Welcome to PureAire Monitoring Systems

I’d like to thank you for investing in our continuous life safety and process control toxic gas monitoring systems.

PureAire offers an unbeatable combination of experience and innovation in solving the safety and environmental needs of our customers. We’re capable of providing small systems of a few points to a total multi-point turnkey computerized package.

PureAire’s proprietary sensor cell technology and state-of-the-art electronics are designed to interface with the latest distributive or PLC based control systems. We believe that our experience, innovative products and commitment to service will satisfy your specific monitoring needs now and in the future.

Our growth is a result of our total commitment to supporting our customers. We’re available 24 hours a day, 7 days a week to help you when you need us. Our 24 hour Emergency phone number is 1-847-420-3814. We can provide field service, preventative maintenance programs and training to your technicians in the operation of our equipment. Our goal is to provide the best after sale service and support in the industry. That’s just one way PureAire takes that extra step to ensure your complete satisfaction.

Thank you again for investing in PureAire Monitoring Systems for your monitoring needs and I’m proud to welcome you to our family of valued and satisfied customers.

Sincerely,

Albert A. Carrino
President
Read Before Operating

This gas monitoring system has been designed to provide long-term reliable performance. We recommend the following basic precautions while installing, operating and maintaining this device.

- Read this “Guide to Operation and Installation” carefully. Installation, maintenance, calibration and testing should be carried out by qualified personnel only.

- Check if the power supply matches the specifications given in this guide and ensure that the system has been connected properly. This monitor must be powered by a regulated 24VDC power supply. **Please insure the proper polarity. Reversing the polarity will damage the fuse on the drive PCB.**

- **This monitor has a digitally controlled sample flow system.** On power up, the monitor will immediately start a 4 minute countdown. It will then display a Flow Fault Out of Range (F34) then Pyrolizer Heater Fault (F02). In approximately 40 seconds the Yellow Fault LED will clear and a ppm gas concentration will display on the second line of the digital display. The last remaining Fault, Pyrolizer Heater Fault will display on the first line. To clear this fault from the display, push the joystick down.

- After power up, please let the system equilibrate a few hours before making any adjustments.

---

**This system has a built-in pyrolizer. The pyrolizer insulation temperature can reach 150 F and can cause burns if touched. Use Caution when working near the pyrolizer.**

---

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The Air Check Acrylonitrile Monitor is a compact extractive gas sampling system designed for the continuous detection and measurement of toxic gas leaks. It is capable of sampling over distances of up to 100 feet (33 meters).

The Air Check is a single point monitoring system built into an a Nema 4x water resistant housing that may be wall mounted and is designed to require as little space for installation as possible.

The system has the following features:
- 24 VDC operation
- Built-in pyrolizer
- Integral digitally controlled sampling pump and flow system
- Local digital display
- User selectable dual level alarm and system fault relays
- 4-20 mA output
- Renewable long life electrochemical sensor cell
- Supervised electronics monitors sensor, pyrolizer and sample pump

⇒ NOTE: The Air Check Acrylonitrile enclosure is NOT rated for Class 1, Division 1 Groups B, C & D
1.1 Component Identification

1.1.1 Overall System Composition

The Air Check Acrylonitrile Monitor may be integrated into the overall hazardous gas monitoring system. As a result, it may be remotely located for the monitoring of process areas and other environments where access to the instrument for maintenance or service may be restricted. It may also be used as a stand-alone detection system.

**Front Cover**—This permits accessing the inside of the sample and control system.

**Mounting Tabs**—Adjustable feet designed to connect the methyl bromide enclosure to walls or other solid surface. There is one on each corner of the enclosure.

**Cover Fastening Screws**—Captive Philips head plastic screws used to fasten the front cover to the base of the methyl bromide monitor. There is one on each corner of the front cover.

**NOTE:** Please Do not over tighten the screws as the Phillips head will strip.

**Cable Port**—This is the opening in the transmitter housing for connecting the 4-20 mA output, 24 VDC power cable, and alarm relay wiring.

**Sample Inlet**—This serves as the connection for the incoming sample line.

**Sample exhaust**—This serves as the connection for the sample exhaust line.
1.1.2 Front View Control Panel

1. **Local Digital Display** — During normal operation, displays the name and concentration of the target gas. Also displays alarm messages and programming/calibration menus and information.

2. **Joystick** — Used for selecting and adjusting the built-in menus for alarm threshold settings, relay state, alarm delay etc.

3. **Alarm & Fault LED’s** — These LED’s illuminate when a gas concentration alarm or instrument fault is detected.

4. **Flowmeter** — This flow meter displays the flow rate to the sampling system in SCFH.

**NOTE** — *The flow rate is factory set and is continuously regulated via a built-in flow sensor. Flow rate is factory set for sampling distances up to 100 feet. Field adjustment should not be required.*
1.1.3 Internal View

1. **Main Power Connector** — Connector for 24VDC power input. See section 3: Installation for more information.

2. **Pyrolizer Assembly** — Converts AN gas into HCN gas prior to presentation to the gas sensor.

   ☢ **CAUTION** - *The pyrolizer insulation temperature is above 150 F and can cause burns if touched*

3. **Pyro & Pump Drive PCB** — Controls power to the pyrolizer filament and regulates the sample pump flow control

4. **Control Electronics and Readout** — Converts the signal from the sensor cell and sends information to the local digital display and analog/relay terminal block.

5. **Flow Meter** — Provides positive indication of flow through the monitor.

   ☢ **NOTE** – *The flow rate is factory set and is continuously regulated via a built-in flow sensor.*

6. **Flow Chamber** — The converted gas from the pyrolizer is introduced to the gas sensor in this chamber. Sample flow into the chamber is continually monitored. If the sample pump fails, the system fault relay is activated.

