

**AIR SYSTEMS INTERNATIONAL, INC.**  
**CHESAPEAKE, VA 23320**

**MANUAL NUMBER**  
HP4009  
**MONTH/YEAR ISSUED**

Nov 2004

**MANUAL DESCRIPTION**  
**INTRINSICALLY SAFE**  
**COMPRESSOR**

**REV**

2

**ENGINEERING ORIGINAL DO NOT REMOVE**

**THIS MANUAL COVERS THE FOLLOWING ASI**  
**MODELS:**

- TA3-AXAF

**COMPUTER REVISED**

**MANUALS PULLED**

11/04

**APPROVED**

**DATE**

11-04  
DSG

**MANUAL DWGS APPROVED**

**DATE**

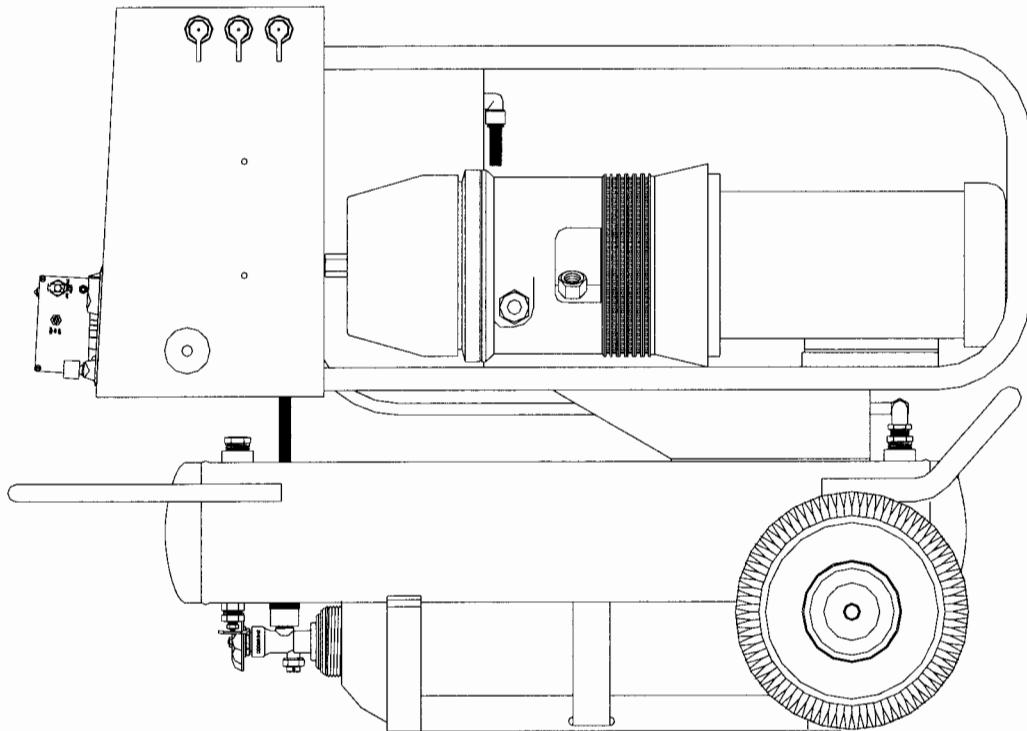
11-04  
DSG

**Model TA3-AXAF**  
**INTRINSICALLY SAFE BREATHING**  
**AIR COMPRESSOR**

Manual No. HP4009  
(Rev 02 Nov 2004)



## Operating Manual



### **AIR SYSTEMS INTERNATIONAL, INC.**

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Air Systems International, Inc.  
Registered to ISO 9001  
Certificate No. A5033

## 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 monthly. 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 manufacturer's recommendations. 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  
O<sub>2</sub> - Oxygen  
CO<sub>2</sub> - Carbon Dioxide  
H<sub>2</sub>O - 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 sales for a copy of the latest standards.**

***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"**

## COMPRESSOR SETUP/ELECTRICAL REQUIREMENTS

The compressor contains a UL listed explosion-proof electric motor that is pre-wired. A certified electrician should properly install the appropriate plug to meet local electrical codes and working conditions. The electric motor is wired for and requires 208-230 volts (3-phase) with approximately a 10 amp service connection. The electric motor can be run on 440 volt current, however, the electric switch box will have to be rewired per the wiring schematic plate located on the motor housing.



**Never run** this compressor on lower than the rated voltage or electric motor damage may occur. When using extension cords, **never use** less than 14 gauge wire size or motor overheating may occur.

