VILPE® Sense

VILPE SENSE GUIDEBOOK

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VILPE®
Innovative and Easy

Contents

1. WARNINGS, SAFETY AND COMPLIANCE

1.1. Safety and Warning Signs

⚠ DANGER Indicates a hazardous situation that, if not avoided, **will result in death or serious injury.**

⚠ WARNING Indicates a hazardous situation that, if not avoided, **could result in death or serious injury or damage.**

⚠ CAUTION Indicates a hazardous situation that, if not avoided, **could result in minor or moderate injury or damage.**

NOTICE Indicates information that is important but not directly related to personal injury. Could include practices for safe operation, equipment protection, or property damage avoidance.

1.2. General Safety Warnings

vilpe.com/usa/sense-installation

⚠ DANGER If a leak is suspected or alarms indicate high moisture, keep people and pets away from visibly bulging, sagging, or water stained ceilings and walls. Water laden gypsum can collapse without warning.

⚠ DANGER If water has entered electrical boxes, luminaires, or junctions, do not energize circuits. Have a qualified electrician inspect before power is restored. Wet electrical equipment can cause shock or fire.

⚠ WARNING When working on rooftops, always comply with all applicable laws, regulations, and safety requirements. Use caution when handling sharp tools, drills, or other cutting equipment.

⚠ WARNING Prolonged high moisture in wood framed roofs/walls leads to decay and loss of strength. Wood at sustained high moisture content supports fungal decay; repair leaks promptly.

⚠ WARNING Visible mold or persistent musty odor: occupants may experience coughing, wheezing, or asthma exacerbation. Address the moisture source and consider professional remediation for extensive growth.

⚠ WARNING Only an authorized and adequately qualified electrician may install the electrical connections.

⚠ WARNING System contains wireless sensors with lithium battery. Risk of fire and burns. Do not open, crush, heat above 140 °F (+60 °C), or incinerate. Do not attempt to open or replace the battery.

⚠ CAUTION Sensors are installed inside structures. Do not drill, cut, crush, puncture or heat areas where sensors may be located. Recycle devices/batteries at approved collection points – never in household trash.

⚠ CAUTION Do not expose sensors to liquid water or > 95 % RH for > 30 days.

NOTICE Unauthorized modifications may void the user's authority to operate this device.

1.3. Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible party:

VILPE USA LLC, 6402 Thornberry Court, 45040 Mason Ohio, Greater Cincinnati USA

NOTICE Mobile Base Station CCU-2 meets FCC radiation exposure limits. Keep at least 7.87 in (20 cm) between the antenna and any person during use.

2. SYSTEM OVERVIEW

The VILPE Sense system is a building protection solution designed to monitor and manage moisture in roof and wall structures. It consists of two main solutions: Leak Detection and Humidity Control. These solutions can be used separately or together, depending on the requirements of the building.

The Leak Detection solution monitors moisture inside structures with wireless sensors installed in the insulation layer, for instance. The sensors measure humidity and temperature, and if abnormal values are detected, the system generates an alert. The high-moisture area can be viewed on the VILPE Sense cloud service, which displays a humidity map of the monitored structure. A mobile base station collects data from the sensors and transmits it to the cloud. This enables early detection of leaks and supports targeted repairs.

The Humidity Control solution prevents excess moisture from accumulating in structures by adjusting roof exhaust fan operation based on real-time measurements. Wireless sensors are installed inside the roof structure and outdoors. The system compares the absolute humidity of both environments and regulates fan speed to optimize drying conditions. This reduces the risk of mold, rot, and insulation damage while also lowering energy consumption. The basic kit includes two wireless sensors and a control unit. A control unit is connected to a roof exhaust fan with speed-controlled EC motor (0-10 V).

Both solutions communicate wirelessly with the mobile base station and the cloud service. System data can be monitored remotely, and integration with building automation systems is available through an API or Modbus. The wireless sensors are battery-powered and have a long service life, reducing the need for maintenance.

The VILPE Sense system provides continuous monitoring, early leak detection, and automatic humidity management. This combination improves building durability, lowers repair costs, and supports energy-efficient operation.

3. VILPE SENSE LEAK DETECTOR

3.1. Design Guide

3.1.1. System Components

VILPE Sense Leak Detector Sensors (RHT-2)

The intelligent VILPE Sense leak sensor detects, locates, and alerts about leaks and other moisture issues. The sensors are installed in the insulation layer of a flat roof and are spaced approximately 13–16 ft (4–5 m) apart. A density of 10 sensors per 2,150 ft² (200 m²) is recommended. To ensure the same installation depth, the sensor can be attached to a suitable long VILPE Croco mount (sold separately). The system also requires a VILPE Sense Mobile Base Station (sold separately) to function. Suitable for roofs or walls. The package includes 10 sensors (RHT-2).

VILPE Sense Mobile Base Station (CCU-2)

Required for cloud connection. Receives data from VILPE Sense Leak Detector sensors (RHT-2) and Control Units (MCU-2) in the smart roof system. Uploads and stores the data directly to VILPE's cloud service for analysis and future use. One Mobile Base Station can be linked with up to 50 Control Units and 200 Leak Detector sensors (RHT-2). The device includes a pre-installed SIM card, which is activated upon purchasing a data subscription from VILPE. An Ethernet (RJ45) port is also available for connecting to the cloud via a local area network (LAN), eliminating the need for a SIM card or data subscription. CCU-2 can also act as a Modbus server for integration with local Building Automation Systems (BAS).

VILPE Sense Leak Detector (RHT-2).

VILPE Sense Mobile Base Station (CCU-2)

3.1.2. Installation of the Leak Detector Sensor (RHT-2)

The Leak Detector sensor (RHT-2) is designed to be installed in the roof insulation of a flat roof, but it can also be installed in many other constructions where temperature and/or humidity conditions needs to be monitored. The sensor measures the condition through the holes located at the pointed end of the sensor. Typically, the sensor's pointed end should be positioned below the midpoint of the insulation.

⚠ WARNING When working on rooftops, always comply with all applicable laws, regulations, and safety requirements. Use caution when handling sharp tools, drills, or other cutting equipment.

⚠ CAUTION Do not expose sensors to liquid water or > 95 % RH for > 30 days.

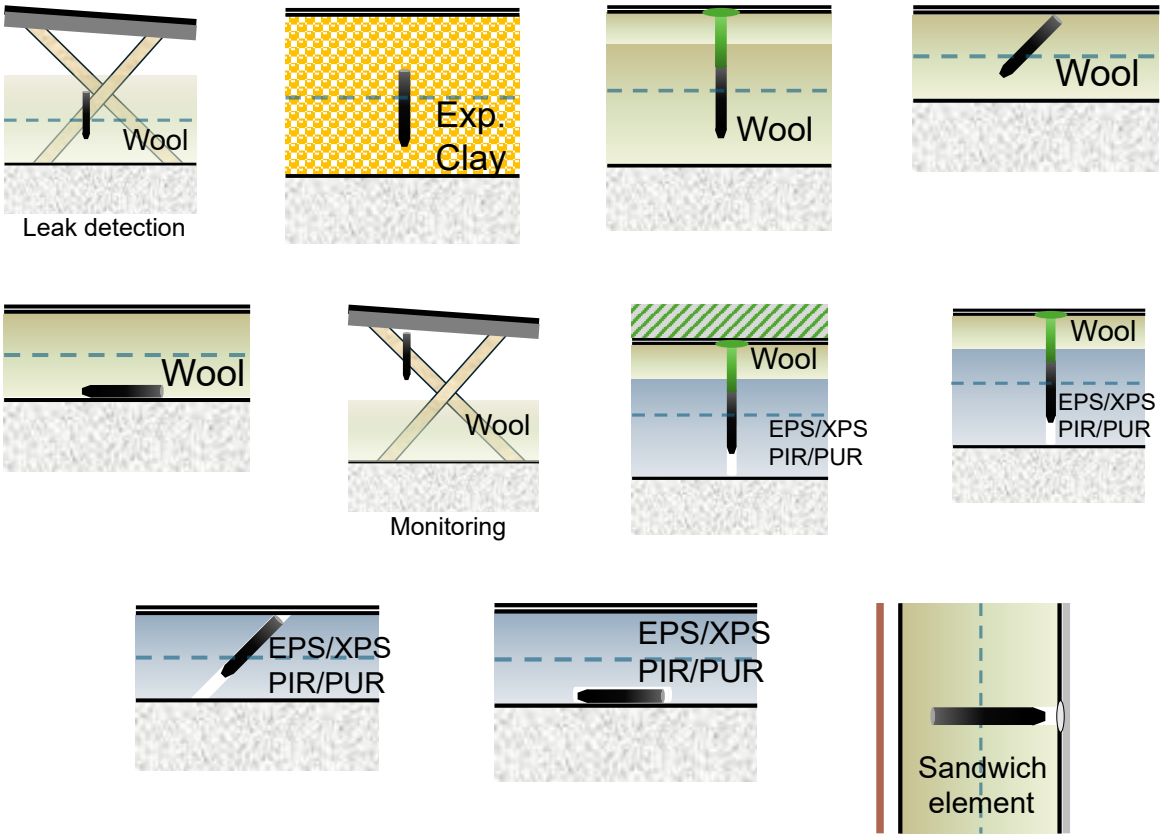
⚠ CAUTION When drilling a hole for the sensor, do not penetrate any vapor barrier that may be located beneath the insulation. Damaging the vapor barrier can compromise the building's moisture protection and lead to condensation or structural issues. If a vapor barrier is present, choose a drilling location and depth that avoids puncturing it.

Example of installing an RHT-2 sensor on a flat roof:

- It is recommended to install the sensors in the site at the same depth. It is recommended to use a Croco fastener to control a sensor's installation depth.
- The sensor can be installed either directly in the roof insulation before the roof membrane is installed or through the roof membrane. You can install the sensor vertically or in other positions. For example, if the insulation thickness is less than 6 inches (150 mm), the sensor can be installed diagonally or horizontally. In this case, the sensor is installed without the Croco fastener.

- If needed, drill a hole with a 25/32" (20 mm) drill through the roof membrane and/or insulation to the desired installation depth for the sensor. If the insulation material is rigid (such as EPS, XPS, or PIR), it is recommended to drill a hole through the insulation board. This way, the water that has flowed onto the vapor barrier and the resulting moisture rise can be detected by the sensor more quickly in the event of a potential leak.
- If the sensor is installed with a Croco fastener, insert the sensor into the hole until it reaches the base of the Croco fastener.
- Seal the installation site waterproof with a new piece of roof membrane.
- The recommendation is to install the sensors 13-16 ft (4-5 m) apart.

Installation examples



3.1.3. Installation According to Your Project Schedule

VILPE Sense Leak Detectors (RHT-2) can be conveniently installed at different stages of a construction project. Here are three options.

1. Sensor Installation Before Installing the Underlay Membrane or PVC Roofing

The biggest advantage of this installation timing is that no holes need to be drilled into the waterproofing membrane. This eliminates the need for patching and keeps installation work costs low. However, this option requires special care to ensure that the sensors are placed accurately according to the plan. It is also important to ensure that the fasteners used for securing the underlay membrane do not damage the already installed sensors. The installation work must also be carefully planned to prevent the roof structures from being exposed to weather conditions for an extended period.

2. Sensor Installation After the Underlay Membrane Installation, Before Installing the Waterproof Roofing

Installing sensors at this stage offers several advantages. The work can be carried out separately from the roof construction work, allowing for easier and more accurate positioning of the sensors, for example by measuring and marking the installation locations on the membrane in advance.

With no time pressure, the measurements can be done more carefully, and the sensor installation and registration in the cloud service can be done systematically, reducing the likelihood of errors.

Additionally, only one or two people are needed for the installation and registration of the sensors. This installation phase also ensures that the roof structures remain protected from the elements, and the work can be scheduled according to the weather.

Retrofit installation on a finished roof offers the same flexibility as the previous option. Additionally, the sensor locations can be easily marked on the roof with paint, for example. Retrofit installation requires drilling holes in the roofing material for the sensors. These holes must be patched, and the patches will remain visible on the roof.

3.1.4. When Should VILPE Sense Leak Detectors Be Registered?

VILPE Sense Leak Detectors (RHT-2) can be registered at different stages of a construction project. Choose the timing that best suits your project. Registering the Leak Detectors is essential for the system to create an accurate humidity map that reflects the locations of the detectors and the conditions of the structures. In all cases, the first step is to create a site plan in the cloud service.

Installation and Registration of Leak Detectors During Roof Construction

Description: The Leak Detectors (RHT-2) are installed and registered in the cloud service during roof construction. The installer registers the detectors using their smartphone as they are placed in the structures. The smartphone is used for both registration and reading the site plan.

Benefits: This option minimises errors in the placement of the detectors. The plan can be adjusted flexibly if, for example, a detector needs to be installed in a different location than originally planned. Using QR codes makes registration easier, eliminating the need for manual entry of serial numbers.

Challenges: Using a smartphone on the roof can be difficult, especially in bad weather.

Registration of Leak Detectors After Installation Using Stickers

Description: The Leak Detectors (RHT-2) are registered after installation. During installation, additional stickers from the product packaging are affixed to the printed site plan and used later for registration, possibly in office spaces.

Benefits: This option provides flexibility during installation. The detectors can be registered conveniently in the office, and there is no need for a smartphone on-site. QR codes make registration easier.

Challenges: Handling the printed site plan on the roof can be challenging, and the additional stickers may get damaged in humid weather.

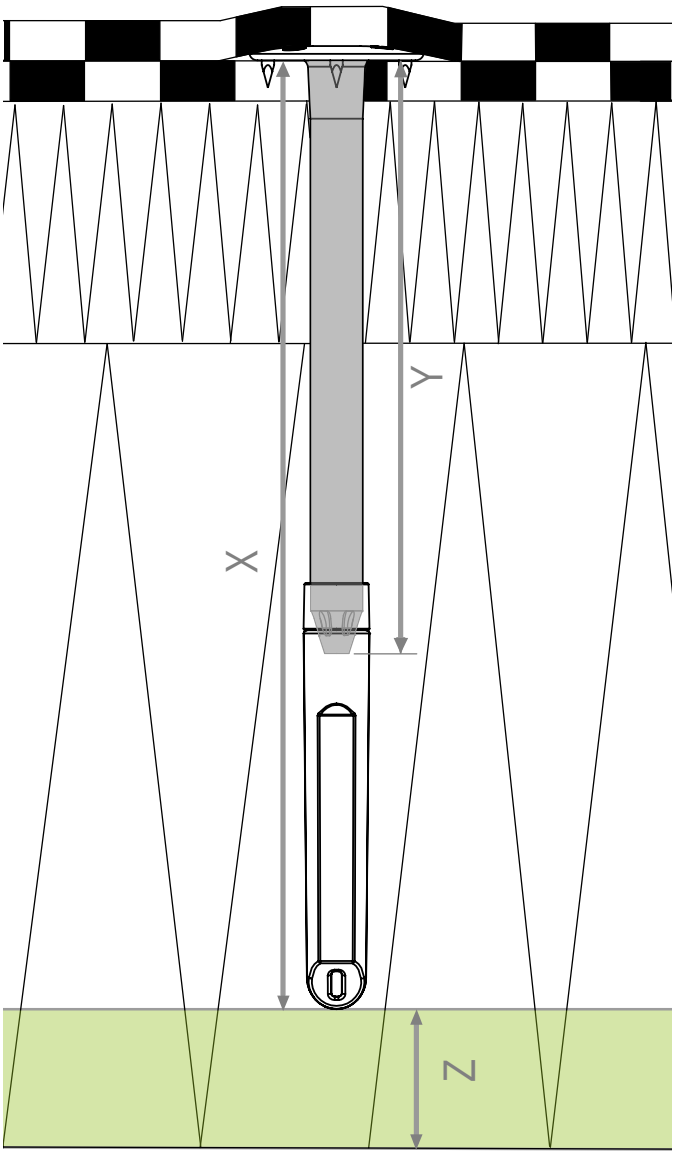
Registration of Leak Detectors Before Installation Using Stickers

Description: The Leak Detectors (RHT-2) are registered in advance before installation. The locations of the detectors are marked on the printed site plan, and the product packages are labelled so that the correct detector can be linked to the right location on the site map.

