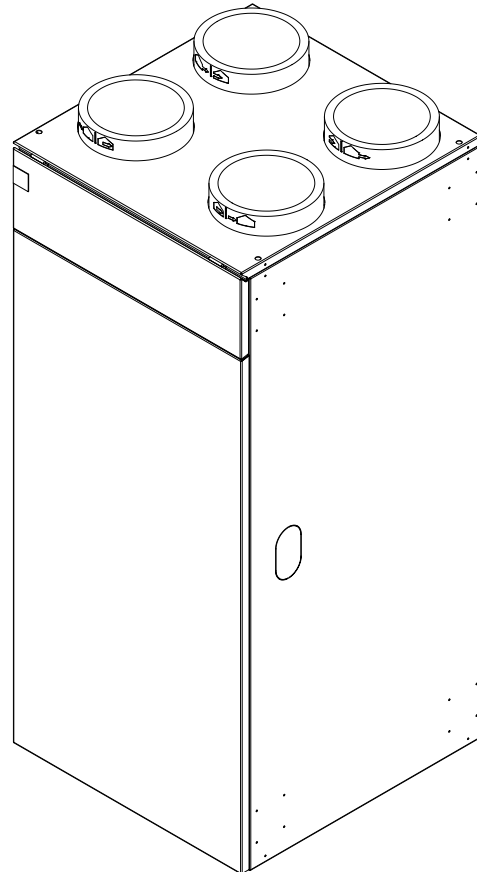

M Flex Air

M Flex Air Plus



Installation and Operating Instruction

Domestic Ventilation Unit
3VSHCS
3VSHCE

Table of contents

1	Safety notes	3
1.1	Symbols and markings.....	3
1.2	Intended use.....	3
1.3	Legal regulations and directives.....	3
1.4	Installation.....	4
1.5	Fireplaces.....	4
1.6	Commissioning, operation, switching off.....	4
1.7	Maintenance, repair, spare parts.....	4
1.8	Energy-efficient use of the ventilation unit.....	4
2	Intended use of the ventilation unit	5
2.1	Area of application.....	5
2.2	Functional principle.....	5
3	System design	6
4	Scope of supply	7
5	Conversion	8
5.1	Transportation.....	8
5.2	Opening the unit.....	8
5.3	Onsite conversion from right-hand unit to left-hand unit.....	8
5.4	Installation of preheating register (5) (accessory).....	10
5.5	Installation of post-heating register (6) (accessory).....	10
6	Installation	11
6.1	Requirements for the installation location.....	11
6.2	Condensate drain (essential accessory).....	12
6.3	Vertical installation.....	13
6.4	Horizontal installation.....	13
6.5	Combination with System M / M Flex.....	14
6.6	Vertical wall mounting (accessory).....	15
6.7	Air duct system.....	16
6.8	Electrical connection.....	18
7	Commissioning	20
7.1	General.....	20
7.2	Building requirements.....	20
7.3	Ventilation system requirements.....	20
7.4	Engineer requirements.....	20
7.5	Commissioning procedure.....	20
8	Operation	21
8.1	General.....	21
8.2	Operating modes.....	22
8.3	User menu.....	22
8.4	Service menu.....	23

9	Operating functions	31
9.1	Internal air quality sensors	31
9.2	Preheating register (optional)	31
9.3	Post-heating register (optional)	31
9.4	Filter monitoring	31
9.5	Switch off limit	31
9.6	Bypass control	31
9.7	Special functions for control element	32
9.8	Switch OFF lock	32
10	Maintenance	33
10.1	General	33
10.2	Filter maintenance	33
10.3	Cleaning air inlets and outlets	34
10.4	Cleaning the heat exchanger	34
10.5	Cleaning the unit	35
10.6	Maintenance of the condensate drain	35
10.7	Additional maintenance measures	35
11	Faults	36
11.1	Internal sensors	37
11.2	Replacing fans	37
11.3	Replacing the bypass	37
11.4	Replacing the heating register	37
12	Environment and disposal	38
12.1	Disposal of packaging	38
12.2	Disposal of the old unit	38
12.3	Removing the old unit	38
13	Device information	39
14	Dimension drawing	41
14.1	Dimension drawing vertical	41
14.2	Dimension drawing key	42
14.3	Dimension drawing horizontal	43
14.4	Dimension drawing key	44
15	Diagrams	45
15.1	Characteristic curve	45
16	Installation checklist	46
17	Filter maintenance checklist	47
18	Warranty certificate	48
19	Product information	49

1 Safety notes

1.1 Symbols and markings

Particularly important information in these instructions is marked with

CAUTION! and **NOTE**.

⚠ CAUTION!

Warning about hazards and faults that could cause serious or fatal injuries or have serious consequences for the product.

i NOTE

Useful notes and additional information.

1.2 Intended use

The ventilation unit may only be used for purging and ventilation in living areas. The unit must be used in a dry and frost-free indoor environment.

Any other use beyond that intended by the manufacturer is prohibited. Improper use can damage the unit and cause considerable hazards.

Unauthorised conversions or modifications to the unit and the entire installed system are not permitted. Structural changes can affect operational safety and must therefore be agreed with an engineer.

1.3 Legal regulations and directives

i NOTE

The construction and design of the domestic ventilation unit comply with the relevant European standards and directives and it therefore complies with basic health and safety requirements. This is documented by the EC declaration of conformity and the CE label on the unit. During installation and operation, country-specific laws, regulations and directives must also be observed.

Failure to observe the safety notes can place the user and the system at risk and invalidates any claim for damages.

⚠ CAUTION!

This unit can be used by children aged 8 and over and by persons with limited physical, sensory or mental aptitude or lack of experience and/or knowledge, providing they are supervised or have been instructed in safe use of the unit and understand the associated potential dangers.

⚠ CAUTION!

Children must not play with the unit. Cleaning and user maintenance must not be carried out by children without supervision.

⚠ CAUTION!

The unit must be installed in compliance with the applicable national installation regulations.

1.4 Installation

The ventilation system must be installed carefully by a qualified engineer in compliance with the installation instructions and with the rules and regulations for accident prevention.

The ventilation unit must be installed in a dry, frost-free environment and must be freely accessible with sufficient space for maintenance and repair work. To prevent electrical hazards and building damage, uninhibited drainage of the condensate must be ensured. The ventilation system may not be installed in areas where caustic or flammable gases or aerosols containing grease or adhesive substances can get into the system or where people are impaired or placed at risk due to air containing harmful impurities. Existing fire protection regulations must be taken into consideration and observed.

⚠ CAUTION!

Connecting extractor hoods to the ventilation system is not permitted.

All electrical connection work must be performed only by a qualified electrician in compliance with all safety regulations for electrical equipment, the applicable standards and the existing local regulations and in accordance with the installation manuals. Work on the unit must always be performed with the power disconnected, otherwise there is a risk of severe or fatal accidents.

Electrical cables must be installed such that there are no mechanical loads acting on the cable connections in the unit and electrical cables cannot come loose from their connecting terminals. It is also important to ensure that no cables are crushed or damaged by casing and maintenance covers.

Improper or incorrect installation can cause significant hazards, e.g. serious accidents or fires. Settings and programming not described in the operating instructions may be relevant to safety and must be performed only by an engineer.

1.5 Fireplaces

Special requirements apply for simultaneous use of ventilation systems and fireplaces (e.g. fireplace, tiled stove, gas heaters). Ensure that no negative pressure is created by the ventilation system in the ventilated residential unit while an indoor air dependent fireplace is in operation. Country-specific and regional rules and regulations must be observed.

1.6 Commissioning, operation, switching off

Once installation is complete, perform a functional test to make sure that there are no irregularities. The system operator must use the operating instructions for information on operating and maintenance procedures.

The ventilation unit contains fans. Placing hands or objects in the unit, in air ducts or in air intake or air outlet elements can cause injuries and also damage to the unit. Make sure that neither children nor people with restricted physical or mental abilities are at risk.

In the event of a defect or extraordinary circumstances (e.g. if the system is or has been under water due to a natural disaster), operation must be ceased immediately. Switch off the power supply and consult an engineer.

1.7 Maintenance, repair, spare parts

To ensure safe operation at all times, the ventilation system must undergo regular maintenance. All maintenance and repair work that extends beyond cleaning or changing filters must be performed by a qualified engineer. Before opening the unit, make sure that all relevant electric circuits are disconnected from the power and secured against inadvertently being switched back on. Use only genuine spare parts from the manufacturer.

1.8 Energy-efficient use of the ventilation unit

In addition to protecting the building structure, improving the air hygiene and comfort, the ventilation system also helps to optimize the efficiency of the building. The ventilation unit should therefore not be switched off, even during extended periods of absence.

1.8.1 Windows

Windows can also be opened when a ventilation system is in use, e.g. for shock ventilation.

Particularly at low outside temperatures, the windows should be kept closed to make optimum use of the heat recovery function. Valuable heating energy is kept in the building, ventilation heat losses are reduced to a minimum and savings are made in the heating costs.

1.8.2 Filters

Soiled filters increase the energy consumption of the ventilation unit. They therefore require regular maintenance (see Maintenance chapter). A filter signal acts as a reminder for the maintenance. Using non-genuine filters can also cause the ventilation unit to have increased energy consumption.

2 Intended use of the ventilation unit

2.1 Area of application

The ventilation unit is designed for controlled purging and ventilation in frost-free living areas. Air ducts are used for the air circuit.

Connecting extractor hoods to the ventilation system is not permitted. The ventilation unit is not designed for drying structures.

2.2 Functional principle

The ventilation unit is equipped with two energy-saving and quiet running fans and provides for a controlled air exchange in apartments and residential buildings.

Used air in the rooms with the highest levels of humidity and odours is extracted as exhaust air and transported outside as extract air through an air duct system. Examples of exhaust air rooms include bathrooms and kitchens. At the same time, fresh outside air is sucked in and brought into living rooms and bedrooms as supply air.

The two separate air flows are directed through a cross current heat exchanger. This heat exchanger recovers most of the heat from the exhaust air and uses it to heat up the supply air. The building thus retains the majority of its heat energy.

The integrated bypass can direct outside air past the heat exchanger directly into the supply air rooms. Heat recovery is deactivated in this case.

Hallways are usually overflow areas through which air flows from supply air rooms to exhaust air rooms. An unhindered overflow is achieved with undercut doors or overflow grilles.

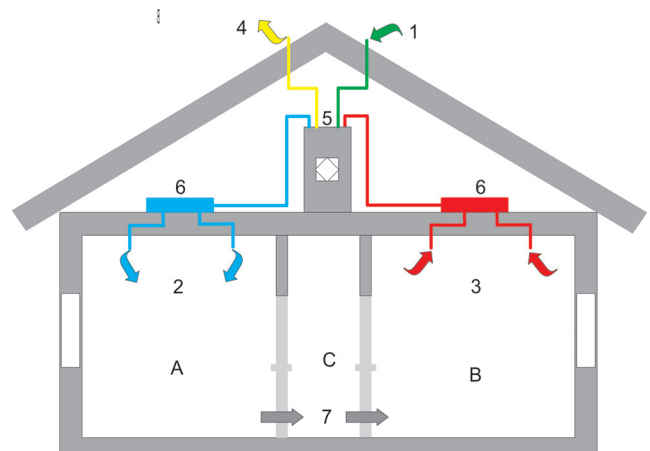


Fig. 2.1: Schematic representation of supply/exhaust air system with heat recovery

- | | | | |
|---|-------------------|---|------------------|
| 1 | Outside air (SAI) | A | Supply air area |
| 2 | Supply air (SAO) | B | Exhaust air area |
| 3 | Exhaust air (EAI) | C | Overflow area |
| 4 | Extract air (EAO) | | |
| 5 | Ventilation unit | | |
| 6 | Air distributor | | |
| 7 | Overflow air vent | | |

The star-shaped structure of the air duct system shown, with direct pipe sections between the air distributors and the supply air/exhaust air valves

- Simplifies the volume-flow balance and pressure balance
- Avoids sound transmission from adjacent rooms
- Simplifies cleaning due to direct pipe sections

3 System design

The requirements for the ventilation system to be installed are as individual as the apartments and residential buildings themselves. A system design is required to select the most suitable ventilation unit and the correct settings.

It is essential to create a balance of air volumes that factors in both the size and the utilisation of the individual rooms to be ventilated. The system design calculates the required air volume flows, the size and number of air inlets and outlets, dimensions the air duct system and ultimately determines the required ventilation unit.

The air volume flows are selected so that the air flows from rooms with low air contamination (supply air rooms) to rooms with higher air contamination (exhaust air rooms).

The following are required for the system design:

- Information on the building and the ventilated living space
- Ground plans with details outlining the use of space
- Sectional view with details of the room height

These documents are used to divide up the building into supply air areas, exhaust air areas and air overflow areas.

Supply air rooms are all living rooms, bedrooms and recreation rooms

Exhaust air rooms are bathrooms, toilets, kitchens, utility rooms

Overflow areas are located between the supply air and exhaust air areas, e.g. hallways

NOTE

An incorrectly dimensioned ventilation system can lead to defective ventilation and purging or cause loud noises and excess energy consumption. Country-specific and regional rules and regulations must be taken into consideration and observed.

CAUTION!

Special requirements apply for simultaneous use of ventilation systems and fireplaces. Country-specific and regional rules and regulations must be observed. Early consultation with the relevant chimney sweep is strongly recommended!

CAUTION!

Existing fire protection regulations must be taken into consideration and observed for the installation of ventilation systems!

4 Scope of supply

The scope of supply of the ventilation unit includes:

- 1) Ventilation unit with integrated control unit
- 2) 4 height-adjustable supporting feet
- 3) Modbus connection plug on ventilation unit
- 4) Installation and usage instructions

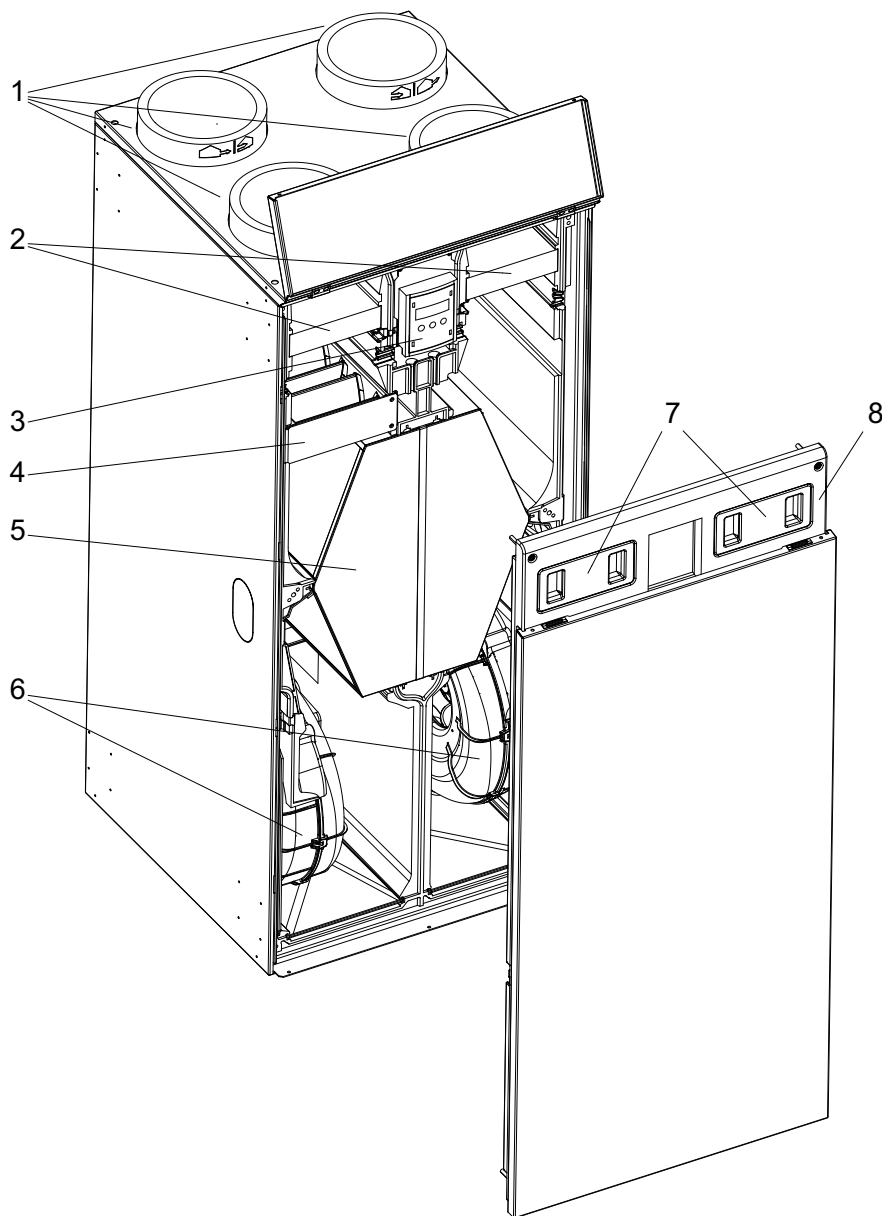


Fig. 4.1: Unit set-up in detail

- | | |
|---|---|
| 1 | Air duct connections |
| 2 | Outside air filter and exhaust air filter |
| 3 | Control unit |
| 4 | Bypass flap |
| 5 | Heat exchanger |
| 6 | Fans |
| 7 | Filter cover (detachable) |
| 8 | Inspection door (EPP) |

5 Conversion

5.1 Transportation

A pallet should be used for transportation to the final installation location. The unit can also be transported horizontally with the rear facing downwards.

The ventilation unit should be securely attached to the transport pallet with a strap.

5.2 Opening the unit

To reach the inside of the unit, the bottom of the front panel must first be removed:

- 1) Loosen the screw on the bottom
- 2) Push the front panel upwards slightly
- 3) Remove the front panel forwards
- 4) Loosen the 6x hexagon socket screws and remove the EPP inspection door

⚠ CAUTION!

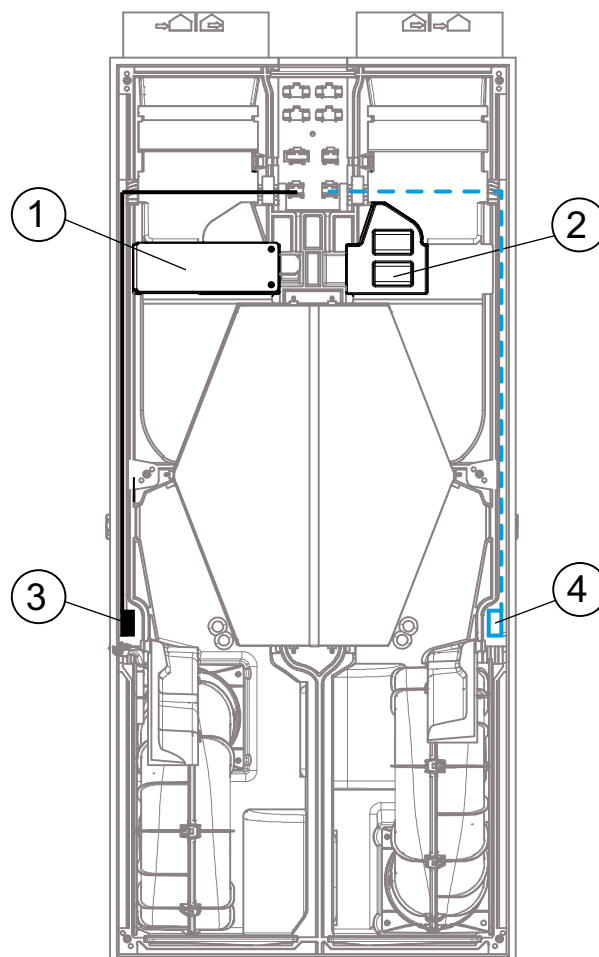
To ensure that the unit is sealed air tight, the screws for the front of the EPP casing must be screwed in by hand to a max. tightening torque of 0.75 Nm.

