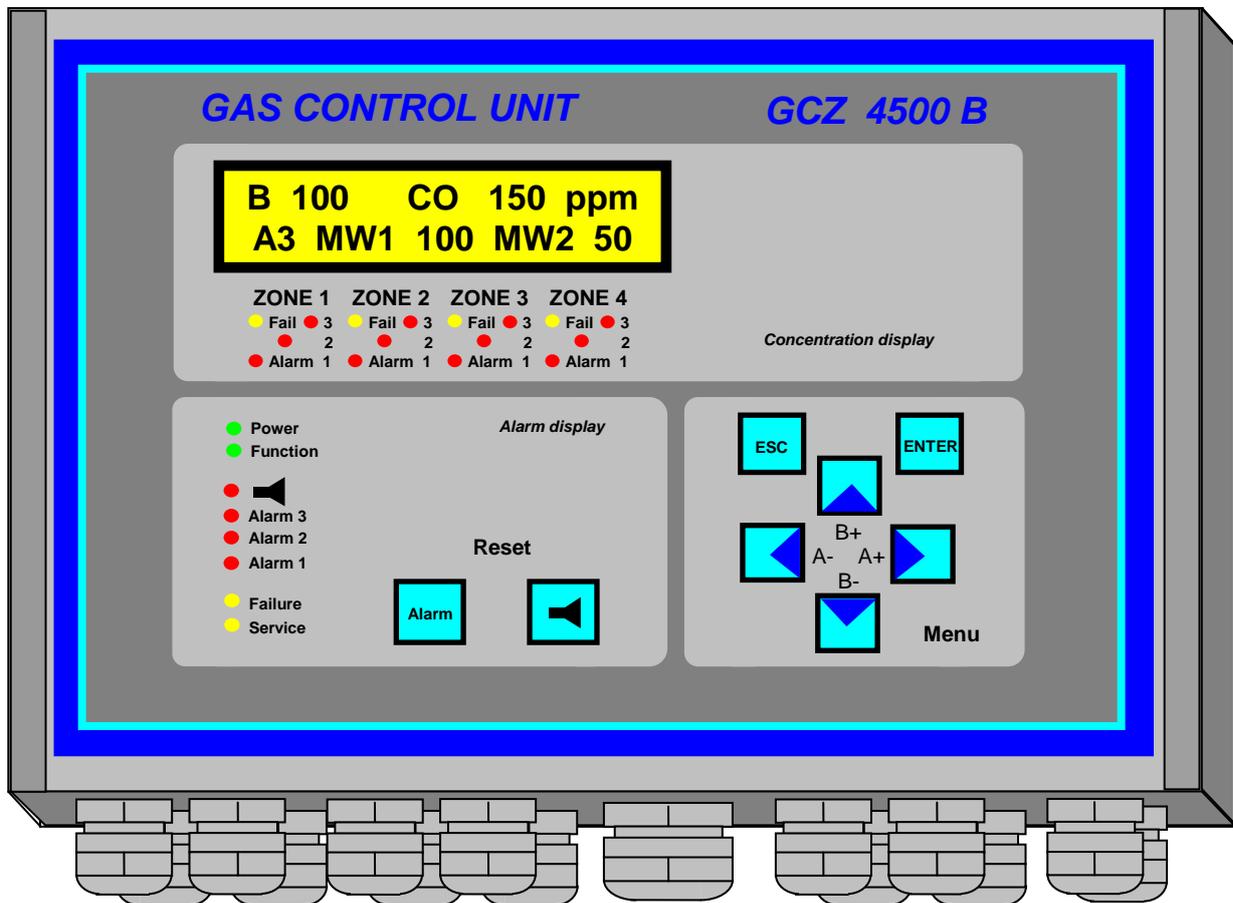


## OPERATION MANUAL

## BUS-Control-Unit GCZ 4500B



### ▼ IMPORTANT!

The device may only be operated if this operating instruction has been understood and is applied. The annex "Safety Instructions for the Installation Company and the User" is to be observed absolutely!

### Liability for Function or Damages

The liability for the function of this device passes over to the proprietor or user, if the maintenance or repair is executed by persons not belonging to the service of the manufacturer, or if a handling is carried out not being in accordance with the regulations. The manufacturer is not liable for damages resulting from non-observance of the comments indicated.

