GENERAL MONITORS

FM002A

Zero Two Series Facilities Module

RK002

Zero Two Series
Rack & Panel Mounted Chassis

INSTRUCTION MANUAL 07/96

Part No. MANFMRK02
Revision F/07-96

F/07-96

Warranty

General Monitors warrants the FM002A, and the RK002 Zero Two Series components to be free from defects in workmanship or material under normal use and service within two years from the date of shipment. General Monitors will repair or replace without charge any such equipment found to be defective during the warranty period. Full determination of the nature of, and responsibility for defective or damaged equipment will be made by General Monitors' personnel. Defective or damaged equipment must be shipped to General Monitors' plant or the representative from which the original shipment was made. In all cases this warranty is limited to the cost of the equipment supplied by General Monitors. The customer will assume all liability for the misuse of this equipment by its employees or other personnel. All warranties are contingent upon proper use in the application for which the product was intended and do not cover products which have been modified or repaired without General Monitors' approval or which have been subjected to neglect, accident, improper installation or application, or on which the original identification marks have been removed or altered. Except for the express warranty stated above, General Monitors disclaims all warranties with regard to the products sold, including all implied warranties of merchantability and fitness and the express warranties stated herein are in lieu of all obligations or liabilities on the part of General Monitors for damages including, but not limited to, consequential damages arising out of/or in connection with the performance of the product.

Warnings

- TOXIC, COMBUSTIBLE & FLAMMABLE GASES AND VAPORS ARE VERY DANGEROUS. EXTREME CAUTION SHOULD BE USED WHEN THESE HAZARDS ARE PRESENT.

- All Zero Two Series Modules contain components which can be damaged by static electricity. Special care must be taken when wiring the system to ensure that only the connection points are touched.

- Only sensors and field devices approved by General Monitors will work with associated Zero Two Series Gas & Flame Detection Modules. Any attempt to use a sensor or device that has not been approved by General Monitors will void the Warranty.

- **SAFETY WARNING: Installation and Maintenance must be carried out by suitably skilled and competent personnel only.**

- The Model FM002A should not be installed in a rack that does not contain any other modules. The card will not function properly without input signals on the bus.

F/07-96

This chapter provides a brief description of the Zero Two Series of Gas & Flame Detection Modules, the Model FM002A, the Model RK002 and some Features & Benefits of Zero Two Series Facilities Module.

1.1 General Description

The Zero Two Series of Trip Amplifiers and Control Modules have been developed for the purpose of creating combined fire and gas detection systems. There is a module for flame detection and each type of gas detection that General Monitors offers.

Module	Type of field device
4802A	Combustible Gas Sensors
2602A	Hydrogen Sulfide (H_2S) Gas Sensors
TA102A	Combustible Gas Smart Sensors
TA202A	H_2S Gas Smart Sensors
TA402A	FL3000 Family of Flame Detectors

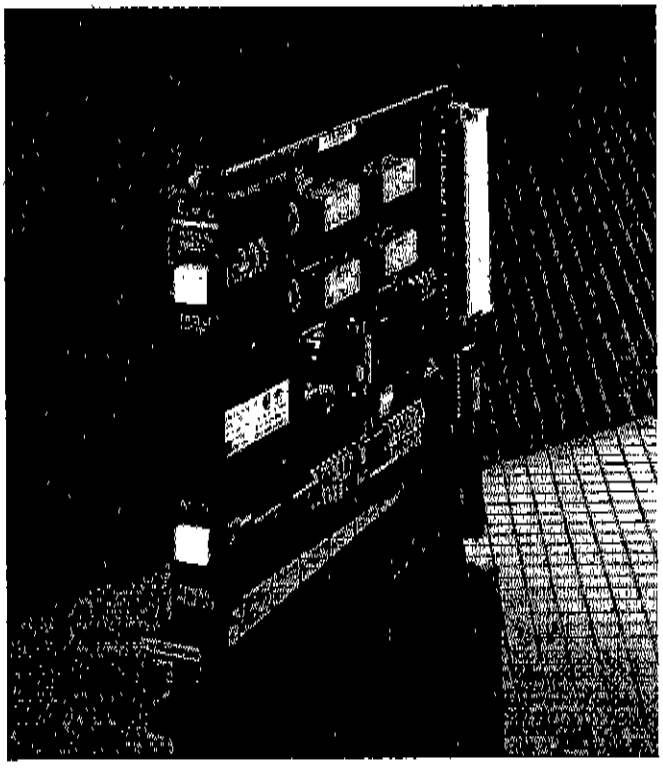

Figure 1

In addition to the Fire and Gas Detection Modules there are Accessory Modules that perform system functions (e.g. alarm reset, alarm accept) and will enhance the performance of the system (e.g. extra relay capacity, zoning and voting).

Module	Description
FM002A	Facilities Module (figure 1)
IN042	Four Zone Input Module
MD002	Monitored Driver Module
PS002	Power Supply Module
RL002	Relay Module
ZN002A	Zone Control Module

The Zero Two Series modules reside in a 2, 4, 8, or 16 channel chassis that can be rack or panel mounted. The back of each chassis provides a bus for the common and system signals that are sent to and from the Facilities Module (FM002A) and the other modules in the system.

The Model FM002A is physically and electrically compatible with all Zero Two Series Modules. This module is black in color with two white push buttons dedicated to the Master Reset (at the top) and Master Accept (at the bottom). The far right slot in each Zero Two Series chassis (except the 2 channel version) is reserved for the Facilities Module. No other module will fit into the slot reserved for the Facilities Module.

The Model RK002 is the designation for the Zero Two Series Chassis. The Model RK002 is available in 2, 4, 8 and 16 channel versions with rack or panel mounting options available for each. The number of channels and the mounting option must be specified at the time of order. The 16 channel rack mounted chassis is compatible with standard 19 inch racks. Each Model RK002 chassis is equipped with an electrical bus located on the rear of each chassis. Connectors are provided so that each module in the chassis can access the bus.

General Description (*continued*)

All 16 channel chassis are provided with an extra connector at the rear of the chassis on the bus board. This connector is used for connecting multiple chassis to make larger systems. Zero Two systems may contain up to 100 modules.

All 2 channel chassis are provided with an extra connector at the rear of the chassis on the bus board. This connector is used to access the bussed input/output open collectors that are normally handled by the FM002A.

1.2 Features and Benefits

The Zero Two Series Modules provide the user with a complete Fire and Gas Detection System fully capable of Zoning, Voting, Common and Discrete Alarm and Fault monitoring.

The Facilities Module (Model FM002A) provides common Alarm, Fault, Master Reset and Master Accept functions for the Zero Two System.

- **Alarms** - Two DPDT relays are provided for common alarm indications. One relay is dedicated to the A1 alarm and the other relay is dedicated to the A2 alarm.
- **Unaccept** - One SPDT relay is dedicated to new or unacknowledged alarms.
- **Fault** - One SPDT relay is provided for common fault indications.
- **Master Reset / LED Test** - One push-button is provided for resetting latched conditions. This push-button performs an alternate function, a system-wide LED test.
- **Master Accept** - One push-button is provided for accepting new alarm conditions.
- **Live Insertion/Removal** - This feature allows the user to insert or remove a module while power is applied to the system without damage to any of the components in the system.

This chapter provides detailed specifications for the Models FM002A and RK002 Zero Two Series Components. System, mechanical, electrical and environmental specifications present the equipment in technical terms. The engineering specification provides a written description that can be inserted into specifications by architects and engineers.

2.1 System Specifications

Available chassis:

2 channel rack or panel mount
4 channel rack or panel mount
8 channel rack or panel mount
16 channel rack or panel mount

Number of channels per module:

The far right channel in each chassis (except 2 channel) has been reserved for the FM002A. The other Modules will not fit into this channel.

