GENERAL MONITORS

MODEL FM002A/RK002

Zero Two Series Facilities Module and Rack & Panel Mounted Chassis

INSTRUCTION MANUAL 01/99

Part No. MANFMRK02
Rev: J/01.99

GENERAL MONITORS

Model FM002A & RK002

Warranty Statement

General Monitors warrants the Model FM002A and the RK002 Zero Two Series components to be free from defects in workmanship or material under normal use and service within two (2) years from the date of shipment. General Monitors will repair or replace without charge any such defective equipment to be found 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 prepaid to General Monitors' plant or the representative from which shipment was made. In all cases this warranty is limited to the cost of the equipment supplied by General Monitors. The customer will assume all liability for the misuse of this equipment by its employees or other personnel. All warranties are contingent upon proper use in the application for which the product was intended 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 use or performance of the product.

Warnings

* TOXIC, COMBUSTIBLE & FLAMMABLE GASES ANI VAPOURS 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 sensor 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.

- To comply with EMC Directive for CE Mark, each chassis must have top and bottom covers installed. This only applies when ordering Zero Two Series Cards for installation after January 1st 1996, within the EU. Contact GM for details. (Covers will be shipped as standard from 1996 onwards).

GENERAL MONITORS

Model FM002A & RK002

EC Declaration of Conformity in accordance with EC Directives

We at General Monitors Ireland Limited, Ballybrit Business Park, Galway, Republic of Ireland, hereby declare that the equipment described below, both in its basic design and construction, and in the version or versions marketed by us, conforms to the relevant safety and health related requirements of the appropriate EC Directives, only as follows.

a) Conforms with the protection requirements of Council Directive 89/336/EEC, + Amd 92/31/EEC, + Amd 93/68/EEC relating to Electromagnetic Compatibility, by the application of:

A Technical Construction File No. 95005, Competent Body Certificate No. 4473-95-106 and Report No. 4473/1K8.

and

b) Conforms with protection requirements of IEC 1010-1:1990 + Amd 1: 1992 (+ Amd 2: 1995 as applicable) relating to safety by the application of:

A Technical Construction File No. 95005 and Competent Body Certificate No. 4146/699L-6870, 4146/1119/9510 and 4146/1119/9507 issued by:

ERA Technology Ltd. Cleeve Road, Leatherhead, Surrey, KT22 7SA, England. Tel: +44-1372-367000

This declaration shall cease to be valid if modifications are made to the equipment without our approval.

PRODUCT: 02 series gas, flame and fire detection and monitoring cards
MODEL/S: 4802A, 2602A, TA102A, TA202A, TA402A, TA502A, IN042, ZN002A, MD002, FM002A and 02 series chassis.

It is ensured through internal measures and our ISO 9001: 1994 certification, that series production units conform at all times to the requirements of these current EC Directives and relevant standards.

Responsible Person _____ Date 15.07.97

General Manager Eur. Ops

The signatory acts on behalf of the company management, and with full power of attorney.

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Model FM002A & RK002 — Introduction

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 and benefits of the Zero Two Series Facilities Module.

Safety Warning

Installation and Maintenance must be carried out by suitably skilled and competent personnel only.

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 (PFG approved)
2602A	Hydrogen Sulphide (H_2S)Gas Sensors
TA102A	Combustible Gas Smart Sensors/IR Point Detector (PFG approved)
TA202A	Hydrogen Sulphide (H_2S) Gas Smart Sensors
TA402A	FL3000 Family of Flame Detectors and FL2000 Family of Flame Detectors
TA502A	Multipurpose Module

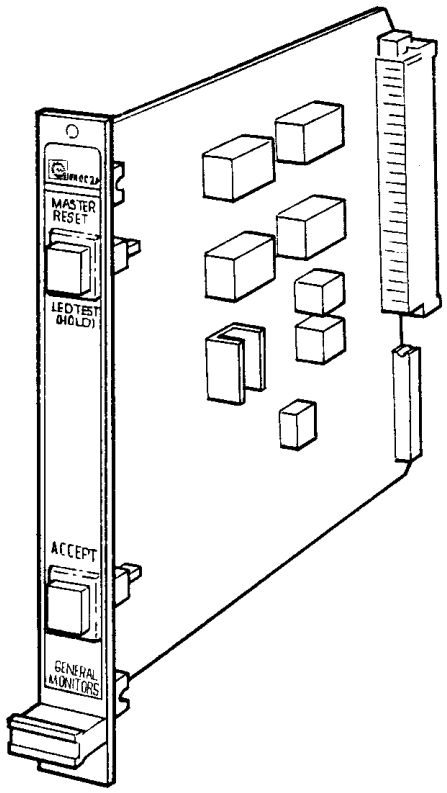


Figure 1

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

Module	Description
FM002A	Facilities Module (Fig. 1)
IN042	Four Zone Input Module
ZN002A	Zone Control Module
MD002	Monitored Solenoid Driver

The Zero Two Series modules reside in a 4, 8 or 16 channel chassis that can be rack or panel mounted. The back of each chassis provides a buss for the common and system signals that are sent to and from the Facilities Module (FM002A) and other modules in the system. The Model FM002A is electrically compatible with all Zero Two Series Modules. This module is black in colour with two white push buttons dedicated to the Master Reset (at the top) and Accept (at the bottom). The far right slot in each Zero Two Series chassis is reserved for the Facilities Module. No other module will fit into this slot. The Model RK002 is the designation for the Zero Two Series Chassis, available in 4, 8 & 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 buss located on the rear of each chassis. Connectors are provided on the buss so that each module in the chassis can access the buss. All 16 channel chassis are provided with an extra connector at the rear of the chassis on the buss board. This connection is used for connecting multiple chassis, to make larger systems. Zero Two systems may contain up to 100 modules.

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 (FM002A) provides common Alarm, Fault, Master Reset and Master Accept functions for the Zero Two System. One FM002A can support up to maximum of 100 modules.

* **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 is dedicated to new or unacknowledged alarms.
* **Fault** - One SPDT relay is provided for common fault indications.
* **Master Reset** - LED Test - One pushbutton is provided for resetting latched conditions. This pushbutton performs an alternate function, a system-wide LED test. (Can be remotely activated).
* **Accept** - One pushbutton is provided for accepting new alarm conditions. (Can be remotely activated).
* **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 Modules FM002A and RK002 Zero Two Series Components. System, mechanical, environmental specifications present the equipment in technical terms. The engineering specifcation provides a written specification that can be inserted into another written specification by architects and engineers.

