

PARAGON VAV

Demand-controlled comfort module for hotels and hospital wards



QUICK FACTS

- Comfort module for demand-controlled indoor climate
- Equipped with control equipment for stand-alone or connectable to BMS via ModBUS
- Complete product with integrated damper for variable air flow control 0-100%
- Energy-efficient operation since the room is ventilated, heated and cooled exactly as called for by the load, neither more or less.
- Ventilation, cooling and heating (electricity and water)
- Straightforward installation with optional water connection side and centred air connection
- Adjustable air direction ADC and adjustable grille louvres
- Low installation height
- High capacity

KEY FIGURES

Air flow range:		Pressure range:	Cooling capacity total:	Heating capacity: (W)	
l/s	m ³ /h	Pa	W	Water	Electricity
0 - 85	0 - 306	20 - 200	Up to 3180	Up to 5060	1000

SIZE

Length (mm)	Width (mm)	Height (mm)
800, 1100, 1400	722 (+0-20)	205

Content

Technical description	3
PARAGON VAV	3
PARAGON VAV in a nutshell	3
Basic function diagram.....	4
Air distribution.....	5
Control equipment.....	6
Technical data.....	9
Room controller, LOCUS.....	10
Sensor module.....	11
SWICCT	12
Sizing	13
Typical room	14
Cooling.....	15
Heating.....	16
Installation	17
Suspension	17
Air connection	17
Connection - Water	18
Water quality	19
Accessories	20
Optional factory-fitted accessories	20
Accessories, factory-fitted.....	21
Loose accessories	22
Accessory kits.....	25
Upgrade kit WISE.....	26
Specification.....	28
PARAGON VAV specification.....	28
PARAGON VAV delivery demarcation	28
Available to order, loose kits and accessories.....	29
Specification text.....	30

Technical description

PARAGON VAV

The product is a demand-controlled comfort module with integrated regulation which, with its mounted control equipment, brings air flow and cooling and heating under demand-control for the best energy efficiency and comfort.

PARAGON VAV has a unique slot opening that means we can always guarantee the air volume into the room and this with our functional controller with many I/O possibilities.

This is a plug & play product for quick and easy installation.

The compact comfort module is primarily designed for hotels and hospitals but can also be installed in offices.

PARAGON VAV provides high cooling/heating capacity through optimal utilisation of its cooling/heating coil even when the air pressure and airflows are low. At the same time, the installation height of the product is kept at an absolute minimum which enables maximum room height in e.g. the entrance to a hotel room.

PARAGON VAV in a nutshell

- Complete plug & play product with factory-fitted control equipment
- Connectable via Modbus
- Low noise level
- Draught-free indoor climate
- Straightforward planning and installation with two optional water connection sides and centred air connection
- No fan in the room
- Dry system without condensation
- No need for any drainage system
- No filter
- Requires minimal maintenance
- Low energy consumption
- Guaranteed comfort through flexible adjustment of the direction of air discharge (ADC)
- Can be ordered with or without grille

Variants

PARAGON VAV is available in the following variants:

- Variant A: Ventilation, waterborne cooling.
- Variant B: Ventilation, waterborne cooling and heating.
- Variant X: Ventilation, waterborne cooling and electric heating.



Figure 1. PARAGON VAV



Figure 2. PARAGON VAV, rear view

Sizes and variants

The product is available in three different lengths 800, 1100 and 1400 mm.

All sizes can be ordered with the water connection on the left or right short side, and there is also a variant with a centred water connection at the rear.

In addition to the standard version, Swegon now also has a Suite version for larger rooms. It has double air connections and is only available in length 1400 mm.



www.eurovent-certification.com
www.certiflash.com

Basic function diagram

The primary air is supplied via duct connection in the rear edge of the unit and this builds up positive pressure inside the unit. The positive pressure distributes the primary air with relatively high velocity via two rows of slots, one row in the upper edge and one row in the lower edge of the outlet. The high velocity of the primary air creates negative pressure which generates induction of the room air. The recirculation air is sucked up through the recirculation grille of the unit and flows through the coil where it is cooled, heated, if required, or just passes untreated, before it mixes with the primary air and is discharged into the room.

The supply air discharged into hotel rooms and hospital wards is advantageously distributed as straight as possible by allowing it to follow the ceiling, i.e. utilising the Coanda effect. This enables the air to reach all the way to the perimeter wall. If horizontal air distribution is desirable, this is simply achieved by means of the ADC (Anti Draught Control) feature, which is included as standard in all PARAGON VAV comfort modules. If vertical air distribution is desirable, this is achieved by setting the outlet grille vanes to slant upward or downward. If you like, you can lock the angle setting of the outlet grille using an accessory that secures the vanes in fixed position.

Our new generation PARAGON VAV has variable k-factor setting and large air flow range.

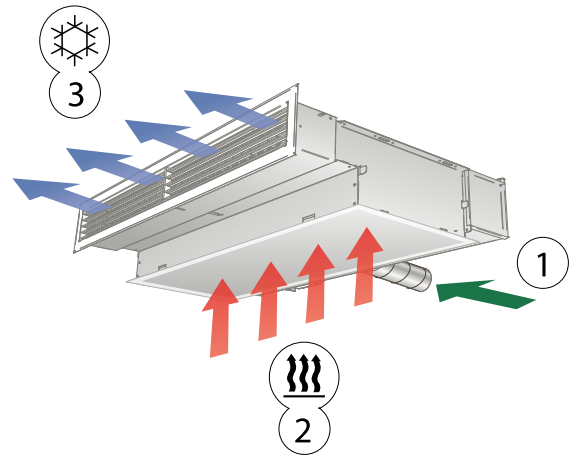


Figure 5 – PARAGON VAV cooling function
 1 = Primary air
 2 = Induced room air
 3 = Primary air mixed with chilled room air

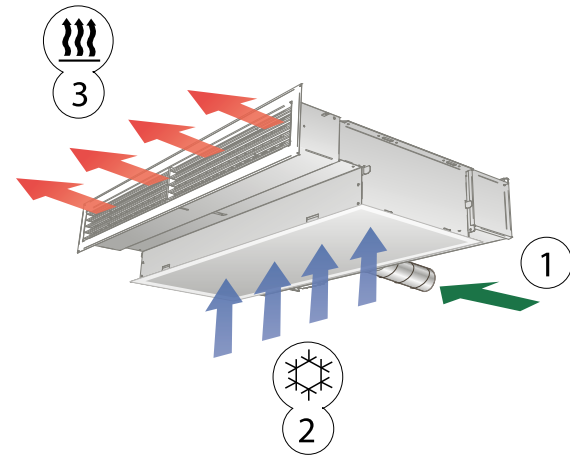


Figure 6 – PARAGON VAV heating function (waterborne)
 1 = Primary air
 2 = Induced room air
 3 = Primary air mixed with heated room air

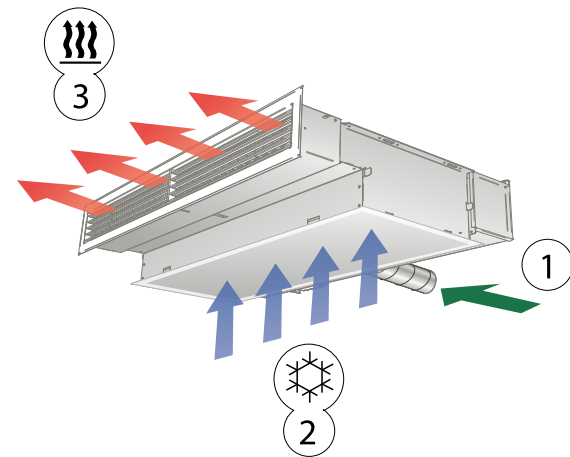


Figure 7 – Heating function PARAGON (electrical heating)
 1 = Primary air
 2 = Induced room air
 3 = Primary air mixed with heated room air

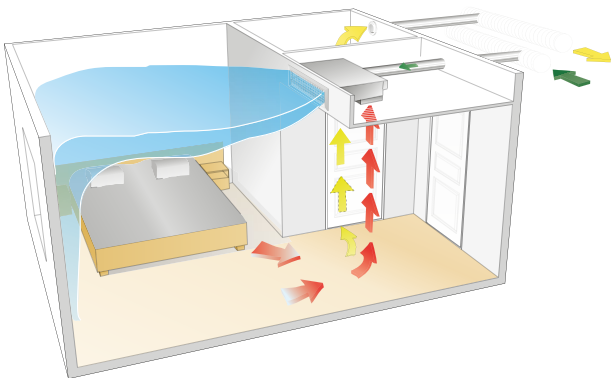


Figure 3 – Air distribution with the PARAGON VAV in a hotel room

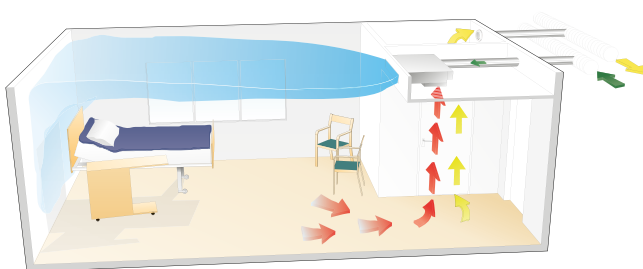


Figure 4 – Air distribution with the PARAGON VAV in a hospital ward

Air distribution

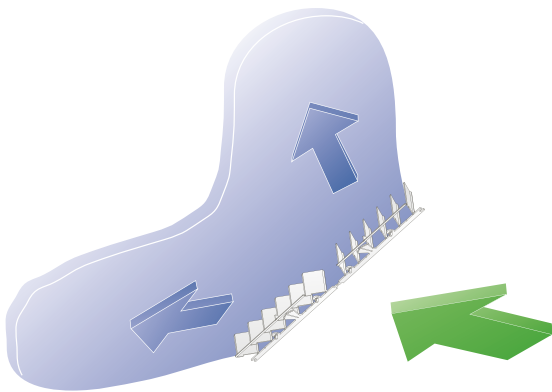


Figure 8 – Horizontal air distribution with ADC

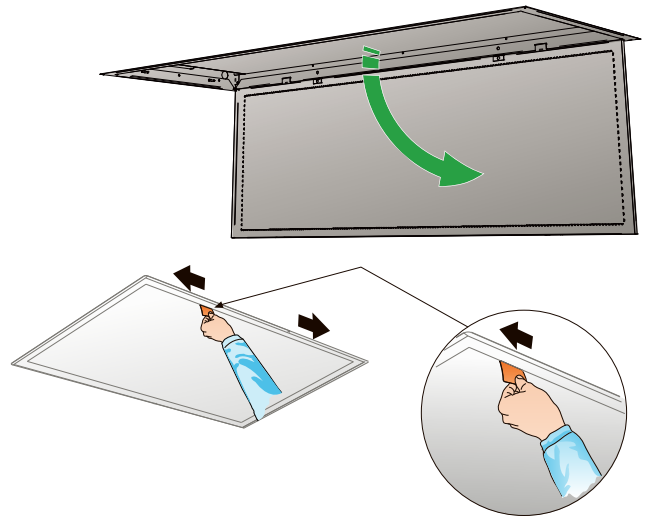


Figure 11. The return grille has a Quick access function, which facilitates cleaning.

