

Diagnostics

General diagnostics

The machine's electrical system includes quality electromechanical components and is therefore extremely durable and reliable over time.

Should there be any malfunctions due to malfunctions of electrical components it will be necessary to act as follows:

- Check the fuses of the power supply for the control circuits and if necessary replace them with fuses having the same specifications.
- Check if the thermal protection switch for the motor has been triggered or if its fuses have blown.

If this has occurred, it may be caused by:

- Motor overload due to mechanical problems. They need to be solved.
- Incorrect supply voltage. Verify the protection trip threshold.
- Malfunction and/or short circuits in the motor. Identify and replace the failed component.

Electrical maintenance

The machine does not require routine maintenance repairs.

Do not modify the machine for any reason and do not add other devices.

The manufacturer is not liable for resulting malfunctions and problems.

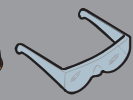
Further clarification is available by contacting the manufacturer's Customer Service.

Troubleshooting table

MALFUNCTION TYPE	COMPONENT	POSSIBLE CAUSE/SOLUTION
NOISE	Fan impeller	Impeller deformed, unbalanced or loose
		Nozzle damaged
		Foreign bodies in the fan
	Transmission	Motor or fan not attached well
	Bearings	Bearing worn or deteriorated
	Motor	Incorrect supply voltage
		Worn bearings
		Contact between the rotor and stator
	Ducts	Excessive speed in the ducts
Anti-vibration joint too taut		
INSUFFICIENT AIR FLOW	Ducts	Load losses superior to the demand
		Dampers closed
		Obstructions in the ducts
	Filters	too dirty
Heat exchange coils	too dirty	
EXCESSIVE AIR FLOW	Ducts	Load losses inferior to the demand
		Ducts too big
		Terminals not installed
	Machine	Filters not inserted
		Access doors open
		Dampers not calibrated
INSUFFICIENT THERMAL EFFICIENCY	Heat exchange coil	Connection of inlet/outlet piping
		Heat exchange coil dirty
		Air bubbles in the pipes
		Excessive air flow
		Insufficient water flow
		insufficient pressure
		Wrong direction of rotation
	Fluid	Temperature different from the project
		Incorrect regulation bodies
WATER LEAK	Fan section	Leak from the heat exchange coil due to corrosion
		Dragging of drops due to high air velocity
		Clogged "overflow" drain

