AIRSENS CO2
AIRSENS VOC
AIRSENS RH

ENGLISH

Intelligent sensor available in three different versions: CO2, VOC and RH. Designed to create direct demand control ventilation systems. AirSens can be linked with AC, ECOWATT (EC) fans or VFTM frequency drive.

SECURITY

Installation must be carried out by a qualified professional. Make sure that the installation complies with mechanical and electrical national regulations. Once in service, the appliance must comply with corresponding Directives.
Do not use this device in explosive or corrosive atmospheres.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children must not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

INSTALLATION

This device must be installed in a dry environment (IP30), over a flat surface through fixing points (see Fig.4) and will require a type X installation. Height installation recommended between 1,5 and 1,8m. At the same time, it is important to choose an installation location free of conditions that could influence the measurement such as direct sun light, too close occupant proximity, air flow coming from windows or doors or ventilation systems.

The front cover is opened a tool pressing both pressure closures located at both edges of the cover (see Fig.5).
In case of an installation where cabling is outdoors, it must be installed inside a cable ducting system with IP4X protection degree classified as "cable ducting with access cover that can only be opened with a tool" according to UNE-EN 50.085-1: Cable trunking systems and cabling ducting systems for electrical installations- Part 1: General requirements.

START UP

Operating modes (see Fig.2)

MF1: Relay + Modbus (reading) – [SW1-4=OFF]
Adjustable relay via P1 potentiometer. Factory settings: 1200 ppm / 70%HR

MF2: 0-10Vdc output analogue signal + Modbus (reading) – [SW1=ON, SW2-4=OFF]
0-10Vdc output analogue signal adjustable via P1 potentiometer. Factory settings: 1200 ppm / 70%HR

MF3: 2-10Vdc output analogue signal + Modbus (reading) – [SW1-2=ON, SW2-4=OFF]
2-10Vdc output analogue signal adjustable via P1 potentiometer. Factory settings: 1200 ppm / 70%HR

MF4: Modbus control – [SW1-3=ON, SW4=OFF]
Access to reading, edition and communication of working parameters via Modbus communication protocol (see Table 1, Modbus registers). Relay and output analogue signal enabled. Factory settings: 1200 ppm / 70%HR .

On electronic board there are three LEDs (see Fig.1) with the following functions. The red D17 switched on indicates that the device is receiving power supply. The red D16 blinking means that Modbus communication is trying to be established, the green D18 blinking that communication is done successfully.

Note: If other switch combination is chosen, LED diffuser is switched off and digital/ analogue signals are inoperative.

LED diffuser

The device displays a real-time concentration level. In operation mode 1, the illumination is two-color while in modes 2, 3 and 4 this is three-color. Light intensity is adjustable via P2 potentiometer (see Fig.1) from OFF to 100%.

Relay + Modbus (reading) – [SW1-4=OFF]
Green: Value below set point.
Red: Value above set point.
Other modes
Green: ≤ 800ppm / ≤ 60%HR
Orange: 800 – 1200ppm / 60 – 80%HR
Red: > 1200ppm / > 80%HR

Modbus registers

Operating modes MF1, MF2 and MF3 allow only reading Modbus communication. It means access to all Modbus registers (see Fig.3) to visualize parameters. If MF4 mode is selected, total control with visualization and modification of parameters. Potentiometers P1 and P2 are disabled in MF4 mode.

In cases where a network communication net is made for multiple controls, it will be necessary for all devices to remove jumper J9 (see Fig.1) except for the last unit that will be kept (default from factory).

For visualization, modification and control via Modbus it will be necessary to have software suitable for this kind of communication. S&P will not provide specific software for this purpose. The information provided on the Modbus registers allows establishing a correct communication between AIRSENS CO2 / VOC / RH and configuration software chosen.

Basic connectivity features
Addressing: 1
Transmission speed: 19200
Parity: EVEN
Mode: RTU
Electrical interface: RS-485
Connector type: wiring D0 – D1 – Common

CALIBRATION / RESET

First time that device is switched on, or after a reset, a 10-minutes calibration process is started during which measurements can be erroneous.

Manual way to start a reset process is disconnecting power supply, wait at least 30 seconds and power again the electronic control. It is also possible to do remotely via Modbus communication using General reset (register number 3).

