



## WISE

Demand-controlled indoor  
climate has never been easier

From software version 1.130

**Swegon** 

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# Demand-controlled indoor climate has never been easier than with WISE

WISE is the smartest solution for demand-controlled indoor climate on the market, and combines optimal comfort with the lowest possible energy use. WISE is a complete system with all the products you need for your indoor climate, including a smart control system and an easy-to-use user interface. WISE is based on a unique technology that forms a safe and flexible system that also simplifies each step of the way – from system selection and planning, to installation and commissioning. This makes it possible to satisfy the highest demands in each project – be it environmental, net operating income or comfort.

## Demand-controlled indoor climate

Many are familiar with the concepts CAV, VAV and DCV - yet it may be difficult to distinguish them and what they really involve.

In brief, they can be explained as:

- **CAV** (Constant Air Volume), system with a constant air flow in the premises.
- **VAV** (Variable Air Volume), system with variable air flow which is influenced by e.g. the temperature or air quality.
- **DCV** (Demand Controlled Ventilation), system with several different operating modes which adapts the air flow and temperature depending on the demand and occupancy status in the room.

These system variants can be combined with different types of heating and cooling systems to regulate the temperature of the indoor climate.

WISE is a comprehensive solution for demand-control of building systems for ventilation, heating and air conditioning - **Demand Controlled Indoor Climate**. A complete solution is now offered for the entire indoor climate, airborne and waterborne, individually or in combination.

## Best possible indoor climate

Did you know that on average people spend 87% of their time indoors and breathe about 15 kg of air per day? This makes it easy to understand that the indoor climate has a major impact on us.

The system for indoor climate and ventilation impacts on most of the important factors for a good indoor climate, which makes it important to bear this in mind when planning your property. By choosing WISE as the indoor climate system, you achieve the best possible indoor climate, which can increase performance capacity significantly.

WISE is a complete system with all the products you need for your indoor climate, including a smart control system and an easy-to-use user interface.

The system also comes with years of experience built-in, that makes the construction process simple, from planning to commissioning, and creates flexibility for future tenant conversions.

The basic purpose of WISE is to adjust the indoor climate to exactly the level required. It ventilates, cools and heats neither too much – which costs energy – nor too little – which adversely affects comfort, but only as much as is needed. With WISE you can combine high energy efficiency, the ideal indoor climate and a full overview of the whole system.

## A flexible system for different requirements

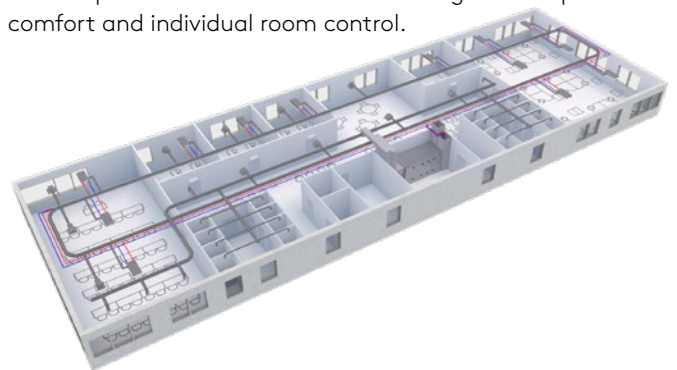
WISE supports different combinations of indoor climate systems. Combine waterborne and airborne within the building, from floor level to zone and room level.

WISE is a flexible and scalable system. The system can be adapted to meet the requirements and wishes of different activities, even when they vary over time.

WISE makes it possible to combine different system solutions. Here follows a brief introduction to some of the activities that may come into question and a few of the solutions Swegon offers.

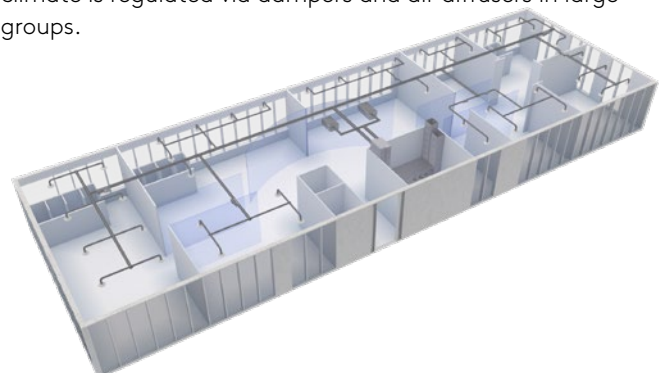
### Offices

For the greatest possible comfort in offices, conference rooms and open-plan offices the indoor climate is regulated in each individual room. Here air diffusers and waterborne climate products are combined for the highest temperature comfort and individual room control.



### Shops and public premises

The need in shops and similar premises with associated ancillary space can vary a great deal. Usually they are large premises with large air volumes. In this example the indoor climate is regulated via dampers and air diffusers in large groups.



## Solutions for CAV, VAV, and DCV

WISE represents the top of Swegon's broad standard range of air and waterborne indoor climate systems. All room products in the system are combined with a consistent look whether it's a question of CAV, VAV or DCV products.

### ADVANCED CUSTOMER REQUIREMENTS

#### Demand-controlled indoor climate

##### WISE

The WISE system manages demand-controlled indoor climate. Ventilation and air and waterborne heating and cooling, with full flexibility and the opportunity to combine products, even down to room level. Guarantees an optimal indoor climate and a minimum of energy consumption with unbeatable flexibility and availability.

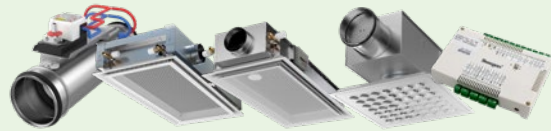


Highest level according to certification programs such as BREEAM Outstanding and LEED PLATINUM

#### DCV/VAV level

##### Stand-alone, connectable

Swegon can offer stand-alone products on room level which are connectable to a BMS system. These are available for demand-controlled DCV/VAV integrated in the product or via dampers.

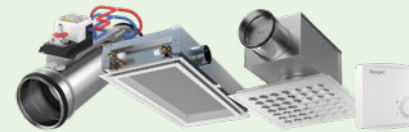


Lowest level according to certification programs such as BREEAM Pass and LEED Certified

#### VAV/CAV level

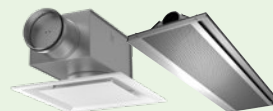
##### Stand-alone

Air and waterborne products on room level controlled via dampers and valves.



#### Product level

For more basic applications. The products are supplied without control.



Lowest level is the legal requirement such as BBR

### FUNDAMENTAL CUSTOMER REQUIREMENTS

## Advantages of different ventilation principles

Each project is a unique mixture of conditions and objectives. Depending on the priorities of the project, with the help of a few general principles, you can identify the type of indoor climate solutions that are best suited, which is illustrated in the figure above.

A CAV solution often brings about a lower initial investment and can therefore be the right choice for simpler projects. However, to attain an acceptable degree of comfort this solution risks being expensive in the long term due to a lack of energy efficiency and flexibility.

The CAV system's direct opposite consists of the WISE system, where the initial investment is slightly higher, but one that gives unbeatable comfort and the highest energy efficiency. The intelligent system ventilates, heats and cools when and where required. Future changes are easy to manage in the user-friendly and flexible system.

# This is how WISE works!

## Step by step

### System selection

#### Simple design of the WISE system

WISE gives you a choice of airborne and waterborne room products, or a combination of both. Use Swegon ESBO to verify your system choices.

### Operation

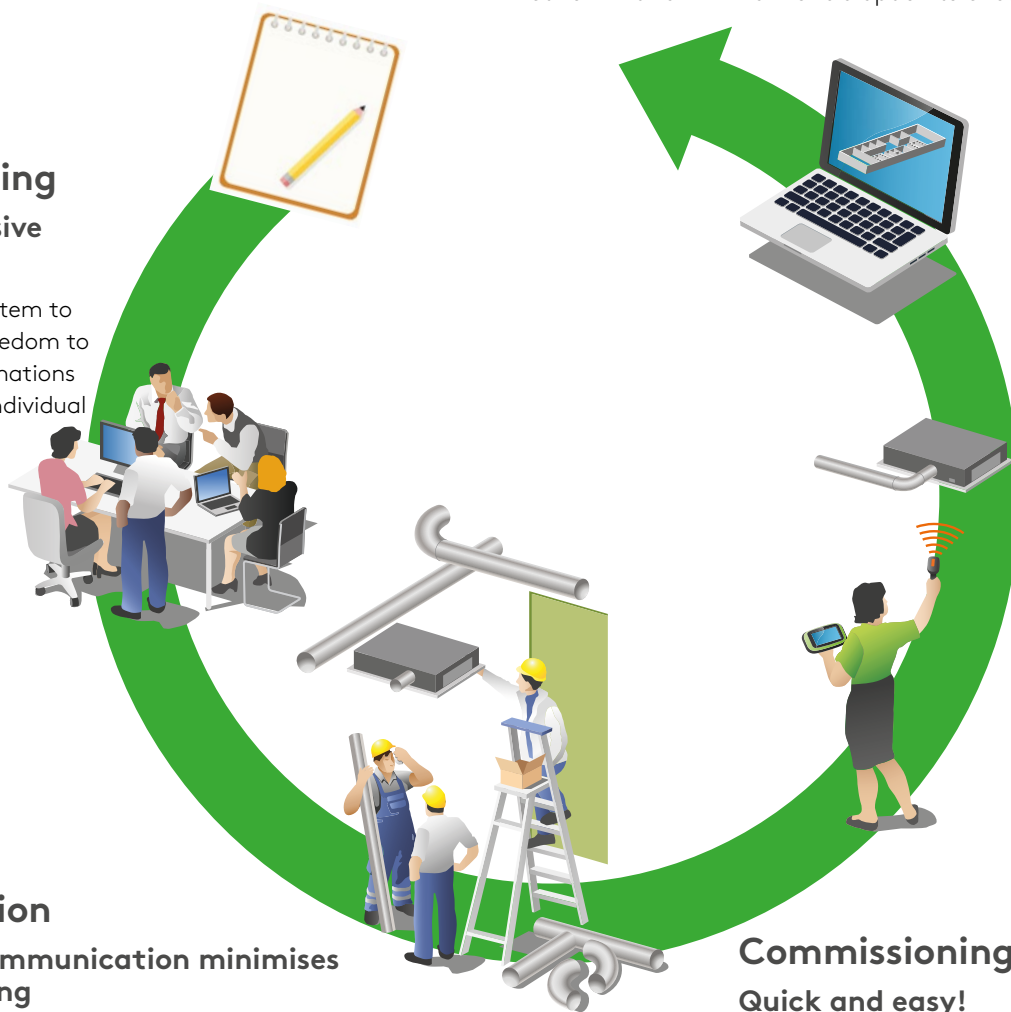
#### Flexible

The SuperWise interface gives you an instant overview and control over the entire system. If any system requirements need to be adjusted, for instance, if walls are moved or activities in the premises change, the system configuration can be altered. Product updates are sent out via the radio network with a minimum of disruption to existing activities.

