50cfm Auto-Air Cart

Model BB50-HTAA

[Air Systems International B100-23HTAP Auto Air Cart 100 CFM](#)
[Air Systems International BB100-HTAA Auto-Air Cart 100 CFM](#)
[Air Systems International BB100-HTAAP Auto Air Cart 100 CFM](#)
[Air Systems International BB30-HTAA Auto-Air Cart 30 CFM](#)
[Air Systems International BB30-HTAAP Auto-Air Cart 30 CFM](#)
[Air Systems International BB50-HTAA Auto-Air Cart 50 CFM](#)
[Air Systems International BB50-HTAAP Auto-Air Cart 50 CFM](#)

Table of Contents

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 products manufactured by Air Systems International Inc., 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 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. Should the location or environment significantly change, the ambient air quality should be retested. The compressor filters and oil should be checked daily and changed when contaminated or when the maximum number of "run" hours are achieved.

The Breather Box™ portable air filtration package should be used according to the manufacturer's recommendations. The standard filtration package is not explosion-proof and should be located in a nonexplosive environment. Ambient air conditions should be tested with proper instrumentation to ensure a nonexplosive environment. Filters should be changed when contaminated or when the total number of "run" hours is achieved. The carbon monoxide monitor should be calibrated monthly or when accuracy of the monitor is in question.

Total system Grade-D air quality should be tested monthly, provided that the environmental or physical location does not significantly change. If the compressor is moved, more frequent testing may be necessary. System air quality should be tested for, but not limited to, the following minimum Grade-D air components:

CO - Carbon Monoxide
CO_2 - Carbon Dioxide
O_2 - Oxygen
H_2O - Water (Optional)
Hydrocarbons (Oil Mist)
Total Particulates

The maximum allowable level of these air quality components varies depending on Grade-D or E requirements.

Our Breathing Air compressors and filtration systems meet all of the following federal specifications when used and serviced in accordance with our instructions.

Federal OSHA 29 CFR 1910.134
"Compressor Operations for Breathing Air"
Army Corps of Engineers EM385-1-1,
paragraph 07b-11-4,
"Compressed Breathing Air"

Auto-Air Breather Box™ Overview

This Grade-D filtration unit has been designed for work in hazardous locations where the worker needs additional egress air to escape harmful gases and chemicals that may be present. IDLH atmospheres require that the worker wear a pressure demand airline respirator with a minimum of five minutes of escape air. However, this five minutes of escape air may not be sufficient time to safely egress from the area. The Auto-Air Breather Box™ is attached to a secondary supply source of air. In the event of primary air loss, the Auto-Air system will automatically switch to the reserve air. Audible and visual alarms sound to signal the worker that they are on the backup air system and that they should egress the hazardous work area. Any size reserve air cylinder system can be attached to the Auto-Air Breather Box™, depending on the number of workers and length of time required to safely egress.

Plant or mobile compressors provide the primary air supply to the system. Continuous carbon monoxide monitoring is provided to meet federal, state, and local regulations.

The Auto-Air Breather Box™ series will supply Grade-D breathing air provided this unit is used according to this instruction manual. The carbon monoxide monitor (Model CO-91AA) continuously receives 50 - 100cc of filtered air and monitors for the presence of carbon monoxide.

The outgoing pressure regulator(s) is adjustable to conform to the particular respirator to determine the correct pressure. Refer to the NIOSH data sheet found with each respirator in use. Always adjust the outgoing pressure with the complete respirator(s) and desired hose length(s) in place.

Note: Always operate the Auto-Air Breather Box™ in the upright position. Failure to comply may result in one or all of the following:

- Auto drains will not function properly. This may result in the contamination of the CO monitor and cause water to be passed on through respirator hose and into worker's mask.
- Auto drains may become clogged, clean or replace auto drains. (See Maintenance Instructions)
- Filters may accumulate moisture and/or contamination; replace if necessary.

Specifications

| # of Outlets:	4
Maximum Air Flow (cfm):	50 scfm @ 110psi
Maximum Inlet Pressure:	150psi
Maximum Inlet Pressure of Reserve Air Regulator:	5000psi
Maximum Outlet Pressure:	125psi (8.6 bar)
Relief Valve:	125psi (8.6 bar)
Monitoring:	Inline continuos monitoring of Carbon Monoxide
Voltage:	8-16 VDC or 110 - 120 VAC 50/60Hz

Filtration Efficiency

| 1st Stage - Particulate/Bulk Liquid Separator	Auto Drain and Filter change indicator. 95% bulk liquids @ 5 microns
2nd Stage - Oil Coalescing	Auto Drain and Filter change indicator. 99.9998% @ 0.01 micron with less than 0.01 ppm/wt
3rd Stage - Activated Charcoal (Taste/odor removal)	Manual Drain and Filter change indicator. Less than 0.003 pp/wt remaining oil content