## COMPRESSOR SPECIFICATIONS

<b>Motor Life:</b>	Rotary vane air compressor with 50,000 hour vane service life
<b>Output Pressure:</b>	Output pressure range adjustable from 5 - 110psi
<b>Motor Specs:</b>	2 HP explosion-proof electric motor, 208-230vac, 60hz, 8amp, 3 phase UL approved Class I, Div. 1, Group D, Class II, Div 1, Groups F and G.
<b>Dimensions:</b>	45" L x 26" W x 32" H
<b>Weight:</b>	240 lbs. without cylinders 266 lbs. with 1) 2216psi 60cf - 30 min. cylinder 254 lbs. with (1) 4500psi 88cf - 60 min. cylinder
<b>Noise level:</b>	0 - 130 dbA @ 3 feet
<b>Reserve Air Sysetm:</b>	Pneumatically operated automatic reserve air system that actuates at 25 - 35 psi descending system pressure. Pneumatically operated adjustable audible alarm with red indicator activating with loss of system pressure to notify operator that they are suppl

## PANEL FILTRATION EFFICIENCY

<b>1st Stage</b>	<b>Particulate/Bulk Liquid Separation</b>	Auto Drain and Filter change indicator. Removes 95% bulk particulate and liquids @ 5 microns
<b>2nd Stage</b>	<b>Oil Coalescing and Ultra Fine Particulate</b>	Auto Drain and Filter change indicator. Removes oil and particulate to 99.9998% @ 0.01 microns
<b>3rd Stage</b>	<b>Activated Charcoal</b>	Manual Drain and Filter change indicator. Removes organic vapors, odors, and tastes. Less than 0.003 pp/wt remaining oil content

## CARBON MONOXIDE MONTIOR SPECIFICATIONS

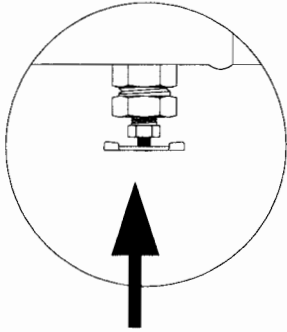
<b>Approval:</b>	This model has been tested by CSA and approved for use in Class I, Group D, Class II, Groups E,F,G environments
<b>Design:</b>	Modular 100mm wide circuit card electronics with quick disconnect pin connectors on boards and sensor
<b>Sensor Type:</b>	Sealed electrochemical cell specific for carbon monoxide (CO)
<b>Response:</b>	90% in 10-15 seconds
<b>Accuracy:</b>	+ / - 1% full scale
<b>Operating Temperature</b>	4 to 113 degrees F. (-20 to 45 degrees C)
<b>Humidity Ra:</b>	10% to 90% RH (Consult factory for dry air applications)
<b>Detectable R:</b>	0 - 200ppm CO
<b>Inlet Flow Range:</b>	50 - 100 cc
<b>Monitor Voltage:</b>	Twin 9-volt battery pack included. 50 hours DC operation on new batteries. <b>Use only the following approved 9-volt batteries for safe operation in hazardous locations:</b> 1. Panasonic Industrial Alkaline Battery - 9 VDC Model No. 6AM - 6PI 9V 2. Duracell Alkaline Battery - 9 VDC Model No. MN1604B2 3. Eveready Battery (Energizer) A lkaline 9VDC - Model No. 6LR61-6AM6-9V
<b>Test Circuit:</b>	Initializes upon energizing manual press-to-test switch to ensure detector is operational.
<b>Initial Alarm Setting:</b>	10ppm CO (5ppm Canadian)
<b>Warning Indicators:</b>	Normal operation - green light High carbon monoxide - red light and audible alarm
<b>Calibration Pots:</b>	Located on the front panel - zero and span adjustment
<b>Shielding:</b>	Internal RFI/EMI filters built into the circuitry.
<b>Display:</b>	3 digit LCD
<b>Warranty:</b>	2 years from date of purchase (covers electronics and CO sensor)

## SETUP/OPERATION

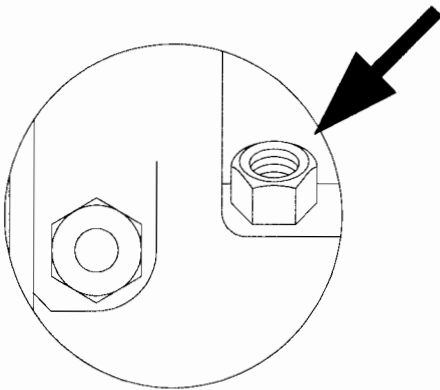
**STEP 1)** Make certain that the compressor is always located in a clean ambient environment, away from toxic dusts, vapors, and gases. Connect power cord to a 230 VAC/3 phase power source rated for a minimum of 10 amps. *Note: A certified electrician should properly install the appropriate plug to meet local electrical codes and working connection.*

### ⚠ CAUTION

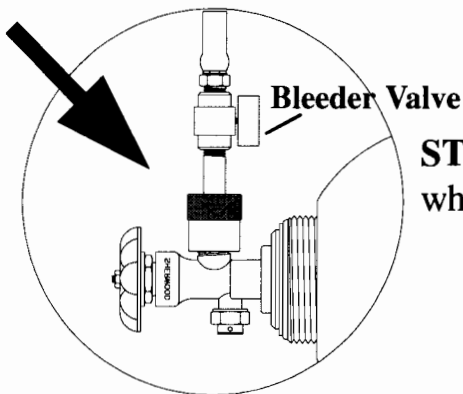
**Never run** this compressor on lower than the rated voltage or electric motor damage may occur. When using extension cords, **never use** less than 12 gauge wire size or motor overheating may occur.



