GENERAL MONITORS

Model 580A

Two Channel Control Module
Combustible Gas Applications

Instruction Manual

MAN580A

Part No. MAN580A
Revision B/11-22-04

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Introduction

Protection for Life

General Monitors' mission is to benefit society by providing solutions through industry leading safety products, services, and systems that save lives and protect capital resources from the dangers of hazardous flames, gases, and vapors.

This manual provides instruction for installing and operating the General Monitors Model 580A Two Channel Control Module for Combustible Gas Applications. While the 580A system is easy to install and operate, this manual should be read in full and the information contained herein understood before attempting to place the system in service.

The safety products you have purchased should be handled carefully and installed, calibrated, and maintained in accordance with the respective product instruction manual. Remember these products are for your safety.

Special Warning

Through engineering design, testing, manufacturing techniques, and rigid quality control, General Monitors (GMI) supplies the finest gas detection systems available. The user must recognize his responsibility for maintaining the gas detection system in operational condition.

The Model 580A Two Channel Combustible Gas Monitor contains components, which can be damaged by static electricity. Special care must be taken when wiring the system, to ensure that only the connection points are touched.

Only catalytic bead sensors designed by General Monitors will work with the Model 580A Controller. Any attempt to use a sensor that has not been approved by General Monitors, will void the warranty.

General Monitors cautions, as with all equipment of this type, that high levels or long exposure to certain atmospheres will "poison" the sensor catalyst and eventually affect sensitivity. Please refer to Section 2.5.5 for specific information. Use in such atmospheres requires calibration checks on a more frequent schedule than normal. General Monitors should be consulted for an application feasibility determination, before installing a system in such atmospheres.

General Monitors' sensors and sensor housings are designed and tested for use in certain classes of hazardous atmospheres. Explosion-proof integrity cannot be maintained, if sensors and sensor housings are operated in other than the "as designed" condition. Terminal access covers of sensor housings must be securely fastened. Sensor housing must be installed in accordance with National Electrical Code acceptable practices, for the class of hazardous atmospheres.

Sensors are designed with sintered metal, or screen covers, that act as flame arrestors. Do not operate sensors without screen or sintered metal parts in place.

General Monitors' gas detection systems are primarily safety devices for the protection of personnel and facilities and must be "always ready". With proper installation, calibration, and maintenance, the system provides continuous monitoring of hazardous areas. The user must assume all liability for misuse of General Monitors' gas detection systems.

The system's full two-year warranty will be voided if customer personnel, or third parties, damage the system during repair attempts.

Customer Support

For additional product information not contained in this manual, please contact General Monitors Customer Support. For contact information, see Section 6.1.

1.0 Before Installation

1.1 Differences Between Models 580A and 580

580A differences:

- Wiring: Connectors must be rewired for 580A
- Auto-Calibration
- Front Panel: Polycarbonate with inlay
- Digital Display

Refer to Section 2.0, ***Installation***, and Section 3.0, ***Startup and Operation***, for details.

1.2 General Product Description

The Model 580A Controller is a two-channel system designed to continuously monitor for potential explosive concentrations of most combustible gases/vapors. Normally, only a periodic calibration check is needed to assure dependable performance. The system operates in the range of 0-100% LEL (Lower Explosive Limit) and is calibrated to a particular gas or vapor. There are relatively few combustible gases, which should not be monitored; however, as a precaution, GMI should always be consulted to verify the feasibility of monitoring any gas or vapor other than those specified at the time of purchase.

The Model 580A Controller consists of a controller plus two sensor assemblies. The controller is fully solid-state. It should be mounted in a weather protected, non-hazardous area. Several GMI mounting accessories are available for panel, wall, or 19-inch rack installation. For hazardous areas, an explosion-proof housing is available for Class I, Division 1 and Division 2, Groups B, C & D.

Any GMI low temperature catalytic bead combustible gas sensor assembly may be used with the system.

NOTE: Sensor assemblies may be mounted outdoors in hazardous areas (National Electric Code Class I, Division 1 and Division 2, Groups B, C & D).

They must be connected to the controller in accordance with the installation instructions in this manual.

NOTE: The 580A is different than its predecessor the 580. The 580A calibration is automatic where the 580 must be manually calibrated. Please check the individual manuals for details about wiring, set up and operation of these two units.

CAUTION: The Model 580A Controller is easy to install and operate. However, one should fully read and understand this manual before attempting to place the system in service.

Figure 1: Model 580A Controller

1.3 Controller

The Model 580A Controller is a two-channel system where the controller continuously monitors the inputs of two sensors. The sensors are monitored independently (i.e. they are not scanned, nor are the signals summed).

The unit has:

- Channel LED indicators for two channels
- LED indicators for High, Low, Fault, Calibration, and Setup
- Mode Button that is accessed using a small screw driver
- Digital Display in %LEL
- High, Low & Fault relays common for both channels

Set points for High and Low alarms are adjustable from **5** to **60**% LEL.

NOTE: A service-loop is necessary between the Model 580A Controller's rear panel terminals and field/power wiring. This service loop permits the controller to be removed or slid forward for servicing. This service loop is a definite advantage when replacing or changing a controller.

1.4 Sensor Assembly

Two sensor assemblies are normally supplied with the system. These assemblies are comprised of the sensor, the sensor housing, and an optional splashguard.

Note: This sensor assembly is CSA approved for Class I, Division 1 and Division 2, Groups B, C & D hazardous areas.

On some occasions, different sensor housing may be supplied. The appropriate sensor is provided if GMI is made aware of the gas or vapor that is to be monitored. Most combustible gases may be monitored, including most hydrocarbons and hydrogen.

⚠ **CAUTION:** Sensors have a different sensitivity to each gas. GMI should be consulted if a sensor is expected to detect more than one gas. GMI can then recommend the best calibration gas.

A variety of sensor covers may be purchased (Section 7.7.2). They provide extra protection from wind, weather and dust.

In the event the system is to have less than two active channels, Part Number 10102-1 (sensor simulator) must be substituted for the unused channel. Otherwise, the **FAULT** LED indicator for the unused channel will flash.

2.0 Installation

2.1 Location of the Controller

The Model 580A Controller should be installed in a weather-protected, non-hazardous area. The following mounting hardware is available to facilitate installation:

Part Description	Part Number
102mm (4") panel mount frame	P/N 10199-1
483 mm (19") rack frame (4 controllers)	P/N 10200-1
Blank panel (one for each unused position in 19" frame)	P/N 10191-1
102mm (4") wall mount bracket	P/N 10202-1
NEMA 7 Explosion-Proof Enclosure	P/N 10099
Desk Top Cabinet (up to 4 controllers)	P/N 914-006

Table 1: Model 580A Mounting Parts

The following are guidelines for mounting the controller.

- To minimize the possibility of electrical shock, mounting must be as free from shock and vibration as possible, in a grounded enclosure that requires a tool for instrument removal.
- Even though the controller is RFI resistant, do not mount the controller in close proximity to radio transmitters or similar equipment.
- It is recommended that a wiring service loop be used to facilitate gaining access to the alarm set points.
- Care should be taken to assure adequate ventilation.
- Do not mount the controller in a manner, which restricts the natural convection airflow from normal ambient air.
- The controller operating temperature range is 0°C to 60°C (32°F to 140°F).

2.2 Power Connections

The system operates on nominal line power of 115 VAC, 50/60 Hz. Power must remain disconnected until all other wiring connections are made.

NOTE: To eliminate accidental system shutdown, GMI does not provide a power on/off switch.

The following are wiring guidelines for the 580A Controller:

- If AC is to power the system, connect the line power supply to the terminals **L**, **N**,  located on the rear of the controller. Use accepted commercial wiring practices.
- Primary DC power may be used instead. Use any 24V nominal direct current supply with a minimum rating of 2 amperes.

- AWG 14 wire should be used to prevent excessive voltage drop.
- Wiring runs should be as short as possible.
- Connect the positive supply to **24VDC (+)** and the negative supply to **24VDC (-)** on the terminal block. An internal diode protects the system in case of inadvertent supply reversal.