Warranty period:

Two Years

2.2 Mechanical Specifications

Model FM002A:

Length	9.900 inches	251 mm
Height	6.825 inches	173 mm
Width	0.750 inches	19 mm
Weight	11.20 oz.	318 grams

Chassis Panel Cutout Dimensions (see figure 2 below):

inches (mm)	Ref. A	Ref. B	Ref. C	Ref. D	Ref. E	Ref. F
2 channel rack mounted						
4 channel rack mounted	6.32 (160.5)	5.82 (147.8)	0.25 (6.4)	1.54 (39.1)	7.08 (179.8)	4.0 (101.6)
8 channel rack mounted	10.32 (262.1)	9.82 (249.4)	0.25 (6.4)	1.54 (39.1)	7.08 (179.8)	4.0 (101.6)
16 channel rack mounted	18.32 (465.3)	17.82 452.6)	0.25 (6.4)	1.54 (39.1)	7.08 (179.8)	4.0 (101.6)
2 channel panel mounted						
4 channel panel mounted	6.09 (145.7)	5.37 (136.4)	0.36 (9.14)	1.54 (39.1)	7.08 (179.8)	4.0 (101.6)
8 channel panel mounted	10.09 (256.3)	9.37 (238.0)	0.36 (9.14)	1.54" (39.1)	7.08 (179.8)	4.0 (101.6)
16 channel panel mounted	18.09 (459.5)	17.37 (441.2)	0.36 (9.14)	1.54 (39.1)	7.08 (179.8)	4.0 (101.6)

**** Inches (millimeters) ****

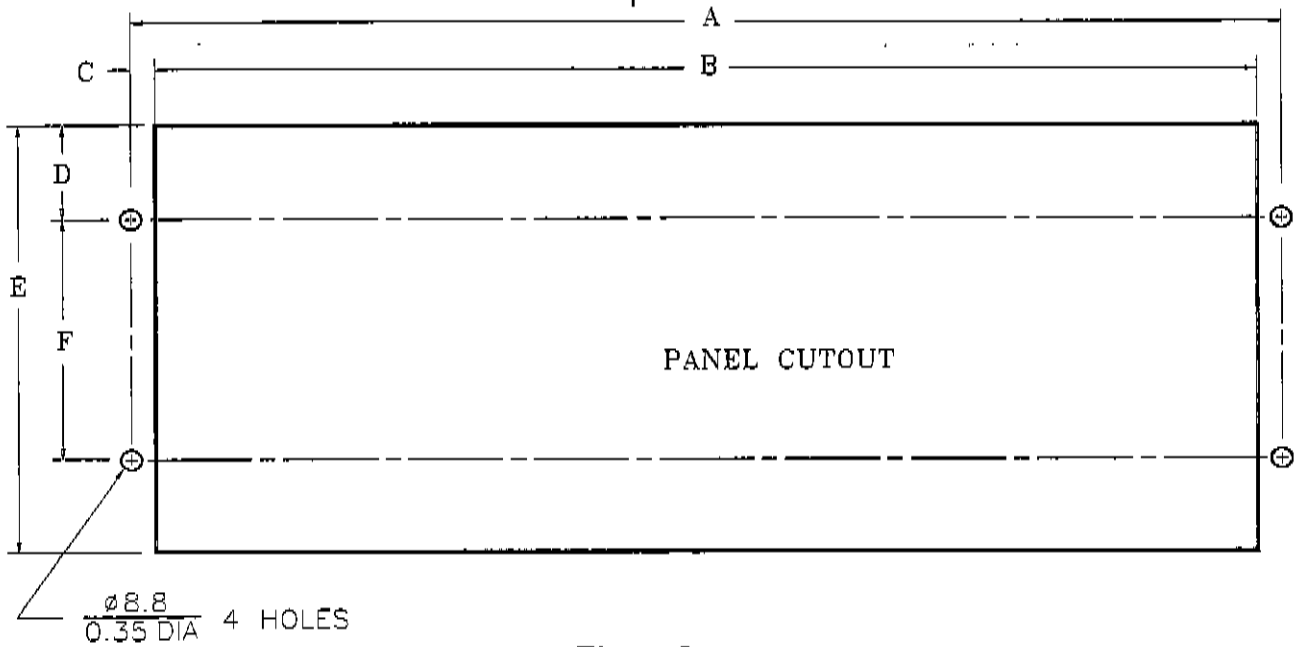

Figure 2

2.3 Electrical Specifications

Electrical Classification:

The Zero Two Series Modules & Control Room Accessories are designed for use in safe (non-hazardous) locations.

Operating Power (FM002A):

24Vdc nominal @ 125mA
20 to 32Vdc maximum range
Low Voltage Fault @ 20Vdc
(*this card will not operate below 18Vdc*)

Relay Contact Ratings (FM002A):

250Vac @ 4A, 30Vdc @ 3A resistive max.

Open Collector Ratings (FM002A):

100mA @ 35Vdc maximum

2.4 Environmental Specifications

Operating Temperature Range:

0°F to 150°F	-18°C to +66°C

Storage Temperature Range:

-40°F to 150°F	-40°C to +66°C

Operating Humidity Range:

5 to 100%	Relative Humidity (non-condensing)

2.5 Engineering Specifications

Zero Two System - Each system shall utilize modules capable of monitoring gas sensing elements or a 0 to 20mA analog signal from gas or flame detection transmitters. The system chassis shall be available in 2, 4, 8 and 16 channels. Each chassis shall contain a bus for the following independent signals:

- A1 Alarm
- A2 Alarm
- Fault
- Master Accept
- Master Reset
- Unaccept
- CAL
- +24Vdc
- System Common

Module signals shall be capable of being bussed from one chassis to another (16 channel chassis only), such that 100 modules can comprise a single system. The gas and flame detection modules shall be electrically and physically compatible and capable of being used in the same chassis to form combined fire and gas detection systems. The system shall consist of Zero Two Series component modules as manufactured by General Monitors (Lake Forest, California, U.S.A. and Galway, Republic of Ireland).

This chapter discusses what to do when a Model FM002A and the Model RK002 is received, the terminal connections & designations and what to be aware of when applying power.

3.1 On receipt of your equipment

All equipment shipped by General Monitors is pre-packed in shock absorbing containers which provide considerable protection against physical damage. The contents should be carefully removed and checked against the packing slip. If any damage has occurred or there is any discrepancy in the order, please notify General Monitors as soon as possible. All subsequent correspondence with General Monitors must specify the equipment part number and the serial number. Each item and piece of equipment is completely checked by the factory, however, a complete check-out is necessary upon initial installation and start-up to ensure system integrity.

3.2 Chassis Installation

The chassis should be mounted in a non-hazardous, protected environment and should be subjected to a minimum of shock and vibration. In installations where two or more module types have been mixed in one chassis, check that the individual channel coding strips match the channel application. The coding strips are pre-configured at the factory and the male portion is already mounted, on each module. The female portion, if unmounted, must be fastened in position on the mounting strip so as to mate with its counter part on the module. Connectors for system expansion should be fastened using the screws provided. Do not over-tighten the connector or coding strip fasteners, as this may damage the plastic molded parts.

If more than one chassis is stacked vertically within an enclosure, forced air may be required for adequate cooling.

3.3 Module Installation

Zero Two Series modules are, to a great extent, immune to electromagnetic interference (EMI). However, they should not be mounted in close proximity to a radio transmitter or similar equipment. These modules require some air circulation to avoid excessive heat build-up inside of an enclosure. The far right channel, in each chassis except the 2 channel, is dedicated to the Facilities Module (FM002A). This channel will not accommodate any other module.

3.4 Terminal Connections

When wiring the terminal connections, it will be necessary to properly strip the wire leads to the proper length (figure 3).

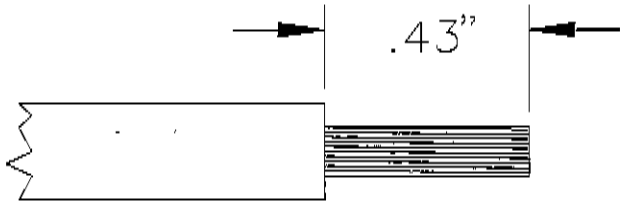

Figure 3

The terminal block accepts 16 to 22 AWG, stranded or solid core wire. 14 AWG wire may be used if it is properly stripped according to figure 3.

Contact with PC Board components should be avoided in order to prevent damage by static electricity.

Terminal Connections (*continued*)

To connect wires to the terminal block on the rear of the Model FM002A, loosen the desired screw, insert the stripped end of the wire and tighten.

Refer to figure 4 for the terminal designations for the Facilities Module (FM002A).

