

ADAPT Parasol EX

Energy saving suspended comfort module



QUICK GUIDE

- Suspended comfort module equipped with control equipment for stand-alone or connectable to BMS via Modbus
- 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 a product or room level.
- Waterborne cooling and heating.
- Draught-free indoor climate, 4-way air distribution and Swegon's ADC (Anti Draught Control) provide maximum comfort and flexibility, both today and for future needs.

Size					
ADAPT Parasol EX 690			ADAPT Parasol EX 1290		
Length	Width	Height	Length	Width	Height
690	690	250	1290	690	250

Primary air flow:	Up to 55 l/s
Pressure range:	50 to 150 Pa
Total cooling capacity:	Up to 1,930 W
Heating capacity:	Up to 2450 W

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Technical description

Comfort module ADAPT Parasol EX

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

Sizes:	690 x 690; 690 x 1290 mm
Modules:	Supply air and cooling Supply air, cooling and heating
Installation:	Suspended, surface mounted on the ceiling

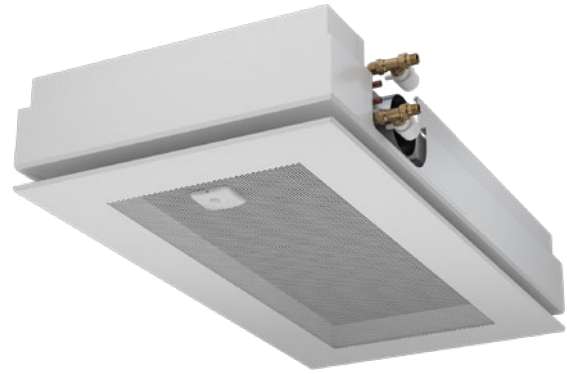
Function

The basic principle of the comfort modules is closely related to that of chilled beams. The difference is mainly that comfort modules distribute air in four directions instead of two. This maximises the area for the mixture of supply air with the room air, which enables you to take out a high capacity, but without occupying more ceiling space than necessary. The comfort modules are also optimised to quickly mix the supply air with the room air, which provides better comfort in the room. In heating applications, this technique can be utilised advantageously to convey heat along the ceiling in a better way. The built-in DCV function presupposes that the duct pressure is held constant e.g. with the help of a zone damper.

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 premises 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 premises. Offices, for example, often have a degree of occupancy below 50%!

ADAPT Parasol EX combines the best of both worlds – demand-controlled ventilation with all its potential for savings combined with the power and performance of the comfort module for air conditioning the room.



Flexibility

The easily adjustable nozzles in combination with Swegon's ADC (Anti Draught Control) offer maximum flexibility if changes in the room layout become necessary. All the sides can be set independently of one another so that the comfort module can distribute more or less air and simultaneously discharge air in whatever direction desired in the room.

Design

The face plate of ADAPT Parasol EX has 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.

Draught-free indoor climate

ADAPT Parasol EX distributes air in four directions at low air velocity. Distributing the cooled air over a large area creates the low air velocity. The special design of the outlet creates a turbulent flow enabling the air to be quickly mixed in the room air. The comfort module's closed design with a circulation opening for return air in the face plate of the module also contributes to its advantageous mixing performance.

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

Variant A: Supply air and waterborne cooling from a coil.
Variant B: Supply air, waterborne cooling and heating from a coil.



www.eurovent-certification.com

www.certiflash.com

Compact and intelligent unit

ADAPT Parasol EX comes as a compact and intelligent unit where the air regulation damper and control equipment are integrated in the product.

The only additional connections are the power and a possible connection to a main control system.

The sensor module, which is a vital part of the product, is a combined occupancy detector and temperature sensor. As standard placement is in the face plate, but it can also be placed on the wall. This together with an intelligent control system that permits many adjustments, contributes to making the product flexible and future-proof.

For example, all units can be a master or slave, easily adjustable by editing a parameter together with moving/replacing an RJ12 cable. This means when, e.g. an open-plan office is divided up into a cellular office layout any extra work is minimised to adapt the product to the new operating mode.

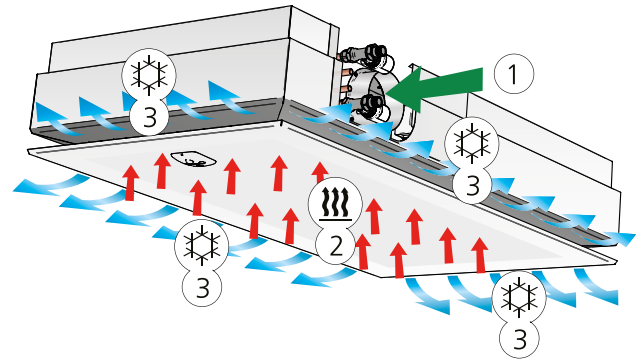


Figure 1. Variant A: Cooling and supply air function
 1 = Primary air
 2 = Induced room air
 3 = Primary air mixed with chilled room air

High capacity

ADAPT Parasol EX with its high capacity, occupies 40-50% less roof space to handle the cooling requirement in a normal office, compared with a traditional climate beam.

If extra capacity is required, air flow connection PF with a Ø160 connection is recommended.

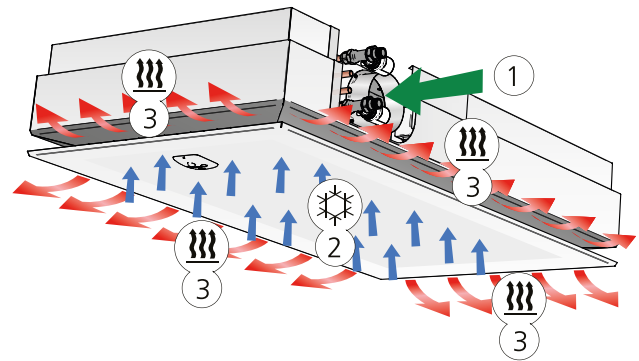


Figure 2. Variant B: Heating and supply air function (also including cooling function)
 1 = Primary air
 2 = Induced room air
 3 = Primary air mixed with heated room air

Simple to adjust

ADAPT Parasol EX provides optimal comfort through the built-in nozzle adjustment and with numerous setting options it can be easily be adapted if the size of the premises or business changes. The comfort module can be set so that different amounts of air can be distributed on each side and for both high and low air flow.

Easy to install

The small dimensions result in simpler handling, especially in when handling the products on the site, which gives less handling damage and a better working environment.

Range of application

ADAPT Parasol EX is ideal for use as a standard application in such premises as:

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

With its many installation options, ADAPT PARASOL EX's functions can easily be adapted to new businesses or changes in the layout of the premises.

Location

In that each side of the product is individually adjustable per side to provide the appropriate airflow, the comfort modules fit in well anywhere in the room. Whether they are located at the front edge, centre, rear edge or symmetrically in the room is of no importance. In rear edge solutions for separate office rooms, for instance, the unit can be installed close to the corridor wall. The only operation that needs to be done is to reduce the volume of air distributed towards the corridor wall and to open on the three other sides more (see Figure 3). This is of benefit in comparison with other rear-edge solutions, because you can make use of the partition walls to increase the air mixing zone. This provides low air velocities and a healthy room climate.

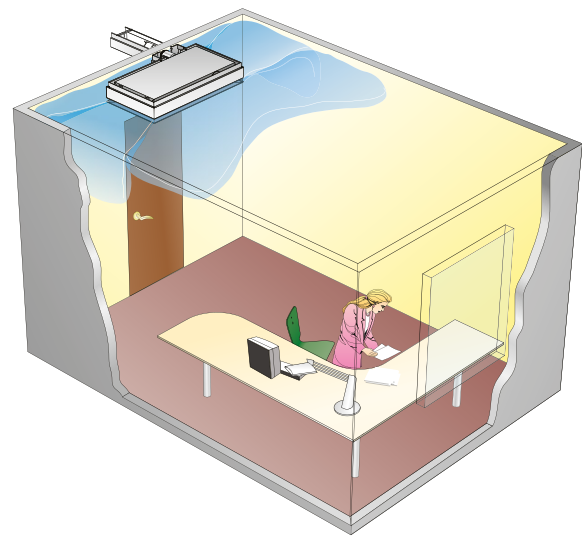


Figure 3. ADAPT Parasol EX as a rear edge solution

Demand-controlled climate in the room

- Variable control of the air flow as required - temperature or air quality.
- If an air quality sensor is used, this overrides this temperature sensor.
- Same variable function irrespective of whether it's a product in a cellular office or several products in an office landscape or conference room.
- In addition to ventilating efficiently, the room temperature is regulated with the help of both water - and air cooling.
- Can ideally heat from the ceiling - everything in one product
- Can be combined with radiators or floor heating - the product then takes this into consideration and regulates the room temperature in an energy-efficient way, for example, by not increasing the air flow when there is an increased heating requirement.

Sequence selection Water / Air

- The control sequence means that water cooling is prioritised before air cooling
- In the event of occupancy, the air flow is regulated variably between min. – and max. depending on the room temperature (or air quality if an air quality sensor is used).
- If the room needs to be cooled, it's first ensured that the air flow creates sufficient pressure in the unit to allow the water valve to open. This safeguards the comfort in the room, i.e. no cold draught from the product.
- The water valve is then allowed to open to supply cooling to the room. If the cooling requirement remains when the cooling valve is fully open, the built-in air damper opens to increase cooling with air.

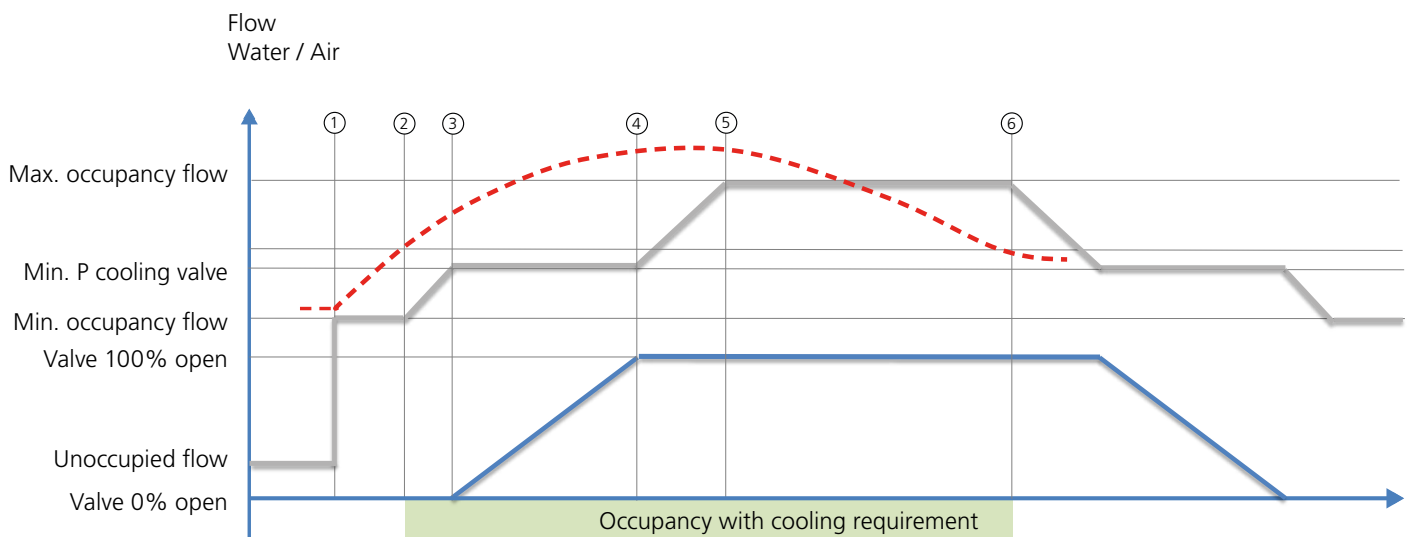


Figure 4.

1. Occupancy - temperature rises
2. Room temperature reaches the level for the cooling demand - air opens to reach the minimum pressure that permits the cooling valve to open
3. The cooling valve is permitted to open
4. Cooling valve fully open, but there is still a cooling demand in the room - air damper opens to cool with more air
5. Cooling valve and air damper fully open
6. Temperature reaches the room's set point, damper and valve close

————— = Water
————— = Air
- - - - - = Room temperature

Sequence selection Air / Water

- The control sequence means that air cooling is prioritised before water cooling
- In the event of occupancy, the air flow is regulated variably between min. – and max. depending on the room temperature (or air quality if an air quality sensor is used).
- In the event of a cooling requirement, the air damper is first opened variably to fully open if the cooling requirement remains the water valve also opens.

