REACT Parasol Zenith

Chilled beam with integrated variable flow regulation

QUICK FACTS

- High performance 4-way blow chilled beam with cooling, heating and ventilation
- The product is equipped with an actuator for flow adjustment, terminal block and air connection for flow measurement
- Simple commissioning because the flow measurement is performed directly in the air connection
- Pressure-independent flow regulation
- Can easily be integrated by a control equipment supplier via Modbus RTU, BACnet or 0(2)-10Vdc communication
- Large span between the lowest and highest air flow
- Few variants for easier sizing and variable air flow control
- Optimised for low energy consumption
- Manages high air flow at low driving pressure
- Easy installation on account of low weight, compact dimensions and optional air connections on short or long sides
- Hygiene design as an option for hospital applications
- For suspended mounting, a design kit and a coanda frame are available as accessories

Variant		Supply air		Performance	
Size	Air connection	IN WG *	CFM	Total cooling capacity	Sound level
ft.	in.			BTUH**	db
2	5	0.3	42	1683	26
2	5	0.3	53	1925	28
2	5	0.3	64	2154	30
2	6	0.3	53	1932	27
2	6	0.3	74	2379	30
2	6	0.3	95	2761	33
4	5	0.3	53	3010	26
4	5	0.3	74	3676	28
4	5	0.3	95	4157	30
4	6	0.3	64	3072	23
4	6	0.3	127	4693	28
4	6	0.3	170	5430	34
6	8	0.3	127	5427	30
6	8	0.3	170	6451	33
6	8	0.3	212	7287	35

Swegon

Contents

Documentation

The following documentation can be downloaded from our website www.swegon.com.

REACT Parasol Zenith installation instructions

REACT Parasol Zenith Modbus

REACT Parasol Zenith Building Materials Declaration

REACT Parasol Zenith CE Declaration

Benefits of REACT Parasol Zenith

The list below shows a few of the benefits enjoyed by the consultant, architect, installer and user

Planning and design

- Energy efficient product - high cooling capacity at low driving pressure
- Few variants with large application area – Large span regarding minimum to largest air flow
- Available in three sizes 2, 4 and 6 ft.
- High comfort irrespective of room placement – Easy to adapt to the direction for optimal room comfort both initially and in the event of future changes to the floor plan
- Easy planning through alternative air connections – choose short or long side connection

Architecture and design

- Face plate always at the same level as the suspended ceiling, irrespective of operating mode
- Space efficient – takes up very little ceiling space
- Numerous options with different colors

Installation

- Simple commissioning directly on the product
- Simplicity in projects where master system is preselected
- Lowest weight on the market – simpler and more ergonomic handling
- Compact dimensions - can often be installed in existing roof system, without the need of dismantling this
- Possibility of air connection on the short side - faster installation with less material usage
- Easily accessible water connections - access with press coupling tool if this is used

Use

- Low energy consumption - high capacity at low driving pressure
- High comfort - double outlet provides improved Coanda effect even at low pressure
- 4-way air blow ensures very good mixing
- ADC air deflector - change the air flow pattern as required for each side
- Low sound levels

Technical description

Chilled beam REACT Parasol Zenith

REACT Parasol Zenith is a combination of a Parasol Zenith Chilled beam and flow regulation (VAV function) in the same unit. Flow measurement is performed in the unit directly by the air connection.

The product is factory-fitted as standard with an air connection for flow measurement, an actuator for flow adjustment and a terminal block. React Parasol Zenith can be controlled with a preselected main control system.

The large cooling capacity also enables a lower duct pressure or a higher cooling water temperature to be used, which saves energy and also improves room comfort further.

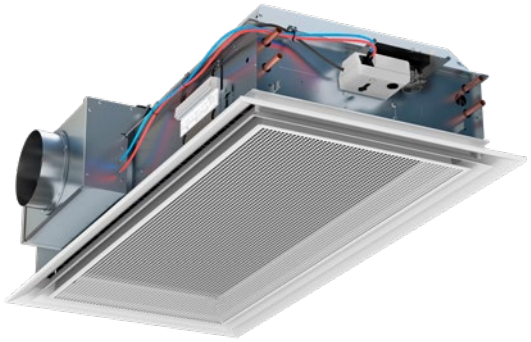


Figure 1. Product image (REACT Parasol Zenith 4 ft.)

REACT Parasol Zenith is available in the following variants:

Variant A: Supply air and waterborne cooling, (2, 4 and 6 ft.)

Variant B: Supply air, waterborne cooling and heating (2, 4 and 6 ft.)

Installation: Flush mounting for suspended ceilings

Range of application

REACT Parasol Zenith is ideal for use as a standard application in such premises as:

- Offices and conference rooms
- Preschools
- Classrooms
- Hotels
- Restaurants
- Hospitals
- Shops
- Shopping centres

Market-based module dimensions

The order range includes module dimensions to fit the standardised ceiling measurement c-c 600, 625 and 675 mm. In addition, there is a mounting frame for drywall ceilings and ceiling solutions of the clip-in-type, for example, Dampa and FineLine. In order to guarantee a good fit in T-bar systems, we recommend T sections with a width of 24 mm.

Design

The face plate of REACT Parasol Zenith is always flush, i.e. always in line with the suspended ceiling, which gives a stylish and discreet installation. The double outlets means that there is no need to lower the face plate for high air flow rates, maximum capacity (induction) is still achieved.

Accessories for suspended mounting

For suspended mounting, a design kit and a coanda frame are available as optional accessories if desired. The design kit and the coanda frame are available in three sizes – 4, 6 and 8 ft. – for cooling or cooling and heating and for air connection on all sides and for dimensions 5, 6 and 8. Both accessories can be ordered in Swegon's standard colors and be ordered individually.

Color

The product, as well as the design kit and coanda frame, are painted as standard in our standard color RAL 9003 signal white, gloss ratio 30 ± 6%.

The product, as well as the design kit and coanda frame, can also be ordered in the following colors.

RAL 7037 dusty grey, gloss ratio 30-40%

RAL 9010 pure white, gloss ratio 30-40%

RAL 9005 jet black, gloss ratio 30-40%

RAL 9006 white aluminium, gloss ratio 70-80%

RAL 9007 grey aluminium, gloss ratio 70-80%

The product, as well as the design kit and coanda frame, can also be ordered in different colors.

Special types

On request, the product, as well as the design kit and coanda frame can also be obtained with e.g.:

- Optional color or relief finish paint.
- Face plate with different perforation pattern

For further particulars about special types, get in touch with your nearest Swegon representative.

Function

REACT Parasol Zenith is a 4-way air discharge chilled beam with induction function. Exactly as in a chilled beam, the supply air is used to operate the cooling and heating function of a central air handling unit and therefore does not include an integrated fan or other moving parts. This gives very quiet operation and minimal maintenance requirements. Unlike a 2-way air discharge chilled beam, air distribution to the room occurs from all 4 sides of the unit, which means as large areas of the ceiling as possible are used to spread the air, thus ensuring comfort in the occupied zone.

REACT Parasol Zenith is a combination of chilled beam Parasol Zenith and a VAV damper in the same unit. All available versions of REACT Parasol Zenith have flow measurement in the air connection. As a result, commissioning is simple as the person performing the commissioning can read the air flow directly on the product.

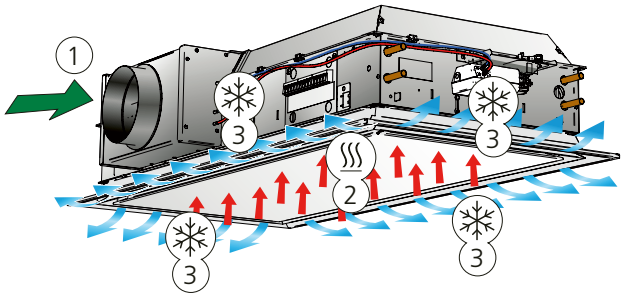


Figure 2. Variant A: Cooling and supply air function
1 = Primary air
2 = Induced room air
3 = Primary air mixed with cooled room air

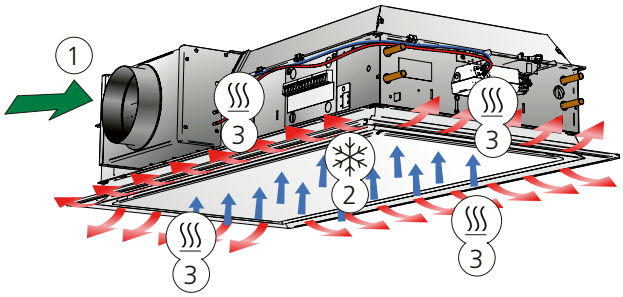


Figure 3. Variant B: Heating and supply air function
1 = Primary air
2 = Induced room air
3 = Primary air mixed with heated room air

Induction principle

Primary air (A) from the air handling unit provides REACT Parasol Zenith with supply air via a supply air duct and builds up positive pressure in the unit's plenum.

