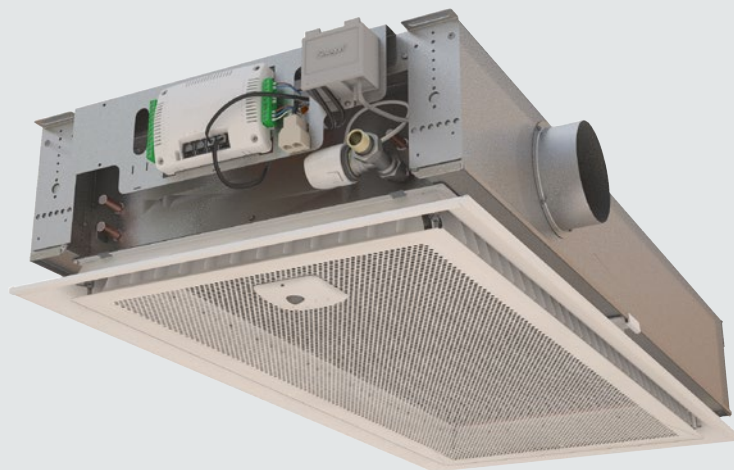# ADAPT Parasol b

Technical manual

- Function in the room
- Technical description
- System technology
- ProSelect
- Heating with ADAPT Parasol
- Air quality sensor
- Change –over system
- Lighting control
- Start-up and Zero point calibration
- Two-stage cooling/two stage heating
- Modbus register
- Alarm list

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Contents

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Installation and safety

About this manual
This manual is intended for technicians or those with the equivalent knowledge who work in design, commissioning, maintenance or for some other reason need a more technical description of the product than offered by a product data sheet.

The manual contains information about:

Technical description.

Help during project design

Installation and start-up

Instruction about how the different settings are made

Changing the project
Swegon reserves the right to make changes to both the manual and to the product without prior notice

Safety Instructions

Responsibility
It is the user's responsibility to:

• Make all relevant risk assessments of the activities that are related with this manual.

• Ensure that all necessary safety precautions have been taken before the activities related with this manual are started.

⚠ **WARNING**
For US and Canada market
The Power feeding to the system shall be a Low Voltage class 2 circuit.

Function in the room

General

ADAPT Parasol is a four-way blowing comfort module with built-in control equipment for demand-control not only of the air but also the entire indoor climate in the room.

The product can work as a stand-alone unit or connected in a system such as Swegon's WISE.

Function of the product is based on a constant duct pressure being provided either through a zone damper such as CONTROL Zone or in a smaller system with a unit that can maintain the duct pressure sufficiently constant.

In a room where the occupancy rate is low and/or uneven ADAPT Parasol can, in the event being unoccupied, save air through the integrated damper and also allow the temperature to deviate more from the room's setpoint than with occupancy, all to save energy.

On occupancy the integrated control equipment quickly takes care of the indoor climate by opening the damper and the cooling or heating valves so that an indoor climate with high comfort is maintained - yet still with minimal energy input.

A sensor module with temperature and occupancy sensors registers what is happening in the room and act at the same time as setpoint selector and alarm indicator.

Functional description air

The product regulates the amount of air to the room according to three levels:

- Unoccupied
- Min. occupancy
- Max. occupancy

For **Unoccupied mode** a low airflow is supplied to save air. When someone enters the room the occupancy is detected by the occupancy sensor integrated in the sensor module and the airflow is increased to the **Min occupancy** level.

In addition to an occupancy sensor there is also a temperature sensor in the sensor module that measures the temperature of the room air. When the temperature exceeds the desired setpoint in the room, the ADAPT Parasol starts to cool, either with air first, or water first depending on which the chosen sequence selection. When the output demand becomes large enough, or air quality is poor enough, ADAPT Parasol will variably open up to **Max occupancy** airflow.

Functional description water

Different temperature settings can be set for

- Unoccupied
- Occupancy:
- Holiday mode, i.e. extended unoccupied mode
- In the case of **unoccupied mode** the temperature can be allowed to deviate more from the room's setpoints than for occupancy. When someone enters the room and the sensor module indicates **occupancy** the ADAPT Parasol is set to normal operation mode and then regulates the desired room temperature more accurately. **Holiday mode** works in the same way as unoccupied mode, but here the temperatures are permitted to deviate further from the room's setpoint and a signal from a master system is required
- Heating and cooling are controlled in sequence to avoid simultaneous cooling and heating. However, there is a cold draught protection that can be activated and this then means that you allow a certain amount of heat simultaneously with cooling.

    20161206

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Adaptation as required

During a day different things occur that affect the room's climate, and ADAPT Parasol uses both air and water to maintain a good climate:

- Night, no occupancy in the room
- The temperature is permitted to deviate slightly more from the setpoint than for occupancy.
- Airflow "unoccupied"

- Morning, no occupancy
- Airflow "unoccupied"
- The temperature is still regulated according to the settings for unoccupied, but if a cooling demand occurs e.g. due to solar incident radiation ADAPT Parasol will start to cool the room.
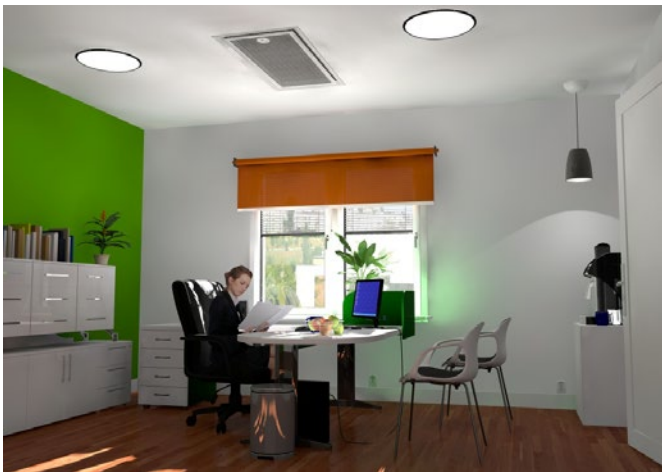
- Morning, the workday begins and someone enters into the room.
- The sensor module detects occupancy and the airflow rises to the set Min Occupancy flow, which is the minimum airflow in the room when someone is present.
- The temperature is now allowed to deviate less from the setpoint value than in unoccupied mode.

- Different things can happen during the day that change the room's climate, such as increased solar incident radiation or increased sensory pollution loads from occupants.
- ADAPT Parasol can now manage this by opening the water valve in combination with variably regulating the airflow towards the Max Occupancy flow.

Distribution of the airflows

The principle is the same for a conference room or a open plan office.

When several ADAPT Parasols are installed in the same room the airflow is evenly distributed between them.

One product is then defined as the master while the others become slaves.

If the room is large and there is a great distance between products, it may be an alternative to allow all the units to be Masters, i.e. all are regulated independently of each other. Different parts of the room can then have different climates, which may be the intention, but you also risk supplying the room as a whole with both cooling and heating simultaneously.

Master and Slave(s) share the room's supply airflow proportionally. Proportionally as two different ADAPT Parasols, e.g. 600 and 1200 can have different maximum flows.

Example: If a 600 gives a maximum of 25 l/s and a 1200 max 40 l/s and the room's total supply airflow at one time is 30 l/s, the 600 will give approx. 12 l/s and the 1200 about 18 l/s. Had both been identical they would have given 15 l/s each.

The extract air constantly receives a signal from the master, a signal voltage of 2-8 V, which is converted from the master's flow.
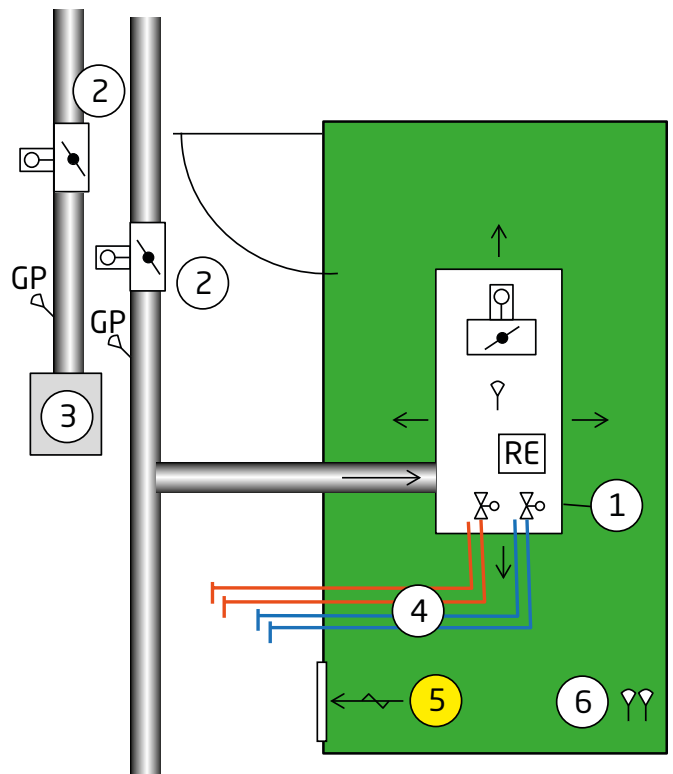
ADAPT Parasol works perfectly as a standalone unit, i.e. without a connection to the master system. The simplest solution is that shown in the picture, a room with ADAPT Parasol and extract air via the air transfer grille. Air balancing occurs on a zone level and ADAPT Parasol demand-controls the climate in the room.

1. Comfort module ADAPT Parasol with supply air, cooling and heating Incl.
   • pressure sensor
   • communications unit/regulator
   • damper with motor.
2. Zone damper CONTROL Zone
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)

Since heating is provided from ADAPT Parasol in the case above, the sensor module is positioned on the wall.

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Distribution of the airflows

Office - Unoccupied
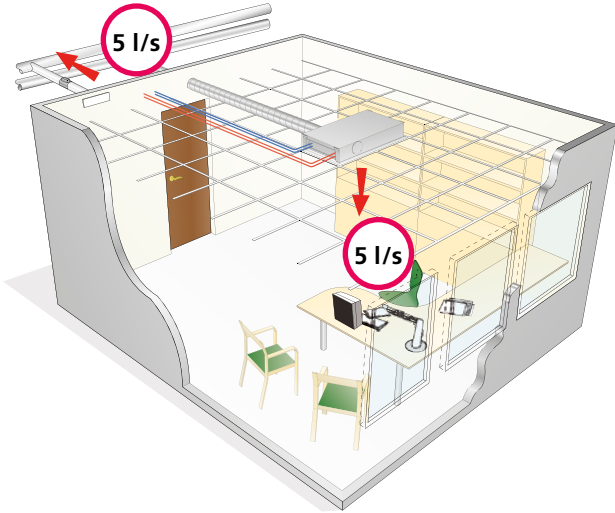
Conference room - Unoccupied

Office - Min. Occupancy
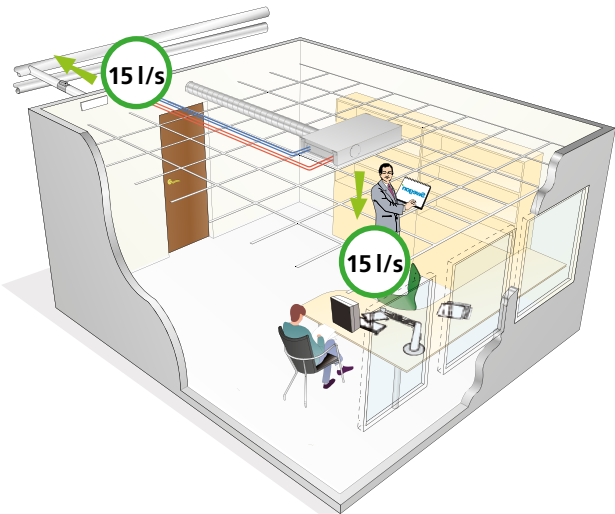
Conference room - Min. Occupancy
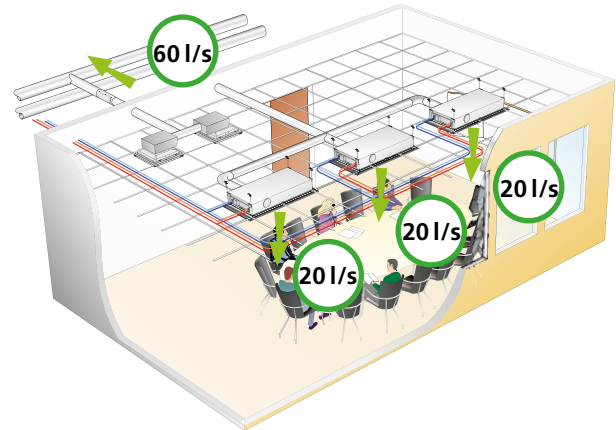
Office - Max. Occupancy
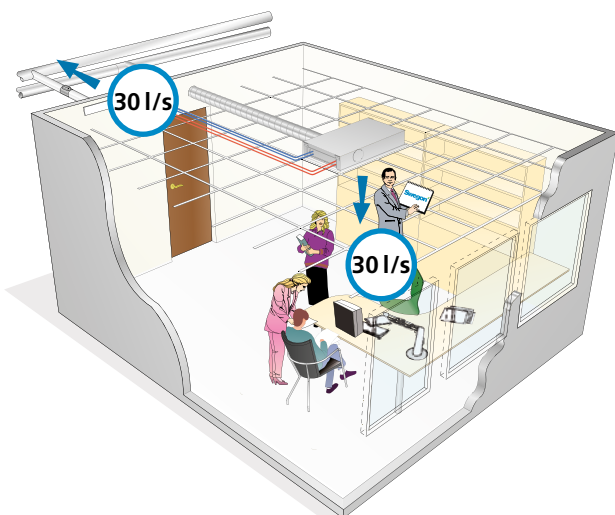
Conference room - Max. Occupancy

20161206   Swegon reserves the right to alter specifications.
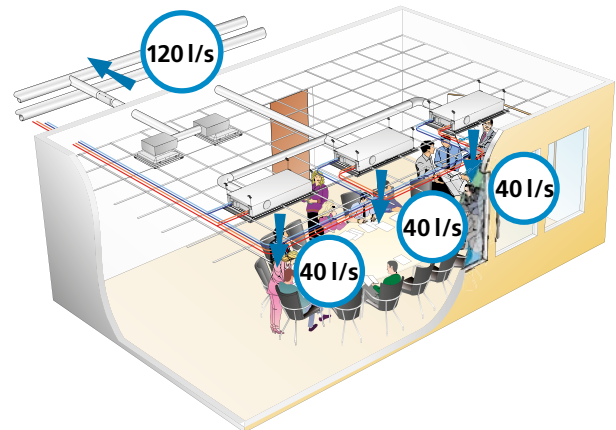
Configuration and settings

The following pages show a room with ADAPT Parasol Master, ADAPT Parasol Slave and ADAPT Damper slave/extract air and the settings you should remember to set on each unit to get the room to perform as intended.