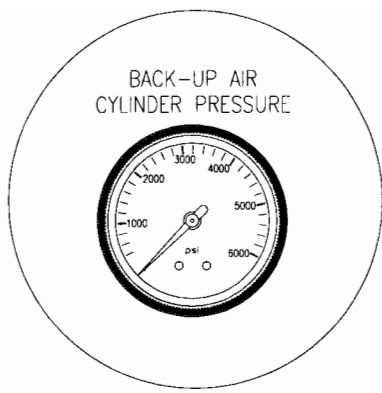
**STEP 2)** Drain water from tanks by opening drain cock located under the tanks. *Note: This should be done daily.*



**STEP 3)** Check compressor oil level daily by removing fill plug using a 7/8" box end wrench. Always use Air Systems' USDA approved oil, **Part No. HP-268** and should be changed every 500 hours of operation. Oil should be up to the lower threads. *Note: The internal threads on the fill plugs are for a thermal probe.*

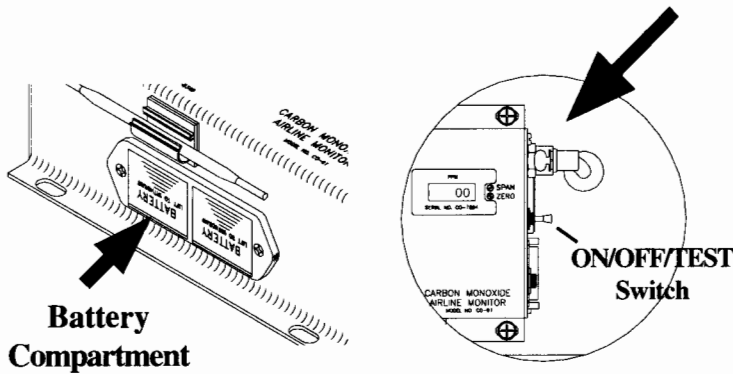


**STEP 4)** Install reserve air cylinder on cart and connect cylinder whip assembly to cylinder. Close bleeder valve.



**STEP 5)** Open the cylinder and check its pressure on the incoming pressure gauge.

**Air Sample Hose**



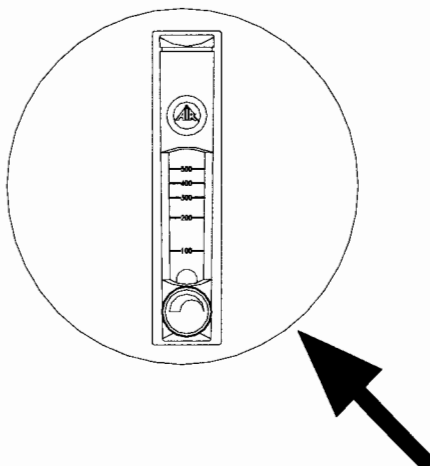
**STEP 6)** Check air line monitor for fresh 9-volt batteries and turn the unit on. Connect the air sample hose to the monitor. Place the “ON/OFF/TEST” switch to the “ON” position. Allow 30 seconds for the readout to stabilize. If a reading other than “ZERO” is displayed, calibration of the monitor may be necessary. See calibration procedure.

*Note: These batteries continuously provide a required bias voltage to the CO sensor and power the monitor. If power is removed for a period of 2 hours or more, a 1 hour restabilization period is required on the sensor as erratic readings may occur.*

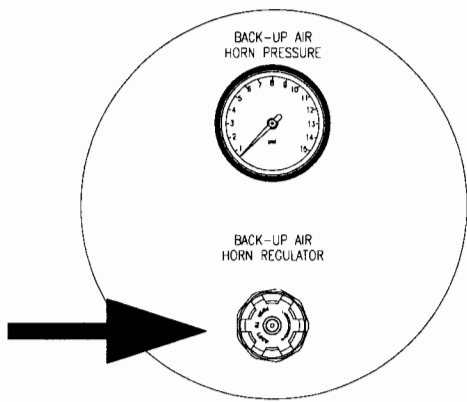
**Batteries approved for use are:**

- **Panasonic Industrial Alkaline Battery - 9 VDC Model No. 6AM - 6PI 9V**
- **Duracell Alkaline Battery - 9 VDC Model No. MN1604B2**
- **Eveready Battery (Energizer) Alkaline 9VDC - Model No. 6LR61-6AM6-9V**

