ADAPT Parasol

Energy-saving comfort module for demand-controlled ventilation

QUICK FACTS

- Comfort modules for demand-controlled ventilation.
- Energy-efficient operation since the room is ventilated, heated and cooled exactly as called for by the load, neither more nor less.
- Highest possible comfort with provision for individual control on the product or at room level.
- Energy-efficient water-based cooling and heating.
- Draft-free indoor climate, 4-way air distribution and Swegon's ADC (Anti Draft Control) provide maximum comfort and flexibility both today and for future needs.
- Simple installation, commissioning and maintenance. Complete product with all components and accessories installed at the factory.

KEY FIGURES

Primary airflow:	Up to 180 cfm
Pressure range:	0.2 to 0.6 inWG
Total cooling capacity:	Up to 7000 Btuh
Heating capacity:	Up to 9200 Btuh
Size:	24″ module: 24 x 24 in. 48″ module: 48 x 24 in.

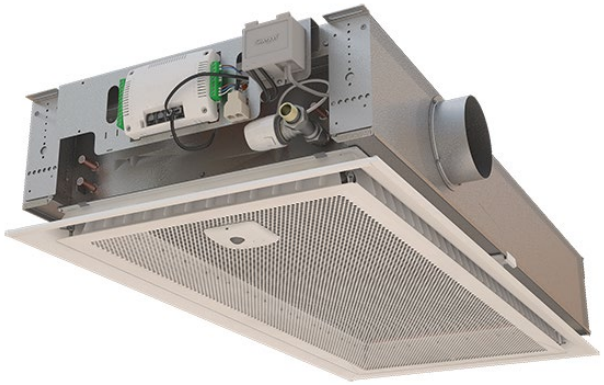
Contents

Technical description

ADAPT Parasol comfort module

The ADAPT Parasol is based on a standard Parasol but is equipped with functions for demand control of the indoor climate. Available as single and two-module units:

Sizes:	24 x 24 in or 48 x 24 in
Modules:	Supply air and cooling Supply air, cooling and heating (water)
Installation:	Flush-mounted in false ceilings. Option for surface mounting frame for plaster ceilings.



Function

The essential function of the comfort modules is closely related to that of climate beams. The major difference is that comfort modules distribute air in four directions instead of two. This maximizes the area for the induction of room air with the supply air which enables the modules to deliver high capacity without occupying more ceiling space than necessary. The comfort modules are also optimized to quickly mix the conditioned air with the room which provides better comfort in the room. In heating applications, this technique also ensures heat is conveyed into the room with more comfortable results.

Demand-controlled indoor climate

Demand-controlled ventilation involves ventilating and conditioning the air in a room precisely to meet our needs – no more and no less. The potential for savings is substantial, especially in buildings where there is considerable variation between low and high load conditions in rooms and during times when there are few or no occupants—which is the case in many buildings. Offices often have an occupancy rate of less than 50%!

The ADAPT Parasol combines the best attributes from two worlds – demand-controlled ventilation with all its potential for savings combined with the comfort module's high capacity and performance for air conditioning rooms. All this packaged in one compact unit that is simple to install.

Flexibility

The easily adjustable nozzles in combination with Swegon's ADC (Anti Draft Control) offer maximum flexibility for future changes in the room layout. All sides of the unit can be set independently of one another and this enables the comfort module to distribute more air or less air to each of the four sides and discharge the air in the preferred direction in the room.

Draft-fee indoor climate

The ADAPT Parasol distributes air in four directions at low air velocity. The low air velocity is created by distributing cooled air over a large area. The special design of the outlet creates a turbulent flow enabling the supply air to be quickly mixed with the room air.

The ADAPT Parasol is available in the following coil/heat exchanger variants:

Variant A:	Supply air and water-based cooling
Variant B:	Supply air, water-based cooling and heating.

Design

The face plate of the ADAPT Parasol is available in three different perforation patterns. As standard, the face plate has round perforations arranged in a triangular pattern; however, other optional patterns are available to special order.

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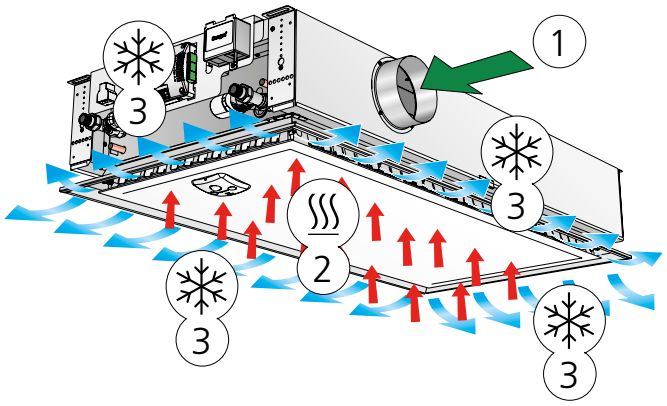


Figure 1. Variant A: Cooling and supply air operation
1 = Primary air
2 = Induced room air
3 = Primary air mixed with chilled room air

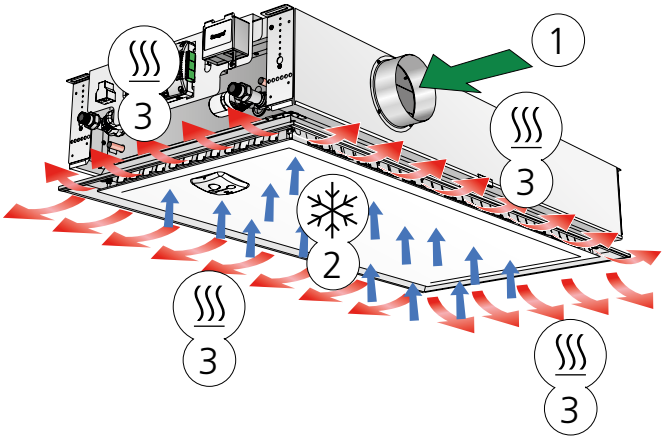


Figure 2. Variant B: Heating and supply air operation (also includes cooling operation)
1 = Primary air
2 = Induced room air
3 = Primary air mixed with heated room air

Compact and intelligent unit

The ADAPT Parasol is supplied as a compact and intelligent unit in with the damper and control equipment integrated into the product. Only the power supply and optional connection to the Building Automation System need to be wired from the module.

The sensor module, a vital part of the product, is a combination occupancy and temperature sensor. Its default location is within the face plate, but it can also be mounted on a wall.

The intelligent control system offers numerous in-the-field adjustments. Numerous adaptations can be made, contributing to a very flexible and future-proof product.

As an example, it is noteworthy that all the units can operate as master or slave, since they can be adjusted simply by changing a parameter together with repositioning an RJ cable. This means that in the event an open-plan office, for example, is divided up into office cells, the extra work involved in adapting the product to the new operating conditions is minimized.

ADAPT Parasol PlusFlow

If you need both high cooling capacity and high airflows, then the ADAPT Parasol PF is the right choice. ADAPT Parasol PF installed in a conference room, can reduce the number of installed products by 50%.

The module can handle large airflows and at the same time has the same high cooling and heating capacity as a standard ADAPT Parasol, with high level of comfort maintained in the room, of course.

High capacity

With its high capacity, the ADAPT Parasol utilizes 40 – 50% less ceiling area for handling the cooling energy demand in a normal office, compared with a traditional climate beam.

Simple to adjust

By means of built-in nozzle regulation with numerous possible settings, the ADAPT Parasol offers optimum comfort and can be easily adapted to meet a change in room size or operations conducted inside the premises. The comfort module can be set so that different air volumes are diffused on each side and can be set for both high and low airflows.

Range of Application

The ADAPT Parasol is ideal as a standard application in the following typical premises:

- Offices and conference rooms
- Classrooms
- Hotels
- Restaurants
- Hospitals
- Shops
- Shopping centers

With its numerous possible settings, the functions of the ADAPT Parasol can easily be adapted to changes in the design of the premises.

Simple to install

The ADAPT Parasol's small compact units are designed to fit the most common modular ceiling dimensions and this makes them simple to install. The small dimensions offer benefits in handling, especially at the building site, with easier installation and reduced health and safety issues.

Comfort and capacity

One of the advantages with the ADAPT Parasol is that the pressure in the nozzles can be kept constant, and this means controlled throw lengths, high capacity and maintained Coanda effect of the air regardless of the operating conditions.

A Zone damper is used for keeping the pressure constant in the zone and in each ADAPT Parasol module.