TECHNICAL DATA

Power supply voltage ..... 100-240Vac – 50/60Hz
Protection against electric shock ..... Class II
Installation type required ..... Tipo X
Maximum consumption ..... 0,7 W
Maximum current ..... 0,01 A
Output ..... 0-10 Vdc, 2-10 Vdc, maximum current 5mA
Relay ..... 3 A – 250Vac

Electric connection:
All cables used must fulfil with IEC 60.227.
5 x terminals, supply and relay ..... Min. 0,25 mm2 cable / Máx. 1,5 mm² cable
M3 screw and 0,5 Nm torque
5 x terminals, analogue output
and Modbus ..... Min. 0,25 mm2 cable / Máx. 1,0 mm² cable
M2 screw and 0,3 Nm torque
Note: Same tool can be used for both terminals types

Measurement range:
CO2 ..... 450-2000ppm
VOC ..... 50-2000ppm (CO2 equivalent relative)
HR 0-100%
Temp ..... -10-50°C

Accuracy:
CO2 ..... ± 50ppm
VOC ..... ± 100ppm
HR ..... ± 2%
Temp ..... ± 0,3°C

Ambient air humidity ..... 10-95% without condensation
Case dimensions [height x width x deep.] .. 89 x 122 x 26 mm

ENVIRONMENTAL DATA

Ambient temperature ..... 0-50°C
Covering classification IP30
Pollution degree 2
Weight ..... 150 g

MAINTENANCE

Before maintenance, make sure that the controller is disconnected from the mains supply even if it is previously been switched off. Prevent the possibility of anyone else connecting it while it is being inspected.
Regular inspection of the appliance is required, the frequency must be depend of the working conditions to avoid the accumulation of dirt that could trigger risks and would reduce the life expectancy. In all maintenance work, safety regulations in each country must be taken into account.

PUTTING OUT OF SERVICE AND RECYCLING

EEC legislation and our consideration of future generations mean that we should always recycle materials where possible; please do not forget to deposit all packaging in the appropriate recycling bins. If your device is also labeled with this symbol, please take it to the nearest Waste Management Plant at the end of its servicable life.

Fig. 1: Electronic board

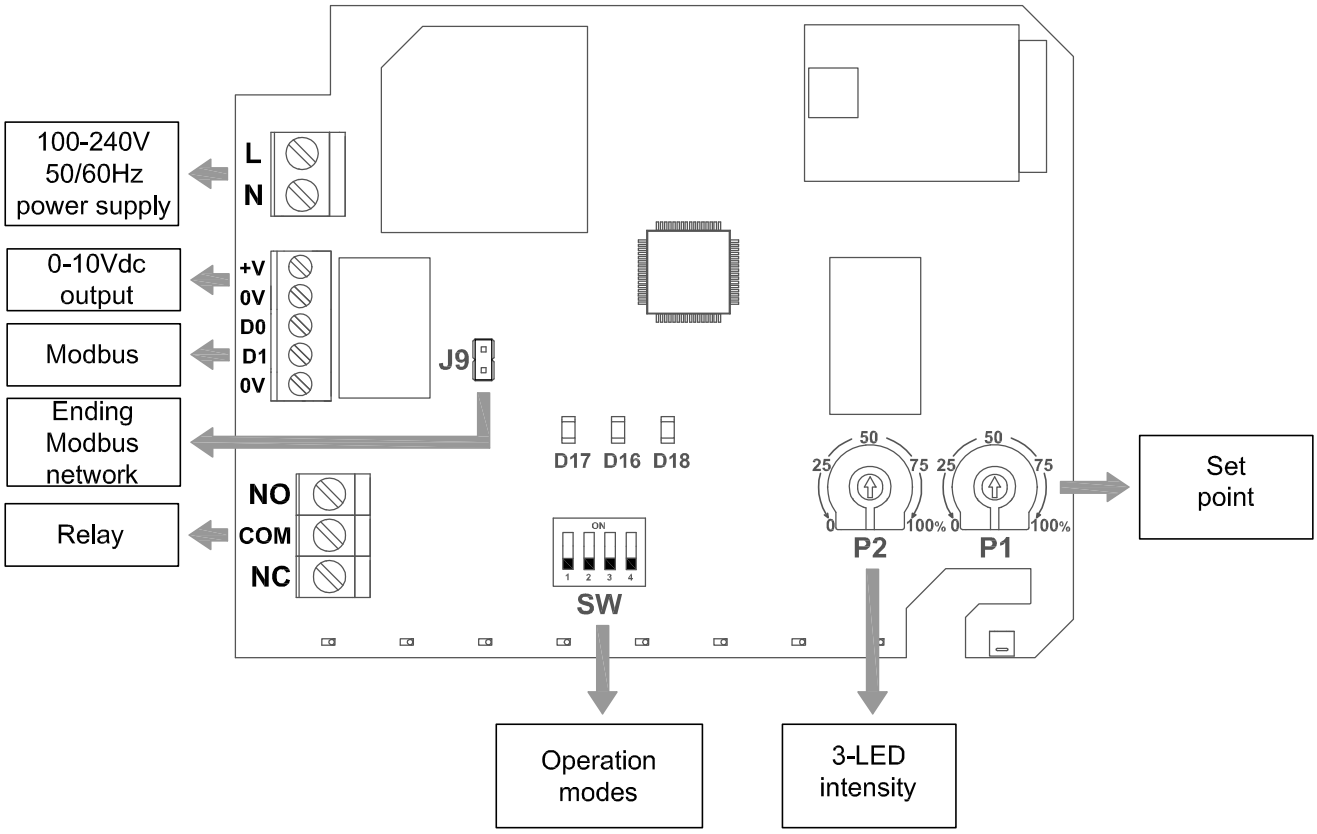
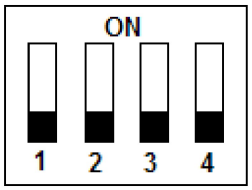
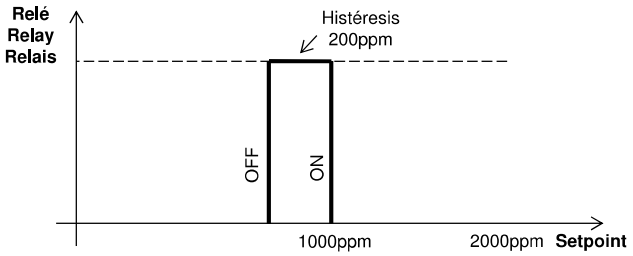
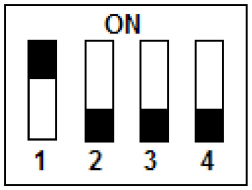


