



# **VENTILATION OF THE FUTURE**

Individual. Automatic. Healthy.



# HAVE YOU EVER FORGOTTEN TO AIR YOUR HOUSE?

THEN YOU DO NOT NEED TO READ ON.

**You have obviously bought an I-tec ventilator from Internorm already and do not need to think about airing your house any longer.**

Internorm is therefore offering you windows where the ventilation is completely integrated into the frame. Even with closed windows, this ensures 24 hour of continuous fresh air and an optimum room climate.

## **Why is airing actually that important?**

Fresh air is enormously important for your health. Fresh air ensures;

- Comfortable well-being
- Good sleep
- Improved concentration
- Better performance

## **What happens with poor airing?**

Humidity, CO<sub>2</sub> or other air impurities remain in the room. This can cause considerable damage:

- The structure of the building can be damaged through mould and humidity
- Your health is endangered by mould, pollen and house dust
- Heat is lost
- Security is lacking

## **How do I air correctly?**

For example, you can use decentral room ventilation. It ensures perfectly fresh air – fully automatic and individual for each room.



# IS AUTOMATIC VENTILATION BETTER THAN CONVENTIONAL AIRING?

WE SAY YES – 11 DEFINITE ADVANTAGES ARE SUGGESTING THIS:



## FRESH AIR FOR HEALTHY LIVING

Specific supply of fresh air is an absolute 'must' for our well-being and our performance. Fresh air also plays an important role in good, refreshing sleep. However, there is not always enough time to air rooms sufficiently. Automatic ventilation with an impressive air volume will supply each room with sufficient fresh air. Automatically, humid air, unpleasant smells and pollutants are exchanged for fresh air.



## FRESH AIR WITHOUT POLLEN LEVELS

Runny noses, stinging eyes, sneezing – as soon as the first pollen appear in spring, people with allergies need to close all their windows so no airing can occur. Opening of windows becomes unbearable for people suffering with hay fever. Thanks to the integrated pollen filter, the automatic ventilation keeps the pollen out. Only fresh, clean air comes inside – and you can breathe easily again!



## FRESH AIR WITHOUT MOULD

Room temperature, humidity and the right nutrients in the room can lead to mould becoming a problem. Mould likes damp, sealed off houses best. Automatic ventilation ensures continuous fresh air and airs specifically in areas where high humidity occurs such as in bathrooms or kitchens. – all this happens automatically. A humidity sensor activates the ventilation if the humidity is too high and guarantees perfect room climate during day and night.



## FRESH AIR WITHOUT DUST

Dirt and dust from outside sneaks invisibly into our houses and flats. In urban areas dust exposure is quite high. Open windows allows dust in freely. This is not the case with automatic ventilation. Integrated filters stop dust streaming in. All impurities stay behind and only pure, clean air reaches the inside.



## FRESH AIR WITHOUT DRAUGHTS

A small breeze and straight away we feel uncomfortable – open windows can create quite a draught inside the house when it is windy outside. Windows and doors can be slammed shut, sheets of paper can be whirled around and curtains can flap madly in the draught. The window remains closed with automatic ventilation. The used air is exchanged with fresh air via small slots – no chance for draughts!



#### FRESH AIR WITHOUT LOSING MUCH HEAT

The main conditions for modern architecture are: look after resources, act sustainably and save energy. Conventional ventilation, however, leads to big heat losses, especially during the cold season. Thanks to the integrated heat exchanger, heat recovery of up to 93 percent is possible. This makes energy loss a thing of the past. The extracted warm room air heats up the sucked in fresh air from outside.



#### FRESH AIR WITHOUT NOISE FROM THE OUTSIDE

Good sleep and fresh air simply belong together. However, leaving your window open at night can lead to disturbances. With automatic ventilation the window remains closed – even at night. You can enjoy the peace and are not disturbed by any noise from the outside, whilst benefiting from fresh air.



#### FRESH AIR WITHOUT THE RISK OF BURGLARY

Open windows are an invitation to any burglar. No need to worry about this with an automatic ventilation: your window remains closed, your protection against intruders remains intact. When leaving the house, you can be assured your belongings are safe and yet, the air exchange is taking place.