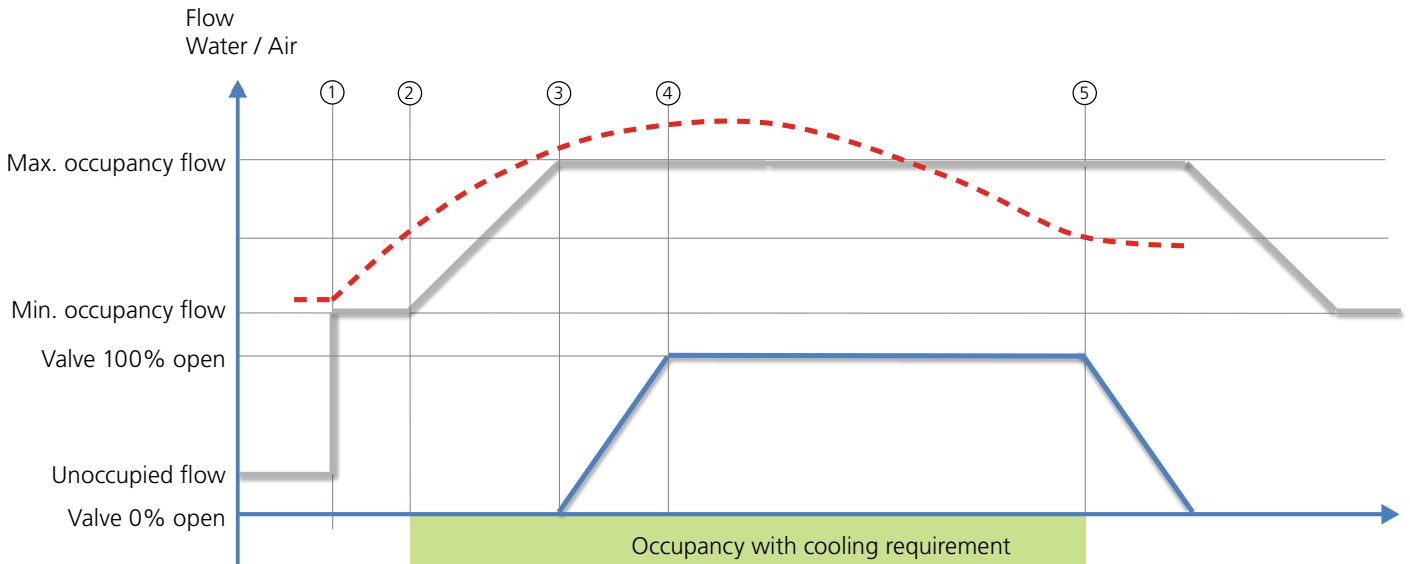


Figure 5.

1. Occupancy - temperature rises
2. Room temperature reaches the level for cooling demand - air opens
3. Air damper fully open, but there is still a cooling demand in the room - valve opens for cooling with water
4. Air damper and water valve fully open
5. Temperature reaches the room's set point, damper and valve close

— = Water
— = Air
- - - = Room temperature

Sequence Air quality

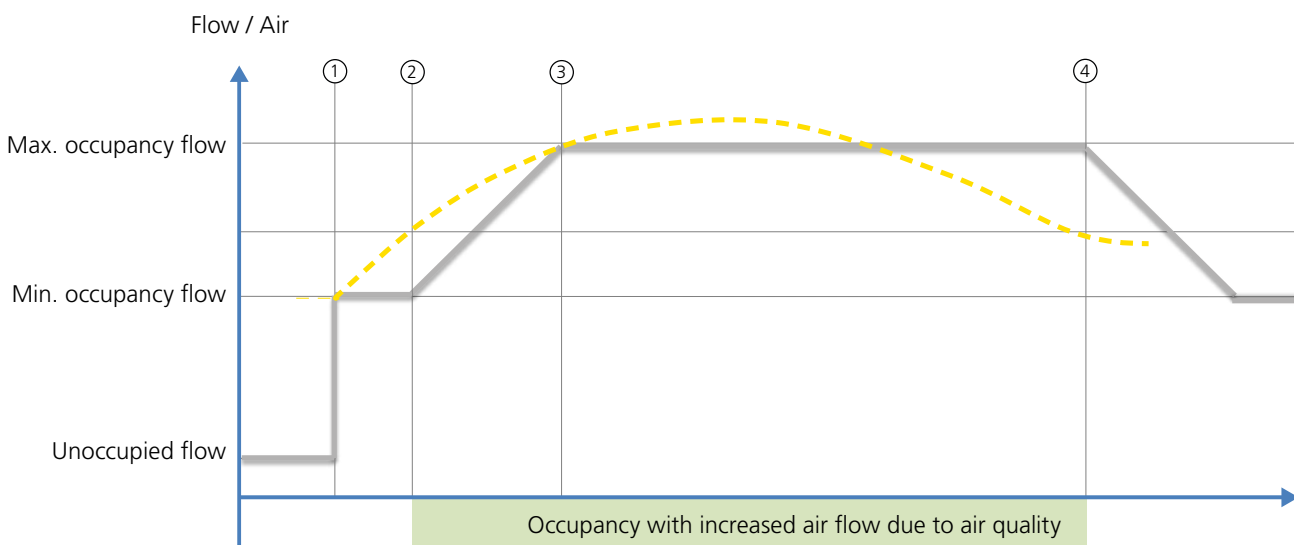


Figure 6.

1. Occupancy – CO₂ / VOC content rises
2. CO₂ / VOC content reaches the permitted upper limit value - air damper opens variably
3. Air damper fully open
4. CO₂ / VOC content reaches the permitted lower limit value - air damper closes

— = Air
- - - = VOC/CO₂

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

Operating modes

There are several operating modes in ADAPT Parasol EX

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

Occupancy mode

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

No occupancy mode

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

Holiday

When Holiday mode is enabled, the system automatically switches to energy save mode exactly as in No occupancy mode, but with the possibility to permit an even greater temperature difference. Controlled from the main control system.

Standby mode

When the control system registers that a window is open the controller switches to Standby mode. When the window is closed the controller switches to Occupancy mode. When the controller is in Standby mode, the room temperature is kept above 10 °C (frost protection).

Emergency mode

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

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

Commissioning mode

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

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

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

More details about commissioning mode can be read in the sensor module description on page 12.

Summer night cooling

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

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

Functions

Change over

The function involves the use of only one valve actuator which should be wired to the cooling output terminal. This actuator then controls both the heating water and the cooling water, which is transported in the same pipe. An external temperature sensor should be used and this should measure on the main pipe where the water always circulates.

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

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

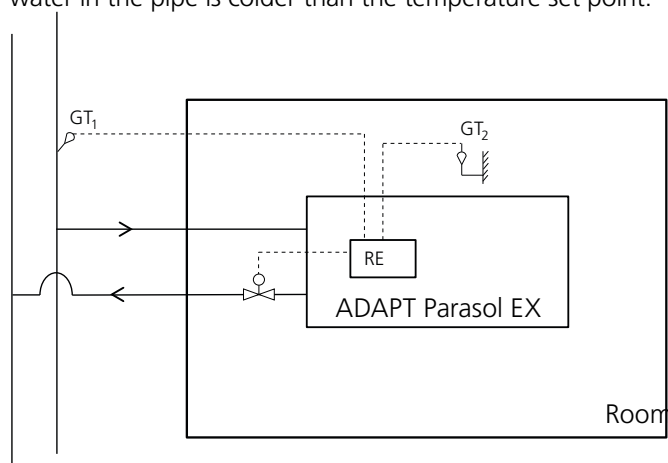


Figure 7.

- 2-pipe system with cooling water in the summer and heating water in the winter
- GT_1 is placed where heating or cooling water always circulates
- Summer: If the room temperature T_2 is higher than the water temperature T_1 , the valve opens when cooling is required.
- Winter: If the room temperature T_2 is lower than the water temperature T_1 , the valve opens when heating is required.
- GT_1 is connected to the regulator as an external temperature sensor
- In SWICCT or SuperWISE you tell the regulator that the sensor is to be used for the Change-Over function.
- GT_2 is the temperature sensor which is located in the sensor module
- The valve actuator must be connected to the regulator's cooling output.

External temperature sensor use

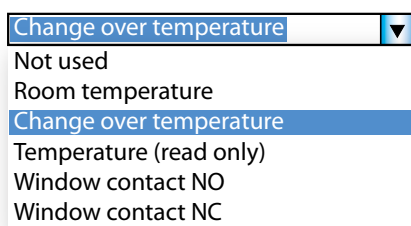


Figure 8.

Activating valves

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

Frost protection

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

Sensor module

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

As standard this is mounted in the face plate on ADAPT Parasol EX, but can also be ordered as an accessory for installation on the wall, and then recess mounted in a standard junction box or surface mounted.

The push buttons on the sensor module allow you to adjust the temperature in the room, put the ADAPT Parasol EX in commissioning mode and read the alarm list.

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

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

The floor surface that the presence sensor covers is approximately 24 m² when installed at a height of 2.7 m above the floor and parallel to it.