### Project planning

#### Fully comprehensive solution

WISE is a complete system to give you maximum freedom to create the best combinations of products for each individual interior.



### Installation

#### Wireless communication minimises cable routing

Wireless communication between the products significantly reduces installation time and eliminates the risk of misconnections. Logistics throughout the building process are simplified, as no unique pre-configurations are required – all you need to do is install the right type of product in the right place.

### Commissioning

#### Quick and easy!

The system's components are digitally matched with the role they assume in the system. The first time the system is started, each component is configured automatically, which saves time and eliminates the risk of human error. Moreover, Swegon engineers will always be present for your system's commissioning to ensure that everything is running.

### Additional help

- I would like to know more about the WISE system in general
- I would like help to plan the electricity, water and air
- I would like detailed data for individual products
- I would like help early in the construction process to select the system type
- I want to check and see an overview of a specific WISE-system

- See the System Guide
- See the Project planning guides
- See the Product data sheets
- Log in to Swegon ESBO
- Log in to SuperWISE



## Tangled cables and communications problems a thing of the past

The WISE system comprises room products for both air and waterborne climate systems, all the requisite control equipment, as well as room units and sensors. All this is linked together to form an entirety via a unique patented system for wireless communications, which is self-healing and neither disturbs nor is disturbed by other equipment. It is encrypted for the highest safety level, which makes it a secure for sensitive environments such as hospitals and airports. Unique in terms of reliability and simplicity in installation and commissioning.



### Meshed structure

Each unit forwards information about nearby products, which helps the network to work around obstacles. This also means that the system can quickly repair itself if a product, for example, loses power.

### Coexistence

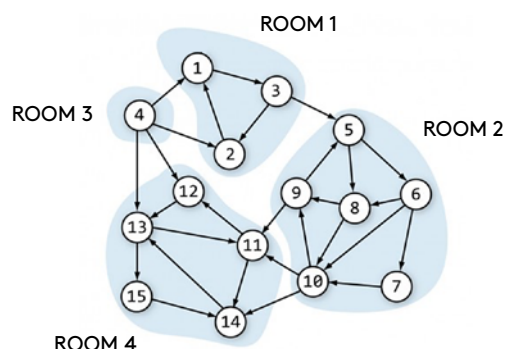
The equipment avoids creating bottlenecks by scanning the ambient noise of the signals and then sends their own signals on the frequencies where competition for space is at a minimum. This means the risk of disruptions and the impact of other communications are minimised.

### Ultra Low Power

The system sends only data when it is required and not continuously as other similar methods. This in combination with unique energy efficient technology and hardware permits a battery life of up to 10 years.

### AES 128-bit encryption

WISE not only ensures that communications work, it also safeguards its integrity with high level encryption - using the same technology deployed by e.g. the federal authorities in the United States.



### Advantages of wireless communication

With WISE wireless communication you get:

- The most flexible system on the market for e.g. rebuilding and conversions.
- A modern and reliable system that can manage a large amount of data and with that is future-proof for a long time to come.
- The open interface makes it possible to share data and information with other technical systems and building systems, which makes adapted and smart functions possible.
- In most instances you get significantly lower installation costs as the cables needed (24 V) can be routed the shortest way, and no consideration needs to be given to how component products are interconnected.

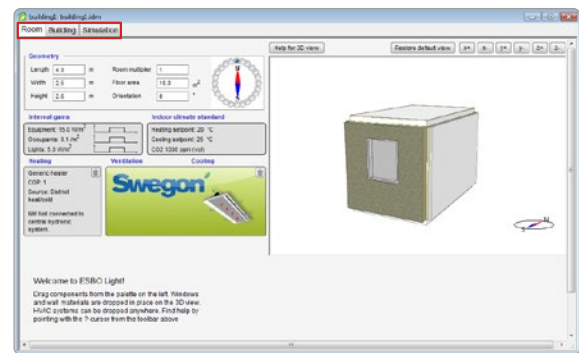
# Function, sizing and product selection software

The WISE system is supported by modern and digital tools. Irrespective of whether you're working with planning, administration or you own a WISE system all the necessary system support is available.

## Energy and capacity calculation with Swegon ESBO

Swegon ESBO will aid you during the whole process, from prospect through construction to the finished building, supporting you to deliver the best indoor climate. The software helps you to handle all factors surrounding the project such as climate conditions, customer demands, energy requirements, legislations, etc.

Swegon ESBO can manage capacity and energy calculations for different types of VAV and DCV systems. With just a few simple settings the software can make the same calculations for a WISE system.

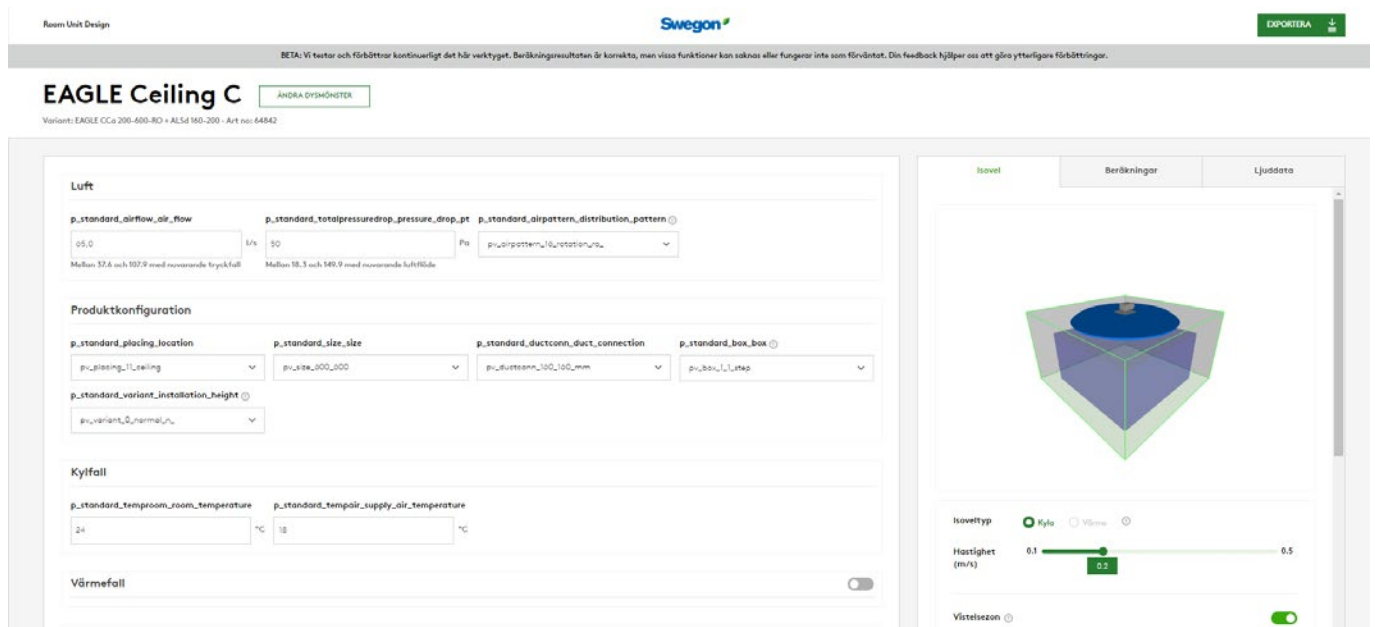


Room tab in Swegon ESBO

## Easy and quick calculation with Single Product Calculator

Single Product Calculator is a calculation tool for room products. Capacity, sound, flow, isovel and more can be quickly and easily calculated and printed.

SPC is reached via the "Calculate" button on our product pages on our website. No login or software download needed, quick and easy!



Single Product Calculator

**Simplicity**

**Flexibility**

**Clearly arranged**

**User friendliness**

## **New opportunities**

Swegon's WISE system makes it possible to cool, heat and ventilate in the way that is best suited to the project in question.

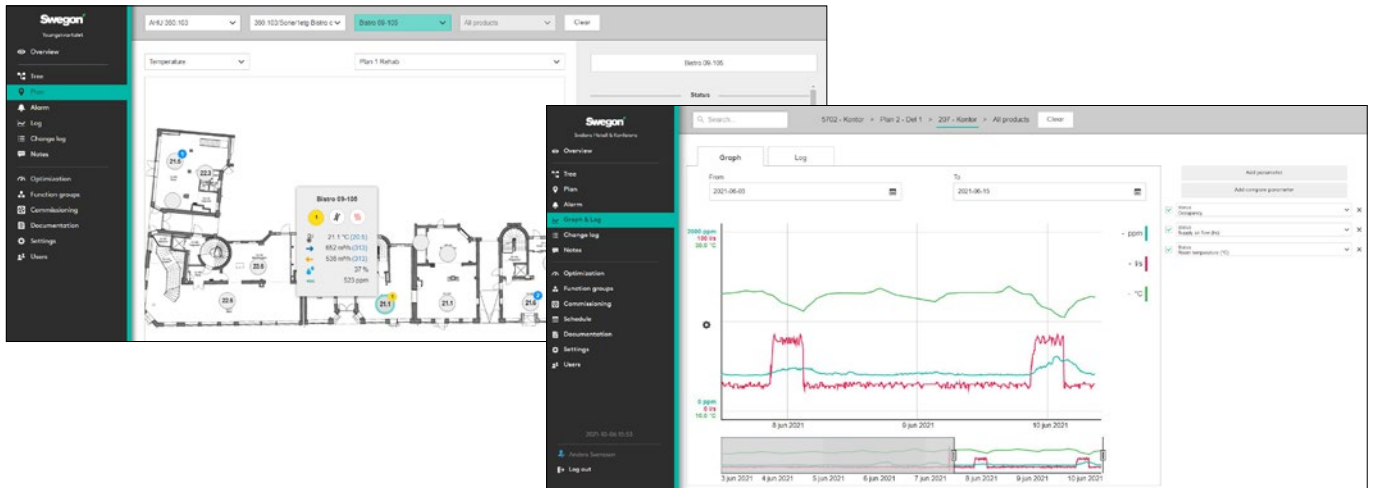
All Swegon's indoor climate products can be combined and integrated in the system, which creates the prerequisites to achieve maximum comfort with minimal energy consumption.