#### FRESH AIR WITHOUT THE RISK OF RAIN COMING IN

Quick – we need to get home – the windows are open! Threatening thunderclouds make us race home and leave what we're doing. An outburst of thundery showers can create a wet surprise. No longer! With automatic ventilation the window remains closed, the rain stays outside – kept off by the outside wall and the windows. And yet – inside you can enjoy fresh air as if your windows have been open all day long.



#### FRESH AIR CUSTOMISED FOR EACH ROOM

Who doesn't know misted up mirrors after a shower or a bath? High humidity in small rooms is the reason for this. However, in large rooms we often have the impression that the air is too dry and we end up with an itchy throat. Requirements on temperature levels in individual rooms can often differ greatly. Decentral automatic ventilations can regulate the intensity of the air exchange individually. Different operating levels and also a short-time turbo mode ensure maximum performance – depending on the room's requirements.



#### FRESH AIR WITHOUT ANY WORRIES – AUTOMATIC FUNCTION

Have I aired sufficiently today? This question will soon be a thing of the past. The automatic humidity control in automatic ventilation systems establishes the temperature and humidity of the room air automatically. As a result of this, the air exchange is taking place fully automatically – without you moving even as much as a single finger.



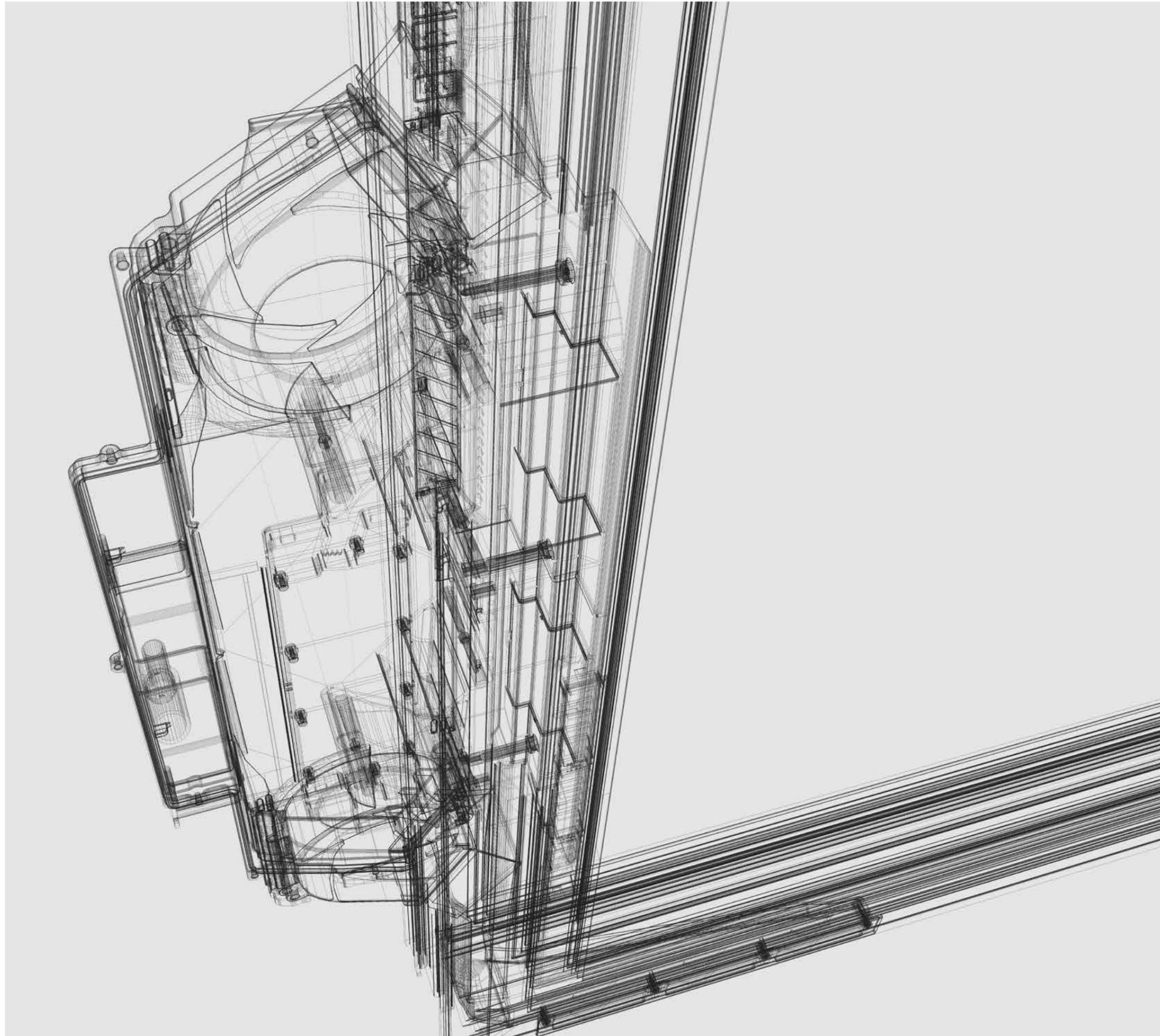
## WHY SHOULD I DECIDE FOR THE INTERNORM I-TEC VENTILATION?

