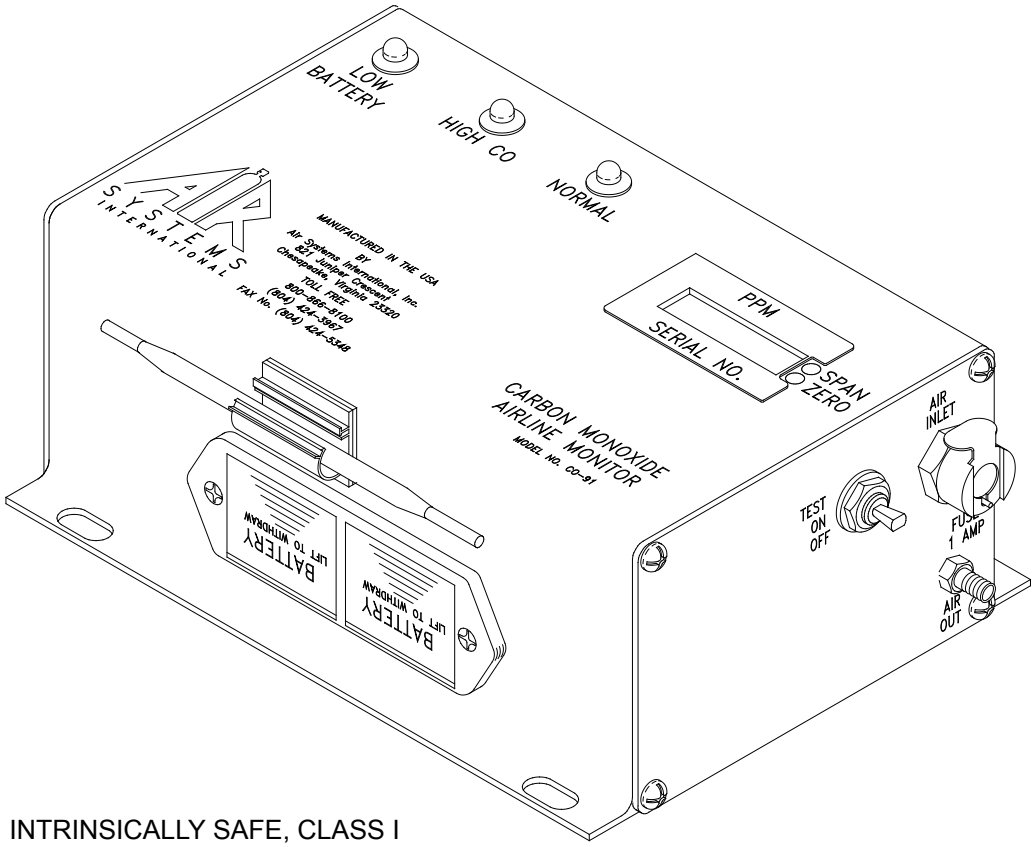
OPERATING INSTRUCTIONS AND REPLACEMENT PARTS

Models: CO-91IS and CO-91ISLA



® INTRINSICALLY SAFE, CLASS I
DIVISION I, GROUPS C AND D

C US
1072398

WARNING

This manual must be read carefully and followed by all persons who have or will have the responsibility for using or servicing this equipment. This equipment will perform as designed only if used according to the instructions. Otherwise it could fail to perform as designed, causing personal injury or death.

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Warranty

Air Systems' manufactured equipment is warranted to the original user against defects in workmanship or materials under normal use for one year from the date of purchase. Any part which is determined by Air Systems to be defective in material or workmanship will be, as the exclusive remedy, repaired or replaced at Air Systems' option. This warranty does not apply to electrical systems or electronic components. Electrical parts are warranted, to the original user, for 90 days from the date of sale. During the warranty period, electrical components will be repaired or replaced at Air Systems' option.

NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AS TO DESCRIPTION, QUALITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER MATTER IS GIVEN BY AIR SYSTEMS IN CONNECTION HEREWITH. UNDER NO CIRCUMSTANCES SHALL THE SELLER BE LIABLE FOR LOSS OF PROFITS, ANY OTHER DIRECT OR INDIRECT COSTS, EXPENSES, LOSSES, OR DAMAGES ARISING OUT OF DEFECTS IN, OR FAILURE OF THE PRODUCT OR ANY PART THEREOF.