2.3 Battery Backup

An emergency battery backup may be employed on a system normally powered by AC. A Model 580A Controller requires approximately 2 ampere (peak) at 24 VDC. The battery rating (ampere-hour capacity) is dictated by the length of time power outages may last. General Monitors recommends that a Lead-Acid type battery be used. This type of battery can be expected to last for several years with minimum maintenance.

The customer-furnished battery may be connected as shown below. Manual or relay switching is not required. There is no provision for battery charging. A customer furnished battery charger must be used to keep the battery charged to the battery manufacturer's recommended level. The cable length from battery to controller should be as short as possible. Should an AC power failure occur, the 24-Volt battery supplies current through the diode to the controller circuitry. **DO NOT USE MORE THAN A 24-VOLT BATTERY**.

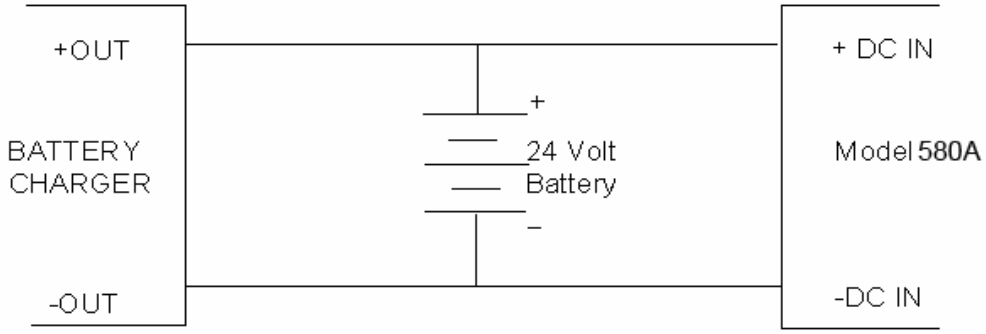

Figure 2: Schematic Battery Backup System

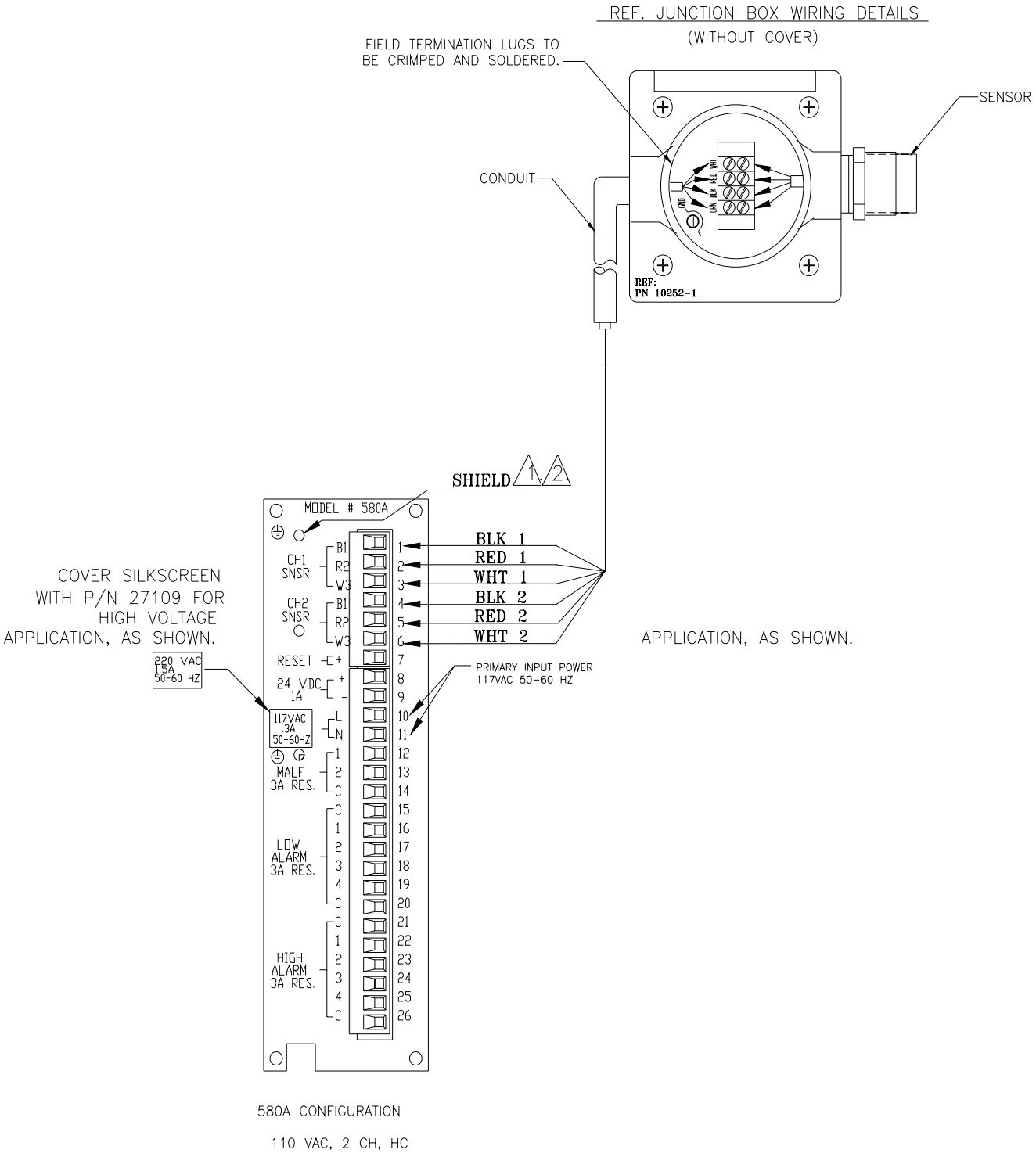

Figure 3: Rear Terminal Connections (REF: 20659)

2.4 Remote Reset Connection

Remote Reset (of alarm circuits) connections are made to rear panel terminal board connections **RESET** and the **24VDC (-)** terminal. If a remote reset switch is used, it must be a "**normally open, momentary action**" type.

NOTE: If the system is to be powered from a primary DC power supply or if battery backup is provided, the **24VDC (-)** terminal has two wires when remote reset is used. The diameter of the two wires cannot be larger than an AWG 14 wire.

2.5 Choosing Sensor Locations

Several variables are involved in selecting locations to install sensors. There are no hard and fast rules defining the optimum location. However, the following general suggestions should be considered with regard to particular conditions at the site where a Model 580A Controller is being installed.

2.5.1 Vapor Density

Whether the gas/vapor to be monitored is lighter or heavier than air affects sensor placement. For lighter-than-air gases, sensors are generally placed close to the roof or ceiling in indoor installations. For gases much heavier than air, sensors are generally placed near the floor or ground when there are no air currents in the area. Gases with a density equal to air or slightly greater than air tend to rise, particularly when air currents are present.

2.5.2 Air Currents

If there are winds, fans, or other sources of air movement, combustible gases tend to rise or to accumulate in certain sections of a facility. Local air currents should be studied to aid in selection of sensor locations.

2.5.3 Likely Sources of Gas Emission

In general, at least one sensor should be located in close proximity to each point where a leak of a combustible gas is likely to occur. This is particularly important when a liquid having a high volatility is to be monitored.

2.5.4 Environmental Factors

Avoid installing sensors where they are exposed to wind, dust, water, shock, or vibration. Observe the temperature range limitations of sensors (Section 7.4.2).

2.5.5 Catalytic "Poisons"

Sensors are adversely affected by prolonged exposure to certain materials. Loss of sensitivity (i.e. reduced response to combustible gases) or corrosion may be gradual if such materials are present in low concentrations, or it may be rapid at high concentrations. The more important materials adversely affecting sensors are:

- Halides (compounds containing chlorine, fluorine, bromine, or iodine).
- Sulfur compounds such as SO_2 (Sulfur Dioxide), H_2S (Hydrogen Sulfide), CS_2 (Carbon Disulfide).
- Heavy metals such as tetraethyl lead.
- Silicones (often contained in greases and aerosols). Silicones do not chemically attack the sensor. They, instead, coat the beads and, therefore, reduce or stop the oxidation of the combustible gas at the catalytically active bead.
- Acid vapors.
- Caustic liquids or vapors.