Setup and Operation Procedure

1. Secure a primary air source of sufficient airflow and output pressure. The number and type of respirators being used determine the flow rate and pressure required.
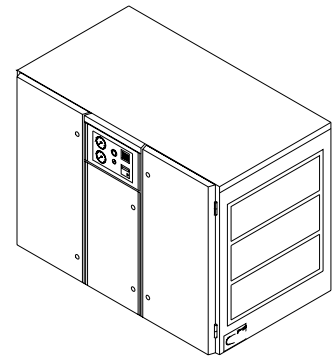
2. Secure a reserve (backup) air supply of sufficient capacity to achieve the desired time for all workers to egress from the hazardous area. The reserve air supply should be able to produce a sufficient flow rate and output pressure based on the flow rate and pressure required by the number and type of respirators being used for a specific duration. *CAUTION: Reserve air must be at least Grade-D breathing air and must be set at a minimum of 50psi but not to exceed 125psi*
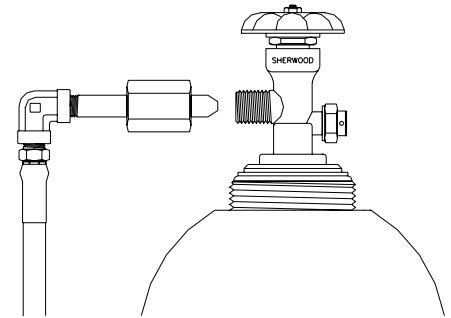
3. Check CO monitor for fresh 9-volt batteries and turn on unit. See "CO-91AA section" for further information on calibration, testing, and usage.
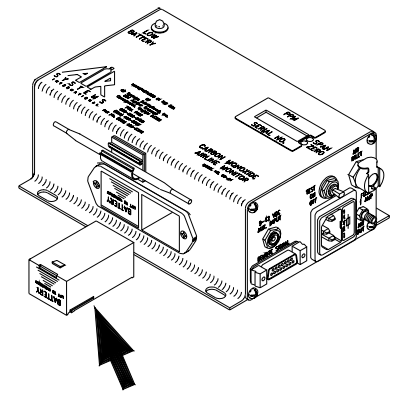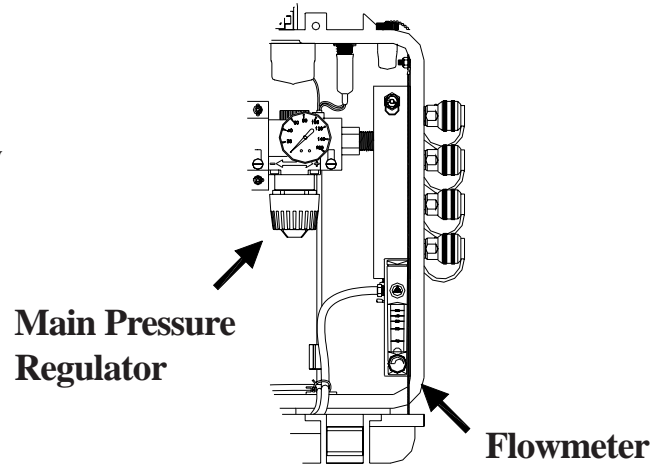
4. Connect the power plug, remote signal cables, and the air sample hose to their respective ports.
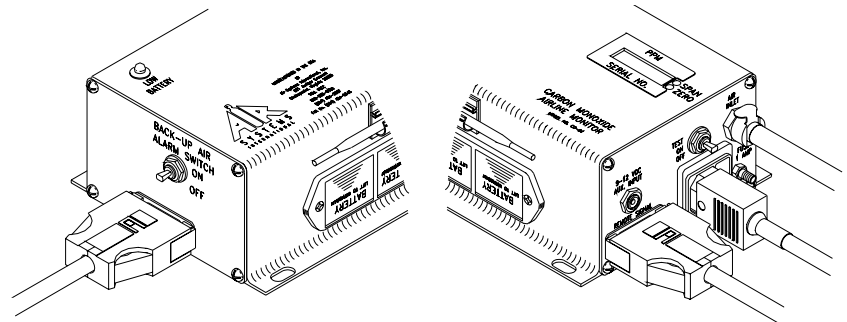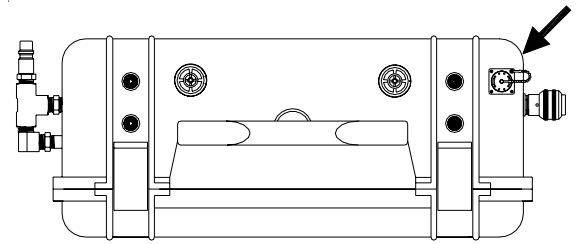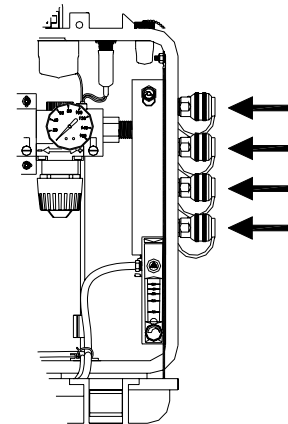
5. Connect remote alarm (if used) into the remote alarm jack.

6. Close the flowmeter, by turning the control knob fully clockwise and the main pressure regulator by turning the knob fully counter clockwise.
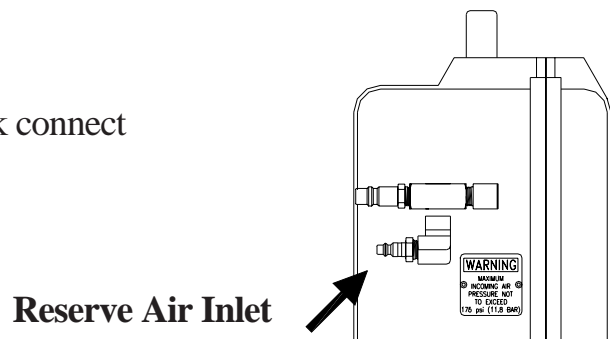
Main Pressure Regulator

Flowmeter

7. Install desired respirators and lengths of hose to the quick connect outlet couplings.

8. Connect 120 VAC to the recess plug by way of the supplied extension cord.

Recess Plug
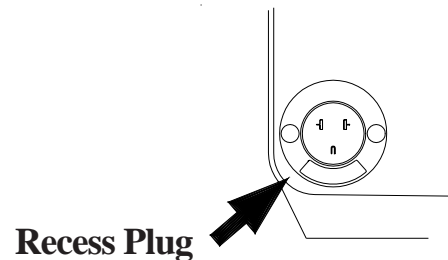
9. Connect reserve air to the unit at the inlet quick connect plug (1/4" Hansen).