BECAUSE YOU CAN RELY ON THEIR PERFECT QUALITY, FUNCTIONALITY AND MORE COMFORT.

Nowadays there are many central and decentral ventilation systems on offer when building or refurbishing your house. Often you will be spoilt for choice.

The decision does not have to be a difficult one. We will tell you why our I-tec Ventilation system is unique.

- The Internorm I-tec Ventilation is fully integrated into the window frame. This means – no additional fitting work and therefore reducing costs.
- The Internorm I-tec Ventilation is perfect for refurbishments. It can be retrofitted and can be installed without any effort.
- The Internorm I-tec Ventilation – due to its short air pipe – is easy to clean and therefore far more hygienic than central ventilation systems.
- The Internorm I-tec Ventilation can be individually controlled for each room. This offers the advantage to air each room specifically depending on temperature and humidity.
- The Internorm I-tec Ventilation offers a heat recovery level of 93 percent. Therefore, there are no heat losses when airing, you save energy and reduce CO<sub>2</sub> emissions.
- The Internorm I-tec Ventilation offers integrated pollen protection as standard.
- The Internorm I-tec Ventilation can easily be operated through a control unit on the window frame. Additionally, the ventilation can be controlled comfortably via tablet or smart phone with the I-tec Smart-Window App.
- Additionally, the Internorm I-tec Ventilation offers automatic control. An automatic humidity control determines temperature and humidity of the room air automatically. As a result of this, the air exchange takes place fully automatically.
- The Internorm I-tec Ventilation can be integrated into the UPVC or UPVC/aluminium window KF 410 as well as into the UPVC/aluminium window with integrated blinds KV 440.



# WOULD YOU LIKE TO KNOW MORE?

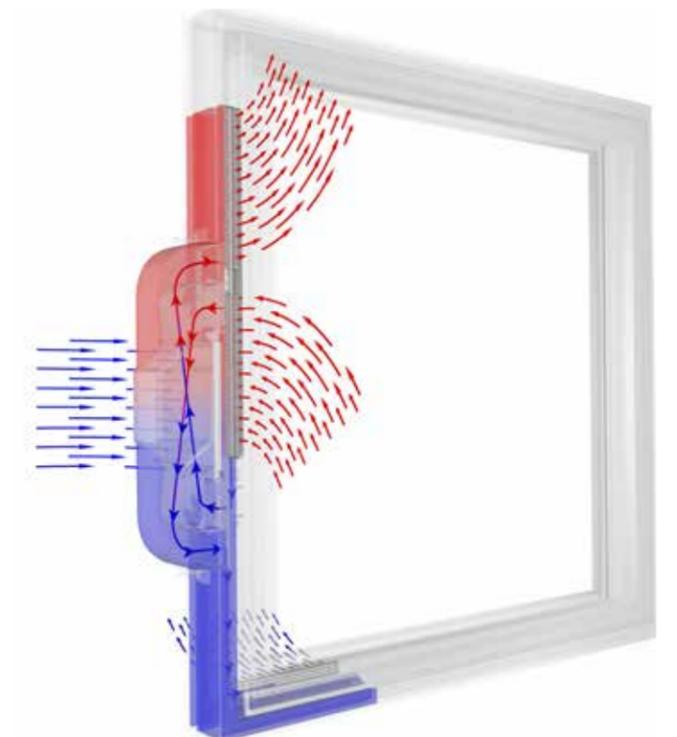
## TECHNICAL INFORMATION FOR YOU.

