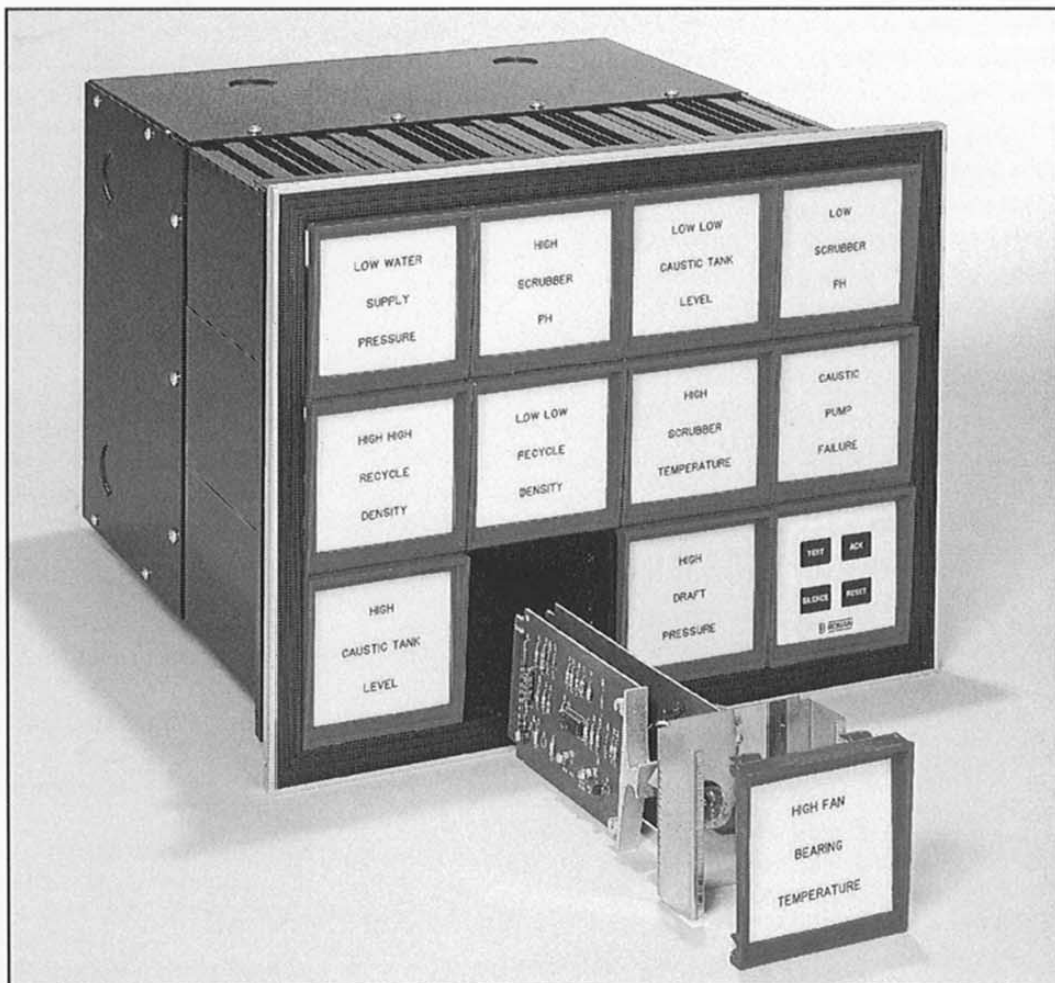


Instructions and Operating Manual

SERIES X12 AND X16 **SOLID STATE ANNUNCIATOR SYSTEMS**



 **RONAN**

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1.0 GENERAL DESCRIPTION

The Ronan Series X12 Solid State Annunciator Systems are the most versatile window annunciators on the market. The systems accept a wide variety of inputs such as live or dry contacts, solid-state switches, analog signals such as Thermocouples, RTD's, millivolt or milliampere, externally sourced ac or dc voltages or pulse signals. The inputs, conditioned through modules integral to the system, provide alarm status identification to be displayed on multi-sized conventional windows. The superior mechanical construction and the quality of workmanship, combined with the most reliable electronic designs, have established the X12 Series as the leader in the field on window annunciation.

These features are also available in the X16 Series Remote Logic configuration, suitable for split architecture layouts. The X16 Series may interface with window lamp displays, graphics, or individual lamp assemblies without compromise to the flexibility of the input and output features.

2.0 SPECIFICATIONS

Cabinets - Window Series:

- Standard cabinet finish is black baked semi-gloss enamel.
- Other finishes are available to meet customers' specifications.
- Adjustable cabinet mounting clamps can be located anywhere around the assembled cabinet.
- Rear covers are complete with captive fasteners.

Chassis - Remote Series:

- Units can be mounted in any position.
- Standard chassis finish is grey baked semi-gloss enamel.

Plug-In Alarm, Flasher-horn Driver, Lamp, and Filter Modules:

- All circuit boards are standard 2 oz. glass epoxy, type G-10.
- Contoured aluminum card pullers/guards.
- 304 stainless steel lamp reflectors.
- Normally Open/Normally Closed field contact selectors.
- Lock-in/Auto Reset selector as required.

Electronic Components:

- Silicon integrated circuits.
- Silicon transistors and diodes.
- Carbon and carbon film resistors.
- Electrolytic and polyester capacitors.

Electrical Ratings:

- Operating Voltage: 24 Vdc \pm 25%.
- Operating Current for Normal Condition:
 - Sequence AS*: 6 mA per point.
 - Sequence FD, RD*: 15 mA per point.
 - All Others*: 9 mA per point.
 - Field Contact Current*: 6 mA.
 - Field Contact Voltage*: 24 Vdc.
- Horn Relay Driver Capacity: 1.5 W at 30 V.
- Series X16 Lamp Driver Capacity: 6 W at 30 V.
- Response Time: 10 milliseconds nominal.
- Field Wiring Series Resistance: 1000 ohms max.
- First Alert Grouping Capacity: 150 points max.
- Flasher Capacity: 150 points

2.1 Sequence Intermixing – Cautionary Notes

All Ronan Standard Alarm Sequences, except RD, intermix freely in an alarm cabinet which was originally built to accommodate a specified mixture. Some intermixing, however, is so illogical as to make operation both confusing and difficult. A frequent trap is the mixing of AS with such as FSM or FSMH. Both of these FS Sequences have Manual Reset and one has Horn Silence – and they are mixed with AS which has neither. The system thus has push buttons which affect only some of the alarm points - a ready source of confusion.

Far more conformity will be maintained if the following mixtures are utilized: AS - FS; AM - FSM; AH - FSH; AMH - FSMH.

Sequence RD tends to have sufficiently different functional characteristics as to want to be alone in a separate cabinet and is not offered as available for intermixing.

Sequence FD is the only really satisfactory First Out Sequence and was specifically designed for operation with AS. We highly recommend this usage for maximum utility.

2.2 Remote Systems - Cautionary Notes

Experience has shown that there are a number of difficulties commonly encountered when commissioning an X16 Remote System. In each case they are wiring errors.

- A. The wiring of the remote lamps is generally accomplished with one side of each lamp being connected to the appropriate AL terminal on the alarm chassis, the other side of the bulb going to the lamp voltage source (VL). All too frequently V+ is jumpered to the wrong side of a bulb causing the alarm board's lamp drive transistors to blow out when an alarm is triggered. If the wiring error is continued quite

a few boards can be damaged. Please check your wiring carefully before applying power.

- B. Bad bulbs. Every once in a while, a bulb with a 12–20 W filament is found in a batch of 1, 2, or 3 W bulbs. If several alarm boards have been damaged in one particular position, check for this possibility.
- C. Separate Lamp Power Supply. Should such be used please verify and then re-verify the polarity, the voltage, and the V– common interconnection before applying power. Polarity reversal protection on an external VL (Lamp) supply is not provided.

2.3 Push Button Operation – Sequence is Important

Several alarm sequences will appear to operate strangely if the operational push buttons are depressed out of sequence. The proper sequence is always as follows: TEST, SILENCE, ACK, RESET. (Skip any not included in your system.)

2.4 Power Supplies – Alternate Voltage and Customer Furnished

Ronan Solid State Alarm Systems operate normally between +20 Vdc and +30 Vdc with a nominal 24 - 27 Vdc being recommended to utilize the maximum operating margins and bulb life. Any power source furnishing the above voltages with adequate current capacity may therefore be used. A word of caution, however; rectified ac MUST have adequate filtering to prevent the ripple valley from dropping below +20 V under full load conditions. Do not rely on a voltmeter to give this information – use only properly filtered supplies, a battery, or a Ronan supply of the proper rating.

Ronan also furnishes Dc/Dc Static Inverters to allow alarm system operation from both 48 Vdc and 125 Vdc customer furnished sources. Alarm boards also accommodate other Vdc field contact voltages if ordered for such usage.

2.5 Field Contact and Wiring Resistance – General

Approximately 6 milliamps of current are drawn by each Alarm Board's FC input – thus only .6 V is lost for each 100 ohms of field wiring. So long as V+ is maintained in the 24 – 27 V range, proper operation will result even if about 2,000 ohms of contact and wiring resistance are encountered. (Conversely 2000 ohms of leakage across an open field contact will cause improper operation.)

Ronan has developed alarm boards which accommodate many diverse customer-furnished voltages such as instrument output, computer-level signals, integrated circuit levels, etc. Contact the factory for your special requirements.

2.6 First Alert Sequences – ME Terminal Loading

- A. Each first alert sequence alarm board is factory checked for its ability to drive 150 other alarm boards. Use in applications greater than 150 is possible, but not recommended. Consult factory for extended drive capability.
- B. Exercise caution such that stray voltages are not inadvertently applied to ME terminals while system is in operation.

2.7 Ambient Temperature

The outside ambient air temperature surrounding an annunciator in normal operation may vary from –40°F to 120°F maximum. Internal temperature of the annunciator must be kept below 150°F. In large annunciator cabinets, where during start-up periods there are large numbers of off-normal points, provision should be made for forced cooling of the cabinet. Fans can be provided as required, mounted in the rear cover, when high internal temperatures are anticipated.