Temperature adjustment

Reduce the temperature by pressing the left-hand button



Increase the temperature by pressing the right-hand button

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

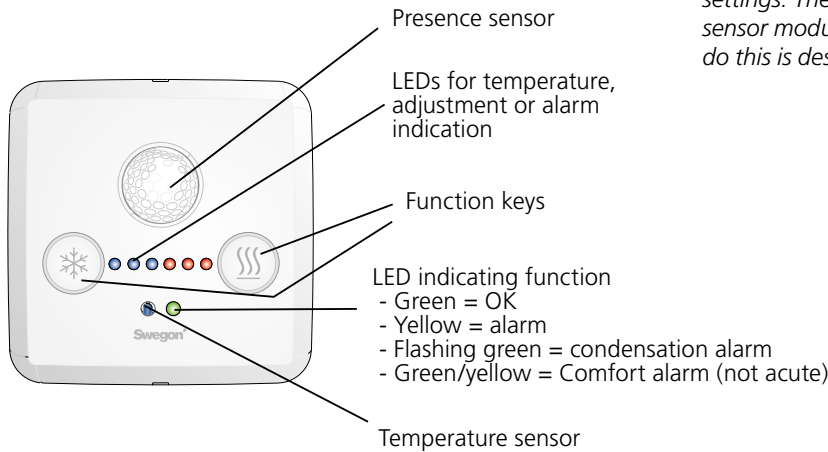


Figure 9. Sensor module seen from the front

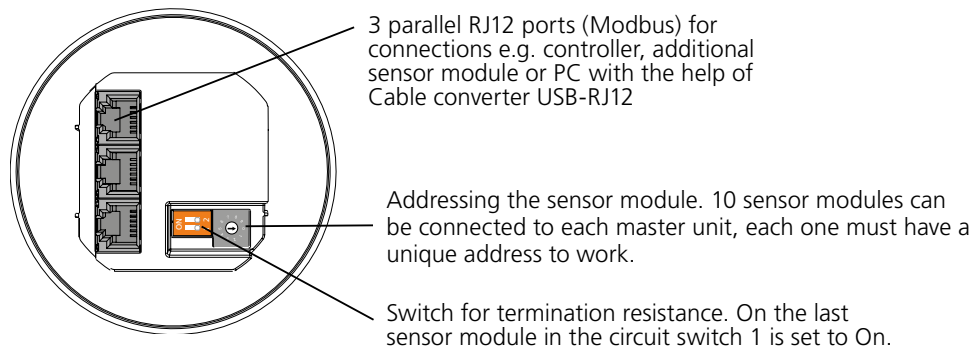


Figure 10. Sensor module seen from the back

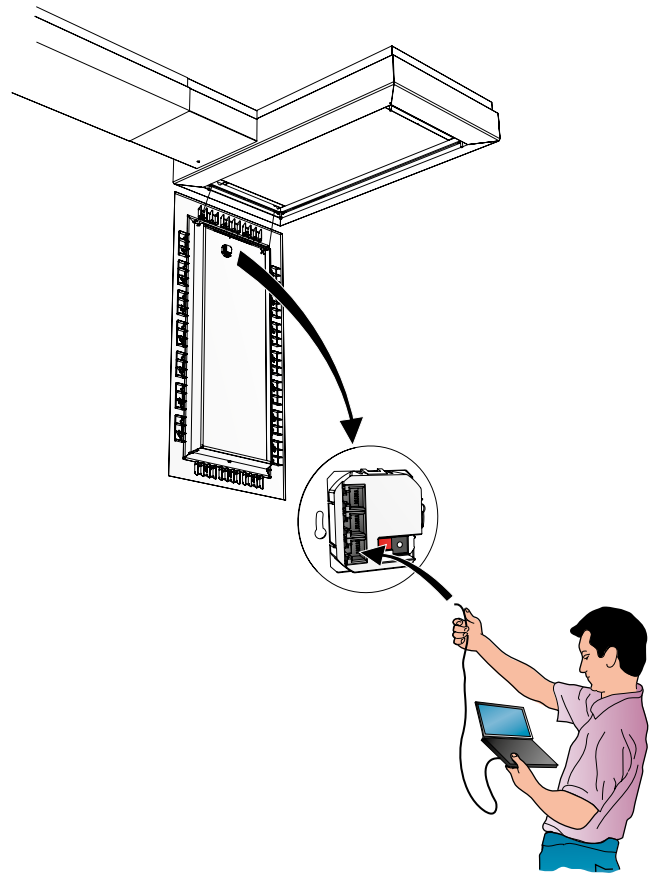


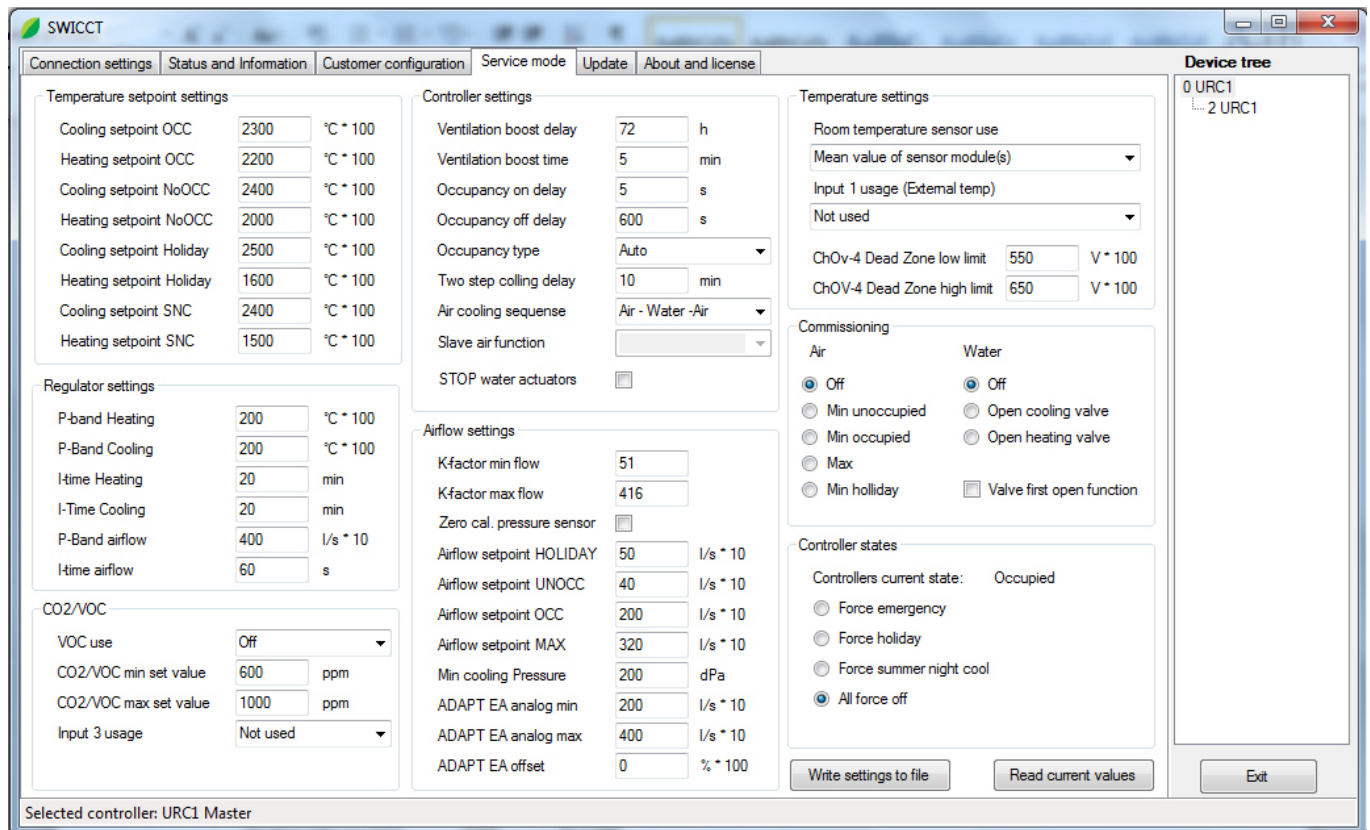
Figure 11. With the help of CABLE CONVERTER USB-RJ12 (RS485), you can easily connect a PC to make e.g. software settings. The connection can either be made on the rear of the sensor module as illustrated, or directly on the controller. How to do this is described in the SWICCT manual

SWICCT

SWICCT (SWegon Indoor Climate Configuration Tool) is the software that makes it easy to make settings in the controller.

Here it is possible to make all essential settings for the Product, for example;

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



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

Installation examples

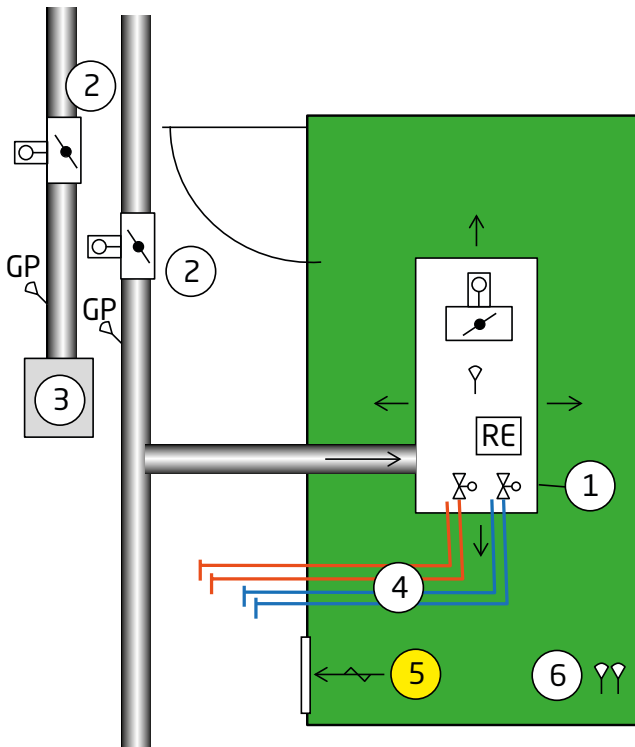


Figure 12. Type room 1 shows ADAPT Parasol EX in an office Extract air via air transfer diffuser (balance on zone level)

1. Comfort module ADAPT Parasol EX with supply air, cooling and heating Incl.
 - pressure sensor
 - communications unit/regulator
 - damper with motor.
2. Zone damper
3. Extract air diffuser
4. Cooling water and heating water
5. Extract air via transfer air to the corridor
6. External Sensor module (occupancy and temperature sensors)

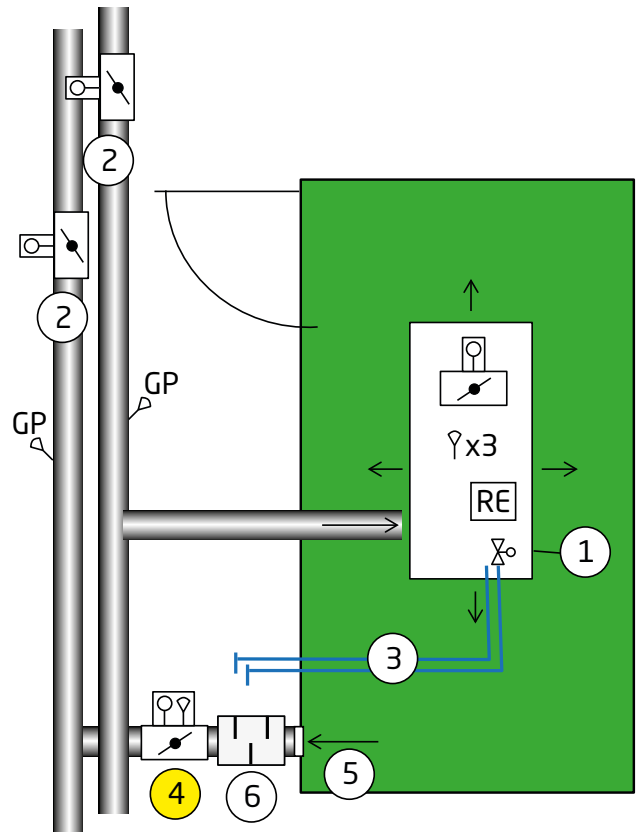


Figure 13. Type room 2 shows ADAPT Parasol EX in an office Supply and extract air in balance.

1. Comfort module ADAPT Parasol Ex with supply air, cooling and heating Incl.
 - pressure sensor
 - occupancy sensor
 - temperature sensor
 - communications unit/regulator
 - damper with motor.
2. Zone damper
3. Cooling water
4. Extract air via damper slave controlled from ADAPT Parasol EX
5. Grille or fully open extract air diffuser type EXC
6. Sound attenuator CLA / SORDO

Operating modes

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

Commissioning

Specific nozzle settings

To specify optimised nozzle settings, always begin from the side with the water connection. From there, specify side after side in anticlockwise order, see figure 14-15. If you like, you can order the units preset from the factory (does not apply to units held in stock).

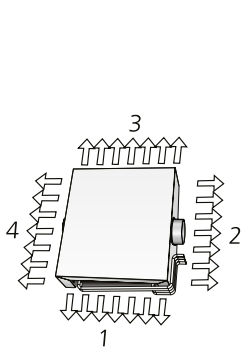


Figure 14. Top view, side 1-4 ADAPT Parasol EX 690

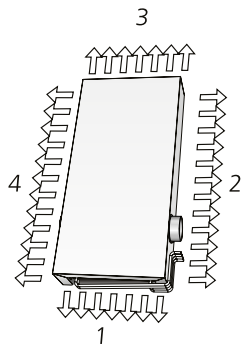


Figure 15. Top view, side 1-4 ADAPT Parasol EX 1290

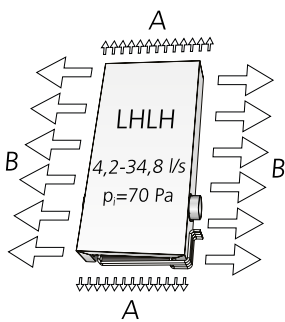


Figure 16. Example 1.
A = 2.1 l/s, B = 15.3 l/s

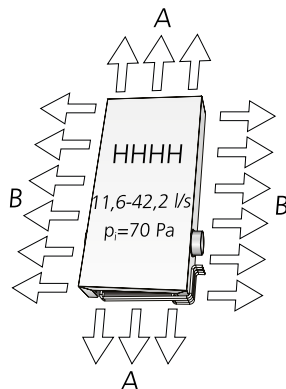


Figure 17. Example 2.
A = 5.8 l/s, B = 15.3 l/s

Example 1:

Nozzle setting LHLH gives the lowest possible absence flow (side 1 + 3 open). This provides a minimum flow/absence flow of approx. 4 l/s and a maximum flow of approx. 35 l/s at $p_1=70$ Pa

Example 2:

If it instead is more important to get the highest possible maximum flow/output, the nozzles are set to position HHHH, i.e. fully open all around. A higher maximum flow is then obtained, but with the consequence of a slightly higher absence flow.

These adjustments are only different settings on the same physical product, which means a very flexible and adaptable unit, in particular, together with the integrated software.

K-factors for each side can be obtained from the table 2-5 or from the installation instructions on the Internet, but even easier in ProSelect where you can quickly test different variants.

Nozzle setting

The unique built-in nozzle control in the ADAPT Parasol EX means that each of the four sides can be set individually. Depending on the unit's location and the room's primary air requirement, the primary air can be guided in all desired directions. The direction of the airflow can be easily optimised using the Swegon ProSelect sizing program available at www.swegon.com.

The required nozzle setting is made at the factory, but can if necessary be easily changed on site.

K-factor (COP)

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 optimised nozzle setting can also be obtained in ProSelect.

