

## Monitoring device TGÜ-KM 3.6 for car parks



- Gas control center with bus technology
- Up to 24 measuring points for CO, NO<sub>2</sub>, LPG, CH<sub>4</sub>
- Menu-driven pushbutton operation
- 4 variably adjustable alarm thresholds
- Password protected configuration level
- Large LCD plain text display
- 6 floating alarm relays
- Bus interface to the BMS (Modbus RTU)
- LED status display for the system

### Technical Data

<b>Housing:</b>	ABS plastic
<b>Dimensions:</b>	265 x 145 x 87 mm (L x W x D)
<b>Protection class:</b>	IP 65
<b>Alarm switching points:</b>	4 adjustable thresholds free choice of the time averages free choice of hysteresis
<b>Alarm relays:</b>	6 switching relays 250 V/5 A for fan 1, fan 2, horn, transparent warning light, failure, BMS external reset for the horn
<b>Input:</b>	
<b>Supply voltage:</b>	230 V AC 50/60Hz and 24 V DC
<b>Ambient temperature:</b>	0 °C to +40 °C
<b>Optional UPS:</b>	24 V DC (20 up to 32 V DC)
<b>Cable entry point:</b>	11 x M16 x 1.5
<b>Connection:</b>	spring clips 0.5 – 1.5 mm <sup>2</sup>
<b>Weight:</b>	1 kg
<b>Guidelines:</b>	
- <b>EMC directives:</b>	EN 61000-6-2 EN 61000-6-3
- <b>Low voltage directive:</b>	EN 60950-1 VDI 2053
<b>Data communication:</b>	
To the sensors	via RS485 interface, GMF-Modbus (for cable lengths, see page 3)
<b>Measuring head:</b>	CO, NO <sub>2</sub> , LPG, methane Description on page 3

Different types of gas sensors can be connected simultaneously. A maximum of 24 sensors can be monitored. (See the table on page 3). The connection between control unit and sensor takes place via four wires, 2 for the supply and 2 for data transmission. Data transmission to the gas sensors is digital. Communication is via RS485 Bus.

The control center cyclically queries the gas sensors and stores the instantaneous values for further processing. In this way even buses and sensors are monitored. Malfunctions are signaled. The measuring signals of the gas sensor heads are digitized in the sensor electronics. The measurement data is temperature compensated, scaled and evaluated according to the set alarm thresholds.

In case the preset thresholds are exceeded, control commands for fans, transparent warning lights, horns and BMS (building management system) are passed via relay. 4 variable thresholds regarding average time and hysteresis can be set independently from each other.

In normal failure-free and alarm-free operation, the green "operational" LED, all relays are energized and the operating mode as well as the current time and date are shown on the display (overview display). By using the arrow keys you can switch to the detail view. The detailed measurement values from each sensor are displayed here (scroll using the arrow keys). The Home key can switch the display back to the overview. If a failure or an alarm occurs during the detailed view, or if no key is pressed for a while, the device will automatically switch to the overview display. In the event of an alarm all sensors whose measured values are above the alarm value are displayed in order. By pressing the arrow keys the detailed measurements of each sensor can be viewed. A device test can be carried out by pressing the reset button in failure-free and alarm-free operation. All the relays drop out so that the connected warning devices can be tested.

### System description

TGÜ-KM 3.6 is a bus-compatible measurement and control system used to monitor the air for toxic carbon monoxide, nitrogen dioxide or propane/methane concentrations in underground car parks or similar enclosed spaces in which motor vehicles with internal combustion engines are operated.

You can return to the overview by using the Home key. If the measurement signal at all sensors fall below their threshold values once again, the alarm is cancelled. The internal buzzer and horn relay can be acknowledged at any time using the reset button or a connected external switch (closing contact). The unit status is signaled simultaneously to the LCD display via LEDs.

Parametrization of the TGÜ is carried out via special TGÜ software. The clear text display in the control center's LCD is in German. Access to the main menu is password-protected to prevent improper use.

A connection to the BMS, e.g. for data logging, can also take place via RS485 Modbus RTU. Please refer to the separate bus protocol for this.

