PURIFICATION SOLUTIONS

B-Series[1] BAP Breathing Air Panel operating & maintenance manual

Specifications

BAP 0050 CP

Length	22”
Height	23”
Depth	8”
Weight	28 lbs (12 kg)
Inlet Size	1/2” NPT (f)
No. of Outlets	4
Outlet Size & Type	3/8” NPT (f), 1/4” Hansen or 1/4” Schrader (female)
Maximum Air Flow	50 scfm @ 110 psi (1415 lpm @ 7.6 bar)
Remote Alarm Signal	Yes
Inlet Pressure Range	15 to 150 psi (1.0 to 10.3 bar)
Relief Valve	125 psi (8.6 bar)
Monitoring	In-line Continuous Monitoring of Carbon Monoxide (CO)
Power	9-16 VDC or 115 VAC 50/60 Hz

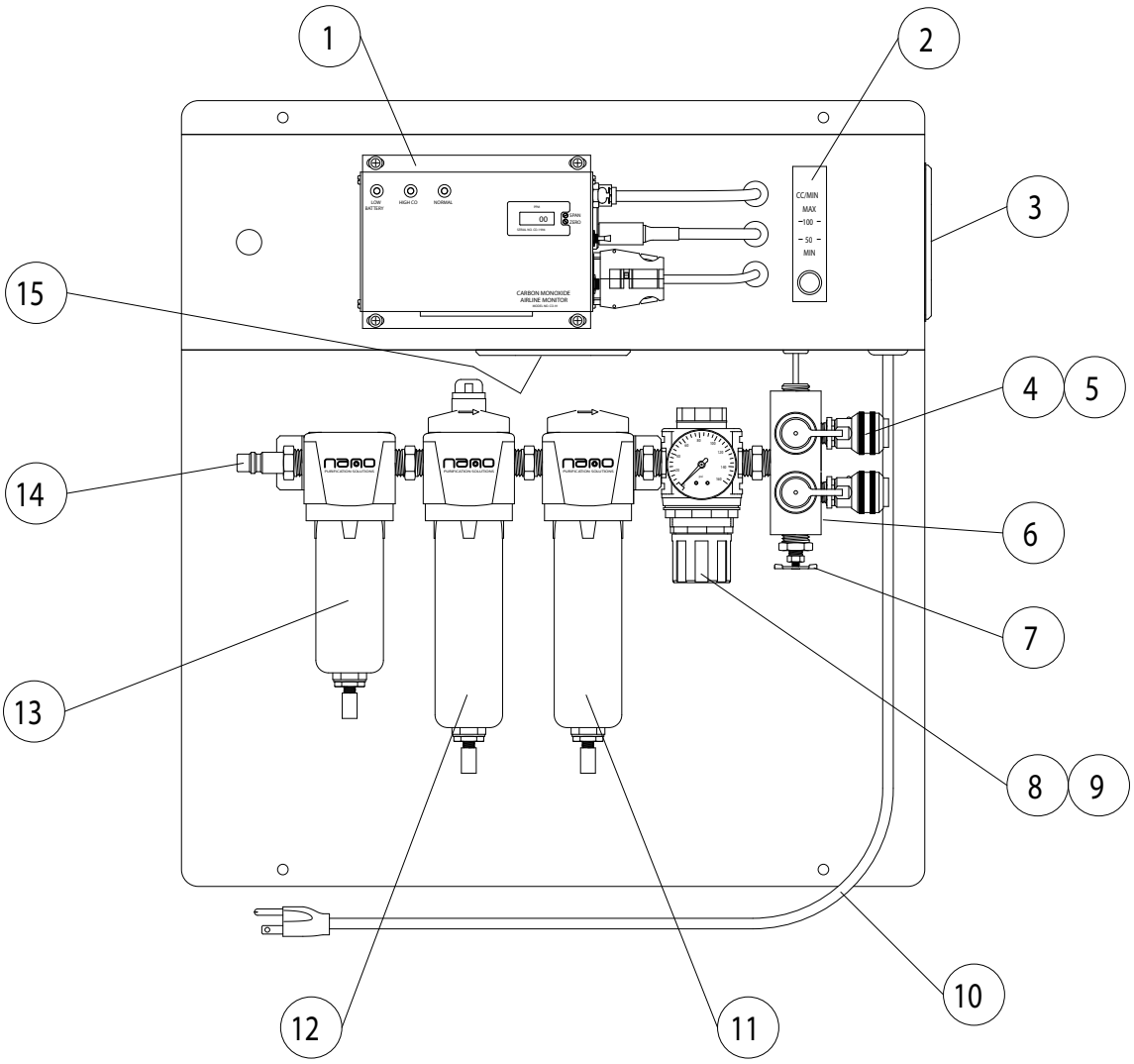
BAP 0100 CP

Length	22”
Height	23”
Depth	8”
Weight	40 lbs (18 kg)
Inlet Size	3/4” NPT (f)
No. of Outlets	4
Outlet Size & Type	3/8” NPT (f), 1/4” Hansen or 1/4” Schrader (female)
Maximum Air Flow	100 scfm @ 110 psi (2831 lpm @ 7.6 bar)
Remote Alarm Signal	Yes
Inlet Pressure Range	15 to 150 psi (1.0 to 10.3 bar)
Relief Valve	125 psi (8.6 bar)
Monitoring	In-line Continuous Monitoring of Carbon Monoxide (CO)
Power	9-16 VDC or 115 VAC 50/60 Hz

BAP 0175 CP

Length	22”
Height	23”
Depth	8”
Weight	45 lbs (20 kg)
Inlet Size	3/4” NPT (f)
No. of Outlets	6
Outlet Size & Type	3/8” NPT (f), 1/4” Hansen or 1/4” Schrader (female)
Maximum Air Flow	175 scfm @ 110 psi (4955 lpm @ 7.6 bar)
Remote Alarm Signal	Yes
Inlet Pressure Range	15 to 150 psi (1.0 to 10.3 bar)
Relief Valve	125 psi (8.6 bar)
Monitoring	In-line Continuous Monitoring of Carbon Monoxide (CO)
Power	9-16 VDC or 115 VAC 50/60 Hz

Parts Identification



ITEM #	DESCRIPTION	PART NUMBER		
		BAP 0050 CP	BAP 0100 CP	BAP 0175 CP
1	CARBON MONOXIDE MONITOR	CO-91ACRL	CO-91ACRL	CO-91ACRL
2	FLOW-METER	WL033NS	WL033NS	WL033NS
3	115 VAC REMOTE ALARM GANG BOX COVER	ELA099	ELA099	ELA099
4	OUTLET COUPLING	CF	CF	CF
5	DUST CAP	CF	CF	CF
6	125 PSI RELIEF VALVE	VR4125BR	VR4125BR	VR4125BR
7	DRAIN COCK	BR2DCM	BR2DCM	BR2DCM
8	PRESSURE REGULATOR	WL257	WL257	WL257
9	PRESSURE GAUGE	GA20160B	GA20160B	GA20160B
10	POWER CORD	ELCB012	ELCB012	ELCB012
11	ACTIVATED CARBON FILTER	NF 0050 AC	NF 0125 AC	NF 0175 AC
12	0.01 MICRON COALESCING FILTER	NF 0050 M01	NF 0125 M01	NF 0175 M01
13	WATER SEPARATOR	NF 0050 WS	NF 0125 WS	NF 0175 WS
14	INLET FITTING	QDH5PL8M	QDH5PL8M	QDH5PL8M
15	AUDIBLE ALARM	ELLS003	ELLS003	ELLS003