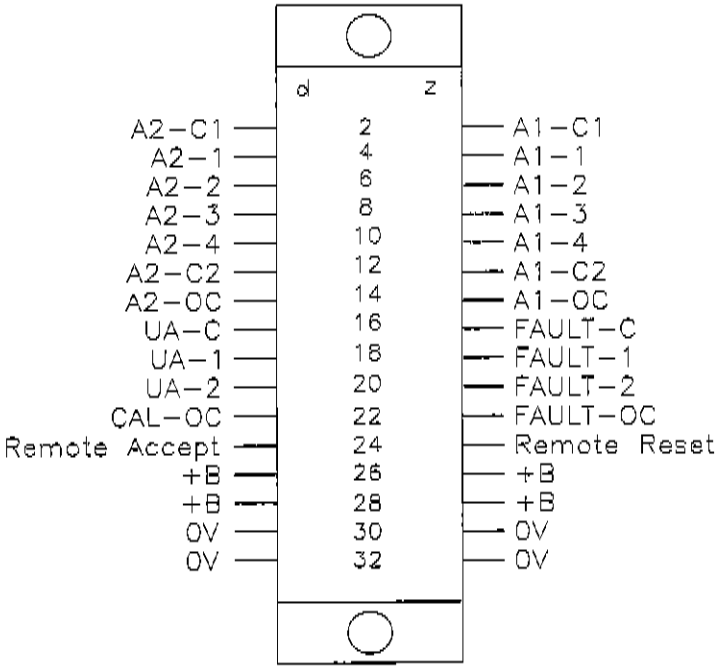

Figure 4

For the Gas and Flame Detection Modules, refer to the specific manual for detailed information on terminal connections on those modules.

The terminations for **A1** are as follows:

Label	Term	Contact
A1-C1	2z	Relay Common (1 & 2)
A1-1	4z	Relay Contact
A1-2	6z	Relay Contact
A1-3	8z	Relay Contact
A1-4	10z	Relay Contact
A1-C2	12z	Relay Common (3 & 4)
A1-OC	14z	Open Collector (OC)

The A1 alarm outputs are DPDT relays and and open collector output (A1-OC) that follows the logic of the A1 relays. The A1-C1 designation is common for the A1-1 and A1-2 contacts. The A1-C2 designation is common for the A1-3 and A1-4 contacts.

The normally open (NO) and normally closed (NC) contacts depend on a user selectable option (Energized / De-Energized). The table below refers to the proper open and closed A1 alarm relay contacts while the unit is on power.

Contacts	Normally Energized	Normally De-Energized
A1-1 & A1- C1	Normally Open	Normally Closed
A1-2 & A1-C1	Normally Closed	Normally Open
A1-3 & A1-C2	Normally Open	Normally Closed
A1-4 & A1-C2	Normally Closed	Normally Open

The terminations for **A2** are as follows:

Label	Term	Contact
A2-C1	2d	Relay Common (1 & 2)
A2-1	4d	Relay Contact
A2-2	6d	Relay Contact
A2-3	8d	Relay Contact
A2-4	10d	Relay Contact
A2-C2	12d	Relay Common (3 & 4)
A2-OC	14d	Open Collector (OC)

The A2 alarm outputs are DPDT relays and an open collector output (A2-OC) that follows the logic of the A2 relays. The A2-C1 designation is common for the A2-1 and A2-2 contacts. The A2-C2 designation is common for the A2-3 and A2-4 contacts.

Terminal Connections (*continued*)

The normally open (NO) and normally closed (NC) contacts depend on a user selectable option specified in section 4.6 of this manual. The table below refers to the proper open and closed A2 alarm relay contacts while the unit is on power.

Contacts	Normally Energized	Normally De-Energized
A2-1 & A2- C1	Normally Open	Normally Closed
A2-2 & A2-C1	Normally Closed	Normally Open
A2-3 & A2-C2	Normally Open	Normally Closed
A2-4 & A2-C2	Normally Closed	Normally Open

The terminations for **FAULT** are as follows:

Label	Term	Contact
F-C	16z	Relay Common
F-1	18z	Relay Contact (NO)
F-2	20z	Relay Contact (NC)
F-OC	22z	Open Collector (OC)

The Fault outputs are SPDT relays and 1 open collector (F-OC) that follows the logic of the Fault relays. The F-C designation is common for the F-1 and F-2 contacts. The Fault outputs are always normally energized when power is applied to the module.

NOTE: *There are no fault relay options. The standard configuration for the fault relay is normally energized and non-latching.*

The terminations for **UA** are as follows:

Label	Term	Contact
UA-C	16d	Relay Common
UA-1	18d	Relay Contact
UA-2	20d	Relay Contact

The UA outputs are SPDT relays only. The UA-C designation is common for the UA-1 and UA-2 contacts. The normally open (NO) and normally closed (NC) contacts for the UA relay depend on a user selectable option (Energized / De-Energized).

The table below refers to the proper open and closed UA relay contacts while the unit is on power.

Contacts	Normally Energized	Normally De-Energized
UA-1 & UA- C	Normally Open	Normally Closed
UA-2 & UA-C	Normally Closed	Normally Open

The termination for **CAL** (section 4.7) is:

Label	Term	Contact
CAL	22d	Open Collector

Inductive loads (bells, buzzers, relays, etc.) on dry relay contacts must be clamped down. Unclamped inductive loads can generate voltage spikes in excess of 1000 volts. Spikes of this magnitude may cause false alarms and contact damage. Figures 5 & 6 show relay protection circuits that are recommended for DC and AC loads, respectively.

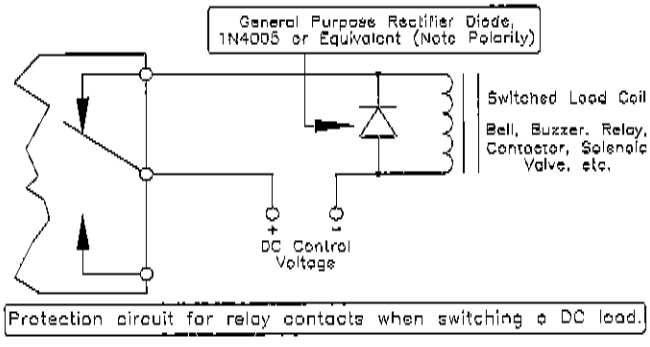

Figure 5

Terminal Connections (*continued*)

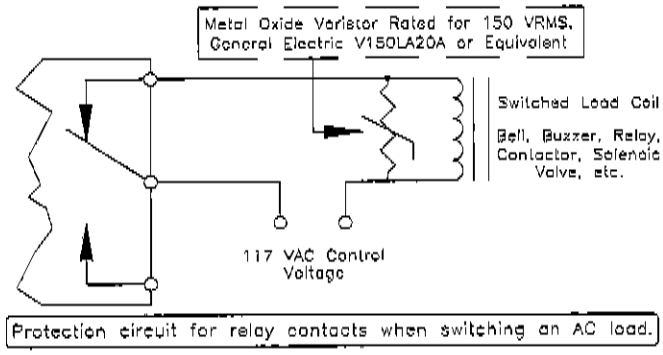

Figure 6

The relay contact ratings for the A1 alarm, A2 alarm, Fault and UA outputs are 4A @ 250Vac, 3A @ 30Vdc, resistive, max.

Figure 7 illustrates some typical open collector external circuits.

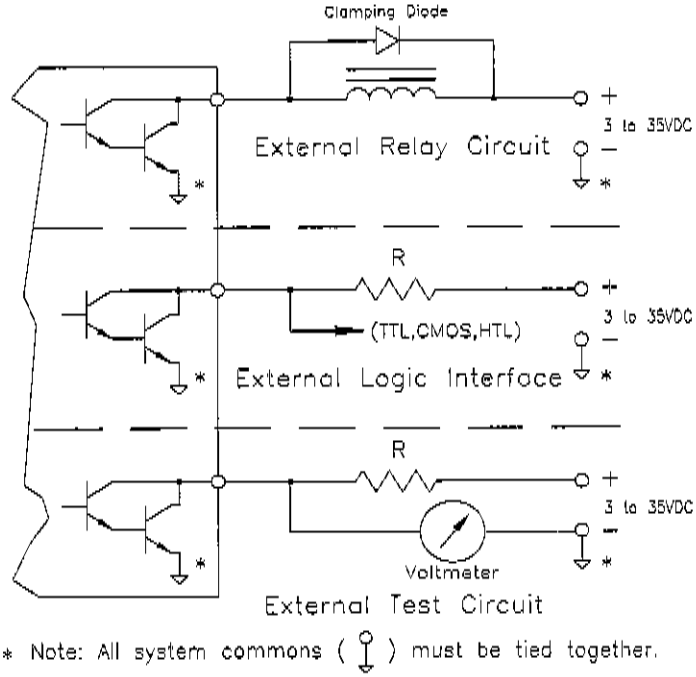

Figure 7

The electrical rating for all open collector outputs is 100mA @ 35Vdc.