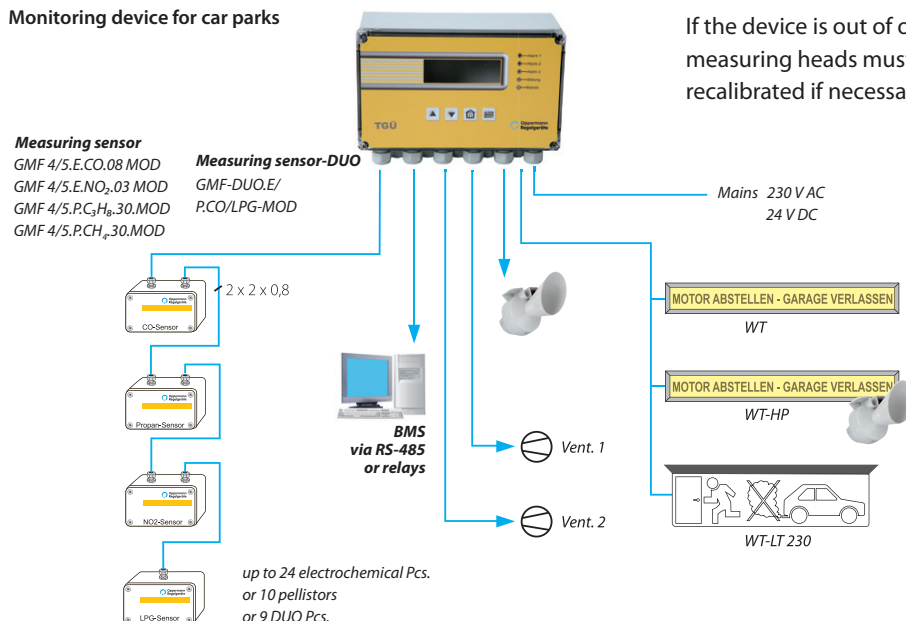
The calibration of the connected gas sensors is carried out at the sensors with an HB1.0 manual control unit. Supply voltage for the TGÜ-KM 3.6 is 230 V AC, the connection of an additional uninterruptible power supply (UPS) is provided.

## Device malfunction alert

A device malfunction alert is displayed under the following conditions:

- Power failure
- With active false alarm reduction in the warm-up phase until about 1 Min. after power recovery
- Fuse failure
- Equipment failure
- Break or short circuit of measuring head supply line
- Sensor failure

### Monitoring device for car parks



## Power failure alarm suppression

The device has a time delay that is activated after power supply failure, and the alarms which would inevitably arise due to the warming up of the sensors are suppressed. During this time the malfunction alert is displayed.

About 1 minute after application of the power supply, the device is in a state of readiness, as long as there are no other malfunctions.

## Start of operation

All work (such as installation, electrical connection, start-up, operation and maintenance), must be carried out by sufficiently qualified craftsman. Current local rules and regulations (e.g. building regulations, electrical/VDE guidelines, etc.) are to be observed. Installers and operators are required to be adequately informed before operation. Read the product description before device start-up. Make sure that the product is fully suited to the respective applications. We assume no liability for misprints and changes after printing. Compliance with operating and installation instructions is also included within the regulations of intended use. We assume no liability for damages caused by improper use. Operating licenses and guarantees and all warranty claims will be voided in the event of unauthorized modifications or any tampering with the device. The device's functions should be checked through a test with test gas during initial operation.

## Maintenance / removal from service

To maintain operational reliability, maintenance at specific intervals is required. The maintenance interval is found on the test label. It is a maximum of 1 year.

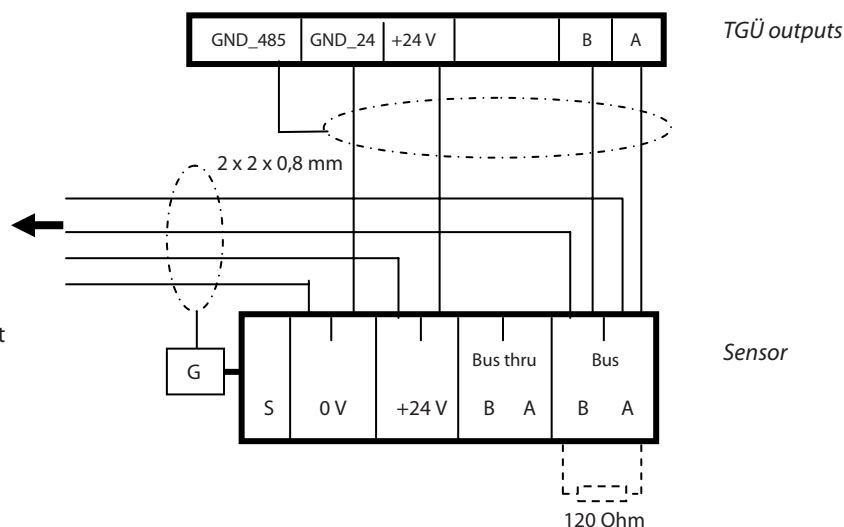
If the device is out of operation for longer than 4 weeks, the measuring heads must be tested with test gas after start-up and recalibrated if necessary.

