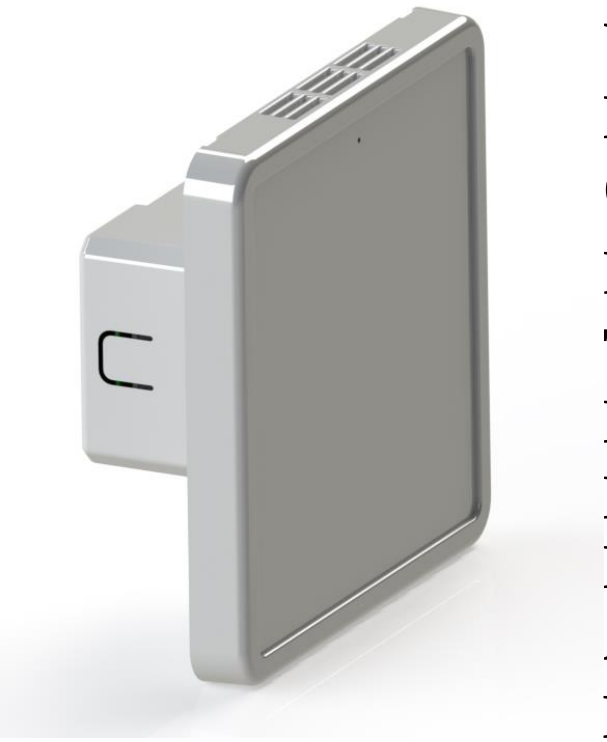
123 rue de Bellevue, 92100 Boulogne Billancourt
France
Tél : 33-(0) 1 41 41 00 02 - www.nano-sense.com

EP5000ME datasheet

Flush mounted Indoor Air Quality Probe



CO2
VOCT
NOx
Ozone
Particles
Temperature
Humidity
Noise
Light
Atmospheric pressure
Bad Odors (Sulphurous)

Ver	Date	Update
V1	25/01/2022	Initial version

 All Rights Reserved

Summary

 All Rights Reserved

1. Keynote

To comply with in force regulations on buildings energy efficiency, ventilation must be automatically on demand controlled.

2. Measuring indoor Air quality for HVAC control

Energy losses by air renewal in a conventional building are estimated to 30% of the heating and air conditioning cost. Losses become predominant for very isolated buildings even with heat exchanger. The increasing airproofing of buildings also imposes on demand air renewal based on IAQ to ensure productivity, comfort and health.
By controlling the ventilation on human occupancy materialized by the expiration of CO2 (meeting rooms, offices, bedroom) and air quality (VOC, toxic compounds and odors, particulate maters), significant energy savings can be achieved.

3. Multi sensors probe.

This probe is the most comprehensive on the market and can combine the following measurements:

- CO2
- Total VOC
- Sulphurous Odors
- NO_x (Optional)
- Ozone (Optional)
- PM1, PM2.5, PM10
- Humidity
- Temperature
- Light intensity
- Color temperature (in °K)
- Audible Noise
- Flickering (Optional)

4. Commissioning

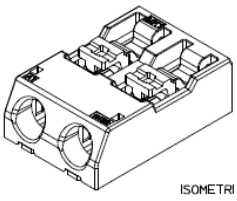
This probe is Modbus and EnOcean.
Commissioning can be set via a smartphone and NFC. See Android Application for details.

5. Power supply

Voltage	24V DC ± 12V
Average current	15mA @ 12V
Pic current	40mA @ 12V
Average power consumption	360mW max (all LEDs ON)

6. Connection

Power supply:	2 pins (polarized).
Modbus:	2 pins (polarized).
Connector type:	Push In.
Release:	Push button.
Type of cable:	Solid or Stranded.
Diameter of cable:	AWG 18-24 (Solid), 22-26 (Stranded).



 All Rights Reserved

7. Maintenance free

Each component of the IAQ probe has been selected and are managed in order to achieve at least 10 years' life span without any maintenance or recalibration.

This probe is designed to work in a ventilated area where sensors have the opportunity to see outdoor CO2 and VOCt concentration at least every 15 days.

The automatic baseline calibration is set on a 2 weeks' period. In order to get a good auto calibration after commissioning, it is recommended to open windows for at least 5 minutes with the probe powered.

8. Durability index

Some countries require indicating the Durability index but calculation is not yet harmonized among counties. As a consequence, we provide raw and detailed information as follow:

The design of the probe is made for a durability of at least 30 years.
PM, CO2 and VOC sensors have a 10 years' life span but can be replaced (plug and play) by end user without special tool. See reparability for details.

9. Reparability index

Some countries require indicating the Reparability index but calculation is not yet harmonized among counties. As a consequence, we provide raw and detailed information as follow:

The design of the probe is made of a stack of 5 PCB as follow (mounting order from rear to top)

- Power supply board.
- PM sensor.
- Inter board interface.
- Main board with the following sensors: CO2 (pluggable), TVOC (pluggable), Atmospheric pressure, noise.
- The front board with NFC and the following sensors: T°, RH, light

The main board has a built in test feature for each LRU (Line Replaceable Unit) with a status report through the digital communication and LED interface.
Each above board is designed to be a LRU and each LRU is a SKU (Stock Keeping Unit).
In case of failure each board can be ordered and changed by skilled end user according to the Maintenance and repair manual.
Most of sensors are SMD digital sensor with small drift along the life span of the probe.
Sensor with 10 years' lifespan are pluggable and considered as LRU: PM, CO2, TVOC.
LRU only requires a simple screwdriver for replacement operation. LRU are SKU that can be ordered separately.
Plastic parts are SKU and can be ordered separately in the frame of the reparability and sustainability policy.
Details of SKU part number are given in the "Maintenance and repair manual".

10. Firmware update

The EP5000 probe benefit from an OTC feature (update Over The Cable).
An OTC firmware update takes about 7 minutes from a PC and less from an automat.
Please read the details in the EP5000-Modbus Firmware Update document.

 All Rights Reserved

11. Flush-mounting

The flat design of the IAQ probe has been studied to be flush mounted in standard electric boxes. Integrated in the wall, the visible part is just few millimeters thick.
The air is sensed by the air diffusion going between the front panel and the wall (few millimeters).
In case of building retrofit a surface box is available.

12. Specifications of sensors after integration in the probe

12.1. Technologies

Protocols	EnOcean (EU) RS485 Modbus (See Modbus protocol specification for details). Default RTU, 9600 bauds.
Power supply	12V to 30V DC, Protection against transient-voltage-over 35V
CO2 sensor	Single band NDIR (Dual bands NDIR in option) with auto zero
TVOC sensor	Digital Metal Oxide pulsed MEMS with auto zero
PM sensor	Laser scattering with laser source
Temperature sensor	Digital MEMS
Relative humidity sensor	Digital MEMS
Atmospheric Pressure	Digital MEMS
Noise sensor	Digital sensor
Light sensors	Digital MEMS

12.2. Lifespan and drifts

Probe: 30 years (MTBF >48 years).
Gas and PM sensors: 10 years under normal conditions of use. Beyond 10 years, a replacement message is activated.
Humidity: Max drift 0.5% RH / year.
Temperature: Max drift of 0.04 ° C per year.
Noise: NA.
Atmospheric Pressure: +/- 1mbar/year.

12.3. Measurement ranges and accuracies

12.3.1. Single band NDIR CO2 (EP5000XX-YN):

+/- 50ppm and 3% at 25°C and 1013mbar, measuring range: 390 to 5000 ppm, resolution 1ppm.
Automatic Baseline Calibration (ABC): lowest value on 15 days adjusted at 400ppm.
The accuracy of the CO2 measurements indicated above requires that the room be unoccupied and ventilated for some time at least once every 15 days.

12.3.2. Double bands NDIR CO2 (EP5000XX-YD):

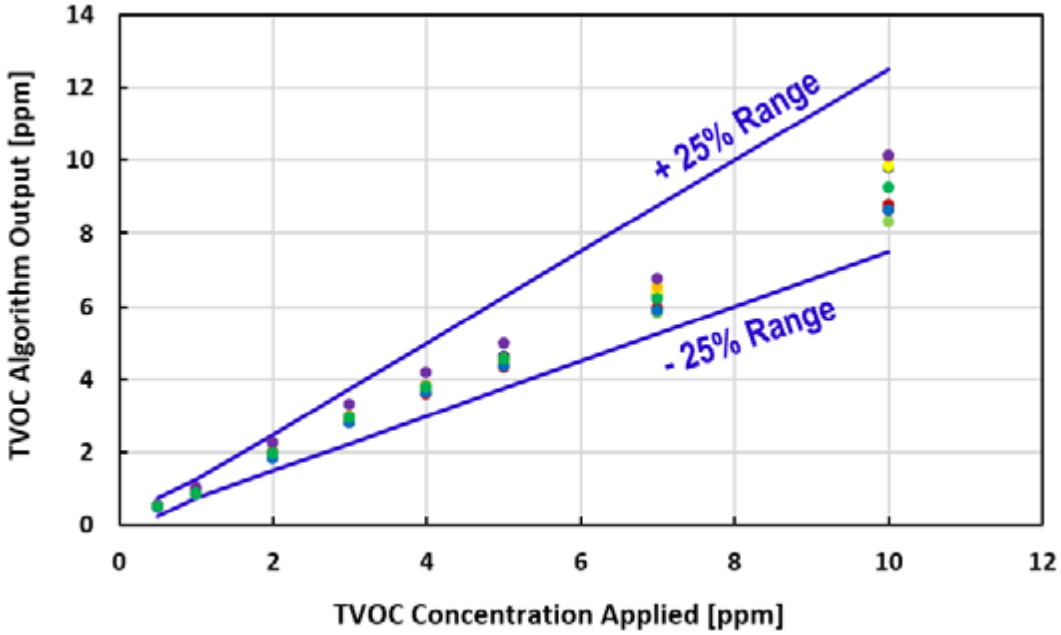
+/- 50ppm and 3% at 25°C and 1013mbar, measuring range: 390 to 5000 ppm, resolution 1ppm.
Long Term Adjustment (LTA): lowest value on 45 days adjusted at 400ppm.
The accuracy of the CO2 measurements indicated above doesn't requires that the room be unoccupied and ventilated for some time (Hospital patient room. Etc.).