Earlier limits and restrictions are now being eliminated, which we call **Demand controlled indoor climate**.





# SuperWISE II



SuperWISE II Interface

SuperWISE is the WISE system’s interface with which the user integrates and communicates with the system and its products. As SuperWISE is the system’s single point of access, it's easy to monitor and adjust the system, via computer or tablet, even remotely via Swegon Connect.

Here you'll find all requisite information, without it being complicated or confusing. The common platform manages multiple air handling units and refrigerant units while there is considerable space for adaptation to each individual building. Virtual rooms make it easy to assign room associations and balance the ventilation flows, which gives unbeatable flexibility during rebuilding - without any difficulties.

## Easy planning, installation and commissioning

The system is configured and commissioned by Swegon’s Technical departments. This configuration file, with all project specific functions and settings, are then used for commissioning. In connection with each individual product being “paired” in the system, it receives its role and function via SuperWISE.

Using the TuneWISE hand-held terminal and scanner, each room product is identified and connected (paired) and then receives its function in the WISE system. This procedure minimises incorrect connections, time for troubleshooting and ensures installation and operation.



Scanner and TuneWISE handheld terminal

## Updates

Software updates are managed via SuperWISE and can be installed at the same time as the system is running without disturbing existing activities. The update is downloaded in the background and is then automatically distributed to the system and its products.

## Straightforward and visual

The property’s floor drawings can be loaded into SuperWISE and image files (\*.jpg or \*.png). When the system is put into service and the products paired, the occupancy status, temperature, air flow, etc. can be read for each floor, room and product. In the event of rebuilding or extension, the existing floor drawings can be simply updated and new added.

SuperWISE shows specific parameters for the system’s air handling units. A SuperWISE can manage up to 60 air handling units.

## Documentation

It is possible to save all documentation for the product under the SuperWISE document tab. All documents such as product sheets, project instructions, operating cards, self-inspection reports, etc. are collected in one place for quick access.

## Logs and graphs

Logging saves all signals in the system to a file. It is also possible to analyse graphs directly in the SuperWISE web interface.

## Simplified operation and maintenance

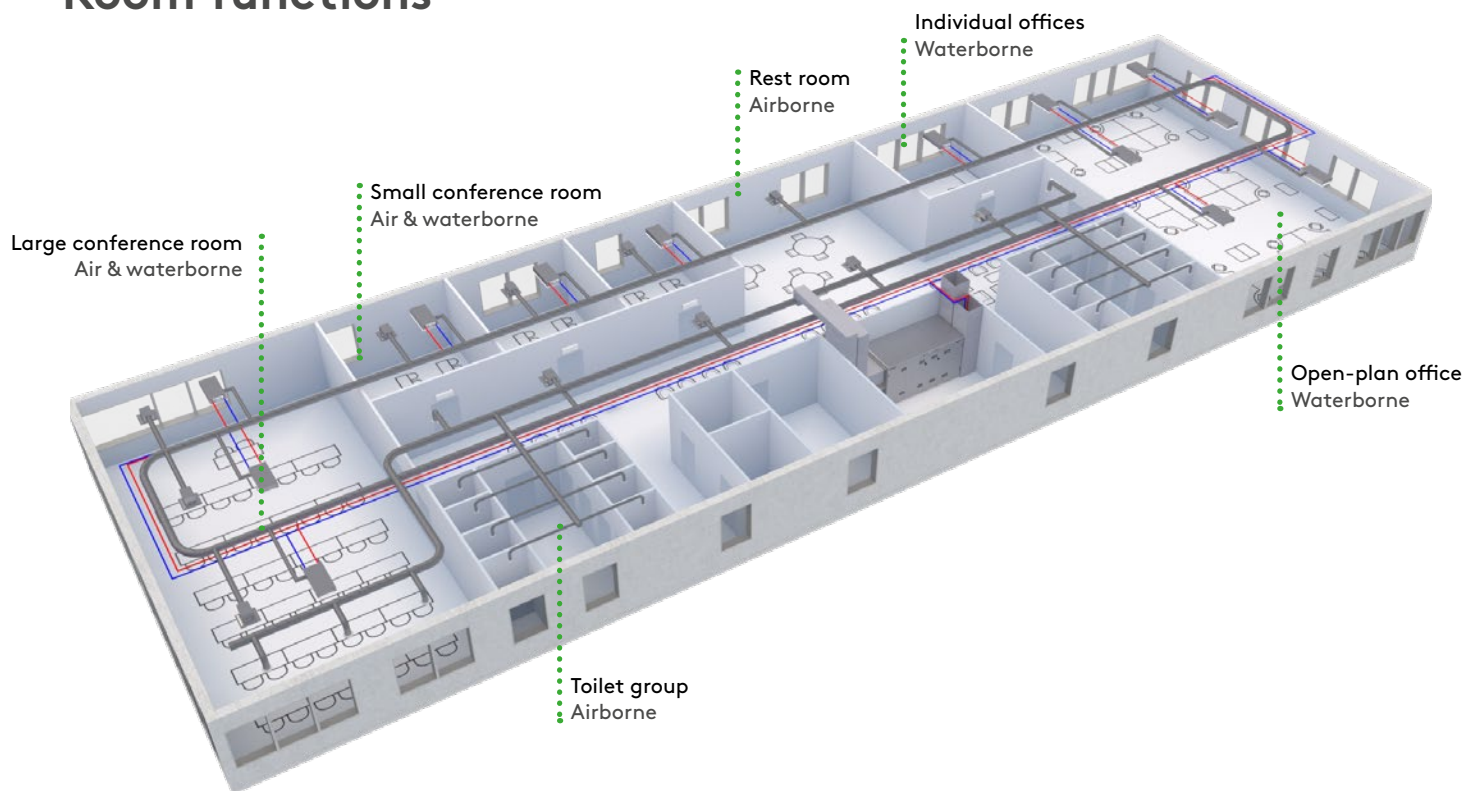
In SuperWISE it is possible to see alarms in real time or in a log of previous alarms. Notes can be added to each alarm in terms of who performed any actions, what was done as well as the time and date.

Parameters that are changed in the system are collected in a change log and even here it is evident who has performed actions, what has been done and when. The log shows the previous parameter setting to provide a complete view of the extent of the change.

The system can be reached remotely via Swegon Connect for diagnosis, monitoring and optimisation (see separate section).

# Functionality in the WISE system

## Room functions



Room functions are the functionality available on room level. Typically a room consists of a floor area surrounded by walls. However, a room can also be seen as a floor area where the same climate is required. Therefore it is also possible to divide a large building into several climates by creating virtual rooms. Virtual rooms act in the same way as real rooms, with the difference virtual rooms do not have walls. In the WISE system a room can consist of one or more room dampers (supply air and/or extract air) as well as one or more comfort modules or air diffusers in order to influence the room climate. The room can be supplemented with different types of sensors to measure the room climate and other properties that influence.

| Room functions                        | Explanation  |
|---------------------------------------|--|
| <b>Air quality control</b>            | Sensors to measure the air quality are available as an accessory, either for installation on walls or factory mounted in room products. If the room has several sensors, it is possible to regulate on an average, min. or max. value of these sensors.<br>Detection and regulation can be performed on the levels of VOC (Volatile organic compounds), CO <sub>2</sub> (Carbon dioxide) and RH (Relative humidity). |
| <b>Temperature control</b>            | It is possible to cool and heat rooms and premises in several different ways, depending on the current comfort and performance requirements. All set point values and settings can be accessed via Super-WISE.   |
| <b>Additional moisture regulation</b> | By measuring and comparing the vapour content in the indoor air with the prevailing vapour content in the outdoor air, WISE calculates the additional moisture (g/m <sup>3</sup> ) in each room. The system increases the air flow when necessary to ventilate out the additional moisture.  |
| <b>Occupancy detection</b>            | When occupancy is detected in the room the settings for temperature, air quality and air humidity are changed from unoccupied to occupancy settings. Occupancy detection is also used for e.g. lighting control.   |
| <b>Flow balance</b>                   | Balances the air flows in a room so that negative or positive pressure and the problems that these can cause, for example, noise and difficulties to open/close doors/windows are avoided.   |

| Room functions                                   | Explanation   |
|--|---|
| <b>Operating mode room: Occupancy</b>            | The mode is adopted for occupancy.  |
| <b>Operating mode room: Unoccupied</b>           | The mode is adopted for unoccupancy to reduce energy consumption. When unoccupied a higher/lower temperature and lower air flows can be permitted than for occupied. Some functions can be deactivated in unoccupied mode, for example, cold draught protection or air quality control.   |
| <b>Operating mode room: Checked-in</b>           | This mode is adopted with an external signal from the BMS-system, for example, a hotel booking system, or is activated from SuperWISE. Primarily works as Occupancy, but without occupancy in the room being a requirement. Air boost is available and is always activated when the mode is activated. The function is activated according to the time specified under "Air flow boost", or until occupancy in the room is indicated. If occupancy in the room is indicated during this time the room adopts "Occupancy", otherwise the room returns to "Unoccupied".                     |
| <b>Operating mode room: Commissioning</b>        | This mode is adopted through the active selection by the user on the web interface's Commissioning tab. The function of the mode is to set the whole system, or parts of it, in different fixed modes in order to ensure the right air flows and functions in these. The air flows are determined by the user via the SuperWISE interface.  |
| <b>Operating mode room: Holiday</b>              | This mode is adopted through the active selection by the user on the web interface's Commissioning tab. The mode has its own parameters for temperature limits and minimum flow. Occupancy will not be activated in the room when it is set to holiday mode.  |
| <b>Operating mode room: Morning heating</b>      | This mode is adopted with an external signal from the BMS system or from a GOLD unit. The function of the mode is to heat the room with warm air from the air handling unit. The air flow is set to maximum and is maintained as long as the temperature is below the cooling setpoint value, or until the external signal stops. There are separate settings for temperature and minimum flow in this mode.  |
| <b>Operating mode room: Summer night cooling</b> | This mode is adopted with an external signal from the BMS system or from a GOLD unit. The function of the mode is to cool with cool outdoor air from the air handling unit. The air flow is set to maximum and is maintained as long as the temperature is above the heating setpoint value, or until the external signal stops. There are separate settings for temperature and minimum flow in this mode.   |
| <b>Control of lighting in the room</b>           | Used to switch on the lighting with occupancy, and prevents the need of an extra occupancy sensor and an additional system for lighting control. This saves the number of components, number of systems and installation costs.<br><br>All lighting outputs in the room are switched on when the lighting status for the room is in "ON" mode. The lighting can be switched on either with the lighting switch, presence sensor or group signal via SuperWISE or the BMS system.  |
| <b>Solar protection in rooms</b>                 | Solar protection can be used as part of temperature control, by utilizing solar radiation to heat the room or, conversely, shutting it out to cool the room. Solar protection can be used as insulation, to prevent heat escaping through windows during the night if it is cold outside. It can also be used as a glare shade, to prevent light from disturbing those in the room. It's also possible to control the solar protection manually via push buttons. Each room is connected to a façade, and information about the brightness of the sun is obtained from a weather station. |
| <b>Cold draught protection</b>                   | Can be used if the room is heated with a radiator. This means that it is possible to cool with a room product and at the same time heat with a radiator to prevent uncomfortable cold draughts close to the façade.   |
| <b>Frost protection</b>                          | When there are waterborne products in a room, this function can be activated. If the temperature drops below a specified frost protection threshold, the thermostat in the room opens to 100%, regardless of current setting.   |
| <b>Open window</b>                               | The window contact indicates whether a window is open and sends a signal to the system to regulate its air flows. If the room has waterborne products, the water flow is also regulated.  |
| <b>Control of fancoil</b>                        | Used so that two separate systems do not counteract each other. One fancoil can be controlled with WISE IORE. One output is then used to control the water valve and the other output to control the fan speed. The water valve can be either used for cooling or heating.<br><br>Air and water are regulated in parallel where the fan speed is proportional to the water valve. The fan speed increases/decreases to the same extent as the water valve.  |
| <b>Underfloor heating</b>                        | The function to maintain the required floor temperature and room temperature, where the system's sensor to measure both the room temperature and surface temperature of the floor is used.  |
| <b>Air boost</b>                                 | Used to quickly ventilate a room to return to a starting point, which makes it possible to create a good indoor climate.  |
| <b>Condensation</b>                              | If condensation is detected on the cooling water supply pipes, the cooling valve closes immediately, and the air flow is set to maximum or minimum depending on configuration.  |
| <b>Duct heater/cooler</b>                        | Used to heat/cool the air on a room or zone level. This function can be used when certain rooms have different temperatures compared to the rest of the building. For example, a conference room may need to be heated when it is not used at the same time as the rest of the building needs to be cooled due to a high temperature load on account of occupancy.  |