Breathing Air Quality Position Statement

The responsibility for the quality of breathing air rests with the user. Compliance with federal, state, or local regulations are the responsibility of the user and this recommendation does not supersede any existing rules, regulations, or laws which may apply. Breathing air filtration products meet or exceed CGA Grade-D specifications for air quality as adopted by Federal OSHA. Compressor air quality standards meet or exceed OSHA 1910.134 requirements. When the components are used in accordance with the manufacturer's instructions and recommendations, the "system" meets or exceeds federal regulations presently in force. It is incumbent upon the user to comply with any changes in the regulations or law which may occur in future situations.

The air supply compressor should be located in a safe, clean ambient air environment. This "safe" location should be tested periodically using proper instruments to ensure clean ambient air quality on a consistent basis. Total system Grade-D air quality should be tested at the time of initial setup. If the compressor is moved, retesting air quality is recommended. Should the location or environment significantly change, the air quality should be retested. The compressor filters and oil level should be checked daily and changed when contaminated or when the maximum number of "run" hours is achieved.

This series of air filtration units should be used according to the recommendations specified in the manual. The standard filtration package is not explosion-proof and should be located in a non-explosive environment. (An intrinsically safe model is available, please contact support@n-psi.com for further information.) The carbon monoxide monitor should be calibrated monthly or if the accuracy of the monitor is in question. System air quality should be tested for, but not limited to, the following Grade-D air components:

- CO - Carbon Monoxide
- O2 - Oxygen
- CO2 - Carbon Dioxide
- H2O - Water (Moisture Content)
- Hydrocarbons (Oil Mist)
- Total Particulates

The maximum allowable level of these air quality components varies depending on Grade-D or E requirements. Contact support@n-psi.com for a copy of the latest standards.