Energy efficient houses need to achieve a high air tightness. Change of construction methods as well as new heating systems encourage the formation of condensation. Correct airing is the only way to counteract this and to create a healthy living climate for your well-being.

Decentral domestic ventilation systems are less expensive to purchase and, due to their short air pipes, are more hygienic.

Internorm's IV 40 is a ventilation system which is integrated directly into the window frame. This offers numerous advantages:

- Each room can be air according to its needs
- The intensity of the air exchange can be regulated per room
- Short air pipes for better hygiene
- Problem-free fitting of ventilator in refurbishments
- The appearance of the facade remains undisturbed
- Simple and cost effective installation



# GENERAL INFORMATION ABOUT AIRING

## What is good air?

Good, healthy air consists of several quality criteria. The most important characteristics are air humidity, room temperature and CO<sub>2</sub> content. Pollen and dust also contribute.

## Why is airing so important?

Especially the CO<sub>2</sub> content in closed rooms is quickly exceeded. This causes headaches, dizziness and poor concentration.

How quickly the CO<sub>2</sub> content of 1500 ppm (inside room value in parts per million) is exceeded, is illustrated in the following three examples (acc. to own calculations):

Living room, 25m <sup>2</sup> , 3 people	< 2 h
Classroom, 70m <sup>2</sup> , 20 people	< 1 h
Office, 30m <sup>2</sup> , 4 people	< 1.5 h

Mould can be created through high humidity in a room. High humidity is easily reached. For example: a family of four loses about 12 litres of humidity a day. The largest source of humidity is cooking, showering and house work. Correct and consistent airing is therefore extremely important.

## Why is correct airing so difficult?

A good rule of thumb suggests to air two to four times per day for at least five minutes for good air exchange.

With this method, however, you will never know if sufficient air was exchanged.

The Internorm I-tec ventilator continuously measures the humidity in the room and, if necessary, activates the ventilation automatically. This ensures permanent perfect humidity in the room.

## Why is airing more important nowadays than years ago?

Our building envelopes are becoming tighter. Be it refurbishment or new buildings – due to new wall constructions, thermal insulation or high-quality glazing for windows, our houses are becoming increasingly air-tighter.

**The advantage:** energy losses have decreased and therefore heating costs have reduced.

**The disadvantage:** air which used to continuously circulate due to bad insulation or glazing, is kept out.

## How can I prevent energy loss while airing?

A ventilation system with heat recovery helps to save energy. Using the warm extracted room air the heat exchangers heats up the fresh sucked in air from the outside. The Internorm I-tec Ventilation recovers up to 93 percent of heat in this way.

# VENTILATION SYSTEMS

## What are the advantages of a decentral ventilation?

One big advantage is that each room can be controlled individually. This room-specific ventilation is also the basic condition for different temperature levels of the different rooms. Another advantage is the short distance between inside and outside. This avoids long pipes which are difficult to clean.

## How many ventilators per room will I need?

We recommend to fit one ventilator for each room. Sufficient supply of fresh air is important especially for rooms like bedrooms, bathroom, kitchen and living room. Larger rooms or rooms with higher demands would benefit from two ventilators.

## How much energy do I lose?

There is a heat exchanger integrated in the Internorm I-tec Ventilation which uses the energy of the used air. This achieves an efficiency level of up to 93 percent. With conventional airing this energy would be lost. Therefore, up to 20 kWh/m<sup>2</sup> of energy can be saved compared to conventional airing.

## Can the heat exchanger ice up?

No. The software of the ventilator includes anti-frost protection. If there is danger of the heat exchanger icing up, the anti-frost protection switches on automatically. The air volume is controlled in such a way which rules out icing up. If necessary the ventilator also switches itself off.

## Does the heat exchanger need maintenance?

No. However, the heat exchanger can be removed and rinsed with water. You must not use any aggressive cleaning materials. Ensure that the heat exchanger is completely dried out again before installing it.