## Light and lighting

A good level of air quality and a thermal climate that maintains a certain level adapted to the operation in the premises are required for the indoor climate to be perceived as comfortable. Light and lighting are also important for human well-being. Light comes partly from natural daylight (outside) and partly from the internal luminaires.

### Control of the lighting

Incorrect lighting can, for example, contribute to tiredness, tension in the neck/back and flicker from lighting sources can give rise to stress reactions in the nervous system.

With the WISE system it is not only the ventilation and indoor climate that we control, it is also possible to control the lighting as required in the premises. A flexible solution that is easily adapted to the changes in the premises, exactly as the rest of the WISE system! Functionality is also adapted to satisfy a number of requirements regarding lighting control in different building certification programmes.



### Solar protection

Natural light entering the room through windows can be an important part of well-being. The WISE system also offers the possibility to control internal solar protection according to the needs of the premises.

- Save energy and increase comfort by utilizing the sun's rays to heat your premises, or shutting them out to cool
- Insulate the heat, to prevent it from escaping through a window during the night if it is cold outside
- Protect against glare, to prevent light from disturbing those in the room

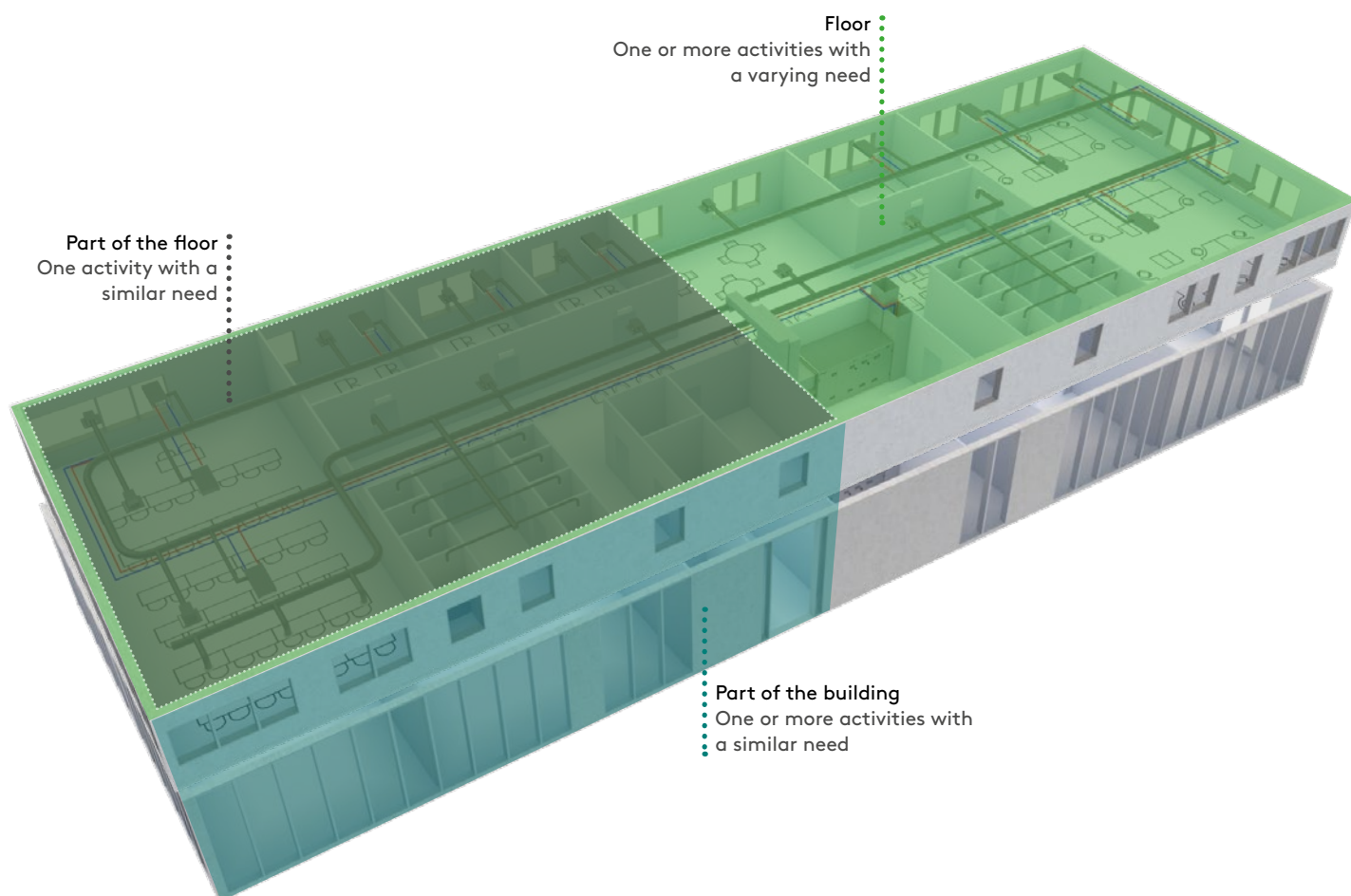
## Function groups



Function groups give the opportunity to share functions between room or products in the same room. WISE has the following function groups:

| Function group                       | Explanation   |
|--------------------------------------|---|
| <b>Temperature group</b>             | It is possible, by defining temperature groups in SuperWISE, for products in the same room to share temperature sensors or regulate with the help of each other's sensors. It is also possible to compare the measured temperatures of products and to regulate on an average value of several sensors' temperatures or the highest/lowest measured temperature.  |
| <b>Occupancy group</b>               | In an occupancy group signals can be shared between several rooms. However, for occupancy in a room, all rooms in a group can receive the occupancy status. Occupancy can be indicated by WISE OCS and WISE SMB. The occupancy signal can also come from a BMS system.  |
| <b>Air quality group</b>             | In an air quality group several rooms can be regulated via a common air quality sensor, for example placed in a common extract air duct. For several sensors within the same group, the sensor that first indicates impaired air quality can regulate the air flow for all the group's rooms, and in doing so, guarantee good air quality.  |
| <b>Window contact group</b>          | Open windows make it difficult for the system to regulate the indoor climate in an energy efficient manner. The function means that all rooms in the group receive the status "open window" if any of its sensors detect an open window. This can be managed by using wireless window contacts WISE WCS.  |
| <b>Lighting group</b>                | Lighting can be controlled via the WISE system and several rooms can be included in a lighting group. It is therefore easy to manage the lighting in the rooms, regardless of the size, floor layout and any possible changes.<br>Rooms included in a group can give lighting information to the group, without being switched on by the group's lighting status. It is possible to configure what switches on the lighting in a room. See the section Lighting control in rooms under Room functions for more information. |
| <b>Air balancing group</b>           | Group several rooms to get air balance. All supply air dampers, constant extract air dampers, fume hoods, etc. are included in the calculation of the total flow for the group.   |
| <b>Duct heater/cooler in a group</b> | Used to heat/cool the air on a room or zone level. This function can be used when certain rooms have varying temperatures compared to the rest of the building. For example, a conference room may need to be heated when it is not used at the same time as the rest of the building needs to be cooled due to a high temperature load on account of occupancy.  |
| <b>Additional moisture group</b>     | In an additional moisture group, several rooms can share additional moisture values or regulate with the help of each other's values. It is also possible to compare the measured additional moisture of products and to regulate on an average value of several rooms or the highest/lowest calculated value.  |
| <b>RTA-group</b>                     | In an RTA group, it is possible for several rooms to share the setpoints from a WISE RTA. A room with WISE RTA can send its information to other rooms in the group, and in this way several rooms can use the same setpoint selector switch.   |

## Zone functions



Zone functions is the collective name for the functionality on the level above room level. Typically a zone is a part of the whole duct system. The zone can consist of one or more WISE Dampers.