All components in the product can be installed directly from the factory

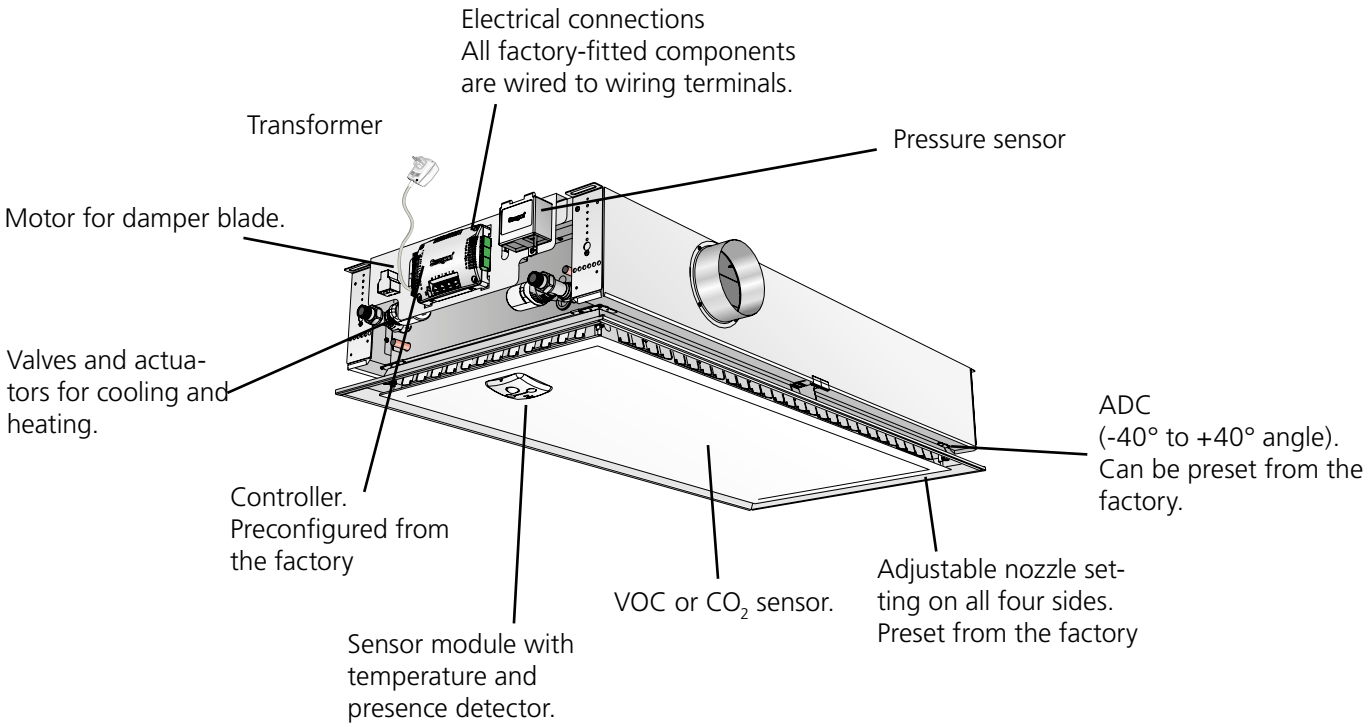
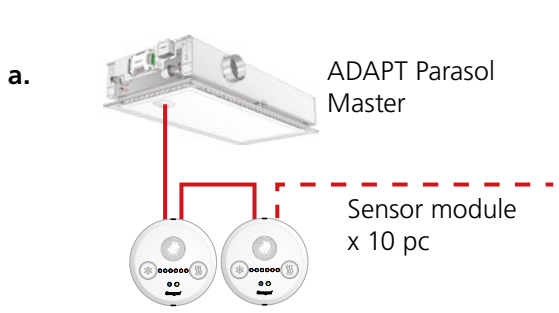
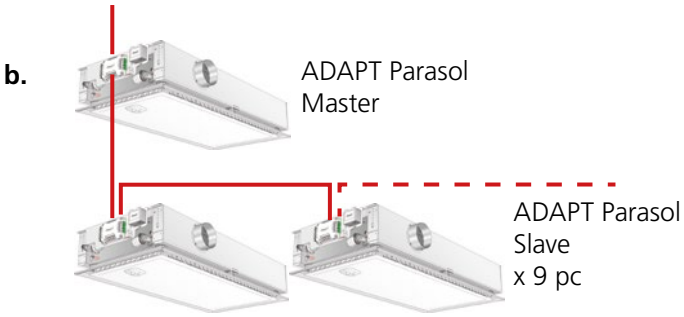


Figure 3. All components in the product can be installed directly from the factory.
** temperature measurement from the sensor module mounted in the face-plate is not recommended in the case of heating.*



To obtain full coverage of occupancy detection, up to 10 sensor modules can be connected to each ADAPT Parasol (in total on Master and possible Slave units)

Figure 4 a. ADAPT Parasol master with extra sensor modules



Up to 9 ADAPT Parasol slaves can be connected to each master.

4 b. ADAPT Parasol master with slaves

The ECOPulse function

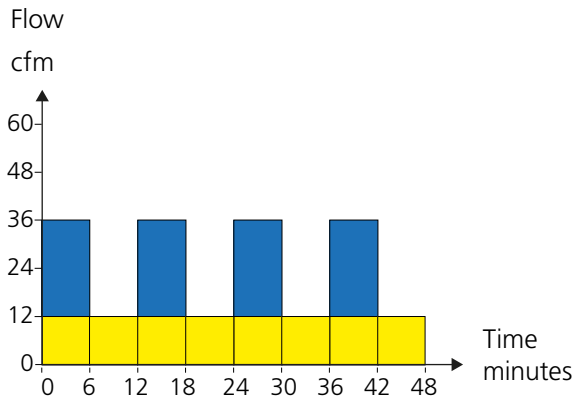
The ADAPT Parasol has 2 basic ventilation flows, min. & max. When the ECOPulse (standard) function has been selected, the controller calculates the amount of time the damper will be closed (min. flow) and open (max. flow), to obtain the required occupancy flow.

The ECOPulse function guarantees that the module always delivers highest possible capacity.

Example:
Max. airflow 36 cfm
Required occupied flow 24 cfm
Min. flow 12 cfm

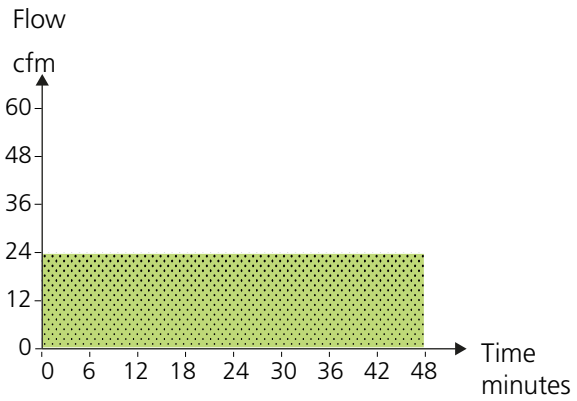
In this example, the allocation of time at closed (min. flow) and open (max. flow) will be approximately 50/50 as the required occupied flow is halfway between the min. and max.

The sequence consists of periods (minimum of 6 minutes) that always begin with a period with max. flow, which is then followed by the right number of periods with min. flow to obtain the correct air change rate.



When the system has operated for 48 minutes, it has fulfilled a complete sequence. Then it begins a new sequence that lasts another 48 minutes provided no change in demand has occurred (temperature, CO_2, occupancy etc).

If we now distribute the yellow and blue airflows as a mean value over time, we reach the required flow of 24 cfm.



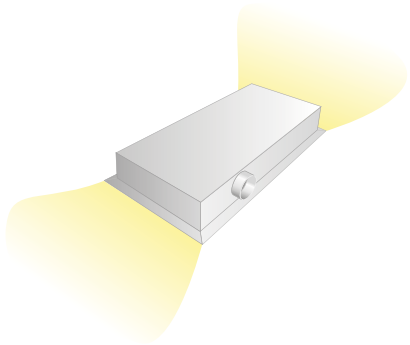


Figure 5. Min. flow, unoccupied in the room.

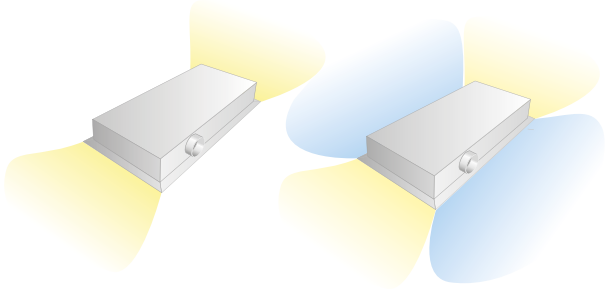


Figure 6. Occupied flow, a combination of min. and max. flow.