The supply air is forced out at high speed through small slots (B). The high speed means that the surrounding air is drawn in and mixed with the supply air, which generates negative pressure above the unit's integrated heat exchanger (C). Room air (D) is continuously drawn up from the room through the water-based heat exchanger where, if necessary, it is cooled or heated before it mixes with the supply air.

The mixed air is then distributed to the room via aero-dynamically designed outlets. The outlets are designed to ensure that the distributed air follows the suspended ceiling by utilizing the so-called Coanda effect (E). The supplied air is then mixed with additional room air, which further lowers the air velocity and lessens the temperature difference before it reaches the occupied zone.

The volume of recirculated room air drawn through the heat exchanger is typically about 3-5 times the volume of primary air, i.e. if 42 CFM l/s supply air comes from the air handling unit, then approximately 127 - 212 CFM room air will pass through the exchanger and be tempered.

Condensation-free cooling

REACT Parasol Zenith has been developed to work condensation-free and therefore requires no drainage system or filter. Normally inlet temperatures between 57.2 - 60.8 are used for the cooling water.

High comfort – today and tomorrow.

A good indoor climate is characterized by good air quality and the correct room temperature without draughts and noise. Different requirements are made on air flow, cooling capacity and heating capacity depending on the type of building in question and how this will be used.

As greater demands are made on being able to offer customised office solutions and to easily change the floor layout for new or existing tenants if changed needs arise, it is important to take this into consideration as early as the design phase. As this will minimise future costs for rebuilding. Regardless of the scenario, the new REACT Parasol Zenith – through its simplicity in terms of air flow range, operation and commissioning – provides all the opportunities to find this flexible and optimal solution.

Control variants

REACT Parasol Zenith provides unique advantages with its slot control and, through this, a large working range on the air side.

REACT Parasol Zenith is a developed version of Parasol Zenith that has been produced to cope with a large air flow range in one and the same product, which provides benefits during dimensioning.

REACT Parasol Zenith can be used with LUNA room controller or integrated with controlles by others

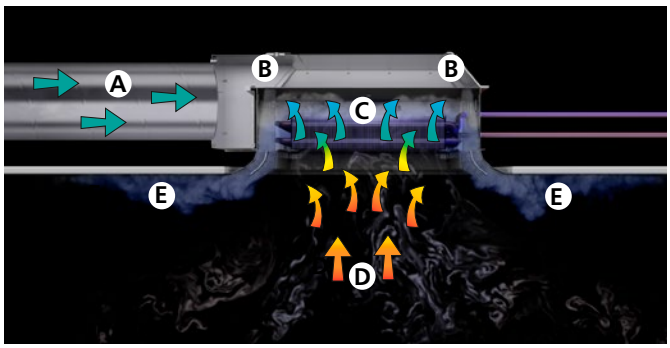


Figure 4. Induction principle in REACT Parasol Zenith

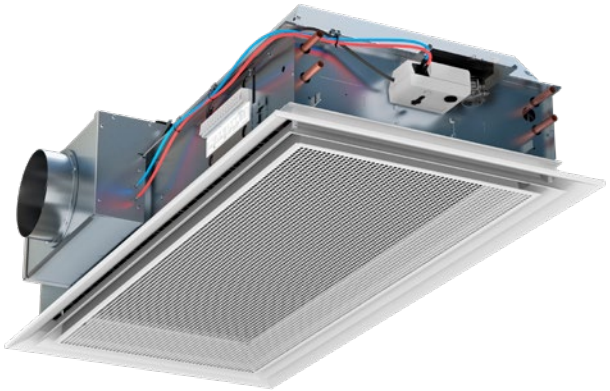


Figure 5. REACT Parasol Zenith.

Large working range

REACT Parasol Zenith controls the internal air flow with slot control instead of nozzles. This maintains the air pressure within the product, which ensures the function even at low air flows. This means that one product can manage a large air flow range, which provides benefits during sizing, rebuilding work and in the event of altered requirements.

The following benefits are provided during installation:

- Fewer variants through large air flow ranges/K-factor areas
- Products with easy k-factor setting on site for quick start of the build
- Simple commissioning

In order to clarify the large working range of REACT Parasol Zenith, we can compare the curves for cooling capacity/air flow with the cooling requirements for seven different types of rooms:

A+B	Individual office room (1 person)
C+D	Office for customer visits (3 people)
E, F, G, H	Conference room (4, 6, 8, 12 people)

The individual office and the office for customer visits are assumed to be placed at the façade, while the conference room is assumed to be placed on the floor's inner zone.

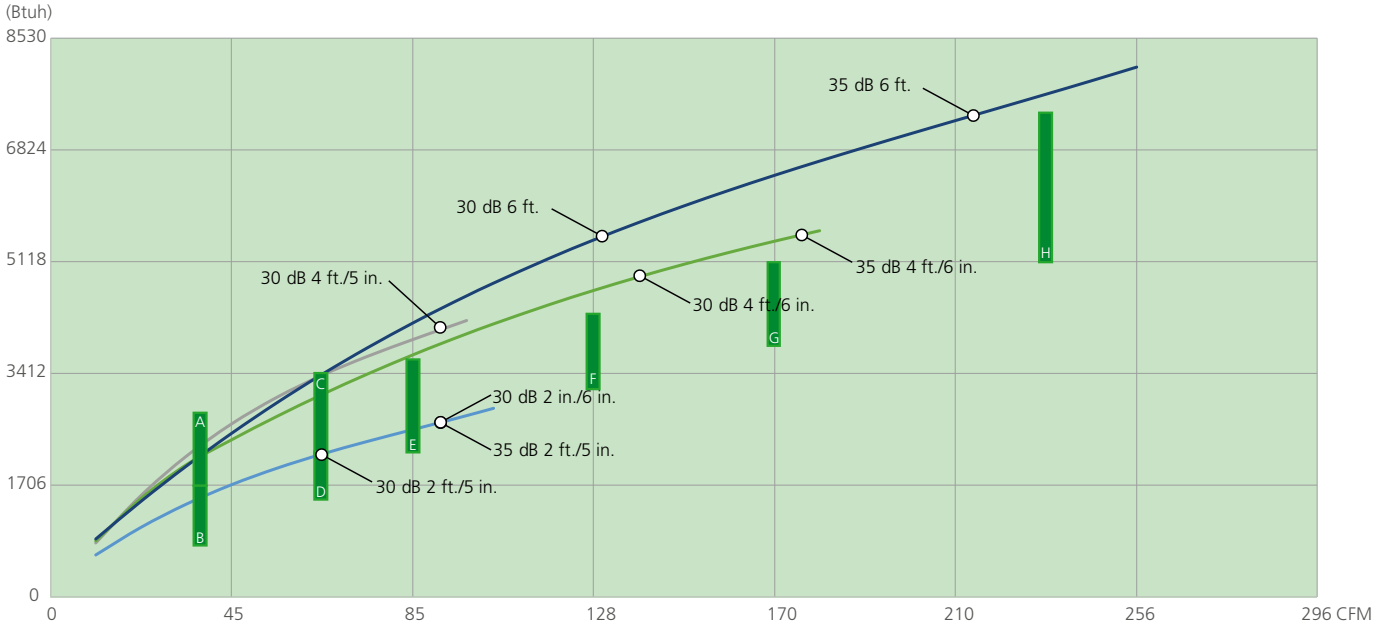
In the diagram, we can see that the product variants can handle all types of rooms. All that is required is to adjust the slot openings as required.

