G300 Series

Operation Manual

GfG Instrumentation

Worldwide Manufacturer of Gas Detection Solutions

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For your safety
Like any piece of complex equipment, the GfG G 300 II will do the job designed to do only, if it is used and serviced in accordance with the manufacturer's instructions. This manual must be carefully read by all individuals who have or will have the responsibility for using and servicing this product.

The warranties made by GfG with respect to the product are voided, if the product is not used and serviced in accordance with the instructions in this manual. Please protect yourself and your employees by following them. The above does not alter statements regarding GfG's warranties and conditions of sale and delivery.

General description
The G 300 II is a very light and compact leak detector for combustible gases. It detects these gases from a few ppm up to high concentrations in the LEL range. The G 300 II recognizes, if the gas concentration rises or falls and indicates the change optically and acoustically. The sensor can be easily extended by means of a gooseneck or a helix cable, thus providing leak detection even at hardly accessible areas.

Detection principle
The G 300 II uses a chemosorption sensor. This principle guarantees a quick and reliable response even for lowest gas concentrations, but still gives a stable signal for high concentrations in Vol.-% range as well. Chemosorption sensors are very easy to be serviced and calibrated and have a very long lifetime.

Design
The G 300 II consists of the basic unit and the sensor. The sensor converts the measured gas concentration into an electrical signal which is processed by the basic unit. The basic unit provides the evaluation electronics with the operational elements and the bargraph display. The gooseneck or helix cable extension can be used between the basic unit and the sensor.

Detection mode
Switching on
Turn the G 300 II on by means of the On/Off switch (pos. 3) and allow a warm-up time of about 2 seconds before the instrument is ready for operation. In case the G 300 II had not been switched on for an extended period (several weeks), it may need a warm-up time of several minutes, before all gas molecules are absorbed from the sinter metal.

Together with the red LED (pos. 6) you will hear an audible signal during the warm-up time, which, during the detection mode, assists the search for leakages. You can turn this audible signal on or off by means of the signal switch (pos. 2). The optical signal is not affected by this switch.

G 300 II **–Design**

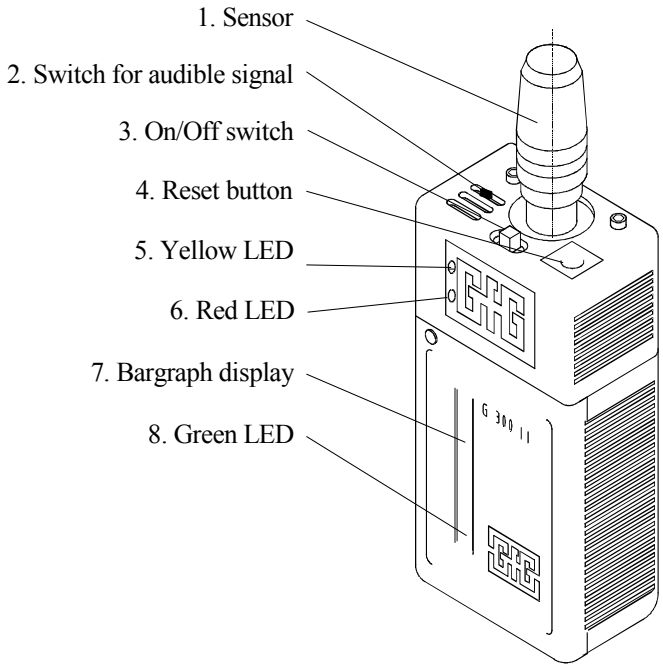


Figure 1

1. **Bring the On/Off switch (fig. 1, pos. 3) in position "ON".**
   The red LEDs in the bar graph display (pos. 7) lights up and turns off during the warm-up time. If the unit has only been switched off shortly, it may not need any or only very short warm-up time and the red LEDs may not light.

2. **Push the reset button (fig. 1, pos. 4).**
   During the warm-up time the detector gives an audible signal and the red LED (pos. 6) lights up. Once the warm-up time has ended, the audible signal can be set to a new starting point by pressing the reset button; this makes the detector ready for operation. As soon as the 6 LEDs in the bargraph display have gone off, repeated pressing of the reset button during the warm-up time resets the audible signal.

