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CO_2 Control for the UltimateAir RecoupAerator

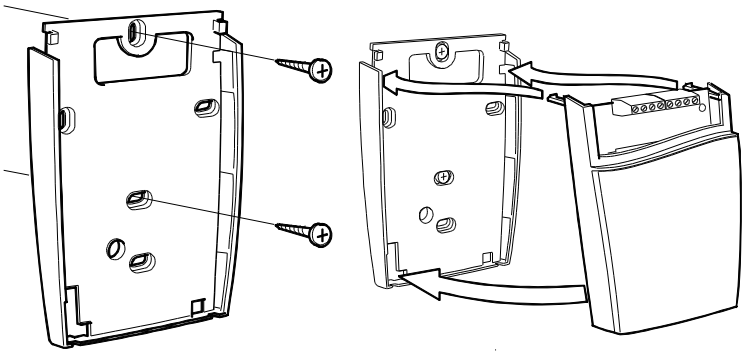
Installation and Setup Guide

Thank you for purchasing the CO_2 (Carbon Dioxide) Occupancy Sensing Switch for use with your **RecoupAerator®**. Designed to reduce excess CO_2 levels, the sensor will automatically turn on the RecoupAerator to maximum air flow (boost) when the factory set point of 1000ppm has been exceeded.

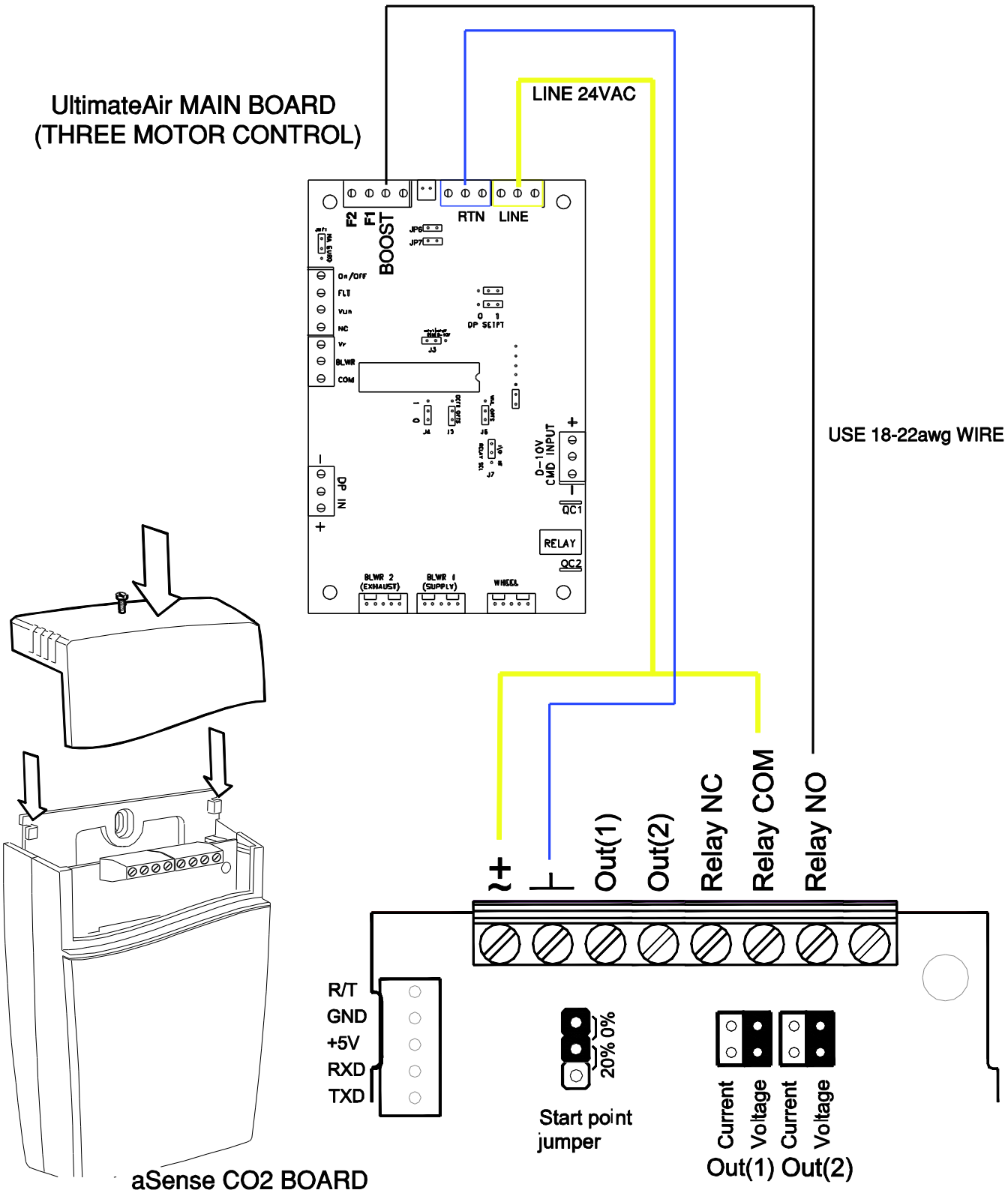
To use the Occupancy Sensing Switch it will need to be located where carbon dioxide levels may be of concern. For example, areas where people gather and a significant amount of time will be spent.

