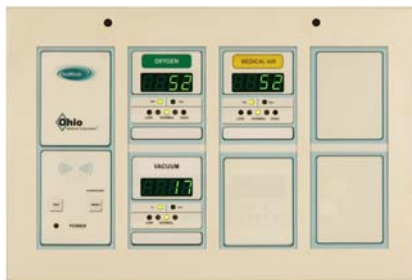
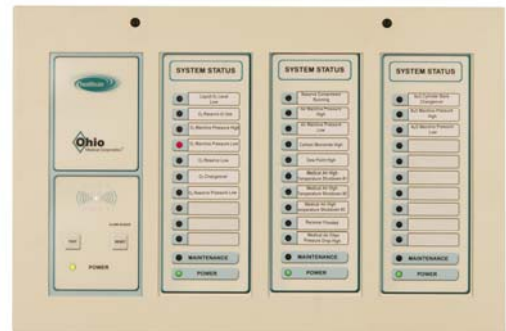


Medical Gas Alarms

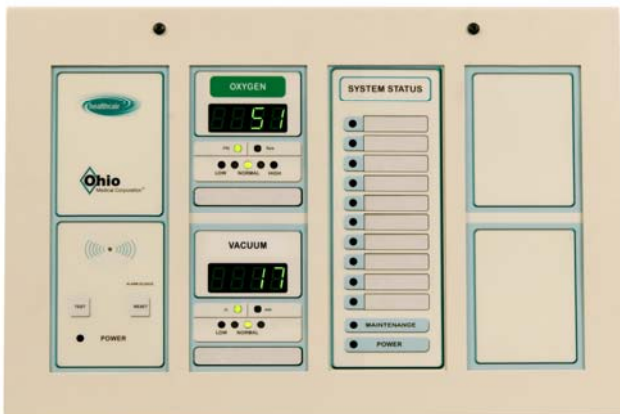
Installation and Maintenance Manual



Area Alarm



Master Alarm



Combo Alarm



NOTES

SQUIRE-COGSWELL COMPANY WAS FORMED IN 1916 AS A SUPPLIER OF RAILWAY AND FOUNDRY EQUIPMENT IN CHICAGO. IT CONTINUED ALONG THIS BUSINESS PATH UNTIL 1951 WHEN WALTER F. DEVEREUX PURCHASED THE COMPANY. AT THAT TIME THE COMPANY BEGAN TO CONCENTRATE ITS EFFORTS ON A LINE OF NON-LUBRICATED AIR COMPRESSORS AND VACUUM PUMPS AND A NICHE WAS FOUND SERVICING THE PRINTING PRESS INDUSTRY. UTILIZING THIS EXPERTISE, THE COMPANY BEGAN TO SUPPLY CUSTOM PUMPING PACKAGES FOR A VARIETY OF APPLICATIONS AND IN THE EARLY 1950'S SQUIRE-COGSWELL SOLD ITS FIRST HOSPITAL VACUUM PUMP PACKAGE, THE CORNERSTONE OF TODAY'S BUSINESSES AND PRODUCT LINES.

IN 1962, MR. HERBERT SCHIFTER, MR. DEVEREAUX'S SON-IN-LAW TOOK OVER AS PRESIDENT. MR. SCHIFTER WAS THE ORIGINAL INVENTOR OF THE "DIAMOND ONE" GAS OUTLET WHICH HE PATENTED IN 1959. THE BUSINESS GREW SIGNIFICANTLY AS A SUPPLIER OF CUSTOM DESIGNED AND CONSTRUCTED VACUUM AND AIR COMPRESSOR SYSTEMS FOR MEDICAL AND INDUSTRIAL USE. TO DATE, SQUIRE-COGSWELL HAS MANUFACTURED OVER 15,000 HOSPITAL AIR COMPRESSOR AND VACUUM PUMPING SYSTEMS THAT HAVE BEEN INSTALLED AROUND THE WORLD BEARING A VARIETY OF VERY WELL-KNOWN TRADE NAMES.

TODAY IN THE THIRD GENERATION OF FAMILY OWNERSHIP AND MANAGEMENT, SQUIRE-COGSWELL COMPANY CONTINUES TO SERVE THE WORLDWIDE NEEDS FOR HOSPITAL VACUUM PUMPING AND AIR COMPRESSOR PACKAGES ALONG WITH THE COMPLETE **HEALTHCAIR®** MEDICAL GAS PIPELINE OFFERING.

IN 1962, THE SUBSIDIARY COMPANY, AEROS INSTRUMENTS, INC., WAS FORMED TO MANUFACTURE SUCTION AND OXYGEN THERAPY EQUIPMENT FOR THE MEDICAL COMMUNITY. TODAY AEROS CONTINUES TO MANUFACTURE ALL OF THE SALES REQUIREMENTS FOR ONE OF THE LARGEST SUPPLIERS OF SUCH EQUIPMENT IN THE WORLD. AT THE SAME TIME, AEROS INSTRUMENTS PRODUCES AND SELLS IT'S OWN LINE OF PORTABLE SUCTION MACHINES UNDER THE WELL-KNOWN NAMES OF MOBLVAC®, INSTAVAC®, CARE-E-VAC® AND TOTE-L-VAC®.

THE AEROS INSTRUMENTS SUBSIDIARY, WHICH IS AN ISO 13485 REGISTERED COMPANY AND IS A GOVERNMENT REGISTERED MEDICAL DEVICE MANUFACTURER, PRODUCES THE **HEALTHCAIR®** SERIES OF MEDICAL GAS PIPELINE EQUIPMENT INCLUDING THE MEDICAL GAS OUTLETS AND MEDICAL GAS ALARM SYSTEMS.

SQUIRE-COGSWELL/AEROS INSTRUMENTS INC. ARE THE ONE SOURCE FOR ALL MEDICAL GAS PUMPING, MEDICAL GAS PIPELINE EQUIPMENT AND MEDICAL ASPIRATION EQUIPMENT. FROM CUSTOM DESIGNED PUMPING SYSTEMS TO THE MOST MODERN LINE OF ASPIRATION EQUIPMENT AND MEDGAS PIPELINE AVAILABLE ANYWHERE, SQUIRE-COGSWELL-AEROS DOES IT ALL. NO OTHER SUPPLIER SURPASSES OUR CONTINUITY OF EXPERIENCE AND LEADERSHIP IN THE MEDICAL GAS PUMPING, PIPELINE AND ASPIRATION MARKETS.

TABLE OF CONTENTS

1.0	Responsibilities	5
1.1	Installer ..	5
1.2	User	5
2.0	System Description & Function	5
2.1	Sensor Module.....	7
2.2	Annunciator Panel.....	8
2.3	Area Alarm Module	9
2.4	Master Alarm Module	9
3.0	Labeling	10
3.1	Area Alarm Module Labeling	10
3.2	Master Alarm Module Labeling	10
4.0	Installation.....	12
4.1	Mounting Instructions Prior to Drywall & Plaster Installation	12
4.2	Installation & Wiring Instructions After Drywall & Plaster Installation	13
4.3	Area Alarm Remote Output Signal Connections	16
4.4	Master Alarm Connections From Source Equipment.....	17
4.5	Dry Contacts Master Alarm Output Connections ..	18
4.6	Remote Audible Alarm Installation	19
4.7	Initial Start-Up Checks	20
5.0	Programming	20
5.1	Programming Chart.....	21
5.2	Default Settings Tables.....	22
5.3	Calibration Precautions.....	23
5.4	Programming Change Example.....	24
5.5	Review Area Alarm Programming Parameters	24
5.6	Master Alarm Programming Mode	24
6.0	LonWorks® Capabilities ..	25
7.0	Specifications.....	25
8.0	Troubleshooting	26
9.0	Cleaning.....	27
10.0	Service Item List	27
11.0	Warranty	29

1.0 Responsibilities

The information contained in this Installation and Operation Maintenance Manual, pertains only to the Ohio Medical Corporation medical gas alarm system. The medical gas alarm system will operate in conformance with the descriptions outlined in this manual only when it is operated, maintained and serviced properly and in compliance with the instructions contained herein.

1.1 Installer Responsibilities

All contents of the alarm are shipped in ISTA approved packaging. The alarm should be handled, installed, and tested per the recommended practices in this manual. Should such repair or replacement become necessary, contact Ohio Medical Customer Service (800-448-0770) for original equipment replacement parts.

1.2 User Responsibilities

The alarm should be tested and examined periodically. Any parts which are found to be damaged, corroded, contaminated, etc. should be replaced. Possible replacement items are listed on pages 26 to 27 in this manual. Should such repair or replacement become necessary, contact Ohio Medical Customer Service (800-448-0770) for original equipment replacement parts.