## Measuring sensor

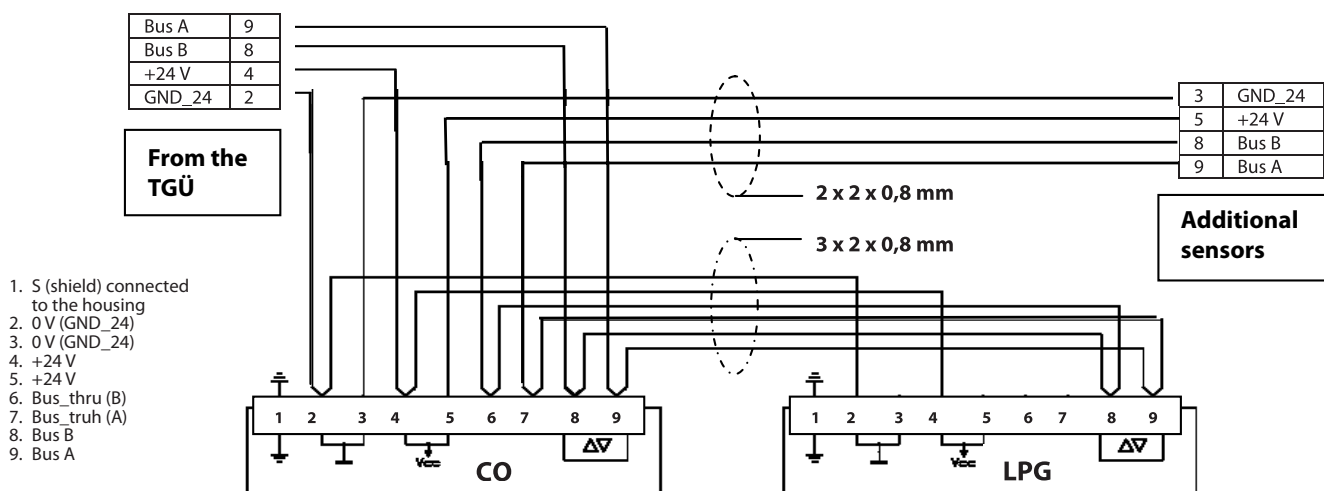
## Modbus connection

## Additional sensors

To avoid reflections when using long cable lengths, the communication lines A+B must be provided with a terminating resistor of 120 ohm at both ends.



## Wiring for GMF DUO.E/P.CO/LPG. MOD



Measuring sensor type	Max. wire	Max. sensors
GMF 4.E.CO.08.MOD	500 m	24 Pcs.
GMF 4.E.CNO2.03.MOD	500 m	24 Pcs.
GMF 4.P.C3H8.30.MOD	200 m	10 Pcs.
GMF 4.P.CH4.30.MOD	200 m	10 Pcs.
GMF DUO.E/P.CO/LPG.MOD	180 m	9 Pcs.

**When wiring the Modbus (EN 50173) the technical guidelines must be considered.**

Wiring: JY (St) Y 2 x 2 x 0.8 mm<sup>2</sup>

## Sensors to be connected to the TGÜ-KM 3.6

Carbon monoxide CO  
Nitrogen dioxide NO<sub>2</sub>  
Propane (LPG) C<sub>3</sub>H<sub>8</sub>  
Natural gas (methane) CH<sub>4</sub>  
Combi CO/LPG

Typ GMF 4.E.CO.08.MOD  
Typ GMF 4.E.NO2.03.MOD  
Typ GMF 4.P.C3H8.30.MOD  
Typ GMF 4.P.CH4.30.MOD  
Typ GMF DUO.E/P.CO/LPG.MOD

Data sheet No.: 38100  
Data sheet No.: 38101  
Data sheet No.: 38102  
Data sheet No.: 38103  
Data sheet No.: 38104

**Note:** All sensors are also possible in a version with housing type 5. See data sheet 38106/38107.

## Bus cable

Only wiring cables which comply with the recommendations of the EIA 485 guidelines may be used for the Modbus.