The presence of such materials in an area does not necessarily preclude the use of a catalytic bead sensor. The feasibility of using a sensor in such areas must be determined by an analysis of the specific factors in each application. However, sensors used in such areas usually require calibration checks on a more frequent basis, and typically have a shorter life than normal. In many such applications, the normal two-year warranty does not apply.

CAUTION: General Monitors discourages the painting of sensor assemblies for two reasons. First, if the sensor head is painted-over, gas will not be able to diffuse into the sensor. Second, many paints contain lead, which can poison a sensor.

2.6 Sensor Installation

Various types of sensors can be provided with the Model 580A Controller. However, the installation method is identical in all cases. Please refer to Section 7.6 for further information.

The sensor assembly, (Figure 4), is used most often. It consists of P/N 10001-1 sensor plus GMI P/N 10252-1 Sensor Housing.

This assembly (P/N 10001-1 + P/N 10252-1) is CSA approved for NEC Class I, Division 1 and Division 2, Groups B, C and D hazardous areas.

Each sensor assembly is connected to the controller using 3-conductor stranded cable, and must be installed with conduit in hazardous areas. Total loop-resistance excluding the sensor must not exceed 40-Ohms. A separate cable is required for each sensor.

GMI recommends the use of shielded cable generally, though in some cases it is not an absolute necessity. Due to the low levels of sensor signal voltages, shielded cable is **required** in some installations to guard against extraneous electrical noise. The shield must be enclosed in a suitable insulating outer jacket, and must be grounded only at the rear-panel sensor-shield ground terminal (Figure 4). Care must be taken to assure that the shield does not contact the sensor housing or metal conduit.

CAUTION: Avoid running sensor cables close to high power cables, radio transmission lines, or cables subject to pulses of high current.

Sensor cable connections must be crimped and **SOLDERED** for stable operation. Use only continuous, un-spliced cable runs if possible. Improperly spliced cable can result in corrosion, resistance changes, and drift.

To connect the cable at the sensor:

1. Remove the P/N 10252-1 housing lid to reveal the terminal strip. The sensor is connected in the housing according to the color designations (Figure 3). The green position is not used.

2. Sensor cables are connected at the controller to the terminal blocks located along the top of the rear of the controller. The channel numbers (1&2) read from top to bottom on this terminal.

3. Connect the cable so that the terminal color at the sensor housing matches the terminal color at the controller as follows (Figure 4):

WIRE COLOR	TERMINAL NUMBER	
	CH1	CH2
Black	B1	B1
Red	R2	R2
White	W3	W3

Table 2: Terminal Colors

4. Cable runs should not exceed the following distances (maximum loop resistance of 40-Ohms):

AWG	METERS	FEET
20	580	1900
18	910	3000
16	1460	4800
14	2320	7600

Table 3: Maximum Cable Run Distance

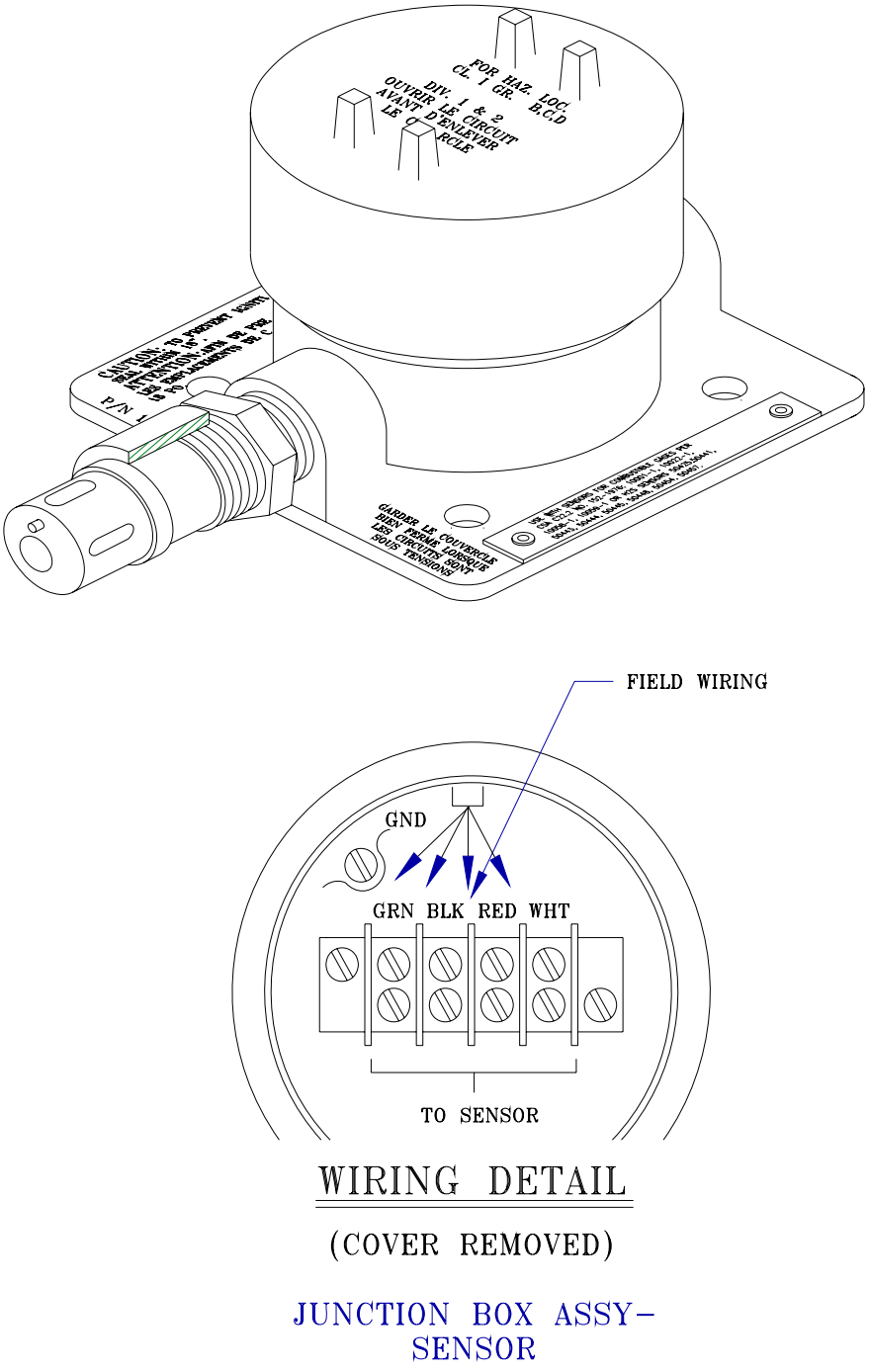

Figure 4: Junction Box Assembly – Sensor

SENSOR GUARDS	
PART NUMBER	DESCRIPTION
1800822	DUST GUARD
10395-1	SPLASH GUARD
10110-1	DUST GUARD WITH DISPOSABLE SCREEN

Table 4: Sensor Guards

CAUTION: Always mount sensors pointing downward, so that water does not accumulate on the sensor head. Mounting must be as free from shock and vibration as possible, and should be convenient for calibration checks in place. The sensor housing must never be opened when the power is on otherwise; the explosion-proof integrity of the sensor assembly is compromised. The threads on the housing lid must be fully engaged.

2.7 Alarm Wiring Connections

The low and high alarm contacts for customer use are DPDT (double pole, double throw), and are rated 4 amps at 115 VAC, resistive. The fault alarm contact is SPDT (single pole, double throw), 4 amps at 115 VAC, resistive. These contacts are brought out to terminals on the rear of the controller as follows.