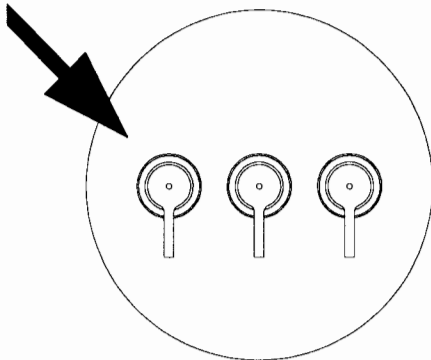
**⚠ WARNING: INSTALL 9-VOLT BATTERIES OUTSIDE THE HAZARDOUS ENVIRONMENT TO PREVENT POSSIBLE IGNITION.**



**STEP 7)** Close flowmeter by turning knob fully clockwise.

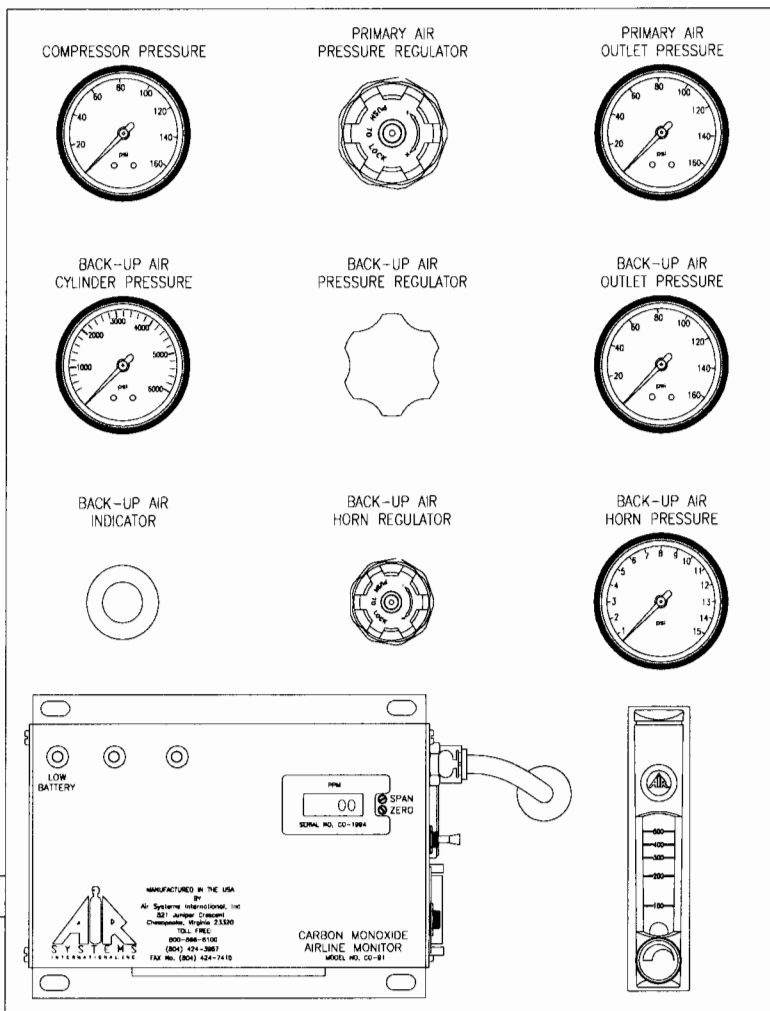


**STEP 8)** Close the back-up air horn regulator by turning the knob fully counterclockwise. Note: The knob has a locking feature. Pull out to release, push in to lock.

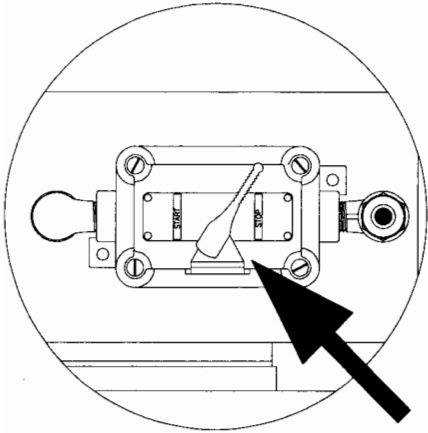


**STEP 9)** Install respirators and lengths of hose to the quick connect outlet coupling.

*Special note: Make certain that the respirator hose is disconnected from the compressor before removing the mask from the worker's face. Loss of system pressure to the other workers will occur. Do not leave a respirator mask open to free flow as this will cause a loss of main system air pressure and the reserve air will actuate.*

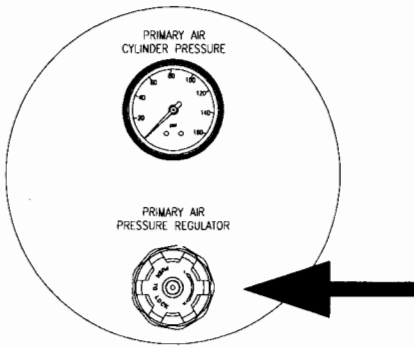


**STEP 10)** Adjust the back-up air pressure regulator to the minimum operating pressure required by the respirator manufacturer. Confirm proper operation of the back-up air red indicator. Adjust the back-up air horn regulator clockwise to obtain desired sound level of horn. *Warning: The pneumatic horn can produce a high dbA level.*