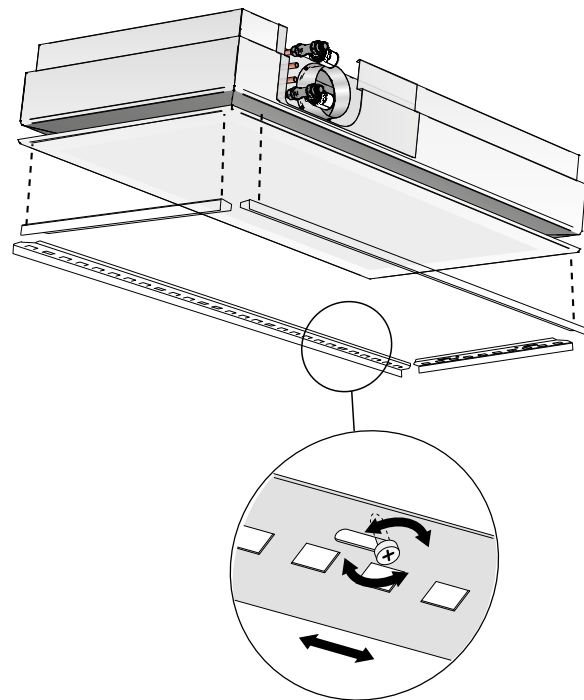


Figure 18. Nozzle setting

ADC

All the comfort modules are supplied with the ADC air deflector.

ADC stands for Anti Draught Control, which enables you to set the diffusion pattern of the air being distributed to avoid risk of draught. 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 provides great flexibility and can be easily adjusted without having to affect the system as a whole.

The ADC does not affect the noise level or static pressure at all. The water capacity is reduced by 5 - 10% if the ADCII is adjusted to "fan-shape".

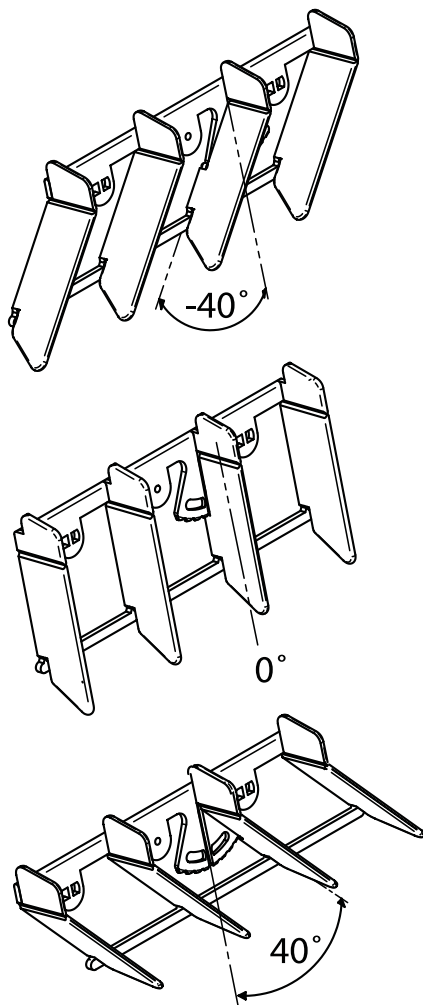


Figure 19. ADC, setting range from -40° to +40° in increments of 10°

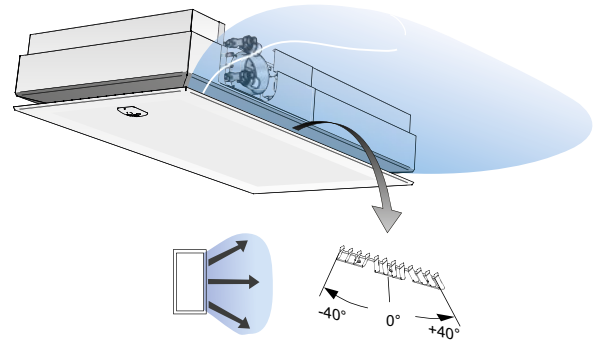


Figure 20. Possible settings for the ADC, Fan-shape

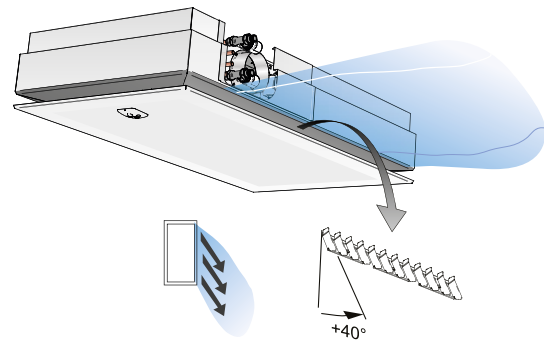


Figure 21. Possible settings for the ADC, X-shape

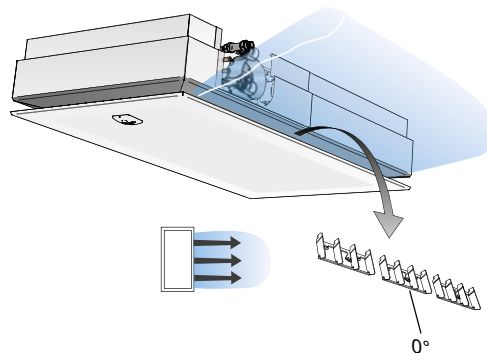


Figure 22. Setting options ADC, Straight setting

Technical data

Total cooling capacity, max.	1930 W
Heating capacity, total, max.	2450 W
Air flow	
Single-module unit	7-34 l/s
Double module unit	9-55 l/s
Length	
Single-module unit	690 mm
Double module unit	1290 mm
Width	690 mm
Height	250 mm
Dimensions of the units have a tolerance of	(±2) mm.

Power consumption

Power consumption for transformer rating:

Actuator	6 VA
Damper motor	2 VA*
Module Controller	1 VA*
Sensor module	1 VA*

* Always included in the product

Example A:

ADAPT Parasol EX 1290-B-HF; 6+2+1+1 = 10 VA

6 VA for cooling - OR heating actuator when they are normally regulated in sequence.

Example B:

ADAPT Parasol EX 1290-B-HF; 6+6+2+1+1 = 16 VA

For operating modes such as Radiator Heat and Cold draught protection power consumption will then be 6+6 VA for actuators when they are not regulated in sequence.

Recommended limit values

Pressure levels

Coil working pressure, max. 1600 kPa *

Coil test pressure, max. 2400 kPa *

* Applies without control equipment mounted

Nozzle pressure

Recommended min. nozzle pressure if coil heating is used, p_i 70 Pa

Recommended minimum nozzle pressure with face plate in the high output mode, p_i 70 Pa

Water flow

Ensures evacuation of any air pockets in the system.

Cooling water, min. 0.030 l/s

Heating water, min. 0.013 l/s

Temperature differentials

Cooling water, temperature increase 2–5 K

Heating water, drop in temperature 4–10 K

Temperature differences are always expressed in Kelvin (K).

Supply flow temperature

Cooling water **

Heating water, max. 60 °C

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

Designations

P Capacity (W)

t_i Temperature of primary air (°C)

t_r Temperature of room air (°C)

t_m Mean water temperature (°C)

ΔT_m Temperature difference $t_r - t_m$ (K)

ΔT_i Temperature difference $t_i - t_r$ (K)

ΔT_k Temperature difference of cooling water flow and return (K)

ΔT_v Temperature difference of heating water flow and return (K)

v Water velocity (m/s)

q Flow (l/s)

p Pressure (Pa)

Δp Pressure drop (Pa)

Supplementary index: k = cooling, v = heating, l = air, i = commissioning, $corr$ = correction

Nozzle pressure (commissioning pressure)

$$p_i = (q_i / k_{pi})^2$$

p_i Nozzle pressure (pa)

q_i Flow of primary air (l/s)

k_{pi} Pressure drop constant for nozzle setting, see Tables 2-5

Cooling

Default

The cooling capacities have been measured in conformance with EN 15116 Standard and have been recalculated for a constant water flow according to Diagram 2/3.

Calculating Formulae - Cooling

Below are some formulae that enable the user to calculate which comfort module selection is best suited for the application. The values for the calculations can be taken from the tables.

Pressure drop in cooling coil

$$\Delta p_k = (q_k / k_{pk})^2$$

Δp_k Pressure drop in cooling coil (kPa)

q_k Flow of cooling water (l/s), see Diagram 1

k_{pk} Pressure drop constant for cooling coil, see Tables 1-4

Cooling capacity of the air

$$P_i = 1.2 \cdot q_i \cdot \Delta T_i$$

P_i Primary air's cooling capacity (W)

q_i Flow of primary air (l/s)

ΔT_i Temperature difference between primary air (t_i) and room air (t_r) (K)

Cooling capacity of the water

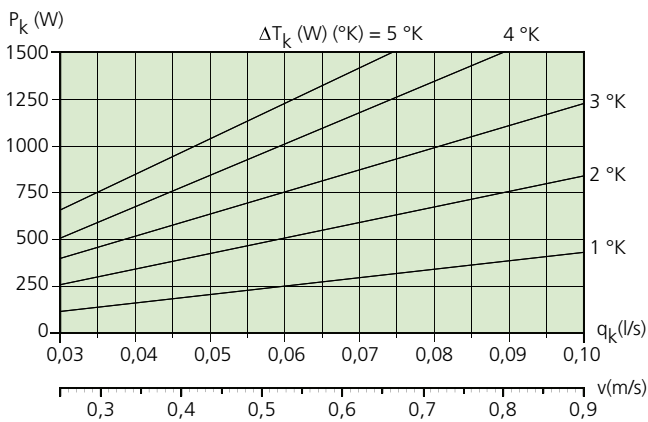
$$P_k = 4186 \cdot q_k \cdot \Delta T_k$$

P_k Cooling capacity of the water (W)

q_k Cooling water flow (l/s)

ΔT_k Temperature difference of cooling water flow and return (K)

Diagram 1. Water flow - cooling capacity



Corrected capacity – water flow

Different water flow rates to some extent have effects on the capacity output. By checking calculated water flow against Diagrams 2 or 3, the capacity indicated in Tables 1-4 may need to be slightly adjusted up or down.

$$P_{corr} = k \cdot P_k$$

P_{corr} Corrected capacity (W)