The purchaser shall be solely responsible for compliance with all applicable Federal, State and Local OSHA and/or MSHA requirements. Although Air Systems International believes that its products, if operated and maintained as shipped from the factory and in accordance with our "operations manual", conform to OSHA and/or MSHA requirements, there are no implied or expressed warranties of such compliance extending beyond the limited warranty described herein. Product designs and specifications are subject to change without notice. Rev. 2, 12/98

Air leaks are not covered under warranty except when they result from a defective system component, i.e. an on/off valve or regulator or upon initial delivery due to poor workmanship. Air leaks due to poor delivery or damage will be covered under delivery claims. Minor air leaks are part of routine service and maintenance and are the responsibility of the customer just as are filters and oil changes.

Overview

The monitor will analyze the air sample and display the CO concentration in parts per million (ppm). The system's green "NORMAL" operation light will illuminate and the red "HIGH CO" light will flicker approximately every second when the CO level is below 10ppm (5ppm Canadian). If the CO concentration level exceeds the alarm set point, the green "NORMAL" light will turn off, the red "HIGH CO" light will illuminate, the audible alarm will sound, and the remote alarm connections will energize. Once the CO concentration levels drop below the alarm set point, all alarm indicators will deactivate and the unit will return to "NORMAL" operation.

Monitor Specifications

Size	2.75"H X 6.57"L X 5.1"W
Weight	2.8 IBS. (1.27kg.)
Case	Extruded Aluminum - anodized black
Voltage	9 VDC
Operating Temperature	4° to 113° Fahrenheit (-15.5° to 45° Celcius)
Humidity Range	10% to 90% relative humidity
Flow Requirement	50 - 100 cc/min
Display	3 digit LCD CO concentration
Test Circuit	Manually activated

Sensor Type	Sealed electrochemical sensor for Carbon Monoxide
Accuracy	+/-1% full scale
Response	90% in 10-15 seconds
Detectable Range	0-200 ppm CO
Calibration	Manual CO zero and span adjustments
Alarm Setting	10 ppm CO (5 ppm - Canadian)
Warning Signals	Normal Operation - Green Light High CO - Red Light High CO - Audible Alarm Low Battery - Amber Light
Warranty	2 years from original date of purchase

Maintenance Items

Calibration: Monitor calibration should be done monthly or whenever the reading may be questionable. A calibration date sticker should be affixed for future reference. To obtain an accurate calibration, we recommend the use of Air Systems' calibration kits.

Part Number:

BBK-10 Canadian calibration kit for CO monitor; 10ppm CO, zero air, regulator and case - 17 liter size.

BBK-20 Calibration kit for CO monitor; 20ppm CO, zero air, regulator and case - 17 liter size.

BBK-20103 Calibration kit for CO monitor; 20ppm CO, zero air, regulator and case - 103 liter size.