ALARM RELAY	CONTACT CONDITION		
	OPEN	COM	CLOSED
Fault	4	C	3
Low Alarm	2,3	C	1,4
High Alarm	2,3	C	1,4

Table 5: Alarm Relay Contacts

The above chart shows the high and low alarm contacts in the standard de-energized state (with power applied). These two alarm relays are normally de-energized unless specially ordered for normally energized operation. **The fault relay is always supplied normally energized.**

If normally energized, the terminations are:

ALARM RELAY	CONTACT CONDITION		
	OPEN	COM	CLOSED
Fault	4	C	3
Low Alarm	1,4	C	2,3
High Alarm	1,4	C	2,3

Table 6: Alarm Relay Terminations

For more information, see Section 7.10.

Caution: Inductive loads, such as bells, buzzers, relays, contactors, solenoid valves, etc., connected to the High alarm, Low alarm and Fault alarm relays must be clamped down as shown in the diagrams below. Unclamped inductive loads can generate voltage spikes in excess of 1000 Volts. Spikes of this magnitude will cause false alarms and possible damage.

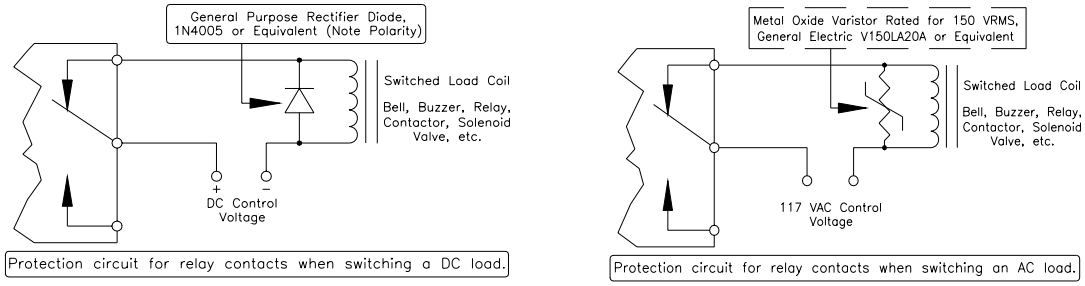

Figure 5: Protection Circuit for Relay Contacts

3.0 Start-Up and Operation

3.1 Types of User Interfaces

User interfaces are provided so that the operator may interpret and direct the Model 580A in the performance of its various functions. User interfaces consist of a digital display, status indicators, a channel/select button, a mode button, and a reset button.

Figure 6: Front Panel Display

- The digital display provides the user with the gas concentration at the sensor site, fault diagnostic codes, calibration prompts and setup parameters. The highest gas concentration of the two channels is displayed.

NOTE: If one channel is in fault, and the other is in alarm, the gas reading of the alarmed channel displays. The error code of the channel in fault is shown after the alarm condition is removed.

NOTE: If one channel is in fault, and the other channel's gas reading is below alarm level, the fault error code displays. To see the gas concentration of the working channel in this case, use Calibration Check mode.

- The status indicators provide the user with an indication of the current mode of operation: **HIGH** (high alarm), **LOW** (low alarm), **FAULT** (fault alarm), **SETUP** (setup and setup check modes), and **CAL** (calibration or calibration check modes).
- The channel indicators provide the user with the indication of an active channel. In normal operation mode a steady channel's LED indicates an active channel. A flashing channel's LED means that the channel has a fault. In Calibration Check or Calibration mode, the channel's flashing LED shows which channel is being checked or calibrated.
- The **Mode** button provides the user access to the Calibration, Calibration Check, Setup, and Setup Check modes.
- The **Reset** button allows the user to reset latched alarms.
- The **Channel/Select** button allows the user to access the desired channel. In normal mode, if there are no faults, pressing the **Channel/Select** button causes the display to show the gas reading of another channel. Releasing the button restores the highest gas concentration display. The button also allows selecting a channel for Calibration and Calibration Check mode.

3.2 Initial Application of Power

Before applying power for the first time, double-check all wiring components.

The system has a time delay feature. The High and Low alarm circuits are disabled for approximately 45 seconds after power is applied. This feature prevents false alarms while the sensor circuits are stabilizing.

At the initial application of power, the unit will enter a 45-second start-up mode. During this time, the display will read "SU". The unit then enters operational mode and the current gas concentration of the sensor displays. If a channel fault occurs, the **FAULT LED** will flash, the fault relay will become active and the unit will display the appropriate error code. This fault indication is independent of the abovementioned time delay feature.

3.3 Resetting Latched Alarms

The user may select a "latching" or "non-latching" alarm output for High and/or Low. If an alarm output activates and the condition that caused that activation is no longer present, a non-latching alarm output resets automatically. A latched alarm output must be reset manually.

NOTE: A channel's sensor detects a gas concentration in excess of an alarm set point. The associated alarm outputs will activate. After a few moments, the gas concentration drops below the alarm set point. If the alarm outputs are latched, the operator can press the **Reset** button and the latched alarm outputs will return to their normal (safe) state.

3.4 Calibration Check Mode

To perform a calibration check, use the following procedure:

- Place the cup from the portable purge calibrator over the sensor.

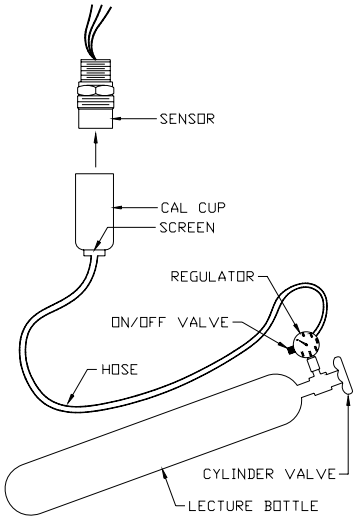

Figure 7: Portable Purge Calibrator

NOTE: The Calibration Check mode cannot be entered if the unit is in alarm.

1. Enter the Calibration Check mode by pressing and holding the **Mode** button until the **CAL** LED flashes (about ten seconds). The unit displays the calibration level. When the **CAL** LED flashes, release the **Mode** button. The channel is now in the Calibration Check mode.
2. When the Mode button is released, the display flashes a pair of bars (**--**) for about ten seconds. After that "**C1**" or "**C2**" displays for a short time indicating which channel is being checked. The channel's LED is flashing. To select another channel press the **Channel/Select** button.
3. When the display flashes digits, for example "**0**", apply the test gas to the sensor (open the ON/OFF valve on the cylinder) and wait a few seconds. The display begins to go up scale as the sensor sees the gas. If no gas is applied, the unit returns to the normal operating mode after 6 minutes.

4. The reading stabilizes after 30 to 60 seconds of exposure to the test gas. This response time may increase due to the presence of the Dust Guard, Splash Guard or other sensor accessories.
5. If the sensor sees the gas, the read-out on the display flashes for as long as the channel remains in the Calibration Check mode.
6. The operator should compare the reading with the gas concentration applied and determine if it is necessary to calibrate the sensor.
7. Remove the gas and expose the sensor to clean air. If the gas is not removed within 6 minutes, the channel reverts to a fault condition.
8. If another channel needs to be checked press the **Channel/Select** button and repeat steps 4 through 8 of this procedure.
9. Press the **Mode** button. The calibration level displays for a short time, and then the channel exits out of Calibration Check mode.

NOTE: Low and High alarms for checked channel are disabled during calibration check mode. If an alarm happens on another channel, the alarm actuates and the gas concentration of the alarmed channel displays.

3.5 Calibration Mode

NOTE: For better results power up the sensor at least an hour before calibration.