All products within a specific zone are regulated by the same WISE DIR. Underlying zone products, room products and sensors provide the system input to regulate. The products are designed based on the existing need and deliver the best possible indoor climate on each specific occasion.

| Zone function                                      | Explanation   |
|--|---|
| <b>Constant pressure regulation</b>                | For constant pressure regulation, a duct WISE Damper has the task to maintain a constant pressure independent of the flow that passes.  |
| <b>Air flow limitation for pressure regulation</b> | When using a WISE damper with pressure regulation there is a possibility to set a maximum limit for the air flow.<br>If the measured flow exceeds the maximum flow limitation, the regulator starts and regulates according to the set maximum flow until the air flow drops below the set value, the damper will then return to pressure regulation again. |
| <b>Constant flow regulation</b>                    | Constant flow regulation is used when a constant flow is to be maintained in a duct.  |
| <b>Flow balance</b>                                | A zone is always a ventilation group. Within a ventilation group, the sum of the total supply air flow is calculated minus the total extract air flow. The difference is the flow that needs to be created so there is balance in the zone.   |
| <b>Position optimisation zone</b>                  | The position optimised damper analyses the position of the underlying room dampers, and adjusts its own position until the most open of the underlying dampers is virtually in the fully open position. This approach minimises pressure losses in the system.  |

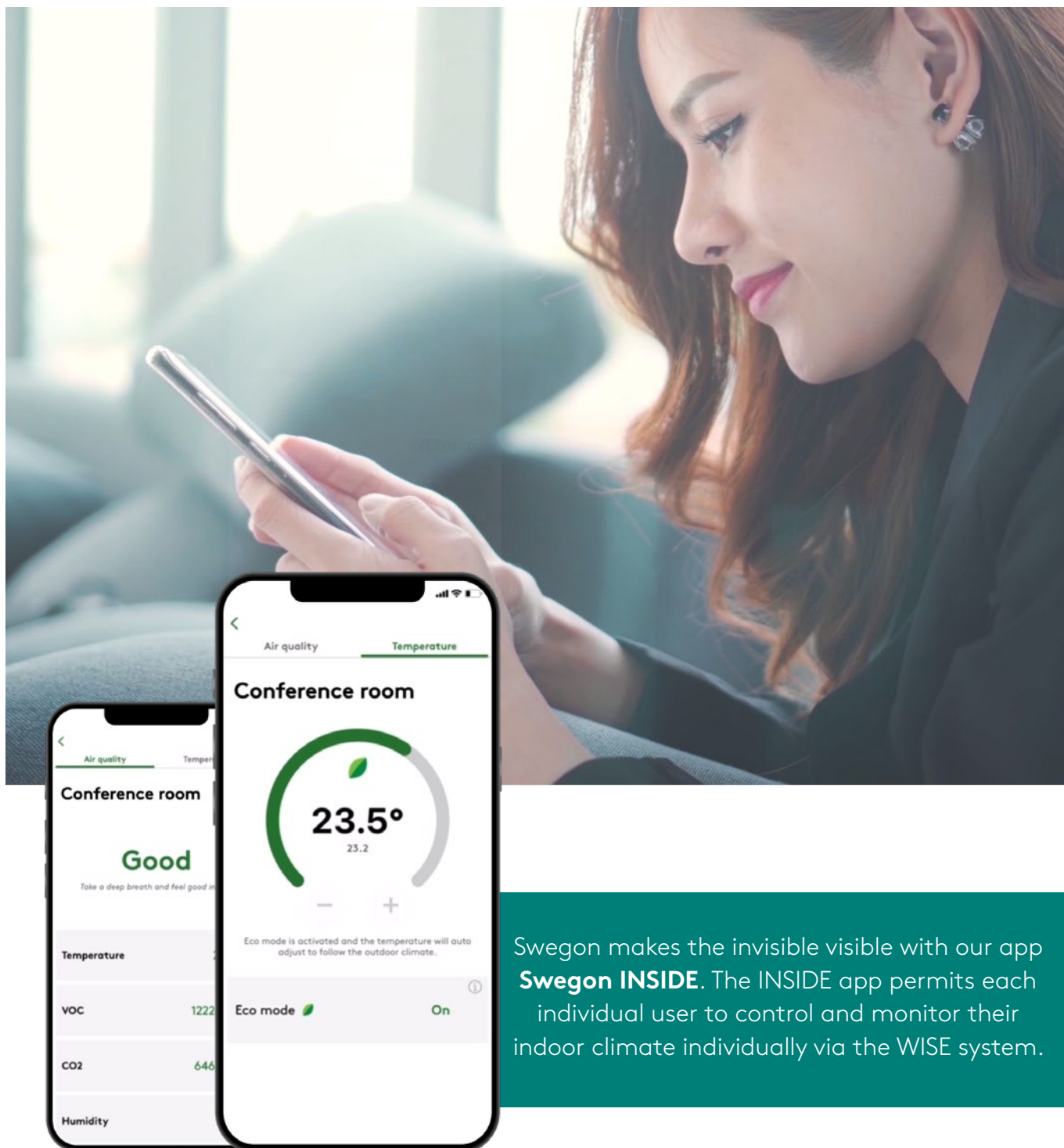
# System functions

Interacting functions for the whole system that define the prerequisites in order to be able to create the optimal indoor climate in each individual project.

SuperWISE is the system's interface with an overview of the whole system with up to 60 air handling units. SuperWISE, DIRECTOR and the air handling unit have a wired connection to each other via a permanent network. Each DIRECTOR manages a network consisting of zone and room products, and communicates wirelessly with all products in its network. All system accessories can have functions on both zone and room levels. The Swegon Connect cloud service permits remote connection for monitoring and support.

| System function   | Explanation   |
|---|---|
| <b>Graphical system management and supervision</b>                    | SuperWISE is the WISE system's interface with which the user integrates and communicates with the system and its products. Here you'll find all requisite information, without it being complicated or confusing. The common platform manages multiple air handling units while there is considerable space for adaptation to each individual building.   |
| <b>Logging and Graphs</b>   | Logging saves all signals in the system to a file. It is also possible to show graphs and perform analyses directly in the SuperWISE interface.   |
| <b>Forwarding of operating information to/from BMS</b>                | SuperWISE channels operational data to and from BMS via Modbus TCP or BACnet IP. Such information for example can be Holiday mode, Summer night cooling or information from a hotel booking system. Certain sensor data can also be transferred to and from the BMS system via SuperWISE.<br>SuperWISE has the BACnet profiles BACnet Building Controller (B-BC) and BACnet Gateway (B-GW) implemented and uses the BACnet protocol revision 14. Descriptions of all specific possibilities via BACnet in SuperWISE are set out in the so-called PICS document. |
| <b>Schedule and calendar</b>  | With the help of the schedule and calendar it is possible to control the system via weekdays and periods, by scheduling room functions. This, for example, can be Room mode, such as Occupancy or Holiday, Temperature offset or Air flow boost. The schedule can be set either via BACnet or directly in the SuperWISE interface.  |
| <b>Quick settings</b>   | Quick settings are made via the SuperWISE interface and permits the user to send a specific set value to more than one air handling unit/zone/room.   |
| <b>Commissioning</b>  | The user can set the whole of the system or parts of it in a specific mode via the SuperWISE interface. Commissioning is divided into two parts, commissioning of the air and commissioning of the water.   |
| <b>Air optimization functions</b>                                     | Pressure optimisation means that SuperWISE reads the degree of opening on the WISE Damper that serves as the system's zone damper. SuperWISE calculates and adapts the pressure in the duct system to the lowest possible operating pressure. This approach minimises pressure losses in the system.<br>Temperature optimisation means that SuperWISE continuously calculates an optimal supply air temperature by reading the room's heating and cooling requirement.  |
| <b>Water optimization functions</b>                                   | Water temperature optimization optimizes the water temperature of the system based on the actual demand at room level. The function ensures that the temperature difference between the desired and the supplied inlet water temperature is as small as possible. This minimises the energy required to heat or chill the property.   |
| <b>Morning heating</b>  | The general function morning heating is initiated from an external system such as GOLD or BMS system. The function is used to heat the building in the morning with hot air from the air handling unit. Morning heating is used when you have a lower night temperature (night reduction) in the building.  |
| <b>Summer night cooling</b>   | The general function summer night cooling is initiated from an external system such as GOLD or BMS system. Summer night cooling is used to cool down the building during the night with cool outdoor air from the air handling unit.  |
| <b>Room temperature for communication</b>                             | The aim of this function is to provide a representative temperature for all selected rooms under the air handling unit. The temperature mirrors the current room temperature better than e.g. an individual sensor in the extract air. The function can be used by GOLD or the BMS system to better improve the supply air temperature by knowing the room temperature.   |
| <b>Forwarding of operating information from the air handling unit</b> | The operating information from the air handling unit is communicated to the WISE system, which results in several common benefits. Signals that are transferred are Summer night cooling, Morning heating and Stop.   |
| <b>Outdoor temperature via communication (GOLD)</b>                   | The aim of this function is to use one or more outdoor temperature sensors for several air handling units. All GOLD units with the function activated are included in this function. An average outdoor temperature is calculated from all existing outdoor temperature sensors. This temperature is then written to GOLD.  |
| <b>Filter calibration</b>   | A function used by a connected air handling unit when the air handling unit calibrates the pressure drop across an air intake filter. During filter calibration the air handling unit delivers a high air flow to give a correct pressure drop reading from the air handling unit filter.   |
| <b>Emergency mode</b>   | When an emergency signal is written from GOLD or the BMS system, all products follow the configured emergency mode function for each output. The emergency mode function can be found under each output setting on the product.   |
| <b>External heating/cooling signal</b>                                | External sources for heating and cooling can be integrated in the WISE system by signalling a general need for heating or cooling for the system.   |
| <b>System occupancy</b>   | The system occupancy signal indicates whether the system is in occupancy mode, and is used for communication to the BMS system or air handling unit.  |

## Individual indoor climate - just a click away!



Swegon makes the invisible visible with our app **Swegon INSIDE**. The INSIDE app permits each individual user to control and monitor their indoor climate individually via the WISE system.

The app can display air quality (VOC, CO<sub>2</sub>, humidity\*), temperature and information about the measured values. Just set the desired temperature to get the optimal indoor climate that's right for you!

