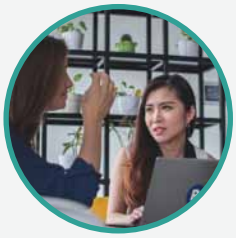


SENTICON LTD - DESIGNED AND MADE IN THE UK

PureAirnergy™ Solutions

AIR QUALITY & ENERGY CONTROL FOR HEALTHCARE AND HOSPITALS







Senticon
SENTIENT CONTROL SOLUTIONS

PureAirnergy™ EXCELLENCE IN HEALTHCARE



Hospitals and healthcare buildings run their ventilation and air conditioning plant around the clock, every day of the year. Getting indoor air quality wrong affects patient recovery and infection risk; getting energy use wrong affects the trust's running costs for decades. Senticon's control and measurement team has spent over 20 years developing room controllers and sensors for demanding building types.

PureAirnergy™ brings that experience together into a single family of controllers purpose-built for wards, clinics, theatres, waiting areas and consulting rooms – measuring, alarming, predicting, controlling, optimising and securing the air patients and staff breathe.

The products use industry-standard communications and meet the latest guidance on healthy, low-carbon buildings, including WELL Building Standard and RESET® Air compliant measurement modes.

WHY AIR QUALITY & ENERGY CONTROL MATTER IN HEALTHCARE BUILDINGS

Senticon

Healthcare estates carry some of the highest energy costs per square metre of any building type, driven by continuous ventilation, tight temperature and humidity tolerances, and 24/7 occupancy. At the same time, indoor air quality has a direct, measurable effect on infection transmission, patient recovery times and staff wellbeing.

A modern hospital control system has to do more than hold a room at setpoint. It must monitor CO2, PM2.5, PM10, TVOC, humidity and temperature accurately; alarm clearly when conditions fall outside safe limits; predict problems such as condensation before they cause damage; and optimise plant run-time so that energy is never wasted heating, cooling or ventilating an empty room.

Many private healthcare trusts are now under real pressure to cut carbon emissions across their estates while simultaneously tightening infection-control standards – two goals that can pull in opposite directions unless the control strategy is right.

With Senticon's QCR10 and QVR20 Series controllers and PMR25 particulate sensors, both goals are achieved together: accurate, room-by-room measurement drives tighter ventilation control, occupancy-based optimisation removes wasted plant run-time, and every reading is available to the BMS for estate-wide reporting and compliance..