Our breathing air filtration systems meet all of the following federal specifications when used and serviced in accordance with our instructions including:

- Army Corps of Engineers EM385-1-1, paragraph 07b-11-4, "Compressed Breathing Air"

Carbon Monoxide Monitor Overview

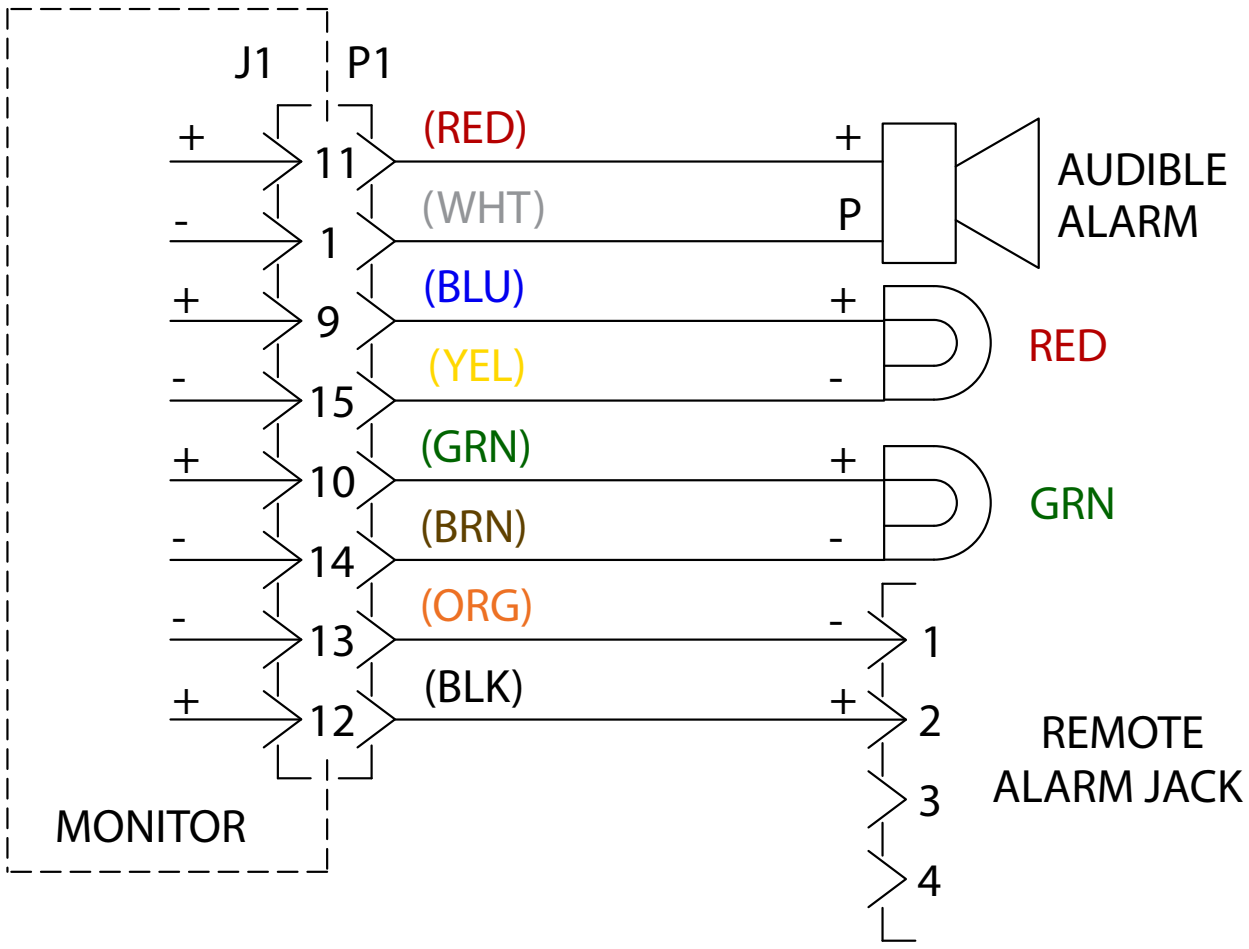
The monitor will analyze the air sample and display the CO concentration in parts per million (ppm). The system's green "NORMAL" operation light will illuminate and the red "HIGH CO" light will flicker approximately every second when the CO level is below 10ppm (5ppm Canadian). If the CO concentration 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.