Optional connection - assembly instruction

Electrical Heaters Assembly Instructions

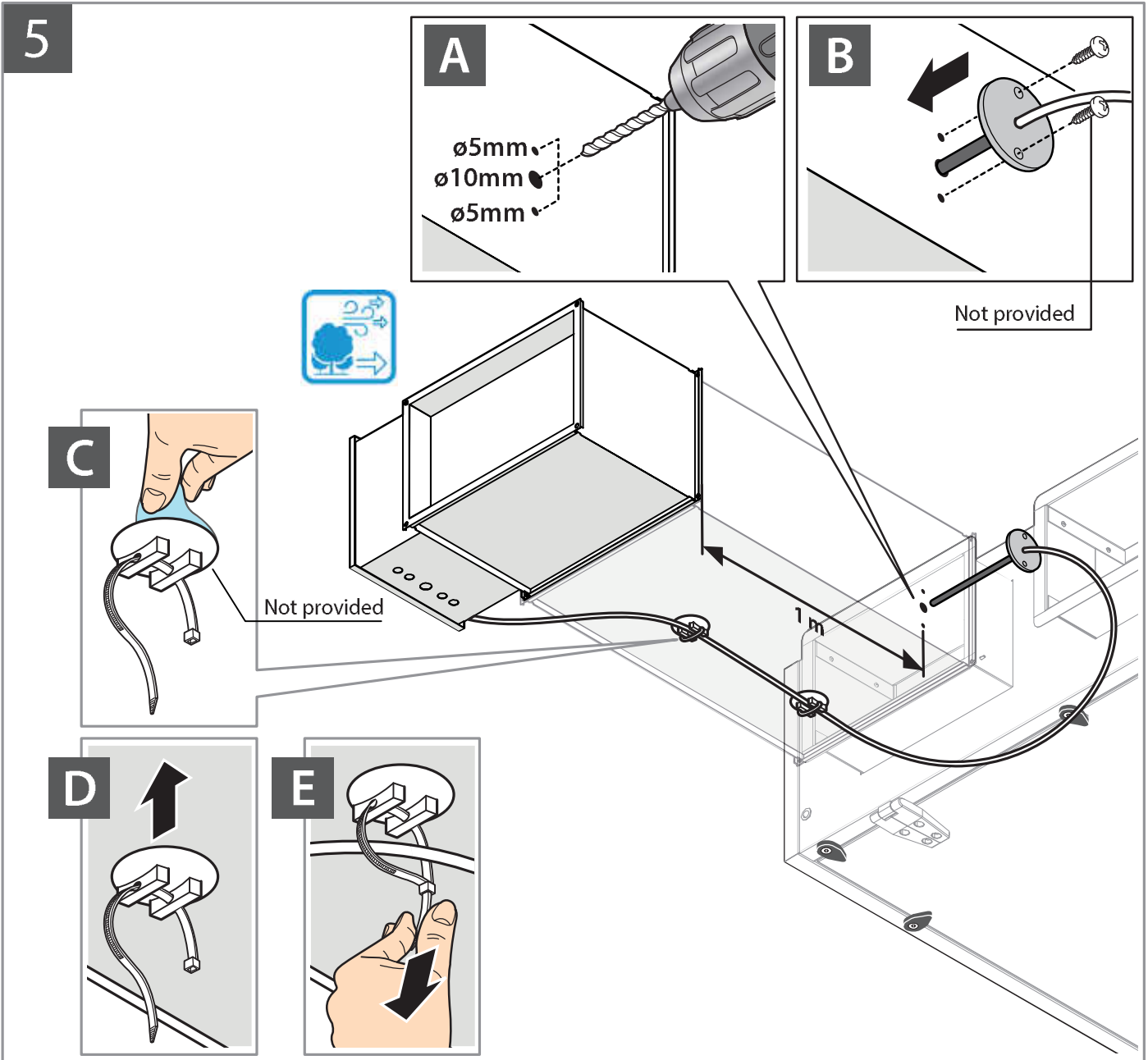
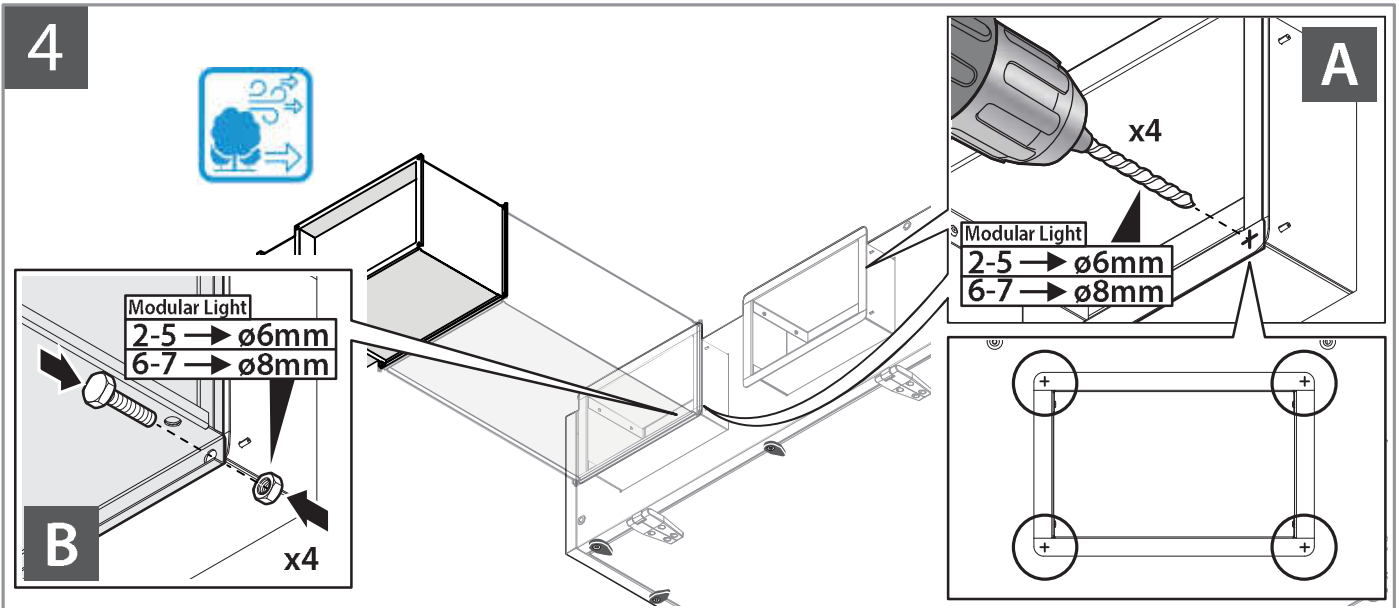