Reserve Air Inlet

10. Turn "BACK-UP AIR ALARM" switch to the "ON" position. The red back up light and audible alarm (constant tone) should be on at this time.
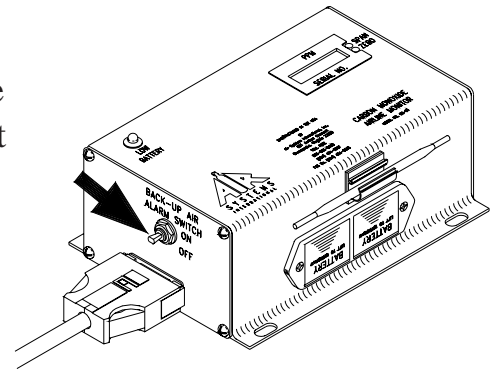
11. Connect primary air to unit at the inlet quick connect plug (1/2" Hansen) and adjust primary pressure regulator to the proper discharge pressure for the respirators in use by turning the regulator knob clockwise. The presence of sufficient primary air pressure (50psi or greater) will cause the valve to shift out of the reserve air position and all audible and visual alarms will deactivate. The green "PRIMARY AIR" indicator will illuminate.
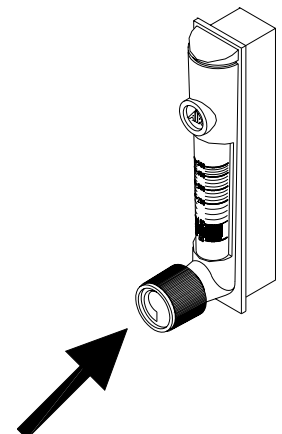
Primary Air
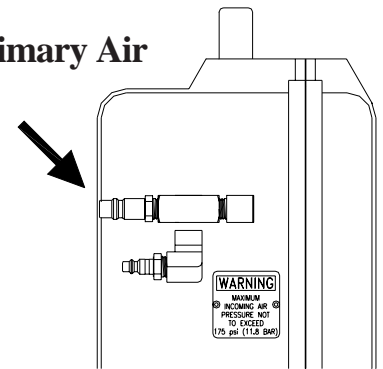
12. Adjust reserve air regulator to the proper discharge pressure by turning the regulator knob clockwise to increase or counterclockwise to decrease.
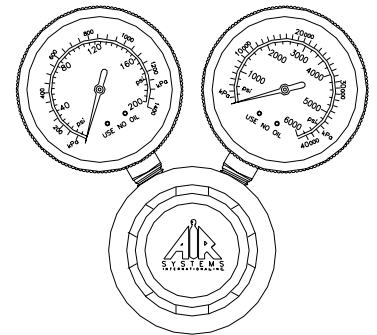
13. Adjust CO monitor air sample flow rate by turning the flowmeter control knob counter clockwise until the internal float hovers in the green bar area (approximately 50 - 100cc/min).

Flowmeter

Shutdown

1. Make sure all workers have egressed the work area.
2. Depressurize both the main and reserve air supply lines. Close reserve air cylinder valves.
3. Bleed system pressure by pulling the ring out on the relief valve or relieve pressure through the manual drain located at the base of the filter.
4. Turn off the CO monitor.

Maintenance

CAUTION: *Always depressurize the system before performing service.*

Filter Housing/Bowls: Periodic cleaning of the polycarbonate bowls may become necessary. Simply remove the auto drains. Clean the bowls with a mild soapy solution. Reinstall into the filter housing.

Auto Drains: The automatic drains are designed to remove bulk liquid contaminants. The drains (1st & 2nd stages only) will automatically drain the liquids after the level has reached over 1/3 of the bowl capacity. For periodic cleaning, use a mild soapy solution.

Filter Change: The filtration system consists filter change indicators which will gradually change from green to red when filter life is spent.

Note: Air must be flowing through the filtration unit before the filter change indicators will function.

Drain Lines: Make sure the auto drain tubes are placed in the holes at the bottom of the box to allow the liquids to drain outside the box.

Calibration: Monitor calibration should be done monthly to ensure accuracy. See CO-91AA monitor section.
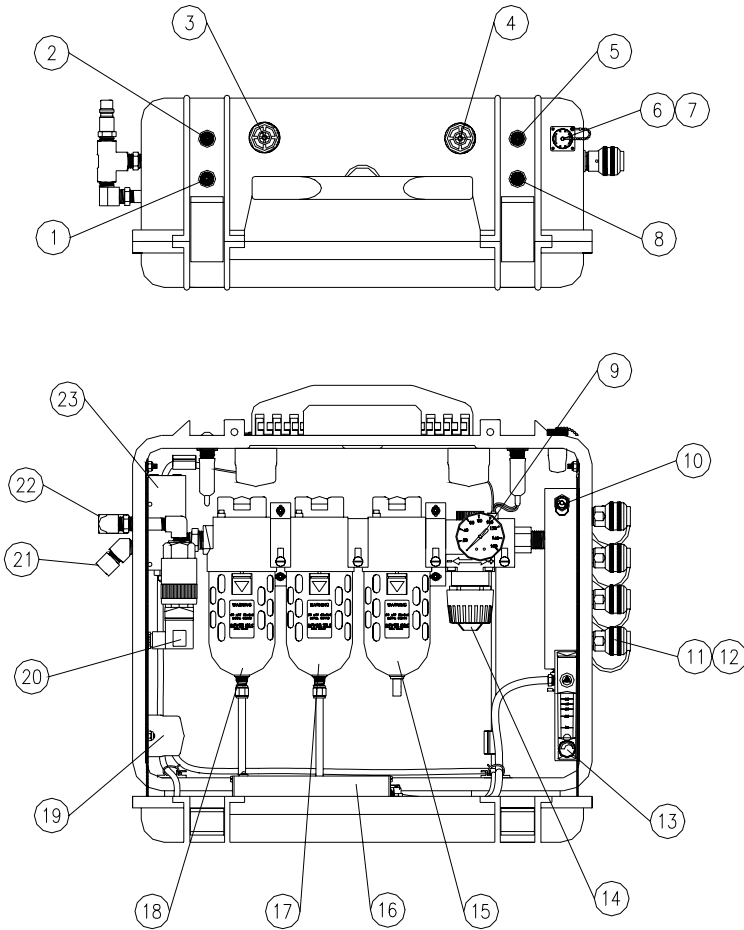
Filter Assembly & Ordering Information