2.0 System Description & Function

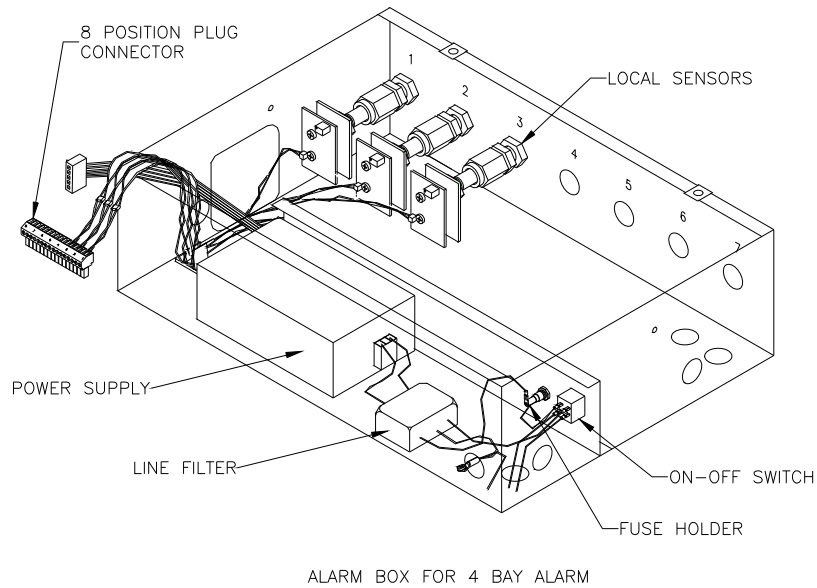
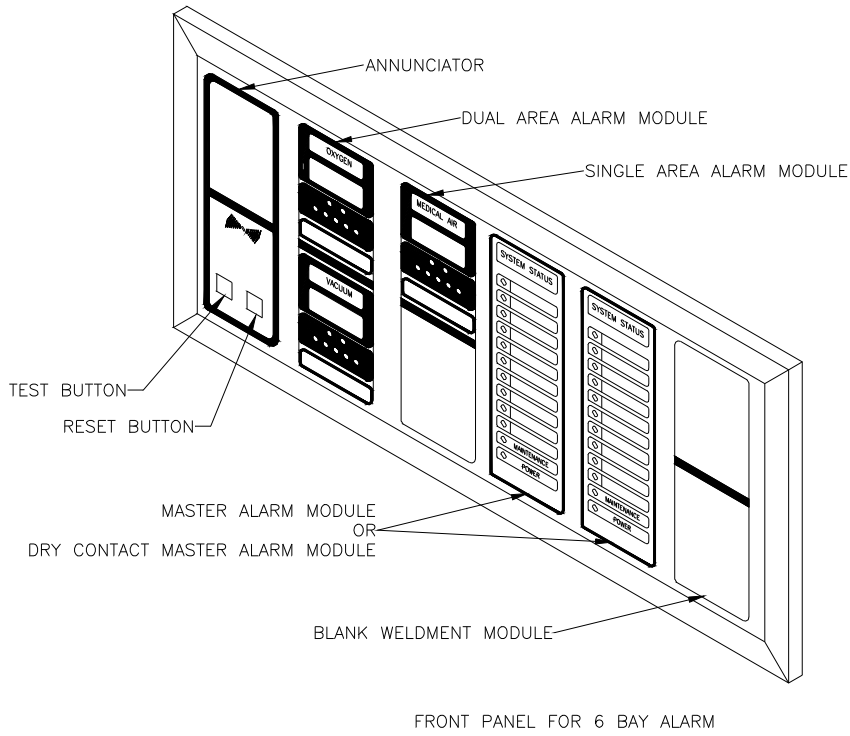
The Ohio Medical Corporation Medical Gas Alarm System is designed to continuously monitor the status of source equipment and gas line pressure of medical gases. The system is comprised of Area Alarm Modules which monitor and indicate the gas pressure or vacuum level of a specific gas at a specific point in the hospital and Master Alarm Modules which monitor source equipment such as oxygen systems, air compressors or vacuum pumps.

The Alarm System monitors gas line pressure with sensors. The Alarm's Annunciator determines the status of the pressure and the pressure is displayed on an area alarm module. The alarm module also has trend light LED's to show that the displayed pressure is either in a normal, caution, or a high or low alarm condition.

The Alarm System also has a master alarm module to monitor 10 condition points from source equipment. Each point represents a condition that the source equipment might have. A dry contact version of the master alarm is also available to relay conditions of the source equipment to a building management system.

More detailed descriptions of each module is explained on pages 5 through 8.

Figure 1: Typical Alarm Componentry Configuration



The Alarm System is fully contained in a metal enclosure. The enclosure is available in two sizes. The smaller enclosure can contain any combination of up to six Area Alarm Modules or three 10 point Master Alarm Modules. The larger enclosure can contain any combination of up to eight Area Alarm Modules or five 10 point Master Alarm Modules.

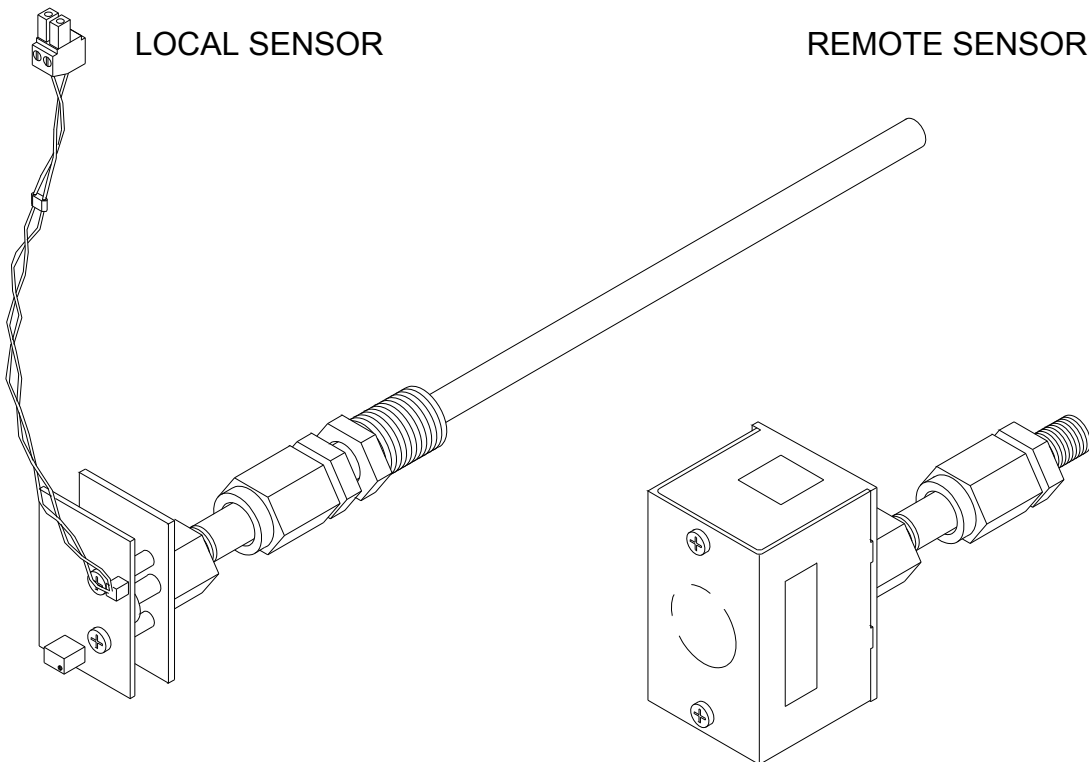
The overall design of the Ohio Medical Corporation Medical Gas Alarm System complies with the National Fire Protection Association NFPA-99 code.

2.1 Sensor Module

The function of the Sensor Module is to sense the pressure/vacuum of the gas in the line in which it is installed and transmit that data to the Annunciator Panel. The sensor modules are attached with a gas specific (DISS) demand check unit allowing ease of installation in a gas piping system.

There are different sensor modules used depending upon the gas being monitored. Each is clearly marked with its gas type and is identified with a color-coded label.

In “local” applications, the Sensor Modules are installed in the alarm enclosure and are hard piped directly into the gas line and wired to the Annunciator Panel. In “remote” applications the sensors are mounted outside the alarm enclosure in a metal housing and wiring is run from the sensors to the alarm panel. For “remote” installations where codes may require the use of electrical conduit the Sensor Module enclosure has a standard 7/8” knockout for conduit installation.



2.2 Annunciator Panel

The Annunciator Panel is the main processing board for the Medical Gas Alarm System. The Annunciator Panel accepts information by two different means. For gas pressure, the input signal comes from the Sensor Module and goes to the annunciator to evaluate the pressure being observed. This information is then transmitted directly to the corresponding Area Alarm Module where the pressure or vacuum is displayed via the ribbon cable. For source equipment, a condition is relayed to a point on a master alarm module first and then transferred to the Annunciator via the ribbon cable. In normal operation, the Annunciator continuously monitors all pressure, vacuum, and source equipment for alarm conditions. When an alarm condition is detected, an audible alarm (approximately 80 decibels measured at 3 feet) will sound and the appropriate red LED will illuminate from the corresponding Area or Master Alarm Module. The audible alarm will sound under one of the four conditions listed below.

