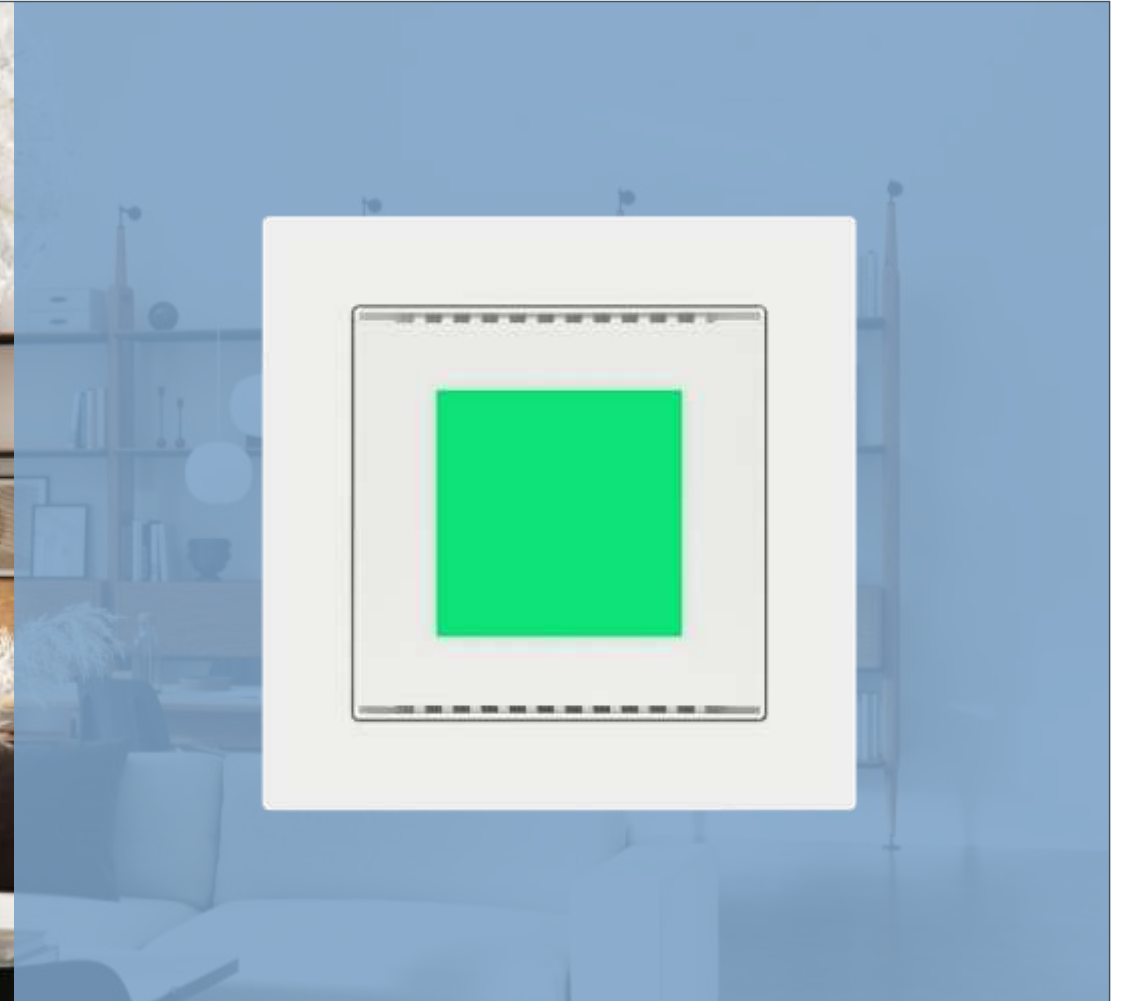




Improving Indoor Air Quality with KNX

CO₂ and VOC Sensors for a Healthy Environment

Frederik Riedel & Martin Speer | 24.09.2025

» We are your
speakers today



Frederik Riedel

- Manager and trainer in technical service at Elsner Elektronik GmbH
- Support, product consulting



Martin Speer

- Product Manager at Elsner Elektronik GmbH
- Practical experience as a KNX system integrator and in sales

AGENDA

1. Air quality foundations
2. Difference from CO₂ & VOC
3. Areas of application for air quality sensors
4. Product presentation
5. Mounting
6. Parameter Cala IL CO₂
7. Application examples