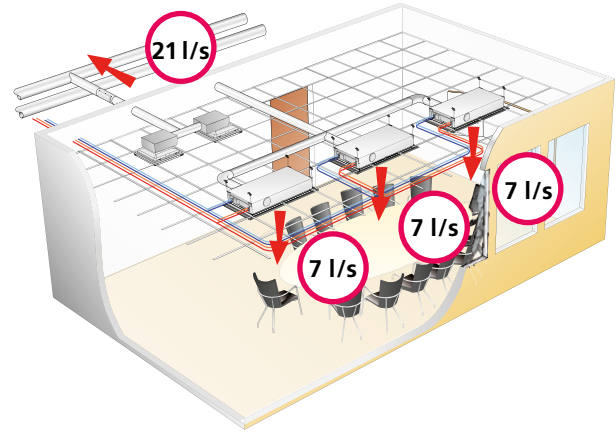**Master**: All settings for the room; temperature, airflow etc. are made here.

- Output no. 19 is set to "ADAPT analogue extract air" to send the control signal to the extract air damper.
- Modbus address 4, 8, 12 etc. as per SuperWISE std.
- Pressure sensors and sensor module are addressed 0 with the dial.
- K-factor for ADAPT Parasol master
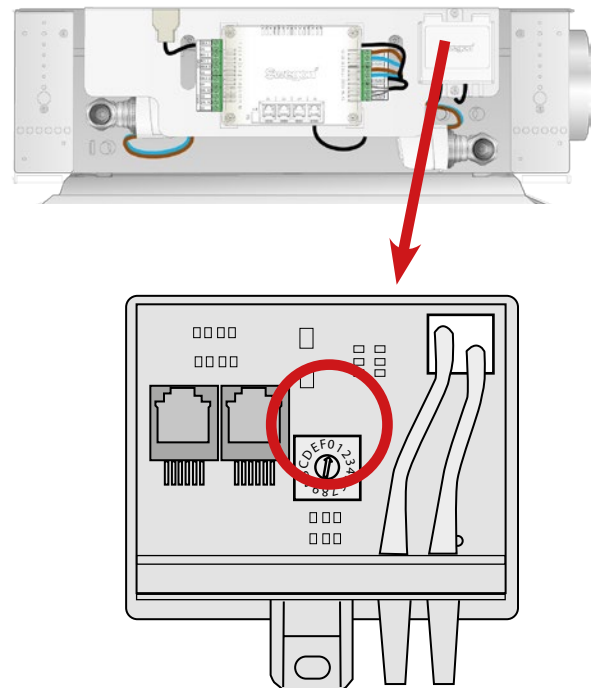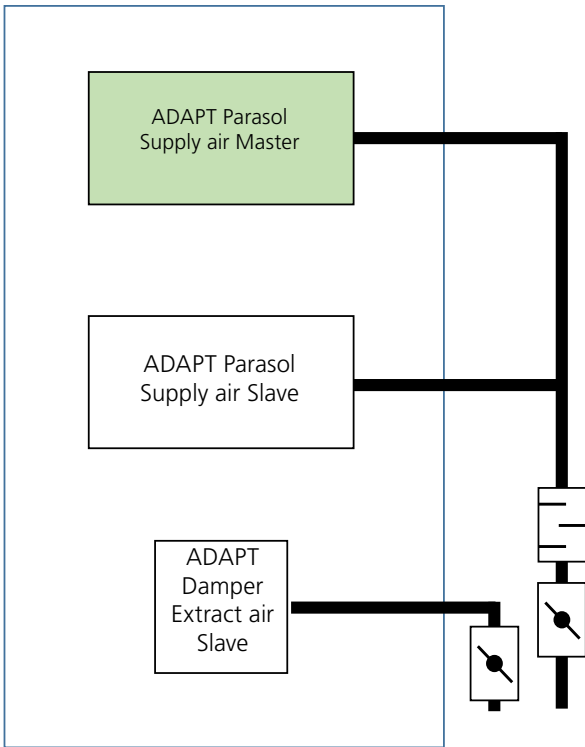
SWICCT

Airflow settings		
K-factor min flow	51	k*100
K-factor max flow	416	k*100
Zero cal. pressure sensor		
Airflow setpoint UNOCC.	50	l/s *10
Airflow setpoint OCC.	40	l/s *10
Airflow setpoint MAX	200	l/s *10
Airflow setpoint HOLIDAY	320	l/s *10
Min cooling Pressure	200	dpa
ADAPT EA analogue min	200	l/s *10
ADAPT analogue max	400	l/s *10
ADAPT EA offset	0	%* 100

K-factor for ADAPT Parasol master

Room air flows

Working range for the extract damper.

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Configuration and settings
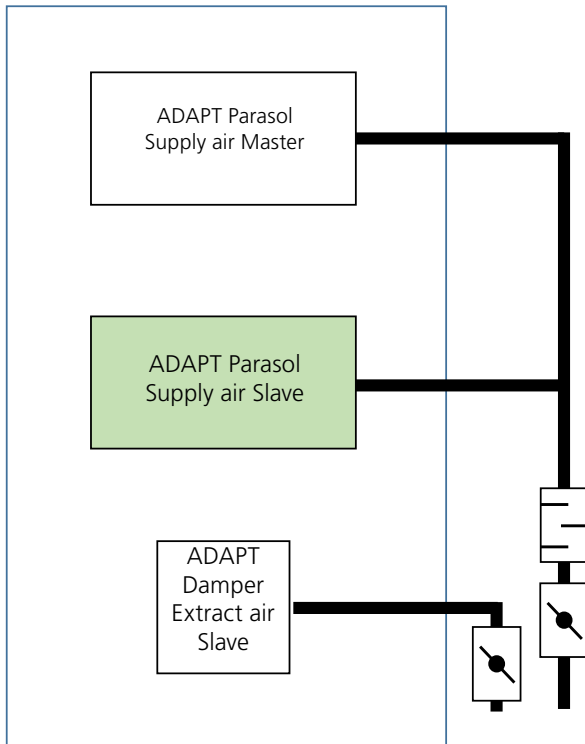
Slave:
- Output no. 13 is set to "ADAPT slave supply air" to slave control the damper signal from the master.
- The Modbus ID is set between 1-9, not connection to SuperWISE.
- Addressing of the pressure sensors via the dial should always follow the slave unit's Modbus ID 1-9. Addressing of the sensor module ideally follows the same pattern, but is not required. Crucially, two sensor modules must not have the same address if they are connected on the same circuit as in this case with master/slave in the room.

  The regulator on the slave unit serves in this case as the connection point, all intelligence is used in the master unit.

  However, if the room in the future is fitted with a partition, the unit can be easily reconfigured as the master in its room.

  The sensor module connected to the slave unit reports occupancy and temperature to the master.
- K-factor for ADAPT Parasol slave should be set in the slave-controller.
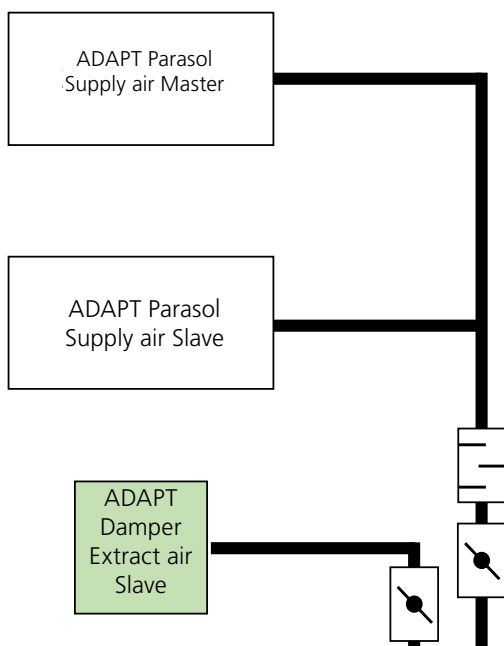
Extract air
The right size of damper for the extract air is selected using the product sheet for ADAPT Damper.

All dampers have default settings for unoccupied, min. occupancy and max. Occupancy. These values (or new if they have been changed) must be specified in the software settings for ADAPT Parasol master in the room, see the description of Master on page 8 and extract air page 10.

ADAPT Damper

- Must be set "Extract Air" (Temp Sensor Use =1)
- Must be "slave"(Application Type = 3)
- Must be MB address 5, 6, 7, 9, 10, 11 as per SuperWISE std.
- Is delivered in commissioning mode, needs to be changed to "normal" or "Commissioning Air = Not active" before normal operation.

Settings are made with TUNE Adapt or via SuperWISE

Configuration and settings

Continued, extract air

Example:
Assume that the room shown with ADAPT Parasol master + slave + ADAPT Damper extract air slave must have the flows

Unoccupied = 12 l/s

Min. occupancy = 25 l/s

Max. occupancy = 60 l/s

By stating the extract air damper's Min and Max. Flow in the ADAPT Parasol master (via SWICCT or SuperWISE) this knows what 2V and 8V represent for flows on the extract air damper.

The master then converts the inputted room flows (12/25/60) to an analogue signal between 2-8 V which then slave controls the extract air damper. The damper can by means of its flow measurement report back the flow.

ADAPT Damper product sheet:

Standard settings for default products

Airflows (l/s)	Unoccupied*	Min. airflow	Max. airflow
Size 125	0/4	8	35
Size 160	0/6	10	80
Size 200	0/10	15	125

SWICCT, input in ADAPT Parasol master:

Airflow settings

K-factor min flow	51	k*100
K-factor max flow	416	k*100
Zero cal. pressure sensor	☐	
Airflow setpoint HOLIDAY	50	l/s *10
Airflow setpoint UNOOCC.	120	l/s *10
Airflow setpoint OCC	250	l/s *10
Airflow setpoint MAX	600	l/s *10
Min cooling Pressure	200	dPa
ADAPT EA analogue m.	100	l/s *10
ADAPT EA analogue max	800	l/s *10
ADAPT EA offset	0	%* 100

12 l/s = 2.17 V
60 l/s = 6.28 V

2V = 10 l/s
8V = 80 l/s

Note that the extract air damper's work range must be equal or greater than the room flow.

If the extract air flow must be shared by the two ADAPT Dampers, these must be of the same size and it is the total flow of the two dampers that should be entered in ADAPT Parasol master controler.

In the above the settings are described based on the ADAPT Damper's default values being used. **These values can be changed as usual with TUNE Adapt or SuperWISE, and then it is these new values that must be entered in ADAPT Parasol master controler as set out above.**

Configuration and settings

Sequences

Sequence selection, cooling with Air or Water first.

It is possible to prioritise cooling with water first or air first.

For the sequence selection water/air the cooling valve is not permitted to open until a given nozzle pressure is reached, this is to ensure that no cold air drops down into the occupancy zone.

The sequence selections are parameter selections in software, i.e. it is the same physical product being delivered from the factory.

The principle is the same irrespective of whether you have one product in the room or several Master/Slaves connected.

Sequence selections are described in the following graphs.

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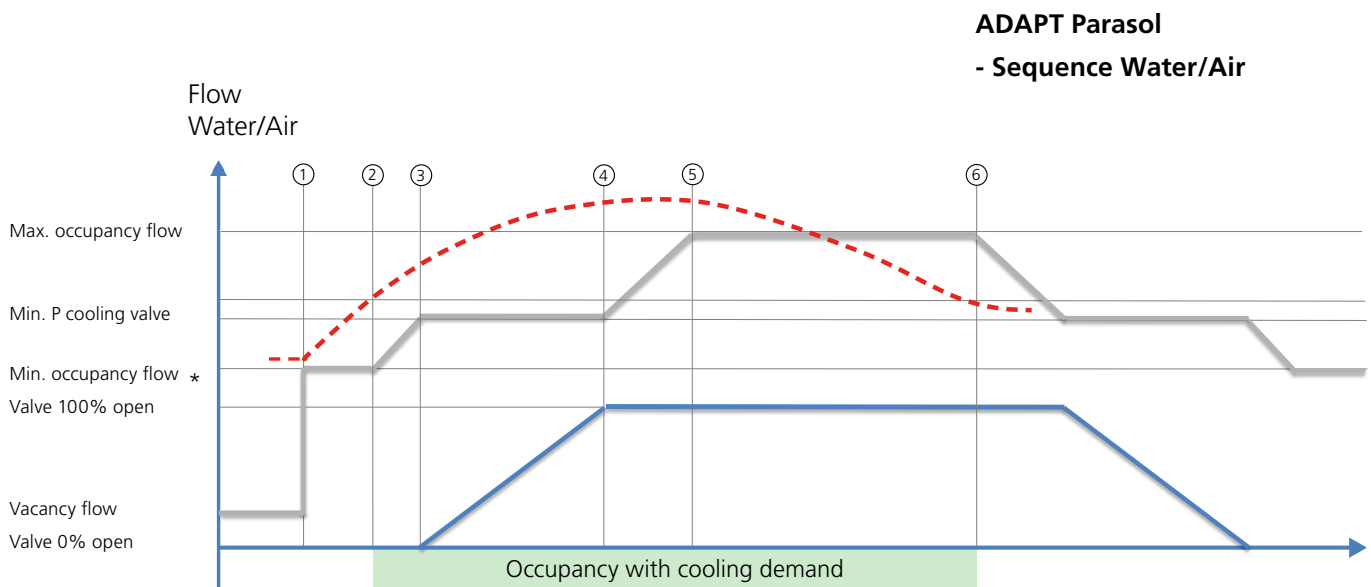
1. Occupancy - temperature rises
2. Room temperature reaches the level for the cooling demand - air opens to reach the minimum pressure that permits the cooling valve to open
3. The cooling valve is permitted to open
4. Cooling valve fully open, but there is still a cooling demand in the room - air damper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

—— Water
—— Air
- - - Room temperature

* Min P (Min cooling pressure): minimum permitted nozzle pressure to allow the cooling valve to open, this is to prevent cold draughts when the cold water circulates in the coil. In the event of a too low nozzle pressure and low temperature there is a risk the air drops too early from the ceiling.
20 Pa default but can be changed.

