GfG Instrumentation

GfG Instrumentation, Inc. • 1194 Oak Valley Dr. Suite 20 • Ann Arbor, MI 48108
800-959-0329 • 734-769-0573 • 734-769-1888 fax • www.gfg-inc.com

G 300 TOX

Operation Manual

Content

For your safety

Like any piece of complex equipment, the GfG G 300 TOX will only do the designed job, 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 of using and servicing this product.
The warranties made by GfG with respect to the product are null and void, 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 TOX is a very light and compact leak detector for ammonia (NH_3). It detects low amounts of ammonia from a few ppm up to high concentrations (1000 ppm). The G 300 TOX recognizes the rise or fall of the gas concentration and additionally indicates the measured concentration. 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 TOX 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. Chemosorption sensors are very easy to be serviced and calibrated and have a very long lifetime.

Design

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

G 300 TOX - Design

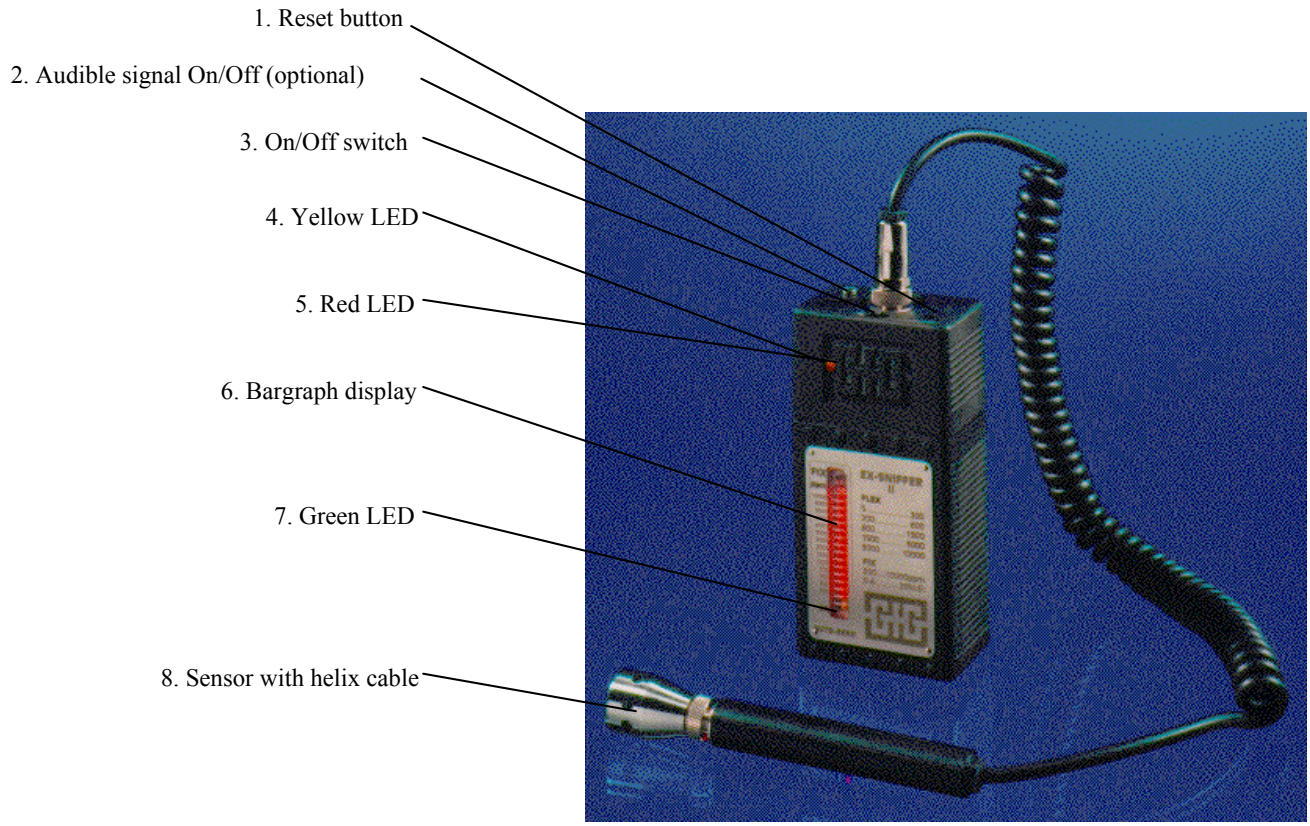


Fig. 1

Operation

Switching on

Turn the G 300 TOX on by means of the On/Off switch (fig. 1, pos. 3) and allow a warm-up time of about 2 seconds before the instrument is ready for operation. In case the G 300 TOX had not been switched on for an extended period (several weeks), it may need a warm-up time of up to 60 seconds.

1. **Bring the On/Off switch (fig. 1, pos. 3) in position "ON".**

   The red LEDs in the bargraph display (fig. 1, pos. 6) light up and go out during the warm-up period. If the unit has only been switched off shortly, it may not need any or only a very short warm-up time and the red LEDs will not light.

2. **Push the reset button (fig. 1, pos. 1).**

   During the warm-up time the detector gives an audible signal, which can be switched off by pressing the reset button. This button may be pushed frequently in case of extended warm-up time.

If the reset button is pushed in the presence of gas or before the warm-up, the yellow LED (fig. 1, pos. 4) might go on after a short while. Push the button again until the warm-up period is over or until there is no gas left in the ambient air.

