

VILPE[®]
Innovative and Easy



VILPE Sense

Design Guide

System Components

- **VILPE ECo Sense or VILPE ECo FLOW roof fan.** The system may contain several fans, in which case each is connected to a single control unit with sensors (VILPE Sense basic kit).
- **VILPE Sense Basic kit mob.** At least two sensors must be connected to one control unit: an indoor control sensor and an outdoor control sensor. A maximum of five sensors can be connected to the control unit.
- **VILPE Sense Mobile base station.** Required for cloud connection.
- **Possible additional sensors.**



Functions

The VILPE Sense system measures the temperature and relative humidity of roof structures or crawl spaces. It also measures the outdoor air temperature and relative humidity. Based on these measurements, an algorithm developed for VILPE Sense calculates, among other things, the corresponding absolute humidity values in order to set roof fan to the appropriate speed.

The algorithm specifically uses absolute humidity values for control, as warm air can contain much more water than the same volume of cold air, and relative humidity alone is not an indication of the amount of moisture in the structure or the outside air.

Suitable structures

The VILPE Sense system is suitable for ventilating and monitoring a wide range of structures as required. It is designed primarily for the ventilation and monitoring of roof structures and ventilated subfloors or crawl spaces. VILPE Sense can also be used to cool roof structures in summer.

All that is required for the system to work is some air circulation in the space being ventilated and sufficient replacement air. On low-pitch roofs, the replacement air is usually provided by negative pressure vents or from under the eaves. The better the circulation of air in the space to be ventilated, the better the system will work.

The algorithm monitors and adjusts the speed of the roof fan (and hence the ventilation of the structure) to keep the humidity levels and temperature as appropriate as possible. In other words, the system aims to keep conditions in the structure as unfavourable as possible for mould and microbial growth. Thanks to an intelligent algorithm, the system can also be used to cool roof structures in summer.

The measurement data is collected and stored in the VILPE Sense cloud service, where it can be further analysed if necessary. It is also possible to set alarm limits for the temperature or humidity level measured by each sensor.

The insulation on a low-pitch roof is best ventilated when the insulation has ventilation grooves and a collector channel at the roof fan and negative pressure vent pass-throughs. Even if the insulation has no ventilation at all, the airflow provided by VILPE Sense helps to keep the structure dry.

In ventilating a base level or crawl space, the location of the replacement-air vents or Ross ventilation poles plays an important role, as the air must circulate as fully as possible throughout the ventilated space.

The area to be ventilated must be a single, open space, or exhaust ducting must be built into the base levels to circulate air through all parts of the area.

Sizing and layout

Ventilation of roof insulation on a low pitch roof

On a low-pitch roof, one roof fan and the VILPE Sense basic kit can be used to ventilate and monitor an area of around 200m².

The system works best with insulation with ventilation grooves. In a new building, it is necessary to include collector channels in the insulation for the roof fan and the negative pressure vents, to allow air to circulate through all the ventilation grooves in the insulation.

If the insulation does not have ventilation grooves or cavities, the roof fan mounted on a negative pressure vent, and any other negative pressure vents, should be raised slightly to achieve better airflow. The aim is to have an air gap of 5-10 mm between the underlay and the insulation at the point where the vent is installed. A piece of the insulation material can be used to raise the vent.

The VILPE ECo Sense roof fan can be installed directly onto a roof-mounted negative pressure vent. With the supplied adapter, it fits either 110 mm or 160 mm outer diameter pipes or negative pressure vents. In general, it is best to place the roof fan at the roof's highest point.

If there are fire breaks in the structure, a roof fan and Sense basic kit must be installed in each section to be monitored. 1-3 additional sensors can be installed per Sense basic kit.

An existing roof will usually need to be opened to allow additional sensors to monitor potential leak risk locations. The best places for additional sensors are, for example, insulation around inlets and roof drains, or other areas with a higher risk of leakage.