12.3.3. TVOC:

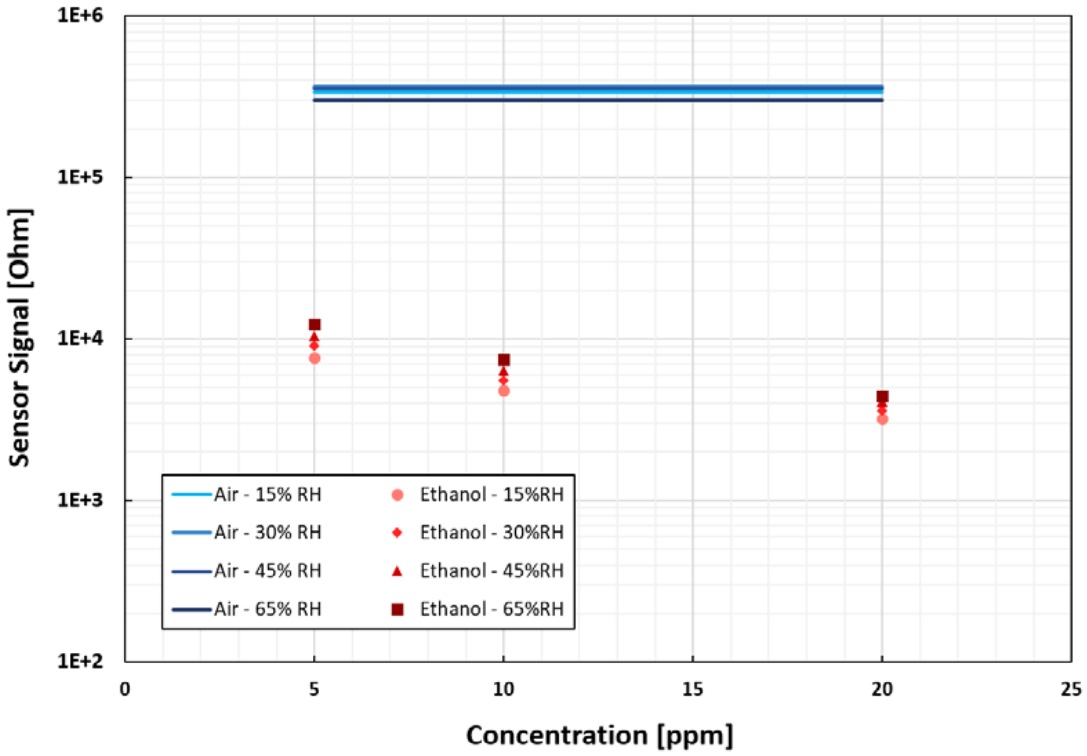
Total VOC according to UBA standard.
Range from 0 to 65 520 µg/m^3.
Resolution: 1 µg/m^3.
Stability: after 48 hours conditioning in clean air.
The automatic baseline adjustment requires the probe to be exposed expose to clean air at least once every 15 days.

 All Rights Reserved

Accuracy, consistency and repeatability: ±25%.



Self-calibration: Yes (ABC type, relative measurement).
Self-calibration period: 15 days.
Manual auto zero: By smartphone in the same time than for CO2.
Lifespan: 10 years without exposure to stressful environment.
Poisoning: less than ±8% sensitivity with siloxanes exposure at high concentration during hundreds of hours.
Influence of humidity: variations in relative humidity while stimulated with 3 levels of ethanol:

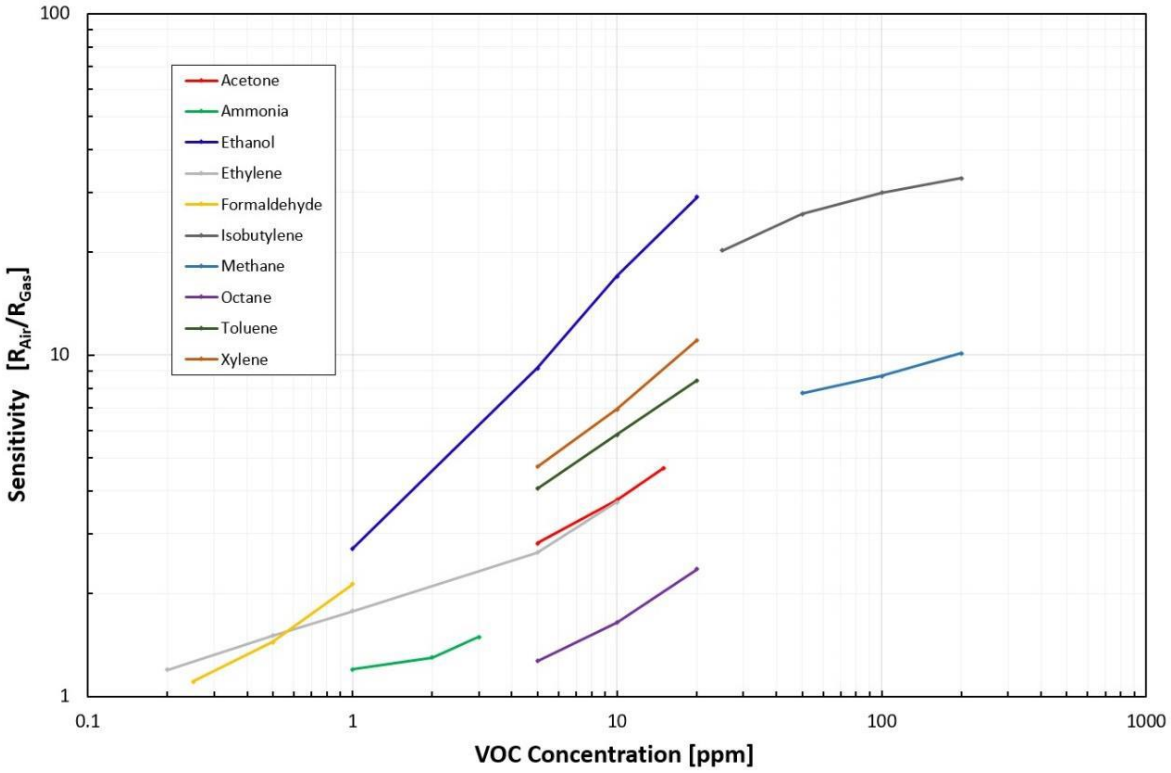


Due to the low influence of humidity, no algorithmic compensation is necessary.

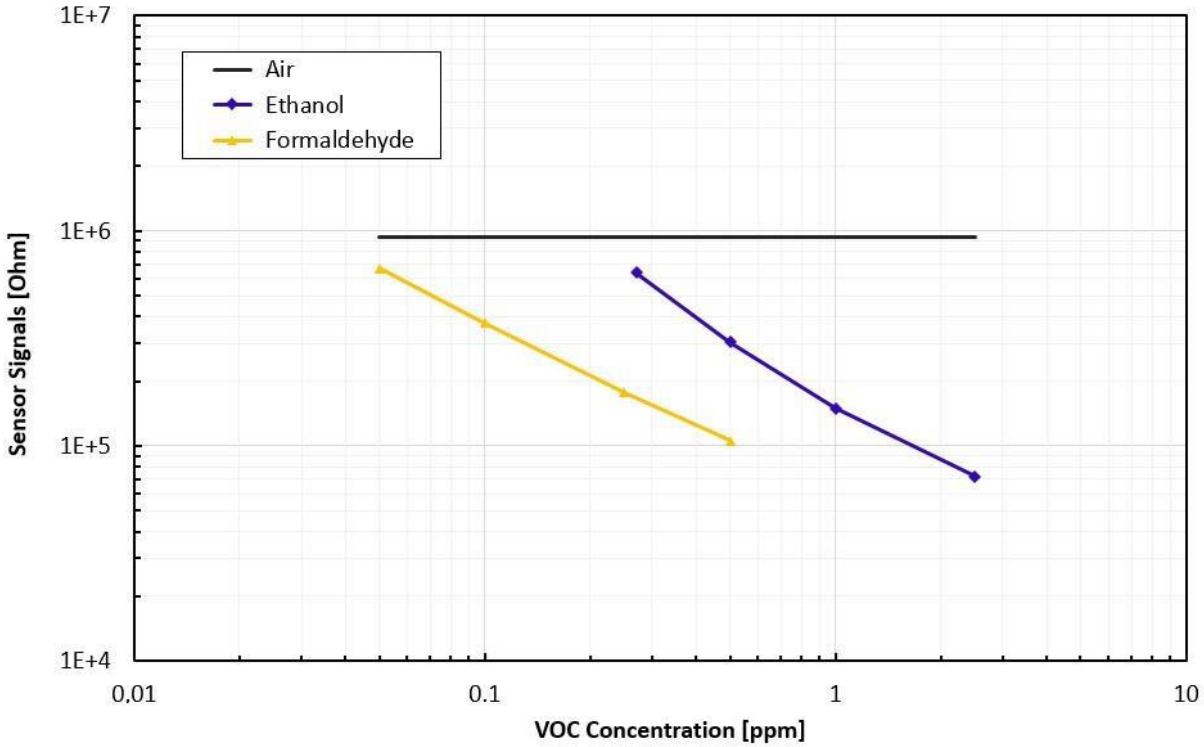
Relative measurement: The lowest possible value achievable by ventilation or air treatment becomes the zero on a 15 days' period.
The accuracy of the relative VOC measurements indicated above requires that the probe be associated with an active ventilation.