7. **Acrylonitrile Sensor Cell** — A renewable electrochemical sensor cell. Typical life is 3 to 6 years.

8. **Sample Pump** — This internal sample pump is used to draw the gas sample from the area into the pyrolizer and flow chamber.

9. **Inlet & Exhaust** — These are connections for the incoming gas sample and outgoing exhaust sample
1.2.5 Transmitter Interior

1. Power Analog Terminal Block — This terminal block is where the 24VDC power and 4-20 mA analog output connection is made.

1.2.6 Alarm Relay Board

Remote Reset

C NC NO  C NC NO  C NC NO

Alarm 2 Relay  CONN1

Alarm 1 Relay  CONN2

Fault Relay  CONN3
Sample Pump

Status LED’s

Green Power LED. Confirms Power is being supplied to the monitor

Yellow Flow Status LED. Confirms the sample pump is operating and flow is being maintained at the proper flow rate

Blue Fault Status LED. Indicates various system faults.
6 quick flashes = Flow fault
3 quick flashes = pyrolyzer fault
When not in fault the Blue LED remains illuminated continuously

Main power connection

Flow Sensor

Pump and Pyrolyzer Drive Assembly
2: Specifications

 NOTE: Due to our commitment to continual product improvement, all specifications are subject to change without notice.

2.1 Performance Specifications

Models: Air Check Acrylonitrile Monitor
Sensor Type: Renewable electrochemical cell. Field rechargeable.
Response Time: Within 60 seconds to T90.
Repeatability: ±10% of full scale.

Fault Indicators:
- Loss of VDC power (4 mA signal drops to 0, system fault alarm relay de-energizes);
- Loss of sensor signal (local visual alarms, system fault alarm de-energizes);
- Loss of sample pump (4 mA signal drops to 0, system fault alarm relay de-energizes);
- Loss of Pyrolyzer filament (4 mA signal drops to 0, system fault alarm relay de-energizes)

Operating Temp: 14° to 86°F (0° to +30°C); consult PureAire for lower or higher operating temperatures.
Humidity: Typically 20 to 95% RH;

2.2 Gas Detection System

Type: Proprietary renewable electrochemical gas sensor.
Sensor Life: 3 to 6 years under normal conditions.
Detectable Gas: Acrylonitrile Standard Range 0-30ppm *
*Consult PureAire for other available gas ranges.
2.3 Signal Outputs

Local Display: Digital display calibrated for Acrylonitrile. The range is stated on the serial number and can be accessed via the joystick on the front panel.

Analog Output: DC 4-20 mA

Relay Output: Dual level user selectable alarm relays and one fault relay
Rated, 2amps @ 30VDC; 2amps @ 250VAC

2.4 Electrical Requirements

Power: 24 VDC external power. ➤ NOTE: Must be a regulated 24VDC Power Supply

Consumption: 2.0 amps.

2.5 Physical Characteristics

Dimensions: 10” W x 7.0” H x 7.0” D inches;
254 x 178 x 178 mm

Weight: 10 pounds (4.5 kg)

Enclosure Type: Polycarbonate wall mounted enclosure. Not for use in hazardous environments.
## 2.6 AirCheck Acrylonitrile Default Factory Settings

The Air Check Acrylonitrile Monitor is shipped with factory defaults for the alarm relay settings. The following are the factory defaults:

<table>
<thead>
<tr>
<th>Menu Function</th>
<th>Factory Default</th>
<th>Menu Defined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm Thresholds</td>
<td>Alarm 1 = 1.0ppm</td>
<td>At what level do you want to alarm?</td>
</tr>
<tr>
<td></td>
<td>Alarm 2 = 5.0ppm</td>
<td></td>
</tr>
<tr>
<td>Set Alarm Threshold</td>
<td>Alarm 1 = Normal</td>
<td>Do you want to alarm at a level higher, (normal) or lower, (inverted) than the alarm threshold?</td>
</tr>
<tr>
<td>Polarity</td>
<td>Alarm 2 = Normal</td>
<td></td>
</tr>
<tr>
<td>Alarm Delay</td>
<td>Alarm 1 = 5 seconds</td>
<td>How long do you want to wait until the alarms activate?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zero Suppression</td>
<td>0.3ppm</td>
<td>At what level do you want to see the initial gas concentration reading?</td>
</tr>
<tr>
<td>Set Alarm Hysteresis</td>
<td>Alarm 1 = 0.0 ppm</td>
<td>For use when using the monitor for control. It is recommended to set both alarm hysteresis at 0.0%</td>
</tr>
<tr>
<td></td>
<td>Alarm 2 = 0.0 ppm</td>
<td></td>
</tr>
<tr>
<td>Relay Latching</td>
<td>Alarm 1 = Non-latching</td>
<td>Do you want the alarm to automatically reset? (non-latching) or do you want to manually reset the alarm? (latching)</td>
</tr>
<tr>
<td></td>
<td>Alarm 2 = Non-latching</td>
<td></td>
</tr>
<tr>
<td>Format Relay - LED</td>
<td>Alarm 1 = Normal</td>
<td>Do you want the relays to energize, (normal) or de-energize, (fail safe) when the alarm activates?</td>
</tr>
<tr>
<td>State **</td>
<td>Alarm 2 = Normal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fault = Normal</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** The built-in relay settings may be changed by the user in the field. Refer to Section 4.5

**NOTE:** The LED indicators on the front panel are connected directly to the alarm relays.
3: Installation

3.1 Site Requirements

The Air Check Acrylonitrile monitoring system should be mounted in an area free of vibration and electrical noise or interference. If possible, avoid areas with continuous high temperatures or relative humidity.

The unit should be installed in a location where gas leaks are likely to occur or where released gases may accumulate. Airflow within the monitored area, the characteristics of the target gas (lighter or heavier than air), and the position of workstations and personnel should all be considered in determining the most suitable installation location.

