

HOME VENTILATION WITH HEAT RECOVERY

**Ventilation units**  
**M-WRG-II P (-F, -FC)**  
**M-WRG-II E (-F, -FC)**



**OPERATING INSTRUCTIONS**

Part no. 744007EN Week 32/2021 EN



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# 1 Introduction

## 1.1 Notes on the operating instructions



These original operating instructions contain important information that should be followed when setting up and using the M-WRG-II P (-F, -FC) and M-WRG-II E (-F, -FC) ventilation units.

- ▶ Read all the instructions carefully before starting up the ventilation unit to avoid possible risks and mistakes.
- ▶ When assembly is complete, give these instructions to the home owner, caretaker or property manager.
- ▶ These instructions are part of the product. Keep the instructions in a safe place for future reference.

### **WARNING**

- ▶ Follow ALL danger and warning instructions and notes on precautionary measures.
- ▶ Read section “2 Safety instructions” on page 11 carefully.

## 1.2 Description

These instructions describe how to set up and operate the decentralised ventilation units M-WRG-II P (-F, -FC) and M-WRG-II E (-F, -FC) (see Fig. 1).

M-WRG stands for Meltem heat recovery. Home ventilation expertise extending back over 40 years has been incorporated into this product from Meltem Wärmerückgewinnung.

Using windows for ventilation, particularly during periods of cold weather, is now a thing of the past. This ventilation unit brings in outdoor air fully automatically, and heats it by recovering heat from the air that is extracted. Outdoor air and extract air are routed in separate ducts through a cross-counterflow plate heat exchanger (see section 5.2.2 on page 19). You save on heating costs, increase your living comfort and are kind to the environment by reducing CO<sub>2</sub> emissions. An air filter also removes respirable particulates such as pollen, soot and bacteria from dust class PM1 from the outdoor air. It is also possible to monitor the outdoor air quality with a VOC sensor; if the air load is high (e.g. due to biological decay and decomposition processes, motor traffic exhaust fumes or volatile by-products from industrial



Fig. 1: M-WRG-II P / M-WRG-II E ventilation unit

and commercial operations) the proportion of supply air can be reduced temporarily until the available outdoor air quality has improved (only for units with a CO<sub>2</sub> sensor, specifically M-WRG-II...-FC units).

The ventilation units are designed to run continuously and can be equipped with sensors for demand-controlled ventilation. They can be surface-mounted, flush-mounted or integrated into the wall (U<sup>2</sup>). The ventilation units are low-maintenance, but **regular air filter changes** are important.

The 5 buttons on the membrane touch pad on the side of the unit are used to set different ventilation levels / programs and a time-limited intensive ventilation program. It therefore allows you to adapt the air flow to your needs.

Beside each button is an LED that displays the active ventilation program and further information about the unit's status (air filter change, fault, etc.).

The ventilation units from the M-WRG-II P and M-WRG-II E series are equipped with heat exchangers that work on the cross-counterflow principle. M-WRG-II E also has a function for recovering moisture from the extract air (enthalpy heat exchanger).

The M-WRG-II P-F and M-WRG-II E-F ventilation units have various ventilation levels / programs, including a humidity control. The M-WRG-II P-FC and M-WRG-II E-FC units have an automatic mode (humidity and CO<sub>2</sub> control). The CO<sub>2</sub> value is the most important measurement for assessing the air quality. A microprocessor integrated into the unit calculates the optimum air renewal from the values measured by the relative humidity and CO<sub>2</sub> sensors and sets the correct ventilation level fully automatically.

### 1.2.1 Optional accessories

Part no.	Type	Description
5478-10	M-WRG-FBH	The wireless remote control is used to control, program and extend the range of functions of all M-WRG-II units. It can also be used to read the number of operating hours.
5478-20	M-WRG-FT	The 4-way wireless pushbutton switch with LED feedback allows the M-WRG-II units to be operated wirelessly.

Table 1: Optional accessories

### 1.3 Target group

These operating instructions are intended for users of the ventilation unit. No special prior knowledge is needed.

## 1.4 EU declaration of conformity

The ventilation units from the M-WRG-II P and M-WRG-II E series manufactured by  
Meltem Wärmerückgewinnung GmbH & Co. KG  
Am Hartholz 4  
D-82239 Alling

conform to the regulations and standards listed in the EU Declaration of Conformity provided.

## 1.5 National technical approval (for Germany)

A valid national technical approval from the Deutsches Institut für Bautechnik (DIBt) must be obtained for the ventilation unit before it is installed in Germany. This approval can be provided upon request or can be downloaded from our website at [www.meltem.com/waermerueckgewinnung/downloads/](http://www.meltem.com/waermerueckgewinnung/downloads/) (see also the QR code on the back page of these instructions). The approval number is Z-51.3-431 (see item 1 in Fig. 3)

- For installation outside Germany, the national regulations applicable in your country should be followed.

## 1.6 Nameplate

<b>Meltem</b> Wärmerückgewinnung GmbH & Co. KG Am Hartholz 4 82239 Alling www.meltem.com Tel.: 08141-40 41 79-0			
Device no.:	Type: M-WRG-II P		
	Part no.: 700000		
	max. 53 W		
	230 V	50 Hz	IP X4
	CE	□	iso-Kl. B

Fig. 2: Nameplate

You will find the nameplate on the intermediate plate on the inside of the housing (see item 2 in Fig. 3).



Fig. 3: Position of the nameplate

## 1.7 Technical data

### 1.7.1 Electrical connection

Unit types	M-WRG-II P / M-WRG-II E	M-WRG-II P (-F, -FC) / M-WRG-II E (-F, -FC)
Operating voltage	230 V AC (working voltage range: 85 V AC to 265 V AC)	
Mains frequency	50 to 60 Hz	
Power consumption	4.6 to 52.4 W / 4.4 to 53.4 W	
Standby power consumption	0.8 W	
Maximum current consumption	0.42 A	
IP code	IPX4 IPX5 with Integrated into wall U <sup>2</sup> installation version	
Energy efficiency class (ErP)	B	A

### 1.7.2 Dimensions and weight

Unit dimensions excluding air connectors, see also section 4 on page 15	364 x 590 x 218 mm (W x H x D)
Visible unit depth when surface-mounted	218 mm
Visible unit depth when flush-mounted	58 mm
Visible unit depth when integrated into wall	-
Outdoor air/exhaust air connectors	DN 100
Weight	Approx. 8.3 kg

### 1.7.3 Noise emission

Sound pressure level $L_{P,A}$ surface-mount	11.6 to 48.1 dB(A)/ $A_{eq}$ 10 m <sup>2</sup>
Sound pressure level $L_{P,A}$ flush-mount or with ductwork connection on extract air side	12.3 to 47.5 dB(A)/ $A_{eq}$ 10 m <sup>2</sup> or 12.3 to 46.4 dB(A)/ $A_{eq}$ 10 m <sup>2</sup>
Sound pressure level $L_{P,A}$ integrated into wall U <sup>2</sup> with ductwork connection on extract air side	8.4 to 42.6 dB(A)/ $A_{eq}$ 10 m <sup>2</sup>
Sound insulation $D_{n,e,w}$ unit in use depending on installation version	51 to 70 dB

### 1.7.4 Ambient conditions

Storage temperature range (in the original packaging in a dry place)	0 °C to +40 °C
Permitted temperature range of outdoor air during operation at a room temperature of at least 20 °C	-18 °C to +40 °C
Permitted ambient air humidity during operation	up to approx. 70 % RH



### 1.7.5 Unit properties

Unit types	M-WRG-II P / M-WRG-II E	M-WRG-II P (-F, -FC) / M-WRG-II E (-F, -FC)
Type of system	Decentralised, heat recuperation	
Air flow	10 to 100 m <sup>3</sup> /h	
Heat recovery efficiency (max.), DIN EN 13141-8	Up to 94 % / 91 %	
Colour	White similar to RAL 9010	
TÜV-tested	Yes	
Hygiene tested for conformity with VDI 6022 sheet 1	W-304132-18-WD	
Passivhaus certificate (PHI)	1327vs03 / 1328vs03	
National technical approval (DIBt)	Z-51.3-431	

### 1.7.6 Unit features

Unit types	M-WRG-II P / M-WRG-II E	M-WRG-II P (-F, -FC) / M-WRG-II E (-F, -FC)
Output control	5-level on the unit, 10-level with accessories	5-level on the unit, 10-level with accessories, infinitely variable with humidity/CO <sub>2</sub> sensors
Supply air / exhaust air fan	EC direct current radial fan	
Heat exchanger	Cross-counterflow plate heat exchanger, on M-WRG-II E (-F, -FC) with enthalpy	
Filter monitoring with filter change indicator	Runtime-controlled, visual	
Condensate drain	Via condensate connection / not required*	
Fully automatic cover flap control when switching On / Off, in Standby mode and if the power fails	Yes	
Frost protection function	Yes	
“Unit OFF” input (smoke detector, window contact)	Optional	
Fault indicator output	Optional	
Operating hours display	Using optional accessories (see section 1.2.1 on page 6)	
Humidity control	No	Yes
Automatic mode (humidity and CO <sub>2</sub> control)	No	With -FC units
Filter type	Round filter cartridges for outdoor air and extract air	

\* Intended usage as described in operating instructions, not exposed to excessive humidity

### 1.7.7 Air filters

Designation	Filter class
Outdoor air filter	ISO ePM1 60% (F7)
Activated charcoal filter for outdoor air (optional)	ISO ePM2,5 55% (F7)
Extract air filter	ISO Coarse 60% (G4)

### 1.8 Environmentally-friendly disposal

The ventilation units must not be disposed of in the residual waste bin.