The bus cable must be laid at a distance of at least 20 cm from other lines. It should be installed in a separate, conductive and grounded cable trunking.

It is important to ensure that no potential differences between devices can occur on the Modbus (perform equipotential bonding).

The cable shield must be connected to the sensor in the housing (ground screws are available). In the TGÜ the cable shield is to be contacted to the terminal GND\_485/Schirm.

## Ensure EMC-compliant wiring:

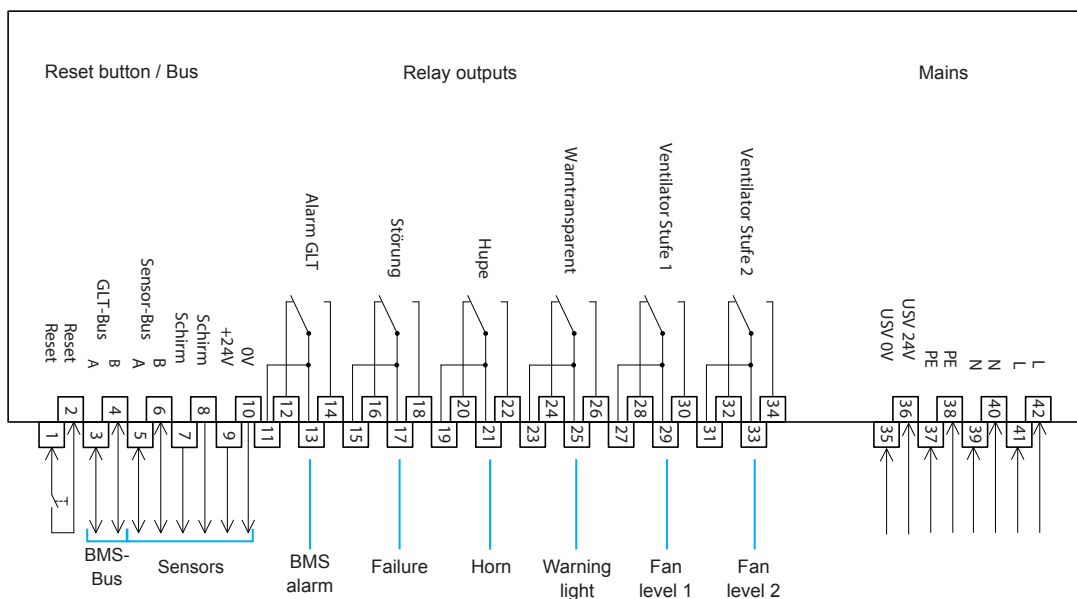
Signal and bus lines are susceptible to interference.

Motor cables tend to be prone to disruptions. Lines that are susceptible to interference and prone to disruption should be placed at the greatest possible distance from one another. The interference immunity of signal and bus cables increases when the cables are laid close to the ground potential. If possible, avoid long wires and make sure that they are installed in areas of less interference. Avoid long parallel segments of cable that are either susceptible or prone to interference.

## Connection diagram

Work on electrical systems or equipment must be carried out only by a qualified electrician or by instructed personnel under the direction and supervision of a qualified electrician according to electrotechnical regulations.

**Note:** Depiction of the output relay in de-energized (alarm) status. The 24 V DC supply voltage must be secured on site with a 2.5 A fuse.



## Alarm output

The following standard configuration is provided. Adjustments are possible via the TGÜ Configurator software menu.

Threshold value S1 → Relay fan speed 1 = Display alarm 1

Threshold value S2 → Relay fan speed 1 + Relay fan speed 2 = Display alarm 1 + 2

Threshold value S3 → Relay transparent warning light + Relay fan speed 1 + Relay fan speed 2 + Relay horn + Relay BMS = Display alarm 1, 2, 3

Threshold value S4 → Relay transparent warning light + Relay fan speed 1 + Relay fan speed 2 + Relay horn + Relay BMS = Display alarm 1, 2, 3



Ex-Ox-Tox Gasdetectie  
Westerdreef 5V  
2152 CS Nieuw-Vennep  
Telefoon: 0252 620885  
E-mail: [info@exotox.nl](mailto:info@exotox.nl)  
Website: [www.exotox.nl](http://www.exotox.nl)