01 | Air quality foundations

Air quality

| Definition and influences

- Air quality describes how clean or polluted the air we breathe is.
- Temperature, humidity and wind play a role as they influence the spread of pollutants



Air quality

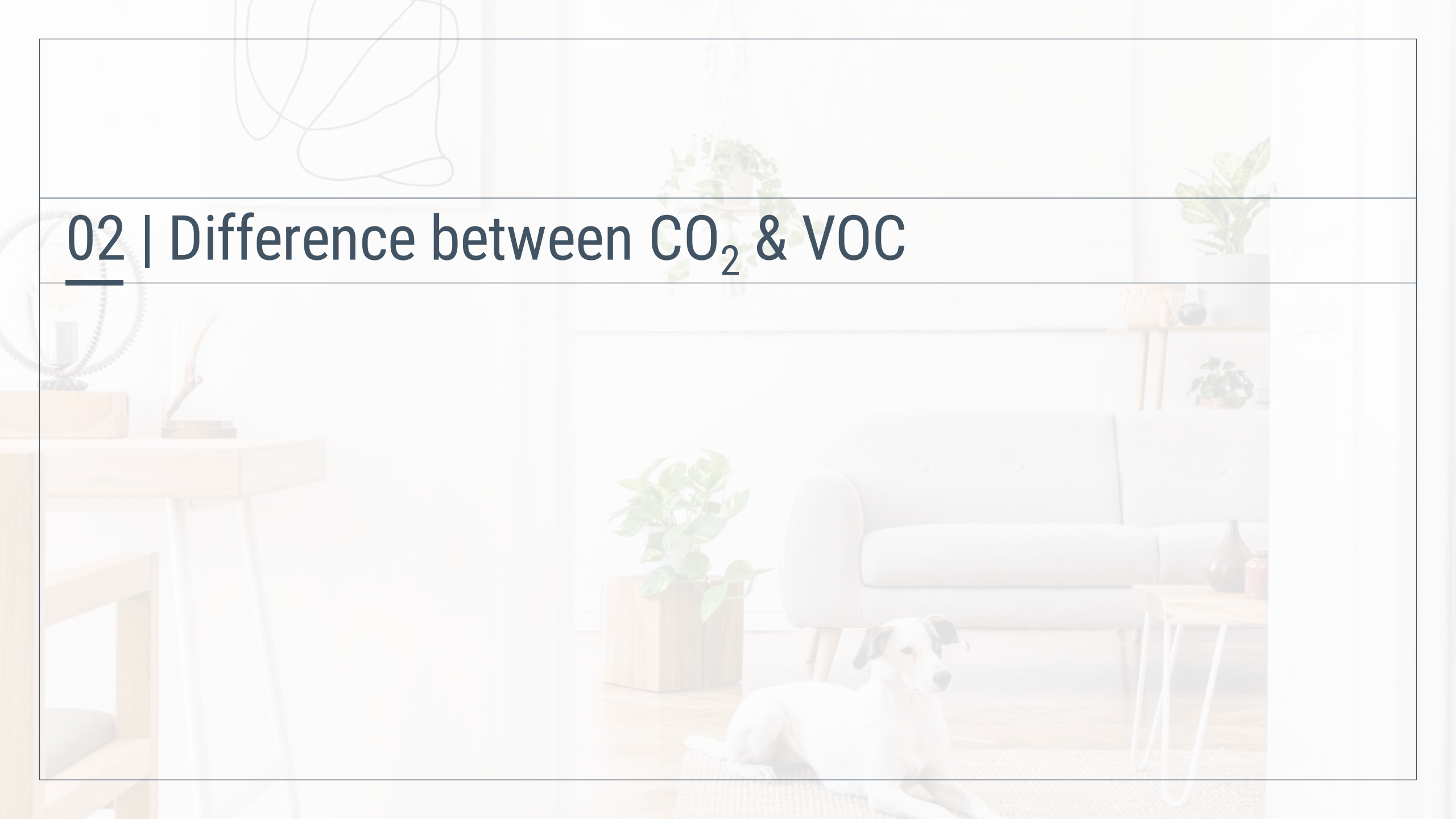
| Why is air quality important?