Carbon Monoxide Monitor Specifications

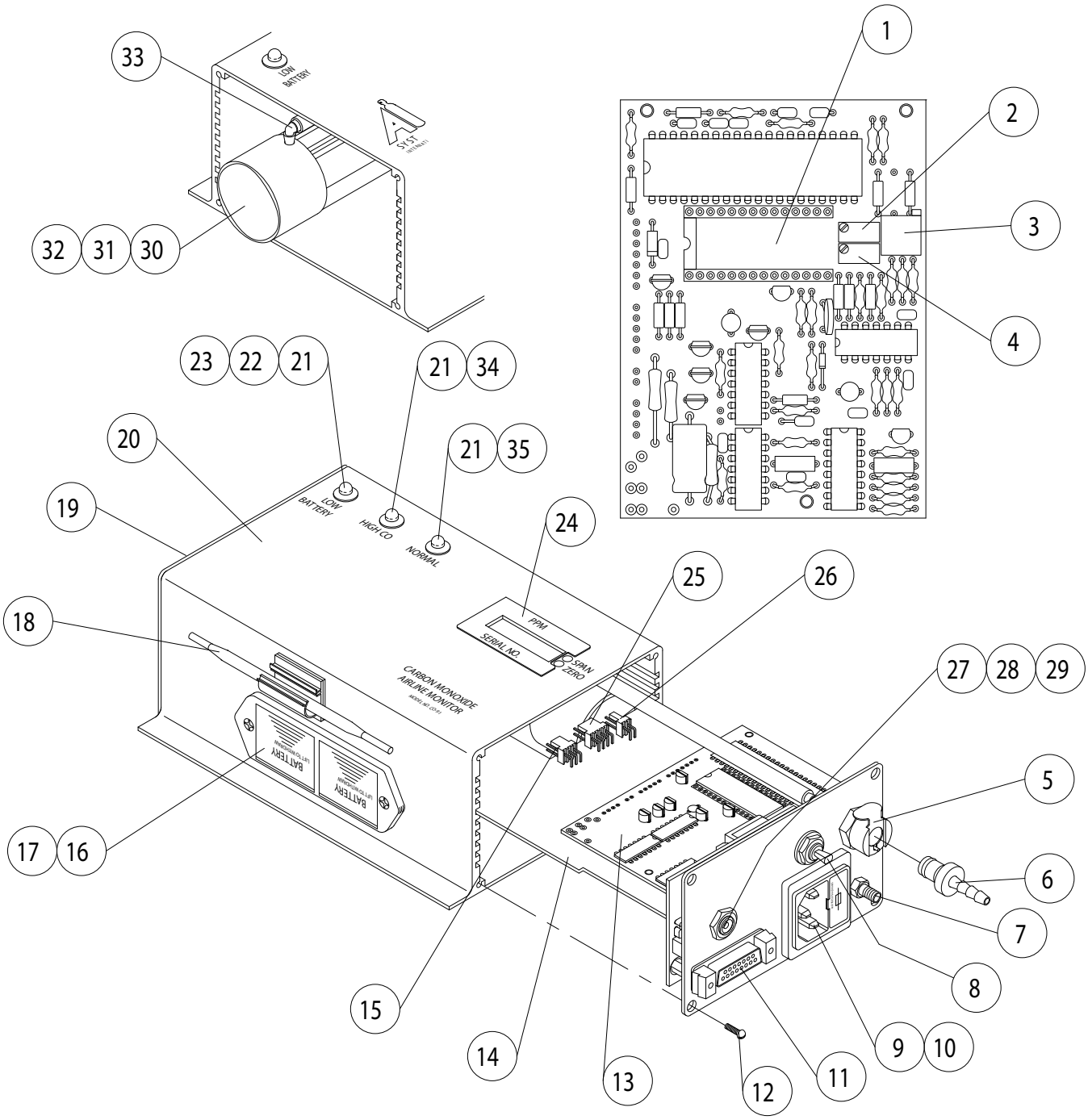
Size	2.75" H x 6.57" L x 5.1" W
Weight	2.8 lbs (1.27 kg)
Case	Extruded aluminum - anodized black
Voltage	115 VAC and/or 9-16 VDC
Shielding	Internal RFI/EMI filters
Fuse	250 VAC/1 amp fast acting
Operating Temp	4° to 113°F (-15.5° to 45°C)
Humidity Range	10% to 90% relative humidity
Flow Requirement	50 - 100 ml/min
Display	3 digit LCD: CO concentration
Test Circuit	Manually activated