5.3 Onsite conversion from right-hand unit to left-hand unit

M Flex Air factory default, supply air fitting rear right.

For a description of the air connections see cap. 6.7.1 on page 16

For a description of the condensate drain see cap. 6.3 and Cap. 6.4 on page 13



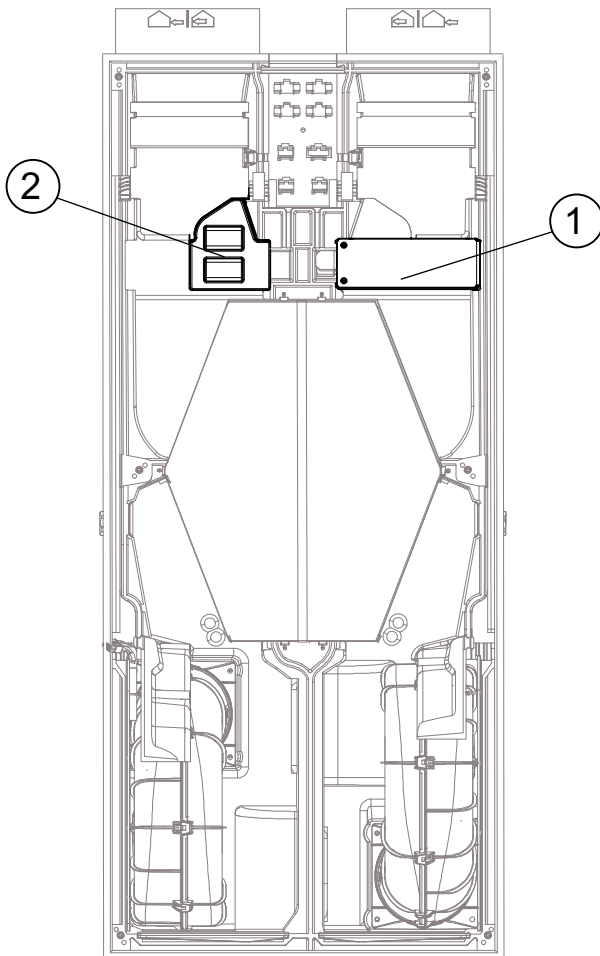
Step 1:

Remove the bypass flap (1) and the sealing plug (2) for the bypass duct. Carefully push in on the opposite side. The bypass flap (1) is rotated by 180° and the wiring is not disconnected but is merely routed in the opposite cable duct. The bypass flap (1) must be located on the outside air side and the sealing plug (2) on the exhaust air side.

Completely push in the sealing plug (2).

i NOTE

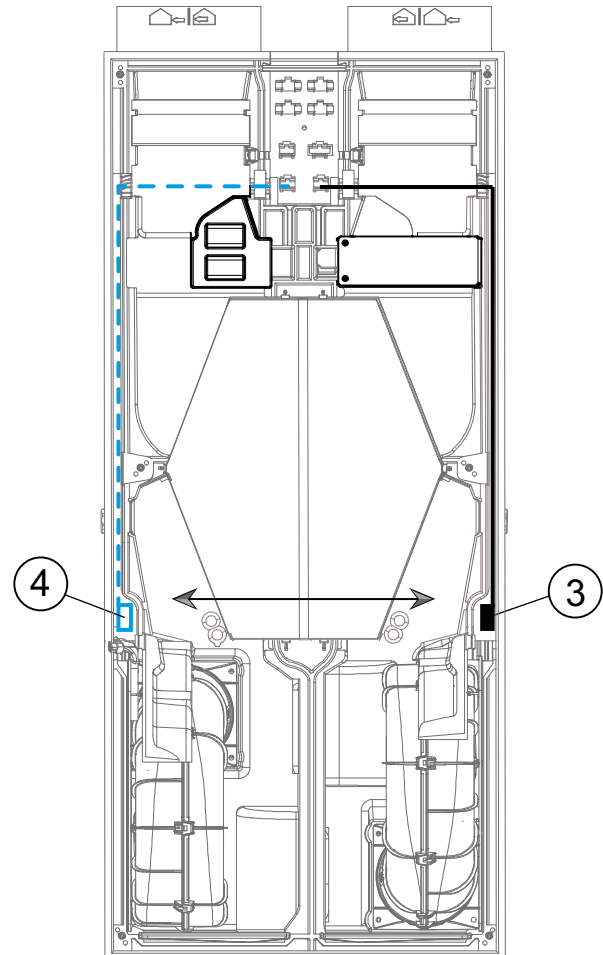
Pay attention to the cable and the bypass motor and prevent damage to the terminal and cable.

**Step 2:**

Replace the wiring harnesses for the fans: the outside air fan with the blue marking (4) must be shifted from the right-hand side to the left. Shift the exhaust air fan with the black marking (3) from the left to the right.

i NOTE

When routing the cables in the cable ducts, ensure an even arrangement without crossovers and re-attach the seals. This is the only way to guarantee the tightness of the unit.

**Step 3:**

In the service menu under Settings - 27 R/L Selection activate "Left".

i NOTE

If a preheating and post-heating register are fitted, do not install them until the directions of air flow have been changed.

5.4 Installation of preheating register (5) (accessory)

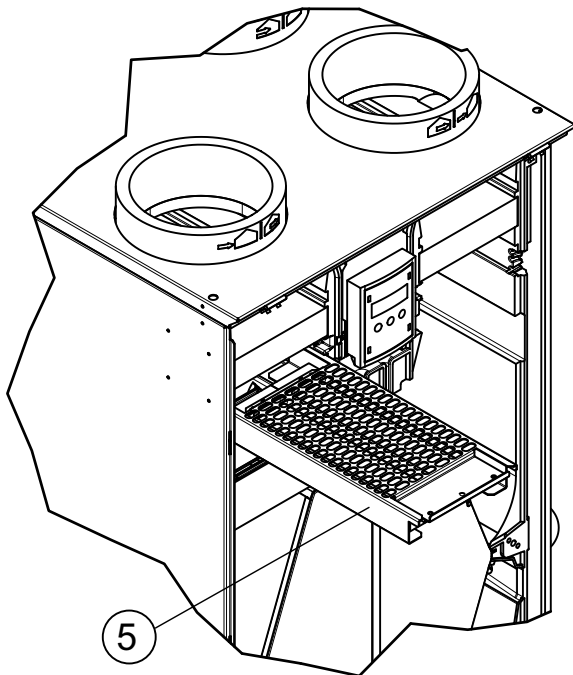


Fig. 5.1: Ventilation unit section with preheating register

Installation of preheating register (5):

- 1) Push the pre-assembled assembly into the installation slot provided above the bypass flap.
- 2) Connect the plug for the assembly to the 6-pin connector socket below the control unit.
- 3) Register the preheating register in the service menu under Settings, Preheating.

5.5 Installation of post-heating register (6) (accessory)

The post-heating register is supplied pre-assembled for a right-hand unit. The standard installation slot is located above the right-hand fan.

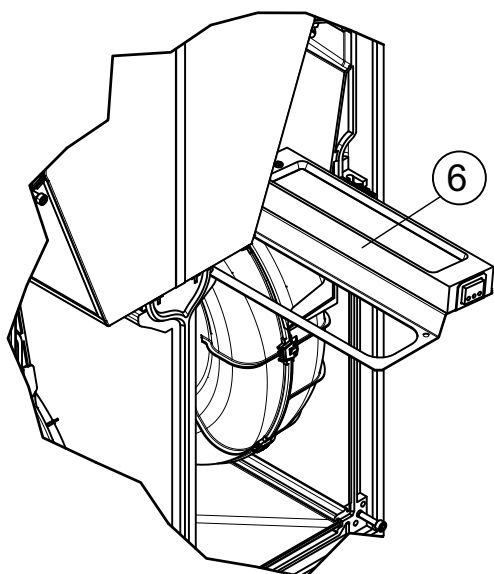


Fig. 5.2: Ventilation unit section with post-heating register

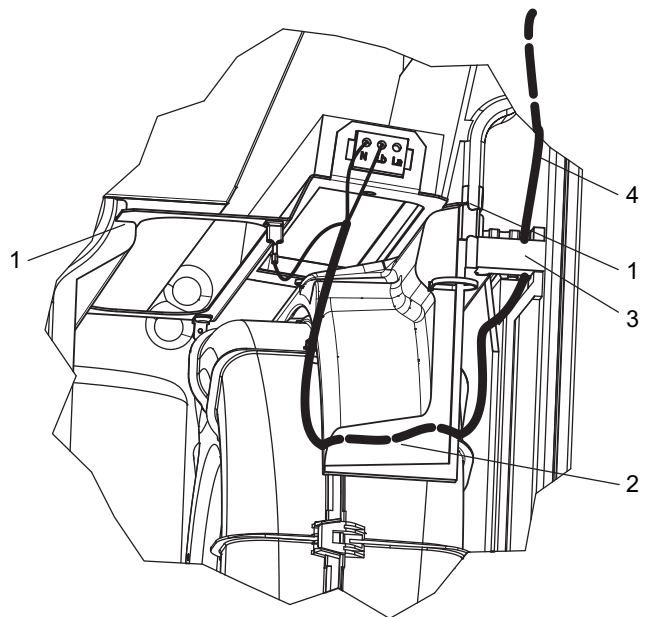


Fig. 5.3: Installation of post-heating register in "right-hand unit"

Installation of post-heating register (6):

- 1) Insert the post-heating register assembly in the two grooves and push backwards.
- 2) Run the cable underneath the condensate protection into the side cable duct.
- 3) Run the cable underneath the cable seal.
- 4) Run the cable in the side duct.
- 5) Connect the plug to the 3-pin socket XH3 provided below the control unit.
- 6) Register the post-heating register in the service menu under Settings, Post-heating.

Installation of post-heating register in "left-hand unit"

To use the post-heating register in a "left-hand unit", it is necessary to unscrew the PTC heating element, rotate the holder and screw it back into place so that the connection cable points forwards. The post-heating register can now be pushed into the installation slot provided under the left-hand fan.

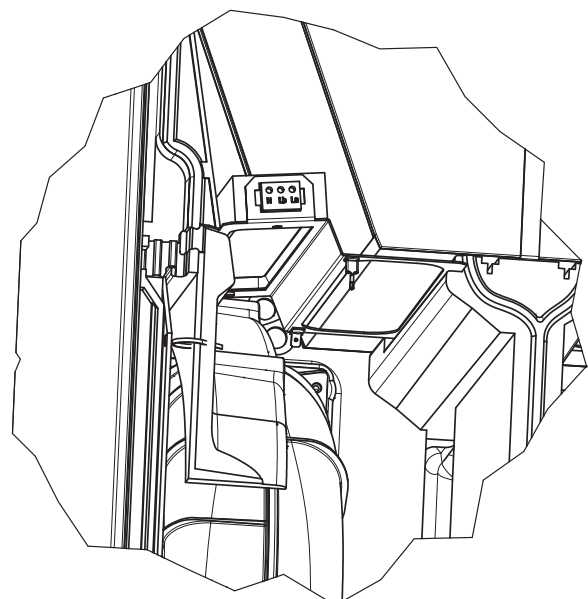


Fig. 5.4: Installation of post-heating register in "left-hand unit"

6 Installation

The ventilation system must be installed carefully by a qualified engineer in compliance with the installation instructions, the safety rules for electrical equipment, applicable standards and relevant local regulations, as well as the rules and regulations for accident prevention.

Improper or incorrect installation can cause significant hazards, e.g. serious accidents or fires. Settings and programming not described in the installation instructions may be relevant to safety and must be performed only by an engineer.

6.1 Requirements for the installation location

The installation location for the ventilation unit must be dry and free from frost. The ambient temperature in the installation room must not fall below +10 °C and must not rise above +40 °C. The installation room must not suffer from odours. Suitable installation locations include ancillary rooms, e.g. utility rooms and building services rooms, cellars, storage rooms and attics. Effective and frost-free drainage of condensate water must be guaranteed.

There must be sufficient space for maintenance and repair work.

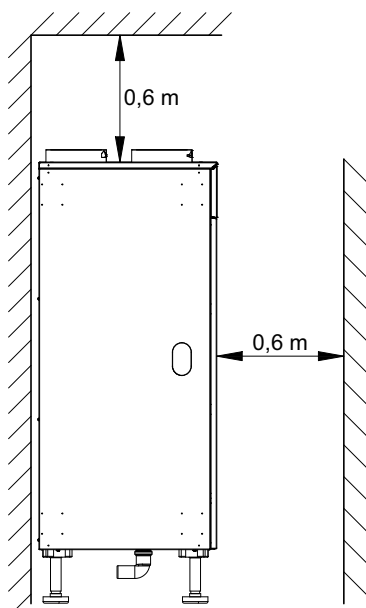


Fig. 6.1: Vertical installation

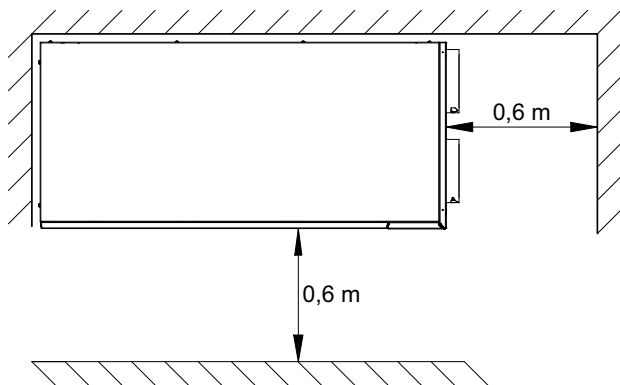


Fig. 6.2: Horizontal installation (top view)

⚠ CAUTION!

The required minimum clearances must be observed for installation.

⚠ CAUTION!

The ventilation unit and the corresponding power supply disconnect device must be freely accessible.

i NOTE

The air circuit made up of all air inlets and outlets, as well as overflow passages, must not be obstructed, covered or sealed. Settings carried out by the engineer must not be changed.

⚠ CAUTION!

Changes to the unit or on the installed complete system, as well as any structural changes, can have an impact on safety and must therefore be agreed with an engineer.

⚠ CAUTION!

Special requirements apply for simultaneous use of ventilation systems and fireplaces. Country-specific and regional rules and regulations must be observed. Early consultation with the relevant chimney sweep is strongly recommended!

i NOTE

The unit must not be installed at altitudes greater than 2,000 m above sea level.

It must be possible to shut off combustion air lines and exhaust gas systems for fireplaces that depend on room air to ensure fault-free operation of the ventilation unit.

6.2 Condensate drain (essential accessory)

6.2.1 General

Under certain conditions, condensate may occur when operating the ventilation unit. The ventilation unit is equipped with four condensate collection trays.

i NOTE

The installation location of the ventilation unit and the entire condensate drain installation must be free from frost!

The condensate siphon with integrated sealing lip valve is available as an essential accessory. It combines low pressure protection and dry running protection. The subsequent condensate circuit must be installed with a downward gradient and using standard sanitary piping.

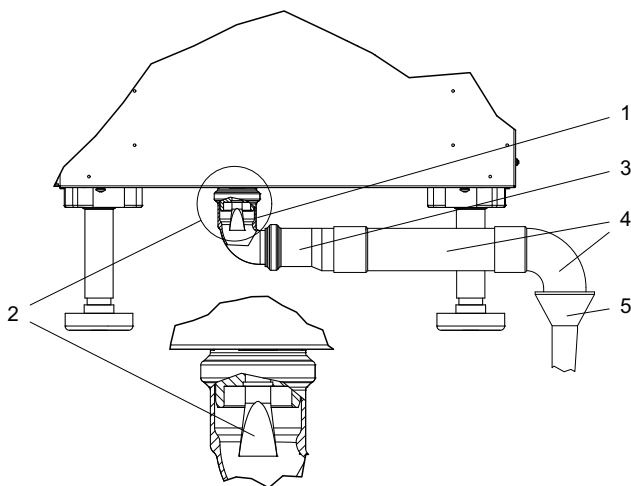


Fig. 6.3:

- 1 Condensate drain including low pressure protection
- 2 Low pressure protection
- 3 HT reduction DN40 to DN50 (part of condensate drain accessory)
- 4 Condensate drain HT pipe (on site)
- 5 Outlet hopper (on site)

6.2.2 Preventing false air intake

False air intake into the ventilation unit via the condensate connection must be prevented. To achieve this, the condensate drain is equipped with an automatically sealing low pressure protection mechanism. The condensate drain must be connected to a siphon on site.

6.2.3 Prevention of sewer gas intake

For hygiene reasons, the condensate pipe from the ventilation unit must not be connected directly to the building drainpipe.

In case of a fault, the siphon cannot provide a complete seal. Intake of sewer gases into the ventilation unit must be reliably prevented. To do this, a free inlet for the ventilation unit condensate pipe must be installed in a funnel on site. Another siphon must be installed on site in front of the funnel to prevent odours from escaping from the drainpipe.

i NOTE

Ensure that there is a sufficient gradient over the entire condensate drainage system! Incorrect installation can result in water damage!

i NOTE

The condensate drain must be checked and cleaned at regular intervals and at least once a year!

6.3 Vertical installation

The supporting feet are screwed onto the pre-punched cover sections on the underside of the unit using the panel screws supplied and are then aligned horizontally and vertically.

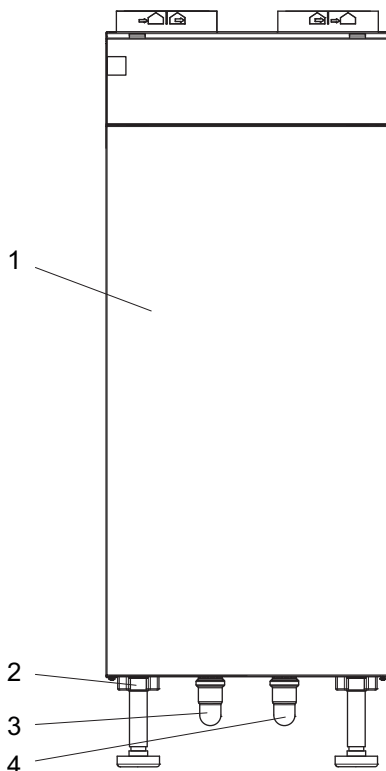


Fig. 6.4: Unit positioned vertically

- 1 Ventilation unit with control unit
- 2 Supporting foot
- 3 Condensate drain (right-hand unit)
- 4 Condensate drain when using the unit in cooled living areas

To cover the visible supporting feed, a base plate for vertical installation can be ordered as an accessory.