- The CO₂ content in the air influences general well-being.
- Poor air quality can put a strain on the respiratory tract, heart and circulation.

Conclusion: Good air quality maintains health, increases well-being and reduces the risk of illness.



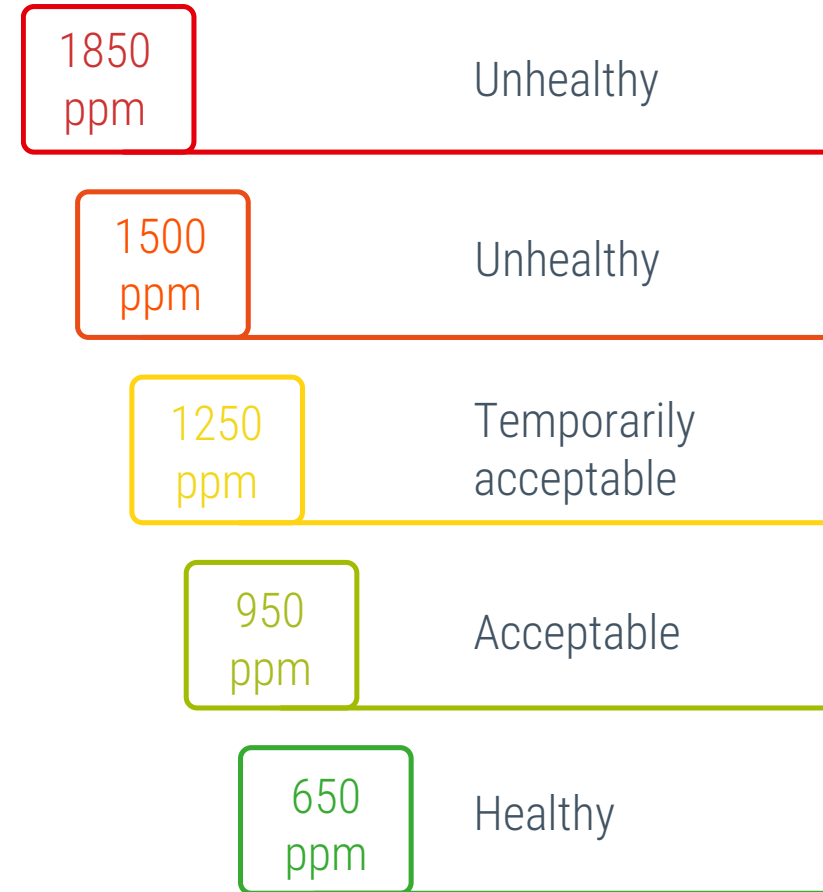
02 | Difference between CO₂ & VOC



Carbon dioxide

| CO₂

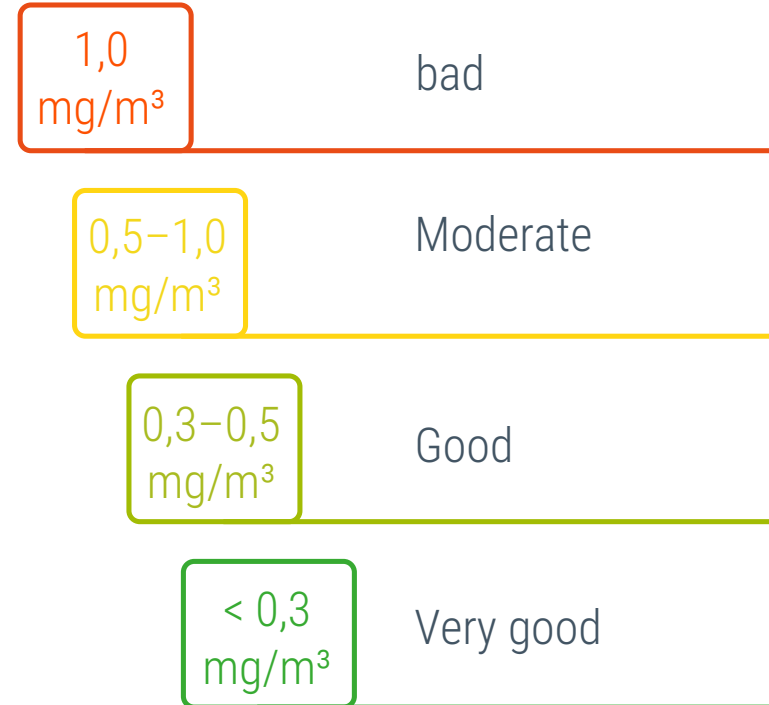
- Colorless, odorless gas produced naturally by respiration, combustion and industrial processes.
- CO₂ indicates how much breathing air has already been used - the higher the CO₂ value, the less oxygen is available in the room.
- Not a pollutant in the classic sense, but harmful to health in high concentrations (e.g. fatigue, lack of concentration).
- Direct indicator of indoor air quality, as it is strongly related to fresh air supply.