- ▶ Dispose of the ventilation unit in accordance with the waste disposal regulations that apply on site.

### 1.9 Revision index

Edition	Manual	Date
4 <sup>th</sup> edition	Operating instructions for M-WRG-II P (-F, -FC) and M-WRG-II E (-F, -FC) ventilation units	Week 32/2021 EN

### 1.10 Explanation of the symbols used

- ▶ This symbol indicates an action to be taken.
- This symbol indicates a list.

### 1.11 Supplementary documents

Manual	Part no.
Installation manual for flush-mount installation kit with plastering trim (solid construction) M-WRG-II M/MB	744001EN
Installation manual for flush-mount installation kit M-WRG-II M (frame construction)	744002EN
Installation manual for flush-mount installation kit M-WRG-II M-U <sup>2</sup>	744003EN
Installation manual for M-WRG-II ventilation units	744004EN
Installation manual for outer wall terminals M-WRG-II ES (-P, -PK)	744005EN
Installation manual for window reveal installation kit (in preparation)	744006EN
Maintenance instructions for M-WRG-II P... / M-WRG-II E... ventilation units	744015EN
User guide for M-WRG-FBH wireless remote control	5302-25-01

Table 2: Supplementary documents

## 2 Safety instructions

These instructions contain notes that you must follow for your own personal safety and to avoid injury and damage to property. They are highlighted by warning triangles and are shown as follows according to the level of danger.

### 2.1 Hazard classification

#### **DANGER**

The signal word designates a hazard with a **high** degree of risk which, if it is not avoided, will result in death or severe injury.

#### **WARNING**

The signal word designates a hazard with a **medium** degree of risk which, if it is not avoided, will result in death or severe injury.

#### **CAUTION**

The signal word designates a hazard with a **low** degree of risk which, if it is not avoided, could result in minor or moderate injury.

#### **NOTICE**

A note as used in this manual contains important information about the product or about a part of the manual to which particular attention should be paid.

### 2.2 Notes on using the ventilation units safely

#### 2.2.1 Fire protection

Follow the generally applicable fire safety requirements when planning and installing the unit.

#### 2.2.2 Operation with fireplaces

- When M-WRG-II ventilation units are used in conjunction with fireplaces, an additional safety device (underpressure or differential pressure monitor) is needed to monitor operation and to switch off the (230 V) power supply to the units when necessary.
- Follow the requirements of the German Fire Code (FeuVo) when planning and installing the unit.
- Contact the local chimney sweep before the end of the planning phase.
- Have the chimney sweep approve the operation of the ventilation unit.
- Correct use of a ventilation system set up with the decentralised ventilation unit requires the possibility of shutting off combustion air pipes and flue systems for solid fuel fireplaces during periods in which the fireplaces are not in use.

### 2.2.3 Installation in wet areas

The following rules from DIN VDE 0100-701/702 (IEC 60364-7-701) apply to installation of M-WRG-II ventilation units in wet areas:

- Protection zone 0: The unit must NOT be installed in this area.
- Protection zone 1: The unit must only be installed with the “integrated into wall” U<sup>2</sup> variant. The extract and supply air valves must be installed in the top part of the wall or in the ceiling.
- Protection zone 2 and other zone: The unit may be installed in this area.

Country-specific standards/regulations on observing the protection zones for installation in rooms with bathtub or shower must also be followed.

### 2.2.4 Condensate drain

The heat recovery process in our ventilation units causes condensation. This condensation is dissipated via the exhaust air pipe.

- If M-WRG-II P ventilation units are used, a condensate connection should be provided (see installation manuals for installation kits and ventilation units in section 1.11 on page 10).
- With M-WRG-II E ventilation units (with enthalpy heat exchanger) there is no condensation if the following requirements are fulfilled:
  - The ventilation unit is operated as described in “Intended use” (see section 2.5 on page 13) and chapter “6 Rules for correct usage” on page 20.
  - There is no exceptional loading due to very high atmospheric humidity.

### 2.2.5 Starting and using the ventilation unit

- Do not start up the ventilation unit until it is fully installed.
- Always operate the ventilation unit with the air filters fitted.
- Always make sure that the cover is closed and locked in place before using the ventilation unit.
- Please note that the ventilation unit must not be used without the outer wall terminal for safety reasons.

## 2.3 Notes on using the ventilation units

- This unit may be used by children from 8 years old and by persons of restricted physical, sensory or mental abilities or persons lacking experience and knowledge if they are supervised or have been instructed in how to use the unit safely and understand the associated hazards. Do not allow children to play with the unit. Cleaning and user maintenance must not be carried out by children unless they are supervised.
  - ▶ Follow the regulations applicable in your country concerning the age from which people may be permitted to operate the ventilation unit.

- The ventilation unit must always be freely accessible for operation and maintenance.
  - ▶ Make sure that the ventilation unit is not covered or obstructed when the room is subsequently decorated and furnished, otherwise it cannot be operated and it will not be possible to replace the air filters. You should therefore maintain a clearance of at least 15 cm in front of the ventilation unit cover.
  - ▶ Make sure that the supply and extract air openings are not covered when the room is subsequently decorated and furnished, otherwise the ventilation unit's functions may be impaired.

## 2.4 Note on use in conjunction with room air conditioners

Condensation may form in the ventilation unit if the outdoor air temperature and humidity are high, but the room temperature is cool.

For these conditions, we recommend using the M-WRG-II E ventilation unit with enthalpy heat exchanger. This has the advantage of removing both sensible and latent heat from the supply air. As a result, the air is dehumidified as well as being pre-cooled. The room air conditioner needs to do less work, so the user saves money on the reduced power consumption.

## 2.5 Intended use

- The ventilation unit is designed to ventilate living spaces and rooms used for quasi-residential purposes. The ventilation unit is installed in a perpendicular position in the external wall. Any different or more extensive usage will be regarded as contrary to the intended use.
- The intended use also includes compliance with all the notes in the operating instructions.
- The ventilation unit must not be operated without air filters or outer wall terminal.
- The ventilation unit is intended for use in rooms with normal room air humidity levels of approx. 40 % to 70 % RH. It must not be installed in rooms in which the relative humidity during operation constantly exceeds 80 %.
- The ventilation unit's functions may be impaired or the unit may be damaged in rooms with a lot of dust (e.g. model-making) or corrosive gas emissions (e.g. blueprint shop, cleaning).
- For any use contrary to the intended use, Meltem Wärmerückgewinnung GmbH & Co. KG shall accept no liability for any damage that may occur and offers no warranty that the ventilation unit will work perfectly and correctly.

## **3 Warranty and liability**

### **3.1 Warranty**

The following cases shall invalidate the warranty:

- The installation kit was not installed as described in the installation manual.
- The ventilation unit was not installed as described in the installation manual.
- The ventilation unit was flush-mounted without using a flush-mount installation kit.
- Genuine parts/genuine air filters were not replaced with genuine parts.
- Unapproved changes were made to the installation kit or ventilation unit.
- Repairs were not carried out by Meltem or by an authorised specialist company.
- The ventilation unit was operated without air filters and outer wall terminals.
- The warranty does not cover wearing parts such as air filters.

### **3.2 Liability**

The manufacturer's liability shall not apply in the following cases:

- The installation kit was not installed as described in the installation manual.
- The ventilation unit was not installed as described in the installation manual.
- The ventilation unit was flush-mounted without using a flush-mount installation kit.
- Genuine parts/genuine air filters were not replaced with genuine parts.
- Unapproved changes were made to the installation kit or ventilation unit.
- Repairs were not carried out by Meltem or by an authorised specialist company.
- The ventilation unit was operated without air filters and outer wall terminals.