Sequences

**ADAPT Parasol
- Sequence Air / Water**

Flow
Water/Air

Max. occupancy flow

Min. occupancy flow
Valve 100% open

Vacancy flow
Valve 0% open

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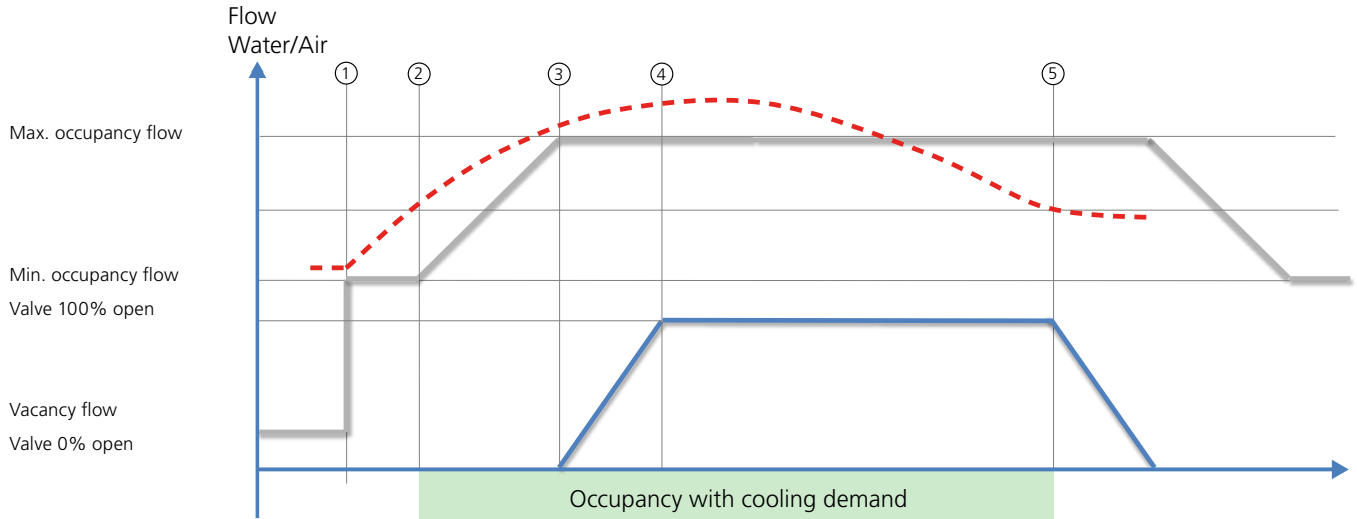
1. Occupancy - temperature rises
2. Room temperature reaches the level for cooling demand - air opens
3. Air damper fully open, but there is still a cooling demand in the room - valve opens for cooling with water
4. Air damper and water valve fully open
5. Temperature reaches the room's setpoint, damper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

— Water
— Air
- - - Room temperature

**ADAPT Parasol
- Sequence Air quality**

Flow
Air

Max. occupancy flow

Min. occupancy flow

Vacancy flow

Occupancy with increased airflow to improve air quality
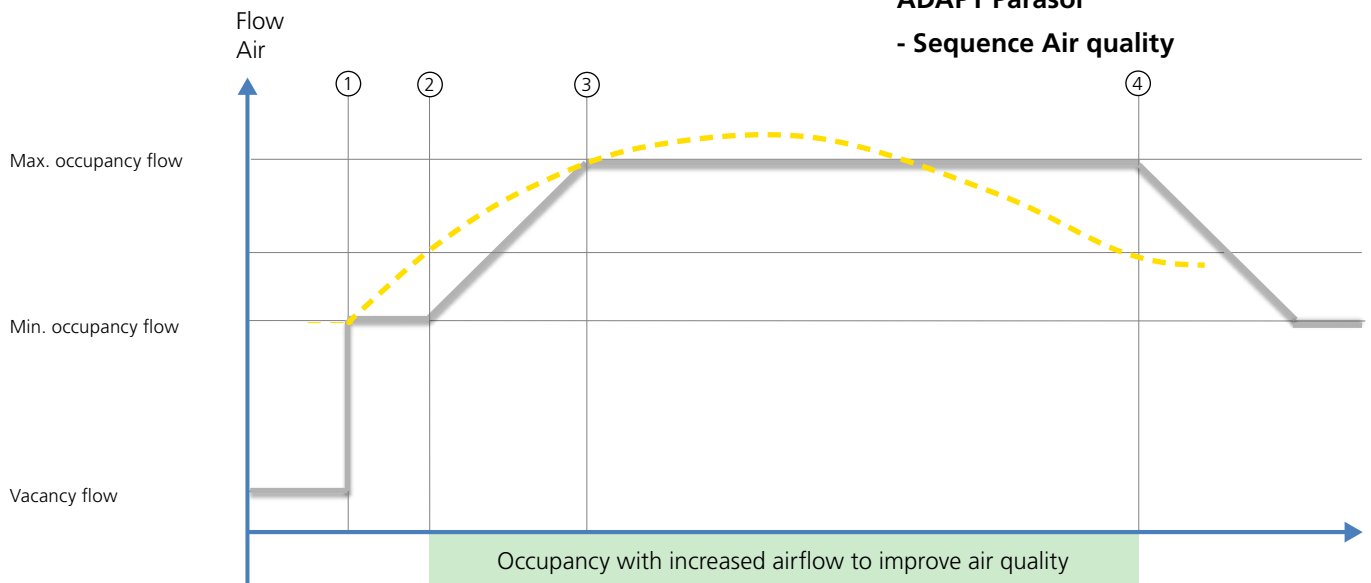
1. Occupancy - CO_2 / VOC content rises
2. CO_2 / VOC content reaches the permitted upper limit value - air damper opens variably
3. Air damper fully open
4. CO_2 / VOC content reaches the permitted lower limit value - air damper closes

— Luft
- - - VOC/CO_2

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Technical description

Sensor module overview
- Temperature and occupancy sensor
- Setpoint selector switch
- Installation on a wall or on the face plate
- Circular or rectangular
- Alarm indication
- Open/close the product's dampers and valves for e.g. function control/commissioning.
- Modbus connected
- Alternative connection point for the connection of a PC for software configuration

Sensor module occupancy
- Occupancy detector of the IR type, i.e. a heat-detecting sensor that quickly reacts to occupancy in the room
- Coverage area depending on the placement in the room, see figure.
- On and off delay adjustable via SWICCT default is 10 s, and 10 minutes respectively.
- Several sensor modules can be used in the room, for example, in a conference room if you want the setpoint selector switch on the wall but the occupancy sensor on the ceiling.

Sensor module front

Sensor module rear
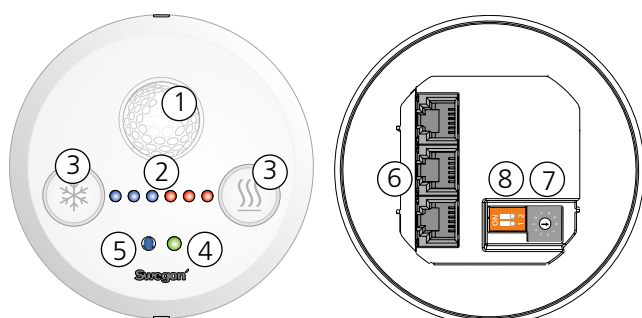
1. Occupancy sensor / IR sensor
2. LEDs for temperature, adjustment or alarm indication
3. Function keys
4. LED indicating function
   Green = OK
   Flashing Green = Condensation alarm
   Yellow = alarm
   Green/yellow = Comfort alarm (not acute)
5. Temperature sensor
6. 3 parallel RJ12 ports (Modbus) for connections e.g. regulator, additional sensor module or PC.
7. Addressing the sensor module A maximum of 10 sensor modules (possibly slaves included) can be connected to each master regulator. Each one must then have its own address 0-9.
8. Switch for termination resistance. Switch 1 is set to On on the last device in a circuit.

Ceiling mounted
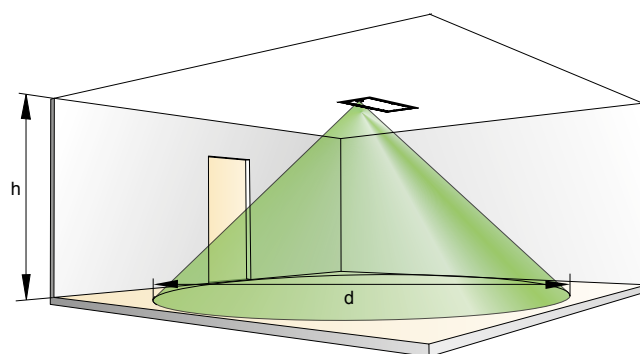
h (m)	d (m)	A (m^2)
2.5	5.2	21
2.7	5.6	24
2.9	6.0	28
3.1	6.4	32

Wall mounted

Swegon reserves the right to alter specifications.
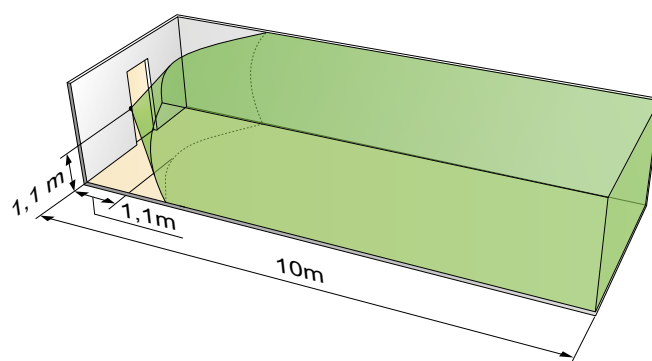
Sensor module temperature

Temperature settings

Room temperature sensor use

Mean value of sensor module (s)	▼
Mean value of sensor module (s)	
Sensor module id 0	
External temperature sensor	
Mean value off sensor module(s) and ext.temp.sens.	

In SWICCT it is possible to state how you wish to measure the temperature in the room:

- **Mean value of sensor modules:** In cases where multiple sensor modules are connected to the master, for example, when using slave units, the mean value of all sensor modules can then be used for temperature control in the room.

- **Sensor module id 0:** the selection means that only one sensor module (the one with id 0, master unit) is used for temperature control.

- **External temperature sensor:** here you state that an external temperature sensor is used, and regulation occurs only according to this sensor.

- **Mean value of sensor modules and ext. Temp. Sens:** signifies that the mean value of both sensor modules and external temperature sensors is used for temperature control.

- The temperature in the room is set by pressing the function buttons (A)=cooling / (B)=heating.

- Both cooling and heating setpoints move, which means that the previously created neutral zone is maintained.

- For example, Cooling Setpoint = 24°C (call for cooling when the room temperature exceeds 24°C) Heating Setpoint 22°C (Start heating when the room temperature is below 22°C).

- Press the sensor module twice to make it warmer means the set values shift 2°C to 24 and 26°C respectively.

- If the desired temperature is not reached after a specific time a comfort alarm is generated, which is indicated by the alarm LED switching between yellow/green.

- The sensor module can be mounted on a wall where the room's setpoint needs to be changed often. Normally this need arises only in rooms used by different people with different needs.

- Wall mounting is also recommended when you heat with ADAPT Parasol, usually this gives a fairer measurement of the room temperature.

Regulator overview

Connections

24V
G | G0

white
black
white
brown
black

brown
blue
grey
black

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |

| 22 | 23 | 24 | 25 |

| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |

brown (US=white)
blue (US=black)
brown (US=white)
blue (US=black)

24V
G | G0

y | ⊥ | 24V

For US and Canada market WARNING:
The power feeding shall be a Low Voltage Class 2 circuit.
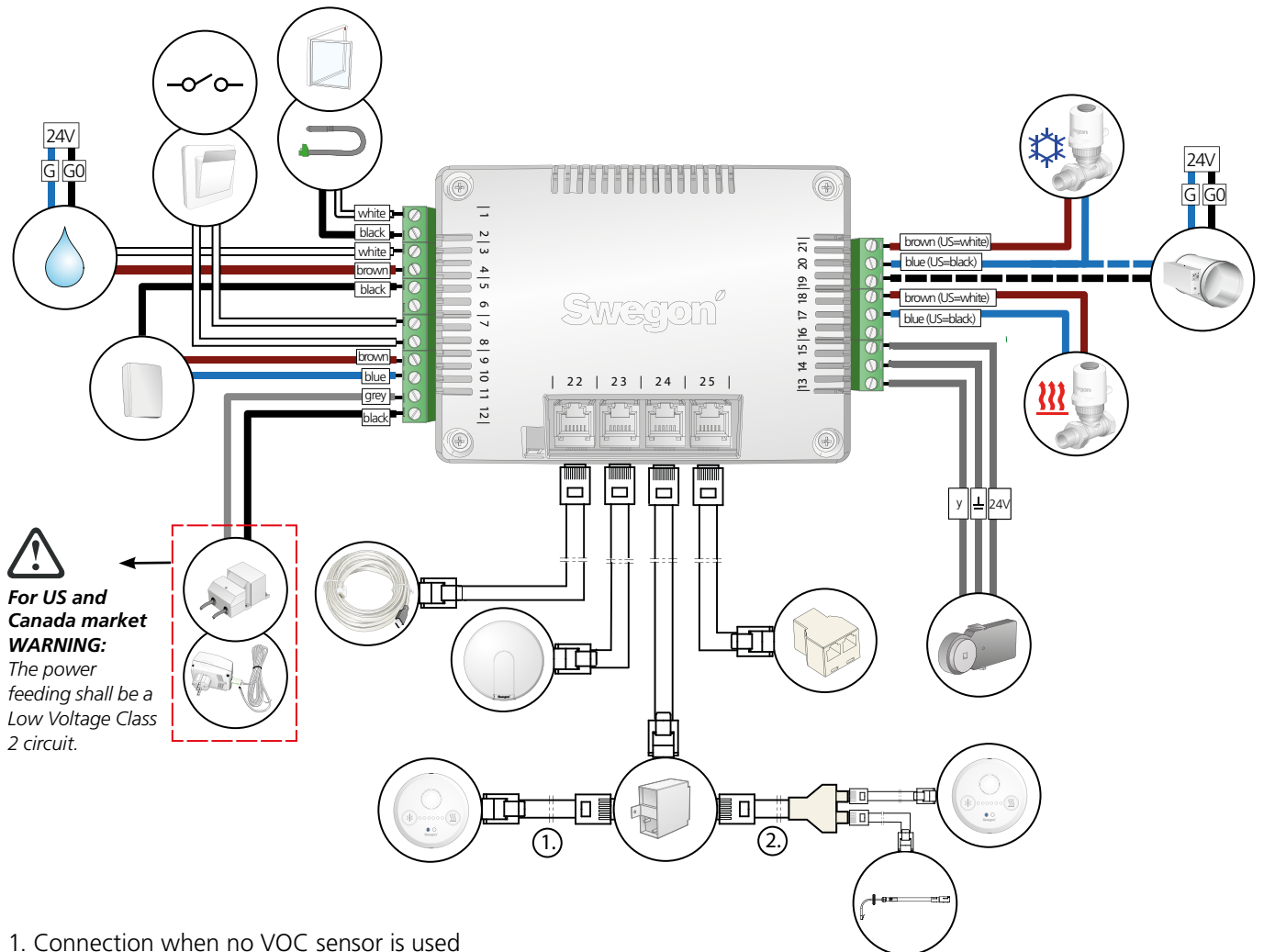
1. Connection when no VOC sensor is used

