

# MIKrovent<sup>®</sup>

## VENTILATION SYSTEM



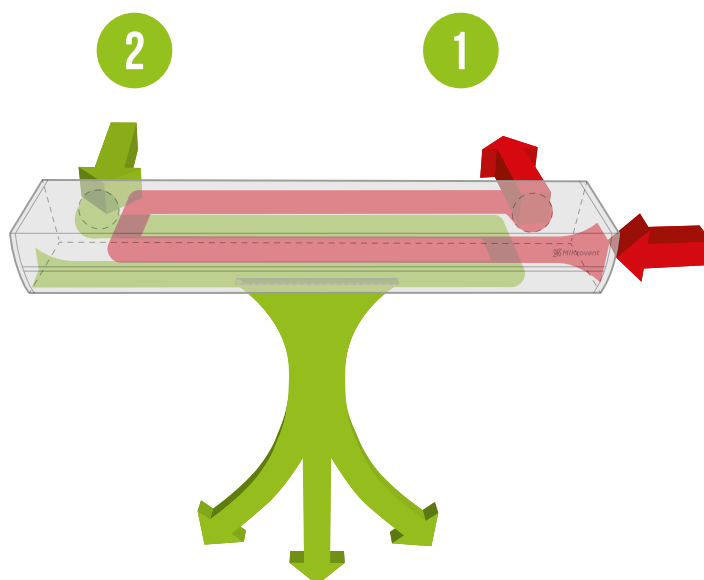
### OPERATING PRINCIPLE

**Up to 87% heat recuperation rate with constant intake of outside air\***

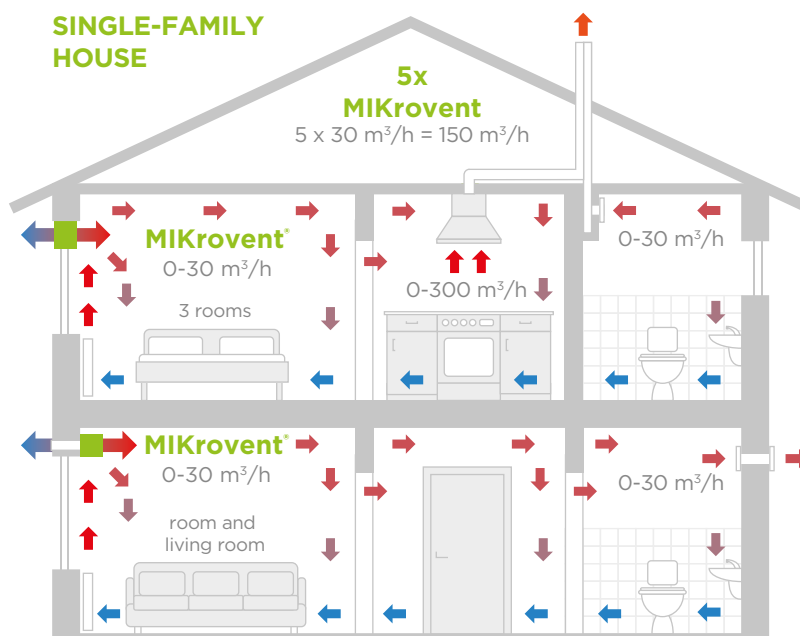
**1** The intake ventilator sucks in the outside air through the intake grate and intake air filter and pushes it into the room through the patented heat exchanger. Capillary heat exchanger (recuperator) is shipped in three standard lengths (267, 467 and 667 mm) and can be adapted to the varying lengths of MIKrovent systems.

**2** The outgoing ventilator sucks out the warm air under the ceiling and pushes it outside through the filter and heat exchanger. Since the air just under the ceiling is usually the warmest and also the most polluted we thereby solve two problems at the same time: we use the heat of the polluted air (if heated with convective heaters, it usually has a temperature above 20°C) and also remove the lowest quality air from the room.