Fig. 2: Operating modes

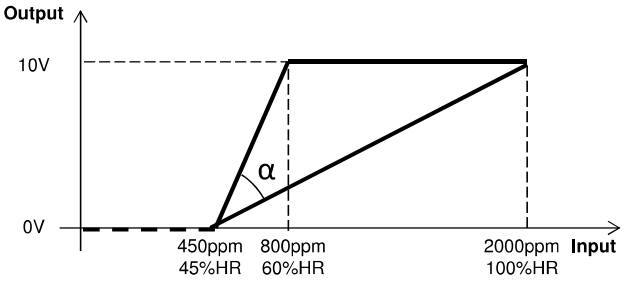


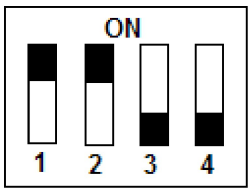
MF1: Relay + Modbus (reading)
Adjustable relay via P1 potentiometer



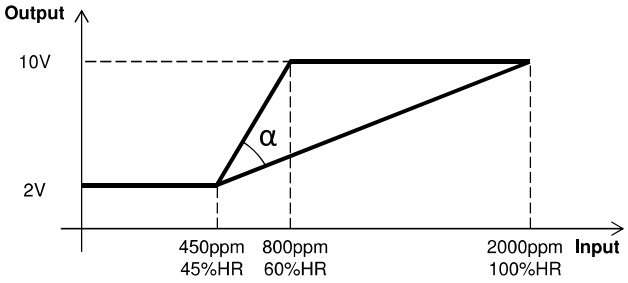


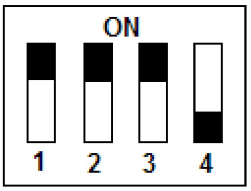
MF2: 0-10Vdc output + Modbus (reading)
Adjustable α angle via P1 potentiometer





MF3: 2 -10Vdc output + Modbus (reading)
Adjustable α angle via P1 potentiometer





MF4: Modbus control
Access to all operating modes and parameters via Modbus communications (see Fig.3).

Note: If other switch combination is chosen, LED diffuser is switched off and digital/ analogue signals are inoperative.