2. Connection when a VOC sensor is used

Inputs

Outputs

Modbus
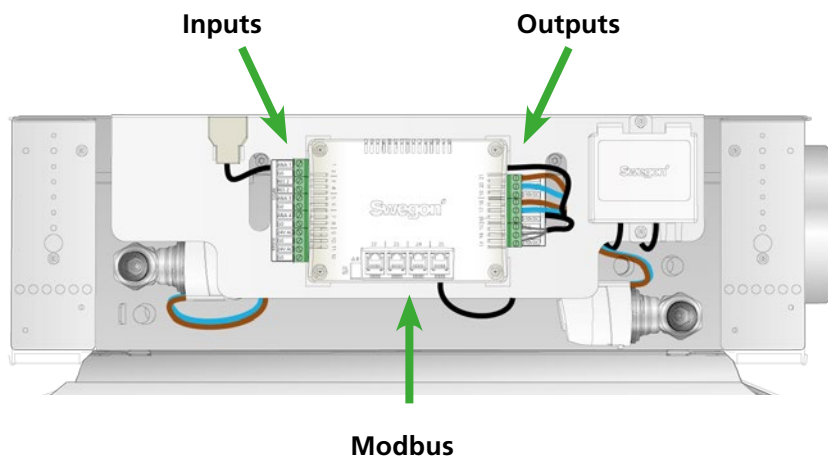
Regulator outputs

The outputs on the regulator

21		- 24 V	Digital 1	
20		- GND	Analog 1	Max 60 VA
19		- AO1		
18		- 24 V	Digital 2	
17		- GND	Analog 2	Max 60 VA
16		- AO2		
15		- 24 V	Digital 3	
14		- GND	Analog 3	Max 60 VA
13		- AO3		
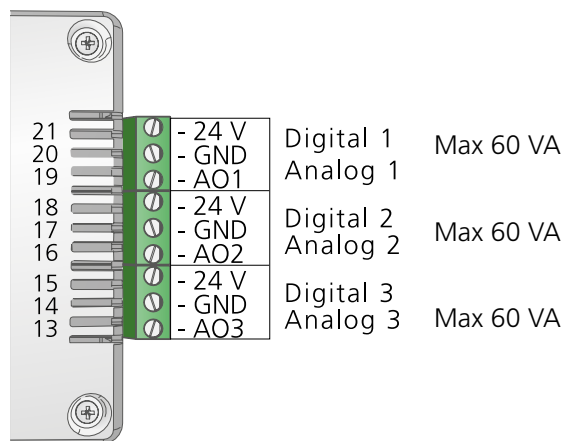
Outputs' standard settings

Output configuration

Digital output 1 (21)	Water cooling ▼	Normally closed ▼
Analogue output 1 (19)	Not used ▼	Normally closed ▼
Digital output 2 (18)	Water heating ▼	Normally closed ▼
Analogue output 2 (16)	Not used ▼	Normally closed ▼
Digital output 3 (15)	Power supply ▼	Normally closed ▼
Analogue output 3 (13)	Variable ▼	Normally closed ▼

The outputs can be switched with SWICCT for alternative functions, for example, the use of a 0-10 V actuator for cooling/heating instead of 24V

Digital output 1, 2, 3 (21, 18, 15)	Description
→ Not used	No signal on the output
→ Power supply	24V constant supply out from the output
→ Water cooling	24V when there is a cooling signal
→ Water heating	24V when there is a heating signal
→ Water change over 2 pipe	24V for cooling/heating demand
→ Water cooling primary sequence	Cooling sequence 0-50% 24V
→ Water cooling secondary sequence	Cooling sequence 50-100% 24V
→ Water heating primary sequence	Heating sequence 0-50% 24V
→ Water heating secondary sequence	Heating sequence 50-100% 24V
→ Light Control	Lighting output on/off signal
Analogue output 1, 2, 3 (19, 16, 13)	**Description**
→ Not used	No signal on the output
→ Water cooling	0-10V for a cooling demand
→ Water heating	0-10V for a heating demand
→ Water change over 2 pipe	0-10V for cooling/heating demand
→ Water change over 4 pipe	For 6-way valve, 0-5V=cooling, 5-10V=heating
→ Water cooling primary sequence	Cooling sequence 0-50% 0-10V
→ Water cooling secondary sequence	Cooling sequence 50-100% 0-10V
→ Water heating primary sequence	Heating sequence 0-50% 0-10V
→ Water heating secondary sequence	Heating sequence 50-100% 0-10V
→ ECOPulse	Control signal for integrated damper at 3 different operating modes
→ 2step	Control signal for integrated damper at 3 different operating modes
→ Variable	Control signal for integrated damper at 3 different operating modes
→ ADAPT analogue extract air	Calculated 0-10V signal for extract air (ADAPT Damper)
→ ADAPT slave supply air	ADAPT Parasol slave (control signal to internal damper)
→ Light Control	Lighting output control signal

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Regulator inputs

The inputs on the regulator
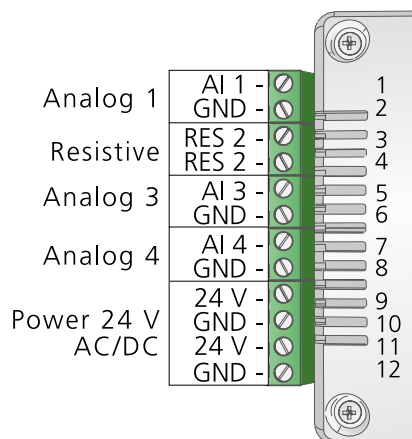
Inputs' standard settings

Input configuration

Input 1 usage	Not used ▼
Input 3 usage	Not used ▼
Input 4 usage	Not used ▼
Occ. mode	Use occupancy sensor ▼

The inputs can be switched with SWICCT for alternative functions, for example, the use of keycard switches and window contacts

Input 1 usage	Description
→ Not used	Not used.
→ Room Temperature	External temperature sensor is used
→ Change over temperature	Ext. Temp sensor for change-over is used
→ Temperature (read only)	Only temp. reading, no regulation
→ Window contact NO	Window contact normally open
→ Window contact NC	Window contact normally closed
Input 3 usage	
→ Not used	Not used.
→ CO2 0-10V	CO2 sensor with 0-10 V control range
→ CO2 2-10V	CO2 sensor with 2-10 V control range
Input 4 usage	
→ Not used	Not used.
→ Keycard switch NO	Keycard switch normally open
→ Keycard switch NC	Keycard switch normally closed
→ Window contact NO	Window contact normally open
→ Window contact NC	Window contact normally closed
→ Change-over contact NO	Change-over contact normally open
→ Change-over contact NC	Change-over contact normally closed
Occ mode	
Use occupancy sensor	Detect occupancy/unoccupied
Always occupied	Force on occupancy mode
Always unoccupied	Force on in unoccupied mode

Regulator's Modbus connections

| 22 | 23 | 24 | 25 |

RS 485 MB 1	RS 485 MB 2
SuperWISE bus	Sensor module
BMS bus	Pressure sensor
	Slave controller
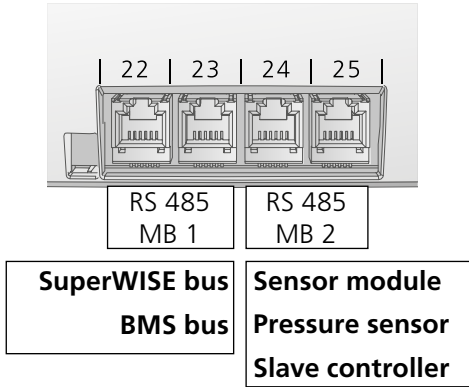
The master circuit (22, 23) is used for communication between ADAPT Parasol master units and communication from the master unit up to the superordinate system, for example, SuperWISE.

The slave circuit (24, 25) is used for communication between slave units ADAPT Parasol and to connect the sensor module, pressure sensor, VOC sensor, etc.

Note that 22 and 23 are parallel (same function), and 24 and 25 are parallel. Important to distinguish between the pairs 22/23 and 24/25.

The order of the connected units on each circuit is not important, however it is more important to avoid so-called Stubs and build just one circuit instead.

4x RS485, modular RJ12 6/6

22 & 23 parallel, master circuit

24 & 25 parallel, slave circuit

System technology

Duct system

Remember:

- ADAPT Parasol measures the pressure in each unit and can therefore manage the occupancy flow accurately as long as there is sufficient duct pressure available.

- The built-in damper generates very little noise compared with traditional balancing damper and in many cases a sound attenuator in the room can therefore be excluded. However, beware of other sounds such as crosstalk and noise from other sources such as zone dampers further back in the system.

- By selecting the unoccupied flow and maximum occupancy flow in a smart way in the software you also compensate for the duct pressure drop and control measurement is easier, see page 20-21.

- The software manages the flows, but beware of the noise.

- However, traditional balancing dampers may be required for duct lengths and duct pressure drop outside the recommended ranges. This is easily checked by using ProSelect by entering the actual duct pressure on the actual product.
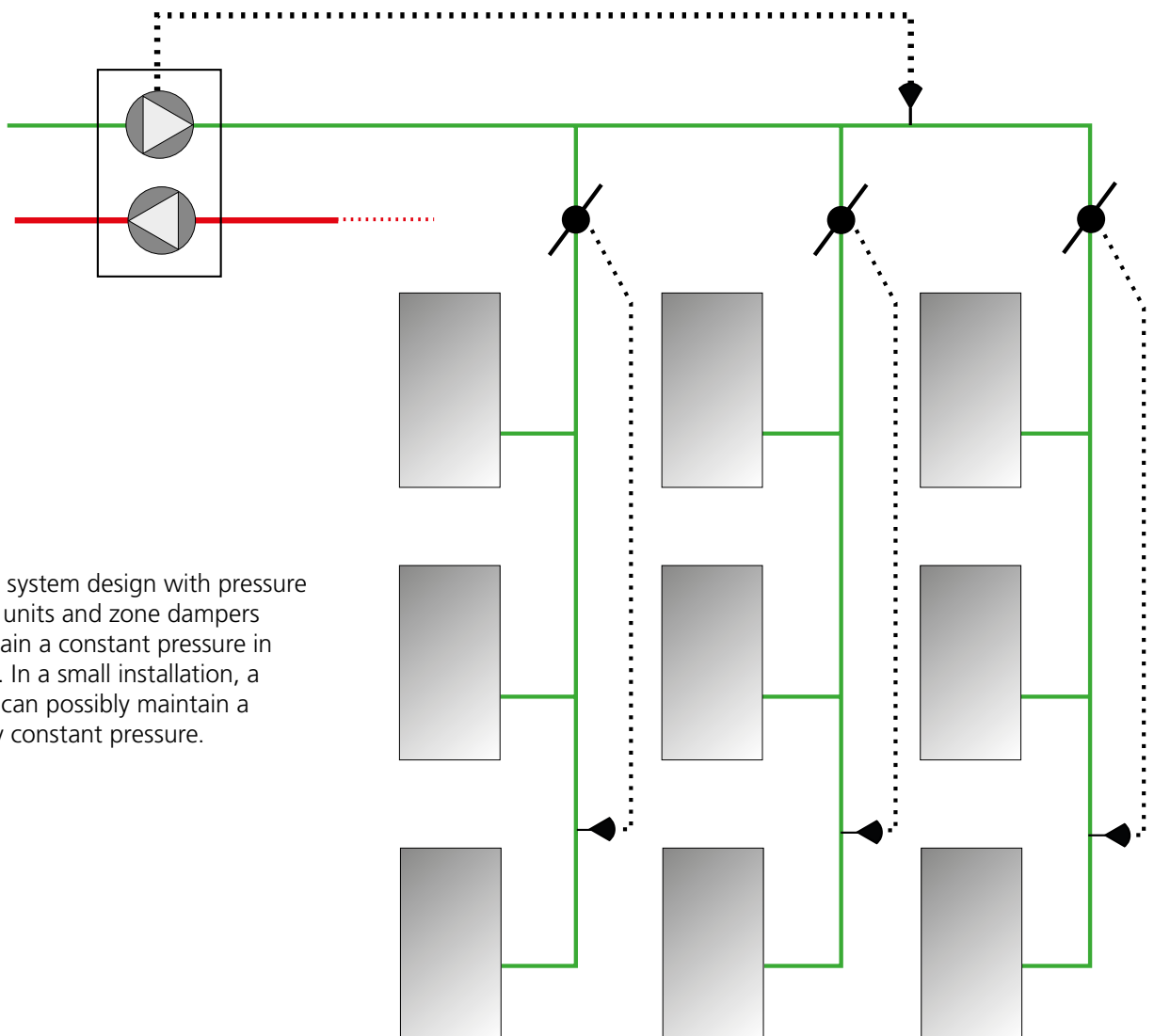
Traditional system design with pressure controlled units and zone dampers that maintain a constant pressure in each zone. In a small installation, a good unit can possibly maintain a sufficiently constant pressure.

