Transmitter IR24

for carbon dioxide (CO_2)

- Reliable CO_2 detection
- Transmitter with infrared (NDIR) sensor
- One-man calibration at site
- Output 0.2 .. 1 mA or 4 .. 20 mA
- Long lifetime, reduced cost of ownership

Worldwide Supplier Of Gas Detection Solutions

Transmitter with NDIR-sensor for CO_2

CO_2 - a toxic danger

Carbon dioxide (CO_2) is used in many applications. It is stored, transported or it occurs as a waste product. The special characteristics of CO_2 make this gas a sneaking danger: CO_2 is much heavier than ambient air and quickly collects in pits, mines, hollows and cellars building up dangerous concentrations. Only 4 Vol.-% is enough to show intoxication. More than 8 Vol.-% can be lethal. Additionally the risk of suffocation increases with deficiency of oxygen. The human sensory organs cannot detect carbon dioxide: Carbon dioxide is completely odor- and tasteless. GfG`s fixed gas detection systems allow an early detection of gas hazards at any time. It also allows quick and early counter measures. A gas detection system comprises a transmitter and a controller (e.g. GMA41, GMA81, GMA101, GMA301), connected with a cable. The controller supplies the transmitter with the necessary voltage and evaluates the sensor signal.

Extremely reliable

The reliability of a gas warning system depends to a high degree on the transmitter used. The transmitter is mounted in a place where CO_2 occurs. Also very low gas concentrations will be detected safely with the transmitter IR24. This concentration will be converted into a signal which is transfered to the gas detection system.

Infra-red detection principle

The infra-red sensor uses the characteristics of gases to absorb light in certain ranges of the spectrum. The NDIR-technique reliably and precisely measures the carbon dioxide concentration. The infra-red light emitted by a lamp passes the measurement distance through the gas sample. The gas absorbs the light, thus reducing the radiation energy. The amount of absorption of infra-red radiation in a certain range of wavelengths depends on the concentration of the gas to be measured. Detectors measure the energy reduction of the infra-red radiation caused by absorption.
Water vapour and other gases within the sensor housing do not affect the absorption of light in this spectral range. The use of the infra-red principle is also possible in inert atmospheres and even when high gas concentrations prevail. This principle can be used when catalyst poison like silicones, sulfide compounds, freons, halogens and lead compounds occur. Changing beam sources or dirty mirrors does not affect the accuracy of the measurements.

Reliable measurement results, even with high variations in temperature

The detection with the precision of light enables a high reliabilty and reproduceability of the measurement. The IR detection principle is as exact as a fingerprint in criminology. That means, that no other gas besides carbon dioxide affects the measurement. False alarms by further gas components are impossible. GfG transmitters provide an electronic voltage stabilization and temperature compensation. That´s why stable measuring results are reached even with variation of temperature.

Concentration in Vol.-%	Effect on human body	Incidence
>10,0	Unconsciousness, attacks, death in a few seconds	Candle burns out
10,0	Strong activation of the heart, headache, dizziness, muscular attacks	
7,0		
6,0	Changing ECG	
5,0	Strong activation of the blood flow, the kidneys and the brain	Muscular attacks
4,0		Exhaled air
2,0	Hard respiration, increased pulse headache, tinnitus, hypertension	
1,0	**Short term exposure level (STEL)**	
0,7		Big crowds in rooms (e.g. cinema)
0,5	**Threshold Limit Value (TLV = 0,5 Vol.-%)**	
0,3		High concentration in offices
0,15	**Hygienic inner room air level**	
0,1 0,07	Sensitive persons get a headache	High concentration in offices Ambient air in cities
0,03		Fresh air

Transmitter with NDIR-sensor for CO_2

Robust technique for long lifetime

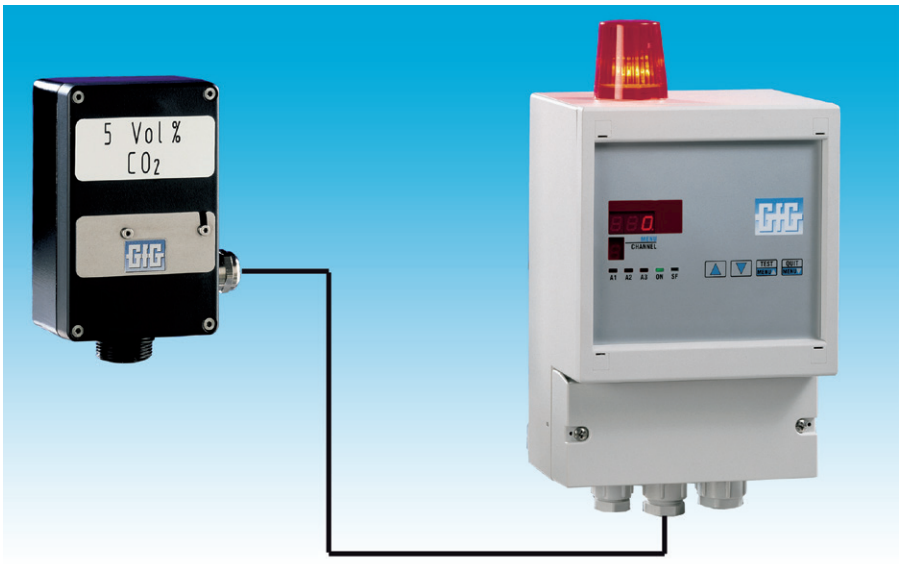
The IR24 does not contain any moving parts, which may be subject to wear and tear. This ensures a long lifetime and low maintenance cost. Additional safety is provided by the permanent self-check and function test by the GMA controller. Sensor and electronics are protected in a solid enclosure from dust and water according to IP54. This ensures that splash water cannot enter the detector, even in wet environments.

