

Transmitter

for toxic gases and vapors



Ex-proof and EMC tested

One-man calibration on-site

Output 0.2 .. 1 mA or 4 .. 20 mA

Worldwide Supplier of Gas Detection Solutions



Stationary monitoring of toxic gases and vapors



Protection from toxic gases

Toxic gases are sometimes used as production or work media, or as a by-product of certain processes. Many of such gases can be difficult to store or ship. Most toxic gases are imperceptible to human senses, but even the lowest concentrations can cause poisoning or health hazards in the long term. The values fixed as TLV (Threshold Limit Value) and TRK (Technical Guideline Concentration, Germany) give an indication for the peak concentrations people may

be exposed to at their workplaces. Not only legal regulations and inspections, but also your own responsibility for employee safety and production efficiency require continuous monitoring of the ambient air for toxic gases. GfG's fixed gas warning systems allow an early recognition of gas hazards to ensure that countermeasures are taken in time. A fixed gas monitoring system consists of one or more transmitters connected by cable to a controller such as the GMA 100 or GMA 300.

Transmitter

The transmitter is the key component of a gas monitoring system. It is installed wherever toxic gases might be present and cause health hazards. Even very low gas concentrations are converted into an electrical signal that is proportional to the actual gas concentration. The signals are then transmitted to a central controller.

Four detection principles are used to monitor toxic gases, depending on different measurement requirements:

- Charge Carrier Injection (CI)
- Chemosorption sensors (CS)
- Electrochemical sensors (EC)
- Infrared sensors (IR)

All GfG transmitters offer integrated electronic circuits for voltage stabilization, signal transmission and temperature compensation. This results in stable measurement signals, even in case of considerable temperature changes.

The transmitters are produced by GfG and are subject to a 100% quality control. Installation is easy; since the transmitters are calibrated before shipment, the service engineer does a quick readjustment when putting them into operation.



EC 25 Ex

Transmitter with electrochemical cell for measurement of toxic gases and vapours (see gas list).

- EX-proof (intrinsically safe) according to CENELEC standard
- Digital display
- Sensors with long-term stability
- Highly selective
- Easy handling
- 0.2 .. 1 mA or 4 .. 20 mA output signal
- Service lid for:
 - Measurement of output signal
 - Service switch for output signal suppression allows maintenance without alarm activation
 - Simple one-man calibration on-site
- Plug-in sensor cell in stainless steel sleeve, replaceable without opening the casing

The transmitter EC 25 EX is particularly used in places where an EX-proof unit with a high selectivity is needed. It can be operated as a stand-alone unit or in combination with any GfG controller.



EC 24

Transmitter with electrochemical cell for measurement of toxic gases and vapours (see gas list).

- For use in non-hazardous areas
- Sensors with long-term stability
- Highly selective
- Easy handling
- 0.2 .. 1 mA or 4 .. 20 mA output signal
- Service lid for:
 - Measurement of output signal
 - Simple one-man calibration on-site
- Solid aluminium casing, IP 54 (optionally IP 68 for up to 10 m water column)
- Plug-in sensor cell in stainless steel sleeve, replaceable without opening the casing

The most important features of the EC 24 are its easy handling and long life.



CS 24 EX

Transmitter with chemisorption cell for measurement of toxic gases and vapours (see gas list).

- EX-proof according to CENELEC standard
- Fast response time
- Easy installation
- Almost maintenance-free
- High sensitivity
- Easy handling
- Long-life sensors
- 0.2 .. 1 mA or 4 .. 20 mA output signal
- Service lid for:
 - Measurement of output signal
 - Service switch for output signal suppression allows for maintenance without alarm activation
 - Simple one-man calibration on-site
- Solid aluminium casing, IP 54 (optionally IP 68 for up to 10 m water column)
- Plug-in sensor cell in stainless steel sleeve, replaceable without opening the casing



CI 21

Transmitter with special sensor for measuring of ammonia.

- Stable measurement values even at temperature changes by using a thermostatic sensor
- Measurement in dry air and at 99% humidity
- No false alarms for hydrogen, natural gas, carbon monoxide, oil vapours, solvents
- Wide dynamic detection range, starting from a few ppm, up to Vol. %

CS 21

Monitoring of toxic gases and vapours.

- Fast response time and high sensitivity
- Wide detection range
- Affordable
- Long-life sensors
- Minimum follow-up costs

IR 24

Transmitter with infrared cell for measurement of carbon dioxide (CO₂).

- Almost maintenance-free
- Easy handling
- Long-life sensors
- Low follow-up costs
- Wide detection range



Accessories

GfG offers a wide range of accessories for regular functional checks and for difficult measurement tasks.

Measurement cable

The connection between transmitter and controller is effected by means of a shielded three-core cable.