 All Rights Reserved

Sensitivity to various VOC:



Sensitivity to formaldehyde:



12.3.4. Sulphurous odors

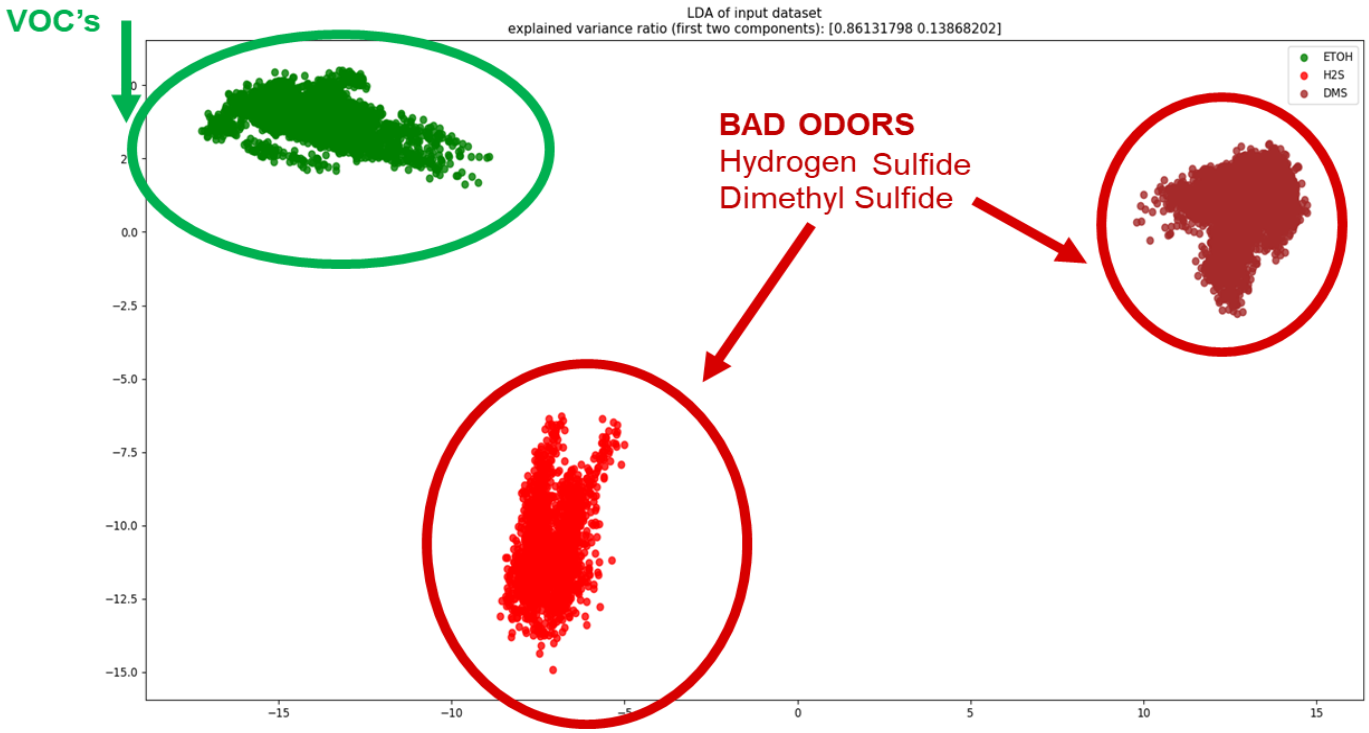
When olfactory threshold of Sulphurous odors is reach the general odors index is provided on a range of 0 to 100. Sulphurous odors are universally considered as bad odors. Olfactory threshold is different from one person to another and this threshold shall be considered for an average human nose.

Method of discrimination: Multi virtual sensors by temperature cycling + Trained neural net in inference state. Training based on H2S, C2H6S (DMS) versus ethanol.

Resolution: 0.2.

 All Rights Reserved

Classification of odors by categories (Illustration):



12.3.5. Stabilization time

The VOC and sulfur odors sensor works with an algorithm designed for 24-hour a day sensor operation. The sensor needs at least 48 hours at first start-up to reach its nominal sensitivity and calculate its baseline. This stabilization time may vary depending on the environment (Humidity, VOC, etc.)
In the event of a power shut down, the sensor will regain its performance according to the cut-off time. For a cut-off between 4 hours and one day, consider a relative measurement error of less than 25% after 30 minutes of restarting then < 5% after 2 hours.

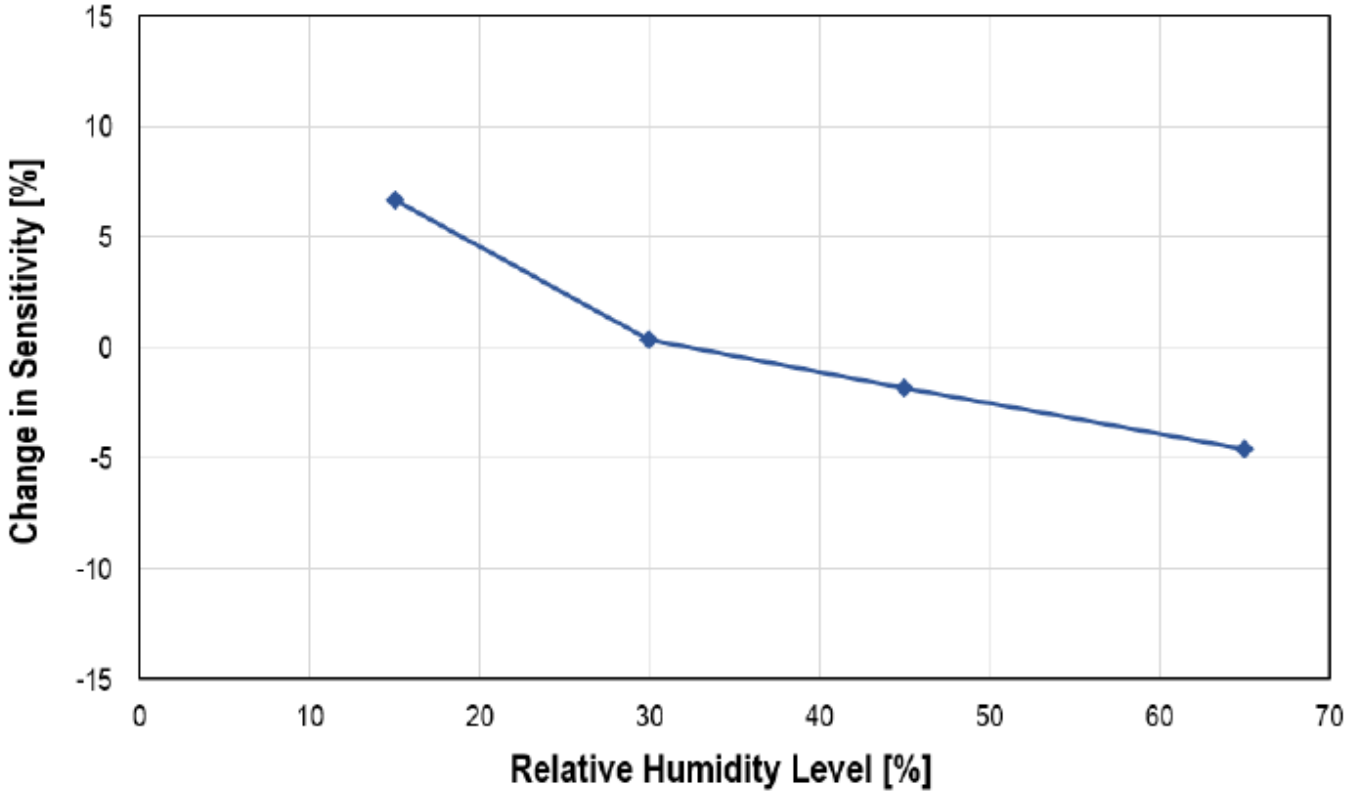
12.3.6. NOx (Optional sensor)

The current algorithm discriminates Ozone from NOx from the same MOX sensor but the NOx are not quantified. A later evolution will allow the measurement of NOx and can be implemented via the OTC.
Range from 20 to 500ppb
Resolution: 1ppb

12.3.7. Ozone (O_3) (Optional sensor)

Range from 20 to 500ppb.
Resolution: 1 ppb.
Stability: after 48 hours conditioning in clean air.
Repeatability ±25%.
Self-calibration: Yes (ABC type, relative measure).
Self-calibration period: 15 days.
Manual automatic zero: By smartphone at the same time as for CO2
Lifespan: 10 years without exposure to a stressful environment
Poisoning: sensitivity less than ±8% with exposure to high concentration siloxanes for hundreds of hours.

 All Rights Reserved



Due to the low influence of humidity, no algorithmic compensation is necessary.