k Correction factor

P_k Cooling capacity of the water

Diagram 2. Corrected capacity – water flow, ADAPT Parasol EX 690

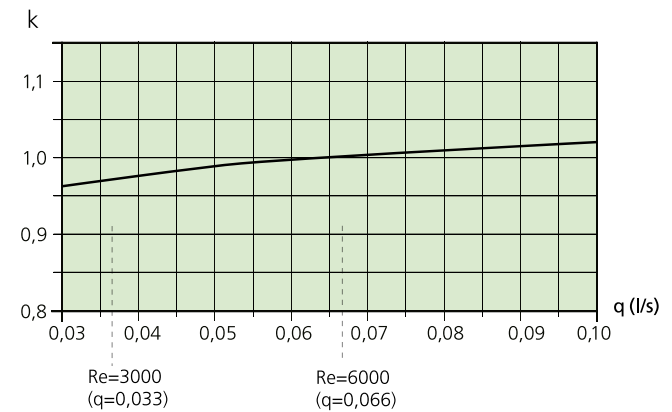


Diagram 3. Corrected capacity – water flow, ADAPT Parasol EX 1290

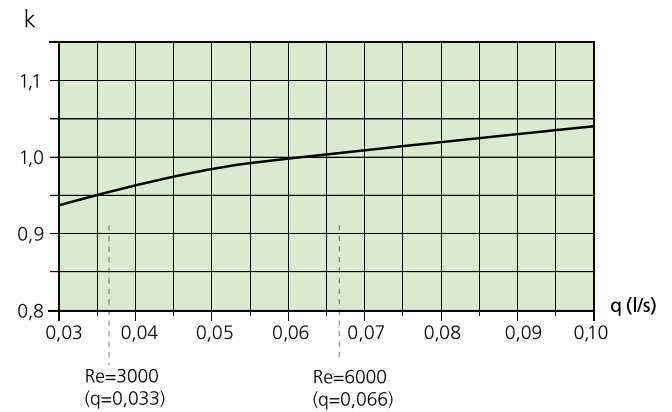


Diagram 4. Pressure drop – water flow, cooling

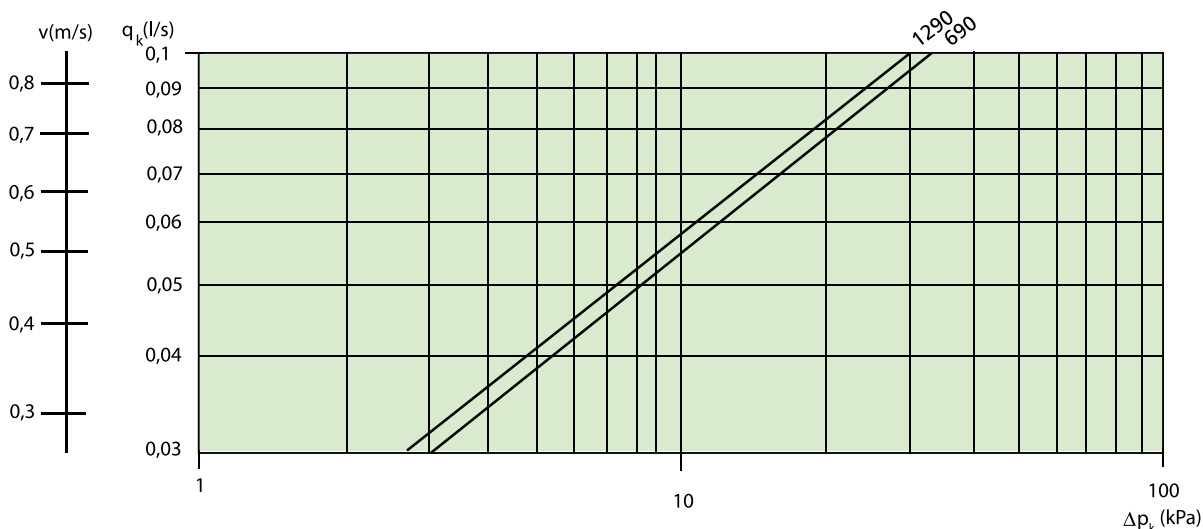


Table 1. Cooling capacity ADAPT Parasol EX 690

Nozzle pressure	Nozzle setting 1)	Primary air flow (l/s)	Sound level dB(A) 2)	Cooling capacity of primary air (W) for ΔT_1				Cooling capacity of the water (W) at $\Delta T_{mk} 3)$						Pressure drop constant air/water	
				6	8	10	12	6	7	8	9	10	11	k_{pl}	k_{pk}
50 Pa	LLLL	7.2	<20	52	69	86	104	166	194	219	246	271	298	1.01	0.0173
	LHLH	13.4	<20	96	129	161	193	218	254	287	323	359	392	1.89	0.0173
	HHHH	19.6	20	141	188	235	282	236	275	315	354	390	429	2.77	0.0173
70 Pa	LLLL	8.5	<20	61	82	102	122	197	226	259	288	321	353	1.01	0.0173
	LHLH	15.8	24	114	152	190	228	257	299	337	378	420	461	1.89	0.0173
	HHHH	23.2	25	167	223	278	334	278	323	368	413	458	498	2.77	0.0173
90 Pa	LLLL	9.6	20	69	92	115	138	217	254	287	323	359	392	1.01	0.0173
	LHLH	17.9	27	129	172	215	258	283	329	375	420	466	507	1.89	0.0173
	HHHH	26.3	29	189	252	316	379	310	360	409	458	502	551	2.77	0.0173

Table 2. Cooling capacity ADAPT Parasol EX 690 PF

Nozzle pressure	Nozzle setting 1)	Primary air flow (l/s)	Sound level dB(A) 2)	Cooling capacity of primary air (W) for ΔT_1				Cooling capacity of the water (W) at $\Delta T_{mk} 3)$					Pressure drop constant air/water	
				6	8	10	12	6	7	8	9	10	k_{pl}	k_{pk}
50 Pa	LLLL	22.1	23	159	212	265	318	215	250	286	322	358	3.13	0.023
	LHLH	27.9	27	201	268	335	402	233	272	311	350	389	3.95	0.023
	HHHH	33.7	27	243	324	404	485	263	306	350	394	438	4.76	0.023
70 Pa	LLLL	26.2	28	189	252	314	377	257	300	343	386	429	3.13	0.023
	LHLH	33	32	238	317	396	475	275	320	366	412	458	3.95	0.023
	HHHH	39.8	32	287	382	478	573	314	367	419	471	524	4.76	0.023
90 Pa	LLLL	29.7	32	214	285	356	428	292	340	389	438	486	3.13	0.023
	LHLH	37.5	35	270	360	450	540	314	366	418	470	523	3.95	0.023
	HHHH	45.2	36	325	434	542	651	359	418	478	538	598	4.76	0.023

1) For the sizing of alternative nozzle settings, use the Swegon ProSelect sizing program that is available for use at www.swegon.com.

2) Room attenuation = 4 dB

3) The water capacity can vary depending on the installation and how the air deflectors are set. The primary air capacity is not affected.

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

Table 3. Cooling capacity ADAPT Parasol EX 1290

Nozzle pressure	Nozzle setting 1)	Primary air flow (l/s)	Sound level dB(A) 2)	Cooling capacity of primary air (W) for ΔT_1				Cooling capacity of the water (W) at ΔT_{mk} 3)					Pressure drop constant air/water	
				6	8	10	12	6	7	8	9	10	k_{pl}	k_{pk}
50 Pa	LLLL	13	<20	94	125	156	187	349	404	459	515	569	1.84	0.0183
	LHLH	29.4	22	212	282	353	423	444	517	583	649	715	4.16	0.0183
	HHHH	35.6	26	256	342	427	513	463	531	599	667	740	5.04	0.0183
70 Pa	LLLL	15.4	<20	111	148	185	222	389	457	518	580	641	1.84	0.0183
	LHLH	34.8	26	251	334	418	501	498	578	651	730	802	4.16	0.0183
	HHHH	42.2	29	304	405	506	608	519	594	669	749	823	5.04	0.0183
90 Pa	LLLL	17.5	<20	126	168	210	252	425	491	558	630	696	1.84	0.0183
	LHLH	39.5	29	284	379	474	569	541	626	704	788	864	4.16	0.0183
	HHHH	47.8	32	344	459	574	688	555	643	722	807	892	5.04	0.0183

Table 4. Cooling capacity ADAPT Parasol EX 1290 PF

Nozzle pressure	Nozzle setting 1)	Primary air flow (l/s)	Sound level dB(A) 2)	Cooling capacity of primary air (W) for ΔT_1				Cooling capacity of the water (W) at ΔT_{mk} 3)					Pressure drop constant air/water	
				6	8	10	12	6	7	8	9	10	k_{pl}	k_{pk}
50 Pa	LLLL	40.6	25	292	390	487	585	362	422	483	543	603	5.74	0.022
	LHLH	53.8	25	387	516	646	775	394	460	525	591	657	7.61	0.022
	HHHH	59.6	26	429	572	715	858	421	491	561	632	702	8.42	0.022
70 Pa	LLLL	48	30	346	461	576	691	422	492	562	633	703	5.74	0.022
	LHLH	63.7	30	459	612	764	917	456	532	608	684	760	7.61	0.022
	HHHH	70.4	32	507	676	845	1014	493	575	657	740	822	8.42	0.022
90 Pa	LLLL	54.5	34	392	523	654	785	475	554	634	713	792	5.74	0.022
	LHLH	72.2	34	520	693	866	1040	510	595	680	765	850	7.61	0.022
	HHHH	79.9	36	575	767	959	1151	548	639	731	822	913	8.42	0.022

1) For the sizing of alternative nozzle settings, use the Swegon ProSelect sizing program that is available for use at www.swegon.com.

2) Room attenuation = 4 dB

3) The water capacity can vary depending on the installation and how the air deflectors are set. The primary air capacity is not affected.

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

Table 5. Cooling capacity for natural convection

Unit (mm)	Cooling capacity (W) for temperature difference, room - water ΔT_{mk} (K)						
	6	7	8	9	10	11	12
690	17	21	25	29	34	39	43
1290	41	51	61	72	83	95	107

Calculation example - cooling

A cellular office without suspended ceiling with dimensions $w \times d \times h = 2.4 \times 4 \times 2.7$ m is to be equipped with a comfort module. The total cooling requirement is estimated to 50 W/m^2 . In order to meet this cooling requirement one ADAPT Parasol EX is needed that gives $50 \times 2.4 \times 4 = 480 \text{ W}$.

Design room temperature (t_r) 24°C , cooling water temperature (flow/return) $14/16^\circ\text{C}$ and the primary air temperature (t_p) 16°C produces:

$$\Delta T_k = 2 \text{ K}$$

$$\Delta T_{mk} = 9 \text{ K}$$

$$\Delta T_1 = 8 \text{ K}$$

Required primary air flow for the room (q_p) has been set to 16 l/s . A zone damper ensures that the pressure in the duct is held constant at approx. 73 Pa which in this case gives a nozzle pressure of 70 Pa .

The sound from the unit must not exceed 30 dB (A) .

Solution**Cooling**

The cooling capacity of the primary air can be calculated using the following formula: $P_1 = 1.2 \cdot \Delta T_1 \cdot q_1$

$$P_1 = 1.2 \cdot 8 \cdot 16 = 154 \text{ W}$$

Accordingly, the comfort module ADAPT Parasol EX shall be able to give $480 - 154 = 326 \text{ W}$ in cooling capacity on the water side.

From Table 1 we can read that a ADAPT Parasol EX 690×690 mm with a nozzle setting LHLH for a primary air flow of 15.8 l/s gives 378 W in cooling capacity on the water side. Thus this is sufficient to meet the cooling requirement.

At the same time, this nozzle configuration means that a large amount of air can be saved for absence mode, which in this case gives 4.3 l/s (see ProSelect).

Alternatively, nozzle HHHH can be set, it then gives more air for absence (minor saving), but an overcapacity in air flow and cooling is available if, for example, you visit the office often.

Cooling water

With a cooling capacity requirement of 326 W for cooling water, the necessary water flow can be obtained in Diagram 1. With the temperature increase $\Delta T_k = 2 \text{ K}$ the water flow will be 0.039 l/s .

In Diagram 2 we can read that a water flow of 0.039 l/s does not produce a fully turbulent outflow, but the capacity must be corrected by a reduction factor of 0.97 . The loss of capacity is compensated by calculating the comfort module's required cooling capacity as follows: $P_k = 326 / 0.97 = 336 \text{ W}$.

New water flow is obtained from Diagram 1, $q_k = 0.040 \text{ l/s}$.

The pressure drop can now be read at 5.5 kPa from Diagram 4.

Heating

Heating function

As the comfort module is able to quickly mix the primary air with room the air, ADAPT Parasol EX is ideal to manage 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. When ADAPT Parasol EX maintains a high nozzle pressure even at low flow rates, there is a specific heating output even, for example, for weekend operations when the flow is reduced over 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 20–24°C, and the optimal comfort requirements are normally met when the room temperature is 22 °C. This means that for a room with a cold perimeter wall, the air temperature must be higher than 22 °C to compensate for the chilling effect of the wall. In new buildings with normal insulated perimeter walls and normal 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 ProClim Web software 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 40 °C, the stratification is non-existent, while at 60 °C 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, computers and people are present, the stratification is reduced or disappears depending on the heating load.

When heating with ADAPT Parasol EX, use of an external temperature sensor or additional sensor module in the room is recommended.

Calculation formulae - water-based heating

Below are some formulae that enable the user to calculate which comfort module selection is best suited for the application. The values for the calculations are in Tables 6-9.