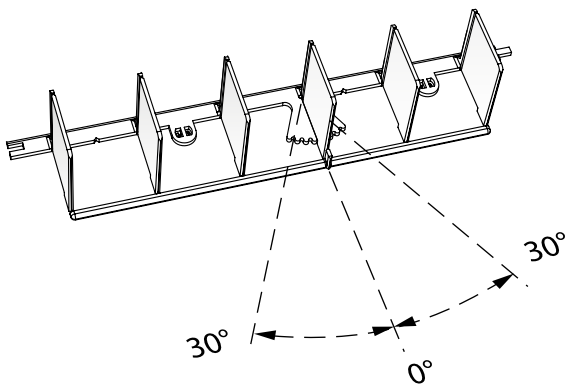


Figure 9. PARAGON VAV ADC

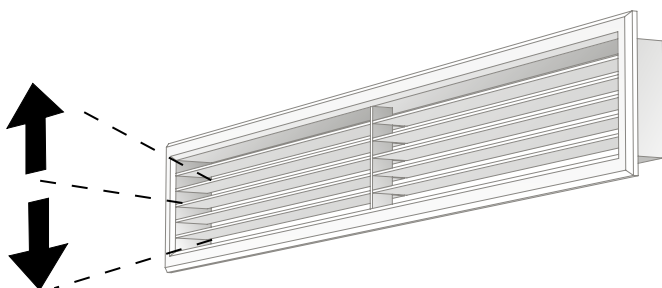


Figure 10. Vertical air distribution with adjustable louvers in the supply air grille.

Control equipment

VAV - Control equipment for demand-controlled ventilation, heating and cooling

Occupancy in hotel rooms varies daily and throughout the day.

The room has different needs depending on both occupancy/non-occupancy, but also individual needs depending on the individual in the room. The best solution to ensure the right air flow into the hotel room is by means of our functional VAV controller with numerous I/Os that can easily be integrated into a BMS system via Modbus.

The needs of the room are managed by different sensors in the room where the controller sets different operating modes. When for example the key card (or equivalent) is activated in the room, the air flow increases from the economical low flow to the normal flow, while the temperature adjusts to the comfort level. When the room is empty, the ventilation and temperature return to economic low flow. In addition to the automatic room control, the guest can manually adjust the temperature and air flow.

PARAGON VAV is fully equipped with actuator, controller, pressure sensor, valves and valve actuators for optimum demand control according to the actual need and the occupancy level in the hotel.

As standard the product has two selectable water connection sides.



Figure 12. PARAGON VAV, complete with factory-fitted controller, actuator, pressure sensor and valves and valve actuators for cooling and heating water.



Figure 13. VAV controller for demand-controlled ventilation



Figure 14. Room controller/Setpoint selector switch LOCUS

Operating case

Depending on the status of connected sensors, the controller adjusts the outputs from any of several possible operating modes.

Operating modes are described below, these are based on occupancy in the room, status of the current sensor or the signal from the main control system.

Operating modes

There are a variety of operating modes for PARAGON VAV:

- Occupancy mode.
- No occupancy mode.
- Emergency mode.
- Commissioning mode
- Summer night cooling.

Occupancy mode

When the product receives a signal via the occupancy sensor that someone is present in the room, the valve actuator is regulated for cooling or heating water according to the chosen switching temperatures for cooling or heating linked to this operating mode. The air flow is controlled to the selected occupancy flow, but is naturally influenced by sensors such as condensation sensor, temperature sensor, window contact, possible air quality sensor, etc.

No occupancy mode

When No occupancy mode is enabled, the system automatically switches to energy save mode. In Energy-save mode/No occupancy mode, the valve actuator is controlled for cooling or heating water according to the status on other sensors in the room, but normally with a greater permissible difference between switching temperature cooling and heating than in Occupancy mode at the same time as the air is regulated to Min. flow. The system returns to the Occupancy mode when occupancy is registered again.

Emergency mode

In the event of a fire alarm, the air damper in the extract air duct is open or closed, depending on how the control system has been set. In Emergency mode cooling and heating are switched off. Supply air is normally switched off.

Operating mode EMERG can only be handled in control systems that are connected to the main control system via Modbus RTU.

Commissioning mode

The "first open" function means that the water valves are open during installation, which simplifies filling, pressure testing and venting the water system.

The function is disabled automatically after being energised for about 6 minutes.

A clicking noise can be heard when the valves and dampers change over to NC mode (normally closed) and the normal control function is enabled.

Summer night cooling

The function means that cold outdoor air is used to cool the room during the night to the predefined level.

The function can only be handled in control systems that are connected to the main control system via Modbus RTU.

Functions, system

Change-over

During change-over at system level, the building can have a two-pipe system and is then often divided into several different rooms, depending on whether the facade faces north-east or south-west. Heating or cooling is supplied, depending on the season. The function involves the use of only one valve actuator which should be wired to the cooling output terminal. This actuator then controls both the heating water and the cooling water, which is transported in the same pipe. An external temperature sensor should be used and this should measure on the main pipe where the water always circulates.

In winter, when heating is required, the valve opens if the water in the pipe is warmer than the temperature set point. If the water is colder, the valve does not open.

In summer, when cooling is required, the valve opens if the water in the pipe is colder than the temperature set point.

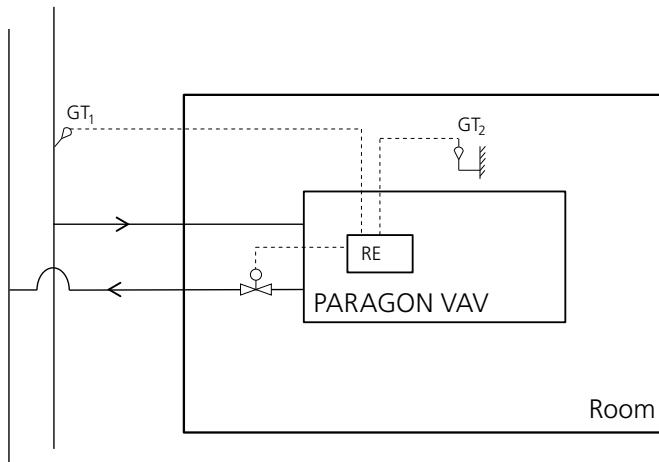


Figure 15.

- 2-pipe system with cooling water in the summer and heating water in the winter
- GT1 is placed where heating or cooling water always circulates
- Summer: If the room temperature T2 is higher than the water temperature T1, the valve opens when cooling is required.
- Winter: If the room temperature T2 is lower than the water temperature T1, the valve opens when heating is required.
- GT1 is connected to the regulator as an external temperature sensor
- Via the room setpoint selector switch or hand-held unit, set up for the unit to be used in a change-over system
- GT2 is the temperature sensor which is located in the Sensor module
- The valve actuator must be connected to the regulator's cooling output.

Activating valves

The function requires regular automatic activation of the water valves to avoid them beginning to stiffen or stick. During activation, all valves connected to the regulator are open for a maximum of 6 minutes, and then closed. The valves for the cooling system are activated first, followed by those for the heating system.

Frost protection

The function means that heating operations start at 10°C to counteract the risk of damage that can otherwise occur due to freezing.

Technical data

Cooling capacity total, max.	3180 W
Heating capacity, water, max.	5060 W
Heating capacity, electricity, max.	1000 W
Air flow	0-85 l/s
	0-306 m ³ /h
Pressure range	20-200 Pa
Dimensions:	
Length:	800, 1100, 1400
Width:	722 (+0-20) mm,
Height:	205 mm

See the dimensional drawing for exact measurements

Power consumption

Power consumption for transformer sizing:	VA / unit
Actuator	6
Damper motor (315C) *	2
Controller *	2
Sensor module *	1

* Always included in the product

Example A:

PARAGON VAV 1100-B-HF; 6+2+2+1 = 11 VA
6 VA for cooling - OR heating actuator when they are normally regulated in sequence.

Example B:

PARAGON VAV 1100-B-HF; 6+6+2+2+1 = 17 VA
For operating modes such as Radiator Heat and Cold draught protection, power consumption will then be 6+6 VA for actuators when they are not regulated in sequence.