MONITOR, MEASURE & SAVE

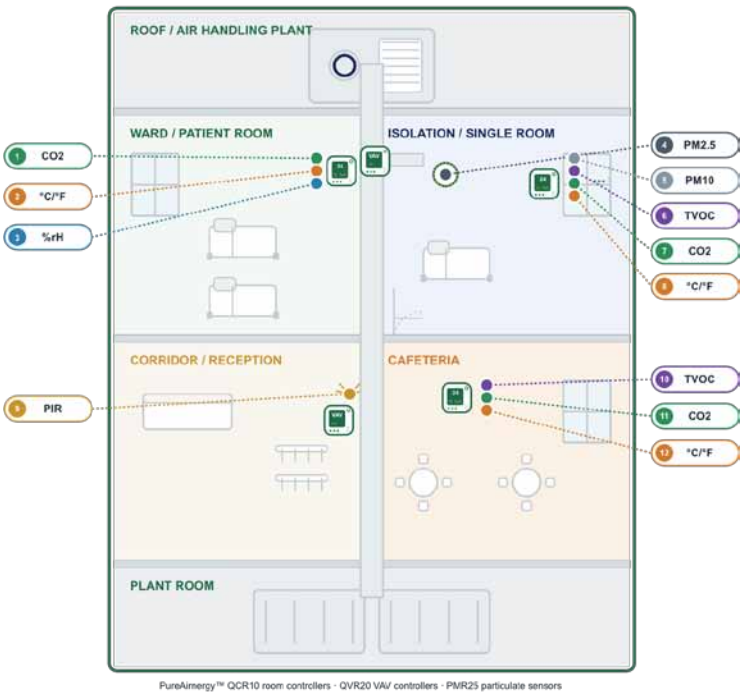
ACCURATE MONITORING

Every PureAirnergy™ QCR10 and QVR20 Series controller is a multi-measurement instrument, not just a thermostat. Built-in sensors cover temperature (±0.5°C), CO2 (0–5,000ppm, ±30ppm + 3% of reading) and, where fitted, humidity (±2%RH) and TVOC air quality index – with the optional PMR25 sensor adding PM1.0, PM2.5, PM4 and PM10 particulate measurement calibrated to the TSI DustTrak™ DRX reference standard.

Rather than a single combined sensor/actuator compromise, Senticon keeps measurement accuracy separate from actuation, so every reading reported to staff, patients and the BMS reflects the real condition of the room – not an estimate.

Occupancy is measured too: an integrated PIR sensor tracks whether a room, ward bay or consulting suite is actually in use, feeding directly into the optimisation strategy described on the following pages.

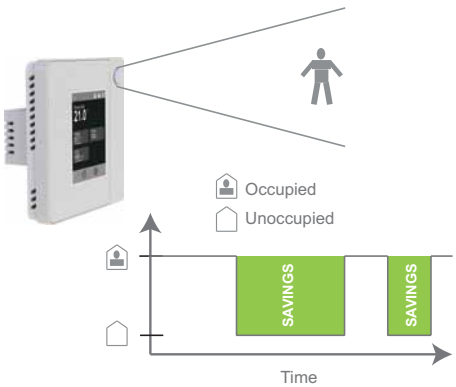
All measurements are logged and available over BACnet MS/TP or Modbus RTU for estate-wide dashboards, audit trails and compliance reporting.



PureAirnergy™ QCR10 room controllers · QVR20 VAV controllers · PMR25 particulate sensors



- Accurate CO2 Monitoring (±30ppm + 3% of reading)
- TVOC Total Volatile Organic Compound Monitoring according to Well Building Standards and Reset Air Standards
- 2%rH Accurate Relative Humidity Monitoring
- Accurate Temperature Control with integrated Occupancy Detection
- PM2.5 and PM10 Particulate Matter monitoring for pollution particles in the clean Air



OCCUPANCY CONTROL WITH INTEGRATED SENSING

Senticon multi-measurement PureAirnergy™ VAV, FCU and Chilled Ceiling controllers optimise the building space usage profile offering additional significant savings by switching the system to stand-by when the room is unoccupied using integrated occupancy sensor.

By reducing or increasing setpoint by one degree - in Senticon solutions automatically - for every degree 10% energy savings can be achieved.

CO2 PIR TVOC PM10 °C/°F %rH PM2.5

DESIGN EQUALS SIMPLICITY

DESIGNED FOR THE USER - MODERN, INTUITIVE AND ATTRACTIVE USER INTERFACES

PureAirnergy™ controllers use a high-end glass touchscreen interface for ease of use in clinical and public-facing spaces. The display can be customised to project requirements, and every controller can also be configured and monitored from a mobile phone through built-in Bluetooth.



Capacitive Touchscreen with High End Glass Surface

Configured to Requirements:

