

 BSK

CLERVO



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CLERVO MONITORING ECOSYSTEM



INDOOR AIR QUALITY



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INTRODUCTION

The name **Clervo** is derived from the word **clairvoyant**, meaning the ability to perceive what cannot normally be seen. Inspired by this idea, the Clervo product family is designed to reveal the **invisible environmental factors** that shape the air we breathe indoors.

Many of the most important elements of indoor air quality—such as radon, particulate pollution, or volatile chemical compounds—are completely invisible to human senses. Yet these factors play a crucial role in long-term health, comfort, and building performance.

Clervo devices are developed to make these hidden environmental conditions visible and understandable. Through precise sensing technologies and clear data interpretation, the system allows users to monitor and understand the air inside their living spaces in real time.

This philosophy is reflected in the guiding principle of the product family:

Make the invisible visible.

The Clervo ecosystem combines environmental monitoring devices with digital analysis tools and ventilation system integration. When connected to **BSK ventilation solutions**, the system supports proactive indoor climate management by translating environmental data into actionable insights.

Beyond the current devices, ongoing engineering research continues to explore additional indoor environmental parameters and analytical models. As new sensing technologies and environmental metrics become available, the **Clervo ecosystem** is designed to expand, gradually incorporating new monitoring capabilities and analytical tools.

This long-term approach reflects a broader goal: building a transparent and continuously evolving platform for understanding and improving **indoor environmental quality**.





Indoor Air Quality

Indoor air quality has a direct impact on health, comfort and daily well-being. Yet many of the factors shaping the air inside buildings remain invisible.

Modern buildings are increasingly airtight in order to improve energy efficiency. While this reduces energy consumption, it can also limit natural air exchange and allow pollutants to accumulate indoors.

Indoor environments may contain particulate matter, volatile organic compounds, carbon dioxide and naturally occurring gases such as radon. Temperature and humidity also play a critical role in shaping these conditions.

Understanding indoor air quality begins with reliable measurement. Continuous monitoring makes it possible to detect environmental changes early and maintain healthier indoor environments.

Clervo Monitoring Ecosystem

Clervo devices are part of a connected environmental monitoring ecosystem designed to provide a clearer understanding of indoor air conditions.

Each device continuously measures key environmental parameters and translates them into simple and understandable indicators. The collected data is transmitted to the **BSK Connect** mobile application, where users can monitor real-time conditions and analyze long-term environmental trends.

When integrated with **BSK ventilation systems**, such as **BSK Notus** or **BSK Zephyr**, the monitoring system can also support automated responses. Ventilation levels can automatically adjust when air quality parameters move outside recommended ranges.

Together, sensing devices, digital analysis and ventilation integration form a unified system that helps maintain stable and healthier indoor environments.

The Clervo ecosystem is designed as an evolving platform. Ongoing engineering research continues to explore new environmental parameters and analytical models, allowing the system to expand with future monitoring capabilities.



CLERVO RADON

Clervo Radon is designed to continuously monitor radon levels inside residential environments while also tracking key indoor climate conditions.

Radon is a naturally occurring radioactive gas that forms underground and can enter buildings through small openings in foundations or building materials. Because it is colorless, odorless and invisible, the only reliable way to detect radon is through continuous measurement.

Clervo Radon provides precise monitoring of radon concentration together with temperature and humidity conditions. This combined monitoring helps homeowners understand the environmental factors that influence indoor air quality and building health.

When connected with BSK ventilation systems, the device can also support automated responses that help maintain healthier indoor environments.

Radon and Indoor Health

Radon is a naturally occurring radioactive gas produced by the decay of uranium in soil and rock. It can enter buildings through cracks in foundations, construction joints or small openings in building structures. Once inside, radon may accumulate in enclosed spaces, particularly in energy-efficient buildings with limited natural ventilation.

Long-term exposure to elevated radon levels is considered one of the leading causes of lung cancer among non-smokers.

International health organizations recommend maintaining indoor radon concentrations below **100 Bq/m³ (approximately 2.7 pCi/L)** to reduce long-term health risks.

Continuous monitoring allows potential radon exposure to be identified early and managed through ventilation or structural mitigation measures.