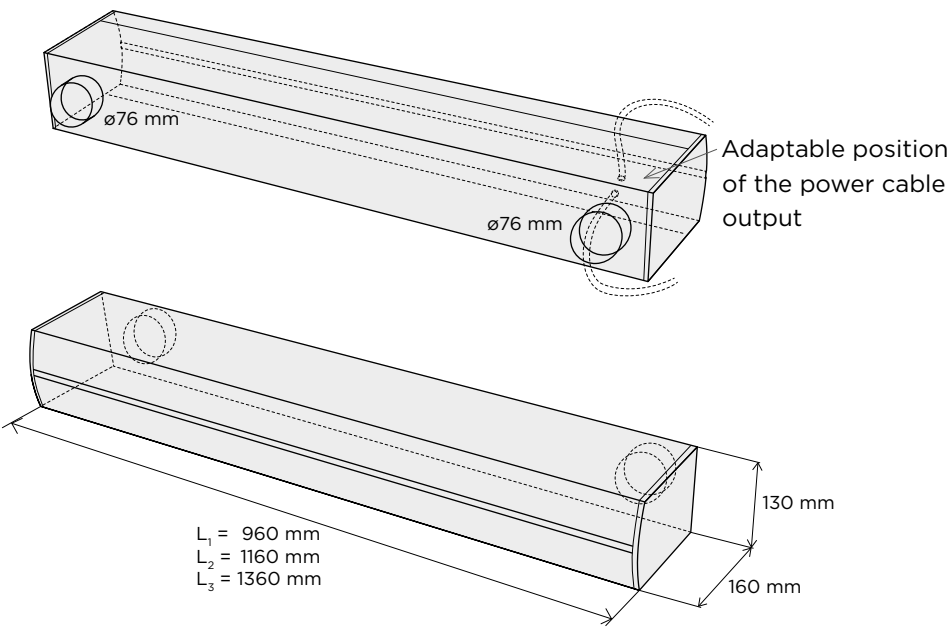
\*depends on model and air quantity.



### SINGLE-FAMILY HOUSE



# TECHNICAL SPECIFICATIONS

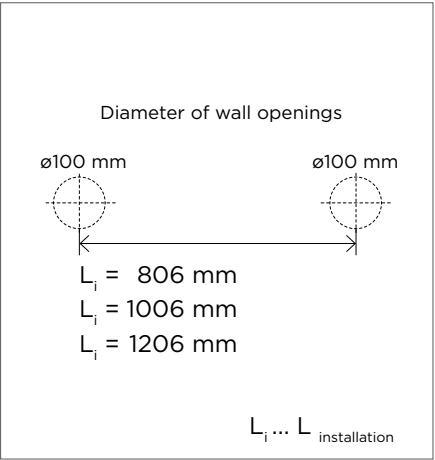


## Standard lengths

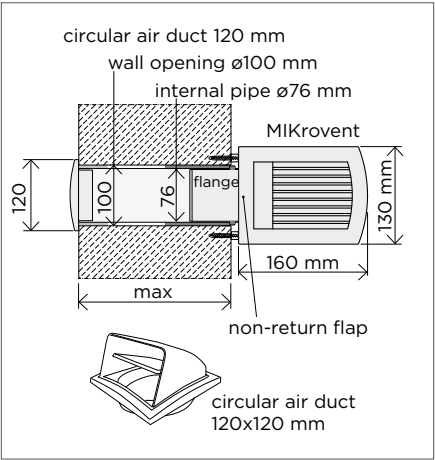
- $L_1 = 960$  mm
- $L_2 = 1160$  mm
- $L_3 = 1360$  mm