Duct system

Minimum and maximum flows from ProSelect limited by the available pressure and nozzle configuration selected for an ADAPT Parasol 1200 HF LMLM.

Min. occupancy flow is selectable in ProSelect and here is set to 15 l/s.

For an accepted pressure drop in the duct system of 1 Pa/m, the following can be used:

Duct pressure, Pa	104
Min. l/s	5
Occupancy l/s	15
Max. l/s	27.9

Design unit

Duct pressure, Pa	80
Min. l/s	4.4
Occupancy l/s	15
Max. l/s	24.4

Duct pressure, Pa	68
Min. l/s	4
Occupancy l/s	15
Max. l/s	22.5

3 m

104 Pa 101 Pa 98 Pa 95 Pa 92 Pa 89 Pa 86 Pa 83 Pa 80 Pa 77 Pa 74 Pa 71 Pa 68 Pa

27 m

40 m
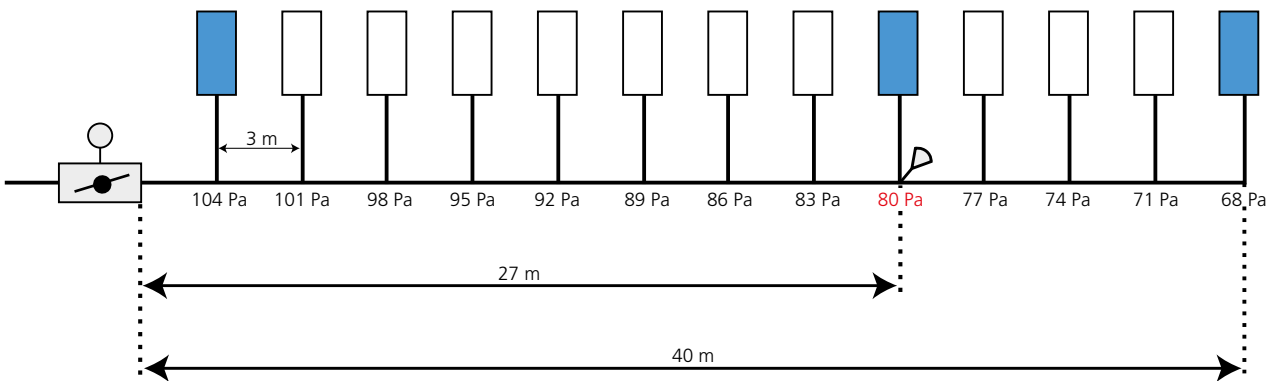
In SWICCT or by configuring ADAPT Parasol in ProWISE limits can also be set for unoccupied and occupancy max flow (note the product's absolute min and max from the previous figure which are controlled by the selected nozzle setting!)

By letting the most exposed product in this way be the design unit for the current duct section and taking this into account at an early stage, you do not use a balancing damper before each product and can thus save both available pressure and money on unnecessary balancing dampers, which in addition also risk creating noise.

Of course, the pressure fluctuations in a duct system can be so large that a traditional balancing damper may still be required, but in all probability a damper in front of each product is not necessary as it should be enough to lower the pressure in some of the duct system and then apply the above.

Duct pressure, Pa	104
Min. l/s	5
Occupancy l/s	15
Max. l/s	22.5

Duct pressure, Pa	80
Min. l/s	5
Occupancy l/s	15
Max. l/s	22.5

Duct pressure, Pa	68
Min. l/s	5
Occupancy l/s	15
Max. l/s	22.5

3 m

104 Pa 101 Pa 98 Pa 95 Pa 92 Pa 89 Pa 86 Pa 83 Pa 80 Pa 77 Pa 74 Pa 71 Pa 68 Pa

27 m

40 m

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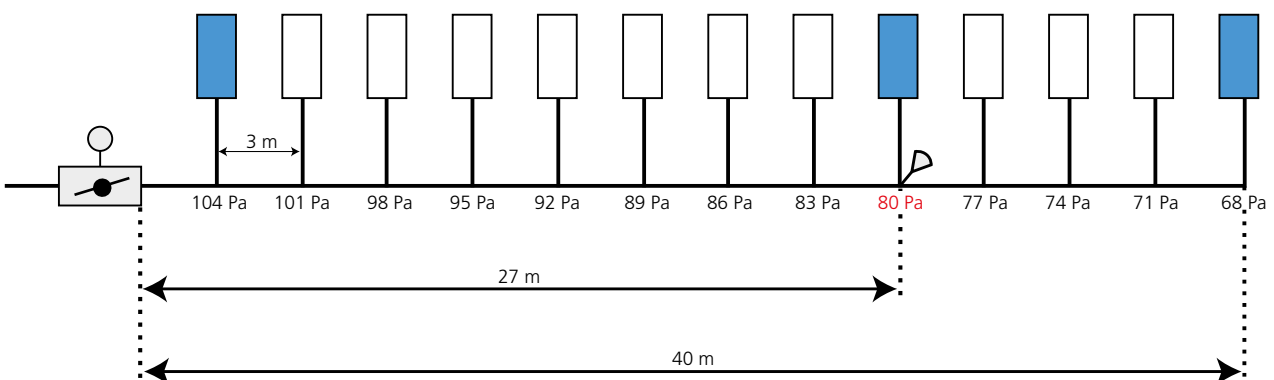
Duct system

In the case below the design unit is of 110 Pa instead of as in the previous example, 80 Pa, and now we see that the first unit in the duct branch will have 31.6 l/s and a pressure of 134 Pa. This flow gives a slightly higher noise level, but as before lowering the maximum flow in software gives the same measured flow in each room, and also an improved noise level on the most exposed ADAPT Parasol.

Setting the max airflow to 27 l/s gives 29 dB, and the maximum flow is the same for all units which may be desirable for commissioning/control measurement. Check, however, that the cooling/heating output to the room is still OK.

1.

	Design unit	

Duct pressure, Pa	134
Sound pressure level, Lp(A)	31
Min. l/s	5.7
Occupancy l/s	15
Max. l/s	31.6

Duct pressure, Pa	110
Sound pressure level, Lp(A)	28
Min. l/s	5.1
Occupancy l/s	15
Max. l/s	28.7

Duct pressure, Pa	98
Sound pressure level, Lp(A)	27
Min. l/s	4.8
Occupancy l/s	15
Max. l/s	27.0

Design instance 110 Pa gives 28 dBA and 28.7 l/s in the maximum position. The most vulnerable unit in this case will have 134 Pa, 31 dBA and 31.6 l/s.

3 m

134 Pa 131 Pa 128 Pa 125 Pa 122 Pa 119 Pa 116 Pa 113 Pa 110 Pa 107 Pa 104 Pa 101 Pa 98 Pa

27 m

40 m

2.

Duct pressure, Pa	134
Sound pressure level, Lp(A)	29
Min. l/s	5.7
Occupancy l/s	15
Max. l/s	**27**

Duct pressure, Pa	110
Sound pressure level, Lp(A)	27
Min. l/s	5.1
Occupancy l/s	15
Max. l/s	27

Duct pressure, Pa	98
Sound pressure level, Lp(A)	27
Min. l/s	4.8
Occupancy l/s	15
Max. l/s	27.0

By balancing the flows as before in software, in this case you can also reduce the noise level. However, note the slightly lower effects produced.

2-step optimisation in WISE

1. Zone and room optimisation

2-step optimisation is a further development of the optimisation performed by SuperWISE. All zone dampers continuously check the damper position on products that are below them in the system and are connected via Modbus communications.

It is always the room damper with the greatest degree of opening that controls the zone damper for optimisation.

During normal operation, the most open *room* damper as standard should be between 70-90% open. If the most open *room* damper is open more than 90% the airflow in the *zone* is not sufficient. In this case, the *zone* damper will be opened until the most open *room* damper is open to less than 90%. If the most open *room* damper is open less than 70% the airflow in the *zone* is too high. In this case, the *zone* damper will be closed until the most open *room* damper is open to more than 70%.
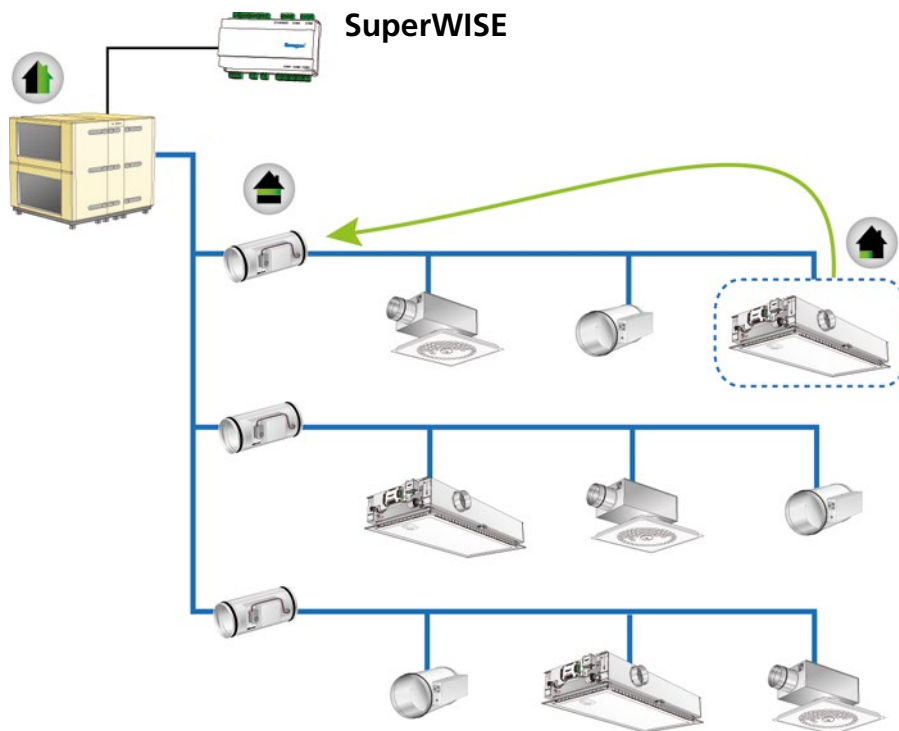
SuperWISE

If a room damper is outside the limit 70-90% open, the zone damper is adjusted by being opened/closed.

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2-step optimisation in WISE

2. Units and zone optimisation

SuperWISE continuously controls the position of the zone damper, according to the same principle previously described for room dampers.

The unit's pressure setpoint is increased/decreased depending on the needs of the zones. The router simulates a zone damper and always shows the most open room product for supply air and extract air that is connected via Modbus to the router. If only the supply or extract air is used only this appears.
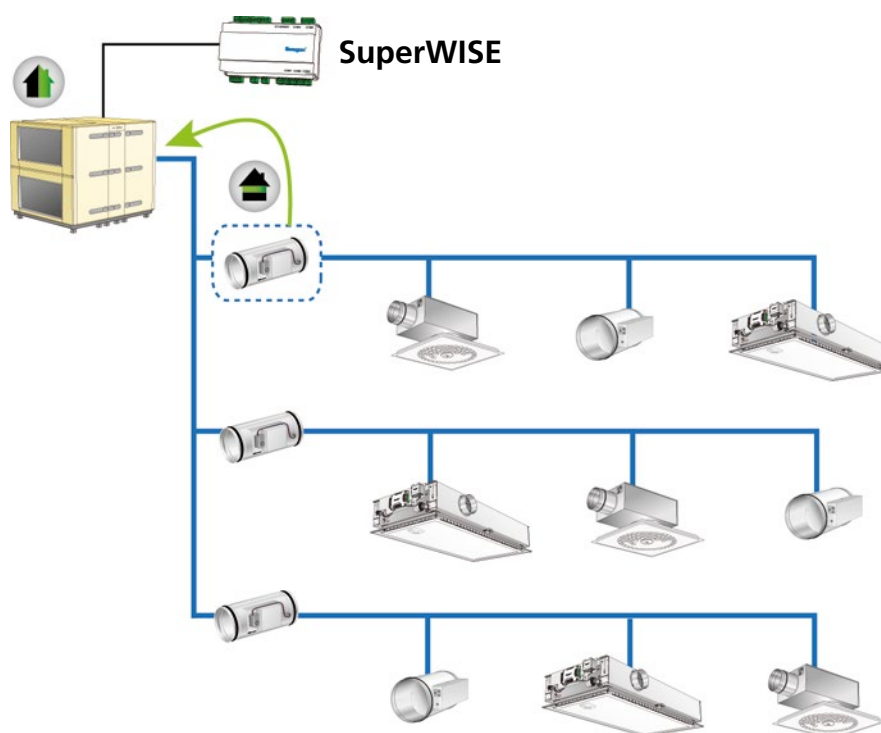
If a zone damper is outside the limit 70-90% open, the unit's pressure setpoint is increased/decreased until the zone damper is within the limits.

Master/Slaves

SuperWISE

Zone **CONTROL Zone**

Room 1

Master	Slave	Slave	Slave
Mb id 4	Mb id 5	Mb id 6	Mb id 7

Room 1:
WISE room with air products that can be supply air or extract air products

Room 2

Master	Slave	Slave	Slave
Mb id 8	Mb id 9	Mb id 10	Mb id 11

Room 2:
WISE room with ADAPT Parasol and traditional WISE products where ADAPT Parasol is always the master, and the slaves with Mbid 9-11 can be extract air products.

In addition, ADAPT Parasol can manage up to 9 x ADAPT Parasol supply air slaves with individual IDs 1-9.

Slaves Supply air Max 9 pcs

Slave	Slave	Slave	Slave
Slave Id 1	Slave Id 2	Slave Id 3	Slave Id 4

Slave	Slave	Slave	Slave	Slave
Slave Id 5	Slave Id 6	Slave Id 7	Slave Id 8	Slave Id 9

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Display in Super Wise

Room 1

ADAPT Parasol

ADAPT Damper S1

ADAPT Damper S2

230.5 l/s
229.4 l/s
47.31%
M

117 l/s
116 l/s
30%
S

117 l/s
116 l/s
30%
S

22.0ºC
21.55ºC
20.0ºC

The SuperWISE display illustrates a room with 6 x ADAPT Parasol for supply air and 2 x ADAPT Damper extract air.