*Note: Replacement filters can be ordered as a kit. Model BB50-FK and includes one (1) of each filter.*
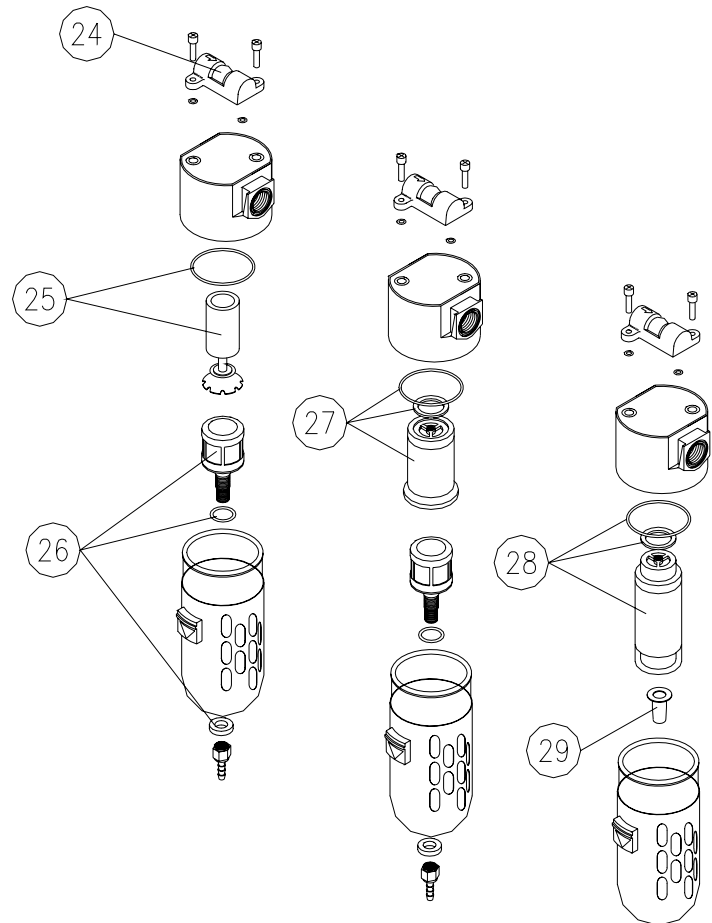
Replacement Parts

ITEM #	DESCRIPTION	PART #
1	PRIMARY AIR INDICATOR BULB	ELDS003
2	BACK-UP AIR INDICATOR BULB	ELDS001
3	BACK-UP AIR WARNING ALARM	ELLS004
4	HIGH CO WARNING ALARM	ELLS004
5	NORMAL INDICATOR LED	MONC005
6	REMOTE ALARM JACK	ELJP004
7	REMOTE ALARM JACK COVER	ELJP005
8	HIGH CO INDICATOR LED	MONC004
9	PRESSURE GAUGE	GA20160B
10	RELIEF VALVE	VR4125BR
11	QUICK CONNECT COUPLING, HANSEN	QDH3SL6M
11A	QUICK CONNECT COUPLING, SCHRADER	QDSSL6M
12	DUST CAP, HANSEN	QDH3DCAP
12A	DUST CAP, SCHRADER	QDSDCAP
13	FLOWMETER	WL033NS
14	PRESSURE REGULATOR	WL014
15	"D" FILTER ASSEMBLY	WL009
16	CO MONITOR	CO-91AA
17	"C" FILTER ASSEMBLY	WL008
18	"A" FILTER ASSEMBLY	WL007
19	RECESSED PLUG, 115 VAC	ELJP006
20	PRESSURE SWITCH	PSVLV005
21	BACK-UP AIR INLET	QDH3PL6M
22	PRIMARY AIR INLET	QDH5PL6M
23	VALVE ASSEMBLY	PSVLV009
24	FILTER CHANGE INDICATOR	WL056
25*	"A" FILTER ELEMENT	BB50-A
26*	AUTO-DRAIN ASSEMBLY	WL024
27*	"C" FILTER ELEMENT	BB50-C
28*	"D" FILTER ELEMENT	BB50-D
29*	MANUAL DRAIN	WL153

* SEE PAGE 8
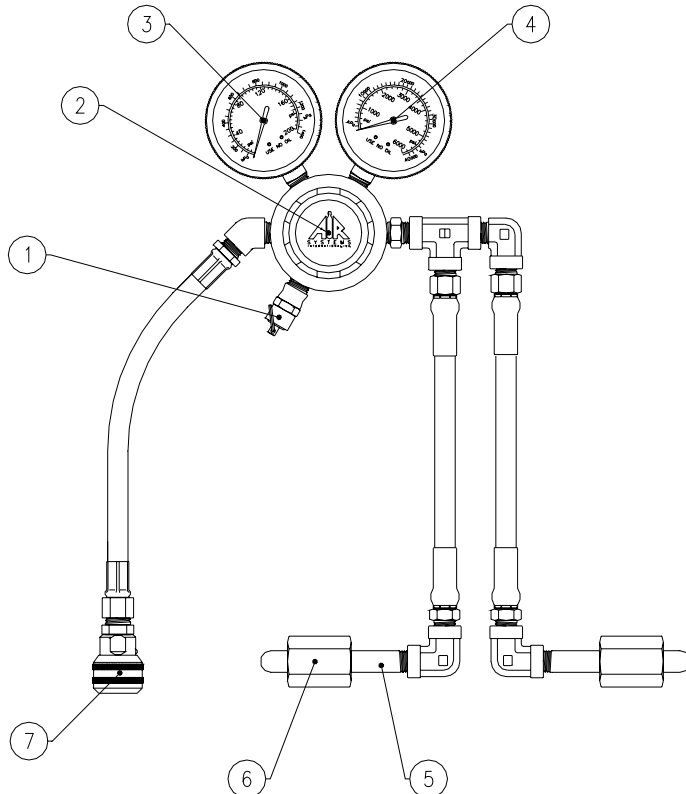
Regulator Assembly Replacement Parts

| ITEM #	DESCRIPTION	PART #
1	RELIEF VALVE	VR4125BR
2	PRESSURE REGULATOR	REG-5000NG
3	OUTLET GAUGE	GA25200S
4	INLET GAUGE	GA256KS
5	CGA-347 NIPPLE	HPBR050
6	CGA-347 NUT	HPBR049
7	QUICK DISCONNECT	QDH3SL4M