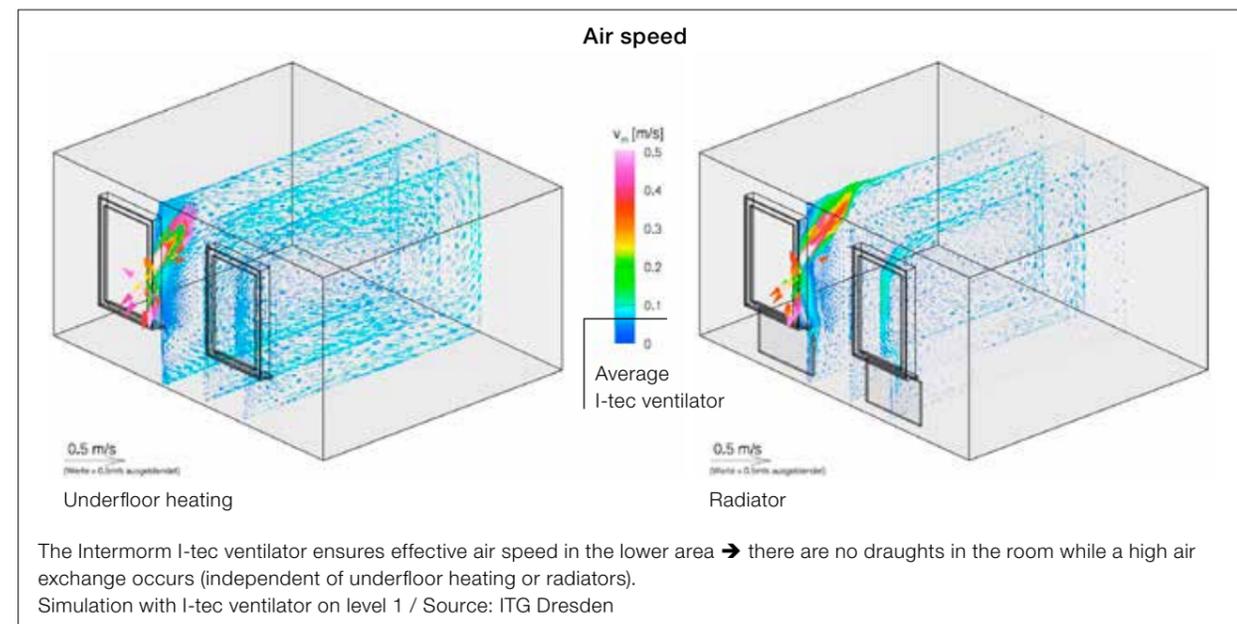
## How does the air flow work?

The air flow occurs through integrated air channels in the window frame. Therefore, no wall openings in walls or facades are necessary. Also the created condensation is led to the outside via the air channels in a controlled way. The channels were kept as short and smooth as possible to improve the air current and avoid dirt building up. Changes of air flow direction are carried out in an optimised way.

## How can the ventilator be closed?

Both inside flaps can be closed. This prevents air entering the room from the outside if the ventilator is switched off. This also prevents draughts.

If the ventilation flaps are closed while the ventilator is in operation, the ventilator automatically switches off and switches back on at the previously set level once the flaps are opened again.



# PLANNING

## During planning, what do I need to consider in regards to construction connections?

Look out for the wall opening and the cover on the side of the ventilator. Further, the housing should not directly touch the wall to minimise noise transmission.

## What happens during a power cut?

No problem. The Internorm I-tec Ventilation switches back on as soon as power is restored and returns to the previously set level.

## Can the ventilator be included in the house control?

Yes. The I-tec ventilator IV40 is integrated into the Internorm building control I-tec SmartWindow and can be controlled with it.

Through the building control the following functions can be controlled manually or via a timer:

- Increase ventilation level
- Decrease ventilation level
- Directly call up a ventilation level from scenes or tasks
- Switch on/off automatic mode
- Switch on turbo mode
- Switch off ventilator completely

## Can the adjacent ventilation grids cause a ventilation short circuit?

The air flow behaviour was investigated at the Institute for Technical Building Services in Dresden. There is a very low probability for this.