Sensor Type	Sealed electrochemical sensor for CO
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

15 Pin Connector Wiring Diagram



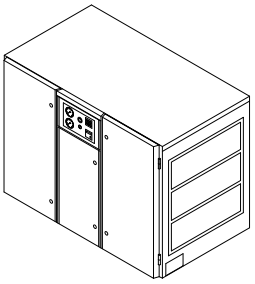
CO Monitor Parts Identification



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	Recessed Plug With Fuse Holder	MONC020
10	1 Amp Fast Acting Fuse, 5 X 20Mm	ELF001
11	15 Pin Socket	MONC520
12	Faceplate/End-plate Screw	MONC023
13	Main Circuit Board Assembly	CO-91PCB
14	Power Supply Board	CO-91PSB
15	Sensor Connector (Soldered To PCB)	MONC509
16	Battery Box	MONC006
17	9 Volt Battery	ELB9V
18	Calibration Tool	MONC028
19	End Plate	CO-91BEP
20	Aluminum Housing	CO-91HOU
21	Led Socket	MONC009LA
22	Yellow Led	MONC008NS
23	Led Socket And Yellow Led	CO-91LED
24	PPM/Serial No. Sticker	MONC031
25	Battery Box Connector (Soldered To PCB)	MONC516
26	Led Connector (Soldered To PCB)	MONC511
27	12 VDC Power Socket	MONC522
28	12 Volt Power Plug (Optional)	ELJP018
29	12 Volt Cable (Order By The Foot)	ELCB035
30	CO Sensor	CO-91NS
31	CO Sensor Holder	MONC810
32	CO Sensor Electrical Leads	CO-91SL
33	90° Hose Barb	MONC811
34	Red Led	MONC035NS
35	Green Led	MONC036NS

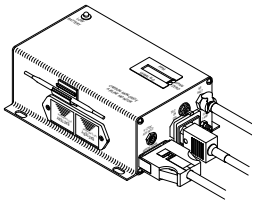
Breathing Air Panel Start Up and Operation

WARNING! Always operate the unit in the upright position. Operation in any other position prohibits proper operation of the automatic condensate drains causing condensate to collect in the filter housings, potentially contaminating the CO monitor, and/or causing contaminated condensate to pass into the respirator hose and the user's breathing air mask.



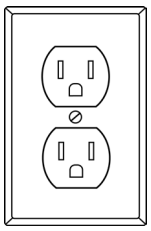
STEP 1

Secure a primary air source of sufficient air flow and discharge pressure. The number and type of respirators being used determines the flow rate and pressure required.



STEP 2

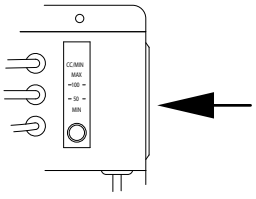
Check airline monitor for fresh 9 volt batteries and turn unit on. Connect the remote signal cable, 115 VAC plug, and air sample hose to the monitor. Place the "ON/OFF/TEST" switch to the "ON" position. Allow 30 seconds for the readout to stabilize. If a reading other than "00" is displayed, calibration of the monitor may be necessary. See calibration procedure.



STEP 3

Connect the extension cord to a 115 VAC receptacle.

Note: The CO monitor can run off the 9 volt batteries if AC power is not available.



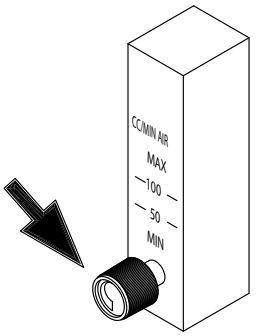
STEP 4

Connect the optional remote alarm (115 VAC only) assembly to the remote alarm leads located behind the remote alarm gang box cover located on the right side of panel. Connections are as follows:

Black - 115 VAC line

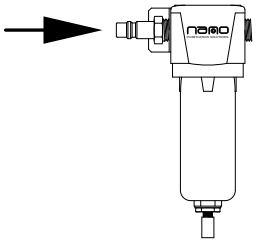
White - 115 VAC Neutral

Green - Ground



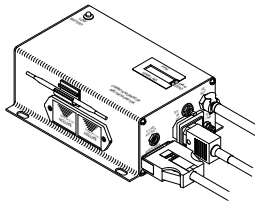
STEP 5

Close the flow-meter by turning the control knob fully clockwise. Do not over-tighten.