Benefits: Using QR codes and pre-registering the products in the office simplifies the process, eliminating the need for a smartphone during installation.

Challenges: Making changes to the plan after registration can be difficult, and there is an increased risk of incorrect installation.

3.2. Recommended Croco Length for Leak Detector



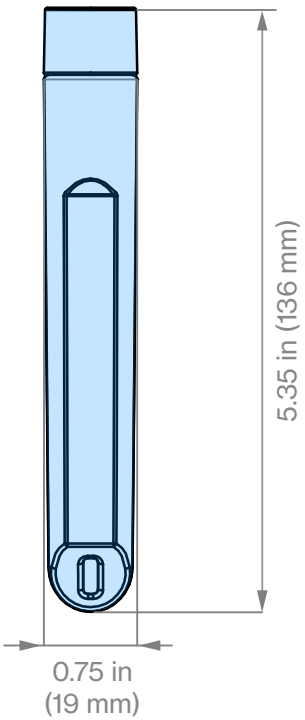
⚠ CAUTION

When drilling a hole for the sensor, do not penetrate any vapor barrier that may be located beneath the insulation. Damaging the vapor barrier can compromise the building's moisture protection and lead to condensation or structural issues. If a vapor barrier is present, choose a drilling location and depth that avoids puncturing it.

X Sensor depth (in)

Y Croco A/B

Z Leeway / Distance to vapor seal



Insulation depth (in)	Croco A/B Y	Sensor depth (in) X	Leeway (in) Z
< 6	-	-	-
6.3	20	5.3	1.0
6.7	20	5.3	1.4
7.1	20	5.3	1.8
7.5	20	5.3	2.2
7.9	50	6.5	1.4
8.3	50	6.5	1.8
8.7	50	6.5	2.2
9.1	80	7.7	1.4
9.4	80	7.7	1.8
9.8	80	7.7	2.2
10.2	100	8.5	1.8
10.6	100	8.5	2.2
11.0	120	9.3	1.8
11.4	120	9.3	2.2
11.8	120	9.3	2.6
12.2	150	10.4	1.8
12.6	150	10.4	2.2
13.0	150	10.4	2.6
13.4	170	11.2	2.2
13.8	170	11.2	2.6
14.2	200	12.4	1.8
14.6	200	12.4	2.2
15.0	200	12.4	2.6
15.4	230	13.6	1.8
15.7	230	13.6	2.2
16.1	250	14.4	1.8
16.5	250	14.4	2.2
16.9	250	14.4	2.6
17.3	250	14.4	3.0
17.7	250	14.4	3.3
18.1	300	16.3	1.8
18.5	300	16.3	2.2
18.9	300	16.3	2.6
19.3	300	16.3	3.0
19.7	300	16.3	3.3
20.1	350	18.3	1.8
20.5	350	18.3	2.2
20.9	350	18.3	2.6
21.3	350	18.3	3.0
21.7	350	18.3	3.3
22.0	400	20.3	1.8
22.4	400	20.3	2.2
22.8	400	20.3	2.6
23.2	400	20.3	3.0
23.6	400	20.3	3.3
24.0	450	22.2	1.8
24.4	450	22.2	2.2
24.8	450	22.2	2.6
25.2	450	22.2	3.0
25.6	450	22.2	3.3
26.0	500	24.2	1.8
26.4	500	24.2	2.2
26.8	500	24.2	2.6
27.2	500	24.2	3.0
27.6	500	24.2	3.3
28.0	550	26.2	1.8
28.3	550	26.2	2.2
28.7	550	26.2	2.6
29.1	550	26.2	3.0
29.5	550	26.2	3.3
29.9	600	28.1	1.8
30.3	600	28.1	2.2
30.7	600	28.1	2.6
31.1	600	28.1	3.0
31.5	600	28.1	3.3

4. VILPE SENSE HUMIDITY CONTROL SYSTEM

4.1. Design Guide

4.1.1. System Components

- **Electronically Commutated (EC) roof exhaust fan with 0-10 V (DC) control.**

  The system may contain several exhaust fans, in which case each is connected to a single control unit with sensors (VILPE Sense Basic Kit).

- **VILPE Sense Basic Kit**

  Includes Control Unit (MCU-2) and two wireless Sensors (RHT-1). Requires a Mobile Base Station (CCU-2) to connect to the cloud service. Each Control Unit must have at least two connected Sensors: one indoor control Sensor and one outdoor control Sensor. A maximum of five Sensors can be connected to a single control unit.

- **Possible additional Sensors (RHT-1).**

- **VILPE Sense Mobile Base Station (CCU-2)**

  Required for cloud connection. Receives data from VILPE Sense Leak Detector sensors (RHT-2) and Control Units (MCU-2) in the smart roof system. Uploads and stores the data directly to VILPE's cloud service for analysis and future use. One Mobile Base Station can be linked with up to 50 Control Units and 200 Leak Detector sensors. The device includes a pre-installed SIM card, which is activated upon purchasing a data subscription from VILPE. An Ethernet (RJ45) port is also available for connecting to the cloud via a local area network (LAN), eliminating the need for a SIM card or data subscription. CCU-2 can also act as a Modbus server for integration with local Building Automation Systems (BAS).

VILPE Sense Basic Kit Mob.

VILPE Sense Sensor (RHT-1)

VILPE Sense Mobile Base Station (CCU-2)

4.1.2. 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 exhaust 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.

The algorithm monitors and adjusts the speed of the roof exhaust 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.

4.1.3. 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 the structures will have 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.

In every building project, ensure that air can move at least slightly within the insulated space. Typically, air can move if mineral wool is used as insulation. If rigid insulation materials such as EPS, XPS, or PIR are used and the waterproofing material is glued or welded to the insulation, air will not be able to move within the insulated space unless there are ventilation grooves in the insulation. The type of roofing material used can also affect ventilation; for example, air typically can move between a mechanically fastened PVC membrane and the insulation.

The insulation on a low-pitch roof is best ventilated when the insulation has ventilation grooves and a collector channel at the roof exhaust 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.

4.2. Sizing and Layout

4.2.1. Ventilation of Roof Insulation on a Low Pitch Roof

On a low-pitch roof, one roof exhaust fan and the VILPE Sense Basic Kit can be used to ventilate and monitor an area of around 2150 ft^2 (200m^2).

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 exhaust 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 exhaust 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 13/64 to 25/64 (5-10mm) in 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.

If there are fire breaks in the structure, a roof exhaust fan and Sense Basic Kit must be installed in each section to be monitored.

The indoor control Sensor (RHT-1) is placed inside the exhaust air duct equipped with a roof exhaust fan, on top of the insulation. The outdoor control Sensor (RHT-1) is installed, for example, under the eaves in a location that is not exposed to direct sunlight and will not be covered in snow in winter. The maximum operating range of the Sensors (RHT-1) from the Control Unit (MCU-2) is typically 130-330 feet (40-100 m).

Often, there are various structures between the Control Unit (MCU-2) and the Sensor (RHT-1) that can cause signal distortion, reflection, or attenuation. In particular, metal sheeting or thick or multiple heavy structural layers between the Control Unit and the Sensor can significantly shorten the signal range. Typically, a reliable 330 feet (100 m) operation range can only be achieved if there is a direct line of sight between the devices.

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.

4.2.2. Ventilation of the Attic or Roof Void on a Steep Pitch Roof

Roof Exhaust Fan Selection

The VILPE Sense system is suitable for ventilating attic spaces (but not an attic room) or open roof structures. The roof exhaust fan is chosen based on the required air volumes so that the air in the ventilated space changes once every two hours when the roof exhaust fan operates at half-power.

If the selected roof exhaust fan is too powerful and the air exchange rate at half-power is too high, the reference control voltage (default value 4 V) or the maximum control voltage (default value 9.5 V) of the control unit's algorithm can be adjusted in the cloud service. This allows for the ventilation rate to be set appropriately to the desired reference point.

Replacement air must be provided in the ventilation space if it is not available, for example from under the eaves.

If there are fire compartments in the structure, a dedicated roof exhaust fan and Sense Basic Kit should be installed in each section to be monitored.

Sensor Placement

The indoor control Sensor (RHT-1) is placed in the ventilated space near the exhaust ventilation point, such as on a roof truss. The indoor Sensor (RHT-1) is installed, for instance, under the eaves in a location that is not exposed to direct sunlight and will not be covered in snow in winter. The typical maximum operating range of the Sensors from the Control Unit (MCU-2) is 130-330 feet (40-100 m). Generally, on steep roofs, the distances are short, and sensor placement is easy.

When planning the ventilation for roof structures of larger warm halls, special attention should be paid to sensor placement. For example, if the Roof Fans and Control Units (MCU-2) are located at the ridge, placing the external sensor under the eaves might weaken the signal too much, depending on the distance and construction materials. Often, various structures between the Control Unit and the Sensor (RHT-1) can cause signal distortion, reflection, or attenuation. In particular, metal sheets or thick or multiple heavy structural layers between the devices can significantly reduce the signal range. In practice, a reliable range of 330 feet (100 m) is typically achieved only if there is a direct line of sight between the devices.

If alternative placement for the external Sensors (RHT-1) cannot be arranged, one solution is to place them in a separate ventilated plastic installation box. The installation box can be mounted on the roof of the hall or on a pole next to the building that extends above the roofline.

In order to monitor the ventilated space in more detail, 1-3 additional Sensors (RHT-1) per Sense Basic Kit can be installed, for example within mineral wool insulation at the ends of the roof space.

4.2.3. Ventilation of a Crawl Space or Other Ventilated Base Levels

The roof fan is chosen based on the required air volumes so that the air in the ventilated space changes once every two hours when the roof exhaust fan operates at half power.

If the selected roof exhaust fan is too powerful and the air exchange rate at half-power is too high, the reference control voltage (default value 4 V) or the maximum control voltage (default value 9.5 V) of the Control Unit's (MCU-2) algorithm can be adjusted in the cloud service. This allows for the ventilation rate to be set appropriately to the desired reference point.

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 exhaust 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 exhaust fan and VILPE Sense Control Unit (MCU-2) 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.

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 (RHT-1) so that it measures the temperature and humidity of the exhaust air from either the top or the bottom of the exhaust air duct. The outdoor control Sensor (RHT-1) is installed outdoors in a location that is not exposed to direct sunlight and will not be buried in snow in winter.

The maximum operating range of the Sensors (RHT-1) from the Control Unit (MCU-2) is typically 130-330 feet (40-100 m). Often, there are various structures between the Control Unit and the Sensor that can cause signal distortion, reflection, or attenuation. In particular, metal sheeting or thick or multiple heavy structural layers between the Control Unit and the Sensor can significantly shorten the signal range. Typically, a reliable operating range of 330 feet (100 m) can only be achieved if there is a direct line of sight between the devices.

In order to monitor the humidity levels more closely, 1-3 additional Sensors (RHT-1) can be installed, for example in corners where there is no ventilation opening.

4.3. Installation and Set-up

Note the serial numbers of the Control Units (MCU-2) and Sensors (RHT-1) 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 exhaust 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 exhaust fan should be provided in accordance with the installation instructions. The Control Unit (MCU-2) of the Sense Basic Kit should be installed alongside the roof exhaust fan, and the exhaust fan's control cable should be connected to the Control Unit according to the Basic Kit's instructions.

An indoor control Sensor (RHT-1) 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 covered in 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/usa/sense-installation

Once the devices are registered and the electricity is connected, the first readings will be available in the cloud within 12-24 hours.

4.4 Installation and Registration

There are two options for planning and registering VILPE Sense devices:

1. Pre-planning in the Cloud Service

In this method, a new site is created in the cloud using a site layout image. Planned device locations, basic information, and necessary links are added in Planning Mode. During installation, these planned devices can be registered one by one in their designated locations. After installation, all devices are visible on the site's humidity map.

This method is recommended for most installations. A complete procedure is available in Chapter 5: VILPE Sense cloud service and planning.

2. Direct Registration Without Pre-planning

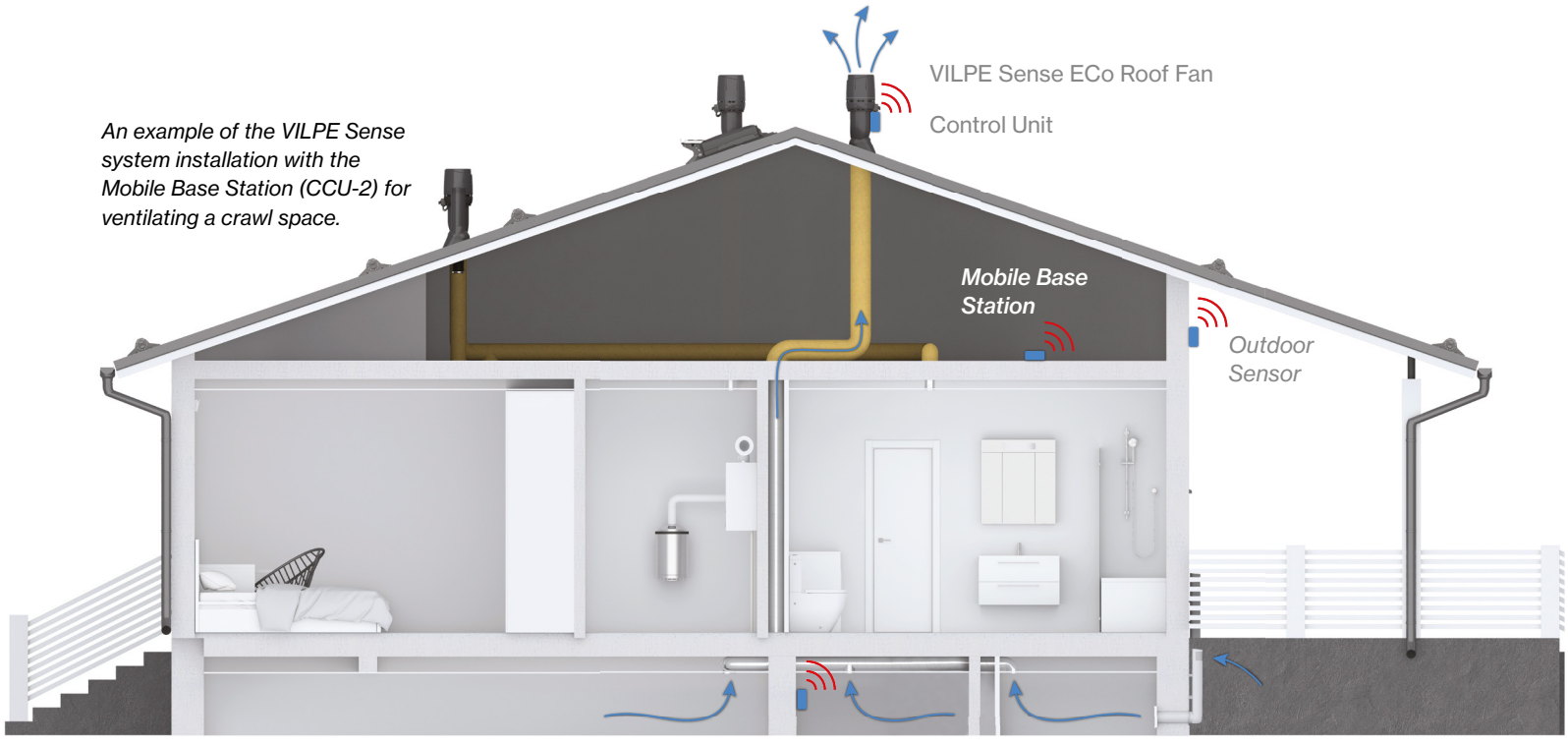
Use this method when installing a single Basic Kit and humidity mapping is not needed.

The Mobile Base Station (CCU-2), Control Unit (MCU-2), and Sensors (RHT-1) are registered as a new device without linking to a site layout. Devices will appear in the device list only. A layout can be added later, and the already registered devices can then be positioned on the humidity map.