2.8 Humidity

The annunciator should be protected from excessive moisture and corrosive atmospheres. Special enclosures are available, i.e., NEMA 1, 4, 12 etc.

The printed circuit card is furnished with a fungus proof varnish coating on all exposed circuitry where specified. Epoxy coatings are also available.

2.9 Pressure

Normal atmospheric variations will not affect the annunciator.

2.10 Ambient Lighting

Standard alarm windows are illuminated by 2-3 W bulbs which are acceptable for use in ambient light conditions to 85 foot-candles. Color sandwich lens will be provided at customer request. Use in ambient light conditions exceeding 50 foot-candles is not recommended.

2.11 Position

The annunciator will operate in any position. Transient shock loads of 5G's will not damage the annunciator. In normal operation the system will operate satisfactorily under 3G's shock loads. In vibratory environments, special consideration should be given to shortened life of light bulbs due to filament construction. Special shock mounting enclosures are available.

2.12 Hybrid Systems

Ronan RTD Temperature Monitoring Systems and Relay Alarm Systems are such that they may be physically intermixed in the same integral cabinet under certain conditions. Frequently, a considerable savings results. Contact the factory with your requirements.

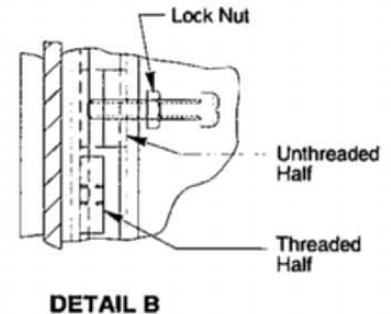
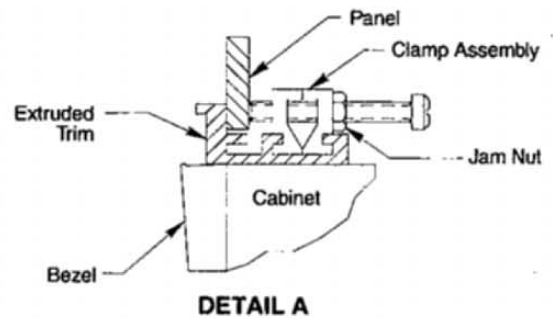
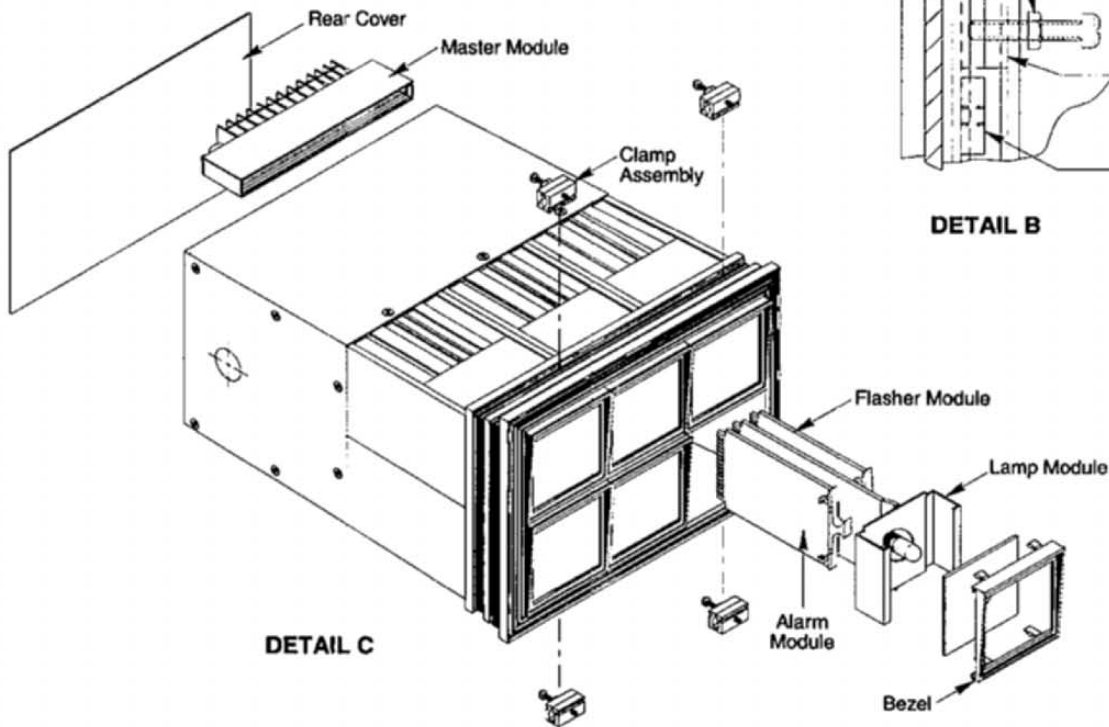
- A. Install the alarm cabinet from the front of the panel. Orient the cabinet in the cutout so that the cabinet rests on the front extruded trim (see detail A). Make sure that the front trim is held firmly against the panel both top and bottom.
- B. From the rear side of the panel insert the two halves of the clamp assembly (one-half threaded and the other half unthreaded) in the groove of the front trim (see detail C).
- C. Slide the clamps together until both holes align (see detail B).
- D. Insert the jack screw and tighten to secure the cabinet in the panel. Install all the clamps the same way and be sure to tighten evenly.
- E. Finally tighten up the locknuts of each jack screw.

3.0 INSTALLATION INSTRUCTIONS

3.1 X12 Solid State Annunciators – Panel Mounted

The annunciator is shipped with all of the alarm plug-in modules and flasher units installed in the cabinet.

External auxiliary horn relays, push buttons, horns, bells and remote relay sockets are packed separately.



4.0 TEST PROCEDURES

CAUTION: Before turning on power and proceeding with testing it is important to review all external equipment and even the alarm system itself to verify that each component meets the standards required for area and environment required by the National Electrical Code governing the installation of this equipment. Particular attention must be paid to reviewing push buttons, horn relays, horn and bells, to see that they meet the right classifications of the electrical code. The wiring inspection falls into the following areas.

4.1 Alarm Inputs

Each active alarm input must be wired to customer's sensing device to provide an opening or closing contact on alarm condition. The terminals on the alarm system for each alarm input are marked "1" (H) and "2" (FC). The "1" terminal in the standard alarm system is the main system voltage that is supplied via a resistor on each lamp module. This resistor is used in the V+ source to each field contact to reduce the effect of large transients entering the alarm chassis. Each alarm input module is provided with a separate "1" terminal. However it is common practice to run one common "1" wire to many field contacts to reduce the number of field wires required. When using a common "1" it is important to jumper together the "1" terminals of the respective alarm cabinet modules to provide the correct amount of current source to the field contacts. This also prevents removing the field contact voltage source when a lamp module in a group of alarms is taken out of service for testing purposes. The return wire from the field contact is wired to the "2" terminal on each respective alarm module. Since the alarm system provides the power to the field contacts it is important to verify that no other voltage source appears on either the "1" or "2" terminals. Note: On special alarm systems the alarm inputs can be supplied from transistor switch outputs in which case the V- of both systems are common and V+ source is supplied from the customer's equipment. If the system under test has this feature, verify by reviewing the electrical drawings, particularly the alarm module schematic.

In general, the solid state alarm system is a floating system. The V+ and V- should be verified as ungrounded.

4.2 Normally Open - Normally Closed Field Contacts

All alarm modules are equipped for operation with normally open or normally closed field contacts. This is accomplished by using a screw-type switch or slide pin on each alarm module, identified as N.O. and N.C. for the normally open and normally closed position respectively. When the complete system is in operation, the field contact that opens with an alarm condition is termed a "normally closed" alarm input and conversely, the field contact that closes with an alarm condition is termed "normally open" alarm input.

4.3 Push Button Wiring

Referring to electrical drawings: It is most important to verify the correctness of the wiring to all of the push buttons including the push-button contacts to see that the normally open contacts are used. Should push-button contact be closed this is the same as having the operator pushing the push button continuously which obviously will drastically affect the operation of the alarm system. Alarm systems using the multiple alarm cabinets may use a common set of push buttons to control the total system and here we recommend a detailed check for proper installation including diode type isolation if specified on the electrical drawings.

4.4 Horn and Bell Wiring

If electronic horns are used the horns can be directly connected to audible output on the master terminals. Systems using the conventional ac or dc horns and bells, must use a horn relay with suitable contact rating. It is also recommended on multiple alarm cabinet systems if individual power input is preferred on each cabinet with a common horn for the system, a horn relay must be used with each cabinet to maintain electrical isolation.

4.5 Power Supplies

Verify the correct polarity of connections to the alarm system. In the larger systems, it is important to verify the wire sizes of the power leads to the alarm cabinets. To protect the larger alarm chassis it is common to provide more than one input to the cabinet in which each section is provided with a separate filter, fuse and supply input terminals. In cases with multiple supply input it is necessary for the customer to make the parallel V+ and V- connections.

4.6 Interface Modules

Refer to individual data sheets for details of auxiliary contact modules, reflash modules, ground detector modules and integral trip modules.

Carefully inspect the hookup wiring to insure conformity with the furnished schematic. Pay particular attention to the power source polarity and ascertain that the ME terminals (First Alert Sequences) are connected only to other ME terminals. Now remove the alarm modules one at a time and determine whether or not the normally closed - normally open switch is in the proper position for the associated field contact. If not, place the switch in the proper position and reinsert the card firmly seating it in the connector. Power may now be applied to the system.

Upon power application, immediately depress SILENCE, ACKNOWLEDGE and RESET in that order. (Not all systems are equipped with all push buttons). The system should now be in a quiescent state with the horn(s) off and no lamps flashing. Some lamps may, however, be on if their associated field contacts are in an abnormal condition.