To calibrate the Model 580A:

1. Make sure the calibration gas is the same concentration as the user specified calibration level.
2. Make sure the sensor is seeing clean air.
3. Enter the Calibration mode by following the same procedure for entering the Calibration Check mode. Press and hold the **Mode** button until the **CAL** LED becomes steady, approximately fifteen seconds. When the **CAL** LED is steady, release the **Mode** button. The display shows C1 as the channel being calibrated and then flashing bars (**--**) for about 30 to 90 seconds. When the display changes from (**--**) to **AC**, clean air calibration is complete. Channel C1 is now being calibrated at clean air. To select channel C2 for calibration, use the Channel Select button.
4. Place the cup from the portable purge calibrator over the sensor.
5. When the channel displays **AC**, apply gas to the sensor. Watch the display changing from **AC** to **CP** as the sensor detects gas. If the display does not change from **AC** to **CP** after six minutes, the channel returns to normal operation.
6. Wait for the display to change from **CP** to **CC** when the calibration routine is complete. If the display indicates **F2** (failure to calibrate), remove the gas, close the valve, and take the calibration cap off the sensor. Recalibrate the channel after 5 minutes.

7. Remove the gas by closing the valve on the cylinder and taking the calibration cap off the sensor. Watch the display return to normal operation, when the gas concentration drops below 5% LEL.

8. Repeat steps 1-7 for the other channel.

NOTE: Low and High alarms are disabled during Calibration mode for the calibrated channel. If an alarm occurs on another channel during the calibration, the channel exits out of calibration. After the alarm condition is removed on another channel, an **F2** error displays. If necessary, remove the gas and recalibrate the sensor.

3.6 Aborting Calibration

Calibration can be aborted before the calibration gas has been applied.

To abort calibration:

1. Wait until **AC** displays. Calibration cannot be aborted when (**--**) is flashing.

2. Press the **Mode** button and hold it for approximately 5 seconds. Release the button, when the calibration level displays.

3. The channel returns to normal operation.

3.7 Setup and Setup Check modes

The Setup Check mode allows the operator to view the selected options for the module without allowing any changes to be made. Once this mode has been entered, the module automatically displays each of the selected options for a short period of time and then it returns to normal operation. The Setup mode allows the operator to change the operating parameters by making choices for selected options.

The Setup Check & Setup modes display identical information with the following exceptions:

- The Setup Check mode allows the user to view the operating parameters of the channel, whereas the Setup mode allows the user to change these parameters.
- Entering the optional password is only available in the Setup mode.

NOTE: The Setup and Setup Check modes cannot be entered if the unit is in alarm or fault.

During the Setup mode the operator is allowed to select options. The selection procedure is the same for most of the options. Pressing the **Mode** button toggles the available choices. When the display has indicated a choice for five consecutive seconds, without the operator pressing the **Mode** button, the setup routine accepts that selection and moves on to the next option available.

NOTE: Before entering the Setup mode to make changes, the user should fill out the Setup Mode Selection Table (Section 3.9). This aids the user during the selection process in the Setup mode.

The Password, the High & Low Alarm set points and the Calibration Level options offer the operator more than two choices. While these options are being selected, pressing the **Mode** button repeatedly sequences the display to the next available choice for that option.

To enter the Setup Check mode:

1. Press and hold the **Mode** button until the **SETUP** LED begins flashing (about twenty seconds).
2. When the **SETUP** LED is flashing, release the **Mode** button to enter the Setup Check mode

To enter the Setup mode:

1. Press and hold the **Mode** button until the **SETUP** LED begins flashing (about twenty seconds
2. Continuing to press and hold the **Mode** button until the **SETUP** LED stops flashing (about five seconds more).
3. When the **SETUP** LED stops flashing and stays on, release the **Mode** button and the unit enters the Setup mode.

3.7.1 Entering the Password

This option applies to the Setup mode only:

- If the Password option is enabled, the right digit of the display is blank and a "**0**" appears in the left digit on the display. Press the **Mode** button until the first number of your password displays, and then wait about five seconds.
- The left digit of the display blanks out and a "**0**" appears in the right digit on the display. Press the **Mode** button until your correct password number displays, then wait about five seconds. If the password is correct the unit proceeds to the Password Enabled/Disabled option. If the password is incorrect the user cannot proceed and the unit returns to the normal operating mode. Once in the operating mode the user may re-enter the Setup Mode. The factory default password is **00**.

3.7.2 High Alarm Options

Next, the **High** LED is flashing while the energized/de-energized option displays. This option is available for discrete relay configuration only. The display indicates the current selection, (**En or dE**). Press the **Mode** button to toggle the selection. **De-Energized (dE)** is the factory default for this selection.

The **High** LED on the front panel flashes while the latching/non-latching option displays. The display indicates the current selection, (**nL or LA**). Press the **Mode** button to toggle the selection. **Latching (LA)** is the factory default for this selection.

The last High alarm option to appear on the display is the alarm set point (trip level). If this level is reached or exceeded, the High alarm outputs activate. The display indicates the current High alarm set point (**5** to **60** in increments of 5). Press the **Mode** button repeatedly, until the desired high alarm set point appears on the display. For this selection the factory default is **60**. In case of common alarms, this option is available at the master board only.

NOTE: The High set point cannot be set lower than the current Low set point. To accomplish this, you need to go through set-up twice. The Low set point should be set lower than the desired High set point, then re-enter the Setup mode and set the High set point.

3.7.3 Low Alarm Options

Next, the **Low** LED flashes while the energized/de-energized option displays. This option is available only for discrete alarms configuration. The display indicates the current selection, (**En or dE**). Press the **Mode** button to toggle the selection. **De-Energized (dE)** is the factory default for this selection.

The **Low** LED on the front panel flashes while the latching/non-latching option is displayed. The display will indicate the current selection, (**nL or LA**). Press the **Mode** button to toggle the selection. **Non-Latching (nL)** is the factory default for this selection.

The last Low alarm option to appear on the display is the alarm set point (trip level). If this level is reached or exceeded, the Low alarm outputs activate. The display indicates the current Low alarm set point. Press the **Mode** button repeatedly, until the desired Low alarm set point appears on the display (**5** to the **High** set point in increments of 5). The Low set point cannot be set higher than the High set point. A set point of **30** is the factory default for this selection. In case of common alarms, this option is available at the master board only.

3.7.4 Calibration Level Option

After the Low alarm options have been selected, the user chooses the Calibration Level. This option displays **CL** for 5 seconds, then the current calibration level. The acceptable range of calibration level, in % LEL (lower explosive limit), is between **25** and **90**, inclusive. A calibration level of **50** is the factory default for this selection.

3.7.5 Password Enabled/Disabled Option

After the Calibration Level option has been selected the Password Enabled/Disabled option displays. The display indicates the current selection, (**PE or Pd**). Press the **Mode** button to toggle the selection. **Password Disabled (Pd)** is the factory default for this selection.

If the Password Disabled is selected, the unit returns to normal operation. If this setting is changed from Password Disabled to Password Enabled, the user enters a new password. The unit displays the left digit of the existing password (flashing on the display). The right digit is blank until the left digit has been selected. Press the **Mode** button repeatedly until the desired value displays. Once the left digit is correct, wait for five seconds and the right digit of the display begins flashing and the left digit is blank.

Press the **Mode** button repeatedly; until the desired value displays, the unit then executes the Setup Check mode and then returns to normal operation.

3.8 Setup Mode Selection Table

This section helps the operator make selections during the Setup mode. It is recommended that the operator fill-in the selections in the proper blanks and then use this page as a reference while programming the Model 580A. The table shown below indicates the order of options in the Setup mode. To the right of the option entry is a description of the choices that are available for that option.

OPTION	DESCRIPTION	ENTER SELECTION
Password	Enter the Password, if the Password is enabled	_____
High Alarm Options	Set the Energized (En) / De-Energized (dE) Option Set the Latching (LA) / Non-Latching (nL) Option Set the High alarm set point	_____ _____ _____
Low Alarm Options	Set the Energized (En) / De-Energized (dE) Option Set the Latching (LA) / Non-Latching (nL) Option Set the Low alarm set point	_____ _____ _____
Calibration Level	Set the calibration level	_____
Password Options	Set the Password to be Disabled (Pd) or Enabled (PE) If the Password option to be changed from Disabled to Enabled: Set the password digits	_____ _____ Left_____ Right_____

Table 7: Setup Display Options

3.9 Check Points for Calibration and Operation

3.9.1 Frequency of Calibration

It is very important that the owner/operator of this equipment determine the correct calibration schedule for their particular environment. The frequency of calibration may be substantially shorter then 90 days depending on environmental contaminants and conditions. This calibration frequency should follow a regular calibration routine and procedure.

