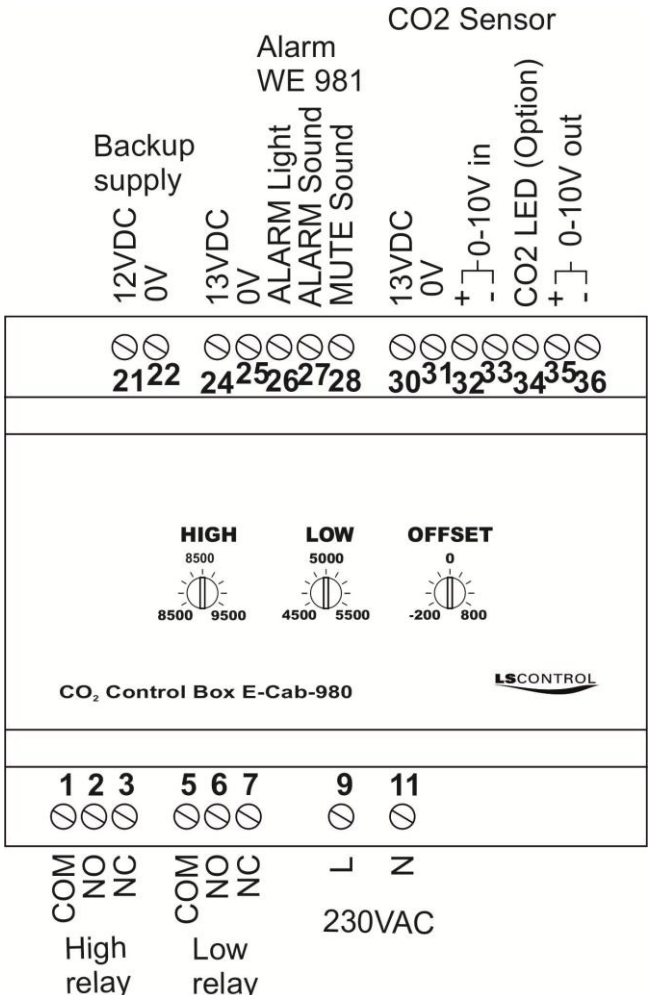
CO2 Control Box E-Cab-980

The CO2 Control Box E-Cab-980 is intended for detection and warning in case of leaks in CO2 refrigeration plants in refrigeration and freezer rooms. CO2 Control Box E-Cab-980 is intended for use together with *Alarm WE 981* and *CO2 sensor high range*.



Mounting

The Control Box E-Cab-980 is designed for mounting in switch board or DIN rail cabinet (35 mm DIN rail). The Box E-Cab-980 must not be mounted on a moving or vibrating surface.

Electrical connections

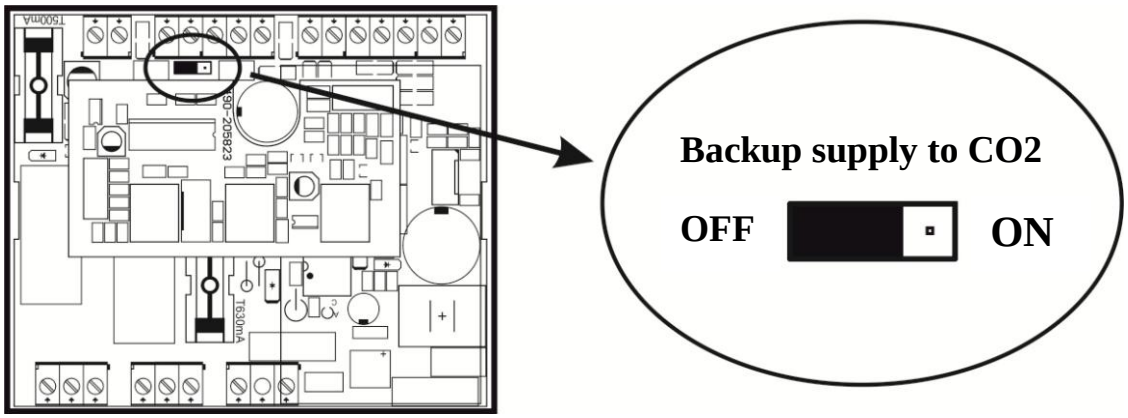
Terminal connections for CO2 Control Box E-Cab-980