- When the pressure input increases above a specified high set-point
- When the pressure or vacuum decreases below a specified low set-point
- When an alarm condition is detected on the Master Alarm Module
- When one of the Sensor Module's wiring has become disconnected

There are two momentary push buttons on the Annunciator Panel, which are labeled as "TEST" and "ALARM SILENCE/RESET". To stop the audible alarm from sounding, press the "ALARM SILENCE" button. However, the alarm will re-sound again after the specified repeat time has elapsed unless the alarm condition has been cleared. When a new alarm condition is detected from another alarm panel, the audible alarm will sound again. Each time the "Alarm Silence" button is pressed the alarm repeat time will reset. To review if the alarm's displays and audible alarm are in working order, press the "TEST" button for approximately 3 seconds. While testing, all display segments and independent LED's will be illuminated and the audible alarm will sound.

The Annunciator has a relay for wiring an external buzzer to a remote location. This relay energizes the external buzzer when the audible alarm sounds.

A communications port is provided on the Annunciator Panel that allows for integration with a LonWorks® network system allowing the medical gas alarm system to communicate with a LonWorks® capable building management system.

2.3 Area Alarm Panel

The Area Alarm Panel provides a digital display of the actual gas line pressure or vacuum being monitored. The module has three different color trend lights to indicate three different conditions of the gas pressure. These colors are green, yellow and red for normal, caution, and high or low pressure indications respectfully. The trend lights and how they correspond to range in pressure is explained in more detail while programming in Chapter 5.2 on page 21. When an alarm detects a “LOW” or “HIGH” condition the corresponding red LED on the Area Alarm Panel will be illuminated and an audible alarm will sound from the Annunciator Panel. The red LED will stay illuminated until the alarm condition has been corrected and the “Reset” button is pressed.

The two LED’s above the colored trend lights indicates which unit of measure is being displayed. The units are English (Standard) or Metric units for pressure or vacuum accordingly and can be changed to whichever units when programming.

The Area Alarm Module has dry contacts on the backside to connect to a pair of contacts on a Master Alarm Module for remote monitoring purposes.



2.4 Master Alarm Panel

The Master Alarm Panel monitors dry contacts from source equipment or area alarm panels. Each individual Master Alarm Panel can monitor up to 10 signals. Each pair of contacts is either configured for normally open or normally closed operation. The default mode is normally closed per NFPA code. The Master Alarm panel may be easily labeled to indicate each of the conditions being monitored. A Dry Contact Master Alarm Module is also available for computer interface or service to a building management system.

In operation, the unit continuously monitors for alarm conditions. Except for the green “POWER” indicator, all Master Alarm Panel LED lamps will be off when there are no alarm conditions present. When an alarm condition is detected, the corresponding LED on the Master Alarm Panel will flash and the audible alarm from the Annunciator Panel will sound. The LED will continue to flash until the alarm condition has been corrected and the alarm has been reset. If two or more alarm condition occur at the same time, the most recent alarm will flash and the other existing alarms will remain in constant illumination. Any alarm will remain lighted until the respective alarm condition has been corrected and the alarm has been reset.



3.0 Labeling Alarm Modules

Each application needs to describe the medical gas conditions and locations that are unique to each installation. To provide clear and precise representation of this information, the area and master alarm modules allocate a sufficient size area on their displays to label this information. To simplify in labeling the area or master alarms, please try to label these assemblies prior to connecting leads to the dry contacts.

3.1 Labeling Area Alarm Modules

For ease of referencing what specific location the area alarm is representing, a window on the bottom of each alarm is provided to label this information. See Labeling Module Diagram on figure 3.

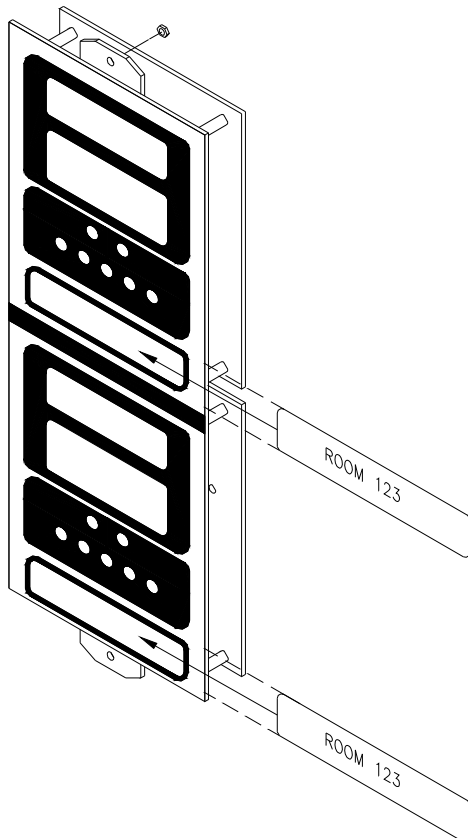
1. Make sure the alarm assembly is turned **off** prior to servicing.
2. Referencing figure 9, disconnect the cable ribbons leading to and from adjacent PCB/Weldment assemblies.
3. Unfasten top and bottom hex nuts only. ***Do not unscrew the button head screws attaching the circuit board to the weldment plate.***
4. Extract the area alarm PCB/Weldment assembly from the front panel assembly.
5. Either slide required label through pocket provided in mylar screen or affix required label directly over screen per Figure 3.
6. Refasten the master alarm assembly to the front panel with the hex nuts.
7. Reconnect cable ribbons as demonstrated in figure 6 on page 14 of your manual.

3.2 Labeling Master Alarm Modules

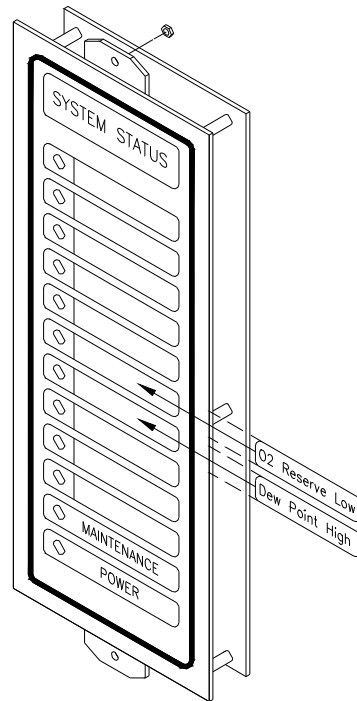
For ease of referencing what specific alarm conditions are present, each LED on the master alarm module can be labeled to identify what condition it is represent. See Labeling Module Diagram on figure 3.

1. Make sure the alarm assembly is turned **off** prior to servicing.
2. Disconnect cable ribbons from master alarm board.
3. Unfasten top and bottom hex nuts only. ***Do not unscrew the button head screws attaching the circuit board to the weldment plate.***
4. Extract master alarm PCB/Weldment assembly from the front panel assembly
5. Either slide required label through pocket provided in mylar screen or affix required label directly over screen per Figure 3. Note that the “**MA 1**” dry contact will activate the top LED, the “**MA 2**” contact activates the second from the top, and then follows on down in that consecutive order.

6. Refasten the master alarm assembly to the front panel with the hex nuts.
7. Reconnect cable ribbons as demonstrated in figure 6 on page 14 of your manual.



Area Alarm Module
(Dual area alarm module shown)



Master Alarm Module

Label Modules Diagram
Figure 3

4.0 Installation

For ease of installation, the Ohio Medical Corporation medical gas alarm is delivered in two separate assemblies; the box assembly and the front frame assembly. All box assemblies include the box itself, mounting brackets and hardware, the power supply, the terminal block and the fuse holder module. When specified for “local” installation, per the customer requirement, the appropriate sensor modules equipped with gas-specific DISS demand check units and type K copper stubs are also part of the box assembly. When the customer has specified a “remote” sensor installation, the sensors are not part of the box assembly and will be shipped loose.

The front-frame assembly consists of the frame, hinge, the Annunciator module and the individual Area or Master Alarm modules as specified by the customer. The front-frame assembly is fully wired and tested at the factory. To insure product functionality, leave the front panel in the anti-static bag(s) and packaging until it is ready to be installed.

4.1 Mounting Instructions (Prior to Drywall & Plaster Installation)

The box assembly includes adjustable brackets to allow for varying wall thickness and for ease of installation.