### Device Maintenance

The device is subject to regular inspections executed by qualified technical personnel. The maintenance interval depends on the sensors connected and additionally is required by law. It is recommended to conclude a service contract in order to keep to the regular maintenance interval.

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## Application

The device serves

- acquisition or measurement and evaluation of carbon monoxide concentration or other gases
- control of countermeasures, f. ex. ventilation, disconnection of aggregates
- warning in case of dangerous concentrations.

The device corresponds to the regulations of VDI 2053 and is suitable for the employment in basement garages.

## Device Design

### GCZ Gas Control Unit with BUS-Technology

- robust RS 485-Topologie
- up to 120 sensors directly connectable
- up to zu 500 sensors by use of sub system units
- monitoring several gases (f.e. CO, NO<sub>2</sub>, LPG)
- 8 Bus wires/unit each with up to 50 sensors / 500m
- 5 Alarm levels
- 2 average timer
- fits the requirements of the hessian statutory technical order for car parks
- LCD-Display for current readings and averages, device failure indication and parameter settings
- LED zone alarm display
- LED collective alarm display
- up to 4 zone-relais output modules included on order
- as well as a collective alarm output module for signalling to building control system
- 8 digital Inputs for Horn-/Alarmreset/Ventilation etc.
- extentionable with sub system units or input- resp. output modules
- Visualisation of Sensor/building shemata on CBCS-PC or TFT-Display with RS485/USB/LAN under preparation
- Data logging on Chip-cards or PC under preparation
- Gateways for LON, Profibus etc. under preparation

## Switching thresholds

The reading of every sensor is monitored to 5 thresholds. The thresholds can depend on the actual reading or on one of two different mean values.

Every threshold triggers one or more alarm level. When an alarm is triggered, dedicated LED light up and the dedicated relay is activated.

The determination of measuring parameters and switching thresholds for the individual measuring points as well as the allocation of output relays for alarm signals are to be set via an easily operated parameterization software.

The parameters set can be read from the test certificate or they can be printed out via laptop or PC with serial interface RS 232 and a printer.

Individual alarm signals can continue to be enabled, after discontinuation of the basic cause. This is the case, if a temporal after-running has been programmed for the alarm level, f. ex. to provide for sufficient ventilation or minimum ventilator running time.

If necessary, individual alarm levels of particular measuring points can be programmed self-storing, so that they are reset not until the alarm Reset Key is activated. A reset of stored sensor alarms is only possible after the alarm cause is eliminated.

Otherwise the alarm resets automatically after signal is passing through a signal hysteresis ( at least 3 digits) and the alarm reason is eliminated.

alarm reason is eliminated.

## Device Fault Alarm

After 10 seconds a device fault alarm is issued on the following conditions:

- mains failure (without USV undelayed)

- after cold start until 1 minute after mains recuperation
- blown fuse
- device damage
- drop of distribution voltage of the sensors (< 12 V)
- interruption/short circuit of sensor feeder
- malfunction of the software
- loss of parameter settings
- disabeling the main alarm manually by pressing the alarm reset key

In case of malfunction, the contacts 11 and 14 of the device fault alarm relay (relay GSM) are closing, contact 12 will be separated from contact 11.

The Ready-LED is deactivated and a device malfunction LED flashes. A plain text appears on the LCD display.

Malfunctions marked with (\*) can be programmed to cause alarm levels, so Sensor faults cause ventilation in the corresponding alarm zone.

Defects of the main unit cause ventilation in all alarm zones. Malfunctions not marked with (\*) can only cause ventilation when the control wire is connected through the fault relay (GSM).

### Sensor malfunction:

When a yellow zone fault indication LED (fail) lights up, minimal one sensor is defective. Push the ENTER-key to read more info about the malfunction off the selected sensor.

Each individual sensor can be disabled temporarily by the buildings caretaker.

To do this, press the ESC and ENTER-key simultaneously, enter caretakers code and select the sensor to disable. Call service immediately.

## Mains failure alarm blocking

The device possesses a time delay to be activated optionally, that is activated after each failure of the power supply (cold start), and the alarms are suppressed until the sensors are ready for operation. During this time the fault alarm is indicated.