Volatile Organic Compounds

| VOC, volatile organic compounds

- Large group of substances consisting of gaseous organic compounds, e.g. solvents, fragrances or plasticizers.
- Arise from furniture, paints, cleaning agents, adhesives or tobacco smoke.
- Many VOCs have an irritant, allergenic or even carcinogenic effect.
- No direct correlation with fresh air content, but with emissions from materials and products.



Summary

| Difference between CO₂ and VOC

CO₂ → Shows that oxygen has been consumed by living organisms.

VOC → Shows the chemical air pollution caused by substances in the environment.

- VOC is often used as a substitute parameter because it can capture many pollutants and odors - e.g. in the kitchen or WC. e.g. in the kitchen or WC.
- However, CO₂ is the better measured variable for fresh air assessment in the room, as it directly reflects the load from exhaled air.



03 | Areas of application for air quality sensors



Air quality sensors

| Goal: health, comfort and energy efficiency

- CO₂ sensors usually measure the carbon dioxide concentration in ppm (parts per million).
- CO₂ sensors indicate when ventilation is needed → better concentration & less fatigue.
- Measurement of VOCs → Early detection of pollutants and odors from furniture, paints, candles or cooking.
- Automatic control of ventilation systems and air purifiers.



Air quality sensors

| Areas of application

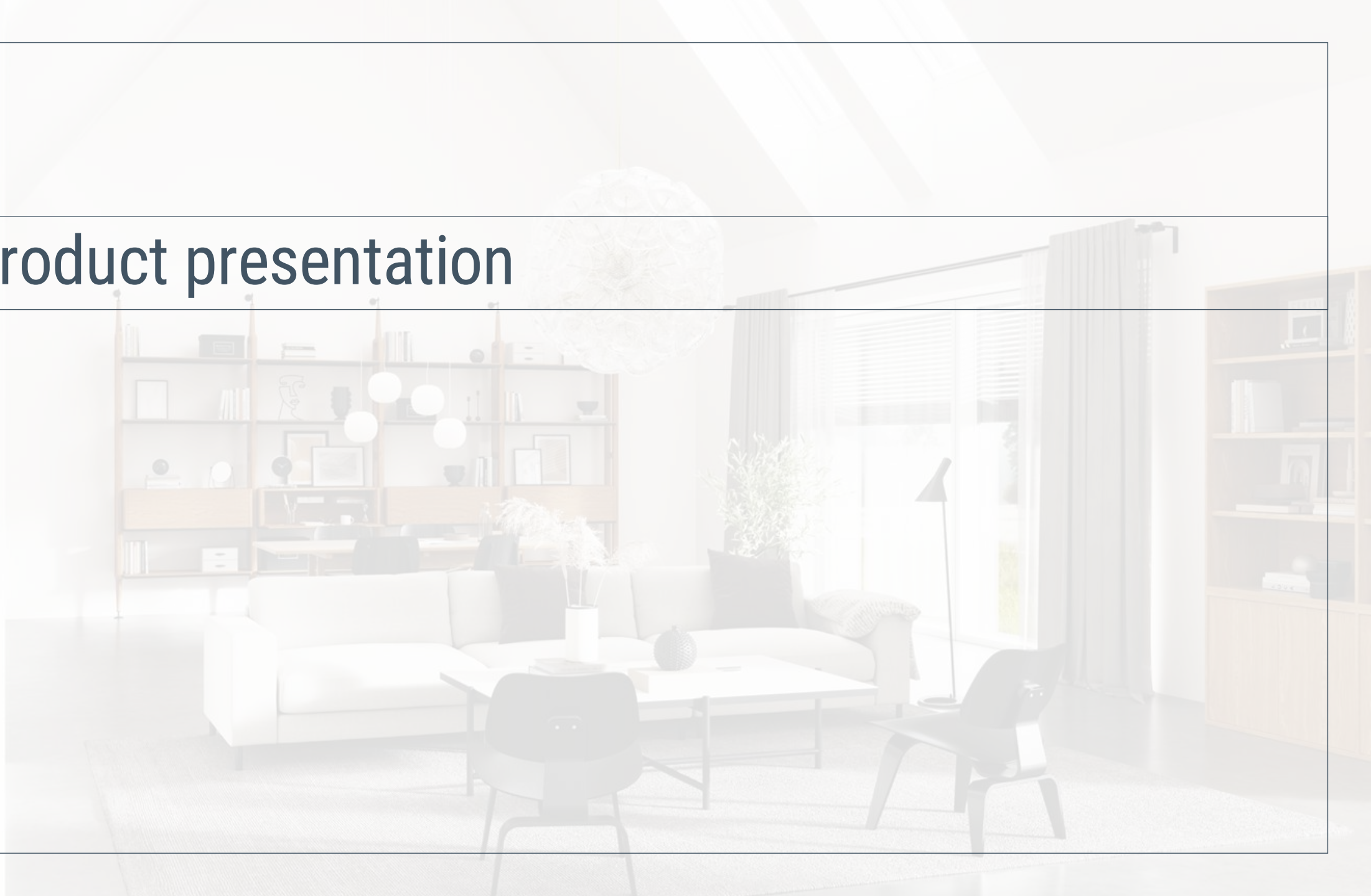
- Offices
- Hotel rooms
- Classrooms
- Meeting rooms
- Event rooms
- Kindergartens