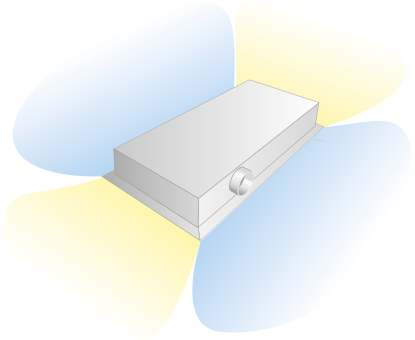


Figure 7. Max. flow when the temperature or CO_2 content is too high

Basic adjustment of nozzles

In the example above, the nozzles on the short side can be configured so that at a certain pressure they will deliver 12 cfm min. flow, which also is the unit's unoccupied flow.

The max. flow is obtainable by adjusting the nozzles on the long side so that the four sides together will deliver 36 cfm required max. flow.

By using Swegon ProSelect, the sizing program that is available at www.swegon.com, you can test various variants and combinations of nozzle settings on the sides to save as much air as possible in the no occupancy mode combined with always obtaining a sufficiently good climate in the room in the occupied mode.

Control functions

Regardless of which ADAPT Parasol model is ordered and how this module is configured from the beginning, you can simply choose between the following three operating modes by making a selection in the software:

ECOPulse

The ECOPulse function enables the ADAPT Parasol to alternate between min. and max. mode in order to obtain the required air change rate. See the more detailed description on page 6.

Variable

If the Variable function is selected, the nozzle configuration still sets the limits for min. and max. flows just as for the ECOPulse function, but in this case the integrated damper delivers the exact air flow all the time.

When selecting the Variable function, all airflows between min. and max. will give a lower capacity compared with the ECOPulse function.

Example: Unoccupied flow approx. 10 cfm, required occupied flow 40 cfm and max. flow 70 cfm.

In the occupied case, the max. flow will be utilized only if the temperature or air quantity requires this, and when these requirements have been met, the flow will decrease back to the occupied flow again.

2-Step

Here, the min. and max. flows are used just as before, but the max. flow is the same as the occupied flow. So, if the same nozzle setting as the one in the Variable example above is used.

Unoccupied = min. flow 10 cfm.

Occupied = max. flow = 70 cfm.

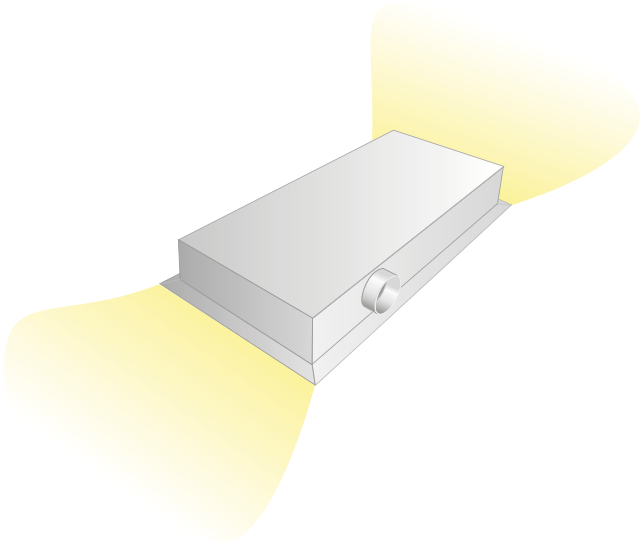


Figure 8. Unoccupied/min. flow for all the control functions

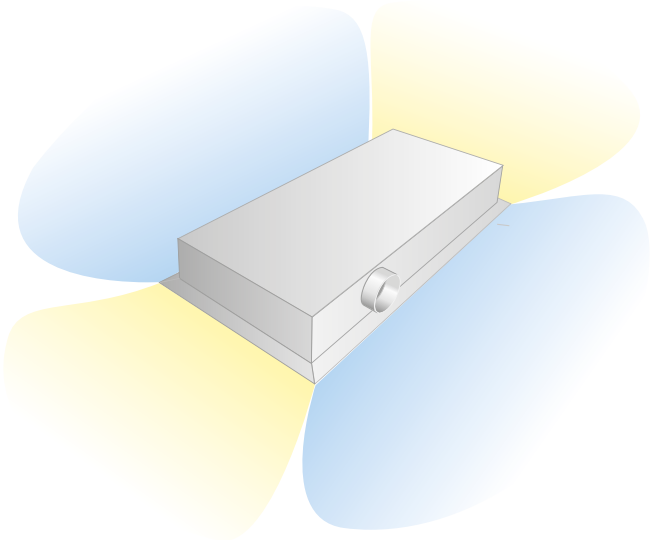


Figure 9. Occupied/max. flow for 2Step. For the Variable control function, the long sides variably discharge air between the min., occupied and max. ventilation flows.

Operating mode

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

Operating modes

There are numerous functions in the ADAPT Parasol:

- Occupied mode.
- Unoccupied mode.
- Stand-by, idle mode.
- Commissioning.

Occupied mode

When the controller receives an Occupied signal from the occupancy sensor, the chilled or hot water valve actuator opens or closes as appropriate to maintain temperature setpoint. Airflow is controlled to the occupied flow setpoint, but may be increased by signals from the room temperature sensor, or optional condensation sensors, temperature sensors, window contacts and air quality sensors.

Unoccupied mode

When the controller receives an Unoccupied signal from the occupancy sensor, the water valve actuators are controlled to regulate the chilled water flow or hot water flow but with a greater room temperature setpoint deadband than when in Occupied mode. Airflow is controlled to the min. flow setpoint.

Stand-by, idle mode

When the controller receives an Open signal from the window/door sensor (by others) the controller switches to the Stand-by mode. During Stand-by mode, the valve actuators are opened or closed to maintain room temperature above 50°F (frost protection). When the controller receives a Closed signal from the window/door sensor (by others) the controller switches to the Occupied mode.

Commissioning

The water valves ship in a "First open" mode, whereby the water valves remain open during installation, to simplify filling, pressure-testing and venting the water system. The function will be automatically deactivated after approx. 6 minutes while the system is energized.

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

Further particulars of the commissioning mode can be read in the mounting instruction for ADAPT Parasol.

Functions

Exercising of valves
Water valves are exercised regularly by means of automatic control equipment to prevent them from seizing or becoming stuck. During the exercising process, all the valves wired to the controller open to the max. setting for 6 minutes and then close. The valves of the cooling system are exercised first; after that the valves of the heating system are exercised.

Frost protection
Heating operation begins whenever the room temperature falls below 50°F to prevent the risk of damage that otherwise could occur due to freezing.

Change over
The function involves the use of only one valve actuator wired to the cooling output terminal, thus allowing for 2-pipe heating and cooling. The valve actuator controls both the heating and the chilled water, which is transported in the same pipe. An optional external temp. sensor measures the pipe temperature.

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

Nozzle setting

The unique built-in nozzle control in the ADAPT Parasol makes it possible to individually set each one of the four sides. Depending on the unit's location and the room's primary air requirement, the primary air can be divided between the four sides to achieve symmetric, or asymmetric flow. The volume and direction of the airflow can be easily optimized using the Swegon ProSelect sizing program that can be used at www.swegon.com.

The required nozzle setting is factory-set, but may be easily adjusted in the field (fig 14.)

Specific nozzle settings

To specify nozzle settings, always begin from the side where the water pipes are located. From there, proceed in counter-clockwise direction and specify side after side, see Figures 10 and 11. Units can be ordered with nozzles factory-preset (this does not apply to units held in stock).

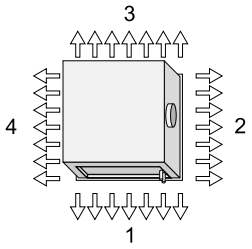


Figure 10. Top view, sides 1-4 ADAPT Parasol 24 in.

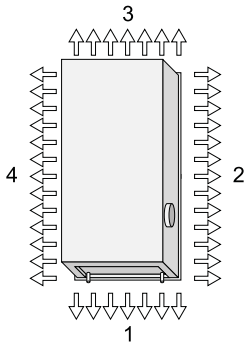


Figure 11. Top view, sides 1-4 ADAPT Parasol 48 in.

