



Technical Data	Sensor Board
Power supply	24Vac/dc reverse-polarity protected or 230Vac
Power consumption (24 Vdc)	Max. 60 mA (1.5 VA)
Sensor horn / warning light	Max. 85 mA (2.1 VA) Max. 40 mA (1.0 VA)
Alarm relays (3)	250 Vac, 5 A, potential-free, contacts (SPDT)
Volt free output (2)	24 Vdc/ 0.1 A (switching to plus)
Digital input (2)	Potential-free
Analog input (2)	4 – 20 mA overload and short-circuit proof, input resistance 200 Ω
Analog output signal (1)	Proportional, overload and short-circuit proof, load ≤ 500 Ω 4-20 mA or 2-10V = meas. range 3.0 < 4 mA = underrange >20- 21.2 mA = overrange 2.0 mA = fault
Output for local bus	5 Vdc, 250 mA max. Overload, short-circuit and reverse-polarity protected
Temperature range	-35 °C to +40 °C (-31 to 104 °F)
Humidity range	15 - 95 % r.H not-condensing
Storage temperature	+5 °C to +30 °C (+41 °F to +86 °F)
Storage time	6 months
GCD bus	1-wire / 19200 Baud
Field bus, Modbus	RS 485 / 19200 Baud
Tool bus	2-wire / 19200 Baud
Housing	Polycarbonate
Combustion	UL 94 V2
Housing colour	RAL 7032 (light grey)
Dimension housing (W x H x D)	130 x 130 x 75 mm (5.12 x 5.12 x 2.95 in.)
Weight	ca. 0.6 kg (1.32 lb.)
Protection class	IP 65
Installation	Wall mounting
Cable entry	Standard 6 x M20/25

Features

- Internal function monitoring with integrated hardware watchdog
- Hardware and software according to SIL2 compliant development process
- Easy maintenance / calibration by replacing the sensor cartridge or via comfortable on-site calibration
- Up to three different sensor readings can be built in from different gases
- LCD display (option)
- Status LED for alarm, fault, operation and service (option)
- Warning buzzer (option)
- Reset button (option)
- UPS (option)
- Life span: 15 years

Application

This detector is used as a stand-alone unit with its relay outputs or alternatively with its analog output signal or ModBus.

It is also used as a two-wire connection and contact by Modbus anywhere in the building network.

The SCO₂ is designed for detection and warning of carbon dioxide gases in many commercial and industrial applications such as freeze and refrigeration application.

Design Features

Gas measuring, monitoring and warning detector based on state-of-the-art micro-technology for continuous monitoring of the ambient air to detect Carbon Dioxide.

The detector monitors the measured values and activates the alarm relays if the set alarm thresholds for pre-alarm and main alert are exceeded.

In addition, the values are provided for direct connection to the BMS via an RS-485 Modbus interface and also as 4-20 mA output.

The SIL 2 compliant self-monitoring function in the SCO₂ and in the connected sensor activates the fault message in case of an internal error as well as in case of a fault in the local bus communication and/or at the 4-20 mA input / output current signals.

Other options such as LCD display, three-color status LED, buzzer, digital input for acknowledgment or test function, various communication protocols ensure proper adaptation to the wide range of applications in gas detection technology.

For convenient commissioning the SCO₂ can be pre-configured and parametrised with factory-set defaults.

Ordering Codes on next page



Carbon Dioxide Stand-Alone Detector - Analog, Modbus, Relay

SCO2

Dec. 17

Wire connection:

- **Local bus (SC2)** 3-pin connector
- **Digital input, analog output** Screw-type terminal min. 0.25 mm², max. 1.3 mm²
- **Power supply, relays** Screw-type terminal min. 0.25 mm², max. 2.5 mm²

Mounting height 0.3 - 1 m above floor

Pre-programmed alarm output (Standard 0-2000 ppm)
Alarm 1 = 600 ppm
Alarm 2 = 800 ppm
Alarm 3 = 1000 ppm

Directives
EMC directives 2014/30/EU
Low voltage directive 2014/35/EU
CE
Conformity to:
EN 50271 / IEC 61508
60079-29-1
EN 61010-1:2010
ANSI/UL 61010-1
CAN/CSA-C22.2 No. 61010-1
1 year on material

Technical Data Sensor

Electrical

Power supply 5 Vdc from sensor board, reverse polarity protected

Power consumption: 50 mA, max. (1.0 VA)

Serial interface local bus 1-wire / 19200 Baud

Sensor element Infrared, NDIR

Measuring range 0 – 2000, 0 - 2 vol %, 0 - 5 vol %

Accuracy < 10% of its range

Measuring intervals 2 secs

Response time t₉₀ ≤120 sec.