12.3.8. PM1:

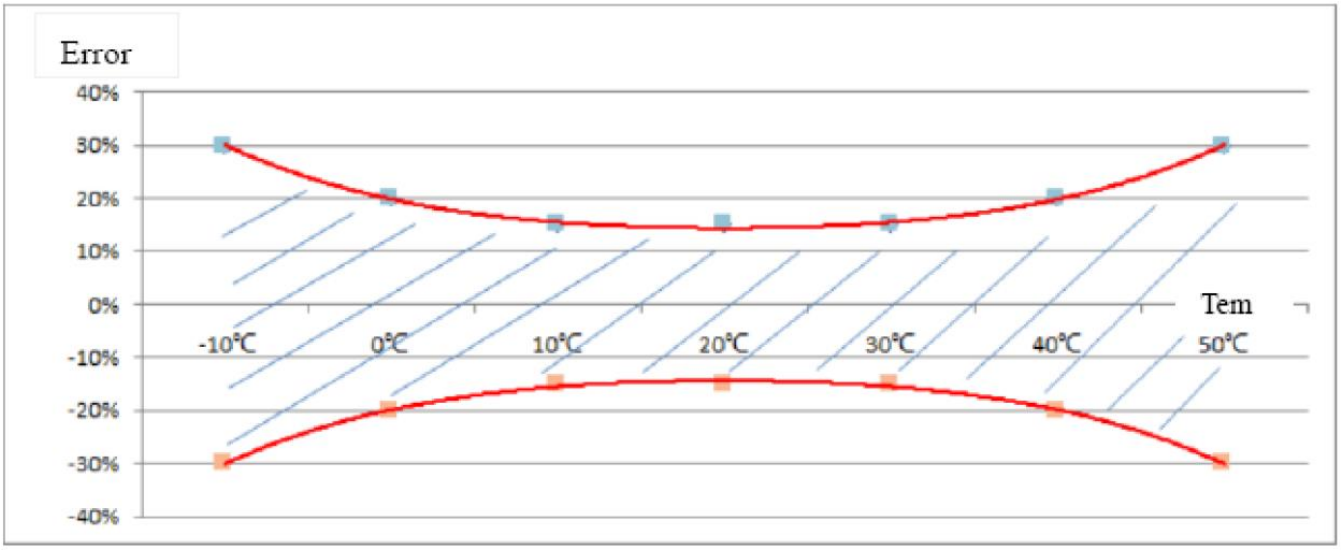
Range of measurement 0 to 1000 µg/m^3.
Accuracy: indicative, no accuracy commitment. Calibration with cigarette smoke.

12.3.9. PM2.5:

Range of measurement 0 to 1000 µg/m^3
Accuracy: < 50µg/m^3: ± 10µg/m^3, 50~100µg/m^3： ± 15µg/m^3 > 100µg/m^3: ± 15% reading.
Temperature influence: 0.5 to 1%/°C or 0.5 to 1µg/m^3/°C around 20°C, whichever is larger.

12.3.10. PM10:

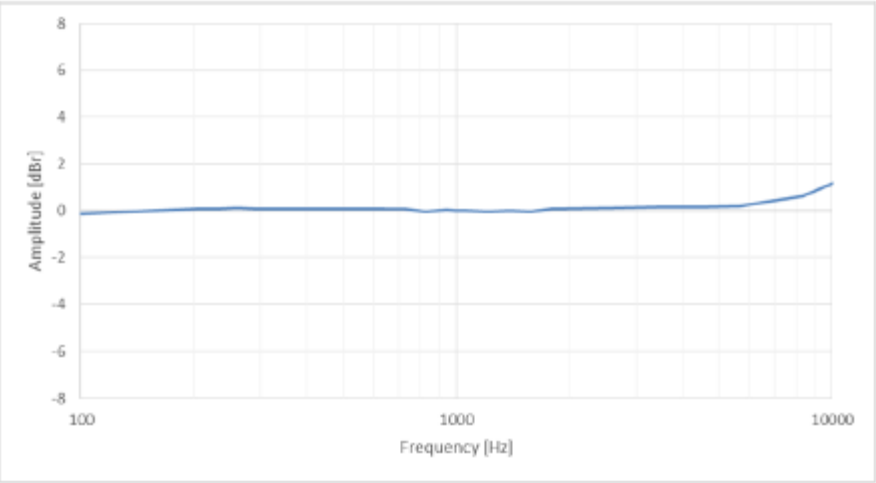
Range of measurement 0 to 1000 µg/m^3
Accuracy: indicative, no accuracy commitment. Calibration with Arizona sand.



 All Rights Reserved

12.3.11. Noise sensor

Range: 122.5 dBA SPL.
Pick and average calculated on 30 seconds period.
Signal to Noise Ratio: -64 dBA.
Omnidirectional sensitivity: -26 dBA FS ±3 dB sensitivity.
Drift: not significant.
Frequency response.



12.3.12. Atmospheric pressure sensor

Range: 0 to 1 200 mbar.
Error band, 700 to 1100 mbar,25°C: +/- 1.5 mbar.
Error band, 700 to 1100 mbar, 0°C to 50°C: +/- 2mBar.
Resolution: 0.13 mbar.

12.3.13. Light sensor

Illuminance: Lux computed from RGB and Clear channel.
Color temperature: computed from RGB and Clear channel.
Characteristic of channels:

Parameter	Test Conditions	Red Channel		Green Channel		Blue Channel		Clear Channel			Unit
		Min	Max	Min	Max	Min	Max	Min	Typ	Max	
R_e Irradiance responsivity	$\lambda_D = 465$ nm(2)	0%	15%	10%	42%	65%	88%	11.0	13.8	16.6	counts /µW /cm^2
	$\lambda_D = 525$ nm(3)	4%	25%	60%	85%	10%	45%	13.2	16.6	20.0	
	$\lambda_D = 615$ nm(4)	80%	110%	0%	14%	5%	24%	15.6	19.5	23.4	

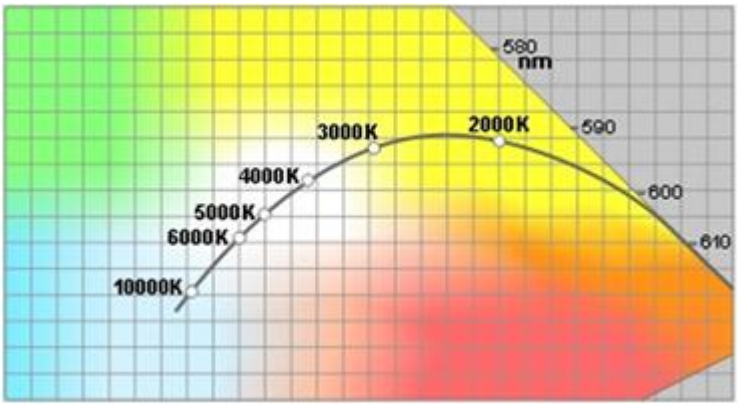
Notes:
1. The percentage shown represents the ratio of the respective red, green, or blue channel value to the clear channel value.
2. The 465 nm input irradiance is supplied by an InGaN light-emitting diode with the following characteristics: dominant wavelength λD = 465 nm, spectral halfwidth Δλ. = 22 nm.
3. The 525 nm input irradiance is supplied by an InGaN light-emitting diode with the following characteristics: dominant wavelength λD = 525 nm, spectral halfwidth Δλ. = 35 nm.
4. The 615 nm input irradiance is supplied by a AlInGaP light-emitting diode with the following characteristics: dominant wavelength λD = 615 nm, spectral halfwidth Δλ. = 15 nm.

 All Rights Reserved

Range of measurement 0 to 30 000 Lux
Resolution: 1 lux.

12.3.13.1. Color T°:

Range: 1 635°K to 7 500 °K
Resolution: 23°K/LSB



Examples of light temperatures

Light Source	Color Temperature (K)
Candle	1900
Sunlight at sunset	2000
Sodium bulb	2200
Incandescent bulb	2500 / 2800
Cold white fluorescent lamp	2700 / 3000
Halogen lamp	3300
Carbon arc lamp	3780
Neutral white fluorescent lamp	4000 / 4200
Sun light plus sky light	5500
Sun at its zenith	5800
Xenon strobe light	6000
Overcast sky	6500 / 8000
Electric arc	10000

Attention: The higher the temperature, the colder the light.

12.3.13.2. Lux:

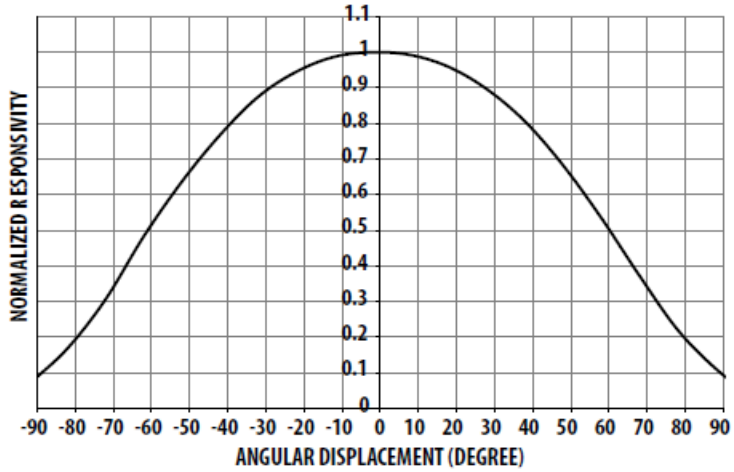
Range: 0 to 30 000 lux
Resolution: 1 Lux

Examples of illuminance

Activity or concerned places	Average illumination
Full moon night	0,5 lux
Well-lit night street	20 à 70 lux
Living room	100 à 200 lux
Well-lit apartment	200 à 400 lux
Workstation	500 à 600lux
Outdoors by overcast sky	500 à 25 000 lux
Outdoors in direct sunlight	50 000 à 100 000 lux