Allow sufficient space around the instrument to permit access for maintenance and calibration.

**NOTE: The Air Check Acrylonitrile Monitor is NOT designed for installation in hazardous areas.**

3.2 Mounting

The Air Check is designed primarily for wall mounting and should be installed no closer than 36 inches (915 mm) above floor level. If mounted outdoors, keep direct sunlight off of the enclosure.

3.3 Sensor Installation

**IMPORTANT: Be careful not to turn the sensor or touch the membrane on the bottom of the sensor during installation.**

**CAUTION: The target gas is factory programmed and cannot be adjusted in the field. Failure to install the correct sensor in the instrument will adversely affect detection reliability and/or measurement accuracy.**

1. Remove the front cover by turning the cover counter clockwise.
2. Remove the sensor shorting plug or battery if supplied.
3. Plug the Methyl Bromide sensor into the flow chamber inside the instrument housing.

**NOTE: Do not twist the gas sensor inside the flow chamber. This may loosen the sensor cell box nut on H type renewable sensor cells.**

**IMPORTANT: Remove the shorting plug from the sensor cell connector before connecting the sensor cell to the transmitter.**

Insert the sensor cell into the flow chamber by pushing the sensor cell down until it seats inside the O-ring.

Never twist the sensor cell inside the flow chamber.
3.4 Wiring

3.4.1 24 VDC Power

Connect the 24 VDC power cable to the terminal block located on the inside of the instrument. The terminal connections are as follows: (Pin 6) +24V, (Pin 5) Common, and (Pin 4) shield. A three-wire shielded cable (3-conductor, 18 AWG stranded shielded) General Cable #E2203S.30.86 or equivalent should be used for the connection. The total length of the cable between the gas detector and controller must not exceed 0.62 miles (1 km).

⚠️ CAUTION: The Air Check Acrylonitrile Monitor must only be powered using a regulated 24VDC Power Supply. Failure to use a regulated 24VDC power supply will void the warranty.

The 24 VDC power in connections are made on the 6 pin terminal connection located on the Power Supply PCB. These connections are made as follows:

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>DC + 24V</td>
</tr>
<tr>
<td>5</td>
<td>Common</td>
</tr>
<tr>
<td>4</td>
<td>Shield</td>
</tr>
</tbody>
</table>

CAUTION: The Air Check Acrylonitrile Monitor must only be powered using a regulated 24VDC Power Supply. Failure to use a regulated 24VDC power supply will void the warranty.
3.4.2 Alarm Relays

The Air Check monitor incorporates two, gas concentration alarm and one system fault relay. These relays may be wired for normally open (N.O.) or normally closed (N.C.) operation and are rated as follows:

Rated, 2amps @ 30VDC; 2amps @ 250VAC

3.5 Initial Startup

Once installation of the gas detector has been completed, it is ready for startup. The following procedures should be performed before putting the instrument into operation:

1. Check the integrity of all wiring. Confirm the power polarity.
2. Apply 24 VDC power to the Power Supply PCB board. The sample pump and pyrolizer heater will operate.

   NOTE: The Air Check requires a regulated 24VDC power supply

   ➤ CAUTION - The pyrolizer insulation temperature is above 150 F and can cause burns if touched.

3. On power up, the monitor will immediately start a 4-minute countdown. It will then display a **Flow Fault Out of Range (F34)** then **Pyrolizer Heater Fault (F02)**. In approximately 40 seconds the Yellow Fault LED will clear and a ppm gas concentration will display on the second line of the digital display. The last remaining Fault, **Pyrolizer Heater Fault** will display on the first line. To clear this fault from the display, push the joystick down. ↓

   ➤ NOTE: After power up, please let the system equilibrate a few hours before making any zero and span adjustments. The Acrylonitrile sensor may read a high ppm gas concentration on startup. The sensor’s zero will stabilize during this warm period.

3.5.1 Pump Adjustment

The Air Check Acrylonitrile Monitor has a built in digitally controlled flow controlled sample pump. The pump flow is set at the factory and should not require adjustment. It has a range to accommodate tubing lengths of 3 feet to over 100 feet. Flow rate is between 0.5 and 0.9 SCFH. If flow adjustment is necessary, please contact PureAire.
4: Air Check Monitor Programming

The Air Check Acrylonitrile Monitor is supplied with user selectable settings to adjust the alarm settings, 4 and 20mA output and minor sensor adjustments. The settings are arranged in menus that are accessed by moving the joystick. To access the menus a factory set password is used.

NOTE: The Air Check Acrylonitrile Monitor will continuously monitor Acrylonitrile while accessing the menus. The alarm, fault relays and mA output are all active and on line while making any changes to the menus.

4.1 Control Panel Overview

All instrument configuration and operational programming is performed from the front panel of the Air Check Monitor using the joystick.

4.2 Joystick Operation

The Air Check Acrylonitrile monitor uses an 8-position joystick with a center pushbutton for selecting menus and changing values. The joystick is programmed to standard protocol as follows:

NOTE: The joystick has a built-in delay to prevent accidental tampering of the menus. Deliberate entries are required.

- **Plus** – Pushing the joystick in this direction increases the value
- **Minus** – Pushing the joystick in this direction decreases the value
- **Next** – Pushing the joystick in this direction moves you to the next level of the menu hierarchy.
- **Previous** – Pushing the joystick in this direction takes you out to the last level of menu hierarchy.
- **Enter** – Pushing the joystick directly in the center enters the information into the microprocessor

NOTE: The joystick has four other positions that are only used to only access factory menus. A separate factory password is required obtain entry.
4.3 Program Flowchart

NOTE: All numerical values shown are only examples and are not Factory Defaults.
PassCode OK

Set Alarm Threshold Polarity

Set Alarm 1

Normal

Invert

Set Alarm 2

Normal

Invert

Set Audio Alarm

Not available

Set Latching

Set Latching

Nonlatch

Latching

Set Latching Relay 2

Nonlatch

Latching

Set Latching Audio

Not Available

NOTE: All numerical values shown are only examples and are not Factory Defaults.
4.4 Entering the Password

The Air Check Acrylonitrile monitor is supplied with a factory set password to prevent unauthorized access to the menus. **The Password is 557.** The following explains how to enter the password.