You can also see that the products can give a higher cooling capacity than the demand. This allows several options:

- Use the full capacity to quickly correct the deviations in room temperature
- Lower the driving pressure in the supply air duct and save fan energy
- Increase the supply flow temperature of the cooling water and save energy (chiller)

Total cooling capacity, air and water

Diagram 1: Capacity range



A: Individual offices, south-facing
130 ft² 32 CFM
1700-2700 BTUH cooling load

B: Individual office, solar protection
130 ft² 32 CFM
850-1700 BTUH cooling load

C: Individual offices for customer visits
130 ft² 64 CFM
2400-3400 BTUH cooling load

D: Individual office for customer visits, solar protection
130 ft² 64 CFM
1540-2560 BTUH cooling load

E: Conference room
86 ft² 85 CFM
2400-3750 BTUH cooling requirement

F: Conference room
108 ft² 128 CFM
3070-4440 BTUH cooling requirement

G: Conference room
130 ft² 170 CFM
3920-5100 BTUH cooling requirement

H: Conference room
194 ft² 232 CFM
5100-7500 BTUH cooling requirement

Prerequisites:
Supply air: ΔP_l = 0.3 in wg; ΔT_l=12.6°F
Cooling water: t_{in} = 57.2°F; t_{out} = 62.00°F
Room: t_{room} = 75.2°F

Comfort guarantee

As previously described, REACT Parasol Zenith has 4-way air distribution, which gives low air velocities in the occupied zone. Distributing the cooled air over a large ceiling area creates the low air velocity. The chilled beam's closed design with a circulation opening for return air in the face plate of the module also contributes to its advantageous mixing performance.

With its aerodynamically designed dual outlets in combination with the integrated damper and the placement of the slot openings, REACT Parasol Zenith distributes the air with very good adhesion to the suspended ceiling (Coanda effect) even at low driving pressure and you do not need to place a commissioning damper in front of the product.

If you still, for example in large conference rooms with up to four products, want to install a VAV damper in front, the duct pressure, dependent on the air flow rate, can be lowered down to 0.080 in wg.

Figure 6. Double outlets.

All chilled beams contain ADC as standard. ADC stands for Anti Draught Control, which enables you to set the diffusion pattern of the air being distributed to avoid risk of draught.

ADC can also be used to reduce the throw length. By setting ADC to L-shape, the distance between two units can be reduced to a minimum and still ensure good comfort.

A number of ADC sections with nine air deflectors per section are arranged on each side of the unit. Each section is adjustable from a straight setting to 40° air deflection to the right or left in increments of 10°. This provides great flexibility and can be adjusted without having to affect the system as a whole.

The direction of the air can be easily adjusted and gives future-proofing, offering a simple measure on location for any change to the furnishings and layout. The ADC does not affect the noise level or static pressure at all.

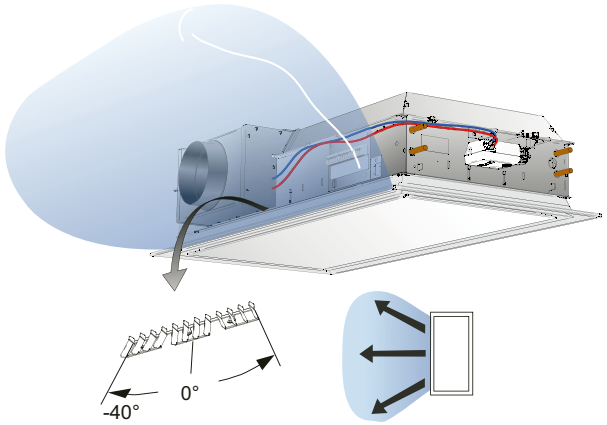


Figure 7. Possible settings for the ADC, Fan-shape

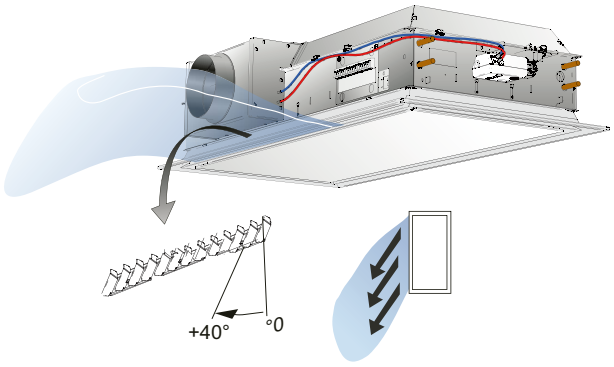


Figure 8. Possible settings for the ADC, X-shape

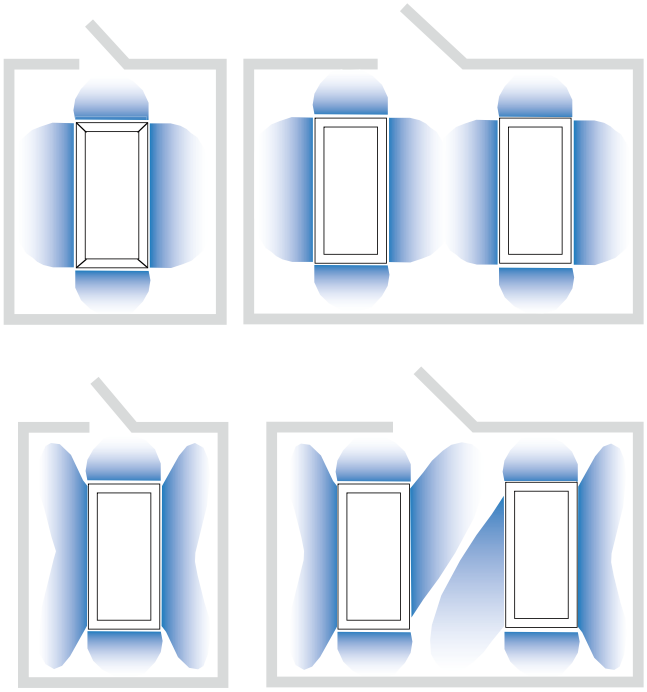


Figure 9. REACT Parasol Zenith with examples of different ADC settings

Easy installation

REACT Parasol Zenith is built on a platform with very compact dimensions. In many cases the design permits installation in the existing T-bar system without the need of dismantling, provided that there is at least 11.9 inches of space between the suspended ceiling and the joists.

The slim design and low weight result in simpler handling, especially when handling the products on the construction site, which provides less handling damage and a better working environment. REACT Parasol Zenith's compact units fit most common modular dimensions and fit most suspended ceiling systems on the market. As standard the units include four mounting brackets. These are adjustable +/- 0.8 inch in both directions and in doing so create the adjustment range normally required during installation.

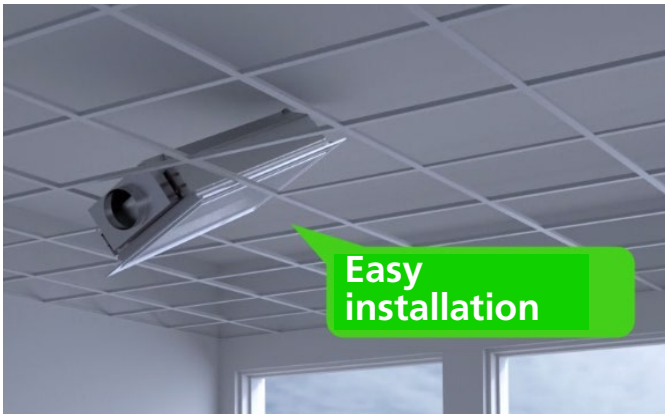


Figure 10. Installation in existing T-bar system

Hygienic design

REACT Parasol Zenith is available as a variant with a fold-out coil for easy access to the complete heat exchanger.

A dust-free environment is especially important in rooms with elevated hygiene demands. Over time, large amounts of room air pass through REACT Parasol Zenith's coil (heat exchanger). Dust particles, which fasten on the coil, not only result in less capacity, but also fail to comply with the hygiene requirements that apply to the room. REACT Parasol Zenith has, as an option, the possibility of fold-out coils to meet these requirements.

In addition to normal cleaning, by wiping off dust from the white painted surfaces exactly as you clean other surfaces in the room, the option of more thorough cleaning is now possible.

