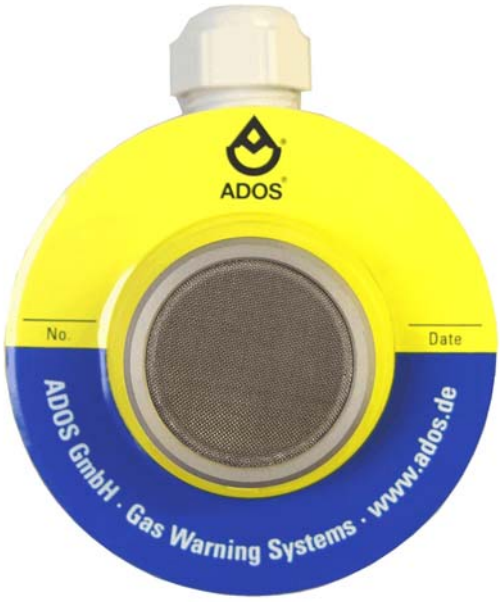
ADOS®

TOX 592 CO

Operating Instructions

Chemical Gas Sensor for Measuring Carbon Monoxide

(according to German VDI 2053 recommendations)



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1. Function

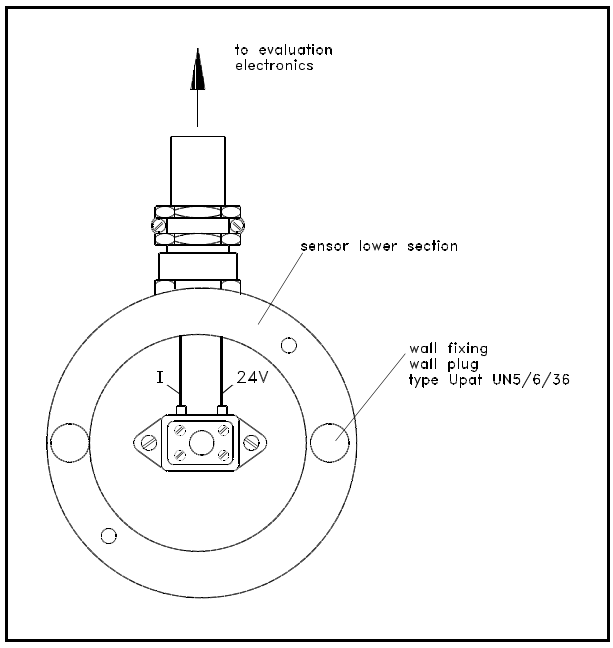
The carbon monoxide gas sensor, ADOS 592 CO functions with a chemical measurement cell, in which the air for sampling is diffused.
At the electrodes, the released H^+-ions and electrons are consumed in a cathode reaction.

The current produced between anode and cathode, is proportional to the concentration of CO in the air being sampled.

The sensor current is amplified and via a 4-20 mA interface using 2-wire techniques, is fed to the evaluation electronics which process the measured value and displays the value as the concentration, as well as completing any control and warning functions.

2. Construction

A sensor consists of a two-section round housing, where the top section contains the measuring element and the lower section has the wall-fixings and is for connecting the fixed measurement signal cable. The sensor head is complete with a filter cartridge, the chemical measurement cell and evaluation electronics. The small filter cartridge filters dust, etc. and prevents errors in the chemical cell due to cros-sensitivity, compared to other gases. The electronics section is polarity-protected, so that an unintentional wrong connection of the signal cable will not causes any serious damage.



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Measurement signal cable, fixed to evaluation electronics.

e.g. 2 x 0.25 mm^2 for 500 m length of line
2 x 0.50 mm^2 for 1 km length of line
2 x 0.80 mm^2 for 2 km length of line
2 x 1.50 mm^2 for 5 km length of line

The length details given, include the forward and return paths.