3.9.2 Background of Combustible Gases

In some applications, there is an occasional or continuous presence of "background" combustible gases. Generally, this is a very small % LEL. Usually, it is advisable to zero out the background gas concentration during calibration.

To Zero the Background Gas Concentration

1. Isolate the sensor from the surrounding air by placing your hand tightly over the sensor.
2. Observe the reading on the "%" LEL display. A gradual drop in reading indicates the presence of background or combustible gases. Keeping the hand over the sensor, wait for the reading to stabilize and start the calibration without the calibration cap.
3. When "**AC**" displays, remove your hand from the sensor, place the cap over the sensor and continue the calibration.

3.9.3 Replacing a Sensor

When a sensor is replaced, the new sensor **must** be calibrated. To avoid false alarms, GMI recommends disabling all the alarm circuits until the sensor is calibrated. For better results, the sensor should be powered up at least one hour before calibration.

CAUTION: Extended exposure of a sensor to a high concentration of combustible gases can introduce stress in the sensing element, which may seriously affect performance. Re-calibration should therefore be performed after an alarm due to a high concentration of gas, and the sensor should be replaced, if necessary. A display reading of "99"% LEL, or high off scale, may mean an explosive concentration of gas is present.

NOTE: The previous warning is applicable to all catalytic bead sensors.

4.0 Maintenance

4.1 General maintenance

Once installed, the Model 580A Controller requires little or no routine maintenance, other than periodic calibration checks. GMI recommends that a calibration schedule be established and adhered to. GMI also recommends that a logbook be kept, showing calibration dates and dates of sensor replacement.

General Monitors recommends that a calibration check should be conducted at least every ninety (90) days. This is the only method of ensuring proper system operation and response to combustible gases. More frequent calibration checks are encouraged to detect problems, such as mud collecting on the sensor heads; accidental painting over of sensors, etc. A calibration check is defined as the procedure of applying a known concentration of gas to the system sensors, while observing the controller. The visual display will indicate the gas concentration, and alarm indicators/circuits will activate in direct relationship to gas concentration. Calibration adjustments must be made if results vary (Section 3.6).

The removal of particulate matter from accessory sensor covers may be facilitated by the use of an appropriate halogen-free solvent. Water, and ethanol are examples of suitable solvents. Dry the sensor cover thoroughly with compressed air if necessary, before refitting to the sensor body. A calibration check must be made after the cleaned cover is re-installed, because the cleaning process may increase response due to removal of dirt, etc.

4.2 Periodic System Verification

The following system verifications should be performed annually. Verify wiring, terminal connections and stability of mounting for all integral safety equipment including, but not limited to:

- Power supplies
- Control modules
- Field detection devices
- Signaling / output devices
- Accessories connected to field and signaling devices

Proper system operation should be verified by performing a full, functional test of all component devices of the safety system, ensuring that the proper levels of alarming occur.

Fault/Malfunction circuit operation should be verified. Calibration intervals should be independently established through a documented procedure, including a calibration log maintained by plant personnel or third party testing services.

5.0 Troubleshooting

5.1 General

It is highly recommended that a spare sensor be on hand at all times. GMI sensors are the most reliable, longest life catalytic bead sensors available. Sensor failure tends to be one of the potential causes of real downtime. A full complement of other GMI recommended spare parts should also be on hand (Section 7.7). It is recommended that defective controllers be returned to the factory for repair, even if the warranty has expired.

5.2 Troubleshooting Table

The information presented in the following table is designed to correct the more common problems, which appear during system startup and operation. Should the various actions suggested in the table fail to restore normal operation, we recommend that the factory be consulted and, if necessary, that the system be returned to the factory for repair.

This section is intended to be a guide in correcting problems that may arise in the field. This section is not all-inclusive, and General Monitors should be contacted for assistance, if the corrective actions listed do not eliminate the problem. If equipment or qualified personnel required for various tests is not available, it is recommended that the defective unit be returned to General Monitors for repair. A complete written description of the problem should be included.

Be sure to disconnect external alarm wiring before making any check that might send the unit into alarm, if an alarm condition will create problems.

NOTE: If the equipment is under warranty, any repairs performed by persons other than General Monitors' authorized personnel, may void the warranty. Please read the warranty statement carefully.

5.3 Fault Codes

In addition to the Fault LED on the front panel, the Model 580A provides a Fault Code on the digital display whenever a fault condition occurs. The Fault Codes that can appear on the digital display are

FAULT CODE	DESCRIPTION	SOLUTION
HI	High Supply Voltage	Make sure the supply voltage level is within specification limits.
LO	Low Supply Voltage	Make sure the supply voltage level is within specification limits.
SE	Sensor Failure	Sensor connections are open or short circuited or there is excessive zero drift. Make sure the sensor wires are connected properly (in the field and at the rear of the unit) and recalibrate if necessary. If this fault continues to occur, replace the sensor.
F1	Channel Select Button Malfunction	If the fault occurs, consult the factory or your GMI Representative.
F2	Failed to Complete Calibration	If this fault occurs, remove the gas and expose the sensor to clean air for at least five minutes. Then attempt another calibration. If the second attempt fails, replace the sensor. If this fault continues to occur after the sensor has been replaced, consult the factory or your GMI Representative.
F3	Software Checksum Error	This fault occurs during initial power-up of the unit. If this fault occurs, remove and reapply power to the unit. If the fault continues to occur, consult the factory or your GMI Representative.
F5	Reset Button Malfunction	If the fault occurs, consult the factory or your GMI Representative.
F6	Mode Select Button Malfunction	If the fault occurs, consult the factory or your GMI Representative.
F7	EEPROM Verification Error for Calibration Storage	If the fault occurs, consult the factory or your GMI Representative.
F8	EEPROM Verification Error for Setup Storage	If the fault occurs, consult the factory or your GMI Representative.
F9	Calibration Check Period Exceeded	If the calibration checks gas is left on the sensor for more than 6 minutes, this fault occurs. Remove the gas and expose the sensor to clean air.

Table 8: Troubleshooting Table

6.0 Customer Support

6.1 General Monitors' Offices

Area	Phone/Fax/Email
UNITED STATES	
	Toll-Free +1-800-446-4872
Corporate Office: 26776 Simpatica Circle Lake Forest, CA 92630	Phone: +1-949-581-4464 Fax: +1-949-581-1151 Email: sales@generalmonitors.com
9776 Whithorn Drive Houston, TX 77095	Phone: +1-281-855-6000 Fax: +1-281-855-3290 Email: gmhou@generalmonitors.com
UNITED KINGDOM	
Heather Close Lyme Green Business Park Macclesfield, Cheshire, United Kingdom, SK11 0LR	Phone: +44-1625-619-583 Fax: +44-1625-619-098 Email: info@generalmonitors.co.uk
IRELAND	
Ballybrit Business Park Galway, Republic of Ireland	Phone: +353-91-751175 Fax: +353-91-751317 Email: service@gmil.ie
SINGAPORE	
No. 2 Kallang Pudding Rd. #09-16 Mactech Building Singapore 349307	Phone: +65-6-748-3488 Fax: +65-6-748-1911 Email: genmon@singnet.com.sg
MIDDLE EAST	
LOB12, #G20 P.O. Box 61209 Jebel Ali, Dubai United Arab Emirates	Phone: +971-4-8815751 Fax: +971-4-8817927 Email: gmme@emirates.net.ae

6.2 Other Sources of Help

General Monitors provides extensive documentation, white papers and product literature for its complete selection of safety products. A selection of these documents are available online at the General Monitors website at **http://www.generalmonitors.com**.