The termination for remote **RESET** is:

Label	Term	Contact
Reset	24z	Remote Reset Terminal

The termination for remote **ACCEPT** is:

Label	Term	Contact
Accept	24d	Remote Accept Terminal

Figure 8 illustrates the terminal connections for the remote ACCEPT and RESET.

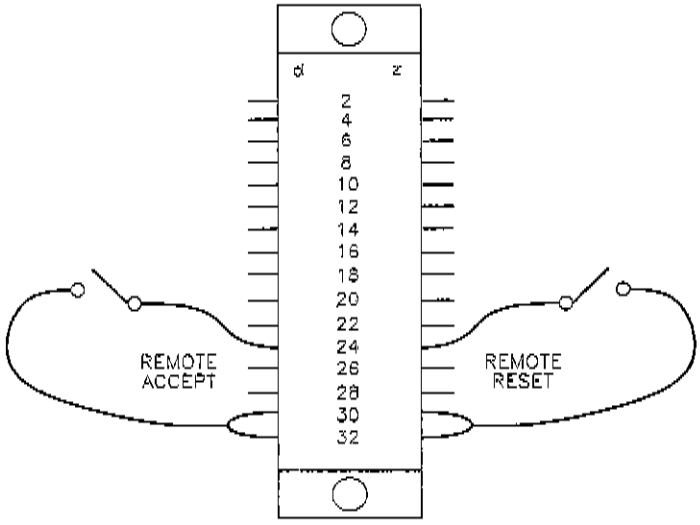

Figure 8

The terminations for the **Alternate Power Supply** input are:

Label	Term	Contact
B+	26d,z	Alternate +24VDC input
B+	28d,z	Alternate +24VDC input
0V	30d,z	Alternate common input
0V	32d,z	Alternate common input

Terminal Connections (*continued*)

Figure 9 illustrates the terminal connections for the Alternate Power Supply.

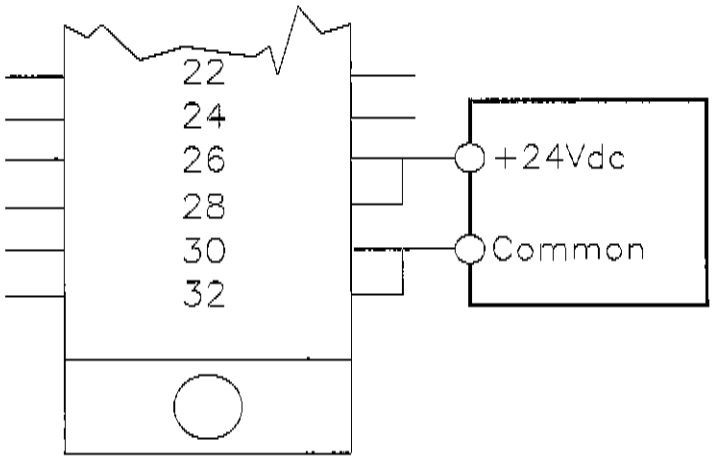

Figure 9

3.5 Applying Power

Zero Two Series Modules do not have an ON/OFF power switch. Each module in the Zero Two Series is designed to operate on 24Vdc nominal voltage. The current requirements will vary according to the number and type of modules in the system, as well as the number and type of field devices. *If the Model FM002A does not perform properly after the initial application of power check fuse F1 on the control board.*

The power connections for all of the Zero Two Chassis are located on the bus board at the rear of each chassis (see figure 10).

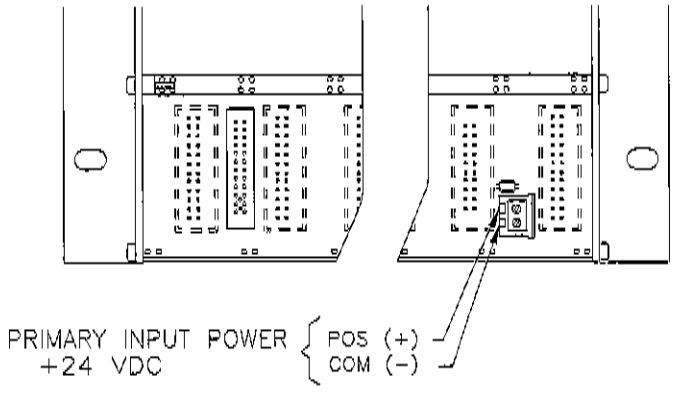

Figure 10

This chapter discusses what general maintenance to perform, describes the electrical inputs, electrical outputs, accepting & resetting alarms & fault and the user selectable options.

4.1 General Maintenance

Once the Model FM002A has been installed, no maintenance, other than periodic checks to verify the integrity of the system is required.

- Each gas and flame detection site, in the field, should be evaluated to determine the frequency of calibration checks.
- A functional test of the system should be performed at least once each year. This test should include full operation on stand-by systems or back up power for the prescribed period.
- An LED test may be performed by depressing the Master RESET switch on the Facilities Module for more than 2 seconds (see section 4.5 of this chapter).

4.2 Electrical Inputs

The Facilities Module receives all of it's input signals from the bus located on the rear of the Zero Two Series Chassis. They are:

A2 (A2 Alarm)
A1 (A1 Alarm)
Fault
UA (Unaccept)
CAL
Accept
Reset
+24Vdc
Common

The A2, A1, Fault, UA and CAL input signals are the source for the common outputs described in section 4.3 of this chapter and section 3.4 of the previous chapter.

The Accept and Reset input signals are looped to the output, as described in section 4.3 of this chapter, in order to provide each module in the system with a common Accept & Reset function. The Accept and Reset functions are accessed via push buttons on the front panel of the Facilities Module.

The alternate power supply connections are made via the rear terminal block as discussed previously in section 3.4 of the previous chapter.

Other inputs include the remote accept and remote reset features (see sections 4.4 & 4.5 of this chapter).

4.3 Electrical Outputs

The Facilities Module provides a variety of common outputs. The following outputs have rear terminal relay contacts:

A1 Alarm - DPDT relay contacts
A2 Alarm - DPDT relay contacts
Fault - SPDT relay contacts
Unaccept (UA) - SPDT relay contacts

All of the relay contacts on the Model FM002A have a maximum rating of:

4A @ 250Vac, 3A @ 30Vdc resistive

The following outputs have rear terminal open collectors:

A1 Alarm
A2 Alarm
Fault
CAL

All of the open collector outputs on the Model FM002A have a maximum rating of:

100mA @ 35Vdc

Electrical Outputs (*continued*)

When any gas or flame detection module activates an alarm (A1 or A2), the associated alarm outputs on the Facilities Module will activate. The energized/de-energized options for the A1 and A2 alarm outputs are user selectable (see section 4.5 of this chapter). The latching/non-latching logic of the A1 & A2 alarm outputs will follow the logic of the module that generated the alarm signal. The latching/non-latching options for the gas and flame detection modules are user selectable. Refer to the specific instruction manual for selecting these options on each module.

If the output for a particular alarm (A1 or A2) on the Facilities Module is selected as de-energized, the open collector output that is associated with that alarm will not sink current until the alarm condition occurs. If an open collector device is sinking current, it is providing a path to ground. When it is not sinking current, it is in an electrical state of high resistance (Mega-Ohms or infinity). The converse is true also. If an alarm output is selected as energized, the open collector output that is associated with that alarm will sink current until the alarm condition occurs.

When any gas or flame detection module activates its Fault outputs, the Fault outputs on the Facilities Module will activate also. The fault output configuration is standard and not user selectable. The fault output configuration is normally energized and non-latching.