1

Material name
ALD02HEFB
ALD03HEFB
ALD05HEFB
ALD07HEFB

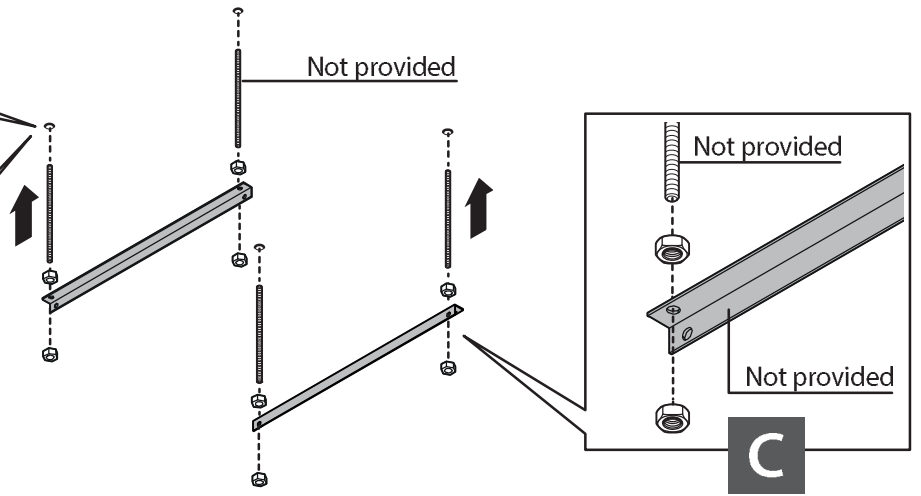
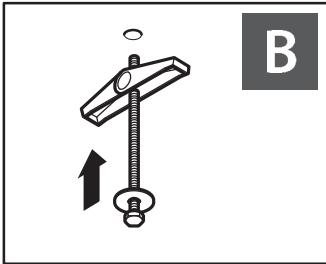
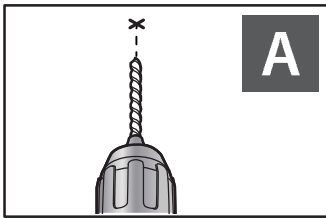
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3



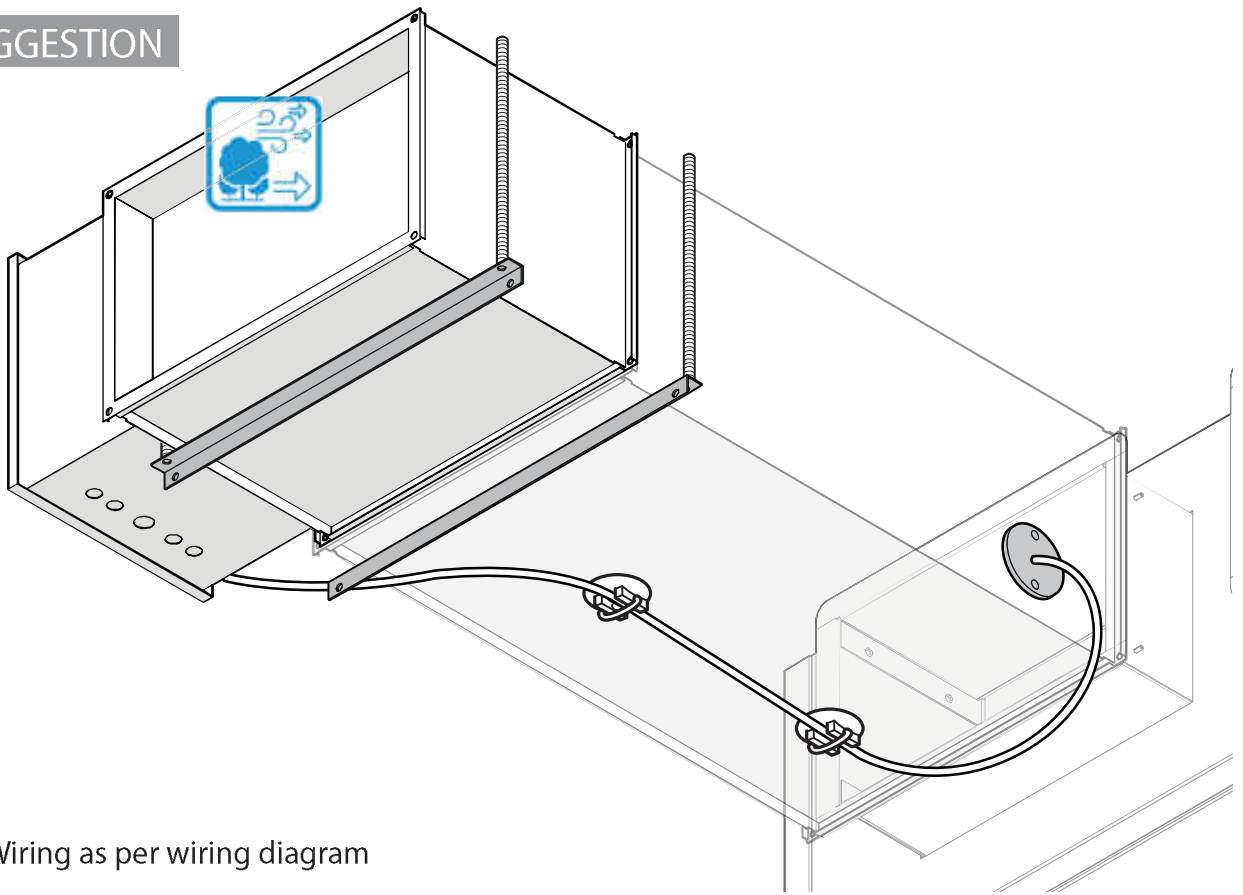
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SUGGESTION