1. Push the joystick once to the right. **Enter Password** will scroll on the first line of the digital display. The second line will still display the current oxygen level.

   ..Enter password...

2. Push the joystick again once more to the right to enter the input screen. **The letter A will appear and flash.**

   A

   **NOTE:** *The display has characters that start with A through Z and 0 through 9. Pushing the joystick up or down will permit you to scroll through the alphanumeric characters.*

3. Push the joystick up or down to enter the first digit. The display is an alphanumeric display and toggles from A through Z followed by 0 to 9. The character to be entered will flash.

   5

4. Push the joystick again to the right to select the second entry. Push the joystick up or down to select the second digit. The character being entered will flash and the first character entered will remain lit.

   55

5. Push the joystick again to the right to select the third entry. Push the joystick up or down to select the third and final digit. The character being entered will flash and the first and second characters entered will remain lit. You are now ready to enter the 3-digit password.

   557
6. Push the joystick in the center to enter the password. If you entered it correctly the display will scroll Password OK.

...Password OK......

NOTE: If an incorrect password has been entered, the display will indicate Password Failed. Push the joystick to the left to access the monitoring mode. From this mode you can reenter the password again.

4.5 Changing the User Password

The Air Check Acrylonitrile monitor is supplied with a factory set password to prevent unauthorized access to the menus. The user can change this password and the following explains how to change the password.

1. Push the joystick down to access the Manage Passwords Menu. Manage Passwords will scroll on the first line of the digital display. The second line will still display the current oxygen level.

..Manage Passwords...

2. Push the joystick to the right to enter the input screen. Enter New User Password will scroll on the first line of the digital display

...Enter New User Password...

0.0 PPM

3. Push the joystick to the right to enter the input screen. The letter A will appear and flash.

A

NOTE: The display has characters that start with A through Z and 0 through 9. Pushing the joystick up or down will permit you to scroll through the alphanumeric characters.
4. Push the joystick up or down to enter the first digit. The display is an alphanumeric display and toggles from A through Z followed by 0 to 9. The character to be entered will flash.

   2

5. Push the joystick again to the right to select the second entry. Push the joystick up or down to select the second digit. The character being entered will flash and the first character entered will remain lit.

   25

6. Push the joystick again to the right to select the third entry. Push the joystick up or down to select the third and final digit. The character being entered will flash and the first and second characters entered will remain lit. You are now ready to enter the 3-digit password.

   253

7. Push the joystick in the center to enter the password. This will display the next command, Re-Enter New Password

   ...Re-Enter New Password...
   0.0 PPM

8. Push the joystick to the right to enter the input screen. The letter A will appear and flash.

   A

9. Push the joystick up or down to enter the first digit. The display is an alphanumeric display and toggles from A through Z followed by 0 to 9. The character to be entered will flash.

   2
   0.0 PPM
10. Push the joystick again to the right to select the second entry. Push the joystick up or down to select the second digit. The character being entered will flash and the first character entered will remain lit.

11. Push the joystick again to the right to select the third entry. Push the joystick up or down to select the third and final digit. The character being entered will flash and the first and second characters entered will remain lit. You are now ready to enter the 3-digit password.

12. Push the joystick in the center to enter the password. If you entered it correctly the display will scroll “New Password Entry OK”.

NOTE: If on the second entry the password entered was not the same as the first, the display will take you back to the “Re-enter Password Screen”. You’ll need to repeat steps 2 through 11. If you do not enter the password correctly, the monitor remembers the last password that was properly input.

If you misplace or lose your password, contact PureAire with the monitors DTM# for instructions on recovering your password. The DTM# is displayed by moving the joystick to the left.

4.5.1 Enable User Password

This menu permits the user to activate or disable the password function on the Methyl Bromide monitor. Push the joystick down. “Enable User Password” will scroll on the first line of the digital display.

Push the joystick right to display the status. If enabled it will display ”Enabled”.

Push the joystick up or down to change the status. Once enabled or disabled is selected, push the joystick in the center to enter the new status. If entered correctly the display will scroll “Enable User Password”.

…Enable User Password…

Enabled

…Enable User Password…

0.0 PPM
4.6 Entering the Menus

The Air Check Acrylonitrile monitor is supplied with main menus with sub menus to adjust mA outputs, alarm relay settings, sensor adjustments and zero suppression.

4.6.1 Set 4-20mA loop

This main menu will permit the adjusting of the 4mA and 20mA output from the Air Check Acrylonitrile Monitor. It also provides a function that will send an actual output between 4mA and 20 mA to test any remote control and alarm system attached to the AN monitor.

**NOTE:** To read the mA output, Air Check monitor must either be connected to a remote PLC controller or SCADA system. You can also connect the Air Check monitor to a volt meter to read the mA output. Please consult PureAire for more information.

From this main menu, pushing the joystick to the right will select the sub menu and the digital display will scroll the following:

```
...Set 4mA zero....
```

This is the menu at which to adjust the 4mA output being sent from the Air Check Monitor.