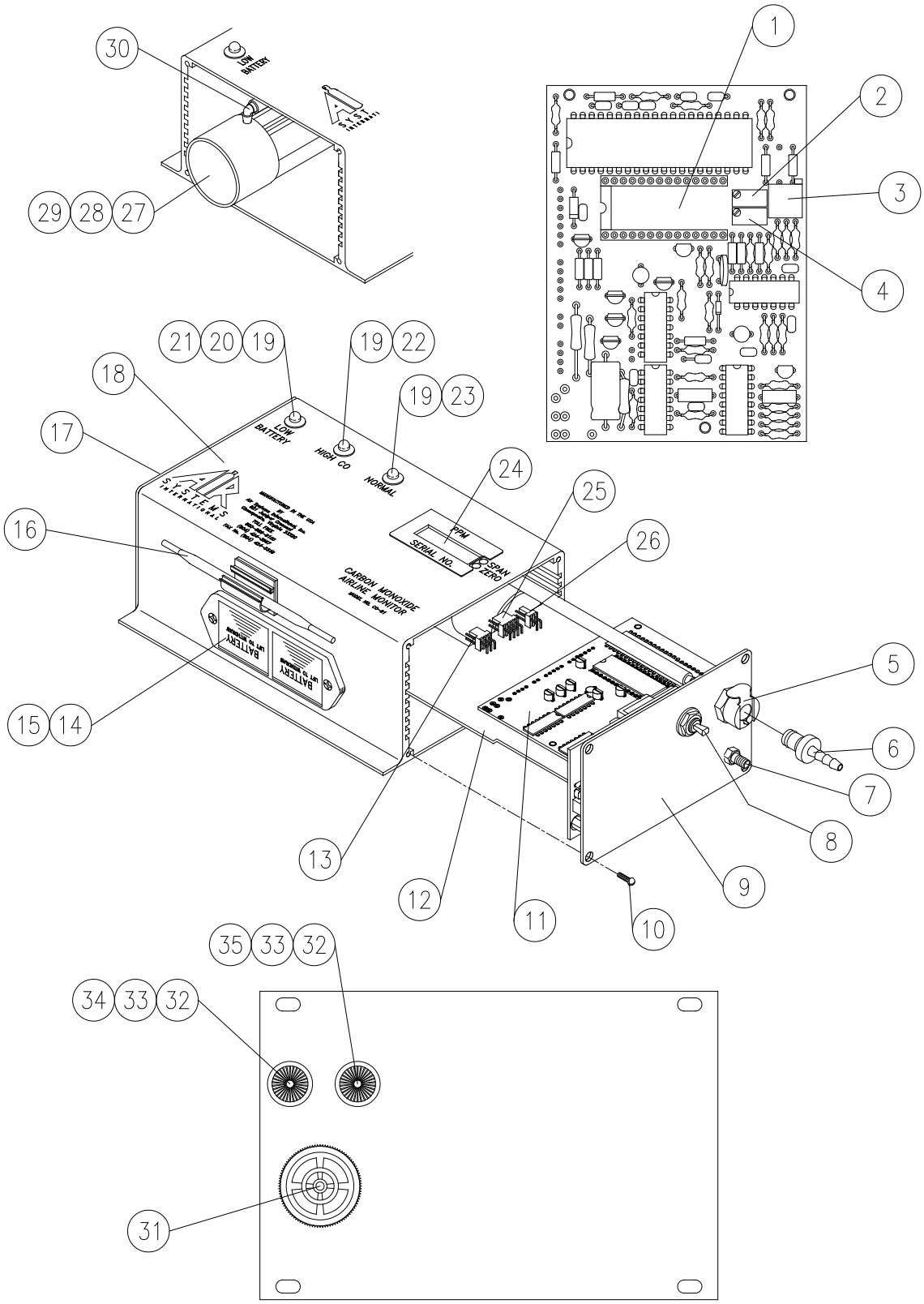
DECAL085CD Calibration decal card, contains 14 calibration decals.

To assure sensor accuracy, calibration of monitor is required. If you cannot obtain an accurate calibration, sensor replacement may be necessary. Consult Repair Service Department before ordering.

Part Number:

CO-91NS Replacement CO sensor

Carbon Monoxide Monitor System Components

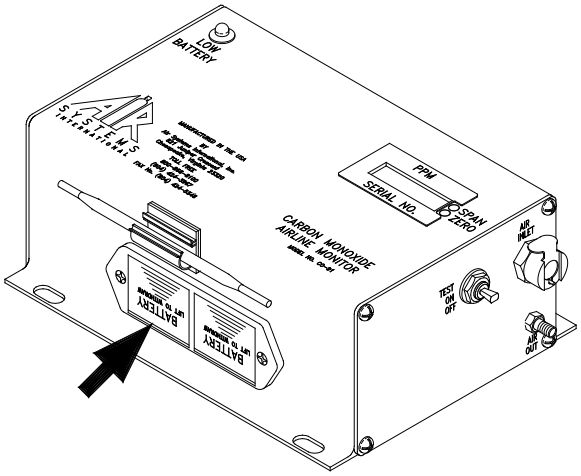


NOTE: Model CO-91IS has the indicator lights and audible alarm mounted on bottom of housing and model CO-91ISLA has the indicator lights mounted on top of housing with the audible alarm being mounted on the left endplate.