## 4 Dimensions

### 4.1 Ventilation unit without duct adapters

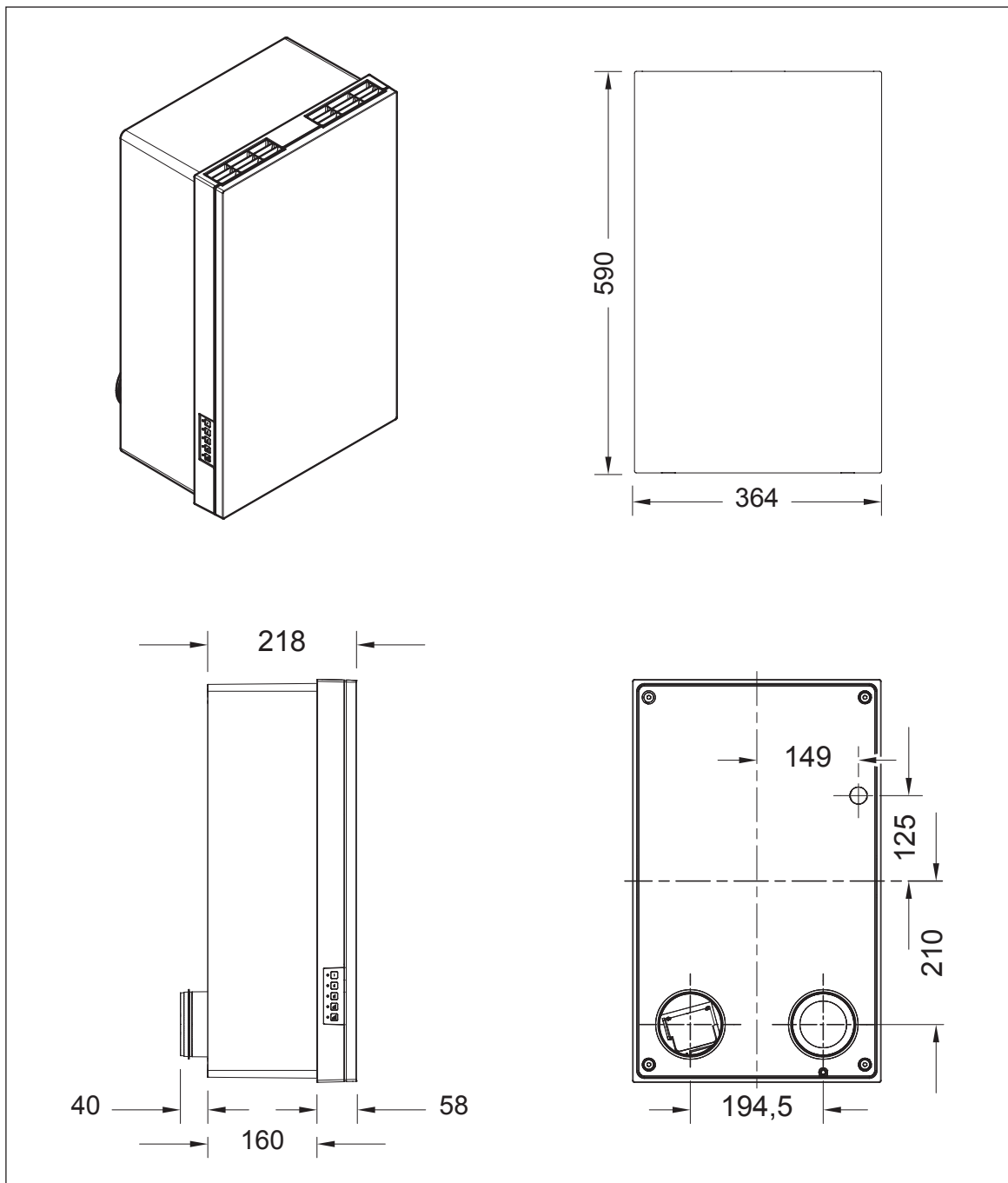


Fig. 4: M-WRG-II ventilation unit without duct adapters, dimensions in millimetres

## 4.2 Ventilation unit with duct adapters

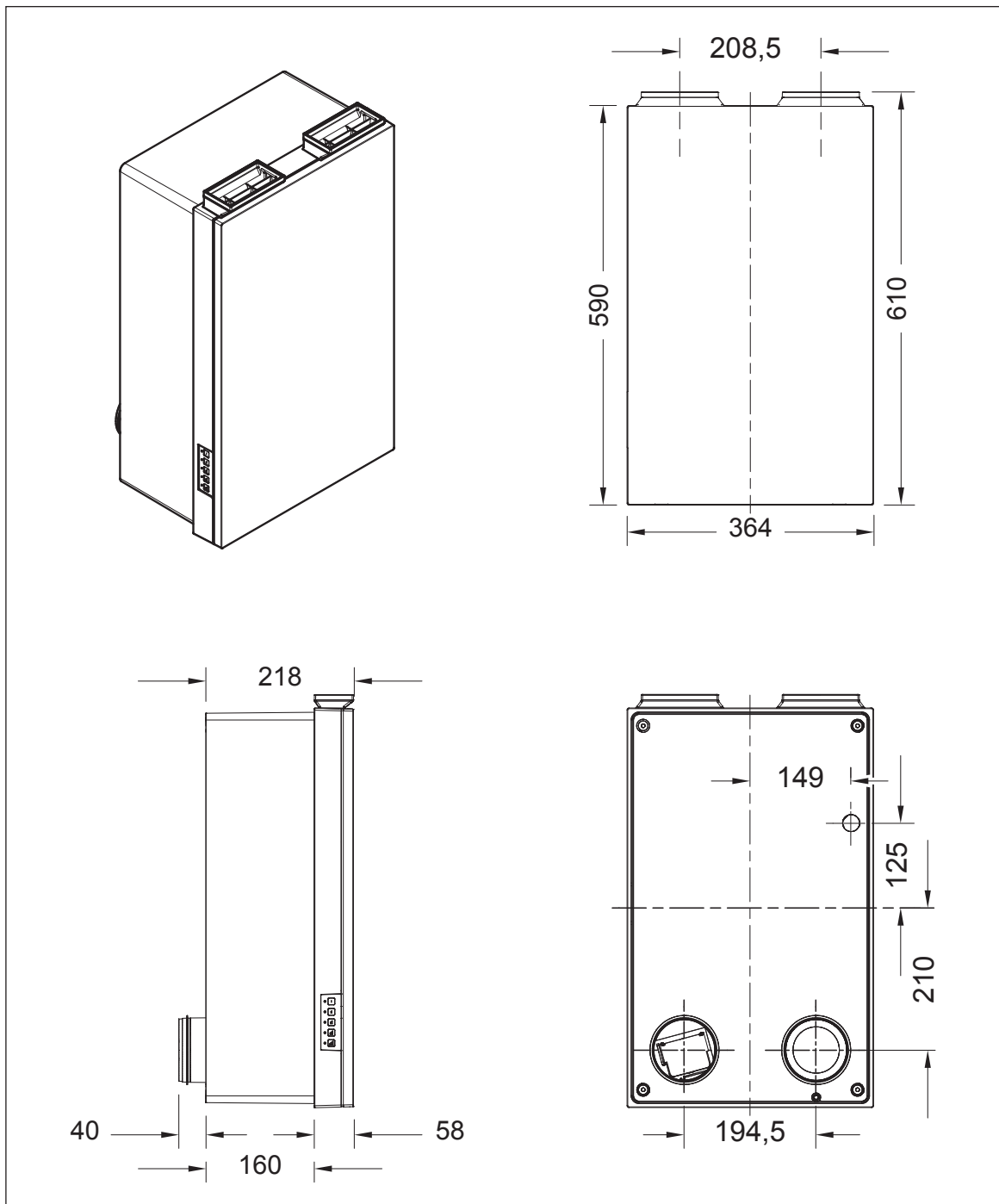


Fig. 5: M-WRG-II ventilation unit with duct adapters, dimensions in millimetres



## 5 Structure and function

### 5.1 Overview of the modules

#### 5.1.1 Ventilation unit – with cover attached

Item in Fig. 6	Designation
1	Housing
2	Unit cover
3	Membrane touch pad with 5 buttons for selecting the ventilation levels / programs and 5 status indicator LEDs

#### 5.1.2 Ventilation unit – with cover removed

Item in Fig. 7	Designation
1	Supply air grille
2	Outdoor air filter with filter cover
3	Mains switch "On / Off"
4	Extract air filter with filter ring
5	Extract air grille



