

Technical Specifications and User Guide for GC20R Detector

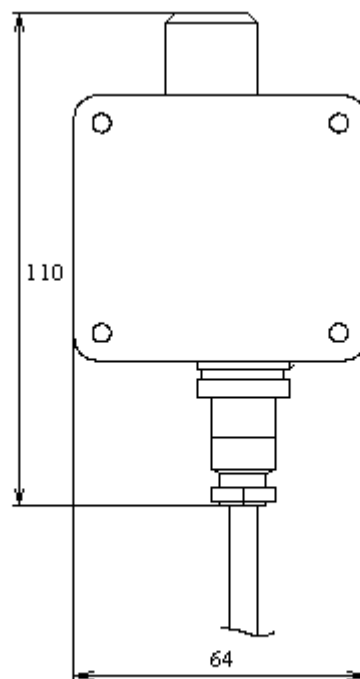
The GC20R detector is a stationary electronic device designed to detect the presence of a refrigerant in the air. Its task is a timely signalling of refrigerant leaking into the air. It is designed for the detection of a refrigerant based mainly on tetrafluoroethane, mainly in industrial and commercial settings.

In the detector, we use a non-selective heated semiconductor sensor that reacts to the presence of a wide range of refrigerants such as R134A, R404A, R407C, and R410A. Precise adjusting for a specific application is achieved by calibration via required specific controlled substance. The field of application includes refrigeration and air conditioning equipment, various storages, or technological businesses using refrigerants.

The detector can be used separately or in a group of several pieces. Each detector is a separate unit requiring 12V DC supply and its output is a two-stage signal indicating whether the set level of the gas concentration is or is not exceeded. The detector comprises two separate outputs, allowing monitoring of two different levels of concentration. The output element on both levels is a switching transistor with open collector.

The printed circuit board carries adjusters which allow choosing the desired level of monitored concentration and control some of the detector parameters. The user can choose the output signal polarity or a memory function for one of the outputs.

The GC20R detector is attached by a slip-on clip and the electronic connection is provided with a connector with a locknut. The detector output can be connected to a suitable higher-level system or if a power supply source NZ23(-DIN) is provided, it can be used for enhancing the output signal in a stand-alone mode.



GC20R

Technical Specifications

Detected gas	refrigerants - primarily gases based on tetrafluorethane (standard calibration - R134A)
Signalling	two-stage (two outputs)
Outputs	open collector transistor (60 V / 0.3 A)
Warm-up time	about 1 minute
Default signaling level (other settings can be agreed upon with the customer)	1000 ppm for stage II and 300 ppm for stage I
Measuring range	100 - 1500 ppm
Response time	< 10 sec
Recovery time (reset)	< 2 minutes
Supply voltage	12 V DC +/- 10%
Current consumption	max. 130 mA
Protection	IP20
Weight	about 150 g
Operating environment	AB4 according to EN 33-2000-3 without the danger of explosion
Storage temperature	-20 to 50 °C / non-condensing humidity
Dimensions without the bracket	110x64x35 mm
Detector connection	multicore (4) cable, diameter 5 mm; for a distance over 5 m use shielded cable
Constructed according to	ČSN EN 14624

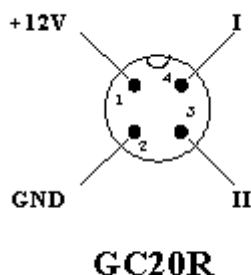
Function Description

To detect gas, GC20R uses heated semiconductor sensor. This sensor is not-selective, it reacts in the presence of any flammable substance in the air. After connecting the supply voltage, which is indicated by a green light, the sensor starts to warm up.

Until the operating temperature is reached (about 15-20 seconds) the sensor response corresponds to the state of the detected gas presence. During the warming-up period, the detector outputs are blocked - the detector does not respond to the presence of any gas. This is indicated by a yellow LED. After the sensor is heated to the adequate temperature, yellow LED turns off and the detector is ready for operation. When the preset gas concentration emerges, the corresponding output (by setting the corresponding switches - see below) changes its status.

Detector Connection

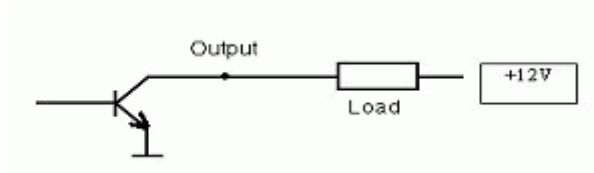
The detector is connected into the detection system via 4 wires. The GC20R detector is connected by clip-in connector with a locknut. The supplied connector comes by default with a 2 m cable.