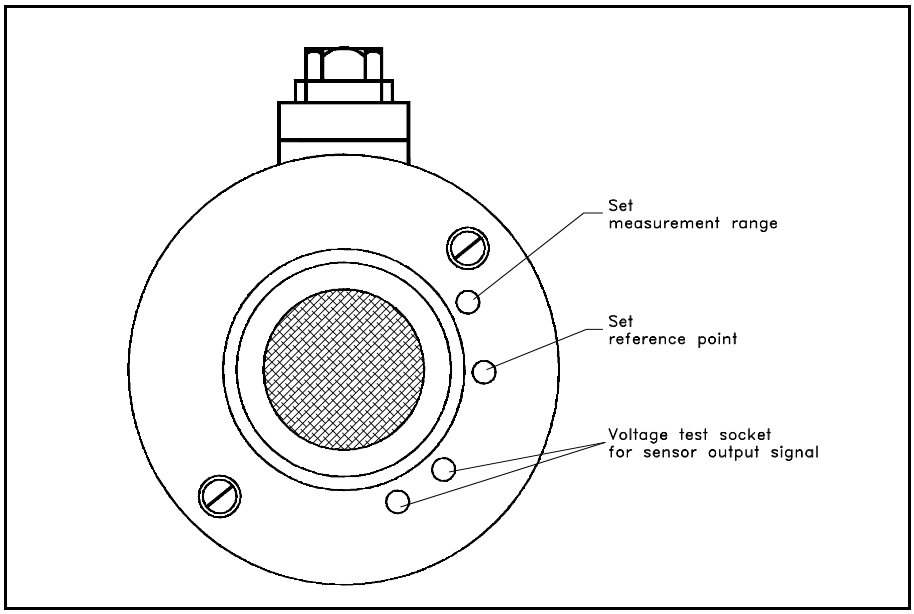
Screened signal cables (2 x 0,5 mm^2) are preferred.

When using multi-way cables in one sheath (16 x 0,5 mm^2), at least 2 cables must be included for the 24V supply.

The screening must be connect only to the Ground connection of the test instrument.

The screening is effective only when one end of the screening is connected.

3. Calibrating the gas measurement cell, ADOS 592 CO



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The test unit must be in operation for at least two hours, before calibrating the gas sensor.
As reference gas, synthetic air, free of CO is to be used. A suitable test gas adapter must be used for connecting the test gas to the measurement cell. This adapter must not cause any pressure bulid-up in the flow of calibration gas to the measurement cell, otherwise, calibration errors will be produced.

The steps given below, must be followed:

Connect a voltmeter to the test gas sockets.
4 mA Sensor output signal corresponds to 0,204 V = 0 ppm CO
20 mA Sensor output signal corresponds to 1,02 V = 300 ppm CO

Example: Test gas 250 ppm CO

$$V = \frac{(1{,}02\ V - 0{,}204\ V) \times 250\ ppm}{300\ ppm} + 0{,}204V = 0{,}884V$$

The test gas flow-through should be set at 40 l/h

Reference point setting:

1. Connect the reference gas via the test gas adapter to the measurement cell.
2. When the sensor output signal settles to a constant value, adjust the reference potentiometer for 4mA (=204 mV) sensor output signal.

Setting the measurement range:

1. Connect the CO-test gas in synthetic air to the test gas adapter
2. When the sensor output signal settles to a constant value, align the sensor output signal with the range potetiometer.

4. Maintenance

The following maintenance (or upkeep) work is based on checks twice yearly, which must be completed only by trained personnel.

The End-user can undertake a Maintenance contract with the manufacturer, ADOS GmbH, where the servicing is completed by the company's own customer service.

Once each year, a complete functional check must be made of the gas measurement system by qualified technical inspectors.
The technical commissioning and acceptance, according to german VDI 2053 standards, is nullified when components are used as replacements which are not identical to the original components of the commissioned equipment.

Maintenance work can be divided into testing the sensor ADOS 592 CO and testing the Multitronik 592.

On all sensors being used, the calibration checks outlined in section 3, must be completed since over a period of time, the chemical sensors lose some of their sensitivity.
For this reason, once a loss of sensitivity has been established, the chemical sensor must be replaced and re-calibrated.

Each sensor contains a filter cartridge that must be replaced if found necessary.
The filter cartridge prevents error indications of the chemical sensor due to cross-sensitivity, compared to other gasses.

5. Technical Data, Gas Sensor ADOS 592 CO

Sampled substance	:	CO
Measurement range	:	0-300 ppm CO other ranges by request
Reference point error	:	< 10 ppm CO
Level value oscillation	:	< 3 ppm CO
Accuracy	:	± 3% of f.s.d.
Reference point drift	:	< 2% (1 year)
Repeatability	:	< 2% (1 year)
Linearity	:	< 2% of f.s.d.
Settling time (T90-time)	:	< 60 seconds
Cross-sensitivity	:	< 2% with integrated filter
Interface	:	2-wire current interface, 4-20 mA
Operating voltage	:	15 - 24 V depending on max, load: 100 Ω - 500 Ω
Ambient temperature	:	-10 bis 40°C Sensor temperature compensated over this range
Dimensions	:	80 mm diameter, 80 mm high.
Material	:	Aluminium
Weight	:	0,6 kg
Expected lifetime	:	2 years
Warranty periode	:	1 year