With all modules in the Zero Two Series the following is true with respect to fault or malfunction conditions:

- A loss of power to the system will cause the fault outputs to de-energize.
- If a fault condition occurs and is corrected, the unit will return to a normal operating condition.
- The open collector output associated with the fault outputs will sink current until the fault occurs.

4.4 Master Accept

The Master Accept button is provided so that new alarm conditions can be acknowledged and the UA can be de-activated. The Master Accept button is located in the lower portion of the front panel on the Facilities Module.

When any gas or flame detection module activates a new alarm, the UA outputs activate also. The associated LED on the front panel of the module that went into alarm will be "flashing". The UA open collector on the same module will activate along with the UA output on the Facilities Module. When the Master Accept button is pressed, the UA outputs on the module in alarm and on the Facilities Module will de-activate. The front panel LED will go from a "flashing" state to a "steady on" state. If any new alarm occurs, these same actions will be repeated.

Master Accept (*continued*)

There is a rear terminal connection for remote Accept operation (see section 3.4 of the previous chapter). In order to use this remote feature, connect one end of a normally open switch (SPST) to the terminal designated for remote Accept and the other end to system common. The remote switch will perform the same function as the front panel button. General Monitors recommends that a normally open push-button switch be used in these applications.

4.5 Master Reset & LED Test

The Master Reset button is provided so that latched alarm conditions can be reset (i.e. de-activated). The Master Reset button is located in the upper portion of the front panel on the Facilities Module.

The Master Reset button is used to reset any latched alarm condition(s) that have occurred and are no longer present. When any module in the system goes into alarm and the condition that caused the alarm has gone away and the alarm output is latched, depressing the Master Reset button on the Facilities Module will return the output to its normal state. There is a rear terminal connection for remote Reset operation (see section 3.4 of the previous chapter). In order to use this remote feature, connect one end of a normally open switch (SPST) to the terminal designated for remote Reset and the other end to system common. The remote switch will perform the same function as the front panel button. General Monitors recommends that a normally open push-button switch be used in these applications.

There is a special "Latching Over-Range" feature on two of the Zero Two Series Gas Detection Modules (Models 4802A & TA102A). Any time a gas concentration that exceeds full scale is detected, this feature is activated. All of the alarm and display outputs on the affected Module(s) will latch. When the condition that activates the Latching Over-Range feature goes away, the Module(s) will need to be reset. Any other latched A1 or A2 alarm will also need to be reset. Some conditions may require a user to press the Master Reset button twice (i.e. the Master Reset button should be pressed once to remove the Latching Over-Range and once more to remove any latched A1 or A2 conditions).

An LED test can be performed by depressing the Master Reset button for more than two seconds. When activated, all front panel LEDs and 7-segment displays will illuminate for as long as the Master Reset button is depressed. When the button is released the LEDs and 7-segment displays will return to their normal state reflecting the current status condition of each module.

4.6 User Selectable Options

The table below indicates the settings for the user selectable options (DIP switch SW3) on the Facilities Module. See Appendix B for SW3 location.

Switch	OPEN	CLOSED
1	A1 Alarm Outputs are Normally De-Energized	A1 Alarm Outputs are Normally Energized
2	A2 Alarm Outputs are Normally De-Energized	A2 Alarm Outputs are Normally Energized
3	UA Alarm Outputs are Normally De-Energized	UA Alarm Outputs are Normally Energized
4	NOT USED AT THIS TIME	

4.7 CAL Open Collector

There is an open collector that will energize when a module in the system is placed in the Calibration Mode or the Calibration Check Mode. This open collector output is present on the Models 2602A, 4802A, TA102A, TA202A and the FM002A.

In the case of the Trip Amplifier Modules (TA102A & TA202A) the Field Device must transmit a 1.5mA Signal to the Module in order for this output to energize. In the case of the Control Modules (2602A & 4802A) the user must enter the Calibration Mode or Calibration Check Mode. If a Trip Amplifier receives a 1.5mA signal or the user places a Control Module in the CAL or CAL Check Mode this output will activate on the FM002A (common CAL / CAL Check output).

This output is referenced to the system's ground/common as is the case with all open collector outputs in the system.

- Energizing this output merely provides a path to ground.
- De-Energizing this output places the open collector in a high impedance state.

Glossary of Terms

AC - Alternating Current.

Alarm Set Point - This is a fixed value that can be set by the user. When this value is exceeded, the microprocessor will activate the Alarm Relay.

Analog - Continuous, without steps.

Ambient Temperature - Surrounding or background temperature.

AWG - American Wire Gauge.

Calibration - Applying a known level of gas to a sensor and making adjustments so that the output signal matches the level of gas applied.

Canadian Standards Association - CSA is an approval agency. Testing laboratories will test Gas Detection Equipment to the standards that are set by approval agencies such as CSA. CSA certification is required for selling such equipment in Canada. CSA standards are recognized by many organizations outside of Canada.

Class I, Division 1, Groups B, C & D - This is a National Electric Code (NEC) classification dealing with hazardous locations, the degree with which the hazard is present, and the type of hazard that is present. Class I, Division 1 is defined as any location where ignitable concentrations of flammable gases or vapors may be present under normal operating conditions.

COM - Common.

Combustible Gases - Any elements or compounds, when in a gaseous or vaporous state, that can support combustion.

Conduit - Tubing, pipe or a protected trough for electrical wires.

DC - Direct Current.

DCS - Distributed Control System.

De-Energized - A relay is de-energized when it is at mechanical rest. That is, the position of the contacts will not change until power is applied to the relay.

Digital - Stepped in specific increments.

DPDT - Double Pole Double Throw. Each Pole is a set of throws. Each Throw is a normally open or closed set of contacts. A double throw is one of each. So a DPDT relay has 2 open and 2 closed sets of contacts.

Drain Loop - The purpose of a drain loop is to collect condensation so as to prevent moisture from entering the housing.

Energized - When a relay is energized, power is applied to the relay such that the contacts are held in a position for as long as the power is applied.

FMRC - Factory Mutual Research Corporation.

Group B is atmospheres containing more than 30% Hydrogen or gases/vapors of equivalent hazard.

Group C is atmospheres such as cyclopropane, ethyl ether, ethylene, or gases/vapors of equivalent hazard.

Group D is atmospheres such as acetone, ammonia, benzene, butane, ethanol, gasoline, hexane, methanol, methane, natural gas, naphtha, propane, or gases/vapors of equivalent hazard. For more information on Hazardous Locations, refer to the National Electrical Code, Article 500.

Latching - To latch is to hold on to. A latching condition is a result of a condition occurring and going away, but the signal will be held by the electronics until manually reset.

Glossary of Terms (*continued*)

mA - Milliampere, One thousandth (.001) of an amp.

Microprocessor Based Electronics - All of the input signal processing, fault monitoring, calibrating routines, and the outputs are controlled by a microprocessor.

MPU - Microprocessor Unit.

Non-Latching - A non-latching condition exists when the signal follows the condition (i.e. if a condition occurs, a signal occurs; if the condition returns to normal, the signal returns to normal). The signal automatically resets.

PLC - Programmable Logic Controller.

Potentiometer - An adjustable resistor.

PTFE - Polytetrafluoroethylene, otherwise known by its trade name, Teflon.

RFI - Radio Frequency Interference.

SPDT - Single Pole Double Throw. Each Pole is a set of throws. Each Throw is a normally open or closed set of contacts. A double throw is one of each. So an SPDT relay has 1 open and 1 closed set of contacts.

TB - Terminal Block.