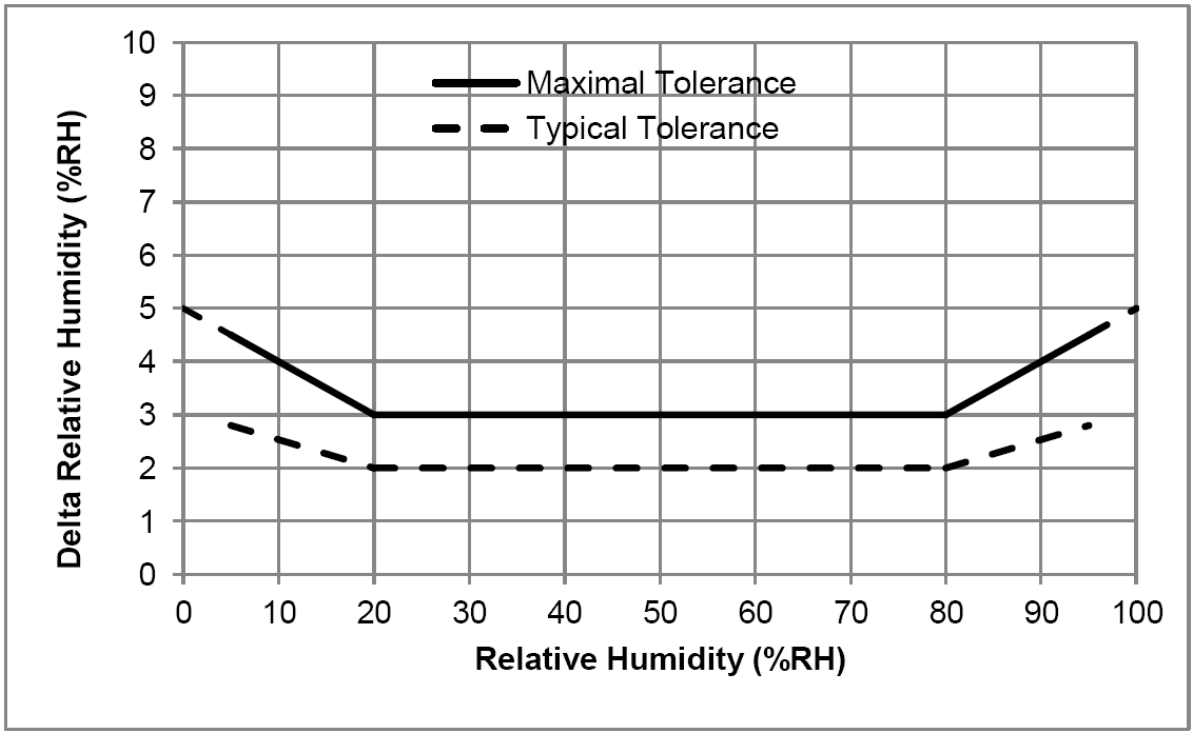
 All Rights Reserved

12.3.13.3. Receptivity



12.3.14. Humidity:

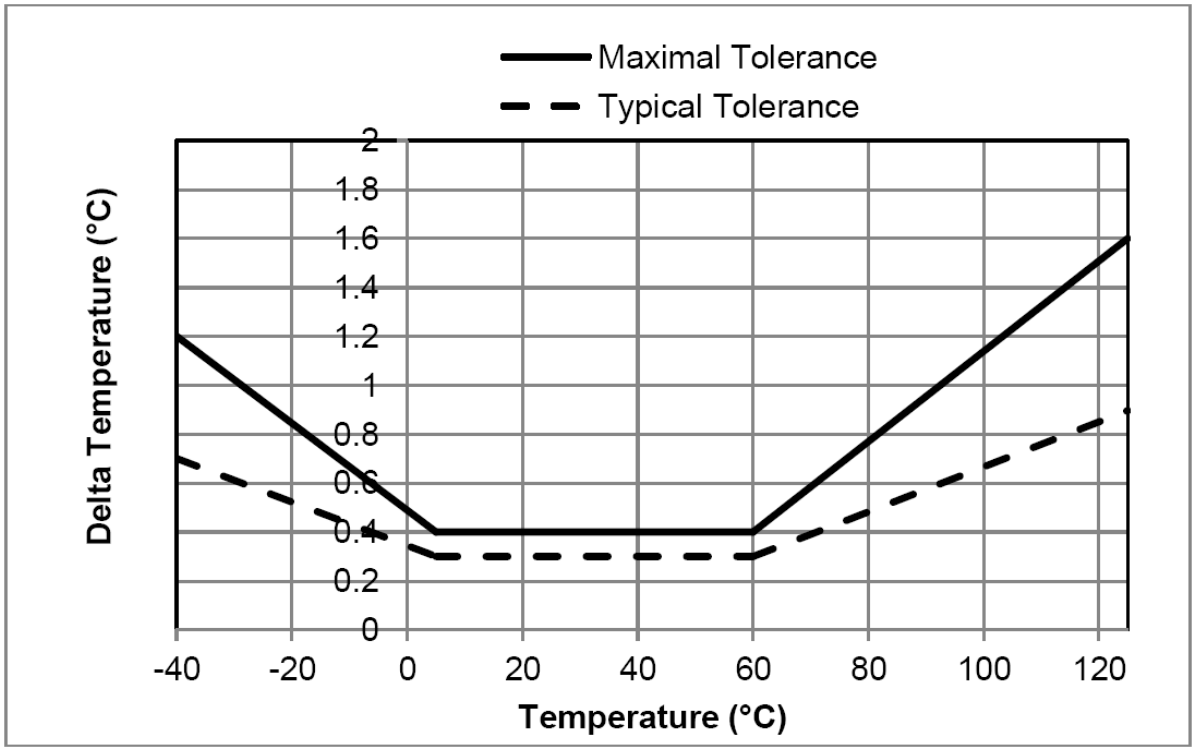
+/- 3% RH, minimum measurement range: 0% to 100% RH, resolution 1%.



 All Rights Reserved

12.3.15. Temperature:

+/- 0.3°C, measuring range from 0° to + 50°C, resolution 0.1°C.



13. Improvement of the ABC auto zero

The probe automatically activates an over ventilation (max flow) once every 15 days during a period of vacancy to improve the ABC process which requires a CO2 concentration as close as possible to the outdoor level over a similar period (single band) and a TVOC level close to that outdoor air. The duration of over-ventilation is not fixed and ends when the change in CO2 and VOC are stable for at least 10 minutes (<10ppm CO2). There is a big chance than the NOx and O3 level been higher than indoor when over ventilating so this process doesn't concern NOx and O3.

The probe can receive over-ventilation opportunity data from ecosystem based on occupancy sensors. In the absence of occupancy sensors, the occupancy period is estimated based on a low CO2 value (<500ppm) and low CO2 variations (<20ppm in 30 minutes).

If the probe has over-ventilated, it no longer takes into account the opportunity information (sufficiently long absence) that it receives during the next 15 days.

To trigger over ventilation on the basis of opportunity information provided by the eco system, the CO2 stability criteria must also be valid.

If the probe does not receive opportunity information from the ecosystem at least once every 24 hours, it will only rely on the unoccupancy estimated via CO2.

14.CO2 manual calibration

A manual CO2 recalibration can be launched via NFC (smartphone App) or Modbus.

LEDs will blink during 20minutes. During this time, the windows shall be opened and the room unoccupied to reach the outdoor CO2. At the end of the 20 minutes, the CO2 sensor baseline is set to 400ppm then the LED stop blinking.

15. Controls

- Ventilation: On Off or Continuous on PI.
- Heating Control: Continuous on Fuzzy logic PID.
- Cooling control: Continuous on Fuzzy logic PID.

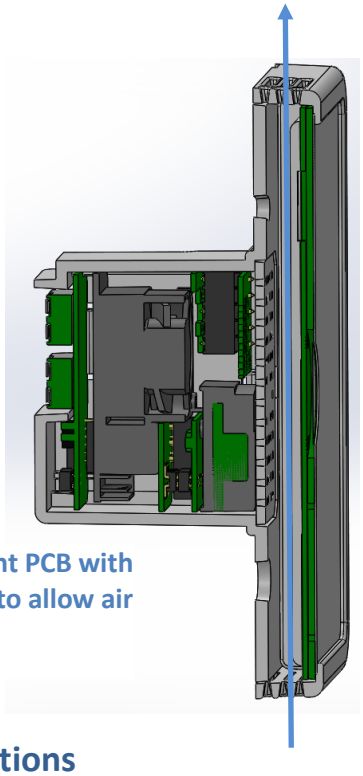
 All Rights Reserved

16. Set points

- Ventilation: on thresholds or physiological effects objectives.
- Heating.
- Cooling.

See smartphone App for details.

17. Air flow



EP5000 probe vertical cut view: The front PCB with T° and RH sensor is away from the wall to allow air flow in front of other sensors.

18. Operation and storage conditions

Working temperature range:	0°C to +45°C.
Working humidity range:	0 to 95% non-condensing.
Storage temperature range	-30°C to 60°C.
Storage humidity range:	0 to 95% non-condensing.

19. Noise

PM sensor fan activated 6 seconds every minutes: < 20dBA at 30cm (background noise < 16dBA).

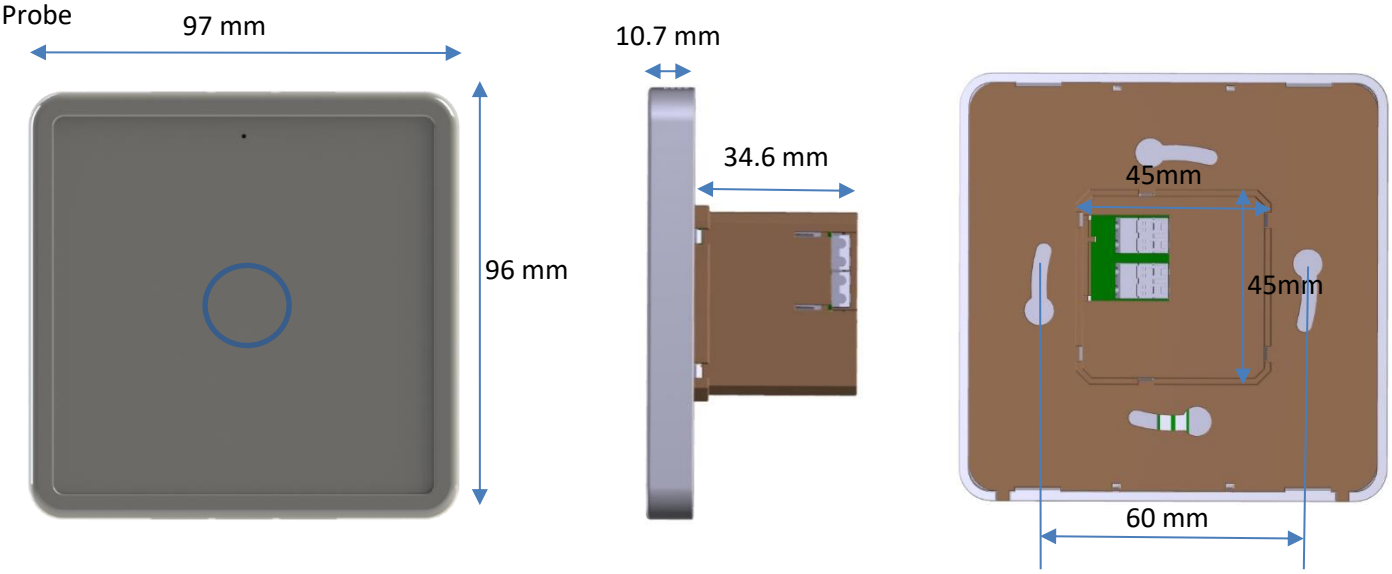
20. Protection index

Protection class: III.
Protection grade: IP 30.