Carbon Monoxide Monitor Overview

A carbon monoxide (CO) monitoring instrument is used in breathing air applications because CO can be ingested into compressor intakes by external exhaust emissions or from the combustion of hydrocarbons (Reference OSHA standard 1910.134). The CO-91 series monitors have been developed to continuously monitor CO concentrations in breathing air systems. When connected to an in-line sample stream, these instruments offer continuous, fast response, accurate (+/- 1% full scale) CO concentration levels displayed in parts-per-million (ppm).   The CO-91AA will switch to back-up (Auto-Air) service if 115 VAC service has been interrupted or with a loss of primary air pressure. The instruments activate local and remote audible/visual alarms when CO concentrations are detected in the sample stream or if the back-up (Auto-Air) service has been activated.

Specifications

|	
Size:	2.75"H x 7.0"L x 5.1"W (6.9cm x 17.7cm x 12.9 cm)
Weight:	2.85 lbs. (1.29kg)
Case:	Extruded aluminum Anodized black
Voltage:	115 VAC/ 9-15 VDC
Shielding:	Internal RFI/EMI filters
Fuse:	115 VAC 1 amp fast acting
Operating Temperature:	4 to 113 degrees F (-20 to 45 degrees C)
Humidity Range:	10% to 90% RH
Flow Requirement:	50 - 100 cc
Display:	3 digit LCD
Output Signals:	CO-91AA (DC) via 15 pin D-subminiature connector
Test Circuit:	Manually activated
Sensor Type:	Sealed electrochemical sensor Carbon Monoxide specific
Accuracy:	+/- 1% full scale
Response:	90% in 10-15 seconds
Detectable Range:	0 - 200ppm CO
Calibration:	Manual zero and span adjustments
Alarm Setting:	10ppm CO (5ppm Canadian)
Warning:	*Normal operation - Green light *High CO - Red Light and Audible Alarm *Back-up Air - Red Light and Audible Alarm Low Battery - Amber Light
Warranty:	2 years from original date of purchase

Remote Signal Connections
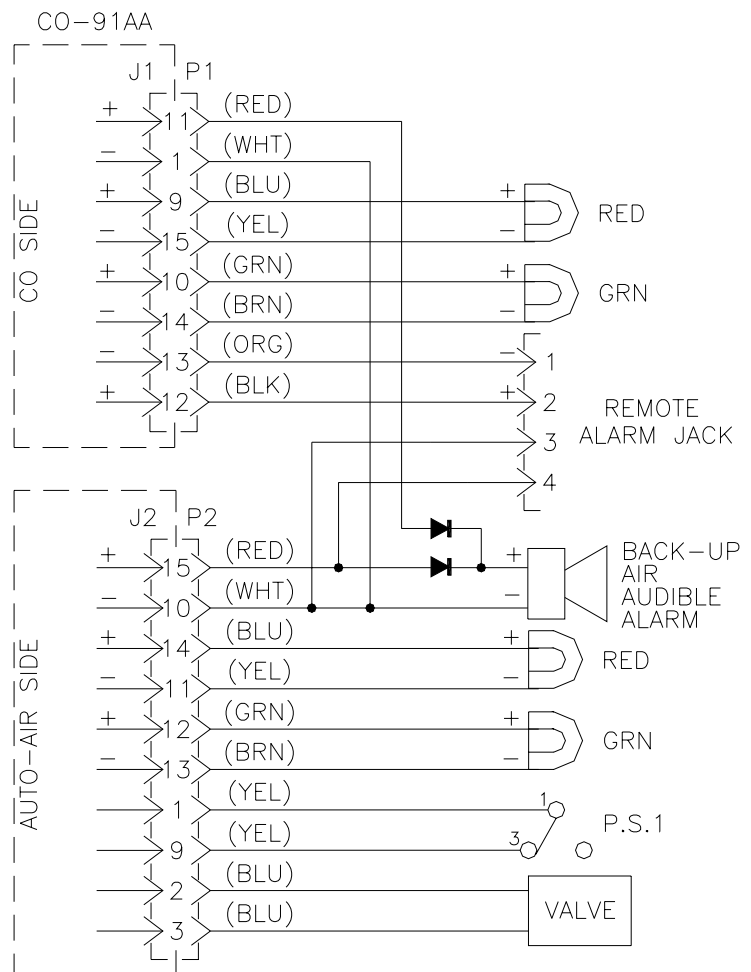
1   LOW BATTERY INDICATOR
2   CALIBRATION TOOL
3   BATTERY HOLDER
4   REMOTE SIGNAL CONNECTOR
5   RECESS PLUG WITH FUSE HOLDER (1 AMP FAST ACTING)
6   AUXILIARY DC POWER JACK
7   ON/OFF/TEST SWITCH
8   AIR SAMPLE INLET
9   AIR DISCHARGE PORT (DO NOT BLOCK)
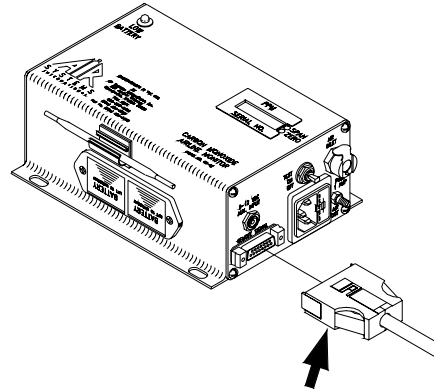10 AUTO-AIR ALARM ON/OFF SWITCH
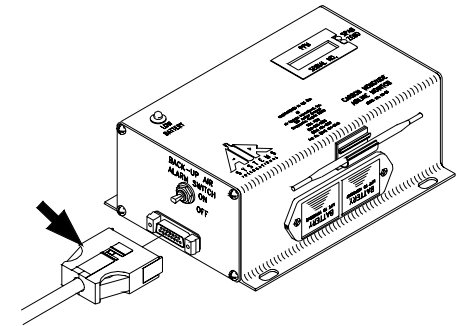11 AUTO-AIR CABLE CONNECTION
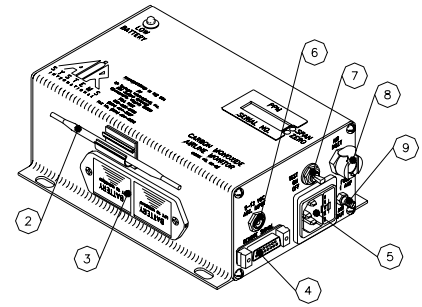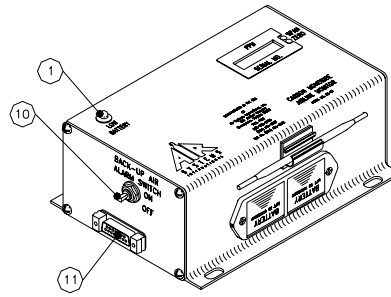
Monitor Setup
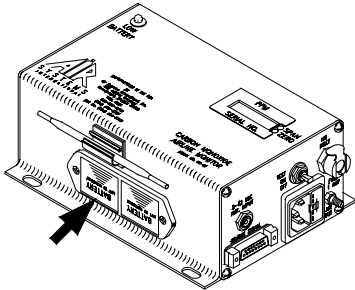
STEP 1)
Install new 9-volt batteries. These batteries continuously provide a required bias voltage to the CO sensor and power the monitor in the event of AC power loss. If AC and DC power are removed for a period of 2 hours or more, a 1 hour restabilization period is required.