## Does use of the ventilator cause an over pressure or negative pressure in the building?

Generally, ventilation control works in such a way that a slight negative pressure occurs (acc. to interpretation of DIBt guide line for domestic ventilation). This, however, is massively overlaid by pressure conditions in the building or the pressure/suction conditions due to wind loads.

When using an open fireplace or a gas fired boiler, please contact your chimney sweep. If necessary, when using a fire place an additional pressure controller has to be fitted in the room for complete safeguarding.

## Is it possible to retrofit a ventilator into an existing window?

No. The ventilator has to be ordered when the window is being ordered. Retrofitting of the ventilator due to the complex milling of the UPVC profile is not possible.

## Is the I-tec ventilator IV40 also usable in refurbishment?

Yes, the IV40 is especially suitable in refurbishment, as without any extra effort (only by purchasing the window) a decentral ventilator can be integrated.

# FILTER

## Is there a pollen filter?

A pollen filter class M5 is used already as standard filter in the Internorm I-tec Ventilation.

## Are the filters washable?

No, the filters are not washable and need to be replaced by new filters when the red LED lights up.

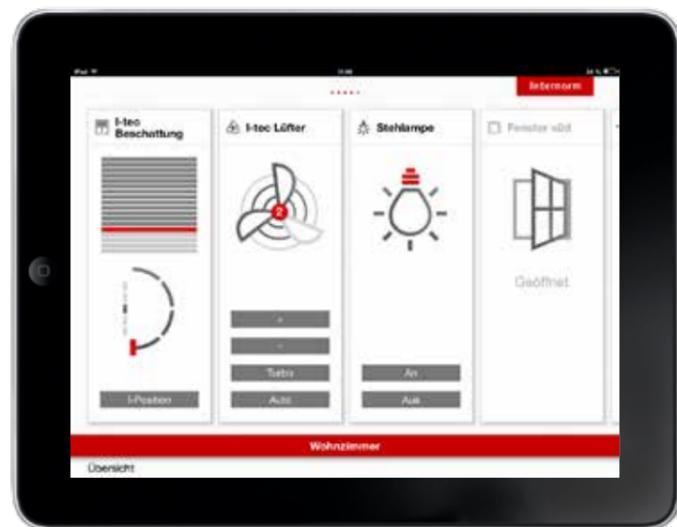
## How often do the filters need to be changed?

A required filter change is indicated through a continuous red shining LED on the operating unit. The filter needs to be changed approx. once a year.

Experience shows that the filters become dirtier quicker during the spring months than during the summer months.

## Why do I need to change the filters once a year?

Due to hygienic reasons the filters need to be changed once a year. Another reason is the lack of air permeability due to dust settling on the filter.



Google Play



App Store



# WINDOWS

## Which window systems can the I-tec ventilator be integrated?

Internorm's intelligent ventilation system can be integrated into the UPVC or UPVC/aluminium window KF 410 and into the UPVC/aluminium window with integrated blinds KV 440.

## What do I need to consider with the Blower door test?

During the Blower door test all ventilation grids, like with any other ventilation appliances, need to be sealed off.

## Does the ventilator affect the thermal insulation of the window?

Due to the small area of the ventilator compared to the rest of the frame or window, there is only a slight worse-

ning of the  $U_w$  value. Partly there is also an improvement, as additional air chambers are created by the channels. There is virtually no difference.

### KF 410 UPVC & UPVC/ALUMINIUM WINDOW

- Thermal insulation**  $U_w$  up to 0.62 W/m<sup>2</sup>K
- Sound protection** Soundproofing up to 45 dB
- System description** 90 mm construction depth
  - Passive house certified in the standard version acc. to ift Rosenheim
  - Fully concealed hardware
  - Continuous all around fixing of glass pane for better stability, thermal and sound insulation, burglary protection and safe functioning
  - Standard security
  - 5 chamber system with highly thermally insulating thermal foam



### KV 440 UPVC/ALUMINIUM WINDOW WITH INTEGRATED BLIND

- Thermal insulation**  $U_w$  up to 0.64 W/m<sup>2</sup>K
- Sound protection** Soundproofing up to 45 dB
- System description** 93 mm construction depth
  - Sun and privacy protection integrated between the panes and therefore protected
  - Fully concealed hardware
  - Continuous all around fixing of the glass pane for better stability, thermal and sound protection, burglary protection and safe functioning
  - 5 chamber system with highly thermally insulating thermal foam



# CONTROL

## Why is there a turbo mode?

This is best explained with an example:

You have a shower in the morning. This causes high humidity in the room. As you need to leave for work, there is no time left to air and the humidity stays in the room.