Depression of TEST should cause all extinguished lamps to come on flashing (rapid flash for sequences FD and RD) and the audible alarm to sound. From this point onward, refer to the particular Sequence Charts to obtain normal system operation. Sequence FSMH, for example, should achieve horn off upon SILENCE, steady lamps upon ACKNOWLEDGE, and extinguished lamps upon RESET. Sequence AS, on the other hand, will silence and extinguish upon release of the TEST button if operated in the autoreset mode. Particular caution is warranted when system-testing First Alert and Ringback Sequences due to their relative complexity and the requirement that SILENCE, ACKNOWLEDGE, and RESET be actuated in the proper order following TEST. When testing an on-line system, be alert to the possibility that an actual alarm may initiate during the test procedure and appear to give conflicting results.

Simple attention to the obvious can often solve what appears to be a problem in the system.

- A. A burned out or broken bulb or bulb pair not properly seated in their bases will not light.
- B. Remote bulbs with no lamp voltage cannot light.
- C. The alarm module could be installed in the wrong slot.
- D. The resistor on the lamp module may be broken providing no voltage at the "1"(H) terminal.

- E. The LOCK-IN/AUTOMATIC RESET screw could be in the wrong hole on Sequence AS.
-

5.0 TROUBLESHOOTING

If the Alarm System appears to be totally non-operating:

- A. Verify that the power source is operating and that the V+ to V- voltage on the rear terminals is in the range 20 - 28 V. (Below 18 V, operation may prove erratic.) Verify polarity.
- B. If the power supply fuse blows each time power is supplied:
 1. Check the Power Supply Parts List for proper fuse size.
 2. Remove the Alarm System from the supply and try again. If fuse holds, double-check polarity and reconnect. If fuse still blows, remove all alarm modules and flasher and try again. If fuse blows at this point, the problem has been isolated to the filter or a short in the internal wiring. A possible source of trouble is the diode on the Filter Module (CR1). Substitute a fresh filter module or remove the diode and try again. The system may be run without this diode, but do not apply reverse polarity to the system with CR1 removed as damage will result.
- C. If power remains on but any or all push-button functions (SILENCE, TEST, RESET, ACKNOWLEDGE) do not appear to function:
 1. Verify proper wiring by measuring the voltage at terminals T, A, R and/or S as applicable. Voltage measurements are taken with respect to the V-terminal and should in all cases be zero volts with the button released and V+ volts (20-28 Vdc) with the button depressed.
 2. If the problem persists, the Filter and/or Flasher Module are suspect. Replace the Flasher Module and try again. The filter contains only passive components and is not likely to fail.
 3. Be alert to the possibility that a single board can, under unique conditions, cause what appears to be a system malfunction. Two examples of this are:
 - a. If the Horn fails to silence, the trouble could be one module only failing to silence.
 - b. If a large group of First Alert points comes on steady rather than flashing during TEST, one board can be sending a signal to all of the others. A failure of the flasher or the Test circuit is not necessarily indicated.
 - c. In either of the above cases, remove Alarm

Modules sequentially and repeat testing until the trouble clears.

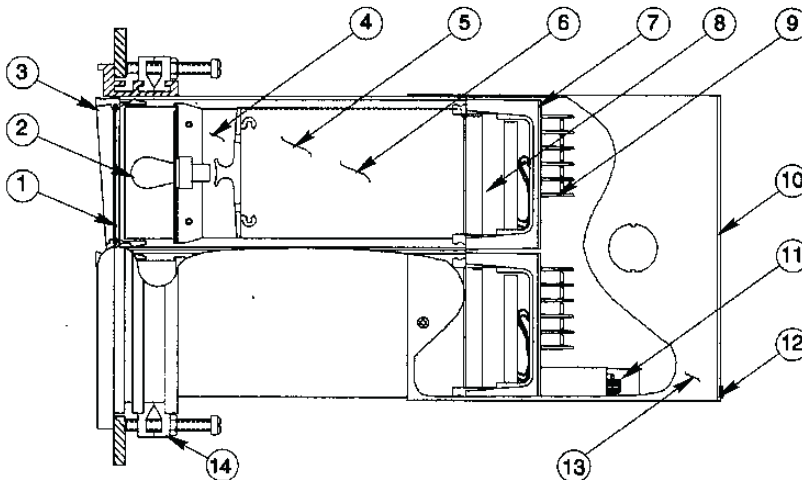
- d. As a general rule, common sense in isolating trouble will prevail. If one or more alarm boards appear to be malfunctioning, remove them from the system entirely before continuing, and fill their positions with boards from the upper left or lower right of the system so as to concentrate known good modules; then proceed with diagnosis and analysis of the remainder. Working with several scattered, diverse problems simultaneously is nearly always self-defeating.
- e. Refer to the section on TEST (SYSTEM) for further procedure.

5.1 Step by Step Procedure

- A. Check the system voltage and verify polarity of supply input voltage and that the system is not grounded.
- B. Isolate all external devices except the input power connections.
- C. Unseat all lamp modules and alarm modules except the No. 1 alarm point. At this point the only items plugged into the alarm chassis are one lamp module, alarm module, flasher horn driver module, and filter module. Jumper the push-button input terminals on the master module to simulate the correct connections for operation of the alarm system (since only normally open push button contacts are used for all push button functions, no connections will be made for normal operation).
- D. Connect a simulating set of devices to replace the field contacts as shown on the electrical schematics on alarm position No. 1.
- E. Using the simulating field contacts and following the "Test Procedure" instructions, check the sequence operation of the annunciator.
- F. If the first alarm module does not operate correctly replace the flasher module then the filter module to eliminate the possibility of a faulty flasher and filter module. Once established that the flasher and filter are correct, the fault probably will lie in one of the following areas:
 - 1. A faulty alarm module.
 - 2. A faulty lamp module (H resistor blown).
 - 3. Chassis wiring fault such as a short or cold soldering joint.
- G. After checking the lamp module resistor for proper operation of "1" (H) output, remove the No. 1 alarm module and insert the No. 2 alarm module in the No. 1 chassis position. If the No. 2 alarm module operates correctly, this indicates that the No. 1 alarm module is faulty. Should the No. 2 alarm module not function in the No. 1 chassis position the fault lies in the chassis wiring.
- H. If the failure is isolated to the chassis wiring we recommend the removal of each alarm input terminal plate for inspection for foreign objects causing a shorting condition, or review for any damaged wiring or broken connections to the printed circuit board connectors. Finally, if the above procedure does not produce the solution to the fault, we recommend a thorough review of all solder joints.
- J. Referring back to paragraph F, should No. 1 alarm function correctly, continue with the same procedure for checking all lamp module and alarm modules by seating each module and using the simulating field contact switch at each alarm input. After the testing should all the alarm and lamp modules function correctly, it must be assumed the whole alarm system and modules are not faulty.
- K. To avoid further damage to new alarm modules, do not place another alarm module into an alarm position that has produced circuit board trace failures. A detailed review of the trace failure will determine the reason for the failure. In most cases the damage can be the result of high voltage inputs or shorting in the chassis.

6.0 CHASSIS ASSEMBLY DRAWINGS

6.1 Models X12-1000, X12-2000, X12-3000, X12-4000, X12-1000LR, X12-2000LR, X12-3000LR, X12-4000LR

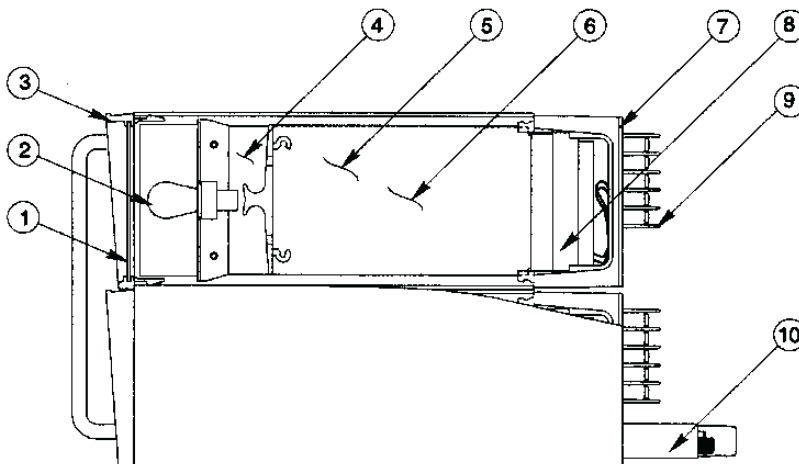


Item	Description
1	Nameplate – Specify Color
2	Alarm Lamp
3	Bezel – Specify Color
4	Lamp Module
5	Alarm Module
6	Flasher-Horn Driver Module
7	Rear Terminal Plate
8	Printed Circuit Connector
9	Alarm Point Module
10	Rear Cover Plate
11	Filter/Master Module
12	Rear Cover Fasteners
13	Rear Housing Enclosure
14	Panel Clamp Assembly

NOTES:

1. See Spare Parts List for part numbers.
2. Please specify the following when ordering replacement parts.
 - A. Cabinet Serial Number.
 - B. System Voltage – Ac or Dc.
 - C. Electrical Classification: General Purpose or Class I, Division II Area.
3. Rear cover removed on all LR Series.