2.1 System Specifications

Available chassis:

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

Number of channels for modules

4, 8 or 16

The far right channel in each chassis 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: 251mm (9.900")
Height: 173mm (6.825")
Width: 19mm (0.750")
Weight: 318 grams (11.20 oz)

Chassis Panel Cutout dimensions, see figure 2 below.

mm (Inches)	Ref. A	Ref. B	Ref. C	Ref. D	Ref. E	Ref. F
4 channel rack mounted	160.5 (6.32)	147.8 (5.82)	6.4 0.25)	39.1 (1.54)	179.8 (7.08)	101.6 (4.0)
8 channel rack mounted	262.1 (10.32)	249.4 (9.82)	6.4 (0.25)	39.1 (1.54)	179.8 (7.08)	101.6 (4.0)
16 channel rack mounted	465.3 (18.32)	452.6 (17.82)	6.4 (0.25)	39.1 (1.54)	179.8 (7.08)	101.6 (4.0)
4 channel panel mounted	145.7 (6.09	136.4 (5.37)	9.14 (0.36)	39.1 (1.54)	179.8 (7.08)	101.6 (4.0)
8 channel panel mounted	256.3 (10.09)	238.0 (9.37)	9.14 9).36)	39.1 (1.54)	179.8 (7.08)	101.6 (4.0)
16 channel panel mounted	459.5 (18.09)	441.2 (17.37)	9.14 (0.36)	39.1 (1.54)	179.8 (7.08)	101.6 (4.0)

Millimeters (Inches)

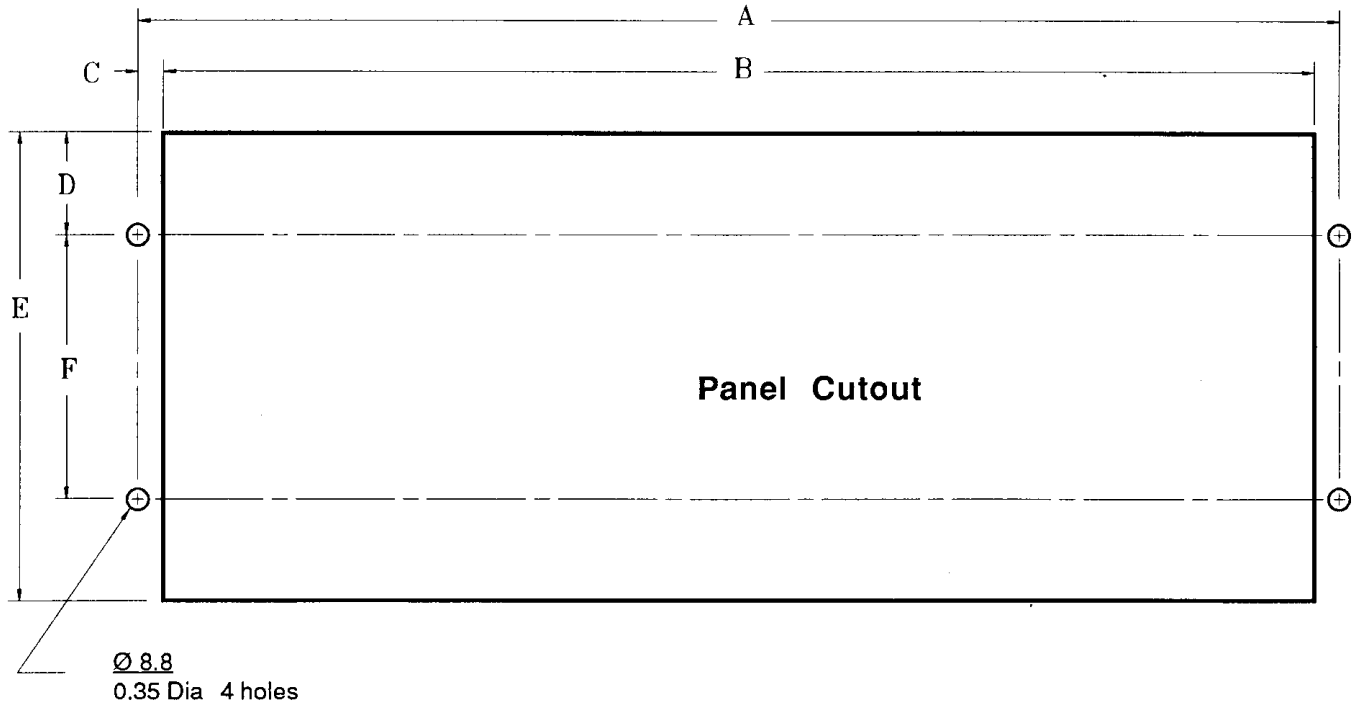


Figure 2

2.3 Electrical Specifications

Electrical Classifications:

The Zero Two Series Modules and RK002 Chassis are designed for use in safe (non-hazardous) locations.

Operating Power (FM002A)

24 VDC nominal @ 125 mA
20 to 32 VDC maximum range
Low voltage fault @ 20 VDC
(this module will not operate below 18 VDC)
PSU noise and ripple voltage 1.0Vpp max. The customer supplied PSU must comply with IEC 1010-1, limiting current to 8A under Fault conditions, in order to comply with CE Marking requirements.

Relay Contact Ratings (FM002A)

30 V RMS 42.4V Pk. @ 4A, 30 VDC @ 3A resistive max.

Open Collector Ratings (FM002A):

100 mA @ 35 VDC maximum

2.4 Environmental Specifications

Operating Temperature Range:

– 18°C to + 66°C (0°F to 150°F)

Storage Temperature Range:

– 40°C to + 66°C (– 40°F to 150°F)

Operating Humidity Range:

5 to 100% Relative Humidity (non-condensing)

EMC Susceptability: (EN50082-2 : 1995)

10 V/m max.

2.5 Engineering Specifications

Zero Two System - Each system utilises modules capable of monitoring gas sensing elements or a 0 - 20mA analogue signal from gas or flame detection transmitters. The system chassis is available in 4, 8 and 16 channels. Each chassis contains a buss for the following independent signals:

* A1 Alarm
* A2 Alarm
* Fault
* Master Accept
* Master Reset
* Unaccept
* Cal
* + 24 VDC
* System Common

Module signals are 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 are electrically and physically compatible and capable of being used in the same chassis to form combined fire and gas detection systems. The system consists of Zero Two Series component modules manufactured by General Monitors (Lake Forest, California, USA and Galway, Republic of Ireland).

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

Safety Warning

Installation and Maintenance must be carried out by suitably skilled and competent personnel only.

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. Chassis must be connected to Safety Earth. 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 counterpart on the module. Female portion is pre-mounted as standard on chassis fitted with connectors.

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 moulded parts.

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

3.3 Module Installations.

Zero Two Series modules comply with the EMC Directive for application of CE Marking. However, they should not be mounted in close proximity to a radio transmitter or similar requiment. Cables should be screened or screened and armoured to BS5308 or equivalent. These modules require some air circulation to avoid excessive heat build-up inside an enclosure. The far right channel, in each chassis, is dedicated to the Facilities Module (FM002A) This channel will not accommodate any other module.