Fig. 6: Ventilation unit – with cover attached

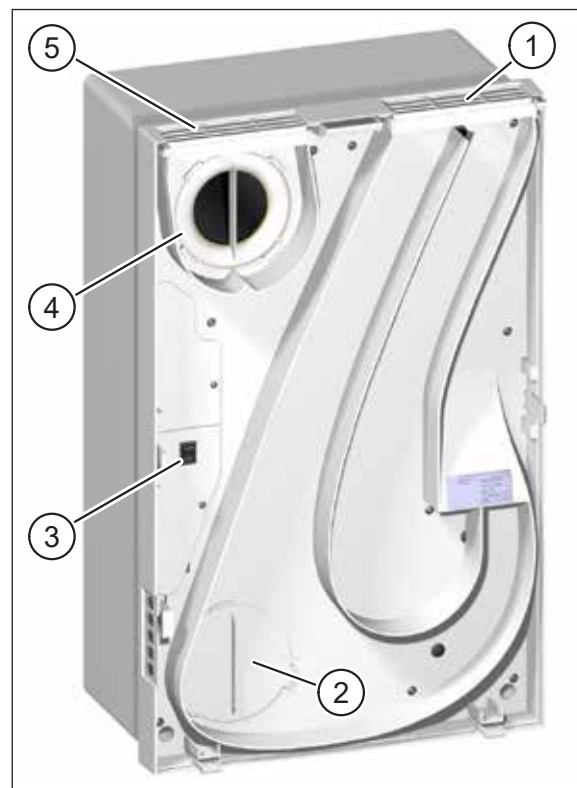


Fig. 7: Ventilation unit – with cover removed

## 5.2 Description of the functions

### 5.2.1 How the M-WRG-II ventilation unit works

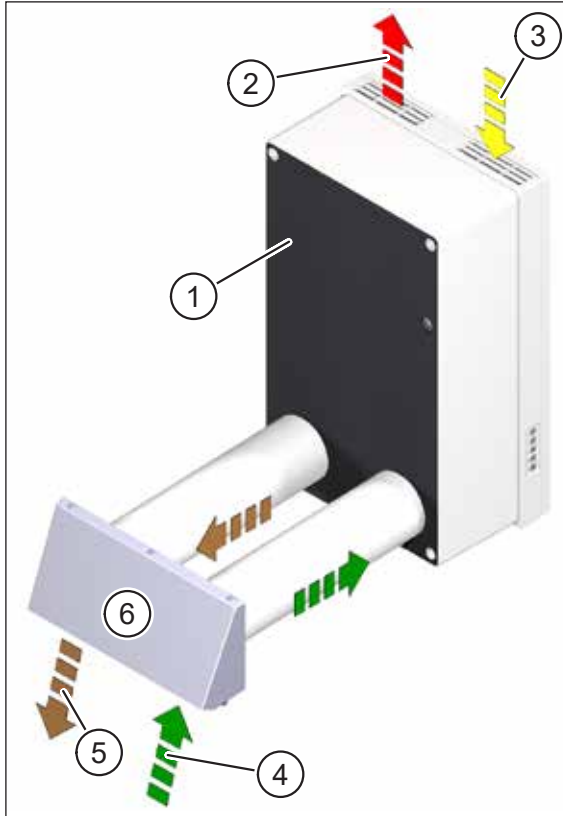


Fig. 8: How the ventilation unit works

Item in Fig. 8	Designation
1	M-WRG-II ventilation unit
2	Supply air
3	Extract air
4	Outdoor air
5	Exhaust air
6	Outer wall terminal

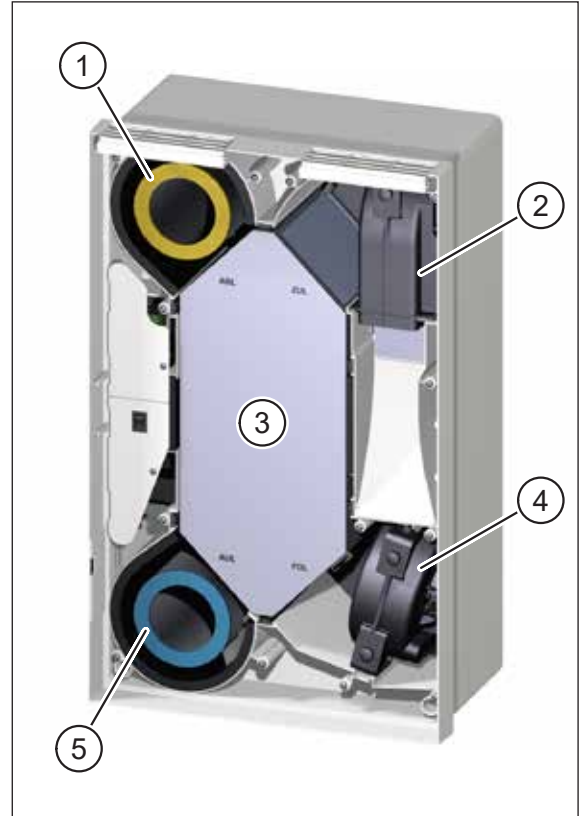


Fig. 9: Components for air exchange

Item in Fig. 9	Designation
1	Extract air filter
2	Supply air fan
3	Cross-counterflow plate heat exchanger
4	Exhaust air fan
5	Outdoor air filter

The ventilation unit operates continuously, transports outdoor air and extract air at the same time and guides and filters the outdoor air and extract air separately. The self-regulating fans (which ensure a constant volumetric flow rate) are arranged on the supply air and exhaust air sides. The supply air fan (item 2 in Fig. 9) transports outdoor air (item 4 in Fig. 8) through the outdoor air filter (item 5 in Fig. 9) and cross-counterflow plate heat exchanger (item 3 in Fig. 9) into the interior as supply air (item 2 in Fig. 8). The exhaust air fan (item 4 in Fig. 9) extracts the extract air (item 3 in Fig. 8) from the interior. In the extract air filter (item 1 in Fig. 9), the extract air is cleaned, guided through the cross-counterflow plate heat exchanger and carried outside as exhaust air (item 5 in Fig. 8). The supply air and exhaust air fans each transport the same volume of air. The pressure in the interior remains practically constant.

## 5.2.2 How the cross-counterflow plate heat exchanger works / moisture recovery with enthalpy heat exchanger

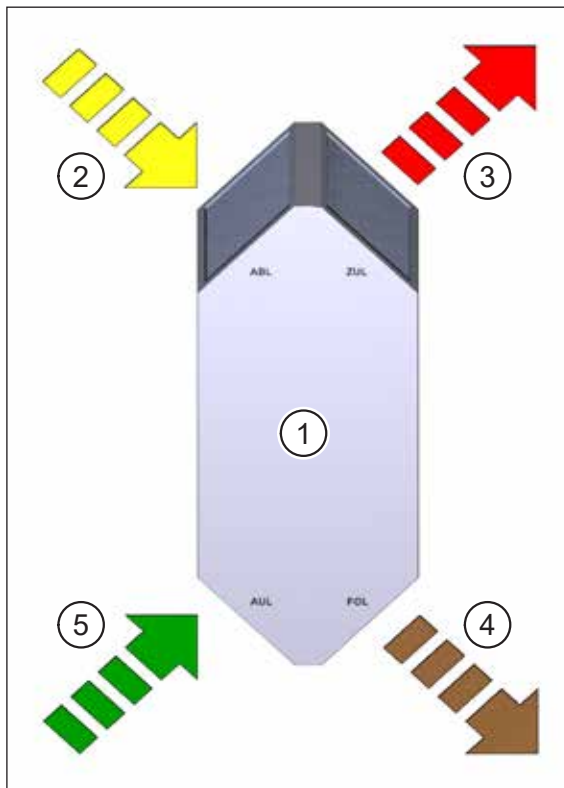


Fig. 10: How the cross-counterflow plate heat exchanger works

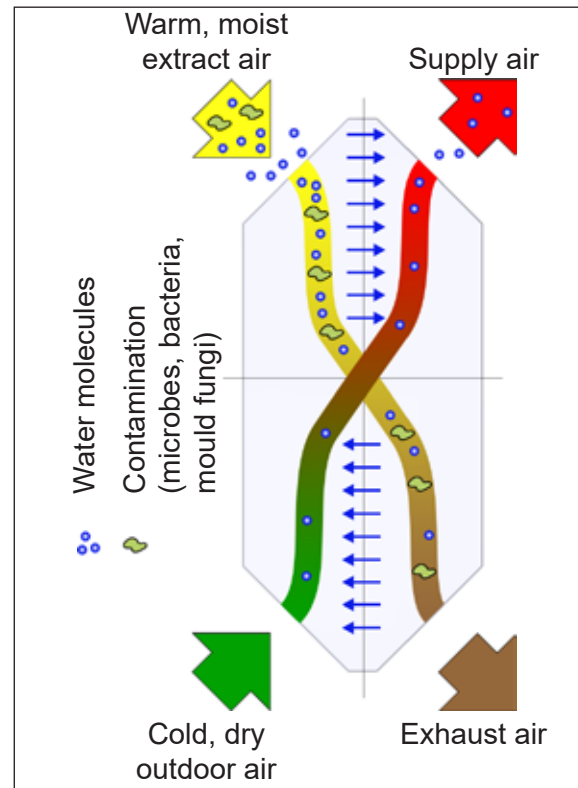


Fig. 11: Moisture recovery with enthalpy heat exchanger

The channels on the cross-counterflow plate heat exchanger (item 1 in Fig. 10) are designed so that the air flows move in opposite directions. This guarantees the greatest possible exchange of thermal energy.