   If the reset button is pushed in the presence of gas or before the warm-up time is over, the yellow LED (pos. 5) might go on after a short while. Push the reset button again until the warm-up time is completed or until there is no gas left in the ambient air

The G 300 is also ready for operation, if e.g. by changes of temperature or humidity the bar graph display is still lit and the audible signal is out, while the yellow and the green LEDs are lit.

Detection
In case of presence of combustible gases or vapours in the ambient air they are continuously measured and displayed. The gas concentration is indicated in two ways:

1. **Bar graph display of gas concentration**
   The bar graph display indicates the present gas concentration.
2. **Indication for leak detection**
   Rising or falling gas concentrations are indicated audible and visually.

The evaluation for the bar graph display is independent from

that of the audible signal, thus providing double safety.

1. **Bar graph display of gas concentration**
   The bar graph (14 red LEDs) provides a visible indication for a change in the gas concentration. The more LEDs are lit, the higher the gas concentration is. When all LEDs light up, the concentration has reached or exceeded the full scale of the G 300 II.

   The green LED at the bottom of the bar graph is lit, when the G 300 II is ready for operation. If this LED does not light, the zero point has to be adjusted (see "calibration").

2. **Audible indication of gas concentration**
   Rising or falling gas concentrations are indicated acoustically by faster or slower rhythmic signals. The red LED (fig. 1, pos. 6) flashes with the same frequency. The audible signals allows leak detection without keeping an eye on the display. The visual indication supports the audible signal in noisy environments.

   To cover the wide detection range of the G 300 II from a few ppm up to the Vol.-% range for leak detection, push the reset button (fig. 1, pos. 4) to give the signal a new starting point:

- When the audible signal gives a permanent sound, push the reset button during leak detection to set a new start point for leak detection. This allows to detect leakages even in gas contaminated environment.
- If the gas concentration falls below the new starting point of the visual and audible indication for leak detection, push the reset button again to set another start point from the actual gas concentration.

Meaning of signals and signal changes during leak detection:

Signal	Meaning	Action
Pulse frequency increases	Rising gas concentration	Getting closer to leakage
Pulse frequency decreases	Falling gas concentration	Getting away from leakage
Permanent sound, red LED is lit, LEDs in bar graph are lit	Exceeding the current leak detection range	Pushing the reset button sets a new starting point. When more than 6 LEDs are lit in the bar graph, the setting of a new starting point is not possible.
No sound, yellow LED is lit	Falling below the current leak detection range	Pushing the reset button sets a new starting point
Permanent sound, red LED is lit, no LEDs in bar-graph	Battery alarm	The battery pack of the G 300 II has to be recharged

During leak detection, pressing the reset button sets a new starting point for the audible and visual signal.

Fixing a new starting point for the audible and visual leak detection signal does not affect the bar graph display.

Mounting of sensor and extensions

The G 300 II consists of the basic unit and the sensor. For better handling during leak detection the sensor can be extended by means of a gooseneck and/or a helix cable. The extensions provide plug connectors, so you do not need any special tools. Should you have several G 300 II detectors, make sure that the sensor of one detector is not put on another

G 300 II, as the sensors re always adapted to their basic unit.

The following combinations are possible:

- Basic unit + sensor
- Basic unit + gooseneck + sensor
- Basic unit + helix cable + sensor
- Basic unit + helix cable + gooseneck + sensor

Those components are simply plugged together and fixed with a knurled screw.

Note: Turning the knurled screw violently might damage the instrument. If the sensor is taken off the activated detector, the G 300 II triggers a failure signal (permanent sound + lit yellow and red LEDs). The failure signal goes out as soon as the sensor is plugged on the unit correctly.

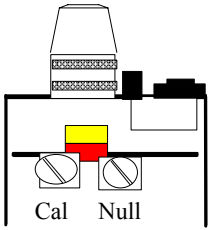
Check of electrical zero point and sensitivity
The evaluation for absolute values and leak detection is done independently from each other.