Easy handling

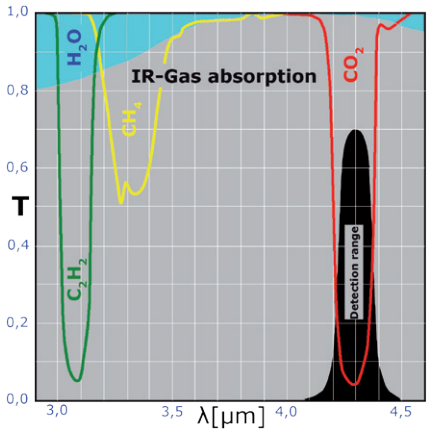
Behind a service lid on the front of the IR24 you find potentiometers and test connectors for easy adjustment of zero point and span. This allows one-man calibration at site and reduces service down-time.

Quality control for additional safety

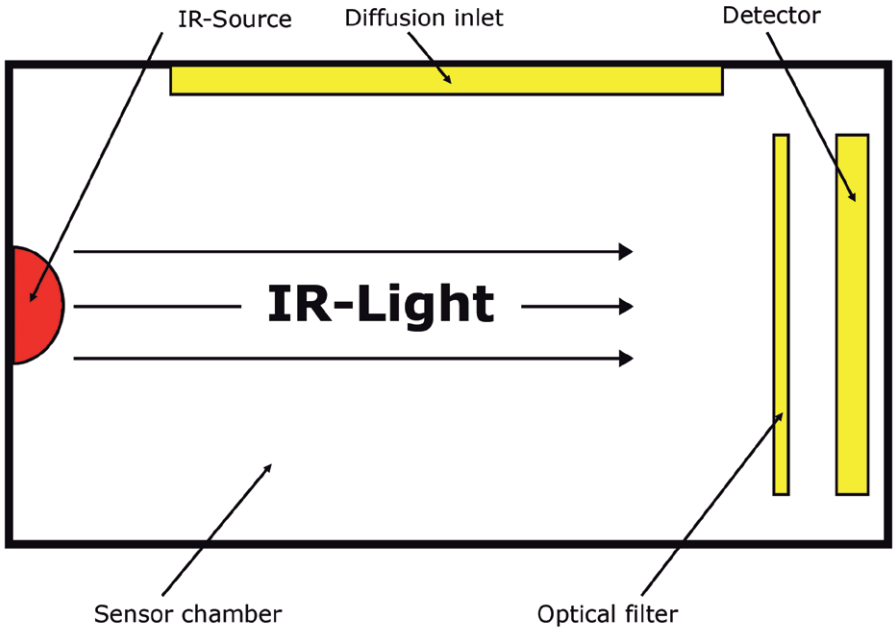
All GfG transmitters are subject to 100% quality control. Installation is easy; since the transmitters are calibrated before shipment, the service engineer does a quick readjustment when putting them into operation.



GMA81 A with IR24



Gas absorption of the IR detection principle



Simple presentation of the IR detection principle

Transmitter IR24 at a glance

- Selective NDIR detection principle
- Long sensor life for reduced cost of ownership
- Easy handling
- Output signal 0.2 .. 1 mA or 4 .. 20 mA
- Potentiometers for easy adjustment of zero point and span
- Connectors for test of output signal
- Solid aluminium casing, IP54
- High reliability and repeatability of measurement results of very low and even of very high concentrations
- Very resistant against catalyst poisons
- Wide detection range
- Excellent long-term stability

Transmitter with NDIR-sensor for CO_2

Calibration 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.

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.

Weather protection
The transmitters´ protective casing is durable in harsh environments where there are dirt, rain and unstable temperatures.

Thermostat
The temperature at the sensor is kept constant by an electronic thermal switch. That keeps the high accuracy of measurement even when environmental temperature changes. Additionally the thermostat prevents the creation of condensate on optical components.

Transmitter IR24 Technical Data

Gas:
Carbon dioxide (CO_2)

Detection range:
0 .. 5 Vol.-%
(other detection ranges on request)

Detection principle:
NDIR
Single-beam system,
temperature compensated

Gas supply:
Diffusion

Response time:
t_{90} < 25 seconds

Expected sensor life:
5 years

Humidity:
0 .. 99 % r. h.
non-condensing

Pressure:
800 .. 1200 mbar

Ambient temperature:
-20°C .. +40°C

Casing protection:
IP54

Cable gland:
PG 11

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

Power supply:
18 .. 26 V, 100 mA

Dimensions:
100 x 145 x 60 (W x H x D)

Weight:
approx. 550 g

Accessories:
Calibration adapter
Weather protection
Sampling system

GfG Europe Ltd
710 Avenue West ▪ Skyline 120 ▪ Great Notley
Essex ▪ CM77 7AA ▪ United Kingdom
Tel: +44 (0)1376 342236 Fax: +44 (0)1376 341741
info@gfgeurope.com ▪ www.gfgeurope.com