6.4 Horizontal installation

The supporting feet are screwed onto the pre-punched cover sections on the desired side of the unit using the panel screws supplied and are then aligned horizontally and vertically.

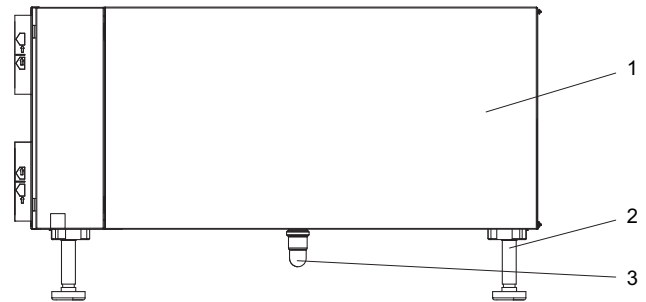


Fig. 6.5: Horizontal installation with air duct connections to left (factory default, right-hand unit)

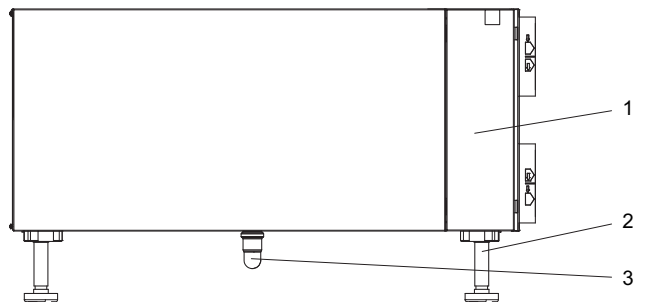


Fig. 6.6: Horizontal installation with air duct connections to right (converted to left-hand unit on site)

- 1 Ventilation unit with control unit
- 2 Supporting foot
- 3 Condensate drain

CAUTION!

When the air duct connections are aligned to the right, the unit must be converted to a left-hand unit (siehe Kap. 5.3 auf S. 8)!

For the condensate drain position, see Fig. 6.5 and Fig. 6.6

For horizontal versions, the side panel must first be broken out at the pre-perforated location.

For use in cooled buildings, a vertically installed unit is preferable.

To cover the visible supporting feed, a base plate for horizontal installation can be ordered as an accessory.

6.5 Combination with System M / M Flex

6.5.1 Adjacent to Compact, Comfort and Comfort with X(X)L domestic hot water cylinder

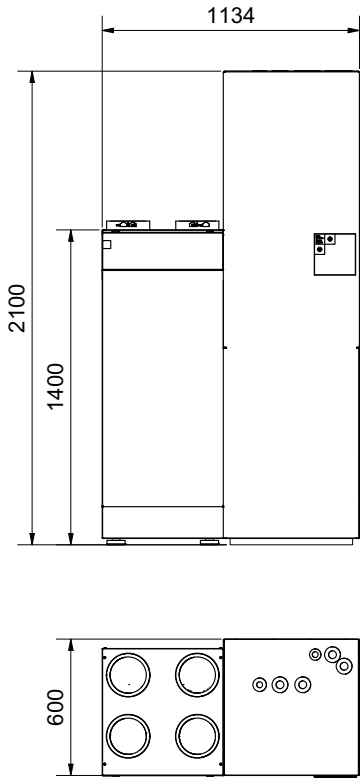


Fig. 6.7: Installation example: System M Compact

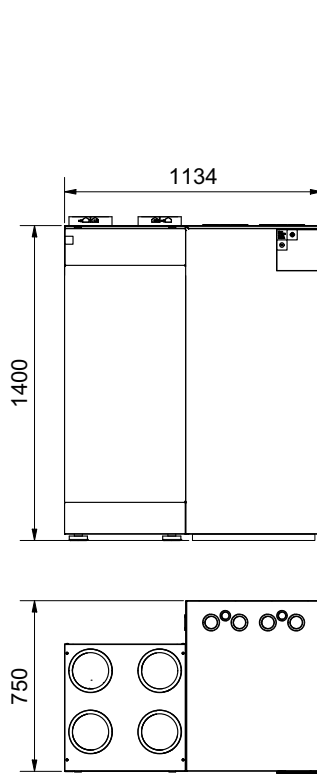


Fig. 6.8: Installation example: System M Comfort

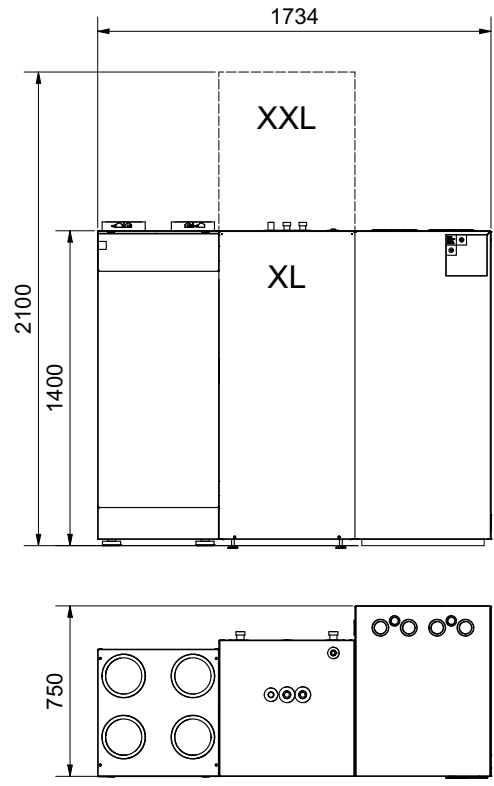


Fig. 6.9: Installation example: System M Comfort with X(X)L domestic hot water cylinder

6.5.2 Installed on top of Comfort with XL domestic hot water cylinder

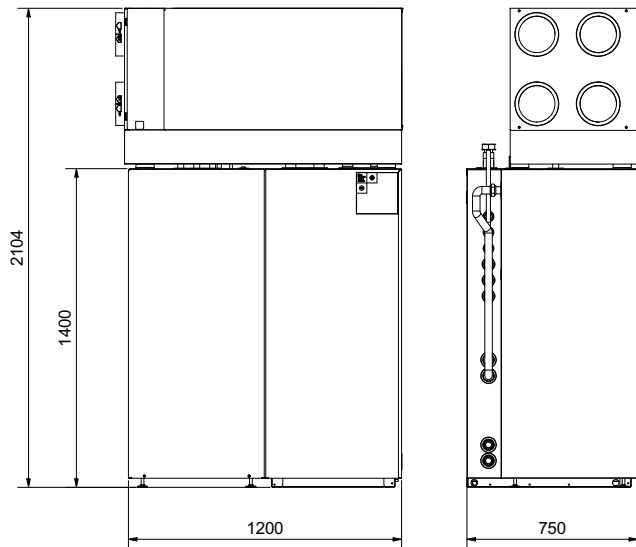


Fig. 6.10: Installation example: System M Comfort with XL domestic hot water cylinder installed on top

6.5.3 Data connection

An RS 485 cable must be installed to connect to the heat pump manager. The plug for connection to the connector panel on the ventilation unit is included in the scope of supply. It must be attached to an on site cable - LIYY 3 x 0.34 mm² is recommended.

Only the end customer menu options level adjustment, filter reset and information can be accessed in the System M / M Flex user interface. All other menu options must be set on the ventilation controller.

6.6 Vertical wall mounting (accessory)

6.6.1 Scope of supply

The scope of supply of the accessory includes:

- 1) Mounting rail
- 2) Unit/mounting rail screws
- 3) Set screws

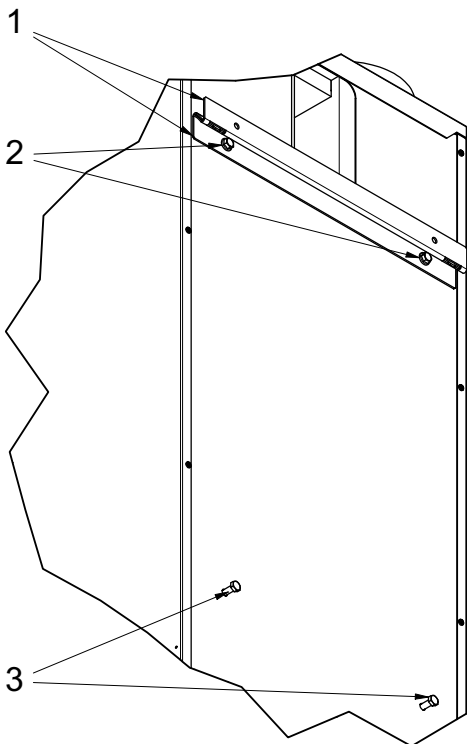


Fig. 6.11:Accessories

6.6.2 Wall mounting installation

The wall mounting must be installed horizontally. When installing the unit, a vibration decoupling mounting may be necessary depending on the construction of the wall. This is to be carried out on site.

i NOTE

Where possible, the device should not be installed on a wall adjoining a bedroom. Alternatively, a vibration decoupling mounting should be used.

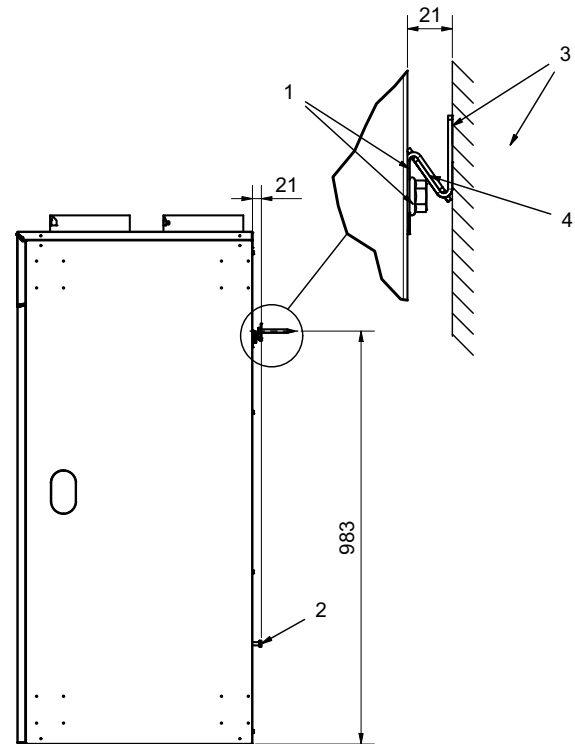


Fig. 6.12:Wall mounting installation

- 1) Attach the mounting rail at the upper threaded inserts on the rear of the unit
- 2) Screw the set screws into the lower threaded inserts on the rear of the unit
- 3) Screw the mounting rail horizontally onto the wall. The installation materials should be selected according to the nature of the wall
- 4) Mount the unit
- 5) Align the unit using the set screws

6.7 Air duct system

6.7.1 Air duct connections

The connecting stubs for the air duct system are located on the top of the device in a vertical direction. The direction of air flow can be changed by modification (supply air connection on left or right), siehe Kap. 5 auf S. 8.

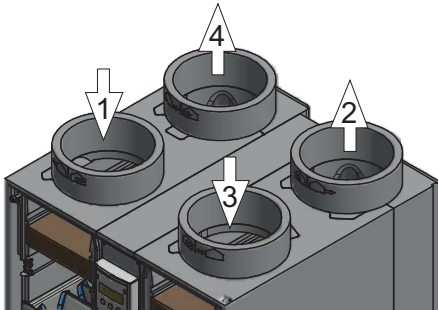


Fig. 6.13: Right-hand unit air duct connections

- 1 Outside air (SAI)
- 2 Supply air (SAO)
- 3 Exhaust air (EAI)
- 4 Extract air (EAO)

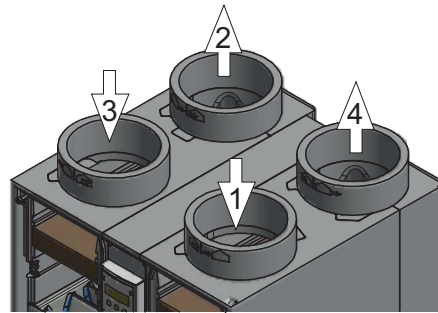


Fig. 6.14: Left-hand unit air duct connections

- 1 Outside air (SAI)
- 2 Supply air (SAO)
- 3 Exhaust air (EAI)
- 4 Extract air (EAO)

Outside air and extract air ducts connect the ventilation unit with the external wall vents or roof hoods.

Supply air and extract air ducts are routed from the ventilation unit to air distributors. From the air distributors, they must be routed in a star shape directly to the valve or the ventilation grilles without branches.

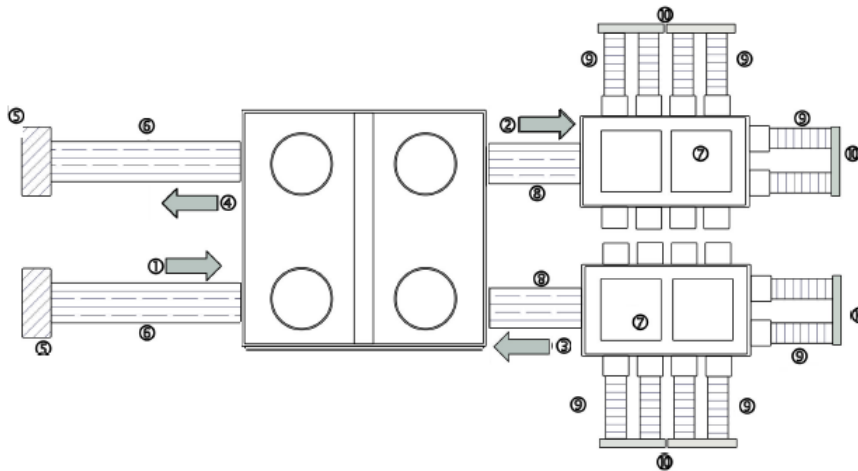


Fig. 6.15: Air duct system (schematic, shown for "right-hand unit/supply air connection on right")

- 1 Outside air (SAI)
- 2 Supply air (SAO)
- 3 Exhaust air (EAI)
- 4 Extract air (EAO)
- 5 Outside / extract air grille/roof cover
- 6 Outside / extract air sound damper (flexible)
- 7 Air distributor
- 8 Supply air / exhaust air sound damper (flexible)
- 9 Air distribution pipe
- 10 Ventilation valves

i NOTE

The air duct system must be sized and planned according to the requirements of the building and the selected ventilation unit (see System design chapter).

An incorrectly sized or incorrectly installed air duct system can result in inadequate ventilation or increased odour problems, draughts and excessive energy consumption. Country-specific and regional rules and regulations must be taken into consideration and observed.

i NOTE

Extractor hoods and vented tumble driers must not be connected to the domestic ventilation unit. It is advisable to use extractor hoods with air circulation and condensing tumble driers.

6.7.2 Thermal insulation

The ventilation unit, air distributor and air duct system must be installed within the thermally insulated building shell

i NOTE

To prevent condensate formation, outside air and extract air ducts must be sealed completely air-tight at both sides and over the entire distance between the ventilation unit and air inlet/outlet with sufficiently strong steam-resistant thermal insulation. When using a ventilation hose with multiple layers, the outer shell in particular must be masked off so it is air-tight. The temperatures in the duct are approximately the same as the outside temperature level.

Supply air and exhaust air ducts must also be fitted with thermal insulation to prevent heat losses if they pass through unheated areas or areas with limited heating.

6.7.3 Vibration decoupling and sound insulation

To prevent vibration transmission from the ventilation unit to the duct system, connect all air ducts flexibly to the ventilation unit.

Install sound damping ventilation hoses or sound dampers in the supply air and exhaust air duct and in the outside air and extract air duct. Flexible air hoses must be installed in an accessible location for cleaning or replacement.

When installing mountings, clips, brackets and other duct mountings, sound damping measures should be used where applicable. Wall or ceiling openings must be filled and sealed with suitable material. If ventilation ducts are installed in the insulation layer under the screed, suitable vibration decoupling and impact sound decoupling measures must be used (e.g. insulation strips under the ventilation pipe).

Sound transmission from adjoining rooms (transmitted sound) is suppressed by a star-shaped set-up of the air duct system.

6.7.4 Air inlets and air outlets

The outside air and extract air are routed through external wall grilles and/or roof covers, the positioning of which must factor in sunlight, the direction of the weather and prevailing wind, snow levels and other external influences. The outside air drawn in should, in theory, be cool, dry and odourless. Avoid intake of extract air (air short circuit). Where possible, it is recommended that the outside air is drawn in via a wall grille on the external wall or gable at least 1.5 m above ground level and to route the extract air via a roof cover.

Arrange air outlets and inlets for supply and exhaust air in the room such that a good flow of air through the room is ensured. Position ventilation valves on the ceiling or in the top part of walls and take into account the subsequent position of the furniture (particularly seats and beds, in order to prevent perceived draughts).

Hallways are overflow areas through which air flows from supply air rooms to exhaust air rooms. Air overflow vents must be provided to ensure an unobstructed overflow. These can be implemented using gaps beneath doors or ventilation grilles.

6.8 Electrical connection

6.8.1 General

The ventilation unit must be connected to a 230V/50Hz power supply. All plug connections are on the rear of the ventilation unit.

CAUTION!

All electrical connection work must be performed only by a qualified electrician in compliance with the safety regulations for electrical equipment, the applicable standards and the existing local regulations.

The power supply disconnect device must be freely accessible at all times. Work on the unit must always be performed with the power disconnected.

6.8.2 Connection cable

The unit is supplied with a pre-assembled mains power connection. This is plugged into the rear of the unit (X210).

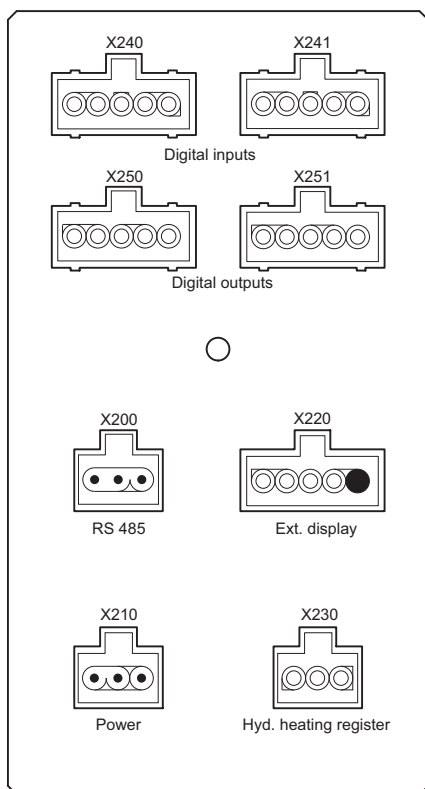


Fig. 6.16:Rear unit connection plate

Connector	Connection
X 200	Modbus RS 485
X 210	Power supply 230V/50Hz
X 220	External display (CAN bus, SELV)
X 230	Not used
X 240 / X 241	Digital inputs (optional equipment)
X 250 / X 251	Digital outputs (optional equipment)

NOTE

An all-pole mains disconnect device with a contact clearance of at least 3mm is required on the installation side.