1. It is recommended to vacuum clean the coil several times a year. More frequently in a room with a lot of textiles and a high rate of air change. The face plate is opened or dismantled to gain access to the coil, see figure 11.
2. In environments with elevated hygiene demands additional cleaning of the chilled beam may be a requirement. The use of flexible connection hoses and the possibility to fold out the coil also permits cleaning of the top of the coil in these instances, see figure 12.

Figure 11. Removing the face plate to access the coil

Figure 12. Removing the face plate and folding out the coil for accurate cleaning in the event of high hygiene requirements. Note! requires the product to be ordered with the accessory, fold-out coil, and that flexible connection hoses are used on the water side.

Alternative air connections

To simplify the duct installation and reduce the number of duct bends gives several advantages. Installation time is shorter and the cost of materials decreases while the pressure drop and noise generation are also reduced.

Installations frequently appear as in figure 13. Straight ducts are of course always preferable.

Depending on the size, you can order REACT Parasol Zenith with air connections on any long or short side, see table and figure 16.

It's also possible to change the air connection side at a later date, see page 12 for more information.

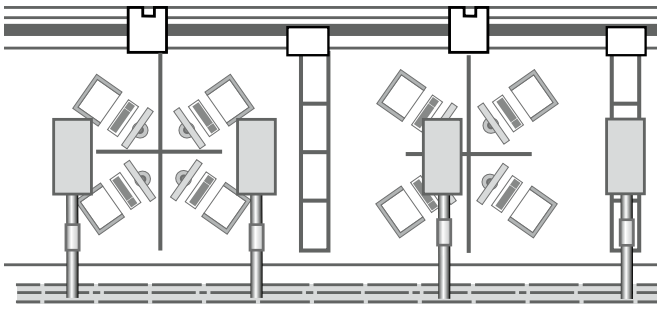


Figure 13. Installation example.

Selectable air connection sides

When ordering, depending on the length, it is possible to choose air connection side 1, 2, 3 or 4 as set out in the table below, also see figure 16.

Length	Air connection side			
	1	2	3	4
2 ft.	Yes	No	Yes	No
4, 6 ft.	Yes	Yes	Yes	Yes

Easily accessible water connections

The water pipes are very easily accessible, which facilitates connection, particularly if e.g. press couplings and associated tools are used.

This saves installation time and simplifies a safe water connection.

The pipes are placed in a standardised fashion, which means irrespective of product the cooling and possibly heating pipes are always positioned in the same way, which facilitates installation

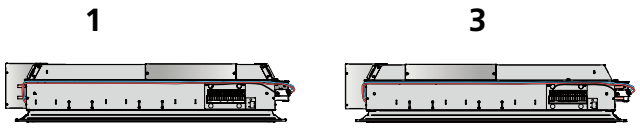


Figure 14. Air connection on the product's short side, 1 or 3.

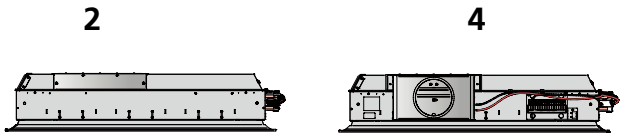


Figure 15. Air connection on the product's long side, 2 or 4.

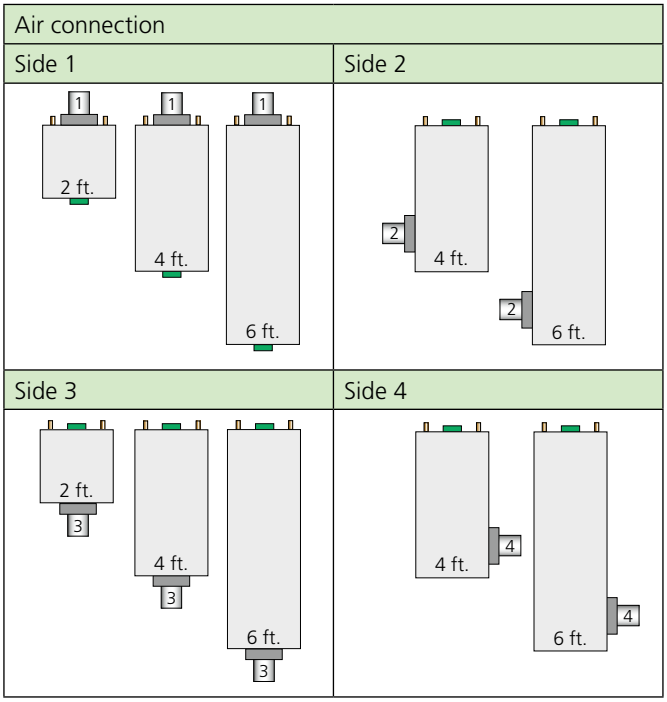


Figure 16. Selectable air connections, (view from above)

Key to symbols

Water pipe

Actuator

Air connection

Installation - Details

Suspension

REACT Parasol Zenith has four mounting brackets for suspension and is installed using one threaded rod in each mounting bracket (Figure 18). A double threaded rod with a thread lock should be used if there is substantial distance between the overhead slab and the unit. A 7.9-inch threaded drop rod is used for surface mounting. Threaded drop rods and assembly fitting SYST MS M8 (Figure 17) are ordered separately.

For installation in an existing T-bar system, the product is stabilized by the T-bar system and in this case it is sufficient to suspend the product from two brackets (diagonal).

Quick bracket

For an even more efficient and time-saving installation, we have developed a kit for easier installation. PARASOL Z QUICK SUSPENSION KIT, consisting of 2 fixed brackets.

The fixed brackets are fastened to the ceiling. The product can then be pushed into place without the use of tools. The brackets also feature an integrated fine adjustment of approx. 2 inches in height. (Figure 19).

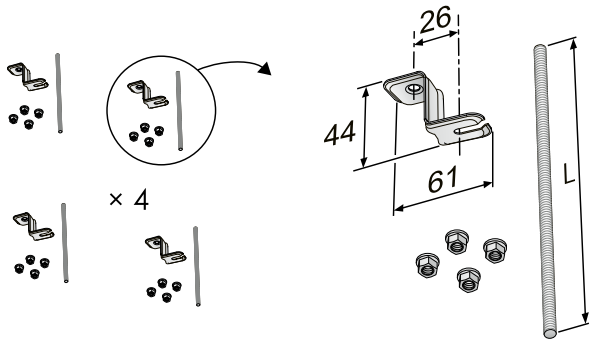


Figure 17. Assembly fitting SYST MS M8-1, ceiling mount and threaded rod

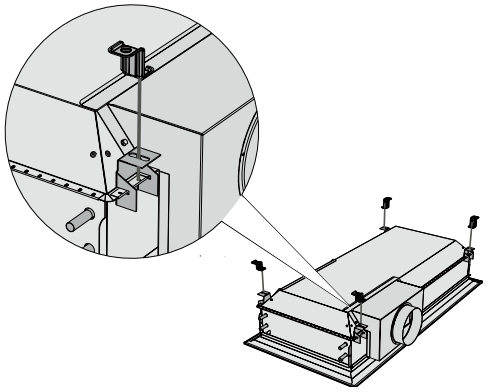


Figure 18. Suspension in four brackets with SYST MS M8

Accessories for suspended mounting

For suspended mounting, a design cover and a coanda frame are available, if required (Figure 20 and 21).

- PARASOL Z DK (Design kit)
- PARASOL Z CF (Coanda frame)

PARASOL Z DK is available in the following variants:

- Sizes 2, 4 and 6 ft.
- Cooling or cooling and heating
- Air connection Ø5, Ø6 and Ø8 in.
- Air connection on all four sides

PARASOL Z CF is available in the following variants:

- Sizes 2, 4 and 6 ft.

PARASOL Z DK and PARASOL Z CF can be ordered in Swegon's standard colors and be ordered individually.

Note! Design kit and coanda frame are only valid in zizes: 592, 1192 and 1792 mm.

For installation, see the installation instructions.

For more information about PARASOL Z DK and PARASOL Z CF, contact Swegon.