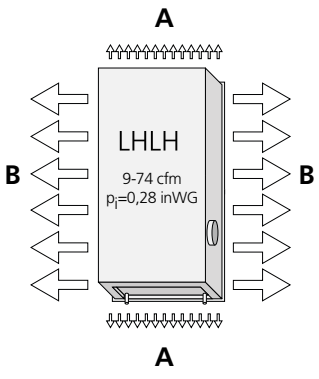


Figure 12. Example 1. A = 4.5 cfm, B = 32.5 cfm

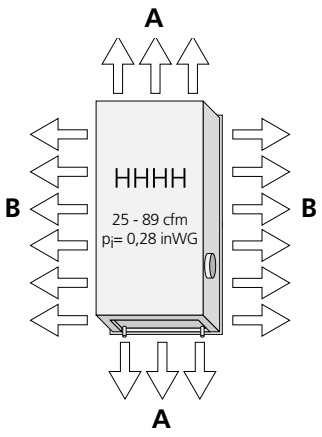


Figure 13. Example 2. A = 12.5 cfm, B = 32 cfm

K-factor

Each nozzle setting has a specific K-factor. A total K-factor for the unit can be determined by adding together the K-factors for the nozzle settings on each side. The relevant K-factor for optimized nozzle setting can also be obtained in ProSelect.

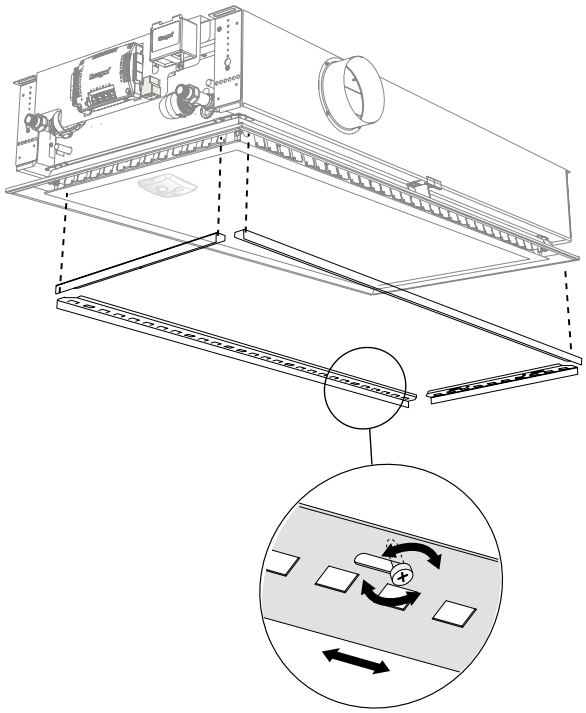


Figure 14. Adjusting the nozzle setting

Example 1:
Nozzle setting LHLH produces the lowest possible Unoccupied flow (sides 1 + 3 open). This produces a min. flow/ No Occupancy flow of 9 cfm and a max. flow of 74 cfm at pi = 0.28 inWG

Example 2:
If it is instead more important to obtain the highest possible max. flow/capacity, the nozzles should be set to the HHHH position, i.e. fully open on all sides. A higher max. flow will then be obtained, however the Unoccupied flow will consequently also be slightly higher.

These adjustments are only different settings on the same physical product which makes the unit very flexible and adaptable, particularly together with the integrated software.

K-factors for each side can be obtained from the installation instructions on the Internet; however, the easiest way to do this is in ProSelect where you can quickly test various variants.

The sensor module

The sensor module consists of a combination occupancy and temperature sensor.

This module is mounted as standard in the face plate on the ADAPT Parasol but it can also be ordered as an accessory for wall mounting, and in that case either recessed in a standard electrical component box or surface-mounted on the wall.

By pressing the appropriate buttons on the sensor module, the room temperature can be read, the unit can be set to Commissioning Mode, and alarms can be read.

During normal operation, 6 LEDs indicate operating mode, and may be used to adjust the temperature setpoint. If an error occurs, the current alarm is shown as a series of flashes that correlate to an alarm list (see IOM instruction for details.)

The floor area covered by the presence detector is approx. 280 ft2 if it is mounted at a height of 9 ft above the floor and in parallel with the floor.

Basic setting for temperature adjustment

To lower the temperature setpoint, press down the left-hand button.

To raise the temperature setpoint, press down the right-hand button.

Each diode corresponds to 2°F degree increase or decrease of the set point.

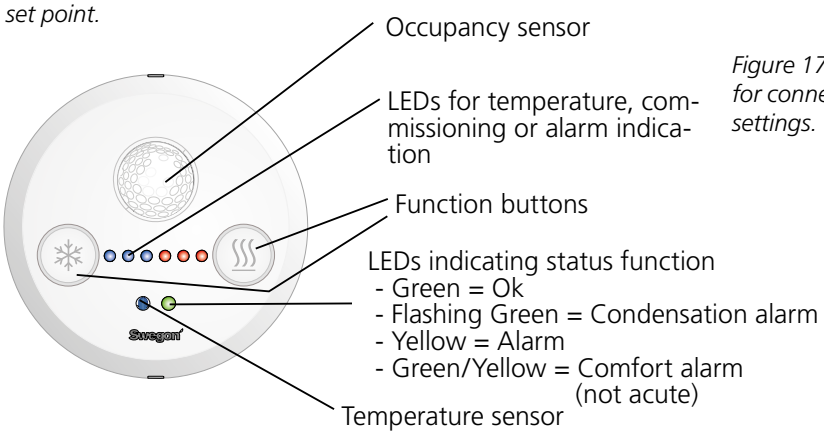


Figure 15. Sensor module viewed from the front

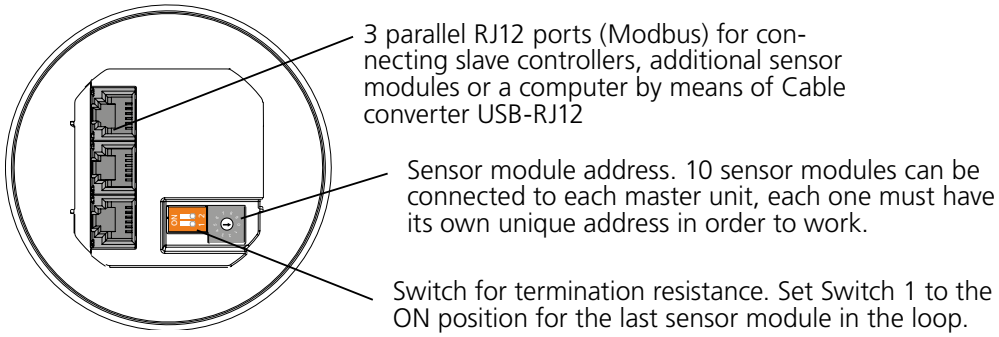


Figure 16. Sensor module viewed from rear

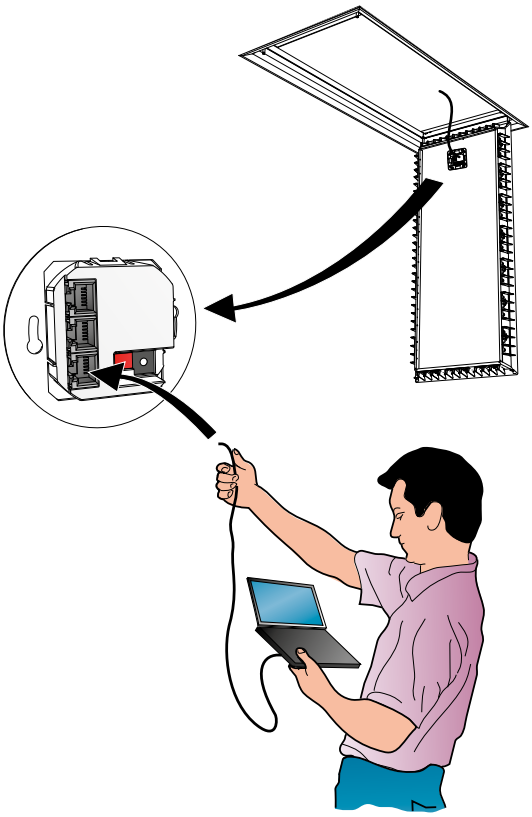


Figure 17. CABLE CONVERTER USB-RJ12 (RS485) can be used for connecting a computer to the module for entering software settings.