1. Remove the power supply cover.
2. Install the brackets to the left and right sides of the box assembly using the hardware provided. Do not tighten hardware at this time.
3. Adjust the brackets so that the front edge of the box assembly will be flush with the finished wall.
4. Tighten the hardware securing the mounting brackets to the box assembly.
5. Mount the box securely to the wall studs at the desired height.
6. The copper pipe stubs may now be silver-brazed to the appropriate gas pipeline. The pipe stubs are clearly marked with color coded labels indicating the correct gas. Take extreme caution not to overheat the DISS check units during the brazing process by wrapping the lower part of the pipe stub in a cool, damp cloth. In remote sensor installations, the installer must braze a tee with a ¼” NPT Female port at a convenient location. The Remote Sensor Module can then be installed into the appropriate gas pipeline.
7. Per NFPA-99 and/or local standards, pressure testing of all joints must be inspected for leaks. When spraying leak-testing solution on the check units adjacent to the sensor modules, it is recommended to do so conservatively and with a solution consisting of liquid dishwashing detergent and distilled water only. Verify that each gas stub is connected to a pipeline which carries the same gas labeling as the sensor module does.

2. For alarms using local sensors, insert the 8 position plug connector into the annunciator as shown in figure 5. For remote sensors, follow the steps below.

Note: Connection between the sensor and the annunciator panel is made with 18-22 gauge shielded twisted pair wire that can be as long as 5000 feet, which is to be provided by the installer. Make sure wire is in good repair and that the insulation on the ends is not excessively stripped to avoid shorts. Make sure shielding is

- 2.1. After wiring the remote sensors, insert the sensor wires through the ferrite approximately 2 inches from the end. Twist the wires below the ferrite to hold it in place.
- 2.2. Connect wires to the sequenced position on the plug connector with the positive and negative leads going to the appropriate connections for each sensor position. Gases are to be wired in the same order as programmed.

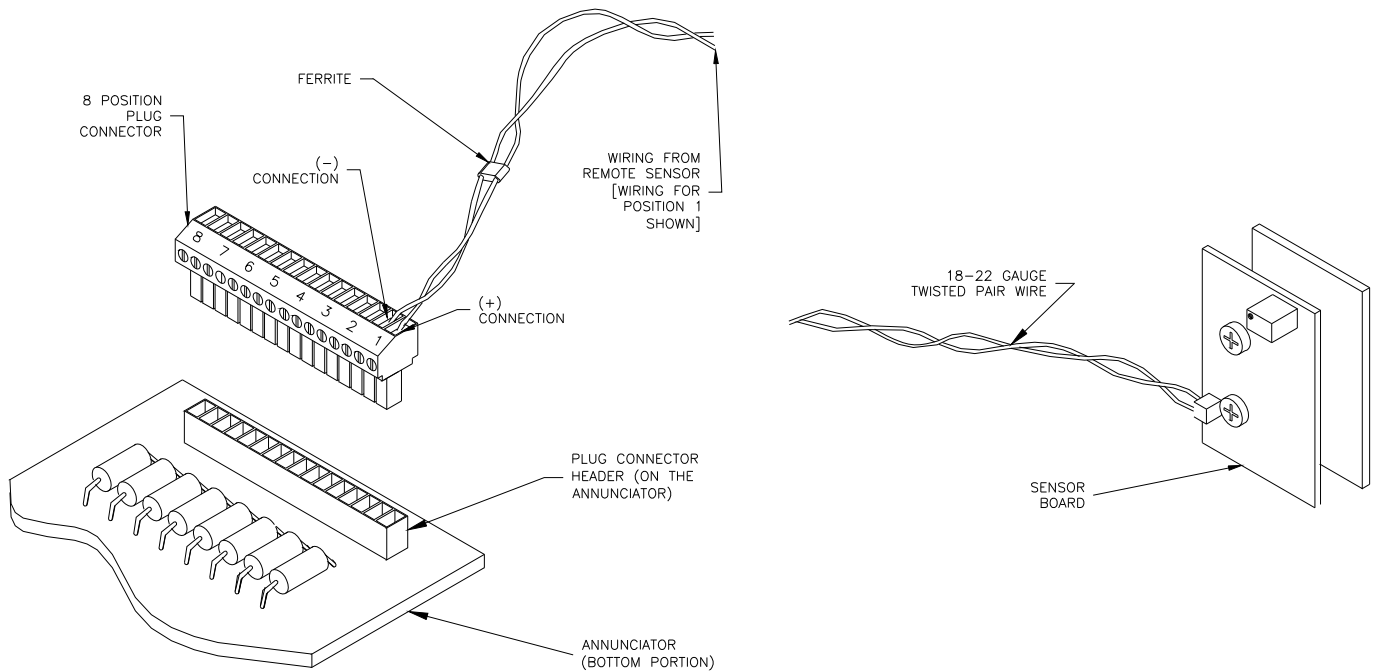
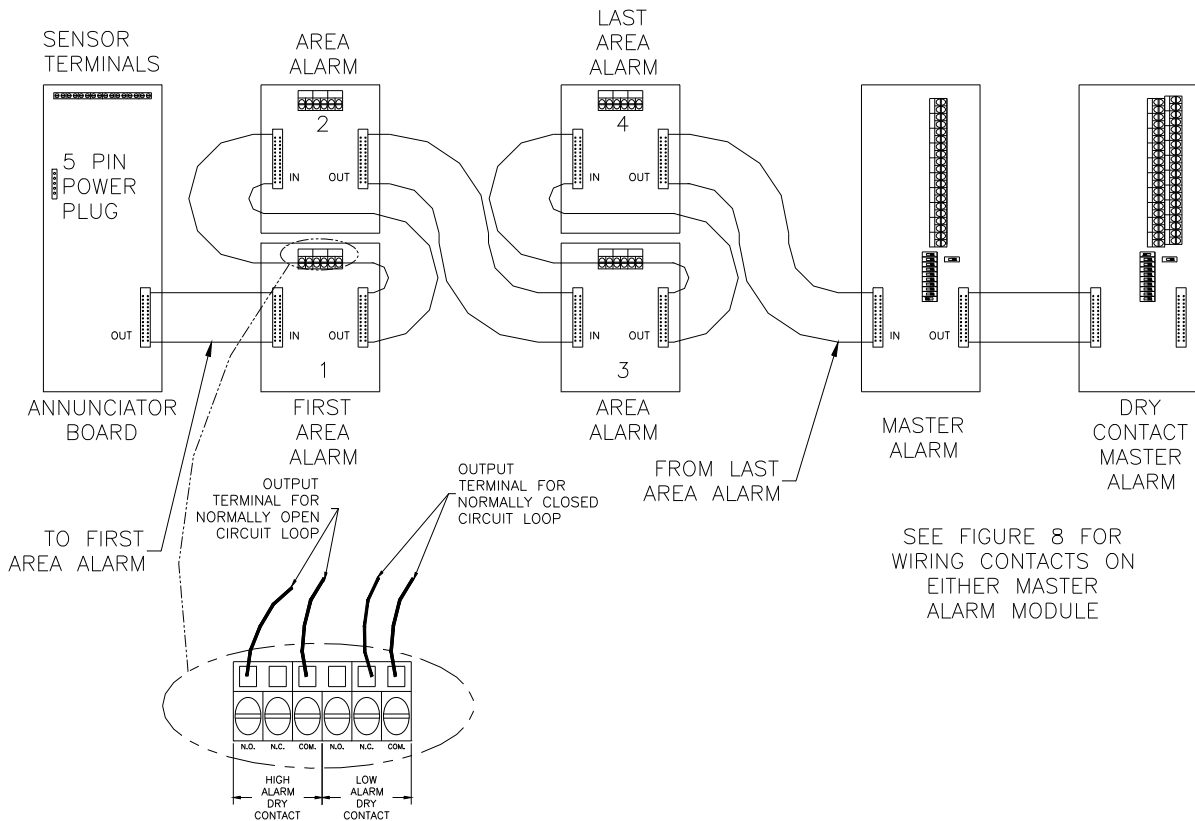


Figure 5: Wiring diagram for sensor modules

- The ribbon cable, which connects the Annunciator Panel to the Area and Master Alarm Panels, are installed at the factory. However, in the event that the ribbon cables become disconnected or for other field installation needs, it is imperative that they be installed in the correct order. The ribbon cable must sequentially be run from the Annunciator Panel to Area Alarm module #1, from Area Alarm module #1 to Area Alarm module #2 and so on. Master Alarm modules are also connected from one to another sequentially. In combination alarms, the Master Alarms are connected after the Area Alarm modules per the following diagram. See Figure 6 below.

CAUTION! Make sure that the power switch must be in the “off” position at any time when wiring the alarm. The box assembly and front-frame assembly must be field assembled and all electrical interconnections must be made before applying power to the alarm system. All panels and sensors must be connected prior to applying power.

Figure 6: Ribbon Cable Wiring Sequence



4. Connect the DC power from the power supply to the Annunciator Panel. The five-wire connection cable is used to make this connection. This cable can only be installed one way, it makes the connection from on the power supply to position “J8” of the Annunciator Panel. This connection will provide the voltage needed for operation of all panels and sensors.
5. After all interconnections have been made, the AC power may be connected to the power terminal strip. The hot wire is connected to the fused terminal block, the neutral wire to the neutral terminal block and the ground wire is connected to the green/yellow terminal block.
6. Re-install the power supply cover.