Equipment is to be installed in Rack System or Cabinet meeting the fire enclosure requirements of IEC 1010-1.

3.4 Terminal Connections

When wiring the terminal connections, it will be necessary to properly strip the wire as shown (figure 3).

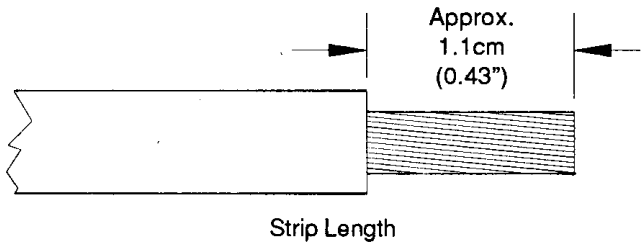


Figure 3

The terminal block accepts 1.5mm^2 to 0.75mm^2 (16 to 22 AWG) stranded or solid core wire. 2.5mm^2 (14 AWG) wire may be used if it is stripped according to figure 3.

Terminal Connections (continued)

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

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. Non screw-type connectors are available. Contact GM for details.

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

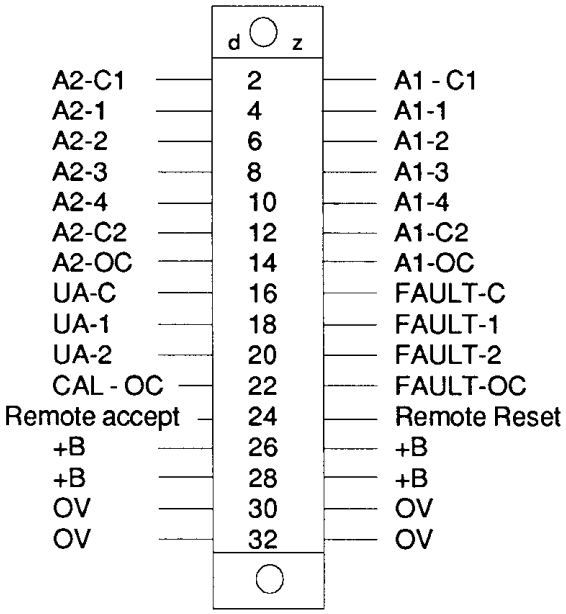


Figure 4

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 open collector outputs (A1-OC) that follow 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 (Engergised/De-engerised). The table below refers to the proper open and closed A1 alarm relay contacts while the unit is on-power.

Contacts	Normally Energised	Normally De-energised
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 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.

The normally open (NO) and normally closed (NC) contacts depend on a user selectable option (Energised/De-energised). The table below refers to the proper open and closed A2 alarm relay contacts while the unit is on-power.

Contacts	Normally Energised	Normally De-energised
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
Fault-C	16z	Relay common (Both F1 & F2)
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 Fault-C designation is common for the F-1 and F-2 contacts. **The Fault outputs are always normally energised when power is applied to the module.**

Note: There are no fault relay options. The standard configuration for the fault relay is normally energised 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 (Energised /De-energised).

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

Contacts	Normally Energised	Normally De-energised
UA-1 & UA-C	Normally Open	Normally Closed
UA-2 & UA-C	Normally Closed	Normally Open

The termination for **CAL** is:

Label	Term	Contact
CAL-OC	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.

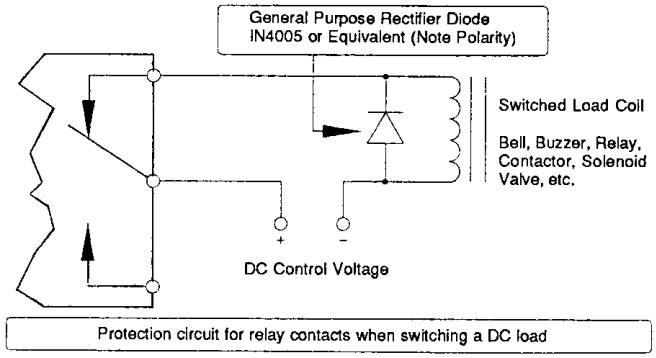


Figure 5

Terminal Connections (continued)

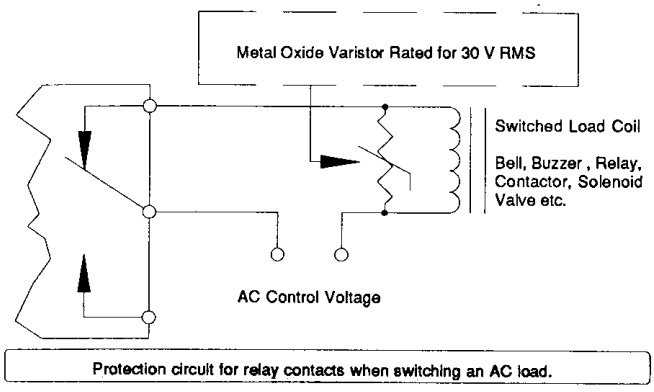


Figure 6

The relay contact ratings for the A1 alarm, A2 alarm, Fault and UA outputs are 4A @ 30 V RMS/42.4 V Pk. 3A @ 30 VDC resistive max.

Figure 7 illustrates some typical open collector external circuits.

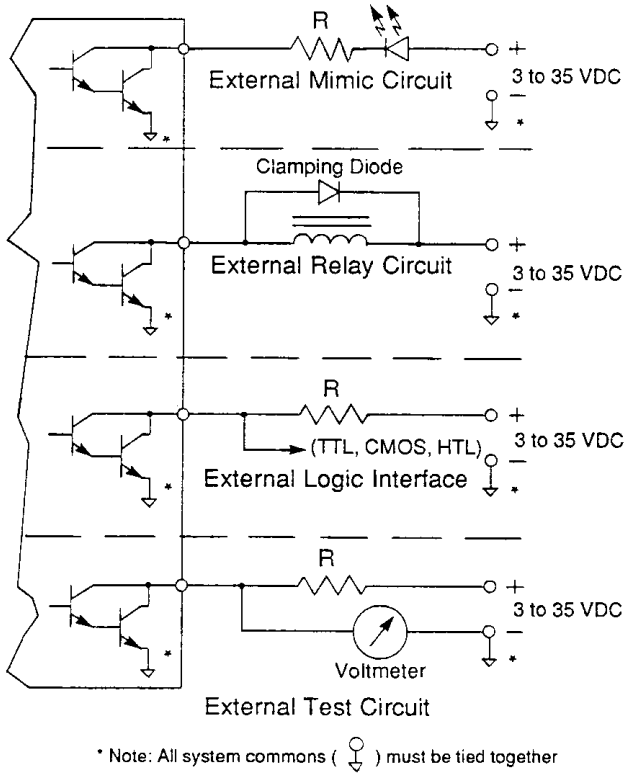


Figure 7

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

The termination for remote **RESET** is:

