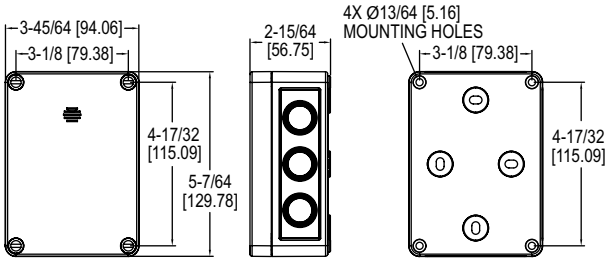
Model CMS300 Carbon Monoxide Transmitter and Switch

Specifications - Installation and Operating Instructions



The **Model CMS300 Carbon Monoxide Transmitter and Switch** provides a field selectable current or voltage output that is proportional to the carbon monoxide concentration in underground parking garages, vehicle maintenance facilities, or mechanical rooms. An integral relay can be used for alarm conditions and is configured with preset jumper selectable ranges of 25, 60, or 150 PPM. Field calibration can be done by using Dwyer Instruments Model GCK-200CO-2000CO2 calibration gas, Model A-507 calibration adapter, and the on-board zero and span potentiometers.

⚠ WARNING Disconnect power supply before installation to prevent electrical shock and equipment damage. Make sure all connections are in accordance with the job wiring diagram and national and local electrical codes. Use copper conductors only.

CAUTION Use electrostatic discharge precautions (e.g., use wrist straps) during installation and wiring to prevent equipment damage.

CAUTION Avoid locations where mechanical shock or vibration, excessive moisture or corrosive fumes are present.

CAUTION Do not exceed ratings of this device; permanent damage not covered by warranty may result. The 4-20 mA wiring configurations are not designed for AC voltage operation.

INSTALLATION

NOTICE These are general guidelines. Local laws or ordinances will take precedence.

- The transmitter should be mounted at normal breathing height, approximately 5 to 6 ft above the floor.
- The unit may be mounted in the horizontal or vertical position. It should be mounted in an area that is shielded from direct contact with the elements or direct sunlight.
- Mount in an area that will prevent the sensor from having any direct contact with water.
- The unit should be placed in an area that will give an average of the air quality. Do not place the unit so it will receive direct engine exhaust. Prolonged exposure to direct engine exhaust may damage the sensor.

MOUNTING

1. Remove the cover plugs from the face of the unit and the top cover.
2. Remove the desired conduit fitting knock out and install conduit fitting (not provided).
3. Position the transmitter where it is to be mounted and mark the mounting holes in each corner of the housing.
4. Drill or punch out marked locations.
5. Place the transmitter box over mounting holes on wall and align. Install wall mount screws (not provided) in mounting holes.
6. Proceed with all wiring according to Figures 1 through 4.
7. Replace cover and cover plugs on the face of the unit.

SPECIFICATIONS

Sensor: Electrochemical, 5 years typical lifespan.
Range: 0-300 PPM.
Output Drift: <5% per year in air.
Temperature Effect: ±2% over range.
Coverage Area: 7,500 ft² (700 m²) or 50 ft (15 m) radius.
Accuracy: ±5 PPM or 5% of reading for 0-300 PPM (whichever is greater).
Resolution: 1 PPM.
Temperature Range: -4 to 122°F (-20 to 50°C).
Storage Temperature: For best sensor life, 32°F to 68°F (0 to 20°C).
Humidity Range: 15-90% RH constant; 0-99% RH intermittent.
Response Time: <45 s to 90% of final value.
Calibration: 15 turn span and zero adjustment potentiometers.
Housing: UV resistant glass filled polycarbonate.
Analog Output: Jumper selectable 4-20 mA (loop powered) or 2-10 V (max. load 2 kΩ).
Enclosure Rating: IP64.
Switch Type: Single-pole double-throw (SPDT).
Relay Electrical Rating: 30 VDC, 250 VAC. N/O=5 A. N/C=3 A resistive.
Set Point: Jumper selectable 25, 60, or 150 PPM.
Set Point Differential/Hysteresis: 3% of scale.
Relay Action: Factory set for direct acting.
Weight: 1 lb (0.45 kg).
Compliance: Sensor is UL recognized component for ANSI/UL-2034, UL-2075, E340403, CE.

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WIRING

Use 22-16 AWG wire for wiring to the terminal blocks. Refer to Figures 1 through 4 for wiring information. The terminal blocks are removable for ease of installation. Please see Figure 1 below for the layout of the board within the CMS300 unit.