The supply air is distributed on one master and five slaves, and as previously noted the slaves are not shown in this view, the master shows the room's supply air flow

Master
Mb id 4

Slave
Mb id 5

Slave
Mb id 6

Slave
Slave Id 1

Slave
Slave Id 2

Slave
Slave Id 3

Slave
Slave Id 4
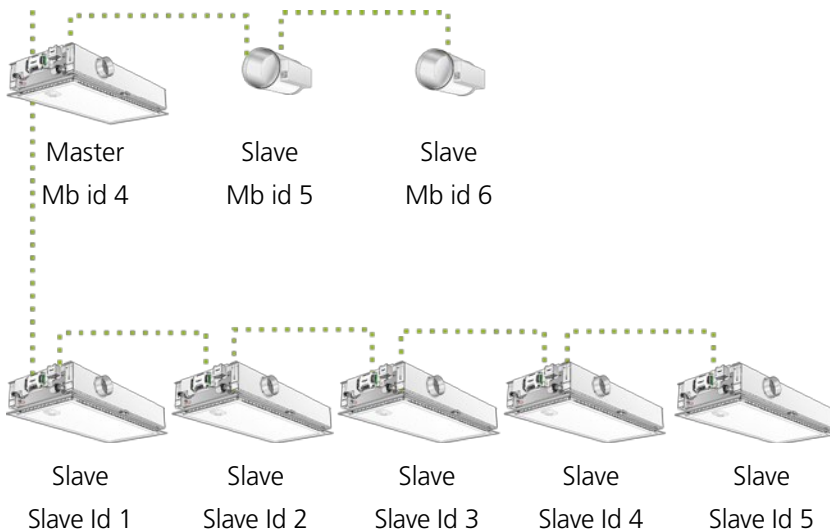
Slave
Slave Id 5

If you wish to see the supply air flow in more detail, highlight ADAPT Parasol in the menu tree and the flow for all 5 underlying slaves will be shown.

Room 1

ADAPT Parasol

ADAPT Damper S1

ADAPT Damper S2
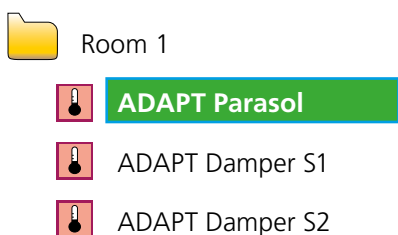
Airflow actual values	
Total supply air flow to the room	230.5 l/s
Calculated setpoint for the total supply airflow	229.4 l/s
Current pressure, Master.	31.0 Pa
Supply air flow slave 1	46.4 l/s
Supply air flow slave 2	46.5 l/s
Supply air flow slave 3	45.8 l/s
Supply air flow slave 4	24.4 l/s
Supply air flow slave 5	22.9 l/s

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ProSelect

Sizing and hardware configuration

This is not a manual describing how ProSelect works, the page is just meant to point out some things in particular that are worth considering.

1. As ADAPT Parasol is always supplied with some sort of control this is included as an accessory from the outset. Clicking on the button takes you to the configuration page for the control.

2. Calculations can be done for min/occupancy/max airflow. However, only the current selection is shown on the calculation page.

3. Nozzle settings can be made just like for a standard Parasol to influence the airflow and direction, but it should be remembered that at the same time you influence the product's minimum and maximum flow.

4. The min and max positions are highlighted in grey as they cannot be entered as the occupancy flow. This is because the min/max is directly dependent on the selected nozzle setting. HOWEVER, in the context of these flows you can then enter the desired Min occupancy and max flow in software.

Sizing and hardware configuration

Number of accessories	1

Controller
ADAPT Controller ▼

Valve, Actuator Cool
SYST VEN115 angeled valve + I ▼

Valve, Actuator Heat
No ▼

Sensor
CO2 Sensor ▼

Sensor Module
Sensor Module Square ▼

Clicking on the accessory button opens the dialogue box to select accessories, both loose and as shown below, the factory fitted.

Following will be mounted on product
ADAPT Controller
Sensor Module Square
SYST VEN115 angeled valve + LUNA AT-2 actuator 24V NC
CO2 Sensor

The choices made are shown at the bottom of the page with a clearer explanation text.

Heating with ADAPT Parasol

Heat type	Radiator ▼	
① Cold draught protection level	3000	% * 100
② Cold draught protection stop	5000	% * 100
③ Cold draught protection UnOcc	☑	

Display from SWICCT and part of the "service mode" tab.

1. **Protection level:** The amount the heating actuator is permitted to be open for cold draught protection. Default 30%, i.e. even if there is no heating load the 30% signal is sent out on the heat output.

2. **Protection stop:** At what cooling signal the cold draught protection should stop. Default 50%, i.e. when the cooling signal is 50% or more the cold draught protection is not permitted and no signal is sent out on the heating output.

3. **UnOcc:** Checked box means that the cold draught protection is active even when no one is in the room.

Heat type Radiator

In cases where the room is heated with ADAPT Parasol, an increased airflow will result in an increased heat output being supplied to the room, the increased air volume induces more air over the heating coil.

However, if the heat comes from an external radiator or a floor heating system, an increased airflow gives the opposite effect, it only adds cold air to the room.

In order to avoid this you can choose radiator in the software as heat-type, which means that the boost function is blocked in heating situation.

Heat type Water actuator means the heat is controlled as usual with ADAPT Parasols heating coil and the actuator there.

Cold draught protection

Cold draught protection, allows the ADAPT Parasol to send out heat signal even though there is a cooling load.

This is to be able to counteract cold draughts from such inferior glazing with a radiator.

Cold draught protection is only run together with the choice Heat type radiator.

Note that the cold draught protection means that both cooling and heating actuators are energized at the same time, which increases the load on the output and transformer with 6 VA / actuator.

Sensor module

The sensor module is ideally placed on the wall for temperature measurement in heating applications, if located in the faceplate there is a risk it measures a too high temperature.

Alternatively, an external temperature sensor can be used.

In a conference room you can have sensor modules in all faceplates to indicate occupancy and an extra sensor module on the wall for temperature measurements and/or setpoint setting.

20161206

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Air quality sensor

General

- The VOC sensor (Volatile Organic Compound), measures the content of emissions/impurities in the unit % VOC.
- When an occupant emits CO_2, this creates a proportional amount of emissions/impurities which are measurable by the VOC sensor.
- For an approximate translation of the % VOC to CO_2 content, see diagram
- The sensors are concealed behind the faceplate on the ADAPT Parasol and thus sit in the path of induced room air.
- The VOC sensor generally does not react to a specific substance but a variety of substances.
- The VOC sensor is Modbus connected and can be connected to ADAPT Parasol master or slave.
- The CO_2 sensor is connected to an analogue input and must be connected to ADAPT Parasol master.
- Both can be factory fitted behind the faceplate.

CO_2 comparison/ppm

CAC outsignal %

CO2/VOC		
VOC use	Auto ▼	
CO2/VOC min set value	700	ppm
CO2/VOC max set value	1000	ppm
Input 3 usage	CO2 2-10V ▼	
CO2/Volt (sensor)	200	ppm
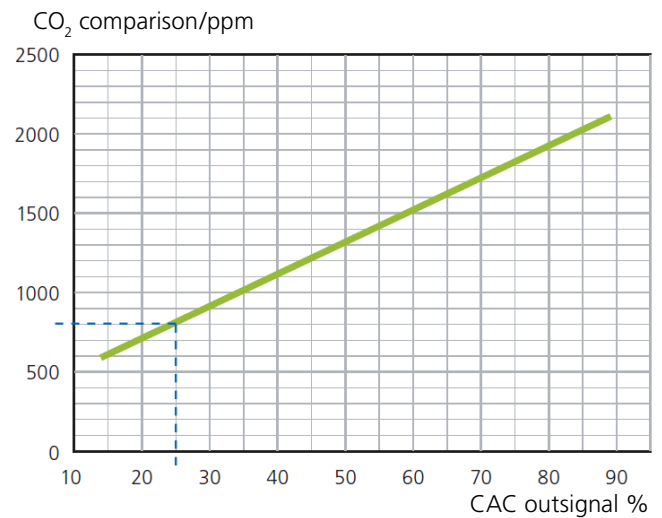
Data entry in SWICCT:

- The PPM values are similar as for a CO_2 sensor, and are then recalculated to a correct output signal corresponding to diagram.
- The values set in figure to the right signifies that the ADAPT Parasol has started to release more air at the equivalent of 600 ppm in the room, and continues variably up to 1200 ppm (max flow)
- VOC use Auto means that the control automatically detects whether the sensor is connected.
OFF mode is used to disable already read sensors.
- Input 3 usage is only used for CO_2 sensors and you specify here whether it is a 0-10V or 2-10 V sensor.
- PPM CO_2 / volt can also be set for the CO_2 sensor in instances when sensors other than standard are used.
- See functional description air on page 17.
- More info about VOC and substances: Product sheet CAC on swegon.com
- Air regulation from air quality sensor also takes place in absence mode (can be changed)

CO_2 or VOC?
Carbon dioxide CO_2 is in itself harmless, but is easy to measure and provides a good indication to the occupancy load in a building. However, a CO_2 sensor does not react to emissions from e.g. building materials or strong odours such as perfume, unlike a VOC sensor.

Change –over system

2-pipe system with cooling in the summer and heating in the winter

- 2-pipe system with cooling water in the summer and heating water in the winter
- GT_1 is located where hot or cold water always circulates
- Summer: If the room temperature T_2 is higher than the water temperature T_1 the valve opens for a cooling load.
- Winter: If the room temperature T_2 is lower than the water temperature T_1 the valve opens for a heating load.
- GT_1 is connected to the regulator as an external temperature sensor
- In SWICCT or SuperWISE (See figures below) 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 ADAPT Parasol's sensor module
- NOTE! The valve actuator must be connected to the regulator's cooling output.
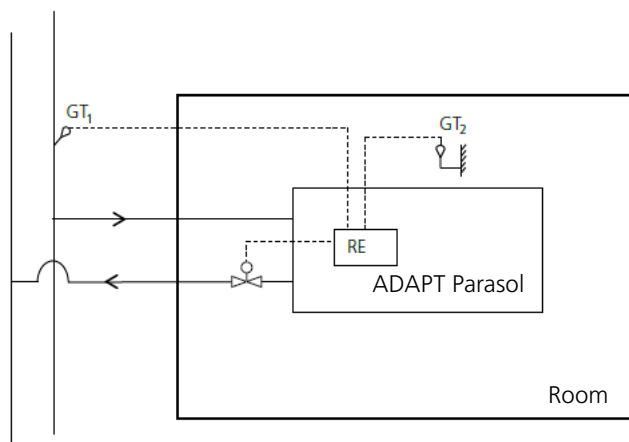
In SWICCT you make the change in one of these places, either under "Input configuration" or "External temperature sensor use". Irrespective of where you make the change, the other changes automatically.

Input configuration

Input 1 usage
Input 3 usage
Input 4 usage
Occ. mode

Change over temperature ▼

Not used
Room temperature
Change over temperature
Temperature (read only)
Window contact NO
Window contact NC

External temperature sensor use

Change over temperature ▼

Not used
Room temperature
Change over temperature
Temperature (read only)
Window contact NO
Window contact NC

The input's function can also be changed via SuperWISE:

Other parameters

Analogue input 1   Extern temp.
Analogue input 2
Analogue input 3

Select value: Non active

Non active
Extern temp. room
Extern temp. ChOv
Extern temp. reading
Window contact NO
Window contact NC

Cancel   OC

    20161206

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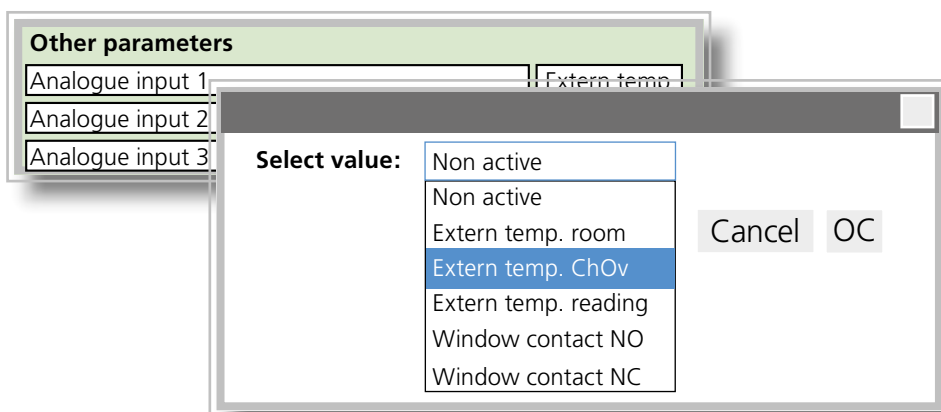
Control of the lighting

Use of analogue output to switch an external relay

The regulator's analogue outputs no. 13 or 19 (see page 16) can be used to switch an external relay for lighting. The output is really intended to control actuators or internal dampers, but when 10V is fed on the output for occupancy (assuming that the output is configured 2-step, i.e. 0% output signal for unoccupied and 100% output for occupancy) lighting can also be managed for example by means of an external relay.

Note that this is an alternative use of the output, which means no intelligence for lighting control is connected to this.

For more information and assistance with connections contact the factory.

Start-up and Zero point calibration

During initial start-up after a power failure and for zero point calibration, the internal damper will open to fully open to read the current duct pressure in this position.

The damper is open for a few minutes and then closes and then start normal regulation of the airflow.

For zero point calibration, close the damper, the pressure sensor actual value is reset and then the start-up procedure is performed as above.

Calibration is activated via SuperWISE, SWICCT or via Modbus.

Two-step cooling/two step heating

The function two-step cooling means that both actuator outputs are used for cooling, this in order to supplement with extra cooling on output number two when the cooling on output number one is not sufficient.

For 0-50% of the cooling load, 100% is put on one output and for a 50-100% cooling load is 100% output signal is put on both outputs.

Note that in this case the voltage is on both outputs simultaneously, which can affect the choice of transformer.

The above applies in the same way in two-step heating.