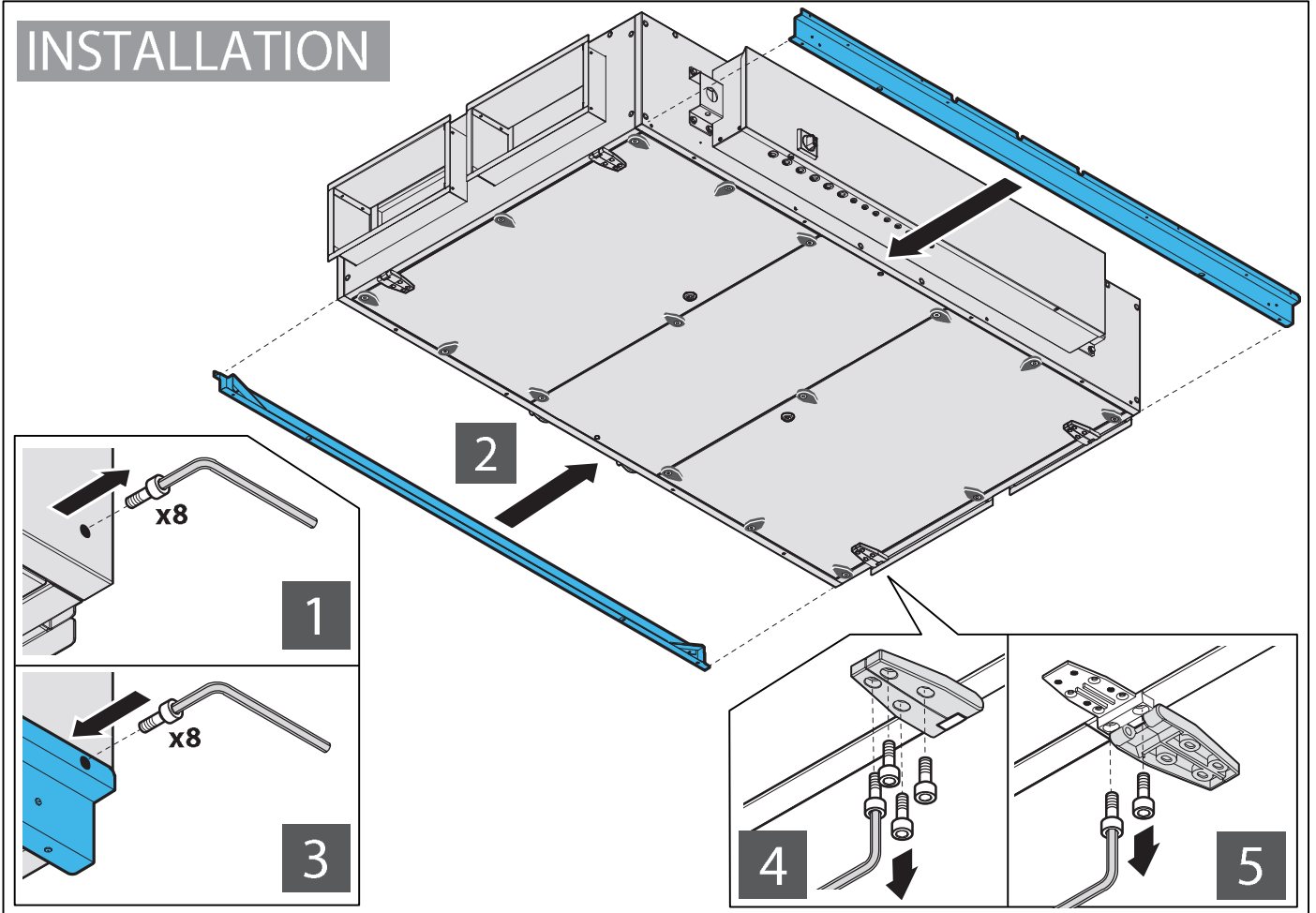
7

SUGGESTION

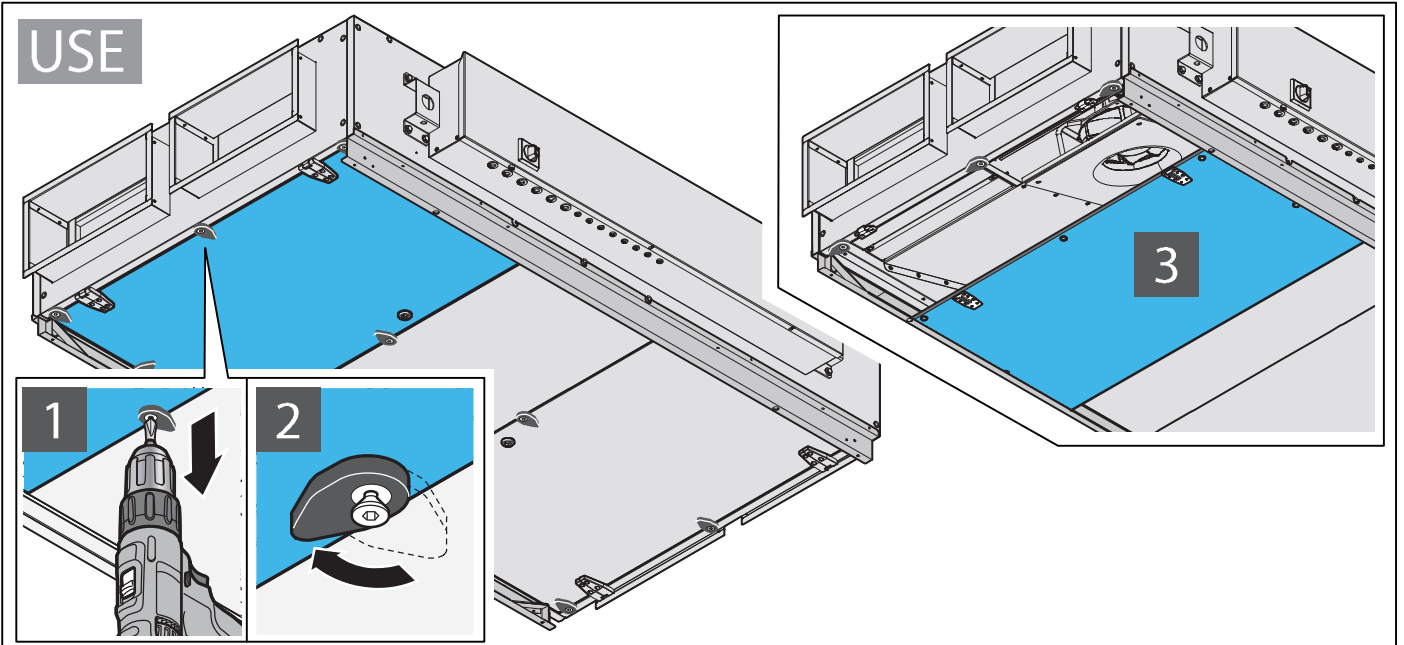