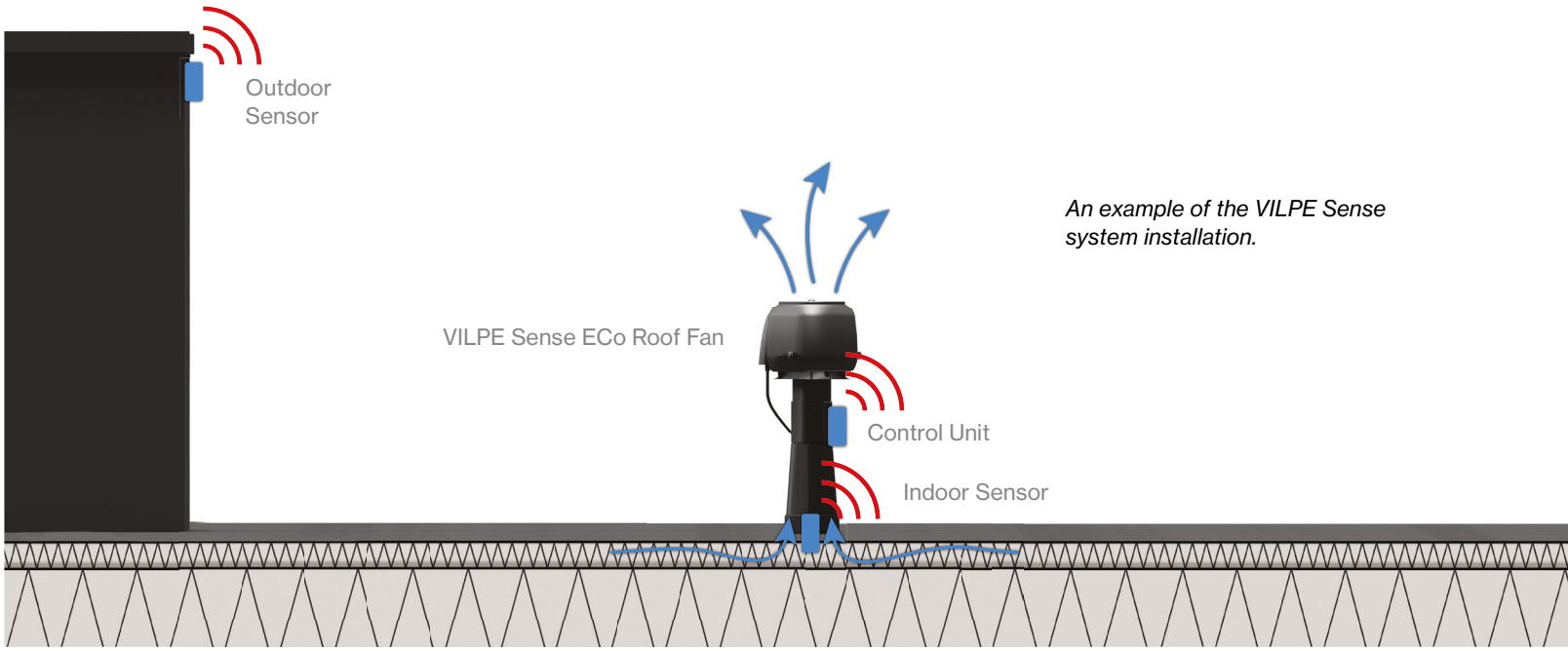
4.4.1. VILPE Sense Mobile Base Station and Basic Kit Installation and Registration

1. Before installing the Basic Kit, make sure the roof exhaust fan is turned off.
2. Record the serial numbers of the Basic Kit devices before installation. These are found on the nameplate (e.g., A123456ABCD).
    a. Take a photo or write them in the installation manual.
3. Install the Control Unit (MCU-2) on the side of the roof exhaust fan, and install the Sensors (RHT-1) according to the included instructions.
    a. Do not place the outdoor Sensor (RHT-1) in direct sunlight.
    b. Remove the red jumpers from the Sensors (RHT-1) before installation.
4. Turn on the roof exhaust fan.
    a. Initially, the Control Unit (MCU-2) supplies 10 V to the exhaust fan. After a few hours of charging, it reduces to 3 V until cloud connection is established.
5. Record the serial number of the Mobile Base Station (CCU-2).
    a. Take a photo or write it down in the installation notes.
6. Install the CCU-2 indoors, on the floor closest to the roof.
7. Visit sense.vilpe.com to register the devices.
8. If you don't have an account, click "Go to registering".
9. Enter the serial number of the CCU-2 and follow the website instructions.
    a. Don't forget to register the Control Unit (MCU-2) and the Sensors (RHT-1) on the next page.

For more information, please visit: vilpe.com/usa/sense



An example of the VILPE Sense system installation with the Mobile Base Station (CCU-2) for ventilating a crawl space.



An example of the VILPE Sense system installation.

5. VILPE SENSE CLOUD SERVICE AND PLANNING

5.1. Planning Instructions

5.1.1. Descriptions of VILPE Sense Device Types Used in the Cloud Service

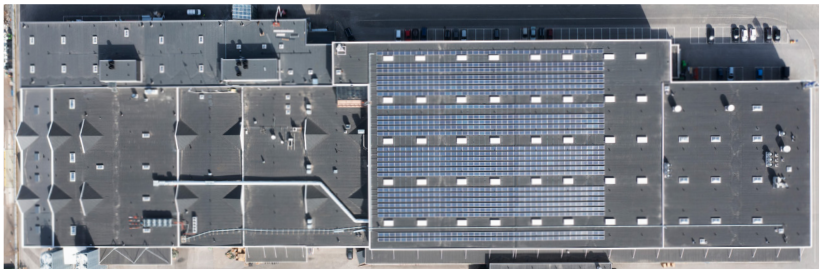
Device Type	Description
VILPE CCU-2	The Mobile Base Station CCU-2 is a gateway device through which the RHT-2 and MCU-2 connect to the cloud service.
VILPE RHT-2	The Sensor RHT-2 is a leak detection sensor that transmits data to the cloud service via CCU-2.
VILPE MCU-2	The Control Unit MCU-2 is a moisture management control unit that must be linked to a Mobile Base Station (CCU-2) to connect to the cloud service. It also always requires at least two Sensors (RHT-1) to function.
VILPE RHT-1	The Sensor RHT-1 is a moisture management sensor that must always be linked to a Control Unit (MCU-2) to function.

5.1.2. How to Use the Cloud Service in the Planning and Installation Phases

Before installing the VILPE Sense system, the installation needs to be pre-planned using VILPE's Sense cloud service at sense.vilpe.com through the browser on your computer.

During the planning phase, you enter information about the site and specify the VILPE Sense device locations in the system prior to installation. This allows you to only read the unique serial numbers of the devices being installed and register them to the corresponding devices in the plan during the installation phase. A mobile phone with a camera can be used to read the serial number from the device if the serial number label includes a QR code. Otherwise, the serial number is entered manually.

Before you can start planning the project in the cloud service, you must have valid user credentials for the system. You can create the user credentials in the system when registering the devices, but you will need the serial numbers of the devices for this. If you do not yet have access to physical devices or serial numbers, you can request user credentials via email from sales@vilpe.com or by submitting an inquiry through the web form at: https://www.vilpe.com/request-access/



Example of the site layout image

5.1.3. You Will Need a Site Layout Image for the Cloud Service

The purpose of the layout image is to describe the installation site as a two-dimensional area, including the shape of the roof as seen from above. It can be taken from the blueprint or a direct image of the roof from the air. You can also use an image from Google Maps. Ensure that all parts of the roof are in the correct proportions.

At least one actual measurement in site layout image should be known (in feet), such as the length of one side of the roof. If desired, you can also mark the measurements on the site layout image.

During the installation phase, it is easier to locate planned sensor positions in the construction site when there are some reference points visible on the site layout image, such as other technical equipment on the roof.

The site layout image should be in png, jpg/jpeg, or gif format (maximum size is 10 MB).

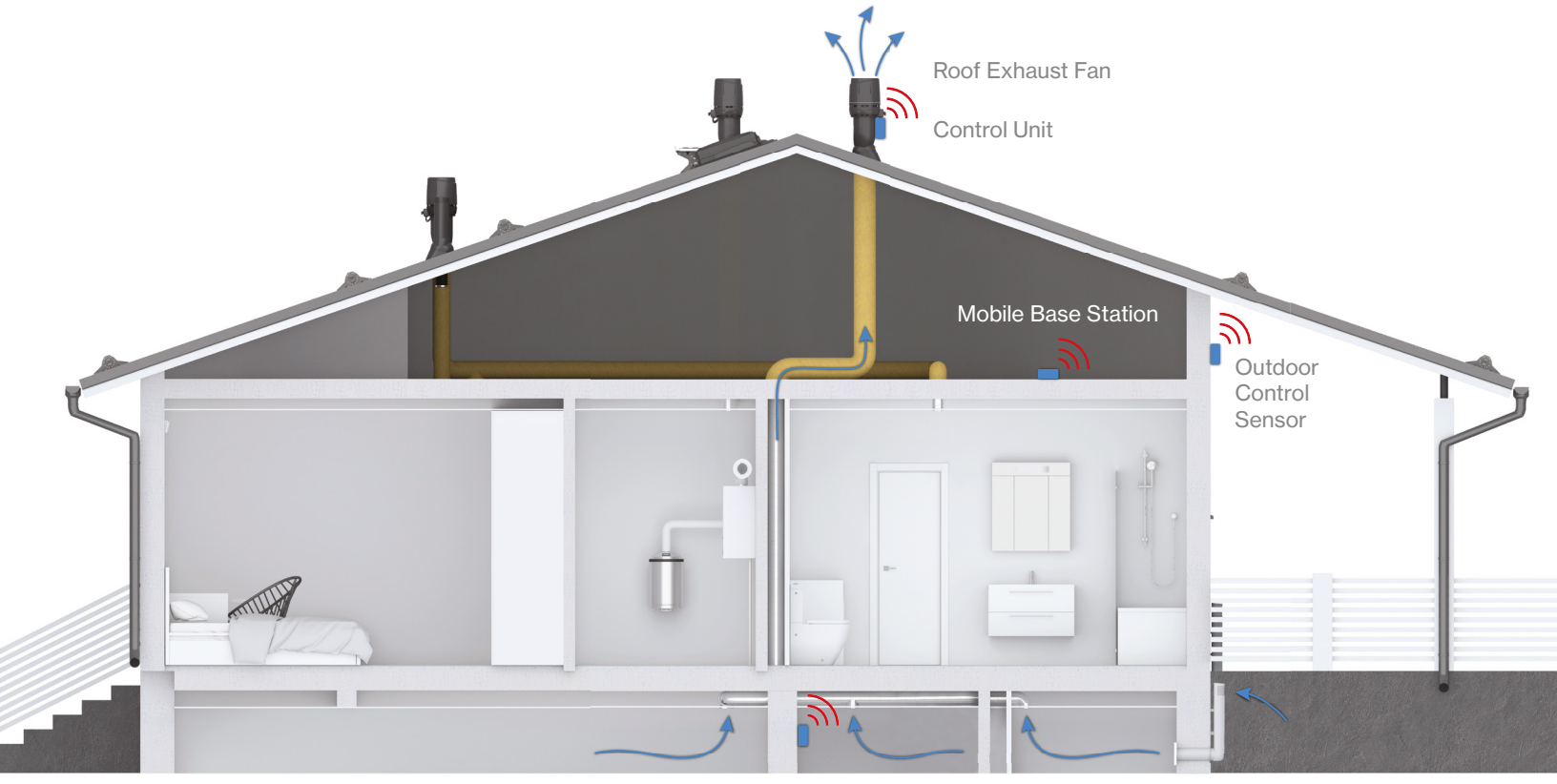
You can add your own annotations to the site layout image, such as names of different areas.

5.1.4. Instructions for Mobile Base Station

The maximum operating range between the Mobile Base Station (CCU-2) and the Sensors (RHT-2) depends on both the physical distance and the materials obstructing the signal between the devices. Heavy structures, such as concrete and metal, interfere with the signal the most. The actual operating distance between devices is typically 130-330 feet (40-100 m).

Number and Placement of Mobile Base Stations:

1. **Distance to metal surfaces:** Do not install the Mobile Base Station (CCU-2) or Control Unit (MCU-2) directly against metal surfaces or inside a metal enclosure. Aim to place the device at least 12-20 inches (30-50 cm) away from large metal surfaces. Avoid installing the devices in areas where the signal may reflect off multiple surrounding metal surfaces.
2. **Installation in open space:** Install the Mobile Base Station (CCU-2) at least 40-80 inches (1-2 m) above the ground or floor surface. If possible, choose a location where there is as much open space around the base station as possible.
3. **Minimize obstacles:** Avoid installing in locations where there is a large, direct metal obstacle, thick or multiple layers of heavy structures between the Mobile Base Station (CCU-2) and the device. However, corrugated metal roofing or reinforced concrete slabs usually do not cause significant signal interference.
4. **Distance to the base station:** Keep in mind that points 1–3 can significantly impact signal behaviour and may reduce the recommended maximum distance between the devices. Use the maximum distance as a guideline only if the requirements of points 1–3 are met.

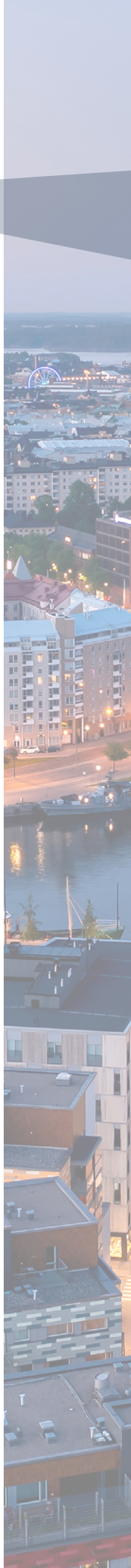


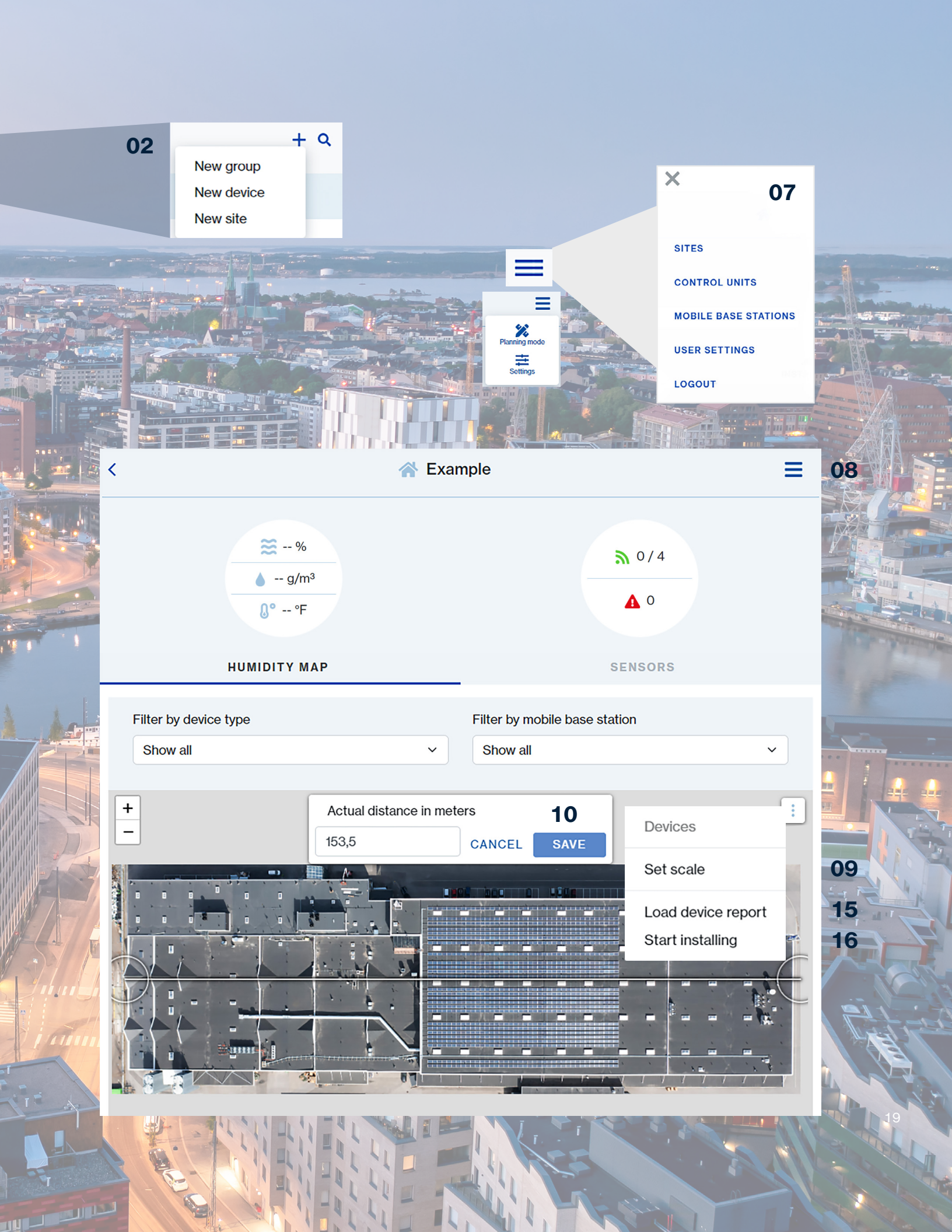
5. **Number of Mobile Base Stations (CCU-2):** The required number of Mobile Base Stations depends on the number of devices, distances, and possible obstacles. One Base Station can serve up to a maximum of 200 Leak Detector (RHT-2) sensors and 50 Control Units (MCU-2). Base Stations can be easily added to the system later if needed. If retrofitting additional Base Stations is not desirable, the system should be designed so that the estimated coverage areas of the Base Stations overlap sufficiently. This way, if the signal is weak, a device can be linked to use an alternative Base Station.