STEP 6

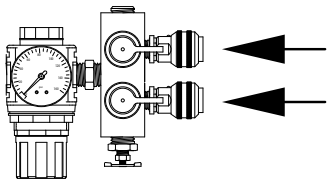
Connect the air source, 150 psi max., to the inlet fitting.



STEP 7

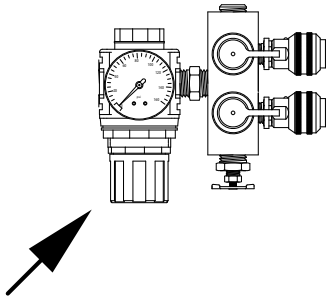
Hold the “ON/OFF/TEST” switch in the “TEST” position. All local and remote audible/visual indicators will activate. If indicators do not activate, check all electrical connections, then contact support@n-psi.com.

Note: An alarm function test can be performed at any time by lifting the “ON/OFF/TEST” switch to the “TEST” position.



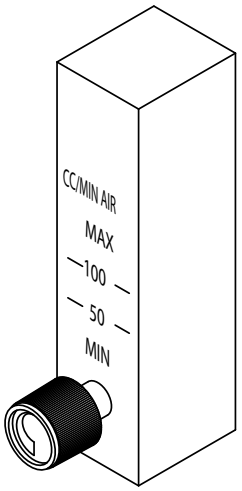
STEP 8

Attach desired respirators and hoses to the quick connect couplings.



STEP 9

Adjust the outlet pressure to the setting recommended by the respirator manufacturer. Turn the knob clockwise to increase pressure, counterclockwise to decrease pressure.



STEP 10

Adjust CO monitor air sample flow rate by turning the flow-meter control knob counterclockwise until the ball hovers between 50 and 100 cc/min. The panel is now ready for operation.

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 faintly approximately every second when the CO level is below 10ppm (5ppm Canadian).

When the CO concentration level exceeds the alarm set point, the green “NORMAL” light will turn off, the red “HIGH CO” light illuminates, the audible alarm will sound, and the remote alarm connections will energize.

When CO concentrations drop below the alarm set point, all alarm indicators will deactivate and return to normal operation.

Shut Down

1. Make sure all personnel have egressed from the work area.
2. Shut off air source to the panel.
3. Remove air pressure from the panel by pulling the relief valve ring out.
4. Turn the CO monitor off. Do not remove the 9 volt batteries. These are used to maintain a bias voltage to the sensor; this keeps the sensor ready for immediate use.
5. Disconnect airline hoses.
6. Install dust caps if applicable.

System Maintenance

WARNING! Always be sure to depressurize the system before performing maintenance

Filter Housings: Periodic cleaning of the filter housings is recommended. Remove the auto drains and clean the bowls with a mild soapy solution. The auto drains may also be cleaned with a mild soapy solution at this time. Dry and reinstall into the filter housing.

Filter Element Replacement: Replace filter elements as necessary to maintain breathing air quality. As a minimum, coalescing elements must be changed every 8000 hours or less, and activated carbon elements must be changed every 1000 hours or less. Differential pressure indicators are an indication of premature blockage only and should not be used as an indication of element life.

Filter Elements:

description	maximum life [1]	part no.	fits
50 scfm 0.01 micron coalescing filter element	12 months [1]	E 0050 M01	BAP 050 CP
100 scfm 0.01 micron coalescing filter element	12 months [1]	E 0135 M01	BAP 100 CP
175 scfm 0.01 micron coalescing filter element	12 months [1]	E 0175 M01	BAP 175 CP
50 cfm activated carbon filter element	1000 hours [1]	E 0050 AC	BAP 050 CP
100 cfm activated carbon filter element	1000 hours [1]	E 0135 AC	BAP 100 CP
175 cfm activated carbon filter element	1000 hours [1]	E 0175 AC	BAP 175 CP

(1) Elements and service kits must be changed as needed to maintain breathing air quality. This value is provided as a maximum only. Actual service life may be less.

Calibration: Monitor calibration should be done at least monthly, and whenever the reading may be questionable. Use and refer to calibration date stickers to ensure they are calibrated regularly. Use only nano calibration kits and accessories.

Calibration Kits and Accessories:

description	part no.	fits
120 VAC remote alarm - includes conduit box, audible & strobe alarms	BAP-RA	all models
US calibration kit - includes 20 ppm CO, zero air, regulator, tubing & hard case	COL CAL KIT20	all models
Canadian calibration kit - includes 10 ppm CO, zero air, regulator, tubing & hard case	COL CAL KIT10	all models
17 liter replacement zero air cylinder, zero air	BBG-00	all models
17 liter replacement 20 ppm CO cylinder (USA)	BBG-20	all models
17 liter replacement 10 ppm CO cylinder (Canada)	BBG-10	all models
replacement CO sensor [1]	CO-91NS	all models

(1) To assure sensor accuracy, calibration of monitor is required. If you cannot obtain an accurate calibration, sensor replacement may be necessary. Consult support@n-psi.com before ordering.