Calibration adapter – flow adapter

During periodic sensitivity checks, the transmitters are exposed to certain test gases. The calibration adapter, which is screwed on the transmitter, allows for a reliable and steady gas supply.



Weather protection

Transmitters that are mounted outdoors, can, in version IP 68, be further protected from dirt, temperature extremes or rain, by means of a protective casing.

Sampling system

The sampling system supplies gases to the transmitter from inaccessible areas. There are special filters available to protect the transmitter from dust, condensation and corrosive compounds. The EX-proof model of the sampling system can also be used for explosive gas mixtures.



Gas list – Toxic gases

Gas list for EC 25 EX and EC 24

Gas	Chemical formula	Gas density (air=1)	TLV (TRK*)		Minimum range ppm	Maximum range ppm	Resolution ppm	Alarm threshold ppm	
			ppm	mg/m ³				1	2
Ammonia	NH ₃	0.59	50	14	0 .. 50	0 .. 200	1	50	75
Chlorine	Cl ₂	2.45	0.5	1.5	0 .. 5	0 .. 20	0.1	0.5	1
Hydrogen chloride	HCl	1.26	5	7	0 .. 10	0 .. 50	1	5	10
Hydrogen cyanide	HCN	0.93	10	11	0 .. 20	0 .. 50	1	10	15
Ethylene oxide	C ₂ H ₄ O	1.52	(1*)	(2*)	0 .. 20	0 .. 100	1	5	10
Carbon monoxide	CO	0.97	30	33	0 .. 100	0 .. 4000	1(10)	30	60
Ozone	O ₃	1.66	0.1		0 .. 2	0 .. 5	0.1	0.5	1
Sulphur dioxide	SO ₂	2.21	2	5	0 .. 10	0 .. 2000	1(10)	2	4
Hydrogen sulphide	H ₂ S	1.19	10	14	0 .. 30	0 .. 1000	1	10	15
Nitrogen dioxide	NO ₂	1.59	5	9	0 .. 10	0 .. 1000	1	5	7.5
Nitrogen monoxide	NO	1.04	20	30	0 .. 100	0 .. 5000	1(10)	10	20

Gas list for CS 24 EX, CS 21 and CI 21**

Gas	Chemical formula	Gas density (air=1)	TLV (TRK*)		Minimum range ppm	Maximum range ppm	Alarm threshold ppm	
			ppm	mg/m ³			1	2
Acetone	C ₃ H ₆ O	2.00	500	1200	(0)20 .. 500	(0)50 .. 10000	500	1000
Ammonia	NH ₃	0.59	20	14	(0)20 .. 300	(0)30 .. 10000	50(500)	200(800)
Butyl acetate	C ₆ H ₁₂ O ₂	4.01	200	950	(0)20 .. 1000	(0)50 .. 10000	200	400
Dimethylether	C ₂ H ₆ O	1.63	1000	1910	(0)20 .. 1000	(0)50 .. 5000	1000	1500
Ethanol	C ₂ H ₆ O	1.59	1000	1900	(0)20 .. 500	(0)50 .. 10000	250	1000
Ethyl acetate	C ₄ H ₈ O ₂	3.04	400	1400	(0)20 .. 1000	(0)50 .. 10000	400	600
Frigen R 22	CHClF ₂	2.98	500	1800	(0)30 .. 1000	(0)50 .. 5000	500	800
n-Butane	C ₄ H ₁₀	2.05	1000	2350	(0)20 .. 500	(0)50 .. 10000	000	2000
n-Hexane	C ₆ H ₁₄	2.79	50	180	(0)20 .. 1000	(0)50 .. 10000	500	1000
n-Pentane	C ₅ H ₁₂	2.49	1000	2950	(0)20 .. 1000	(0)50 .. 10000	1000	2000
Propane	C ₃ H ₈	1.56	1000	1800	(0)20 .. 1000	(0)50 .. 10000	1000	2000
Solkane/ Frigen R 134a	CH ₂ F-CF ₃	3.45	1000		(0)20 .. 500	(0)50 .. 5000	100	400
Toluene	C ₇ H ₈	3.18	50	380	(0)20 .. 1000	(0)50 .. 10000	500	1000

Gas list for IR 24

Gas	Chemical formula	Gas density (air=1)	TLV (TRK*)		Minimum range ppm	Maximum range ppm	Resolution ppm	Alarm threshold ppm	
			ppm	mg/m ³				1	2
Carbon dioxide	CO ₂	1.52	5000	9000	0 .. 10000	0..5..100	1 (100)	300 (5000)	500 (10000)

Excerpt taken from GfG Gas list. Transmitters for other gases and ranges are available.
For combustible gases, oxygen and gas mixtures further transmitters are available.
Please ask for special catalogues.