Engineering Documentation

Schematic - Facilities Module

Reference 11205-3

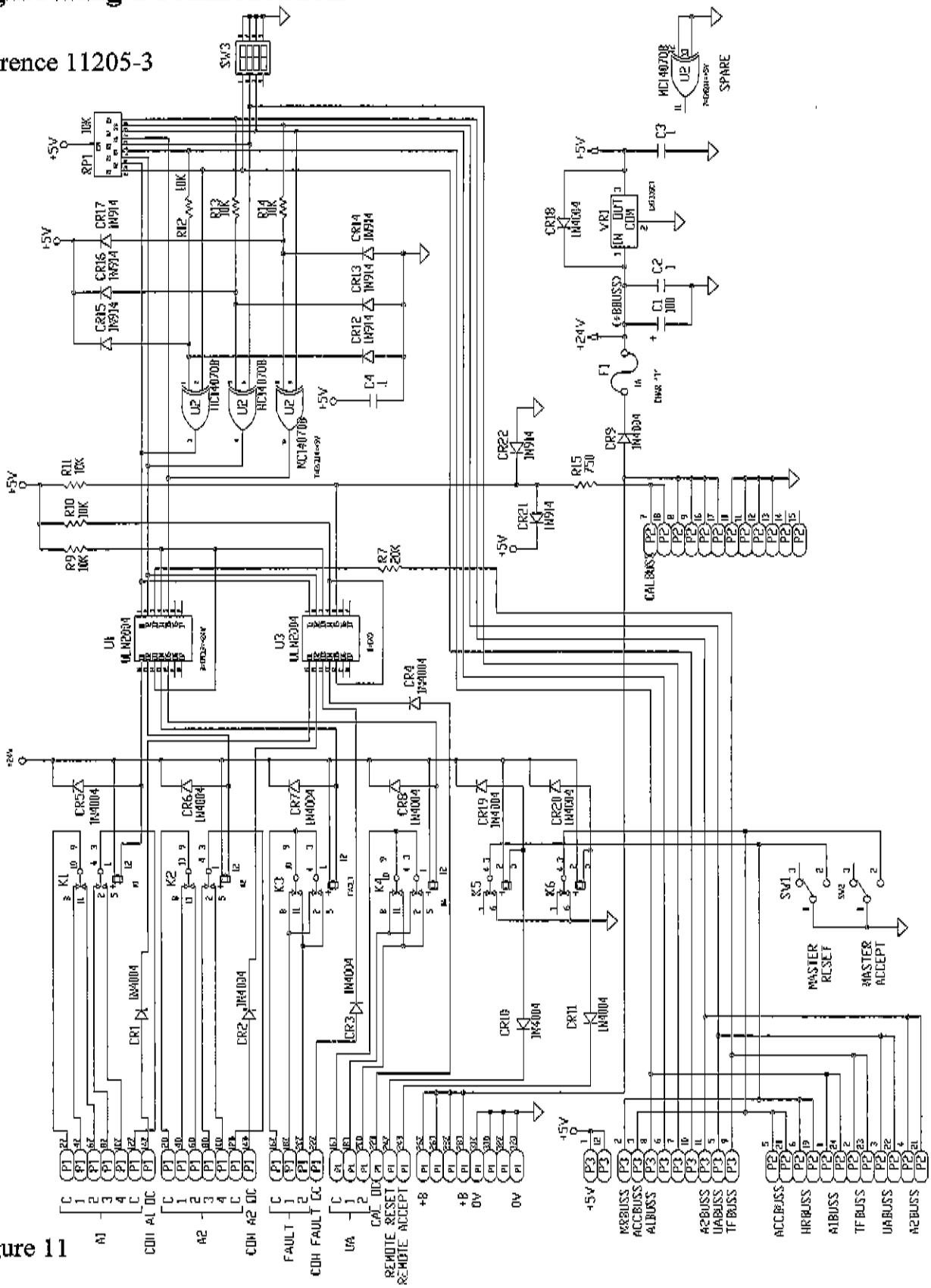

Figure 11

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Engineering Documentation (*continued*)

Circuit Card Assembly - Facilities Module

Reference 11206-3

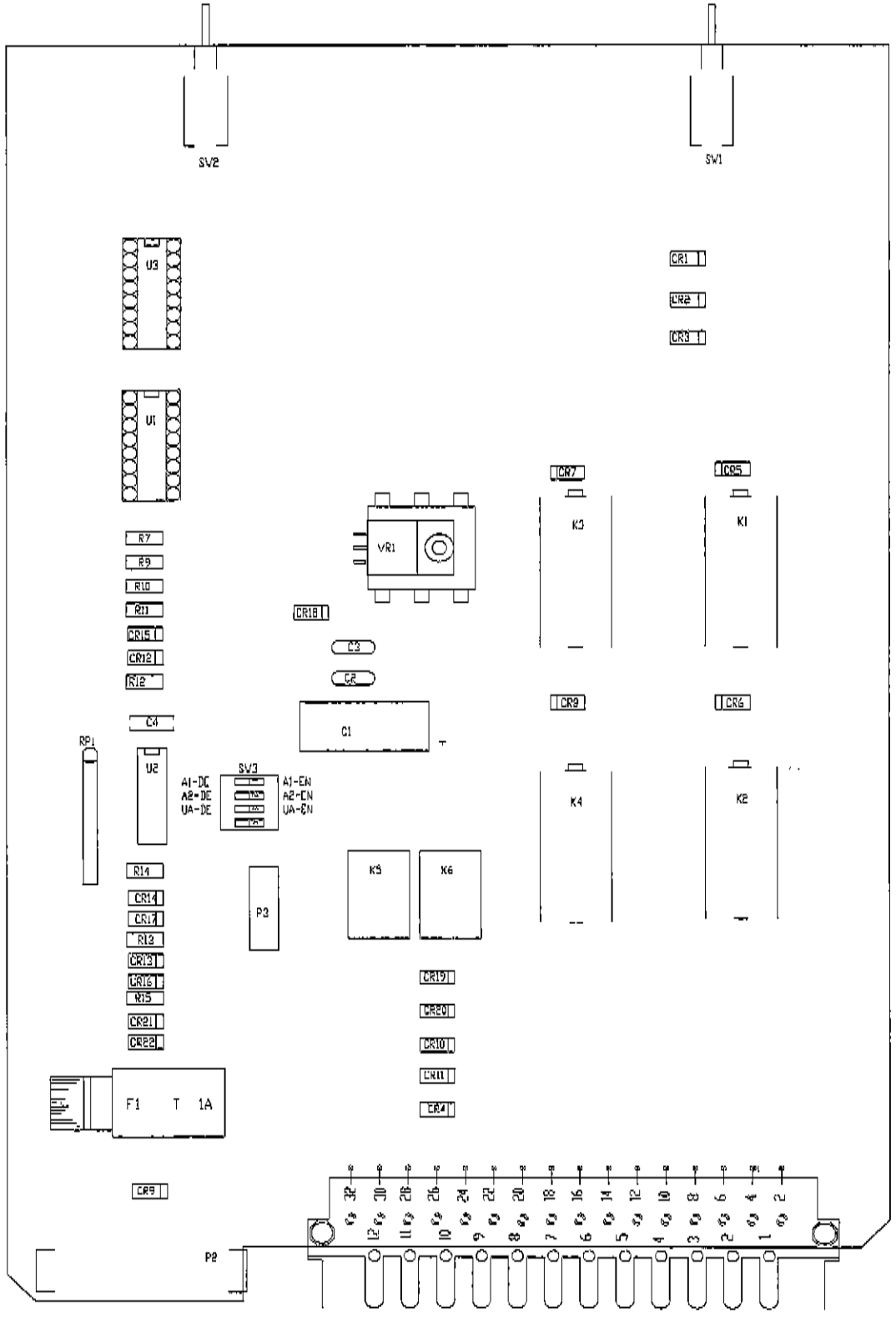

Figure 12

Engineering Documentation (*continued*)