| Do you have any questions
about CO₂ or VOC?



04 | Product presentation



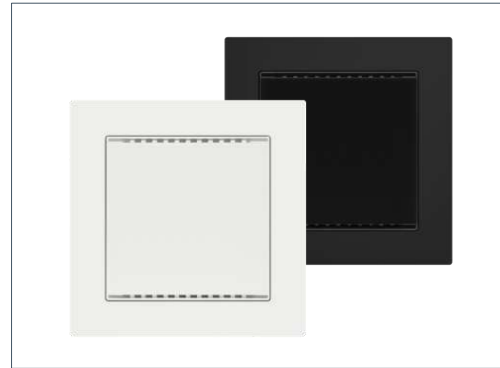
KNX air quality sensors

Overview



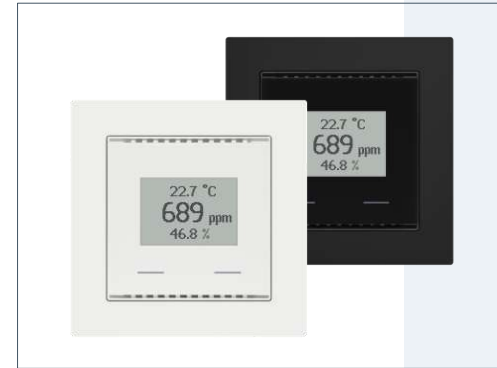
Cala KNX IL (CO₂)

- Traffic light function for visualizing statuses
- Display (permanent or flashing) of one of the colors green, yellow or red
- Variant with CO₂ measurement and control of the CO₂ concentration of the air



KNX AQS/TH-UP gl

- Measurement of CO₂, temperature and humidity
- Calculation of the dew point
- PI- control integrated



KNX VOC/TH-UP Touch

- Measurement of mixed gas, temperature and humidity
- Integrated PI- control
- Display 1-3 lines
- 2 touch buttons



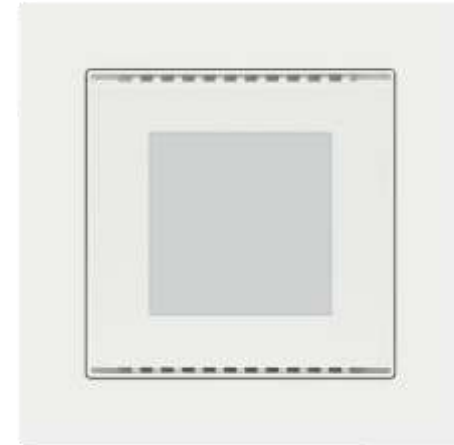
Sewi KNX AQS/TH-D L-Pr

- Measurement of brightness, CO₂, temperature, humidity and air pressure
- Presence of persons is detected
- PI- control is integrated