5.1.5. Planning Phase in the Cloud Service

1. Log in to VILPE Sense cloud service at sense.vilpe.com using your login credentials.
2. Select *New site* by clicking on the plus sign in the upper right corner to create a new site.
3. Provide a name for the site and upload a site layout image. Then click *Next*.
4. Optionally, specify the time of day you want the Leak Detector (RHT-2) sensors to measure humidity levels. This can be changed later.
5. You can set alarm thresholds for temperature and/or relative humidity, or based on percentage points above the average relative humidity. These settings can also be modified later. The alarm settings apply only to leak detection, and the alarm settings related to humidity control can be configured separately in the controller settings.
6. Once the settings are complete, click *Create*.
7. You will be taken to the *Sites* view, where the newly created site is displayed. Click on the site's name to open the *Humidity map* view. The actual humidity map will be displayed once the system has been fully planned and the devices have been registered.
8. Go to planning mode by selecting *Planning mode* from the menu next to the site name on the right side.
9. Set the scale for the site layout image by selecting *Set scale* from the menu icon (*three dots*) in the upper right corner of the view with the site image.
10. Move the endpoints of the visible line on the site layout image to mark the measurements. Enter the corresponding length in feet in the field, e.g., *153.5*, and then click *Save*.
11. If the Mobile Base Stations (CCU-2) or other devices have already been registered in the system for the respective site, you can add them to the plan (layout image) by selecting *Devices* from the menu icon (*three dots*). Choose the relevant device from the list and then click to place the device in your chosen location on the layout image. If this is not the case, you can proceed to the next step.
12. Add new devices to the layout image by left-clicking at the desired location on the layout image. From the form that opens, first select the device type and name the device if needed. Depending on the device type, necessary linkages, such as selecting a possible Mobile Base Station (CCU-2) or Control Unit (MCU-2), must also be made. The most recently selected Base Station or Control Unit is automatically pre-filled. The number of devices already linked to the Control Unit or Mobile Base Station is displayed below the selection box. Click *Add* when the desired settings are entered.
13. Optionally, you can move the planned device's position on the site layout image. First, select the device by clicking on its icon. Hold down the left mouse button over the highlighted icon and drag it to the desired location. If the device is already registered, you can move it as follows: select the device, open the device information menu, choose *Move device*, and click on the desired location on the layout image.
14. Add all devices to the site layout image in the same manner.
15. Once the plan is complete, you can generate a device report from the plan. The report can be downloaded by clicking the menu icon (*three dots*) and selecting *Load device report*. The report will include information such as the number of different types of devices added to the plan.
16. Optionally, you can activate the installation mode for the site, which prevents movement and addition of devices. If necessary, you can easily switch from installation mode back to planning mode to make changes to the plan.

    After the planning phase comes the installation phase. The site owner can invite the installer as a user through the site settings, creating the necessary user credentials for the installer. During the installation phase, the devices to be installed must be accessible to the installer. The installer logs into the cloud service using their own user credentials. It is recommended to first register the Mobile Base Stations (CCU-2) according to the plan before registering other devices.




02
New group
New device
New site
07
SITES
CONTROL UNITS
MOBILE BASE STATIONS
USER SETTINGS
LOGOUT
Planning mode
Settings
Example
08
-- %
-- g/m³
-- °F
0 / 4
0
HUMIDITY MAP
SENSORS
Filter by device type
Show all
Filter by mobile base station
Show all
Actual distance in meters
10
153,5
CANCEL
SAVE
Devices
Set scale
09
Load device report
15
Start installing
16

5.1.6. Installation Phase in the Cloud Service Using a Mobile Device

1. Log in to the VILPE Sense cloud service on your mobile device through the browser.
2. Go to the *Sites* view in the top left corner of the menu.
3. Select the site where the devices will be installed.
4. Choose *Planning mode* from the menu in the upper right corner.
5. When you are ready to start the installation, select *Installation mode.*
6. Tap on the icon of the device in the plan that you want to install. By tapping the icon, the device registration process will automatically start.
7. Enter the device's serial number or tap *Read QR code* if the device has a QR code.

   If the device has a QR code, you can use your mobile device's camera to read it. Refer to Chapter 5.2: *Reading QR codes with a mobile device* for more information.
8. Tap *Next* once the serial number has been entered.
9. Install the device in the location marked on the image and click *Register*.
10. Tap on the icon of the next device to be installed according to the plan.
11. Install all devices in the same manner.
12. Sensor activation is required for Leak Detector sensors (RHT-2) to make the site fully functional and to begin receiving measurements. Refer to Chapter 5.3: *Activating Leak Detector sensors (RHT-2)* for detailed instructions.

    After the installation, the site owner can deactivate the planning mode in the site settings, which means that only the owner can make changes to the site. If ownership needs to be transferred to another person (e.g., from the contractor's representative to the end user), it can also be done in the site settings. Ownership can be transferred to any user who has been added to the site. Ownership can be transferred to another user by selecting *Move ownership* from the menu next to the user (*three dots*). It is advisable to agree with the relevant user in advance before the ownership transfer. Once the ownership has been transferred, the new owner can log into the system with their login credentials.

5.2. Reading QR Codes With a Mobile Device

Each VILPE Sense device has a unique serial number printed on its type label. In addition, some devices – such as Leak Detector (RHT-2) sensors – also feature a QR code that contains the serial number.

To enable communication between VILPE Sense products and the cloud service, ***all devices must be registered*** to the cloud using their serial numbers.

Using QR codes can make the registration process faster and more convenient.

To get the most out of this feature, please review the following tips:

- You can use almost any mobile device with an internet connection, web browser, and camera.
- Recommended browsers:
  - Google Chrome (Android/iOS/PC)
  - Microsoft Edge (Android/PC)
  - Apple Safari (iOS)

There are two options for reading a QR code: *Scan code* (recommended) or *Read QR code from picture.*

5.2.1. Scan Code (Recommended)

- This mode automatically activates your camera and reads the QR code as soon as it is detected.
- On some mobile devices, you may be able to select which camera to use.
- Depending on the camera, zoom features may be available. *Note: Not all cameras support autofocus.*
- We recommend using a back-facing camera that supports 3x or 4x zoom and autofocus.
- You may need to test different options to find the best setup.
- Once a working setup is found, it will be remembered and automatically used for the next QR code scan.

5.2.2. Read QR Code From Picture

- This mode starts the camera, and the user must manually take a picture of the QR code.
- After capturing the image, it is shown to the user for review and approval.
- Once approved, the system attempts to recognize the QR code from the image.
- Use this mode only if you're unable to get a good result using Scan Code mode.
- Camera settings may vary depending on your mobile device, camera, or browser.
- *Note: Any custom settings used in this mode will need to be reconfigured manually each time you scan a new QR code.*

5.3. Activating Leak Detector Sensors (RHT-2) After Installation and Registration

To make the site fully functional and begin receiving measurements from the sensors, activation of Leak Detector sensors (RHT-2) is required.

Sensors are shipped from the factory in a deactivated state, meaning they do not transmit any measurements until activated. Each sensor must receive an activation signal from the Mobile Base Station (CCU-2) that was linked to it during the registration process.

Important: Sensor activation must be initiated separately for each CCU-2 at the site.

The activation process can take up to 24 hours to complete. After that, all linked sensors will be activated and begin functioning. You can monitor the activation status at any time from the CCU-2 settings.

Steps to activate Leak Detector sensors (RHT-2)

1. Go to the site where you want to initiate the sensor activation process.
2. Select the Mobile Base Station (CCU-2) from the humidity map.
3. Click on the Mobile Base Station name in the device information panel at the top of the humidity map. You will be redirected to the CCU-2 settings page.
4. On the settings page, locate “Activate sensors” and click “Begin activation.” Follow the on-screen instructions to start the activation process.
5. Repeat steps 1–4 for each CCU-2 at the site.
6. Monitor the activation status during the process, or check again after 24 hours to confirm completion.

5.4. Control Unit Adjustments for VILPE Sense Humidity Control

5.4.1. Modifying the Control Unit's Adjustment Algorithm Parameters

In some cases, it may be necessary to modify the parameter values of the Control Unit's (MCU-2) adjustment algorithm. It is important to note that the default values generally work best in most situations and consulting an HVAC professional or VILPE's technical support is recommended before making any changes.

The need to adjust parameters may arise in the following situations, for example:

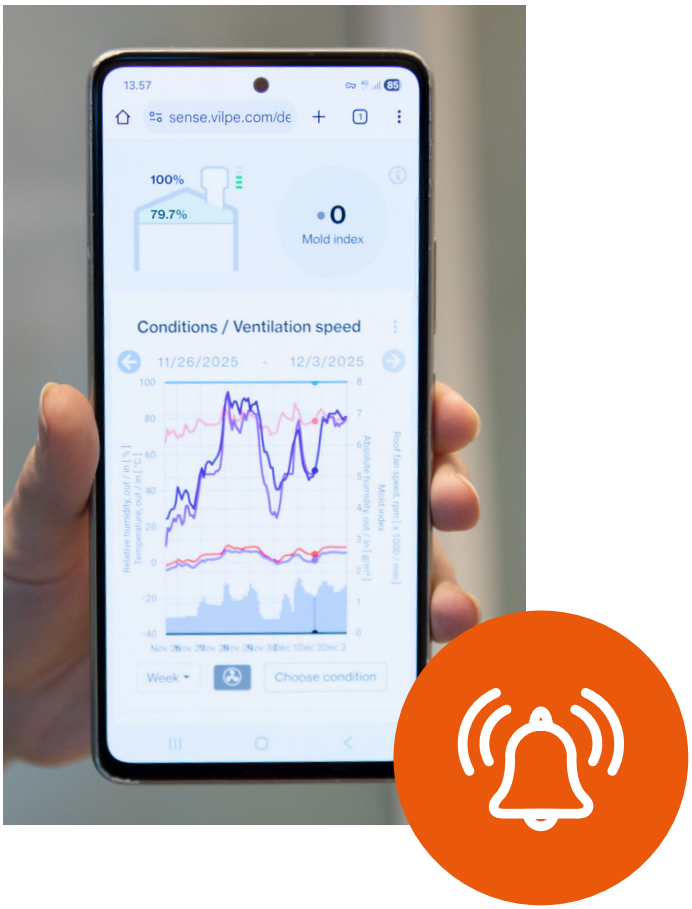
Oversized exhaust fan: If the selected exhaust fan is oversized for the ventilation requirements, modifying the adjustment parameters may be necessary to ensure optimal performance.

Special conditions: If you want the exhaust fan to stop completely as soon as the absolute humidity of the outside air is higher than that of the space being ventilated.

Temperature limits: If the fan needs to be stopped when the outdoor temperature falls below a certain level, parameter adjustments may be required.

5.4.2. Descriptions of Control Unit Adjustment Algorithm Parameters

Below are descriptions of the Control Unit's (MCU-2) adjustment algorithm parameters, including their adjustment ranges, default values, and important considerations.



Parameter (unit)	Adjustment range (step)	Default value	Description	Important considerations
Reference control voltage (V)	0...10 (0,1)	4	Reference control point of the roof fan, where the target/design ventilation air exchange rate is achieved.	The reference point set by the HVAC designer is based on the characteristics of the ventilated space and the selected roof fan. This value is essential for achieving the correct air exchange rate.
Maximum control voltage (V)	0...10 (0,1)	9,5	Maximum control voltage of the roof fan.	The algorithm controls the roof fan between the minimum and maximum control voltages. If the maximum control voltage is reduced, the maximum ventilation power is scaled down, which may be necessary in cases where the exhaust fan is oversized.
Minimum control voltage (V)	0...10 (0,1)	1,8	Minimum control voltage of the roof fan.	With the default value, ventilation is continuously active when the outdoor temperature is above the stopping temperature. If the minimum control voltage is set to, for example, 0 V, the algorithm scales down to zero, allowing ventilation to stop based on humidity conditions as well. Typically, the exhaust fan stops when the control voltage is below 1 V. This setting impacts energy efficiency and the system's response to changes in humidity conditions.
Stopping temperature (°F)	19...50 (1) (-7...+15 °C)	19 (-7 °C)	Ventilation stopping temperature. The exhaust fan is stopped when the outdoor temperature falls below this value.	By increasing the stopping temperature, ventilation stops more readily as the outdoor temperature drops.

- **Default values:** In most cases, the default values are optimized for common applications, ensuring efficient and safe system operation.
- **Documentation:** It is advisable to carefully document any changes made for future reference and potential adjustment restoration.

Additional Instructions:

- **Monitoring:** The effects of changes on system performance should be monitored regularly.
- **Safety:** Incorrectly set parameters can lead to inefficient operation or even damage to the system.
- **Interdependence with other settings:** Parameter adjustments may also affect other parts of the system, so a comprehensive review is important.

If you are uncertain about the suitability of the settings, we recommend contacting VILPE's technical support or a qualified HVAC professional to determine the correct values.

5.5. Alarm Settings

For the VILPE Sense Leak Detector and Humidity Control, it is possible to enable various alarms. It is recommended to activate these alarms immediately upon system installation. The recommended initial alarm settings can be found in the following tables. It is essential to regularly check the alarm settings and adjust them as necessary. The goal is to set the alarms to be sensitive enough without causing false alarms.