CAUTION!

Electrical cables must be installed in such a way that there are no mechanical loads acting on the cable connections in the unit and electrical cables cannot come loose from their connecting sockets. Cables must not be damaged by the casing covers or maintenance covers.

6.8.3 Electronic boards in the ventilation unit

The ventilation unit is equipped with an electronics box, which contains the boards.

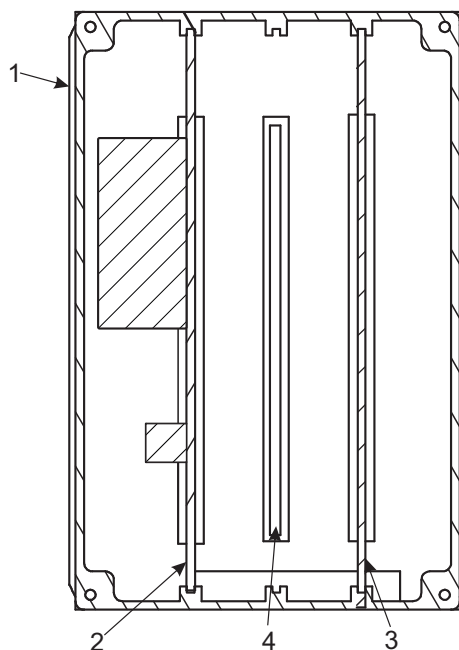


Fig. 6.17:Electronics box

- 1 Electronics box
- 2 Power supply board
- 3 Control / CPU board
- 4 Slot for EnOcean/digital input and output board (optional)

6.8.4 Electrical circuit diagram

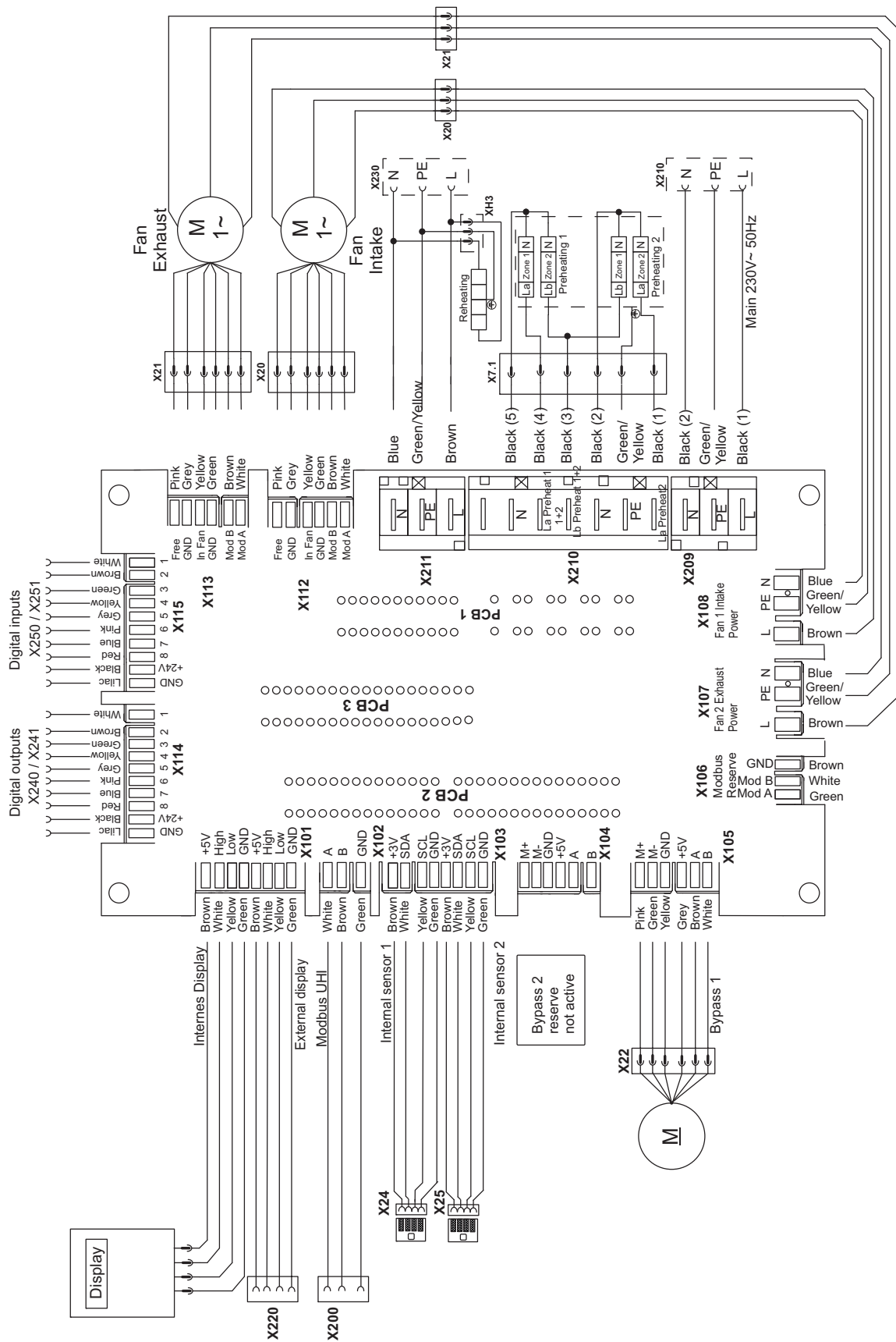


Fig. 6.18: Circuit diagram, internal wiring

7 Commissioning

7.1 General

Once installation of the ventilation system is complete, correct commissioning must be carried out to ensure proper function.

The system operator must use the installation instructions for information on operating and maintenance procedures.

In the event of a defect or extraordinary circumstances (e.g. if the system is or has been under water due to a natural disaster), operation must be ceased immediately. Switch off the power supply and consult an engineer.

7.2 Building requirements

The ventilation system may only be commissioned if the building / ventilated residential unit is in a ready to move in condition. Before switching on the system, all rooms must be cleared of building dust:

- Interior fittings are completely installed
- Wall openings and installation shafts have been correctly closed
- Plastering, grinding and painting work is complete
- Floor coverings have been fitted
- Internal doors are in place
- Overflow openings are present

i NOTE

The ventilation unit and all air inlets and outlets must be freely accessible for commissioning.

7.3 Ventilation system requirements

Installation of all components of the ventilation system must be complete before commissioning can take place:

- The ventilation unit and all components are installed
- The condensate pipe has been connected correctly
- The power supply is installed and working
- Accessories are electrically connected
- Air duct systems are completely installed
- Air inlets and outlets are installed
- Filters are in place and clean

⚠ CAUTION!

Commissioning only with air ducts connected

i NOTE

A check must be carried out to ensure that all parts that come into contact with the air flow are clean before switching on the fans for the first time (additional cleaning may be required).

7.4 Engineer requirements

The trained engineer requires the following measuring equipment for commissioning the ventilation system:

- Multimeter
- Temperature measuring device
- Fan wheel anemometer with measuring funnel
- Differential pressure gauge where applicable

i NOTE

The commissioning must be carried out by a qualified engineer. Incorrect commissioning can result in inadequate ventilation, increased odour problems, draughts and inefficient operation

7.5 Commissioning procedure

The following general procedure is used for commissioning the ventilation system:

- 1) Visual inspection of the installed system
 - Ventilation unit, condensate connection, filters
 - Controller, sensors, accessories
 - Air duct system
 - Special features (e.g. fireplaces)
- 2) Startup
 - Switch on the power supply
 - Carry out a function check on the unit and accessories
- 3) Adjustment
 - Volume flows, setting of the unit and valves
 - Programming the control
- 4) Instruction
 - Instruction of the user in operation and maintenance procedures

While calibrating the ventilation system, all internal doors and windows must be closed.

The settings required for commissioning are made in the service menu (see Operation chapter).

The commissioning report for the ventilation systems helps to ensure that all commissioning points are covered and documented.

i NOTE

Settings in the service menu have a major impact on the operation of the system and should only be carried out by a qualified engineer. Improper or incorrect settings can reduce the efficiency of the system and result in malfunctions!

i NOTE

Once the system is complete, there must not be any safety, health or environmental risks. The heat recovery device manufacturer is not liable for any damage.

8 Operation

8.1 General

The ventilation unit can be operated with no additional control components. It is operated on the display and the control unit. Other optional control elements and sensors can also be connected.

⚠ CAUTION!

Do not operate the ventilation unit if it is visibly damaged. Disconnect the unit from the power supply and inform your installation engineer.

After a power failure, the ventilation unit starts automatically at speed 1 (reduced ventilation) or at the speed defined in the service menu.

i NOTE

Only switch off for a short time, e.g. for a filter change. There is a risk of moisture damage if the ventilation unit is switched off for a long period!

8.1.1 Display and control on the unit

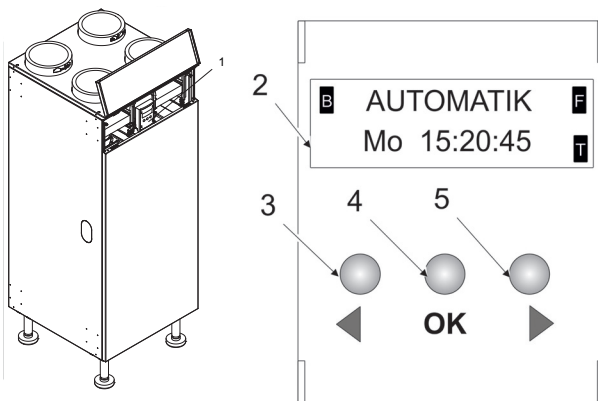


Fig. 8.1: Display and control unit

- 1 Display and control unit
- 2 LCD display
- 3 ◀ key (back/down)
- 4 **OK** key (select/save)
- 5 ▶ key (next/up)

Within the menu levels:

Level down: **OK** key

Level up: ◀ key for 1 sec

8.1.2 Basic display

The basic display contains information about the current operating status of the ventilation unit.

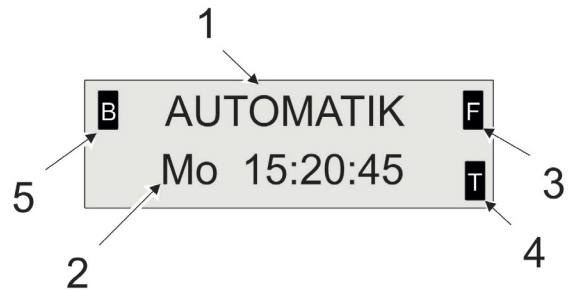


Fig. 8.2: Basic display

- 1 Operating status
- 2 Day/Time
- 3 Fireplace function active
- 4 Timer program active
- 5 Bypass active/open

8.2 Operating modes

The ventilation unit has 3 fan speeds. The following operating modes can be selected:

Operating mode	Application
OFF ¹	Ventilation unit should always be in operation (moisture protection, including during long periods of absence)
AUTOMATIC	Minimum operation for moisture protection, automatic continuous air volume regulation if air quality sensor connected
SPEED 1	Reduced ventilation (e.g. at night or during periods of absence)
SPEED 2	Normal ventilation (normal operation when people are present during the day)
SPEED 3	Intensive ventilation (e.g. shock ventilation or party mode)

1. May not be available depending on the unit configuration

Fig. 8.3: Operating modes

The operating mode is set in the basic display on the ventilation unit control unit using the ◀ and ▶ keys.

Pressing the OK key in the basic display opens or closes the bypass. The manual bypass control depends on the configuration and may not be activated (see User menu under 20 - Settings).

- OFF
The fans in the ventilation unit are switched off (depending on the unit configuration, setting may not be available or may be configured differently)
- AUTOMATIC
Demand-based control of the ventilation unit using air quality sensors enables extremely economical operation. In automatic mode, the volume flow is regulated continuously depending on the exhaust air quality. The speed of the fans is increased at higher ventilation requirements. With low ventilation requirements, the fans run at low speeds in energy-saving mode.
If the outside air quality is poor, the additional integrated air quality sensor in the outside air enables automatic mode to adjust to low speeds to guarantee continued moisture protection but to ensure that only a small proportion of the poor outside air is brought into the building.
- SPEED 1
(Reduced ventilation)
Basic ventilation to prevent moisture damage, e.g. during periods of absence or at night.
- SPEED 2
(Normal ventilation)
Normal operation when people are present, e.g. during the day.
- SPEED 3
(Intensive ventilation)
Shock ventilation during temporary extremely high ventilation requirements to combat load peaks, e.g. when cooking, taking a shower or bath, smoking or if large numbers of people are present.

8.3 User menu



The user menu is used to set weekly timer programs and operating parameters (filter signal, bypass, external units and sensors) and displays information on the status and operation of the ventilation unit (fan speed, volume flows, temperatures, input/output status, error history).

Access: Press the ◀ and OK keys simultaneously for 5 sec

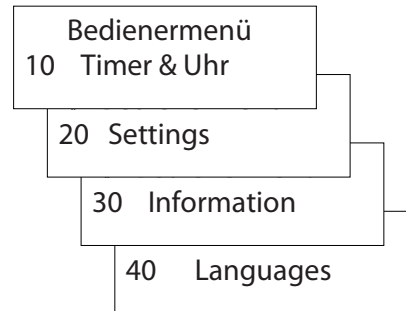


Fig. 8.4: User menu

The user menu is indicated in the top left of the display by the



symbol.

i NOTE

A detailed description of the user menu can be found in the operating instructions.

Programs

Activation times can be programmed for every day of the week. First select the day of the week, then set the activation time with the hour and minute and then select the operating mode to be activated.

Setting the clock

The ventilation unit is equipped with a real time clock with calendar function. If the day of the week or time is incorrect, the time can be set again.

First set the current date (day, month, year). The day of the week is determined automatically by the calendar function. Then set the time (hour, minute).

i NOTE

Changing between summer/winter time takes place automatically if the power supply is switched on.

In the event of a power failure, the real time clock continues running with a buffer battery. The set time is retained.

Filter time

The filter signal provides a filter maintenance reminder as a text notification and flashing of the display after the set interval time has elapsed or a predefined maximum level of soiling has been reached.

The filter time can be set in a range of 2 - 18 months. The factory setting is 6 months.

Reset active filter signal:

After the filter maintenance the signal is acknowledged / reset using the OK key and the filter time is then restarted.

Reset without filter signal:

The interval time can be restarted in the user menu under 30 - Parameter / 31 - Status signal by pressing the OK key in the display 315 - Filter signal.

i NOTE

In the event of a power failure or if the ventilation unit is switched off, the filter time is not reset.

Bypass

The bypass directs the outside air past the heat exchanger and directly into the building. Heat recovery is deactivated. In summer, this function can be used to direct cool outside air (e.g. at night) into the rooms.

Sensor

The control sensitivity of the connected air quality sensors (optional) can be changed in a range of -10...0...+10.

The sensitivity can be increased, e.g. for a duct sensor (+1...+10), or decreased e.g. for a room sensor (-1...-10). The factory setting is 0.

Operating and status information

A wide range of information can be shown relating to the status and operation of the ventilation unit. It is not possible to change settings in this menu.

The information shown in the menu items described below can help the installation engineer, after-sales service or Service Hotline staff to perform diagnostics in the event of a fault. Much of this information will only be understood by trained engineers.

Status signal

Displays the current operating mode, bypass flap status, fire-place safety function and temperatures

Air flow

Displays the configured supply air and exhaust air volume flows for the relevant operating modes speed 1, 2, 3 and Automatic

Error signal

Displays the currently active error message (active error) with details of the date, time and operating mode.

Displays the 8 most recent error messages (error history, entry 1...8), each with details of the date, time and operating mode at the time the error occurred.

8.4 Service menu



Basic settings for operating the ventilation system are made in the service menu. The parameter settings in the service menu adapt operation of the unit to individual requirements of the relevant building. The settings must be carried out by an engineer during commissioning and usually should not need to be changed after that.

Access: Press the **▶** and **OK** keys simultaneously for **5 sec**

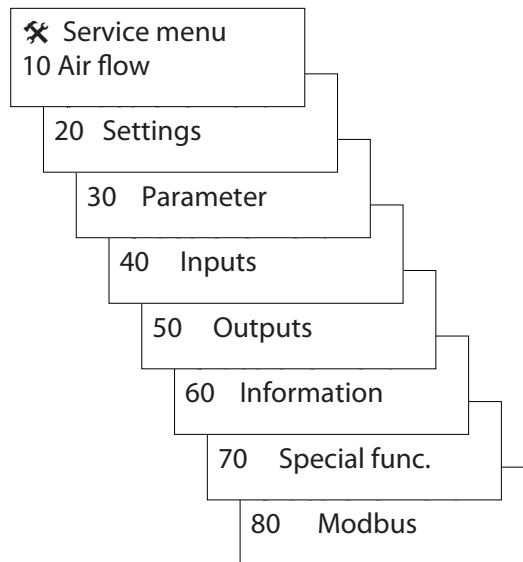


Fig. 8.5:Service menu

The service menu is indicated with the **⚙** symbol in the top left of the display.

i NOTE

Settings in the service menu have a major impact on the operation of the system and should only be carried out by a qualified engineer. Improper or incorrect settings can reduce the efficiency of the system and result in malfunctions!

Navigation in the menu structure takes place within the level using the **◀** and **▶** keys. The required menu item is selected using the **OK** key. To exit a level, press the **◀** key for longer.

The **settings are changed** in a similar way using the **◀** and **▶** keys. Press the OK key to save the desired value. To exit the menu item without saving, press the **◀** key for 1 sec.

i NOTE

If no settings are made for 180 seconds, the user is returned to the basic display.

The ventilation unit is designed for use in different regions. Minor variations from the following menu description are not relevant for general operation.

8.4.1 General

Basic settings for operating the ventilation system are made in the service menu. The parameter settings in the service menu adapt the operation of the unit to the individual requirements of the relevant building. The settings must be carried out by an engineer during commissioning and usually should not need to be changed after that.

NOTE
Settings in the service menu have a major impact on the operation of the system and should only be carried out by a qualified engineer. Improper or incorrect settings can reduce the efficiency of the system and result in malfunctions!

8.4.2 Service menu 10 – Air flow

The ventilation unit is supplied with preset air volume flows for the 3 fan speeds (including automatic).

The preconfigured values can be changed and adapted to individual requirements during commissioning.