Recommended limit values, water

Max. recommended operating pressure (above coil only): 1600 kPa *

Max. recommended test pressure (across coil only): 2400 kPa *

* Applicable without control equipment mounted

Max. recommended pressure drop across the CCO valve: 20 kPa

Max. recommended pressure drop across a standard valve: 20 kPa

Min. permissible heating water flow: 0.013 l/s

Max. permissible supply flow temperature: 60 °C

Min. permissible cooling water flow: 0.04 l/s

Lowest permissible supply flow temperature: Must always be sized so that the system works without condensation

Designations

P: Capacity (W, kW)

v: Velocity (m/s)

q: Flow (l/s)

p: Pressure, (Pa, kPa)

t_r: Room temperature (°C)

t_m: Mean water temperature (°C)

ΔT_m: Temperature difference [t_r-t_m] (K)

ΔT: Temperature difference, between inlet and return (K)

ΔT_i: Temperature difference, between room and supply air (K)

Δp: Pressure drop (Pa, kPa)

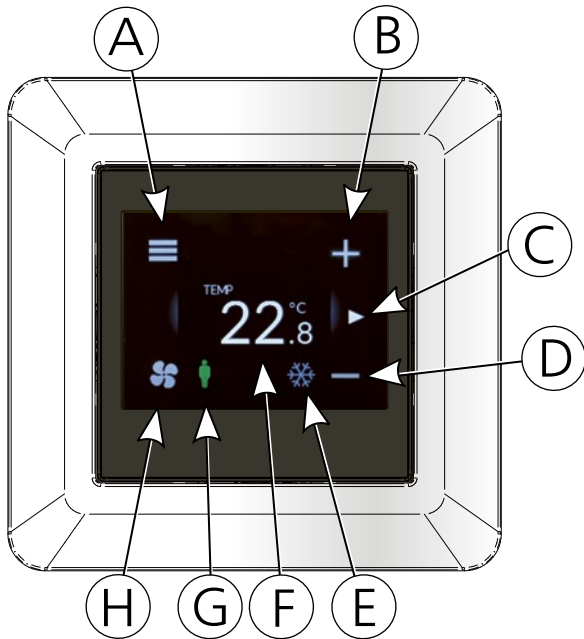
k_p: Pressure drop constant

Supplementary index:

k = cooling, l = air, v = heating, i = commissioning

Room controller, LOCUS

Main menu and explanation of symbols



- A. menu
- B. increase
- C. swipe left to go to the next page
- D. decrease
- E. symbol showing ongoing cooling or heating
- F. shows programmed setpoint or measured temperature
- G. shows occupancy in the room
- H. press to activate boost flow

Technical data

Display	Capacitive touch TFT Display QVGA 2.3"
Screen resolution	320x240
Communication	Modbus RTU via RS-485
Temperature sensor	Internal 10K NTC sensor
Operating temperature	+5 ... +40°C
Degree of protection	IP20
Dimensions	88 x 88 x 35 mm
Operating voltage	12-40 VDC
Current requirement	0.5 W

Connection

LOCUS	Connection	Description
VDD	RJ12	12-40 VDC power supply
A+	RJ12	RS-485 bus connection
B-	RJ12	RS-485 bus connection
GND	RJ12	Earth for 12-40 VDC power supply
Memory card slot		The user panel's software can be updated via a Micro SD card

Standards and directives

The following standards have been observed:

EC Directive:	93/68/EEC
Low Voltage Directive:	2014/35/EU
Machinery Directive:	2006/42/EEC
EMC Directive:	2014/30/EU
RoHS Directive:	2002/95/EC
Vibrations:	EN-60721-3-3

Description of display

If the screen is in standby mode, it is activated by clicking.

Display	Description	Explanation
	Display in standby mode	Activated with a click
	Active main menu	Click on the + or - signs to increase/decrease the setpoint temperature
	Activated boost mode	
	Swipe left for next display page	Shows input values from connected sensors
	Swipe right to go back to the main menu	

For more detailed information about LOCUS room controller. See documentation at www.swegon.com

- LOCUS Product datasheet
- LOCUS Instructions for Use (IOM)

Sensor module

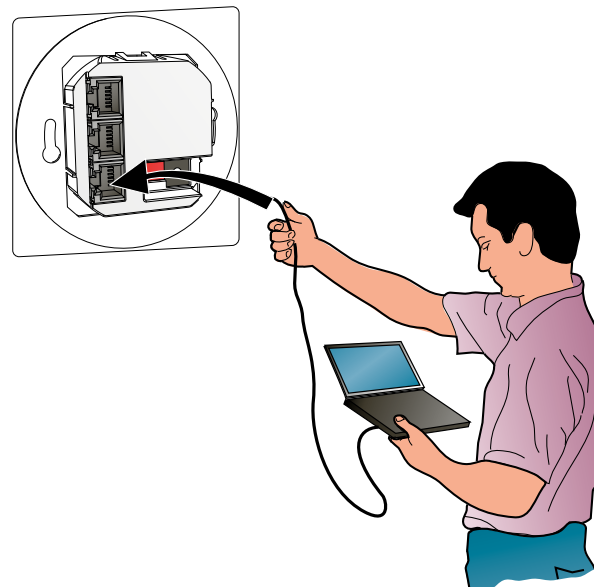
The sensor module consists of an occupancy sensor and a temperature sensor in the same unit.

The sensor module is ordered separately and is mounted on a wall, flush mounted in a standard electrical box or surface-mounted.

The push buttons on the sensor module allow you to adjust the temperature in the room, put the PARAGON Wall VAV in commissioning mode and read the alarm list.

In normal mode, 6 LEDs indicate the selected temperature level. In the event of a fault, the relevant alarm is indicated in the form of flashing LEDs that is translated with the help of an alarm list.

The sensor module is connected to the controller with the help of an RJ12 cable.



Temperature adjustment

Reduce the temperature by pressing the left-hand button



Increase the temperature by pressing the right-hand button

Each LED corresponds to an increase or decrease of the set point by one degree. Base setting of temperatures is made in SWICCT or SuperWISE

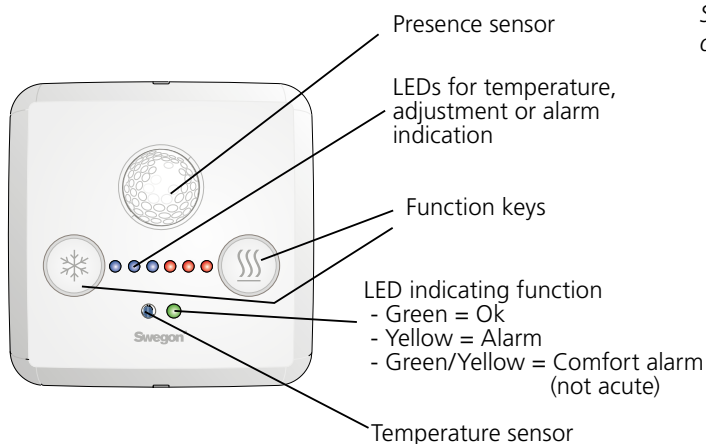


Figure 16. Sensor module seen from the front

Figure 18. With the help of CABLE CONVERTER USB-RJ12 (RS485), you can easily connect a PC to make e.g. software settings. The connection can either be made on the rear of the Sensor module as illustrated, or directly on the controller. How to do this is described in the SWICCT manual.

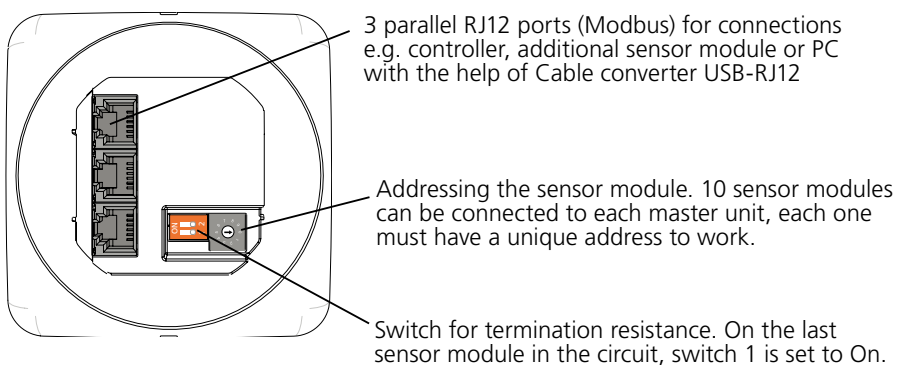
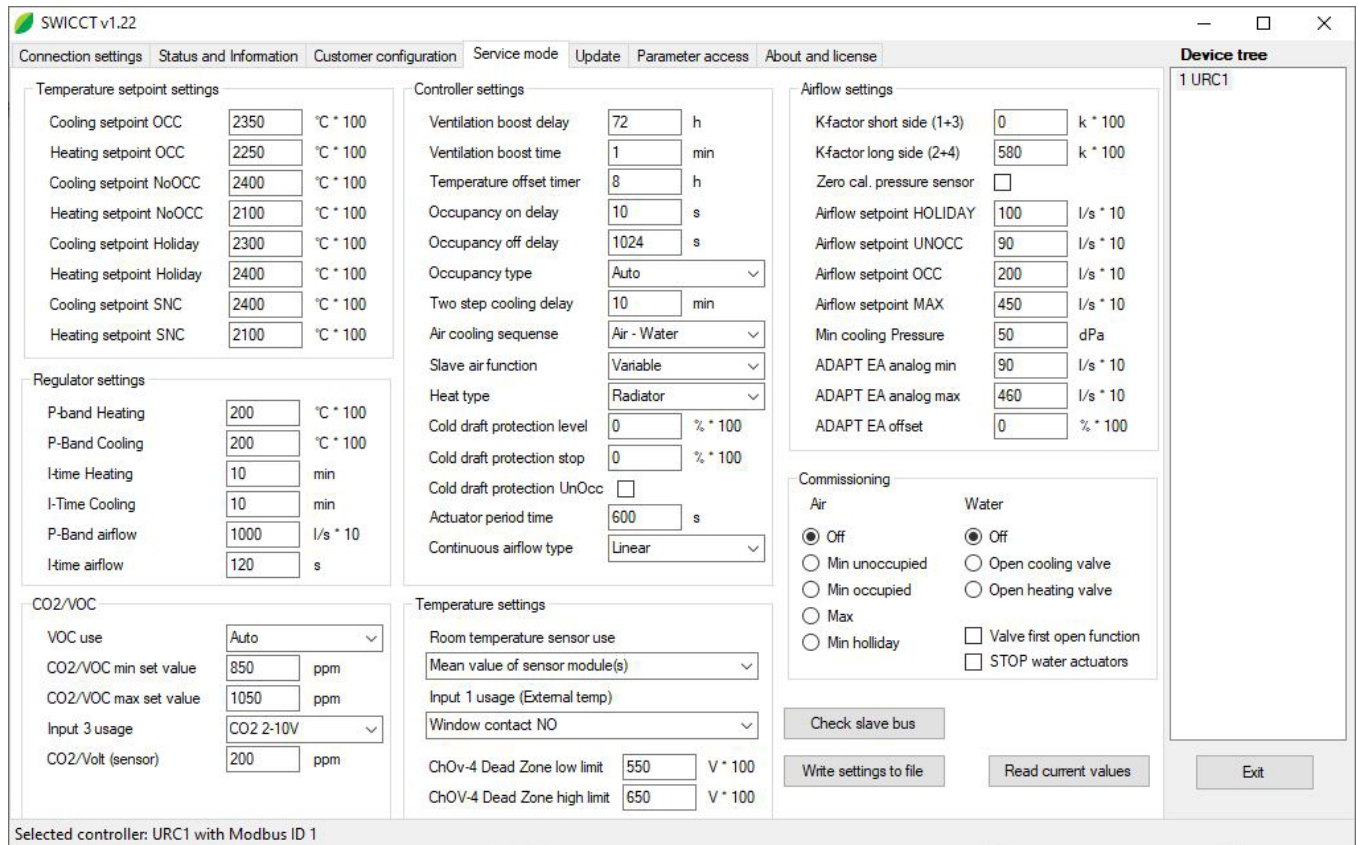


Figure 17. Sensor module seen from the back

SWICCT

SWICCT (SWegon Indoor Climate Configuration Tool) is the software that makes it easy to make settings in the controller. (To make settings requires the cable “CABLE CONV. USB RJ-12”, and the installation of this, see the SWICCT manual) Here it is possible to make all essential settings for the Product, for example;

- Base settings for temperature
- Use of external sensors, e.g. for air quality
- Air flows
- Commissioning



SWICCT is available for download from www.swegon.se, both the software and a separate manual.