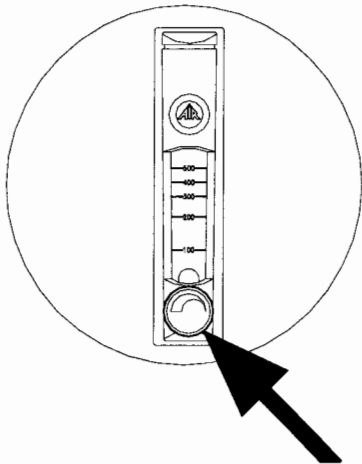
**STEP 11)** Turn compressor on.

*Note: During initial setup and running of compressor, high levels of carbon monoxide may be experienced for up to 1 minute. This will be quickly purged from the system by bleeding off system air.*



**STEP 12)** Adjust the primary air pressure regulator at least 10psi above the reserve air pressure set in Step 10. Confirm proper operation of reserve air directional valve. The presence of sufficient primary pressure will cause the directional valve to shift out of the reserve air position and both audible and visual indicators will deactivate. The reserve air activation pressure can be changed by adjusting the reserve air pressure regulator shown in Step 10. The following settings should cover most respiratory requirements:

RESERVE AIR PRESSURE	ALARM/RESERVE AIR ACTIVATION
70psi	55psi
80psi	60psi
90psi	68psi
100psi	75psi



**STEP 13)** Adjust CO monitor air sample flow rate by turning the flowmeter control knob counterclockwise until the float hovers in the green bar area (approximatley 50-100 cc/min).

*Note: It may take a few seconds for the pneumatic alarm system to depressurize.*

## SHUTDOWN

1. Make sure all personnel have egressed from the work area.
2. Shut air cylinder valves.
2. Turn "OFF" compressor switch.
3. Turn monitor "OFF" at the "ON/OFF/TEST" switch. **Do not** remove 9-volt batteries. These are used to maintain a bias voltage to the sensors; this keeps the sensor ready for immediate future use.
4. Bleed water from aftercooler as explained in Step 2.

## SYSTEMS MAINTENANCE



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

**Filter Housing/Bowls:** Periodic cleaning of the polycarbonate bowls may become necessary. 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 1/3 of the bowl capacity. For periodic cleaning, use a mild soapy solution.

**Filter Change:** The filtration system consists of a filter change indicator which will gradually change from green to orange 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 unit to allow the liquids to drain outside of the box.

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

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

To assure sensor accuracy, calibration of the 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** New Replacement Sensor

**Oil Change:** Check compressor oil level daily by removing fill plug. Always use Air Systems' USDA approved oil, **Part No. HP-268** and should be changed every 500 hours of operation.

**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 battery condition and replace if necessary. See Step 6 for a list of batteries approved for use.

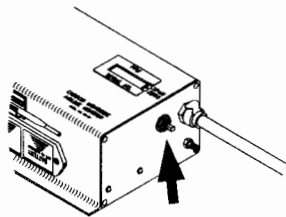
# CALIBRATION PROCEDURE

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

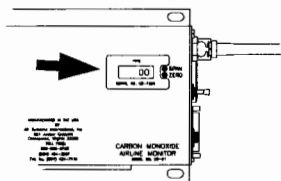
## CO Zero Adjustment

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.

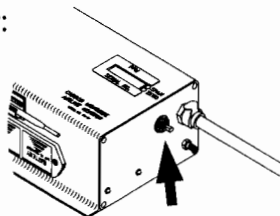


2. Allow 30 seconds for the readout to stabilize.  
The green indicator light will illuminate.



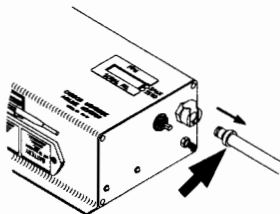
3. Hold the “on/off/test” switch in the “test” position. The following will occur:

- Audible alarm will sound
- Green indicator LED will flash
- Amber low battery indicator LED will illuminate
- Red lamp on

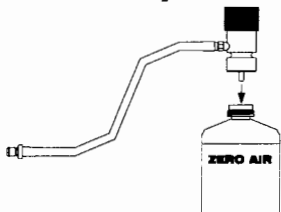


This test ensures the circuitry is operable and the continuity to the sensor is proper. Release the switch.

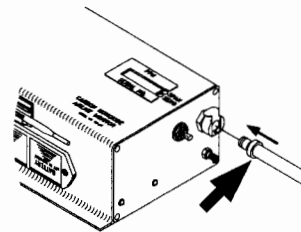
4. Remove air sample inlet tube.