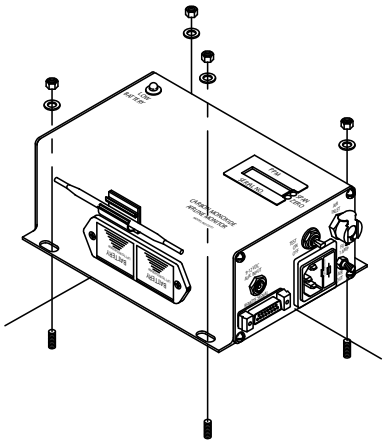
CO Monitor Battery Replacement

These batteries provide the required continuous bias voltage to the CO sensor and power the monitor in the event of AC power loss. If AC and DC power are removed for a period of 2 hours or more, a 1 hour re-stabilization period is required as erratic readings may occur.

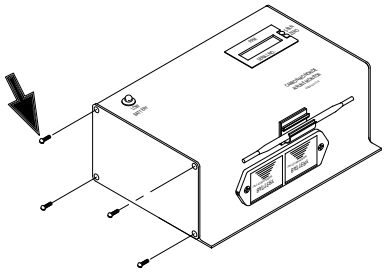
Battery Replacement: Replace 9 volt batteries when the amber "Low Battery" light illuminates. If the monitor is not used for 90 days, check the 9 volt batteries and replace if necessary.

CO Monitor Sensor Replacement

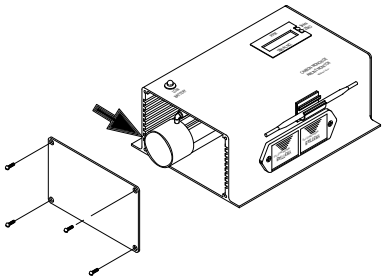
WARNING! Replacement sensors are shipped with a metal spring installed between the electrodes. Do not remove the clip until the sensor is to be installed into the monitor.



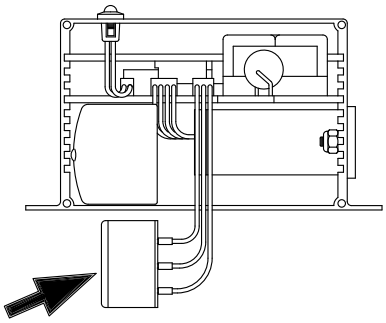
STEP 1
Disconnect all external connections and remove CO monitor from the unit.



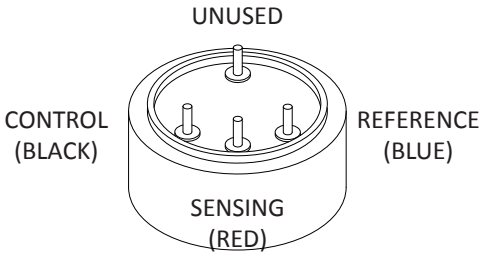
STEP 2
Remove the four screws from the monitor's left end-plate.



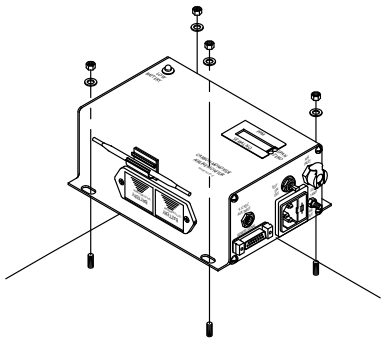
STEP 3
Remove end-plate to gain access to the sensor cup.



STEP 4
Remove sensor from sensor cup and remove leads. Take the new sensor and remove the metal spring.



STEP 5
Reattach leads to the proper colored terminals on the new sensor. Install new sensor into sensor cup.



STEP 6
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: Zero Adjustment

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

Follow the steps below to "zero" the monitor. 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.***

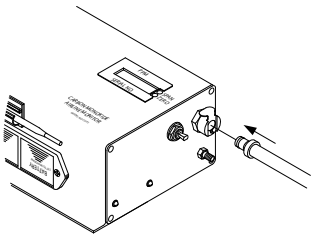
STEP 1
Place the "ON/OFF/TEST" switch in the "ON" position.