The cooling or heating capacity of the air

$P_i = 1.2 \cdot q_i \cdot \Delta T_i$

P_i The cooling or heating capacity of the air (W)

q_i Flow of primary air (l/s)

ΔT_i Temperature difference between primary air (t_i) and room air (t_r) (K)

Pressure drop for heating coil

$\Delta p_v = (q_v / k_{pv})^2$

Δp_v Pressure drop in cooling coil (kPa)

q_v Flow of heating water (l/s), see Diagram 6

k_{pv} Pressure drop constant for heating coil, see Tables 6-9

Heating capacity of the water

$P_v = 4186 \cdot q_v \cdot \Delta T_v$

P_v Heating capacity of the water (W)

q_v Flow of heating water (l/s)

ΔT_v Temperature difference between the heating water's flow and return flow (K)

Diagram 5. Water flow - heating capacity

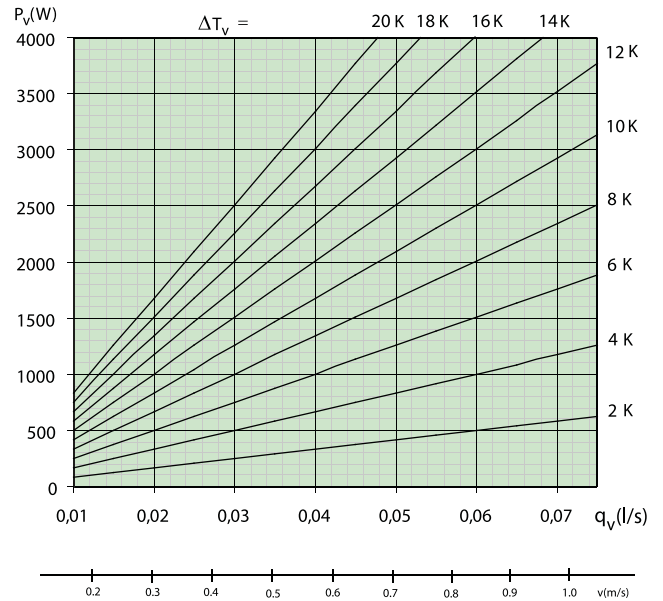


Diagram 6. Pressure drop – heating water flow

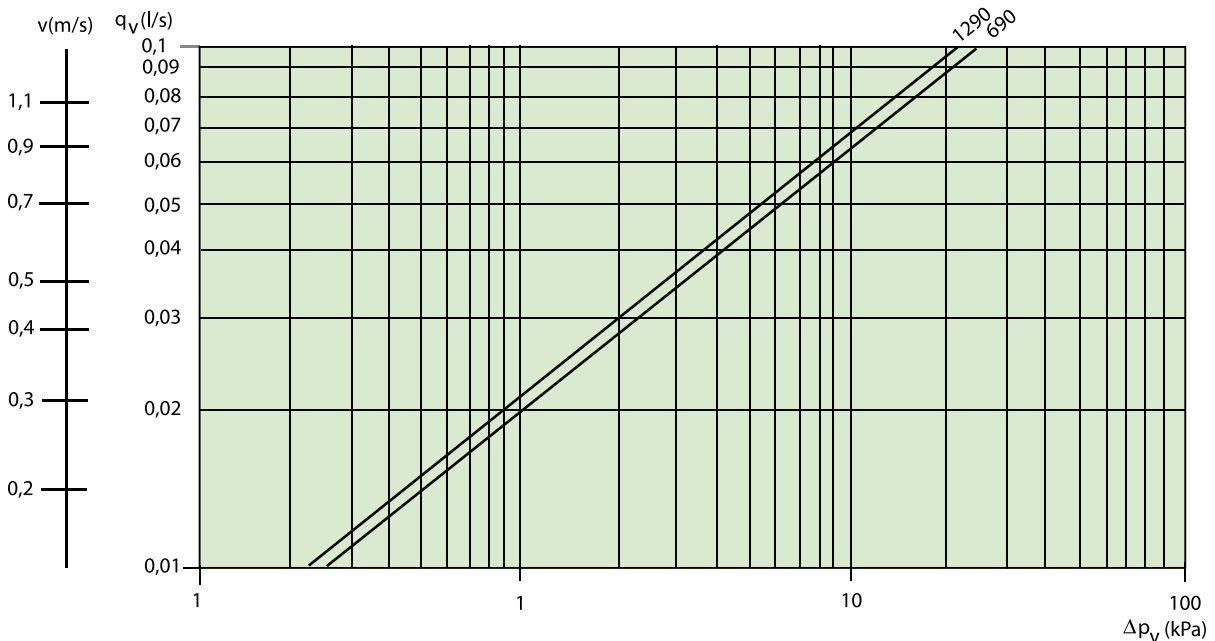


Table 6 - Heat capacity ADAPT Parasol EX 690

Nozzle pressure	Nozzle setting 1)	Primary air flow (l/s)	Sound level dB(A) 2)	Heating capacity, water (W) for ΔT_{mv} 3)						Pressure drop constant air/water	
				5	10	15	20	25	30	k_{pl}	k_{pv}
50 Pa	LLLL	7.2	<20	114	190	285	379	473	567	1.01	0.0200
	LHLH	13.4	<20	125	248	365	485	600	716	1.89	0.0200
	HHHH	19.6	20	135	270	396	524	647	774	2.77	0.0200
70 Pa	LLLL	8.5	<20	110	221	331	442	552	661	1.01	0.0200
	LHLH	15.8	24	140	281	416	551	682	816	1.89	0.0200
	HHHH	23.2	25	151	304	448	592	733	875	2.77	0.0200
90 Pa	LLLL	9.6	20	124	245	365	488	609	731	1.01	0.0200
	LHLH	17.9	27	152	306	453	600	745	890	1.89	0.0200
	HHHH	26.3	29	165	327	485	641	797	950	2.77	0.0200

Table 7 - Heat capacity ADAPT Parasol EX 690 PF

Nozzle pressure	Nozzle setting 1)	Primary air flow (l/s)	Sound level dB(A) 2)	Heating capacity, water (W) for ΔT_{mv} 3)						Pressure drop constant air/water	
				5	10	15	20	25	30	k_{pl}	k_{pv}
50 Pa	LLLL	22.1	23	103	206	308	411	514	617	3.13	0.018
	LHLH	27.9	27	117	233	350	466	583	699	3.95	0.018
	HHHH	33.7	27	121	243	364	485	606	728	4.76	0.018
70 Pa	LLLL	26.2	28	121	242	362	483	604	725	3.13	0.018
	LHLH	33	32	134	267	401	534	668	801	3.95	0.018
	HHHH	39.8	32	139	278	416	555	694	833	4.76	0.018
90 Pa	LLLL	29.7	32	135	269	404	538	673	807	3.13	0.018
	LHLH	37.5	35	147	294	440	587	734	881	3.95	0.018
	HHHH	45.2	36	152	304	455	607	759	911	4.76	0.018

1) For the sizing of alternative nozzle settings, use the Swegon ProSelect sizing program that is available for use at www.swegon.com.

2) Room attenuation = 4 dB

3) The water capacity can vary depending on the installation and how the air deflectors are set. The primary air capacity is not affected.

Note! The total heating capacity is the sum of the airborne and waterborne heating capacities. If the primary air temperature is lower than the room temperature, it causes a negative impact on the total heating capacity.

Table 8 - Heat capacity ADAPT Parasol EX 1290

Nozzle pressure	Nozzle setting 1)	Primary air flow (l/s)	Sound level dB(A) 2)	Heating capacity, water (W) for ΔT_{mv} 3)						Pressure drop constant air/water	
				5	10	15	20	25	30	k_{pl}	k_{pv}
50 Pa	LLLL	13	<20	155	313	584	850	1008	1163	1.84	0.0213
	LHLH	29.4	22	199	394	735	1072	1272	1471	4.16	0.0213
	HHHH	35.6	26	205	410	760	1110	1311	1515	5.04	0.0213
70 Pa	LLLL	15.4	<20	176	353	658	959	1136	1312	1.84	0.0213
	LHLH	34.8	26	220	439	819	1201	1421	1645	4.16	0.0213
	HHHH	42.2	29	225	455	846	1237	1466	1691	5.04	0.0213
90 Pa	LLLL	17.5	<20	190	384	712	1044	1234	1428	1.84	0.0213
	LHLH	39.5	29	239	474	885	1298	1537	1767	4.16	0.0213
	HHHH	47.8	32	245	490	912	1334	1579	1811	5.04	0.0213

Table 9 - Heat capacity ADAPT Parasol EX 1290 PF

Nozzle pressure	Nozzle setting 1)	Primary air flow (l/s)	Sound level dB(A) 2)	Heating capacity, water (W) for ΔT_{mv} 3)						Pressure drop constant air/water	
				5	10	15	20	25	30	k_{pl}	k_{pv}
50 Pa	LLLL	40.6	25	238	477	715	954	1192	1431	5.74	0.027
	LHLH	53.8	25	278	556	834	1112	1389	1667	7.61	0.027
	HHHH	59.6	26	282	565	847	1130	1412	1694	8.42	0.027
70 Pa	LLLL	48	30	281	561	842	1123	1404	1684	5.74	0.027
	LHLH	63.7	30	325	650	975	1301	1626	1951	7.61	0.027
	HHHH	70.4	32	330	659	989	1319	1648	1978	8.42	0.027
90 Pa	LLLL	54.5	34	312	625	937	1249	1562	1874	5.74	0.027
	LHLH	72.2	34	359	719	1078	1437	1797	2156	7.61	0.027
	HHHH	79.9	36	365	731	1096	1461	1826	2192	8.42	0.027

1) For the sizing of alternative nozzle settings, use the Swegon ProSelect or IC Design sizing program that is available for use at www.swegon.com.

2) Room attenuation = 4 dB

3) The water capacity can vary depending on the installation and how the air deflectors are set. The primary air capacity is not affected.

Note! The total heating capacity is the sum of the airborne and waterborne heating capacities. If the primary air temperature is lower than the room temperature, it causes a negative impact on the total heating capacity.

Calculation Example - Heating

In a cellular office without a suspended ceiling with dimensions $w \times d \times h = 2.4 \times 4 \times 2.7$ m (same room as in the example for cooling) there is also heating requirement during the winter of 450 W. The primary air flow must be the same as in the summer case, 16 l/s and the duct pressure is now also held constant.

Design room temperature (t_r) 22 °C, the heating water temperature (supply/return) 45/39 °C and the primary air temperature (t_p) 20 °C give:

$$\begin{aligned} \Delta T_v &= 6 \text{ K} \\ \Delta T_{mv} &= 20 \text{ K} \\ \Delta T_r &= -2 \text{ K} \end{aligned}$$

Solution

Heating

The primary air flow of 16 l/s in combination with the primary air temperature of 20 °C produces a negative impact on the heating capacity: $1.2 \times 16 \times (-2) = -38$ W. The heating capacity requirement from the heating water is thus increased to $450 + 38 = 488$ W. Table 6 gives at $\Delta T_{mv} = 20$ K and primary air flow 16 l/s, a heat capacity. $P_v = 551$ W from a single-module unit with nozzle setting LHLH, which is enough to meet the heating requirement.

Heating water

With a heating requirement of 488 W and $\Delta T_v = 6$ K, the requisite water flow is then obtained from Diagram 5: 0.019 l/s. The pressure drop for the heating water is calculated on the basis of a water flow of 0.019 l/s and pressure drop constant $k_{pv} = 0.0200$, which is taken from Table 6. The pressure drop will then be: $\Delta p_v = (q_v/k_{pv})^2 = (0.019 / 0.0200)^2 = 0.90$ kPa. Alternatively, the pressure drop can be read from Diagram 6.

Acoustics

Natural attenuation and end reflection

Natural attenuation ΔL (dB) including end reflection.

**Table 10. Natural attenuation ΔL (dB)
ADAPT Parasol EX 690**

Nozzle setting	Octave band (Hz)							
	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 11. Natural attenuation ΔL (dB)
ADAPT Parasol EX 1290**

Nozzle setting	Octave band (Hz)							
	63	125	250	500	1k	2k	4k	8k
LLLL	18	19	16	15	16	15	14	14
MMMM	16	17	14	13	14	13	12	12
HHHH	14	15	12	11	12	11	10	10

Installation

Recommended ceiling types

ADAPT Parasol EX is designed for suspended installation, either as pendant or surface mounted.

Suspension

The product consists partly of a base module and partly of a design module with face plate. The base module has four brackets for suspension.

No extra assembly parts are required for surface mounting, expect the supplied spacers that are used for suspension of variant MF/HF with Ø125 connection.

A threaded rod in each mounting bracket is used for suspended installation (Figure 25). Threaded drop rods and assembly fitting SYST MS M8 (Figure 26) are ordered separately.

Connection side

The product can be ordered with air and water connections on the side 2 (standard) or side 4.

Connection sizes

Water

Without valves:

Cooling, plain pipe ends (Cu) Ø 12 x 1.0 mm
 Heating, plain pipe ends (Cu) Ø 12 x 1.0 mm

Supplied and connected valves:

Cooling Male thread DN15 (1/2")
 Heating Male thread DN15 (1/2")

Air

Connecting sleeve Ø125 (MF/HF) or Ø160mm (PF)

To connect the air

The product is supplied with connecting sleeve mounted on side 2 or 4 depending on which side is ordered.

There is a cover on the opposite side, which can only be used as a cleaning cover. The pipe kit and enclosures will not fit if you use the cleaning cover as an air connection.

Connecting water

Connect the water pipes using push-on couplings or compression ring couplings when the product is ordered without valves.

Note that compression ring couplings require support sleeves inside the pipes. Do not use solder couplings to connect the water pipes.

High temperatures can damage the unit's existing soldered joints.

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

Condensation-free cooling

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

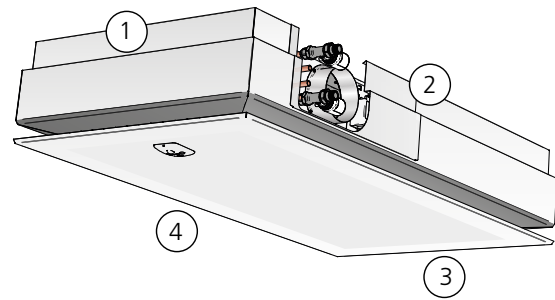


Figure 23. Water and air connection on side 2 (standard).