* TLV (Threshold Limit Value) TRK (Technical Guideline Concentration, Germany)

** CI 21 for ammonia only

Transmitter

Technical Data

General

Gas

Toxic gases (see gas list)

Range

ppm range (see gas list)

Gas supply

Diffusion or flow adapter

Humidity

20 .. 95 % r.h.

Pressure

900 .. 1100 hPa

Cable gland

PG9

Casing protection

IP 54 / IP 68 (option)

Cable length to controller

<300 m (3 x 0.75 mm² cable)

>300 m (3 x 1.5 mm² cable)
shielded cable (LiYCY)

EC 25 EX

Response time

T₉₀ 10 – 300 seconds
(depending on gas)

Output signal

0.2 .. 1 mA or 4 .. 20 mA

Supply voltage

12 .. 24 V

Ambient temperature

-35 to +40°C
(-31 to +104°F)

Expected lifetime

2 .. 4 years
(depending on sensor)

Dimensions

120 x 122 x 95 mm (WxHxD)
(4.8 x 4.88 x 3.8 inches)

Weight

1500 g
(52.5 oz)

EX-approval

EEx ia IIC T6 (with Ex-barrier)

Type certificate

DMT-BVS-No. 91C2033
Type: MWG 2500

EC 24

Response time

T₉₀ < 5 seconds
(depending on gas)

Output signal

0.2 .. 1 mA or 4 .. 20 mA

Supply voltage

18 .. 24 V, 4mA

Ambient temperature

-15 to +45°C
(+5 to +113°F)

Expected lifetime

>2 years (for toxic gases)

Dimensions

80 x 185 x 60 mm (WxHxD)
(3.2 x 7.4 x 2.4 inches)

Weight

980 g
(34.3 oz)

CS 24

Response time

T₅₀ < 8 seconds
(depending on gas)

Output signal

0.2 .. 1 mA or 4 .. 20 mA

Supply voltage

18 .. 24 V (max. 26V), 300 mA

Ambient temperature

-40 to +60°C, -20 .. +40°C tested
(-40 to +140°F, -4 .. +104°F tested)

Expected lifetime

Approx. 5 years

Dimensions

80 x 125 x 57 mm (WxHxD)
3.2 x 5 x 2.28 inches)

Weight

980 g
(34.3 oz)

EX-approval

EEx dem [ib] IIC T6, Ex s IIC
Ex s IIC T6
BVS-No. 94.C.20714 /
94Y60034
Type: MWG 2400

CI 21

Gas

Ammonia, NH₃

Detection range

0 .. 200 / 0 .. 1000 / 0 .. 10000 ppm

Humidity

0.1 .. 99 % r.h.

Ambient temperature

-35 to +55°C
(-31 to + 131°F)

Response time

T₉₀ < 8 seconds
(depending on gas)

Output signal

0.2 .. 1 mA or 4 .. 20 mA

Supply voltage

10 .. 32 V

Expected lifetime

Approx. 2 years

Dimensions

100 x 100 x 57 mm (WxHxD)
(4 x 4 x 2.28 inches)

Weight

370 g
(12.95 oz)

CS 21

Response time

T₅₀ < 8 seconds
(depending on gas)

Output signal

0.2 .. 1 mA or 4 .. 20 mA

Supply voltage

10 .. 32 V, 300 mA

Ambient temperature

-30 .. +55°C
(-22 to +131°F)

Expected lifetime

Approx. 5 years

Dimensions

100 x 100 x 57 mm (WxHxD)
(4 x 4 x 2.28 inches)

Weight

370 g
(12.95 oz)

IR 24

Response time

T₅₀ < 8 seconds

Output signal

0.2 .. 1 mA or 4 .. 20 mA

Ambient temperature

-20 to +45°C
(-4 to +113°F)

Expected lifetime

Approx. 5 years

Dimensions

10 x 145 x 80 mm (WxHxD)
(0.4 x 5.8 x 3.2 inches)

Weight

780 g
(27.3 oz)

We reserve the right of
modification



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Singapore: ccchek@pacific.net.sg | South Africa: gfgsa@icon.co.za |

Worldwide Supplier of Gas Detection Solutions

The complete range



GfG Service

A thought-out system of service performance ensures the reliability of your portable and fixed gas monitoring equipment. Quick and skilled support by GfG's experts guarantees the safety for operation and maintenance of your detectors.

GfG Competence

For over 40 years GfG engineers have proved to be the specialists for all gas-induced problems. The mining industry with its particularly harsh environment has been a good master. A strong team of R&D engineers use state-of-the-art technologies to make GfG gas detectors even more capable and user-friendly.

GfG Worldwide

GfG is represented all over the world by its distribution network. Moreover GfG has subsidiaries in the U.S.A., South Africa, Switzerland and Singapore.