To change this value, push the joystick right to display the 4 mA setting. The display will indicate a value between 0 and 255 counts. Pushing the joystick up increases the value and pushing the joystick down decreases the value. The 4mA output being sent from the Air Check Methyl Bromide monitor will change as the number on the digital display changes. Press **ENTER** to accept the value.

```
255
```

Push the joystick to the left brings you back to the pervious Main menu. The digital display will scroll the following:

```
...Set 4mA zero.....
```
Push the joystick down to access the next sub menu; **Set 20mA Span will scroll**.

![Set 20mA Span...](image)

This is the menu at which to adjust the 20mA output being sent from the Air Check Monitor.

To change this value, push the joystick right to display the 20mA span setting. The display will indicate a value between 0 and 255 counts. Pushing the joystick up increases the value and pushing the joystick down decreases the value. The 20mA output being sent from the Air Check monitor will change as the number on the digital display changes. Press **ENTER** to accept the value.

![255](image)

Push the joystick to the left brings you back to the previous Main menu. The digital display will scroll the following:

![Set 20mA span.....](image)

Push the joystick down to access the next sub menu; **Force loop will scroll**.

![....Force Loop....](image)

**NOTE:** *This menu item is not available on the Acrylonitrile monitor.*

Push the joystick to the left brings you back to the previous menu. The digital display will scroll the following:

![...Set 4-20mA loop.....](image)

### 4.6.2 Set Formats

This is the menu at which to adjust the relay states for the two gas alarm relays and the individual instrument fault relay.

Push the joystick down to access the next main menu, **Set Formats**. The display will scroll the following:
This menu will permit the setting of the two alarm relays and the fault relay settings from normally de-energized state, **Normal**, to normally energized state, **Inverted**.

From this main menu, pushing the joystick to the right will select the sub menu and the digital display will scroll the following:

> **Format Relay 1**

This is the menu at which to adjust the first level alarm relay state on the Air Check AN Monitor.

To change this value, push the joystick right to display the relay state. The display will indicate **NORMAL**. Pushing the joystick down will change the relay state from **NORMAL** to **INVERT**. Press **ENTER** to accept the value.

![Normal to Invert](image)

After entering the relay state the display will default back to the Set Formats menu. The display will scroll the following:

> **Set Formats**

From this main menu, pushing the joystick to the right will select the sub menu and the digital display will scroll the following:

> **Format Relay 1**

Push the joystick down to access the next main menu, **Set Formats**. The display will scroll the following:

> **Format Relay 2**

This is the menu at which to adjust the second level alarm relay state on the Air Check Monitor.
To change this value, push the joystick right to display the relay state. The display will indicate **NORMAL**. Pushing the joystick down will change the relay state from **NORMAL** to **INVERT**. Press **ENTER** to accept the value.

![Diagram](image)

After entering the relay state the display will default back to the Set Formats menu. The display will scroll the following:

---

---

From this main menu, pushing the joystick to the right will select the sub menu and the digital display will scroll the following:

---

---

Push the joystick twice to select the fault relay to be adjusted. The display will scroll; **Format Fault Relay**.

---

---

This is the menu at which to adjust the fault alarm relay state on the Air Check Monitor.

To change this value, push the joystick right to display the relay state. The display will indicate **NORMAL**. Pushing the joystick down will change the relay state from **NORMAL** to **INVERT**. Press **ENTER** to accept the value.
After entering the relay state the display will default back to the Set Formats menu. The display will scroll the following:

```
..Set Formats...
```

### 4.6.3 Set Alarm Threshold Polarity

Alarm Threshold Polarity determines if an alarm concentration is set above or below a threshold value. For example, if an alarm of 2.0ppm is selected, the Alarm Threshold Polarity must be set to **Normal** for the monitors alarm to activate when the reading goes above 2.0ppm. Selecting an **Invert** setting for the Alarm Threshold Polarity means that the system will alarm when the gas concentration, goes below, an alarm set point. This menu will permit the selection of the alarm polarity. To access this menu from the “Set Formats” menu, push the joystick down to display the Set Alarm Threshold Polarity adjustment menu. This will scroll on the digital display.

```
..Set Alarm Threshold Priority..
0.0ppm
```

Push the joystick right to access the first sub menu; **Set Alarm 1 Polarity** will scroll on the display. This is the menu at which to adjust the first level alarm polarity state on the Air Check Acrylonitrile Monitor.

```
..Set Alarm 1 Polarity...
0.0ppm
```

To change this value, push the joystick right to display the relay state. The display will Indicate **INVERT**. Pushing the joystick down will change the relay state from INVERT to NORMAL. Press **ENTER** to accept the value.

```
NORMAL
```

```
INVERT
```

After entering the relay state the display will default back to the Set Alarm 1 Polarity menu. The display will scroll the following:

```
..Set Alarm Polarity..
0.0ppm
```
Push the joystick down to access the next sub menu; **Set Alarm 2 Polarity** will scroll on the display. This is the menu at which to adjust the second level alarm polarity state on the Air Check Acrylonitrile Monitor.

![Set Alarm 2 Polarity.. 0.0ppm](image)

To change this value, push the joystick right to display the relay state. The display will Indicate **NORMAL**. Pushing the joystick down will change the relay state from **NORMAL** to **INVERT**. Press **ENTER** to accept the value.

![NORMAL](image)

![INVERT](image)

After entering the relay state the display will default back to the Set Relay 2 Alarm Threshold menu. The display will scroll the following:

![Set Alarm 2 Polarity.. 0.0ppm](image)

Push the joystick down to access the next sub menu; **Set Audio Alarm Polarity** will scroll on the display. This is the menu at which to adjust the second level alarm polarity state on the Air Check AN Monitor.

![Set Audio Alarm Polarity... 0.0ppm](image)

**NOTE:** The audio alarm option module is not available for Acrylonitrile
4.6.4 Set Latching

This is the menu at which to adjust the relay alarm state for the two gas alarm relays and the individual instrument fault relay. The selection permits setting the relays to a latching or non-latching state. In a latching state, the relay will remain activated until the user manually selects the Enter Key. In a non-latching state, the alarm relay will automatically reset once the gas concentration has returned to 0.0ppm Acrylonitrile.