# INSTALLATION MODES

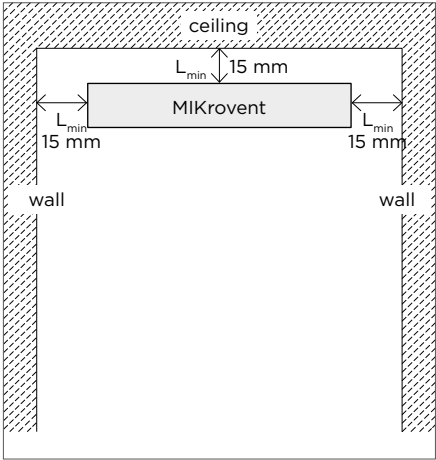
## Standalone horizontal installation



External side - distance between the openings

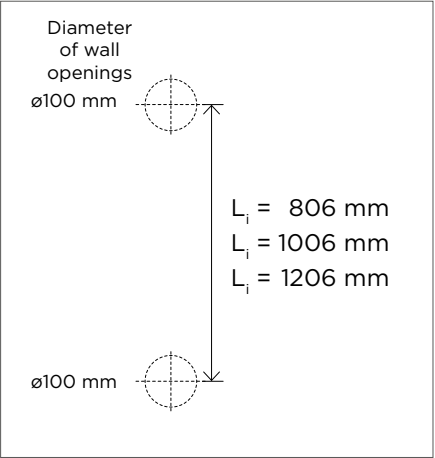


Internal side

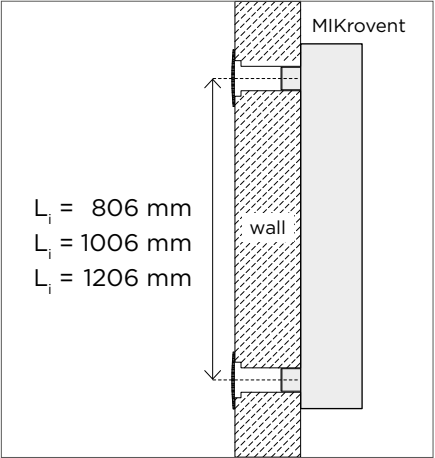


Distances from the wall

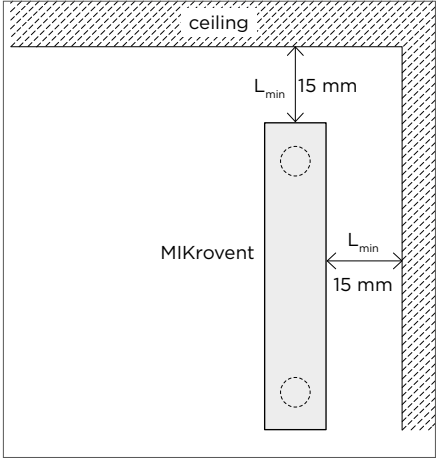
## Standalone vertical installation



External side

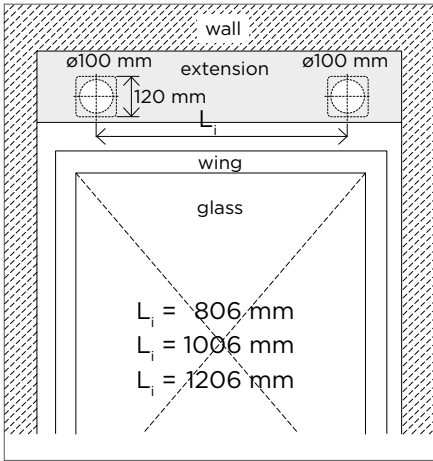


Cross section of the internal side

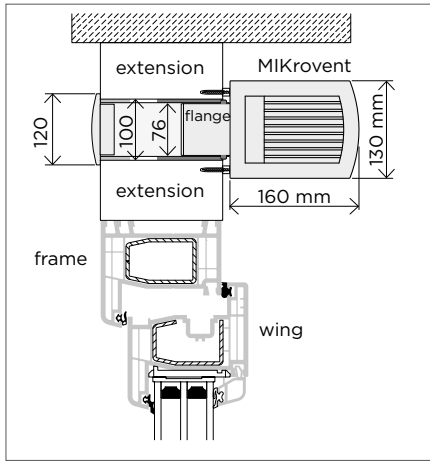


