CO2 GAS ALARM GX-D500P

Prof. CO2 warning device for Carbon dioxide from technical systems

item no. 300263

Thank you for your Trust!

In order to always guarantee optimal function and readiness for performance for the product and to ensure your personal safety, we have one request of you: Read these instructions for use thoroughly before assembly and first use and, above all, follow the safety instructions!

The user manual is part of this product. Keep these for future reference!

important note:
This is a translation from the German original, we are not liable for errors in the automatic translation.

1. Scope of Delivery

· 1 GX-D500P CO2 warning device
· 2 meter hose (item no. 21002)
· 1 dust filter (item no. 300259)
· 2 large and one small PG gland
· Mounting material (4 screws + dowels, 2 cable ties, 2 screwdrivers)
· 1 USB calibration adapter cable (optionally available, item no. 200340)

2. Safety Instructions

2.1 General
Before assembling or starting up the device, read the instructions for use carefully.
Installation must be carried out by a qualified specialist.
Packaging material is not a child's toy. Keep this away from children.

2.2 Environmental conditions
The standards used to evaluate the product specify limit values for use in residential, business and commercial areas as well as in small businesses, which means that the use of the product is intended for this operating environment:
· Residential buildings/areas such as houses, apartments, rooms, etc. Retail areas such as shops, wholesale markets, etc.
· Rooms of small businesses such as workshops, service centers etc. as well as all dry indoor areas

- Rooms in commercial establishments with household-like use such as kitchens, pantries, bars ...
- All locations are characterized by being connected to the public low-voltage network.

3. Intended Use

The GAS ALARM GX-D500P is a carbon dioxide alarm device for residential and similar use with an integrated NDIR sensor. An LCD display provides constant information about the operating status and the rounded percentage of the CO_2 concentration measured in the monitored room, which is either thermally demanding or heavily loaded with dust. To do this, the warning device is connected via a hose to the room to be monitored (e.g. a cold store) in which the warning device itself cannot be operated.

The alarm is acoustically and optically, at the same time a potential-free relay is switched, e.g. to activate forced ventilation or to block a gas line with a magnetic shut-off valve so that no further CO_2 can escape in the event of a defect in the system. Another relay switches in the event of technical faults that the warning device detects itself. The CO_2 sensor evaluation, measuring cell and software were developed entirely in Germany by Elektrotechnik Schabus. The evaluation and software were subjected to a complex full test by TÜV Süd as part of the development of a CO warning device, and the software was certified for safety and stability. The device for permanent installation must not be used in potentially explosive areas.

The device is not approved for any other use than that described above.

4. Assembly Instructions

⚠️ The GAS ALARM GX-D500P may only be installed on a wall in dry indoor areas. The „middle height" mounting position is chosen so that the display is easy to read when standing.
This also ensures that the warning device functions correctly.

4.1 wall mounting GX-D500P
For wall mounting, the four housing screws must be loosened. Then the front panel is removed and, if necessary, the ribbon cable is pulled off the connector. The bottom shell of the housing can now be mounted on a wall (mounting material is included). Wall mounting is important for the reliable functioning of the hose suction.

⚠️ Important! The connection cables that lead to the CO_2 detector must be permanently installed as surface-mounted cables.
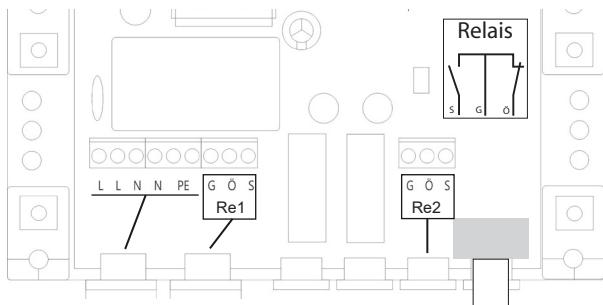
4.2 Pin assignment relay
When connecting accessories to the potential-free relay, it must be noted that the switching current of 5 amperes must never be exceeded.