This menu will permit the setting of the two alarm relays and the fault relay settings from a latching to a non latching state when they are activated.

From this main menu, pushing the joystick to the right will select the sub menu and the digital display will scroll the following:

![Set Latching Relay 1... 0.0ppm]

This is the menu at which to adjust the first level alarm relay state on the Air Check Monitor.

To change this value, push the joystick right to display the relay state. The display will Indicate LATCH. Pushing the joystick down will change the relay state from LATCHING to NON-LATCHING. Press ENTER to accept the value.

After entering the relay state the display will default back to the Set Latching menu. The display will scroll the following:

![Set Latching... 0.0ppm]

From this main menu, pushing the joystick to the right will select the sub menu and the digital display will scroll the following:
Push the joystick down to select the next relay to be adjusted. The display will scroll the following, **Set Latching Relay 2**.

This is the menu at which to adjust the second level alarm relay state on the Air Check Monitor.

To change this value, push the joystick right to display the relay state. The display will indicate **LATCHING**. Pushing the joystick down will change the relay state from **LATCHING** to **NONLATCH**. Press **ENTER** to accept the value.

After entering the relay state the display will default back to the **Set Latching** menu. The display will scroll the following:

From this main menu, pushing the joystick to the right will select the sub menu and the digital display will scroll the following:

Push the joystick twice to select the Audio Alarm relay to be adjusted. The display will scroll; **Set Latching Audio Alarm**.

**NOTE:** *The audio alarm option module is not available for Acrylonitrile.*
4.6.5 Set Alarm Delay

Push the joystick down to access the next main menu, **Alarm Delay**. The display will scroll the following:

```
…Alarm Delay…
  0.0ppm
```

This is the amount of time an alarm level concentration of oxygen must be present before the instrument’s gas concentration alarm(s) will be activated. This menu will permit setting a user selected time delay for activating alarm relays 1 and 2. You can select from 0 seconds up to 255 seconds after an alarm level has been exceeded before the alarm relays to activate.

To change this value, push the joystick right to display the time screen. The display will indicate a value between 0 and 255 seconds. Pushing the joystick up increases the value and pushing the joystick down decreases the value. Press **ENTER** to accept the value.

```
  005
  0.0ppm
```

After entering the alarm delay, the display will default back to the Alarm Delay menu and the display will scroll the following:

```
…Alarm Delay…
  0.0ppm
```

**NOTE:** The alarm delay is only available for alarms 1 and 2. There is no delay for the fault relay. Any system fault will immediately activate the Fault Relay.

4.6.6 Set Zero Suppression

This setting is used to decrease the sensitivity of selected gas sensors. It essentially programs the instrument to ignore gas measurements that are below the programmed ppm level.

**EXAMPLE:** If the measurement range of the instrument is 0 to 30 ppm, gas measurements below 0.5 ppm will be displayed and output as 0 (zero) when the suppress level is set at 0.5ppm.

```
…Zero Suppression…
  0.0 PPM
```
To change this value, push the joystick right to display the Zero Suppression screen. The display will indicate a value between 0 and 100%. Pushing the joystick up increases the value and pushing the joystick down decreases the value. Press ENTER to accept the value.

0.5 PPM
0.0 ppm

After entering the zero suppression value, the display will default back to the Zero Suppression menu and the display will scroll the following:

...Zero Suppression...
0.0ppm

4.6.7 Set Alarm Thresholds

..Set Alarm Thresholds..
0.0ppm

This main menu will permit adjusting the Acrylonitrile concentration ppm level that will activate alarm levels 1 and 2.

From this main menu, pushing the joystick to the right will select the first sub menu and the digital display will scroll the following: Set Relay 1 Alarm Threshold.

..Set Relay 1 Alarm Threshold...
0.0ppm

This is the gas concentration at which the instrument’s first level alarm will be activated. To change the displayed value, push the joystick to the right to display the first level alarm setting. The display will indicate a value between 0.0ppm and full scale.

Pushing the joystick up increases the value and pushing the joystick down decreases the value. Press ENTER to accept the value.

1.0 PPM
0.0 ppm

After entering the relay state the display will default back to the Set Relay 1 Alarm Threshold Menu. The display will scroll the following:

..Set Relay 1 Alarm Threshold...
0.0ppm
Push the joystick down to access the next sub menu; Set Relay 2 Alarm Threshold, will scroll on the digital display.

| .Set Relay 2 Alarm Threshold… | 0.0ppm |

This is the gas concentration at which the instrument’s second level alarm will be activated. To change the displayed value, push the joystick to the right to display the second level alarm setting. The display will indicate a value between 00.0% and full scale.

Pushing the joystick up increases the value and pushing the joystick down decreases the value. Press ENTER to accept the value.

| 5.0 PPM |
| 0.0 PPM |

After entering the relay state the display will default back to the Set Relay 2 Alarm Threshold Menu. The display will scroll the following:

| .Set Relay 2 Alarm Threshold… | 0.0ppm |

Push the joystick down to access the next sub menu; Set Audio Alarm Threshold, will scroll on the digital display.

**NOTE:** The audio alarm option module is not available for Methyl Bromide.

**4.6.8 Set Alarm Hysterisis**

This function was designed for PureAire’s Oxygen deficiency monitor when used as a control system.

**NOTE:** The Hysterisis function is permits a user to set the dead band for both Alarms 1 and 2 and is not applicable to the Acrylonitrile toxic gas monitor. The Hysterisis setting is factory set at 0.0 ppm. It is recommended to set both alarm hysteresis at 0.0ppm. Changing it will affect when the alarm relay deactivates after tripping.