In the winter, the highly thermally conductive plates transfer the heat from the extract air flow (item 2 in Fig. 10) to the supply air flow (item 3 in Fig. 10). The cooled extract air is carried to the outside as exhaust air (item 4 in Fig. 10). In the summer, this is reversed; the warmer, incoming air is cooled.

Ventilation units from the M-WRG-II E series also incorporate a moisture recovery (enthalpy) function (see Fig. 11). An enthalpy exchanger works on the principle of osmosis; the water molecules pass through the pore structure of an antimicrobial polymer membrane, driven by the moisture's concentration gradient from the warm air to the cold air side. The membrane film acts as a separating layer for the air flows and guarantees that only water vapour from the two air flows adjacent to the membrane is transferred. Microbes, mould fungi and bacteria are unable to penetrate and settle in the membrane due to their relatively large size compared to water molecules. The innovative polymer membrane that makes this possible is hygiene-certified to VDI 6022. The enthalpy heat exchanger effectively prevents the air we breathe being too dry in the winter and prevents excessive atmospheric humidity in the summer. This combination of heat and hygienic moisture recovery saves on heating costs and protects the respiratory tract.

## 6 Rules for correct usage

### 6.1 General

- ▶ Always operate the ventilation unit with the unit cover attached.
- ▶ Run the ventilation unit in continuous mode or demand-controlled with humidity and/or CO<sub>2</sub> control (only possible if the unit contains the appropriate sensors). While continuous mode constantly ensures a good and healthy atmosphere in the room, demand-controlled ventilation uses sensors to provide particularly energy-efficient ventilation that is tailored precisely to requirements.
- ▶ Adapt the air flow through the ventilation unit to take account of the air load created by cooking, washing, ironing, visitors, showers, sauna, etc.
- ▶ Set the ventilation unit so that the relative humidity ranges between 40 % and 65 %. People feel most comfortable within this range.

### 6.2 Seasonal operation

#### 6.2.1 Operation at cold times of year

- ▶ During cold times of year, run the ventilation unit either in continuous mode or demand-controlled via the humidity or CO<sub>2</sub> sensors (only if the unit has the appropriate sensors).
  - Energy-saving motors and an innovative controller ensure a very low power consumption, even in continuous mode.
  - Continuous removal of moisture from the interior is only guaranteed while the unit is in operation.
- ▶ Run the intensive ventilation program in the following cases:
  - regularly if there is high atmospheric humidity in the interior
  - if you need to switch off the ventilation unit.This will remove any condensate that is present in the ventilation unit.
- ▶ Maintain the temperature in bedrooms at 16 °C to 18 °C or more. This temperature is also more healthy for the people in the bedrooms. Do not run the ventilation unit at room temperatures below 15 °C, and particularly not at low external temperatures below 0 °C. Otherwise the ventilation unit will constantly activate the frost protection function or switch off altogether. The higher the interior temperature, the bigger the buffer for operating the ventilation unit and for heat recovery.

#### NOTICE

Supply air or exhaust air operation alone is not recommended. Firstly because the unit is often in the unbalanced frost protection mode and secondly because the incoming flow of cold outdoor air causes the rooms to cool down.

### 6.2.2 Summer mode

On hot summer days, the heat recovery effect can be utilized the opposite way around during the day by correcting the temperature of the supplied hot outdoor air with the removed cooler extract air.

At night, when the outdoor air temperature is lower than the interior temperature, the ventilation unit can be set to allow supply air or extract air operation alone, with the effect that there is no heat recovery.

In addition, a cross-ventilation effect can be created by setting one ventilation unit to supply air operation and the other to extract air operation.

In supply air mode, the exhaust air fan switches off, i.e. only supply air is transported. The necessary extract air flow rate must be guaranteed by arrangements in the building (e.g. tilted window) or a second unit.

The supply air or extract air mode program can be implemented using the optional controller options: InControl pushbutton sensor, Modbus, RS-485 bus or the M-WRG-FBH wireless remote control.

#### NOTICE

- ▶ In the summer months, ventilate cellars and similar rooms only during the night. Otherwise condensation from the atmospheric humidity can cause damage due to damp on the cold walls.

### 6.3 Air filters

- Never run the ventilation unit without air filters.
- Always use genuine Meltem filters. These are precisely matched to your M-WRG-II ventilation units, ensure minimal pressure losses and will ensure a long service life from your ventilation units.
- DIN 1946-6 “Ventilation for residential buildings” recommends changing air filters every six months. The air filters for outdoor air and extract air should be replaced at least once a year on hygiene grounds, ideally before the cold weather starts.
- In high levels of air pollution (e.g. from road traffic or industry, rooms with high dust levels) change the filters **every six months**.
- Always replace air filters in pairs. The permeability of both air filters affects the efficiency and power consumption of the ventilation unit.
- Observe the filter change indicator (see chapter 12 on page 30) and replace the air filters as necessary.

#### NOTICE

An outdoor air filter from filter class ISO ePM1  $\geq 50\%$  (F7) is needed to fulfil the hygiene requirements defined in VDI 6022 and DIN 1946-6 (category H). Every M-WRG-II ventilation unit is equipped with such an air filter as standard.

## 7 Controls and indicators on the ventilation unit

On the left of the ventilation unit there is a membrane touch pad with 5 buttons (items 1 to 5 in Fig. 12). These buttons are used to set the ventilation levels / programs. The 5 LEDs (LEDs 1 to 5 in Fig. 12) indicate the status of the ventilation unit. They also display any fault messages or whether an air filter needs to be changed.

The mains switch (item 1 in Fig. 13) is located behind the unit cover. The unit cover must be removed in order to access it.

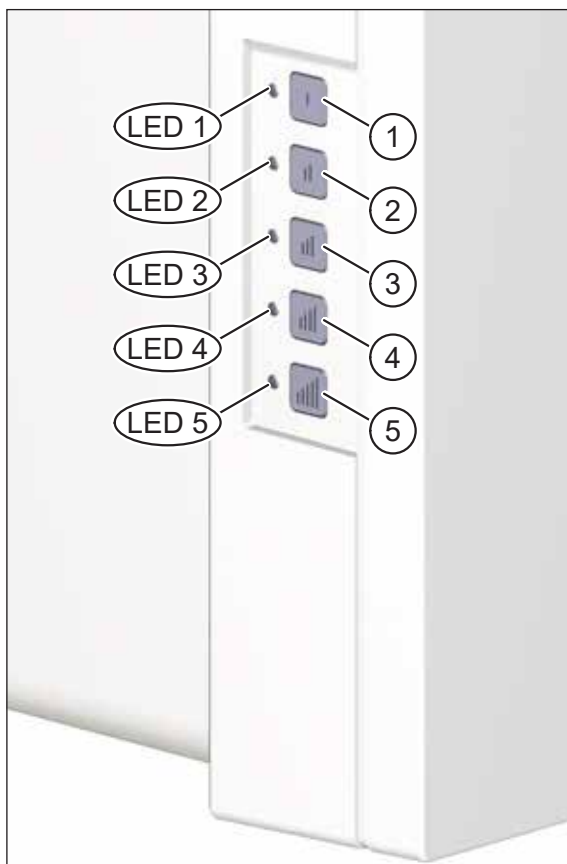


Fig. 12: Membrane touch pad and LEDs on the left of the unit



Fig. 13: Mains switch, visible when unit cover is removed

## 7.1 Default assignment of the membrane touch pad

This section illustrates the default assignment of the individual buttons on the membrane touch pad for the different types of unit. How the individual ventilation programs work is described in section 10 on page 26.

### NOTICE

The optional wireless remote control M-WRG-FBH, part no. 5478-10, is used to control, program and extend the range of functions of all M-WRG-II units. The functionality of the individual buttons on the membrane touch pad can thus be adapted to suit the customer's requirements. You will find more details in the user guide "Wireless remote control M-WRG-FBH" (see section 1.11 on page 10).

### 7.1.1 M-WRG-II P / M-WRG-II E

Button in Fig. 12	Ventilation program	Air flow
1	Reduced ventilation (people absent)	10 m <sup>3</sup> /h
2	Normal ventilation (people present)	30 m <sup>3</sup> /h
3	Increased ventilation	50 m <sup>3</sup> /h
4		70 m <sup>3</sup> /h
5	Intensive ventilation (15 min)	100 m <sup>3</sup> /h

### 7.1.2 M-WRG-II P-F / M-WRG-II E-F

Button in Fig. 12	Ventilation program	Air flow
1	Reduced ventilation (people absent)	10 m <sup>3</sup> /h
2	Normal ventilation (people present)	30 m <sup>3</sup> /h
3	Increased ventilation	50 m <sup>3</sup> /h
4	Humidity control	10 - 60 m <sup>3</sup> /h, infinitely-variable
5	Intensive ventilation (15 min)	100 m <sup>3</sup> /h

### 7.1.3 M-WRG-II P-FC / M-WRG-II E-FC

Button in Fig. 12	Ventilation program	Air flow
1	Reduced ventilation (people absent)	10 m <sup>3</sup> /h
2	Normal ventilation (people present)	30 m <sup>3</sup> /h
3	Increased ventilation	50 m <sup>3</sup> /h
4	Automatic mode (humidity and CO <sub>2</sub> control)	10 - 60 m <sup>3</sup> /h, infinitely-variable
5	Intensive ventilation (15 min)	100 m <sup>3</sup> /h

## 7.2 LED indicators

### 7.2.1 Selected ventilation program indicator

When a ventilation program is activated on the membrane touch pad, the corresponding LED lights up (see Fig. 12 on page 22) for 10 seconds and then goes out again.