Typical installation

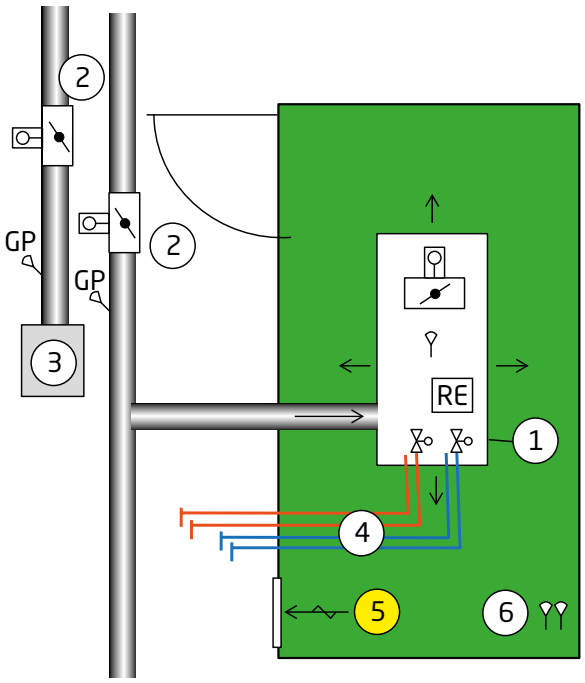


Figure 18. Typical room 1 shows ADAPT Parasol in an office. Return air leaves the room via a transfer air grille (balance at zone level)

1. ADAPT Parasol comfort module with supply air, cooling and heating.
   - Pressure sensor
   - Communication unit/controller
   - Damper with motor.
2. Control Zone damper keeping the duct pressure constant by others or optional by Swegon
3. Extract air diffuser
4. Chilled water and hot water
5. Return air via transfer air grille to the corridor
6. External sensor module (occupancy and temperature sensor)

In this case the ADAPT Parasol is used for both cooling and heating.

Due to the heating, the sensor module is placed on wall instead of integrated in face plate.

ADC

All the comfort modules are supplied with ADC air deflectors.
ADC stands for Anti Draft Control, which enables adjustment of the air diffusion pattern, in order to prevent draft. A number of ADC sections with four 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 offers enormous throw length and direction flexibility and can be easily adjusted without affecting the sound level or the static pressure.

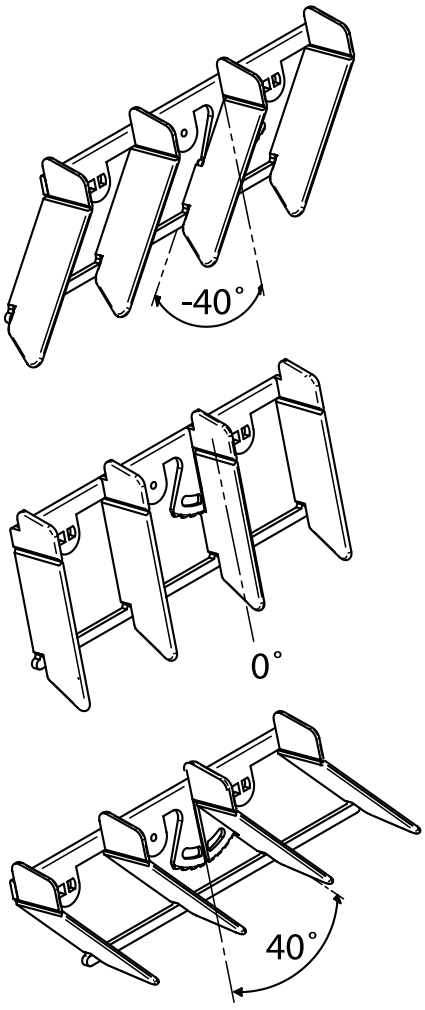


Figure 19. ADC, setting range from -40° to +40° in increments of 10°

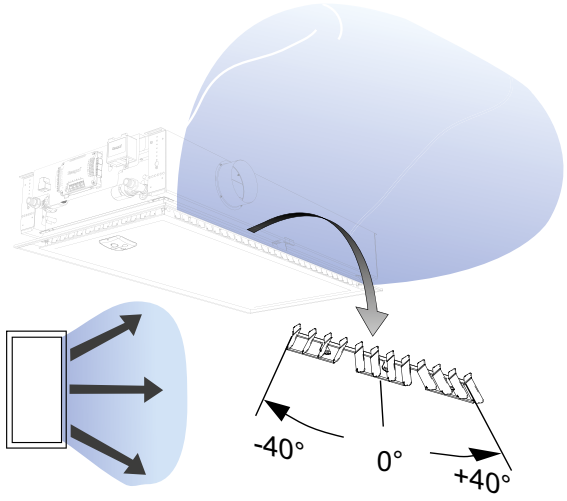


Figure 20. Possible settings for the ADC, Fan-shape

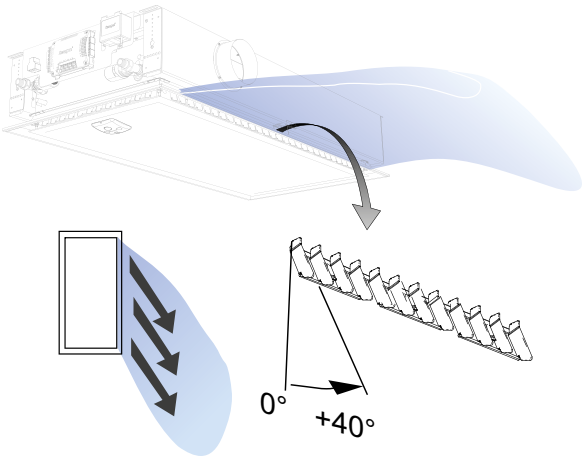


Figure 21. Possible settings for the ADC, X-shape

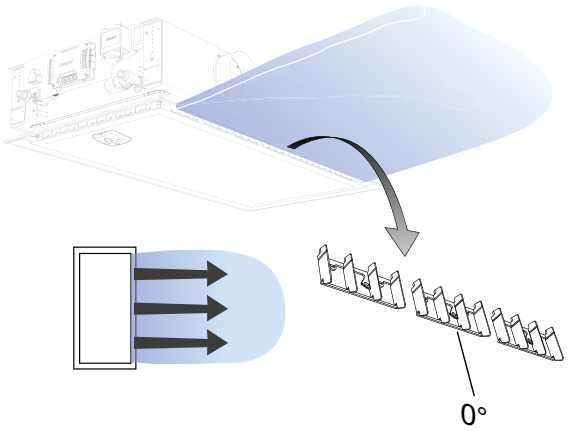


Figure 22. Possible settings for the ADC, Straight airflow setting

Installation

Recommended types of ceiling

The ADAPT Parasol is designed to fit in most T-Bar and Clip-in type ceiling systems in terms of length and width. To guarantee a quality finish in T-Bar ceiling system, we recommend T profiled sections with a width of 0.9 in.

Suspension

The ADAPT Parasol has four mounting brackets for suspension, and are installed using a threaded rod in each mounting bracket (Figure 26). A double threaded rod with a thread lock should be used if there is substantial distance between the overhead slab and the unit.

If the unit is to be mounted directly against the ceiling, use an 8 in. long threaded rod.

The threaded rod, assembly piece SYST MS M8 (Figure 27), may be ordered as an optional accessory.

Connection dimensions

Water	
With factory-installed valves:	
Cooling	Male threads, NPT (1/2")
Heating	Male threads, NPT (1/2")
Air	
Air connection piece, standard variant	4.92 in OD
variant PF	6.30 in OD (5.9" adapter is option)

To connect air

ADAPT Parasol is supplied as standard with an open air the duct connection on the right-hand side (viewed from side 1, where the water is connected).

A flanged duct connection piece is provided with the unit for connection to the primary air duct (see Figure 24). A cover is factory-installed to the left-hand air connection, but the cover and connection flange may be easily reversed if necessary to facilitate ducting.

To connect the water pipes

Connect the water pipes to the products male threaded NPT ½" connections.

Flexible hoses

Flexible hoses for connecting water supply and return may be ordered as an optional accessory in a variety of configurations.

Condensation-free cooling energy

Since the comfort modules have to be designed to operate without condensation, no drainage system is required.

ETL listed

ADAPT Parasol has been tested and is compliant to the ETL standard.