If the time delay is switched on, the device is on stand-by 1 minute after the power supply is connected, provided no other malfunctions are in existence.

## Sensor Connection

In order to supply the sensors, a direct voltage of 22,5..24V is provided by the device or the USV.

8 terminals for BUS-cables are in-built.

If possible, install the BUS-cable without additional stub lines. To eliminate difficultly in communicating a sensor, install a 120 Ohm end resistor between clamp 2 and 3 at the last sensor of a BUS-cable.

The shielded cable JY(St)Y2x2x0,8mm can be used as sensor feeder.

The wire colours can be allocated as follows:

Red => +24V (CI 1), White => RS485 A (CI 2) ,  
Yellow => RS485 B (CI 4), Black => 0 V (CI 4)  
supplementary earth wire => earth (CI 5)

### Important:

By installing the sensor prevent contact between the circuit and the stripped supplementary earth wire. Check this, before setting the system into operation.

## Relay Outputs

The device possess a relay with double-throw contact for the device fault alarm (GSM).

The device possess, in addition, up to 20 double-throw alarm relays for ventilation, valves, building control signals and for warning lights and horns.

It is also possible to extend them with zone (alarm) output modules.

Max. relay current is 6A/230VAC,  
the relay for warning lights drives 16A/230VAC.

### Air extraction

At the digital input „Ventilation“ a switch is connectable to ventilate the car park in case of formation of smoke. Alarm 1 and alarm 2 will be set in all alarm zones simultaneously.

### Ventilator system

The unit supports single step ventilatores

### Service connector RS 232 C / USB

The interface RS 232 C (plug 4 pins at the underside) serves to connect a service-dongle. This is a computer-interface for data exchange, data logging and program parameter settings. Maximum distance: 15 m. For the output over longer distances interface converters are available.

The service dongle is chargeable with cost and is available only for trained personal.

### LCD-Display

A double-line LCD display serves for the indication of the current measuring and mean values and the parameterization of the individual measuring points.

Press key B+ resp. B- to select a sensor.

Press key A+ resp. A- to select a sensor with alarm.

Faulty sensors show crossed out readings.(----)

Other malfunctions can be read out as text message.  
To select press A+, A- .

### Start-Up

**All functions of the device are to be verified by means of a test gas task on start-up. A certificate has to be drawn up.**

### Maintenance

**Maintenance in certain intervals is required to maintain the functional safety. Maintenance interval can be taken from the test label, amounting to 1 year, at the most.**

### Placing out of Service

In case of placing the device out of service the programmed data are not lost. The data of the memory for accumulated messages continue to remain, too.

If the device is out of service for more than 4 weeks, the sensors have to be verified and calibrated once again, if necessary, after start-up with test gas.

Technical Modifications are subject to change.

## Function for the facility manager

The facility manager can disable sensors temporarily to avoid permanent ventilation caused by a defect sensor until the customers service arrives.

**IMPORTANT:** The customers service ist o be called immediately to set the system in normal operation as soon as possible.

To enter the facility manager menu, press „ESC“ and „ENTER“ simultaneously for 5 seconds, then enter the Code “0000 0020”.

```
<Service Mode Entry>
Code: 00000020
```

The Service-LED lights up.

Now the sensors menu appears and you can select a sensor with the keys „+B“ and „-B“ The selection begins with sensor 1, independent which sensor was displayed bevor entering the menu.

```
Sensor      B  1
Status:aktiv/inaktiv
```

- Press „-A“ und „+A“ to toggle the status as requested.
- Select more sensors if needed and toggle the status as requested.
- Leave the menu:
  - Leave the menu with the ENTER-key to store the new status of the sensors
  - Leave the menu with the ESC-key to disgard the modifications.
- The Service-LED will be shut off after 4 hours.