### 7.2.2 Status indicators

An LED that lights up continuously or flashes indicates one of the following ventilation unit states:

LED in Fig. 12	Status
LED 1 lights up continuously	Air filter change required
LED 2 lights up continuously	Unit fault (e.g. faulty sensor or motor)
LED 3 flashes for 10 s	The absolute atmospheric humidity of the supply air is greater than the absolute atmospheric humidity of the extract air
LED 4 flashes for 10 s	The VOC value of the supply air is greater than 1500 ppm for 10 minutes (factory setting, only for units with the M-WRG-II O/VOC-AUL option)
LED 5 flashes for 10 s	Ventilation unit in frost protection mode

## 8 Starting up

### 8.1 Checking the ventilation unit before switching on for the first time

- ▶ Check the ventilation unit for damage.
- ▶ Check that the air grilles for extract air and supply air (item 1 and 5 in Fig. 7 on page 17) are unobstructed.

### 8.2 Switching on the ventilation unit

- ▶ Remove the cover from the ventilation unit (see section 12.3.1 on page 31).
- ▶ Switch the ventilation unit on at the mains switch (item 1 in Fig. 14).

After roughly 1 second, the electromechanically-operated vent flaps on the supply air and exhaust air sides open.

- ▶ Reattach the cover to the ventilation unit (see section 12.3.6 on page 33).



Fig. 14: Mains switch, visible when unit cover is removed



## 9 Operating the ventilation unit

### 9.1 Selecting the ventilation level / program with the membrane touch pad

The buttons on the membrane touch pad (items 1 to 5 in Fig. 12 on page 22) are used to select 5 ventilation levels/programs (see section 7.1.1 to section 7.1.3 on page 23).

### 9.2 Frost protection function

The ventilation unit is equipped with a frost protection function. In low outdoor temperatures, the ventilation unit automatically switches to frost protection mode.

- ▶ Do not switch the ventilation unit off in the winter. Note section “6 Rules for correct usage” on page 20.

#### How it works:

The temperature on the exhaust air side is constantly monitored to prevent the heat exchanger freezing. If the exhaust air temperature drops below  $-1.5\text{ °C}$  ( $-1.0\text{ °C}$  with M-WRG-II E), the motor controller gradually changes the supply air and/or extract air volume flow according to the set ventilation level so that the proportion of extract air is increased. This causes the temperature to rise on the exhaust air side.

When an exhaust air temperature  $>5.5\text{ °C}$  ( $>7.0\text{ °C}$  with M-WRG-II E) is maintained for a period of 3 minutes, the unit gradually switches back to the previous operating state.

If a value of  $>5.5\text{ °C}$  ( $>7.0\text{ °C}$  with M-WRG-II E) is not reached on the exhaust air side, despite increasing the proportion of extract air within the unit's control range (e.g. because the room has cooled down), both the supply air fan and the exhaust air fan are switched off.

After one hour, the unit resumes operation for 6 minutes and checks the exhaust air temperature. If the measured exhaust air temperature exceeds a value of  $5.5\text{ °C}$  ( $7.0\text{ °C}$  with M-WRG-II E), ventilation mode starts with the previously set operating state.

If the measured exhaust air temperature is below a value of  $5.5\text{ °C}$  ( $7.0\text{ °C}$  with M-WRG-II E), the sequence described above is repeated.

Frost protection mode is ended when the exhaust air temperature is constantly above  $5.5\text{ °C}$  ( $7.0\text{ °C}$  with M-WRG-II E) and the two fans are balanced.

In addition to monitoring of the exhaust air temperature, the speed of the exhaust air fan is monitored continuously. When the exhaust air temperature has dropped to  $<2\text{ °C}$ , if the speed increases significantly within a period of 2 hours, frost protection mode is activated by the motor controller.

Any condensate is removed via the exhaust air pipe and condensate connection and with M-WRG-II E units (with enthalpy) there is practically no condensation at all (if used for the intended use, see section 2.5 on page 13, and in accordance with the rules for correct usage, see section 6 on page 20, and if not exposed to excessive humidity).

## 10 Ventilation levels/programs

There are different ventilation programs/levels available for selection, depending on the type of ventilation unit (see section 7.1.1 to section 7.1.3 on page 23).

### 10.1 “Reduced ventilation (people absent)”

The ventilation unit runs at the lowest ventilation level (10 m<sup>3</sup>/h). This operating mode can be selected when the occupier is absent (e.g. on holiday) to ensure a minimum level of air renewal. This includes ventilation for moisture protection.

### 10.2 “Normal ventilation (people present)”

The ventilation unit runs at the middle ventilation level (30 m<sup>3</sup>/h). This is the normal mode used to achieve the ventilation needed to meet hygiene and health requirements when the users are present.

### 10.3 “Increased ventilation”

The ventilation unit runs at a higher ventilation level (50 or 70 m<sup>3</sup>/h) in order to dissipate load peaks, e.g. when there are multiple people present or increased odour nuisance.

### 10.4 “Intensive ventilation (temporary 15 min)”

The ventilation unit runs at maximum ventilation level (100 m<sup>3</sup>/h). After roughly 15 minutes or when another button is pressed, the intensive ventilation is ended and the previously set ventilation program is resumed.

### 10.5 “Humidity control”

The ventilation unit runs constantly at the lowest ventilation level (10 m<sup>3</sup>/h<sup>(1)</sup>). If the relative room air humidity exceeds 60 % RH, the ventilation level is increased continuously up to max. 60 m<sup>3</sup>/h until the humidity in the room drops back below 60 % RH.

#### NOTICE

To ensure dehumidification, the ventilation unit compares the calculated absolute humidity of the supply air and extract air. LED 3 (see Fig. 12 on page 22) flashes when the humidity of the outdoor air is greater than that of the extract air, which means that dehumidification is not possible.

### 10.6 “Automatic mode”

The ventilation unit runs constantly at the lowest ventilation level (10 m<sup>3</sup>/h<sup>(1)</sup>). A CO<sub>2</sub> sensor monitors the air quality in the room. If the limit of 800 ppm is exceeded, the ventilation unit calculates the optimum air renewal and sets the required ventilation level in the range from 10 - 60 m<sup>3</sup>/h.

(1) The ventilation level can be reduced from 10 to 0 m<sup>3</sup>/h at the factory or using the optional wireless remote control M-WRG-FBH. The ventilation unit switches to sniffing mode and interrupts its operation for the set pause time (set to 60 minutes at the factory). The relative humidity or CO<sub>2</sub> concentration is then checked for a 5-minute period. If the corresponding limit is exceeded, the ventilation unit switches back to ventilation mode.

The relative room air humidity is monitored in addition to the CO<sub>2</sub> concentration (see section 10.5 on page 26). The CO<sub>2</sub> sensor and the humidity sensor both send feedback to the ventilation unit, indicating the ventilation level at which it should work. The ventilation unit automatically assumes the higher of the two suggested ventilation levels and thus ensures the priority.

The M-WRG-II O/VOC-AUL option allows volatile organic compounds in the outdoor air to be detected as well using a VOC sensor.

#### NOTICE

- When it is started up for the first time, the ventilation unit must remain switched on for at least 15 minutes without interruption so that the VOC sensor can be calibrated.
  - ▶ Make sure that the air is not severely contaminated during the calibration phase by solvents, for example.
- When you switch on again, it will take roughly 5 minutes for the sensor to recalibrate.

## 11 Options for ventilation mode

### 11.1 External control input

#### 11.1.1 Description

With the external control input supplied as standard, the M-WRG-II unit has an additional input terminal for 230 V AC (working voltage range: 85 V AC to 265 V AC / 50 - 60 Hz) to which a switch, time switch, motion detector or similar may be connected.

The external control input is equipped with a time-delay relay that can be used to set a switch-on delay and a run-on time:

- Switch-on delay:  
the M-WRG-II unit does not start until the set time has elapsed.
- Run-on time:  
the M-WRG-II unit does not switch to the previously active ventilation program until the set time has elapsed.