Label	Term	Contact
Reset	24z	Remote Reset Terminal

The termination for remote **ACCEPT** is:

Label	Terms	Contact
Accept	24d	Remote Accept Terminal

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

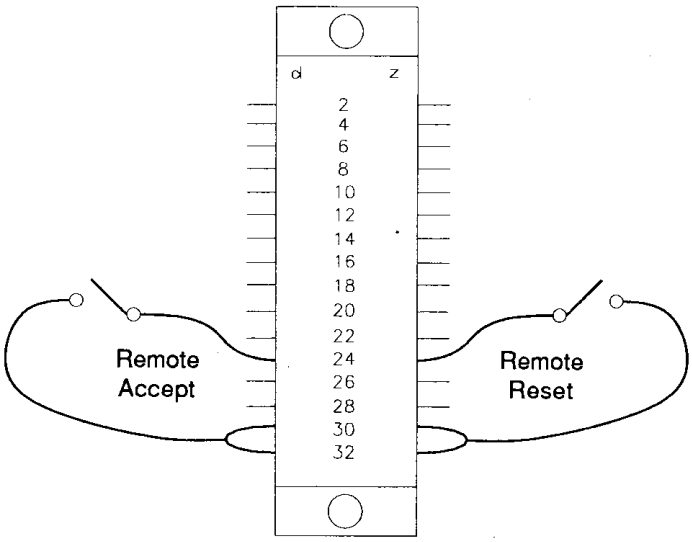


Figure 8

The terminations for an **Alternate Power Supply** input.

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

Terminal Connections (continued)

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

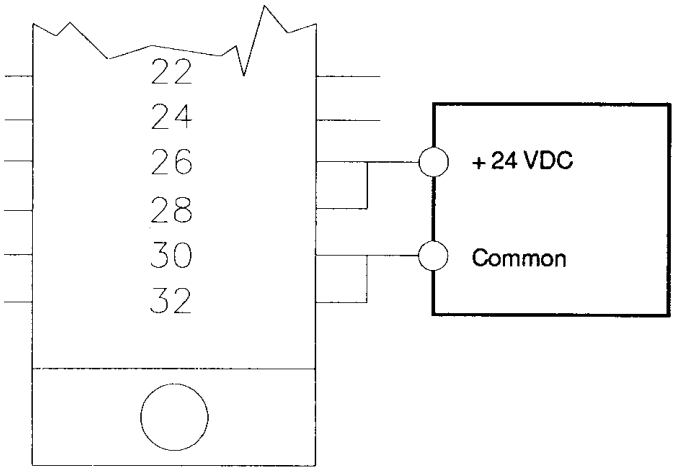


Figure 9

3.5 Applying Power

Zero Two Series Modules do not have an ON/OFF 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.

The power connections for all of the Zero Two Chassis are located on the buss board at the rear of each chassis (see Figure 10). **DO NOT** daisy chain + 24VDC and Common between individual chassis. Apply power separately.

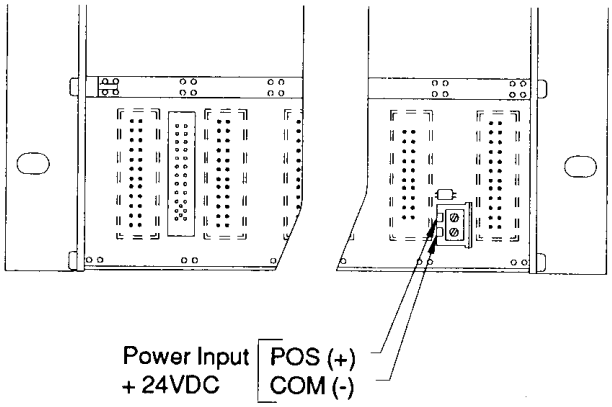


Figure 10

3.6 Interconnecting cable Guidelines

The interconnecting cable should have an overall screen or screen and armour. Cables to BS5308 or equivalent are suitable. Note that the terms 'screen' and 'shield' are equivalent for the purposes of this manual.

Interconnecting cables should be segregated from power and other 'noisy cables. Avoid proximity to cables associated with radio transmitters, welders, switch mode power supplies, inverters, battery chargers, ignition systems, generators, switchgear, arc lights and other high frequency or high power switching process equipment. In general, maintain a separation of at least 1m between instrument and other cables. Greater separations are required where long parallel cable runs are unavoidable. Avoid running instrument cable trenches close to lightning conductor earthing pits.

General Monitors do not recommend the use of cable shoes or crimps on any junction box or housing wiring terminals. Poor crimping can cause bad connection when unit experiences temperature variations. We therefore recommend good practice is to just terminate cable or sensor wires as is, especially in remote sensor applications.

Complete all cable insulation testing **before** connecting the cable at either end.

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

Safety Warning

Installation and Maintenance must be carried out by suitably skilled and competent personnel only.

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 and/or maintenance 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 buss located on the rear of the Zero Two Series Chassis. They are:

A2 (A2 Alarm)
A1 (A1 Alarm)
Fault
UA (Unaccept)
CAL
Master Accept
Master Reset
+ 24 VDC
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 and 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 in section 3.4 of the 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:

4 A @ 30V RMS/ 42.4V PK., 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 @ 35 VDC

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 energised/de-energised 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 and 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-energised, 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 energised, 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 energised 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-energise.
- If a fault condition occurs and is corrected, the until will return to a normal operating condition.
- The open collector output associated with the fault outputs will sink current until the fault occurs.

Inputs include the remote accept and remote reset features (see Sections 4.4 & 4.5 of this chapter).

4.4 Master Accept

The Accept Button on the FM002A Module is provided so that new alarm conditions can be acknowledged and the UA can be de-activated. The 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 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.

This feature can also be accessed remotely. See Figure 8.

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 is 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 is used in these applications.

There is a special "Latching Over-range" feature on two of the Zero Two Series Gas Detection Modules (Models 4802A and 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).

This feature can also be accessed remotely. See Figure 8.

In addition to resetting, an LED test can be performed by depressing the Master Reset button for more than two seconds. When activated, all front panel LEDs on modules will illuminate for as long as the Master Reset Button is depressed. When the button is released the LEDs 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). **Factory default are all outputs de-energised** (open).

Switch	Open	Closed
1	A1 Alarm outputs normally de-energised	A1 Alarm outputs normally energised
2	A2 Alarm outputs normally de-energised	A2 Alarm outputs normally energised
3	UA Alarm outputs normally de-energised	UA Alarm outputs normally energised
4	Not used at this time	

4.7 CAL Open Collector

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

In the case of the Trip Amplifier Modules (TA102A and TA202A) the Field Device must transmit a 1.5mA Signal to the Module in order for this output to energise. In 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 when the user places the Control Module in the CAL or CAL Check Mode this output will activate on the FM002A (CAL-OC).