Radon is an invisible radioactive gas that can accumulate in indoor environments without noticeable signs. Maintaining healthy indoor air conditions is particularly important for sensitive groups such as pregnant women, as both the mother and the developing baby are affected by the quality of the air they breathe. Continuous monitoring helps detect elevated radon levels early and supports timely ventilation measures to maintain a safer indoor environment.

What Clervo Radon Measures

Clervo Radon monitors several environmental parameters that influence indoor air quality and building conditions.

The device continuously measures:

- **Radon concentration**
- **Indoor temperature**
- **Relative humidity**

These parameters provide a clearer understanding of the indoor environment and help identify potential risks related to air quality, building physics and occupant comfort. The collected data is transmitted to the BSK Connect ecosystem for deeper analysis and long-term monitoring.



How Clervo Radon Works

Clervo Radon operates continuously and quietly in the background, measuring environmental conditions in real time.

High-precision sensors inside the device monitor radon concentration together with temperature and humidity levels. The collected data is processed instantly and communicated through simple visual indicators on the device.

Intuitive LED signals provide immediate feedback about indoor air conditions, allowing users to understand the environment at a glance. For deeper analysis, detailed measurements and historical data are accessible through the **BSK Connect** mobile application.



Technical Specifications

Radon Measurement Range

2 Bq/m³ – 20 kBq/m³

Humidity Accuracy

±1.8 % RH

Temperature Accuracy

±0.1°C

Connectivity

Compatible with Google Home

Fully compatible with Home Assistant

Power Supply

Type-C connection

Data Recording

Real-time monitoring and continuous data logging

Installation

Simple plug-and-play

Temperature and Humidity Monitoring

Temperature and relative humidity strongly influence indoor air quality, comfort and building health. Maintaining an indoor temperature between **20-24°C** and relative humidity between **40-60%** helps create balanced living conditions. Air that is too dry may irritate respiratory systems and increase the survival time of airborne viruses.

Excessive humidity combined with higher temperatures may create favorable conditions for mold growth and dust mites. By continuously monitoring these parameters, Clervo Radon helps maintain a stable indoor climate and supports healthier living environments.

Mold Analyzer

The Mold Analyzer evaluates environmental conditions that may lead to mold formation inside buildings.

Using temperature differences, humidity levels and building surface conditions, the system analyzes whether condensation may occur within walls or interior surfaces. Advanced building-physics algorithms estimate the likelihood of mold development and provide early warnings before visible mold appears.

This allows homeowners to take preventive action by adjusting ventilation, heating or humidity levels, helping protect both indoor air quality and building structures.





CLERVO IAQ

Clervo IAQ is designed to provide a comprehensive understanding of indoor air conditions through continuous monitoring of key environmental parameters.

The device measures particulate matter, volatile organic compounds, carbon dioxide, carbon monoxide, temperature and relative humidity in real time. By analyzing these parameters together, Clervo IAQ provides a clear overview of indoor air quality and helps identify potential environmental risks.

Through intuitive indicators and detailed data available via the BSK Connect mobile application, the system transforms complex environmental information into accessible insights for everyday use.

When integrated with BSK ventilation systems, Clervo IAQ can also support automated ventilation responses, improving indoor air circulation and maintaining balanced environmental conditions.



Indoor Air Quality Monitoring

Indoor air quality has a direct impact on health, comfort and overall well-being.

Modern buildings are designed to be energy efficient and airtight. While this improves thermal performance, it can also limit natural air exchange, allowing pollutants and excess humidity to accumulate indoors.

Continuous monitoring of indoor air conditions makes it possible to identify changes in air quality early and respond through improved ventilation or environmental adjustments.

Clervo IAQ provides reliable measurements that support healthier indoor environments in homes, offices and other indoor spaces.

Air Quality Parameters

Indoor air quality is influenced by multiple environmental factors. Clervo IAQ evaluates the most important parameters that affect air cleanliness, ventilation efficiency and overall indoor comfort. By measuring several environmental indicators simultaneously, the device provides a complete picture of indoor air conditions rather than relying on a single parameter.



Volatile Organic Compounds (VOC)

Volatile organic compounds are gases emitted from various indoor sources such as cleaning products, furniture, paints, adhesives and building materials. VOC levels may increase in newly furnished spaces or in environments with insufficient ventilation. Monitoring VOC concentrations helps identify indoor pollution sources and supports improved ventilation strategies that reduce long-term exposure.