Pressure range Atmospheric ± 30 % (influence + 1.6% on measured value per kPa)

Relative gas density 1.53 (Air = 1.0)

Sensor life time 15 years / normal ambient conditions

Calibration interval¹ 5 years

Storage temperature range + 5 to + 30 °C (41 to 86 °F)

Warranty 1 year on material (without sensor element)

¹ Manufacturer-recommended calibration interval for normal environmental conditions.

Ordering Codes

Supply Voltage 24Vac/dc (12Vdc on request)

SCO2 2000 0 - 2000 ppm

SCO2 002 0 - 2 vol%

SCO2 005 0 - 5 vol%

XCO2 2000 Sensor Head 0 - 2000 ppm for exchange (15 years)

XCO2 002 Sensor Head (Repl.) 0 - 2 vol% for exchange (15 years)

XCO2 005 Sensor Head (Repl.) 0 - 5 vol% for exchange (15 years)

Supply voltage 230 Vac

SCO2 2000/3 0 - 2000 ppm

SCO2 002/3 0 - 2 vol%

SCO2 005/3 0 - 55 vol%

Supply voltage 24Vac/dc (12Vdc on request)
Display and keyboard

SCO2 2000 0 - 2000 ppm

SCO2 002 0 - 2 vol%

SCO2 005 0 - 5 vol%

Supply voltage 230Vac, Display and keypad

SCO2 2000/3 0 - 2000 ppm

SCO2 002/3 0 - 2 vol%

SCO2 005/3 0 - 5 vol%

SPS 12 Power Supply 12Vdc

USV 90240 Battery Power Supply 90 - 240V/24V 0.8Ah

SPS 230 Power Supply 90 - 240Vac/15VA

SSTOP Reset button with external input, incorporated in detector

SBUZ LED Buzzer with built-in LED indication in three colours, incorporated in detector

SDUCT Duct Kit

DR 24/30 Power supply 24Vdc

SSTAIN Option, stainless housing

SP 600 Impact protection



LCD display	Options
LCD	Two lines, 16 characters each, background highlighted in two colours
Operation	Menu driven via six push-buttons
Power consumption	5V, 60 mA, 0.3 VA
Status LED	
Colour / mode	Red / yellow / green (alarm – fault – operation - service)
Protection class	IP 65
Warning buzzer	
Acoustic pressure	> 90 dB (A)
Frequency	2300 Hz
Protection class	IP 65
Power supply 230Vac	
Wide range input	90 -240Vac - 50/60 Hz
Output rating type 5	5 VA
Output rating type 7	15 VA
UPS	
Power unit with wide range input	90 -240Vac - 50/60 Hz
Output rating	15 VA
Rechargeable battery	12V, 0.8 Ah
Operating time	> 60 min
Power supply 12Vdc	12Vdc reverse-polarity protected
Power consumption (12 Vdc)	Max. 120 mA (1.5 VA)
- sensor	Max. 170 mA (2.1 VA)
- horn / warning light	Max. 80 mA (1.0 VA)

Ordering Codes

Alarm Units

AAW 24	Warning Horn 24Vdc 98dB
AAW 230	Warning Horn 230Vac 98dB
OA 24	Flashlight 24Vdc, red
OAW 24	Combined Warning Horn/Flashlight, 24Vdc 98dB
OAW 230	Combined Warning Horn/Flashlight, 230Vac 98dB
OAW 24T	Combined Warning Horn/Flashlight with reset button, 24Vdc 98dB