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

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

Glossary of Terms

AC - Alternating Current.

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

Analogue - 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 applied gas.

COM - Common

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

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

DC - Direct Current

DCS - Distributed Controls System.

De-energised - A relay is de-energised 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.

Energised - When a relay is energised, 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.

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.

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

Microprocessor Based Electronics - All of the input signal processing, fault monitoring, calibrating routines, setup routines, and the outputs are under the control of a microprocessor unit (MPU).

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.

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.

Schematic - Facilities Module

Engineering Documentation

Reference 11205-3

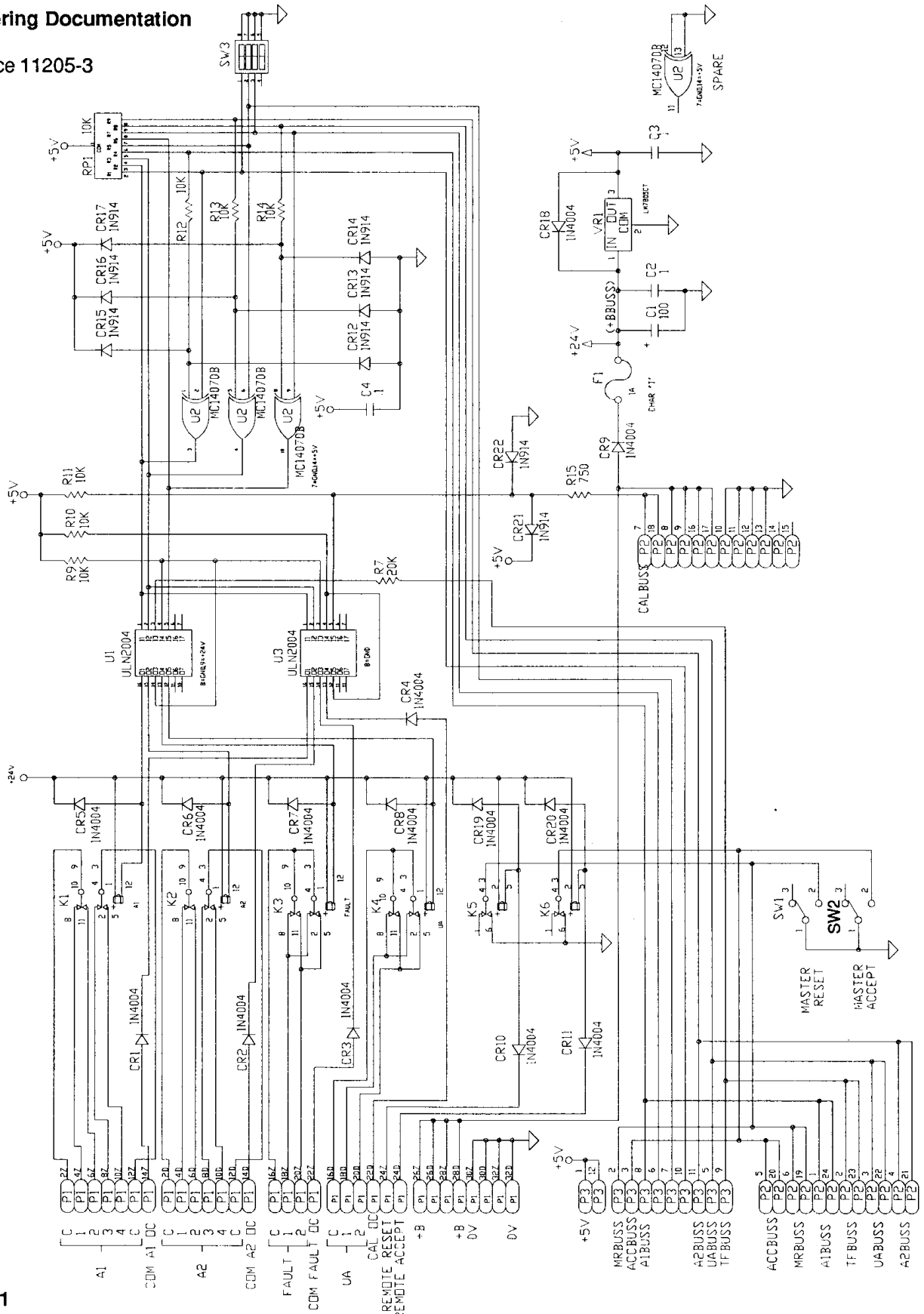


Figure 11

Engineering Documentation (continued) **Circuit Card Assembly - Facilities Module**