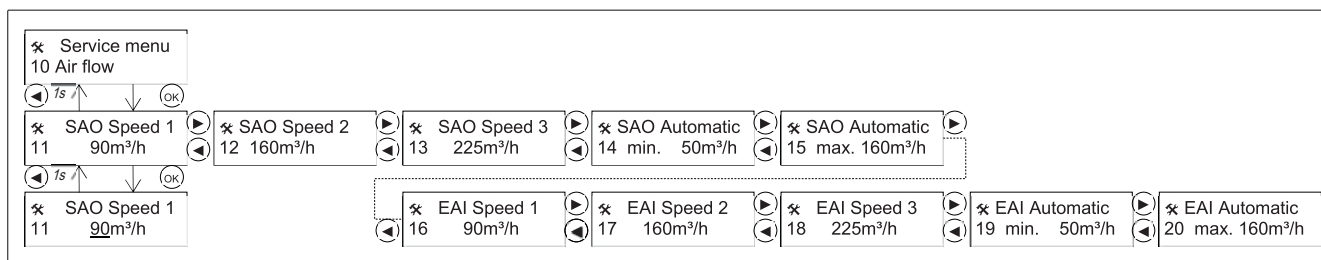


Fig. 8.6:Service menu 10: Air flow

8.4.3 Service menu 20 – Settings

21Control elem.

The ventilation unit can be operated without an external operating switch using the integrated control unit. Type 1 and 2 wired control elements and type 3 Enocean wireless switches are available. For operation of an additional control element, an I/O expansion card is necessary (optional accessory).

If an additional control element is connected, it must be registered in the Control element menu.

control element	type 1	type 2	type 3
symbol			

Fig. 8.7:Control element types

22,23 Sensor 1 / Sensor 2

The ventilation unit is equipped with a total of 4 sensors, one sensor in each air flow. The sensors for extract air and supply air cannot be reconfigured.

The control sensitivity of the combined sensors (temperature, humidity and air quality) in the outside air and the exhaust air can be adjusted in range from -10 ... 0 ... +10. If necessary, the control sensitivity can be increased (+1 ... +10) or reduced (-1 ... -10) in the Sensitivity menu. The factory setting is +0.

24Bypass

In the Bypass menu, it is possible to set whether the ventilation unit is equipped with a bypass. This setting is factory preconfigured according to the equipment fitted.

25Int. Heaters

Activation of preheating.

The ventilation unit can be retrofitted with an electric preheating register, which can be ordered as an accessory. For retrofitting instructions, see see cap. 5.4.

It is controlled depending on the outside air and the supply temperature.

25Int. Heaters

Activation of post-heating.

The ventilation unit can be retrofitted with an electric post-heating register, which can be ordered as an accessory. For retrofitting instructions, see see cap. 5.5

26 Voltage return

Configuration of the ventilation unit restart after a power failure at the speed defined here or at the speed that was active before the power failure.

The factory setting is Memory.

26 L/R Selection

Configuration of switching the supply air / exhaust air side to the left or right.

The factory setting is right.

i NOTE

The settings in menu item 20 should not be changed without consulting the installation engineer.

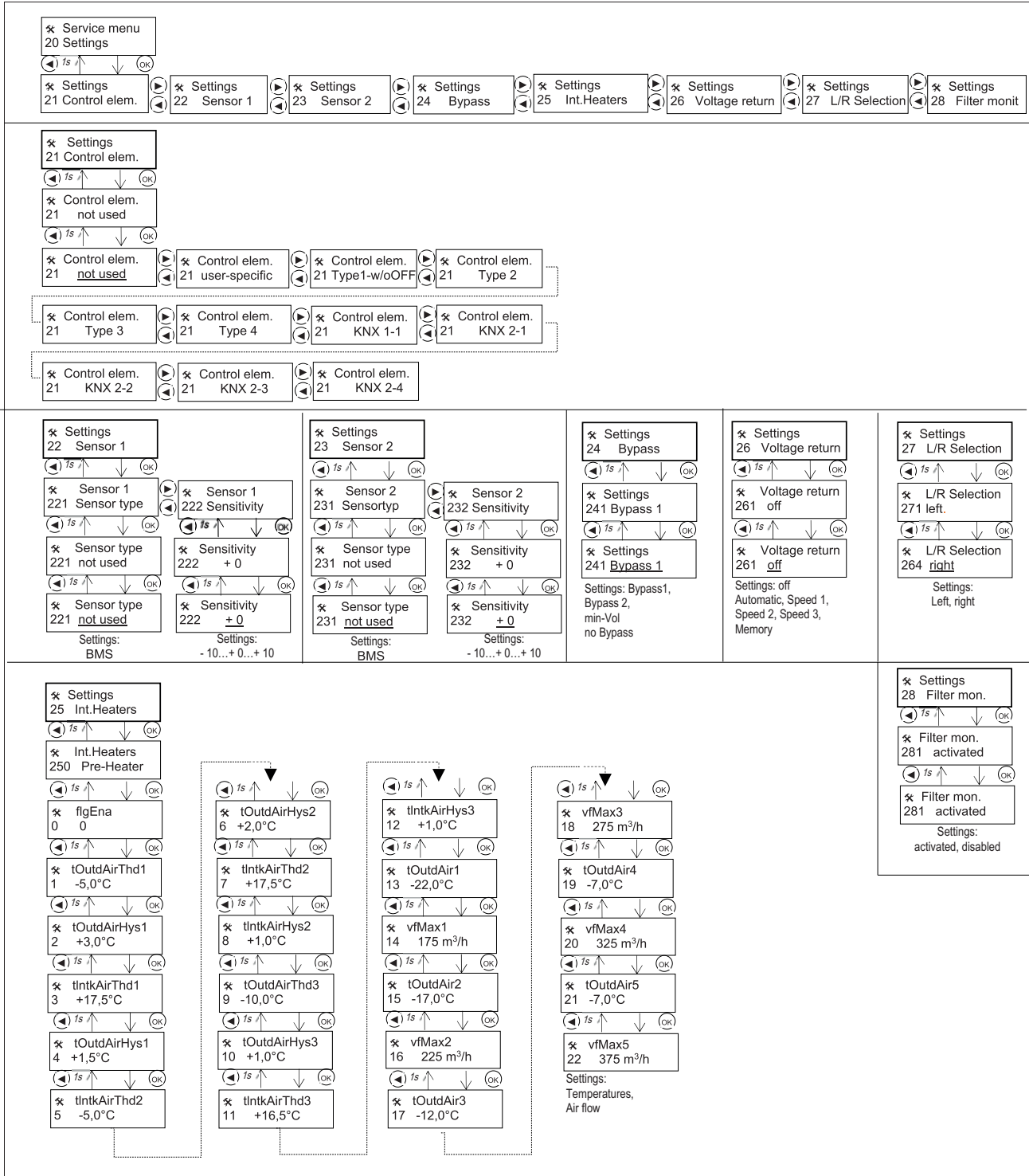


Fig. 8.8:Service menu 20: Settings

8.4.4 Service menu 30 – Parameter

31 Parameter save

Saves the currently programmed volume flows or all settings for the digital inputs and outputs.

NOTE
Particularly before changing the parameters for the digital inputs and outputs, it is advisable to save the currently configured parameter settings.

32 Parameter load

Loads / restores the settings for the volume flows or the digital inputs and outputs saved in the Save parameters menu.

33 Parameter restore

Resets the parameters for the volume flows or the digital inputs and outputs to the factory setting.

34 Unit config.

Loads the basic configuration for the relevant unit model. To do this, the 4-digit UV code must be entered. This can be found on the type plate of the ventilation unit.

The basic configuration configures the fans and sets the parameters for the internal and external device components.

NOTE
The unit configuration is factory preset when the ventilation unit is delivered.
The UV code must be entered after replacing the motherboard for a replacement board. The unit cannot be operated without the basic configuration.

35 Factory set.

Sets the ventilation unit to the factory settings. The UV code must be entered to restart the software (see Unit configuration). All parameters and individual settings are reset, any programming and the fault memory are deleted.

36 Error memory

Up to 8 errors that have occurred are saved in the user menu under Information / Error signals. All saved error messages are deleted in the Error memory menu.

37 Fan config.

The built-in fans communicate with the control PCB via Modbus RS 485. The required configuration is loaded in the factory. If a fan is replaced, the configuration has to be reloaded. To do this, go to 30 Service menu - 37 Fan config. First select step 373 - "Factory set. - Start" then step 372 "Configuration - Start" and then step 371 "Addressing - Start".

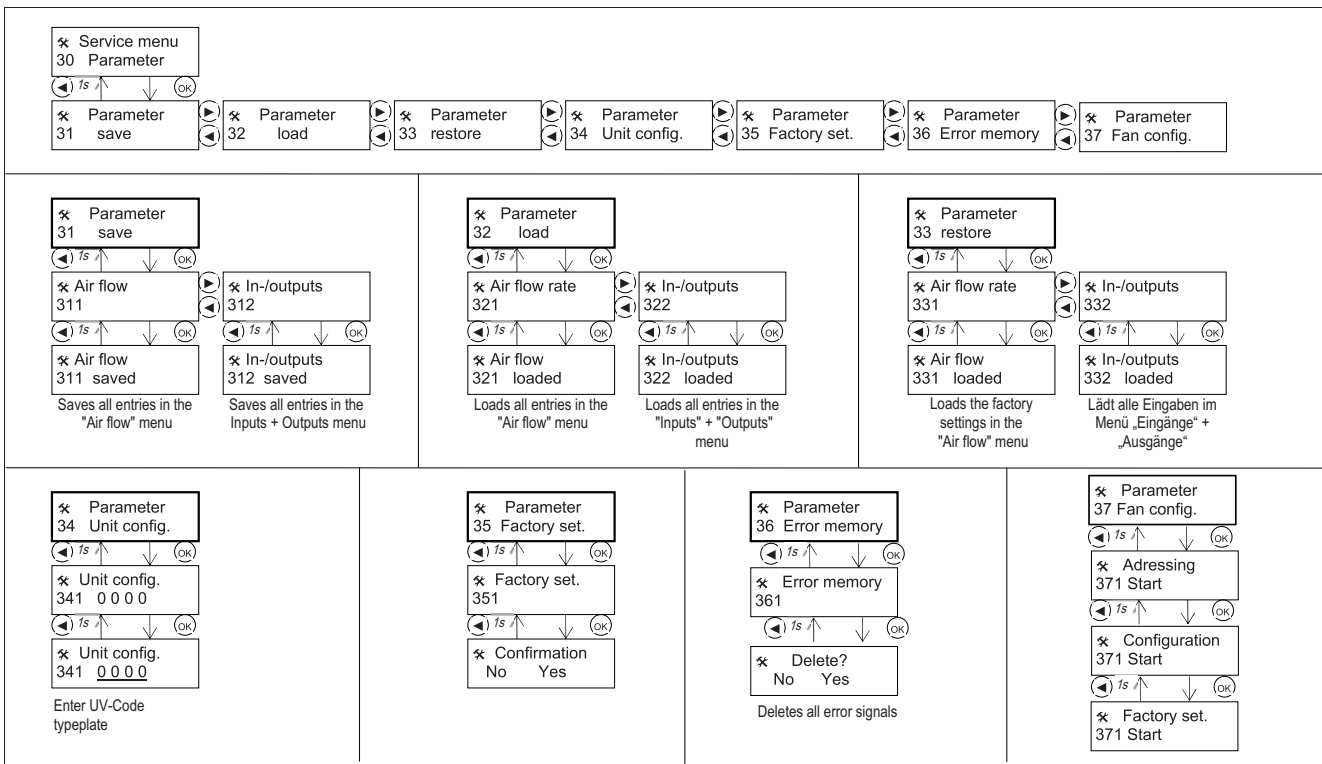
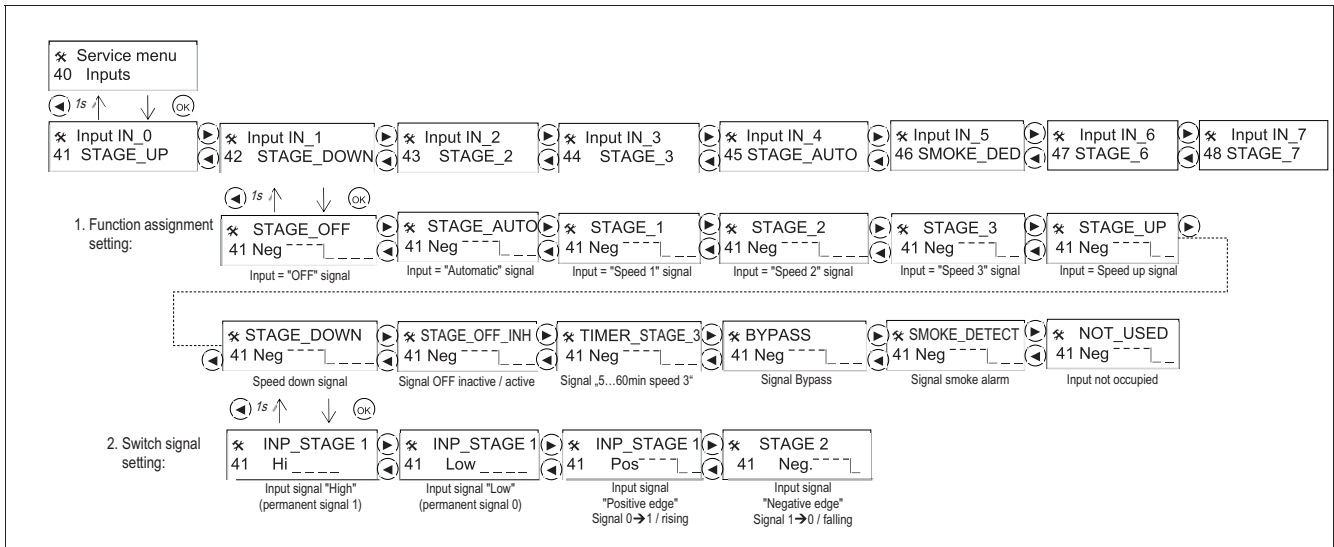


Fig. 8.9:Service menu 30: Parameter

8.4.5 Service menu 40 – Inputs

The ventilation module can be fitted with an additional board that provides 6 freely configurable digital inputs. For each input, the function assignment is selected, followed by the external switching signal type.

The digital inputs can be used to control the ventilation unit using external signals



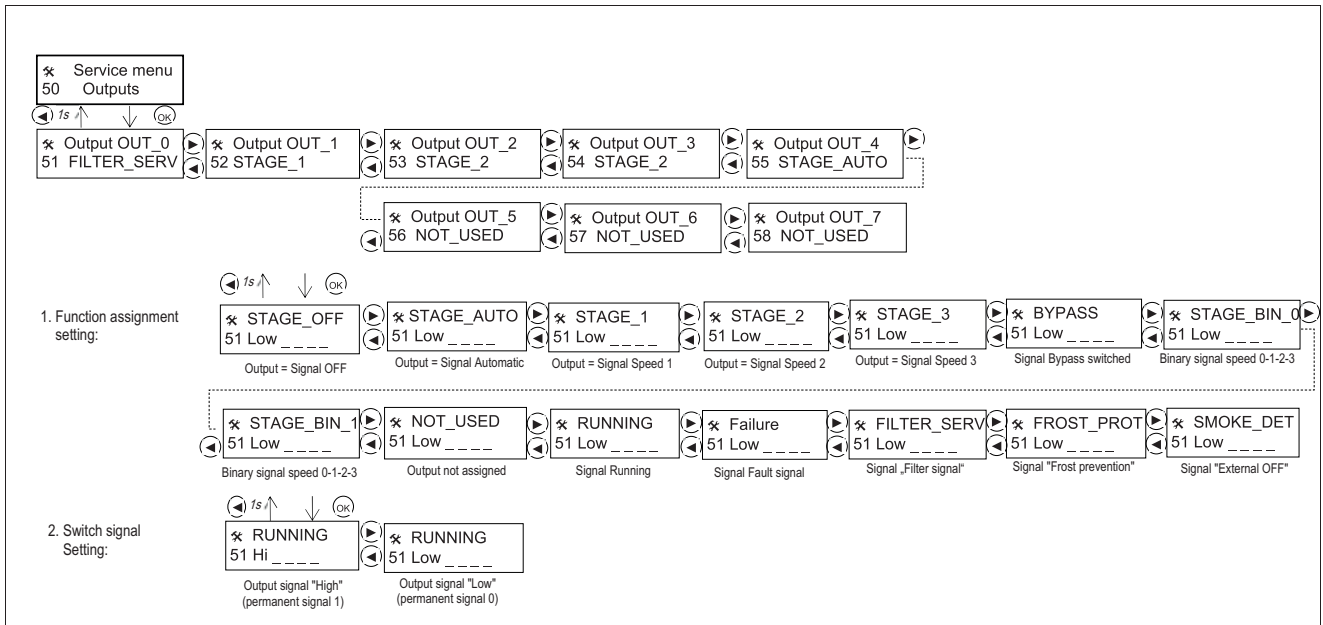
i NOTE

If external control elements are connected and configured, some of the inputs are allocated.

8.4.6 Service menu 50 – Outputs

The ventilation module can be fitted with an additional board that provides 6 freely configurable digital outputs. For each

output, the function assignment is selected, followed by the switching signal type.



i NOTE

If external control elements are connected and configured, some of the outputs are allocated.

8.4.7 Service menu 60 – Information

61 Software

Shows the configured or installed software version.

62 Unit config.

Shows the loaded basic configuration of the ventilation unit.

63 Control elem.

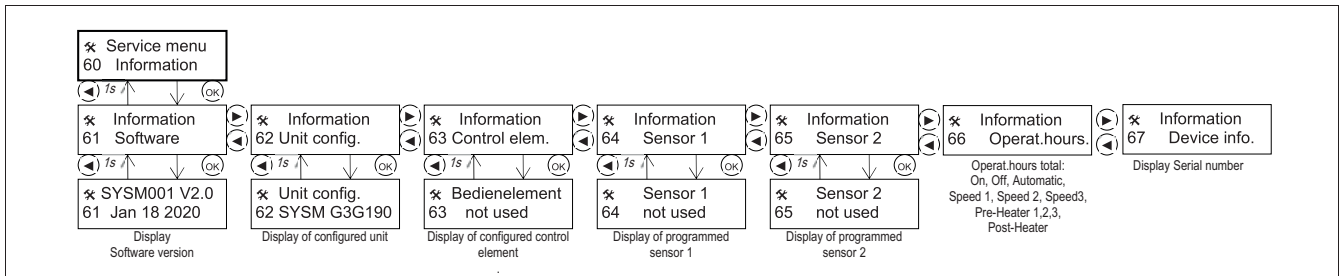
Shows whether the digital inputs are configured for a sensor.

Note: If a standard configuration has been selected for a control element and then changed later, the display "user defined" appears.

64,65 Sensor 1 / Sensor 2

Shows the configuration of the internal sensors.

i NOTE
Further information on the status and operation of the ventilation unit can be displayed in user menu under 30 - Information.



8.4.8 Service menu 70 – Special func.

Settings for special requirements can be configured in this menu.

71 Passive house

If the ventilation unit is installed in a passive house, the "Passive house" function must be activated. This function switches off the ventilation unit automatically at a supply temperature of < +5°C.