Sizing

SPC for calculating room products

Single Product Calculator "SPC" is a simple quick calculation for room products. Capacities, sounds, flows, isovels, etc. can be calculated and printouts can be made.

SPC is accessible from our product pages at www.swegon.se where there is a "Calculate" button. No login or software download needed, incredibly quick and easy!

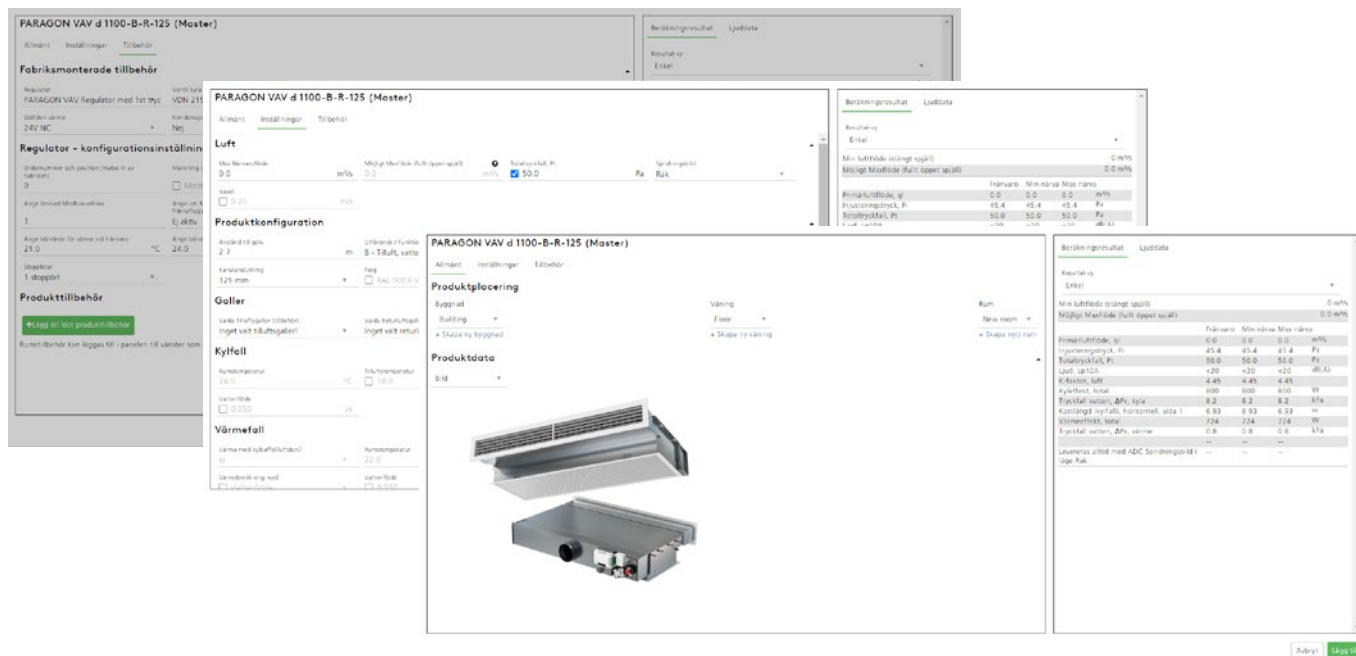


Figure 19. PARAGON VAVd length 1100 for cooling and heating, water connection on the right side, factory-fitted controller, valves and valve actuators for cooling and heating.

Typical room

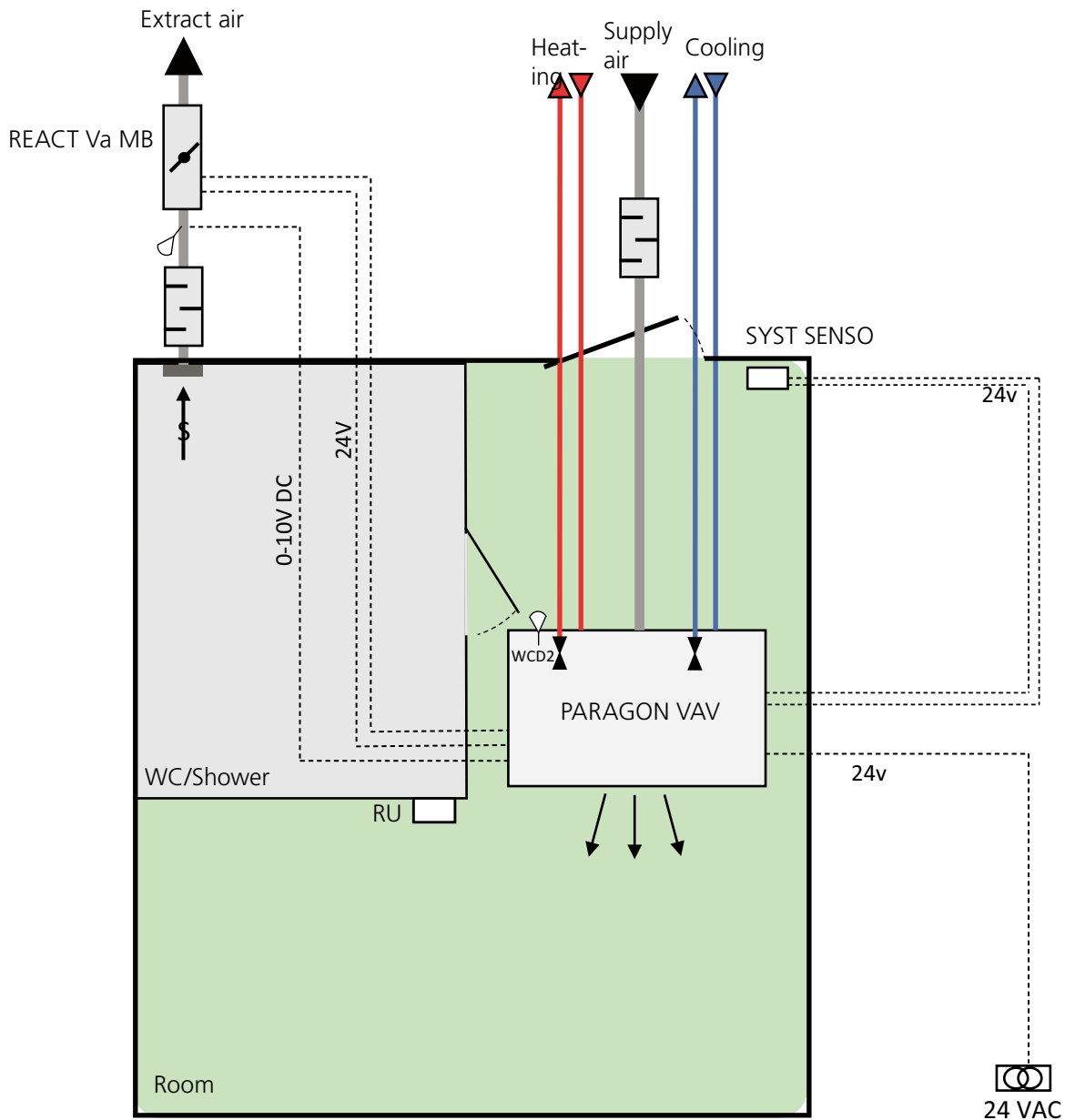
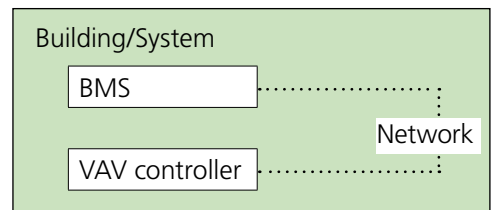


Figure 20. Hotel room with VAV solution.

- PARAGON VAV is supplied with factory-fitted accessories as listed below and with water valves, actuators and motor for the integrated damper
- VAV controller regulates valve actuator and damper motor. Communicates via RJ12 cable with Modbus.
- SYST PS measures pressure of supply air.
- WCD2 Condensation prevention sensor
- Extract Air Kit VAV-REACT-125. REACT Va MB damper on the extract air is controlled via a 0-10V DC control signal
- The room controller RU is a setpoint selector switch and temperature sensor that communicates via RJ12 cable



Cooling

Cooling capacity

Table 1-2 shows the cooling capacities achieved from both the primary air and chilled water for various lengths of unit and air flows.

The total cooling capacity for one unit is the sum of the cooling capacity of the primary air and the chilled water.