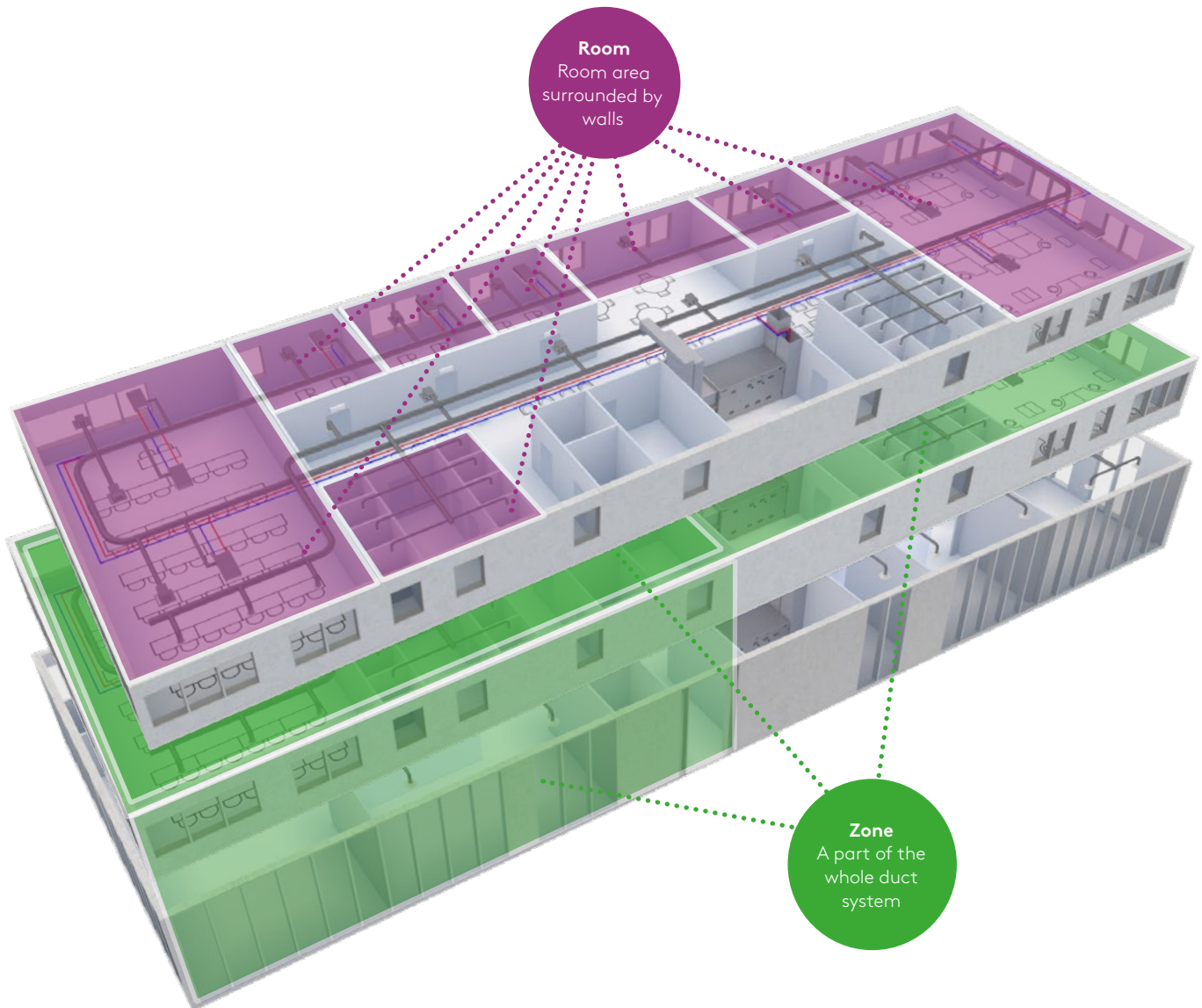
The INSIDE Manager administrator tool allows you to control which rooms different people have access to through the app, safely and easily.

Swegon INSIDE app also offers, "Eco Mode". Eco Mode adjusts the temperature inside to the temperature outside, which is good for both you and the environment.

\*Depending on which sensors are installed



# Component products of the WISE system



WISE provides maximum freedom to create the best combinations of products for each individual room. Instead of starting off with a number of components and trying to make these into a system, you create the system and choose products based on the need in each room and zone. This is possible thanks to our flexible products and wireless communication, yet the user interface SuperWISE also play a significant part.

## System products

SuperWISE is the system's interface with an overview of the whole system with up to 60 air handling units. Super-WISE, DIRECTOR and the air handling unit have a wired connection to each other via a permanent network. Each DIRECTOR manages a network consisting of zone and room products, and communicates wirelessly with all products in its network. All system accessories can have functions on both zone and room levels. The Swegon Connect cloud service permits remote connection for monitoring and support.

### WISE DIRECTOR

WISE DIRECTOR (WISE DIR) can be seen as the system's logical centre where the majority of the system's calculations are made. Data is collected and processed to be sent back to the system's products/nodes with instructions to regulate the indoor climate.

### Swegon Connect

The demand for remote control is constantly increasing and through Swegon Connect a flexible cloud based service is offered which permits communications between products, systems and users.

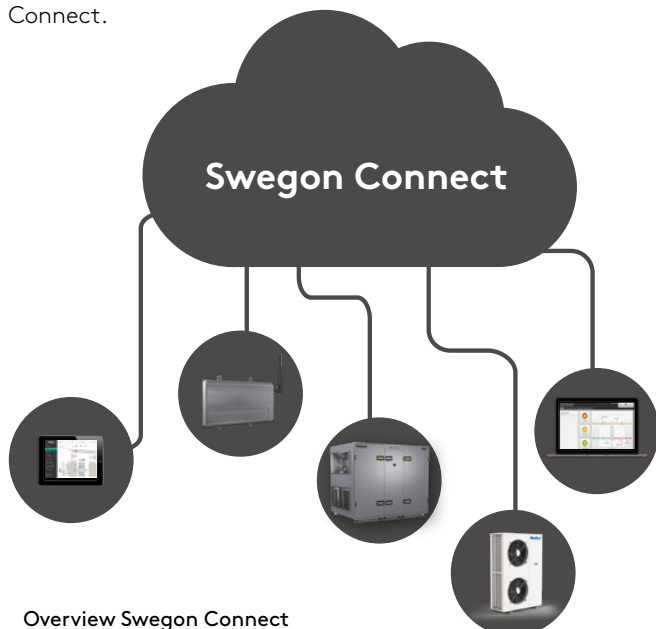
Using Swegon Connect the system can be monitored and controlled remotely. Being able to plan maintenance and employ the right resources in advance, saves both time and money. In addition, many cases can be managed remotely, which means further savings. If necessary, Swegon's technicians can also connect to the system.

Swegon Connect works together with all Swegon's products with an integrated web server.

- GOLD
- SuperWISE
- COMPACT

This creates the conditions for simplified operation and maintenance management.

Swegon Connect gives the user full control irrespective of their geographical location. All system products with an integrated web server can be reached and managed via Swegon Connect.



Overview Swegon Connect

### Subscription for mobile connection

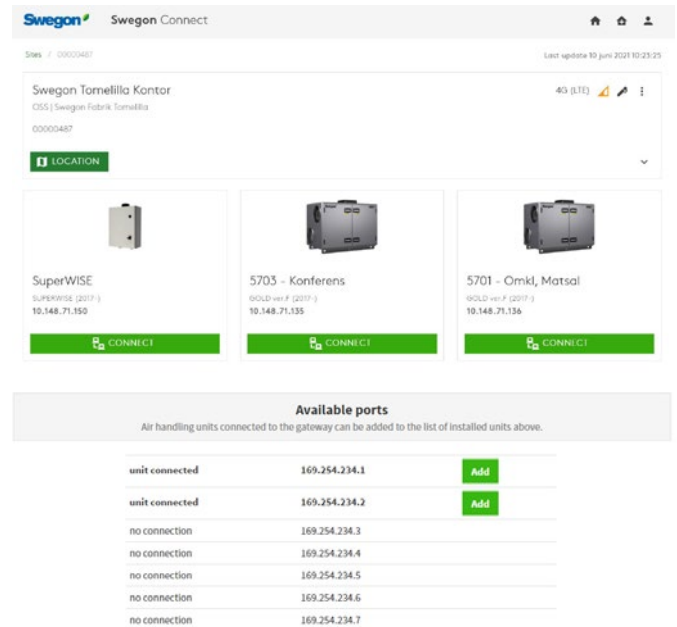
A 24-month subscription for mobile connection is included on delivery. After this it is possible to extend the subscription by 12 or 24 months at a fixed rate.

### Security

Each Swegon Connect router is equipped with a unique security certificate. The router's internal firewall prevents traffic between the mobile connection and other networks. The customer portal's web page is encrypted and requires the user to login. Connected climate products are also protected by separate login procedures. An external security feature means Swegon Connect's router can be activated/deactivated via SMS.

### Customer portal

Users can reach all their connected installations via the customer portal and quickly receive a good overview of the systems, either directly in the customer portal or via Super-WISE.



## Climate products

### WISE Parasol Zenith

Comfort module with integrated radio module that demand controls the air flow as well as cools and heats waterborne for the best energy efficiency and comfort. WISE Parasol can be adapted and combined to meet comfort requirements in most projects, both now and in the future. A complete and flexible product with adjustable air distribution pattern – all accessories are factory mounted. The unit is powered by 24 V AC.



### WISE Colibri C

Air diffuser with integrated radio module for regulation of the air flow - variable alternative constant flow. Measures the current duct temperature and is equipped with sensor module WISE SMB for measuring the room temperature and occupancy in the room. The unit is powered by 24 V AC.



### WISE Sphere

Air diffuser with integrated radio module for regulation of the air flow - variable alternative constant flow. Measures the current duct temperature and is equipped with sensor module WISE SMB for measuring the room temperature and occupancy in the room. The unit is powered by 24 V AC.



### WISE Damper

Damper with integrated radio module, can be flow controlled, pressure controlled or have optimised functionality together with other products. Measures the current duct temperature. Can be supplemented with sensor module WISE SMA for air quality measurements in the duct. The unit is powered by 24 V AC.



### WISE Measure

Measurement unit with integrated radio module. Integrated air flow and duct temperature sensor. The unit is powered by 24 V AC.



### WISE DPS

Pressure sensor to measure the pressure in air ducts.



## Waterborne products

All waterborne products can be integrated in the WISE system with the help of the factory mounted WISE IORE. The unit is powered by 24 V AC and can regulate actuators and any condensation sensor. An analogue input (0-10V) is also available.



## System accessories

### WISE RTA (Room Temperature Adjuster)

WISE RTA measures the temperature and has set point selector switches as well as a digital input for connection of e.g. a card reader and lighting switches. The unit can also be used to change the fan speed when controlling the Fan coil. The unit communicates wirelessly and is powered by 24 V AC/DC or by a 3.6 V Lithium battery.



### WISE IAQ (Indoor Air Quality Sensor)

WISE IAQ is a sensor for wall mounting that measures temperature and air quality in the room. The unit communicates wirelessly and is powered by 24V AC/DC.

WISE IAQ is available in three variants where:

- WISE IAQ MULTI measures: VOC, CO<sub>2</sub>, RH and temperature
- WISE IAQ CO<sub>2</sub> measures: CO<sub>2</sub>, RH and temperature
- WISE IAQ VOC measures: VOC, RH and temperature



### WISE IRT (Infra Red Temperature Sensor)

WISE IRT is a temperature sensor for wall mounting. The sensor measures both room temperature and surface temperature of e.g. floors with the help of IR. The unit communicates wirelessly and is powered by 24 V AC/DC or by a 3.6 V Lithium battery.