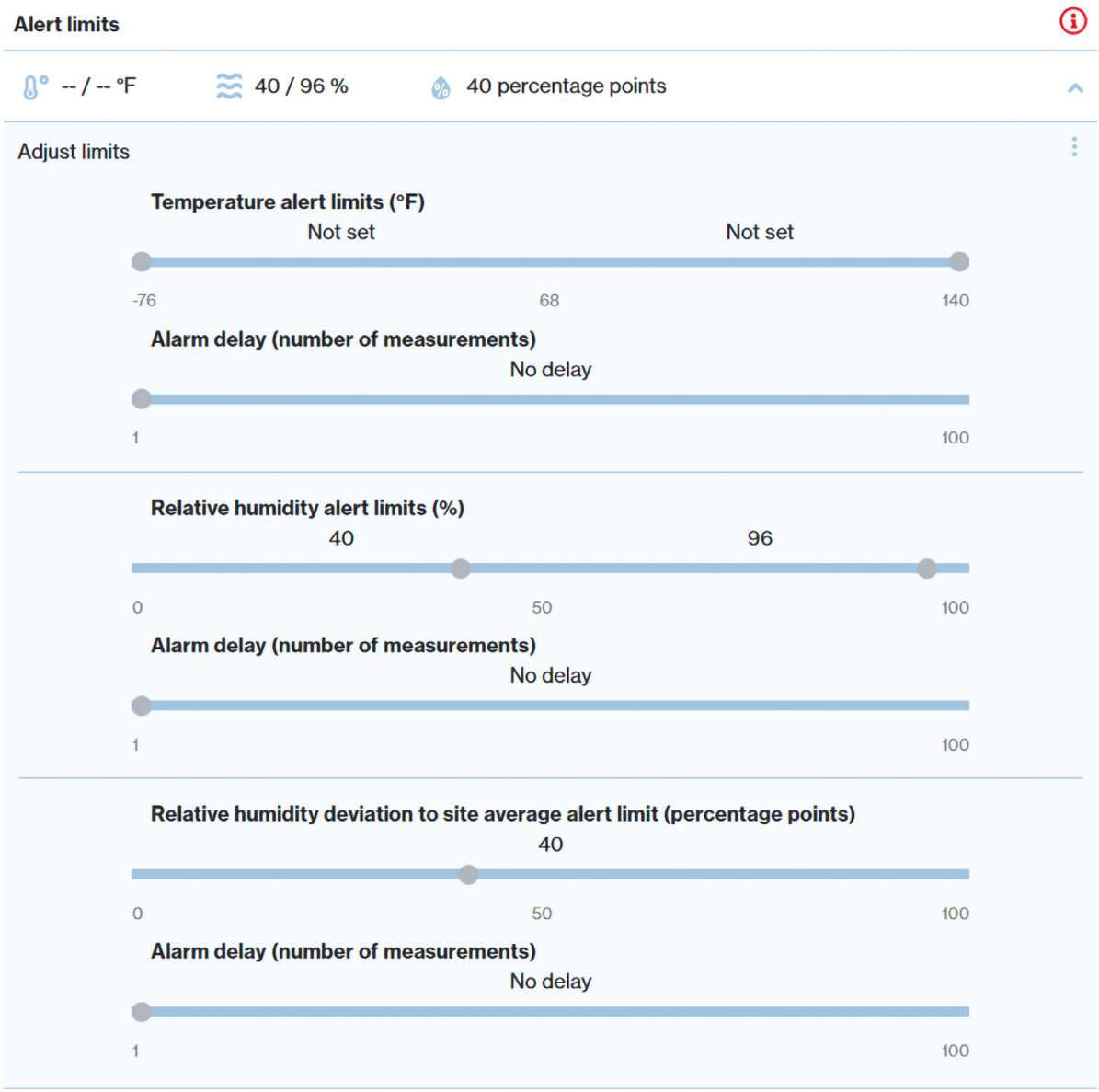
5.5.1. Alarm Types and Recommended Initial Settings:

VILPE Sense Humidity Control

Alarm type	Description	Recommended initial settings
Mold index	Mold index-based alarm. The alarm threshold is not user-adjustable. The alarm threshold for the mold index is 2.5.	Mold index alarm on.
Relative humidity	Alarm when the relative humidity measured by the sensor is above or below the alarm threshold continuously for at least the alarm delay time.	Indoor Sensor (RHT-1): • Upper limit: 90 % • Alarm delay: 12 measurements (24 hours)
Temperature	Alarm when the temperature measured by the sensor is above or below the alarm threshold continuously for at least the alarm delay time.	

VILPE Sense Leak Detector

Alarm type	Description	Recommended initial settings
Relative humidity deviation from average	The alarm is activated when the relative humidity measured by a single sensor deviates from the average of all sensors continuously for at least the alarm delay time. If the deviation setting is 20 percentage points and the sensor average is 55 %, the alarm threshold is 75 % (55 % + 20 %).	• Deviation: 20 percentage points (*Note:* The average of the sensors must be below 79 %) • Alarm delay: 4 measurements (48 hours)
Relative humidity	The alarm is activated when the relative humidity measured by the sensor is above or below the set alarm threshold continuously for at least the alarm delay time.	• Upper limit: 90 % • Alarm delay: 4 measurements (48 hours)
Temperature	The alarm is activated when the temperature measured by the sensor is above or below the set alarm threshold continuously for at least the alarm delay time.	



5.6. VILPE Sense Cloud Service – User Access Management

The core principle of user access management in the VILPE Sense cloud service is that the owner account has full control over the sites and devices it owns. The owner is considered the top-level operator responsible for one or more sites or for managing the service provided to the end-user.

All other participants are referred to as users. The owner can assign various access rights to different users, typically based on the tasks and responsibilities agreed upon.

5.6.1. Access Roles and Permissions

Access role/rights	Description	Remarks
Owner	The site and all devices within it are registered under the owner account.	Only the owner can grant the *Full Control* access right to other users.
User (Viewer)	A user without any additional access rights. Can only view measurements and data charts. In the planning phase, this role may be granted to individuals responsible for device planning, installation, or registration. In normal operation, this role remains as viewer only.	If *Planning Mode* is activated in the site settings, the user can also operate in planning and installation modes – i.e., add/remove/move planned devices and register devices.
User + Full managing rights	User has full management access to site/device settings and can operate the site/devices on behalf of the owner.	Useful for delegating day-to-day site management. Does *not* include access to alert settings or email alerts unless explicitly granted.
User + Right to set alerts	User can access site/device alert settings and related history logs and can modify alert settings.	Ideal for those responsible for configuring and managing alerts. Does *not* include receiving email alerts unless the "Send Alerts" right is also granted.
User + Send alerts	User receives all alert-related emails for the site/devices and has access to history logs.	Designed for parties tasked with responding to alerts. Does *not* include access to modify alert settings.
User + Right to add users	User can invite or add other users to the site/devices.	Useful for delegating basic access management. The user can only add *User (Viewer)* roles without any additional rights unless they also have rights to assign specific permissions.
User + Right to remove users	User can remove other users from the site/devices.	The user can only remove *User (Viewer)* roles or users with access rights they themselves are authorized to assign.

Sense User Access Management

✓ Allowed for owner. Allowed for user if additional access rights granted.
× Disallowed
● Additional permission required
○ Optional permission or not required

Action/Access	Owner	User (Viewer)	User + Full managing rights	User + Right to set alerts	User + Send alerts	User + Right to add users	User + Right to remove users
Site/device measurements data views access	✓	✓	○	○	○	○	○
Can grant/deny User+Full managing rights	✓	×	○	○	○	○	○
Can grant/deny User+Right to set alerts	✓	✓	●	○	○	●	○
Can grant/deny User+Send alerts	✓	✓	●	○	○	●	○
Can grant/deny User+Right to add users	✓	✓	●	○	○	●	○
Can grant/deny User+Can remove users	✓	✓	●	○	○	○	●
Can invite user (viewer) access	✓	✓	○	○	○	●	○
Can remove user (viewer) access	✓	✓	○	○	○	○	●
Can remove any user from site/devices	✓	×	○	○	○	○	○
Can modify alert settings	✓	✓	○	●	○	○	○
Receives email alerts	✓	✓	○	○	●	○	○
Can modify planned devices in planning mode	✓	✓	○	○	○	○	○
Can install/register planned devices in installation mode	✓	✓	○	○	○	○	○
Can enable/disable site planning mode	✓	✓	●	○	○	○	○
Can remove registered device from site	✓	✓	●	○	○	○	○
Can replace registered device with new one	✓	✓	●	○	○	○	○
Can add registered device (to site) owned by owner	✓	×	○	○	○	○	○
Can delete sensor (RHT-2) from site (complete removal)	✓	✓	●	○	○	○	○
Can modify site/device settings	✓	✓	●	○	○	○	○
Can move/release ownership of site/device	✓	×	○	○	○	○	○
Can delete site	✓	×	○	○	○	○	○
Can create public link	✓	✓	●	○	○	○	○
Can enable/disable site API access	✓	✓	●	○	○	○	○
Can see device history log	✓	✓ ✓ ✓	○ ○ ●	● ○ ○	○ ● ○	○ ○ ○	○ ○ ○
Can add note to device history log	✓	✓ ✓ ✓	○ ● ●	● ○ ○	○ ● ○	○ ○ ○	○ ○ ○
Can see site via main menu	✓	✓	○	○	○	○	○
Can see mobile base stations via main menu	✓	✓	●	○	○	○	○
Can see control units via main menu	✓	✓	○	○	○	○	○
Can access and modify advanced settings	✓	✓	●	○	○	○	○

6. TECHNICAL DATA

6.1. Mobile Base Station CCU-2 (NA)

Radio	
- Downlink	918.9 MHz
- Uplink	LTE Cat M1
Operating Voltage	5 V DC, max. 5 W
Operating temperature	32...122 °F (0...+50°C)
Operating humidity	5...95 % RH, non condensing
Storage/transport temperature	-40...86 °F (-40...+30°C) long-term, max. 140 °F (+60 °C) for up to 7 days
Storage/transport humidity	5...95 % RH, non condensing
IP rating	IP20
Power adapter	
- Input	2-pin NEMA 1-15 (Type A), 100-240 V AC, 50/60 Hz
- Output	5 V DC, 1 A, max. 5 W

6.2. Sensor RHT-2 (NA)

Measuring range /accuracy	
- Temperature	-38...255 ± 1.8 °F (-39...124 ±1 °C) typical
- Relative humidity	0...100 ±2 % RH typical
Operating temperature	-22...122 °F (-30...+50 °C)
Operating humidity	5...95 % RH
Storage/transport temperature	-40...86 °F (-40...+30°C) long-term, max. 140 °F (+60 °C) for up to 7 days
Storage/transport humidity	5...95 % RH, non condensing
IP rating	IP20
Radio	
- Uplink	918.9 MHz
Estimated battery lifetime	15 years

6.3. Control Unit MCU-2 (NA)

Radio	
- Downlink	918.9 MHz
- Uplink	918.9 MHz
Power supply	10 ± 0.4 V DC , ≥ 1.0 mA
Operating temperature	-22...122 °F (-30...+50 °C)
Operating humidity	5...95 % RH
Storage/transport temperature	-40...86 °F (-40...+30 °C) long-term, max. 140 °F (+60 °C) for up to 7 days
Storage/transport humidity	5...95 % RH, non condensing
IP rating	IP65
Control output	
- Output voltage	0-10 VDC
- Maximum burden	50 kΩ

6.4. Sensor RHT-1 (NA)

Measuring range /accuracy	
- Temperature	-38...255 ± 1.8 °F (-39...124 ±1 °C) typical
- Relative humidity	0...100 ±3 % RH typical
Operating temperature	-22...122 °F (-30...+50 °C)
Operating humidity	5...95 % RH
Storage/transport temperature	-40...86 °F (-40...+30 °C) long-term, max. 140 °F (+60 °C) for up to 7 days
Storage/transport humidity	5...95 % RH, non condensing
IP rating	IP53
Radio	
- Uplink	918.9 MHz
Estimated battery lifetime	10 years

7. MAINTENANCE

7.1. VILPE Sense Preventative Maintenance/ Recommendation

To ensure the optimal functionality and longevity of your VILPE Sense system, VILPE Oy recommends adhering to the following preventative maintenance schedule and practices:

Visual Inspection (Annual): At least once a year, conduct a visual inspection of the exterior components of the VILPE Sense system, including the sensors and roof fans. Check for any visible signs of wear and tear, damage, or obstructions.

System Performance Check (Bi-Annual): Every six months, verify the system's performance by checking the temperature, relative humidity, absolute humidity, mold index, and roof fan motor speed data on the VILPE cloud service. If any unusual or inconsistent data is observed, consider having the system inspected by a professional.

Data Connection Check (Quarterly): Ensure that the system's data connection to the VILPE cloud service is functioning correctly. Check the data updates regularly and troubleshoot any connection issues promptly to ensure continuous system monitoring.

Cleaning (As Needed): If debris, dirt, or other obstructions are observed during your visual inspection, arrange for careful cleaning of the exterior components. Be sure to follow VILPE Oy's guidelines to prevent damage to the system.

Sensors: The lifespan of the sensors will inevitably decrease if they are continuously exposed to extremely moist conditions, such as in an area with an unresolved leaking issue. If, for example, a roof is already thoroughly wet, a leak detector may not function as intended. Therefore, if sensors detect leaks in a structure, it is essential that these leaks be promptly repaired.

Software Updates (As Released): Ensure the VILPE Sense system is always running the latest software version. Regular updates not only provide new features but also improve the system's performance and reliability.

Remember, this maintenance schedule is a general guideline. Depending on the local climate, the environment around the building, and the specifics of the building itself, maintenance needs may vary. Always consult with a professional if you're unsure about any aspect of the system's maintenance.

Please note, failure to comply with these recommended preventative maintenance practices may affect the validity of your Limited Warranty. If you have any questions or need further information, please contact VILPE Oy's customer service team.

8. WARRANTY

8.1. VILPE Limited Warranty for the VILPE Sense System (U.S.)

This Limited Warranty is provided by VILPE Oy, a Finnish company with its registered office at Kauppatie 9, FIN-65610 Mustasaari, Finland. For sales and service in the United States, warranty obligations are supported by VILPE Oy and its authorized U.S. partners.

This Limited Warranty applies to VILPE Sense products purchased in the United States on or after January 1, 2023.

1. WARRANTY COVERAGE

VILPE Oy warrants that, under normal use and service:

- **VILPE Sense Sensors and Control Units**, including all electrical components, will be free from defects in materials and workmanship for a period of two (2) years from the original purchase date.
- **VILPE ECo Roof Fan** used for the VILPE Sense system, including all electrical components, will be free from defects in materials and workmanship for a period of five (5) years from the original purchase date.
- **VILPE Sense Mobile Base Station**, including all electrical components, will be free from defects in materials and workmanship for a period of five (5) years from the original purchase date.

If a defect arises during the warranty period, VILPE will, at its option:

1. Repair the product using new or refurbished parts,
2. Replace the product with a new or refurbished product of equivalent performance, or
3. Refund the purchase price of the product.

This warranty is labeled as a **Limited Warranty** under U.S. law.

2. WHAT IS NOT COVERED

This Limited Warranty does not cover:

- Defects or damage resulting from misuse, accident, neglect, improper installation, operation, or maintenance.
- Defects caused by alterations or modifications not authorized by VILPE.
- Damage from external causes such as power surges or power failures.
- Products subjected to abnormal physical, thermal, or electrical stress.
- Normal wear and tear.
- Any installation or removal services.

3. WARRANTY CLAIM PROCEDURE

To make a warranty claim, the buyer must contact VILPE or its authorized U.S. service partner promptly after discovery of a defect. Claims should include:

- The name, address, and telephone number of the owner,
- The serial number of the affected product,
- A description of the defect or failure, and
- The date the failure was first detected.

VILPE may require that the product be returned for inspection. Instructions for returns and repairs will be provided when the claim is received.

4. LEGAL RIGHTS

This warranty gives you specific legal rights. **You may also have other rights which vary from state to state.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

To the maximum extent permitted by law:

- VILPE's liability is limited to the remedies described above.
- VILPE is not responsible for indirect or incidental damages beyond the purchase price of the product.

5. DISCLAIMER OF IMPLIED WARRANTIES

To the extent permitted by law, all implied warranties (including warranties of merchantability and fitness for a particular purpose) are limited in duration to the express warranty periods stated above.

6. GOVERNING LAW

This Limited Warranty shall be governed by the laws of the state where the product was purchased, without regard to conflict of law principles.

7. CUSTOMER SUPPORT

For warranty service in the United States, please contact:

VILPE USA LLC
6402 Thornberry Ct, Mason
OH 45040, USA

Tel: +1 (513) 338-7979

Email: daniel.mccaul@vilpe.com

Website: vilpe.com/usa/sense

9. DISPOSAL

When the VILPE Sense system or its components reach the end of their service life, proper disposal is required to protect the environment:

- **Electronic Components:** The sensors, control units, and other electronics contain valuable and recyclable materials. Dispose of them at designated electronic waste collection points in accordance with local regulations.
- **Packaging Materials:** Recycle the product packaging in accordance with local waste management guidelines.
- **Environmental Responsibility:** VILPE products are designed with sustainability in mind. By recycling components and materials responsibly, you contribute to reducing environmental impact.