The limits are for
· Alarm relay Re1 (left):   250 volts AC / 5 A (3 A) / 1250 VA (750 W)
· Fault relay Re2 (right): 60 volts DC / 5 A / 300 W

· Relay status in monitoring mode:
· The relay is "picked up" (NO contact closed/NC contact open)
· Relay status in alarm or fault mode:
· The relay "drops out" (NO contact open/NC contact closed)

4.3 terminals

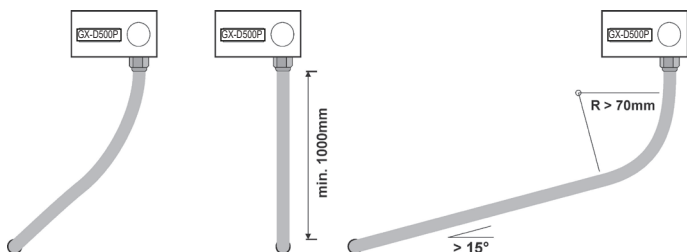

L, N and PE - clamps are connected 2 each to facilitate bridges to the relay, relay contacts: G = common contact, Ö = NC / opener, S = NO / closer

4.4 Laying the hose to thermally demanding rooms

First of all and valid for all applications:

- · The warning device must always be positioned over the hose inlet
- · Clever laying will definitely rule out the formation of sacks
- · The hose length between the CO2 warning device and the wall outlet is at least 1000mm
- · Vertical laying is optimal, horizontal laying is not possible
- · In the case of a lateral offset, the minimum incline is 15°, better 20°, see graphic
- · The maximum hose length is 4 meters, the laying radius at least 70 mm
- · Of course, the hose must not be kinked or squeezed
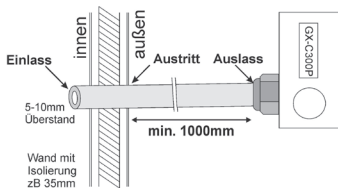- · the hose is regularly checked for damage and dirt

Depending on the position of the hole for the hose and the place where the warning device is attached, the hose can be shortened accordingly.

The minimum hose length of 1000mm between outlet (hole) and outlet (GX-D500P) must be observed in hot/cold rooms.

For shortening, the thickness of the wall and an overhang of the hose of 5 to 10 mm are added, in the drawing on the right it is e.g. at least 1040 mm.

(In rooms to be monitored with dust exposure, significantly more hose is required „inside" to connect the dust filter with the minimum laying radius.)

Vertical hose routing is ideal, with a lateral offset, a minimum incline of 15° - 20° must be observed. Sac formation must be avoided at all costs! The warning device cannot detect accumulations of condensed water and other deposits that impair the diffusion of the medium to be monitored into the device and may lead to a delayed alarm response, in the worst case to failure of the monitoring. The user regularly checks the

cleanliness of the hose and, if necessary, carries out cleaning measures or exchanges the hose for an equivalent one. We only recommend thick-walled types made of silicone, e.g. Schabus item no. 21002. If other types or hoses with a total length of more than 4 meters are used, the response time can be significantly delayed. Hose inlet close to the ground is optimal with CO_2.
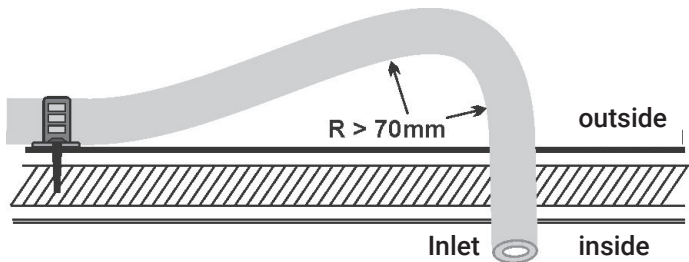
4.5 Hose routing and attachment

If the GX-D500P is mounted vertically above the exit hole, there is no need to attach or route the hose, unless it is a public space.
If there is likely to be public traffic, we recommend covering it with a commercially available cable duct.
When mounting with a lateral offset, the use of empty pipes or hose clamps made of plastic is recommended.