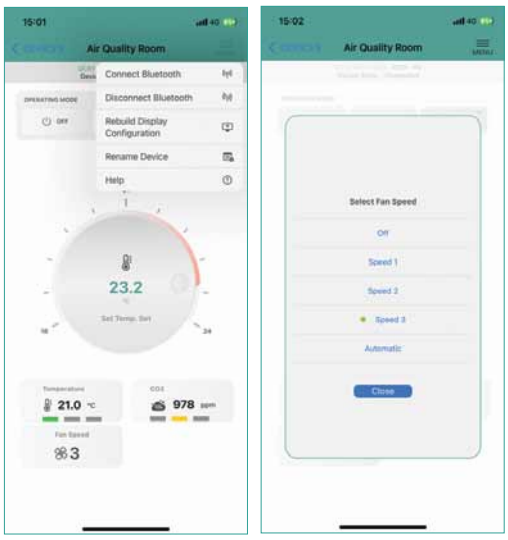
- Display Measurements and Alarms (green/amber/red colour)
- Display Energy and Consumption Readings from BMS
- Fully Customisable 5 Display Locations (values, descriptions, units)
- User Setpoint Adjustments, Operating Mode and Boost Functions
- On/Off Button Overrides
- Customisable Screen Colours



SmartPhone SmartView User App (iOS)

PureAirnergy™ devices can be equipped with built-in Bluetooth, giving estates and facilities staff direct access from the SmartView mobile app without opening a panel or logging into the BMS.

The app gives a quick, on-the-spot way of checking room settings and current air quality readings during ward rounds or commissioning.



iOS Bluetooth



CO2 PM10

TVOC PM2.5

°C/°F %rH

ALARM INDICATION WHEN OPERATING CONDITIONS EXCEED

Senticon's PureAirnergy™ controllers have integrated alarm functionality that allows the visual indication of abnormal air quality conditions. The PureAirnergy™ controllers react immediately to the increased pollution levels, alarming functionality provides visual indication exceeded pollution load, or system failures.

- Amber and Red alarm indications when CO2 or TVOC levels exceed the amber and red alarm limits
- High Humidity Alarms
- PM2.5 an PM10 Particulate Matter Pollution Alarms on PMR25 Controllers