Readiness for operation

The G 300 TOX is ready for operation, if:

- all red LEDs in the bargraph display (fig. 1, pos. 6) are out (with zero gas),
- the green LED at the bottom of the bargraph display is lit,
- the red LED (fig. 1, pos. 5) blinks and a slow rhythmic signal sounds.

Measurement

In case ammonia is present in the ambient air, it is continuously measured and displayed. The gas concentration is indicated in two ways:

1. **Bargraph display of gas concentration,**

   the present gas concentration can be read from the bargraph (referring to calibration gas ammonia).

2. **Audible indication of gas concentration,**

   rising and falling gas concentrations are indicated audibly and visually.

The evaluation for the bargraph indication is different from that of the audible signal, thus providing double safety.

1. Bargraph display of gas concentration

The bargraph continuously shows the absolute value of the gas concentration.

Detection range: 200 .. 1000 ppm

The green LED at the bottom of the bargraph is lit, when the G 300 TOX is ready for operation. If this LED does not light, the zeropoint has to be adjusted (see "Calibration", page 5).

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. 5) blinks 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 TOX from a few ppm up to 1000 ppm for leak detection, pushing the reset button (fig. 1, pos. 1) gives the signal of a new starting point:

- Push the reset button during leak detection to set a new start for the audible and visual signal.
- If the gas concentration falls below the new starting point for leak detection, push the reset button again to set the new start to the actual gas concentration.

Meaning of signals and signal changes during leak detection:

Signal	**Meaning**	**Action**
Pulse frequency becomes faster	Rising gas concentration	Getting closer to leakage
Pulse frequency becomes slower	Falling gas concentration	Getting away from leakage
Permanent sound, red LED is lit, LEDs in bargraph are lit	Exceeding the current leak detection range	Pushing the reset button sets a new starting point. A permanent sound remaining in spite of repeated pushing the reset button means that full scale value is exceeded
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 bargraph	Battery alarm	The battery pack of the G 300 TOX has to be recharged

During leak detection the reset button divides the detection range. The "FLEX" chart on the face plate (1 .. 10 ppm, 10 .. 150 ppm and so on) is an indication of the division of the leak detection range.

Fixing a new starting point for the audible and visual leak detection signal does not affect the bargraph display, which always reads the present gas concentration.

Audible signal On/Off (optional)

The audible signal can be switched on or off by means of the little switch (fig. 1, pos. 2). This does not change the detecting functions of the G 300 TOX. Changing gas concentrations during leak detection are still indicated by the red LED (fig. 1, pos. 5).

Mounting of sensors and its extensions

The G 300 TOX 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.

The following combinations are possible:

- Basic unit + Sensor
- Basic unit + Gooseneck + Sensor
- Basic unit + Helix cable + Sensor
- Basic unit + Gooseneck + Helix cable + Sensor

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

Note: Turning the screw violently may damage the instrument.

If the sensor is taken off the switched on detector, the G 300 TOX triggers a failure signal (permanent sound + lit yellow and red LED). The failure signal goes out as soon as the sensor is plugged into the unit correctly.

Check of electrical zeropoint and sensitivity

The evaluations for absolute value and leak detection are independent from each other.

1. Check of zeropoint for bargraph display

Make sure that the sensor is exposed to zero gas. The zeropoint is set correctly, if:

- the green LED in the bargraph display is lit,
- all red LEDs in the bargraph display are out.

2. Check of starting point for audible and visual leak detection

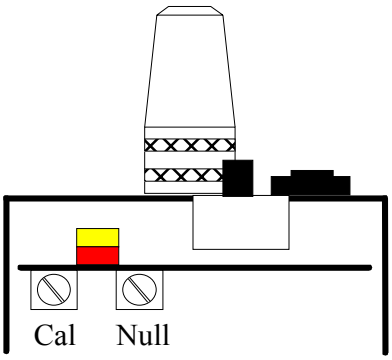
Make sure that the sensor is exposed to zero gas. The zeropoint is set correctly, if:

- the audible signal gives a slow and steady sound,
- the red LED blinks with the same frequency as the audible signal.

Calibration of electrical zeropoint and sensitivity

For calibration of G 300 TOX 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.
- 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**".



Sensitivity "Cal"

Sensitivity calibration with test gas is to be done by trained personnel only. The potentiometer "**Cal**" must not be turned.

Zeropoint "Null"

For zeropoint calibration turn the potentiometer "**Null**":

a) Turn potentiometer "Null" to the right until the first red LED in the bargraph lights up (the zeropoint is too high now).
b) Turn potentiometer "Null" to the left until the green LED in the bargraph goes out (the zeropoint 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 zeropoint for the G 300 TOX is set correctly and the detector can be closed again. Do not turn the Allen screws violently, as this may 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 (bargraph) is out	Gas concentration has fallen below the detection range for bargraph display	Calibrate zeropoint (see page 5)
Red LED is lit, permanent audible sound (failure signal)	1. Battery alarm 2. No sensor or sensor not plugged in correctly Loose cable	1. Recharge the battery pack 2. Check sensor connection Call for GfG service

Technical data

G 300 TOX	
Gas:	Ammonia
Detection range:	(0) 5 .. 1000 ppm
Detection principle:	Chemosorption
Gas supply:	Diffusion
Response time:	< 3 seconds
Sensor life:	> 5 years
Temperature range:	-20 .. +50 °C
Humidity:	20 .. 99,9 % r. h.
Ambient 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 rod
Helix cable:	
	20 .. 90 cm extendible

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Fax: (734) 769-1888
E-mail: info@gfg-inc.com
Web: www.gfg-inc.com

7004-302 031308