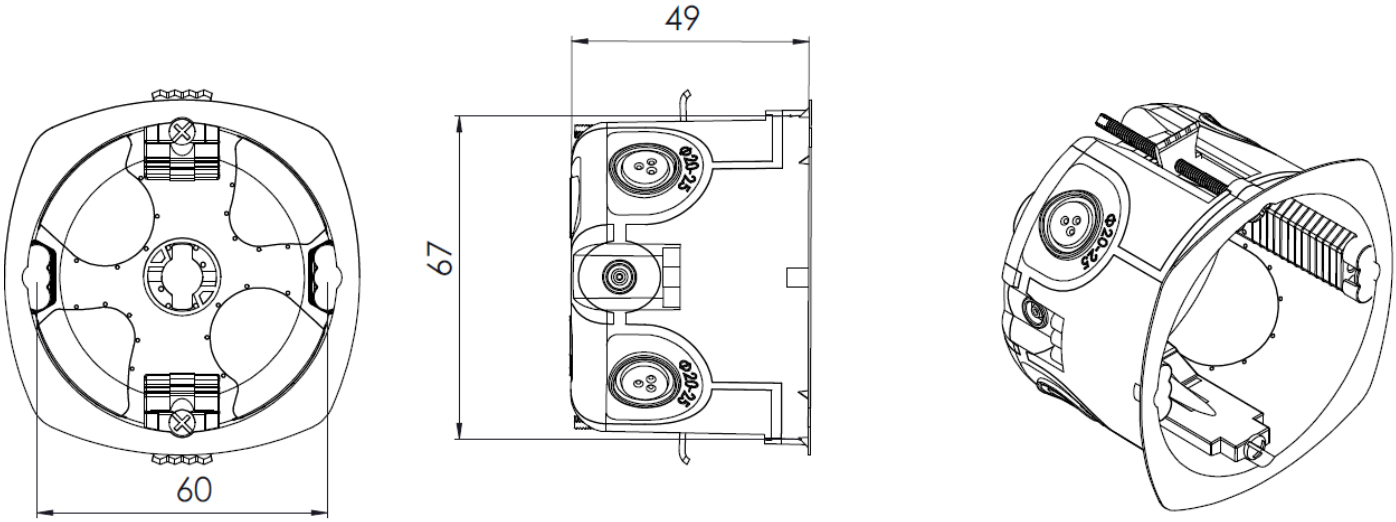
 All Rights Reserved

21.Dimensions

Probe



Wall box



22. Weight

Probe alone: 120g.

23. Packaging

Ecological natural carton gift box.
Dimensions: 195 x 140 x 48 mm.
Weight: 222 grams.

24. Packing list

Probe.
Silicone free Wall box.
Card with QR code link for online documentation.

 All Rights Reserved

25. Product Label

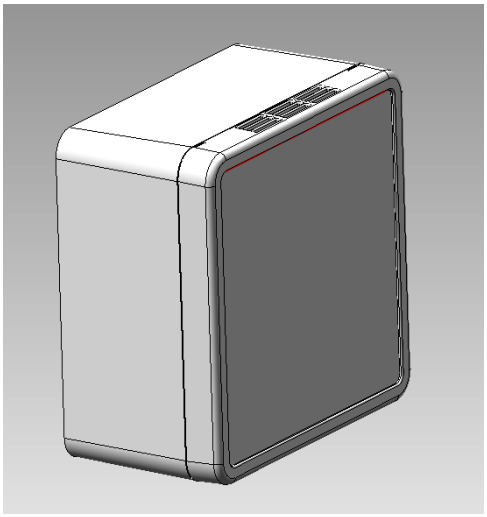
The label in the back of the product identify the model.
M termination means **Modbus**.
E termination means **EnOcean**
The serial number is registered in the main MCU and can be read via NFC with a dedicated smartphone App.

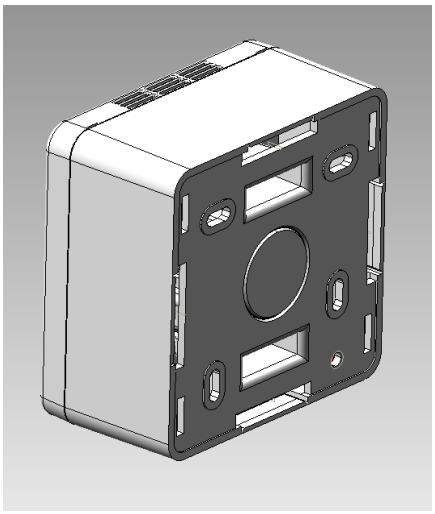
26. Marking

The type of connection (power supply) is indicated in front of each connector as well as polarities.

27.Option de montage

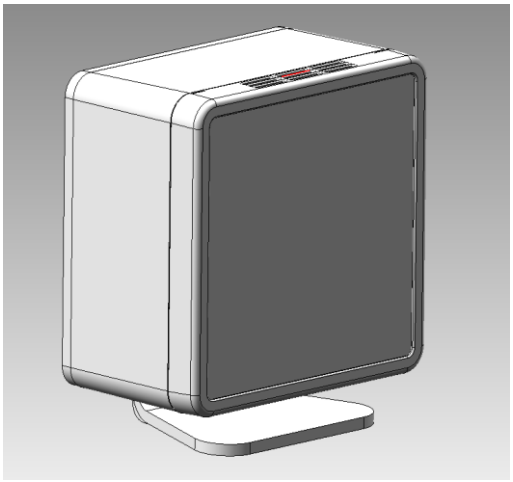
In case of renovation, a surface mounting box is available as an option.
Pre-cuts allow the side passage of cables under trunking and a rear passage allows the passage of a recessed cable.

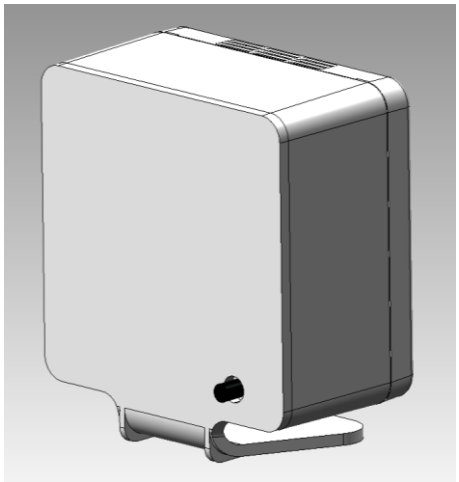




28.Option diagnostic

Although intended primarily for remediation control, the EP5000 probe can also be used to perform diagnostics and has a table support for this purpose.





29. Applicable Standard

EN 60730-1 (electrical controls for household machines and the like).
The unit complies with European Directive 73/23/EEC (Low Voltage Directive) and 89/336/EEC (EMC Directive).

30. Flammability

Flammability class according to UL 94: V0.

 All Rights Reserved

31. RoHS / Reach compliance

See separate certificate for details.

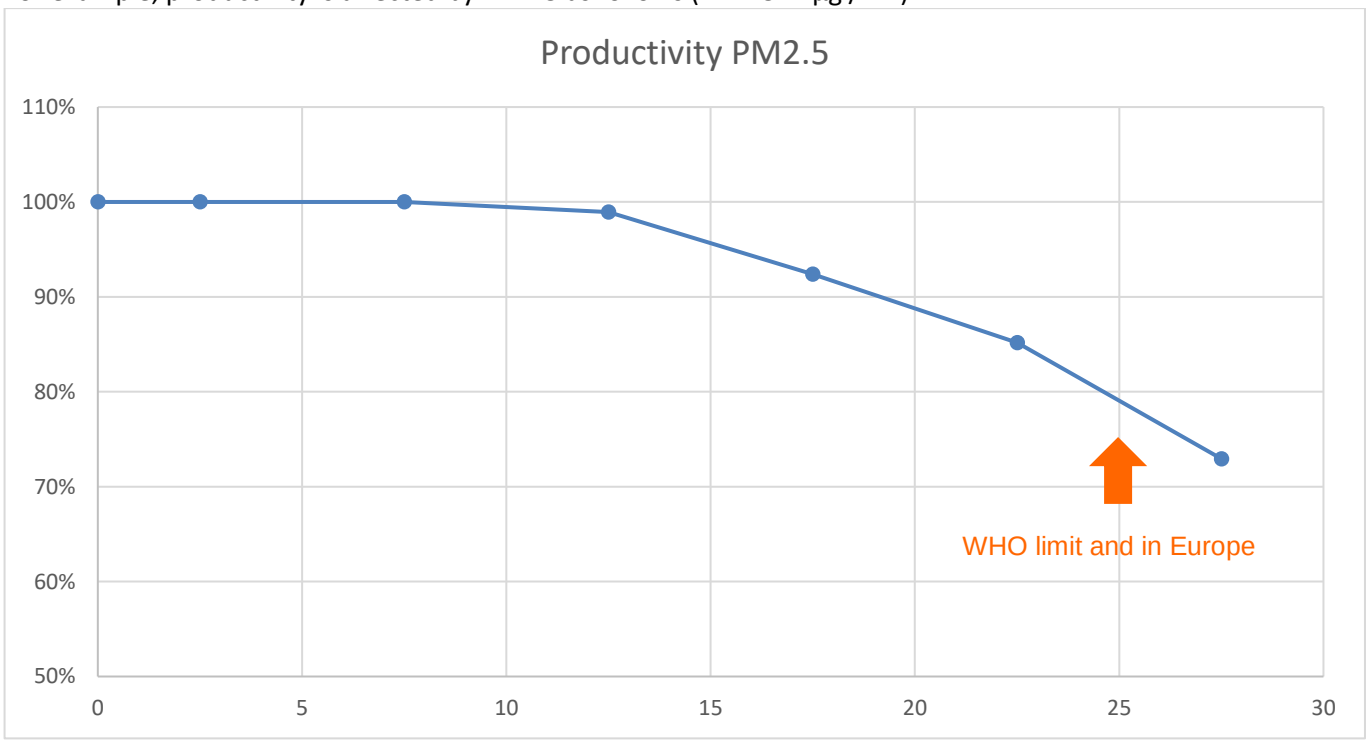
32.Physiological effects

This algorithm is based on international university studies quantifying the physiological impacts of air quality on humans.