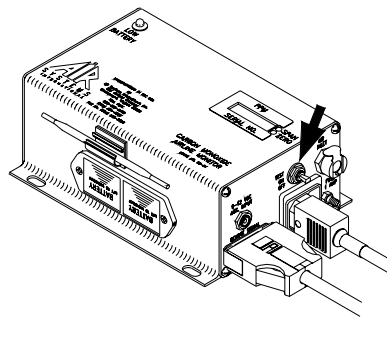**STEP 2)**
Connect alarm cable to the remote signal jack.

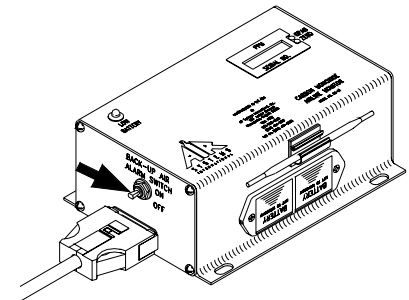**STEP 3)**
Connect Auto-Air cable to Auto-Air signal jack.
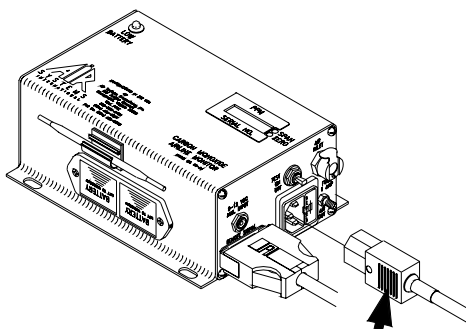
**STEP 4)**
Connect the AC power cord to the 115 VAC jack.

STEP 5)
Place the "ON/OFF/TEST" switch to the ON position. Allow 30 seconds for the readout to stabilize. If a reading other than "ZERO" is displayed calibration of the monitor may be necessary. See calibration procedure.
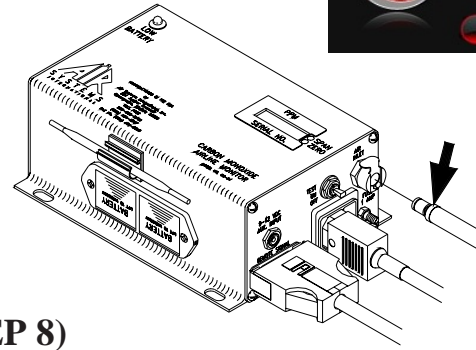
STEP 6)
Place the "BACK-UP AIR SUPPLY" switch to the "ON" position. Back up lights and alarms will activate. If no alarms are present repeat steps 3 - 5.
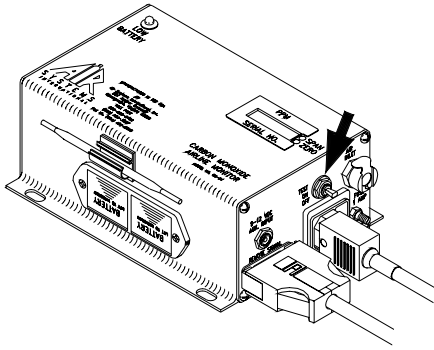
STEP 7)
Hold the "ON/OFF/TEST" switch in the "TEST" position. CO local and remote audible/visual indicators will activate.

STEP 8)
Connect air sample tube from filtration system to the monitors air sample inlet connect port. Assure that the sample air flow rate is within the 50 - 100cc (green bar area). The monitor is now operational.

Operation

1.) The instrument 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).

2.) When 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.

3.) When CO concentration levels drop below the alarm set point, all alarm indicators will deactivate and return to "NORMAL" operation.

4.) An alarm function test can be performed at any time by lifting the "ON/OFF/TEST" switch to the "TEST" position.