NOTICE Sensors contains lithium battery.

10. LEGAL

10.1. VILPE Sense Cloud Service Terms of Use

Updated: April 17, 2025

These Terms of Use (“Terms”) govern the use of the VILPE Sense cloud service (“Service”). By using the Service through registration, or otherwise interacting with it, you accept these Terms. If you do not agree to the Terms, you may not use the Service.

1. Definitions

• **Service:** The VILPE Sense cloud service, including the web platform and/or other provided digital services.
• **User:** A person or legal person registered to or using the Service.
• VILPE: VILPE Oy (or its group/subsidiary companies).
• **Partner:** VILPE Oy’s cooperation partner providing the Service.
• **Agreement:** These Terms of Use form a binding agreement between the User and VILPE.

2. Service Content and Use

2.1 Service Description
The Service allows the User to monitor data collected by VILPE Sense devices (e.g., sensors) and manage device settings through a cloud-based web interface. The Service may also include notifications, reports, statistics, and other analytics functions.

2.2 Right to Use
VILPE grants the User a limited, non-exclusive, personal, and revocable right to use the Service in accordance with these Terms. The User does not have a right to resell or commercially exploit the Service without VILPE’s explicit written permission.

2.3 User Account
To access certain features of the Service, the User must create a user account and provide accurate, correct, and complete information. The User is responsible for the safety of their account (e.g., keeping the password confidential) and all activity occurring under it.

3. User Responsibilities

3.1 Devices and Connections
The user is responsible for the acquisition, use, functionality of their own devices and for necessary internet connections (except those devices and services that contain an internet connection managed or provided by VILPE or its partners). VILPE is not liable for disruptions or delays caused by improperly installed or configured devices or internet connections.

3.2 Legal Use
The User agrees to use the Service only for lawful purposes and in accordance with these Terms. The User must not use the Service in a way that disrupts its operation, violates third-party rights, or violates applicable laws or regulations.

3.3 Accuracy of Information
The User is responsible for the accuracy, timeliness, and legality of all information submitted to the Service (e.g., installation or device data). VILPE is not liable for any consequences resulting from incomplete or incorrect information provided by the User.

3.4 Duty to Report
The User must notify VILPE immediately if they suspect misuse of the Service, their account, or credentials.

4. Changes and Availability of the Service

4.1 Service Development
VILPE continually strives to develop and improve the Service. Therefore, features, functionality, or content may be modified, added, or removed from time to time. VILPE may also provide updates, fixes, and other modifications to the Service and devices without prior notice.

4.2 Interruptions
VILPE does not guarantee the continuous or uninterrupted operation of the Service. The Service may be suspended due to maintenance, updates, technical issues, or other similar reasons. VILPE will try to provide advance notice of any planned maintenance interruptions exceeding two hours, whenever possible.

4.3 Usage Restrictions
If necessary, VILPE may restrict the use of the Service, block access to the Service, or close or delete the User's account if there is a justified reason to suspect that the User is violating these Terms of Use or using the Service unlawfully.

5. Fees and Pricing

5.1 Service Pricing
Basic use of the Service is included in the device purchase price. The use of possible paid add-on features or services within the Service may be subject to charges which will be communicated separately at the time of subscription (such as monthly or annual fees, extended functionalities, or similar).

5.2 Payment Terms
The User agrees to pay applicable fees in the manner and schedule specified by VILPE (e.g., credit card, online payment, invoice). In case of delayed payment, VILPE reserves the right to charge statutory late payment interest and applicable collection costs.

6. Intellectual Property

6.1 Ownership
All intellectual property rights (including copyrights, trademarks, patents, databases, and code) related to the Service and its content belong to VILPE or its partners. The Terms of Use do not transfer any ownership rights to the User but only grant a limited right to use the Service.

6.2 User Content
If the User submits own content to the Service (e.g., comments, settings, data inputs), the User ensures it does not violate third-party rights or applicable law. The User grants VILPE the right to process, save and display the content as needed to provide the Service.

7. Personal Data and Privacy

7.1 Privacy Statement
VILPE complies with applicable data protection legislation (e.g., EU's General Data Protection Regulation "GDPR"). Personal data is processed in accordance with the Privacy Policy, available in the Service under User Settings.

7.2 Data Processing
The Service collects and processes the sensor measurement data (e.g., temperature, humidity) which may in some cases be comparable to personal data (e.g., location, building information). The User accepts this information processing to enable Service functionality.

7.3 Cookies
The Service may use cookies and similar technologies for personalizing the user experience and analytics. The User can adjust their browser's cookie settings if desired, but this may limit the functionality of the Service. The Service's cookie policy can be reviewed within the Service.

8. Limitations of Liability

8.1 Service Content
The Service is provided "as it is." VILPE does not guarantee that the Service is error-free, uninterrupted, or suitable for the User's personal needs. The Service may include content provided by third parties, for which VILPE is not responsible. All advice, information, or reports made available through the Service are for indicative purposes only, and VILPE or its partners are not liable for their complete accuracy.

8.2 Direct and Indirect Damages
To the extent permitted under applicable law, VILPE is not liable for direct or indirect damages, including loss of income, loss of business profits, loss of data, or costs incurred due to interruptions in the use of the Service. Furthermore, VILPE shall not be held liable for any malfunctions or deficiencies in third-party services or products that impact the operation of the Service.

8.3 Devices and Installation
VILPE is not responsible for installation, maintenance, or environmental conditions where the User installs VILPE Sense devices. The User is solely responsible for ensuring proper installation and maintenance of the devices in accordance with the provided instructions and applicable regulations. VILPE is not liable for any damages resulting from improper use or lack of maintenance of the devices.

9. Amendments to Terms
VILPE reserves the right to update these Terms from time to time. Users will be notified of any essential material changes in a reasonable manner (such as via email or through the Service). The updated terms will become effective on the date specified in the notice. After accepting the updated terms, the User can continue using the Service.

10. Term and Termination
10.1 Term
The Agreement is valid until further notice.

10.2 Termination
The User may terminate use of the Service at any time by requesting account deletion or notifying VILPE of their wish to terminate the Agreement. VILPE may terminate the Agreement if the User materially breaches these Terms or if the Service is permanently discontinued.

11. Governing Law and Dispute Resolution
These Terms of Use and any disputes arising in connection with them will be governed by the Finnish law, excluding its conflict of law rules. Possible disputes will primarily be resolved through negotiation. If no settlement is reached, the matter shall be submitted to a competent court in Finland. A consumer user may also choose to use the services of the Finnish Consumer Disputes Board.

12. Contact Information
If you have questions about these Terms, the Service, or you want to provide feedback, please contact:

VILPE Oy
Kauppatie 9, FIN-65610 Mustasaari
Email: sense-admin@vilpe.com
Website: https://sense.vilpe.com

10.2. VILPE Sense Cloud Service Privacy Policy

1. Controller
VILPE Oy (Business ID: 0558172-1)
Kauppatie 9, 65610 Mustasaari
Sales and Technical Support: +358 20 123 3222

2. Contact Person in Matters Related to the Register
VILPE Oy
Kauppatie 9, 65610 Mustasaari
Email: sense-admin@vilpe.com

3. Name of the Register
User Register for the VILPE Sense Cloud Service

4. Purpose and Legal Basis for Processing Personal Data
The VILPE Sense cloud service collects data from IoT devices. The cloud service users register their devices, and after this they can monitor sensor data related to humidity and structural conditions. The controller also uses this data to improve and develop services and devices and to develop and provide potential additional services.
The processing of personal data is based on the consent of the data subject. The data subject may prohibit the processing of their personal data. In such cases, the devices connected to the cloud service only transmit anonymized (non-personal) data to the controller's cloud service.

5. Data Content of the Register
The personal data register may contain the following information:
- Registered user's email address
- Other information provided by the data subject
- Data transmitted by sensors and any refined data derived from it

6. Retention Time for Personal Data
Personal data is retained until the user requests the deletion of their account and the account is removed from the system. If the user has not logged into the system within the last year and no devices are linked to the account, the account will be automatically deleted from the system.

7. Regular Sources of Data
Data is automatically collected from registered devices. Personal data is obtained from the customer or their representative.

8. Regular Disclosures of Data
Data is disclosed to the controller's group companies for the purposes described in section 4 of this privacy policy, to the controller's direct marketing register, and to other possible personal data registers within the controller's group, always in accordance with applicable data protection legislation and within its limitations. The user (the user account marked as the device owner) can grant access to third parties by assigning permissions to other individuals.

9. Transfer of Data Outside the EU or EEA
No data is transferred outside the EU or EEA.

10. Principles of Register Protection
A. Manual Data
- Manual data is generally not processed. If manual data is processed, it is stored in secured premises accessible only to authorized individuals.

B. Electronically Stored Data
- The controller's employees and any external parties operating in the controller's name who participate in the processing of data have a confidentiality obligation regarding all registered personal data.
- The use of the register is protected by usernames, passwords, and access rights.
- Data is transferred in networks by using strong encryption.

11. Profiling
Automated decision-making is not used in processing personal data. However, the controller may utilize non-personal data collected from the systems.

12. The Right of Data Subjects to Object to the Processing of Personal Data and Direct Marketing
Data subjects have the right to object to profiling and other processing carried out by the controller regarding their personal data, insofar as the processing of personal data is based on a customer relationship between the controller and data subject. Data subjects can present their objection to the processing of personal data in accordance with Contact section of this privacy policy. Data subjects must indicate the special circumstances, on the basis of which they object to processing. The controller may refuse to stop processing personal data, if there are compelling legitimate grounds for the processing.
The data subject may also submit consents or prohibitions regarding direct marketing or profiling to the controller.

13. Other Rights of the Data Subject Related to the Processing of Personal Data
Right of access to data (right to inspect)
Data subjects have the right to obtain information about what data concerning them has been saved in the controller's register. The request to access data must be presented in accordance with Contact section of this privacy policy. The right of access may be denied on legal grounds. The right of access can primarily be exercised free of charge once a year.

Right to request the rectification, deletion, or restriction of processing of data
After detecting an error, data subjects can request data to be rectified or deleted and processing to be restricted in accordance with Contact section of this privacy policy.
Furthermore, data subjects have the right to demand the controller to restrict the processing of their personal data, for example, in situations in which a data subject is waiting for the controller's response to their request to have data rectified or erased.

Right to have data transferred from one system to another
Insofar as data subjects have added data to the register and this data is processed on the basis of the data subject's consent or assignment, data subjects have the right to have this data transferred to themselves or another controller, primarily in a computer readable format.

Right to file a complaint with the supervisory authority
Data subjects have the right to file a complaint with the competent supervisory authority if the controller has not complied with applicable data protection regulations in their activities.

Other rights
If personal data is processed based on consent given by data subjects, data subjects have the right to withdraw their consent by giving notification to the controller in accordance with Contact section of this privacy policy.

14. Contact
Data subjects must contact the person presented in section 2 in all questions related to the processing of personal data and in all situations related to exercising the rights of data subjects. If necessary, the controller or the person presented in section 2 can ask data subjects to specify their request in writing, and the identity of data subjects can be verified before taking any further action.

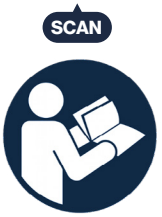
ATTACHMENTS

Attachment 1. VILPE Sense Basic Kit Installation

Quick Start Guide
Guide de démarrage rapide
Guía de inicio rápido

vilpe.com/usa/sense-installation

SCAN



⚠ WARNING
Read and understand all warnings and instructions. Failure to do so may result in injury and property damage.

⚠ AVERTISSEMENT
Lisez et comprenez tous les avertissements et toutes les instructions. Le non-respect de ces consignes peut entraîner des blessures et des dommages matériels.

⚠ ADVERTENCIA
Lea y comprenda todas las advertencias e instrucciones. No hacerlo puede ocasionar lesiones y daños a la propiedad.

NOTICE This device is one component of a complete system. The complete system may require several additional components to function as intended. Refer to the full user documentation for detailed information on required components, installation instructions and system configuration.

AVIS Cet appareil est un composant d'un système complet. Le système complet peut nécessiter plusieurs composants supplémentaires pour fonctionner comme prévu. Veuillez consulter la documentation utilisateur complète pour obtenir des informations détaillés sur les composants requis, les instructions d'installation et la configuration du système.

AVISO Este dispositivo es un componente de un sistema completo. El sistema completo puede requerir varios componentes adicionales para funcionar como se espera. Consulte la documentación completa del usuario para obtener información detallada sobre los componentes necesarios, las instrucciones de instalación y la configuración del sistema.

Safety & Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Responsible party: VILPE USA LLC, 6402 Thornberry Court, 45040 Mason Ohio, Greater Cincinnati USA.

NOTICE Unauthorized modifications may void the user's authority to operate this device.

⚠ WARNING When working on rooftops, always comply with all applicable laws, regulations, and safety requirements. Use caution when handling sharp tools, drills, or other cutting equipment.

Control Unit MCU-2 (NA):

⚠ WARNING Only an authorized and adequately qualified electrician may install the electrical connections.

⚠ CAUTION The enclosure cover is equipped with a sealing gasket to protect against dust and moisture. Make sure that the gasket is correctly seated in its groove before securing the cover. Improper gasket placement may compromise the device's sealing and protection rating.

Sensor RHT-1 (NA):

⚠ WARNING Risk of fire and burns. Do not open, crush, heat above 140 °F (+60 °C), or incinerate. Do not attempt to open or replace the battery.

⚠ CAUTION Do not expose to liquid water or >95 % RH for > 30 days.

NOTICE Remove the red jumper from the wireless sensor before use.

NOTICE This product contains lithium battery.

Sécurité et conformité

Cet appareil est conforme à la partie 15 des règlements de la FCC. Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas provoquer d'interférences nuisibles, et (2) cet appareil doit accepter toute interférence reçue, y compris celles pouvant entraîner un fonctionnement indésirable. Partie responsible: VILPE USA LLC, 6402 Thornberry Court, 45040 Mason Ohio, Greater Cincinnati USA.

AVIS Les modifications non autorisées peuvent annuler le droit de l'utilisateur d'utiliser cet appareil.

⚠ AVERTISSEMENT Lors des travaux sur les toits, respectez toujours toutes les lois, réglementations et exigences de sécurité applicables. Faites preuve de prudence en manipulant des outils tranchants, des perceuses ou d'autres équipements de coupe.

Unité de contrôle MCU-2 (NA)

⚠ AVERTISSEMENT Seul un électricien autorisé et dûment qualifié peut installer les connexions électriques.

⚠ PRÉCAUTION Le couvercle du boîtier est équipé d'un joint d'étanchéité qui protège contre la poussière et l'humidité. Assurez-vous que le joint est correctement positionné dans sa rainure avant de fixer le couvercle. Un mauvais positionnement du joint peut compromettre l'étanchéité et la protection de l'appareil.

Capteur RHT-1 (NA)

⚠ AVERTISSEMENT Risque d'incendie et de brûlures. Ne pas ouvrir, écraser, chauffer au-delà de 60 °C (140 °F) ou incinérer. Ne tentez pas d'ouvrir ni de remplacer la pile.

⚠ PRÉCAUTION Ne pas exposer à l'eau liquide ni à une humidité relative >95 % pendant plus de 30 jours.

AVIS Retirez le cavalier rouge du capteur sans fil avant utilisation.

AVIS Ce produit contient une pile au lithium.

Seguridad y cumplimiento de la normativa

Este dispositivo cumple con la parte 15 de las normas de la FCC. Su funcionamiento está sujeto a las siguientes dos condiciones: (1) este dispositivo no debe causar interferencia perjudicial, y (2) este dispositivo debe aceptar cualquier interferencia recibida, incluida la interferencia que pueda causar un funcionamiento no deseado. Parte responsable: VILPE USA LLC, 6402 Thornberry Court, 45040 Mason Ohio, Greater Cincinnati USA.