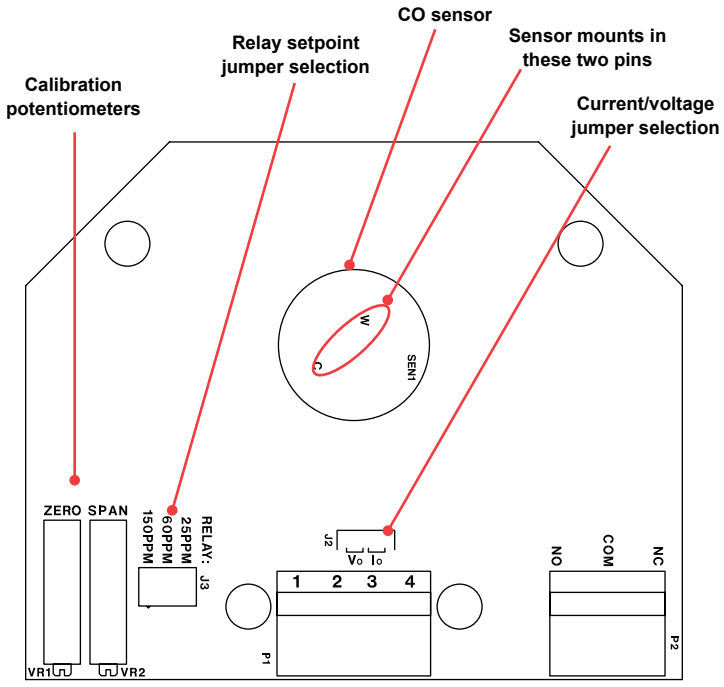

Figure 1: Circuit board layout

Power Wiring

The unit may be powered by 12-40 VDC or 15-32 VAC. For DC power, wire positive (+) to terminal 1 and negative (-) to pin 2 terminal block P1. For AC power, wire to terminals 1 and 2. See Figure 2.

Relay Wiring

Maximum relay load is 30 VAC/VDC. N/O = 5A. N/C = 3A. Wire to terminal block P2 as shown in Figure 2.

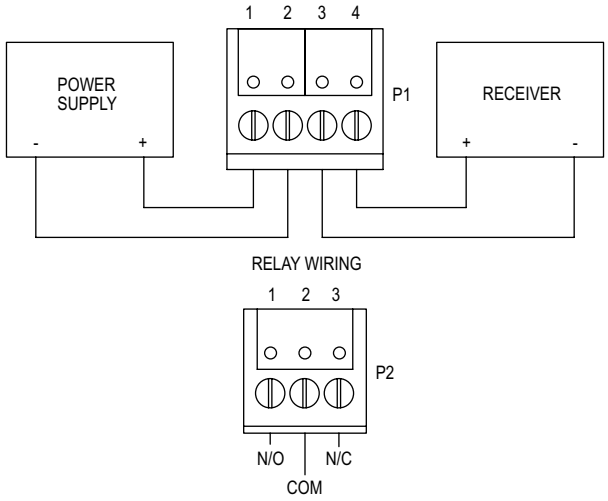

Figure 2: Current and voltage output and relay wiring

Setting the Output for 4-20 mA or 2-10 V Output

Prior to wiring the 4-20 mA or 2-10 V output, verify that the IOUT/VOUT jumper, located just behind the four terminal block P1, is in the correct position. For 4-20 mA output, the two right most pins are shorted. For 2-10 V output the two left most pins are shorted. See Figure 3 for examples.

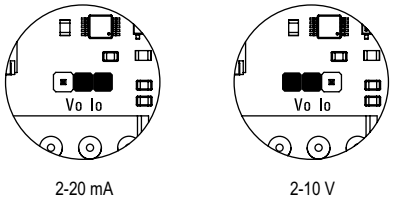

Figure 3: Output jumper positions

4-20 mA and 2-10 V Output Wiring

Wire to terminal block P1, positive (+) to terminal 4 and negative (-) to terminal 3 as shown in Figure 2. For 4-20 mA output, the maximum load resistance is 600 Ω. For 2-10 V output, the minimum load resistance is 2000 Ω, or 5 mA maximum. See Figure 2.

Setting the Relay Trip Point

The relay may be set to turn on (turn on means the relay N/O contacts close) at 25, 60 or 150 PPM. The relay has N/O and N/C contacts available. Place the shorting jumper across the appropriate pins of J3 as shown in Figure 4.