6.2 Models X12RR-1000, X12RR-2000, X12RR-3000, X12RR-4000

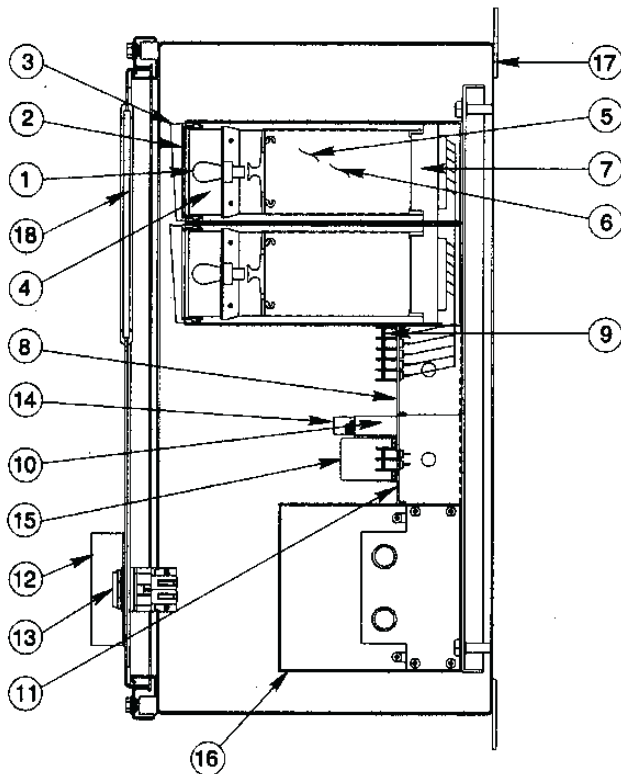


Item	Description
1	Nameplate – Specify Color
2	Alarm Lamp
3	Bezel – Specify Color
4	Lamp Module
5	Alarm Module
6	Flasher-Horn Driver Module
7	Rear Terminal Plate
8	Printed Circuit Connector
9	Alarm Point Module
10	Filter/Master Module

NOTES:

1. See Spare Parts List for part numbers.
2. Please specify the following when ordering replacement parts.
 - A. Cabinet Serial Number.
 - B. System Voltage – Ac or Dc.
 - C. Electrical Classification: General Purpose or Class I, Division II Area.

6.3 Models X12-1000SM, X12-2000SM, X12-3000SM, X12-4000SM

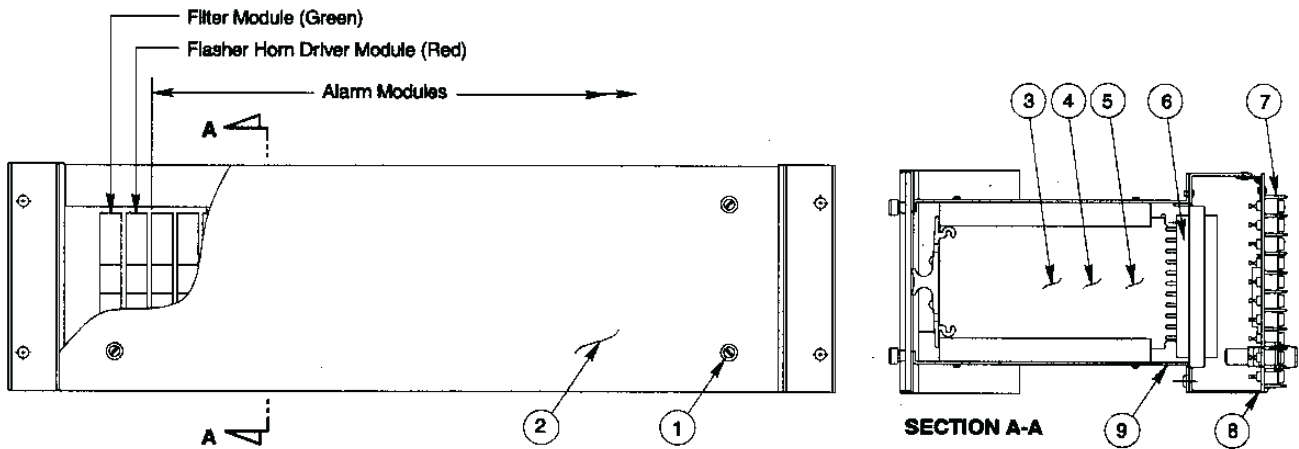


Item	Description
1	Alarm Lamp
2	Nameplate – Specify Color
3	Bezel – Specify Color
4	Lamp Module
5	Alarm Module
6	Flasher-Horn Driver Module
7	Printed Circuit Connector
8	Terminal Plate
9	Alarm Point Terminals
10	Filter/Master Module
11	Master Terminal Plate
12	Horn
13	Push Button
14	Fuse
15	Horn Relay
16	Power Supply
17	Enclosure
18	Viewing Window

NOTES:

- See Spare Parts List for part numbers.
- Please specify the following when ordering replacement parts.
 - A. Cabinet Serial Number.
 - B. System Voltage – Ac or Dc.
 - C. Electrical Classification: General Purpose or Class I, Division II Area.

6.4 Model X16RR

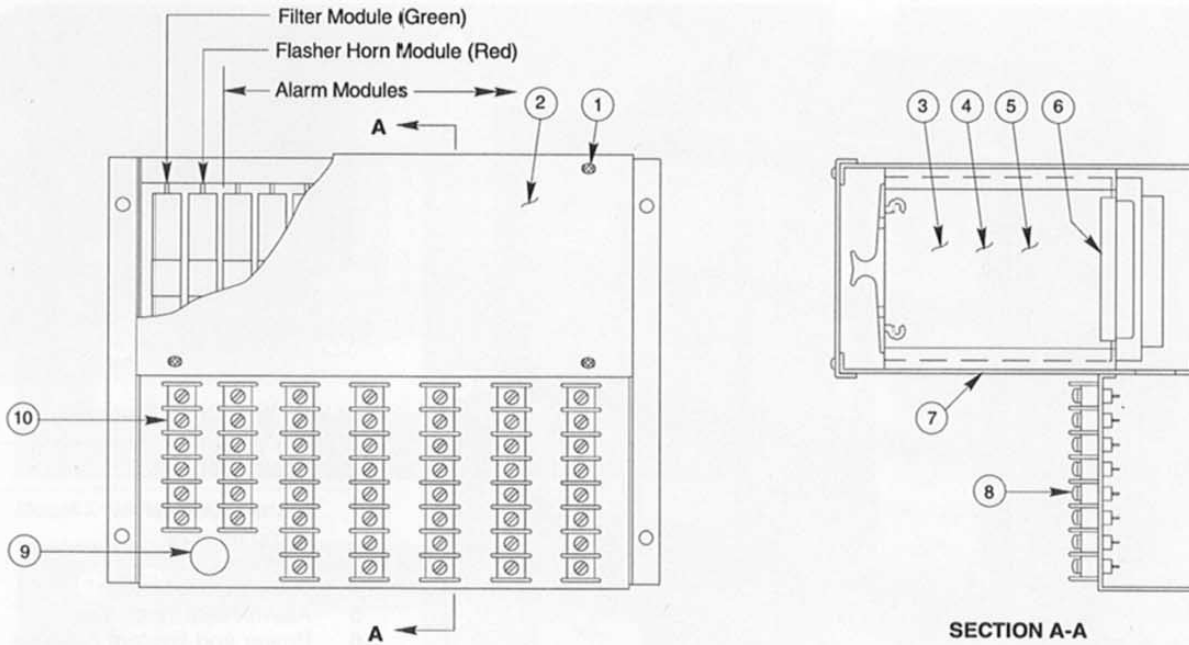


Item	Description
1	Front Panel Fastener
2	Front Panel
3	Alarm Module
4	Flasher-Horn Driver Module
5	Filter Module
6	Printed Circuit Connector
7	Alarm Point Terminals
8	Rear Terminal Plate
9	Chassis Housing

NOTES:

- See Spare Parts List for part numbers.
- Please specify the following when ordering replacement parts.
 - A. Cabinet Serial Number.
 - B. System Voltage – Ac or Dc.
 - C. Electrical Classification: General Purpose or Class I, Division II Area.

6.5 Models X16SM



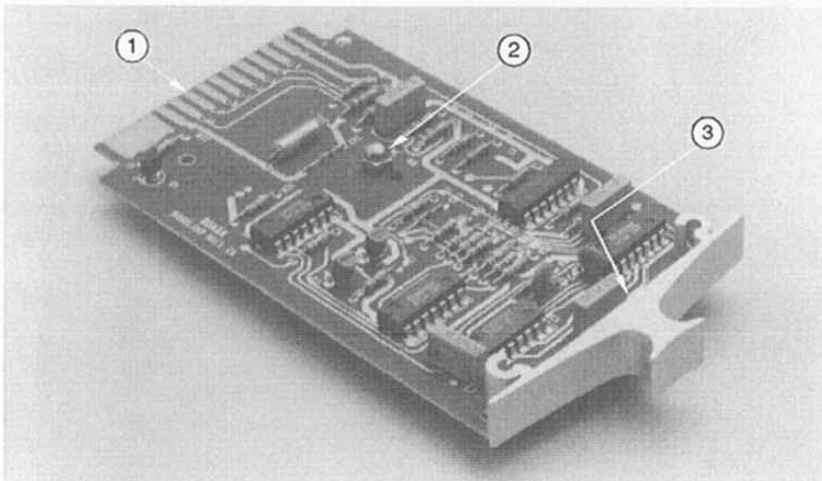
Item	Description
1	Fastener, Cover
2	Front Cover
3	Alarm Module
4	Filter Module
5	Flasher
6	Printed Circuit Connector
7	Chassis Housing
8	Alarm Point Terminals
9	Fuse
10	Master Module Terminals

NOTES:

1. See Spare Parts List for part numbers.
2. Please specify the following when ordering replacement parts.
 - A. Cabinet Serial Number.
 - B. System Voltage – Ac or Dc.
 - C. Electrical Classification: General Purpose or Class I, Division II Area.