Final Assembly - Facilities Module

Reference 11200-1

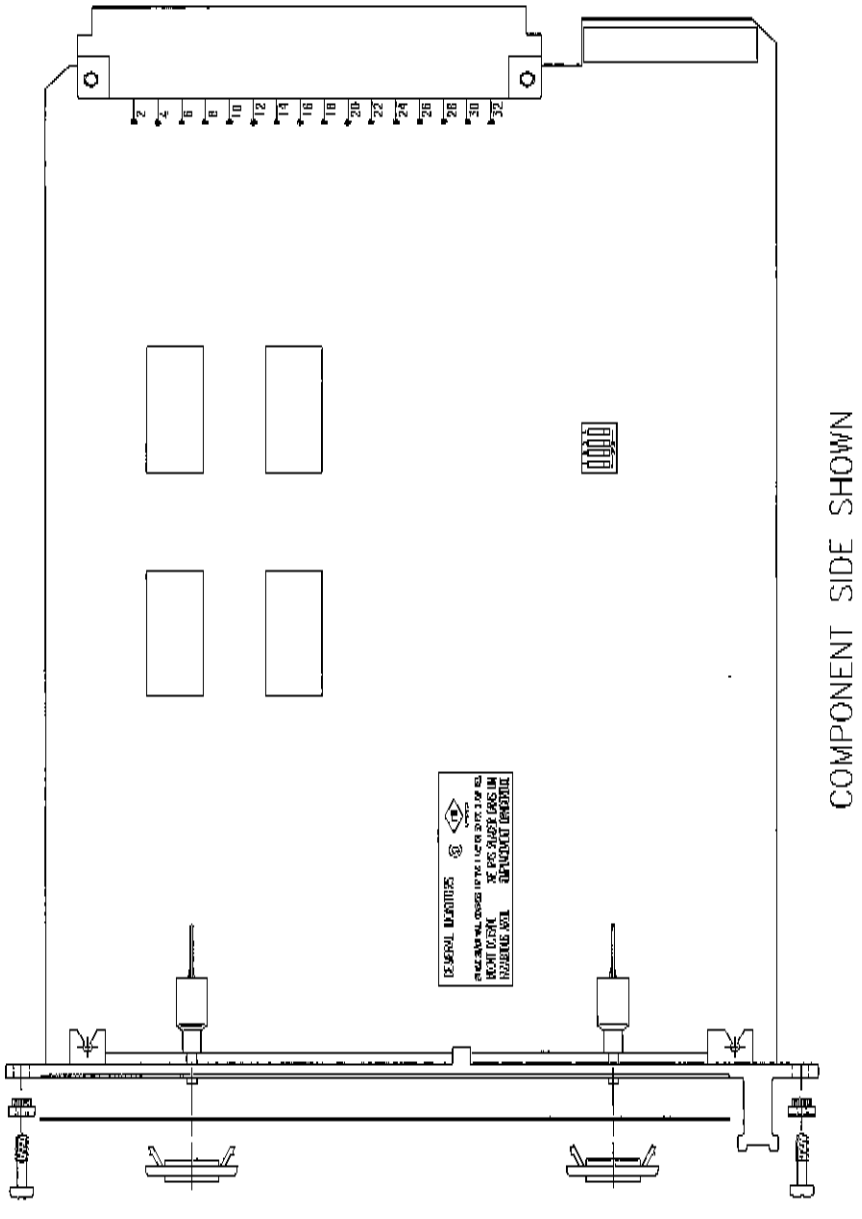

Figure 13

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Engineering Documentation (*continued*)

Exploded Assembly - 4 Channel Chassis

Ref # 10683-5 (rack) or 10727-5 (panel)

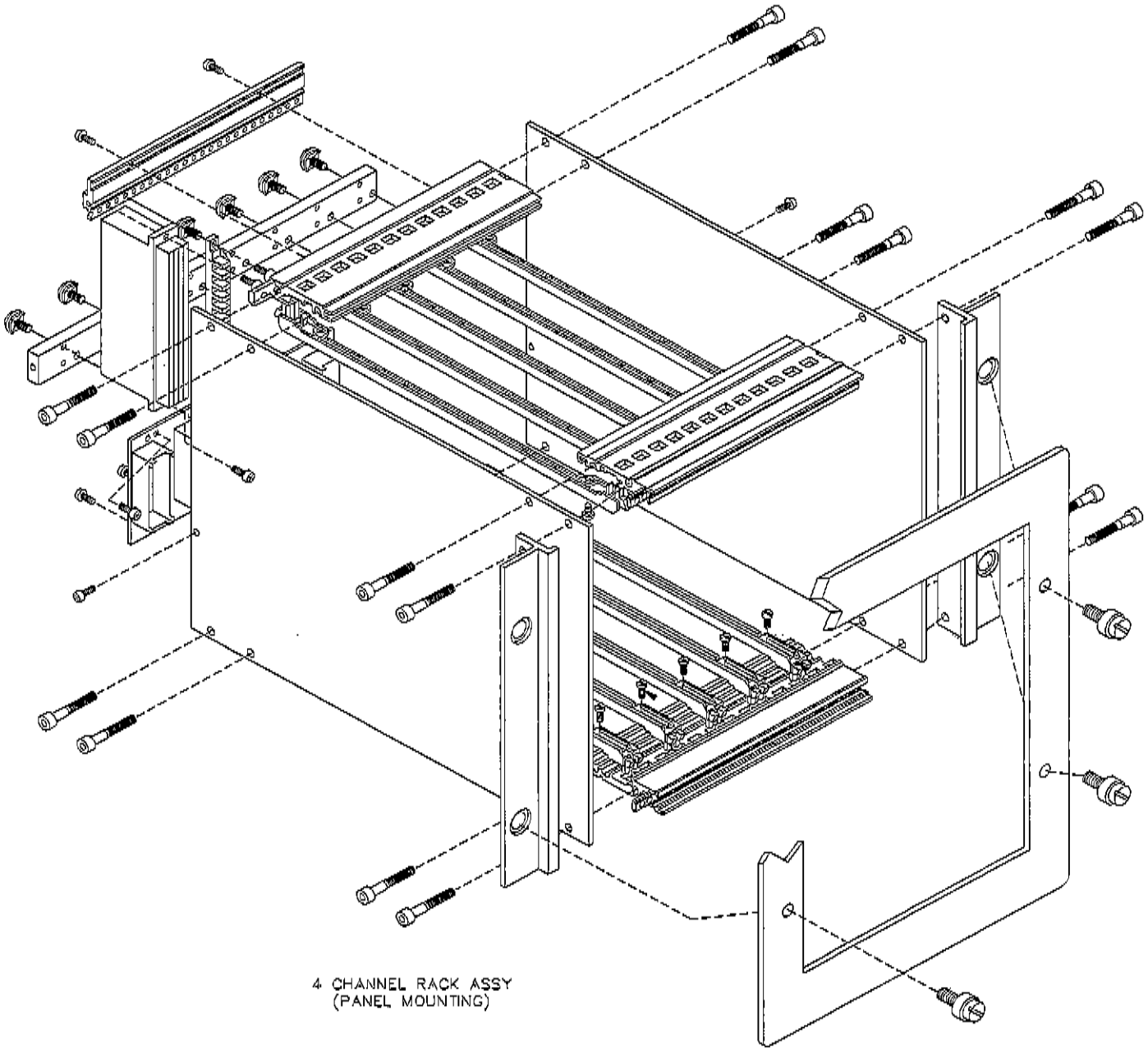

Figure 14

Engineering Documentation (*continued*)

Exploded Assembly - 8 Channel Chassis

Ref # 10683-9 (rack) or 10727-9 (panel)