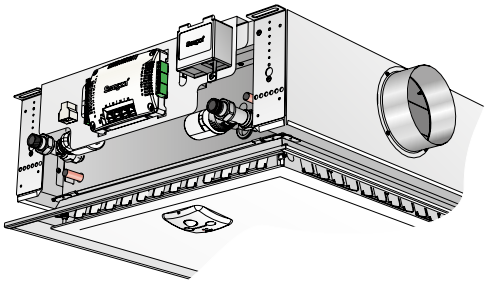


Figure 23. Water connection with factory-fitted valves (An ADAPT Parasol 48 in. is shown in the example)

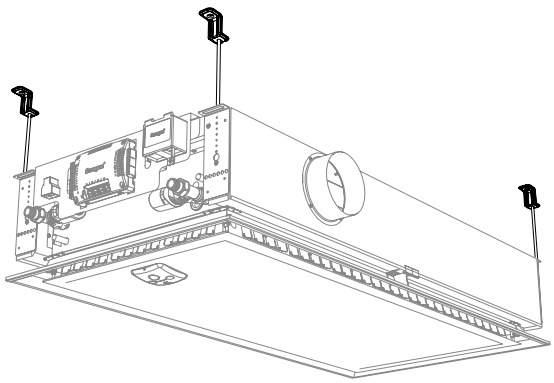


Figure 26. To suspend an ADAPT Parasol, either size

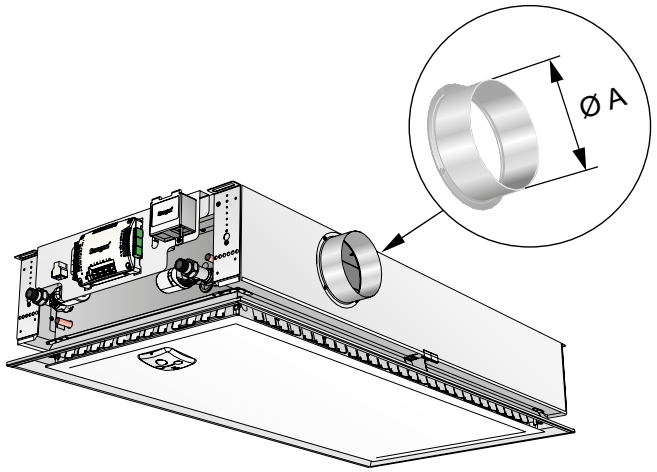


Figure 24. Standard air connection piece

Variant :	
ADAPT Parasol 600	*A = Ø 4.92 in.*
ADAPT Parasol 600 PF	*A = Ø 6.30 in.*
ADAPT Parasol 1200	*A = Ø 4.92 in.*
ADAPT Parasol 1200 PF	*A = Ø 6.30 in.*

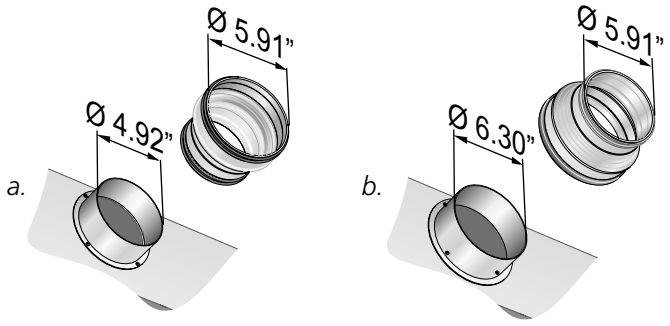


Figure 25 a. Accessories SYST AD 150/125 (5.91"/4.92".)
b. Accessories SYST AD 160/150 (6.30"/5.91")

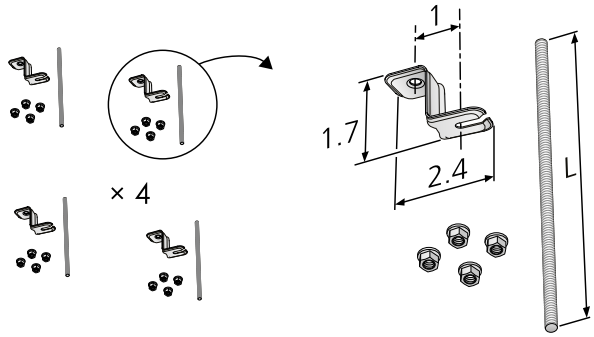


Figure 27. Assembly piece SYST MS M8-1, ceiling mount and threaded rod

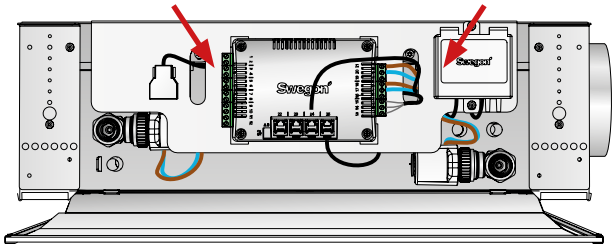


Figure 28. All controll equipment is gathered on the same side to simplify the work during installation and service.

Controller and pressure sensor are mounted to a bracket easy removable by loosing two screws, see arrows.

Technical data

Total cooling capacity, max.		7000 Btuh
Heating capacity, water, max.		9200 Btuh
Airflows		
Single module unit		15-72 cfm
Two-module unit		15-180 cfm
Length		
24" module		24 in. nominal
48" module		48 in. nominal
Width		24 in.
Height	ADAPT Parasol 600	8.66 in.
	ADAPT Parasol 600 PF	9.84 in.
	ADAPT Parasol 1200	8.66 in.
	ADAPT Parasol 1200 PF	9.84 in.

Dimensions of the units have a tolerance of (+/- 0.08) in.

Power consumption

Power consumption, max., with factory installed actuators: 9.8 VA

Recommended limit values

Pressure levels

Working pressure, coil, max.	230 psi *
Test pressure, coil, max.	350 psi *

* Applies to module without installed control equipment

Nozzle pressure	Range: 0.2 – 0.6 inWG
Recommended lowest nozzle pressure if coil heat is used, p_i	0.28 inWG
Recommended lowest nozzle pressure with the face plate in the high capacity position, p_i	0.28 inWG

Water flow

Recommended minimum water flowrate to ensure evacuation of air from the coils:

Chilled water, min.	0.48 gpm
Hot water, min.	0.21 gpm

Temperature differentials

Chilled water, temperature increase	3.7 – 9 °F
Hot water, drop in temperature	7.2 – 18 °F

Flow temperature

Chilled Water	**
Hot water, max.	140°F

** Chilled water must always be kept at a level that ensures that no condensation will form.

ProSelect

Performance data is available online selection software ProSelect, available at www.swegon.com.

Examples of what can be read in the Proselect:

- The size of the comfort module (inches)
- The primary airflow (CFM)
- The noise level
- Nozzle pressure and duct pressure (inWG)
- Airborne capacity (BTU)
- Waterborne capacity (BTU)
- Airflow pattern
- Specification of accessories

N.B. The total cooling capacity is the sum of the airborne and waterborne capacities.

Heating

Heating function

The comfort module's ability to quickly mix the primary air with the room air makes the ADAPT Parasol ideally suited for both cooling and heating. Rooms heated with warm air discharged at the ceiling is an excellent alternative to heating with radiators in the room. Some of the benefits achieved include lower installation costs, simpler installation and more leasable space and improved wall appearance due to perimeter walls free from piping and radiators. When the ADAPT Parasol is set to maintain a high nozzle pressure, there will be a certain heating capacity, even with low airflow conditions or while the module is operating during weekends, for instance, when the flow is reduced for a longer period.

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 in between 68-75°F. The optimum comfort requirements are normally met when the room temperature is 71°F. This means that in a room with a cold perimeter wall, the air temperature must be higher than 71°F to compensate for the radiant cooling energy of the cold perimeter. With efficient windows and exterior insulation, the difference between the room air and operative temperatures nay be small, and this of little concern. But with less energy efficient windows, or minimum exterior insulation, the temperature difference may be high enough to justify a higher room air temperature setpoint. Room load estimating software may be used to evaluate room air and operative air temperatures.

Discharging heated air at the ceiling results in some risk of stratification. For a supply flow temperature of max. 104°F, the stratification is non-existent, while at 140°F it can be around 7°F 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 in use, the lighting is on, a computer is running and occupants are in the room, the stratification will decrease or disappear depending on the heating energy demand.

When heating with the ADAPT Parasol, it is advisable to use an external temperature sensor or an extra sensor module in the room.

Acoustics

Table 1. Cross-talk
Typical R_w-values between office rooms with ADAPT Parasol where the partition wall extends with its top edge against the suspended ceiling (with excellent sealing properties). Assumes that the partition wall will have at least the same R_w-value as that given in the table.

Design	Suspended ceiling R_w(dB)	With ADAPT Parasol R_w(dB)
Light acoustic suspended ceiling. Mineral wool or perforated steel / aluminium coffers or screen.	28	28
Light acoustic suspended ceiling. Mineral wool or perforated steel / aluminium coffers or screen. The suspended ceiling is lined with 50 mm thick mineral wool*.	36	36
Light acoustic suspended ceiling. Mineral wool or perforated steel/aluminium coffers or screen. Vertical 100 mm thick mineral wool panel as sound insulation between the office cubicles*.	36	36
Perforated gypsum panels in T-section grid system. Acoustic insulation on the top side (25 mm thick).	36	36
Seal the gypsum board suspended ceiling with insulation on top side.	45	44
*Overview: Rockwool 4 lb/ft^3, Gullfiber 3 lb/ft^3.		

Natural attenuation and end reflection

Natural attenuation ΔL (dB) including end reflection

Table 2. natural attenuation ΔL (dB)
ADAPT Parasol 24 in.