### WISE OCS (Occupancy Sensor)

WISE OCS is a combined sensor. The unit has a PIR sensor to detect occupancy and sensors to measure air humidity and temperature. The unit communicates wirelessly and is powered by 24V AC/DC.



### WISE IORE (Input Output Radio Extender)

WISE IORE is a unit that can control products in the system without its own radio communication. The unit can power up to 2 motors and/or up to 3 valve actuators as long as the total power consumption is less than 18 VA. WISE IORE has an analogue input (0-10 V) and input for a condensation sensor.



### WISE WCS (Window Contact Sensor)

WISE WCS is a window/door contact and temperature sensor with a magnet and sensor for installation on windows that can open or on doors to activate energy saving functions. The unit communicates wirelessly and is powered by a 3.6 V Lithium battery.



### WISE RTS (Room Temperature Sensor)

WISE RTS is a wireless temperature sensor for wall mounting. The unit communicates wirelessly and is powered by a 3.6 V Lithium battery.



### WISE IRE (Input Radio Extender)

WISE IRE can take in analogue/digital signals from different sensors in the system that are not equipped with radio communications, and send these wirelessly to WISE DIR. The unit communicates wirelessly and is powered by 24 V AC/DC or by a 3.6 V Lithium battery. For supplying with 24 V, WISE IRE can also be used as a communication bridge. When two nodes have limited radio communications, WISE IRE is placed between these and boosts communications.



### TuneWISE

Handheld terminal for identification of room products in the WISE system.



### Scanner TuneWISE

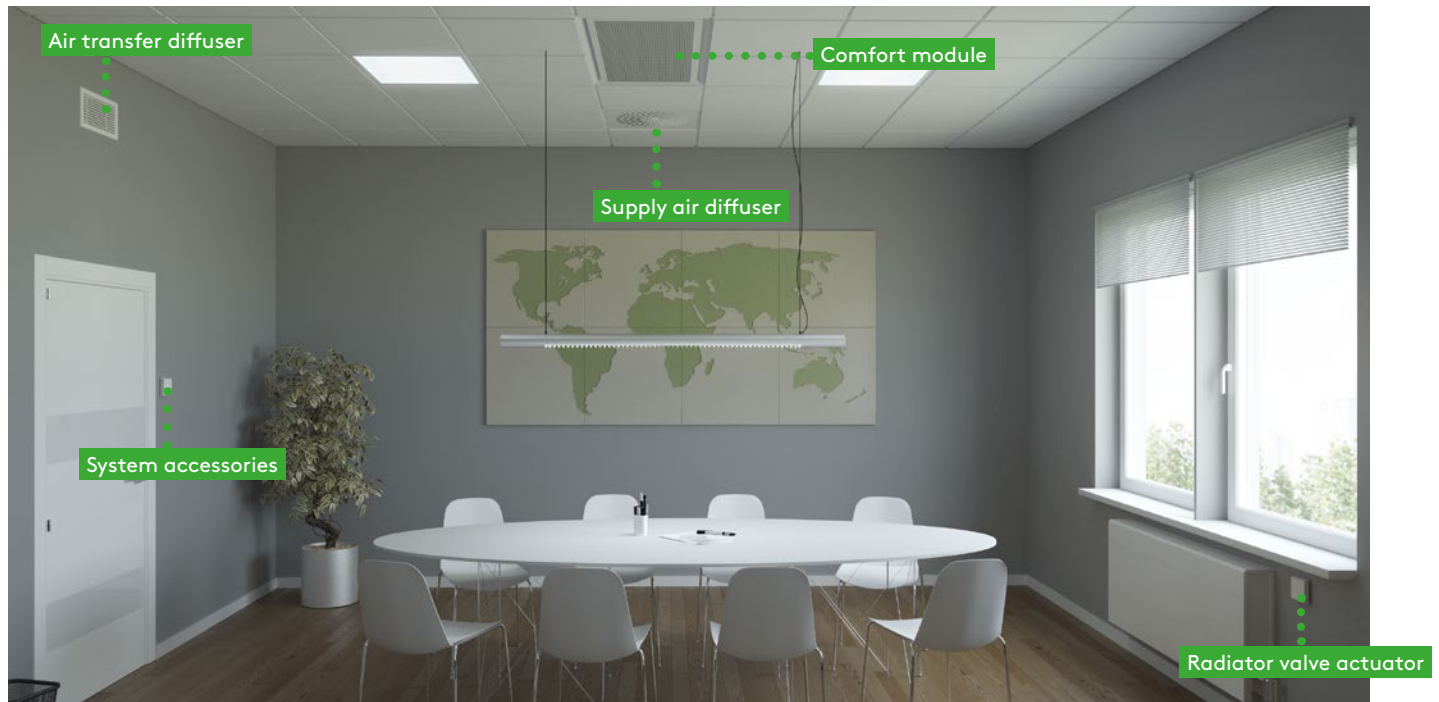
Hand scanner for identification of products in the WISE system.



# Typical room

## Conference room with water and airborne climate

Proposed conference room solution with one or more active comfort modules together with one or more active supply air diffuser. The room has variable supply air flow and extract air via transfer air.

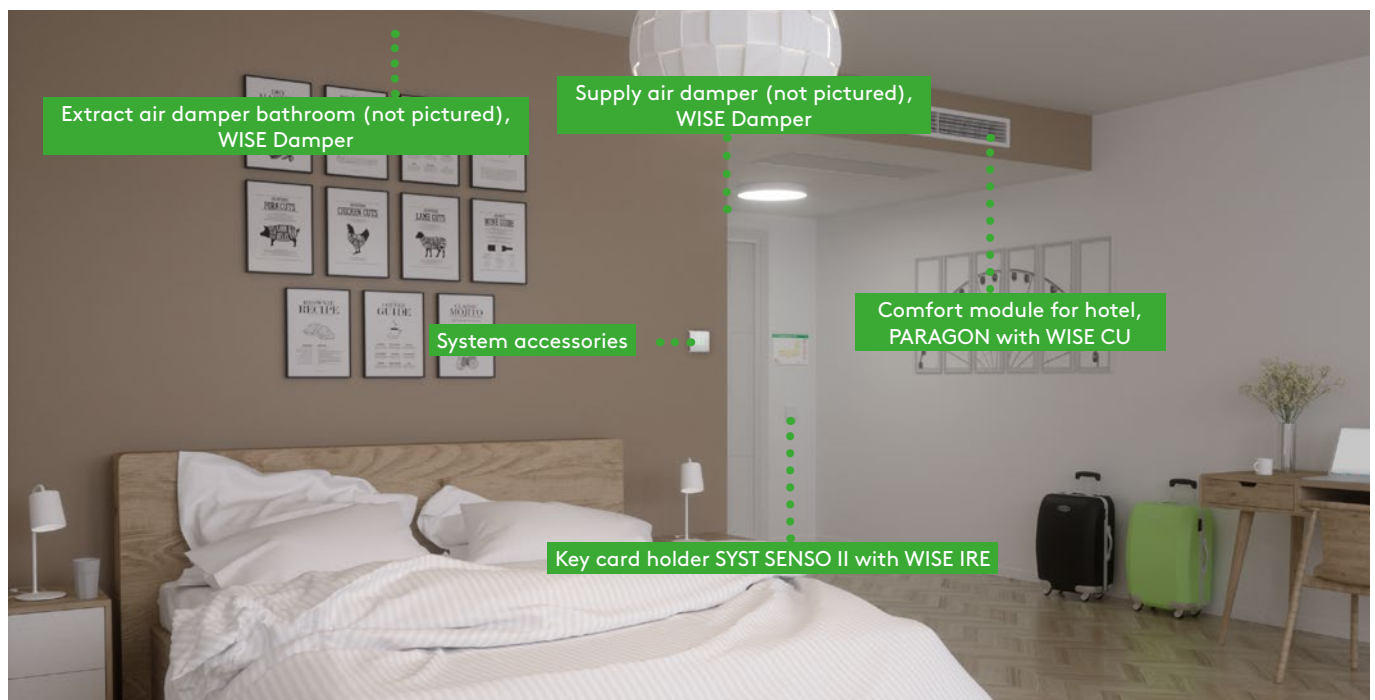


Presence detection and temperature measurements are made in the active supply air diffuser or the comfort module, these co-regulate so that the correct quantity of air is supplied to the room as well as cooling and/or heating so that the set room climate is achieved.

Extract air via sound attenuated air transfer diffuser, adapted for the higher air flows to the corridor with central extract air.

## Hotel room

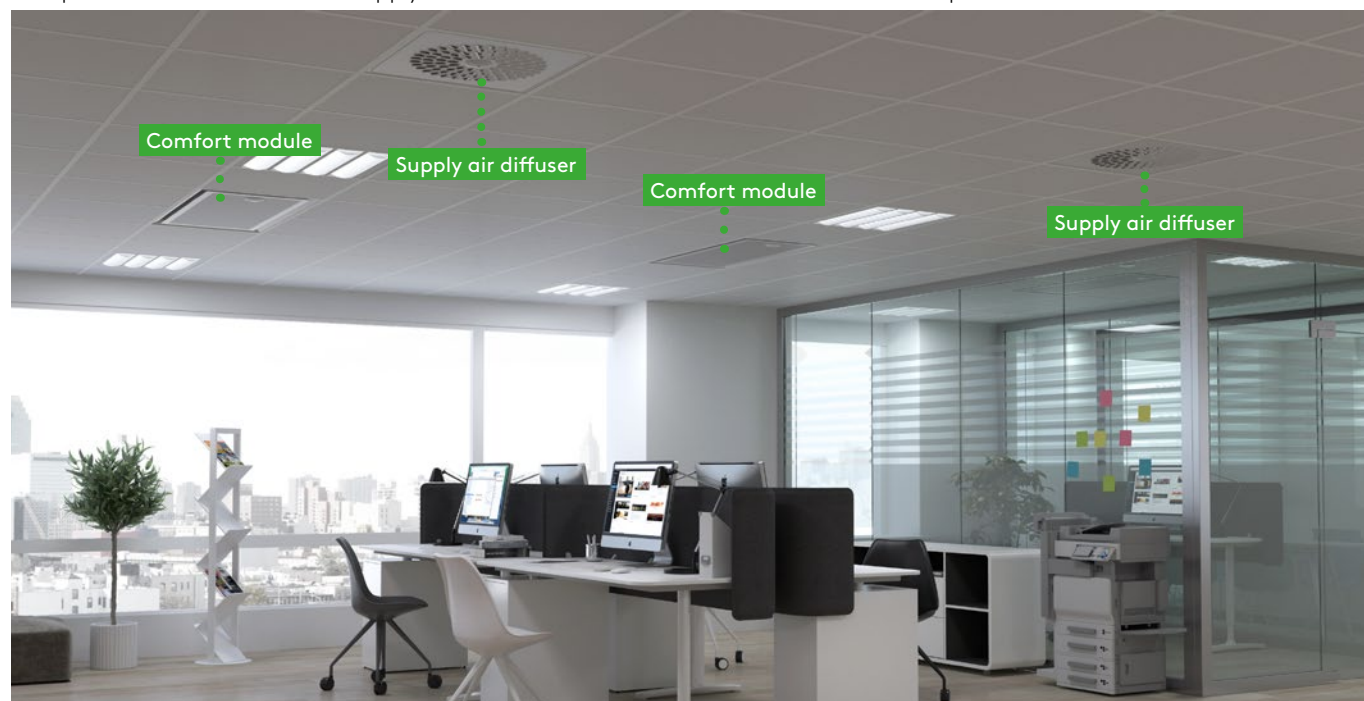
Proposed hotel room solution, the room has variable supply air flow and extract air that is balanced via damper on the supply and extract air.