Reference 11206-3

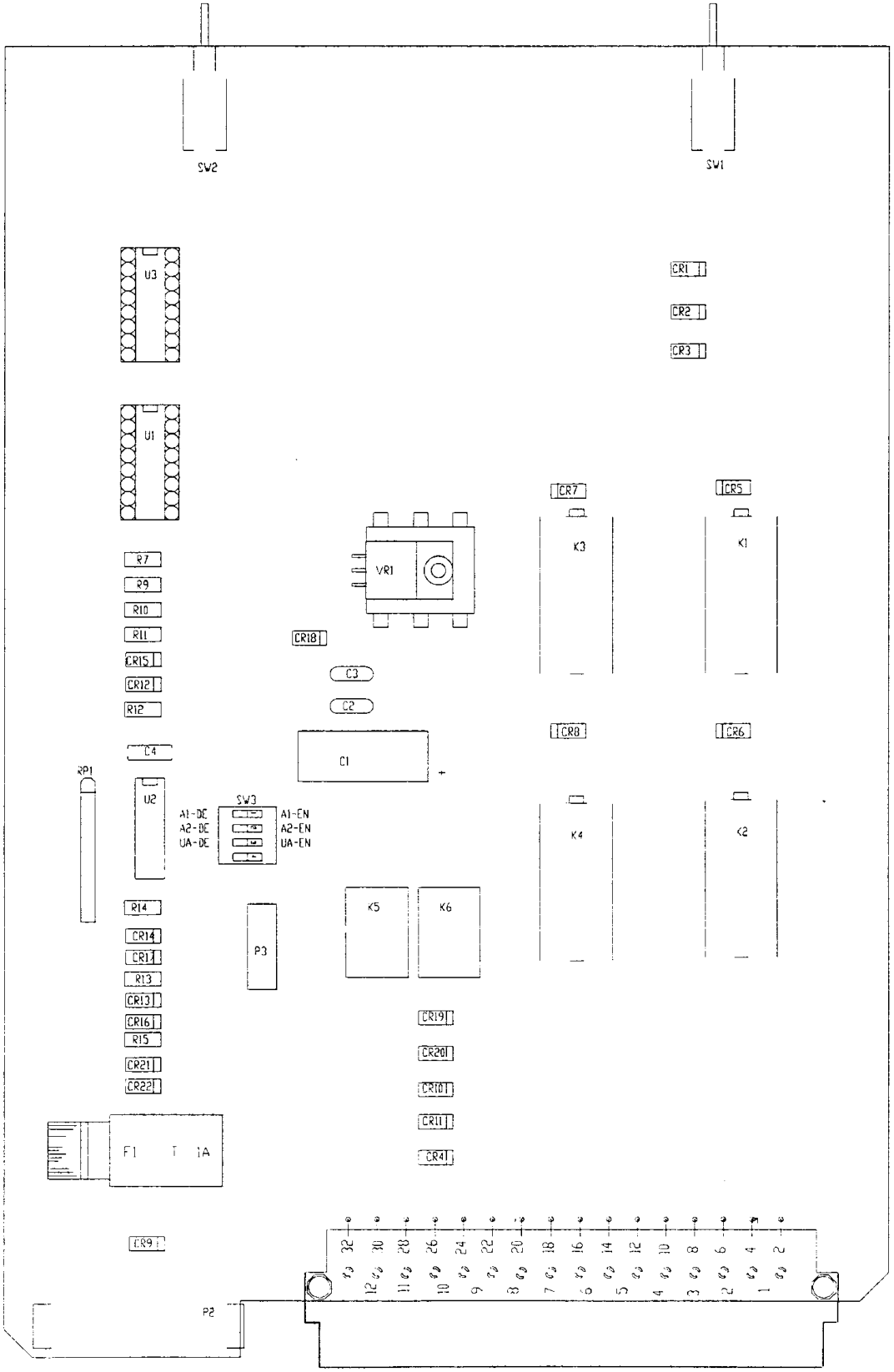
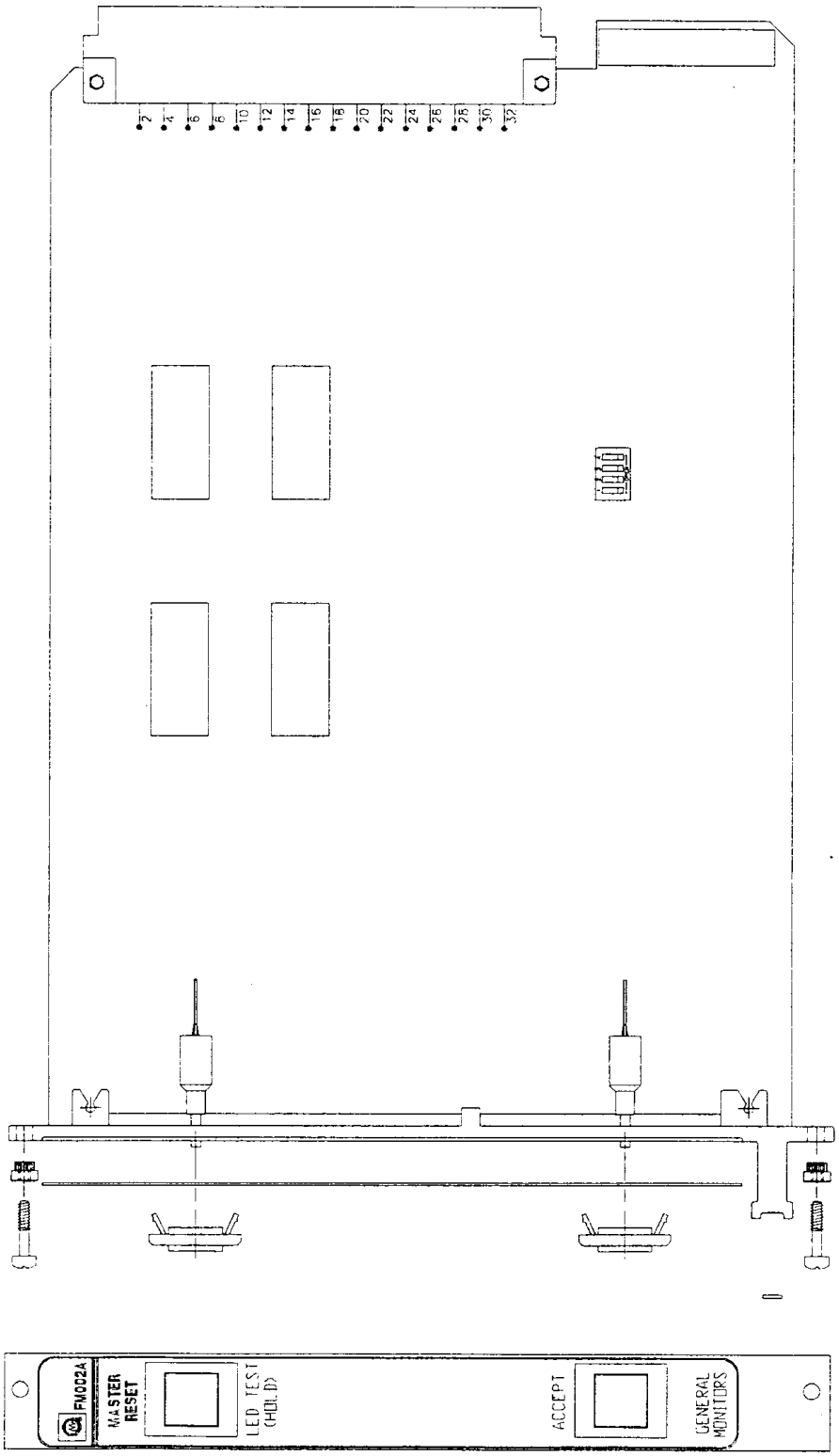