NOTE

In a passive house, a preheating register is required for the outside air.

Instead of the factory fitted supply air filter, the optional supply air filter with filter class F7 must be used.

72 Auto on demand

Auto on demand is a special operating mode for living space that is not used permanently and on a regular basis (e.g. holiday homes and holiday apartments).

The requirement is that an air quality sensor (optional) must be connected to the ventilation unit.

If the Auto on demand function is activated, it replaces the Automatic operating mode ("Auto on demand" is shown in the display instead of Automatic).

After the time shown in Test interval has elapsed, the ventilation unit starts for the configured test period to measure the air quality. Where necessary, the ventilation unit remains in opera-

tion until an adequate air quality is achieved and then stops operation for the set test interval.

The test interval can be set in the range 0.1...24 h. The factory setting is 6 h.

The test period can be set in the range 0...120 min. The factory setting is 15 min.

NOTE

Auto on demand does not satisfy the requirements for normal rooms in permanent use.

73 Defrost time

Configuration of the defrost time after the conditions have occurred for its activation.

The factory setting is 30 min.

74 Defrosting

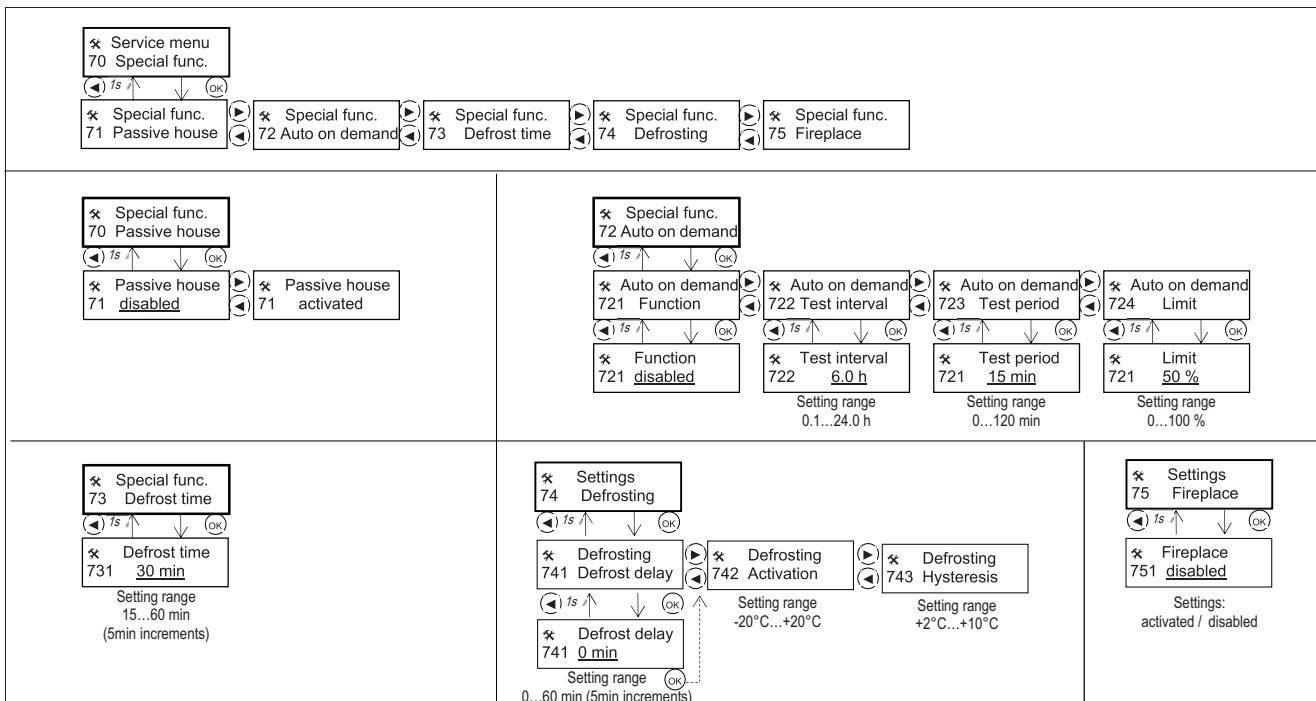
Configuration of the minimum time between defrosting cycles after the end of defrosting. The factory setting is 0 min.

Configuration of the temperature for activation of defrost mode. The factory setting is +3°C.

Configuration of the hysteresis for defrost mode. The factory setting is +5°C.

NOTE

The settings in menu item 70 should only be changed by the installation engineer.



8.4.9 Service menu 80 – Modbus

The ventilation unit is equipped with an RS485 interface for connection to an external gateway or to System M / M Flex heat pumps. This enables the ventilation unit to communicate with an external control unit.

Recommended cable: LIYY,3 x 0.34 mm². The plug for the Modbus connection on the ventilation unit is included in the scope of supply.

81Interface

Activation of the interface. The factory setting is deactivated.

82Baud rate

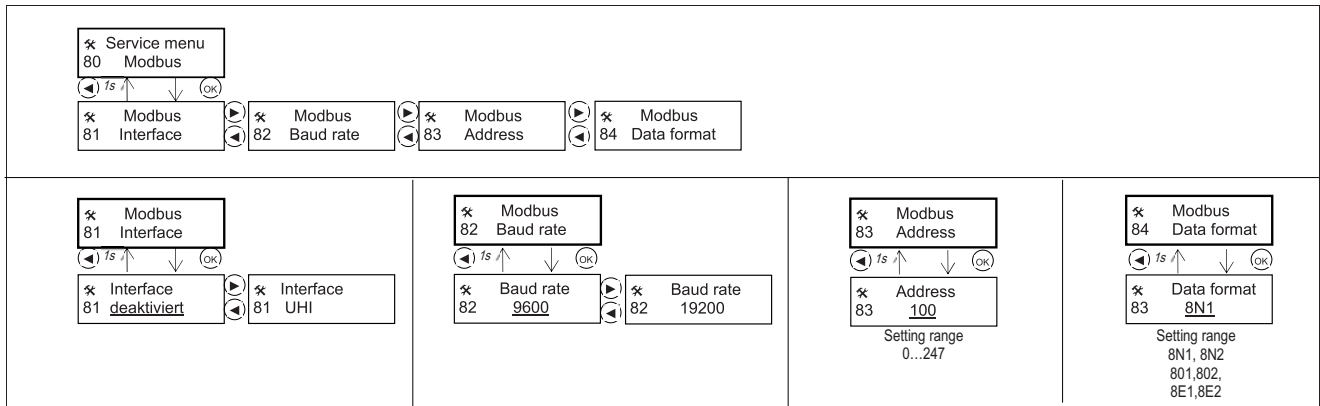
Setting for the transmission speed in the bus system. The factory setting is 9600 kbit/s.

83Address

Setting for the address of the ventilation unit in the bus system. The factory setting is 100.

84Data format

Setting for the data format in the bus system. The factory setting is 8N1.



9 Operating functions

9.1 Internal air quality sensors

The air quality sensor is only active in Automatic mode (for function, see cap. 8.2 Operating modes - Automatic mode).

9.2 Preheating register (optional)

The optional electric heating register can be used for preheating the outside air.

i NOTE

A preheating register must be used if:

- a fireplace is installed in the ventilated residential unit
- the ventilation unit is installed in a passive house.

Preheating the outside air in extremely cold temperatures prevents the heat exchanger from icing up and therefore also avoids defrost mode. The ventilation unit works continuously in heat recovery mode and is therefore efficient.

9.3 Post-heating register (optional)

The optional electric supply air heating register can be used for post-heating the supply air.

This provides greater comfort at low outside air temperatures in the supply air areas.

9.4 Filter monitoring

The filter monitoring is time-controlled. A filter signal provides a filter maintenance reminder as a text notification and flashing in the display after the set interval time has elapsed. The filter signal is configured in the user menu under 20 - Settings / 21 Filter time.

The filter time can be set in a range of 2 - 6 months. The factory setting is 6 months.

Filter monitoring is also carried out by monitoring of the volume flows. If the actual volume flow varies from the set volume flow by a predefined amount, filter maintenance is indicated by a text notification and flashing in the display. The characteristic curve for filter pressure monitoring is taught in using the user menu under 30 Parameter - 31 Status signal - 315 Filter signal by resetting the filter time (press OK for approx. 2 seconds).

“Filter Calib.” appears in the basic display.

Filter reset with active filter signal

Acknowledge / reset the signal by pressing the OK key in the basic display and restart the interval time.

Filter reset without filter signal

Restart the interval time in the user menu under 30 - Parameter / 31 - Status signal in the display 315 - Filter signal by pressing the OK key.

i NOTE

In the event of a power failure or if the ventilation unit is switched off, the filter time is not reset.

i NOTE

Acknowledge / reset the signal by pressing the OK key in the basic display.

9.5 Switch off limit

It is possible to limit the time for which the ventilation unit is switched off (without completely blocking the switch off function). The setting is made in the service menu under 20 - Settings / ? 28 Filter mon.

This enables the ventilation unit to be temporarily shut down (e.g. if there are odours in the outside air) but basic ventilation for moisture protection is still assured.


When the set time has elapsed, the ventilation unit automatically starts at speed 1 (reduced ventilation) or in automatic mode if an air quality sensor is connected.

In the factory settings, the switch off limit is deactivated (setting 0 h), i.e. the ventilation unit can be switched off for an unlimited time.

9.6 Bypass control

The bypass directs the outside air past the heat exchanger and directly into the building. Heat recovery is deactivated. In summer, this function can be used to direct cool outside air (e.g. at night) into the rooms.

The bypass can be controlled automatically and/or manually. The bypass control is configured in the user menu under Set-

tings /  Bypass.

Automatic bypass control

If automatic bypass is activated in menu item 22, bypass control is carried out automatically depending on the outside air and exhaust air temperature.

The target temperature corresponds to the defined comfortable temperature (set in the heating menu (to be rewritten)).

Above the set temperature, the outside air is fed directly into the building. Standard values are from 15 °C (bring cold into the building as much as possible) to 25 °C (keep heat in the building as much as possible).

The factory setting is +22 °C. If the ventilation unit is connected to a System M or M Flex heat pump via an RS 485 Modbus connection, whether the heat pump is in summer or winter mode is taken into account.

The bypass opens (heat recovery is inactive) if all of the following conditions are met:

- Heat pump cooling operation is detected, or the ventilation unit detects summer operation
- Exhaust air temperature above comfortable temperature
- Outside air temperature below comfortable temperature

The bypass also opens for heating operation (heat recovery is inactive) if all of the following conditions are met:

- Comfortable temperature above exhaust air temperature
- Heat pump heating operation detected, or the ventilation unit detects winter operation
- Exhaust air temperature 2 °C below switching temperature
- Outside air temperature 1 °C above switching temperature

If the bypass is activated / open and heat recovery is therefore switched off, this is indicated by a **B** in the basic display.

Manual bypass control

The bypass can be operated manually if required. Pressing the OK key in the basic display opens or closes the bypass.

It is possible to close the bypass flap after an adjustable time; setting options are from 0.1 to 6.0 h.

A setting of 0.0 h deactivates manual control.

The factory setting is 6.0h.

i NOTE

Bypass switching commands from safety functions or the automatic bypass have a higher priority!

To protect from freezing at low outside air temperatures (< +1°C), the bypass flap can be automatically moved briefly on a regular basis. To do this, the frost protection switching interval is set in the range 5 ... 60 min.

The factory setting is 0 min.

9.7 Special functions for control element

(with optional I/O board only)

The function of a key and the LED display for the control element (Type 1) can be configured differently for a special function if required. The electrical terminal assignment remains unchanged. The necessary adjustment of the input function configuration for the key assignment is made in the service menu under 40 - Inputs and for the output function for the LED display in the service menu under 50 - Outputs.

Example 1:

Programming bypass switching to the ▼ key

- For the assignment of the ▼ key in the service menu under 40 - Inputs / 42 Input IN_1, switch to the BYPASS function with "Pos" signal (operating mode setting only possible using ▲ key)
- For the status display in the service menu under 50 Outputs / 51 Output OUT_0, switch to the BYPASS function with "Low" signal (error signal now only on ventilation unit display)
- Set the manual bypass control to > 0 h in the user menu under 20 - Settings / 225 Bypass manual.
- Mode of action: Each press of the ? key switches over the bypass. If the bypass is open, an orange LED is lit. The bypass closes automatically after the set max. opening time at the latest.


Example 2:

Programming time-limited shock ventilation to the ▲ key

- For the ▲ key assignment in the service menu under 40 Inputs / 41 Input IN_0, switch to the TIMER_STAGE_3 function with "Pos" signal (the operating mode can now only be set using the ▼ key)
- Set the running time for shock ventilation in the user menu under 20 Settings / 25 Timer max.
- Mode of action: Pressing the ▲ key switches to speed 3 / intensive ventilation and the unit automatically switches back to the previously active operating mode after the set running time.

9.8 Switch OFF lock

Switching off the ventilation unit can be blocked. For preconfigured control elements, the relevant control element is selected

“without off” in the service menu under 20 - Settings /  21 Control elem.

Alternatively, a free unassigned digital input can be configured for the “STAGE_OFF_INH” function / Low signal in the service menu under 40 Inputs.

10 Maintenance

10.1 General

To ensure safe operation at all times, the ventilation system must undergo regular maintenance. All maintenance and repair work that extends beyond cleaning or changing filters must be performed by a qualified engineer. Before opening the unit, make sure that all relevant electric circuits are disconnected from the power and secured against inadvertently being switched back on. Use only genuine spare parts from the manufacturer.

Regular maintenance on the ventilation system in a cycle of one to two years is necessary for hygiene reasons and to ensure fault-free and energy efficient operation.

Maintenance work includes:

- Checking and cleaning the heat exchanger
- Cleaning the inside of the ventilation unit
- Checking and cleaning the condensate drain
- Checking and cleaning other system components (e.g. heating register, outside air inlet and extract air outlet)

⚠ CAUTION!

Maintenance work on the ventilation unit may only be carried out by a qualified engineer. This excludes tool-free filter changes.

⚠ CAUTION!

Disconnect the ventilation unit from the power supply for maintenance work.

10.2 Filter maintenance

All air filters in the system require regular maintenance to ensure hygienic, fault-free and efficient system operation.

The following maintenance intervals are recommended:

- Replace 4 weeks after startup (building dust).
- Check after 6 months at the latest.
For minor soiling, tap out the filter and clean with a vacuum cleaner (do not wash!), replace if necessary.
- Replace at least once a year.
- If a filter change is indicated

i NOTE

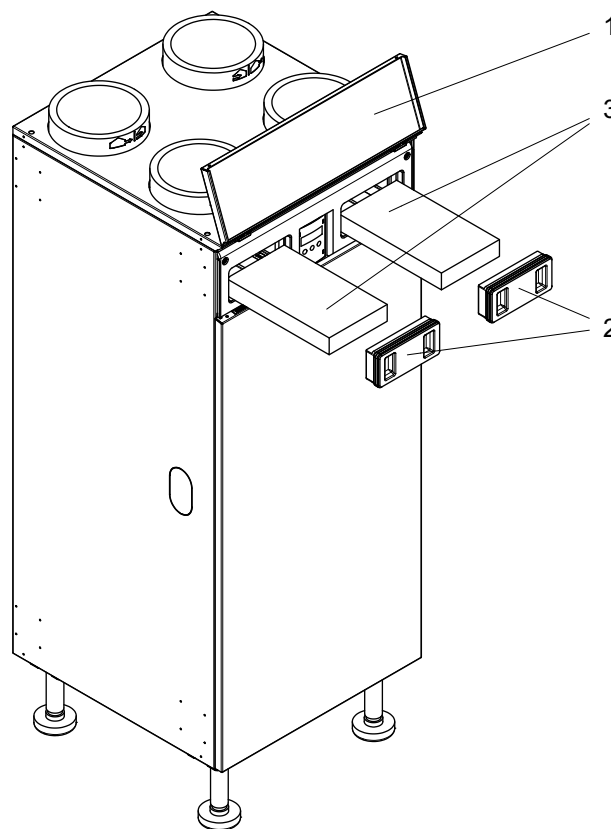
The filter maintenance work carried out must be logged (see cap. 17 on page 47).

10.2.1 Ventilation unit filter maintenance

Maintenance work on the outside air filter and the exhaust air filter can be carried out without tools. Note down the date of the filter change.

Reset:

- (A) After filter maintenance, acknowledge the filter signal and reset with the OK key.
- (B) Restart the interval time for the filter signal by pressing the OK key in the user menu under 30 - Parameter / 31 - Status signal in the display 315 - Filter signal (if there is no active signal).



- 1) Fold up the cover
- 2) Remove the filter cover
- 3) Take out the filter
- 4) Clean/change the filter and re-insert

i NOTE

The ventilation unit must not be operated without filters! Only use genuine replacement filters with the designated filter class. Other filters may impair the function of the ventilation unit. The filter material influences the filter service life, operating noise, ventilation efficiency and energy consumption.

10.3 Cleaning air inlets and outlets

Supply air and exhaust air valves or ventilation grilles and any filters installed in them must be serviced regularly.

- 1) Turn the poppet valve anticlockwise on the valve edge (not on the disc)
- 2) Remove the valve from the installation sleeve
- 3) Clean the valve and if necessary change the filter
- 4) Insert the valve again

i NOTE

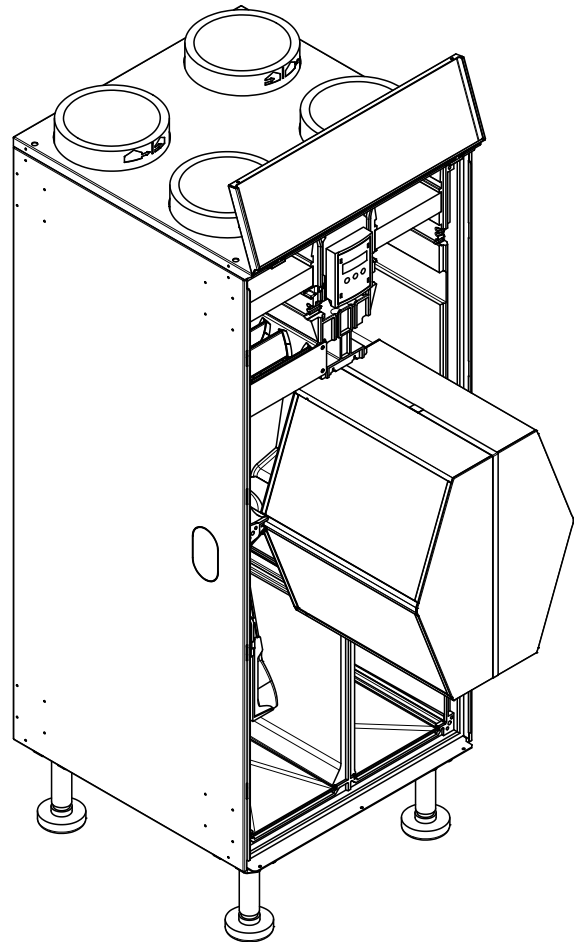
The setting for the valves must not be changed!

i NOTE

Do not use cleaning agents containing sand, soda, acid or chloride, as these can damage the surfaces.