Wire	Cable color	Usage
+12V	Brown	Detector positive supply voltage. The detector power supply can be provided by an output voltage of a higher-level system or by a power supply source NZ23, NZ23-DIN. We recommend using a surge protector on the system power supply input.
GND	Green	Common wire (ground). A wire with a reference potential for the power supply and output signals.
II	Yellow	Stage two output. Switching at the concentration exceeding the trimmer II setting or at the sensor failure.
I	White	Stage one output. Switching at the concentration exceeding the trimmer I setting.

Outputs Connection

Outputs II and I indicate exceeding of the preset concentration level II and I. Both outputs II and I are connected as open collector transistors, i.e. they switch on the load connected to a + supply voltage.



The terminals are connected directly to the output transistor, there are no additional protective transistor circuits on the circuit board. When switching on e.g. inductive loads, it is necessary to use external protective elements.

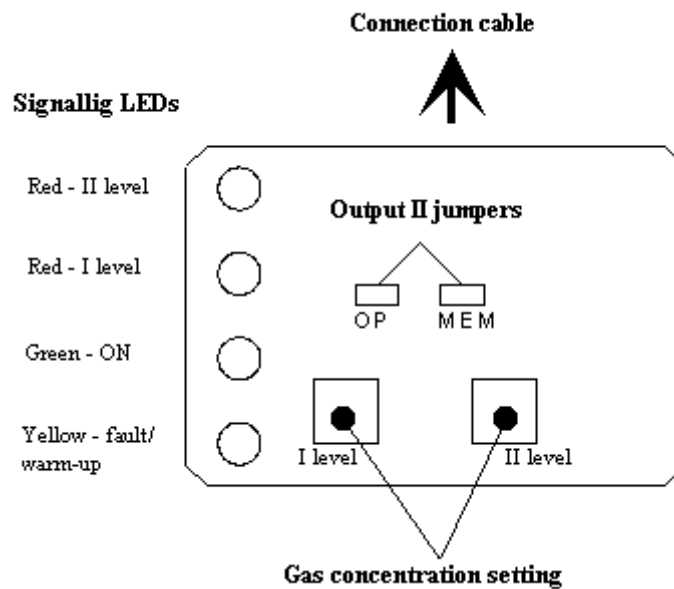
For output II, the circuit board contains a jumper (see below) that allows choosing the idle state of the output transistor.

OP jumper short	The output transistor is switched on when idle - the current is conducted (the power supply and the detector are without fault and the preset concentration level is not exceeded).
OP jumper open	The output transistor is switched off when idle - the current is not conducted (the detector is without fault and the preset concentration level is not exceeded).

While warming up to the operating temperature after switching on the detector, none of the two outputs is active, i.e. they do not indicate the presence of gas in the air.

Operating and Signaling Elements

For operating the detector functions and signaling its state, the circuit board contains several controls.



Monitored Gas Concentration Setting

The monitored gas concentration level for each stage is set by a trimmer. Each stage has a separate trimmer. Turning the trimmer counter-clockwise, a higher concentration of gas can be set (see figure below).

The trimmer for the stage II adjusting determines the watched gas concentration for the output II. By the standard adjustment the gas concentration for the stage II is 1000 ppm and the stage I switching-on by the gas concentration of 300 ppm.



Output II Setting

The output II switching transistor function can be regulated by two jumpers. The OP jumper determines the switching transistor idle state and its function was described above.

The MEM jumper allows setting the output II memory function. When the jumper is short, the output indicates the presence of gas even after the gas concentration falls below the preset level. This can be canceled only by switching off the supply voltage or removing the MEM jumper. If the jumper is open, the output monitors current status of exceeding or non-exceeding the concentration level.