P1 potentiometer position (%)	MF1 mode: Set Point MF2/MF3 mode: Upper limit	
	ppm	HR
0	800	60
5	860	62
10	920	64
15	980	66
20	1040	68
25	1100	70
30	1160	72
35	1220	74
40	1280	76
45	1340	78
50	1400	80
55	1460	82
60	1520	84
65	1580	86
70	1640	88
75	1700	90
80	1760	92
85	1820	94
90	1880	96
95	1940	98
100	2000	100

Fig. 3: Mapa Modbus / Modbus registers / Carte Modbus / Mappa Modbus / Modbus kaart / Proměné modbus

Output Coils (Read)

Register	Output Coil	Data type	Range	Default	Comments
1	Invertir Set Point	BIT	0 : OFF 1 : ON	0	Output analogue signal 0-10V / 2-10V change and have an inverse response
2	Reboot Factory settings	BIT	0 : OFF 1 : ON	0	Modbus registers pass to factory settings
3	General Reset	BIT	0 : OFF 1 : ON	0	General reset activated

Discrete inputs (Read)

Register	Discrete input	Data type	Range	Default	Comments
10001	Relay status	BIT	0 : OFF 1 : ON	-	OFF: Contact (NO) normally opened ON: Contact (NO) normally closed
10002	SW1	BIT	0 : OFF 1 : ON	-	SW1.1 OFF: Set Point + Relay (MF1) ON: Analogue output/Modbus (MF2/MF3/MF4)
10003	SW2	BIT	0 : OFF 1 : ON	-	SW1.2 OFF: Analogue output 0-10V (MF2) ON: Analogue output 2-10V (MF3)
10004	SW3	BIT	0 : OFF 1 : ON	-	SW1.3 OFF: Modbus (only reading) ON: Control via Modbus (MF4)
10005	SW4	BIT	0 : OFF 1 : ON	-	No function
10006	SW5	BIT	0 : OFF 1 : ON	-	No function
10007	SW6	BIT	0 : OFF 1 : ON	-	No function
10008	SW7	BIT	0 : OFF 1 : ON	-	No function
10009	SW8	BIT	0 : OFF 1 : ON	-	No function
10010	Alarm	BIT	0 : OFF 1 : ON	-	Error: Defective sensor, communication fault or other problem OFF: Working correctly ON: Alarm

Input registers (Read)

Register	Discrete input	Data type	Range	Default	Comments
3000**1**	SetPoint	16bits	0-100	-	P1 potentiometer position (%)
3000**2**	SetPoint Value	16bits	0-2000	-	P1 potentiometer value (ppm or HR)
3000**3**	Light guide intensity	16bits	0-100	-	P2 potentiometer position (%)
3000**4**	Analog Output	16bits	0-100	-	Analogue output (Vdc) *(Example: 56 = 5,6Vdc)*
3000**5**	IAQ sensor TVOC	16bits	125-600	-	VOC sensor equivalent value (ppb)
3000**6**	IAQ sensor CO2	16bits	450-2000	-	VOC sensor equivalent value (ppm)
3000**7**	Temp sensor	16bits	-100-500	-	Temperature sensor value (°C) *(Example: 213 = 21,3°C)*
3000**8**	Hum sensor	16bits	0-100	-	Humidity sensor value (%HR)
3000**9**	CO2 sensor	16bits	450-2000	-	CO2 sensor value (ppm)
300**10**	Working mode	16bits	1 : MF1 2 : MF2 3 : MF3 4 : MF4	-	Operating mode

Holding registers (Read and write)

Register	Discrete input	Data type	Range	Default	Comments
40001	Addressing	16bits	1-247	1	Channel
40002	Baud Rate	16bits	48 : 4800 96 : 9600 192 : 19200 384 : 38400	192	Bus speed
40003	Parity	16bits	0 : EVEN 1 : ODD 2 : Non parity	0	Parity
40011	SetPoint HR	16bits	60-100	70	Set Point for HR version (%) MF4 mode
40012	SetPoint VOC/CO2	16bits	800-2000	1200	Set Point for VOC and CO2 versions (ppm) MF4 mode
40013	Relay SetPoint Hysteresis HR	16bits	0-20	5	Relay hysteresis for HR set point (%)
40014	Relay SetPoint Hysteresis VOC/CO2	16bits	0-500	200	Relay hysteresis for VOC and CO2 set point (ppm)
40015	Light guide intensity	16bits	0-100	80	Led diffusor intensity (%) MF4 mode
40021	Temp Measurement Tuning	16bits	-30-30	0	Temperature reading adjustment (°C)
40022	VOC/CO2 Measurement Tuning	16bits	-200-200	0	VOC and CO2 reading adjustment (ppm)
40023	HR Measurement Tuning	16bits	-10-10	0	HR reading adjustment (%)
40024	Green LED illumination stop HR	16bits	0-60	60	Green LED end for HR version (%)
40025	Red LED illumination start HR	16bits	80-100	80	Red LED start for HR version (%)
40026	Green LED illumination stop VOC/CO2	16bits	400-800	800	Green LED end for VOC/CO2 version (%)
40027	Red LED illumination start VOC/CO2	16bits	800-2000	1200	Red LED start for VOC/CO2 version (%)