4.3 Area Alarm Remote Output Signal Connections

Included on each Area Alarm Panel are contacts to be used to transmit an alarm condition to a Master Alarm Panel or to other slave alarm device, if required. These contacts may be used to transmit either a “High Alarm” or “Low Alarm” condition and may be used in either a normally open or normally closed state. The usual connection scheme when connected to a master alarm panel is to make these connections in the normally open mode using the relay connection terminals marked “N.O.” and “C”. These contacts are clearly marked on the Area Alarm circuit board. See Figure 7 for more details. *NOTE: Do NOT wire the sensor modules directly to the area alarm modules*

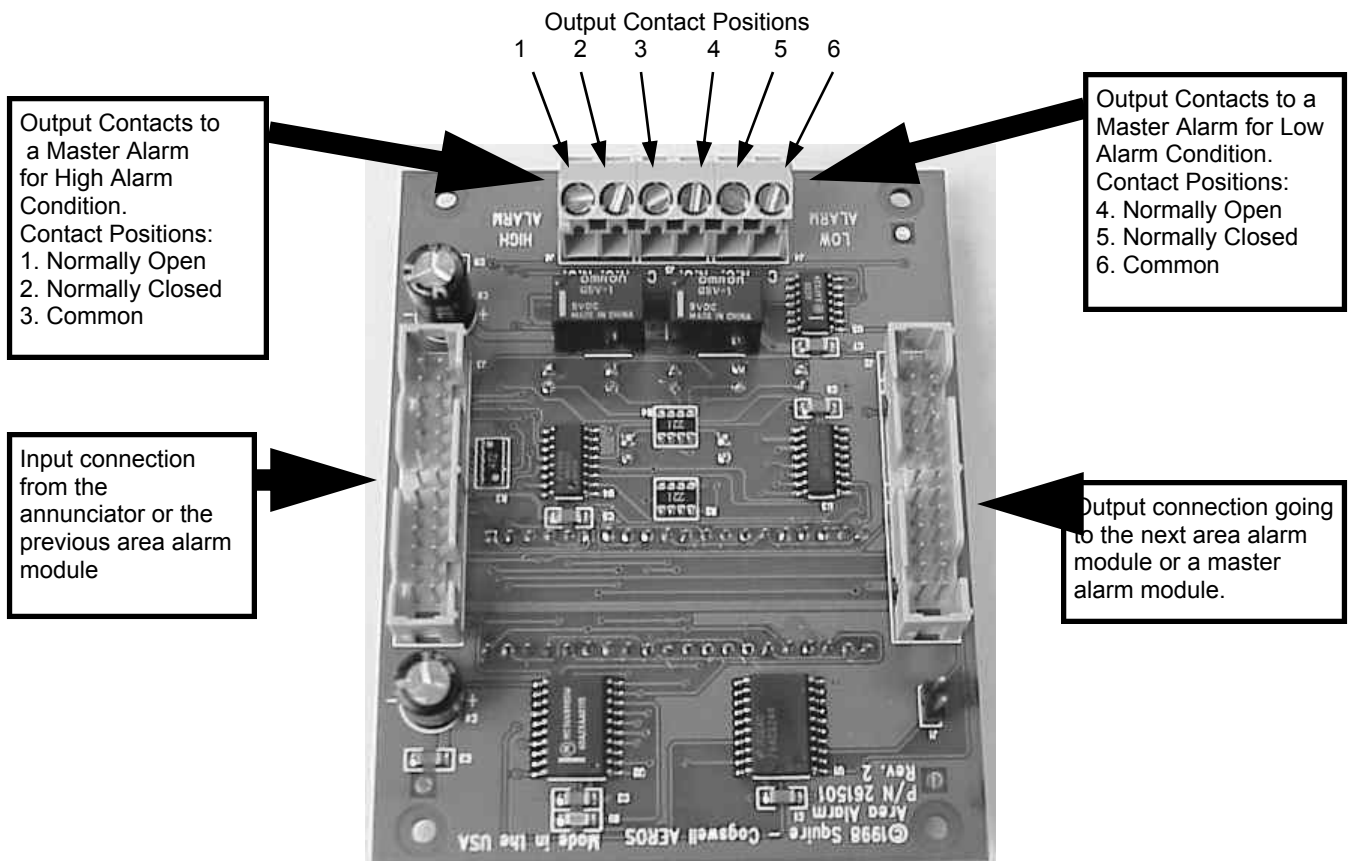


Figure 7: Area Alarm Module

4.4 Master Alarm Connections from Source Equipment

Each Master Alarm Panel may accommodate up to 10 alarm inputs. Dry Contacts from source equipment are connected directly to the Master Alarm Panel circuit board at positions “MA1” through “MA10”. Each of these contact points is clearly marked on the circuit board and includes both positive (+) and negative (-) terminals. The dry contacts from the source equipment must be rated for at least 12 V_{DC}.

WARNING — THE EQUIPMENT THAT IS CONNECTED TO THIS INTERFACE IS NOT CONSIDERED TO BE PART OF THE SYSTEM CONFIGURATION UNLESS THE EQUIPMENT IN QUESTION COMPLIES WITH THE STANDARD FOR HOSPITAL AND SIGNALING AND NURSE CALL EQUIPMENT, UL 1069

The “Maintenance Mode” switch needs to be on to disable the audible alarm while wiring contacts to the master alarm module. To make the Maintenance switch active, move the switch at position “S11” on the Master Alarm Module toward the row of switches labeled “S1” to “S10” as shown in Figure 8A. The maintenance lamp will be illuminated on the front of the panel. Moving the switch away from the row of switches will restore the Master Alarm to normal operation.

Switch settings on the Master Alarm Panel must be set to configure each alarm point for normally open or normally closed operation. As shown on Figure 8A, the switches are on the headers labeled “S1” through “S10”. The switches at position “S1” corresponds to the alarm connected to the first pair of contacts “MA1”, “S2” to “MA2”, “S3” to “MA3”, and so on.

If one of the S1 through S10 switches is positioned toward the “S11” switch, the circuit loop is normally open. It will cause an alarm when a closed contact is applied to the input terminal strip (MA1-MA10). The switches at positions S1 & S3-S10 are shown in this position in Figure 8A. This is the factory default setting. Any pair of contacts that are not connected to source equipment should have their corresponding switch positioned toward the maintenance switch.

If one of the S1 through S10 switches is positioned away from the S11 switch, the circuit loop is normally closed. The contact will create an open circuit loop when an alarm condition exists. The S2 switch is shown in this position in figure 8A. This is the setting for input contact that is closed during normal operation but open during an alarm condition.

Per NFPA 99, information relayed from the source equipment is to be sent to two separate master alarm panels at separate locations inside the medical facility. Wiring from the source equipment is to be ran in parallel to each master alarm module and can not to be slaved from one master alarm panel to the another.

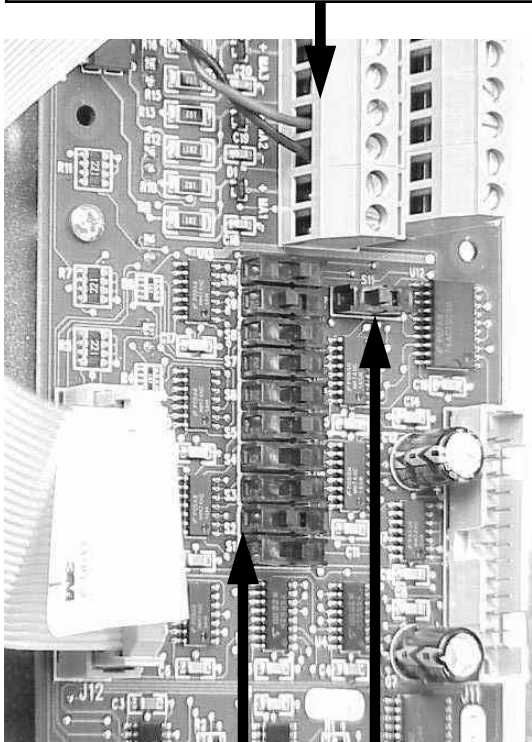
4.5 Dry Contact Master Alarm Output Connections

CAUTION: When testing the output relays, make all connections with the power off. Shorting the terminals together while the relay is energized can cause permanent damage to the relay.

Dry Contact Master Alarm Panel is similar to the Master Alarm Panels except that they also provide 10 alarm outputs that connect to building management systems. These additional connections are connected directly to the Dry Contact Master Alarm Panel circuit board at position “J1” through “J10” as shown in Figure 8B. Each of these pairs of contacts are clearly marked on the circuit board and includes both positive (+) and negative (-) terminals. The dry contacts going to the other alarm devices or a building management system must be rated for at least 12 V_{DC}.