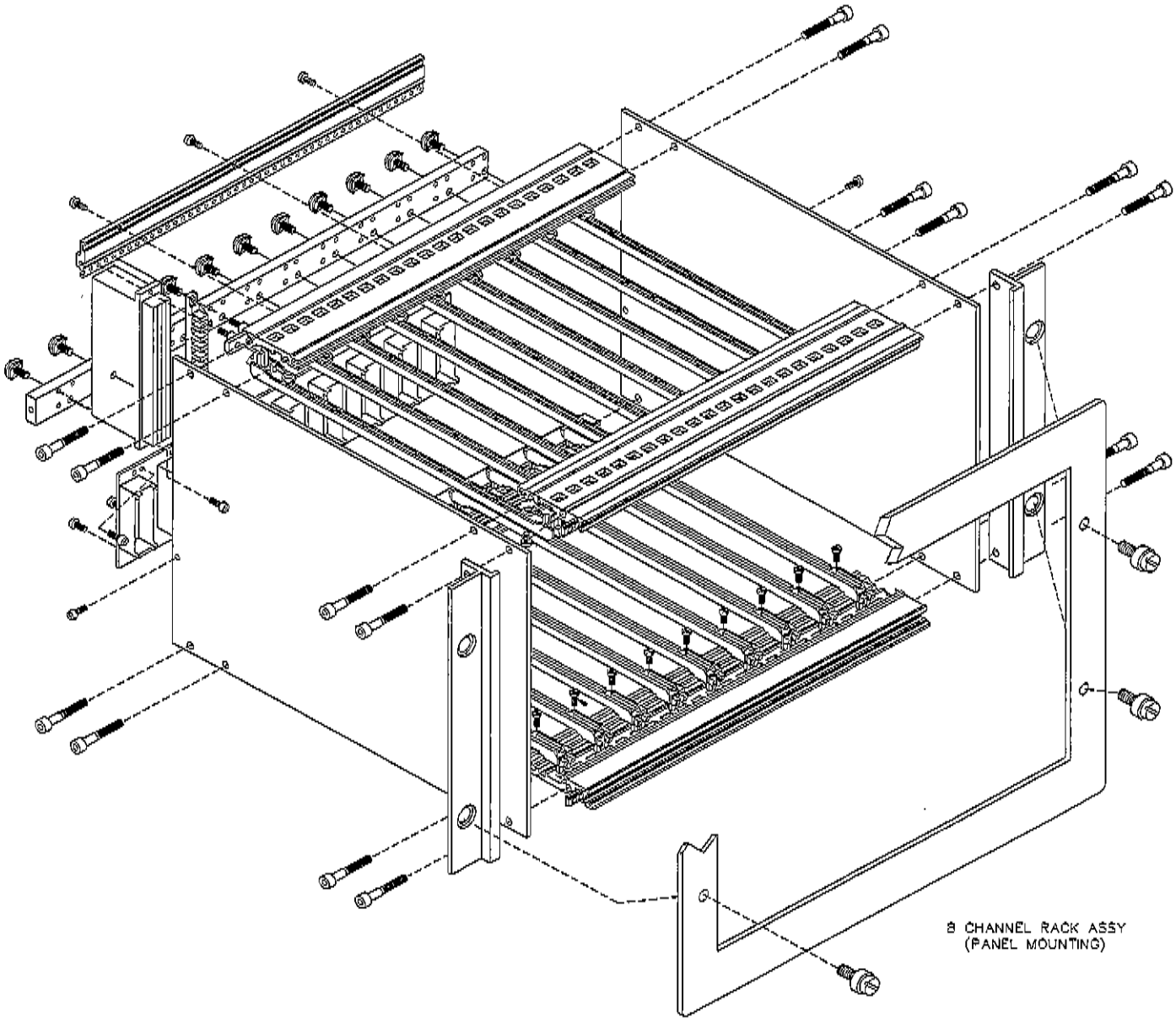

Figure 15

Engineering Documentation (*continued*)

Exploded Assembly - 16 Channel Chassis

Ref # 10683-17 (rack) or 10727-17 (panel)

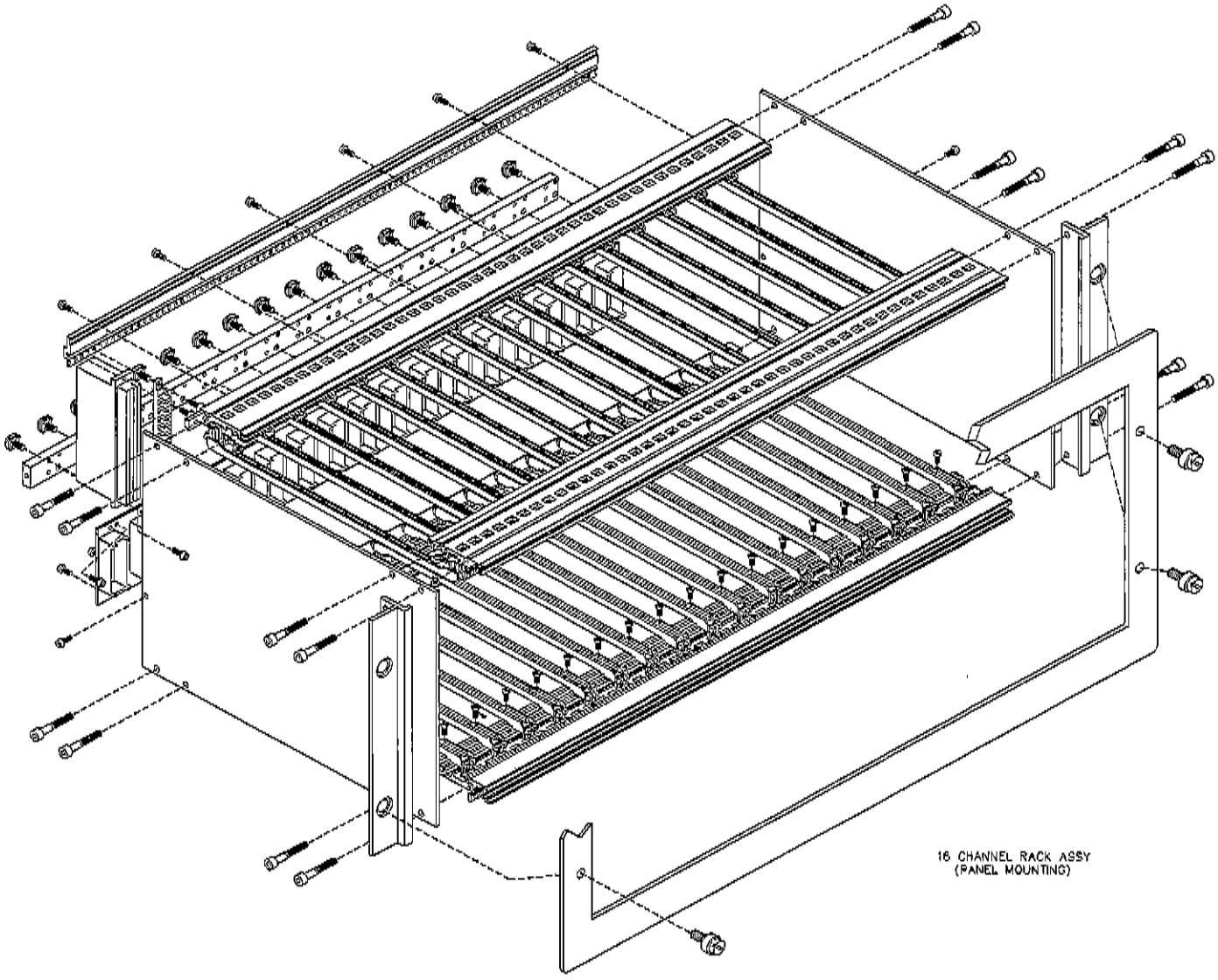

Figure 16

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Ordering Information (*continued*)

The standard configuration for a Zero Two Series Chassis is "RK02-000-000-302".

The options for this configuration are:

RK02 - 0 0 0 - 0 0 0 - □ 0 □

- Cards
  - 1 = Cards Installed
  - 2 = Cards Not Installed (Std)
- Rack Size
  - 1 = 4 Channel Rack Mount
  - 2 = 8 Channel Rack Mount
  - 3 = 16 Channel Rack Mount (Std)
  - 4 = 4 Channel Panel Mount
  - 5 = 8 Channel Panel Mount
  - 6 = 16 Channel Panel Mount
  - 7 = 2 Channel Rack Mount
  - 8 = 2 Channel Panel Mount

Zero Two Series Modules

Model 2602A
Zero Two Series Control Module
for Hydrogen Sulfide Gas
Applications

Model 4802A
Zero Two Series Control Module
for Combustible Gas
Applications

Model TA102A
Zero Two Series Trip Amplifier Module
for Combustible Gas
Applications

Model TA202A
Zero Two Series Trip Amplifier Module
for Hydrogen Sulfide Gas
Applications

Model TA402A
Zero Two Series Trip Amplifier Module
for Flame Detection
Applications

Model TA502A
Zero Two Series Trip Amplifier Module
for Generic Gas Detection
Applications

Model FM002A
Zero Two Series Facilities Module
Performs Common Functions
for Zero Two Systems

Model RL002
Zero Two Series Relay Module
Provides Extra Output Capacity
for Zero Two Systems

Model ZN002A
Zero Two Series Zone Control Module
Performs Zoning and Voting Functions
for Zero Two Systems

Model MD002
Zero Two Series Driver Card
for Monitoring / Driving High Current
Output Devices

Model IN042
Zero Two Series Four Zone Input Card
for Callpoints, Smoke & Thermal
Detection Applications

Model PS002*
Zero Two Series Power Supply Module
for Zero Two Systems

* = Non-European Countries Only.