Figure 12

Engineering Documentation (continued) **Final Assembly - Facilities Module**

Reference 11200-1



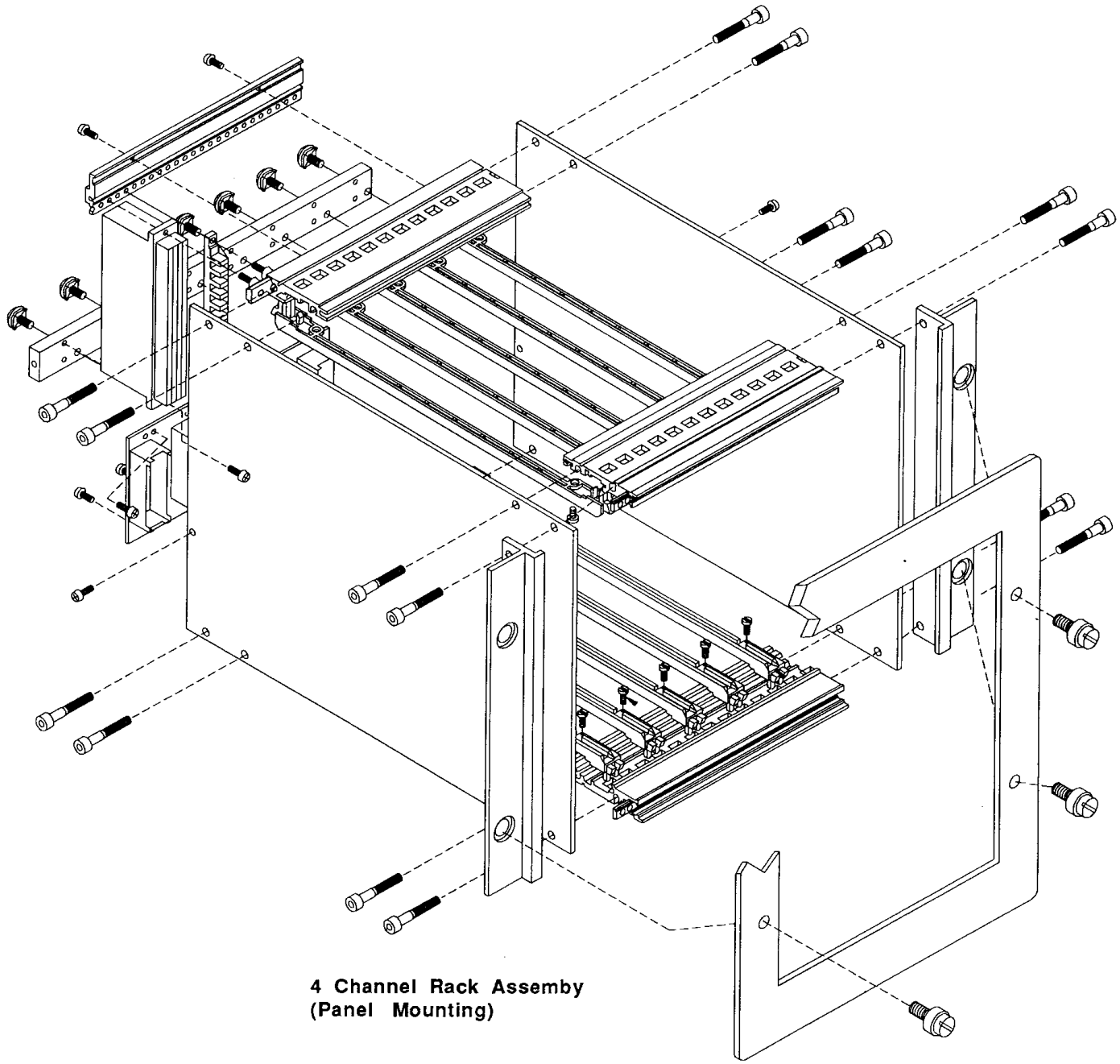
Component side shown

Figure 13

Engineering Documentation (continued)

Reference 10683 (Rack) or 10727 (Panel)

Exploded Assembly - 4 Channel Chassis
(Covers not shown for clarity)



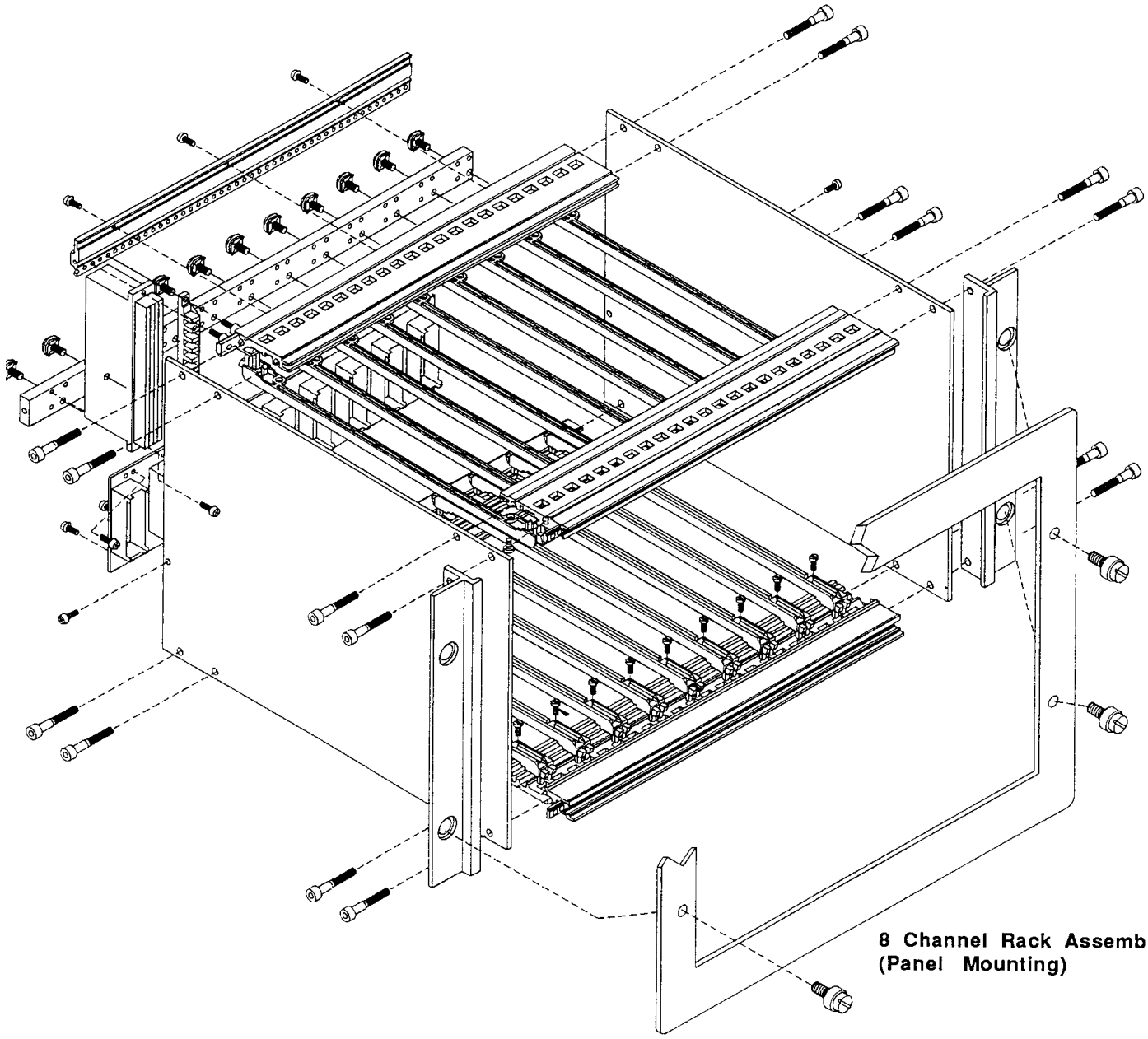
4 Channel Rack Assemby
(Panel Mounting)