Indicator Lights

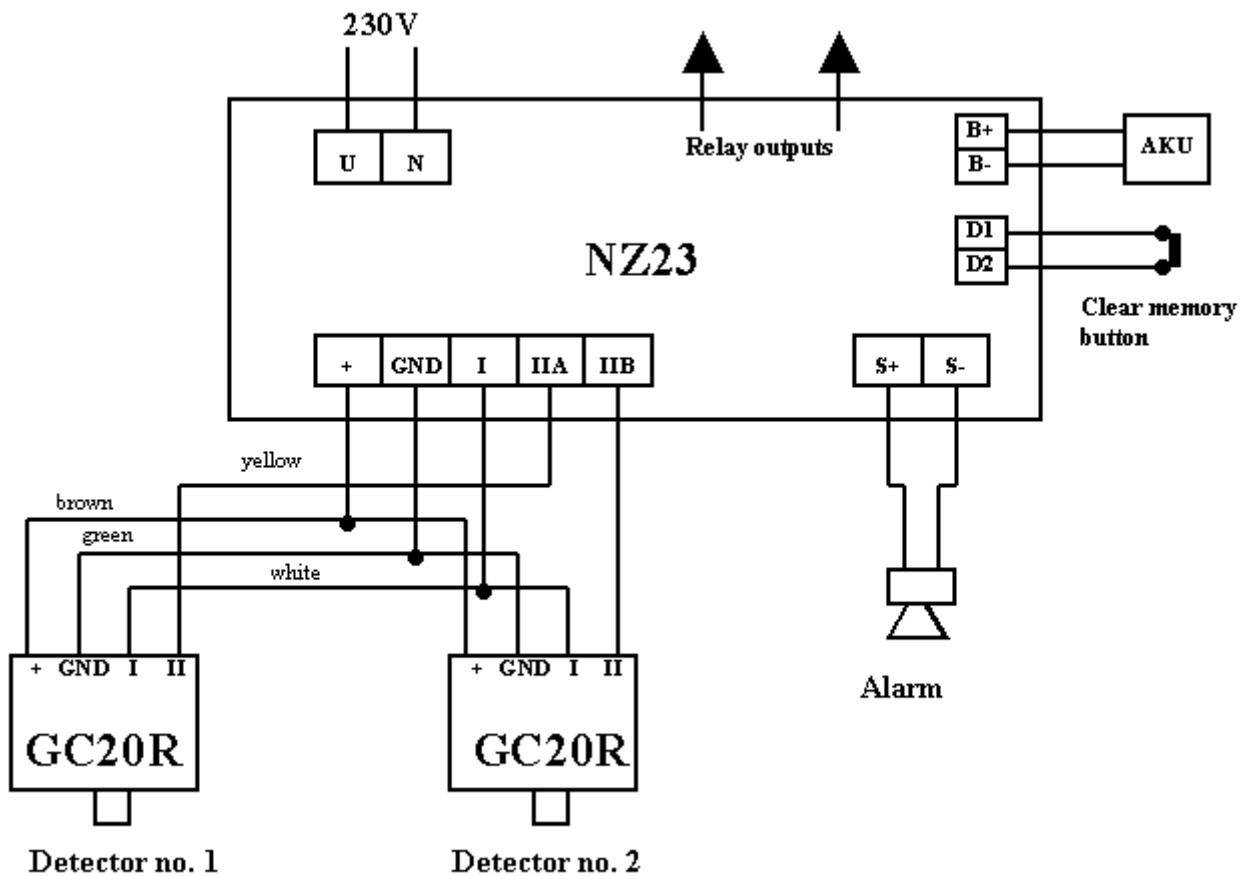
The detector state is optically indicated by means of four LEDs with a diameter of 5 mm.

Green	The detector is activated and powered by supply voltage
Yellow	Sensor warming-up after activation or sensor failure (damage on heating component)
Red	First stage of exceeding the concentration level
Red	Second stage of exceeding the concentration level or sensor failure

Example of Installation

The following figure shows an example of a simple configuration for monitoring two different locations. Two detectors together with a power supply NZ23 are used. Three signal wires (+12 V, GND, I) are in a parallel connection. The detectors' outputs II are routed into separate power supply inputs. In this way each detector is provided with a separate indicator light in the power supply for indication of the second stage of exceeding the concentration level. In this configuration, it is recommended to set the second stage output signal of both, the power supply and the detectors, to the opposite polarity (switched on when idle).

The remaining terminals of the power supply NZ23 are connected in a standard way. The relay outputs can be used to control actuators according to the customer's needs.



Detector Location

When installing the detector in a building it is recommended to comply with the physical properties of a particular monitored gas. To secure a large object, we recommend the individual detectors to be spaced not more than 10 meters from each other and not more than 5 meters from the wall.

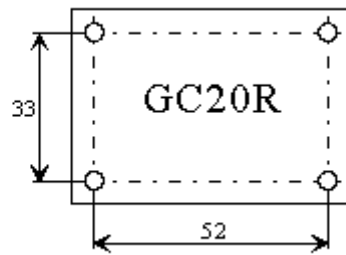
Usage Limitations

The GC20R detector is designed to detect the presence of refrigerant in a standard atmosphere. We do not guarantee correct detection at low or high oxygen concentration. The use of the device in an environment where there may be special chemical substances, e.g. those based on sulphur, arsenic, or phosphorus, can lead to the so-called sensor "poisoning". Possible applications in such environment must be consulted with the manufacturer.

Sensor is designed for normal non-corrosive environment.

Detector Accessories

- Ampoule with test substance
- Metal mounting bracket (see figure below)



Service

Any repairs or technical assistance can be provided at:

J.T.O. System, s.r.o., 1. máje 823, 756 61 Roznov pod Radhostem, CZ, tel. +420 571 843 343

If the device is taken out of service, it must be disposed in environmentally friendly way - i.e. brought to the designated collection point for disposal of electronic waste.