The specialist who carries out the installation is responsible for finding the appropriate attachment for the respective environment and thus contributes to the intended function of the warning device within the framework of the specifications.

Since the hose must not be squeezed or kinked, the formation of loops cannot be avoided when adhering to the smallest laying radius of 70 mm.

R > 70mm

outside

Inlet

inside

4.6 Using the dust filter

In dry interior rooms to be monitored with high levels of dust, e.g. wood workshop, dry ice blasting, please attach the enclosed dust filter (item no. 300259) to the hose inlet and fix it with a cable tie.

The dust filter can be easily attached to the wall using a screw and dowel in the screw hole of the filter. Please pay attention to the smallest laying radius of 70 mm, however, if the warning device and dust filter are in the same room, the hose may also be significantly shorter than would be necessary in thermally demanding rooms. Minimum lengths do not have to be adhered to in rooms with a normal temperature (10°C ... 40°C), see also functional area in the technical data, page 22.

The dust filter must not be used in thermally demanding, i.e. particularly warm or cold, environments. The combination of extraction from a room and the use of the dust filter requires at least similarly tempered rooms in which people (can) stay permanently.

Like the GX-D500P itself, the dust filter is only permanently suitable for temperatures from +10°C to +50°C.

⚠️ Blow regularly to remove dust from the dust filter and avoid moisture/moisture on the filter.
The filter should be replaced after a year of operation.

5. COMMISSIONING / FUNCTIONAL TEST / ALARM (Re1)

An electrical function test is carried out for a few seconds when the mains voltage is applied, after which the warning system is in operation immediately, monitors the room and, apart from the regular calibrations, can remain in continuous operation for years. If the green LED lights up alone, the warning system is ok and ready for use.

Please note: Even if the power failure is brief, the functional test will be restarted.

⚠ For your safety, we recommend that you regularly check that the acoustic alarm device is working properly using the test button! All three LEDs light up and the two relays Re1 and Re2 drop out.

5.1 Alarm
The alarm when the alarm threshold is reached is given with a loud penetrating tone from a piezo sounder, the display lighting and the red LED flashing, and the alarm relay Re1 dropping out.
You acknowledge the acoustic alarm with the test/reset button. If the ventilation measures initiated immediately have not reduced the CO_2 concentration value significantly, at least below 30,000 ppm / 3.0%, the alarm cannot be switched off.

5.2 Alarm thresholds and delay times
The technical guidelines for beverage dispensing systems stipulate that a so-called pre-alarm is triggered from 1.5% CO_2 in the ambient air. This is shown as such on the display and the alarm device whistles twice, each with a 5-second pause. The alarm relay Re1 does not switch here yet.

At 3% CO_2, the main alarm sounds, the alarm device beeps for a long time with short pauses, the alarm relay Re1 switches (drops out), the red LED and the display lighting flash and the display shows „Alarm!". The TEST/RESET button only mutes the acoustic alarm tone, the alarm mode remains.

Alarm delay times are not specified by the software, a natural delay results from the length of the hose and the response time of the NDIR sensor. To ensure a reaction within 3-4 minutes, the hose should not be longer than 4 meters, shorter is always better.

► If the CO_2 concentration falls below the alarm threshold, the device resets itself.

5.3 Behavior in the event of an alarm

Ventilate the room and ensure that no further carbon dioxide can escape by switching off/blocking the CO2 source. Inform other people and ask them to leave the room.

5.3.1 Keep calm and open all doors and windows, finish all use of incinerators. Provide fresh air!

5.3.2 If the alarm persists or occurs again, leave the building and leave all windows and doors open. Make sure everyone is warned in the house.

5.3.3 Get medical help for anyone showing symptoms of carbon dioxide poisoning and point out that inhalation of carbon dioxide is suspected.

5.3.4 If necessary, dial the emergency number so that the source of the CO2 emissions can be identified and eliminated if you are not aware of it.