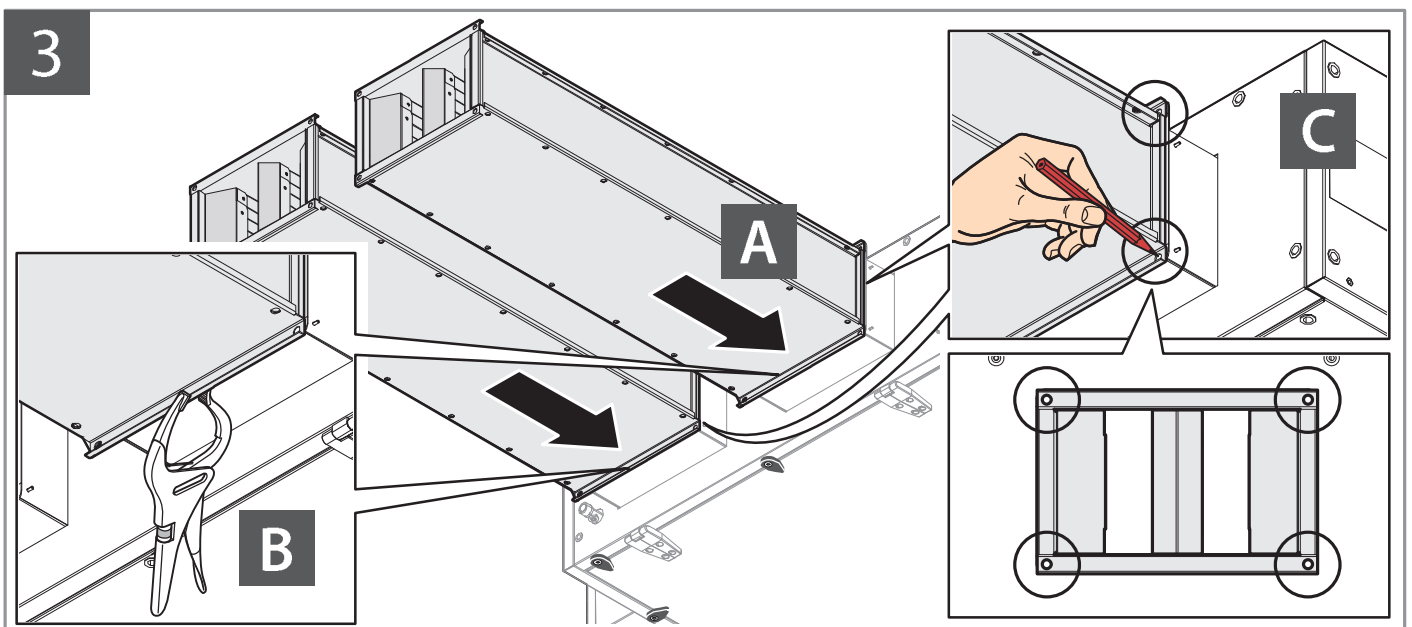
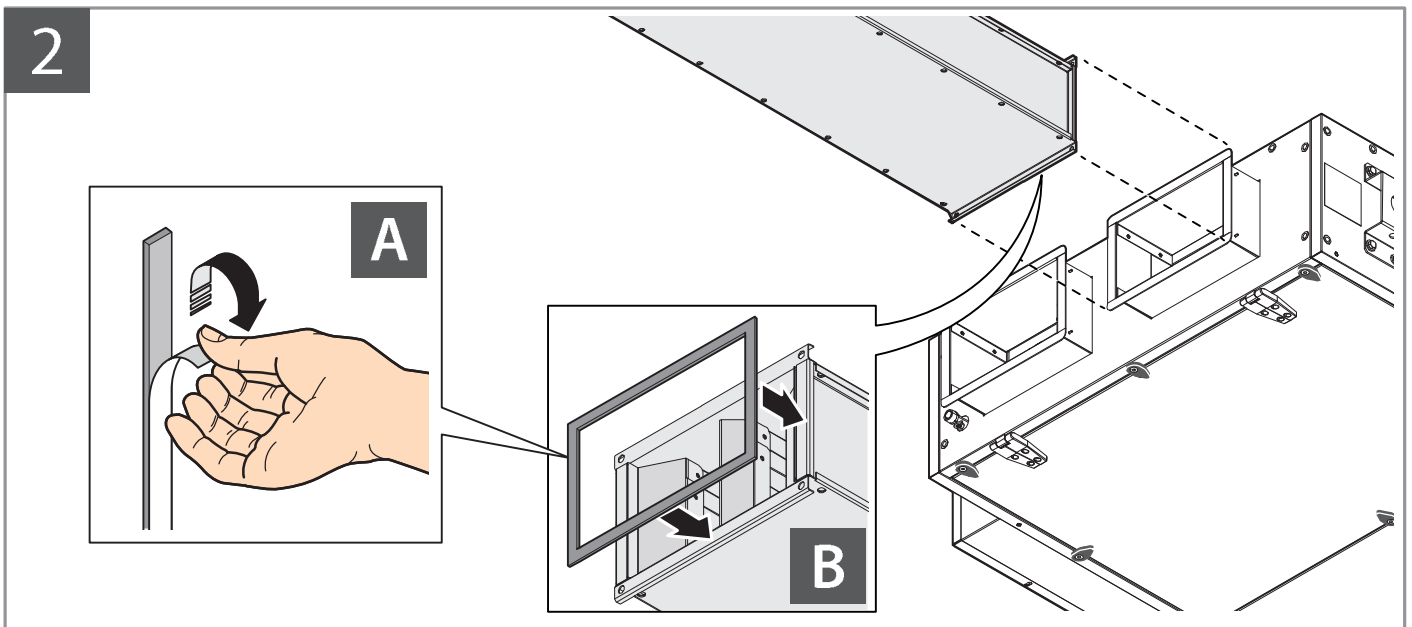