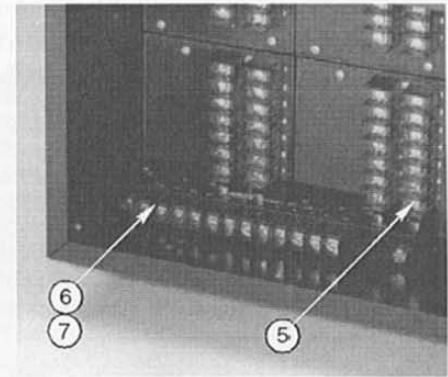
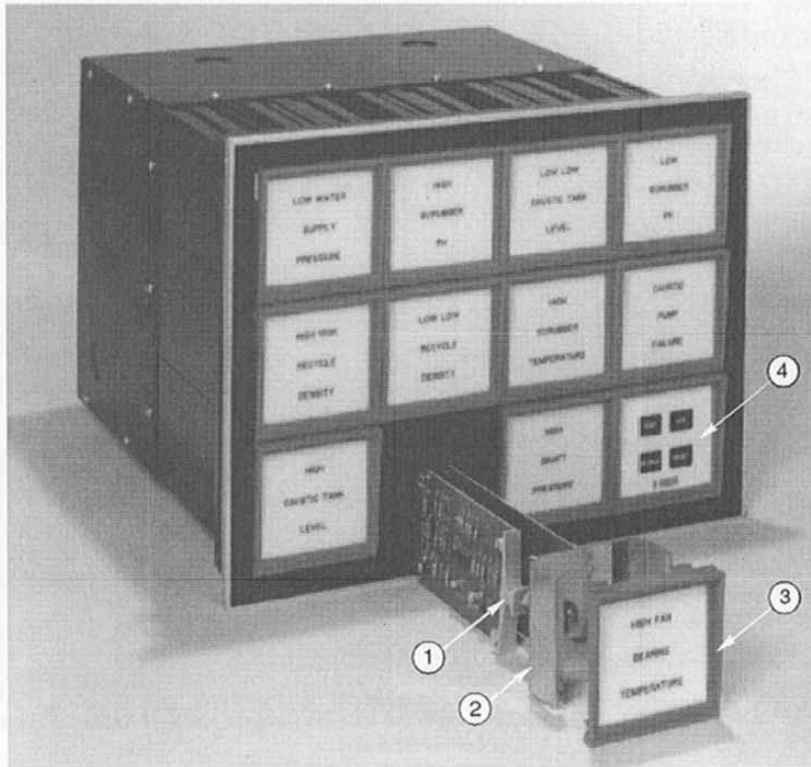
7.0 CHASSIS ASSEMBLY ILLUSTRATIONS

7.1 Plug-In Alarm Module (Typical)



Item	Description
1	Alarm Module Key Slot
2	Field Contact Selector Switch
3	Label with Model Number Placed Inside Handle

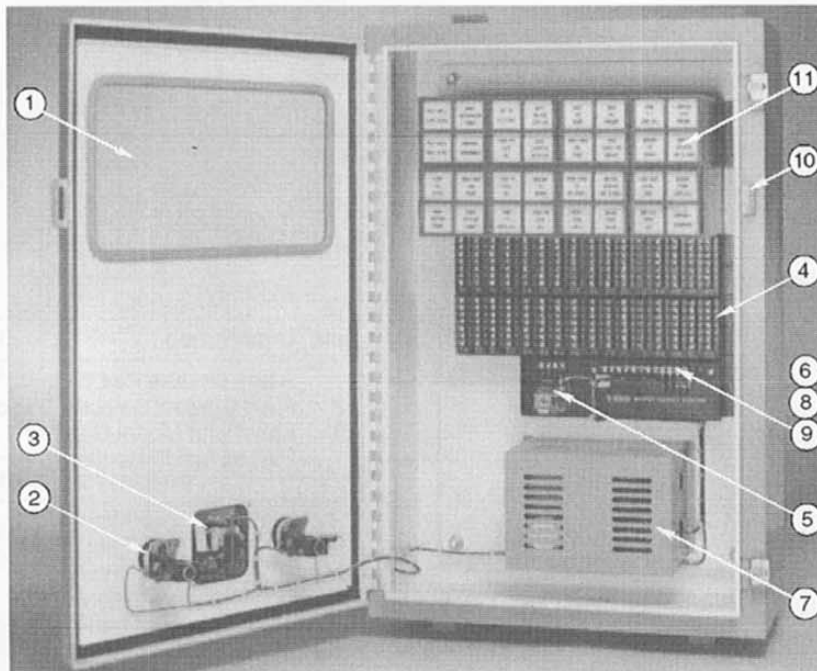
7.2 Flush Mounted Alarm Chassis



Rear View With Cover Removed

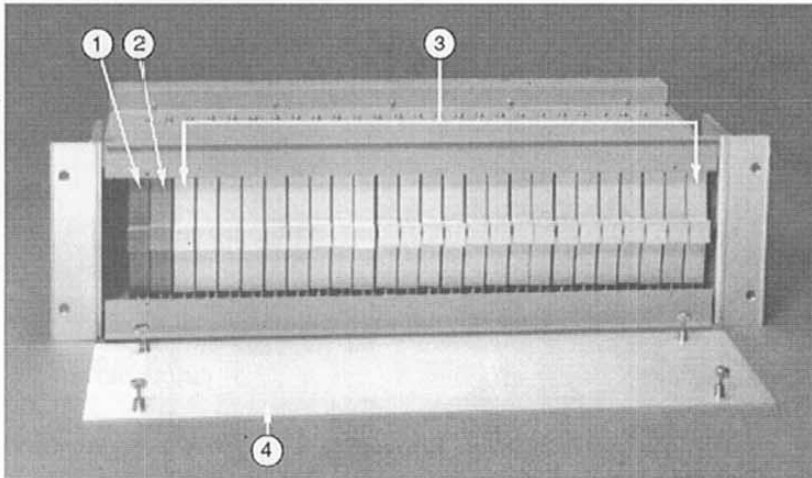
Item	Description
1	Alarm Modules
2	Lamp Module
3	Window Bezel
4	Push Button Station
5	Alarm Point Terminals
6	Power and System Function Terminals
7	Filter Module

7.3 Surface Mounted Alarm Chassis

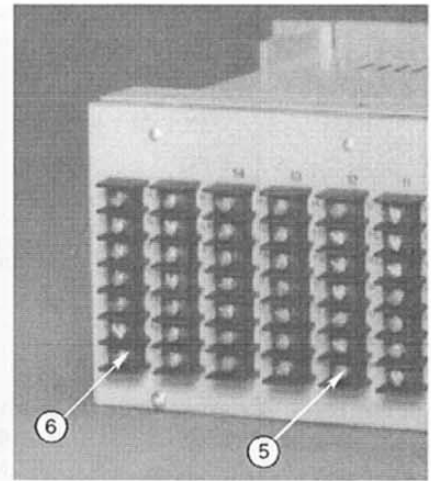


Item	Description
1	Viewing Window
2	Pushbuttons
3	Horn
4	Alarm Point Terminals
5	Horn Relay
6	Filter Module
7	Power Supply
8	Master Terminals
9	Fuse
10	Enclosure
11	Alarm Windows

7.4 Remote Chassis

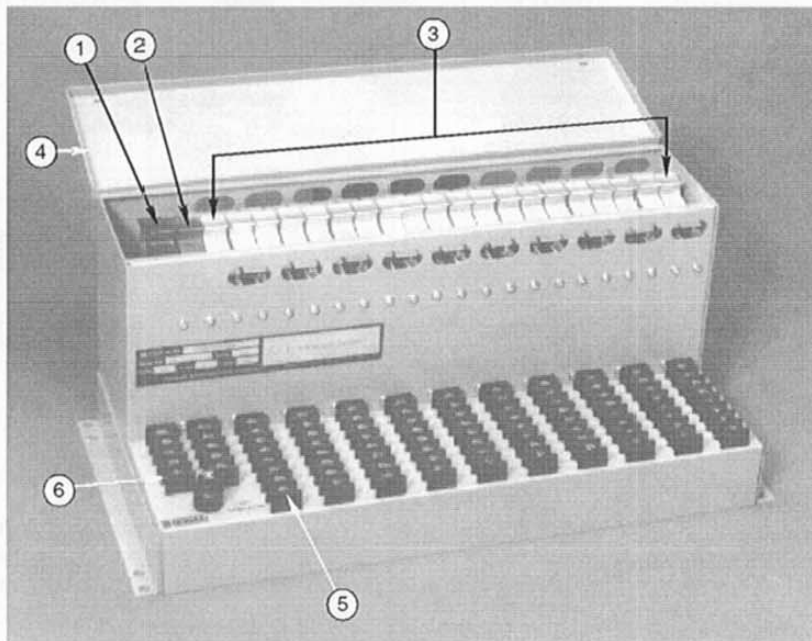


Model X16RR Front View



Model X16RR Rear View

The Remote Chassis is available in both the Model X16RR Rack Mount and Model X16SM Surface Mount versions shown above and at left.



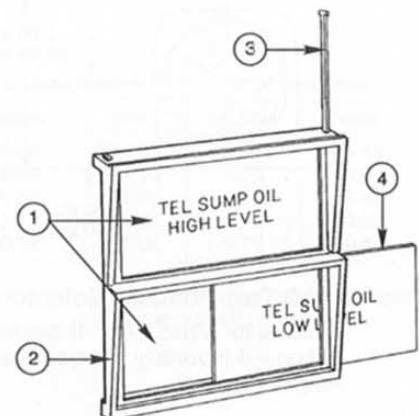
Model X16SM

Item	Description
1	Filter Module
2	Flasher Horn Driver Module
3	Alarm Modules
4	Cover
5	Field Contact Terminals
6	Master Terminals

7.5 Nameplate Installation

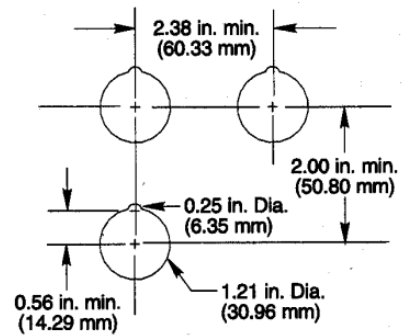
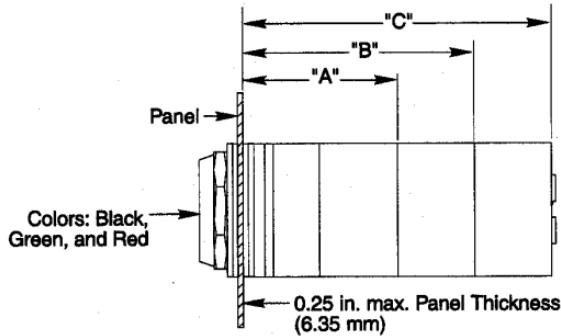
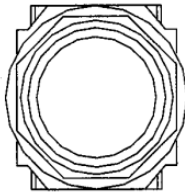
All alarm window lenses are inserted into channeled gooves and retained with vertical locking pins as shown. This design permits the relocation of nameplates for functional purpose without loss of engraved nameplates as found on conventional multipoint alarm windows.