AVISO Las modificaciones no autorizadas podrían anular la autoridad del usuario para operar este dispositivo.

⚠ ADVERTENCIA Al trabajar en techos, cumpla siempre con todas las leyes, normativas y requisitos de seguridad aplicables. Tenga cuidado al manejar herramientas afiladas, taladros u otros equipos de corte.

Unidad de control MCU-2 (NA)

⚠ ADVERTENCIA Solo un electricista autorizado y debidamente calificado puede instalar las conexiones eléctricas.

⚠ PRECAUCIÓN La tapa del gabinete está equipada con una junta de sellado para proteger contra el polvo y la humedad. Asegúrese de que la junta esté correctamente colocada en su ranura antes de asegurar la tapa. Una colocación incorrecta de la junta puede comprometer el sellado y la protección del dispositivo.

Sensor RHT-1 (NA)

⚠ ADVERTENCIA Riesgo de incendio y quemaduras. No abra, aplaste, caliente por encima de 60 °C (140 °F) ni incinere. No intente abrir ni reemplazar la batería.

⚠ PRECAUCIÓN No exponga al agua liquida ni a >95 % de humedad relativa durante más de 30 días.

AVISO Retire la pestaña de seguridad roja del sensor inalámbrico antes de usarlo.

AVISO Este producto contiene una batería de litio.

Technical data
Données techniques
Datos técnicos
Control Unit MCU-2 (NA)
Unité de contrôle MCU-2 (NA)
Unidad de control MCU-2 (NA)

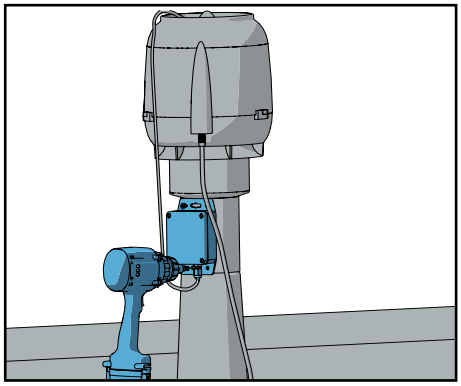
EN	FR	ES	
Radio Downlink Radio Uplink	Liaison descendante radio Liaison montante radio	Enlace descendente de radio Enlace ascendente de radio	918.9 MHz 918.9 MHz
Power supply	Alimentation	Fuente de alimentación	10 ± 0.4 V DC , ≥ 1.0 mA, SELV
Operating temperature	Température de fonctionnement	Temperatura de funcionamiento	-22...122 °F (-30...+50°C)
Operating humidity (RH)	Humidité de fonctionnement (HR)	Humedad de funcionamiento (HR)	5...95 %
Storage/transport temperature - Long term - Up to 7 days	Température de stockage/ transport - À long terme - jusqu'à 7 jours	Temperatura de almacenamien-to/transporte - A largo plazo - Hasta por 7 días	 -40...86 °F (-40...+30°C) max. 140 °F (+60 °C)
Storage/transport humidity (RH, non condensing)	Humidité de stockage/transport (HR, sans condensation)	Humedad de almacenamiento/ transporte (HR, sin condensación)	 5...95 %
IP rating	Indice de protection (IP)	Clasificación IP	IP65
Control output - Output voltage - Maximum burden	Sortie de commande - Tension de sortie - Charge maximale	Salida de control - Voltaje de salida - Carga máxima	 0-10 VDC 50 kΩ

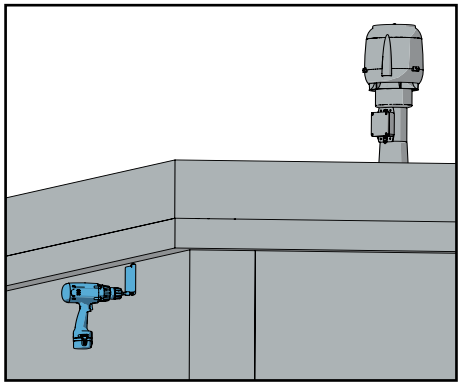
Sensor RHT-1 (NA)
Capteur RHT-1 (NA)
Sensor RHT-1 (NA)

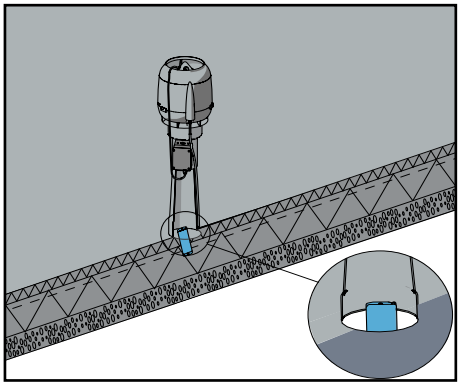
EN	FR	ES	
Measuring range /accuracy - Temperature (typical) - Relative humidity (RH typical)	Plage de mesure/précision - Température (typique) - Humidité relative (HR typique)	Rango de medición/precisión - Temperatura (típico) - Humedad relativa (HR típico)	 -38...255 ± 1.8 °F (-39...124 ±1 °C) 0...100 ±3 %
Operating temperature	Température de fonctionnement	Temperatura de funcionamiento	-22...122 °F (-30...+50°C)
Operating humidity (RH)	Humidité de fonctionnement (HR)	Humedad de funcionamiento (HR)	5...95 %
Storage/transport temperature - Long term - Up to 7 days	Température de stockage/ transport - À long terme - jusqu'à 7 jours	Temperatura de almacenamien-to/transporte - A largo plazo - Hasta por 7 días	 -40...86 °F (-40...+30°C) max. 140 °F (+60 °C)
Storage/transport humidity (RH, non condensing)	Humidité de stockage/transport (HR, sans condensation)	Humedad de almacenamiento/ transporte (HR, sin condensación)	 5...95 %
IP rating	Indice de protection (IP)	Clasificación IP	IP53
Radio Uplink	Liaison montante radio	Enlace ascendente de radio	918.9 MHz
Estimated battery lifetime (years)	Durée de vie estimée de la pile (ans)	Vida útil estimada de la batería (años)	10

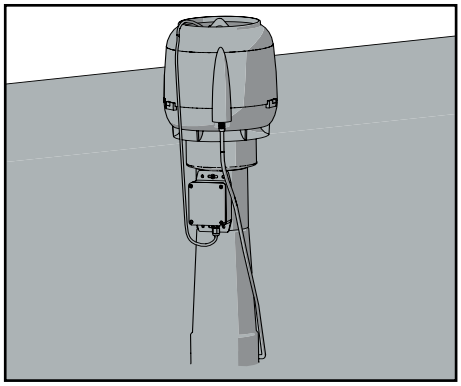
Installation
Installation
Instalación

Register your products online using the serial numbers on the devices: **SENSE.VILPE.COM**
Enregistrez vos produits en ligne à l'aide des numéros de série figurant sur les appareils: **SENSE.VILPE.COM**
Registre sus productos en línea usando los números de serie de los dispositivos: **SENSE.VILPE.COM**





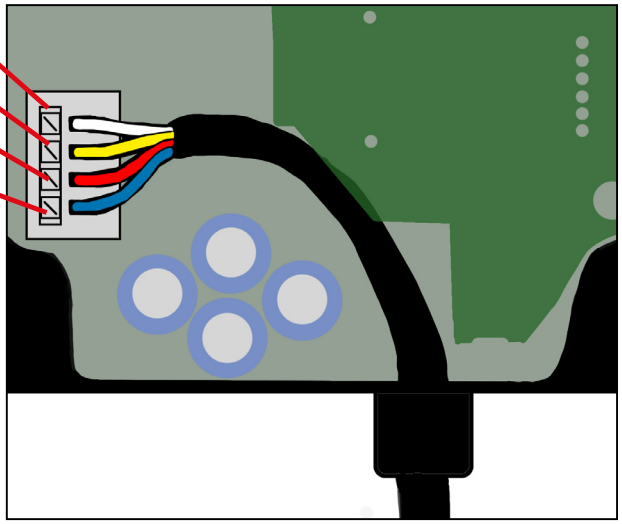




MCU:

RHT:

1. WHITE: ALARM/COUNT
2. YELLOW: INPUT 0-10V
3. RED: +10V OUT
4. BLUE: GND



1. Blanc: Alarme/Compteur
   Blanco: Alarma/Contador
2. Jaune: Entrée 0-10V
   Amarillo: Entrada 0-10V
3. Rouge: +10V SORTIE
   Rojo: +10V SALIDA
4. Bleu : GND
   Azul: GND

NOTICE After installation and registration of the devices, it may take up to 24 hours for data to appear in the VILPE Sense cloud service.

AVIS Après l'installation et l'enregistrement des appareils, les données peuvent prendre jusqu'à 24 heures pour apparaître dans le service infonuagique VILPE Sense.

AVISO Después de la instalación y registro de los dispositivos, los datos pueden tardar hasta 24 horas en aparecer en el servicio en la nube VILPE Sense.

Attachment 2. VILPE Sense Mobile Base Station Installation

CCU-2 Quick Start Guide
CCU-2 Guide de démarrage rapide
CCU-2 Guía de inicio rápido

vilpe.com/usa/sense-installation

SCAN

NOTICE This device is one component of a complete system. The complete system may require several additional components to function as intended. Refer to the full user documentation for detailed information on required components, installation instructions and system configuration.

AVIS Cet appareil est un composant d'un système complet. Le système complet peut nécessiter plusieurs composants supplémentaires pour fonctionner comme prévu. Veuillez consulter la documentation utilisateur complète pour obtenir des informations détaillés sur les composants requis, les instructions d'installation et la configuration du système.

AVISO Este dispositivo es un componente de un sistema completo. El sistema completo puede requerir varios componentes adicionales para funcionar como se espera. Consulte la documentación completa del usuario para obtener información detallada sobre los componentes necesarios, las instrucciones de instalación y la configuración del sistema.

⚠ WARNING
Read and understand all warnings and instructions. Failure to do so may result in injury and property damage.

⚠ AVERTISSEMENT
Lisez et comprenez tous les avertissements et toutes les instructions. Le non-respect de ces consignes peut entraîner des blessures et des dommages matériels.

⚠ ADVERTENCIA
Lea y comprenda todas las advertencias e instrucciones. No hacerlo puede ocasionar lesiones y daños a la propiedad.

Safety & Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Responsible party: VILPE USA LLC, 6402 Thornberry Court, 45040 Mason Ohio, Greater Cincinnati USA.

NOTICE This device meets FCC radiation exposure limits. Keep at least 7 .87 in (20 cm) between the antenna and any person during use.

NOTICE Unauthorized modifications may void the user's authority to operate this device.

⚠ WARNING Dry location use only.

NOTICE This device requires an active Internet connection for operation. It comes with a pre-inserted **Micro SIM (3FF)** card, which can be used if you purchase a data subscription from VILPE. Alternatively, you may:

- Use your own LTE-M mobile network data subscription (requires a compatible Micro SIM (3FF) card), or
- Connect the device via Ethernet to your existing network.

Important:

- LTE-M service availability may vary depending on local mobile network coverage. Please ensure that LTE-M coverage is available at your installation location before use.
- If using a separately purchased LTE-M subscription, your mobile network operator may require you to configure a specific Access Point Name (APN) in the device settings.

Sécurité et conformité

Cet appareil est conforme à la partie 15 des règlements de la FCC. Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas provoquer d'interférences nuisibles, et (2) cet appareil doit accepter toute interférence reçue, y compris celles pouvant entraîner un fonctionnement indésirable. Partie responsible: VILPE USA LLC, 6402 Thornberry Court, 45040 Mason Ohio, Greater Cincinnati USA.

AVIS Cet appareil respecte les limites d'exposition aux rayonnements de la FCC. Maintenez une distance d'au moins 7 ,87 po (20 cm) entre l'antenne et toute personne pendant l'utilisation.

AVIS Les modifications non autorisées peuvent annuler le droit de l'utilisateur d'utiliser cet appareil.

⚠ AVERTISSEMENT Utiliser uniquement dans un endroit sec.

AVIS Cet appareil nécessite une connexion Internet active pour fonctionner. Il est livré avec une carte **Micro SIM (3FF)** préinsérée, que vous pouvez utiliser si vous souscrivez un abonnement de données auprès de VILPE. Autrement, vous pouvez:

- Utiliser votre propre abonnement de données de réseau mobile LTE-M (nécessite une carte Micro SIM (3FF) compatible), ou
- Connecter l'appareil via Ethernet à votre réseau existant.

Important:

- La disponibilité du service LTE-M peut varier selon la couverture du réseau mobile local. Assurez-vous que la couverture LTE-M est disponible à l'endroit de votre installation avant utilisation.
- Si vous utilisez un abonnement LTE-M acheté séparément, votre opérateur de réseau mobile peut exiger que vous configuriez un Nom de Point d'Accès (APN) spécifique dans les paramètres de l'appareil.

Seguridad y cumplimiento de la normativa

Este dispositivo cumple con la parte 15 de las normas de la FCC. Su funcionamiento está sujeto a las siguientes dos condiciones: (1) este dispositivo no debe causar interferencia perjudicial, y (2) este dispositivo debe aceptar cualquier interferencia recibida, incluida la interferencia que pueda causar un funcionamiento no deseado. Parte responsable: VILPE USA LLC, 6402 Thornberry Court, 45040 Mason Ohio, Greater Cincinnati USA.

AVISO Este dispositivo cumple con los límites de exposición a la radiación de la FCC. Mantenga al menos 7 .87 pulgadas (20 cm) entre la antena y cualquier persona durante su uso.

AVISO Las modificaciones no autorizadas podrían anular la autoridad del usuario para operar este dispositivo.

⚠ ADVERTENCIA Solo para uso en lugares secos.

AVISO Este dispositivo requiere una conexión activa a Internet para funcionar. Incluye una tarjeta **Micro SIM (3FF)** preinstalada, que puede utilizar si adquiere una suscripción de datos de VILPE. Alternativamente, puede:

- Utilizar su propia suscripción de datos de red móvil LTE-M (requiere una tarjeta Micro SIM (3FF) compatible), o
- Conectar el dispositivo mediante Ethernet a su red existente.

Importante:

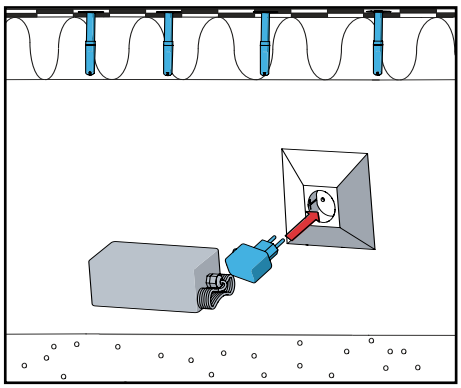
- La disponibilidad del servicio LTE-M puede variar según la cobertura de la red móvil local. Asegúrese de que haya cobertura LTE-M en su ubicación de instalación antes de usarlo.
- Si utiliza una suscripción LTE-M adquirida por separado, su operador de red móvil puede requerir que configure un Nombre de Punto de Acceso (APN) específico en la configuración del dispositivo.