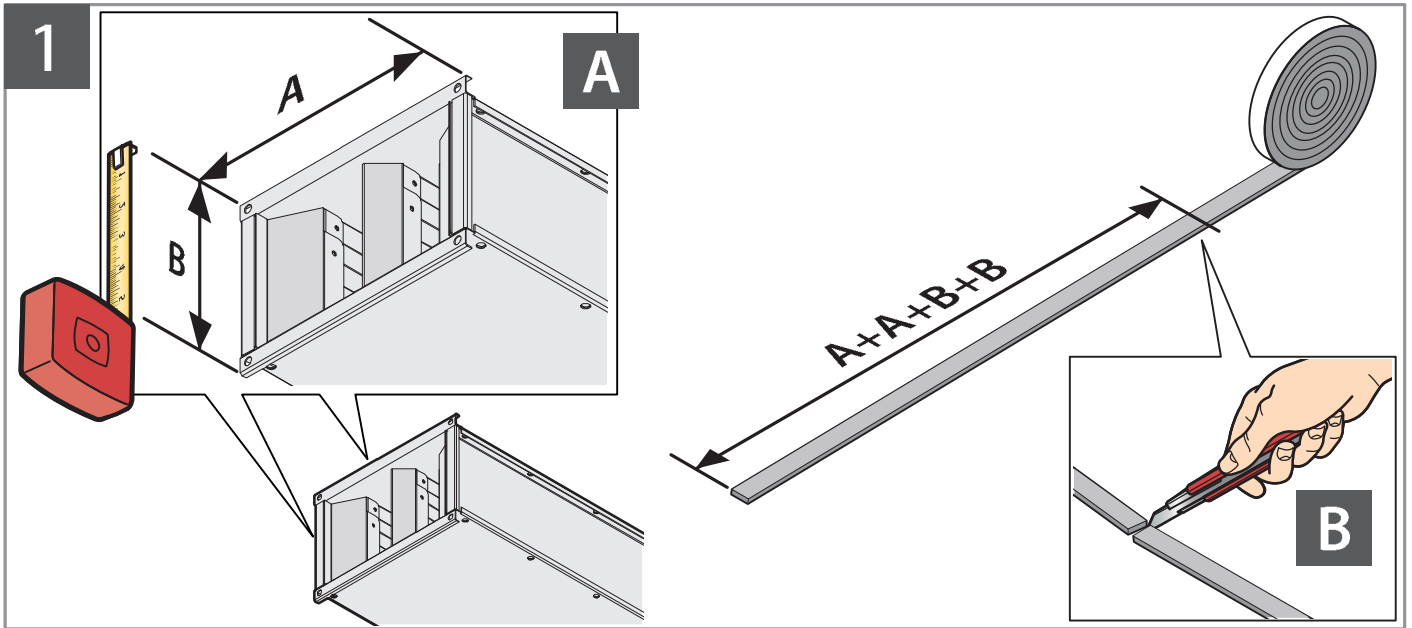
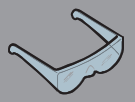