Item	Description
1	WL2AW1 Lens
2	Vertical Locking Pin in position
3	Vertical Locking Pin withdrawn position
4	Removable Lens



8.0 ANNUNCIATOR ACCESSORIES

8.1 Push Buttons

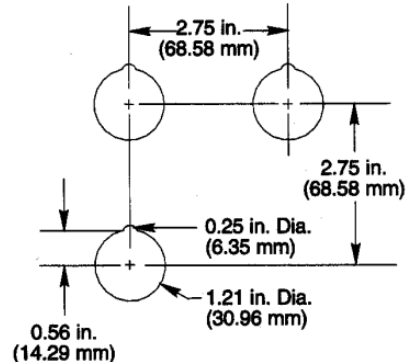
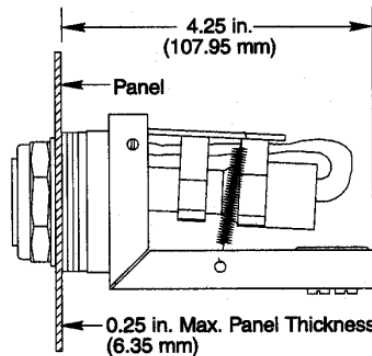
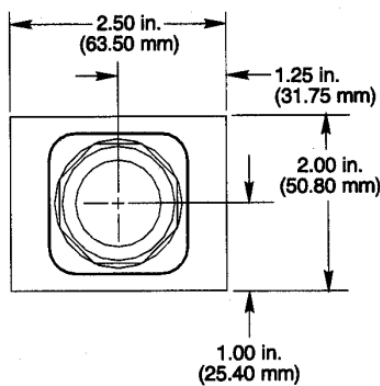


CUTOUT DETAIL

8.1.1 General Purpose Push Buttons Models 202B, 203B, and 204B

Specify nameplates: TEST, SILENCE or RESET.
Colors: Black, Green and Red.

Model	Dimensions		Number of Contacts
	Inches	mm	
202B ("A")	1.88	47.63	1 - N.O. / 1 - N.C.
203B ("B")	2.75	69.85	2 - N.O. / 2 - N.C.
204B ("C")	3.68	93.47	3 - N.O. / 3 - N.C.



CUTOUT DETAIL

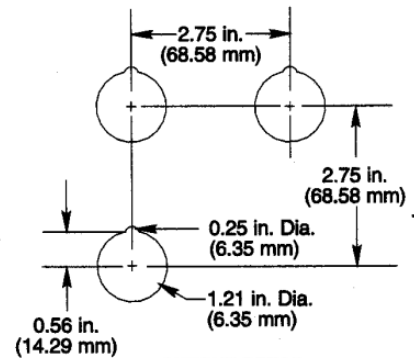
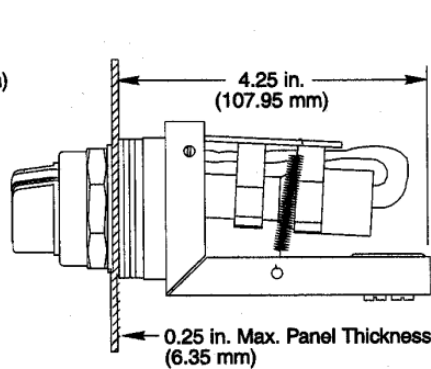
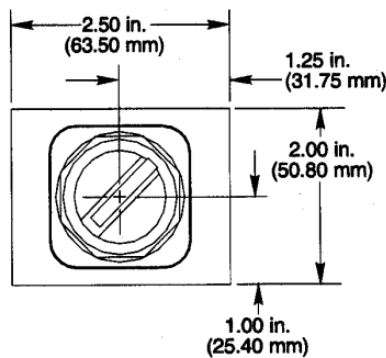
8.1.2 Mercury Push Button Model X13P

Suitable for Class I, Div. II locations. Maximum poles per switch - 4 (normally open or closed). Contact rating: 10 Amps, 115 Vac.

Order Model X13P - () - ()

No. Normally Open Contacts
No. Normally Closed Contacts

Place switch in left position when viewing front to specify contacts.



CUTOUT DETAIL

8.1.3 Two-Position Selector Switch Model X13S

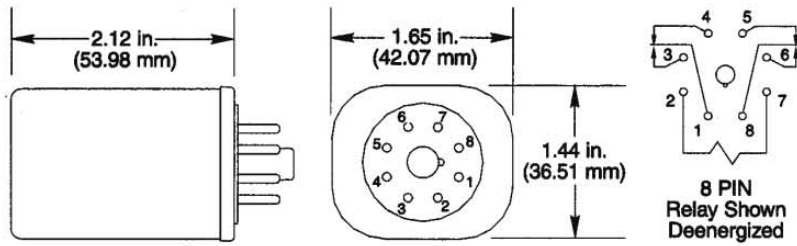
Suitable for Class I, Div. II locations. Maximum poles per switch - 4 (normally open or closed). Contact rating: 10 Amps, 115 Vac.

Order Model X13S - () - ()

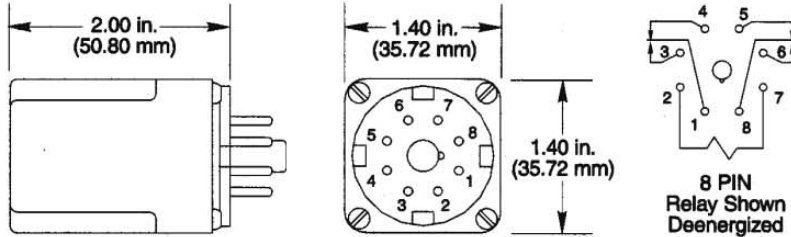
No. Normally Open Contacts
No. Normally Closed Contacts

Place switch in left position when viewing front to specify contacts.

8.2 General Purpose and Hermetically Sealed Relays



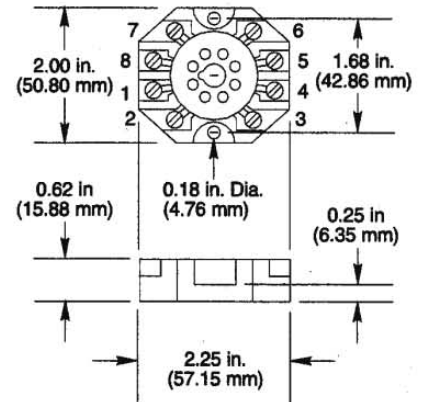
General Purpose Relays



Hermetically Sealed Relays

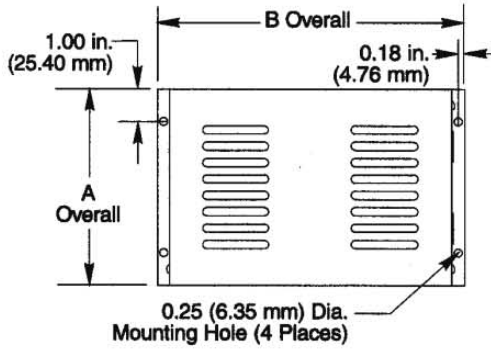
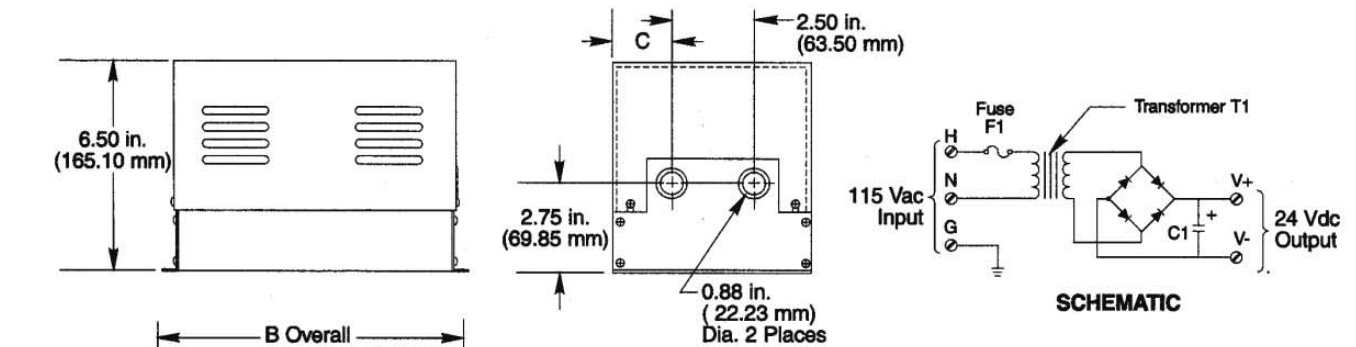
General Purpose			Hermetically Sealed		
Model	Voltage	Contact Rating	Model	Voltage	Contact Rating
KRP-115 Ac	115 Vac	10 Amps	KR7443-115 Ac	115 Vac	10 Amps
KRP-125 Dc	125 Vdc	.75 Amps	KR7627-24 Ac	24 Vac	10 Amps
KRP-24 Ac	24 Vac	10 Amps	KR7272-24 Dc	24 Vdc	10 Amps
KRP-24 Dc	24 Vdc	10 Amps			

8.2.1 Surface Mount 8 Pin Relay Socket Model 146-103



Material: Black Thermoplastic.
Construction: Brass, nickel plated connectors with #6-32 x .28 nickel plated steel screws.
Rating: 300 V @ 10 Amps.
11 Pin also available.