Figure 8A:
Wiring from Source Equipment to a master alarm position
(On either master alarm modules)

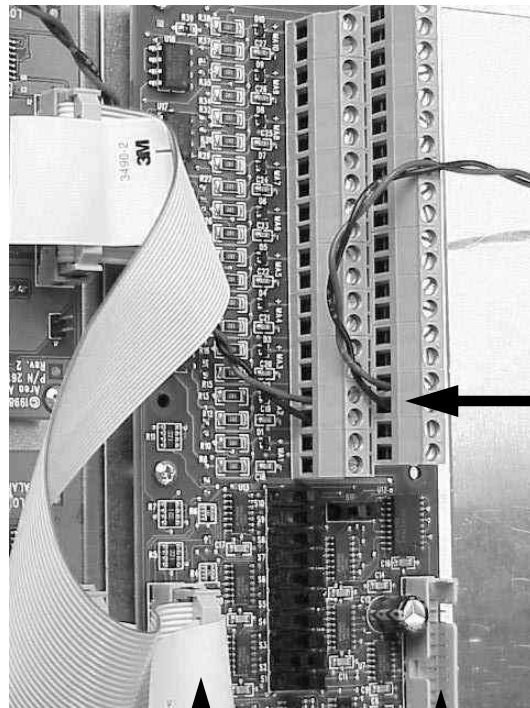
Wiring from the source equipment to the second pair of contacts on the bottom row (MA2) on the master.



Corresponding switch to the second pair of contacts, S2, on the master showing “Normally Closed Circuit Loop”

Maintenance Switch, S11, in the “ON” position

Figure 8B:
Wiring from a master alarm Position to a Building management System
(On Dry Contact Master Modules Only)



Second pair of contacts on the top row (J2) is wired to a building management system

Input Connection from Annunciator or previous alarm module.

Output Connection to the next master alarm module.

4.6 Remote Audible Alarm Installation

The “medical gas alarm system includes two provisions to provide remotely mounted audible or visual alarms which will operate in parallel with the audible alarm on the Annunciator Panel and will sound each time that the alarm sounds. The connections for the remote alarm are on the Annunciator panel.

The +24V and ground terminals allow a buzzer similar to the one mounted on the Annunciator Panel to be used as an remote buzzer. If a different type of buzzer is desired for external mounting, the relay contacts could be used in conjunction with another power source to supply the necessary power.

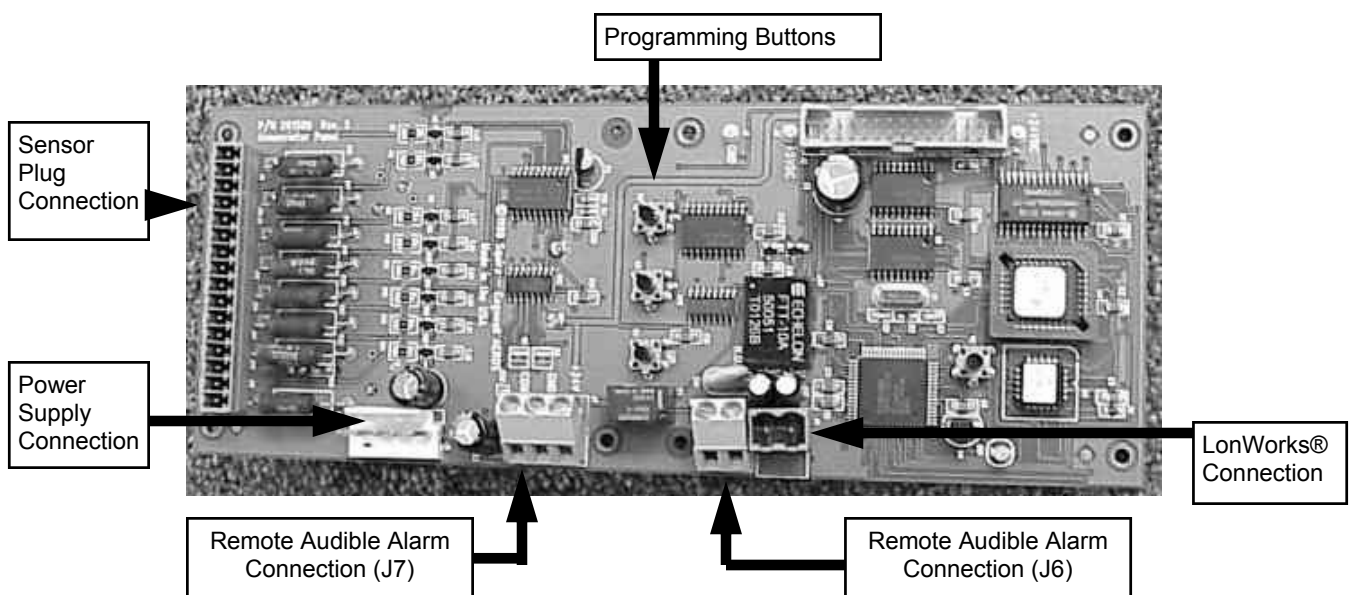
To connect a remote buzzer, which is, similar to the one installed on the Annunciator panel:

1. Connect the +24V terminal to the positive (+) power terminal of the remote buzzer.
2. Connect the negative (-) terminal of the buzzer to the COM terminal of J7.
3. Connect a jumper across the N.O. terminal of J6 to the GND terminal of J7.

To connect an independent 24V relay-operated device:

1. Connect the positive (+) terminal of the external power supply to the positive (+) terminal of the remote buzzer.
2. Connect the ground terminal of the external power supply to the normally open (N.O.) terminal of “J6” on the Annunciator panel.
3. Connect the common (COM) terminal of “J7” on the Annunciator panel to the negative terminal (-) of the external buzzer.

Figure 9: Annunciator



4.7 Initial Start-Up Checks

Perform the following checks ***PRIOR*** to turning the power switch to the “ON” position.

1. For Area alarms, the number of sensors installed must match the number of area alarm modules.
2. Gas lines must have normal pressure.
3. Alarm box and front panel assemblies must be free from plaster dust, tools, and anything else that is not an Ohio Medical component or is not necessary for the proper operation of the alarm.

5.0 Programming

NOTE: Ohio Medical Corporation Medical Gas Alarms, which are purchased as factory assembled, do NOT need to be field programmed unless the user desires to change the default settings.

If the standard default values do not match the desired configuration, the user can change program configuration data and save them. All programming is accomplished by using the 3 programming buttons on the Annunciator circuit board. The buttons are labeled (proceeding from left to right) “UP”, “S” (Save) and “E” (Exit).

To enter the annunciator’s program, press the 2 outside keys as shown in Figure 10A for about 3 seconds. The upper left-hand module will display “SEnr” as shown in figure 10B. Follow the steps in the Programming Sequencing Chart on Page 20 till the desired changes are completed and saved. Tables A & B on page 21 also provide information such as the range setting and the default settings that are used for a certain gases. An example of changing a program setting is shown on page 22 as a programming reference.

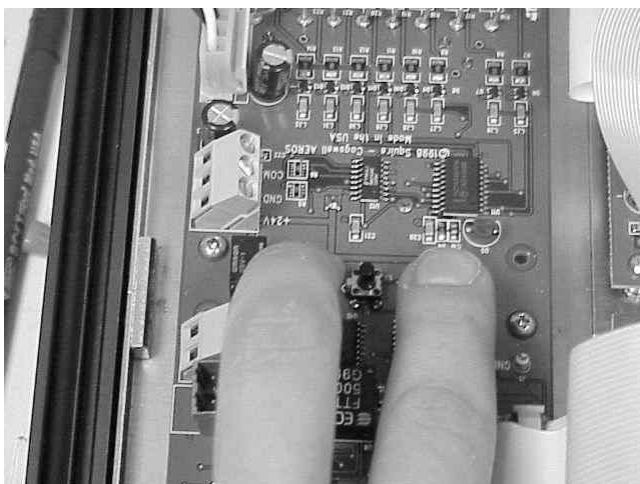


Figure 10A: Initiate Program



Figure 10B; Initial Screen Display (Step 1)