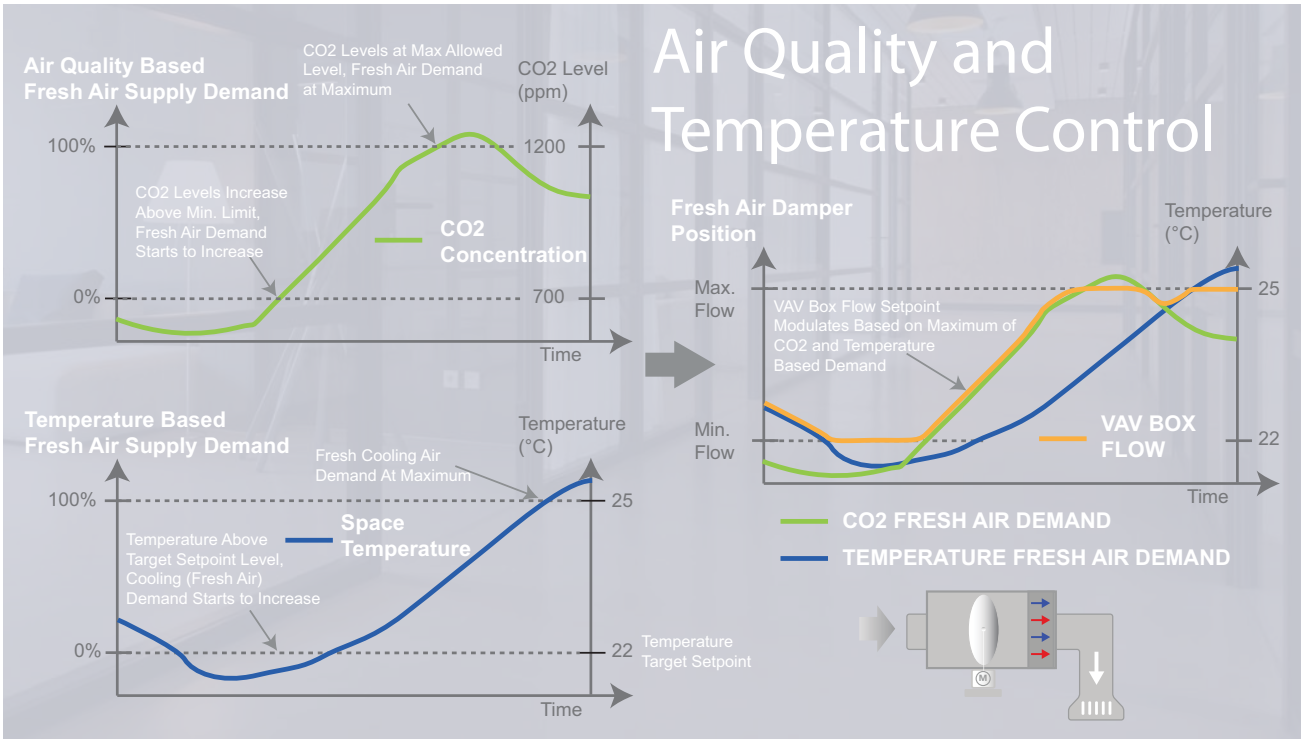




SAFER AIR QUALITY

AIR QUALITY - OPTIMISE AND PROVIDE COMFORT

Senticon Multi-Measurement VAV, FCU, Chilled Ceiling PureAirnergy™ controllers are available with built-in Air Quality measurement (CO2 and Total Volatile Organic Compounds). Optional Particulate Matter Sensors with Control. The controllers control the indoor air temperature to the customer setpoint and simultaneously modulating the fresh air supply maintain the optimum conditions in the room space. Thus achieving the optimum conditions and energy efficiency.



CLEAN ROOM PRESSURE AND AIR QUALITY CONTROL

Senticon PureAirnergy™ TVR20/QVR20 Series controllers can be used to control the pressurised clean rooms in hospitals and healthcare. The PureAirnergy™ controllers monitor the room differential pressure and control the damper position accurately making sure that the correct pressure balance is maintained in the clean room.

The controllers can simutaneously monitor the Air Quality of the room space and boost the fresh air as required. Features like damper position overrides or automatic hold in case of door opening are included as standard.



SOLUTIONS FOR APPLICATIONS

COMFORT CONTROL

COMPREHENSIVE HVAC SYSTEMS SUPPORT IN HEALTHCARE BUILDINGS

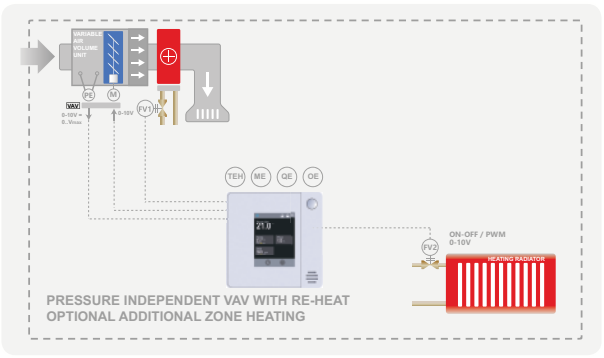
PureAirnergy™ controllers are proven across the HVAC plant types most common in hospitals and healthcare buildings:

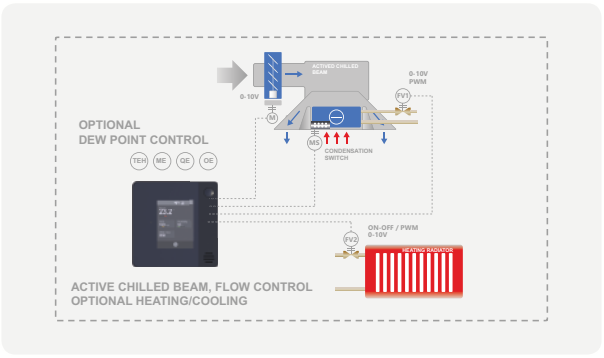
1. Pressure Independent VAV Terminals – the standard for wards, clinics and departments needing precise, independently zoned airflow and, where required, room pressure control (e.g. isolation rooms).