5.3.5 Do not put the CO2 system back into operation until you qualified person and released for use again.

6. Self-Tests and Technical Faults (Re2)

A built-in intelligence (32-bit μController) constantly monitors the system at approx 300 points in hardware and software, several temperatures, voltages and currents are measured and compensated, some of the results for internal long-term tests are saved, offset against each other and some of them are shown on the display.

In addition, the system carries out regular tests on the sensor element. If the program finds the test result to be "good", you won't notice anything from all the self-tests. However, if the result is rated „not good", the system restarts up to three times, repeats the measurements and then decides whether an error message is issued.

6.1 Notification of a technical fault

Disturbances can have many causes and different effects. In any case, **the fault relay Re2** drops out so that the building management system / building automation learns about it and any connected gas boiler is switched off to be on the safe side. In addition, the **yellow LED** flashes or lights up. An audible alarm of a short beep sounds every 10 to 30 seconds.

Keep pressing the service button until the display gives information about the type of fault found, see also point 8, display page (05). The term „error" and a number appear. Please give this number to the technical support of Elektrotechnik Schabus, who will find a solution together with you. **(+49 (0) 8036 674 97 90)**

6.2 Interpretation of technical faults using the yellow LED

There are only a few faults that affect the measurement of the CO_2 concentration and prevent the alarm from being raised in the event of danger, but there are some faults that do not affect the warning system and perhaps only indicate adverse environmental conditions and the associated accelerated aging or, for example, mains voltage fluctuations. Flashing rhythms of the yellow LED come directly from the µController. If this itself has a fault, the yellow LED will only light up continuously. A controller problem can only be fixed here at the plant in Stephanskirchen. Contact us.

6.3 Eliminate simple technical faults

Press the test/reset button so that the fault relay Re2 picks up again. Even if the error persists, relay Re1 remains energized. Relay 2 drops out again only if there is another fault of the same or a different kind. Most faults will correct themselves or if the warning device is unplugged, allowed to cool for a period (about 15 minutes) and then restarted, in fresh air if possible. If there is no improvement, please contact our technical support, see 6.1 „error".

7. MAINTENANCE: Re-calibration by zero point adjustment

7.1 In principle, the CO2 warning device GX-D500P requires little maintenance. Dust it from time to time, using only dry cloths. Please do not blow or suck on the hose.

7.2 Reset the zero point regularly or when necessary. Every sensor is subject to a natural drift, the zero point (410 ppm) shifts upwards, the sensors become more sensitive, and the alarm goes off more often and earlier (intrinsically safe).
The spread of the specified alarm thresholds is retained.
In this context, „regularly" means about every six months to a year and in the case of increased demands or if necessary up to once a month. This also depends on the other environmental conditions. The less often the sensor is exposed to fresh or low-pollution air, e.g. below 800 ppm CO2, the more frequently a zero point adjustment will be necessary.

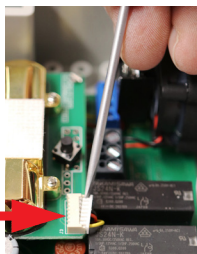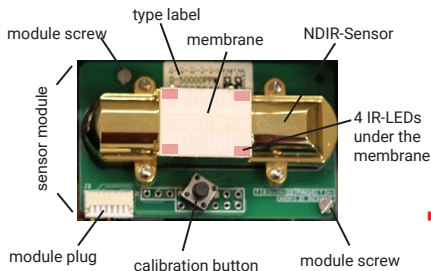### 7.3 Step-by-step instructions for zero point adjustment

⚠️ This operation may only be carried out by an authorized and be carried out by qualified personnel.
Observe the recognized safety rules and de-energize / turn off the GX-D500P if possible.
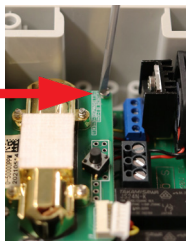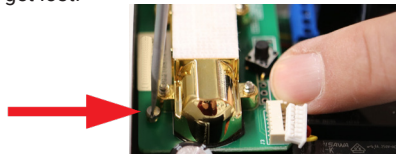
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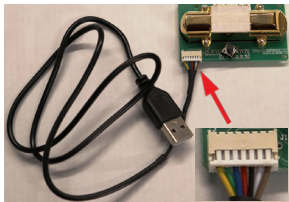
module screw
type label
membrane
NDIR-Sensor
sensor module
4 IR-LEDs under the membrane
module plug
calibration button
module screw

7.3.2 Gently pry with a small screwdriver unplug the connector from the sensor module. Switch at it a few times the sides around the connector to get out as straight as possible. Never pull on the lines!