**Advice:** With flip through the sensors readings by pressing „+B“ or „-B“ the readings of faulty or not connected sensors will be displayed with null strings

```
B 10  ----  ----  ----
A- MW1  ---  MW2  ---
```

## Service functions

The LCD-Display shows the readings and status of the sensors:

Display in normal operation:

```
B 10 CO 45 ppm
A1 MW1 32 MW2 8
```

Sensor: B10,  
Gas type: carbon monoxide (CO),  
Actual reading: 45 ppm,  
Highest actual alarm level: Alarm 1 (A1),  
Mean Value 1 (MW1): 32 ppm (normally = 15 minutes average corresponding to the regulations of VDI 2053)  
Mean value 2 (MW2): 8 ppm (normally = 60 minutes average for special regulations for car parks)

Press the ENTER-key to get more special informations about the sensor:

```
B 10
ZONE: 1
```

Sensor: B10,  
Allocated car park zone: 1

Press the ENTER-key to get more special informations about the sensor:

```
B 10
ZONE: 1
```

```
B 10 BUS-TO: 0
State:READY TYP 430
```

Sensor: B10,  
BUS-Timeout-counter  
Actual sensor status:  
READY = o.k. ; LOST = communication with the sensor is disturbed  
Sensor-type: GMF 430 (BUS-sensor for CO or NO2)

**Advice:** a high reading of the BUS-timeout-counter in the sensors normal operation shows that there are many communication difficulties.

It is recommended for to eliminate difficultiy in communicating a sensor, install a 120 Ohm end resistor between clamp 2 and 3 at the last sensor of each BUS-cable for to set the line impedance ideally to 60 Ohm.

The value of the end resistor must be 60 Ohm, if only one wiring cable is connected to a bus driver. (driver 1 = BUS 1 + BUS 2, driver 2 = BUS 3 + BUS 4 etc.)

Press the ENTER-key to go back to normal display:

```
B 10 CO 45 ppm
A1 MW1 32 MW2 8
```

## Maintenance

Maintenance in certain intervals is required to maintain the functional safety.  
Maintenance interval can be taken from the test label, amounting to 1 year, at the most.

Maintenance only is allowed to licenced and authorized specialists.

To set the unit into maintenance mode press „ESC“ and „ENTER“ simultaneously for 5 seconds, then enter the service code:

```
<Service Mode Entry>  
Code: 00000000
```

If the code is accepted, the Service-LED lights up and the maintenance of the sensor can be started.

To calibrate the sensor a “Gas adaption kit” and a “CO-KEY” is necessary.  
Reading the CO-KEY is possible only in maintenance mode.

Maintenance mode is cleared and the unit is set to normal operation after 4 hours automatically.

## TECHNICAL SPECIFICATIONS

**Microcontrolled device corresponding to the regulations of VDI 2053**

**It is suitable for the employment in basement garages monitoring ambient air for toxic carbon monoxide, nitric oxide and combustible gases.**

**It serves air conditioning, optic and acoustic alarm transmitters and signals to the building control**

In the housing are in-built 1 up to 4 zone alarm relay modules for to serve up to 4 different car park areas.  
Up to 120 sensors can be connected directly to 1..8 BUS-lines  
as well as up to 100 warning transmitters can be connected to the device.

Housing:	Wall mounted ABS-plastic housing IP54, WxH(incl. PG)xT 360x260x120mm <sup>3</sup>
Sensors:	up to 120 directly, up to 500 in connection with sub system units
BUS cable:	JY(St)Y 2x2x0,8
BUS type:	robust RS 485 topology
Alarm thresholds:	5 thresholds, set by mean rading or direct reading
Alarm output:	Collective failure: 1 x isolated double throw relay, 250V/6A Collective alarm: 3 x isolated double throw relay, 250V/6A 4 alarm zones relay module each with 2 ventilation levels: 2 x isolated double throw relay 250V/6A 1 main alarm level: 1 x isolated double throw relay, 250V/6A 1 warning light terminal: 1 x isolated double throw relay, 250V/10A, clocked 1 horn terminal: 1 x isolated double throw relay, 250V/6A, resetable
Displays:	LED-Display for alarm and failures LCD-Display for sensor readings, status, gas type, alarms and failures
Miscellaneous:	average caculation with 2 mean values, system clock, self monitor, BUS-monitor
Interface connector:	connection of laptop, PC, data logger via RS 485/232-Interface
Power supply:	230V/50-60 Hz (100..275VAC) (NYM 3x 2,5mm <sup>2</sup> ) and/or 24 VDC or 24 VDC USV
<b>Options:</b>	communication adapter modules (under preparation): - LON-Bus-Gateway - TCP/IP-Gateway - SPS-Profibus-Gateway