**4.6.9 Sensor Adjustment**

| .Sensor Adjustment… | 0.0ppm |

**NOTE:** Refer to Section 5.5 Sensor Calibration for complete instructions on the use of this menu.
5: Maintenance & Calibration

Only qualified personnel should perform maintenance and calibration.

5.1 Routine Maintenance Schedule

Continuous gas detection systems depended upon to measure and detect hazardous gas leaks in the workplace requires periodic maintenance to ensure proper operation. The frequency with which this routine maintenance is required depends on the environment, since temperature, humidity, gas concentrations, and dust all affect system operation.

The following table is intended to serve as a general guideline for routine maintenance. The conditions in your particular application, as well as your organization’s maintenance policies, will ultimately determine the best routine maintenance schedule for your equipment.

5.1.1 Routine Visual Checks

<table>
<thead>
<tr>
<th>Item</th>
<th>Status With No Gas Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Display</td>
<td>Display should read “0.0”</td>
</tr>
<tr>
<td>4-20 mA Output</td>
<td>Output should be 4 mA</td>
</tr>
<tr>
<td>Gas Concentration Alarm Relays</td>
<td>De-energized (factory default)</td>
</tr>
<tr>
<td>System Fault Relay</td>
<td>De-energized (factory default)</td>
</tr>
</tbody>
</table>

5.1.2 Recommended Routine Maintenance Schedule

- Routine Visual Checks (flow, fault LED) Quarterly
- Flow rate and power status Continually supervised. Flow is constantly monitored and adjusted by the internal CPU
- Electrolyte Replacement (p/n El-4970-7A) Every 6 months
- Membrane Replacement (p/n M-4900M) Every 6 months
- O-rings and silicon sheets (p/n 1516-12W) Replace when damaged
- (p/n SC 2000)
- Sensor Calibration Every 6 months

5.1.3 Recommended Spare Parts

<table>
<thead>
<tr>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Assembly</td>
</tr>
<tr>
<td>Filament for Pyro</td>
</tr>
<tr>
<td>Sensor cell replacement parts</td>
</tr>
</tbody>
</table>

5.2 Loss of Power Indication

In the event the Air Check Acrylonitrile Monitor loses VDC power, the local display will go blank and the 4-20 mA analog output signal drops to 0 and the system status alarm relay de-energizes.

**IMPORTANT:** If the instrument was in the Measure mode when power was lost, it will automatically return to the Measure mode when power is restored.
5.3 Sensor Cell Removal and Installation

5.3.1 Sensor Removal

1. Remove the sensor by gently rocking the sensor side-to-side and simultaneously pulling it up from the flow chamber.
2. Unplug the sensor cable from the sensor cell by pulling straight up.

⚠️ CAUTION: Do not twist the sensor; this will loosen the box nut and cause the cell to leak electrolyte

⚠️ CAUTION: Avoid spilling electrolyte out of the small opening on the side of the sensor.

⚠️ IMPORTANT: Do not touch the membrane at the bottom of the sensor. Oil from your hands or fingers will adversely affect performance.

5.3.2 Sensor Installation

⚠️ IMPORTANT: Be careful not to turn the sensor or touch the membrane on the bottom of the sensor during installation. Oil on your fingers can block the small pores on the membrane surface.

1. Remove the sampling system front cover by unfastening the 4 plastic captive screws.
2. Remove the sensor shorting plug or battery if supplied.
3. Plug the H type sensor into the flow chamber inside the instrument housing.

NOTE: Do not twist the gas sensor inside the flow chamber. This may loosen the sensor cell box nut on the Acrylonitrile renewable sensor cell and cause the electrolyte to leak.
5.4 Electrolyte Replacement (For Renewable Acrylonitrile sensor)

![Diagram showing sensor components]

**CAUTION:** Always wear protective gloves and safety glasses when replacing sensor electrolyte. Be sure to adhere to your facility’s chemical handling guidelines and procedures.

1. Remove the sensor as outlined in section 5.3.

2. Place your finger over the pressure compensation port and turn the sensor upside down. Remove the box nut membrane, retainer ring, O-ring and silicon sheet (depending on sensor model).

3. Place the sensor over the beaker as shown and pour the old electrolyte into the beaker. Some will remain in the sensor until the pressure compensation plug is removed. Remove the plug to release the electrolyte into the beaker.

4. Hold the sensor in your hand with the sensing electrode up. Hold a piece of paper tissue over the pressure compensation port with your thumb. Pour 10 cc’s of fresh electrolyte into the sensor and rinse. Discard into the beaker.

**Acrylonitrile sensor cell uses a White O-ring, p/n 1516-12W and Silicon Sheet is p/n SC2000**

**NOTE:**

- The Pressure Compensation Plug has a Teflon membrane fixed to the inside of the screw.
- Never remove this membrane.

**NOTE:** Replace O-ring only if damaged

**Electrolyte p/n EL-4970-1**
5. Wipe the sensing electrode and the surrounding area with a dry paper tissue.

6. Place a new silicone sheet (if used) and O-ring on the sensor. Make sure that the area is dry of electrolyte.

7. Place a new membrane on the sensor, with the bead of electrolyte between the electrode and the membrane.

⇒ NOTE: Never touch the center of the membrane with bare fingers. Oil on your fingers can block the membrane pores.
8. Place the retainer ring over the membrane and then place the box nut over the retainer ring. Turn clockwise until hand tight; continue tightening until the box nut can no longer be moved by hand.

👉 **CAUTION:** *If the box nut is too loose, the sensor cell response may be affected.*

9. Hold the sensor in your hand with the electrode down. Pour fresh electrolyte in until it reaches the MAX. mark.

👉 **NOTE:** *MAX. level differs from sensor to sensor.*

9. Wipe the pressure compensation port and its surrounding area with a dry paper tissue.
10. Insert the pressure compensation plug into the port.