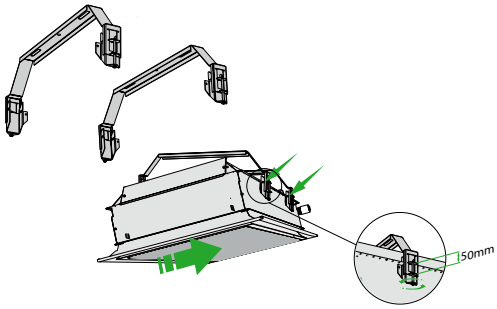


Figure 19. Installation with quick bracket PARASOL Z QUICK SUSPENSION KIT

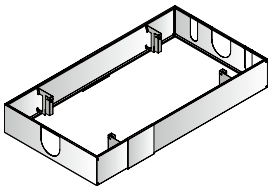


Figure 20. Design kit, PARASOL Z DK

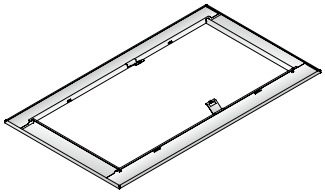


Figure 21. Coanda frame, PARASOL Z CF

Water

Connections

Connection dimensions

Unit	Cooling	Heating
(ft.)	Supply and return	Supply and return
2, 4	plain pipe ends	plain pipe ends
	(Cu) Ø 12 x 1.0 mm	(Cu) Ø 12 x 1.0 mm
6	plain pipe ends	plain pipe ends
	(Cu) Ø 15 x 1.0 mm	(Cu) Ø 12 x 1.0 mm

Adapters and connectors (accessories)

Unit	Adapter/connector	Cooling	Heating
(ft.)	(type)	Supply/return	Supply/return
2, 4	Flexible hose	Ø 12mm to "1/2" NPT	Ø 12mm to "1/2" NPT
	Nominal pipe thread connection	Ø 12mm to "1/2" NPT	Ø 12mm to "1/2" NPT
6	Flexible hose	Ø 15mm to "1/2" NPT	Ø 12mm to "1/2" NPT
	Nominal pipe thread connection	Ø 15mm to "1/2" NPT	Ø 12mm to "1/2" NPT
Adapters/connectors are sold as accessories.			

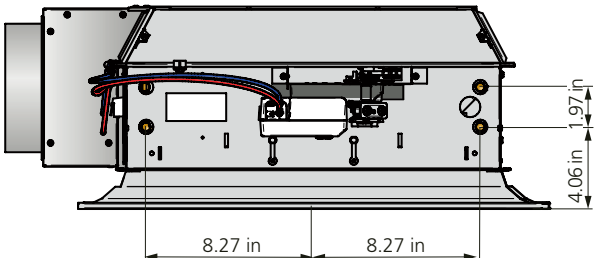


Figure 22. Dimensions, water connection length 2, 4 and 6 ft.

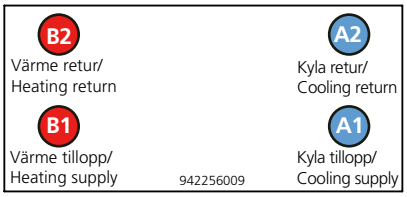


*Figure 23. Water connection - Length 2, 4, 8 ft**
A1 = Supply cooling water ø12x1.0 mm (Cu)
*A1 = Supply cooling water ø15x1.0 mm (Cu) *(Size 6 ft.)*
A2 = Return cooling water ø12x1.0 mm (Cu)
*A2 = Return cooling water ø15x1.0 mm (Cu) *(Size 6 ft.)*
B1 = Supply heating water ø12x1.0 mm (Cu)
B2 = Return heating water ø12x1.0 mm (Cu)

Connecting water

The water pipes are always placed on the product's short side, regardless of the air connection side of the product.

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 can be ordered separately.

Air

Unit	Air connection, diameter Ø in.		
(ft.)	Ø 5	Ø 6	Ø8
2, 4	Yes	Yes	No
6	No	No	Yes

To connect the air

REACT Parasol Zenith comes with open air connection on the selected side 1, 2, 3 or 4.

On delivery the sleeve faces inwards. During installation, the sleeve is turned outwards and is secured with the enclosed screws to then be connected to the primary air duct.

If you subsequently want to change the air connection side than that ordered, you can change the positions of the cover and connection sleeve as set out below.

Possibility to change the connection side

- From side 1 to side 2 or 4. (Does not apply to length 2 ft.)
- From side 2 to side 3 or 4.
- From side 3 to side 2 or 4. (Does not apply to length 2 ft.)
- From side 4 to side 2 or 3.

K-factor

At the air connection, there is a label showing the K-factor for the product with air connection ø5, 6 and 8 in.

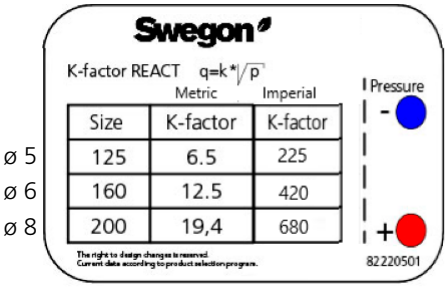


Figure 24. Label with the K-factor values.

REACT Parasol Zenith with bend

We recommend a straight section of at least 1xØ for the product's built-in airflow measurement to function correctly and 3xØ to maintain the tolerances specified in the table below.

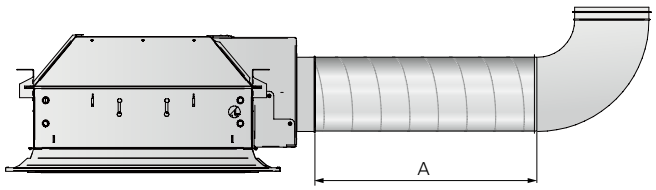


Figure 25. Dimensional drawing, long side connection with bend

Recommendation for accurate flow measurment

Air connection size (in.)	A (in.)
5	15
6	18
8	24

Flow tolerance

Air connection ø	Minimum flow**			Tolerance Q* ±5 % but at least ±x		
	l/s	m^3/h	cfm	l/s	m^3/h	cfm
5	5	18	10	2	7	4
6	10	36	21	2	7	4
8	15	54	32	2	7	4

** Installed according to instructions*
*** For flows below the lowest specified level, we cannot guarantee the tolerances.*

Modbus

For Modbus settings, see:

REACT Parasol Zenith Modbus

Technical data

Recommended limit values

Pressure levels

Coil working pressure, max.	535 ft wg
Coil test pressure, max.	802 ft wg

** Applicable without control equipment mounted*

Nozzle pressure 0,080 - 0,80 in wg

Recommended lowest nozzle pressure, cooling	Airflow (CFM)	Nozzle pressure (in wg)
	<21	0,2
	32 - 65,5	0,1
	>65,5	0,08
Recommended lowest nozzle pressure if coil heat is used.		0,28

Water flow

Ensures evacuation of any air pockets in the system.

Cooling water, min.	0,064 CFM
Heating water (48”), min.	0,028 CFM

Temperature differentials

Cooling water, temperature increase	3,6 - 9,0 F°
Heating water, drop in temperature	7,2 - 18,0 F°

Temperature differences are always expressed in Kelvin (K).

Supply flow temperature

Cooling water	**
Heating water, max.	140 F°

*** Cooling water must always be kept at a level that ensures that no condensation is formed.*

Table 1. Cooling capacity for natural convection

Unit	Cooling capacity (BTUH) for temperature difference, room - water ΔTmk (°F)						
(ft.)	10.8	12.6	14.4	16.2	18	19.8	21.6
2	96	113	133	150	188	191	212
4	235	283	331	379	427	481	529
6	304	362	420	488	546	611	679

Table 2. Pressure drop constant - water, K_{pk}

Unit	Function, k_{pk} cooling	
(ft.)	A2	B2
2	767	904
4	1891	2274
6	2439	2905

A2 = Cooling and supply air, serially connected double-row coil

B2 = Cooling, heating, and supply air, serially connected double-row coil

*K_{pk} values for the water flow 0,106 CFM.

