



BIO 2000



Duct version



Display version



Features

- Automatic drift and temperature compensation
- Precalibrated for ease of commissioning
- High accuracy, selectivity and reliability
- Internal automatic self-diagnostics with auto adjustment

Design Features

The air quality detector is a low-maintenance VOC/CO2 detector based on modern semi-conductor technology.

The detector detects the VOC/CO2 content air and emits a proportional, linear analogue 0-10Vdc/4-20ma or digital RS485/Modbus signal.

In case of restart/voltage breakdown a signal of 80% is output for 20 minutes for maximum ventilation. During this time the detector adopts the current VOC value as zero-point.

In case of improvement of the air quality an automatic correction of the zero-point is performed.

The normal CO2 values are not causing any problems in closed areas but different substances like VOC can be responsible for symptoms like eye irritations, headaches, feebleness, dizziness, as well as diseases and accordingly overexertion like the sick-building-syndrome.

Beyond measurement of CO2 concentration the BIO detector detects the air quality **similar to human sensation**.

That's why VOC/CO2 measurement is the perfect method to define air quality.

The BIO detector is suitable for nearly all application ranges

Furthermore there are a lot of integrated options for measurement and regulation of the temperature.

Ordering Code

BIO 2000	Air Quality Detector, 0-2000ppm
BIO 4000	Air Quality Detector, 0-4000ppm
BIO 2000T	Air Quality Detector, 0-2000ppm Tool
BIO 4000T	Air Quality Detector, 0-4000ppm Tool
MODADT	Protocol for Modbus RTU
MODCAL	Manual calibration for Modbus addressing
RELAY BIO81	Relay pack for 2 alarm levels 800/1000ppm
DUCT ADT	Duct Mounting Kit
MDISPLAY	Two lines, 16 characters each LCD
HEAT	Temp.contr. heating element 3C +/-2C,0,3VA
BUZZ	Internal warning summer 85dB
STAIN	Enclosure of stainless steel
SERV	Service Tool with Keypad and LCD-display
Warning devices	See special datasheet
Warning signs	See special datasheet

Technical Data

Sensor technique	Bio-Conductor
Measuring range	450-2000 and 450-4000ppm VOC
Response time t90	< 60 sec
Repeatability	± 5% of reading
Accuracy	±150ppm
Output signal	
VOC/CO2	0(2)-10Vdc, load 50kohm 0(4)-20mA, load 500ohm
Electric parameters	Rout<100ohm, Rload>5 kOhm
Relay 1	30Vac/dc, 0,5A, pot.free SPDT
Relay 2	Dito SPNO/SPNC potential free
Consumption	30mA, max 0,8VA
Serial Interface	Modbus RS485 9600 baud
Manual adresssing	Modbus RS485
Maintenance interval	12 months
Sensor life expectancy	> 10 years
Consumption	< 1 Watt average
Power supply	24 Vac/dc ±20% 50Hz
Warm-up time	20 min
Installation	Wall mounting
Cable inlet	Standard 1xM20
Connection	Screw terminals 0,25 to 1,5mm
Protection	IP65
Housing	
Material	Polycarbonate RAL 7032 light grey
Dimensions	94 x 130 x 57mm
Ambient range	
Temperature	0...+50°C
Relative humidity	5-95% RH non-condensing
Guideline	EMC Directive 2004/108/EC EN 61010-1:2010
Weight	500 g

Relay Package

The two relays are activated in dependence of the gas concentration.

If the gas concentration exceeds the adjusted alarm threshold, the corresponding relay switches on.

If the gas concentration falls below the threshold minus hysteresis, the relay switches off again.

The contact function for relay 2, NC (normally closed) or NO (normally open), can be selected via jumper NO/NC.

See fig.1 and 3.

Relay one is equipped with a change-over contact.

Via the Modbus interface the two alarm thresholds and the hysteresis are freely adjustable at the PC within the measuring range.

The procedure can be read from the user manual Modbus Software.