Distances from the wall

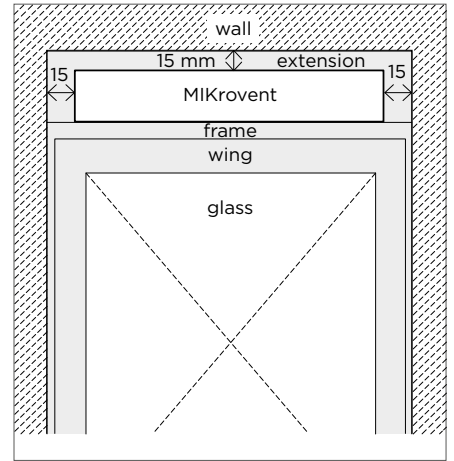
# Installation next to a window



External side



Cross section of the internal side

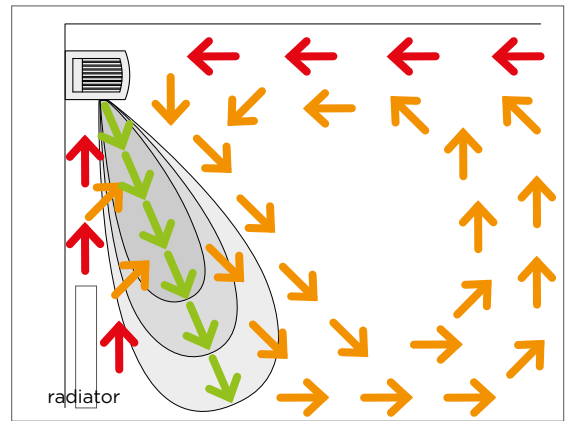


Internal side

## TECHNICAL PROPERTIES

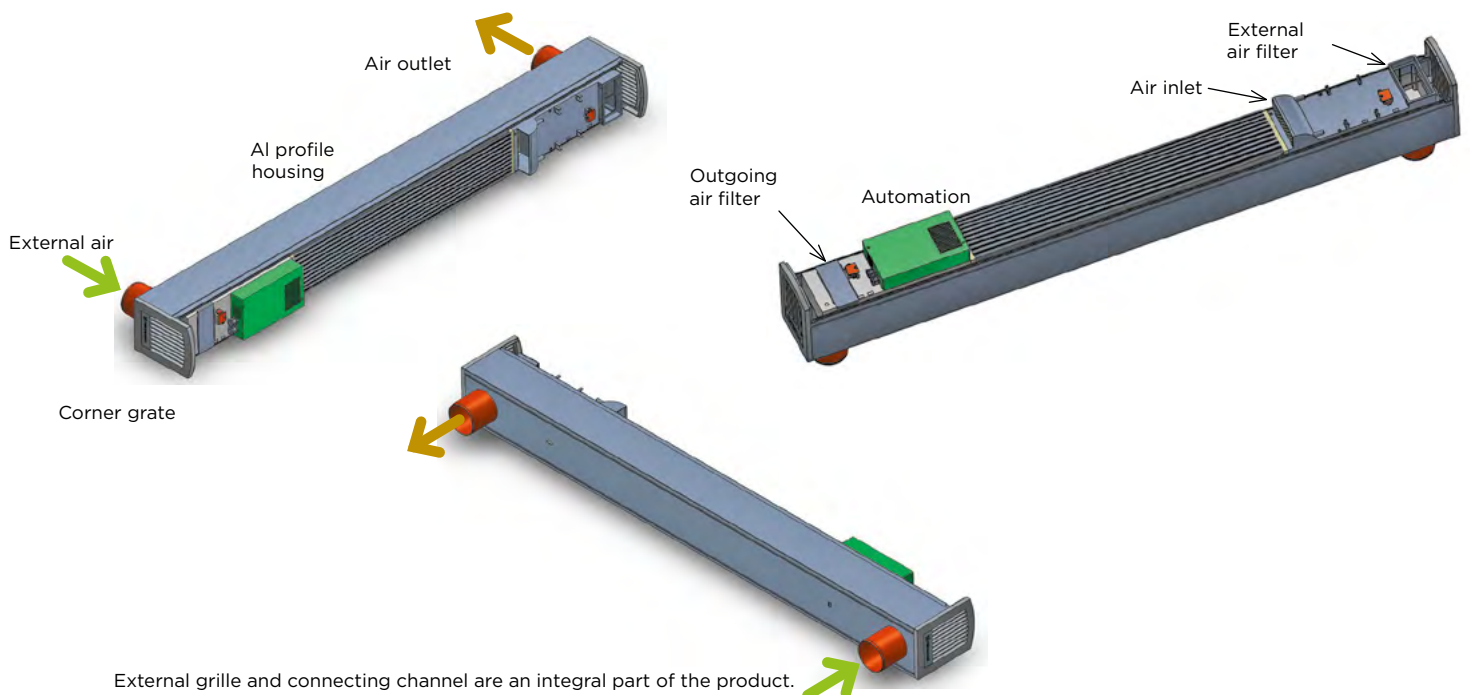
Ventilation system	MIKrovent® 100
Air flow in m <sup>3</sup> /h	10-30
AC/DC voltage (V) AC/DC	230/12 & 110/12
Required power (W)	4-21
Heat recovery ( $\eta_1$ ) to (in %)	71-87
Room noise at 8 dB suppression 8 dB*	25-35