Carbon Dioxide (CO₂)

Carbon dioxide is a key indicator of ventilation efficiency. Outdoor air typically contains approximately 400 ppm of CO₂. In indoor environments with limited air circulation, concentrations may rise as occupants exhale carbon dioxide during normal breathing. Elevated CO₂ levels may lead to reduced concentration, fatigue and decreased cognitive performance. Continuous monitoring helps ensure that indoor environments receive sufficient fresh air.



Particulate Matter (PM)

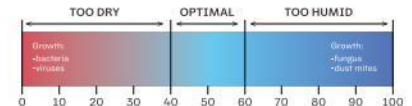
Particulate matter refers to microscopic solid and liquid particles suspended in the air.

Clervo IAQ monitors three particle size categories:
PM10 – larger airborne particles such as dust and pollen
PM2.5 – fine particles generated by combustion, traffic or indoor activities
PM1 – ultrafine particles that can penetrate deeper into the respiratory system

High concentrations of particulate matter may reduce air quality and affect respiratory health. Continuous monitoring helps detect pollution sources and supports cleaner indoor air.

Carbon Monoxide (CO)

Carbon monoxide is a colorless and odorless gas produced by incomplete combustion in heating systems, fireplaces and fuel-burning appliances. Because it cannot be detected by human senses, monitoring carbon monoxide is essential for maintaining safe indoor environments. Even relatively low concentrations may pose serious health risks if exposure continues over time.



Temperature and Humidity

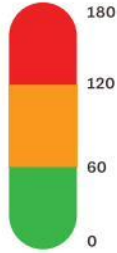
Temperature and relative humidity strongly influence indoor comfort and building health. Maintaining balanced conditions helps prevent issues such as excessive dryness, condensation and mold growth. An indoor temperature range of 20–24°C and a relative humidity level between 40–60% is generally considered optimal for comfort and healthy living conditions. By monitoring these parameters continuously, Clervo IAQ helps maintain a stable indoor climate.

Indoor Air Quality Index (IAQ)

The Clervo Indoor Air Quality Index converts multiple environmental measurements into a single, easy-to-interpret indicator of indoor air quality.

The index integrates key parameters such as particulate matter levels, VOC concentrations and carbon dioxide measurements to represent overall indoor air conditions. Clervo uses a 0-180 index scale, allowing users to quickly understand environmental conditions and identify when ventilation or environmental adjustments may be needed.

By simplifying complex environmental data into a clear visual indicator, the index helps users make informed decisions about maintaining healthier indoor environments.



How Clervo IAQ Works

Clervo IAQ continuously collects environmental data through high-precision sensors integrated inside the device. The system analyzes these measurements in real time and translates them into simple visual signals displayed on the device. These indicators allow users to understand indoor conditions instantly without needing to interpret complex data.

All measurement data is simultaneously transmitted to the **BSK Connect mobile application**, where users can access detailed charts and historical trends.

When connected to compatible BSK ventilation systems, Clervo IAQ can also support automated ventilation responses that maintain stable indoor air conditions.

Environmental Analyzers

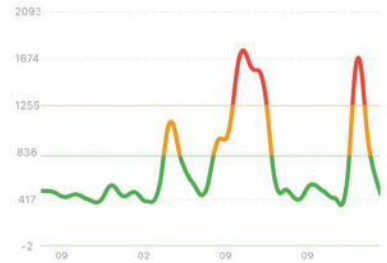
Beyond raw sensor measurements, Clervo IAQ also includes advanced environmental analysis tools that interpret indoor conditions and provide additional insights. These analyzers help users understand potential environmental risks before visible problems appear.

Viral Risk Analyzer

The Viral Risk Index (VRI) is an advanced physics-based computational model designed to dynamically assess indoor airborne viral transmission risks by combining real-time environmental sensor data with established epidemiological principles. At its core, the algorithm integrates the well-known Wells-Riley probability equation with the Rudnick-Milton model, using ambient CO₂ concentrations as a reliable proxy to estimate the fraction of rebreathed air and overall ventilation efficiency (ACH).