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

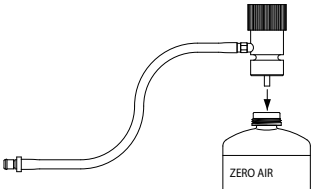
STEP 3
Hold the "ON/OFF/TEST" switch in the "TEST" position. The following will occur:

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

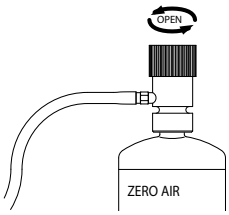
This test ensures the circuitry is operable and continuity to the sensor is proper. Release the switch.



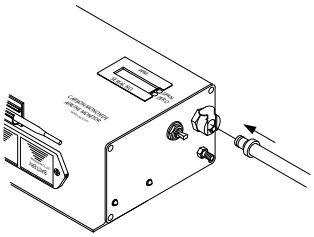
STEP 4
Remove the air sample inlet tube.



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

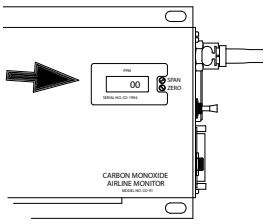


STEP 6
Turn the knob on the regulator counterclockwise to allow the flow of gas through the hose. Verify flow of gas through the hose via touch or sound.



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.

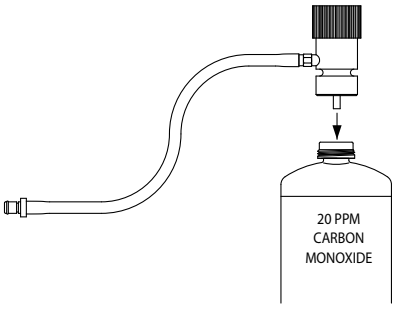


STEP 9
Adjust the "zero" adjustment screw (clockwise to increase or counterclockwise to decrease) until a reading of "00" is obtained.

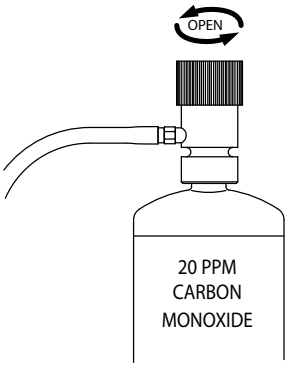
STEP 10
Turn the regulator off and disconnect the regulator from the zero gas cylinder.

Calibration Procedure: Span Adjustment

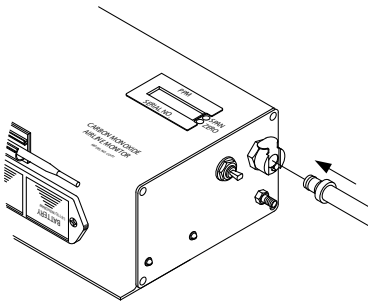
WARNING! Use only 10 - 20ppm CO gas for calibration. Using a higher concentration may decrease accuracy at lower scale readings. Note: 10ppm gas must be used to satisfy Canadian calibration requirements.



STEP 1
Install regulator on the CO calibration gas cylinder.

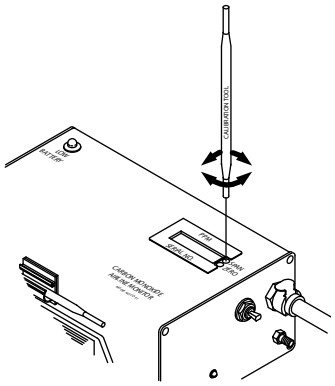


STEP 2
Turn the knob on the regulator counterclockwise to allow the flow of gas through the hose. Verify flow of gas through the hose via touch or sound.

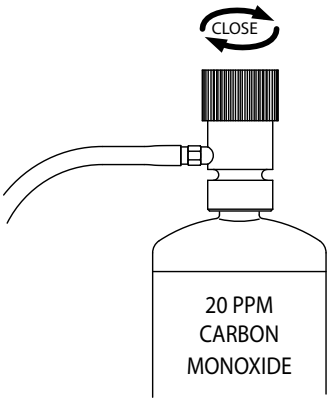


STEP 3
Connect the plug to the air sample inlet on the monitor.

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 re-calibrated monthly or if accuracy is questionable. Check local requirements and recalibrate as required.

Notes

Warranty Disclaimer

nano breathing air 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 nano-purification solutions to be defective in material or workmanship will be, as the exclusive remedy, repaired or replaced at nanos' 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 nanos' option.

NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AS TO DESCRIPTION, QUALITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER MATTER IS GIVEN BY NANO 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 nano-purification solutions 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 as are element replacements and sensor calibration.

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Rev 002