The comfort module is regulated so that the correct quantity of air is supplied to the room as well as cooling and/or heating so that the set room climate is achieved. Extract air via separate extract air damper and passive extract air diffuser in the bathroom.

## Open-plan office with water and airborne climate with balanced extract air

Proposed open office solution with one or more active comfort modules together with one or more active supply air diffuser or damper. The room has variable supply air flow and extract air that is balanced via damper and extract air diffuser.



Presence detection and temperature measurements are made in the active supply air diffuser or the comfort module, these co-regulate so that the correct quantity of air is supplied to the room as well as cooling and/or heating so that the set room climate is achieved.

Extract air via separate extract air damper and passive extract air diffuser.

## Classroom with airborne climate with fume hood ventilation in balance

Proposed classroom solution, with separate WISE damper for supply air and extract air, one or more passive supply air and extract air diffusers. The room has variable supply and extract air flow in balance with fume hood ventilation.



Temperature measurement of the room air is performed in the extract air damper and the system regulates the quantity of supply and extract air in the classroom so that the right room climate is achieved.

Measurement of the fume hood ventilation is performed via measurement flange that balances by first reducing the extract air, if this is not sufficient so the supply air will increase to balance the air flows in the room. Alternatively, flow balancing can be performed via indication from the fume hood.

Supply and extract air is supplied with passive supply and extract air diffusers.

# References



Photo: Francisco Munoz

## HOTEL NORGE BY SCANDIC

Since Hotel Norge opened in 1885, it has gone on to become one of the most prominent hotels in Bergen, Norway. In 2018, the hotel reopened following full refurbishment, and now rebranded as Hotel Norge by Scandic. With its mission to be an iconic, state-of-the-art hotel, today the hotel is a lively meeting place, hosting local functions and international conferences alike.

Creating a pleasant indoor climate calls for a solution capable of balancing superior comfort with energy efficiency. WISE was therefore chosen.

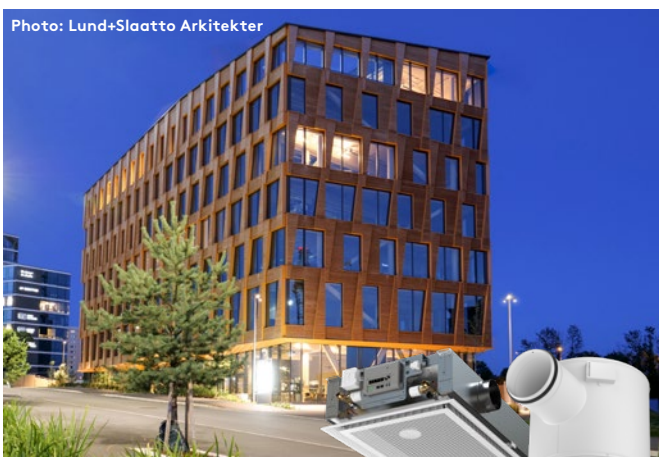


Photo: Lund+Slaatto Arkitekter

## VALLE WOOD

Valle Wood is a unique office building in many ways. As the name of the building suggests, it is made of wood - lots of wood! Valle Wood is in fact Norway's largest commercial wooden building at the time it was built.

WISE can be easily adapted to new layouts in a building, without having to change cables or relocate components, which was one of the reasons the system was chosen.



## A WORKING LAB

A Working Lab in Johanneberg Science Park in Gothenburg is a building that stands out from the crowd, both in terms of the building process and appearance. In 2019 Akademiska Hus opened the doors to its innovative office building or innovation arena as it is also called.

Swegon and WISE were entrusted with the indoor climate in this innovative building, where WISE Sphere Free and WISE Colibri Ceiling have been installed.

# WISE in environmentally certified buildings

WISE is an excellent system for buildings that need to be certified according to environmental or well-being programs, such as BREEAM, LEED and WELL. These certification programs take both the indoor climate and energy consumption into consideration. With WISE installed in the building, you have control of both. The certification programs also value the individual's ability to influence their own individual indoor climate - which is fully possible with WISE.

WISE fulfils many of the assessment criteria for certification of newbuilds, upgrades to existing properties and for premises in use. This makes WISE the perfect choice for buildings with high environmental and certification targets.

WISE is installed in a large number of buildings with a high classification level according to different building certification programs. Below we provide some of them.



## MALMÖ LIVE

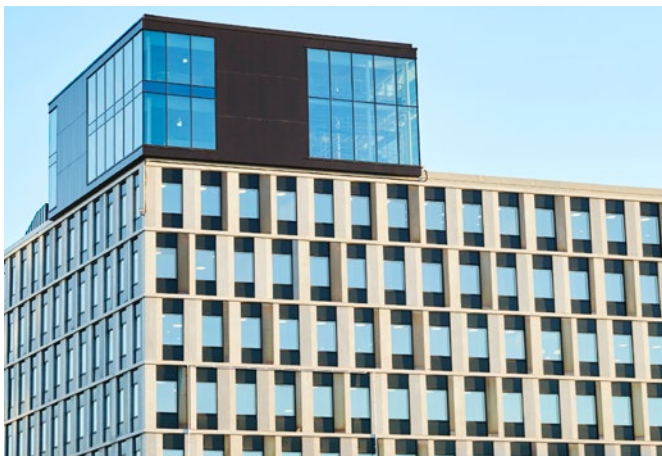
A 56,000-square-metre venue for music, culture and entertainment for the city's residents. Environmentally certified according to LEED as "Platinum".



Photography: Anne Bråtveit

## TELEGRAFEN

Old building that was once the headquarters of Televerket but today houses offices, restaurants, cafés and shops. Environmentally certified according to BREEAM as "Very good".



## TORSPLAN

Commercial and office building with optimal city centre location. Environmentally certified according to BREEAM as "Outstanding".



Photo: RStudio and Krook & Tjäder

## MÖLNDAL GALLERI

Shopping centre with 70 shops, cafés and restaurants in a central location. Environmentally certified according to BREEAM as "Very good".



# Swegon as a turnkey supplier

The WISE system can ideally be supplemented with other Swegon products for added functionality, where Swegon can be a turnkey supplier of the property's ventilation and climate products. Technical departments with system technicians across the country help you to tailor the delivery of the WISE system and other products to satisfy the need in just your property. Swegon has all the component parts and the expertise required to create and control the best indoor climate, at a low energy consumption and life cycle cost.

## Air handling unit GOLD

GOLD is the name of a series of complete air handling units for comfort ventilation in several sizes for air flows up to approximately 14 m<sup>3</sup>/s (50,400 m<sup>3</sup>/h). GOLD is available with a rotary heat exchanger, counter-flow plate heat exchanger or coil heat exchanger.

The unit has low energy fans with EC technology that manage large flow ranges with maintained efficiency.

The integrated control equipment has a large number of control functions of which the following are well-suited for demand-controlled ventilation:

- Pressure regulation of fans
- Slave control of fans
- Compensation for outdoor air temperature
- Summer night cooling
- Demand-control of cooling and heating water production via the SMART Link+ function, which can be advantageously combined with Water optimization in the WISE system
- Demand-control of the supply flow temperature for cooling water and heating water via the All Year Comfort control unit



GOLD is controlled via a user-friendly touch screen, but can also be controlled via mobile phone, computer or central building automation.

## Energy efficient cooling and heating production for all climates

Bluebox products stand out for efficiency, compactness and smartness, from 3kW to 1.5 MW. Always known as a manufacturer of reliable, robust and performing products, Bluebox offers one of the largest and most performing range of chillers, heat pumps and multifunction units on the market. Chillers intended for shopping centers, retail, hospitals, cinemas, residential and industrial applications as well as control rooms (with a wide range of products intended for IT applications). Bluebox products are tested and controlled remotely via cloud applications, so as to monitor every single parameter, 24/7.



## Passive air diffusers, comfort modules, sound attenuator, etc.

The WISE system can also comprise rooms with passive products. Rooms can be designed as a constant flow room without active flow regulation or flow regulation via dampers (WISE Damper). Swegon also supplies other products necessary for good functionality in the WISE-system such as sound attenuators and air transfer diffusers, etc.





### Project management for WISE

In each project with WISE, Swegon's project managers will ensure our system deliveries satisfy our undertaking towards the customer and other contractors in the building project.

The role of the project manager is, together with the designers, to ensure that the design of the ventilation system meets the requirements for the desired function.

In addition the project manager will monitor and coordinate Swegon's deliveries and oversee these with other contractors at the building site such as Ventilation, Electricity, Plumbing and Control and Regulation.

The project manager will also ensure that the WISE system is put into service correctly, and that the project specific documentation is coordinated with other contractors in the building project and is handed over to the customer as agreed.

### Commissioning of WISE

Each WISE system is handed over to the customer commissioned and documented. Swegon's operating technicians will perform commissioning of all supplied Swegon products on site and coordinate this with the other contractors such as Ventilation, Electricity, Plumbing and Control and Regulation.

As the customer you receive a complete delivery of the WISE-system. The advantage is that the risk of coordination problems both during the planning and building are kept to a minimum.

As the owner or orderer of a WISE system you know you will receive a system designed for your requirements, and which is commissioned, documented and coordinated with other installations in the best way possible.

It has never been easier to choose an energy efficient, flexible and future-proof DCV system than with WISE.



Feel good **inside**



**Swegon** 