Terminal number	**Description**	**Comments**
1	HIGH voltage free relay switch. The relay is activated when the set HIGH alarm limit is exceeded.	COM (common)
2		NO (normally open)
3		NC (normal closed)
5	LOW voltage free relay switch. The relay is activated when the set LOW alarm limit is exceeded.	COM (common)
6		NO (normally open)
7		NC (normal closed)
9	Supply power 230VAC+PE	Live cable (L)
11		Neutral cable (N)
21	Backup forsyning	+12Volt (11-14VDC)
22		0V (GND)
24	For connection of ***Alarm WE 981***. Max connection of 2 units of Alarm WE 981.	+13VDC
25		0V (GND)
26		Alarm Light output (active low)
27		Alarm Sound output (active low)
28		Mute Sound input (active low)
30	For connection of ***CO2 sensor high range***	+13VDC
31		0V (GND)
32		0-10Volt (positive terminal)
33		0-10Volt (negative terminal)
34		CO2 LED (Option)
35	0-10volt output. 0ppm = 0V and 10000ppm=10V	0-10Volt (positive terminal)
36		0V (GND)

Functional description

BACKUP supply:

Jumper settings



When the jumper is in position **ON** the backup supply will supply the CO2 sensor. To ensure that the CO2 operated correctly, the backup supply most not fall below 13 volt. Note that the CO2 sensor is equipped with a heating element which uses up to 300mA and therefore quickly could exhaust a battery.
When the jumper is in position **OFF**, the backup supply will supply the Control box and Alarm WE 981, if connected. In this situation the current the consumption will be much lower, and therefore very suitable for battery back-up.
The Backup supply is connected to terminals 21 (+) and 22 (-). The supply voltage from 11 to 14volt DC can be used – though minimum 13volt if the CO2 sensor is to be supplied. The backup supply should be able to supply a minimum of 500mA.

LOW alarm:
The LOW is adjustable from 4500ppm to 5500ppm. The LOW alarm draws the LOW relay when the CO2 concentration exceeds the set value. The LOW alarm will deactivate when the CO2 concentration falls 500ppm under the set value.

HIGH alarm:
The HIGH alarm is adjustable from 8500ppm to 9500ppm. The HIGH alarm draws the HIGH relay when the CO2 concentration exceeds the set value. The HIGH alarm is deactivated when the CO2 concentration falls 500ppm under the set value.
The HIGH alarm also activates the visual and audible alarm if the *Alarm WE981* is connected. It is possible to mute the sound alarm by connecting terminal 28 to 0 volt.
If a CO2 sensor is not connected, the HIGH relay will still be activated indicating system error.

OFFSET:
The CO2 sensor is self calibrating in that it automatically calibrate itself in accordance with the lowest measured CO2 concentration = 400ppm. 400ppm is what is normally measured in atmospheric air. If the CO2 sensor is situated in an artificially high CO2 environment, it is possible

to compensate for this by using the OFFSET trimmer. If the CO2 concentration in the atmosphere where the CO2 sensor is situated is e.g. 700ppm, it is possible to adjust the OFFSET trimmer to 300 (300+400 = 700).
The OFFSET trimmer can also be used for calibration of the CO2 sensor. If the CO2 sensor e.g. is supplied with a calibration gas with a CO2 concentration of 1000ppm, it is possible to adjust the offset trimmer until 1000mV is measured on the 0-10volt output.
Under normal circumstances, the offset should be adjusted to zero.

ANALOGUE 0-10Volt output:
The 0-10 volt output will emit a signal which is proportional with the OFFSET compensated measure CO2 concentration. At 0ppm CO2, the output will be 0 volt, at 10000ppm, the output will be 10 volt.