\* Subject to preliminary measurements. The power consumption data cover transformation and regulation measured at the device mains connection. We reserve the right to modify the technical specifications.



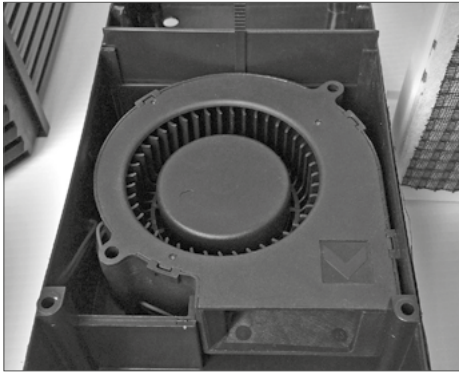
View of fresh air air flow into the room

## COMPONENTS



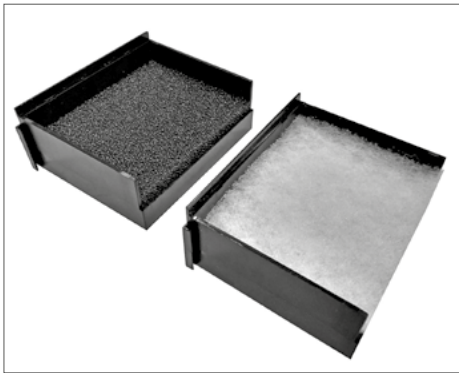
External grille and connecting channel are an integral part of the product.

## Ventilators



MIKrovent 100 comes equipped with two high-efficiency ventilators; one to bring in the air and the other to push it out. The ventilators are powered by two electronically controlled high-efficiency motors. This makes it possible for the air flow rate to be set continuously.

## Filters



Standard models come equipped with F7 class filters (MERV 12 ÷ 14 in line with ASHRAE) at the air inlet and G4 (MERV 4 ÷ 8) at the air outlet. Carbon (AO) filters or the F5 and G4 reusable filters are also available. As higher quality filters also increase flow resistance, power consumption tends to be somewhat higher and the maximum flow is reduced. We can ship any filters the customer prefers with the device.

## Heat exchanger - HE



The heat exchanger or the recuperator is a patented product and serves to preheat the incoming air with the heat of the outgoing air. It is made of polypropylene panels with micro channels that ensure a high rate of heat transfer. The heat exchanger may be cleaned with water if needed; additionally, dust does not stick to its smooth surfaces. No odours and moisture are transferred to the outside air. The heat exchanger has orifices on either side to direct the air flow. HE is fully recyclable.

## PTC heater



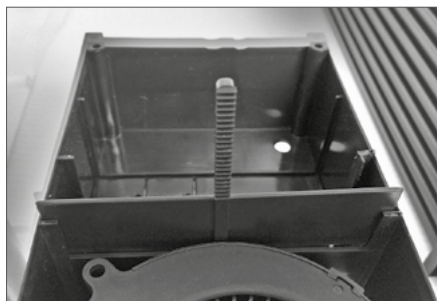
In case of extremely low outside temperatures the air that is channelled out of the room cools down below the condensation temperature and the condensate would begin to freeze upon exiting the device. To prevent this we recommend installing an outside air heater in regions where harsh winters are common. Towards this end, the MIKrovent 100 may be equipped with a special PTC semi-conductor heater, which automatically maintains the temperature of the incoming air at the pre-set level, usually between 0 ÷ +5°C. The PTC heater is installed upon the client's request.