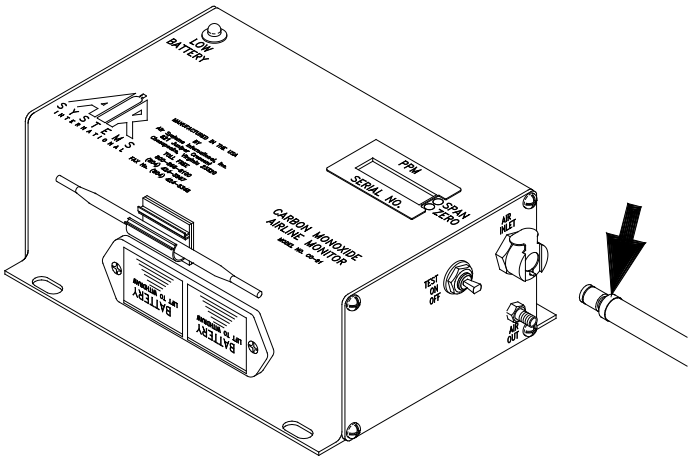
Carbon Monoxide Monitor System Components

ITEM #	DESCRIPTION	PART #
1	LCD Display	MONC703
2	Span Potentiometer	MONC702A
3	Alarm Set Point Potentiometer	MONC702A
4	Zero Potentiometer	MONC702
5	Air Sample Inlet Socket	MONC001
6	Air Sample Plug	MONC002
7	Air Exhaust Port	MONC003
8	On/Off/Test Switch	MONC007
9	CO-91IS/CO-91ISLA Faceplate Assembly	CO-91EXFP
10	Faceplate/Endplate Screw	MONC023
11	Main Circuit Board Assembly	CO-91ISPCB
12	Power Supply Board	CO-91EXPSB
13	Sensor Connector (Soldered To PCB)	MONC509
14	Battery Box	MONC006
15	9 Volt Battery	ELB9V
16	Calibration Tool	MONC028
17	Audible Alarm (CO-91ISLA)	ELLS008
18	Aluminum Housing	CO-91AHOU
19	Led Socket	MONC009LA
20	Yellow LED	MONC008NS
21	LED Socket And Yellow LED	CO-91LED
22	Red LED (CO-91ISLA)	MONC035NS
23	Green LED (CO-91ISLA)	MONC036NS
24	PPM/Serial No. Sticker	MONC031
25	Battery Box Connector (Soldered To PCB)	MONC516
26	LED Connector (Soldered To PCB)	MONC511
27	CO Sensor	CO-91NS
28	CO Sensor Holder	MONC810
29	CO Sensor Electrical Leads	CO-91SL
30	90° Hose Barb	MONC811
31	Audible Alarm (CO-91IS)	ELLS004IS
32	Lamp Socket (CO-91IS)	ELDS004
33	Clear Lens (CO-91IS)	ELDS013
34	Red LED (CO-91IS)	MONC004
35	Green LED (CO-91IS)	MONC005

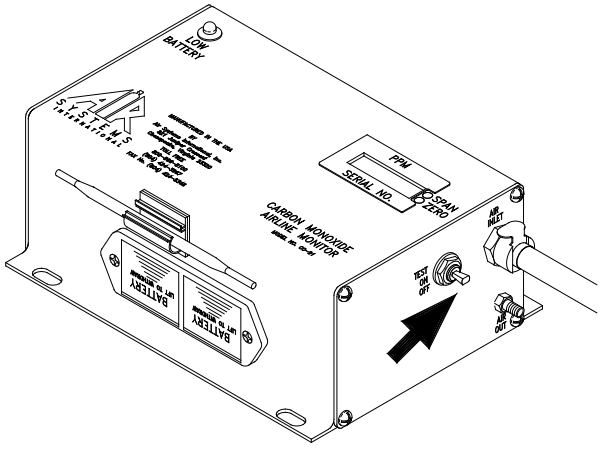
Set-Up/Operation



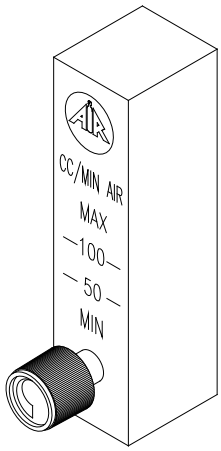
STEP 1)
Check and replace 9 volt batteries if necessary. These batteries provide a bias voltage to the CO sensor. If the batteries are removed from the monitor for 2 hours or more, a 1 hour restabilization period is required before use.



STEP 2)
Connect the air sample hose to the monitor.