**K_{pk} values for the water flow 0,212 CFM

Cooling

Table 3 – Data – Cooling. Sizing Guide for REACT Parasol Zenith at 0.30 in wg

Unit	Air connection	Airflow	Sound level	Cooling capacity (BTUH) of primary air at ΔT_1 (°F)				Cooling capacity (BTUH) water at ΔT_{mk} (°F)					Pressure drop constant, air k_{pl}
ft.	in.	CFM	dB(A)	11	14	18	22	11	13	14	16	18	
2 A	Ø5	21	21	246	328	410	491	570	662	758	853	949	39
		42	26	491	655	819	983	775	904	1034	1164	1294	78
		64	30	737	983	1229	1474	908	1061	1212	1362	1515	119
		85	33	983	1311	1638	1966	990	1157	1321	1485	1652	163
		97	36	1130	1509	1884	2259	1007	1174	1341	1509	1676	191
2 A	Ø6	21	20	246	328	410	491	570	662	758	853	949	39
		42	25	491	655	819	983	782	911	1041	1171	1300	78
		64	29	737	983	1229	1474	918	1068	1222	1375	1529	117
		85	32	983	1311	1638	1966	1010	1177	1345	1512	1683	157
		104	34	1205	1604	2007	2410	1041	1212	1386	1560	1734	194
2 B	Ø5	21	<20	246	328	410	491	519	608	693	778	867	39
		42	25	491	655	819	983	689	802	918	1034	1147	78
		64	27	737	983	1229	1474	805	942	1075	1208	1345	119
		85	29	983	1311	1638	1966	867	1010	1154	1297	1444	163
		97	30	1130	1509	1884	2259	887	1038	1184	1331	1481	191
2 B	Ø6	21	<20	246	328	410	491	519	608	693	778	867	39
		42	23	491	655	819	983	693	805	922	1038	1154	78
		64	25	737	983	1229	1474	812	945	1082	1218	1352	117
		85	28	983	1311	1638	1966	884	1031	1177	1324	1471	157
		104	36	1205	1604	2007	2410	925	1079	1232	1386	1539	194
4 A	Ø5	21	29	246	328	410	491	932	1089	1242	1399	1553	39
		42	30	491	655	819	983	1416	1652	1887	2123	2358	78
		64	31	737	983	1229	1474	1741	2031	2321	2611	2901	119
		85	33	983	1311	1638	1966	1949	2273	2597	2922	3246	164
		95	35	1106	1474	1843	2212	2014	2348	2683	3017	3355	187
4 A	Ø6	21	21	246	328	410	491	939	1096	1253	1410	1567	39
		53	26	614	819	1024	1229	1430	1669	1908	2147	2386	97
		85	30	983	1311	1638	1966	1768	2065	2358	2652	2949	157
		127	33	1474	1966	2457	2949	2102	2451	2802	3154	3502	240
		182	36	2113	2819	3522	4225	2232	2604	2976	3348	3720	360
4 B	Ø5	21	20	246	328	410	491	887	1034	1181	1328	1478	39
		42	25	491	655	819	983	1297	1515	1730	1945	2164	78
		64	29	737	983	1229	1474	1556	1816	2075	2334	2594	119
		85	32	983	1311	1638	1966	1737	2027	2317	2608	2898	164
		95	34	1106	1474	1843	2212	1812	2116	2416	2720	3021	187
4 B	Ø6	21	<20	246	328	410	491	816	949	1085	1222	1358	39
		53	25	614	819	1024	1229	1328	1546	1768	1990	2212	97
		85	27	983	1311	1638	1966	1638	1911	2184	2457	2730	157
		127	29	1474	1966	2457	2949	1932	2256	2577	2898	3222	240
		182	30	2113	2819	3522	4225	2085	2433	2782	3130	3478	360
6 B	Ø8	21	<20	246	328	410	491	802	935	1068	1201	1334	39
		85	23	983	1311	1638	1966	2079	2427	2771	3119	3464	156
		127	25	1474	1966	2457	2949	2597	3031	3464	3898	4331	235
		170	28	1966	2621	3276	3932	2915	3399	3884	4369	4857	317
		212	36	2457	3276	161	4915	3096	3611	4126	4642	5157	402
6 B	Ø8	21	29	246	328	410	491	782	911	1041	1171	1300	39
		85	30	983	1311	1638	1966	1983	2314	2645	2976	3307	156
		127	31	1474	1966	2457	2949	2423	2826	3229	3631	4038	235
		170	33	1966	2621	3276	3932	2696	3143	3594	4044	4492	317
		212	35	2457	3276	161	4915	2881	3358	3840	4321	4799	402

Locked ΔT 5,4°F on the water side, temperature inlet flow +57,2°F, return flow +62,6°F,
The specified sound level applies to a straight connection without a damper or with a fully open damper, Room attenuation = 4 dB

Heating

Heating function

As the chilled beam quickly can mix the primary air with room the air, REACT Parasol Zenith is ideal for managing both cooling and heating. Heating spaces with air heated above room temperature discharged from the ceiling is a good alternative to conventional radiator heating solutions. The benefits achieved include lower installation costs, simpler installation, and perimeter walls free from piping and radiators.

Regardless of the type of heating system installed it is important to consider the operative temperature in a room. Most people are comfortable when the operative temperature in winter is between 68–75 °F and the optimal comfort requirements are normally met when the room temperature is 72 °F. This means that for a room with a cold perimeter wall, the air temperature must be higher than 72 °F to compensate for the chilling effect of the wall. In new buildings with normal insulated perimeter walls and normally standards of window glazing, the difference between the room air temperature and the operative temperature is small. But for older buildings with worse windows, it may be necessary to raise the air temperature to compensate for the chilling effect. Different operating scenarios can be simulated easily using the Swegon ESBO software to calculate the heat balance where both the room air temperature and operative temperature are specified.

Supplying heated air from the ceiling results in some stratification of the air. With a maximum supply flow temperature of 104 °F, the stratification is non-existent, while at 140 °F it can be around 4 K in the occupied zone. This only applies during the warming-up phase, when the room is unused and there is no internal load. When the room is being used and lighting and people are present, the stratification is reduced or disappears depending on the heating load.

Laboratory studies, computer simulations, and reference projects all show that a good indoor climate will be achieved using the PARASOL Zenith chilled beam whatever the time of year.

Table 4. Pressure drop constant - water, K_{pv}

Unit (ft.)	Function, K_{pv} heating*	
	A2	B2
2	-	1.07
4	-	0.79
6	-	0.67

B2 = Cooling, heating, and supply air, serially connected double-row coil

*K_{pv}-values for the water flow 0,064 CFM

Table 5 – data – heating. Sizing Guide for Parasol Zenith at 0,30 In wg

Unit	Air connection	Airflow	Sound level	Heating capacity, water at ΔT_{mv} (K) F						Pressure drop constant, air
ft.	in.	CFM	dB(A)	18*	27	36	45	54	63	kpl
2 B	Ø5	21	21	495*	826*	1177*	1550*	1935*	2338*	39
		42	26	628*	1038*	1485*	1768	2215	2683	78
		64	30	693*	1157*	1659*	1986	2498	3031	119
		85	33	727*	1218*	1751*	2102	2645	3215	163
		97	36	734*	1232*	1771*	2130	2686	3263	191
2 B	Ø6	21	20	495*	819*	1177*	1956	1939	2341	39
		42	25	628*	1041*	1485*	1775	2218	2686	78
		64	29	700*	1160*	1669*	1993	2509	3038	117
		85	32	741*	1236*	1771*	2123	2672	3242	157
		104	34	751*	1259*	1809*	2171	2737	3324	194
4 B	Ø5	21	<20	1181*	1464*	2174*	2922	3604	4300	39
		42	25	1195*	1700	2577	3529	4580	5625	78
		64	27	1393*	2003	3041	4164	5416	6502	119
		85	29	1495*	2147	3232	4410	5683	6812	164
		95	30	1546*	2232	3369	4707	5898	7079	187
4 B	Ø6	21	<20	563*	986*	1440*	1877*	2331*	2795*	39
		53	23	1242*	1775	2662	3614	4741	5693	97
		85	25	1502*	2143	3188	4317	5526	6625	157
		127	28	1707*	2444	3618	4973	6160	7379	240
		182	36	1761*	2536	3768	5160	6403	7683	360
6 B	Ø8	21	29	478*	802*	1140*	1276*	1860*	2236*	39
		85	30	1911*	3242	4683	6195	7287	9454	156
		127	31	2232*	3771	5427	7167	8259	10921	235
		170	33	2413*	4096	5904	7833	8908	11945	317
		212	35	2638*	4427	6348	8396	9420	12730	402

Locked ΔT 18°F on the waterside, temperature room +68°F.