The following table shows the contributors for each physiological impact:

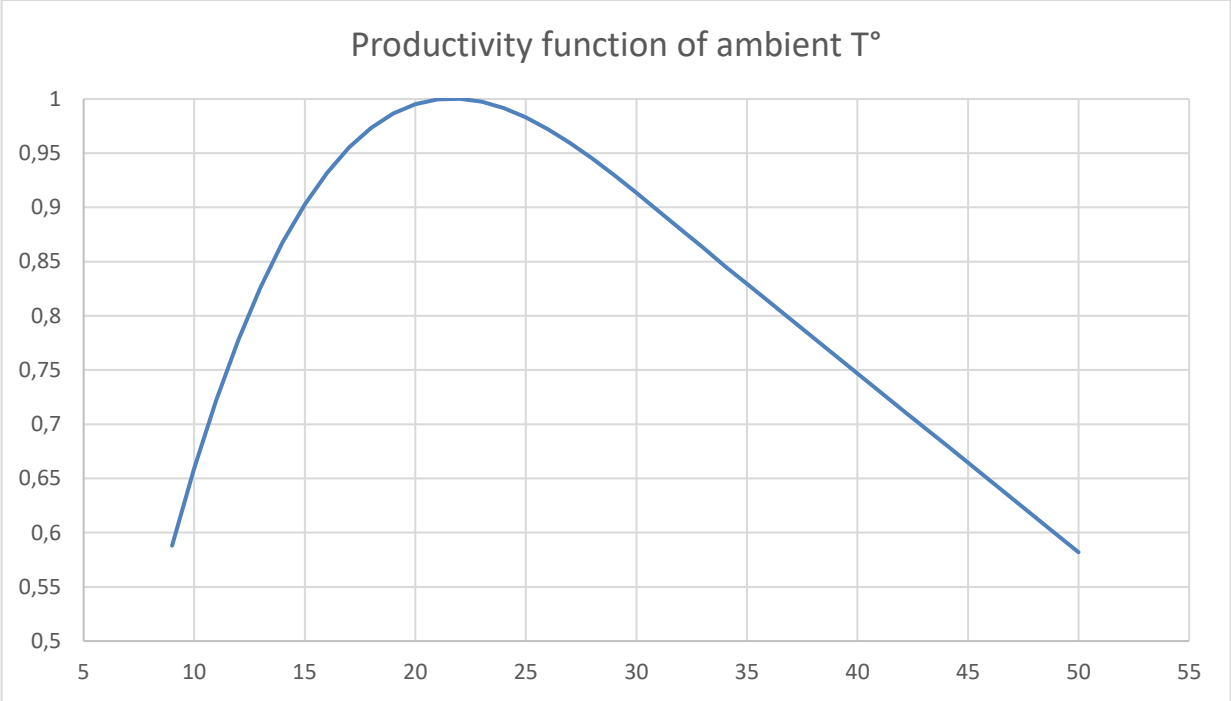
	CO2	COVt	PM	Formaldehyde, Benzene	Radon	Noise	Odors	T°	RH	NOX O3	Lux	Light color	Light flickering
Cognitivity / Productivity	✓	✓	✓			✓	✓	✓			✓	✓	✓
Health		✓	✓	✓	✓	✓		✓					
Quality of sleep	✓					✓		✓			✓	✓	
Asthma attack		✓	✓				✓	✓	✓	✓			
Olfactory Comfort		✓					✓						
Thermal Comfort								✓					
Sound comfort						✓							
Dry air Comfort									✓				
Respiratory tract irritation			✓						✓	✓			
Growth of mold, spores and mites									✓				

For example, productivity is affected by PM2.5 as follows (PM2.5 in µg / m^3):

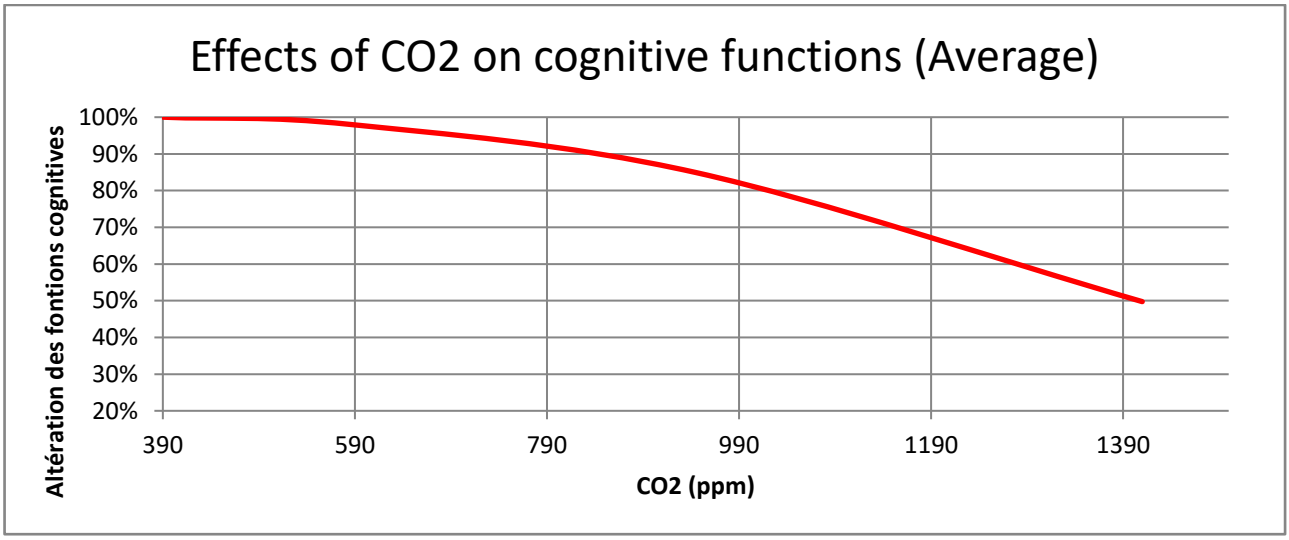


 All Rights Reserved

Productivity is also affected by extreme temperatures as follows:



Source https://iaqscience.lbl.gov/si/performance-temp-office



Source NIH National Institute of Environmental Health Sciences

33.Display

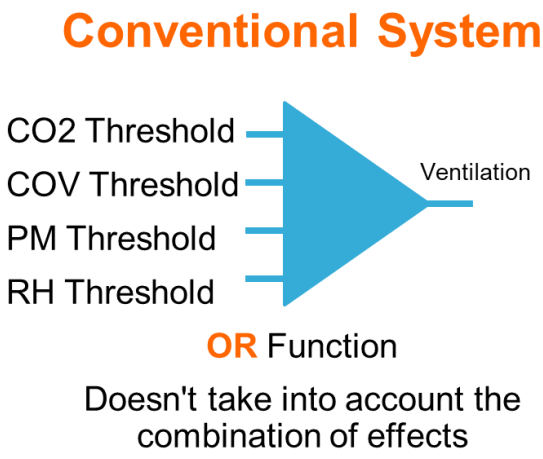
IAQ LEDs summarize health, productivity and quality of sleep indexes and display the lowest.
The ventilation regulation loop is based on settable health, productivity and quality of sleep objectives or by exceeding conventional thresholds.

The comparison between IAQ and AAQ is based on the comparison of physiological effects. An indication by LED for windows on street and backyard. It can be set to WELL V2 criterias.

 All Rights Reserved

34.Remedial control

The probe can control means of remediation (generally ventilation) according to the IAQ instructions (By threshold for each pollutant or by threshold for each physiological effect). In all cases, the control is of the Proportional-Integral (PI) type, which makes it possible to converge quickly towards the setpoint value. The thresholds and the proportional band can be configured via NFC and the smartphone application.
The instructions are specific to each mode: Comfort (presence), Eco (absence), Night..



In a conventional system, a threshold is determined for each pollutant. From this threshold, a PI control loop is calculated for linear control or threshold overrun with hysteresis for On Off control.
The command associated with each pollutant is compared and the strongest command is applied. It is therefore an OR function because either one pollutant generates the strongest command or another and there is therefore no cumulative effect of the pollutants.