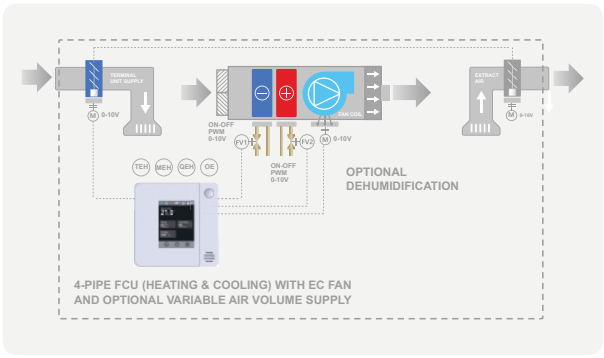
2. Fan Coil Units – QCR10 Series controllers directly drive 2-pipe and 4-pipe fan coil heating/cooling with EC or 3-speed fan control, ideal for consulting rooms, offices and patient rooms.

3. Fan Assisted Chilled Ceilings and Beams – combined radiant and convective cooling with fresh-air ventilation and CO2-led demand control, well suited to wards and clinical spaces needing draught-free comfort.

Across all three system types, the same multi-measurement controller platform is used, keeping spares, configuration tools and BMS integration consistent across the whole estate.





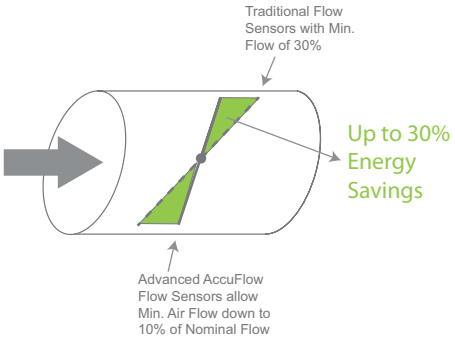


KEY TO ACCURATE, ENERGY EFFICIENT VAV CONTROL

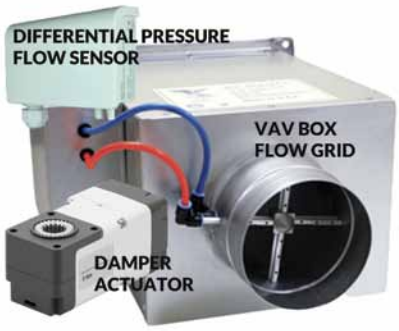
ACCURATE FLOW MEASUREMENT

On the Senticon VAV solutions the VAV flow measurement is carried out with AccuFlow accurate flow sensors. This allows the VAV box minimum flow setting to be reduced to 10% instead of typical 30% in older systems.

By reducing the minimum air flow according to multiple studies including ASHRAE on existing buildings up to **30% energy savings** can be achieved compared to standard solutions.



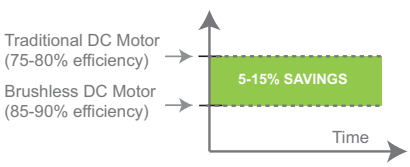
ELEMENTS OF FLOW CONTROL



BRUSHLESS DC MOTOR ACTUATION SAVES 10-15%

With Senticon VAV System a separate Brushless DC motor based actuators are used for changing the flow damper position. These brushless DC motors save about 5-15% energy compared to traditional motors by eliminating brush friction and electrical losses, improving heat dissipaton, and providing more precise electronic control.

Additionally Brushless DC Motor actuators incur lower maintenance costs and longer lifespan, further contributing to overall operational savings despite possibly higher initial costs.



OPTIMISES: ENERGY SAVINGS ACROSS THE HEALTHCARE ESTATE

Senticon products have been designed to be easy to install with robustness and time saving features. The built-in application logic is comprehensive and designed for the real-life HVAC applications. These features guarantee success in projects.