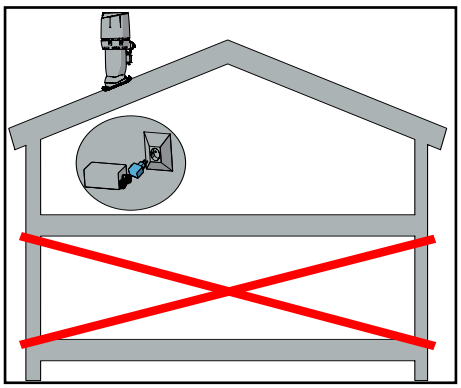
Technical data
Données techniques
Datos técnicos

EN	FR	ES	
Radio Downlink Radio Uplink	Liaison descendante radio Liaison montante radio	Enlace descendente de radio Enlace ascendente de radio	918.9 MHz LTE Cat M1
Operating voltage	Tension de fonctionnement	Voltaje de funcionamiento	5 V DC, max. 5 W
Operating temperature	Température de fonctionnement	Temperatura de funcionamiento	32...122 °F (0...+50°C)
Operating humidity (RH, non condensing)	Humidité de fonctionnement (HR, sans condensation)	Humedad de funcionamiento (HR, sin condensación)	5...95 %
Storage/transport temperature - Long term - Up to 7 days	Température de stockage/ transport - À long terme - jusqu'à 7 jours	Temperatura de almacenamien-to/transporte - A largo plazo - Hasta por 7 días	 -40...86 °F (-40...+30°C) max. 140 °F (+60 °C)
Storage/transport humidity (RH, non condensing)	Humidité de stockage/transport (HR, sans condensation)	Humedad de almacenamiento/ transporte (HR, sin conden-sación)	5...95 %
IP rating	Indice de protection (IP)	Clasificación IP	IP20
Power adapter - Input - Output	Adaptateur secteur - Entrée - Sortie	Adaptador de corriente - Entrada - Salida	 2-pin NEMA 1-15 (Type A), 100-240 V AC, 50/60 Hz 5 V DC, 1 A, max. 5 W

Register your products online using the serial numbers on the devices: **SENSE.VILPE.COM**
Enregistrez vos produits en ligne à l'aide des numéros de série figurant sur les appareils: **SENSE.VILPE.COM**
Registre sus productos en línea usando los números de serie de los dispositivos: **SENSE.VILPE.COM**

Installation
Installation
Instalación





CCU:

NOTICE After installation and registration of the devices, it may take up to 24 hours for data to appear in the VILPE Sense cloud service.

AVIS Après l'installation et l'enregistrement des appareils, les données peuvent prendre jusqu'à 24 heures pour apparaître dans le service infonuagique VILPE Sense.

AVISO Después de la instalación y registro de los dispositivos, los datos pueden tardar hasta 24 horas en aparecer en el servicio en la nube VILPE Sense.

Attachment 3. Leak Detector Installation

Sensor RHT-2 Quick Start Guide
Capteur RHT-2 Guide de démarrage rapide
Sensor RHT-2 Guía de inicio rápido

vilpe.com/usa/sense-installation

SCAN

WARNING
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AVERTISSEMENT
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ADVERTENCIA
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NOTICE This device is one component of a complete system. The complete system may require several additional components to function as intended. Refer to the full user documentation for detailed information on required components, installation instructions and system configuration.

AVIS Cet appareil est un composant d'un système complet. Le système complet peut nécessiter plusieurs composants supplémentaires pour fonctionner comme prévu. Veuillez consulter la documentation utilisateur complète pour obtenir des informations détaillés sur les composants requis, les instructions d'installation et la configuration du système.

AVISO Este dispositivo es un componente de un sistema completo. El sistema completo puede requerir varios componentes adicionales para funcionar como se espera. Consulte la documentación completa del usuario para obtener información detallada sobre los componentes necesarios, las instrucciones de instalación y la configuración del sistema.

Safety & Compliance

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NOTICE Unauthorized modifications may void the user's authority to operate this device.

WARNING When working on rooftops, always comply with all applicable laws, regulations, and safety requirements. Use caution when handling sharp tools, drills, or other cutting equipment.

WARNING Risk of fire and burns. Do not open, crush, heat above 140 °F (+60 °C), or incinerate. Do not attempt to open or replace the battery.

CAUTION Do not expose to liquid water or >95 % RH for > 30 days.

CAUTION When drilling a hole for the sensor, do not penetrate any vapor barrier that may be located beneath the insulation. Damaging the vapor barrier can compromise the building's moisture protection and lead to condensation or structural issues. If a vapor barrier is present, choose a drilling location and depth that avoids puncturing it.

NOTICE This product contains lithium battery.

Sécurité et conformité

Cet appareil est conforme à la partie 15 des règlements de la FCC. Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas provoquer d'interférences nuisibles, et (2) cet appareil doit accepter toute interférence reçue, y compris celles pouvant entraîner un fonctionnement indésirable. Partie responsible: VILPE USA LLC, 6402 Thornberry Court, 45040 Mason Ohio, Greater Cincinnati USA.

AVIS Les modifications non autorisées peuvent annuler le droit de l'utilisateur d'utiliser cet appareil.

AVERTISSEMENT Lors des travaux sur les toits, respectez toujours toutes les lois, réglementations et exigences de sécurité applicables. Faites preuve de prudence en manipulant des outils tranchants, des perceuses ou d'autres équipements de coupe.

AVERTISSEMENT Risque d'incendie et de brûlures. Ne pas ouvrir, écraser, chauffer au-delà de 60 °C (140 °F) ou incinérer. Ne tentez pas d'ouvrir ni de remplacer la pile.

PRÉCAUTION Ne pas exposer à l'eau liquide ni à une humidité relative >95 % pendant plus de 30 jours.

PRÉCAUTION Lors du perçage d'un trou pour le capteur, ne percez pas la barrière de vapeur qui peut se trouver sous l'isolation. Endommager la barrière de vapeur peut compromettre la protection contre l'humidité du bâtiment et entraîner de la condensation ou des problèmes structurels. Si une barrière de vapeur est présente, choisissez un emplacement et une profondeur de perçage qui évitent de la perforer.

AVIS Ce produit contient une pile au lithium.

Seguridad y cumplimiento de la normativa

Este dispositivo cumple con la parte 15 de las normas de la FCC. Su funcionamiento está sujeto a las siguientes dos condiciones: (1) este dispositivo no debe causar interferencia perjudicial, y (2) este dispositivo debe aceptar cualquier interferencia recibida, incluida la interferencia que pueda causar un funcionamiento no deseado. Parte responsable: VILPE USA LLC, 6402 Thornberry Court, 45040 Mason Ohio, Greater Cincinnati USA.

AVISO Las modificaciones no autorizadas podrían anular la autoridad del usuario para operar este dispositivo.

ADVERTENCIA Al trabajar en techos, cumpla siempre con todas las leyes, normativas y requisitos de seguridad aplicables. Tenga cuidado al manejar herramientas afiladas, taladros u otros equipos de corte.

ADVERTENCIA Riesgo de incendio y quemaduras. No abra, aplaste, caliente por encima de 60 °C (140 °F) ni incinere. No intente abrir ni reemplazar la batería.

PRECAUCIÓN No exponga al agua liquida ni a >95 % de humedad relativa durante más de 30 días.

PRECAUCIÓN Al perforar un orificio para el sensor, no atraviese ninguna barrera de vapor que pueda estar ubicada debajo del aislamiento. Dañar la barrera de vapor puede comprometer la protección contra la humedad del edificio y provocar condensación o problemas estructurales. Si existe una barrera de vapor, elija una ubicación y profundidad de perforación que evite perforarla.

AVISO Este producto contiene una batería de litio.

Technical data
Données techniques
Datos técnicos

EN	FR	ES	
Measuring range /accuracy - Temperature (typical) - Relative humidity (RH typical)	Plage de mesure/précision - Température (typique) - Humidité relative (HR typique)	Rango de medición/precisión - Temperatura (típico) - Humedad relativa (HR típico)	 -38...255 ± 1.8 °F (-39...124 ±1 °C) 0...100 ±2 %
Operating temperature	Température de fonctionnement	Temperatura de funcionamiento	-22...122 °F (-30...+50°C)
Operating humidity (RH)	Humidité de fonctionnement (HR)	Humedad de funcionamiento (HR)	5...95 %
Storage/transport temperature - Long term - Up to 7 days	Température de stockage/transport - À long terme - Jusqu'à 7 jours	Temperatura de almacenamiento/transporte - A largo plazo - Hasta por 7 días	 -40...86 °F (-40...+30°C) max. 140 °F (+60 °C)
Storage/transport humidity (RH, non condensing)	Humidité de stockage/transport (HR, sans condensation)	Humedad de almacenamiento/transporte (HR, sin condensación)	 5...95 %
IP rating	Indice de protection (IP)	Clasificación IP	IP20
Radio Uplink	Liaison montante radio	Enlace ascendente de radio	918.9 MHz
Estimated battery lifetime (years)	Durée de vie estimée de la pile (ans)	Vida útil estimada de la batería (años)	15

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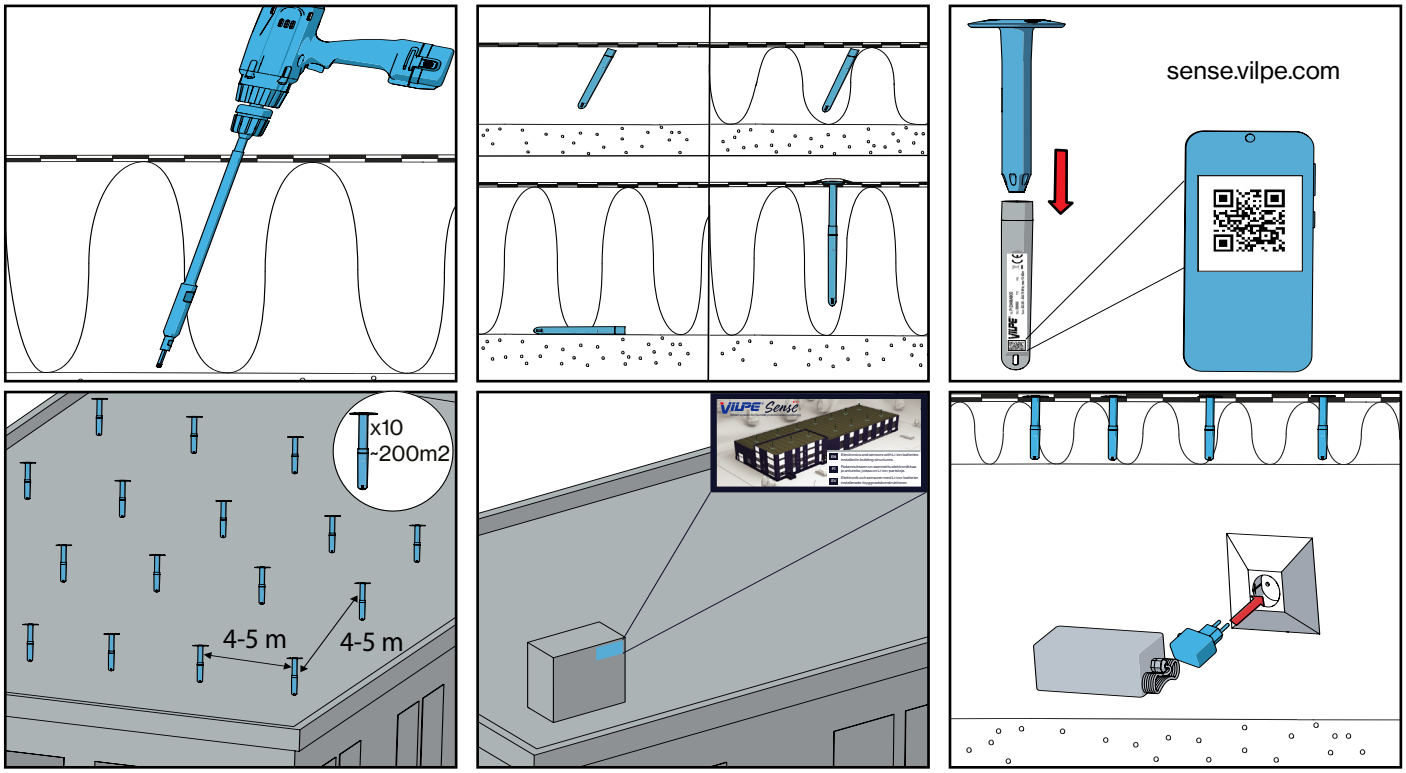

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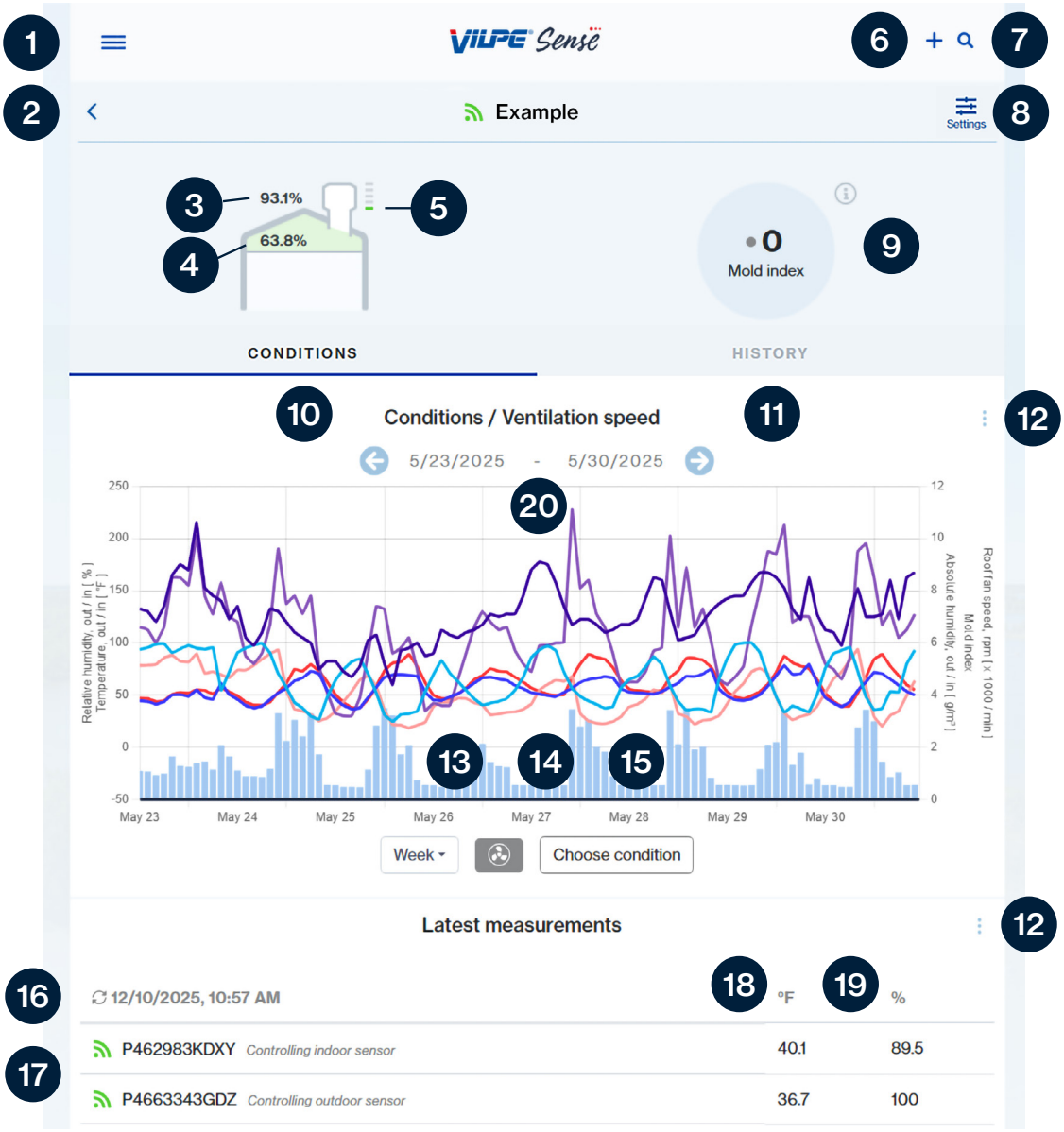
AVISO Después de la instalación y registro de los dispositivos, los datos pueden tardar hasta 24 horas en aparecer en el servicio en la nube VILPE Sense.

Attachment 4. Humidity Control User Interface



1. Settings, log out, front page
2. Choose a location
3. Outdoor air RH level
4. Structures RH level
5. Roof fan rotation speed
6. Create new group / add new device
7. Search
8. Settings (only for admin users)
9. Mold index
10. Conditions
11. History (only for admin users)
12. Refresh
13. Choose time period
14. Roof fan rotation speed
15. Choose sensors/conditions
16. Last update
17. Sensors
18. Temperature
19. RH levels
20. Calendar

VILPE® Sense

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