STEP 3)
Place the “ON/OFF/TEST” switch in the “ON” position. Allow 30 seconds for the display to stabilize. If a reading other than “00” is displayed, calibration of the monitor may be necessary. See calibration procedure beginning on page 8.



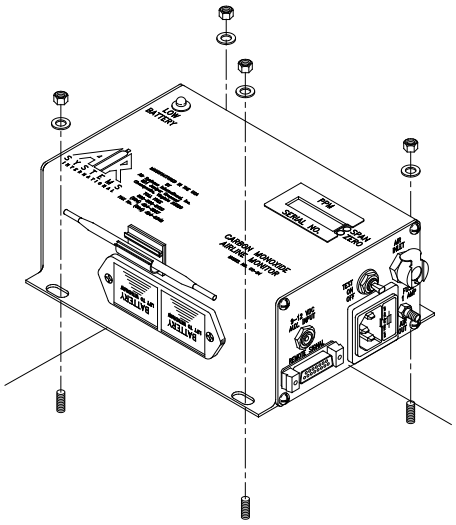
STEP 4)
Adjust flowmeter so flow ball hovers between 50 and 100 cc/min.

Troubleshooting

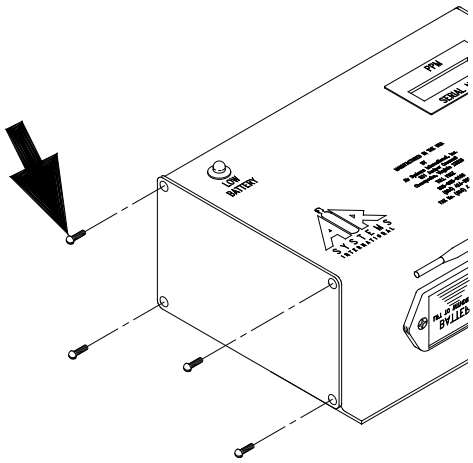
Monitor does not turn on	Check and replace 9 volt batteries
Lights are flashing randomly	Remove left endplate and check sensor connections.

Sensor Replacement

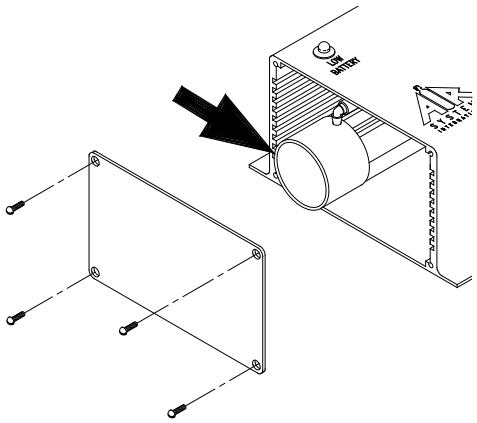
Replacement sensors are shipped with a metal spring installed between the electrodes. Do not remove the clip until the sensor is to be installed into the monitor.



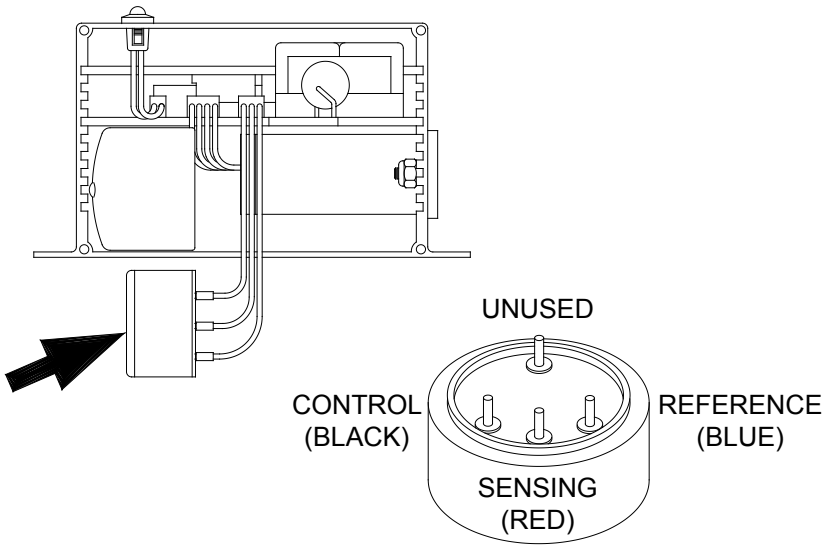
Step 1)
Disconnect all external connections. Remove CO monitor from the unit.