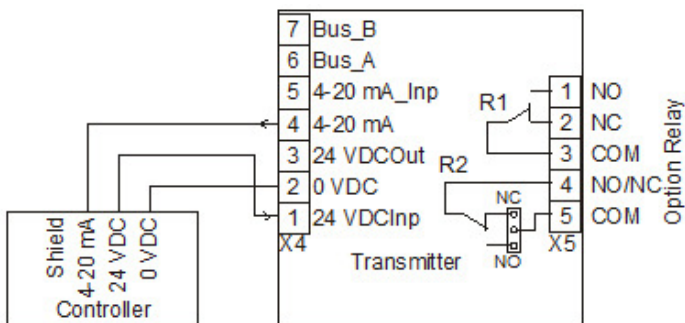
The following parameters are factory set.

Alarm threshold 1 = Relay 1: 800 ppm

Alarm threshold 2 = Relay 2: 1000ppm

Switching hysteresis: 200ppm

Connecting Diagram



Location

Mounting height

High density than air mount low
Low density than air mount high

Sensitive to a range of Contminants

- Acetone
- Acrylonitrile
- Ammonia
- Benzene
- **Carbon dioxide**
- Carbon Monoxide
- Chlorine
- Dimethyl amine
- Ethane
- Ethylene
- Ethylene oxide
- Formaldehyde
- Hydrogen
- Hydrogen sulfide
- Isobutane
- Methane
- Methanol
- Methyl chloride
- Methylene chloride
- Methy ether
- Methyl acetate
- Methyl ethyl ketone
- n-Hexane 2
- n-Petane
- Propane
- R-11
- R-12
- R-502
- R-123
- Sulfur dioxide
- Vinyl chloride

LCD display

LCD Two lines, each 16 characters
Power consumption 10mA (max 0,3VA)

Heating

Temperature controlled 3C +/-2C
Ambient temperature -40C
Power supply 18-28Vdc/ac
Power consumption 0,3A, 7,5VA

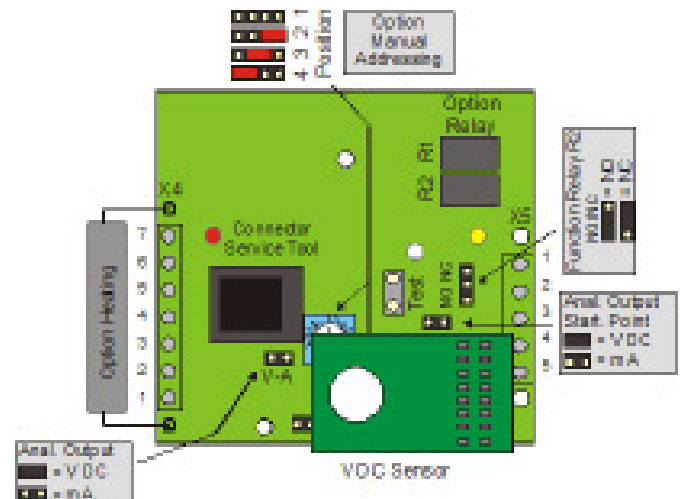
Analogue input

Only for RS-485 mode 4-20mA overload and short-circuit proof, input resistance 200ohm

Power supply for external transmitter 24Vdc max.50mA

Warning buzzer

Acoustic pressure 85db (distance 300m)
Frequency 3,5 kHz
Power consumption 30mA, (max 0,8VA)





Levels to set up for controlling the air quality by the ventilation system

[ppm]	Air Quality
2100	BAD Heavily contaminated indoor air Ventilation required
2000	
1900	
1800	
1700	
1600	
1500	
1400	
1300	
1200	
1100	
1000	FAIR
900	
800	GOOD
700	
600	EXCELLENT
500	
400	

Measurement range is 450-4000ppm to 450-2000ppm
The start of output signal will be at 4000ppm 11% and 22% 2000ppm