7.0 Appendix

7.1 Warranty

General Monitors warrants the Model 580A Controller to be free from defects in workmanship or material under normal use and service, within two (2) years from the date of shipment. General Monitors will repair or replace, without charge, any such defective equipment found to be defective during the warranty period. General Monitors' personnel will make full determination of the nature of, and responsibility for defective equipment. Defective or damaged equipment must be shipped prepaid to General Monitors' plant, or representative from which shipment was made. In all cases, this warranty is limited to the cost of the equipment supplied by General Monitors. The customer will assume all liability for the misuse of this equipment by its employees, or other personnel.

All warranties are contingent upon proper use in the application for which the product was intended. They do not cover products which have been modified, or repaired, without General Monitors' approval, or which have been subjected to neglect, accident, improper installation or application, or on which the original identification marks have been removed, or altered. Except for the express warranty stated above, General Monitors disclaims all warranties with regard to the products sold, including all implied warranties of merchantability and fitness. The express warranty stated herein are in lieu of all obligations or liabilities, on the part of General Monitors for damages including, but not limited to, consequential damages arising out of/or in connection with, the use or performance of the product.

NOTE: The Model 580A Two Channel Combustible Gas Monitor is easy to install; however, this manual should be read and understood before attempting to operate the system.

7.2 General Specifications - Controller

7.2.1 Mechanical Specifications

Dimensions:	2.1"W x 6.9"H x 11.5"D (53mm x 175mm x 292mm)
Weight:	3.8 lbs. (1.8 kg)
Mounting Configuration:	Rack, panel, wall

7.2.2 Environmental Specifications

Temperature Range:	32°F to 140°F (0°C to 60°C)
Storage Temperature:	-4°F to +149°F (-20°C to 65°C)
Operating Humidity Range:	15% to 95% Non-Condensing

7.2.3 Electrical Specifications

Power:	105-130 VAC/50-60 Hz 205-255 VAC/50-60 Hz 22-30VDC. 9-Watts nominal per channel (117 VAC)
Alarm Circuits:	4 Amp relays @117 VAC, resistive
Output Signal:	None

7.2.4 System Specifications

Digital Readout:	Range 0-99% Lower Explosive Limit (% LEL)
Accuracy:	± 3% LEL for ≤ 50% LEL gas, and 5% for >50% LEL gas
Electrical Classification:	General purpose (non-hazardous, indoors)
Warranty:	Two years
Approvals:	CSA

7.3 General Specifications - Sensor

7.3.1 System Specifications

Type:	Diffusion, low temperature catalytic bead Standard Industrial Types: Combustible Gas; High Temperature Combustible Gas
Response Time:	T_{50} typical 6-seconds
Zero Drift:	Less than 5% per year
Typical Life:	3 years in normal service
Electrical Classification:	NEC Class I, Division 1 and 2, Groups B, C, and D
Warranty:	Two years

7.3.2 Environmental Specifications

Temperature Range: (Operating and storage)	-65°F to 200°F (-55°C to +93°C) standard; high temperature special to 400°F (200°C)
Humidity:	15% to 95% R.H

7.4 Cable Requirements

3-wire maximum cable length between controller and sensor assembly with one-way resistance of 20 Ohms (total 40 Ohms loop):

AWG	METERS	FEET
20	580	1900
18	910	3000
16	1460	4800
14	2320	7600

Table 9: Maximum Cable Lengths

7.5 Sensors

The following is a list of GMI sensors available for use with the Model 580A Controller:

PART NUMBER	DESCRIPTION
10001-1	Standard Industrial Combustible Gas Sensor. Used for most hydrocarbons and hydrogen. Temperature range –65°F to +200°F (-55°C to +93°C).
10001-1R	Same as Part Number 10001-1, except greatly improved resistance to poisons, such as HMDS (Hexamethyldisiloxane) and H_2S (Hydrogen Sulfide).
10014-1	High Temperature Standard Industrial Combustible Gas Sensor. Same as Part Number 10001-1, except sensor body is stainless steel.
10058-1	Same as Part Number 10001-1, except sensor body is stainless steel.
10058-1R	Same as Part Number 10058-1, except greatly improved resistance to poisons, such as HMDS (Hexamethyldisiloxane) and H_2S (Hydrogen Sulfide).
10022-1	Similar to Part Number 10001-1, except PTB approved.
10059-1	Same as Part Number 10022-1, except body is constructed of stainless steel.
10015-1	High Temperature equivalent of Part Number 10022-1. It may be used in temperatures up to 400°F (200°C).

Table 10: GMI Sensors Available for 580A System

NOTE: Part Numbers 10001-1, 10058-1, 10022-1, and 10059-1 sensors are CSA C22.2 No. 152-1976 certified. Part Number 10252-1 sensor housing is normally used in the Western Hemisphere. Special ATEX approved housings are normally used in Europe.

7.6 Accessories

7.6.1 Calibration Equipment

Calibration accessories may be purchased from GMI. Contact the factory, or your local representative, for technical or ordering information.

The Portable Calibration Chamber is used to calibrate sensors for any specific combustible vapor, which has a flash point below ambient temperature. The customer must provide his own sample of the liquid to use with the chamber. GMI provides a micro-liter syringe for exact measurement of volumes to be used. Instructions for use are provided with the chamber.

The Portable Purge Calibrators are available for several common gases, including hydrogen, methane, ethane, propane and butane. The portable purge calibrator is a ready-for-use assembly, including a lecture bottle containing approximately 50% LEL of the gas ordered, plus regulator and an adapter, which fits over the sensor. Replacement cylinders are also available.

7.6.2 Sensor Covers

The information below is of a general nature. GMI, or your local representative, should be contacted for specific recommendations:

NOTE: If sensor covers are used, they should remain in place during calibration. If they are going to be cleaned, the sensor should be recalibrated after the sensor cover is re-installed. Although several of the available covers do not effect sensitivity or response-time themselves, accumulations of dust, dirt, water, etc., may do so.

7.6.2.1 Dust Guard Assembly (P/N 10110-1)

The Dust Guard assembly is a simple, threaded stainless steel (type 303) cylinder with a disposable wire screen at one end. It is easily unscrewed for cleaning and/or replacement of the screen. The screen material is stainless steel (type 316) with a nominal 40-micron mesh. This accessory is specially designed to prevent dust and particulate matter from reaching the sensor flame arrestor. Such debris can plug the screen and limit the amount of gas reaching the active surface of the sensor. When the Dust Guard is installed, this problem is minimized and sensor response is virtually unchanged. The Dust Guard is also available in a kit with twelve replaceable screens. It can be used as an effective windscreen, and is recommended for corrosive, windy or high temperature environments. A typical application would be in the area surrounding a drying oven.

7.6.2.2 Sintered Stainless Steel Dust Guard (P/N 1800822)

The construction of this accessory is similar to the Dust Guard assembly, above, but it has a 1/8” (3mm) thick sintered stainless steel disc at one end. The body material is stainless steel. It has an internal thread for installation on the sensor body. This Dust Guard provides protection from fine particulates and windy environments. It should be used only in dry locations because of the tendency of the sintered disc to absorb water, which would then act as a gas diffusion barrier until the disc dried-out again. This Dust Guard reduces sensor response, so it must never be removed for calibration.

7.6.2.3 Splash Guard (P/N 10395-1)

The Splash Guard is a rugged VALOX plastic cylinder, which screws into place over the sensor body. It contains a series of internal baffles and a stainless steel mesh, which are designed to deflect water away from the sensor flame arrestor. The Splash Guard is recommended for areas where heavy rain or frequent equipment hose-downs occur.

7.6.2.4 Sensor Flow Chamber (P/N 10066)

The General Monitors' Sensor Flow Chamber is constructed of aluminum (optional stainless steel construction available). The chamber has an internal thread into which a sensor may be screwed, and two threaded ports, which accept ¼ inch tube fittings. The chamber is designed for insertion into a sampling system.

7.7 Recommended Spare Parts

ITEM	DESCRIPTION	PART NUMBER	QTY.
1.	FUSE, 0.4 amp, 250 VAC	951-206	2
2.	FUSE, 2 amps, 250 VAC	951-015	2
3.	Sensor	10001-1	1

Table 11: Recommended Spare Parts

7.8 Sample Calibration Schedule and Checklist

To perform a Calibration Check or Calibration, refer to Sections 3.4 and 3.5.