Functional overview

Normal function (operation at 230VAC)

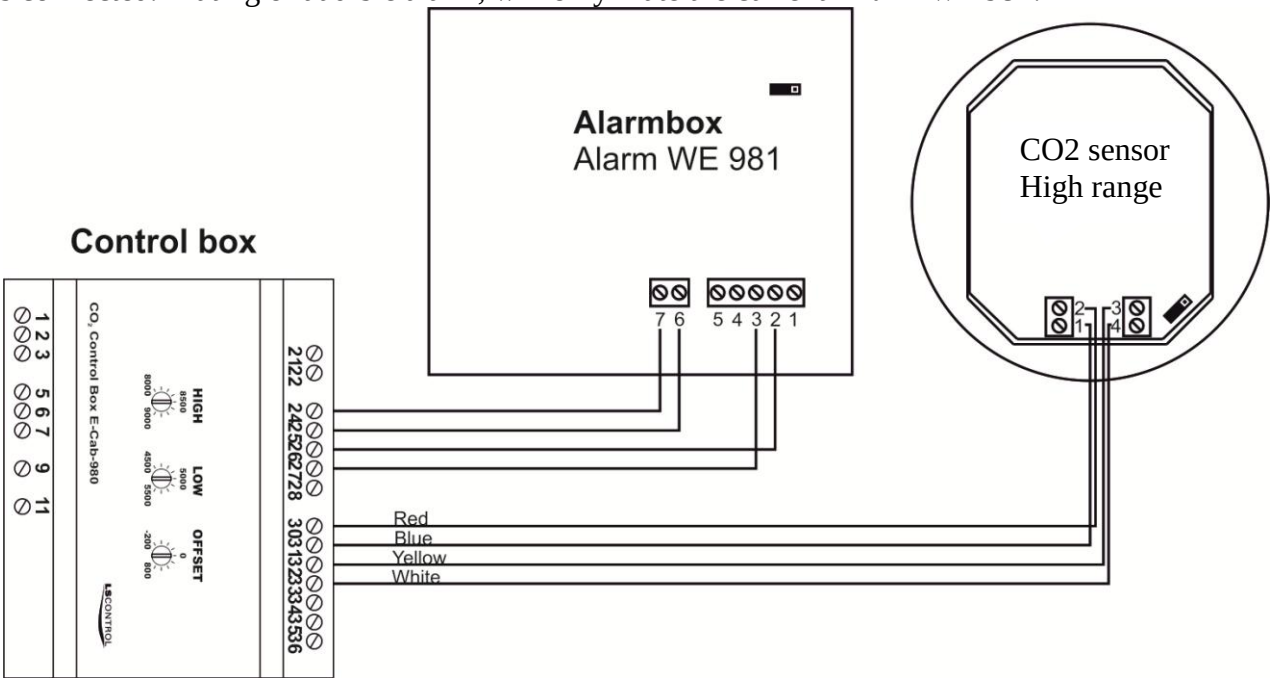
	CO2<LOW	LOW<CO2<HIGH	CO2>HIGH
HIGH relay Terminals 1,2,3	Not active Relay not activated	Not active Relay not activated	Active Relay activated
LOW relay Terminals 5,6,7	Not active Relay not activated	Active Relay activated	Active Relay activated
Visual alarm Terminal 26	Not active	Not active	Active Activated at 0V
Audible alarm Terminal 27	Not active	Not active	Active Activated at 0V

Error functions (CO2 sensor not connected or running on backup supply)