Ventilation of the attic or roof void on a steep pitch roof

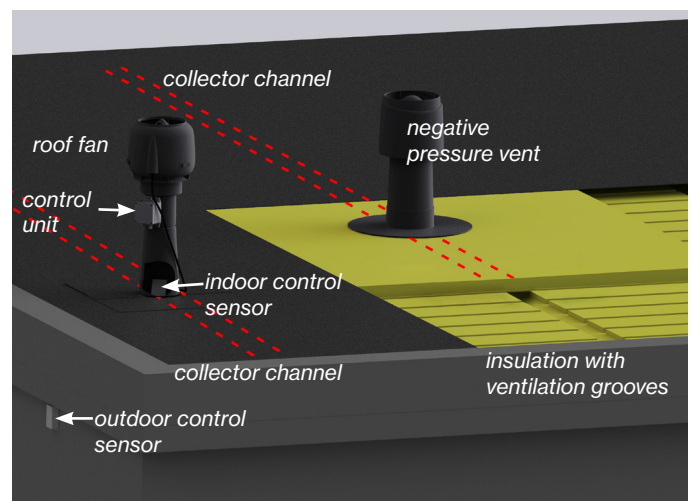
The VILPE Sense system can ventilate the attic or roof void (but not an attic room). The choice of roof fan is based on the air volume: the air in the ventilated space should change once every two hours when the roof fan is running at half power.

If the roof has negative pressure ventilation, the VILPE ECo Sense roof fan (suitable with the supplied adapter for either 110 mm or 160 mm pipes, or negative pressure vents) can be installed directly in place of the existing ventilation pipe.

Otherwise, a VILPE ECo FLOW roof fan with a suitable pass-through should be selected. Replacement air must be provided in the ventilation space if it is not available, for example from under the eaves.

If there are fire breaks in the structure, a dedicated roof fan and Sense basic kit should be installed in each section to be monitored.

In order to monitor the ventilated space in more detail, 1-3 additional sensors per Sense basic kit can be installed, for example within mineral wool insulation at the ends of the roof space.



Ventilation of a crawl space or other ventilated base levels

The choice of roof fan is based on air volume: the air in the ventilated space should change once every two hours when the roof fan is running at half power. A VILPE ECo FLOW roof fan and pass-through, suitable for the air flow, is recommended.

The ventilated space must have Ross ventilation poles or other vents for replacement air. The vents should be located so that air can circulate throughout all parts of the base level (including near corners). Replacement air openings should be sized appropriately so that the negative pressure is not too great, nor that the opening is too large for the amount of air to be ventilated.

New buildings

If the space to be ventilated is complex in shape or consists of separate sections, it is usually sensible to design an exhaust air ducting system. This allows the capacity of the roof fan to be distributed as desired to all sections of the ventilated space.

The exhaust air ductwork must be piped into the structure up to the roof, where the roof fan and VILPE Sense control unit will be installed. If the area to be ventilated is a single open space, then an exhaust duct from the base level to the roof is sufficient.

Installation and set-up

Note the serial numbers of the control units and sensors of all basic kits before installation. You should also mark the sensors to indicate which are indoor and which are outdoor sensors. The serial numbers can be written down in the installation manual, or the model labels can be photographed.

The fan is installed on the roof, either in place of a negative pressure vent or in a suitable pass-through. Power supply to the roof fan should be provided in accordance with the installation instructions. The control unit of the Sense basic kit should be installed alongside the roof fan, and the fan's control cable should be connected to the control unit according to the base kit's instructions.

Existing buildings

The same guidelines for ventilating base levels apply as for new buildings. Note that it may be difficult to build ductwork or run an exhaust duct through the structure to the roof afterwards.

Install the indoor control sensor so that it measures the temperature and humidity of the exhaust air from either the top or the bottom of the exhaust air duct. In order to monitor the humidity levels more closely, 1-3 additional sensors can be installed, for example in corners where there is no ventilation opening.

An indoor control sensor should be installed to measure the temperature and humidity of the exhaust air from the ventilated space. The outdoor sensor should be installed, for example, under the eaves, where it will not be exposed to direct sunlight, nor buried under snow in winter. If necessary, additional sensors can be installed for more detailed monitoring.

Register the products from the basic kit with their serial numbers in the VILPE cloud service at sense.vilpe.com
Registration instructions are also available at vilpe.com/sense-installation

Once the devices are registered and the electricity is connected, the first readings will be available in the cloud within 2-6 hours.