**) ΔT 9°F on the waterside*

The specified sound level applies to a straight connection without a damper or with a fully open damper. Room attenuation = 4 dB

Natural attenuation and end reflection

Natural attenuation ΔL (dB) including end reflection.

Table 6. Natural attenuation ΔL (dB)
REACT Parasol Zenith 4 ft. Ø5

	Octave band (Hz)							
K-factor	63	125	250	500	1k	2k	4k	8k
0	20	19	16	16	13	15	20	26
1	19	16	8	6	7	8	12	19
3	19	15	7	6	6	7	10	16
4	19	14	7	6	6	6	9	15
5.8	17	14	7	5	6	5	9	14

Table 7. Natural attenuation ΔL (dB)
REACT Parasol Zenith 4 ft. Ø6

	Octave band (Hz)							
K-factor	63	125	250	500	1k	2k	4k	8k
0	21	21	20	16	13	16	23	24
1	21	18	9	8	8	9	15	20
3	18	16	9	5	6	6	11	15
4	19	14	9	6	5	5	10	13
5.8	15	11	6	4	5	5	10	13

Table 8. Natural attenuation ΔL (dB)
REACT Parasol Zenith 6 ft. Ø5

	Octave band (Hz)							
K-factor	63	125	250	500	1k	2k	4k	8k
0	22	18	11	11	11	13	18	24
2	20	16	7	7	7	7	11	18
4	19	14	7	6	6	6	9	16
5.6	20	15	6	6	6	6	9	15

Table 9. Natural attenuation ΔL (dB)
REACT Parasol Zenith 6 ft. Ø6

	Octave band (Hz)							
K-factor	63	125	250	500	1k	2k	4k	8k
0	18	16	13	11	12	13	20	22
2	17	13	8	6	7	7	12	18
4	16	13	7	5	6	6	10	16
6	18	13	7	5	5	5	9	15
8	17	13	7	4	5	4	9	14
11	15	13	7	4	5	4	9	13

Table 10. Natural attenuation ΔL (dB)
REACT Parasol Zenith 8 ft. Ø8

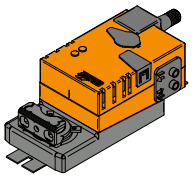
	Octave band (Hz)							
K-factor	63	125	250	500	1k	2k	4k	8k
0	19	15	11	7	7	9	15	19
3	18	14	10	6	6	6	13	17
7	18	14	10	5	5	5	1	16
11	18	14	10	5	5	5	9	15
14.6	18	14	9	5	4	4	9	13

Optional extras and accessories

Factory-fitted optional extras

The optional extras and accessories below can be ordered factory-fitted on the product, and will then be connected to the terminal block

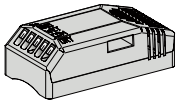
Actuator, BELIMO LMV
Volumetric flow regulator VAV-Compact, 5 Nm, AC/DC 24 V, BACnet MS/TP, Modbus RTU, MP-Bus, IP54



Factory-fitted accessories

Different types of actuators
Do you need a different type of actuator? Swegon has installed a number of different actuators in its products. Get in touch and we will be happy to help you with your particular project.

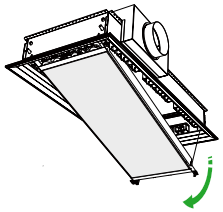
Condensation sensor SYST PCS



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.
Compatible with LUNA.

Fold-out coil



REACT Parasol Zenith can be ordered as a variant with fold-out coil for easy access and cleaning of the complete coil. REACT Parasol Zenith with fold-out coil is well suited for use in rooms where stringent demands are placed on hygiene. The accessory requires the use of flexible hose connections on the water side.

Loose accessories

Controller LUNA RC

Swegon's room controller for air and waterborne indoor climate systems

LUNA RC is a versatile room controller for regulating the temperature in individual rooms and for control applications in respect of variable air volume (VAV)

LUNA RC, available in two variants:

- LUNA RC TEMP-MB room controller in standard version
- LUNA RC CO_2-TEMP-MB room controller with built-in CO_2 sensor

For more information about the LUNA RC control equipment, see the separate product data sheet on www.swegon.com.

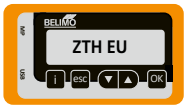
Controller LUNA RE

Swegon's room controller LUNA RE MB for air and waterborne indoor climate systems.

LUNA RE MB for regulating the room temperature. Set point value is set on the controller which is mounted on the wall.

For more information about the LUNA RE MB control equipment, see the separate product data sheet on www.swegon.com

Commissioning tool ZTH EU

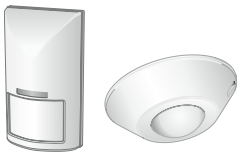


Commissioning/service tool for e.g. setting the air flows and BUS parameters.

Cable, ZK1-GEN

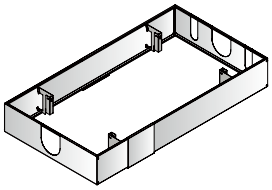
Cable for connecting between actuator and commissioning/service tool.

DETECT Occupancy – Occupancy detector



DETECT O V110 – For wall and corner installation
DETECT O T360 – For ceiling installation.
For more information about DETECT O, see the separate product data sheet on www.swegon.com.

Design kit - PARASOL Z DK

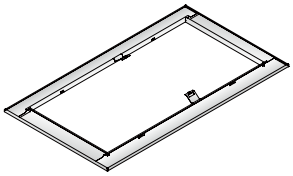


Design kit for stylish design in case of suspended mounting. Consists of brackets, screws and all four side covers, which are easily assembled.

The design kit is available for cooling and cooling/heating as well as for air connection on all four sides and for dimensions 5, 6 and 8 in..

Note! The design kit is only available in sizes: 592, 1192 and 1792 mm.

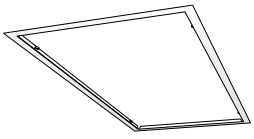
Coanda frame - PARASOL Z CF



Coanda frame for stylish design in case of suspended mounting. Consists of four parts, which are easily assembled to create a frame with the enclosed screws.

Note! The coanda frame is only available in sizes: 592, 1192 and 1792 mm.

Drywall ceiling frame Parasol c T-FPB

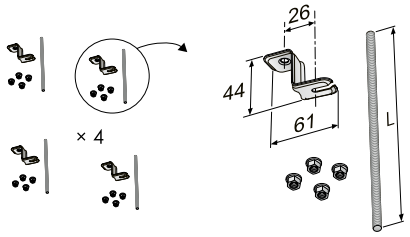


Mounting frame for neat installation of Parasol Zenith in drywall ceilings.

Available in three sizes:
603 x 603 mm, 2 ft.
1213 x 603 mm, 4 ft.
1823 x 603 mm, 6 ft.

Assembly fitting, SYST MS M8

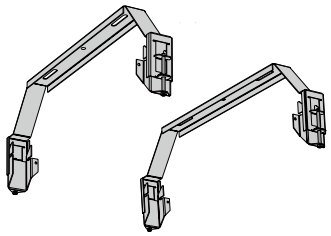
For installation use the assembly fitting containing threaded rods, ceiling brackets, and nuts to all four mounting brackets. Also available with threaded drop rods and thread locks.



Assembly fitting, PARASOL Z QUICK SUSPENSION KIT

The kit consists of 2 fixed brackets to suspend Parasol Zenith.

The fixed brackets are fastened to the ceiling, after which the product can be pushed into place without the use of tools. The brackets also feature an integrated fine adjustment of approx. 2 inches in height.



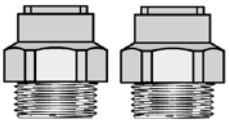
Flexible connection hoses, SYST FH F50

Flexible hoses, Length: 6, 12, 18, 24 and 36 inch.
Quick fit coupling (push-on ø12 or 15 mm against pipe on one end and 1/2" NPT male coupling on the other end.
SYST FH-F50-6in.-12-1/2in. NPT, SYST FH-F50-12in.-12-1/2in. NPT
SYST FH-F50-12in.-15-1/2in. NPT, SYST FH-F50-18in.-12-1/2in. NPT
SYST FH-F50-18in.-15-1/2in. NPT, SYST FH-F50-24in.-12-1/2in. NPT
SYST FH-F50-24in.-15-1/2in. NPT, SYST FH-F50-36in.-12-1/2in. NPT

NPT-connection, SYST CS

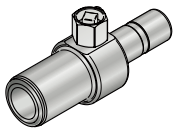
Nominal pipe thread connection, available in two sizes.