Programming Sequence			
To enter program to modify parameters, press the outside 2 buttons on the annunciator simultaneously (as shown in Fig. 9A) for about 3 seconds.			
Step	Alarm Display	Programming Field Description	Button Selection - Hit one of the 3 buttons below to modify the program
			"UP" [Left Key] "S" (Save) [Center Key] "E" (Exit) [Right Key]
1	SEnr	Initial Screen (No Changeable parameters)	Advances to step 2
2	SEn*	* = Number of Gases being Programmed (1 to 8) ¹	Saves Selection, Advances to step 3
3	Alm	Program Name (No Changeable Parameter)	Advances to step 4
4	Ar**	** = alarm resound Interval: ranging 0-99 min. (30 min. default)	Saves Selection, Advances to step 5
5	PSn*	Area Alarm Module Indication ²	Advances to step 6 for the area alarm module specified
6	UnS	(* module specified, I.E. PSn1 = First module)	Advances to step 6 for the area alarm module specified
6A	PS	Units of Measure for Pressure Programming Routine ³	Enters Routine, goes to step 6A
		Types of Units: "PS" for English Pressure Units [see Table A on Page 21] or "PA" for Metric Pressure Units [see Table B on page 21]	Saves Selection, returns to step 6
7	rAn9	Corresponding Sensor's Pressure Range Programming Routine	Enters Routine, goes to step 7A
7A	****	range setting - See Table A if Program is set for English Units in Step 6 or See Table B if Program is set for Metric Units in Step 6	saves selection, returns to step 7
8	HSP	Alarm High Set Point Programming Routine	Skips routine & goes to step 9
8A	FAC	Setting type - "FAC" for utilizing Factory default Setting or "USR" for user to utilize own preferred Setting	changes parameter type
8B	****	HSP, if "FAC" was selected in step 8A, See Tables A or B for Default HSP	no change, shows default HSP
8C	****	HSP, if "USR" was selected in step 8A, See Tables A or B for Default HSP	changes HSP
9	LSP	Alarm Low Set Point Programming Routine	Skips routine & goes to step 10
9A	FAC	Setting type - "FAC" for utilizing Factory default Setting or "USR" for user to utilize own preferred Setting	changes parameter type
9B	****	LSP, if "FAC" was selected in step 9A, See Tables A or B for Default LSP	no change, shows default LSP
9C	****	LSP, if "USR" was selected in step 9A, See Tables A or B for Default LSP	changes LSP
10	CAL	Annunciator's Calibration Reading Programming Routine ⁴	Skips routine & returns to step 6
10A	****	Calibration Value (a fixed value ranging between 190 - 210) [See Chapter 5.3 for Calibration Precautions before continuing.]	no changeable parameter
11	SAuE	Exit Alarm Program	returns to step 10
			Exits program with changes saved
			Exits program without saving changes

NOTES:

- 1) Number of gases being programmed should match the number of sensors and area alarm modules used in the alarm for proper operation.
- 2) Modules progress top to bottom on each bay. Bays progress left to right.
- 3) Steps 6 - 10 are displayed on module selected in step 5
- 4) Only enter routine if existing alarm is to monitor an additional gas or annunciator is being replaced.
- 5) If gas module has been preprogrammed from the factory, Hit "Exit" to avoid changing setting.

5.2 Default Settings Tables

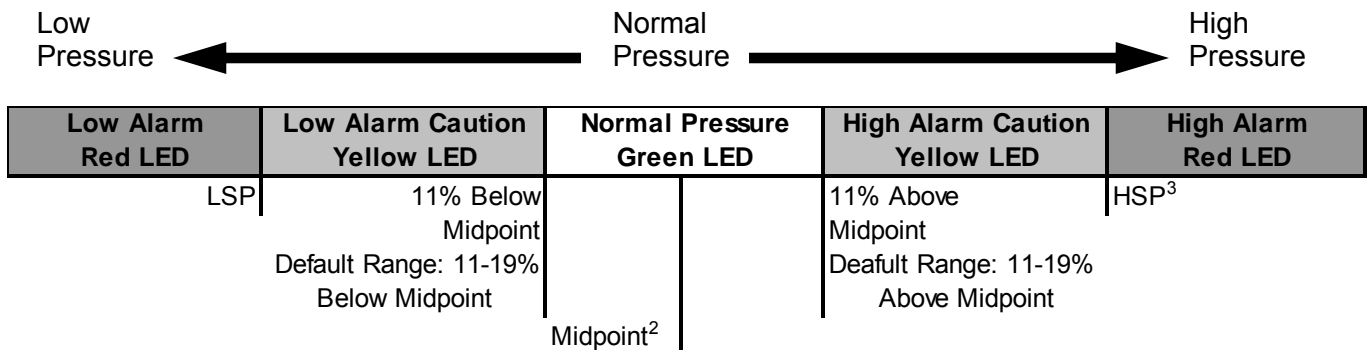
These 2 tables are showing which range setting, the default High Set Point (HSP), and the default Low Set Point (LSP) that the annunciator should be programmed to for the gas specified. Each table shows the default parameters when using either English (standard) or Metric pressure units. The tables also provide the working pressure range that the LSP and the HSP can be set for in the “USr” function sub-routine. When changing the set points, the following limits exist:

1. When changing the HSP number, a value lower than the LSP can never be selected. Likewise for the LSP number, a value higher than the HSP can not be selected.
2. The “Normal Pressure” may not be the midpoint between the LSP and the HSP settings.
3. For Vacuum and WAGD gases only, HSP can be set, but the alarm condition will not be acknowledged if the vacuum reaches the HSP setting.

Table A - English Pressure Units (Step 6)					
Range Setting (Step 7)	Working Pressure Range	Default HSP (Step 8)	Default LSP (Step 9)	Default Normal ² Pressure	Gas Types Corresponding With Range Type
15	0-30" Hg Vacuum	18 see note 3	12	15" Hg Vacuum	VACUUM or W.A.G.D.
100	0-100 PSI	60	40	50 PSI	OXY, N2O, AIR, or CO2
250	0-250 PSI	195	140	160 PSI	NITROGEN

Table B - Metric Pressure Units (Step 6)					
Range Setting (Step 7)	Working Pressure Range	Default HSP (Step 8)	Default LSP (Step 9)	Default Normal ² Pressure	Gas Types Corresponding With Range Type
100	0-776 mmHg Vacuum	414 see note 3	305	381 mmHg Vacuum	VACUUM or W.A.G.D.
700	0-689 kPa	414	276	345 kPa	OXY, N2O, AIR, or CO2
1720	0-1723 kPa	1345	965	1103 kPa	NITROGEN

Table C – Relationship between the Area Alarm Module Trend Lights and the Pressure Range



5.3 Calibration Precautions

NOTE: IN ORDER TO CALIBRATE PROPERLY THE SENSOR MUST NOT CONTAIN ANY PRESSURE OR VACUUM. IN EXISTING INSTALLATIONS, THE GAS LINE MUST BE ISOLATED AND VENTED PRIOR TO CALIBRATING THE SENSOR OR THE SENSOR MUST BE DISCONNECTED FROM THE GAS LINE.

5.4 Programming Change Example

For this example, the second gas is nitrous oxide and the high set point is the factory default of 60 PSI and needs to be changed to 65 PSI.

1. Press the “UP” and “E” keys at the same time for 3 seconds to enter program.
(“SEnr” is displayed and program is at step 1)
2. Press the “S” key to advance to step 2.
3. If the number in the last digit displayed matches the number of sensors and area alarm modules the alarm is using, press the “S” key.
4. Press the “S” key to advance to step 4.
5. Press the “S” key to advance to step 5 if resound interval is not being changed.
6. Press the “UP” key once till “PSn2” is displayed.
7. Press the “S” key to advance to step 6, which “UNS” will be displayed on the second module.
8. Press the “UP” key twice to bypass changing both units of measure (step 6) and sensor pressure range (step 7) to reach the High Set Point programming routine (step 8).
9. Press the “S” key to enter the HSP routine. “FAC” will be displayed (step 8).
10. Press the “UP” key once till “USr” is displayed (step 8A).
11. Press the “S” key to advance to step 8C. “60” is displayed.
12. Press the “UP” key 5 times till “65” is displayed.
13. Press the “S” key to temporarily save the HSP selected and return to step 8.
14. Press the “E” key to return to step 5.
15. Press the “E” key to advance to step 11. “SauE” is displayed.
16. Press the “S” key to permanently save all the changes and exit the program.

5.5 Review Area Alarm Programmed Parameters

To review the programmed parameter of area alarms, press “**S**” and the “**UP**” simultaneously for approximately half a second and the programmed information will then be displayed. To cancel reviewing at any time, press the “**Test**” or the “**Reset**” buttons on the annunciator. The first five items of the review program show up on the first area alarm module as listed below. Information for each individual gas is then displayed on its respective area alarm module.

Displaying Order	Information Description	Programming Step
1.	The program revision	N/A
2.	The revision date of the program	N/A
3.	The number of sensors being used in the alarm	2
4.	The program name, which is “ Apn1 ”	N/A
5.	The alarm interval, which is displayed in this format: “ Al## ”	4

The following information is displayed for each area alarm.

Displaying Order	Information Description	Programming Step
6.	Units of measure (“ PS ” or “ PA ” is shown)	6
7.	Range (first shown is “ rAn9 ” and then variables shown table A or B in chapter 5.2)	7
8.	High set point (first shown is “ HSP ”, second is either “ FAC ” or “ Usr ” and then the high set point value being implemented)	8
9.	Low Set Point (First shown is “ LSP ”, second is either “ FAC ” or “ Usr ” and then the low set point value being implemented)	9
10.	Calibration	10

5.6 Master Alarm Programming Mode

NOTE: No MASTER ALARM PROGRAMMING IS NECESSARY UNLESS THE USER DESIRES TO CHANGE TO A REPEAT TIME, WHICH DIFFERS, FROM THE FACTORY DEFAULT VALUE OF 30 MINUTES.