11. Reinstall the sensor as outlined in section 6.1.2.

**NOTE:** When storing the sensor cell never store the sensor cell horizontal with the Pressure Compensation Plug positioned down or store the sensor cell upside down. This can cause the electrolyte to leak from the sensor cell pressure compensation plug.
5.5 System Calibration

The Air Check Acrylonitrile Monitor requires periodic calibration with the appropriate standard gas. Calibration should be performed whenever:

- Six months has passed without calibration
- The sensor cell electrolyte is replaced

5.4.1 Gas Generation and Calibrating Kits

For generating a calibrating gas, the following PureAire Gas Generation Kits are recommended. They are available by separate order.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PART NUMBER</th>
<th>PRODUCT</th>
<th>PACKAGING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Contact Air Liquide*</td>
<td>Span gas 5** ppm Acrylonitrile blended with air</td>
<td>1 bottle 105 liters</td>
</tr>
<tr>
<td>2</td>
<td>Contact Air Liquide*</td>
<td>Regulator 500cc/min flow</td>
<td>1 each</td>
</tr>
<tr>
<td>3</td>
<td>PureAire p/n 232-05</td>
<td>Tedlar gas-sampling bag, 5 liter capacity</td>
<td>2 each</td>
</tr>
</tbody>
</table>

*Air Liquide can be reached at 248-589-2950

** For higher range monitors please use order span gas concentrations that equal approximately ½ the full scale value

5.4.2 Initial Preparation

NOTE: If the instrument is connected to a controller, set the controller to Standby mode to avoid accidental alarms.

NOTE: If the monitor was powered off, it is recommended to warm up the Acrylonitrile monitor for two hours before making any adjustments to the sensor.

5.4.3 Set Module Zero

NOTE: This procedure should be performed in a gas free atmosphere.

NOTE: Do not make any zero or span adjustments until the monitor has been operating for a minimum of 2 hours with a freshly recharged Acrylonitrile Sensor cell. Failure to do so will affect the calibration.
This is the menu at which to adjust the true zero reading on the Acrylonitrile monitor. The selection permits setting system zero to a new or freshly recharged sensor cell. This procedure must be performed before challenging the monitor to a calibrated span gas. To perform this function enter the Sensor Adjust Menu by pushing the joystick to the right. “Sensor Adjustment” will scroll.

There are 5 sub menus in the Sensor Adjustment Menu. Menus 1, 2, 3 & 5 are not used for the Acrylonitrile monitor. Menu 4 is the only menu used during calibration and sensor adjustment.

1. “Set sensor zero”
2. “Enable Zero Cal”
3. “Start Zero Cal”
4. “Set Module Zero”
5. “Enable Zero Tracker”

To adjust the monitor’s zero reading Select”

Push the joystick up to select the “Set Module Zero” menu. Set Module Zero will scroll.

To automatically reset the zero Press ENTER to reset the zero and accept the new zero value.

Push the joystick to the left twice to exit this submenu and return back to the Sensor Adjustment Menu.

The Methyl bromide monitor zero has been adjusted and the monitor is now ready for calibration.
5.4.4 Gas Preparation

- **CAUTION:** Be sure to observe all safety guidelines when generating and using calibration gases.
- **IMPORTANT:** Due to the different flow rates of the methyl bromide monitor and the regulator of the span gas, do not connect the span gas directly to the monitor.
- **NOTE:** The gas concentration should be close to, but never exceed, full scale.

1. Fill the calibration gas tedlar bag from the Acrylonitrile cylinder span gas.

**IMPORTANT:** Be sure to perform the calibration before the concentration of the gas changes. Also, verify that the concentration of the calibration gas is the same after calibration as it was before.

5.4.5 Span Calibration

- **NOTE:** When using cylinder span gas, gas must be a mixture of the target gas blended with air. Never connect the gas cylinder directly to the sampling system. Exhaust the gas from the cylinder into a Sample gas tedlar bag.

To access the span function, while in the Sensor Adjustment Menu, push the joystick right until the "Set Sensor Span" menu appears. Push the joystick to the right to display the span menu.

1. Connect the waste bag to the exhaust and open the valve on the waste bag and connect the system exhaust tubing to the gas waste tedlar bag. Inspect the flow rate again on the flow meter and adjust to the proper flow rate.
2. Open the valve on the calibration span gas tedlar bag and connect it to the sampler inlet and expose the monitor to gas for 2 minutes. Adjust the display to the span gas reading by pushing the joystick up or down to set the concentration value on the PPM display.

4. Press **ENTER** to accept the calibration value.

After calibration, disconnect the span gas tedlar bag and permit the sampling system display to return to zero.

**NOTE:** The Air Check Acrylonitrile monitor has an internal pyrolizer that converts the gas to HCN. Typical fall times can range from 1 to 4 minutes depending on the exposure concentration. The higher the concentration, the longer the fall time to zero.

3. Return the system to the monitoring mode by pushing the joystick to the left until the “AN” appears on the top line of the display. Reattach the front cover to the sampling system.
Note: The remaining span gas and collected waste gas should be properly exhausted.
Location of 4ea. Front Cover Fastening screws

The Air Check monitor has 4 ea. Front Cover captive fastening screws on each corner of the front cover.

Use a Phillips head screwdriver to unfasten the screws to remove the front cover.

Please Do Not Over tighten

Location of the Sample Inlet and Exhaust connectors

Sample Exhaust  Sample Inlet  Electrical Cable connector

Pyrolyzer Assembly

The pyrolyzer insulation temperature can exceed 150F and can cause burns if touched.

Please power down the system when working inside the enclosure.