8.3 Ac and Dc Type Power Supplies

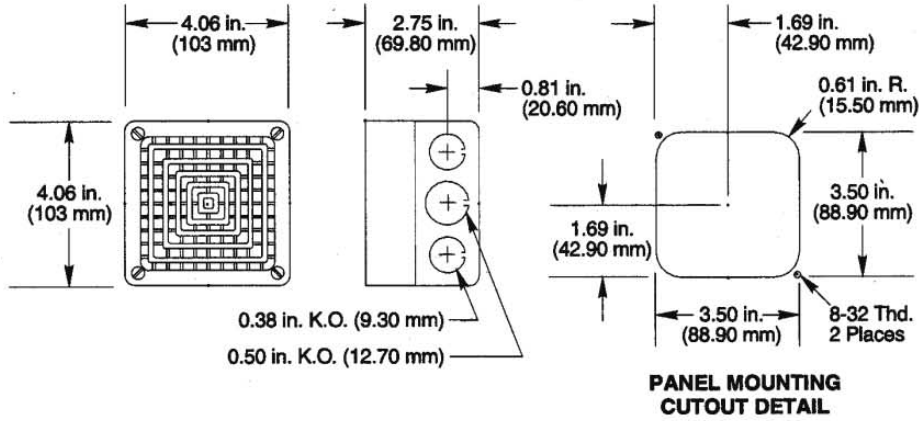


Model	A Dimensions		B Dimensions		C Dimensions	
	Inches	mm	Inches	mm	Inches	mm
115-24-125	6.00	152.40	9.25	234.95	1.75	44.45
115-24-250	6.00	152.40	9.25	234.95	1.75	44.45
115-24-375	6.00	152.40	9.25	234.95	1.75	44.45
115-24-500	8.00	203.20	10.12	257.04	2.75	69.85
115-24-750	8.00	203.20	10.12	257.04	2.75	69.85

Wattage Rating
Output Voltage Dc
Input Voltage Ac

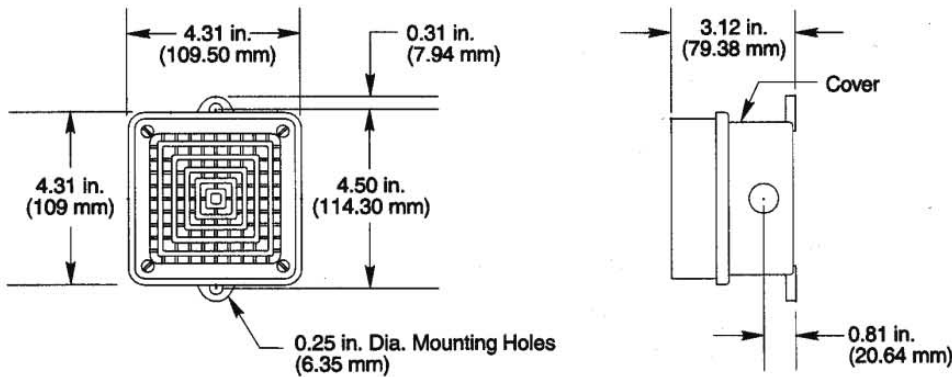
NOTE: For other output voltages please consult factory.

8.4 Horns



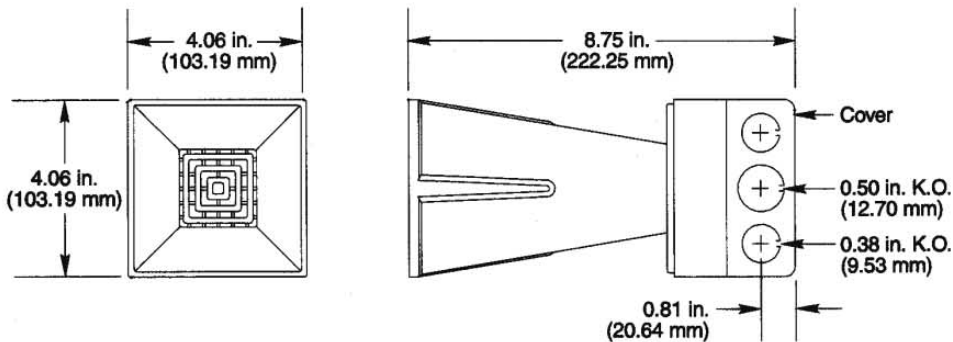
8.4.1 General Purpose Horn

Model 350N, 115 Vac
 Model 450N, 24 Vdc
 Model 450N, 125 Vdc



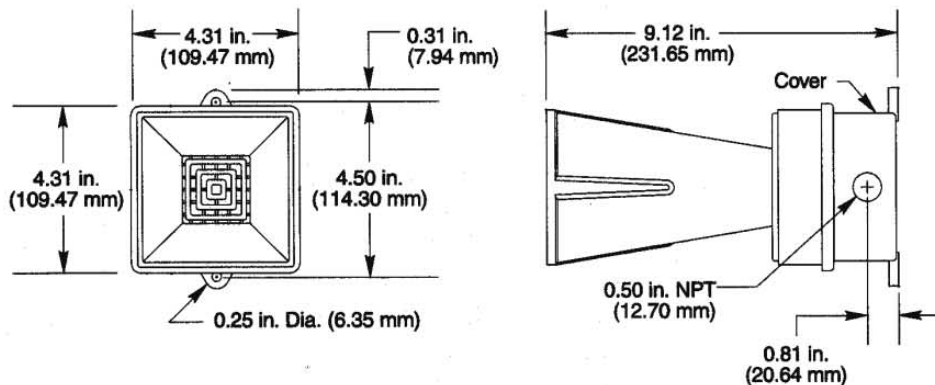
8.4.2 Weatherproof Horn

Model 350W, 115 Vac
 Model 450W, 24 Vdc
 Model 450W, 125 Vdc



8.4.3 General Purpose Projector Horn

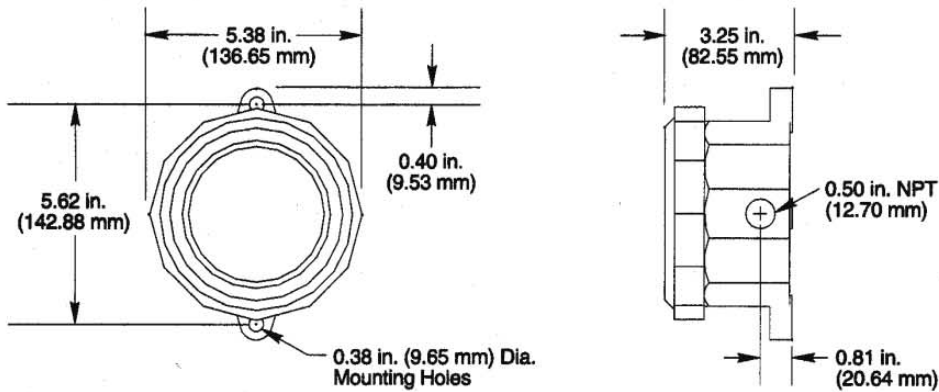
Model 351N, 115 Vac
 Model 451N, 24 Vdc
 Model 451N, 125 Vdc



8.4.4 Weatherproof Projector Horn

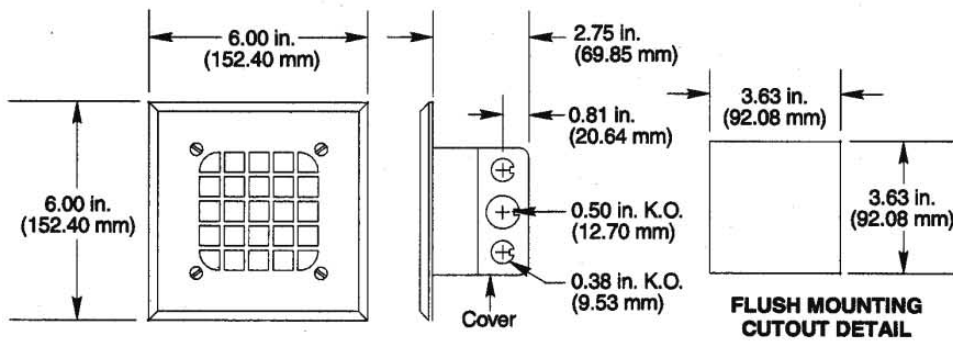
Model 351W, 115 Vac
 Model 451W, 24 Vdc
 Model 451W, 125 Vdc

8.4 Horns (Cont.)



8.4.5 Explosion Proof Horn

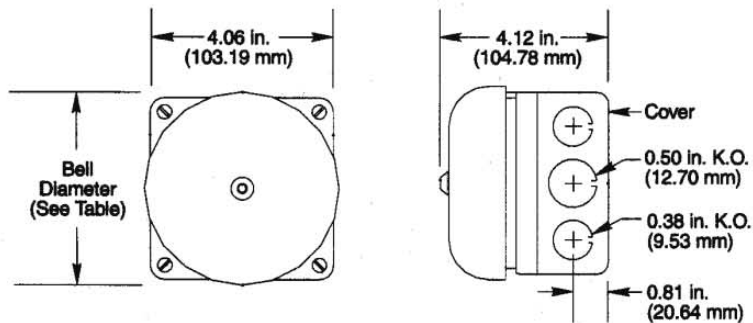
Model 8140, 115 Vac
Model 8141, 24 Vdc
Model 8141, 125 Vdc



8.4.6 General Purpose Horn Flush Mounting

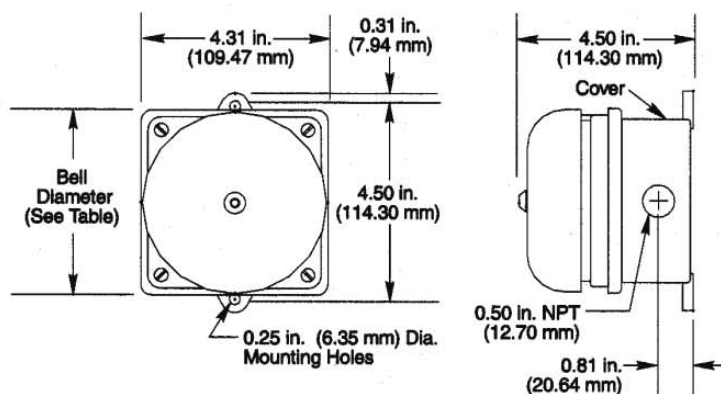
Model 350F, 115 Vac
Model 450F, 24 Vdc
Model 450F, 125 Vdc