Also note that only cooling or heating can be regulated according to the two-step principle when the same outputs are used.

The corresponding settings can be made on the analogue outputs for e.g. 0-10V actuators

Output configuration	
Digital output 1(21)	Water cooling primary sequence ▼
Analogue output 1(19)	Not used ▼
Digital output 2(18)	Water cooling secondary sequence ▼
Analogue output 2(16)	Not used ▼
Digital output 3(15)	Not used ▼
Analogue output 3(13)	Variable ▼

Output configuration	
Digital output 1(21)	Water heating primary sequence ▼
Analogue output 1(19)	Not used ▼
Digital output 2(18)	Water heating secondary sequence ▼
Analogue output 2(16)	Not used ▼
Digital output 3(15)	Not used ▼
Analogue output 3(13)	Variable ▼

Modbus register

Coils		
0x0001	Emergency	GIL_B_EMERGENCY
0x0002	BOOT (first write parameters)	GIL_B_BOOT
0x0003	Force parameter write	GIL_B_PRM_FORCE_WRITE
0x0004	Clear all alarms	GIL_B_CLEAR_ALARMS
0x0005	Holiday	GIL_B_HOLIDAY
0x0006	SNC	GIL_B_SUMMER_NIGHT_COOL
0x0007	Zero calibration demand to pressure sensor	GIL_B_ZERO_CAL_DEMAND
0x0008	Man valve test	GIL_B_VALVE_TEST
0x0009	Man vent boost	GIL_B_VENT_BOOST_MAN
0x0010	Reset temperature offset.	GIL_B_RESET_SM_TEMP_OFFSET
0x0011	Water actuator STOP	GIL_B_VALVE_STOP
0x0012	Air quality active UnOcc	GIL_B_VOC_NOOCC_USE
0x0013	Group occupancy	GIL_B_OCCUPANCY_GROUP
0x0014	Cold draught protection active in unoccupied mode	GIL_B_COLDDRAFTPROT_UNOCC
Input status		
1x0001	AC power supply.	GIL_B_AC_SUPPLY
1x0002	Discrete air hatch open (fixed)	GIL_B_DISCAIR_FIXED
1x0003	Discrete air hatch open (pulsing)	GIL_B_DISCAIR_PAUSPULSE
1x0004	Discrete air hatch Parasol slave	GIL_B_DISCAIR_PARASOL
1x0005	Air flow forced	GIL_B_AIRFLOW_FORCE
1x0006	Vent boost active	GIL_B_VENTILATION_BOOST
1x0007	Valve exercise active	GIL_B_WAT_VALVE_EXERCISE
1x0008	Condensation	GIL_B_CONDENSATION
1x0009	Digital in (IN4)	GIL_B_DIN_1
1x0010	Window open	GIL_B_WINDOW_OPEN
1x0011	Occupancy incl delays	GIL_B_OCCUPANCY
1x0012	Occupancy SM 1	GIL_B_OCC_SM_1
1x0013	Occupancy SM 2	GIL_B_OCC_SM_2
1x0014	Occupancy SM 3	GIL_B_OCC_SM_3
1x0015	Occupancy SM 4	GIL_B_OCC_SM_4
1x0016	Occupancy SM 5	GIL_B_OCC_SM_5
1x0017	Occupancy SM 6	GIL_B_OCC_SM_6
1x0018	Occupancy SM 7	GIL_B_OCC_SM_7
1x0019	Occupancy SM 8	GIL_B_OCC_SM_8
1x0020	Occupancy SM 9	GIL_B_OCC_SM_9
1x0021	Occupancy SM 10	GIL_B_OCC_SM_10
1x0022	Change over Heat present	GIL_B_CHOV2_HEAT_SUPPLY
1x0023	Change over Cool present	GIL_B_CHOV2_COOL_SUPPLY
1x0024	Digital out 1 status	GIL_B_DOUT1_STATUS
1x0025	Digital out 2 status	GIL_B_DOUT2_STATUS

Input status		
1x0026	Digital out 3 status	GIL_B_DOUT3_STATUS
1x1000	Sum alarm for functional alarms	GIL_B_ALRACT_FUNC_ALR
1x1001	Sum alarm for comfort alarms	GIL_B_ALRACT_COMF_ALR
1x1002	Supply voltage low	GIL_B_ALARM_1
1x1003	Supply voltage critical low	GIL_B_ALARM_2
1x1004	Ext temp missing	GIL_B_ALARM_3
1x1005	Ext temp error	GIL_B_ALARM_4
1x1006	Condensation sensor error	GIL_B_ALARM_5
1x1007	SM temp sensor error	GIL_B_ALARM_6
1x1008	SM button error	GIL_B_ALARM_7
1x1009	CO2 sensor missing	GIL_B_ALARM_8
1x1010	VOC Error	GIL_B_ALARM_9
1x1011	Low pressure	GIL_B_ALARM_10
1x1012		GIL_B_ALARM_11
1x1013		GIL_B_ALARM_12
1x1014		GIL_B_ALARM_13
1x1015		GIL_B_ALARM_14
1x1016		GIL_B_ALARM_15
1x1017		GIL_B_ALARM_16
1x1018	SM comm error	GIL_B_ALARM_17
1x1019	Slave comm error	GIL_B_ALARM_18
1x1020	Pressure sensor comm error	GIL_B_ALARM_19
1x1021	VOC sensor comm error	GIL_B_ALARM_20
1x1022	No master request (slave)	GIL_B_ALARM_21
1x1023	Slave incompatible version	GIL_B_ALARM_22
1x1024		GIL_B_ALARM_23
1x1025		GIL_B_ALARM_24
1x1026	Heating comfort alarm	GIL_B_ALARM_25
1x1027	Cooling comfort alarm	GIL_B_ALARM_26
1x1028	Temp. Setpoint overlap alarm	GIL_B_ALARM_27
1x1029	Air quality comfort alarm	GIL_B_ALARM_28
1x1030	Condensation	GIL_B_ALARM_29
1x1031		GIL_B_ALARM_30
1x1032		GIL_B_ALARM_31
1x1033		GIL_B_ALARM_32
1x1034	24 V Out 1 overload error	GIL_B_ALARM_33
1x1035	24 V Out 2 overload error	GIL_B_ALARM_34
1x1036	24 V Out 3 overload error	GIL_B_ALARM_35
1x1037		GIL_B_ALARM_36
1x1038		GIL_B_ALARM_37
1x1039		GIL_B_ALARM_38
1x1040		GIL_B_ALARM_39
1x1041		GIL_B_ALARM_40
1x1042	Slave input sum alarm	GIL_B_ALARM_41
1x1043	Slave output sum alarm	GIL_B_ALARM_42

Input status

1x1044		GIL_B_ALARM_43
1x1045		GIL_B_ALARM_44
1x1046		GIL_B_ALARM_45
1x1047		GIL_B_ALARM_46
1x1048		GIL_B_ALARM_47
1x1049		GIL_B_ALARM_48
1x1050		GIL_B_ALARM_49
1x1051		GIL_B_ALARM_50
1x1052		GIL_B_ALARM_51
1x1053		GIL_B_ALARM_52
1x1054		GIL_B_ALARM_53
1x1055		GIL_B_ALARM_54
1x1056		GIL_B_ALARM_55
1x1057		GIL_B_ALARM_56
1x1058		GIL_B_ALARM_57
1x1059		GIL_B_ALARM_58
1x1060		GIL_B_ALARM_59
1x1061		GIL_B_ALARM_60
1x1062		GIL_B_ALARM_61
1x1063		GIL_B_ALARM_62
1x1064		GIL_B_ALARM_63
1x1065		GIL_B_ALARM_64

Input register

3x0001	Component Name ID	GIL_N_DEVICE_ID_IR_COPY_S16
3x0002	Bootloader revision	GIL_N_BOOT_REV_S16
3x0003	SW revision	GIL_N_SW_REV_S16
3x0004	HW revision	GIL_N_HW_REV_S16
3x0005	Serial number 1	GIL_N_SNR_1
3x0006	Serial number 2	GIL_N_SNR_2
3x0007	Serial number 3	GIL_N_SNR_3
3x0008	Serial number 4	GIL_N_SNR_4
3x0009	Serial number 5	GIL_N_SNR_5
3x0010	Serial number 6	GIL_N_SNR_6
3x0011	Serial number 7	GIL_N_SNR_7
3x0012	Serial number 8	GIL_N_SNR_8
3x0018	Application id	GIL_N_APPLICATION_ID_IR_S16
3x0020	Number of connected sensor modules.	GIL_N_SM_S16
3x0021	Number of connected slaves	GIL_N_SLAVES_S16
3x0022	Occupancy SM (bit code)	GIL_F_OCC_SM_S16
3x0023	Output current	GIL_MA_CURRENT_S16
3x0024	Pressure	GIL_DPA_FLOW_S16
3x0025	CO2 ppm	GIL_PPM_CO2_S16
3x0026	VOC ppm	GIL_PPM_VOC_S16
3x0027	RH %	GIL_PCT_RH_S16
3x0028	Temperature from VOC sensor	GIL_DEGC_VOC_S16

Input register		
3x0029	Input status mirror	GIL_F_INPUTSTATUS1_S16
3x0030	Input status mirror	GIL_F_INPUTSTATUS2_S16
3x0031	Supply voltage	GIL_V_SUPPLY_S16
3x0032	Device state	GIL_E_DEVICE_STATE_S16
3x0033	Actual mean airflow.	GIL_LPS_AIRFLOW_S16
3x0034	Temp Ext	GIL_DEGC_EXT_S16
3x0035	Condensation	GIL_B_CONDENSATION_S16
3x0036	Alarm 1-16	GIL_F_ALARM_1_16_S16
3x0037	Alarm 17-32	GIL_F_ALARM_17_32_S16
3x0038	Alarm 33-48	GIL_F_ALARM_33_48_S16
3x0039	Alarm 49-64	GIL_F_ALARM_49_64_S16
3x0040	Slave id for first Slave active alarm	GIL_N_SLAVE_ALARM_ID_S16
3x0041	SM id for first SM active alarm	GIL_N_SM_ALARM_ID_S16
3x0042	Alarm 1-16 history	GIL_F_ALR_HIST_1_16_S16
3x0043	Alarm 17-32 history	GIL_F_ALR_HIST_17_32_S16
3x0044	Alarm 33-48 history	GIL_F_ALR_HIST_33_48_S16
3x0045	Alarm 49-64 history	GIL_F_ALR_HIST_49_64_S16
3x0046	Analogue input (IN3)	GIL_MV_IN_0_10_S16
3x0047	Digital output 1.	GIL_PCT_DIG_OUT_1_S16
3x0048	Digital output 2.	GIL_PCT_DIG_OUT_2_S16
3x0049	Digital output 3.	GIL_PCT_DIG_OUT_3_S16
3x0050	Analogue output 1.	GIL_PCT_ANA_OUT_1_S16
3x0051	Analogue output 2.	GIL_PCT_ANA_OUT_2_S16
3x0052	Analogue output 3.	GIL_PCT_ANA_OUT_3_S16
3x0053	Room temp	GIL_DEGC_ROOM_S16
3x0054	Room temp setpoint	GIL_DEGC_ROOM_SP_S16
3x0055	Temp Low limit	GIL_PCT_TMP_REG_LOLIM_S16
3x0056	Temp Hi limit	GIL_PCT_TMP_REG_HILIM_S16
3x0057	Temp load	GIL_PCT_TMP_LOAD_S16
3x0058	Temp setpoint offset Occ	GIL_DEGC_SP_OFFSET_S16
3x0059	Sensor module setpoint offset	GIL_N_SM_SP_OFFSET_S16
3x0060	Temp Slave controller 1	GIL_DEGC_SLAVE_1_S16
3x0061	Temp Slave controller 2	GIL_DEGC_SLAVE_2_S16
3x0062	Temp Slave controller 3	GIL_DEGC_SLAVE_3_S16
3x0063	Temp Slave controller 4	GIL_DEGC_SLAVE_4_S16
3x0064	Temp Slave controller 5	GIL_DEGC_SLAVE_5_S16
3x0065	Temp Slave controller 6	GIL_DEGC_SLAVE_6_S16
3x0066	Temp Slave controller 7	GIL_DEGC_SLAVE_7_S16
3x0067	Temp Slave controller 8	GIL_DEGC_SLAVE_8_S16
3x0068	Temp Slave controller 9	GIL_DEGC_SLAVE_9_S16
3x0069	Temp SM1	GIL_DEGC_SENSOR_MODULE_1_S16
3x0070	Temp SM2	GIL_DEGC_SENSOR_MODULE_2_S16
3x0071	Temp SM3	GIL_DEGC_SENSOR_MODULE_3_S16
3x0072	Temp SM4	GIL_DEGC_SENSOR_MODULE_4_S16
3x0073	Temp SM5	GIL_DEGC_SENSOR_MODULE_5_S16