5.) The "BACK-UP AIR ALARM" switch provides an audible alarm and visual indicator. In the event of a power failure/interruption or a loss of primary air pressure, the alarms will sound and the red back-up indicator will illuminate.

6.) The 9-volt battery located in the left compartment supplies power to the back-up air alarm system. The 9-volt battery located in the right compartment supplies a bias voltage to the CO sensor to eliminate warm up times.

Shutdown

1) Turn monitor "OFF" at the "ON/OFF/TEST" switch after all workers have disconnected from the breathing air system.

2) Turn "OFF" the "BACK-UP AIR ALARM" switch.

3) <u>**DO NOT**</u> remove 9-volt batteries from the monitor, these are used to maintain bias voltage to the sensor. This keeps the sensor continuously ready for immediate future use.

Monitor Maintenance

1.) Calibrate the monitor monthly or whenever the reading may be questionable. A calibration sticker should be affixed for future reference. We recommend the use of Air Systems' calibration kits to obtain an accurate calibration.

Note: If monitor can not be calibrated, sensor replacement may be necessary. Contact factory for further information.
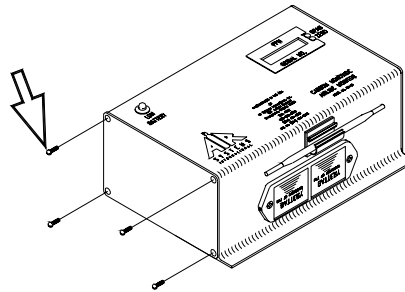
2.) Replacement sensors are shipped with a metal spring installed between the electrodes. Do not remove the clip until the sensor is to be installed into the monitor.

3) Replace 9-volt batteries when the amber "LOW BATTERY" light illuminates.

Sensor Replacement
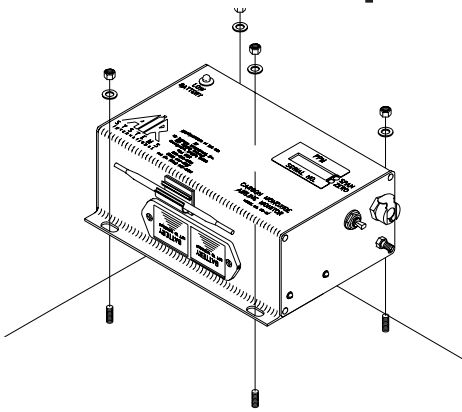
STEP 1)
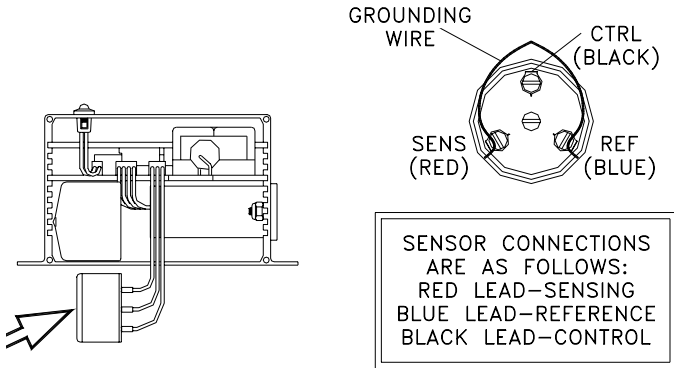Disconnect all external connections. Remove CO monitor from system.

STEP 2)
Remove the four screws from the monitor end plate.
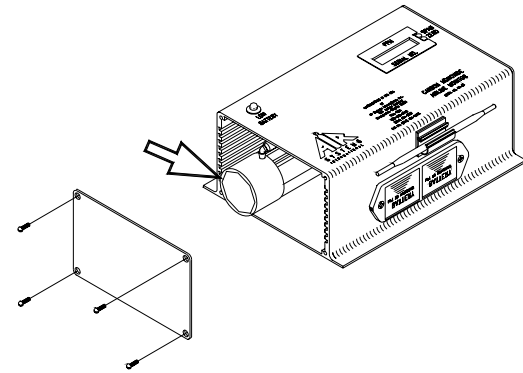
STEP 3)
Remove end plate to gain access to the sensor cup from outside the housing.

GROUNDING WIRE

CTRL (BLACK)

SENS (RED)

REF (BLUE)

SENSOR CONNECTIONS ARE AS FOLLOWS:
RED LEAD—SENSING
BLUE LEAD—REFERENCE
BLACK LEAD—CONTROL

STEP 4)
Remove sensor from sensor cup and remove leads . Take the new sensor and remove the metal spring. Reattach leads to the proper terminals on the new sensor. Install new sensor into sensor cup.
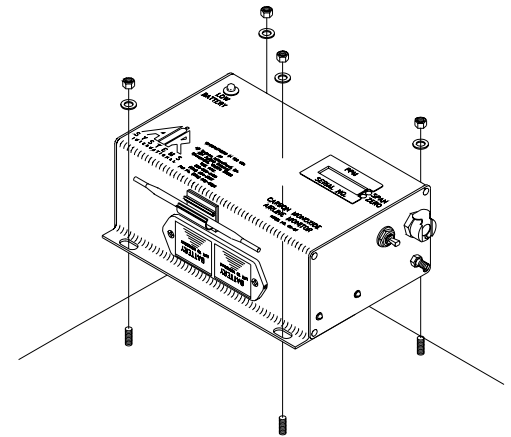
STEP 5)
Reassemble monitor and install back into system. Connect all external connections. Allow monitor to stabilize and recalibrate.