Product presentation

| [Cala KNX IL CO₂-](#)(71390) and [Cala KNX IL](#) (71380)

- CO₂ traffic light for displaying the air quality via three colors (red, yellow, green) illuminated or flashing
- Integrated CO₂ threshold values
- Integrated CO₂ PI control
- Four AND/OR logic gates
- Two variable comparators



Product presentation

| [Cala KNX IL CO₂ CH \(71391\)](#) and [Cala KNX IL CH \(71381\)](#)

- Also available for Swiss installation systems (60 mm)
- Same functionality as 55 mm variant



Product presentation

| [KNX AQS/TH-UP gl](#) (70625/70626)

- Measures CO₂, temperature, humidity, calculates dew point
- Adjustable threshold values, AND/OR logic, control variable comparator
- PI controller for ventilation, heating/cooling, comfort warning in accordance with DIN 1946
- Fits into standard switch frames
- Also available for Swiss installation systems (60 mm)



Product presentation

| [KNX VOC/TH-UP Touch](#) (70970/70973)

- Measures VOC, temperature, humidity, calculates dew point
- Two touch buttons for setpoints/modes, freely programmable; display for measurement and bus data
- Adjustable threshold values, AND/OR logic, control variable comparator
- PI controller for ventilation, heating/cooling, comfort warning in accordance with DIN 1946
- Also available for Swiss installation systems (60 mm)



Product presentation

| [Sewi KNX AQS/TH-D L-Pr \(70398/70698\)](#)

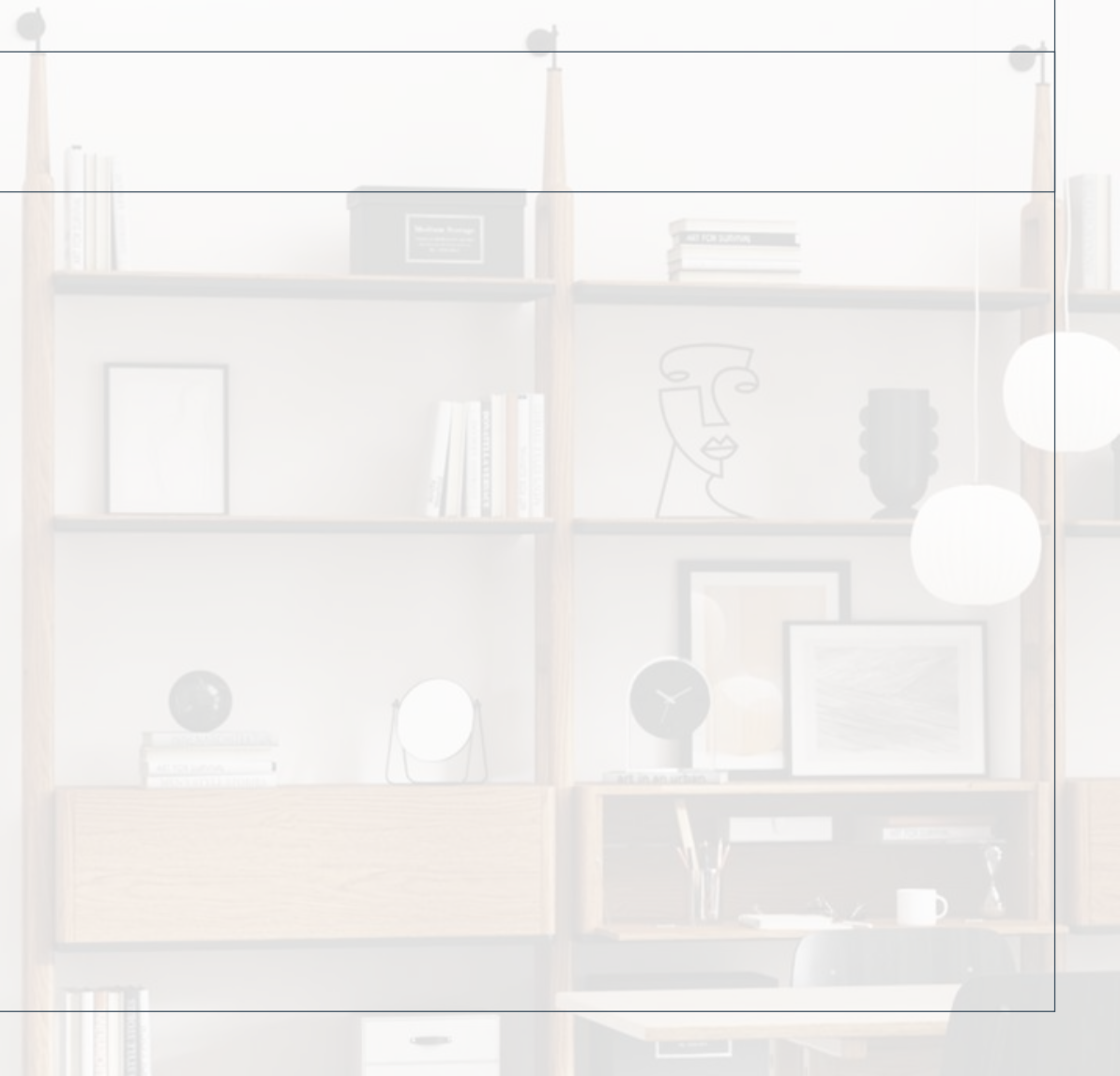
- Detects presence, controls light via brightness threshold value
- Measures CO₂, temperature, humidity, air pressure, calculates dew point
- Adjustable limit values, AND/OR logic, multifunction modules, manipulated variable comparator
- PI controller for ventilation, heating/cooling, comfort warning in accordance with DIN 1946