## Frost protection

Owing to the device's high rate of efficiency condensate may appear at the air outlet of the recuperator if the outside temperatures are low and the device is used occasionally. MIKrovent comes equipped with a special Teflon tube that is used to channel the condensate to the air inlet side as the outside air usually contains a lot less moisture. This way we reintroduce some of the moisture back into the room especially when a fresh air heater has been installed. Condensation usually occurs when the device is started in the winter, when it is only occasionally used and when the room is very humid.

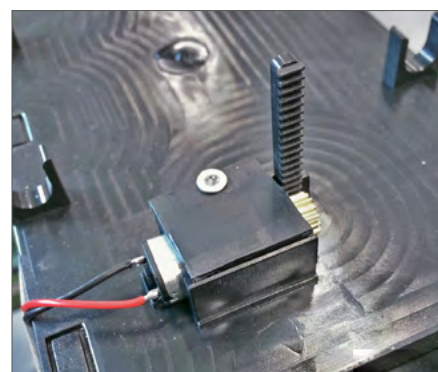
## Shutters



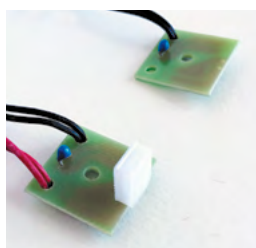
MIKrovent is the only localised venting system equipped with motorised shutters that close the air inlet and outlet when the device is inactive. This ensures that the room temperature remains constant when the device is inactive. Because of natural lift or wind cold or warm air may penetrate the external grates thereby affecting its energy efficiency. Micro motors are also able to close both channels in case of a power outage as they are powered by a special self-charging battery.

## Automatic flaps

In addition to the motorised shutters the MIKrovent 100 also features automatic flaps at the inlet and outlet, which are regulated by the flow of air. When the device is inactive, they are closed and prevent insects and dust from entering the inlet and outlet ducts.



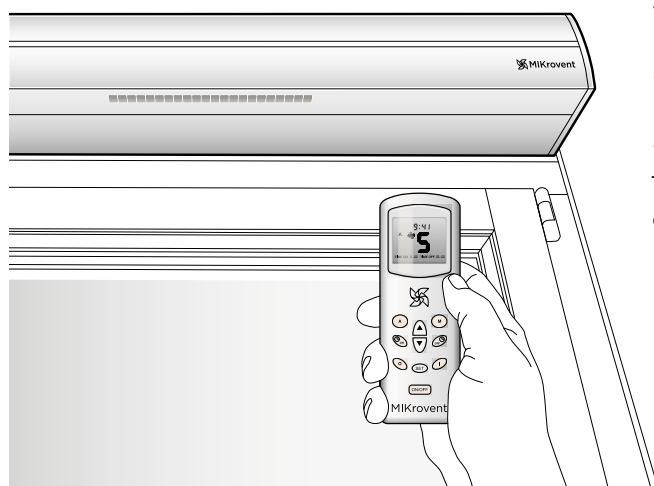
## Temperature, humidity and CO<sub>2</sub> sensors



MIKrovent 100 comes standard with a sensor for air temperature at the air outlet. If this temperature is  $1^{\circ}\text{C} \pm 1 \text{ K}$ , the amount of air channelled into the room is reduced so that the air temperature at the outlet remains above freezing. If MIKrovent 100 is equipped with an air heater, the heater is engaged, the amount does not change and is maintained in line with the amount that has been set. If a humidity sensor has been installed in the room and the device runs in automatic mode, the amount of air depends on the level of humidity in the room. The amount of air is regulated from the minimum at 40% relative humidity in the room to the maximum at 60% relative humidity. When a CO<sub>2</sub> concentration sensor has been installed in the room and the device runs in automatic mode, the amount of air depends on the CO<sub>2</sub> concentration in the room. The amount of air is changed from the minimum at 800 ppm CO<sub>2</sub> concentration in the room to the maximum at 1000 ppm CO<sub>2</sub> concentration in the room.



