

RAM 744

Operation Manual



GfG Instrumentation

Worldwide Manufacturer of Gas Detection Solutions

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For your safety

Like any piece of complex equipment, the GfG RAM 744 will do the job it was designed to do only if it is used and serviced in accordance with the manufacturer's instructions. All individuals who have or will have the responsibility of servicing the equipment must carefully read this manual.

The warranties made by GfG-Instrumentation with regards to this instrument are voided if the product is not used and serviced in accordance with the instructions in this manual. Please protect yourself and others who depend on this instrument by following these instructions. The above does not alter statements regarding GfG-Instrumentation's warranties and conditions of sale and delivery.

Application

The RAM 744 is an inline, respiratory air monitor for protection from carbon monoxide in compressor supplied breathing air. This instrument should be used to continuously monitor for carbon monoxide in the compressor supplied breathing air. Random sampling only checks the air at that moment. It is possible for any air compressor to draw carbon monoxide in via the air intake at any time. The RAM 744 will operate continuously and provide both a visual and audio alarm if carbon monoxide levels exceed the pre-set alarm level. An auxiliary relay allows for the connection of a remote device.

The RAM 744 has been designed for use both indoors and out, and will withstand water splashes or droplets, but it is not water proof and should not be subjected to direct spray or submersion.

General description

The RAM 744 is a compact monitor, designed for use in portable and stationary applications. It is designed to be installed inline via a 1/2" NPT inlet and outlet fitting and should only be used in conjunction with an acceptable filter panel that contains a coalescing and carbon filter.

The RAM 744 is easily operated with one button and a rotary cam valve switch. All user functions are affected directly by means of these two switches.

Detection principle

The RAM 744 measures carbon monoxide using an electrochemical sensor. The electrochemical sensor consists of an electrolyte, a working electrode (anode), and a counter electrode (cathode). Selection of specific electrodes and electrolytes make the sensor suitable for the gas to be monitored. The conversion of the gas between the electrolyte and the electrode generates an electrical signal which is proportional to the gas concentration. GfG electrochemical sensors operate on the capillary diffusion barrier technology.

Operating the RAM 744

The RAM 744 is designed to be plumbed inline with the compressed air. The monitor does not affect PSI and SCFM. A small amount of air (~0.5 lpm), is diverted through a preset internal regulator and flow restrictor, delivering a continuous flow of sample air to the sensor chamber. A low flow alarm will indicate a lack of, or an inadequate supply of air to the sensor. A removable cover plate protects the on/off switch, battery chamber and alarm relay contacts. The instrument is powered via a 9-volt battery or a 12-volt ac/dc adapter.

RAM 744 - design

Relays:

NO

C

NC

12V DC Power Connection:

+

-

9V Battery

On/Off Switch

Rotary Cam Valve

Calibration Orifice



Detection mode

Switching ON

The on/off switch is located behind the cover panel. The cover panel can be easily removed by lifting it from either side. To turn the instrument on, press and release the on/off button. The instrument will greet you and proceed with a 60 second warm up count down.

Switching OFF

Press and hold the on/off button for three seconds, the instrument will beep twice, followed by a series of three short beeps. The instrument is now off.

Function modes

The rotary cam valve switch sets the functions for the RAM 744 and can be switched from RUN, TEST and CAL.

RUN mode is the operation/detection mode. The RAM 744 must be in the RUN mode to monitor the supplied breathing air. Supplied air must be turned on and flowing to the instrument while in this mode. When the supplied air is off or interrupted while the instrument is in the RUN mode, the low flow alarm will sound until the supplied air is turned on.

TEST mode allows for bump testing of the sensor or for silencing of the low flow alarm when the supplied air is shut off. To bump test the instrument, place the instrument in the TEST mode and flow the calibration gas into the orifice on the cam valve. In the test mode, the supplied air will not be monitored and there is no need to turn the supplied air off when entering this mode.

CAL mode is the calibration and zero calibration mode. When the RAM 744 is switched to the CAL mode, the supplied air will not be flowing to the sensor and there is no need to shut off the supplied air. When in the CAL mode, (AC) AutoCal® will be displayed. Pressing the on/off button while in this mode will change the display to (A0) auto zero. For calibration and zeroing instruction, see Calibration.

F1 (fault) is indicated on the display when the cam valve is not positioned in one of the three modes.

LEDs

Green LED (OK) indicator in the run mode indicates a safe condition.

Yellow LED (caution) indicates that the instrument is out of the RUN mode and is not monitoring the supplied air or in the run mode when a low battery (LB) is indicated on the display.

Red LED (alarm) indicates that the alarm threshold has been exceeded or that there is no flow to the sensor. If the alarm threshold has been exceeded, the actual value of CO will be indicated on the display, if the low flow alarm is sounding, LF will be indicated on the display.

Power supply

The RAM 744 may be powered by a 9-volt alkaline battery or with an external 12-volt power supply applied to the 12-volt terminal block.