Table 1 – Cooling capacity, 70 Pa

Length of the Unit	Air flow		Sound level 1)	Cooling capacity air (W) at ΔT				Cooling capacity water (W) at ΔT_{mk} 2)							Pressure drop constant, air
	mm	l/s		m ³ /h	dB(A)	6	8	10	12	6	7	8	9	10	
800	8.4	30.1	<20	60	80	100	120	214	250	285	320	356	391	427	1
800	16.7	60.2	<20	120	161	201	241	319	370	422	473	524	575	626	2
800	27.6	99.4	22	199	265	331	398	360	420	480	540	600	659	719	3.3
1100	8.4	30.1	<20	60	80	100	120	236	274	311	349	386	423	460	1
1100	25.1	90.4	<20	181	241	301	361	445	519	594	668	743	818	893	3
1100	39.3	141.6	27	283	378	472	566	512	599	687	774	862	949	1037	4.7
1400	8.4	30.1	<20	60	80	100	120	263	306	348	391	433	475	517	1
1400	25.1	90.4	<20	181	241	301	361	497	581	665	749	833	917	1002	3
1400	50.2	180.7	29	361	482	602	723	612	717	822	927	1033	1139	1245	6

Table 2 – Cooling capacity, 100 Pa

Length of the Unit	Air flow		Sound level 1)	Cooling capacity air (W) at ΔT				Cooling capacity water (W) at ΔT_{mk} 2)							Pressure drop constant, air
	mm	l/s		m ³ /h	dB(A)	6	8	10	12	6	7	8	9	10	
800	10	36	21	72	96	120	144	258	302	345	389	432	476	520	1
800	20	72	21	144	192	240	288	373	435	496	556	617	678	738	2
800	33	118.8	27	238	317	396	475	423	493	562	630	699	768	836	3.3
1100	10	36	21	72	96	120	144	297	344	390	437	483	529	574	1
1100	30	108	25	216	288	360	432	524	613	703	793	883	974	1064	3
1100	47	169.2	32	338	451	564	677	596	697	799	901	1003	1105	1207	4.7
1400	10	36	22	72	96	120	144	324	378	433	487	542	597	651	1
1400	30	108	24	216	288	360	432	585	684	784	883	983	1082	1182	3
1400	60	216	35	432	576	720	864	715	833	950	1068	1185	1302	1419	6

1) Room attenuation = 4 dB

2) The specified capacities are based on a complete unit including standard distribution and recirculation grille. Without grille the water capacity increases by approx. 5%. With ADC adjusted to Fan shape you lose approx. 5% in water capacity. The primary air capacity is not affected.

NOTE! The total cooling capacity is the sum of the airborne and waterborne cooling capacities.

Heating

Heating capacity

Table 3 – Heating capacity, 70 Pa

Length of the Unit mm	Air flow		Sound level 1) dB(A)	Heating capacity water (W) at ΔT_{mk}							Pressure drop constant, air k
	l/s	m ³ /h		5	10	15	20	25	30	35	
800	8.4	30.1	<20	101	214	332	453	576	702	829	1
800	16.7	60.2	<20	129	274	425	580	738	899	1063	2
800	27.6	99.4	22	125	261	402	546	692	840	989	3.3
1100	8.4	30.1	<20	98	207	319	434	552	671	791	1
1100	25.1	90.4	<20	191	397	608	823	1041	1261	1483	3
1100	39.3	141.6	27	180	376	577	782	990	1201	1414	4.7
1400	8.4	30.1	<20	118	249	384	523	664	808	953	1
1400	25.1	90.4	<20	191	400	615	836	1060	1287	1517	3
1400	50.2	180.7	29	217	453	696	945	1198	1454	1713	6

Table 4 – Heating capacity, 100 Pa

Length of the Unit mm	Air flow		Sound level 1) dB(A)	Heating capacity water (W) at ΔT_{mv}							Pressure drop constant, air k
	l/s	m ³ /h		5	10	15	20	25	30	35	
800	10.0	36.0	21	101	214	332	453	576	702	829	1
800	20.0	72.0	21	129	274	425	580	738	899	1063	2
800	33.0	118.8	27	138	288	444	604	766	931	1097	3.3
1100	10.0	36.0	21	114	238	366	498	631	767	903	1
1100	30.0	108.0	25	210	437	671	910	1152	1397	1644	3
1100	47.0	169.2	32	202	420	645	874	1106	1340	1577	4.7
1400	10.0	36.0	22	136	287	444	604	768	935	1103	1
1400	30.0	108.0	24	217	452	694	940	1191	1444	1700	3
1400	60.0	216.0	35	240	503	774	1052	1334	1620	1909	6

1) Room attenuation = 4 dB

Installation

Suspension

PARAGON VAV has two holes on each short side for hanging and is mounted with a threaded rod in each hole.

For installation use the assembly fitting containing threaded rods, ceiling brackets and nuts to all four mounting brackets. Threaded rod length from 200 mm. In the event of large distances between ceiling and unit, double threaded rods with thread locks are used. Assembly fitting SYST MS M8 (Figure 17) is ordered separately.

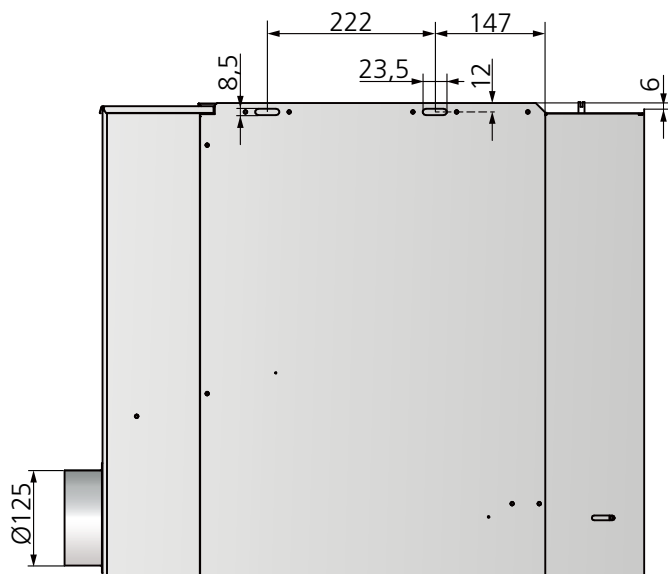


Figure 21. Dimensions, suspension, view from above

Air connection

All variants have the air connection Ø125.

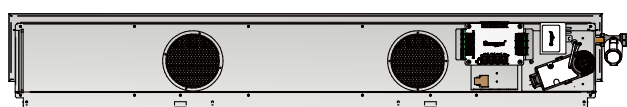
The standard variant has the air connection centred at the rear of the product for easy access from both ends and the rear.

The suite version, which is only available in 1400 mm length, has two parallel air connections at the rear, i.e. 2 x Ø125.

Standard variant



Suite variant



Connection sizes, air

Variant	Length (mm)	Air connection	
		1 x Ø 125	2 x Ø 125
1: Standard	800, 1100, 1400	Yes	No
2: Suite	1400	No	Yes

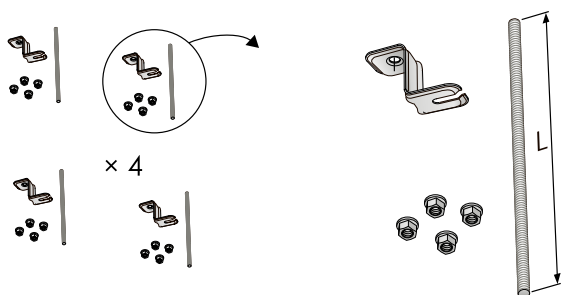


Figure 22. Assembly fitting SYST MS M8-1, ceiling mount and threaded rod

Installation

The work involving the casing can begin once PARAGON VAV has been fully installed. PARAGON VAV is designed for use in most common types of load-carrying T-grid ceiling systems with panels, plaster board, etc. To make your work simpler, detailed dimensions for cutting the opening are specified below in the "Dimensions" section on page 26 in this brochure. More detailed information is also available in separate installation instructions at www.swegon.com.

Connection - Water

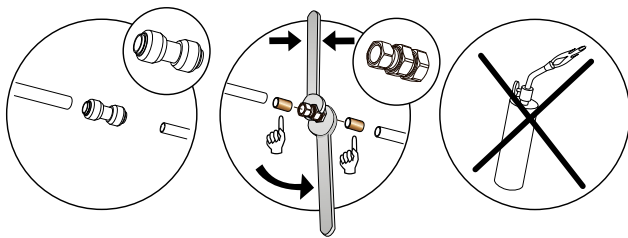
Connection sizes

Standard variant with factory-fitted valves:

Length (mm)	Cooling Return	Heating Return
800, 1100, 1400	DN15 male thread	DN15 male thread

Standard variant without factory fitted valves:

Length (mm)	Cooling Supply and return	Heating Supply and return
800, 1100, 1400	plain pipe ends (Cu) Ø 12 x 1.0 mm	plain pipe ends (Cu) Ø 12 x 1.0 mm



Note that compression ring couplings require support sleeves inside the pipes.

Connecting water

The water pipes are placed on the left or right short side of the product depending on the choice made, there is also a variant with a centred water connection at the rear (WB).

Connect the water pipes using push-on couplings or compression ring couplings. Note that compression ring couplings require support sleeves inside the pipes.

Do not use solder couplings to connect the water pipes. High temperatures can damage the unit's existing soldered joints.

Flexible connecting hoses for water are available for flat-end pipes and valves, and can be ordered separately.