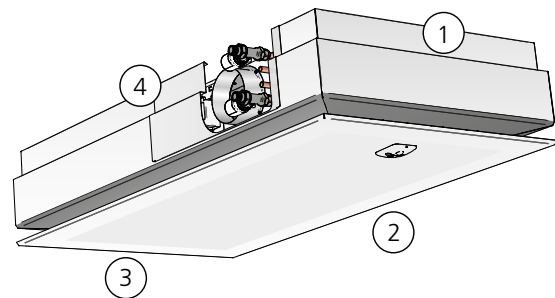


Figure 24. Water and air connection on side 4.

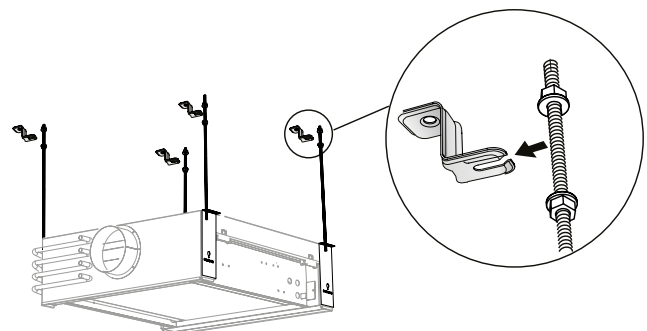


Figure 25. Suspension. No extra assembly parts are required for surface mounting. For suspended installation use SYST MS M8 which are ordered separately.

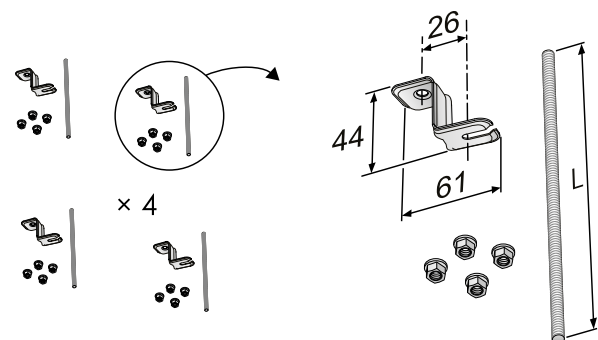


Figure 26. Assembly piece SYST MS M8-1, ceiling mount and threaded rod

Installation, control equipment

On the side of the base module is a control plate with all control equipment assembled. On the same side are water and air connections too, which facilitates installation work and servicing.

If the product is ordered with valve kits, these are supplied connected to the regulator. On delivery they are attached next to the regulator using cable ties. The cable ties are cut and the valve kit is then mounted on pipes for cooling return and heating return according to the installation instruction.

Installation, design module and connection casing

When the valve kit is connected in, the design module and face plate are mounted.

If the product is supplied with a sensor module in the face plate (standard), this is mounted before the face plate is mounted on the product. Cables to the sensor module are then prerouted in the product and connected on the regulator. All that remains is to connect the plug in the sensor module.

Connection casing can be ordered as an accessory and then conceals the control equipment, water and air connections.

For further information, see the relevant documentation at www.swegon.com

ADAPT Parasol EX installation instruction

ADAPT Parasol manual

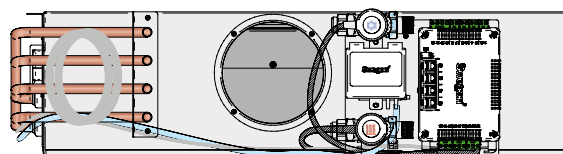


Figure 27. Location of the valve kit on the base module on delivery.

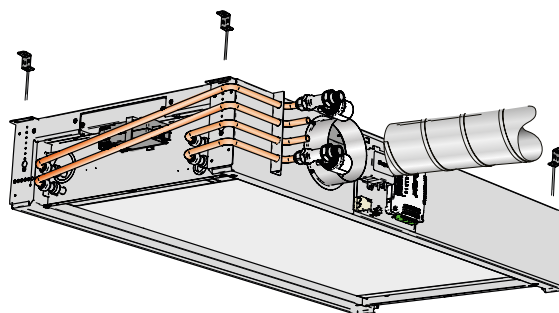


Figure 28. Base module with valve kit mounted

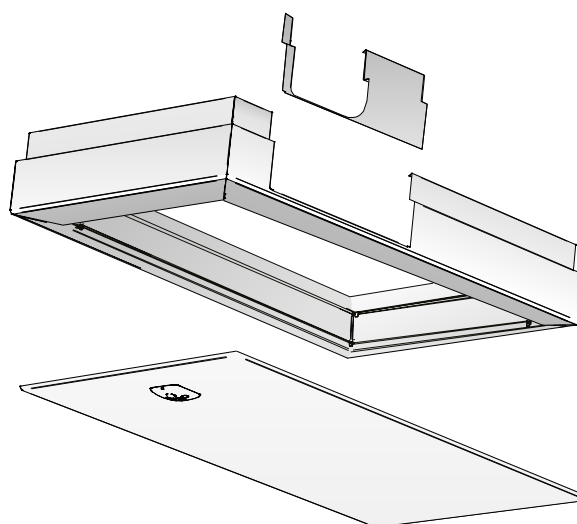


Figure 29. Design module with cover plate and face plate with sensor module

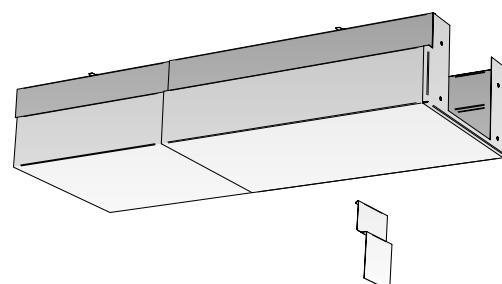


Figure 30. Connection casing incl. extra cover plate to completely cover the gap to the design cover.

Dimensions and weights

ADAPT Parasol EX 690

Table 12. Dimensions 690, base module

Variant	Length (mm) *	Width (mm) *	Height (mm)
690	567 (+ 41)	567 (+ 72)	178
690 PF	567 (+ 41)	567 (+ 72)	208

* Dimension (in brackets) refers to protruding pipes

Table 13. Dimensions 690 incl. design module

Length (mm)	Width (mm)	Height (mm)
690	690	250*

* When the sensor module is installed in the face plate the height measurement (H) increases by 12 mm

Table 14. Weight 690

Size	Type	Dry weight	Water volume	
		(kg)	cooling (l)	heating (l)
690	690-A	22.8	1.1	
690	690-B	24.0	1.1	0.2
690 PF	690-A	24.2	1.1	
690 PF	690-B	25.4	1.1	0.2

Weight incl. design module but excl. sensor module (0.1 kg).

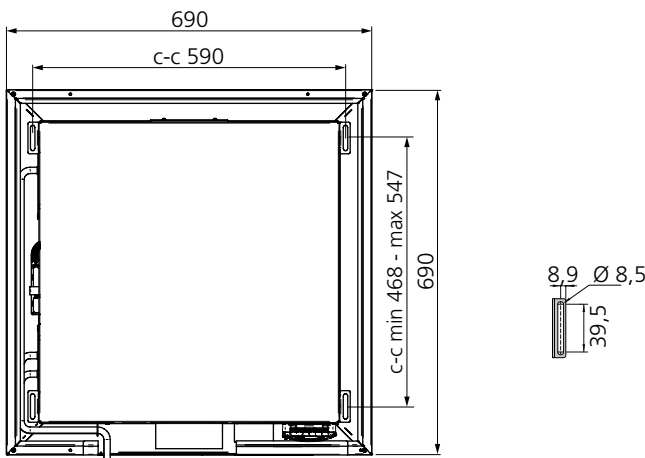


Figure 31. ADAPT Parasol EX 690, top view

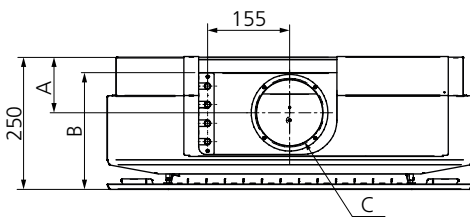


Figure 32. ADAPT Parasol EX 690, side view

Variant	A (mm)	B (mm)	C
MF/HF	105	220	Ø125
PF	101	250	Ø160

* When the sensor module is installed in the face plate the height measurement increases by 12 mm

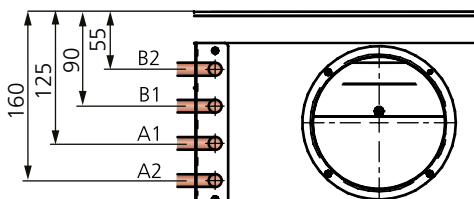


Figure 33. ADAPT Parasol EX 690, side view
 A1 = Supply cooling water $\varnothing 12 \times 1.0$ mm (Cu)
 A2 = Return cooling water $\varnothing 12 \times 1.0$ mm (Cu)
 B1 = Supply heating water $\varnothing 12 \times 1.0$ mm (Cu)
 B2 = Return heating water $\varnothing 12 \times 1.0$ mm (Cu)

ADAPT Parasol EX 1290

Table 15. Dimensions 1290, base module

Variant	Length (mm) *	Width (mm) *	Height (mm)
1290 MF/HF	1167 (+ 41)	567 (+ 72)	178
1290 PF	1167 (+ 41)	567 (+ 72)	208

* Dimension (in brackets) refers to protruding pipes

Table 16. Dimensions 1290 incl. design module

Length (mm)	Width (mm)	Height (mm)
1290	690	250 *

* When the sensor module is installed in the face plate the height measurement increases by 12 mm

Table 17. Weight 1290

Size	Type	Dry weight (kg)	Water volume (l)	
			cooling	heating
1290	1290-A	35.5	1.4	
1290	1290-B	40.3	1.4	0.9
1290 PF	1290-A	37.8	1.4	
1290 PF	1290-B	42.6	1.4	0.9

Weight incl. design module but excl. sensor module (0.1 kg).

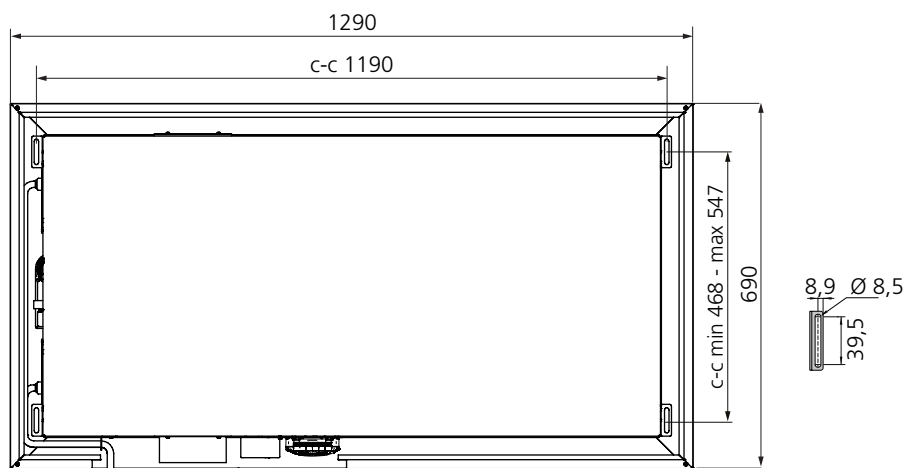
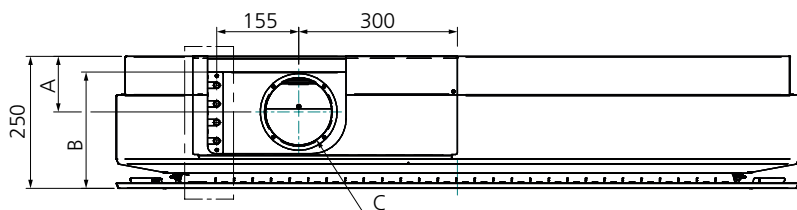


Figure 34. ADAPT Parasol EX 1290, top view (example with connection on side 2).



Variant	A (mm)	B (mm)	C
MF/HF	105	220	Ø125
PF	101	250	Ø160

* When the sensor module is installed in the face plate the height measurement increases by 12 mm

Figure 35. ADAPT Parasol EX 1290, side view (example with connection on side 2).