## Remote control



The remote control is used to remotely control the MIKrovent device. It features an ON/OFF key and keys to set the amount of air. It also features a programmer that can be used to set the daily, nightly and weekly operation of MIKrovent 100. The display can be set to show time or room temperature.

# MIKROVENT OPERATION

## Operating modes

The device has 4 operating modes:



**M - The MANUAL mode** is intended for prolonged operation. The user can set the air volume from minimum to maximum (from 8 to 30 m<sup>3</sup>/h of external air) depending on the size of the room, its use and acceptable noise level. During operation, both shutters driven by electric motors remain open. After the device is switched off, the fans power down and the shutters close.

**A - The AUTO mode** is intended for automatic aeration. The operation speed of MIKrovent is controlled by humidity and temperature sensors.

**O - OUT - In the air removal mode**, only the fan that removes the air from the room is active. This mode is used for kitchens without an extractor hood and in laundry, ironing and other utility rooms. This mode is used to remove air and to create an under-pressure in a room. When first activated, the device runs at the minimum air flow setting but the user can manually set it to any desired intensity rate of extraction of air from the room. The device will remain in this operating mode until it is switched to another mode by the user.

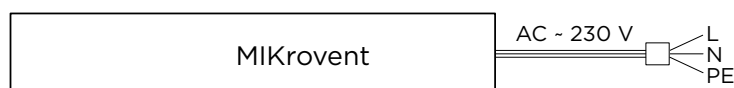


This mode must never be used in rooms with a fireplace and an open flame. Due to the accumulation of CO in the room, the use of this mode may be life-threatening!

**I - IN** - This mode **moves in the exterior air** that can be used to cool rooms naturally. In this mode, only the fan that brings in fresh air from the outdoors is used. In winter, this mode may be used to aerate rooms with an open fireplace. In kitchens that use an extractor hood to remove air from the room it is used to supply fresh air. The user can set the air flow rate from minimum to maximum, as required. The supply of outdoor cool air creates an overpressure in the room. This mode of operation can also be used to undercool rooms and to reduce the cost of cooling with air conditioning devices. If the device is used in accordance with the instructions to supply cool fresh and dry air into a room, it can help reduce the indoor relative humidity. The device will remain in this operating mode until it is switched to another mode by the user.

- If the outdoor temperature in the summer is higher than in the room, and if the relative humidity outside is greater than inside, then it makes sense to turn the ventilation device off. In the AUTO mode, the device will switch itself off automatically.

## ELECTRICAL CONNECTIONS



MIKrovent 100 should be connected to 230V/50Hz mains power in accordance with the instructions using the supplied cable.

**ELECTRICAL CONNECTIONS SHOULD BE CARRIED OUT BY PROPERLY QUALIFIED PERSON.**

# ADVANTAGES OF MIKROVENT

- Ensures healthy, quality and energy-efficient ventilation of rooms with closed windows.
- Ensures up to 68% savings in costs of purchase, installation, operation and maintenance compared to similar competitive ventilation systems.
- Up to 4 times lower cost of initial investment compared to a central ventilation system.
- Requires no additional air distribution channels, in effect eliminating any cleaning and power consumption costs associated with air distribution along the channels.
- Maintains all the benefits of a closed window, such as burglary protection, noise reduction, heat insulation and insulation against external influences.
- Prevents draft, intrusion of dust and noise from the outside, growth of mould and favourable living conditions for dust mites.
- It is easy to use and enables full control of its operation (manual or automatic setting).
- Enables installation of humidity and/or CO<sub>2</sub>/VOC (volatile organic compounds) sensors.
- Provides an option to connect to a central monitoring system.
- By using quality washable fresh-air filters (F7, F8) it cleans incoming air and making life easier for individuals suffering from allergies.
- Can be installed discretely as part of the window's extended profile.
- Ideal for thermal remediation of existing buildings or in new buildings, as it requires no air distribution channels.
- Can be adapted to any window dimension.
- Ensures ventilation in accordance with the requirements of the SIST/EN standards and regulation on energy efficiency of building (PURES dated 1 March 2009).