OPTIMISED ENERGY USE

- Multi-Measurement Controller; Temperature, CO2, VOC, Humidity and PIR ; Compact and Integrated Solution provides Efficency and Reduces Installation Costs
- Easy Access to the Controller Programming; Mounted on the Wall; Save on Maintenance
- Easy application programming with Intuitive Tools; Save on Engineering
- Modbus/BACnet Network Addressing and Baud Setup via software or built-in bit switch; can be addressed without tools; Save on Project Execution
- Wireless LoraWan Variants for Retrofits / Minimised Cabling; Save on Retrofit Projects
- Multi-device backup & restore on the configuration tools; Save on Engineering
- Consistent documentation and programming tools menus; Save on Engineering
- 60V Over-voltage Protected RS485 Channel; robust solution for installations; Save on Fault Finding
- BACnet MS/TP with COV Functionality; optimise the MS/TP networks; Save on Programming

Example Payback Analysis

For a typical single-bed ward room run on continuous ventilation:

- The average annual HVAC energy usage is about 9,800kWh per room.
- At an average commercial electricity rate of $0.15/kWh, this equals an annual energy cost of $1,470.
- Occupancy-based optimisation and accurate CO2/PM2.5-led ventilation control typically save 20–30% against a fixed-schedule system, worth up to 4820 per room, per year.
- A PureAirnergy™ QCR10/QVR20 controller is typically paid back in under 12 months on energy savings alone.

Summary: with wards, clinics and consulting rooms often left ventilating and conditioning unoccupied space, occupancy-aware, multi-measurement control turns wasted plant run-time directly into estate-wide savings.

$$$ SAVE $$$

INSTALL AND MAINTENANCE SIMPLIFIED

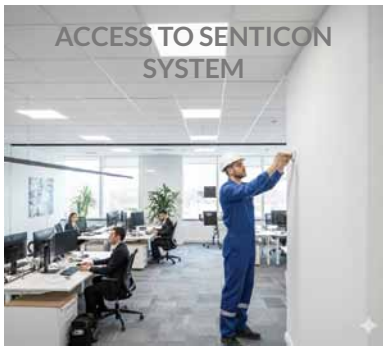
IMPORTANCE OF INSTALLATION LOCATION IN CLINICAL BUILDINGS – MAINTENANCE SIMPLIFIED

In a healthcare building, minimising disruption during maintenance is as important as the control strategy itself – engineers need to fault-find and service equipment without disturbing clinical activity or gaining access to sterile or patient areas unnecessarily.

Ceiling-void mounted plant is not always practical at height, above clean rooms, or in areas where access would disrupt ward activity.

Senticon's control strategy keeps all settings within the room-mounted sensor/ controller, so routine adjustment never requires access to the terminal unit itself – only planned maintenance visits do, and these can be scheduled around clinical activity.

With QCR20, because the AccuFlow pressure/flow sensor is kept separate from the actuator, a fault only ever requires the actuator to be replaced – a fast, low-disruption repair.











SYSTEM INSTALLATION MADE EASY & RELIABLE

Senticon PureAirnergy™ controllers and sensors have been designed for the installers. The multitude of features and functions makes both the physical installation of the products as well as the final commissioning to the applications simple and easy.

- Robust design prevents costly wiring errors on site; 60V over-voltage protection on Modbus/BACnet, extended input voltage range, simple identification of correct wiring terminals, universal inputs
- Commissioning made easy with consistent tools, whether using a PC, a mobile phone or tablet. Pre-commissioning simplied e.g. addressing via bit switch, multi-install application loads, pre-programmed applications
- Factory pre-configuration, addressing and custom location labeling significantly simplifies project engineering with robust outcomes

RANGE OF EASY-TO-USE CONFIGURATIONS TOOLS

Device Configuration Tool for Windows with Bluetooth Connection / Serial Connection to the Devices
Device Modbus Device Configuration Tool for Connection over Modbus Network (RS485)
Smart Configuration Tool App for iOS using Bluetooth Connection