MONITOR CALIBRATION

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

CO Zero Adjustment

To zero the instrument, follow the steps below. Zero calibration gas should be used to properly "zero" the instrument 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 following steps, allow time for the changes to stabilize.*

1. Place the "on/off/test" switch to the "on" position.
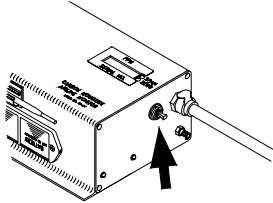
2. Allow 30 seconds for the readout to stabilize. The green indicator light will illuminate.
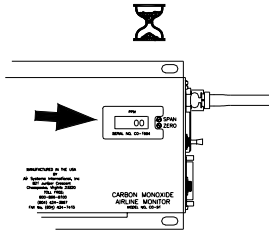
3. Hold the "on/off/test" switch in the "test" position. The following will occur:
   • Audible alarm will sound
   • Green indicator LED and the O_2 red indicator will flash. These will alternate with the CO red indicator.
   • Amber low battery indicator LED will illuminate

This test ensures the circuitry is operable and the continuity to the sensor is proper. Release the switch.
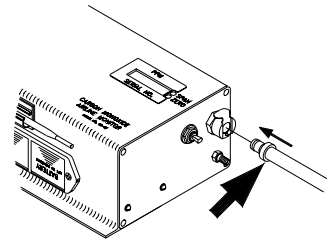
4. Remove air sample inlet tube.
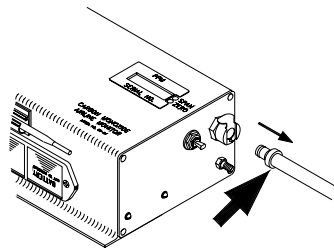
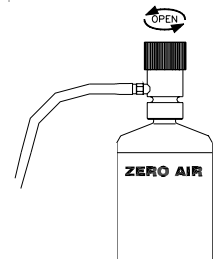5. Install regulator on the zero air cylinder reference gas.
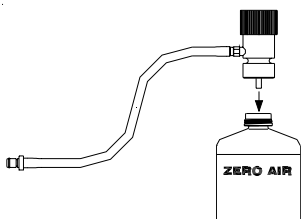
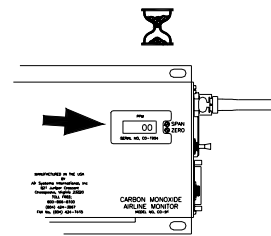6. Attach the clear tubing with male plug into the monitor air sample inlet.

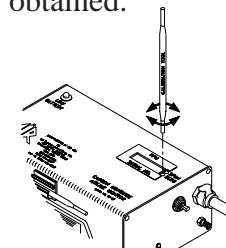7. Open gas regulator by turning the knob two (2) turns counterclockwise.

NOTE: A CONTROLLED ORIFICE IN THE REGULATOR WILL ALLOW THE GAS TO FLOW AT APPROXIMATELY 300 CC/MIN.

8. Allow digital readout to stabilize.

9. Adjust "zero" pot adjustment screw (clockwise to increase, counterclockwise to decrease) until a "00" reading is obtained.
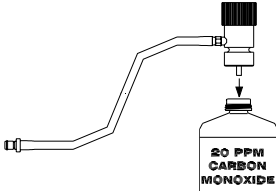
10. Turn off the regulator and disconnect the tubing from the zero air regulator.
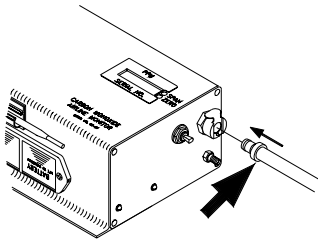
CO/O$_2$ S**PAN** A**DJUSTMENT**

Use only 10 - 20 ppm CO gas for calibration. Using a higher concentration may decrease accuracy on the lower scale. Note: 10ppm gas must be used to satisfy Canadian CO requirements.
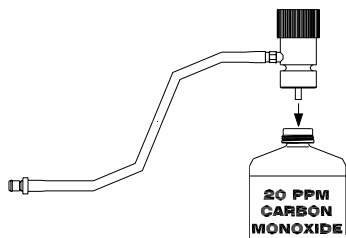
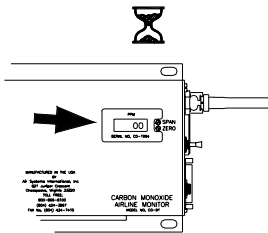1. Install the CO air cylinder reference gas.
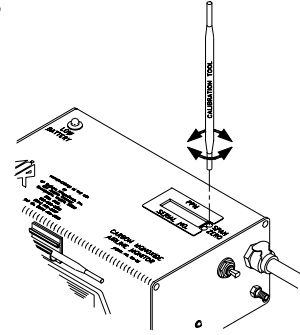

2. Connect the plug to the monitor.

3. Open the gas regulator fully by turning the knob at least two (2) turns counterclockwise.

4. Allow digital display to stabilize approximately 15-30 seconds.
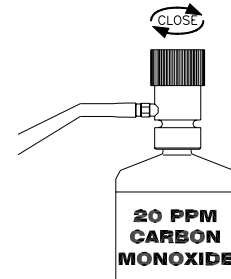

5. Adjust the "span" pot adjustment screw (clockwise to increase, counterclockwise to decrease) until the digital display reads the same concentration (ppm) as the test gas

6. Turn regulator off and repeat zero adjustment procedure (display should return to a "00" reading).

NOTE: CALIBRATION GAS CONCENTRATION IS LOCATED ON THE CYLINDER LABEL

Ordering Information

CO-91NS - "New" replacement sensor

BBK-20 - Small Calibration Kit for CO monitor; includes 20ppm CO gas, zero air, preset regulator, tubing and case - 17 liter cylinders

BBK-20103 - Large Calibration Kit for CO monitor; includes 20ppm CO gas, zero air, preset regulator, tubing and case - 103 liter cylinders

BBK-10 - Small Calibration Kit for Canadian CO monitor settings; includes 10ppm CO gas, zero air preset regulator, tubing and case - 17 liter cylinders

Note: Individual cylinders are available. Consult factory for part numbers and pricing.

Warranty Disclaimer

Air Systems' manufactured equipment is warranted to the original user against defects in workmanship or materials under normal use for one year after 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**