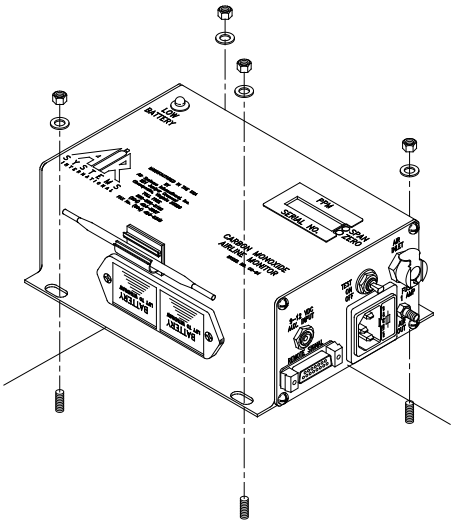
Step 2)
Remove the four screws from the monitor's left endplate.



Step 3)
Remove endplate to gain access to the sensor cup.



Step 4)
Remove sensor from sensor cup and remove leads. Take the new sensor and remove the metal spring. Reattach leads to the proper colored terminals on the new sensor. Install new sensor into sensor cup.



Step 5)
Reassemble monitor and reinstall in unit. Connect all cables and air sample hose. Allow monitor to stabilize 30 minutes to 1 hour and recalibrate.

Calibration Procedure

Do not use inert gases to zero the monitor. This will cause premature failure of the sensor.

CO Monitor Zero Adjustment

To zero the monitor, follow the steps below. Zero calibration gas should be used to properly "zero" the monitor and assure that a valid calibration is achieved. If zero adjustment cannot be made as indicated, sensor replacement may be necessary. ***After each monitor adjustment outlined in the steps, allow time for the changes to stabilize.***

STEP 1)
Place the "ON/OFF/TEST" switch in the "ON" position.

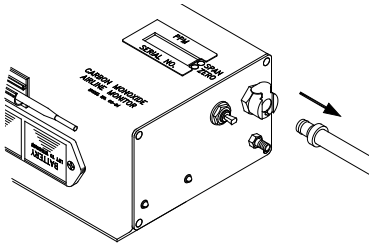
STEP 2)
Allow 30 seconds for the readout to stabilize. The green indicator will illuminate.

STEP 3)
Hold the "ON/OFF/TEST" switch in the "TEST" position. The following will occur:

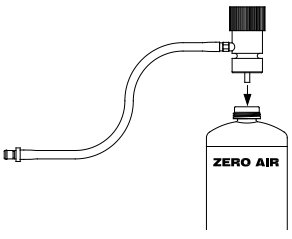
- Audible alarm will sound
- Green LED will flash
- Amber Low Battery indicator on monitor will illuminate
- Red LED will be on

This test ensures the circuitry is operable and continuity to the sensor is proper. Release the switch.

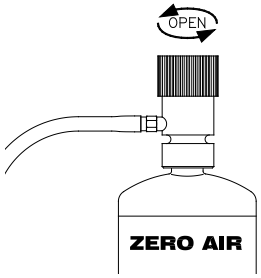
STEP 4)
Remove the air sample inlet tube.



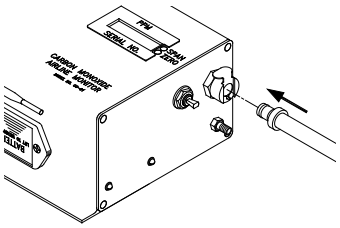
STEP 5)
Install regulator on the zero air cylinder reference gas.



STEP 6)
Turn the knob on the regulator counterclockwise to allow the flow of gas thru the hose. Verify flow of gas thru the hose via touch or sound.

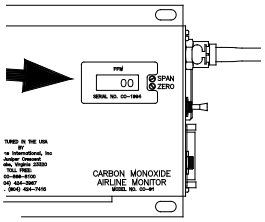


STEP 7)
Attach the clear tubing with the male plug to the air sample inlet on the monitor.



STEP 8)
Allow digital readout to stabilize approximately 15-30 seconds.