8.5 Bells



8.5.1 General Purpose Bells

Model	Voltage	Diameter
504N	115 Vac	4.12 in. (104.78 mm)
506N	115 Vac	6.00 in. (152.40 mm)
510N	115 Vac	10.00 in. (254.00 mm)
604N	125 Vdc	4.12 in. (104.78 mm)
606N	125 Vdc	6.00 in. (152.40 mm)
610N	125 Vdc	10.00 in. (254.00 mm)



8.5.2 Weatherproof Bells

Model	Voltage	Diameter
504W	115 Vac	4.12 in. (104.78 mm)
506W	115 Vac	6.00 in. (152.40 mm)
510W	115 Vac	10.00 in. (254.00 mm)
604W	125 Vdc	4.12 in. (104.78 mm)
606W	125 Vdc	6.00 in. (152.40 mm)
610W	125 Vdc	10.00 in. (254.00 mm)

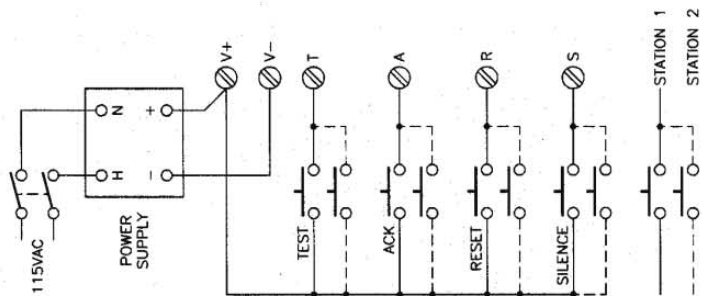


FIG. 1
SINGLE SYSTEM
MULTIPLE PUSHBUTTON STATIONS

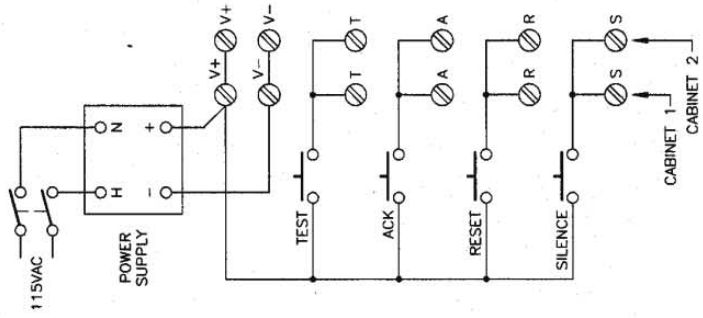


FIG. 2
MULTIPLE CABINETS
COMMON POWER SOURCE
SINGLE PUSHBUTTON STATION*

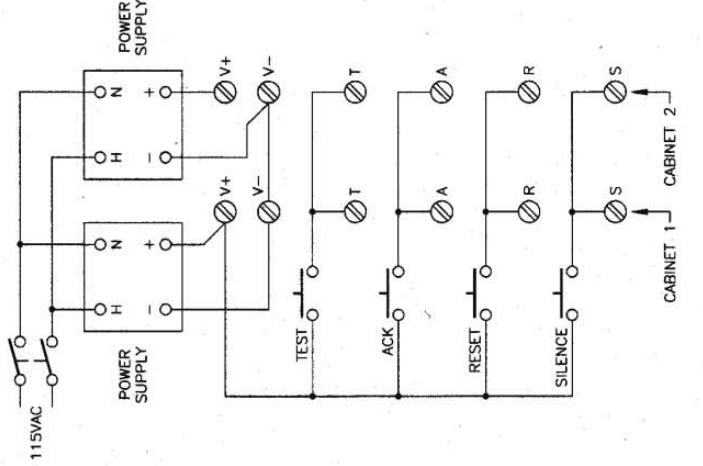


FIG. 3
MULTIPLE CABINETS
SEPARATE POWER SOURCES
COMMON POWER ON-OFF SWITCH
COMMON PUSHBUTTON STATION*

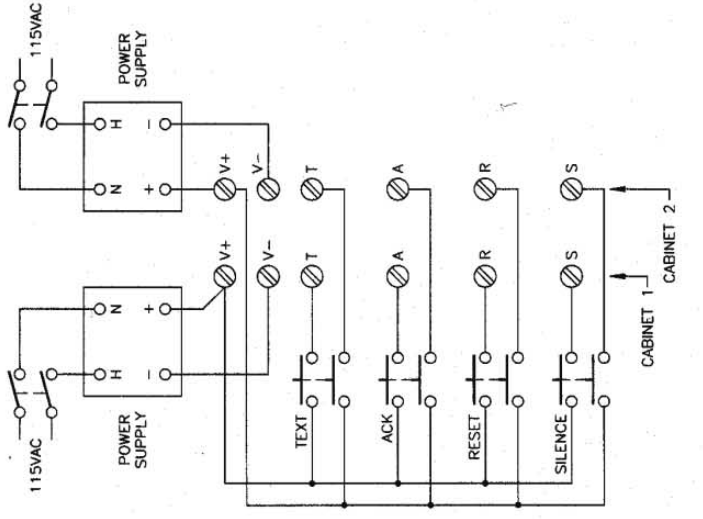


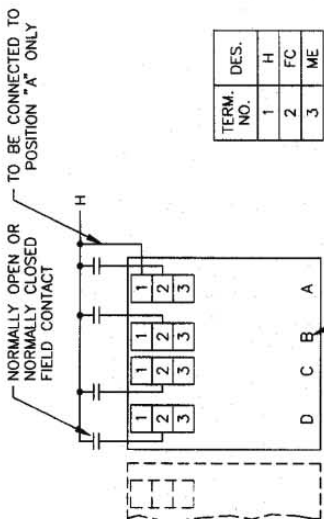
FIG. 4
MULTIPLE CABINETS
SEPARATE POWER SOURCES
SEPARATE POWER SWITCHES
COMMON PUSHBUTTONS*

NOTES:

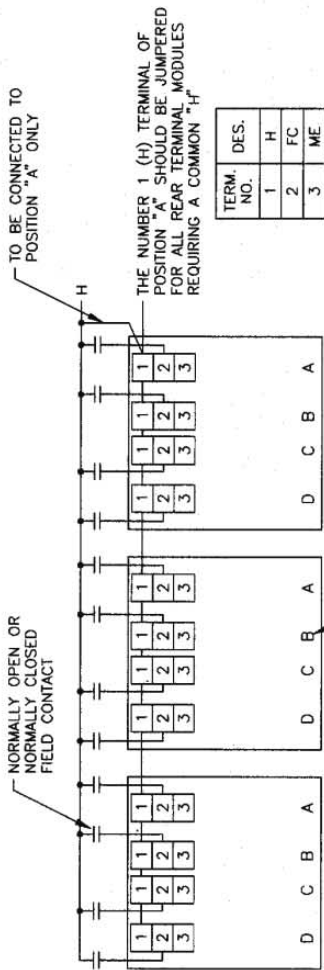
1. FOUR POSSIBLE PUSHBUTTONS SHOWN. REFER TO EXTERNAL HOOKUP OR SYSTEM WIRING DIAGRAM FOR PUSHBUTTONS ACTUALLY USED.
 2. INTEGRAL PUSHBUTTON STATIONS (WINDOW MOUNTED) IN NO WAY INFLUENCE ANY EXTERNAL WIRING.
- *FOR MULTIPLE PUSHBUTTON STATIONS, WIRE EACH ADDITIONAL STATION IN PARALLEL AS SHOWN IN FIG. 1.

ROMAN	
DRAWING NO. SS2062	REV. 3

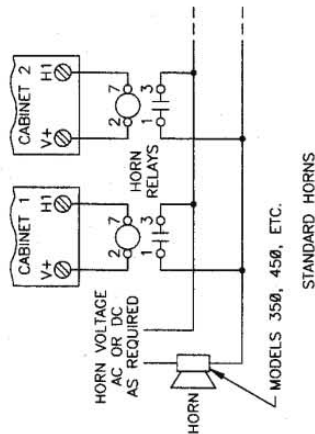
**SERIES X12 AND X16
EXTERNAL PUSH BUTTON
WIRING DETAIL**



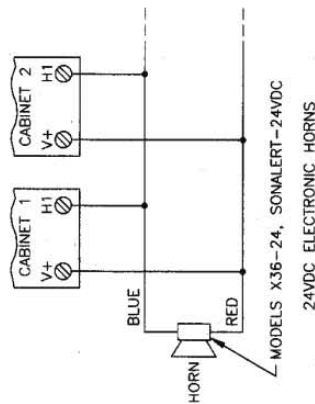
WIRING ARRANGEMENT SHOWING A COMMON 1 (H) FOR A SINGLE REAR TERMINAL MODULE REPRESENTING UP TO FOUR ALARM MODULES



WIRING ARRANGEMENT SHOWING A COMMON 1 (H) FOR MORE THAN ONE REAR TERMINAL MODULE

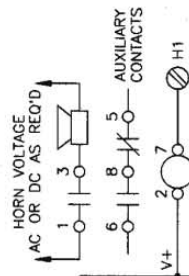


STANDARD HORNS
MODELS 350, 450, ETC.

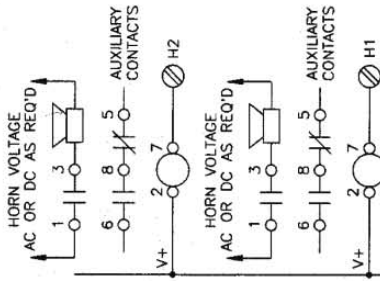


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