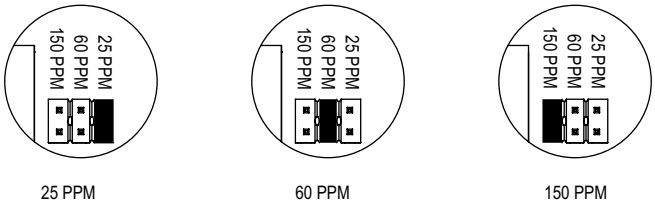

Figure 4: Relay jumper positions

NOTICE The electrochemical sensors should be stored in an environment with a minimum humidity level of 20% RH. If the sensor dries out, replacements will not be covered under warranty, but they can be revived by allowing them to stabilize in an environment above 40% RH for 10 days. Once revived, they need to be recalibrated before use.

CALIBRATION

Calibration of the Model CMS300 requires an A-507 calibration adapter, model GCK-200CO-2000CO2 calibration gas, a multimeter, and a small flat head screw driver.

1. Turn off power to the transmitter.
2. Remove the lid from the housing.
3. Replace the receiver shown in Figure 1 and 2 with a multimeter and restore the power to the transmitter.
4. Attach the tubing from the zero calibration gas to the A-507 calibration adapter.
5. Securely attach the A-507 to the CMS300 as shown in Figure 3.
6. Allow the calibration gas to flow at a rate of 0.5 to 1.0 slpm for at least 3 minutes.
7. Adjust the zero potentiometer in Figure 6 until the output reading on the multimeter reads 4 mA or 2 VDC (depending on output selection).
8. Repeat steps 4 through 6 using the span calibration gas.
9. Adjust the span potentiometer in Figure 6 until the output reading on the multimeter reads 14.67 mA or 7.33 VDC (depending on output selection).
10. Turn off the power to the transmitter.
11. Replace the multimeter with the receiver as shown in Figures 1 and 2 and restore the power to the transmitter.
12. Remove the A-507 calibration adapter.
13. Replace the lid on to the transmitter.

NOTICE If the span potentiometer on the Model CMS300 cannot restore the output to 14.67 mA, the sensor will need to be replaced.

Sensor Replacement

A replacement sensor is available from Dwyer Instruments, Inc. Order part number A-505 for a replacement CO sensor.

CAUTION Sensors contain acid. Do not attempt to open sensors. Sensors should be disposed of according to local laws.

1. Remove the cover plugs from the face of the unit and top cover. Locate the sensor, see Figure 1 – the sensor is mounted on three pin sockets. Remove and discard the sensor.
2. Remove the shorting wire spring located on the bottom of the new sensor.
3. Install the new sensor into the four pin sockets. Note – the sensor has two pins, which are shown in Figure 1. The third and fourth pin on the board is for the stability of the sensor.
4. The unit must be re-calibrated whenever a new sensor is installed.
5. Allow 30 minutes for the unit to come to temperature equilibrium prior to calibration. The unit has internal temperature compensation, and the sensor must be at the same temperature as the unit to calibrate properly.

Figure 5: Circuit board mounting screws

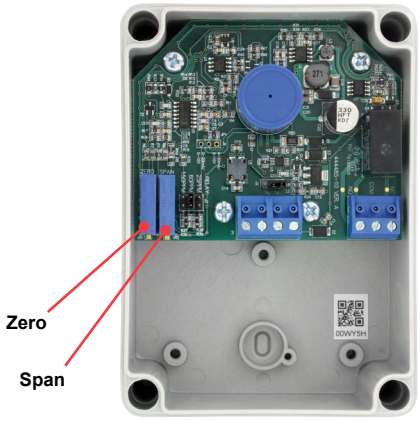

Figure 6: Calibration controls

MAINTENANCE/REPAIR

Upon final installation of the Model CMS300 Transmitter, as with all electrochemical type gas sensors, routine calibration is required. It is recommended that units be re-calibrated at 6 month intervals, to maintain the published accuracy, or as required by local ordinances or other requirements. The units will maintain 5% accuracy if they are re-calibrated at 12 month intervals.

Except for sensor replacement and calibration, the Model CMS300 is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.

WARRANTY/RETURN

Refer to “Terms and Conditions of Sale” in our catalog and on our website. Contact customer service to receive a Return Goods Authorization number before shipping the product back for repair. Be sure to include a brief description of the problem plus any additional application notes.

NOTES

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