Windowless rooms can be ventilated in accordance with DIN 18017-3 in combination with the M-WRG-II O/NOF option, part no. 721004.

#### 11.1.2 Factory defaults and possible adjustment ranges

Parameter	Factory defaults	Possible adjustment ranges
Air flow	60 m <sup>3</sup> /h	10 to 100 m <sup>3</sup> /h
Switch-on delay	1 min	0 to 240 min
Run-on time	15 min	0 to 240 min

#### NOTICE

The above parameters can be changed either at the factory or using the optional wireless remote control M-WRG-FBH.

### **11.1.3 M-WRG-II O/EST-1, part no. 721005, and M-WRG-II O/EST-2, part no. 721006**

The following options may be selected in addition to the external control input which is supplied as standard:

- M-WRG-II O/EST-1: without switch-on delay, needs to be fitted at the factory
- M-WRG-II O/EST-2: without run-on time, needs to be fitted at the factory

### **11.2 Parameter settings for special air outputs for all M-WRG-II units, M-WRG-II O/PARM, part no. 721000**

This option is used to set special air output parameters for all M-WRG-II units. It needs to be fitted at the factory.

### **11.3 Minimum ventilation to DIN 18017-3, M-WRG-II O/MVS, part no. 721001**

This option guarantees a minimum ventilation level to DIN 18017-3. Between 08:00 and 20:00, the unit ventilates at 40 m<sup>3</sup>/h, dropping to 20 m<sup>3</sup>/h between 20:00 and 08:00. The function is activated at the factory, cannot be switched off by the user and has priority over all other settings. It includes the mains switch without function so that the user cannot easily switch the unit off (it can be switched off via the building's fuse box, for example). This option changes the button assignment on the ventilation unit control panels: Button 1, 2, 3, (4): 20, 40, 60, (80) m<sup>3</sup>/h.

The option cannot be used in conjunction with M-WRG-II O/VOC-AUL.

### **11.4 VOC sensor for monitoring the outdoor air quality, M-WRG-II O/VOC-AUL, part no. 721002**

The ventilation unit is equipped with a VOC sensor for monitoring the outdoor air quality. In conjunction with the "Automatic mode" ventilation program, the unit temporarily reduces the supply air if the threshold for contamination with volatile organic compounds (from biological decay and decomposition processes, motor traffic exhaust fumes or volatile by-products from industrial and commercial operations) is exceeded (1,500 ppm). This option is only available for units with a CO<sub>2</sub> sensor (M-WRG-II ...-FC). It needs to be fitted at the factory. The option cannot be used in conjunction with M-WRG-II O/MVS.

### **11.5 "Unit OFF" input, M-WRG-II O/EGG-AUS, part no. 721003**

With this option, the unit is equipped with a "Unit OFF" input and a potential-free fault indicator output.

A smoke detector or a window contact may be connected to the input, for example, allowing the unit to be switched off if smoke is detected or a window is opened.

The fault indicator output allows the ventilation unit's operating state to be signalled to a central point, for example. This option needs to be fitted at the factory.

## 11.6 Mains switch without function, M-WRG-II O/NOF, part no. 721004

The mains switch on the ventilation unit is deactivated with this option. The user can only change the unit's ventilation levels / programs. However it must be ensured that the ventilation unit(s) can be switched off by other means (e.g. via the fuse box in the apartment or house). This option must be fitted at the factory.

## 11.7 Ventilation for moisture protection, M-WRG-II O/LFS, part no. 721007

### 11.7.1 Description

The “ventilation for moisture protection” option is used to set fixed, minimum ventilation levels for day and night. The function is activated at the factory and cannot be switched off by the user (who can only set higher ventilation levels). A humidity program which increases the air flow as required runs continuously in background mode. This option includes the mains switch without function so that the user cannot easily switch the unit off (it can be switched off via the building's fuse box, for example).

This option changes the button assignment on the ventilation unit control panels:

Button 1, 2, 3, (4): 20, 40, 60, (80) m<sup>3</sup>/h.

It may be combined with the external wireless sensor for humidity or CO<sub>2</sub>.

#### NOTICE

- This option can only be selected in conjunction with M-WRG-II units with humidity and/or CO<sub>2</sub> control (excluding types -S 485, -TF, -TFC).
- It needs to be fitted at the factory.

### 11.7.2 Factory defaults

Time	Air flow
08:00 - 20:00	20 m <sup>3</sup> /h
20:00 - 08:00	20 m <sup>3</sup> /h

## 12 Filter maintenance

The ventilation unit has a runtime-controlled filter monitoring function with visual display. It monitors the time since the last air filter change. If the last air filter change was more than one year ago, the filter change display is activated and a pending air filter change is signalled by LED 1, which lights up constantly (see Fig. 12 on page 22).

No tools are needed to change the air filters.

### NOTICE

► Follow the instructions for changing the air filters in section 6.3 on page 21.

### 12.1 Choice of filter

The following air filters may be used or are available for selection for the M-WRG-II ventilation units:

Part no.	Type	Filter type	Filter class	Application
750010	M-WRG-II FA	Outdoor air filter	ISO ePM1 60% (F7)	Effectively filters out respirable particulates such as pollen, soot and bacteria from dust class PM1
750020	M-WRG-II FK	Activated charcoal filter (optional for outdoor air)	ISO ePM2,5 55% (F7)	Effectively retains respirable particulates such as pollen, soot and bacteria from dust class PM2.5, and the activated charcoal layer absorbs odours and harmful gases such as propellants, nitrogen oxides, ozone and solvents
750000	M-WRG-II FS	Extract air filter	ISO Coarse 60% (G4)	Effectively retains coarse particulates such as household dust >PM10

Table 3: Choice of filter

### 12.2 Ordering filters

Please contact your local or regional dealer for information on ordering filters. You will find the contact details on our website at [www.meltem.com](http://www.meltem.com) (or using the QR code on this page).



Go to  
[www.meltem.com](http://www.meltem.com)

## 12.3 Changing the air filters

### 12.3.1 Removing the cover from the ventilation unit

- ▶ Using both thumbs, press the two latches (item 1 in Fig. 15) on the bottom of the ventilation unit. The unit cover will come away.
- ▶ At the same time, push your index fingers into the gap between the unit cover and housing, and lift the unit cover up and away from the housing.
- ▶ Switch the ventilation unit off at the mains switch (see Fig. 13 on page 22). On ventilation units with the M-WRG-II O/NOF option, power to the unit must be switched off using the building's miniature circuit breaker.



Fig. 15: Removing the cover from the ventilation unit

### 12.3.2 Removing the extract air filter

- ▶ Turn the filter ring (item 1 in Fig. 16) using the hand grip (item 2 in Fig. 16) anti-clockwise until the filter ring is released from the retainers.
- ▶ Pull the filter ring together with the extract air filter (item 3 in Fig. 16) out of the ventilation unit.
- ▶ Detach the extract air filter from the filter ring.
- ▶ Clean the filter ring with a damp cloth if it is dirty (see section 13).
- ▶ Dispose of the used air filter in the non-recyclable waste or as required by your country's disposal regulations.

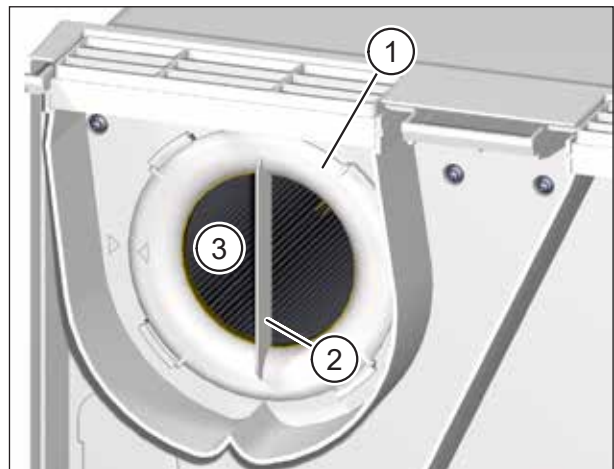


Fig. 16: Removing the extract air filter

### 12.3.3 Removing the outdoor air filter

- ▶ Turn the filter cover (item 1 in Fig. 17) using the hand grip (item 2 in Fig. 17) anti-clockwise until the filter cover is released from the retainers.
- ▶ Pull the filter cover together with the outdoor air filter out of the ventilation unit.
- ▶ Detach the outdoor air filter from the filter cover.
- ▶ Clean the filter cover with a damp cloth if it is dirty (see section 13).
- ▶ Dispose of the used air filter in the non-recyclable waste or as required by your country's disposal regulations.