The turbo mode – where the ventilator runs for one hour on the highest level – ensures high air exchange and the humidity is quickly removed. When you return home from work in the evening, there is fresh air in the room. By reverting to the previously set level, not too much air is exchanged and therefore energy is saved.

## Is there a timer function for the ventilator?

By integrating the ventilator into the building control I-tec SmartWindow a time control of the ventilator can be carried out. A further option for time control can be a timer fitted on to the power supply.

## Is there a control of the ventilator available according to air quality?

The control according to air quality (CO<sub>2</sub>, VCO) is not possible yet.

An automatic humidity control for the room is also possible without an external control, as corresponding humidity sensors are built into the ventilator – see automatic mode.

## How does the automatic mode work?

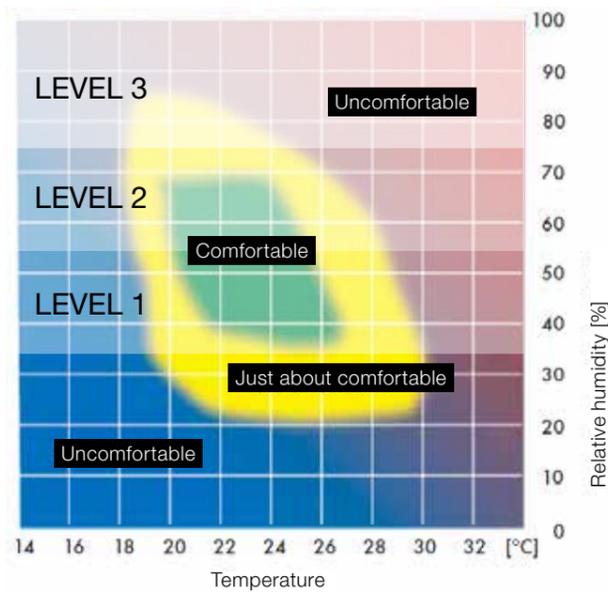
The automatic mode controls the ventilation levels via the room humidity. The relative humidity is measured via a humidity sensor in the ventilator housing. In doing so it is ensured that the relative humidity in the room according to the diagram always remains in the comfortable area.

## Why is the automatic mode deactivated if the outside temperature is higher than the room temperature?

If the outside temperature is higher than the room temperature, the automatic mode switches off and the ventilator is on STANDBY. This prevents that during certain weather conditions (high outside temperature and high humidity) the room humidity increases. Manual control is always available.

## Why does the ventilator switch off below 8°C room temperature?

Below 8°C room temperature safe operation of the ventilator can no longer be ensured, as the anti-frost protection mode is no longer working correctly below 8°C.



In automatic mode the ventilator switches automatically to the necessary service level determined by the humidity of the used air. When the fresh air temperature rises above the room temperature, the automatic function is switched off.



# TECHNICAL DETAILS

## GENERAL INFORMATION

	Air exchange	Power consumption	Efficiency
Stand-by		1.5 W	
Level 1	9 m <sup>3</sup> /h	6 W	93.2 %
Level 2	15 m <sup>3</sup> /h	8 W	86.9 %
Level 3	31 m <sup>3</sup> /h	24 W	77.4 %
Level 4 (turbo)	39 m <sup>3</sup> /h	36 W	73.9 %

Source: Institute HKL Stuttgart

Sound proofing	34 dB window	40 dB window	45 dB window
Example KF 410	4/18/4/18/4	6/18/4/16/4	44.2/14/6/12/44.2
Flaps closed	34 dB	37 dB	41 dB
Flaps open	34 dB	36 dB	39 dB

Source: Ift Rosenheim

The energy saved by airing with the heat exchanger is greater than the energy consumption of the ventilator. Average yearly electricity costs per ventilator amount to approx. £ 8.