Run a 3–conductor wire (18/22GA) from the **RecoupAerator®** to the sensor

Note: For normal residential use, the CO_2 sensor is factory set at 1000ppm.



The removable base allows access to the wall screws.



Revised: Thursday August 21st 2014 by MB

Model aSENSE™

Carbon dioxide & temperature transmitter for wall mounting

PRODUCT DESCRIPTION

aSENSE™ is an all - digital low - cost transmitter for installation in the climate zone. It measures both CO_2 concentration and temperature in the ambient air. The data is transmitted to a BMS system or controller.

aSENSE™ is a key component for climate control of buildings and other processes. It is also a cost-efficient gas alarm sensor for spaces where carbon dioxide gas is a potential danger.

FEATURES

- State-of-the-art Non-Dispersive Infrared (NDIR) technology to measure CO_2
- Maintenance free in normal applications
- Cost optimized for connection to DDC:s
- Contributes to lower energy costs when it is applied in a *Demand Control Ventilation (DCV)* strategy
- Available in different carbon dioxide measurement ranges and different housings
- Internal automatic self diagnostics
- 2 analogue outputs as standard (V/mA). Relay output as option
- Cost-efficient RS485 communication as option
- Internal 2-channel logger as option

APPLICATIONS

aSENSE™ is designed to control ventilation by transmitting the measured carbon dioxide and temperature value to the system´s Master or DDC. The transmitter is flexible and suits many different ventilation strategies.

According to most building regulations, the fresh air flow should, in rooms where people stay more than occasionally, be at least 7 litres/sec and person.

If the room occupants are adults with a light work-load and the outdoor CO_2 concentration is 350 ppm, this airflow answers directly to an in-door CO_2 concentration of 1040 ppm. According to National Boards of Occupational Safety and Health, the CO_2 concentration can therefore be used as an indicator of the Indoor Air Quality (IAQ).
A CO_2 concentration below 1000 ppm should then always be the aim.

aSENSE™ carbon dioxide transmitter Technical Specification* (rev nr 040317)

General Performance

Compliance with	EMC directive 89/336/EEC, RoHS directive 2002/95/EG
Operating Temperature Range[1]	0 to +50 °C
Storage Temperature Range	- 40 to +70 °C (*standard model*) (*models -D*: -20 to + 70 °C)
Operating Humidity Range	0 to 95% RH (non-condensing)
Warm-up Time	≤ 1 min. (@ full specs ≤ 10 minutes)
Sensor Life Expectancy	> 15 years
Maintenance Interval	no maintenance required [2]
Self Diagnostics	complete function check of the sensor
Display	4 Digits, 7 segments LCD with ppm / °C / % indicator *(models –D)*