7.3.3 Unscrew the two screws from the sensor module located in opposite corners. Attention: The screws are very small (M2) and can easily get lost.

7.3.4 The sensor module is now from the main unit disconnected and you can take it out. Now take the USB calibration adapter cable and connect it to the sensor module.

7.3.5 Now connect the USB plug to a 5 volt USB power source, e.g AC adapter, a laptop, a power bank, etc. and turn it on or connect it to the Power grid near a window or equaloutside in the fresh air, e.g. on the terrace.
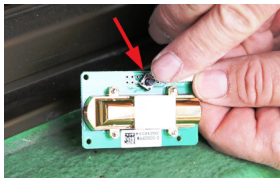

7.3.6 Obscure the membrane with your hand and see whether the IR LEDs under the membrane first glow very faintly red and then flash after up to a minute. This ensures that the power supply is available and the process has started correctly.

7.3.7 Bring the sensor to real ones now fresh air outside and leave him alone there for at least 30 minutes, ideally on one shady place, at least not in the blazing sun.
Walk away from the sensor around through your exhaled air not to falsify the values. Provide an insulating base where the sensor may lie, take on an aluminum window sill a piece of paper.

7.3.8 After the sensor has been fresh for > 30 minutes air, press and hold for at least 7 seconds the calibration button. A clock which shows the seconds can be very helpful here. The zero point calibration is now complete.

7.3.9 Now reinstall the sensor module to the GX-D500P by doing the reverse. Unplug the USB cable, unscrew its module with the two M2 screws on its place and connect it back to the bottom part of the warning device. Take the cover, plug the ribbon cable firmly into its socket and screw the cover to the base. The operating voltage can now be switched on again. Document the calibration with date and time.

8. Display Information

When starting up, i.e. applying mains voltage, the display welcomes you with our name and the device type. After this time, the self-tests and the initialization of the software and sensor start. The display shows for about 3 minutes:

(00)   Wait...   Sensor Preparing
After that, the main screen will appear.
(01)   CO2 : 0,07%*   (correspond 700 ppm*)

Each time you press the SERVICE button, you get to the next display until the main display appears again. If you stay on a display, the device automatically switches back to the main display after a few minutes, or if you press and hold the SERVICE button for a little longer.

page	1st line	2nd line*	
(02)	Product Type	GX-D500	
(03)	Software Version	Dx.xx see display	
(04)	On Time	0h 345sec	
(05)	Last Error	3	
(06)	CO2 Sensor	720 ppm	
(07)	CO2 at alarm	35300 ppm	
(08)	Alarm Counter	1	
(09)	Error Counter	6	
(10)	Starts Counter	13	
(11)	System Temp	17°C	
(12)	Chip Temp	36 °C	
(13)	Last Error at	0 h	
(14)	Max. Chip Temp	43 °C	
(15)	Sensor Range	50.000 ppm	
(01)	CO2 : 0,07%*		
oder			
(01)	CO2 : 1,54%*	pre alarm	display pre alarm (>1,5%)
oder			
(01)	CO2 : 3,24%*	Alarm!	display alarm (>3,0%)

*) Specifications are exemplary, if the second line is empty, you are back in the main display.

