GTA-65 Series

GasTech Australia Pty. Ltd.

Instruction Manual

65-1001-CO sensor and amplifier

Manual Version 20112001

Specifications

Detection Method	**Electrochemical**
Output	**4-20mA**
Alarm relay (optional)	**Two adjustable 24V 3A DC (Order Model 73-1000)**
Nominal Range	**0-100ppm**
Maximum Overload	**5000ppm**
Estimated Operating Life	**Greater than Five Years in air**
Onboard Filters	**To remove H_2S**
Temperature Range	**-20°C to +50°C**
Pressure Range	**Atmospheric +/- 10%**
T_{90} Response Time	**<60 seconds**
Long term output drift	**<5% signal loss/year**
Repeatability	**1% of signal**
Output Linearity	**Linear**
Power Requirements relay option)	**10-30VDC (16 to 30 VDC**
Output Impedance	**4 Megohm**
Warranty	**2 year**

Introduction

In many applications it may be more cost effective to replace a sensing head with one pre-calibrated at a testing station or laboratory, so reducing disruption of the measuring system. To enable this, the GasTech Carbon Monoxide Gas Sensor is supplied as a 4-20mA transmitter comprising a five electrode Toxic Gas Sensor and a rectangular printed circuit board (PCB) acting as a temperature compensated Amplifier. The prime features of these units are ease of use, compactness, and the ability to replace both sensor and electronics very quickly.

The PCB has an amplifier circuit to convert the micro amp level output signal of the sensor to the industry standard 4-20mA output for two wire, remote monitoring systems. The circuit employed imposes no constraints on the sensor, so the performance characteristics of the sensor are unaltered by the addition of the circuit board.

Built In Test (BIT) the built in test is unique to our sensor. The sensor has a small gas-generating cell fitted to the back of the sensor. When a magnet is placed on the face of the housing between “Gas Type” and “Range”, a reed switch automatically activate the BIT test. This will run for about 10 seconds. A successful BIT activation is indicated by the green LED located to the right of the sensor port will brighten then glow red. The BIT test does not remove the need for gas calibration, this feature is a confidence check so the operator can check to see if the sensor is operating. During the BIT the mA signal should go high for a successful test. A 28-30mA signal is normal for a new sensor.

Every transmitter is supplied pre-calibrated for a customer specified range. The table below gives an indication of the ranges available for each particular sensor. For a full list of ranges please refer back to

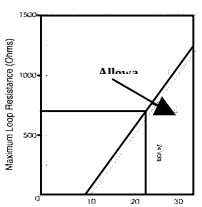
GasTech Australia Pty Ltd. Any sensor can be re-calibrated to an intermediate range, using the calibration procedure detailed in the section Calibration.

Except for periodic re-calibration, transmitters are maintenance free, and should give faultless service throughout the working life of the sensor. It is a matter of customer choice whether the unit is replaced automatically at the time of re-calibration or when the sensor fails to calibrate. Operational experience will indicate the most cost effective method of managing the periodic re-calibration requirements.

Power Supply

Transmitters can be operated with any power supply within the range 10 to 30 VDC. However the power supply used will impose constraints on the total loop resistance in the external circuit, and this must be taken into account when selecting the supply voltage. This includes the measuring resistor at the remote receiver and any meters for calibration etc. The following example illustrates the relationship between the two parameters.

Relationship between Power Supply Voltage and Total Loop Resistance



Supply Voltage

For example:

Using a transmitter with a standard 24V supply the total allowable resistance is as follows:

The minimum voltage required at the transmitter for operation is 10 volts.

Therefore the maximum potential drop allowed due to loop resistance is 14V.

Full scale deflection current requirement: 20mA
maximum loop resistance allowable (using Ohms Law):

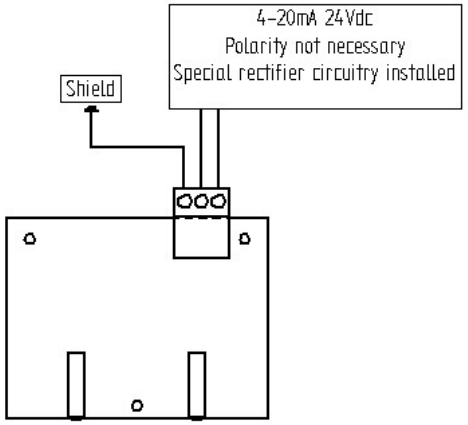
R = V/I

R = 14x1000 20
R = 7OOOhms

In this case a measuring resistor of 250 Ohms is appropriate, giving a scale of 1V to 5V.

Calibration

GasTech transmitters are supplied pre-calibrated and the sensitivity of the device should not drift more than 1.2% of full signal per month. Potentiometers for routine span and zero adjustment are located on the circuit board.



For calibration purposes, the signal may be monitored using either a local meter connected across TP1 and TP2 for mV or TP3 and TP4 for mA, or by a remote receiver. A small non-metallic screwdriver, with a 1.2 x 0.5mm tip, is required to adjust the potentiometers. Although in practise, the calibration procedure will be dictated by the hardware system employed, the following procedure will generally apply:-

1. Gain access to the span and zero calibration potentiometers.

2. Ensure the sensor is free from the gas being measured either by purging with an inert gas.

3. Adjust the zero potentiometer until 0ppm is indicated in the measuring system. At 0ppm the current generated by the transmitter should be 40mV across TP1 and TP2 and 4mA across TP3 and TP4.

4. Apply a test gas of known concentration to the sensor using a suitable flow rate of 0.5-1L per minute. The concentration of gas used for calibration should ideally be between 20 and 50% of range.

5. Wait for a stable reading. A two-minute exposure is normally suitable.

6. Adjust the span potentiometer until the correct reading is shown in the measuring system, or either:

The current (mA) in the system is

$$\{\frac{16 \times (\text{gas concentration})}{\text{Range of sensor}}\} + 4$$

Example

1. Calibrating a carbon monoxide transmitter with a **range of 0 – 150ppm** using a calibration gas of 50ppm:

   $(\text{mA}) = \frac{(16 \times 50)}{150} + 4 = 9.3\text{mA}$ or 93mV

2. Calibrating a carbon monoxide transmitter with a **range of 0 – 150ppm** using a calibration gas of 100ppm:

   $(\text{mA}) = \frac{(16 \times 100)}{150} + 4 = 14.7\text{mA}$ or 147mV

3. Calibrating a carbon monoxide transmitter with a **range of 0 – 100ppm** using a calibration gas of 50ppm:

   $(\text{mA}) = \frac{(16 \times 50)}{100} + 4 = 12.0\text{mA}$ or 120mV

Spare parts

65-1001	CO sensor for 65-1001-CO
57-1001A	Amp 65 series CO sensor
81-0001A (CO only)	Magnet for BIT activation
81-9979-01	CO 100ppm in N2 103L disposable cylinder
81-9998	Regulator set flow 0.5Lpm
81-9001A	Calibration adaptor 65 Series CO 65-1001A