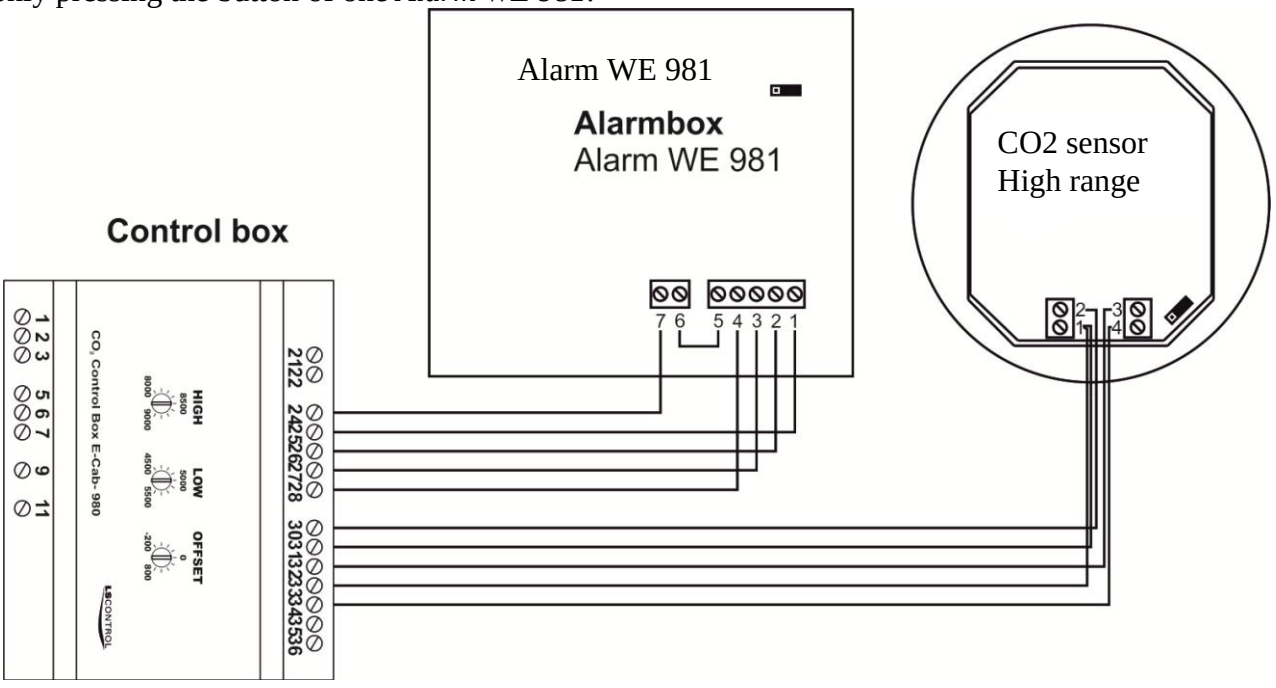
	CO2 sensor not connected	Running on backup supply Jumper in **OFF** position	Running on backup supply Jumper in **ON** position
HIGH relay Klemme 1,2,3	Active Relay activated	Not active Relay not activated	Function as during normal operation
LOW relay Terminals 5,6,7	Not active Relay not activated	Not active Relay not activated	Function as during normal operation
Visual alarm Terminal 26	Pulse. Low 1 second pulse every 4th second	Pulse. Low 1 second pulse every 4th second	Function as during normal operation + Pulse every 8 second
Audible alarm Terminal 27	Not active	Not active	Function as during normal operation

Connection examples

Example 1:
Recommended standard connection diagramt. The CO2 sensor light will be active as soon as power is connected. Muting of audible alarm, will only mute the current *Alarm WE 981*.



Example 2:
The CO2 sensor LED is controlled by the control box and if flashes during the initial 20 minute (start up time). The audible alarm is disabled via the *Contlol Box E-Cab-980*. This function is used if more alarm boxes are connected to the same controller, and all audible alarms are to be muted by only pressing the button of one *Alarm WE 981*.



Technical data

Power supply	:	230VAC ±10% 50Hz
Power consumption	:	Max 10W
Enclosure	:	IP 20
Dimensions (hxwxd)	:	86x105x58 mm
Weight	:	225g
Operating temperature	:	-10 til 40 °C
Relay output (voltage free)	:	Max 230VAC 13A or max 24VDC 13A

Digitale outputs (terminals 26, 27, 34)

- Open collector output
- Active low
- Overcurrent protection
- 30mA max load in low position

Digital input (terminal 28)

- Passive pull-up to 5VDC via 22kohm resistor
- Active low

Analogue inputs (terminals 23, 33)

- Indput impedance 21kohm to 0V (GND)
- Accuracy 2,5%

Analogue output (terminal 35)

- Max load 10mA
- Overcurrent protection
- Max cable length 3 meter
- Accuracy 2,5%

Applied standards

DS/EN 60730-1:2012	Automatic electrical controls for household and similar use
EN 61000-6-3/A1/AC:2012 EN 61000-6-3/A1:2011 EN 61000-6-3:2007	Electromagnetic compatibility (EMC) - Emission standard for residential, commercial and light-industrial environments.
EN 61000-6-1:2007	Electromagnetic compatibility (EMC) - Immunity for residential, commercial and light-industrial environments.

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Manufactured by: LS Control A/S