Figure 14

Engineering Documentation (continued)

Reference 10682 (Rack) or 10726 (Panel)

Exploded Assembly - 8 Channel Chassis (Covers not shown for clarity)



8 Channel Rack Assemby (Panel Mounting)

Figure 15

Engineering Documentation (continued)

Reference 10680 (Rack) or 10725 (Panel)

Exploded Assembly - 16 Channel Chassis (Covers not shown for clarity)

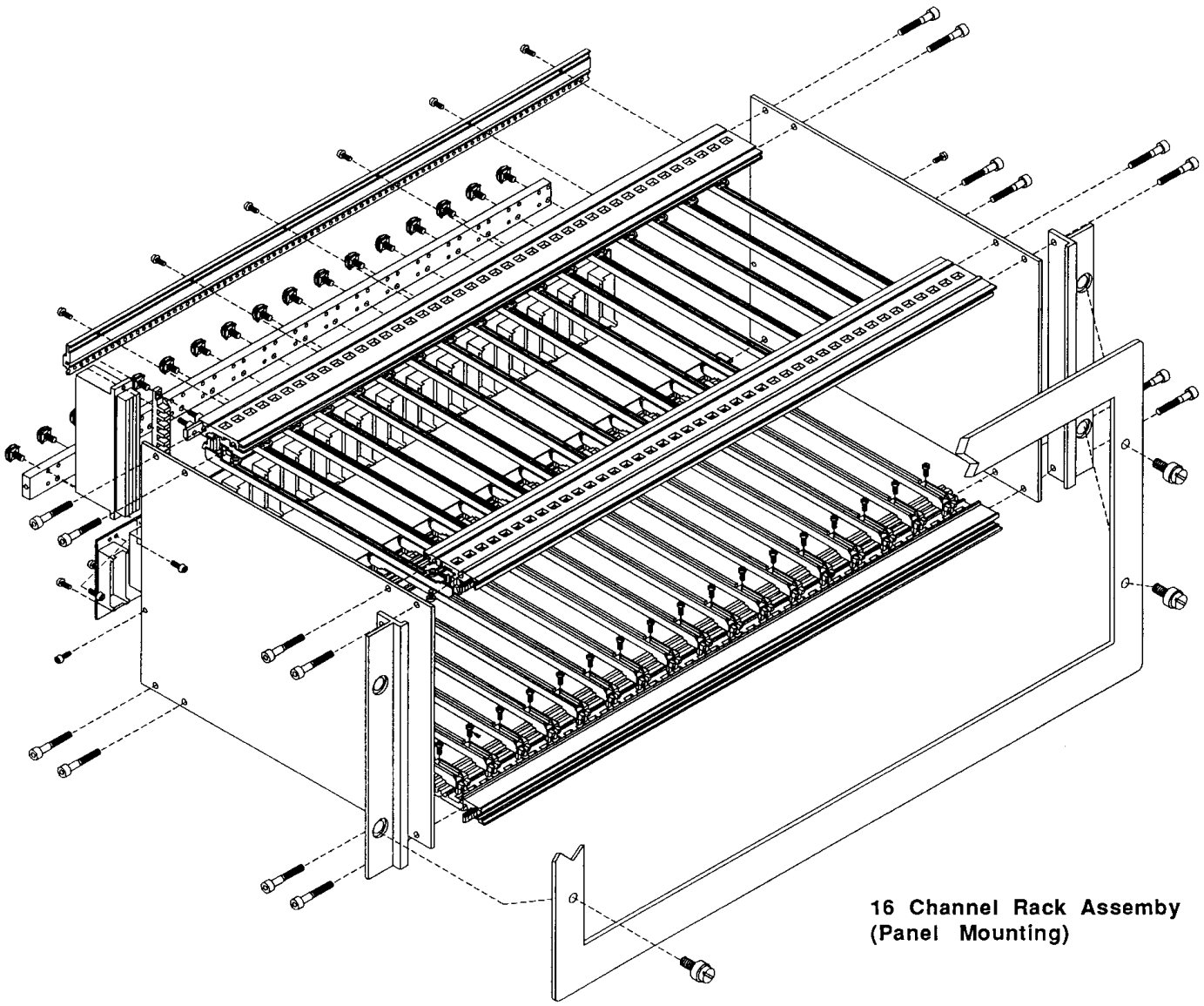
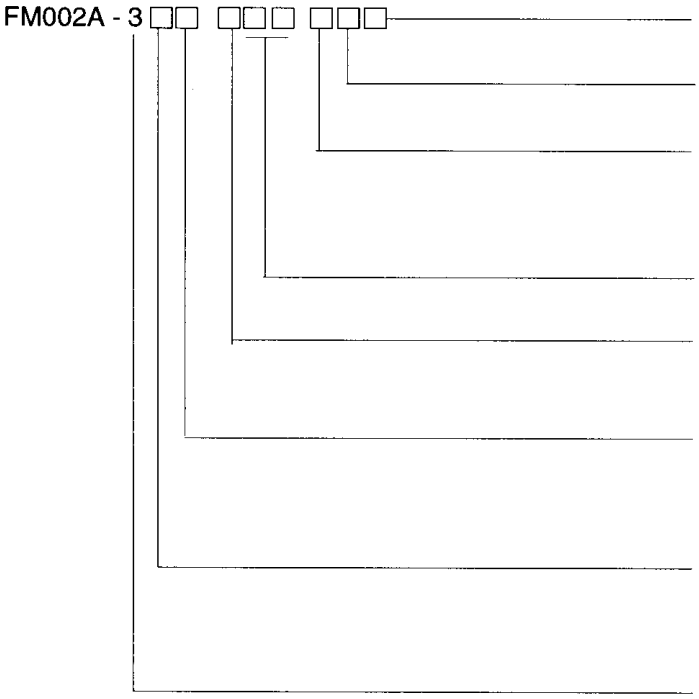


Figure 16

Ordering Information

The standard configuration for the FM002A is

FM002A-321-100-000



Not used

Not used

Approval
0 = CE (std)
1 = Gost

Not used

Active/Channel
1 = One Model Supplied (std)

Relay State
1 = De-energised (std)
2 = Energised

Relays
1 = Without Relays
2 = With Relays (std)

Power
3 = 24 VDC (std)

Note:

1 Gost Approved Cards are only supplied with Russian Nameplates.

Zero Two Series Modules

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

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

Model TA502A
Zero Two Series Trip Amplifier Module
A flexible multipurpose module for a variety of
GM Products.

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

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

Model MD002
Zero Two Series Monitored Solenoid Module
for Monitoring/Driving High Current Output
Devices

Model IN042
Zero Two Series Four Zone Input Module for
Callpoints, Smoke & Heat Detectors

A

B

C

C

D

D (continued)

E

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Z