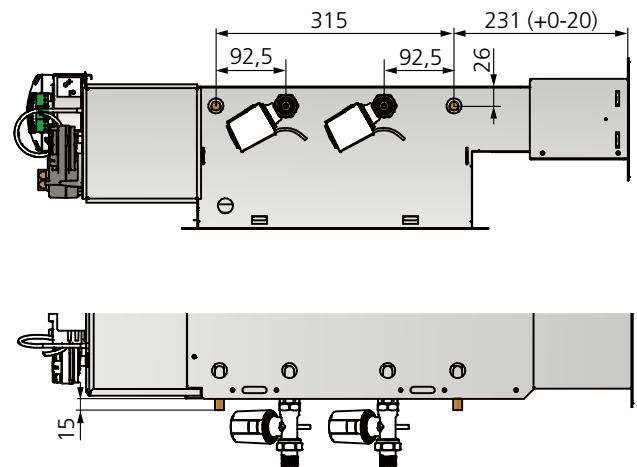
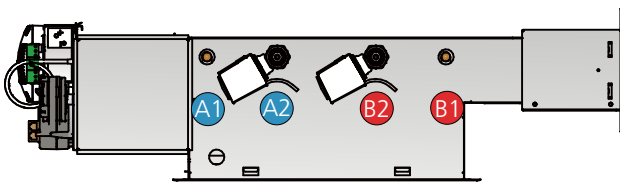


Figure 24. Dimensions water connection

Water connection on the right-hand side "R"

Cooling and heating R. all sizes



Cooling R. all sizes

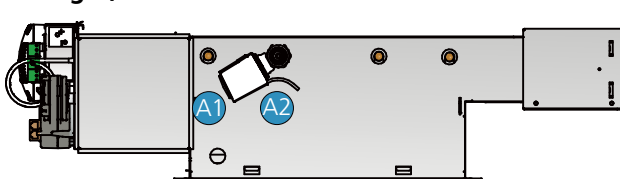
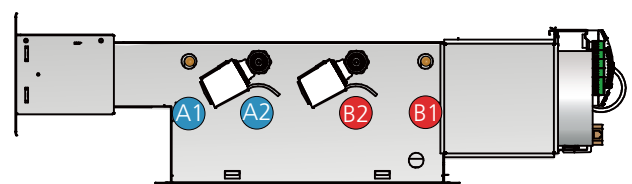


Figure 23. Water connection on right-hand side (R).

- A1 = Cooling water, supply
- A2 = Cooling water, return
- B1 = Heating water, supply
- B2 = Heating water, return

Water connection on the left-hand side "L"

Cooling and heating L. all sizes



Cooling L. all sizes

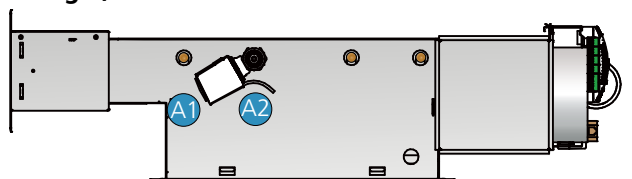


Figure 25. Water connection on left-hand side. (L).

- A1 = Cooling water, supply
- A2 = Cooling water, return
- B1 = Heating water, supply
- B2 = Heating water, return

Water connection at the rear edge "WB"

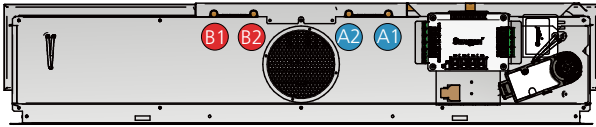


Figure 26. Water connection at the rear edge (WB).
 A1 = Cooling water, supply
 A2 = Cooling water, return
 B1 = Heating water, supply
 B2 = Heating water, return

Connecting CCO valve

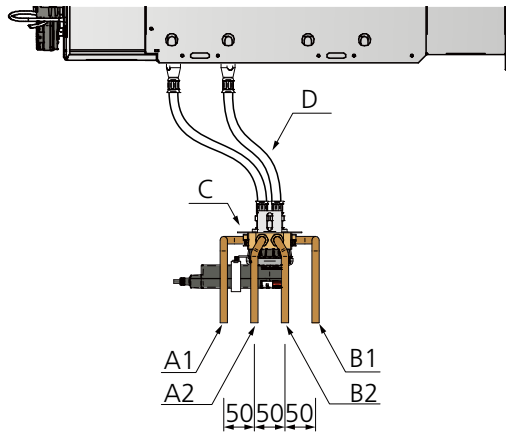


Figure 27. Water connection, CCO valve.
 A1 = Cooling water, supply
 A2 = Cooling water, return
 B1 = Heating water, supply
 B2 = Heating water, return
 C = CCO valve
 D = Flexible hose

Water quality

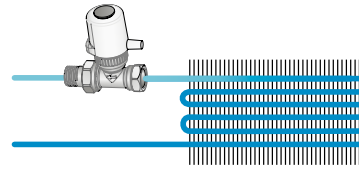
Swegon recommends water quality according to VDI 2035-2 for both the heating and cooling systems. In order to maintain the oxygen content in the water below the levels (<0.1 mg/l) prescribed in VDI 2035-2, it is recommended to install a vacuum degasser, particularly in the cooling system where it's more challenging to dissolved gas. It is also important that the pre-pressure in the expansion vessel is dimensioned according to EN-12828 for both the heating and cooling systems and that regular checks are made of the pre-pressure. The cooling and heating systems must be designed to prevent oxygen from entering the system, this is particularly important to consider when selecting flex hose, pipes and expansion vessels.

When the system is filled with fresh water, it has an oxygen content of approximately 8 mg/l, however, this oxygen is consumed quickly through corrosion processes and within a few days the oxygen in the water should be consumed. Nevertheless, it is important to avoid filling the system with fresh water unnecessarily.

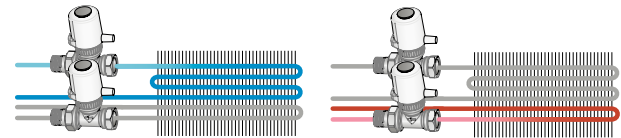
Automatic deaerators are often installed to facilitate filling of the system. It is recommended that the automatic deaerators are turned off once the system has been fully vented to avoid these drawing in air in the system if the pre-pressure in the expansion vessel should drop.

PARAGON A (cooling) with valve and valve actuator

Paragon A for cooling only. The capacity of the heat exchanger is utilised optimally by maximising the cooling circuit through the coil.



PARAGON B (cooling and heating) with valve and valve actuator

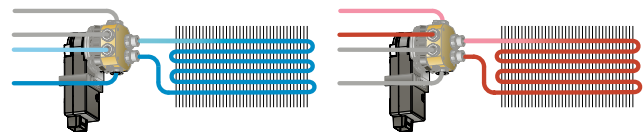


PARAGON B (cooling and heating) with CCO valve

Paragon B with CCO valve Compact Change Over is used to utilise the cooling circuit for both cooling and heating.

Advantages:

- Permits a higher cooling water temperature and lower heating water temperature, which gives lower operating costs for the chiller and heat pump, i.e. less environmental impact.



For more information about the CCO valve, see the CCO product data sheet at www.swegon.se

Accessories

Optional factory-fitted accessories

Factory-fitted control equipment makes the installation work simple. All components are accessible from the back of the product.

A selection of our optional factory-fitted extras:

Controller	PARAGON VAV RE
Actuator	PARAGON VAV SA
Valve cooling	SYST VDN 215 Straight valve
Valve heating	SYST VDN 215 Straight valve
Actuator cooling	ACTUATOR 24 V NC
Actuator heating	ACTUATOR 24 V NC
Pressure sensor	SYST PS
Condensation sensor	CG IV
"	WCD2
Temperature sensor	T-TG-1
Air quality sensor CO ₂	DETECT Qa
Air quality sensor VOC	Detect VOC-2

Upgrade kits

There are also a number of upgrade kits for upgrading from PARAGON VAV and to WISE Paragon

Upgrade kit WISE Paragon CU

Upgrade kit WISE Paragon SA

Control kit WISE Paragon Dew point

In addition to the factory-installed options, loose accessories and kits (not factory-fitted) are also available:

Kits and accessories are easily mounted during installation

Controller	WISE Paragon CU - Kit
Actuator motor	WISE Paragon SA - Kit
Pressure sensor	SYST PS
Valve cooling	SYST VDN 215 Straight valve
Valve heating	SYST VDN 215 Straight valve
Actuator cooling	ACTUATOR 24 V NC
Actuator heating	ACTUATOR 24 V NC
Condensation sensor	Condensation sensor, CG IV-KIT WCD2-KIT WISE SMA
Temperature sensor	T-TG-1 WISE Temperature sensor PT1000
Air quality sensor	CO ₂ -Kit, Detect Qa VOC-Kit, Detect VOC-2
Room controller/ Setpoint selector switch	LOCUS (wall)
Temp/Occupancy detector	VAV sensor (wall) - KIT

Accessories, factory-fitted

Valve, cooling & heating

Factory fitted valves for cooling and heating.

The valve is mounted on the product and preset fully open.

Function	Type	Dim.	K _v (m ³ /h)
Cooling/heating	VDN215	DN15 (½")	0.07-0.89

For more information about the valve, see the separate product data sheet on www.swegon.com.



Actuator cooling & heating, ACTUATORc 24 V NC

Factory fitted valve actuators for cooling and heating.

24V AC/DC, NC (Normally Closed).

For more information about the actuator, see the separate product data sheet on www.swegon.com.



Transformer, Power Adapt 20 VA

Transformer for the voltage supply of products.

Protective transformer with plug type F.

Input voltage 230 V 50-60 Hz

Output voltage 24 V AC

Power 20 VA

Double insulation

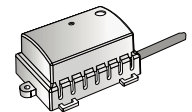
Enclosure IP33



Condensation sensor WCD2

The detector operates at the dew point temperature rather than a fixed relative humidity value.

The dew-point is calculated from a temperature compensated RH element and an extremely accurate sensor element that is bound to the metal plate on the detector.

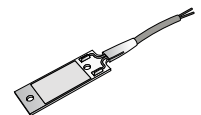


Condensation sensor, CG IV

The condensation sensor is supplied fitted and connected from the factory. The actual sensor element consists of a circuit board with gold plated conductive paths that react when condensation occurs between these. When condensation arises, the cooling valve closes the incoming water flow to the product. When the condensation on the conductive paths has been wiped off, the cooling valve is permitted to open again.

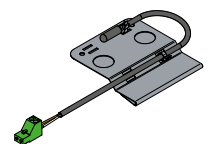
The sensor is positioned on the coil fins by the cooling supply.

For more information about the condensation sensor, see the separate product data sheet on www.swegon.com.



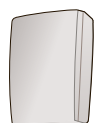
Temperature sensor, T-TG-1

External temperature sensor. Used for example if the room temperature must be measured elsewhere than at the sensor module, or to measure the temperature of the main pipe in change-over systems.



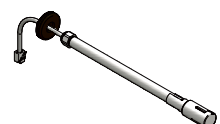
Co₂ sensor. Detect Qa

Analogue carbon dioxide sensor that is mounted concealed, above the extract air grille. See separate product sheet at www.swegon.com.