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Input register		
3x0074	Temp SM6	GIL_DEGC_SENSOR_MODULE_6_S16
3x0075	Temp SM7	GIL_DEGC_SENSOR_MODULE_7_S16
3x0076	Temp SM8	GIL_DEGC_SENSOR_MODULE_8_S16
3x0077	Temp SM9	GIL_DEGC_SENSOR_MODULE_9_S16
3x0078	Temp SM10	GIL_DEGC_SENSOR_MODULE_10_S16
3x0079	Air flow load	GIL_PCT_AIRFLOW_LOAD_S16
3x0080	Air flow setpoint	GIL_LPS_AIRFLOW_SP_S16
3x0081	Air flow moving average	GIL_LPS_AIRFLOW_AVG_S16
3x0082	Air quality load	GIL_PCT_VOC_AIRFLOW_LOAD_S16
3x0083	Air quality	GIL_PPM_AIRQ_S16
3x0084	Damper signal	GIL_PCT_AIRFLOW_FORCE_S16
3x0085	Airflow control signal	GIL_PCT_AIRFLOW_CNTRL_S16
3x0086	Air flow Slave controller 1	GIL_LPS_SLAVE_1_S16
3x0087	Air flow Slave controller 2	GIL_LPS_SLAVE_2_S16
3x0088	Air flow Slave controller 3	GIL_LPS_SLAVE_3_S16
3x0089	Air flow Slave controller 4	GIL_LPS_SLAVE_4_S16
3x0090	Air flow Slave controller 5	GIL_LPS_SLAVE_5_S16
3x0091	Air flow Slave controller 6	GIL_LPS_SLAVE_6_S16
3x0092	Air flow Slave controller 7	GIL_LPS_SLAVE_7_S16
3x0093	Air flow Slave controller 8	GIL_LPS_SLAVE_8_S16
3x0094	Air flow Slave controller 9	GIL_LPS_SLAVE_9_S16
3x0095	Air flow Modbus sensor, lps * 10.	GIL_LPS_AIRFLOW_MB_S16
3x0096	Water cooling regulator signal.	GIL_PCT_WAT_COOLING_S16
3x0097	Water heating regulator signal.	GIL_PCT_WAT_HEATING_S16
3x0098	Airflow demand signal	GIL_PCT_FLOWDEMAND_S16
3x0099	Air flow setpoint master regulator	GIL_LPS_AIRFLOW_REG_SP_S16
3x0100	Pressure slave 1	GIL_DPA_FLOW_SLAVE_1_S16
3x0101	Pressure slave 2	GIL_DPA_FLOW_SLAVE_2_S16
3x0102	Pressure slave 3	GIL_DPA_FLOW_SLAVE_3_S16
3x0103	Pressure slave 4	GIL_DPA_FLOW_SLAVE_4_S16
3x0104	Pressure slave 5	GIL_DPA_FLOW_SLAVE_5_S16
3x0105	Pressure slave 6	GIL_DPA_FLOW_SLAVE_6_S16
3x0106	Pressure slave 7	GIL_DPA_FLOW_SLAVE_7_S16
3x0107	Pressure slave 8	GIL_DPA_FLOW_SLAVE_8_S16
3x0108	Pressure slave 9	GIL_DPA_FLOW_SLAVE_9_S16
3x0109	Pressure duct	GIL_DPA_FLOW_DUCT_S16
3x0110	Master min airflow	GIL_LPS_MIN_DEVICE_S16
3x0111	Master max airflow	GIL_LPS_MAX_DEVICE_S16
3x0112	VOC error status	GIL_F_VOC_ERROR_STATUS_S16
3x0160	Min airflow	GIL_LPS_MIN_AIRFLOW_S16
3x0161	Max airflow	GIL_LPS_MAX_AIRFLOW_S16
3x0162	Minutes since last calibration	GIL_MIN_DUCT_CAL_S16
3x0200	Uptime year	GIL_Y_UPTIME_S16
3x0201	Uptime hours	GIL_H_UPTIME_S16
3x0202	Uptime minutes	GIL_MIN_UPTIME_S16

Holding register		
4x0001	Component Name ID	GIL_N_DEVICE_ID_S16
4x0002	Component name	GIL_ASCII_NAME_1_S16
4x0003	Component name	GIL_ASCII_NAME_2_S16
4x0004	Component name	GIL_ASCII_NAME_3_S16
4x0005	Component name	GIL_ASCII_NAME_4_S16
4x0006	Component name	GIL_ASCII_NAME_5_S16
4x0007	Component name	GIL_ASCII_NAME_6_S16
4x0008	Component name	GIL_ASCII_NAME_7_S16
4x0009	Component name	GIL_ASCII_NAME_8_S16
4x0010	Component name	GIL_ASCII_NAME_9_S16
4x0011	Component name	GIL_ASCII_NAME_10_S16
4x0012	Component name	GIL_ASCII_NAME_11_S16
4x0013	Component name	GIL_ASCII_NAME_12_S16
4x0014	Component name	GIL_ASCII_NAME_13_S16
4x0015	Component name	GIL_ASCII_NAME_14_S16
4x0016	Component name	GIL_ASCII_NAME_15_S16
4x0017	Component name	GIL_ASCII_NAME_16_S16
4x0018	Application ID	GIL_N_APPLICATION_ID_S16
4x0019	Controller Modbus address	GIL_N_BMS_MODBUS_ID_S16
4x0020	Baud rate	GIL_E_BMS_BAUDRATE_S16
4x0021	Parity	GIL_E_BMS_PARITY_S16
4x0022	Stop bits	GIL_N_BMS_STOPBITS_S16
4x0023	Slave id	GIL_N_SLAVE_ID_S16
4x0024	Identification number	GIL_N_IDENTIFICATION_S16
4x0025	Controller type	GIL_E_CONTROLLER_TYPE_S16
4x0026	App AO1	GIL_E_ANA_OUT_1_APP_S16
4x0027	App AO2	GIL_E_ANA_OUT_2_APP_S16
4x0028	App AO3	GIL_E_ANA_OUT_3_APP_S16
4x0029	App DO1	GIL_E_DIG_OUT_1_APP_S16
4x0030	App DO2	GIL_E_DIG_OUT_2_APP_S16
4x0031	App DO3	GIL_E_DIG_OUT_3_APP_S16
4x0032	Input 1 usage	GIL_E_IN1USE_S16
4x0033	Input 3 usage	GIL_E_IN3USE_S16
4x0034	Input 4 usage	GIL_E_IN4USE_S16
4x0035	Room temperature sensor use.	GIL_E_ROOM_TEMP_SENS_USE_S16
4x0036	Occ mode	GIL_E_OCC_MODE_S16
4x0037	Occ off delay	GIL_S_OCC_OFF_DELAY_S16
4x0038	Occ on delay	GIL_S_OCC_ON_DELAY_S16
4x0039	Occupancy trig level	GIL_N_PIR_LEVEL_S16
4x0040	Commissioning mode.	GIL_E_COMMISSIONINGMODE_S16
4x0041	Commissioning max time	GIL_H_MAXCOMMISSIONING_S16
4x0042	Setpoint Cool Occ	GIL_DEGC_SP_HI_OCC_S16

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Holding register		
4x0043	Setpoint Heat Occ	GIL_DEGC_SP_LO_OCC_S16
4x0044	Setpoint Cool UnOcc	GIL_DEGC_SP_HI_NO_OCC_S16
4x0045	Setpoint Heat UnOcc	GIL_DEGC_SP_LO_NO_OCC_S16
4x0046	Setpoint Cool SNC	GIL_DEGC_SP_HI_SNC_S16
4x0047	Setpoint Heat SNC	GIL_DEGC_SP_LO_SNC_S16
4x0048	Setpoint Cool Holiday	GIL_DEGC_SP_HI_HOLID_S16
4x0049	Setpoint Heat Holiday	GIL_DEGC_SP_LO_HOLID_S16
4x0050	Room temperature offset	GIL_DEGC_ROOM_OFFSET_S16
4x0051	SM SP offset step size	GIL_DEGC_SP_OFFSET_STEP_S16
4x0052	Cooling boost delay	GIL_MIN_TWO_STEP_COOL_DELAY_S16
4x0053	Heating boost delay	GIL_MIN_TWO_STEP_HEAT_DELAY_S16
4x0054	Change over 2 act temp	GIL_DEGC_CHOV2_ACTUAL_S16
4x0055	Heat type	GIL_E_HEATTYPE_S16
4x0056	Air flow max	GIL_LPS_MAX_S16
4x0057	Air flow min Occ	GIL_LPS_MIN_OCC_S16
4x0058	Air flow min UnOcc	GIL_LPS_MIN_UNOCC_S16
4x0059	Air flow min Holiday	GIL_LPS_MIN_HOLIDAY_S16
4x0061	Air flow moving average time (hours).	GIL_H_AIRFLOW_AVG_S16
4x0062	Low pressure alarm limit	GIL_DPA_LOW_PRESSURE_LIMIT_S16
4x0063	Vent boost delay	GIL_H_VENT_BOOST_DELAY_S16
4x0064	Vent boost time	GIL_MIN_VENT_BOOST_S16
4x0065	Valve exercise interval	GIL_H_VALVE_EXC_INT_S16
4x0066	Min pressure for cooling	GIL_DPA_MIN_COOLING_S16
4x0067	Air cooling sequence	GIL_E_AIRCOOLING_SEQUENCE
4x0068	K-factor on closed damper	GIL_K_FLOW_CLOSED_S16
4x0069	K-factor on open damper	GIL_K_FLOW_OPEN_S16
4x0070	Heating P-band	GIL_DEGC_PBAND_HEAT_S16
4x0071	Cooling P-band	GIL_DEGC_PBAND_COOL_S16
4x0072	Heating I-time	GIL_MIN_ITIME_HEAT_S16
4x0073	Cooling I-time	GIL_MIN_ITIME_COOL_S16
4x0076	P-band airflow regulator	GIL_LPS_AFR_PBAND_S16
4x0077	I-time airflow regulator	GIL_S_AFR_ITIME_S16
4x0079	Change over 2 hyst temp	GIL_DEGC_CHOV2_HYST_S16
4x0080	Change over 4 low limit	GIL_V_CHOV4_DEADZ_LOLIM_S16
4x0081	Change over 4 hi limit	GIL_V_CHOV4_DEADZ_HILIM_S16
4x0082	Internal LED mode	GIL_E_INTLED_MODE
4x0083	SM offset LED mode	GIL_E_SM_OFLED_S16
4x0084	SM offset LED active	GIL_S_SM_OFLED_ACTIVE_S16
4x0085	SM LED brightness active	GIL_PCT_SM_BRIGHTN_ACT_S16
4x0086	SM LED brightness inactive	GIL_PCT_SM_BRIGHTN_INACT_S16

Holding register		
4x0088	Damper action emergency	GIL_E_EMERGENCY_ACTION_S16
4x0089	Air quality low limit ppm	GIL_PPM_AIRQ_LOLIM_S16
4x0090	Air quality high limit ppm	GIL_PPM_AIRQ_HILIM_S16
4x0091	PPM/V for CO2 or VOC analogue sensor	GIL_PPM_PER_VOLT_S16
4x0092	VOC sensor use	GIL_E_VOCUSE_S16
4x0093	Low lim AO1	GIL_V_ANA_OUT_1_LOLIM_S16
4x0094	Hi lim AO1	GIL_V_ANA_OUT_1_HILIM_S16
4x0095	Low lim AO2	GIL_V_ANA_OUT_2_LOLIM_S16
4x0096	Hi lim AO2	GIL_V_ANA_OUT_2_HILIM_S16
4x0097	Low lim AO3	GIL_V_ANA_OUT_3_LOLIM_S16
4x0098	Hi lim AO3	GIL_V_ANA_OUT_3_HILIM_S16
4x0099	Coil mirror	GIL_F_COIL_S16
4x0100	Modbus master delay time	GIL_MS_MODB_DELAY_S16
4x0101	Restore settings (write 1111)	GIL_N_RESTORE_SETTINGS_S16
4x0102	Save settings (write 2222)	GIL_N_SAVE_SETTINGS_S16
4x0103	Airflow demand min	GIL_LPS_FLOWDEMAND_MIN_S16
4x0104	Airflow demand max	GIL_LPS_FLOWDEMAND_MAX_S16
4x0105	EA offset	GIL_PCT_EA_OFFSET_S16
4x0106	Digital out 1 option	GIL_E_DIG_OUT_1_OPTION_S16
4x0107	Digital out 2 option	GIL_E_DIG_OUT_2_OPTION_S16
4x0108	Digital out 3 option	GIL_E_DIG_OUT_3_OPTION_S16
4x0109	Analogue out 1 option	GIL_E_ANA_OUT_1_OPTION_S16
4x0110	Analogue out 2 option	GIL_E_ANA_OUT_2_OPTION_S16
4x0111	Analogue out 3 option	GIL_E_ANA_OUT_3_OPTION_S16
4x0112	Ignore Occupancy SM (bit code)	GIL_F_OCC_SM_IGNORE_S16
4x0113	Slave air function	GIL_E_AIR_SLAVEFUNC_S16
4x0114	Air-water-air breakpoint A	GIL_PCT_COOLSEQ_A_S16
4x0115	Air-water-air breakpoint B	GIL_PCT_COOLSEQ_B_S16
4x0116	Cold draught protection level	GIL_PCT_COLDDRAFTPROT_S16
4x0117	Cold draught protection limit to turn off	GIL_PCT_COLDDRAFTPROTLIMIT_S16
4x0118	Actuator period time	GIL_S_PWM_PERIOD_S16

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Trouble shooting

Alarm List

Alarm no.	Type of alarm	Probable cause
Alarm no.	Type of alarm	Comment
Alarm 1	Supply voltage low	Low supply voltage, undersized transformer, voltage drop in long cables. Risk of reduced function
Alarm 2	Supply voltage critical low	See above, large risk of reduced function
Alarm 3	Ext temp missing	Temp. sensor not connected
Alarm 4	Ext temp error	Temp. sensor defective
Alarm 5	Condensation sensor error	Condensation sensor defective
Alarm 6	SM temp sensor error	SM temp sensor defective
Alarm 7	SM button error	SM temp button defective
Alarm 8	CO2 sensor missing	CO2 sensor not connected
Alarm 9	VOC Error	VOC sensors, incorrect value
Alarm 10	Low pressure	One of the pressure sensors measure a pressure below the permitted
Alarm 17	SM comm error	Communication error sensor module, check addressing
Alarm 18	Slave comm error	Slave unit not connected
Alarm 19	Pressure sensor comm error	Communication error pressure sensor, check addressing of the pressure sensor
Alarm 20	VOC sensor comm error	VOC sensor not connected
Alarm 21	No master request (slave)	The slave unit cannot find a Master to relate to.
Alarm 22	Slave incompatible version	Software version in slave unit is different to the one in the master unit
Alarm 25	Heating comfort alarm	Room setpoint cannot be reached, even though the output to the heating actuator has been 100% for x minutes
Alarm 26	Cooling comfort alarm	Room setpoint cannot be reached, even though the output to the cooling actuator has been 100% for x minutes
Alarm 27	Temp. Setpoint overlap alarm	Overlapping set values for temperature
Alarm 28	Air quality comfort alarm	Permitted PPM value exceeded during x minutes
Alarm 29	Condensation	The condensation sensor has made the circuit, condensate water or short circuit
Alarm 33	24 V Out 1 overload error	Overloaded output
Alarm 34	24 V Out 2 overload error	Overloaded output
Alarm 35	24 V Out 3 overload error	Overloaded output
Alarm 41	Slave input sum alarm	Input alarm from slave unit
Alarm 42	Slave output sum alarm	Output alarm from slave unit