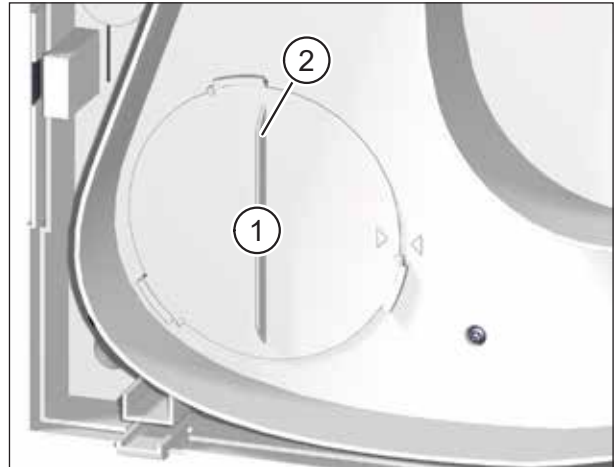


Fig. 17: Removing the outdoor air filter

### 12.3.4 Inserting the new extract air filter

- ▶ Carefully guide the new extract air filter (item 1 in Fig. 18) into the ventilation unit.
- ▶ Make sure that the air filter slides into the 3 retaining tabs (item 2 in Fig. 18) on the back wall of the ventilation unit.
- ▶ Place the filter ring (item 3 in Fig. 18) on the extract air filter. Make sure that the filter ring lies flat on the intermediate plate (item 4 in Fig. 18).
- ▶ Turn the filter ring clockwise until the arrow on the filter ring (item 5 in Fig. 18) lines up with the arrow for the locking position (item 6 in Fig. 18). Make sure that the 4 tabs (item 7 in Fig. 18) on the filter ring engage in the retainers (item 8 in Fig. 18) on the intermediate plate.
- ▶ Check the position of the filter ring. The hand grip must be vertical and the arrow on the filter ring must line up with the arrow for the locking position (see Fig. 16 on page 31).

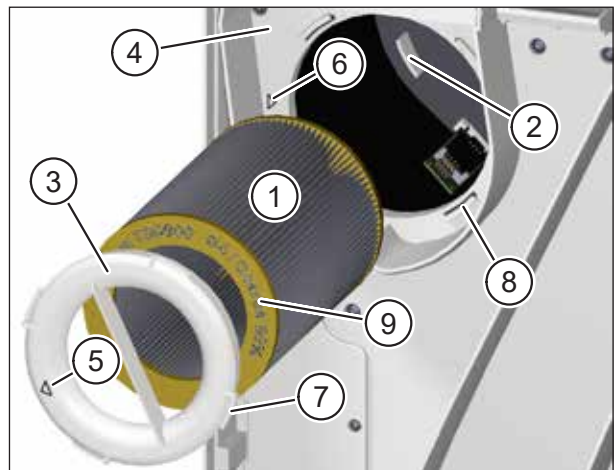


Fig. 18: Inserting the new extract air filter

#### NOTICE

- The ventilation unit will not work as well if the filter ring is not inserted correctly.
- Only M-WRG-II FS, part no. 750000, may be used as the extract air filter. The part no. and air filter class are imprinted on the yellow end plate of the air filter (item 9 in Fig. 18).



### 12.3.5 Inserting the new outdoor air filter

- ▶ Carefully guide the new outdoor air filter (item 1 in Fig. 19) into the ventilation unit.
- ▶ Make sure that the air filter slides into the 3 retaining tabs (item 2 in Fig. 19) on the back wall of the ventilation unit.
- ▶ Place the filter cover (item 3 in Fig. 19) on the outdoor air filter. Make sure that the filter cover lies flat on the intermediate plate (item 4 in Fig. 19).
- ▶ Turn the filter cover clockwise until the arrow on the filter cover (item 5 in Fig. 19) lines up with the arrow for the locking position (item 6 in Fig. 19). Make sure that the 3 tabs (item 7 in Fig. 19) on the filter cover engage in the retainers (item 8 in Fig. 19) on the intermediate plate.
- ▶ Check the position of the filter cover. The hand grip must be vertical and the arrow on the filter cover must line up with the arrow for the locking position (see Fig. 17 on page 32).

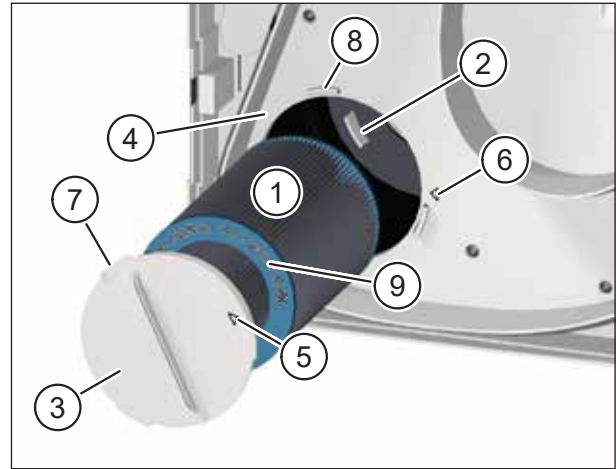


Fig. 19: Inserting the new outdoor air filter

#### NOTICE

- The ventilation unit will not work as well if the filter cover is not inserted correctly.
- Only M-WRG-II FA, part no. 750010, and M-WRG-II FK (activated charcoal filter), part no. 750020, may be used as the outdoor air filter. The part no. and air filter class are imprinted on the turquoise end plate of the air filter (item 9 in Fig. 19).

### 12.3.6 Switching on the ventilation unit and attaching the unit cover to the ventilation unit

- ▶ Switch the ventilation unit on at the mains switch (item 1 in Fig. 14 on page 24).
- ▶ Hold the cover (item 1 in Fig. 20) of the ventilation unit with both hands and tilt the top edge of the cover towards the ventilation unit.
- ▶ Insert the tabs (item 2 in Fig. 20) of the unit cover into the retainers (item 3 in Fig. 20) on the top of the ventilation unit.
- ▶ Lightly press the bottom edge of the cover against the ventilation unit until you hear the cover snap in place.

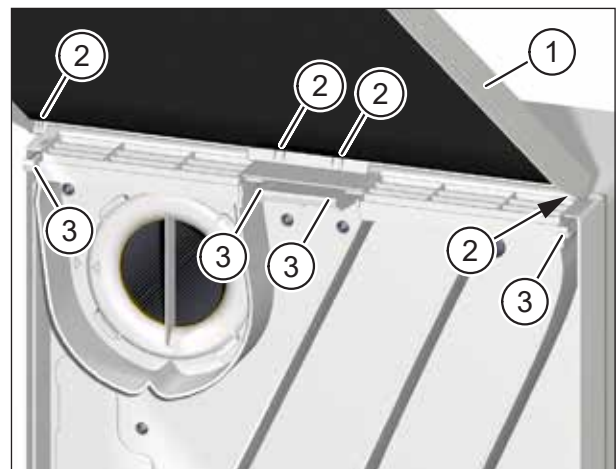


Fig. 20: Attaching the unit cover to the ventilation unit

### 12.3.7 Resetting the filter change indicator

After every air filter change, the filter change indicator must be reset in order to restart monitoring of the period since the last air filter change. The procedure is as follows:

- ▶ Press button 1 (item 1 in Fig. 12 on page 22) for roughly 5 seconds.  
The ventilation unit will beep three times as confirmation. Monitoring of the period since the last air filter change is now restarted.

## 13 Cleaning and maintenance

### **WARNING**

- ▶ Switch off the power to the ventilation unit before cleaning.
- ▶ When cleaning, make sure that no moisture penetrates into the inside of the housing.
- ▶ Never use a high pressure cleaner, steam cleaner or steam jet.

The ventilation unit is made of high quality plastic and requires little care.

- ▶ Wipe the outer surfaces from time to time with a soft, damp cloth. Use mild soapy water. A commercially available plastic cleaner can be used for particularly stubborn dirt.

### **NOTICE**

- ▶ Never use acidic, corrosive or abrasive cleaning agents.

Maintenance of the M-WRG-II series of units is described in separate maintenance instructions (see section “1.11 Supplementary documents” on page 10).

## 14 Troubleshooting

Error	Cause	Remedy
Ventilation unit is not running	Ventilation unit is in safe mode after an EMC fault	Switch the ventilation unit off, wait 15 seconds, then switch on
	Installation error	Have the wiring checked by a qualified electrician
	Faulty switch, motor or controller	Check by a qualified electrician
LED 2 (see Fig. 12 on page 22) lights up continuously	Unit fault	Contact Meltem
The ventilation unit frequently activates the frost protection function	<ul style="list-style-type: none"> <li>— Filter change interval exceeded</li> <li>— The air filter is very dirty (in areas with highly polluted outdoor air this can occur even before the filter change interval has elapsed)</li> </ul>	Change air filters (see “12.3 Changing the air filters” on page 31)
Operating noise of the ventilation unit increases in volume		

Table 4: Troubleshooting



We have checked the content of this publication for conformity with the product described in it. There may nevertheless still be differences, so we cannot guarantee complete accuracy.

The information in this publication is regularly checked and any necessary corrections are made in subsequent editions.

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