| Do you have any questions
about our products?



05 | Mounting



Connection/mounting

| Cala series

Fig. 01



Fig. 02

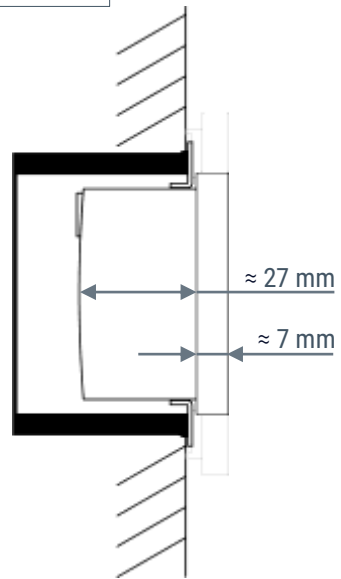


Fig. 03

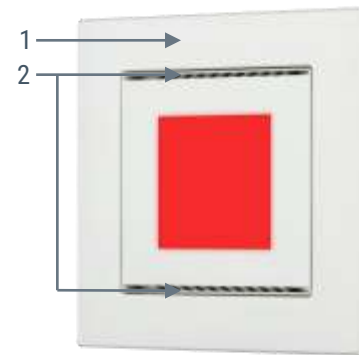


Fig. 04



06 | Parameter Cala IL CO₂





| Do you have any questions
about the parameters?

07 | Application examples

A modern, minimalist interior space featuring a wide, light-colored wooden staircase on the left. The staircase has integrated warm-toned LED lighting under the steps. To the right, a curved glass wall or partition separates a bright area from a darker one. The ceiling is high with exposed ductwork and modern lighting fixtures. The overall aesthetic is clean and contemporary.

Application examples

| for CO₂ sensors

- Classrooms & Lecture Halls
- Office and meeting rooms
- Living rooms & bedrooms
- Smart Building & Energiemanagement



Application examples

| for VOC sensors

- New buildings or renovated rooms
- Schools & kindergartens
- Apartments with low air circulation
- Workplaces with use of chemicals



How to ventilate properly

| Tips



- Ventilate the room several times a day for 5-10 minutes
- Cross ventilation for rapid air exchange
- Ventilate after moisture (e.g. cooking, showering, ...)
- Use CO₂ detectors as an aid for correct ventilation

Air Vision

| For small ventilation applications

- A useful little helper for CO₂ indication
- Without parameter setting (Standalone)
- For the office or home



Further webinars and
recordings can be found here



elsner

elsner

elsner-elektronik.de

Frederik Riedel

f.riedel@elsner-elektronik.de

Martin Speer

m.speer@elsner-elektronik.de