STEP 9)
Adjust the "zero" adjustment screw (clockwise to increase or counterclockwise to decrease) until a reading of "00" is obtained.



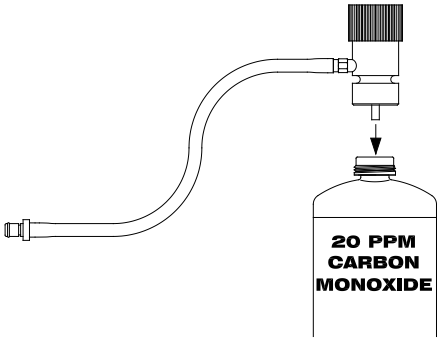
STEP 10)
Turn the regulator off and disconnect the regulator from the zero gas cylinder.

Calibration Procedure

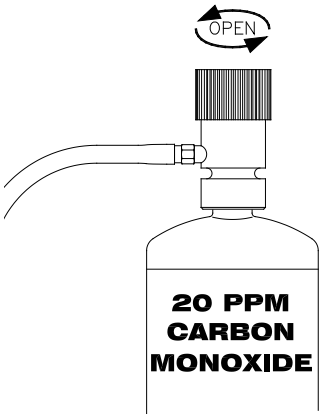
CO Monitor Span Adjustment

Use only 10-20ppm CO gas for calibration. Using a higher concentration may decrease accuracy at lower scale readings. Note: 10ppm gas must be used to satisfy Canadian calibration requirements.

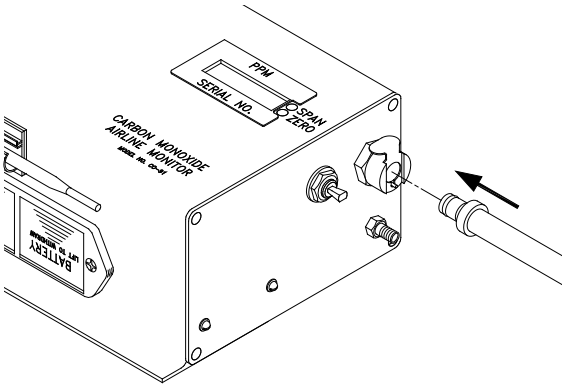
STEP 1)
Install regulator on the CO calibration gas cylinder.



STEP 2)
Turn the knob on the regulator counterclockwise to allow the flow of gas thru the hose. Verify flow of gas thru the hose via touch or sound.

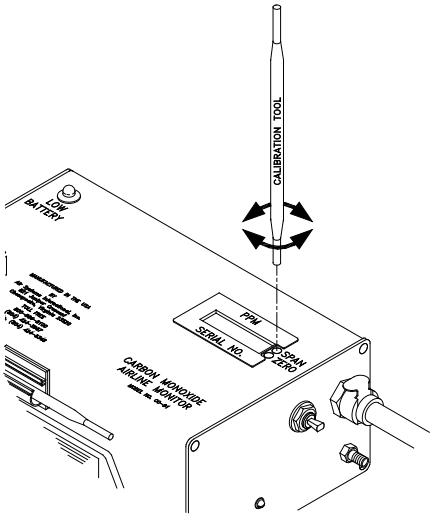


STEP 3)
Connect the plug to the air sample inlet on the monitor.

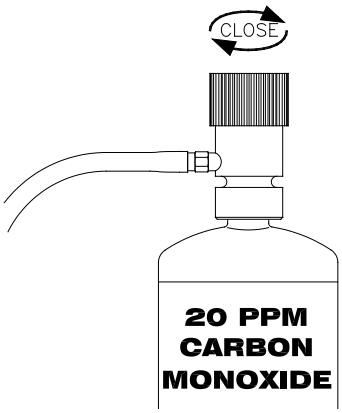


STEP 4)
Allow digital readout to stabilize 15-30 seconds.

STEP 5)
Adjust the “span” adjustment screw (clockwise to increase or counterclockwise to decrease) until the digital readout reads the same as the concentration (ppm) as printed on the calibration gas cylinder.



STEP 6)
Turn the regulator off and repeat the “zero” adjustment procedure. The digital readout should return to a “00” reading.



The monitor is now calibrated and should be recalibrated monthly or if accuracy is questionable. Check local requirements and recalibrate as required.

Notes:

Notes:

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