Electrical/Mechanical

Power Input	24 VAC/VDC±20%, 50-60 Hz (half-wave rectifier input)
Power Consumption	< 3 Watts average
Wiring Connections	screw terminals, max 1,5 mm² wires/ European and US standard J-boxes

Outputs

Analogue [3]

Protection	PTC fuse (auto reset) on signal return *M*, short-circuit safe
Linear outputs OUT1 & OUT2	0/2-10 VDC R_{OUT} < 100 OHM, R_{load} > 5k OHM (0/1-5 VDC optional) 0/4-20 mA R_{load} < 500 OHM
Default ranges	0 – 2000 ppm CO_2, 0 - 50°C
D/A Resolution	10 bits, 10 mV / 0.016 mA
D/A Conversion Accuracy	voltage mode: ± 2% of reading ± 50 mV current loop : ± 2% of reading ± 0.3 mA

ON/OFF

Relay (OUT3)	(accessory *-R*) isolated N.O., 1mA/5V up to 1A/50VAC/24VDC.

UART Serial com port

Protocol	SenseAir protocol *(see comprot 0700xx rev 3_04.pdf)* Modbus as option [4]
PC-interface	RS232 UART cable with sliding contact and driver (model *A232 Cable*)
PC User Interface Program	UIP4 (or higher) [5]
RS485 network com	(accessory *-485)* RS485 terminal slide-on port, network capabilities up to 30 units
LonWorks™ network com.	(accessory *-LON)* LonWorks™ add-on Option Modbus RTU

CO_2 Measurement

Operating Principle	Non-dispersive infrared (NDIR) with Automatic Baseline Correction (ABC) [6]
Response Time ($T_{1/e}$)	2 min. diffusion time
Accuracy [7]	± 1% of measurement range ± 5 % of measured value
Pressure Dependence	+ 1.58 % reading per kPa deviation from normal pressure, 100 kPa
Annual Zero Drift [7]	< ±0.3 % of measurement range
Measurement ranges	different sensor models from 0 - 3 000 ppm (standard) to 0 - 10 %vol.

Temperature Measurement

Operating Principle	Thermistor
Measurement Range	-20 to +60 °C
Accuracy [8] / Digital Resolution	± 0.5 °C / 0.1 °C (0.01 °C via UART)



aSENSE™ – D, aSENSE™



aSENSE™ IP54- D, aSENSE™k - D

Housing Options

The housings are available *with and without display (-D)* From the left:

WALL HOUSING
Dim.: 120 x 82 x 30 mm
Protection class: **IP30**

INDUSTRIAL WALL HOUSING
Dim.: 142 x 84 x 46 mm
Protection class: **IP54**

DUCT HOUSING (model –*K*)
Dim.: 142 x 84 x 46 mm
Duct probe length: 245 mm (adjustable according to duct dimension). *Protection class*: **IP65**

Note 1: Lower temperature operation range can be reached by adding a box heater assembly
Note 2: In normal IAQ applications. Some industrial applications may require an annual zero gas purge, which automatically recalibrates the CO2 sensor.
Note 3: The specifications are valid for the output load connected to ground G0 or common signal return M
Note 4: For more information, please contact SenseAir AB.
Note 5: Free download from SenseAir's web site www.senseair.com
Note 6: The ABC function is the key for maintenance free operation. It assumes normal IAQ environments or applications, where some ventilation occure (at least during some moment over a week period)
Note 7: In normal indoor environment. Accuracy is defined at continous operation (3 weeks minimum after installation)
Note 8: Valid only for units configured in voltage outputs mode

* *Can be changed without notice*

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