Ø 12mm and Ø 15mm to "1/2" NPT



Bleed nipple SYST AR-12 and SYST AR-15

Nipple for venting the water circuit. Equipped with push-on connector adapted for installation with flexible connection hose F50.



Reduction, air connection – SYST AD2

SYST AD2 is used as a reduction between the PARASOL Zenith with air connection Ø160 mm down to 150 mm (Ø6.3 into 5.9 in.), to suit the duct system.

Dimensions and weight

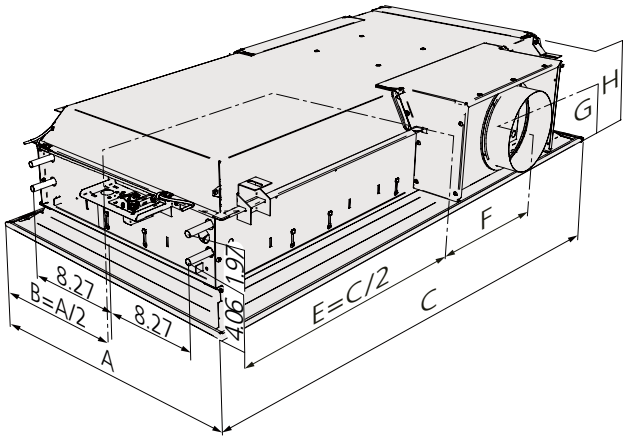


Figure 26. Dimensional drawing - long side connection (the length 4 ft.) with air connection on side 2 is shown in the example).

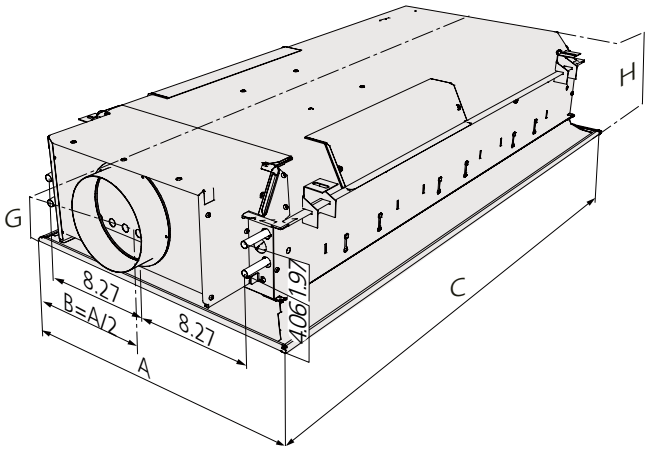


Figure 26. Dimensional drawing - short side connection (the length 4 ft.) with air connection on side 1 is shown in the example).

Table 12. Dimensions

Length, 2 ft.

Dimensions (in.)							
A	B	C	ØD*	E	F	G*	H*
23.7	11.9	23.7	5 in / 6 in	11.9	7	5.39/6.02	8.66/9.84

** Dimensions refer to products with air connection ø5 or ø6*

Length, 4 ft.

Dimensions (in.)							
A	B	C	ØD*	E	F	G*	H*
23.7	11.9	47.8	5 in / 6 in	23.9	7	5.39/6.02	8.66/9.84

** Dimensions refer to products with air connection ø5 or ø6*

Length, 6 ft.

Dimensions (in.)							
A	B	C	ØD	E	F	G	H
23.7	11.9	71.8	8	35.9	18.8	6.8	11.4

Table 13. Weight

Length, 2 ft.

Length	Coil type	Inlet	Dry weight	Water volume, cooling	Water volume, heating
ft.		Ø in.	lb	gal	gal
2	A	5	28.4	4.1	
2	B	5	28.7	3.2	1.3
2	A	6	29.8	4.1	
2	B	6	30	3.2	1.3

Length, 4 ft.

Length	Coil type	Dim.	Dry weight	Water volume cooling	Water volume heating
ft.		Ø in.	lb	gal	gal
4	A	5	52	9.1	
4	B	5	52	6.8	2.6
4	A	6	53.8	9.1	
4	B	6	53.8	6.8	2.6

Length 6 ft.

Length	Coil type	Dim.	Dry weight	Water volume cooling	Water volume, heating
ft.		Ø in.	lb	gal	gal
6	A	8	78.7	14.4	
6	B	8	78.7	10.2	4.2

Weights above are excl.:
Control plate (0.265 lb)

Specification

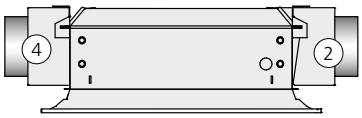
Contractor demarcation

Swegon's delivery ends at the connection points for water and air and the connection of any factory-fitted actuators. (See figures 22-27.)

- The plumbing contractor connects the water to the plain pipe ends fills/flushes the system, bleeds it, and tests the pressure.
  The ventilation contractor connects the supply air duct to the product air connection sleeves.
- If factory-fitted actuators are chosen, the electrical contractor connects the actuators' pinned cable ends to the room controller 24 V AC/DC.

Available to order

Size	Single-module unit: 2 ft. 603 x 603 mm, (23.74x23.74 in.) Double module unit: 4 ft. 1213 x 603 mm, (47.76x23.74 in.) Three-module unit: 6 ft. 1823 x 603 mm, (71.77x23.7 in.) The tolerance is ±0.08 in.
Function	The units can be ordered in various functional versions: A = Cooling and supply air (size 2, 4, and 6 ft.) B = Cooling, heating, and supply air (size 2, 4, and 6 ft.)
ADC	Factory-fitted ADC supplied as standard
Size of the connection sleeve	Ø125 mm/5 in. (size 2 and 4 ft.) Ø160 mm/6 in. (size 2 and 4 ft.) Ø200 mm/8 in. (size 6 ft.)
Positioning of connection sleeves	Connection on the short side 1 = Air and water on the same side 3 = Air and water on the opposite side Connection on the long side 2 = Connection on the right-hand side* 4 = Connection on the left-hand side*
Color	The units are supplied finished in Swegon's standard shade of white, RAL 9003, gloss ratio 30 ± 6%



** Seen from the short side with water connections*

Ordering key - Product

PARASOL Zenith 600 (2 ft.)

REACT Parasol Zenith	e	aaa-	b-	ccc-	1
Version:					
Size: 603 = 603 x 603 mm, (23.74x23.74 in.)					
Function: A = Cooling, and supply air (serially connected double-row coil) B = Cooling, heating, and supply air (serially connected double-row coil)					
Dimensions connection sleeves: 125 = Ø4.92 in. connection, product height 8.66 in. 160 = Ø6.30 in. connection, product height 9.84 in.					
Positioning of connection sleeves: 1 = Short side same side as the water connection 3 = Short side opposite the water connection					

PARASOL Zenith 1800 (6 ft.)

REACT Parasol Zenith	e	aaaa-	b-	200-	d
Version:					
Size: 1823 = 1823 x 603 mm, (71.77x23.74 in.)					
Function: A = Cooling and supply air (serially connected double-row coil) B = Cooling, heating and supply air (serially connected double-row coil)					
Dimensions connection sleeves: 200 = Ø7.87 in. connection, product height 11.4 in.					
Positioning of connection sleeves: 1 = Short side the same side as the water connection 2 = Long side, right side of the water connection 3 = Short side, opposite side as the water connection 4 = Long side, left side of the water connection					

PARASOL Zenith 1200 (4 ft.)

REACT Parasol Zenith	e	aaaa-	b-	ccc-	d
Version:					
Size: 1213 = 1213 x 603 mm, (47.76x23.74 in.)					
Function: A = Cooling and supply air, (serially connected double-row coil) B = Cooling, heating and supply air (serially connected double-row coil)					
Dimensions connection sleeves: 125 = Ø4.92 in. connection, product height 8.66 in. 160 = Ø6.30 in. connection, product height 9.84 in.					
Positioning of connection sleeves: 1 = Short side the same side as the water connection 2 = Long side, right side of the water connection 3 = Short side, opposite side as the water connection 4 = Long side, left side of the water connection					