- The program mode is accessed by simultaneously pressing and holding the “**UP**” and “**E**” buttons. The Master Panel programming mode is only displayed on Master Alarm Panel 1. The maintenance LED will flash and the number of LED lamps lighted on the Master Alarm Panel 1 will indicate the alarm repeat time. Each LED lamp represents an alarm repeat time of approximately 5 minutes. The maximum alarm repeat time is 50 and the minimum is 0. When no lamps are illuminated the repeat time is zero minutes meaning that the repeat feature is disabled.
- When the desired number of minutes are selected, then press “**E**” and all of the lights on Master Alarm Panel 1 will flash.
- To save the changes before exiting, press the “**S**” button or press the “**E**” button again to exit without saving any changes.

6.0 LonWorks® Capabilities

The Medical Gas Alarm System is fully LonWorks® compatible.

In cases where the building management system is LonWorks® capable, the Medical Gas Alarm System may be incorporated into the overall building management system by the building management system installer or systems integrator.

Connections to a LonWorks® capable building management system are made with two wires connected to the appropriate terminals at position “J4” on the Annunciator panel. Device-specific documentation required by your LonWorks® integrator is available from the factory upon request.

7.0 Specifications Summary

- Cable Requirement for
 - a. Area alarm module to remote sensor;
 - b. Master alarm module to source equipment
 - c. Dry contact master alarm module to building management system

Distance: Maximum 5,000 feet (1,500 m)

Cable: 18 - 22 gauge shielded, twisted pair. Multi-conductor twisted pair cable can be used when connecting multiple sensors.

- UL & CSA Listed
- NFPA 99 compliant
- The Medical Gas Alarm System complies with the EMC (electromagnetic compatibility) requirements of all of the following:
 - FCC Part 15
 - CISPR11 (EN55011)
 - EN60601-1-2
 - Canada, Department of Communications
- LonWorks® Interface node to communicate to compatible building management system
- Dry Contact for interface with building management system
 - q 12 V_{DC}, 120 mA rating
- Power Rating: 100-240VAC, 50/60HZ, 1.0A
- Replacement Fuse: ¼” x 1-1/4” (6.3 x 32 mm), Time Delay, 1.25 amp max.

8.0 Troubleshooting

Display does not light, no “POWER” indications

- Check electrical connections
- Check fuses
- Check power supply output

No indication on a single panel of a multi-panel alarm

- Check electrical connections

Audible alarm does not sound or Repeat Alarm does not sound

- Check programming to insure that the resounding interval is not set to zero
- Replace Annunciator panel

Display reads in incorrect units

- Check programming, Units of Measure
- Check wiring connection from sensors

Pressure Reading fluctuates back and forth

- Clean out transducer on sensor board
- Replace sensor board

One or more displays have readings far from the expected pressure or vacuum

- Sensors are connected to the Annunciator in the wrong sequential order
- Check programming, Sensor's Pressure Range is not correct for sensor board being used

“SEnr” is displayed when alarm is turned on

- Check if the number of sensor wired to the annunciator matches the number area alarm modules daisy chained to the annunciator in the alarm.
- Check the wiring from the annunciator to the corresponding sensor board for bad connections or if wiring is in bad repair.
- Check Ribbon Cables are connected firmly to modules and are in good repair.

“CAL” is displayed on an area alarm module

- Check if corresponding gas line has pressure.
- Check if the sensor module has been disconnected from its check unit.
- Check wiring from the annunciator to the corresponding sensor board for bad connections or if wiring is in bad repair.
- Replace sensor module

Calibration value is not between “190” to “210”.

- Check if corresponding gas had pressure in the line while calibrating the annunciator.
- Check if the potentiometer screw on the sensor board has been tampered with.
- Replace sensor board

9.0 Cleaning

The surface of the MEDICAL Gas Alarm is made from a one piece mylar with minimum penetrations. It may be cleaned/disinfected using common surface cleaners and a soft cloth.

10.0 Service Item List

PART NUMBER **CIRCUIT BOARDS**

DESCRIPTION

261500	Annunciator Circuit Board
261501	Area Alarm Circuit Board
262676	Master Alarm Circuit Board
262677	Dry Contact Master Alarm Circuit Board
261579	Single Area Alarm Circuit Board w/ Weldment & Overlay
263060	Master Alarm Circuit Board with Weldment & Overlay
263061	Dry Contact Master Alarm Circuit Board with Weldment & Overlay
261561	Dual Area Alarm Circuit Boards w/ Weldment & Overlay

MOUNTING PLATES, PIPING & STRUCTURAL COMPONENTS

261834	Mounting Bracket Kit
261580	Restraining Cable
261253	Bushing/Copper Tube Assembly
261371	Locknut for Bushing/Tube Assembly
263222	Hinge, Piano, for 4-bay or 6-bay boxes
261584-X	Front Panel Assembly, 4 bay Alarm
261585-X	Front Panel Assembly, 6 bay Alarm

ELECTRICAL COMPONENTS

263299	Replacement Fuse
263506	Power Supply
261874	Power Supply Cable Assembly
261508	Ribbon Cable
261634	Wire, Local Sensor
261599	Ferrite, Local Sensor Wiring
261998	Plug, Connector, Single Position
263267	Plug, Connector, 8 Position
754042	Switch, I/O, Rocker, Panel Mountable, DPST
263297	Fuse Holder, W/ 1 Amp fuse
263519	Line Filter Assembly

SENSOR MODULES

261849-1	Local Sensor w/Demand Check, OXYGEN
261849-2	Local Sensor w/Demand Check, VACUUM
261849-3	Local Sensor w/Demand Check, N2O
261849-4	Local Sensor w/Demand Check, AIR
261849-5	Local Sensor w/Demand Check, N2
261849-6	Local Sensor w/Demand Check, EVAC
261849-7	Local Sensor w/Demand Check, CO2
261581-1	Remote Sensor w/Demand Check, OXYGEN
261581-2	Remote Sensor w/Demand Check, VACUUM
261581-3	Remote Sensor w/Demand Check, N2O
261581-4	Remote Sensor w/Demand Check, AIR
261581-5	Remote Sensor w/Demand Check, N2
261581-6	Remote Sensor w/Demand Check, EVAC
261581-7	Remote Sensor w/Demand Check, CO2

DEMAND CHECK UNITS

261752	Demand Check Unit, EVAC
261753	Demand Check Unit, CO2
261729	Demand Check Unit, AIR
261730	Demand Check Unit, N2O
261731	Demand Check Unit, N2
261732	Demand Check Unit, VACUUM
261733	Demand Check Unit, OXYGEN

11.0 Limited Warranty

1. OHIO MEDICAL CORPORATION warrants the Medical Gas Pipeline Equipment to be free from functional defects in material and workmanship for a period of twenty-four (24) months from the date of shipment or twelve (12) months from the date of start-up, whichever occurs first. Within said period Ohio Medical Corporation will repair or replace any part or component which is proven to be defective in either material or workmanship.
2. To obtain service within the warranty period, first contact the Ohio Medical Service Department.
3. Ohio Medical Corporation's responsibility under this warranty shall be limited to providing at Ohio Medical Corporation's sole discretion, new or replacement parts to replace any component found to be defective within the warranty period. Installation of user replaceable items will be the user's responsibility.
4. Labor to repair any part or component proved to be defective within the warranty period will be provided at no charge for any item returned to our factory adequately packaged and insured with shipping costs prepaid. Standard surface freight shipping cost to return the repaired part or component to the user will be paid by Ohio Medical Corporation.
 - a. Before returning any part or component to the factory, proper return authorization must first be obtained from Ohio Medical Service Department.
 - b. The user will be required to issue a purchase order for replacement items. Upon receipt of the defective items, Ohio Medical Corporation will issue a credit to the user in the amount equal to the purchase order.
5. This warranty is valid only when the product has been properly installed according to Ohio Medical Corporation specifications, used in a normal manner and serviced according to factory recommendations. The warranty does not cover failures due to damage which occurs in shipment or failures which result from accidents, misuse, abuse, neglect, mishandling, alteration, misapplication or damage that may be attributable to acts of God.
6. Ohio Medical Corporation shall not be liable for incidental or consequential damages resulting from the use of this product. There are no expressed or implied warranties which extend beyond the warranties set forth above. Ohio Medical Corporation makes no warranty of merchantability or fitness for a particular purpose to equipment and to its parts and components.
7. THE CONDITIONS OF THE BUYER'S RESPONSIBILITY ARE:
 1. The equipment is stored properly before installation;
 2. The equipment is installed according to Ohio Medical Corporation's specifications and installation procedures;
 3. The equipment is properly maintained and not altered unless by an authorized representative of Ohio Medical Corporation.

573078 (REV.2) 580273

NOTES:

NOTES:

**For 24/7 Technical Support,
call 847-855-6234 for assistance**

LonWorks® is a registered trademark of the Echelon Corporation

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