To deliver a more comprehensive risk evaluation, the VRI also considers thermodynamic environmental factors. The model incorporates the Scofield-Sterling diagram to evaluate humidity conditions, accounting for both excessively dry environments that allow viral aerosols to remain suspended for longer periods and high humidity levels that may promote microbial growth. In addition, the system evaluates temperature-dependent viral decay alongside the potential vectoring and immunosuppressive effects associated with PM_{2.5} and VOC pollution. By integrating these environmental parameters with contextual variables such as room volume, occupant density and metabolic activity-based quanta emission rates, the system calculates a refined logarithmic risk score on a scale from 0 to 100.

This multidimensional index translates complex virological and aerobiological interactions into a clear, multi-level safety indicator, providing users with actionable insights for timely ventilation, filtration and humidity control interventions.



Mold Analyzer

The Mold Analyzer evaluates environmental conditions that may contribute to mold growth. By analyzing temperature, humidity levels and surface conditions, the system estimates the likelihood of condensation and mold formation. Advanced algorithms based on building-physics models calculate the risk level and provide early warnings when environmental conditions become favorable for mold development. This allows users to take preventive action before structural or health problems arise.

Allergy Status Analyzer

Indoor environmental conditions play a significant role in the development of allergic reactions. Airborne particles, humidity levels, and temperature fluctuations can all influence the presence and activity of biological allergens such as dust mites and mold.

The Allergy Status Analyzer evaluates multiple environmental indicators including particulate matter, CO₂ concentration, temperature, and relative humidity to estimate the potential risk of allergy triggers in indoor spaces.

By correlating these parameters, Clervo IAQ provides a clear indication of when indoor conditions may become unfavorable for sensitive individuals. This allows users to adjust ventilation and indoor climate conditions before symptoms occur, supporting healthier living environments for people prone to allergies or respiratory sensitivities.



Sleep Quality Analysis

Indoor air conditions can have a direct impact on sleep quality. Elevated carbon dioxide levels, poor ventilation, and imbalanced temperature or humidity may disturb deep sleep cycles and reduce overall rest efficiency.

Clervo IAQ continuously analyzes key bedroom parameters including CO₂, PM2.5, temperature, and relative humidity to evaluate the overall quality of the sleeping environment. When these conditions begin to deteriorate, the system can communicate with compatible ventilation solutions such as BSK Notus or BSK Zephyr.

By automatically activating these ventilation systems, stale indoor air can be replaced with filtered fresh air while maintaining stable thermal comfort. This process helps regulate carbon dioxide levels and supports a healthier indoor climate for uninterrupted and restorative sleep.

Baby-Elder Risk Analyzer

Infants and elderly individuals are particularly sensitive to indoor environmental conditions. Babies have developing respiratory systems and breathe proportionally more air relative to their body weight, while older adults may be more vulnerable to pollutants and temperature fluctuations.

The Baby-Elder Risk Analyzer continuously evaluates critical indoor air parameters including CO, CO₂, VOC, particulate matter, temperature, and humidity. By monitoring these environmental factors together, the system helps identify conditions that may pose potential risks for these sensitive groups.

This analysis supports the creation of a safer and more balanced indoor environment, helping families maintain healthy living conditions for their most vulnerable members.



Technical Specifications

Measurement capabilities

Particulate Matter (PM1 / PM2.5 / PM10)

VOC concentration

Carbon dioxide (CO₂)

Carbon monoxide (CO)

Temperature

Relative humidity

Measurement accuracy

Humidity accuracy: $\pm 1.8\%$ RH

Temperature accuracy: $\pm 0.1^\circ\text{C}$

CO₂ measurement accuracy:

$\pm(100 \text{ ppm} + 10\%)$ from 400–5000 ppm

CO measurement accuracy:

$45 \pm 15 \text{ nA/ppm}$ from 0–500 ppm

VOC measurement accuracy:

$\pm 20\%$ (0.5–1 ppm)

$\pm 25\%$ (5 ppm)

PM measurement accuracy

0–100 $\mu\text{g}/\text{m}^3$: $\pm 10 \mu\text{g}/\text{m}^3$

101–1000 $\mu\text{g}/\text{m}^3$: $\pm 10\%$

System features

Real-time monitoring and data logging

Exportable historical data

Automatic device pairing after initial setup

Compatible with Google Home · Fully

compatible with Home Assistant

Simple plug -and- play

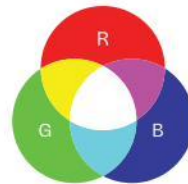


Intelligent Light Feedback

Clervo devices communicate indoor air conditions through a subtle and intuitive lighting system.