VOC sensor Detect VOC

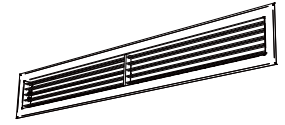
Modbus connected air quality sensor that is mounted concealed above the extract air grille



Loose accessories

Supply air grille, PARAGON T-SG

Front grille for PARAGON, available for products with the length, 800, 1100, 1400 mm



Return grille, PARAGON T-RG

Return grille for PARAGON, available for products with the length, 800, 1100, 1400 mm



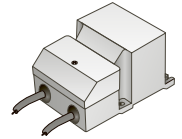
Transformer, Power ADAPT 20 VA (ARV)

Input voltage 230 V, 50-60 Hz, Output voltage 24 V AC
Power 20 VA, Enclosure IP33



Transformer, SYST TS-1

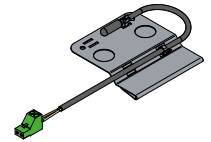
Double-insulated protective transformer 230 V, AC/24 V AC
Input voltage 230 V, 50-60 Hz, Output voltage 24 V AC,
Power 20 VA, Enclosure IP33



For more information, see the separate product data sheet on www.swegon.com.

Temperature sensor, T-TG-1

External temperature sensor. Used for example if the room temperature must be measured elsewhere than at the sensor module, or to measure the temperature of the main pipe in change-over systems.



Valve, SYST VDN 215

Straight valves for cooling and heating.

VDN215 is preset fully open on K_v 0.89.

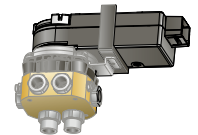
Function	Type	Dim.	K_v (m³/h)
Cooling/heating	VDN215	DN15 (½")	0.07-0.89

For more information about the valve, see the separate product data sheet on www.swegon.com.



6-way valve, CCO

Compact Change Over, for maximum utilisation of the coil and thus high cooling and heating capacity.



Valve actuator, cooling & heating, ACTUATORc 24 V NC

Valve actuators for cooling and heating.

24V AC/DC, NC (Normally Closed).

For more information about the actuator, see the separate product data sheet on www.swegon.com.



Card switch, SYST SENSO II

Key card holder for hotel rooms.



Sensor module, external

Rectangular sensor module with temperature and occupancy sensors for wall mounting

Always supplied with both a mounting frame for the most common junction boxes and a spacer frame for surface mounting.



Room controller, LOCUS

The room controller is a setpoint selector switch with integrated temperature sensor and digital colour display.

LOCUS is available with a white or black frame.

For more information about the room controller, see the separate product data sheet at www.swegon.com.



Cable, SYST CABLE RJ12 6-LED.

Cable for the connection of an external sensor module to the controller or between sensor modules. Available in different standard lengths.

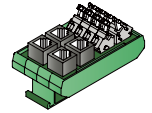


Cable, CABLE CONVERTER USB-RJ12 (RS485)

Cable with integrated modem to connect a PC to the controller. Needed to run e.g. SWICCT or ModbusPoll.



Cable adapter, ADAPTER RJ12-WIRE



LINK Wise

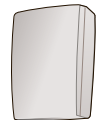
Network cable for Modbus communication in the WISE system.

The cable conforms to EIA 485 standard. Shielded four conductor AWG 24, external diameter Ø 9.6 mm, Grey PVC. The cable is only supplied in reels of 500 m.



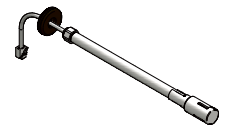
Co₂ sensor. Detect Qa

Analogue carbon dioxide sensor that is mounted concealed in the product. See separate product sheet at www.swegon.com.



VOC sensor Detect VOC

Modbus connected air quality sensor that is mounted concealed in the product.



Assembly fitting, SYST MS M8

For installation use the assembly fitting containing threaded rods, ceiling brackets and nuts to all four mounting brackets.



Grille lock, PARAGON VAV T- GL

Grille lock for fixing the position of the supply air grille.



Flexible connection hoses, SYST FH

Flexible hoses are available with quick-fit, push-on couplings as well as clamping ring couplings for quick and simply connection. The hoses are also available in various lengths. Note that compression ring couplings require support sleeves inside the pipes.

Flexible hoses also reduce the risk of movement in the piping system due to thermal expansion.

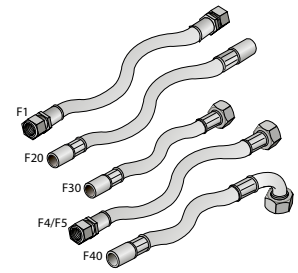
F1 = Clamping ring couplings at both ends.

F20 = Push-on couplings at both ends.

F30 = Push-on coupling at one end and union nut G20ID at the other end.

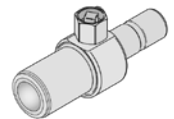
F4/F5 = Clamping ring coupling at one end and union nut with flat seal at the other end.

F40 = Push-on coupling at one end, union nut 90° at the other end.



Venting nipple, SYST AR-12

A venting nipple is available as a complement to the flexible hoses with push-on couplings. The venting nipple fits directly in the push-on hose coupling and can be fitted in an instant.



Connection piece, air – insertion joint, SYST AD1

SYST AD1 is used as a joint between PARAGON VAV and the duct system.

Available in two sizes: Ø125 and Ø160 mm.



Connection piece, air, SYST CA

90° duct bend.

Available in two sizes: Ø125 and Ø160 mm.



Accessory kits

CG-IV-KIT

Condensation sensor CG-IV and assembly parts for retrofitting.

Condensation sensor's sensor element consists of a circuit board with gold plated conductive paths that react when condensation occurs between these. When condensation arises, the cooling valve closes the incoming water flow to the product. When the condensation on the conductive paths has been wiped off, the cooling valve opens again. The sensor is positioned on the coil fins by the cooling supply.

For more information about the condensation sensor, see the separate product data sheet and installation instructions on www.swegon.com.



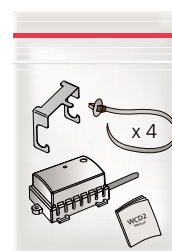
WCD2-KIT

Condensation sensor WCD2 and assembly parts for retrofitting.

The detector operates at the dew point temperature rather than a fixed relative humidity value.

The dew-point is calculated from a temperature compensated RH element and an extremely accurate sensor element that is bound to the metal plate on the detector.

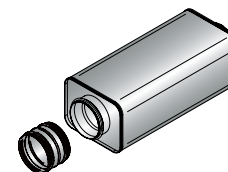
For more information about the condensation sensor, see the separate product data sheet and installation instructions on www.swegon.com.



Supply Air Kit-125

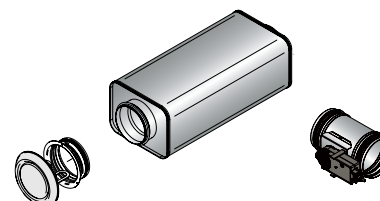
The supply air kit contains a sleeve and sound attenuator.

Accessories must be completed through user configuration of one or more selectable properties on the product.



Extract Air Kit VAV-REACT-125

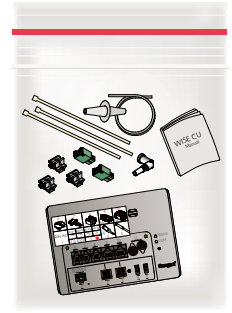
Extract air kit for VAV containing a REACT Va MB damper, control valve EXC and sound attenuator. Accessories must be completed through user configuration of one or more selectable properties on the product.



Upgrade kit WISE

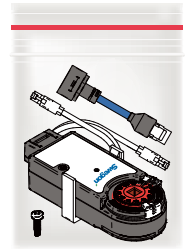
Upgrade kit WISE PARAGON-CU

The upgrade kit WISE PZ CU includes control plate with mounted CU, Phönix connector, assembly clamps, pressure hose, hose coupling and Luer-female.



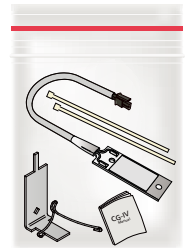
Upgrade kit WISE PARAGON-SA

The upgrade kit includes motor actuator, actuator cable, RJ45 cable and screw



Upgrade kit WISE Condensation sensor CG IV-KIT

The upgrade kit includes condensation sensor and assembly parts



Upgrade kit Dew-point KIT WISE PARAGON

The upgrade kit contains the temperature sensor, WISE TEMP SENSOR PT1000
For dew point regulation, RH measurement is also required in the room.



Upgrade kit WISE SMA

The upgrade kit includes WISE SMA incl. RJ12 cable and assembly plate.



Dimensions and weight

Weight

PARAGON VAV 800

Length mm	Type	Dim. Ø	Dry weight* (kg)		Water volume (l)	
			Without grille	incl. grille	cooling	heating
800 R	A	125	14.0	16.9	1.39	
800 L	A	125	14.0	16.9	1.38	
800 R	B	125	14.0	16.9	1.39	0.38
800 L	B	125	14.0	16.9	1.38	0.37
800 R	X	125	14.0	16.9	1.39	
800 L	X	125	14.0	16.9	1.38	

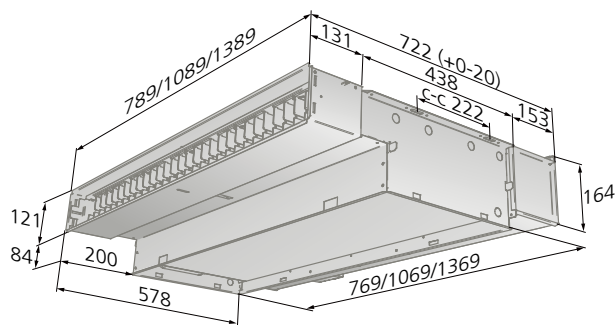


Figure 28. Dimensional drawing without grille

PARAGON VAV 1100

Length mm	Type	Dim. Ø	Dry weight* (kg)		Water volume (l)	
			Without grille	incl. grille	cooling	heating
1100 R	A	125	18.8	22.6	1.93	
1100 L	A	125	18.8	22.6	1.92	
1100 R	B	125	18.8	22.6	1.93	0.52
1100 L	B	125	18.8	22.6	1.92	0.51
1100 R	X	125	18.8	22.6	1.93	
1100 L	X	125	18.8	22.6	1.92	