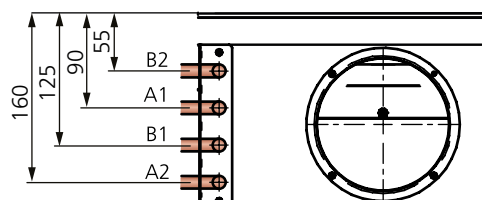


Figure 36. ADAPT Parasol EX 1290, water connection on side 2.
 A1 = Supply cooling water $\varnothing 12 \times 1.0$ mm (Cu)
 A2 = Return cooling water $\varnothing 12 \times 1.0$ mm (Cu)
 B1 = Supply heating water $\varnothing 12 \times 1.0$ mm (Cu)
 B2 = Return heating water $\varnothing 12 \times 1.0$ mm (Cu)

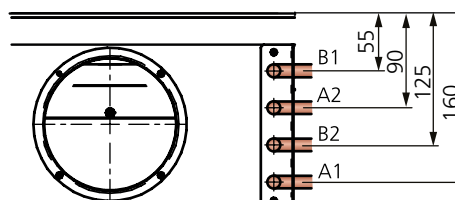


Figure 37. ADAPT Parasol EX 1290, water connection on side 4.
 A1 = Supply cooling water $\varnothing 12 \times 1.0$ mm (Cu)
 A2 = Return cooling water $\varnothing 12 \times 1.0$ mm (Cu)
 B1 = Supply heating water $\varnothing 12 \times 1.0$ mm (Cu)
 B2 = Return heating water $\varnothing 12 \times 1.0$ mm (Cu)

Accessories

Factory-fitted

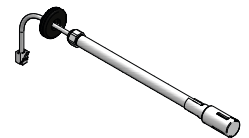
Co2 sensor Detect Qa

Analogue carbon dioxide sensor that is mounted concealed, above the face plate.
See separate product datasheet at www.swegon.com.



VOC sensor

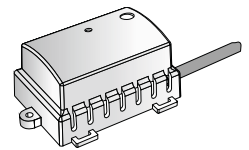
Modbus connected air quality sensor that is mounted concealed above the face plate.
The VOC level is transmitted via Modbus communication to the air handling unit control circuit card.



Condensation sensor WCD2

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

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



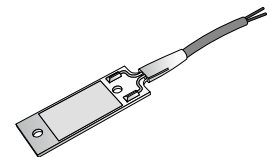
Condensation sensor, CG IV

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

When the condensation on the conductive paths has been wiped off, the cooling valve is permitted to open again.

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

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

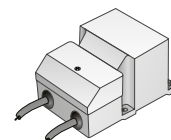


The factory fitted accessories above are also available to order as loose accessories.

Miscellaneous

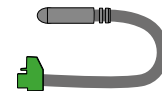
Transformer SYST TS-1 72 VA

Double-insulated protective transformer 230 V AC/24 V AC
See separate product datasheet at www.swegon.com.



Temperature sensor, CONDUCTOR T-TG

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



Sensor module, external

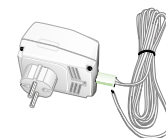
Sensor module with temperature and presence sensors for wall mounting when an extra sensor module is needed in the room (1 always supplied with ADAPT Parasol EX)

Available in a rectangular model and is always supplied with both a mounting frame for the most common junction boxes and a spacer frame for surface mounting. Cable ordered separately, see SYST KABEL RJ12



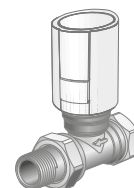
Transformer Power Adapt 20 VA

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



Valve with actuator, SYST VDN215 with ACTUATORc 24V NC for cooling and heating.

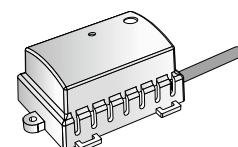
See separate product sheet at www.swegon.com.



Condensation sensor WCD2

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

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



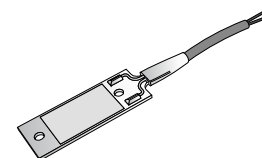
Condensation sensor, CG IV

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

When the condensation on the conductive paths has been wiped off, the cooling valve is permitted to open again.

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

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



VOC sensor

Modbus connected air quality sensor that is mounted concealed above the face plate.
The VOC level is transmitted via Modbus communication to the air handling unit control circuit card.

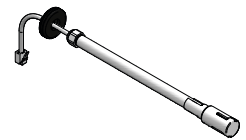
Connection port RJ 12 6/6

Voltage supply 24 V DC (Via modular connector)

Range of measurement, VOC 450 - 10,000 ppm

Enclosure class:

inside the duct IP22 to EN 60529, outside the duct IP54 to EN 60529



Cable, SYST KABEL RJ12 6-LED.

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



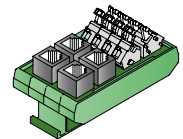
Cable, CABLE CONVERTER USB-RJ12 (RS485)

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



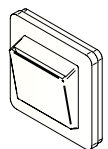
Cable adapter, CABLE ADAPTER

Cable adapter for connecting together cable with RJ12 connector and cable with pinned cable ends.



Card switch, SYST SENSO

Key card holder for hotel rooms.



Assembly fitting, SYST MS M8

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



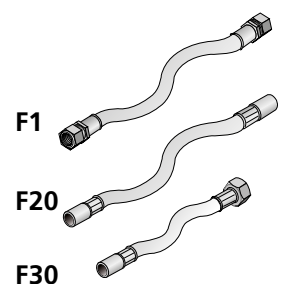
Flexible connection hoses, SYST FH

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

F1 = Flexible hose with clamping ring couplings.

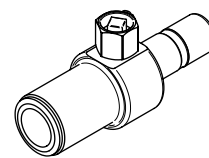
F20 = Flexible hose with quick couplings (push-on)

F30 = Flexible hose with quick couplings (push-on) on one end and the G20ID sleeve nuts on the other end.



Venting nipple, SYST AR-12

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



Connection piece, air – insertion joint, SYST AD1

SYST AD1 is used as a joint between the ADAPT Parasol EX and the duct system. Available in two sizes: Ø125 and Ø160 mm.



Connection piece, air, SYST CA

90° duct bend

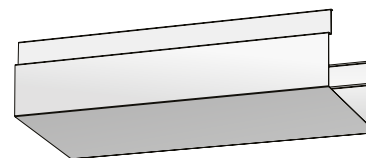
Available in two sizes: Ø125 and Ø160 mm.



Connection casing, Parasol EX c T-CC

Telescopic casing for concealing ducts, pipework and control equipment

Width: 380 mm	Length interval:
	175 - 250 mm
	250 - 400 mm
	400 - 700 mm
	700 - 1200 mm
	1200 - 2000 mm



The connection casing is available in several different colours, see the description on page 32.

Assembly piece SYST MS M8 is required for suspended installation from hangers (ordered separately). One kit is sufficient for two connection casings. No extra mounting parts are needed if the module is installed directly against the ceiling.

Tool for nozzle adjustment, SYST TORX

Tools to facilitate adjustment of nozzle strips.



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 extract air diffusers that share the surface of a suspended ceiling. A ceiling containing different types of perforation patterns can be experienced as disturbing to the eye.

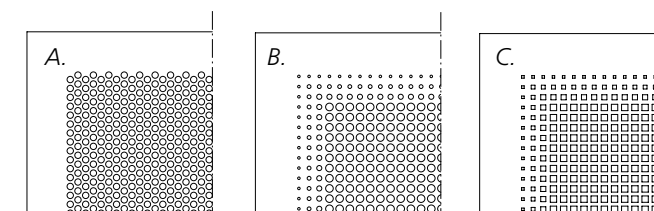
The face plate, like the design cover and connection casing, can be supplied in several different colours, see the description on page 32.

If other patterns or colours are wanted, contact Swegon for more information.

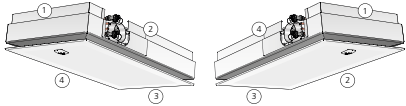
A. Face plate standard PB, Circular holes arranged in a triangular pattern.

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.



Specification

Function	The units can be ordered in various functional versions: A = Cooling and supply air B = Cooling, heating and supply air
ADC	Factory-fitted ADC supplied as standard
Air flow variant	Single-module unit: ADAPT Parasol EX 690 MF/HF ADAPT Parasol EX 690 PF Double module unit: ADAPT Parasol EX 1290 MF/HF ADAPT Parasol EX 1290 PF
Air connection side	The product can be ordered with the air connection on the side 2 (standard) or side 4. 
Software configuration	The product can be delivered with some software settings preconfigured from the factory. For example: Occupancy flow and temperature values.
Nozzle setting	Each side can be set in four different ways, L, M, H L = Low air flow M = Medium air flow H = High air flow
Colour	As standard the units are supplied finished in Swegon's standard shade of white, RAL 9003, gloss ratio 30 ± 6%, but can also be ordered in several other colours.
Communication	Modbus RTU

Contractor demarcation

Swegon's delivery ends at the connection points for water and air and the connection of the room control equipment (see figures 31-37).

- The pipe contractor connects the connections points for water to the plain pipe ends and fills the system, bleeds it and tests the pressure.
- The ventilation contractor connects to the air connecting piece.
- The electrical contractor connects the power (24 V) and signal cables to the connection terminals with spring-loaded snap-in connections. Maximum cable cross section 2.5 mm². For safe operation, we recommend cable ends with ferrules.

Compilation accessories

Sensor module	
Valve actuator	ACTUATORc 24V NC
Valve	SYST VDN215
CO ₂ sensor	DETECT Qa
Temperature sensor	CONDUCTOR T-TG
VOC sensor	VOC Sensor
Condensation sensor	CG-IV
Condensation sensor	WCD2
Tool for nozzle adjustment	SYST TORX
Transformer	SYST TS-1, 72 VA
Transformer	POWER Aa, 20 VA
Connection piece, air – insertion joint	SYST AD1
Connection piece, air – 90°	SYST CA
Assembly piece	SYST MS M8
Assembly piece for casing	
Flexible connection hose with clamping ring couplings.	SYST FH F1
Flexible connection hose with quick-fit couplings (push-on)	SYST FH F20
Flexible connection hose with quick-fit coupling (push-on) at one end and G20ID sleeve nut at the other end.	SYST FH F30
Venting nipple, push-on	SYST AR-12
Connection casing	Parasol EX c T-CC
Cover plate	Parasol EX c T-ICP
Cable (2xRJ12)	SYST CABLE RJ12 6-LED.
Cable (USB+RJ12)	CABLE CONVERTER USB-RJ12 (RS485)
Junction box	CABLE ADAPTER
Card switch	SYST SENSO
Perforated face plate (in addition to standard perforation PB)	PD PE

Optional colours on the design module, face plate and connection casing

Colour no.	Colour
RAL 9003	Standard colour, white, gloss ratio 30 ± 6%
RAL 7037	Grey, gloss ratio 30-40%)
RAL 9010	White, gloss ratio 30-40%)
RAL 9005	Black, gloss ratio 30-40%)
RAL 9006	White, gloss ratio 70-80%)
RAL 9007	Grey, gloss ratio 70-80%).

Ordering key

ADAPT Parasol EX b 690

Size 690	a-	2	bb-	cdef-	RAL gggg
Function:					
A = Cooling and supply air					
B = Cooling, heating and supply air					
Connection side: 2					
Airflow variant:					
MF = Medium flow					
HF = High flow					
PF = Plus flow					
Nozzle setting:					
Side 1: L; M; H; C					
Side 2: L; M; H; C					
Side 3: L; M; H; C					
Side 4: L; M; H; C					
Colour, RAL:					
9003: White, standard color, gloss ratio 30 ± 6%					
7037: Grey, gloss ratio 30-40%					
9010: White, gloss ratio 30-40%					
9005: Black, gloss ratio 30-40%					
9006: White, gloss ratio 70-80%					
9007: Grey, gloss ratio 70-80%					

ADAPT Parasol EX b 1290

Size 1290	a-	b	cc-	defg-	RAL hhhh
Function:					
A = Cooling and supply air					
B = Cooling, heating and supply air					
Connection side:					
2 = Standard					
4 = Alternative long side					
Airflow variant:					
MF = Medium flow					
HF = High flow					
PF = Plus flow					
Nozzle setting:					
Side 1: L; M; H; C					
Side 2: L; M; H; C					
Side 3: L; M; H; C					
Side 4: L; M; H; C					
Colour, RAL:					
9003: White, standard color, gloss ratio 30 ± 6%					
7037: Grey, gloss ratio 30-40%					
9010: White, gloss ratio 30-40%					
9005: Black, gloss ratio 30-40%					
9006: White, gloss ratio 70-80%					
9007: Grey, gloss ratio 70-80%					

Ordering examples

Suspended comfort module with integrated control equipment for demand-controlled air flow / indoor climate

ADAPT Parasol EX b 1290-A-2-HF-LHLH

ADAPT Parasol = Product family

EX = Suspended

b = version letter

1290 = Dimensions

A = Function: Cooling and supply air

2 = Air connection side

HF = Airflow variant: High flow

LHLH = Nozzle setting

9003 = White standard colour