## ISSUES WITH CLEANING OF AIR CHANNELS

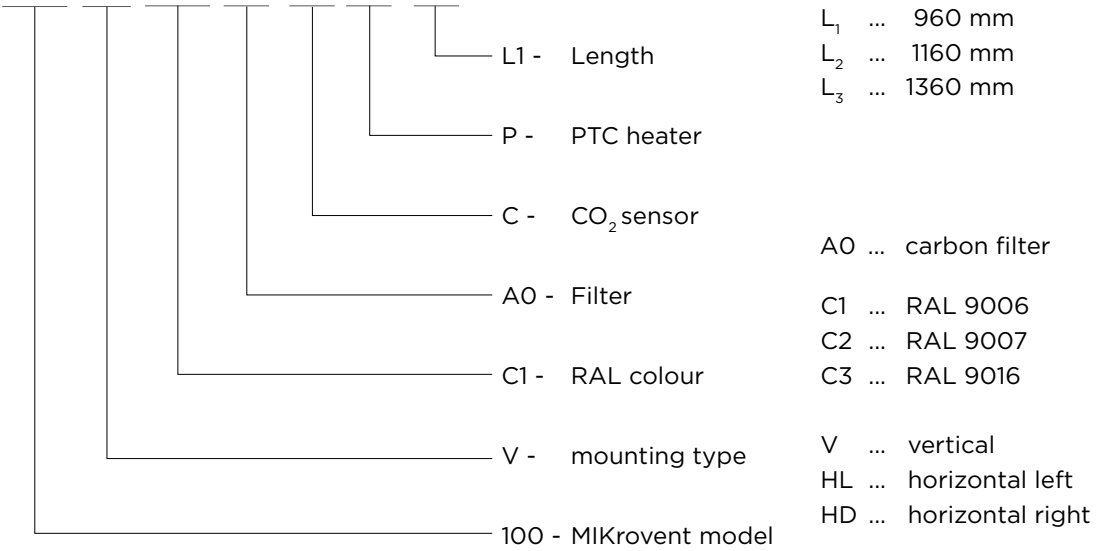
In the course of prolonged use, small areas of dirt tend to appear in the air channels of central ventilation systems providing excellent conditions for the growth of bacteria, mould and other harmful organisms. To prevent this, the channels must be cleaned and disinfected on a regular basis. This is necessary even with the best filters; even when the device is inactive some air circulation always occurs within the channels. Cleaning of smooth and rough channel surfaces with bends and transitions is an extremely demanding, difficult and relatively expensive procedure. Consequently, many countries are considering a ban on installation of central ventilation systems in apartments and individual buildings where their presence would cause significant cleaning difficulties. Local ventilation systems have none of these issues.

## MIKROVENT COLOURS



## ORDERING DESIGNATION

### MIKrovent 100/V/C1/A0/C/P/L1



# TECHNICAL DESCRIPTION

MIKrovent is a local ventilation device designed for installation on walls or above windows. It can be installed in new or renovated buildings. It features a remote control system and 4 modes of operation. The system is comprised of a counterflow high-efficiency heat exchanger - recuperator - and continuously-adjustable ventilators for incoming and outgoing air with electronically controlled high-efficiency motors. The device is equipped with two filters: class F7 filter for incoming air and G4 class filter for outgoing air. Upon request, the device may also come equipped with active carbon or reusable filters. The device also features an anti-frost protection system, two flaps for protection against external influences, two motorised shutters that tightly close the air inlet and outlet thereby preventing - particularly in high-rise buildings - the natural air circulation when the device is inactive. Additionally, the device also features automatic flaps in the inbound and outbound channels that are pushed open by the air flowing in or out of the device. Protective grates against precipitation, insects and wind are delivered with the device by default. The device has spatially separated connections for air intake and removal, which prevent the mixing of incoming and outgoing air.