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



6. Attach the clear tubing with male plug to the monitor air sample inlet.

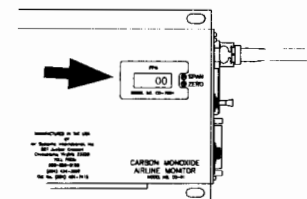


7. Open gas regulator fully by turning the knob at least two (2) turns counterclockwise.

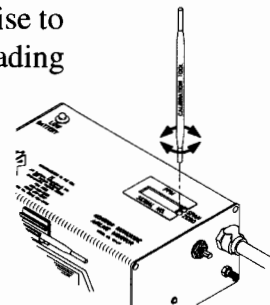
***Note: A controlled orifice in the regulator will allow the gas to flow at approximately 300 cc/min.***



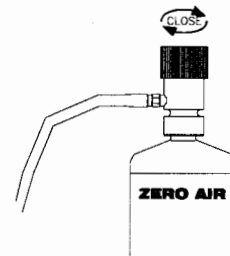
8. Allow digital readout to stabilize approximately 15 - 30 seconds.



9. Adjust “zero” pot adjustment screw (clockwise to increase, counterclockwise to decrease) until a “00” reading is obtained.



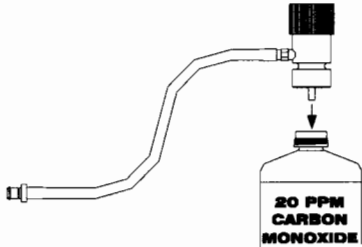
10. Turn off the regulator and disconnect the tubing from the zero air regulator.



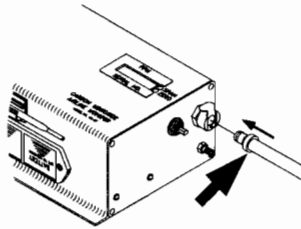
# CO SPAN ADJUSTMENT

*Use only 10 - 20 ppm 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.*

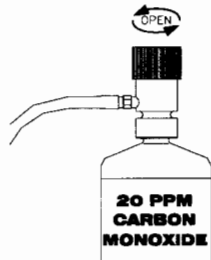
1. Install regulator to the CO calibration gas cylinder.



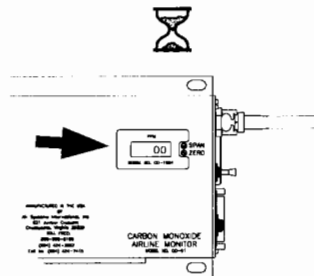
2. Connect the plug to the monitor.



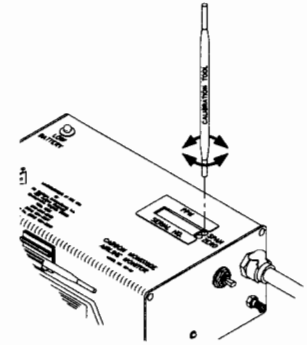
3. Open gas regulator fully by turning the knob at least two (2) turns counterclockwise.



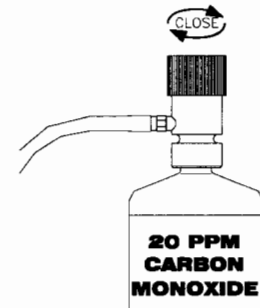
4. Allow digital display to stabilize approximately 15 - 30 seconds.



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



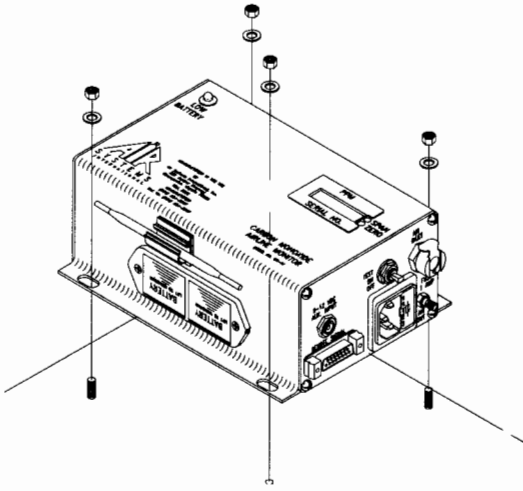
6. Turn regulator off and repeat "zero" adjustment procedure above. Display should return to a "00" reading.