The integrated LED ring provides an immediate visual understanding of the environment while remaining calm and unobtrusive within the interior space. Through the Clervo mobile interface, lighting behavior can be customized, dimmed, or completely disabled depending on user preference.

The system uses a clear color language to represent air quality conditions while allowing different visual preferences.



White – Healthy Air (Calm Mode)

A soft white light confirms that indoor air quality remains within healthy levels. This mode is designed for users who prefer a neutral and minimal light that blends naturally into the environment without introducing colored illumination.



Green – Healthy Air (Visual Mode)

Green represents the same healthy air condition, offering a more explicit visual confirmation for users who prefer to see air quality through defined color feedback.



Yellow – Moderate Air Quality

Yellow signals moderate changes in indoor air conditions. The system continues monitoring the environment and may initiate ventilation cycles when necessary. In this state, the user may also receive a notification through the Clervo mobile application.



Red – Air Quality Alert

Red indicates a significant decline in indoor air quality. When this level is detected, the system alerts the user and sends a notification through the mobile interface, allowing immediate awareness and action if required.

BSK Connect App

The BSK Connect App provides a central interface for monitoring indoor environmental conditions and managing connected BSK devices.

Through the application, users can track real-time measurements collected by Clervo devices and access detailed historical data. The platform transforms environmental information into clear visual insights, allowing users to better understand indoor air conditions and respond when necessary.

By combining monitoring, data analysis and system connectivity, the BSK Connect App supports a more intelligent approach to indoor climate management.



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Real-Time Monitoring

The BSK Connect App provides continuous access to real-time environmental measurements. Users can instantly monitor parameters such as particulate matter, VOC levels, carbon dioxide, temperature and humidity directly from their mobile devices.

Clear visual indicators help users quickly interpret indoor conditions without the need for technical expertise.

This real-time monitoring capability allows users to identify changes in air quality immediately and respond through ventilation or environmental adjustments when necessary.

Data Visualization

Beyond real-time monitoring, the BSK Connect App provides detailed data visualization tools that help users understand long-term environmental trends. Measurement data can be explored through daily, weekly, monthly and yearly charts. These visualizations allow users to identify patterns in indoor air quality and evaluate how ventilation, occupancy or seasonal changes influence environmental conditions.

By presenting complex sensor data through intuitive graphs, the application transforms environmental monitoring into a practical tool for improving indoor comfort and health.

Smart Automation with BSK Ventilation Systems

When connected to compatible BSK ventilation systems, Clervo devices can support automated ventilation responses. Environmental measurements collected by Clervo sensors may trigger ventilation adjustments whenever indoor conditions move outside recommended ranges. For example, elevated CO₂ levels may activate increased fresh air supply, while humidity changes may trigger ventilation responses that help maintain balanced indoor conditions.

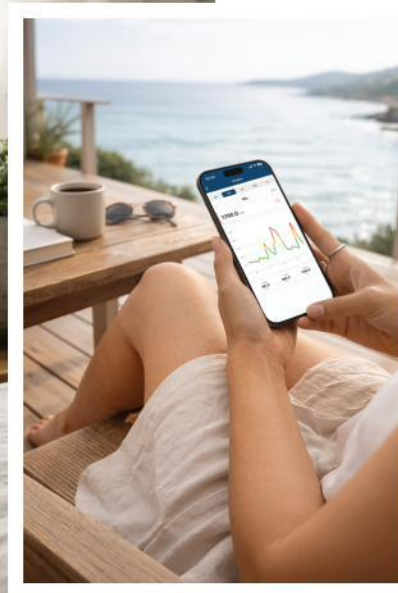
This integration allows monitoring and ventilation to operate together as a coordinated system, supporting healthier and more stable indoor environments.



A Home That Continues to Breathe

Even when you are away, indoor environments continue to change. Air quality shifts, humidity fluctuates and plants, furniture and building materials still interact with the air around them. Clervo IAQ continues to observe these subtle changes in the background. When necessary, it can communicate with BSK ventilation systems to help restore balanced indoor conditions. As a result, the home remains quietly active – maintaining a healthier indoor atmosphere until you return.

A home that continues to breathe, even when no one is there.





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