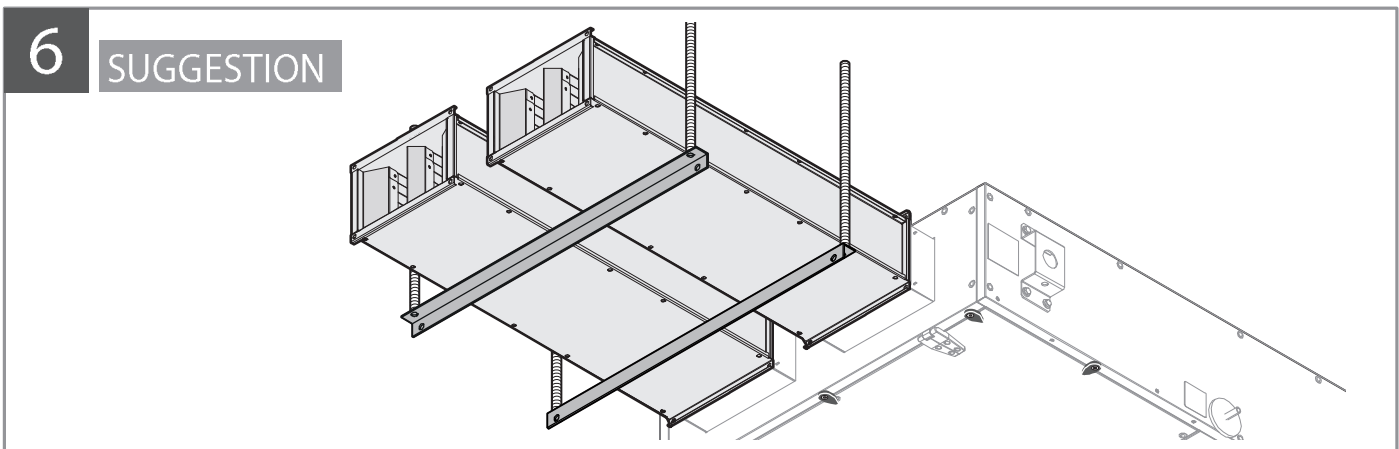
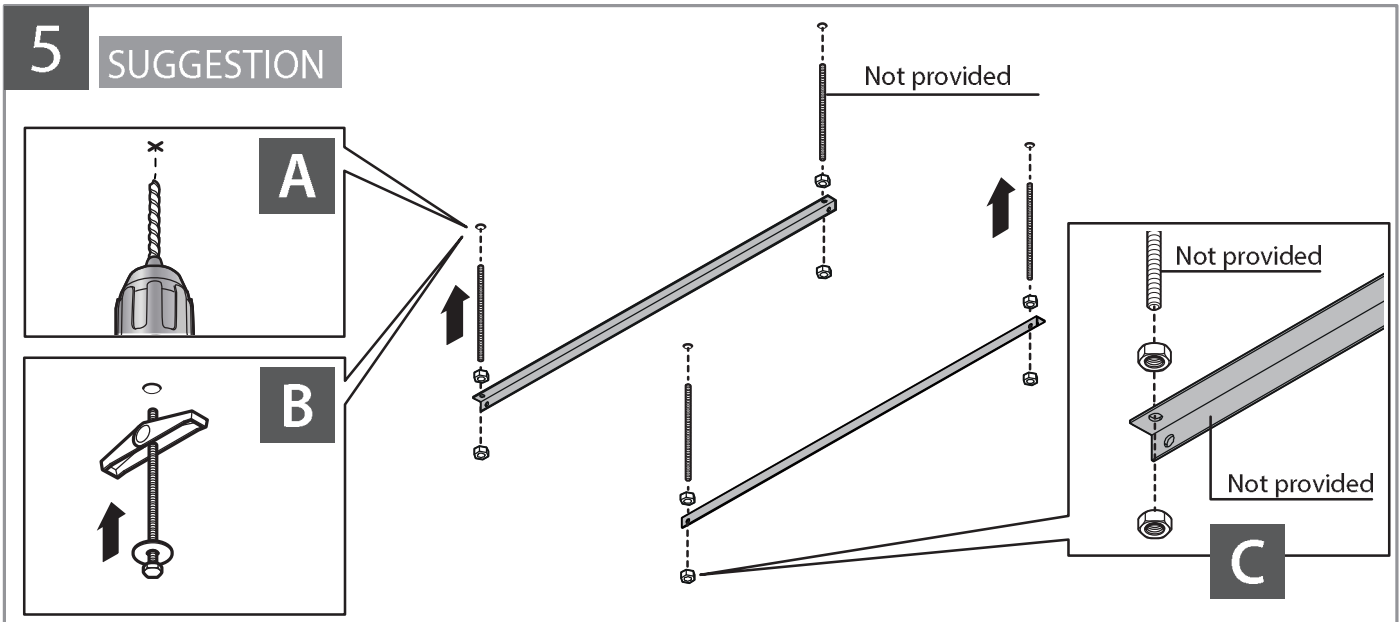
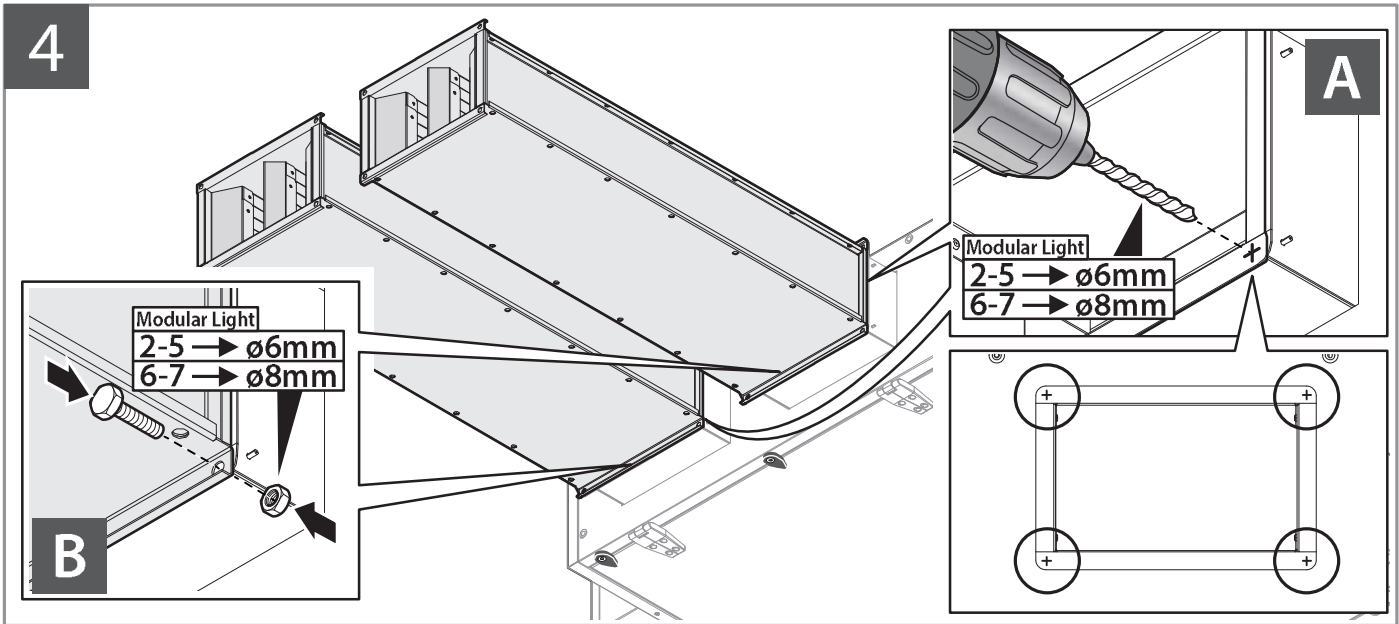
INSTALLATION



USE







Repair log

DATE	SERVICE TYPE	TIME REQUIRED	SIGNATURE

DATE	SERVICETYPE	TIME REQUIRED	SIGNATURE

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