Fig.4: Dimensiones / Dimensions / Dimensioni / Afmetingen / Rozměry

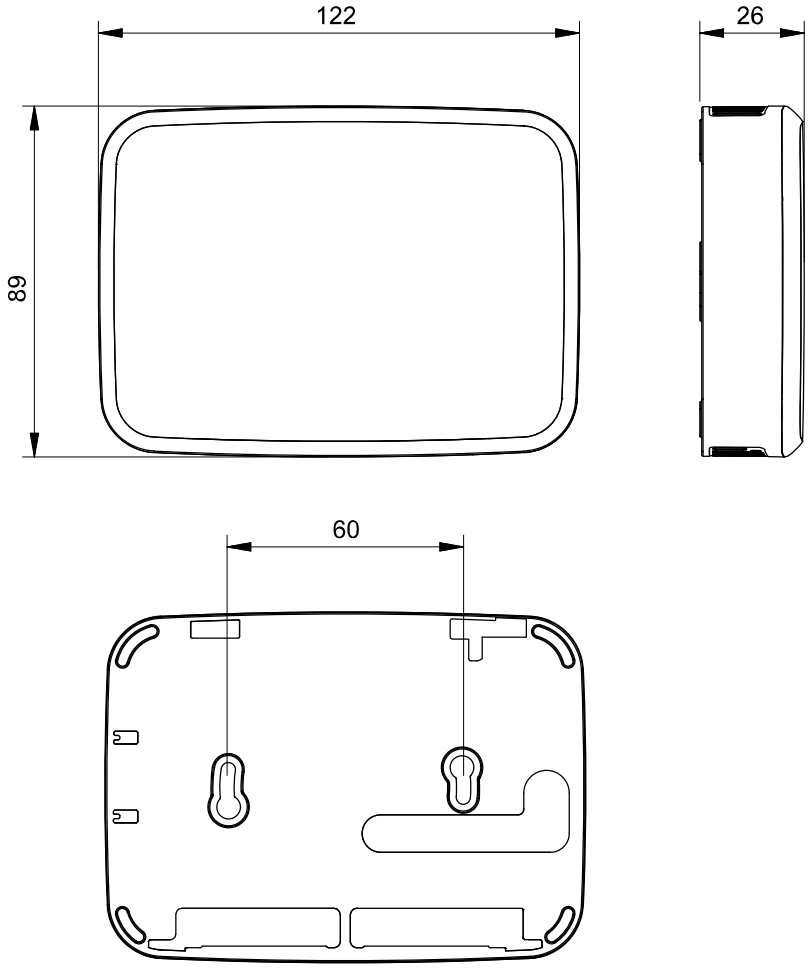
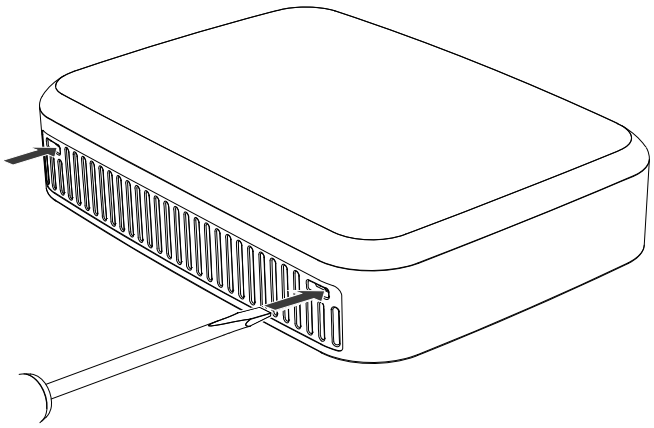


Fig.5: Desmontaje tapa frontal / Front cover dismounting / Démontage du couvercle / Smontaggio coperchio frontale / Demontage voorklep / Odejmutí předního krytu



S&P SISTEMAS DE VENTILACIÓN, S.L.U.

C. Llevant, 4
Polígono Industrial Llevant
08150 Parets del Vallès
Barcelona - España

Tel. +34 93 571 93 00
Fax +34 93 571 93 01
www.solerpalau.com

CE

Ref. 9023071000

Soler&Palau Ventilation Group