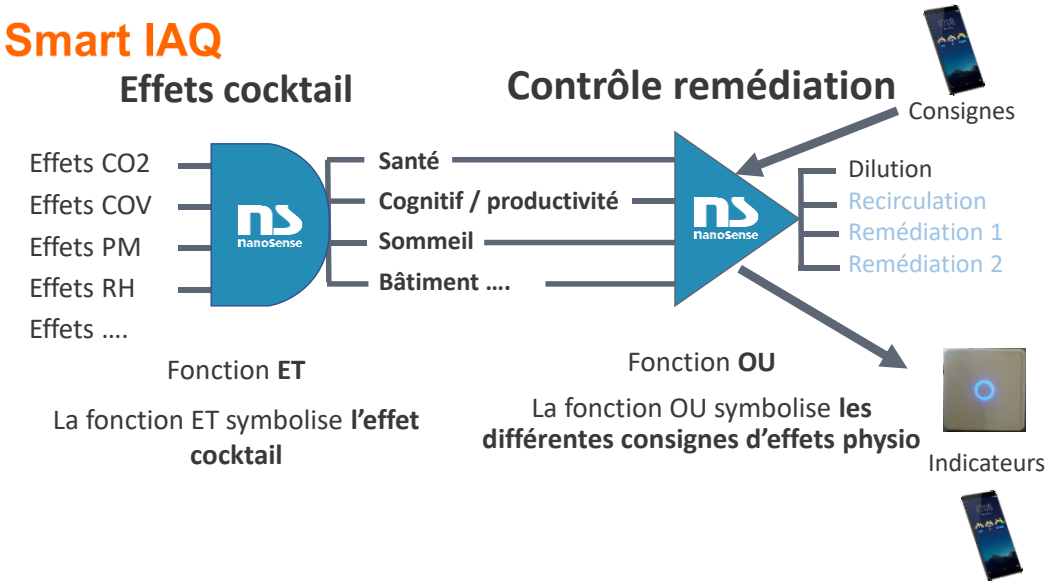
Remediation control via Physiological Effects

There are several physiological effects calculated simultaneously:

- Cognitive / Productivity
- Health
- Quality of sleep
- Olfactory comfort
- Irritation of the respiratory tract
- Building health

The principle of remediation on physiological effects is that the index serves as a setpoint. An index calculation is based on several sensor measurements and their combined effects (cocktail effect). Productivity takes, for example, temperature, light and noise into account without being able to act on them. To be able to achieve the defined objective, the probe has no choice but to reduce the impact of the IAQ which weighs in the calculation of the index. To sum up: in summer, in a non-air-conditioned building, the EP5000 probe will compensate for the loss of productivity linked to excessive heat by over-ventilation in an attempt to meet the desired productivity objective.
The setting of the instructions addresses each physiological effect objective independently for each of the modes (Comfort, Eco, Night).
Each mode normally requires the use of an additional sensor (presence, night sensor or clock). But the EP5000 probe can also use its own sensors to determine presence (on C02) and night (light). Failing this, the EP5000 sensor will operate 24 hours a day in comfort mode.

 All Rights Reserved



For each physiological setpoint, an index is calculated then a PI control (proportional integral) is developed according to the setpoint.
The applied control is the most important value of all the elaborate PI controls (Or function).

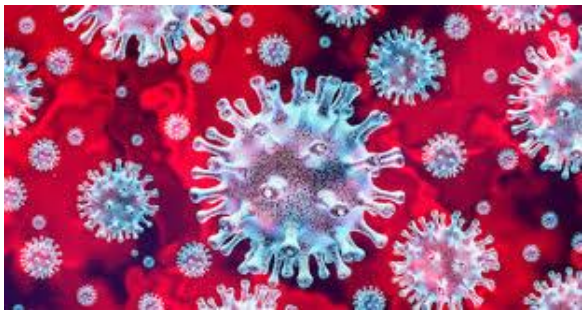
However, since light affects melatonin (sleep hormone), the index of productivity and cognitive functions, when darkness is less than 10 lux, it is considered that it is no longer possible to see and therefore to work and index becomes zero. In this case the probe could try to compensate for the negative influence of light by over-ventilating. To avoid this extreme and inappropriate operation, as soon as the light level drops below the threshold defined for the night via the smartphone application, the probe replaces the cognitive objective with a sleep quality objective. As this last index is not influenced by the luminosity, the ventilation will not try to unnecessarily compensate for the lack of light. Please note that this switching of the physiological effect objective should not be confused with the switch to night mode.

35. Index of viral contamination risk

Virus transmitted through the air as well as direct and indirect contact depends of different factors:

Transmission	Temperature	Humidity	UV	Human density	Air flow	PM2.5
Airborne	✓	✓	✓	✓	✓	✓
Contact	✓	✓	✓			

Virus survival conditions are temperature and humidity dependent. Virus are also sensitive to UV. This explain partially why the flu is more prevalent in winter. Crowded environment (confinement) is also a factor of virus spreading. The EP5000 probe can estimate the number of people in a room from the CO2 measurement and the controlled ventilation flow rate. This index evaluates the risk of viral contamination in a building.



 All Rights Reserved

36. Annex

36.1. Resolutions

Please note that resolution of measures depends of the selected EnOcean profiles Resolutions provided in this document are based on Modbus (16 bits) but EnOcean telegrams s are more compact and for instance use 8 bits for CO2 so resolution is 5000ppm / 255 = 19.6ppm against 1ppm in Modbus. Ditto for the temperature with 0.2°C in EnOcean and 0.1°C in Modbus.

36.2. EEP used

EEPs in bold are the default ones. The others can be chosen during commissioning.
EEPs in gray will be implemented later.

Measures:

CO2

EEP	Comment
A5-09-04	CO2 (2550ppm) + T° + RH
A5-09-08	Pure CO2 (2000ppm), In this case no T° and RH measurement
A5-09-09	Pure CO2 (2000ppm) with power failure
D2-04-00	CO2 (2000ppm) + T° + RH + day/night + autonomy
D2-04-01	CO2 (2000ppm) + RH + day/night + autonomy
D2-04-02	CO2 (2000ppm) + T° + day/night + autonomy
D2-04-03	CO2 (2000ppm) + T° + autonomy
D2-04-04	CO2 (2000ppm) + T°
D2-04-05	CO2 (2000ppm) + T° + day/night
D2-04-06	CO2 (2000ppm) day/night
D2-04-07	CO2 (2000ppm) + day/night + autonomy
D2-04-08	**CO2 (5000ppm) + T° + RH + day/night + autonomy**
D2-04-09	CO2 (5000ppm) + RH + day/night + autonomy
D2-04-10	CO2 (5000ppm) + T° + day/night + autonomy
D2-04-1A	CO2 (5000ppm) + T° + autonomy
D2-04-1B	CO2 (5000ppm) + T°
D2-04-1C	CO2 (5000ppm) + T° + day/night
D2-04-1D	CO2 (5000ppm) day/night
D2-04-1E	CO2 (5000ppm) + day/night + autonomy

VOC

EEP	Comment
A5-09-0C	VOC

NOx

EEP	Comment
A5-09-0C	NOx

O3

EEP	Comment
A5-09-0C	O3

Formaldehyde

EEP	Comment
A5-09-0C	Formaldéhyde

Benzene

EEP	Comment
A5-09-0C	Benzène

 All Rights Reserved

Particles

EEP	Comment
A5-09-07	PM1, PM2.5, PM10

Noise

EEP	Comment
A5-13-11	Db, not DbA

Light

EEP	Comment
D2-14-5A	Illumination, Color temp, flickering
A5-07-03	Lux

Barometric

EEP	Comment
A5-05-01	mBar

Physio effects

EEP	Comment
D2-60-00	Physio effect, Building index, Virus and mode

Control :

Free cooling

EEP	Comment
F6-02-01	Heat recovery bypass

Dilution

EEP	Comment
F6-02-01	ON/Off
A5-3F-7F	**Generic,** B1, 0-100%
F6-02-01	Speed 1 & 2

Recirculation

EEP	Comment
F6-02-01	ON/Off
A5-3F-7F	**Generic,** B1, 0-100%
F6-02-01	Speed 1 & 2

Heating

EEP	Comment
F6-02-01	ON/Off
A5-3F-7F	Generic
A5-20-01	**Valve type (bi dir.)**
A5-20-02	Valve type (bi dir.)
A5-20-03	Valve type (bi dir.)
A5-20-04	Valve type (bi dir.)
A5-20-10	Generic HVAC

Cooling

EEP	Comment
F6-02-01	ON/Off
A5-3F-7F	Generic
A5-20-01	**Valve type (bi dir.)**
A5-20-02	Valve type (bi dir.)
A5-20-03	Valve type (bi dir.)
A5-20-04	Valve type (bi dir.)
A5-20-10	Generic HVAC

 All Rights Reserved

Asséchement

EEP	Comment
F6-02-01	**ON/Off**
A5-3F-7F	Generic
A5-20-10	Generic HVAC

Humidification

EEP	Comment
F6-02-01	**ON/Off**
A5-3F-7F	Generic
A5-20-10	Generic HVAC

Ecosystem:

Température extérieur

EEP	Comment
A5-04-03	Température and RH (used by AAQ probe)

Occupation

EEP	Comment
F6-04-01	Key card activated switch
F6-04-02	Key card activated switch ERP2
A5-07-01	**Occupancy with supply voltage monitor**
A5-07-02	Occupancy with supply voltage monitor
A5-08-01	Occupancy with light & T°
A5-08-02	Occupancy with light & T°
A5-08-03	Occupancy with light & T°

Windows oprning

EEP	Comment
D5-00-01	**Window contact switch**
F6-10-00	Window handle
F6-10-01	Window handle ERP2

Nuight

EEP	Comment
A5-06-02	**light sensor (0 to 1020 Lux)**
A5-06-03	light sensor (0 to 1000 Lux)
A5-08-01	Occupancy with **light** (0 to 510 lux) & T°
A5-08-02	Occupancy with **light** (0 to 1020 lux) & T°
A5-08-03	Occupancy with **light** (0 to 1530 lux) & T°

All Rights Reserved