**THE MONITOR IS NOW CALIBRATED AND SHOULD BE RECALIBRATED MONTHLY OR IF ACCURACY IS QUESTIONABLE. CHECK LOCAL REQUIREMENTS AND RECALIBRATE AS REQUIRED.**

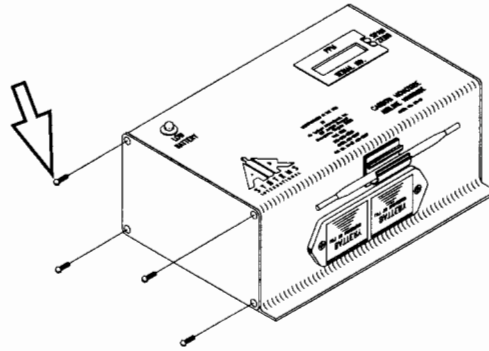
## SENSOR REPLACEMENT

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)

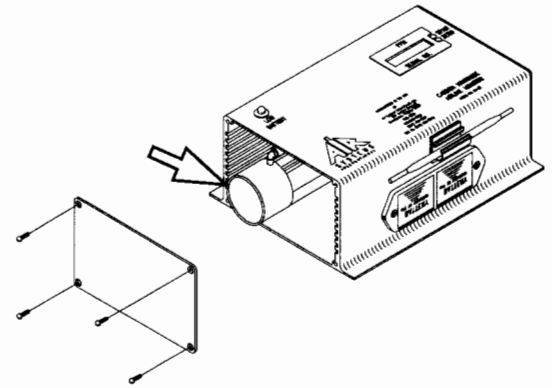
Disconnect all external connections. Remove CO monitor from the unit.



### STEP 2)

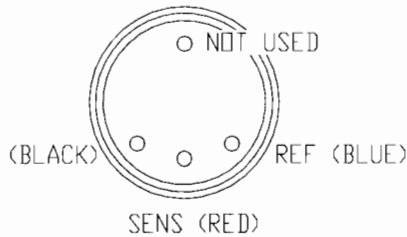
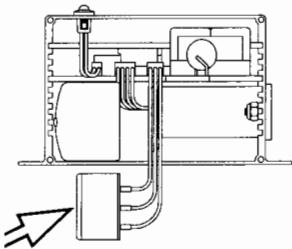
Remove the four screws from the monitor's left end plate.

*Note: Alarm location may vary.*



### STEP 3)

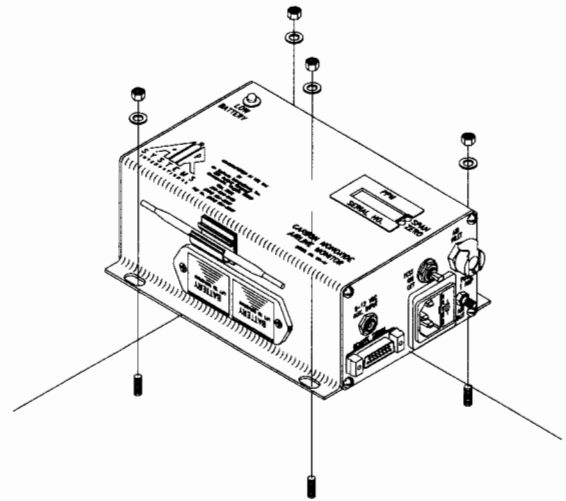
Remove end plate to gain access to the sensor cup from outside the housing.