10.4 Cleaning the heat exchanger

The plastic heat exchanger in the ventilation unit can be cleaned with clean warm water in a shower or tub using a shower head attachment.



- 1) Disconnect the unit from the power supply and detach the front panel
- 2) Loosen the 6 screws in the EPP front panel, and detach the EPP front panel
- 3) Pull the heat exchanger carefully out of the casing using the strap, rinse with clean water, let the water drip off (do not use cleaning agent!) and insert again in a horizontal position.
- 4) Fit the EPP front panel and screw on, attach the front panel, switch on the power supply.

⚠ CAUTION!

Disconnect the ventilation unit from the power supply for cleaning!

i NOTE

Do not immerse the heat exchanger completely in water and do not clean with high pressure! Do not use cleaning agent!

10.5 Cleaning the unit

The outer unit casing, and also the inner unit casing once the heat exchanger has been removed, can be cleaned with a damp cloth.

⚠ CAUTION!

Disconnect the ventilation unit from the power supply for cleaning!

i NOTE

Never use cleaning agents containing sand, soda, acid or chloride, as these can damage the surfaces.

10.6 Maintenance of the condensate drain

The condensate drain on the bottom of the ventilation unit and the installed siphons must be checked regularly and cleaned if necessary.

⚠ CAUTION!

A faulty condensate drain can cause faults on the ventilation unit and result in water damage!

10.7 Additional maintenance measures

The outside air inlet and the extract air outlet must also be checked and cleaned regularly, along with any additional system components fitted (e.g. heating register).

11 Faults

Filter, status and fault signals are displayed with a plain text message on the control panel of the ventilation unit.

If error signals are active, the backlighting of the display flashes.

⚠ CAUTION!
Repairs must be carried out by a qualified engineer. Only use genuine spare parts from the manufacturer.

Code	Display	Status	Fault	Cause	Action
-	None (display off)	Off	Display is blank Unit is not running	No power supply	Check power supply
-	None (display off)	In operation	Display is blank	Cable to the display or display board faulty.	Check cable, replace display board
-	Filter!	In operation	Filter soiled	Level of soiling reached	Check/replace filter, Filter reset
-	Exh.air>Sup.air!	In operation	Exhaust air volume flow greater than supply air volume flow, risk of negative pressure *	Exhaust air fan speed 350 rpm higher than supply fan speed	Check filter, replace if necessary, Regulate and adjust outside air/supply air and exhaust air/extract air duct system volume flows / pressure drops
-	Cooling prevent.	Off	Switch off if residential unit unheated	Exhaust air temperature < +8°C, switch-off for frost protection in the residential unit	Automatic start-up at room temperature > +9°C
-	External OFF	Off	Switch-off via external signal	External on/off signal, external smoke detector, RM contacts	Automatic
E00	E00:Unit config.	Off	Unit will not start up	Unit configuration not entered	Enter unit configuration, for U/V code see type plate
E01	E01:air-balance	Off	Exhaust air volume flow greater than supply air volume flow, risk of negative pressure *	Exhaust air fan speed 500 rpm higher than supply fan speed	Check filter, replace if necessary, Regulate and adjust outside air/supply air and exhaust air/extract air duct system volume flows / pressure drops
E03	E03:int.error	Off	Internal communication error	Microprocessor or CPU board faulty	Replace CPU board
E05	E05:ext.overload	Off	Supply voltage broken down, 24V DC overloaded	Short-circuit	Inform after-sales service
E09	E09:Balance	Off	Input error volume flow: Exhaust air greater than supply air	Volume flow parameter error	Volume flow parameter Correct exhaust air
E11	E11:Fan1 start	Off	Outside air / supply air fan VM1 does not start *	No fan speed for 30 s, cable break, fan blocked or faulty, no data communication	Check / replace connection cable and fan VM1, repeat fan addressing
E12	E12: Fan2 start	Off	Exhaust air / extract air fan VM2 does not start*	No fan speed for 30 s, cable break, fan blocked or faulty, no data communication	Check / replace connection cable and fan VM2, repeat fan addressing
E13	E13: Fan1 high	Off	Outside air / supply air fan VM1 speed too high *	Air resistance in the outside air / supply air duct system too high	Check outside air / supply air duct system, check/replace filter
E14	E14: Fan2 high	Off	Exhaust air / extract air fan VM2 speed too high *	Air resistance in the exhaust air / extract air duct system too high	Check the exhaust air/extract air duct, check/replace filter
E15	E15: Fan1 low	Off	Outside air / supply air fan VM1 speed too low *	Fan impeller mechanically damaged	Check fan VM1
E16	E16: Fan2 low	Off	Exhaust air / extract air fan VM2 speed too low *	Fan impeller mechanically damaged	Check fan VM2
E17	E17: Fan1 stop	Off	Outside air / supply air fan VM1 not running *	Speed = 0, cable break, fan blocked or faulty, no data communication	Check / replace connection cable and fan VM1, repeat fan addressing
E18	E18: Fan2 stop	Off	Exhaust air / extract air fan VM2 not running *	Speed = 0, cable break, fan blocked or faulty, no data communication	Check / replace connection cable and fan VM2, repeat fan addressing
E21	E21: Sensor1	Off	Sensor 1 outside air	Sensor or cable faulty	Check / replace outside air sensor
E22	E22: Sensor2	Off	Sensor 2 supply air	Sensor or cable faulty	Check / replace supply air sensor
E23	E23: Sensor3	Off	Sensor 3 exhaust air	Sensor or cable faulty	Check / replace exhaust air sensor

Code	Display	Status	Fault	Cause	Action
E24	E24: Sensor4	Off	Sensor 4 extract air	Sensor or cable faulty	Check / replace extract air sensor
E25	E25: External Modbus communication	In operation	No external Modbus communication	Modbus cable faulty, interface parameter settings incorrect, CPU card faulty	Check / replace Modbus cable, correct interface parameter settings, replace CPU card
E26	E26: No tacho signal	Off	No tacho signal from fan VM1 / VM2	Sensor or cable faulty	Check / replace fan VM1 / VM2
E27	E27: Heater	Off	No control of preheating register	Cable, PTC element or power card faulty, temperature parameter settings incorrect	Check / replace cable, PTC element or power card, adjust temperature parameter settings
E31	E31: Bypass start	In operation	Bypass does not switch	No power consumption, bypass motor, cable break	Check bypass cable, check / replace bypass flap

* Message/fault only with active fireplace function

Fig. 11.1: Messages and faults

i NOTE

Note: Once the fault has been rectified, it is acknowledged with a power reset (switch off the power supply for 5 s and switch it on again).

11.1 Internal sensors

The ventilation unit is equipped with internal sensors (in the outside air and exhaust air) for temperature, humidity and VOC (air quality) and with two further sensors in the fans for measuring temperature, humidity, speed and volume flow.

The outside air and exhaust air sensors must be completely replaced in the event of a malfunction. If the measured values from the fans fail, the fans should also be completely replaced.

11.2 Replacing fans

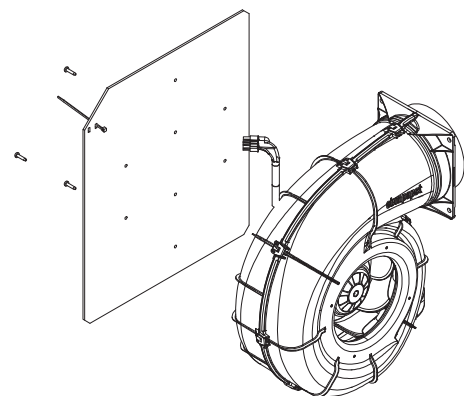


Fig. 11.2: Left fan

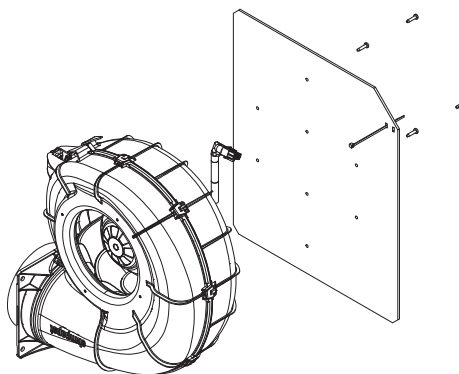


Fig. 11.3: Right fan

If a fan has to be replaced, it can only be removed once the EPP condensate plate has been carefully removed to the front and the cable has been disconnected.

If the incorrect assembly is fitted, the retaining plate (installation on left or right) can be modified, see Fig. 11.2 and Fig. 11.3.

The assignment for control as an exhaust air or outside air fan is defined by the colour of the connecting plug in the wiring harness (outside air blue, exhaust air black).

To teach in the new fan, load the factory settings in the service menu, carry out the fan configuration and re-enter the unit configuration (for U/V see type plate).

11.3 Replacing the bypass

If the bypass has to be replaced, it can be directly disconnected from the bypass motor and removed.

Insert the new bypass in the correct slot and connect.

It starts functioning and performs a trial run once the power has been restored.

11.4 Replacing the heating register

For procedure, see chapter 4.3.

It starts functioning once the power has been restored.

12 Environment and disposal

Please think of the environment and help to protect it.

12.1 Disposal of packaging

The ventilation unit has been carefully packed to protect it against damage during transport. The transport packaging consists of reusable raw materials. Please dispose of these in an environmentally friendly manner.

12.2 Disposal of the old unit



Devices with this mark are not disposed of in general household waste. The unit, including its accessories and spent batteries, must be dealt with separately. They must be disposed of correctly and in accordance with the applicable laws and regulations.

12.3 Removing the old unit

The old ventilation unit is removed by following the installation actions in reverse. All components of the ventilation unit can be dismantled by a qualified engineer using standard tools to ensure efficient and environmentally friendly material recycling.

13 Device information

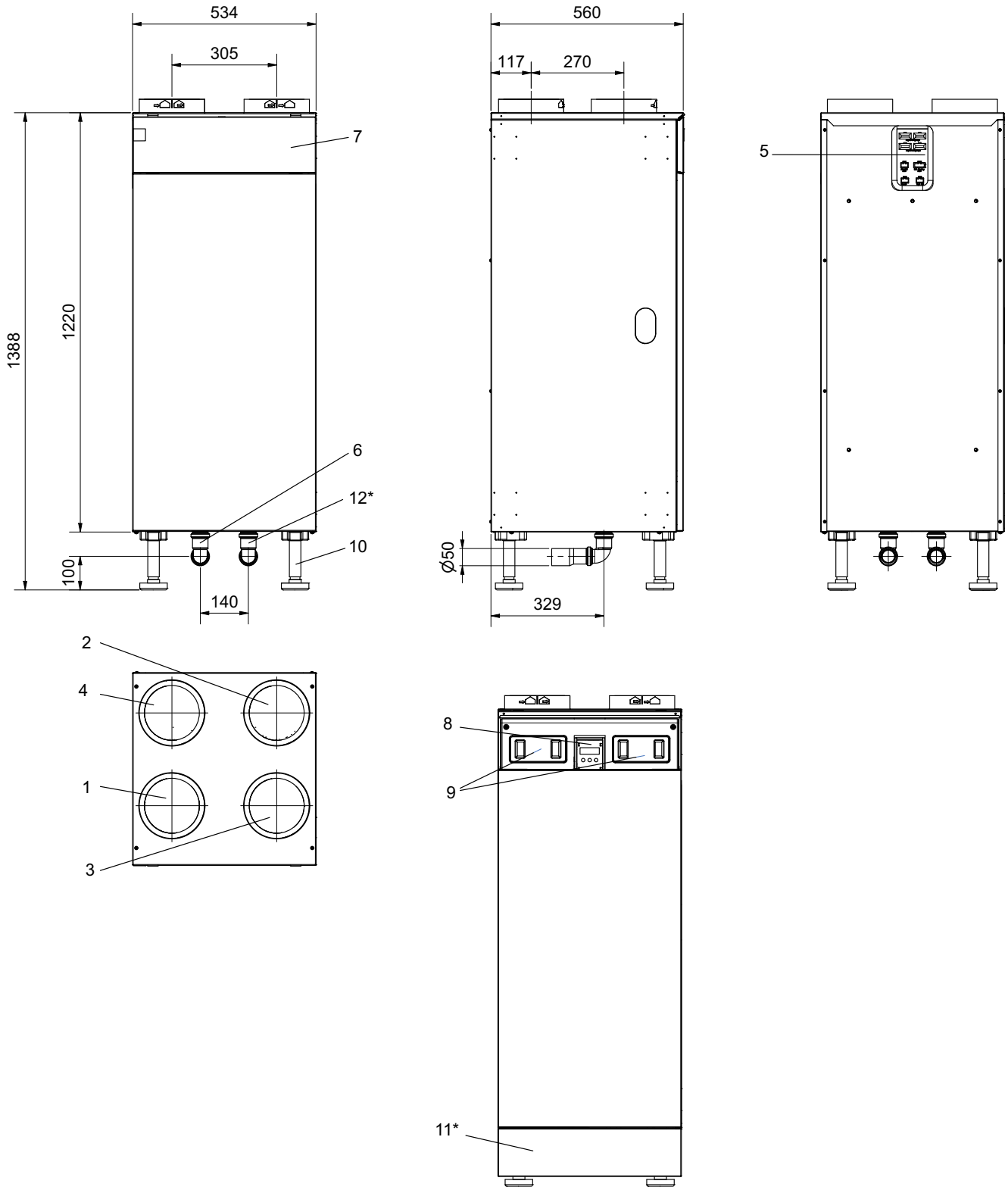
Type and order code		M Flex Air	M Flex Air Plus
1 Design			
1.1 Application		Central ventilation unit	Central ventilation unit
1.2 Number of units		1	1
1.3 Fan design		2x EC radial fan, constant volume flow regulated	2x EC radial fan, constant volume flow regulated
1.4 Heat exchanger design		Cross current flow	Cross current flow enthalpy
1.5 Bypass (integrated)		100 % bypass	100 % bypass
1.6 Exhaust air / outside air filter class (in line with old standard EN779)		M5 / M5 - optional F7	M5 / M5 - optional F7
1.7 Exhaust air / outside air filter class (in line with new standard ISO 16890)		ePM10 / ePM10 - optional ePM1	ePM10 / ePM10 - optional ePM1
1.8 Integrated air quality sensor		2x (exhaust air / outside air)	2x (exhaust air / outside air)
1.9 PTC preheating register		Optional (outside air)	Optional (outside air)
1.10 PTC post-heating register		Optional (supply air)	Optional (supply air)
2 Air volume flow / sound			
2.1 Air volume flow min.	m ³ /h	50	50
2.2 Air volume flow max.	m ³ /h	320	320
2.3 External compression max.	Pa	120	120
2.4 Air volume flow speed 1/2/3 ¹	m ³ /h	90 / 160 / 225	90 / 160 / 225
2.5 Air volume flow free blowing	m ³ /h	370	370
2.6 External compression at 200 m ³ /h	Pa	> 300	> 300
2.7 Sound pressure level speed 1/2/3 at 1 m ²	dB(A)		
2.8 Sound power level ErP	dB(A)		
2.9 Outside air duct sound power level	dB(A)		
2.10 Extract air duct sound power level	dB(A)		
2.11 Exhaust air duct sound power level	dB(A)		
2.12 Supply air duct sound power level	dB(A)		
3 Dimensions / Weight			
3.1 Unit dimensions ³	without supporting feet H x W x D mm	1220 x 534 x 560	1220 x 534 x 560
3.2 Device connections	Air ducts	4x DN 160	4x DN 160
3.3 Device connections	Condensate drain	Ø 50	Ø 50
3.4 Weight	kg	52	52
4 Electrical connection			
4.1 Supply voltage / fusing		1~/N/PE 230 V (50 Hz) / C13A	1~/N/PE 230 V (50 Hz) / C13A
4.2 Control voltage		1~/N/PE 230 V (50 Hz) / C13A	1~/N/PE 230 V (50 Hz) / C13A
4.3 Degree of protection according to EN 60 529	A	IP 21	IP 21
4.4 Auxiliary electric heating power consumption	A		
4.5 Power consumption max.	A	10	10
4.6 Switch-on current max.	W		
4.7 Nominal power consumption	W	56.0	56.0
4.8 Power input speed 1/2/3	W		
4.9 Auxiliary electric heating power input	W		
4.10 Total power input max. with post-heating register	W	2200	2200
5 Operating ranges			
5.1 Installation room temperature operating range	°C		
5.2 Installation room max. humidity operating range	%rel.		
5.3 Exhaust air temperature operating range	°C		
5.4 Exhaust air temperature max. humidity operating range	%rel		
5.5 Outside air temperature operating range	°C	-20 to +40	-20 to +40
6 Complies with the European safety regulations		See CE declaration of conformity	See CE declaration of conformity

Type and order code	M Flex Air	M Flex Air Plus
7 Performance values ¹		
7.1 DIBt heat supply rate average / max %		
7.2 DIBt specific power input W/h		
7.3 DIBt average coefficient of performance		
7.4 Passive House Institute operating range m ³ /h		
7.5 PHI heat supply rate $\eta_{WRG, eff}$ %		
7.6 PHI electrical efficiency P_{el} Wh/m ³		

1. This data indicates the size and capacity of the system in accordance with EN 13141-7. For an analysis of the economic and energy efficiency, further parameters, in particular regulation, should also be taken into account. These figures are only achieved with clean heat exchangers. Notes on care, commissioning and operation can be found in the relevant sections of the installation and operation instructions
2. The specified sound pressure level represents the free sound area level. The measured value can vary by up to 16 dB(A), depending on the installation location.
3. Please note that additional space is required for pipe connections, operation and maintenance.