9-volt battery installation and replacement

The 9-volt battery is installed under the panel cover. To remove the panel cover, lift it off from either the left or right side. The RAM 744 will indicate a low battery (LB) when the battery output is too low.

12-volt external power

When a 12-volt power supply is connected to the 12-volt terminal block, the instrument will use this power supply as its primary source. The 9-volt battery may be installed and will serve as a backup power supply only. (See diagram for connection instructions.)

Calibration

The RAM 744 is an AutoCal instrument. All calibration adjustments are made by the microprocessor.

1. To initiate a calibration, rotate the cam valve switch to the CAL position. AC will appear on the display.
2. Insert the calibration connector fitting into the orifice of the cam valve.
3. Attach the calibration valve to the calibration gas cylinder (10ppm CO).
4. Open the cylinder valve fully (the flow rate is preset and there is no need to adjust it.)
5. The red LED will continue to blink for 90 seconds.
6. Watch for the green LED to blink, this indicates a successful calibration.
7. Remove the calibration gas and rotate the cam valve to the RUN position.

Zero-point adjustment

Zeroing (zero cal) should be performed when the zero-point has drifted. GfG-Instrumentation recommends using impurity free test gas to re-zero this sensor but the sensor can be zeroed without it.

1. To initiate a zero calibration, rotate the cam valve switch to the CAL position. AC will appear on the display.
2. Press the on/off button until it beeps.
3. A0 will now appear on the display.
4. The red LED will continue to blink for 90 seconds.
5. (Steps 5-7 are optional) Insert the calibration connector fitting into the orifice of the cam valve.
6. Attach the calibration valve to the impurity free air gas cylinder.
7. Open the cylinder valve fully, (the flow rate is preset and there is no need to adjust it.)
8. Watch for the green LED to begin blinking. This indicates a successful zero.

9. Remove gas (if applied) and rotate valve to RUN.

Alarm set point

The RAM 744 is shipped with a factory preset alarm level of 10 ppm CO. The Alarm level can be changed to 5 ppm CO by re-positioning the jumper on the PCB.

To gain access to the PCB, remove the four screws on the front of the RAM 744 only. After removing the four screws, gently pry the front housing off from the bottom of the instrument.

WARNING: Removing the front of the housing by prying at the top will result in damage to the housing. This damage is not covered under the warranty.

Sensor replacement

The sensor is located on the PCB and is easily accessible by removing the front of housing from the RAM 744.

1. Gently pull out the old sensor.
2. Remove the shorting clip from the new sensor.
3. Align pins and gently push the new sensor into the sockets.

After replacing the sensor, allow instrument to warm up for at least 30 minutes. The new sensor must be zeroed and calibrated. (See instructions.)

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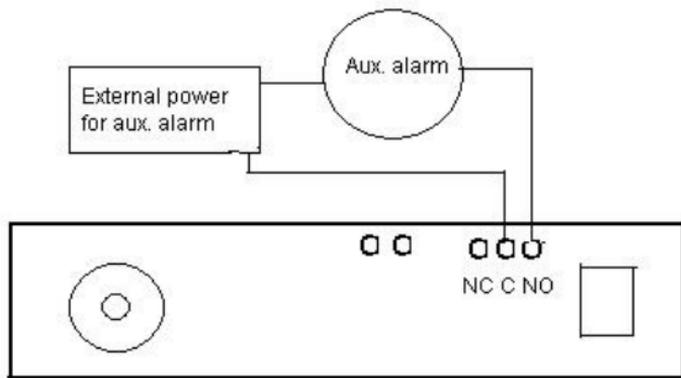
Troubleshooting

Failure	Solution
Instrument will not calibrate	<ul style="list-style-type: none">• Perform a zero calibration, using impurity free air. If instrument zeroes, perform a calibration, using 10 ppm CO.• Verify that calibration gas is 10 ppm CO and verify that the gas cylinder is not empty.• If instrument will not calibrate after trying the above, replace sensor.• (See Sensor Replacement).
Instrument will not zero	<ul style="list-style-type: none">• If the instrument does not zero by following the zeroing instructions with the impurity free gas, replace the sensor.
Instrument has a (-0) reading or displays other than a (0) reading	<ul style="list-style-type: none">• Re-zero the instrument, (follow the zero instructions with impurity-free gas)
Instrument zeros during the zero calibration and the reading elevates after returning to the RUN mode	<ul style="list-style-type: none">• The supply air is contaminated. Check air source.
Instrument will not turn on	<ul style="list-style-type: none">• Check power supply. Verify that the battery is good. If power supply is good and the instrument will not power up, return it to the factory for service.

If the above solutions do not solve the problem or a problem other than those listed above exists, contact the factory.

The technical support staff will offer additional solutions or advise to return the instrument to the factory. All instruments being returned to the factory must be accompanied by a Repair Return Form, which can be obtained by contacting the factory at (800) 959-0329 or (734) 769-0573.

Auxiliary horn wiring diagram





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