Warning Plate

Gas Alarm	Flashing gas alarm plate "GASALARM" 24Vac/dc
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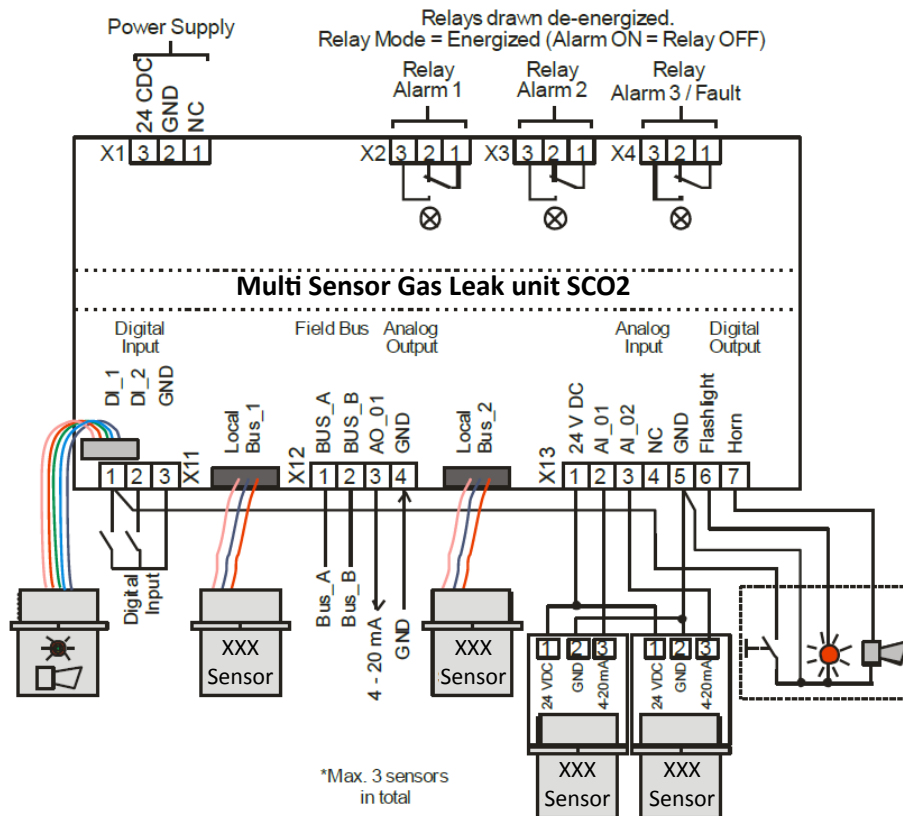
SHORT DESCRIPTION OF THE FUNCTION: DIGITAL OUTPUTS WITH THREE RELAYS

Action	Reaction Relay 1 (Alarm1)	Reaction Relay 2 (Alarm2)	Reaction Warning light (Alarm 2)	Reaction Horn (Alarm 2)	Reaction Relay 3 (Alarm2 + fault)	Reaction LED
Gas signal < alarm threshold 1	OFF	OFF	OFF	OFF	ON	GREEN
Gas signal > alarm threshold 1	ON	OFF	OFF	OFF	OFF	RED
Gas signal > alarm threshold 2	ON	ON	ON	ON	ON	RED
Gas signal < alarm threshold 2, but button Horn OFF activated	OFF		ON	OFF after delay ON		RED
Gas signal < (alarm threshold 2 - hysteresis) but >= alarm threshold 1	ON	OFF	OFF	OFF	OFF	RED
No alarm, no fault	OFF	OFF	OFF	OFF	ON	GREEN
No fault, but maintenance due	OFF	OFF	OFF	OFF	ON	GREEN flashing
Internal error	OFF	OFF	ON	OFF	OFF	YELLOW

Note 1: Status OFF = Relay is configured "Alarm ON = Relay" or the SCO is free from voltage.

Note 2: Alarm thresholds can have the same value, therefore the relays and/or the horn and flashlight can be triggered together.

Electrical Connection



The SCO₂ device combines gas measurement, warning and controller for continuous monitoring of ambient air to detect toxic and combustible gases, refrigerants or oxygen.

The SCO₂ can also be equipped with two digital sensor heads, offers an additional input for an analog sensor and is equipped with three alarm relays (230Vac/5A) and a warning module (power LED and buzzer).

The optional gas selector allows fast configuration or adjustment of the two connected sensor heads (without additional tools) - incorrectly connected or interchanged sensor heads are immediately recognized as errors.

This feature also enables the cost-effective stocking of the devices, since the configuration for a certain number of sensor types and measuring ranges can be carried out just before delivery.

Other features:

- Internal functional monitoring
- SIL2 compliance according to IEC 61508
- Compliance to EN 378-1 and many others
- Reverse polarity protected, overload and short circuit proof
- Two transistor outputs
- Serial RS 485 interface for optional Modbus protocol

We cannot be held responsible for errors in the manual/datasheet and reserve the right to correct any errors and to make product improvements, which may affect the accuracy of the manual/datasheet, without prior notice.