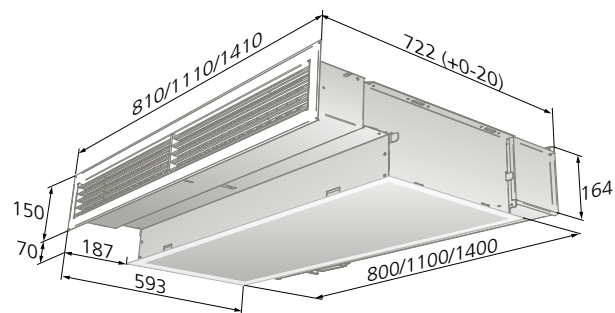


Figure 29. Dimensional drawing with grille

PARAGON VAV 1400

Length mm	Type	Dim. Ø	Dry weight* (kg)		Water volume (l)	
			Without grille	Incl. grille	cooling	heating
1400 R	A	125	23.0	27.6	2.47	
1400 L	A	125	23.0	27.6	2.46	
1400 R	B	125	23.0	27.6	2.47	0.65
1400 L	B	125	23.0	27.6	2.46	0.64
1400 R	X	125	23.0	27.6	2.47	
1400 L	X	125	23.0	27.6	2.46	

*Added weight for:
Control equipment: 0.80 kg
Actuator: 0.28 kg

Specification

PARAGON VAV specification

Type PARAGON VAV comfort module for cooling, heating, ventilation and control. As standard, factory fitted components are included for plug & play installation.

PARAGON VAV delivery demarcation

Swegon's limits of supply are at the connection points for water.

At these connection points, the RE pipework contractor connects to plain pipe end and/or male threads towards valves, fills the system, bleeds it and tests the pressure in the circuits.

The ventilation contractor connects to the duct connections with dimensions as specified on the basic size drawing in the section "Dimensions".

EE electrical equipment contractor provides a 24 V AC network power supply or earthed 230 V outlets for a transformer, as well as a junction box, if required, installed in a wall for a room thermostat.

The building contractor cuts the openings in corridor wall for the supply air duct, in the interior wall and suspended ceiling for the supply air and extract air grilles and in the bathroom ceiling for the extract air duct.

The electrical contractor connects the power (24V) and signal cables to the connection terminals with spring-loaded snap-in connections.

Maximum cable cross section 2.5 mm². For safe operation, we recommend cable ends with ferrules.

Maintenance

Ideally the product should be cleaned twice a year by vacuuming the coil to remove loose dust.

In fibre-dense environments such as hotels, an initial cleaning is recommended, about three months after use, as new textiles usually release more fibres. Thereafter, cleaning is recommended at an interval of one to two times per year.

A simple visual inspection of connections is recommended when cleaning.

For cleaning grilles and other painted surfaces: Avoid aggressive cleaning agents which may harm painted surfaces. Normally a mild soap or alcohol solution is fully adequate for cleaning. See also previous maintenance section in the Instructions for Use.

PARAGON VAV Ordering key

PARAGON VAV	d	aaaa-	b-	c-	dddd
Version:					
Length (mm)					
800, 1100 and 1400					
Function:					
A = Cooling					
B = Cooling and heating (water)					
X = Cooling and electric heating					
Connection side - water (seen from the back of the product)					
R = Right					
L = Left					
WB = Centred at the rear (optional extra)					
Air connections					
125 = Ø125 (standard)					
2x125 = 2Ø125 (suite, only selectable for length 1400)					

Factory-fitted optional extra

Control unit/controller	PARAGON VAV RE
Motor	PARAGON VAV SA
Valve cooling	SYST VDN 215 Straight valve
Valve heating	SYST VDN 215 Straight valve
Actuator cooling	ACTUATOR d 24V NC
Actuator heating	ACTUATOR d 24V NC
Condensation sensor	CG IV WCD2
Temperature sensor	T-TG-1
Air quality sensor CO ₂	DETECT Qa
Air quality sensor VOC	Detect VOC-2

Available to order, loose kits and accessories

In addition to the factory-installed options, loose accessories and kits (not factory-fitted) are also available:

Kits and accessories are easily mounted during installation

Controller KIT	PARAGON VAV RE - Kit
Actuator motor KIT	WISE Paragon SA - Kit
Valve cooling	VDN 215 Straight valve
Valve heating	VDN 215 Straight valve
Actuator cooling	ACTUATOR 24 V NC
Actuator heating	ACTUATOR 24 V NC
Condensation sensor	Condensation sensor, CG IV-KIT
"	WCD2-KIT
Temperature sensor	T-TG-1-KIT
"	Dew-point KIT WISE Paragon
Air quality,	WISE SMA
Air quality, CO2-KIT	CO2 Detect Qa - kit
Air quality, VOC-KIT	DETECT VOC-2 - kit
Condensation sensor KIT	CG IV - kit
"	WCD2 - kit
Pressure sensor	SYST PS
Transformer	Power ADAPT 20 VA (ARV)
Transformer	SYST TS-1
Card switch	SYST SENSO
Supply air grille	PARAGON T-SG
Return grille	PARAGON T-RG
Grille lock	PARAGON T-GL
ADC	ADC-2-105
Sensor module	VAV sensor module
"	WISE SMB
Room controller/Setpoint selector switch	LOCUS
Cable adapter	ADAPTER RJ12-WIRE
Flexible connection hose	SYST FH
Assembly piece	SYST MS-M8
Venting nipple	SYST AR-12
Connection fitting, air – nipple	SYST AD1
Connection fitting, air – elbow	SYST CA
Supply air kit	Supply Air Kit-125
Extract air kit	Extract Air Kit VAV-REACT-125

Ordering key, accessories

Grille	PARAGON d T-	aa-	bbbb
Type:			
SG = Supply air grille			
RG = Return grille			
Product length (mm):			
800, 1100, 1400			

Assembly piece	SYST MS M8	aaaa-	b
Length threaded rod (mm):			
200; 500; 1000			
Type:			
1=One threaded rod			
2=Two threaded rods and one thread lock			

Flexible connection hose, (x1)	SYST FH F1-	aaa-	12
Compression ring (Ø12 mm) against pipe at both ends (excl. support sleeves)			
Length (mm):			
300, 500, 700			

Flexible connection hose, (x1)	SYST FH F20-	aaa-	12
Quick-connector push-on (Ø12 mm) against pipe at both ends			
Length (mm):			
275, 475, 675			

Flexible connection hose, (x1)	SYST FH F30-	aaa-	12
Quick-fit coupling push-on (Ø12 mm) against pipe at one end, union nut G20ID at the other end.			
Length (mm):			
200, 400, 600			

Condensation sensor		aaaa	
WCD2 proactive condensation control			
CG-IV reactive condensation control			

Room controller	LOCUS	a-	b
Version:			
Frame colour:			
W = white			
B = black			

Accessory kits:

- Controller KIT WISE PARAGON CU xx items
- Controller KIT LUNA RE xx items
- Actuator motor KIT WISE PARAGON SA xx items
- Condensation sensor KIT for retrofitting
Condensation sensor CG IV-KIT, xx items
- Condensation sensor for retrofitting, WCD2-KIT, xx items
- Temp. sensor, T-TG1-KIT, xx items
- Temp. sensor, Dew-point KIT WISE Paragon, xx items
- Air quality sensor, CO2-Kit, Detect Qa, xx items
- Air quality sensor, VOC-Kit, DETECT VOC-2
- Air quality, WISE SMA, xx items
- Supply Air Kit-125, xx items
- Extract Air Kit VAV-REACT-125, xx items

Accessories:

- Supply air grille, PARAGON d-T-SG-aaaa xx items
- Return grille, PARAGON d-T-RG-aaaa xx items
- Grille lock, PARAGON T-GL xx items
- Valve cooling SYST VDN 215 xx items
- Valve heating SYST VDN 215, xx items
- 6-way valve, CCO, xx items
- Actuator cooling ACTUATORc 24 V NC, xx items
- Actuator heating ACTUATOR c 24 V NC, xx items
- Transformer, POWER Adapt 20 VA, xx items
- Transformer, SYST TS-1, xx items
- Pressure sensor, SYST PS, xx items
- Room controller/Setpoint selector switch, LOCUS, xx items
- Card switch, SYST SENSO II, xx items
- Assembly piece, SYST MS M8 aaaa-b
- ADC for subsequent installation, SYST ADC-2-105, xx items
- Cable adapter, ADAPTER RJ12-WIRE, xx items
- Flexible connection hose, SYST FH F1 aaa- 12 xx pcs.
- Flexible connection hose, SYST FH F20 aaa- 12 xx pcs.
- Flexible connection hose, SYST FH F30 aaa- 12 xx pcs.
- Venting nipple, push-on, SYST AR-12, xx items
- Connection piece, air – nipple, SYST AD1-aaa, xx items
- Connection piece, air (90°elbow), SYST CA-aaa-90, xx items

etc.

Specify the quantities individually or with reference to the drawing.

Specification text

Example of a specification text according to VVS AMA.

PCT.312 Duct connected chilled beams.

PTD.4 Duct connected room devices for heating and cooling.

KB XX

Swegon's comfort module PARAGON VAV with integrated supply air damper in the product for demand-controlled ventilation.

For rear edge installation in a wall/ceiling, with the following functions:

- Ventilation, waterborne cooling, waterborne heating or electric heating
- Integrated damper for variable air flow control 0-100%
- Ø125 mm duct connection
- Integrated circulating air opening in face plate
- Comfort guarantee ADC with adjustable function +-30 degrees
- Cleanable
- Fixed measurement tapping with hose
- Eurovent certified
- Grilles in standard colour RAL 9003

Contractor demarcation at connection point for water and air as in outline drawing.

- At the points of connection the pipe contractor connects to 12 mm plain pipe end after which the ventilation contractor connects the Ø125 mm insertion piece (sleeve).
- The pipe contractor fills, bleeds, tests the pressure and assumes responsibility for the design water flows reaching each branch of the system and the unit.
- The ventilation contractor conducts initial commissioning of the air flows