Sensor Serial Number _____ Location _____

1. Installation and Preliminary calibration. Record date after preliminary calibration is done.	Date: _____	
2. 24-hour calibration. Record date after 24-hour calibration is done.	Date: _____	
3. 7-day calibration check Record date and reading of calibration check.	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____
4. 14-day calibration check Record date and reading of calibration check.	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____
5. 30-day calibration check. Record date and reading of calibration check.	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____
6. 60-day months calibration check. Record date and reading of calibration check.	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____
7. 90-day calibration check.	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____	Date/Reading ____ ____ ____ ____ ____ ____ ____ ____

Table 12: Calibration Schedule

7.9 Product Configuration Table

MODEL 580A

TWO CHANNEL COMBUSTIBLE GAS CONTROLLER

A	B	C	D
1	**1**	**01**	**2**

A. CONTROLLER

580A	Model 580A Controller 3.0 lbs.
1 (Std) -P1	110VAC/24VDC
2 - P2	220 VAC/24 VDC

B. RELAY – STATE

1	(STD)	RS 1	LATCH ALARM NON-LATCH WARN DE-ENERGIZED
2		RS 2	LATCH ALARM NON-LATCH WARN ENERGIZED
3		RS 3	LATCH ALARM LATCH WARN DE-ENERGIZED
4		RS 4	LATCH ALARM LATCH WARN ENERGIZED
5		RS 5	NON-LATCH ALARM NON-LATCH WARN DE-ENERGIZED
6		RS 6	NON-LATCH ALARM NON-LATCH WARN ENERGIZED
7		RS 7	NON-LATCH ALARM LATCH WARN DE-ENERGIZED
8		RS 8	NON-LATCH ALARM LATCH WARN ENERGIZED

C. COMBUSTIBLE – SENSOR

00		NONE	No Sensor	
01	(STD)	10001-1	Sensor Al Standard Industrial Hydrocarbon	.05 Lbs.
02		10001-1R	Sensor Al Poison Resistant Industrial Hydrocarbon	.05 Lbs.
03		10014-1	Sensor Al Hi-Temp Industrial Hydrocarbon	.05 Lbs.
04		10014-1R	Sensor Al Hi-Temp Poison Resistant Hydrocarbon	.05 Lbs.
05		10022-1	Sensor Al Ptb Industrial Hydrocarbon	.05 Lbs.
06		10058-1	Sensor SS Standard Industrial Hydrocarbon	.05 Lbs.
07		10058-1R	Sensor SS Poison Resistant Industrial Hydrocarbon	.05 Lbs.
08		10164-1	Sensor AL Hydrogen Specific	.05 Lbs.
09		10387-4	Sensor AL Super Poison Resistant Industrial Hydrocarbon	.05 Lbs.
11		10015-1	Sensor Al Hi-Temp Industrial Hydrocarbon Export	.05 Lbs.
12		11159-1	Sensor SS Standard Industrial HC Cenelec	.05 Lbs.
13		11159-1L	Sensor SS Standard Industrial HC Cenelec (W/Lugs)	.05 Lbs.
14		11159-2	Sensor SS Hi-Temp HC Cenelec	.05 Lbs.
15		11159-2L	Sensor SS Hi-Temp HC Cenelec (W/Lugs)	.05 Lbs.

D. ACTIVE CHANNELS

0	Controller Only	
1	One Active Channel	3.5 Lbs.
	1X Sensor Housing	3.0 Lbs.
2	Two Active Channels (STD)	6.0 Lbs.
	2X Sensor Housing	3.0 Lbs.

Table 13: Product Configuration Table

7.10 Engineering Documentation

7.10.1 Panel Assembly, Panel Mount – 98, Ref: 10199C

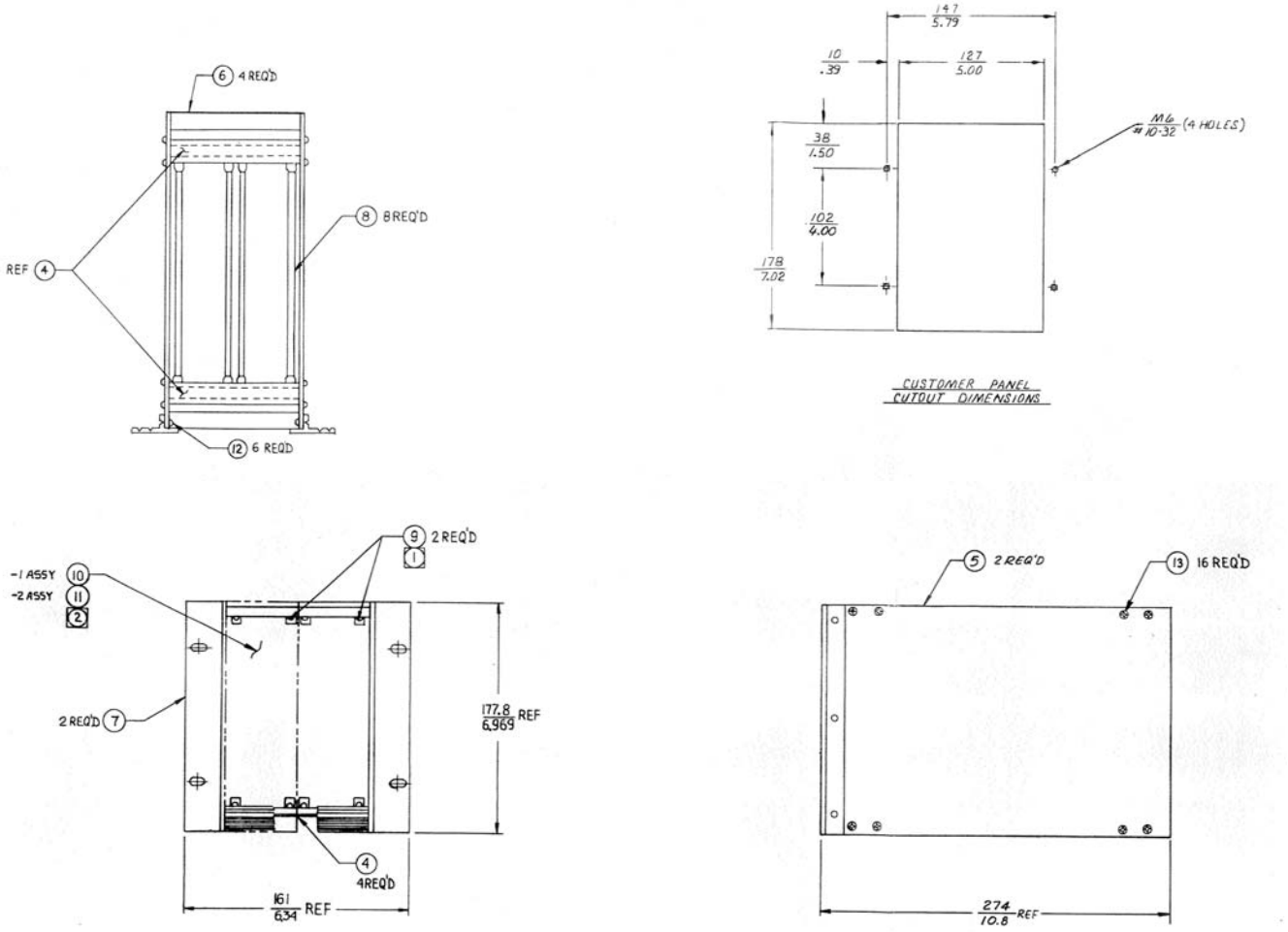

Figure 8: Panel Assembly, Panel Mount –98, Ref: 1019

ADDENDUM
Product Disposal Considerations

This product may contain hazardous and/or toxic substances.

EU Member states shall dispose according to WEEE regulations. For further General Monitors' product WEEE disposal information please visit:
www.generalmonitors.com/customer_support/faq_general.html

All other countries or states: please dispose of in accordance with existing federal, state and local environmental control regulations.

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