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

### STEP 4)

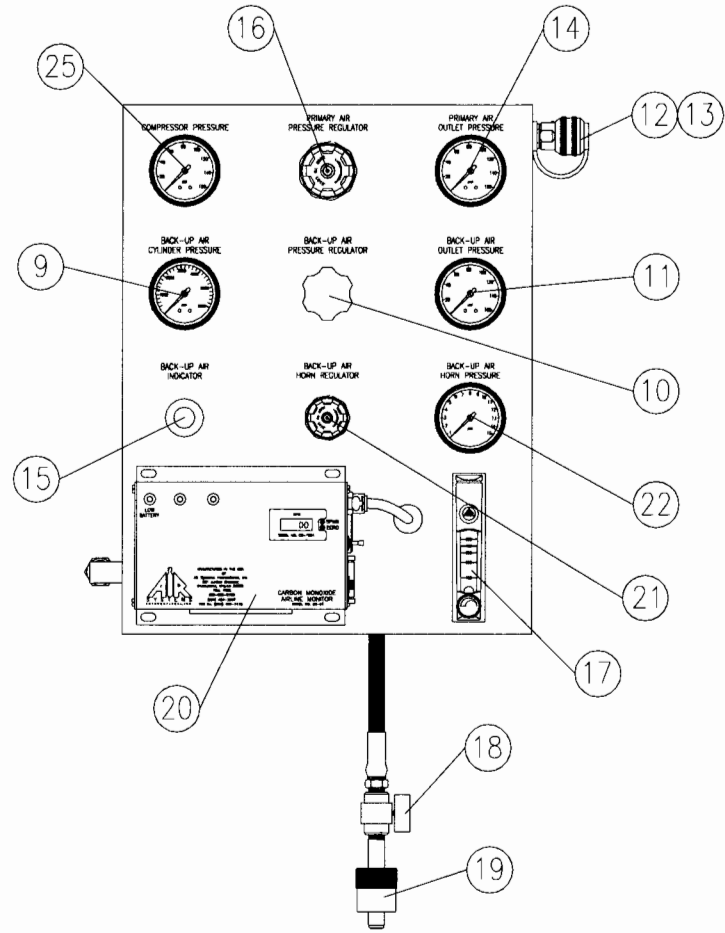
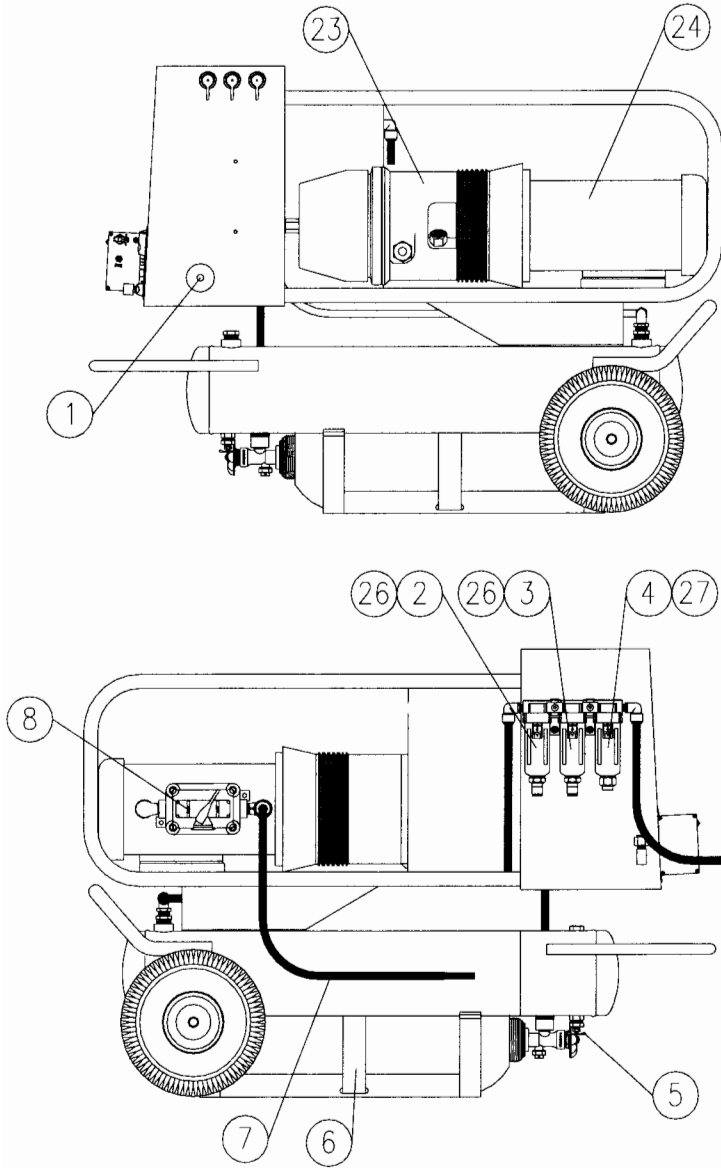
Remove sensor from sensor cup and remove leads. Take the new sensor and remove the metal spring. Reattach leads to the proper colored terminals on the new sensor. Install new sensor into sensor cup.



### STEP 5)

Reassemble monitor and install back into system. Connect all external connections. Allow monitor to stabilize and recalibrate.

# REPLACEMENT PARTS/IDENTIFICATION



## REPLACEMENT PARTS/IDENTIFICATION

ITEM #	DESCRIPTION	PART #
1	BACK-UP AIR ALARM	GAMLHORN
2	"A" FILTER ELEMENT	BB15-AW
3	"C" FILTER ELEMENT	BB15-CW
4	"D" FILTER ELEMENT	BB15-DW
5	DRAIN COCK	BR2DCM
6	CYLINDER STRAP	HDWR113A
7	POWER CORD, 14-4 SOOW	ELCB017
8	ON/OFF SWITCH	ELSW015
9	BACK-UP AIR CYLINDER PRESSURE GAUGE	GA206KP
10	BACK-UP AIR PRESSURE REGULATOR	REG004
11	BACK-UP AIR OUTLET PRESSURE GAUGE	GA20160P
12	RESPIRATOR CONNECTION, HANSEN	QDH3SL6M
13	DUST CAP	QDH3DCAP
14	PRIMARY AIR OUTLET PRESSURE GAUGE	GA20160P
15	BACK-UP AIR INDICATOR	GA15RED
16	PRIMARY AIR PRESSURE REGULATOR	15REGW
17	FLOWMETER	WL033NS
18	BLEED VALVE	VAL030
19	CGA-346/347 HAND-TIGHT	SS347HT
20	CO MONITOR	CO-91ISLA
21	BACK-UP AIR PRESSURE REGULATOR	WL012
22	BACK-UP AIR PRESSURE GAUGE	GA2015P
23	COMPRESSOR	COMP018
24	2 HP MOTOR - EXPLOSION PROOF	MTR018
25	COMPRESSOR PRESSURE GAUGE	GA20160P
26	AUTO-DRAIN ASSEMBLY	15ADW
27	MANUAL DRAIN	15MDW

## *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.

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