9. Tecnical data

Operating voltage:	100 - 240 V AC / 50-60 Hz
Power consumption:	max. 8 VA, depending on the operating status
Installation:	only upright, surface-mounted, permanent installation
Sensor technology:	internal infrared / NDIR sensor up to 50,000 ppm
Sensor resolution / accuracy:	± 100 ppm / ± 10% (of the displayed value)
Relay contact alarm Re1:	250 V~ AC / 5 A (floating changeover contact)
Relay contact fault Re2:	60 V= DC / 5 A (potential-free changeover contact)
Sound pressure control unit:	85 dB(A) (100 cm distance)
Software version control unit:	Dx.xx see display
Functional area for a short time:	-15°C ... +50°C / 10 ... 90% rH, non-condensing
Functional range continuous operation:	+10°C ... +50°C / 10 ... 90% rH, non-condensing
Sensor functional range:	0°C ... 50°C / 10 ... 90% rH, non-condensing
Functional range of monitored room:	-30°C ... +70°C* / 10 ... 90% rH, non-condensing
Functional range of monitored room:	-70°C ... +120°C** / 10 ... 90% rH, non-condensing
Service life of the sensor approx.:	> 8 years, after 5 years Factory testing at ES
Degree of protection:	IP20 standard / up to IP54 possible on request
Dimensions control unit:	80x160x55 mm (HxWxD)

*) extreme temperature range when the control unit is operated between +10°C and +50°C, with a hose of at least 1000 mm on the outside
**) extreme temperature range when the control unit is operated between +18°C and +25°C, with a hose of at least 2000 mm on the outside

10. General

Elektrotechnik Schabus GmbH & Co. KG is not liable for damage and/or loss of any kind, such as individual or consequential damage, resulting from the gas detector not giving an alarm signal despite an increased gas concentration.
In order to always be able to guarantee perfect functionality, you should have the sensor checked after 5 years at the latest and replaced after 8 years for your own safety. See sensor lifetime in the technical data.
10.1 cleaning and care
Avoid the influence of moisture (splash or rainwater), dust and direct sunlight on the device. Only clean the device with a dry linen cloth, which can be slightly moistened if it is very dirty. Do not use any solvent-based cleaning agents for cleaning.

10.2 Declaration of Conformity

The conformity of this device to the EU directives is confirmed by the CE mark on the device. The declaration of conformity can be downloaded from our online shop on the product page or requested from info@elektrotechnik-schabus.de.

10.3 warranty

We grant a statutory warranty on your electronic product from Elektrotechnik Schabus for material defects and quality defects from the date of purchase. Elektrotechnik Schabus will repair or replace your device free of charge under the following conditions:
If there is a statutory warranty, the device must be sent in with the following documents: description of the fault, proof of purchase and your address and delivery address (name, telephone number, street, house number, zip code, city, country).
Devices that are returned to Elektrotechnik Schabus must be adequately packaged. Elektrotechnik Schabus assumes no liability whatsoever for damage or loss during shipping.
The device must have been used in accordance with the instructions for use. Elektrotechnik Schabus accepts no liability for damage caused by accident, misuse, alteration or neglect.
Elektrotechnik Schabus assumes no liability for loss, damage or expenses of any kind resulting from the use of the devices or accessories. The warranty does not affect your statutory rights as a consumer.

10.4 return

If your device is defective or has a fault, please contact us:

Email   info@elektrotechnik-schabus.de

Please provide your complete address and the reason for the return. We will arrange for the package to be picked up for you free of charge (only within Germany). Under no circumstances should you send us a freight collect package, we will not accept it! Unauthorized returns that do not constitute a complaint will be charged to you afterwards.

10.5 environmental information

The production of the product you have purchased required the extraction and use of natural raw materials. It may contain substances that are hazardous to health and the environment. To avoid spreading these substances in your area and to save natural resources, we ask you to use the appropriate return systems. Thanks to these systems, the materials of your product can be reused in an environmentally friendly manner at the end of its lifespan.

(WEEE-NR.: 91394868)

The crossed-out trash can icon on the
Product reminds you to use these systems.
If you need more information about collection, reuse and recycling schemes, contact your city's waste advisory service. You can also contact us for more information about the environmental performance of our products.