	Octave band (Hz)							
Nozzle setting	63	125	250	500	1k	2k	4k	8k
LLLL	19	20	17	16	17	16	15	15
MMMM	17	18	15	14	15	14	13	13
HHHH	15	16	13	12	13	12	11	11

Table 3. Natural attenuation ΔL (dB)
ADAPT Parasol 24 in. PF

	Octave band (Hz)							
Nozzle setting	63	125	250	500	1k	2k	4k	8k
LLLL	19	20	17	16	17	16	15	15
MMMM	17	18	15	14	15	14	13	13
HHHH	15	16	13	12	13	12	11	11

Table 4. natural attenuation ΔL (dB)
ADAPT Parasol 48 in.

	Octave band (Hz)							
Nozzle setting	63	125	250	500	1k	2k	4k	8k
LLLL	16	17	14	13	14	13	12	12
MMMM	14	15	12	11	12	11	10	10
HHHH	12	13	10	9	10	9	8	8

Table 5. Natural attenuation ΔL (dB)
ADAPT Parasol 48 in. PF

	Octave band (Hz)							
Nozzle setting	63	125	250	500	1k	2k	4k	8k
LLLL	16	17	14	13	14	13	12	12
MMMM	14	15	12	11	12	11	10	10
HHHH	12	13	10	9	10	9	8	8

Dimensions and weights

ADAPT Parasol 24”

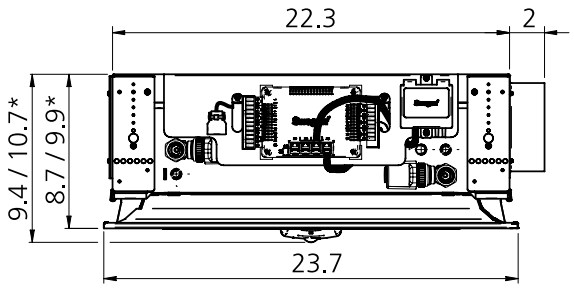


Figure 29. ADAPT Parasol 24”, viewed from end wall
** = ADAPT Parasol 24” PF*

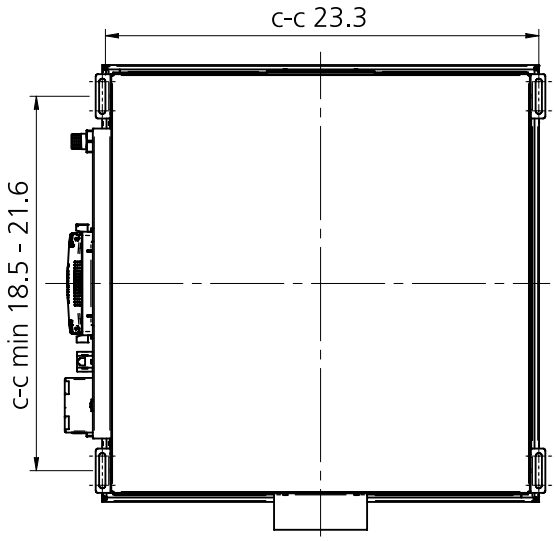


Figure 30. ADAPT Parasol 24”, viewed from above

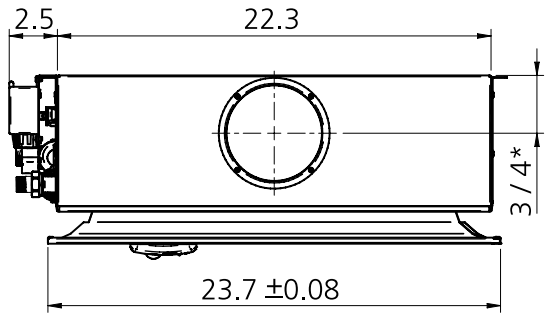


Figure 31. ADAPT Parasol 24”, side view
**= ADAPT Parasol 24” PF*

Water connections, ADAPT Parasol 24”

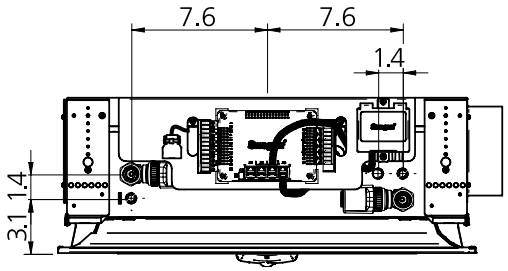


Figure 32. ADAPT Parasol 24”, water connections

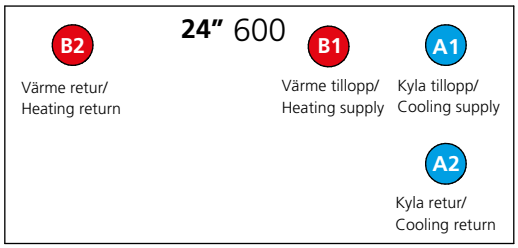


Figure 33. ADAPT Parasol 24” label
A1 = Chilled water supply connection
A2 = Chilled water return connection
B1 = Hot water supply connection
B2 = Hot water return connection

Observe the following:
For the single-module unit, it is important that the chilled water is connected to the correct pipe. The direction of water flow shown here is necessary for obtaining full capacity. **The required direction of water flow is marked by arrows on the end wall of the unit.**

ADAPT Parasol 48”

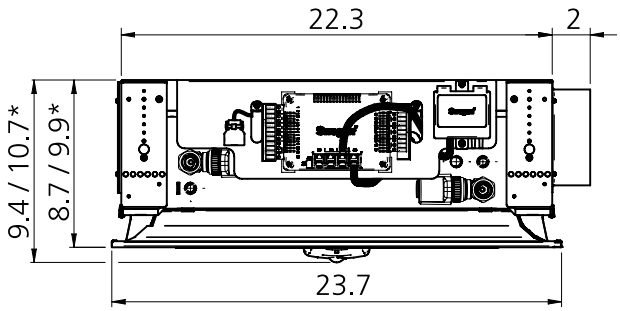


*Figure 34. ADAPT Parasol 48”, viewed from end wall * = ADAPT Parasol 48” PF*

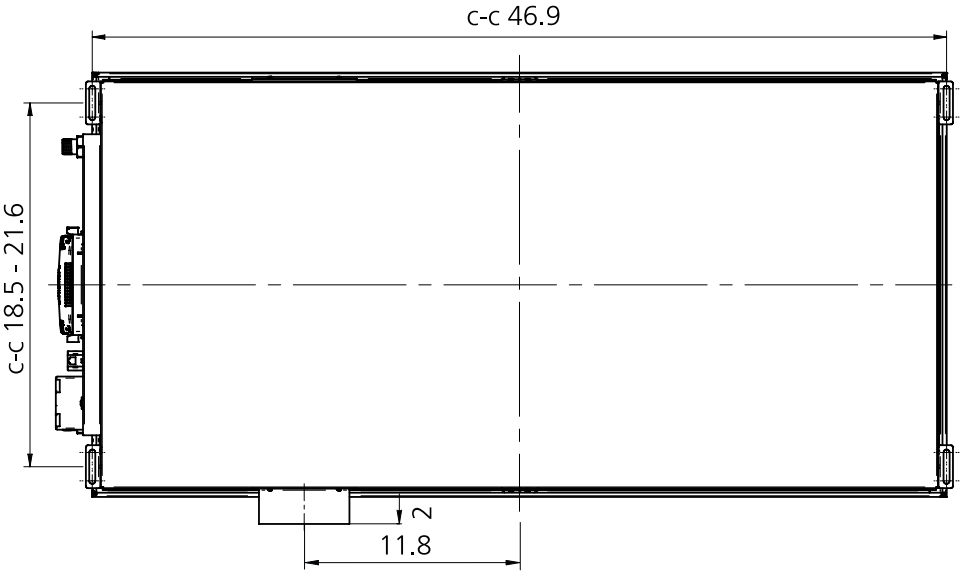


*Figure 35. ADAPT Parasol 48”, viewed from above * = ADAPT Parasol 48” PF*

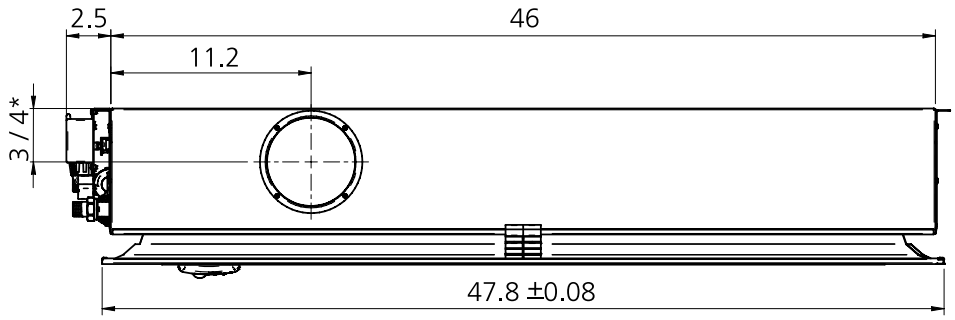


Figure 36. ADAPT Parasol 48”, side view

Water connections, ADAPT Parasol 48”