1. Check of zero point for bargraph display
   Make sure that the sensor is exposed to zero gas. The zeropoint is set correctly, if after the warm-up time:
   - the green LED in the bar graph lights up,
   - all red LEDs in the bar graph have gone out.
2. **Check of sensitivity**
   When supplying a test gas concentration of 20 % LEL CH_4 (=0.88 Vol.-%), 12 or 13 LEDs in the bargraph must light. Should you see more or less LEDs, re-adjust the zero point and, if necessary, the sensitivity.
3. Check of start point for audible and visual indication of leak detection
   Make sure that the sensor is exposed to zero gas. The zero point is set correctly, if after the warm-up time:
   - The audible signal sounds in a slow and regular rhythm and
   - The red LED flashes in the same rhythm.

Calibration of electrical zero point and Sensitivity
For calibration of the G 300 II adhere to the following procedure:

- Plug the sensor to the basic unit without using the extensions.
- Make sure that the sensor is exposed to zero gas (clean ambient air without interfering gas).
- Turn the detector on and wait for at least 5 minutes. The unit must be switched on during the following steps and for calibration.
- Remove the two allen screws from the casing top and pull the top off.

- Inside the detector you can see 2 potentiometers, "**Cal**" and **Null**".



Zero point "Null"
For zero point calibration turn the potentiometer "**Null**":

a) Turn potentiometer "Null" to the right until the first red LED in the bar graph lights up (the zero point is too high now).
b) Turn potentiometer "Null" to the left until the green LED in the bar graph goes out (the zero point is too low now).
c) Turn potentiometer "Null" to the right again until it is in the middle between its positions for a) and b) above.

Now the zero point for the G 300 II is set correctly and the detector can be closed again. Do not turn the Allen screws violently, as this might damage the instrument.

Sensitivity "Cal"
Sensitivity calibration with test gas and turning the potentiometer "**Cal**" shall only be done by an expert, who is trained and authorized by the manufacturer.

For sensitivity calibration turn the potentiometer "**Cal**":

a) Supply a concentration of 1 Vol.-% methane (CH_4) to

the G 300 II.

b) Turn potentiometer "Cal" to the right until all red LEDs in the bar graph are lit.

Now the sensitivity for the G 300 II is set correctly and the detector can be closed again. Do not turn the allen screws violently, as this might damage the instrument.

Trouble shooting

Failure	Reason	Solution
Yellow LED is lit	Gas concentration has fallen below leak detection range	Push reset button
Green LED (bar graph) is out	Gas concentration has fallen below the detection range of the bar graph display	Calibrate zero point (see "Check of electrical zero point and sensitivity")
Red LED is lit, permanent audible sound (failure signal)	1. Battery alarm 2. No sensor or sensor not plugged on correctly. Cable is cut	1. Recharge the battery pack. 2. Check sensor connection. Call for GfG service

Technical data

G 300 II	
Gas:	Combustible gases, e.g. methane (CH_4)
Detection range:	for methane (0) 5 ppm up to approx. 1 Vol.-%
Detection principle:	Chemosorption
Gas supply:	Diffusion
Response time:	< 3 seconds
Expected sensor life:	2 years
Temperature range:	-20 .. +50 °C
Humidity:	20 .. 99.9 % r.h.
Atmospheric pressure:	800 .. 1200 hPa
Power supply:	Rechargeable battery pack
Operational time:	> 8 hours (standard) > 20 hours (special battery)
Casing:	Polyamid, IP 53
Dimensions:	60 x 120 x 35 mm (WxHxD)
Weight:	350 g
Gooseneck:	30 cm flexible sensor extension
Helix cable:	Extendable 20 cm to 90 cm
Ex Approval(*):	Ex s IIC T6 (*) Only for Ex-proof models. Ex areas request the use of Ex-proof detectors only. The accessories sensor, gooseneck and helix cable must be Ex-proof as well.

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