SMARTCONFIG TOOL



- Clear and Intuitive User Interface (= fast tool adaptation and learning curve)
- Easy access to VAV Control Box Flow Control Settings & Fan Coil Unit Settings
- Auto-device detection on connect (= template matched product model automatically)
- Common point structure for Windows, iOS Tools, Modbus and BACnet (= simplified structure, easy to follow regardless of the platform)
- Save, store, upload, download the configuration to devices (= project configuration with multiple identical devices fast)
- Plug & Play Connection with Bluetooth dongle pair to Windows (= remove hassle from Windows Bluetooth configuration, and suitable for laptops without Bluetooth)

PureAirnergy™ CONTROLS OVERVIEW

Senticon offers a complete PureAirnergy™ range for healthcare buildings: QCR10 Series multi-measurement room controllers, QVR20 Series VAV / air volume controllers, and PMR25 particulate matter sensors – together providing accurate, energy-efficient control across wards, clinics, theatres suites and public areas.

QCR10 and QVR20 Series controllers include built-in CO2 measurement as standard on Q-models, with optional humidity, TVOC and PIR occupancy sensing, and can connect directly to a PMR25 sensor for PM1.0, PM2.5, PM4 and PM10 particulate monitoring where the highest levels of air quality assurance are required.

Every controller offers an optional sharp colour touchscreen with glass front for an intuitive user interface, mounts directly to the wall surface or a standard back box, and communicates over BACnet MS/TP or Modbus RTU for full BMS integration. Wireless LoraWan and Bluetooth SmartPhone App options add flexibility for retrofit projects across existing healthcare estates.

Options for Air Quality Measurement:

- CO2 (Carbon Dioxide) - QVR Models
- VOC/TVOC (Total Volatile Organic Compounds)
- PM2.5 and PM10 Particulate Matter (PMR25 Devices)

Options for Energy Optimisation

- High Sentivity PIR Occupancy Sensor

Options Environmental Control

- 2% Accuracy Relative Humidity Measurement

Flow Measurement

- AccuFlow DPT50 Flow Sensors

Design and Display Options

- Colour Capacitive Touchscreen with Glass Front
- Colour LCD Screen with Push Buttons
- Black, White and Aluminium Color Options
- Wall Surface and Slimline 13.8mm Enclosure Options

Communication and Integration to BMS

- BACnet MS/TP
- Modbus RS485
- LoraWan Wireless Communication
- Bluetooth SmartPhone Interface

QCR10/QVR20 TOUCHSCREEN WALL CONTROLLERS

STANDARD TOUCHSCREEN



QCR12/QVR22 SLIMLINE FLUSH CONTROLLERS

SLIMLINE TOUCHSCREEN



QCR04/ QVR02 SLIMLINE LCD BUTTON VAV CONTROLLERS

TACTILE BUTTON



TVR/QVR20 SERIES VAV TOUCH CONTROLLERS

TCR/QCR10 SERIES TOUCHSCREEN ROOM CONTROLLERS

PRM25 SERIES PARTICULATE MATTER SENSORS

Senticon provides advanced building controls and measurement solutions for healthcare and other demanding building types. Our products are developed with over 100 years of combined design team experience in Building Management and Measurement Systems. Our PureAirnergy™ controllers and smart sensors combine aesthetics suited to modern healthcare buildings, accurate and comprehensive measurement, advanced control algorithms for energy savings, and excellent comfort control, with practicality for the installer.

Understanding healthcare building technology and clinical HVAC applications is central to our culture. Our products offer intelligent connectivity to Building Management and IoT systems using industry-standard open protocols such as BACnet, Modbus and LoraWan. Merging deep application knowledge with in-depth networking expertise creates world-class products that monitor, alarm, predict, control, optimise and secure – and look good doing it.

LoRaWAN®

BACnet

Modbus



SmartPhone App offers easy access user interface to Senticon's VAV, FanCoil and Chilled Ceiling Controllers



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SENTIENT CONTROL SOLUTIONS

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