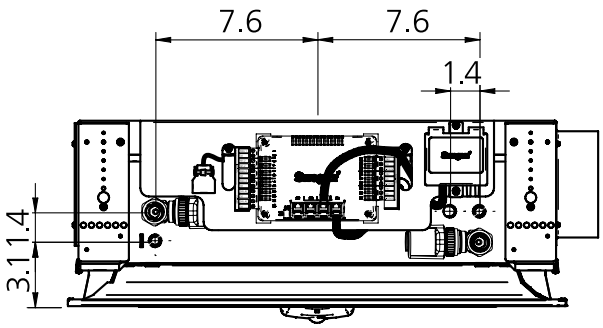


Figure 37. ADAPT Parasol 48”, water connections

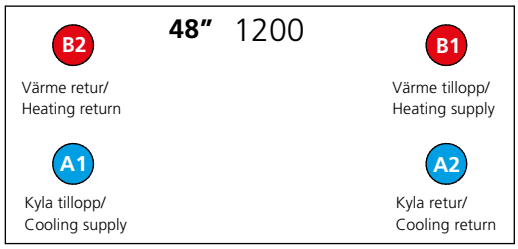


Figure 38. ADAPT Parasol 48” label
A1 = Chilled water supply connection.
A2 = Chilled water return connection.
B1 = Hot water supply connection.
B2 = Hot water return connection.

Air connection, ADAPT Parasol 24”/48”

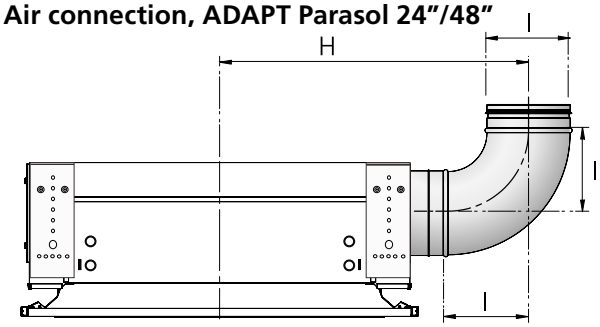


Figure 39. Connection with bend, viewed from end wall
Optional SYST CA xxx-90 connection piece

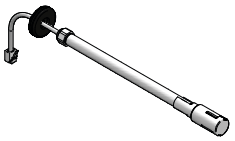
ADAPT Parasol 24”	*H = 18.11*	*l = 4.92*
ADAPT Parasol 24” PF	*H = 19.50*	*l = 6.30*
ADAPT Parasol 48”	*H = 18.11*	*l = 4.92*
ADAPT Parasol 48” PF	*H = 19.50*	*l = 6.30*

Accessories

Accessories, factory-installed

Detect Qa CO_2 sensor
Optional analog carbon dioxide sensor, when ordered, concealed from view above the face plate.
See separate product datasheet at www.swegon.com.

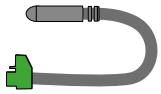
Detect VOC sensor
Optional air quality sensor twhen ordered, concealed from view above the face plate.



The factory-fitted accessories above can also be ordered as individual items of equipment.

Accessories

CONDUCTOR T-TG temperature sensor
External temperature sensor. Used if the room temperature is to be measured at a specific location in the room rather than by the on-board sensor module other than by the sensor module or for measuring the temperature on the water supply pipe in a 2-pipe heating/cooling change-over system.



External sensor module
Sensor module with temperature and occupancy sensor for wall mounting when an extra sensor module is required in the room (1 pc is always supplied with the ADAPT Parasol)

Available in a circular or rectangular model and is always supplied with both mounting frame for the most common existing electrical connection boxes as well as a protruding frame for surface mounting.

Cable, SYST CABLE RJ12 6-LED.
Cable for connection of an external sensor module to the controller or between sensor modules. Available in various lengths.

Cable, CABLE CONVERTER USB-RJ12 (RS485)
Cable with built-in modem for connecting a PC to the controller.
Needed for running SWICCT or ModbusPoll, for instance.

SYST MS M8 Assembly piece
The assembly piece is used for installation and consists of threaded rods, ceiling mounts as well as nuts for all four suspension mounts.

Connection piece, air – insertion joint, SYST AD1
SYST AD1 is used as an insertion joint between the ADAPT Parasol and the duct system. Available in two dimensions: Ø4.92" and Ø6.30".

Connection piece, air, SYST CA
Duct bend, 90°

Available in two dimensions: Ø4.92" and Ø6.30"

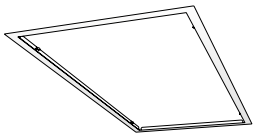
Connection piece, air, SYST AD
SYST AD1 is used as an insertion joint between the ADAPT Parasol and the duct system.

A. SYST AD 150/125, Ø5.91" and Ø4.92"
B. SYST AD 160/150 Ø6.30" and Ø5.91".

A.

B.

Plasterboard frame, Parasol c T-FPB
Frame for creating an attractive interface between the ADAPT Parasol and the opening in the plasterboard ceiling.



Tool for nozzle adjustment, SYST TORX
Tool designed for easy adjustment of the nozzle plates.

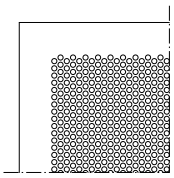
Optional perforation patterns
The face plate of the unit is available with three different perforation patterns that make it easily adaptable to suit different types of ceiling components, e.g. light fittings and exhaust grilles that share the surface of a suspended ceiling. Other patterns are of course available on special order. For further details, contact your nearest Swegon representative.

A. Face plate, standard PB
Circular holes arranged in a triangular pattern.

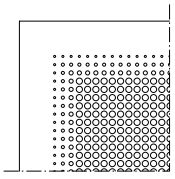
B. Face plate, PD
Circular holes arranged in a square pattern with a graduated border.

C. Face plate, PE
Square holes arranged in a square pattern with a graduated border.

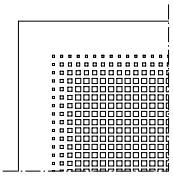
A.



B.



C.



Ordering key

Function	The units can be ordered in various functional versions: A = Cooling and supply air B = Cooling, heating and supply air
Airflow variant	Single module unit: ADAPT Parasol 600 (24") ADAPT Parasol 600 (24") PF Two-module unit: ADAPT Parasol 1200 (48") ADAPT Parasol 1200 (48")PF (PF = PlusFlow, extra high airflow)
Nozzle setting	Each side can be set in three different ways: L, M or H L = Low airflow M = Medium airflow H = High airflow
Color	The units are supplied painted in Swegon's standard shade of white, RAL 9003, gloss level 30 ±6%. Contact Swegon for color and finish options.
Communication	Modbus RTU

Summary of accessories

CO_2 sensor	DETECT Qa
Ext. temperature sensor	CONDUCTOR T-TG
VOC sensor	DETECT VOC
Tool for nozzle adjustment	SYST TORX
Connection piece, air – insertion joint	SYST AD1
Inlet duct adapter, straight	SYST AD 150/125 SYST AD 160/150
Inlet adapter, 90 degree elbow	SYST CA
Assembly piece	SYST MS M8
Plasterboard ceiling frame	Parasol c T-FPB
Cable (2xRJ12)	SYST CABLE RJ12 6-LED.
Cable (USB+RJ12)	CABLE CONVERTER USB-RJ12 (RS485)
Adapter	ADAPTER RJ12-WIRE
Perforated face plate, (in addition to PB standard perforations)	PD PE

Contractor demarcation

Swegon's supply demarcation is at the connection points for water and air as well as for wiring the room control equipment (see Figures 29, 30, 31, 32, 33, 34 and 35, 36, 37, 38, 39).

- The pipework contractor connects the connections points for water to the plain pipe ends and fills the system, vents it and tests the pressure. If the room control equipment is installed from the factory, connect the return pipe for chilled water and heating water respectively to the valve. (DN ½" male threads).
- The ventilation contractor connects ducting to the air connection spigot.
- The electrical installation contractor connects the power (24 V) and the signal cables to the wiring terminals equipped with spring-loaded pressure connections. The maximum permissible cable cross-sectional area is 13 ga. For reliable operation we recommend the use of cable ends with multi-pin connectors.