14 Dimension drawing

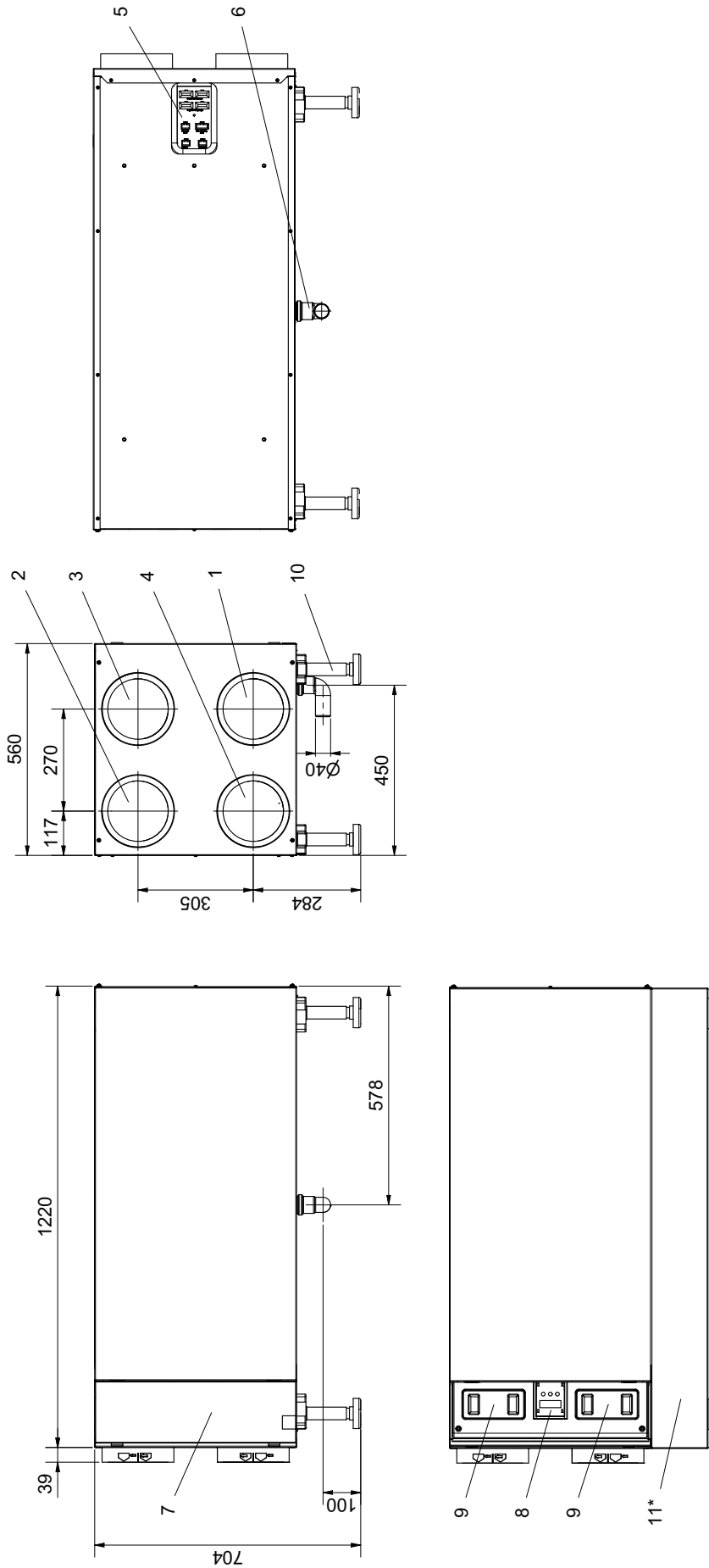
14.1 Dimension drawing vertical



14.2 Dimension drawing key

1	Outside air duct stub (right-hand unit)
2	Supply air duct stub (right-hand unit)
3	Exhaust air duct stub (right-hand unit)
4	Extract air duct stub (right-hand unit)
5	Electric wire connection
6	Condensate drain including reduction (right-hand unit)
7	Control unit flap and filter
8	Control unit
9	Filter cover
10	Supporting feet
11	Cover panel *
12	Condensate drain for use in cooled building *
	* Optional accessories

14.3 Dimension drawing horizontal



14.4 Dimension drawing key

1	Outside air duct stub
2	Supply air duct stub
3	Exhaust air duct stub
4	Extract air duct stub
5	Electric wire connection
6	Condensate drain *
7	Control unit flap and filter
8	Control unit
9	Filter cover
10	Supporting feet
11	Cover panel *

* Optional accessories

15 Diagrams

15.1 Characteristic curve

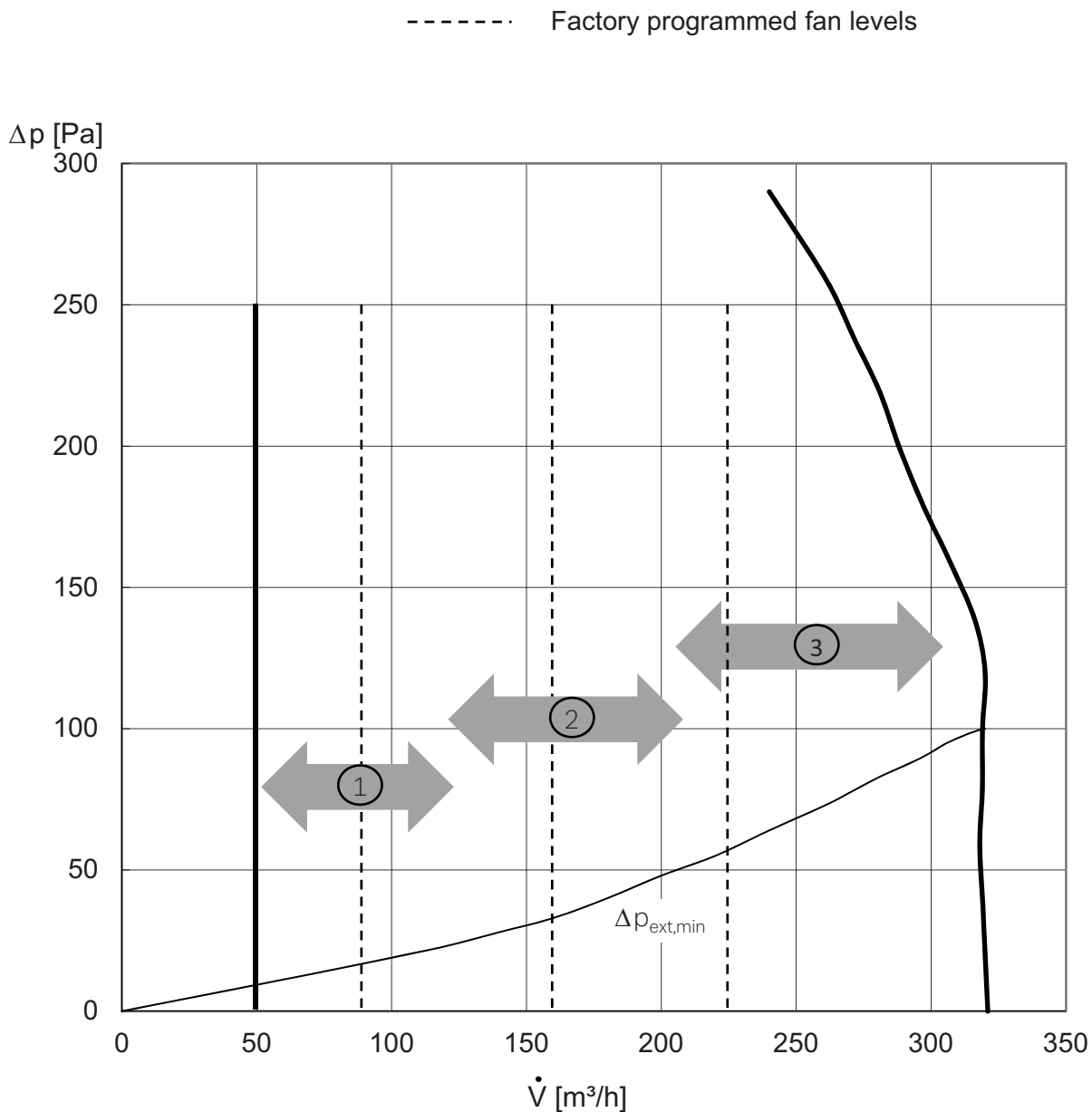


Fig. 15.1: Characteristic curve M Flex Air

- 1 Speed 1 (factory setting*)
- 2 Speed 2 (factory setting*)
- 3 Speed 3 (factory setting*)

* freely programmable

16 Installation checklist

i NOTE

This list does not replace the detailed descriptions with installation and safety notes in the instruction manuals. The installation instructions for the ventilation unit and its accessory components must be observed.

Ventilation unit

- Installation room dry and free from frost
- Ventilation unit installed horizontally and vertically aligned (spacers on the bottom corners)
- Vibration-reducing wall mounting for lightweight construction walls
- Sufficient space for maintenance work
- Power supply connected, all-pole power disconnection possible and accessible (plug, switch or fuse)
- External control element and room air sensor (if fitted) installed and connected
- Outside air preheating register (if fitted) installed and connected, installation position and direction of air flow checked (observe the installation instructions for the heating register)
- Consultation with the district master chimney sweep if fireplace present (fireplace function activated or necessary ext. safety equipment installed)

Condensate pipe

- Condensate pipe connected to the ventilation unit without leaks, fixed in place with a fastening clip
- Frost-free installation of the condensate pipe over the entire distance and pipe installed with a slope (condensate hose not sagging and not buckled)
- Negative pressure on the condensate connection! Siphon installed on the ventilation unit to prevent false air intake (siphon can dry out, a ball siphon with negative pressure protection and dry running protection is recommended!)
- Siphon filled with water, entire condensate drainage system checked for correct function (water filled in the condensate tray)
- Free inlet from the siphon on the unit in a funnel on the drainpipe (no direct connection between the unit and the drainpipe, intake of sewer gases must be reliably prevented!)
- Drainpipe fitted with another siphon to prevent odours from the waste water pipe

Air duct system

- Vibration transmission must be avoided, all air ducts are connected flexibly to the ventilation unit
- Vibration-reducing measures on mountings, brackets, consoles (if required)
- Sound absorbers or sound-absorbing ventilation hoses installed (in the supply air and exhaust air duct and in the outside air and extract air duct)
- Wall or ceiling openings are closed
- Air duct system inside the thermally insulated building shell

- Thermal insulation on the outside air and extract air duct (steam-resistant, sufficiently strong, not damaged or crushed)
- Air duct connections and connection points masked with additional thermal insulation strips
- The air duct system must be installed air-tight! Connections and connection points of the duct and thermal insulation are air-tight and masked where applicable (leaks in the air duct and leaking connections can result in condensate formation - ensure that the outside air and extract air pipe connections in particular are air-tight!)
- Air pipes, in particular flexible ventilation hoses, must not be crushed or heavily buckled (risk of increased pressure drops or reduced thermal insulation!)
- Outside air and extract air inlets/outlets protected from leaves, soiling, odours, ingress of moisture, expected snow levels taken into account
- Supply air and exhaust air valves (ventilation grilles) installed

Commissioning

- Residential unit ready to move in, building work complete, openings closed, interior fittings completely finished, no building dust
- Internal doors in place, unhindered overflow from supply air areas to exhaust air areas is achieved with undercut doors or ventilation grilles
- Direction of air flow on air inlets and outlets checked, air circuit not covered, obstructed, sealed
- Outside air, exhaust air and bypass filters in the unit and clean (replace if necessary)
- External control unit and room air sensor registered in the service menu
- Volume flows set in the service menu
- Ventilation system calibrated and set
- Function check (display working correctly, operating modes can be set, remote control, heating register)
- Room air sensor (if fitted): Function checked in Automatic operating mode (caution: response only after approx. 15 min warm-up phase!)
- Settings adapted in the user and service menu (e.g. bypass, sensor sensitivity)

Instruction

- Instruct operators and users in the operation and explain the proper use
- Inform operators and users of the necessary maintenance measures (filter change, restart the interval time for the filter signal)
- Reference to further maintenance measures to be carried out by the engineer

17 Filter maintenance checklist

The filter maintenance work and other work carried out can be noted down here.

All filters in the ventilation system should be checked at least every six months and replaced annually.

Six months	Year
Date: <input type="checkbox"/> Checked <input type="checkbox"/> Replaced	Date: <input type="checkbox"/> Checked <input type="checkbox"/> Replaced
Date: <input type="checkbox"/> Checked <input type="checkbox"/> Replaced	Date: <input type="checkbox"/> Checked <input type="checkbox"/> Replaced
Date: <input type="checkbox"/> Checked <input type="checkbox"/> Replaced	Date: <input type="checkbox"/> Checked <input type="checkbox"/> Replaced
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Six months	Year
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18 Warranty certificate

Glen Dimplex Deutschland

The conditions for the after-sales service, guarantee and warranty are compiled in the complete system warranty certificate from Glen Dimplex Deutschland GmbH.

The current version is available from the download area of the website.

The ventilation unit has been produced with care and checked thoroughly before delivery.

If the after-sales service is required, however, the authorised local after-sales service for complete systems is notified, who will quickly remedy the problem. You can find out about the after-sales service for complete systems responsible for your area by contacting the central service hotline of Glen Dimplex Deutschland GmbH.

Glen Dimplex Deutschland GmbH

Geschäftsbereich Dimplex

After-sales service

Am Goldenen Feld 18

95326 Kulmbach, Germany

T +49 9221 709 545

F +49 9221 709 924 545




service@glendimplex.de

www.glendimplex.de

i NOTE

To process enquiries, after-sales service orders and complaints, we require the exact unit type, the SN serial number, the SV software version and the FD production code. This information can be found on the ventilation unit type plate in the form of a QR code (1).

The UV number can also be found on the type plate. This is the code for the unit configuration (2).

Glen Dimplex Deutschland	Zentrales Wohnungs- lüftungsgerät mit Wärmerückgewinnung	
	Glen Dimplex Deutschland GmbH, Am Goldenen Feld 18, 95326 Kulmbach	
	Arbeiten an der Anlage dürfen nur von sachkundigen Personen durchgeführt werden. Working on the unit has to be carried out through competent persons. Seules des personnes qualifiées sont autorisées à intervenir sur cette machine.	
Typ <input type="text" value="M Flex Air / M Flex Air Plus"/>	UV <input type="text" value="1701"/>	
<input type="text" value="1~/N/PE 220-240V 50/60 Hz"/>		
Leistungsaufnahme:		
P _{max.} <input type="text" value="150"/> W	I _{max.} <input type="text" value="0,64"/> A	V _{max.} <input type="text" value="320"/> m ³ /h
P _{max. inkl. Vorheiz.} <input type="text" value="1600"/> W	I _{max. inkl. Vorheiz.} <input type="text" value="6,70"/> A	P _{max.} <input type="text" value="120"/> Pa
P _{Nachheiz.} <input type="text" value="-"/> W	I _{Nachheiz.} <input type="text" value="-"/> A	
P _{max. Hyd. Nachheiz.} <input type="text" value="-"/> bar		IP <input type="text" value="20"/>
		 <input type="text" value="52"/> kg
458101.29.04		

After-sales service address:



19 Product information

In accordance with directive (EU) no. 1253/2014

Appendix IV

a	Supplier name	Glen Dimplex Deutschland GmbH												
b	Ventilation unit model	M Flex Air												
b	Air quality sensor	Integrated			Integrated			Integrated			Integrated			
c	Specific energy consumption class (for each climatic zone cold / moderate / warm)													
c	Specific energy consumption SEV (for each climatic zone cold / moderate / warm)	kWh/m ² ·a												
d	Application type (RVU Domestic ventilation, NRVU Non-domestic ventilation)		RVU			RVU			RVU			RVU		
d	Air flow direction type (BVU Bidirectional unit, UVU Unidirectional unit)		BVU			BVU			BVU			BVU		
e	Drive type (VSD speed control, MSD multi-speed drive)		VSD			VSD			VSD			VSD		
f	Heat recovery system type (REC Recuperative, REG Regenerative, None)		REC			REC			REC			REC		
g	Thermal degree of efficiency η_t of heat recovery	%												
h	Maximum air volume flow	m ³ /h	320			320			320			320		
i	Fan drive electric input power	W												
j	Sound power level L_{WA}	dB(A)												
k	Reference air volume flow	m ³ /s	0.062			0.062			0.062			0.062		
l	Reference pressure difference	Pa	50			50			50			50		
m	Specific power input SPI	Wh/m ³												
n	Control factor CTRL		1 (Manual control)			0.95 (Timer control)			0.85 (Central demand)			0.65 (Local demand)		
o	Maximum internal leakage rate	%												
o	Maximum external leakage rate	%												
p	Internal/external mixing ratio (only for bidirectional ventilation systems without duct connection)	%												
q	Filter warning display (VU Display on unit, RC Display on remote control)		VU			VU			VU			VU		
s	Website address for installation and removal instructions		www.glendimplex.de			www.glendimplex.de			www.glendimplex.de			www.glendimplex.de		
t	Air flow pressure fluctuation sensitivity (for units with no duct connection only)	%5												
u	Air tightness between inside and outside	m ³ /h												
v	Annual energy consumption AEC per 100 m ² (for each climatic zone cold / moderate / warm)	kWh/a												
w	Annual heat energy saving AHS per 100 m ² (for each climatic zone cold / moderate / warm)	kWh/a												

a	Supplier name	Glen Dimplex Deutschland GmbH												
b	Ventilation unit model	M Flex Air Plus												
b	Air quality sensor	Integrated			Integrated			Integrated			Integrated			
c	Specific energy consumption class (for each climatic zone cold / moderate / warm)													
c	Specific energy consumption SEV (for each climatic zone cold / moderate / warm)	kWh/m ² ·a												
d	Application type (RVU Domestic ventilation, NRVU Non-domestic ventilation)		RVU			RVU			RVU			RVU		
d	Air flow direction type (BVU Bidirectional unit, UVU Unidirectional unit)		BVU			BVU			BVU			BVU		
e	Drive type (VSD speed control, MSD multi-speed drive)		VSD			VSD			VSD			VSD		
f	Heat recovery system type (REC Recuperative, REG Regenerative, None)		REC			REC			REC			REC		
g	Thermal degree of efficiency η_t of heat recovery	%												
h	Maximum air volume flow	m ³ /h	320			320			320			320		
i	Fan drive electric input power	W												
j	Sound power level L_{WA}	dB(A)												
k	Reference air volume flow	m ³ /s	0.062			0.062			0.062			0.062		
l	Reference pressure difference	Pa	50			50			50			50		
m	Specific power input SPI	Wh/m ³												
n	Control factor CTRL		1 (Manual control)			0.95 (Timer control)			0.85 (Central demand)			0.65 (Local demand)		
o	Maximum internal leakage rate	%												
o	Maximum external leakage rate	%												
p	Internal/external mixing ratio (only for bidirectional ventilation systems without duct connection)	%												
q	Filter warning display (VU Display on unit, RC Display on remote control)		VU			VU			VU			VU		
s	Website address for installation and removal instructions		www.glendimplex.de			www.glendimplex.de			www.glendimplex.de			www.glendimplex.de		
t	Air flow pressure fluctuation sensitivity (for units with no duct connection only)	%5												
u	Air tightness between inside and outside	m ³ /h												
v	Annual energy consumption AEC per 100 m ² (for each climatic zone cold / moderate / warm)	kWh/a												
w	Annual heat energy saving AHS per 100 m ² (for each climatic zone cold / moderate / warm)	kWh/a												



Glen Dimplex Deutschland

Zentrale

Glen Dimplex Deutschland GmbH
Am Goldenen Feld 18
D-95326 Kulmbach

T +49 9221 709-100
F +49 9221 709-339
dimplex@glendimplex.de
www.glendimplex.de

Geschäftsstelle Österreich

Glen Dimplex Austria GmbH
Hauptstraße 71
A-5302 Henndorf am Wallersee

T +43 6214 20330
F +43 6214 203304
info@dimplex.at
www.dimplex.at

Office France

Dimplex SAS
7 rue d'Überach
67590 Schweighouse Sur Moder

T +33 3 88 07 18 00
F +33 3 88 07 18 01
dimplex-ST@dimplex.de
www.dimplex.de/fr