GENERAL MONITORS
Model IN002

IN002
Three Zone Input Card

Instruction Manual 03/93

Part No. MANIN002
Revision A/03-93

GENERAL MONITORS
Model IN002

Warranty

General Monitors warrants the Model IN002 Module 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 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.

Warning

The Zero Two Series module assemblies 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.

GENERAL MONITORS

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01 March 1994

To All IN002 Three Zone Input Card Users:

The Model IN002 Instruction Manual is in the process of being updated, and in order to continue servicing you on this product, please make note of the following change:

> In Section 3 (operation), pages 7 and 8 of the IN002 Instruction Manual, references to voting are no longer valid. Each zone will go into alarm if any of the detectors or callpoints within the zone trigger an alarm. In other words, the voting for each zone is fixed at one.
>
> Switch SW4 is being removed and will be replaced with hardwired circuitry (jumpers).

If you have any questions, please contact your General Monitors' Sales Representative or the factory direct. Thank you.

Respectfully Yours,

Charles Simek
Technical Writer,
General Monitors

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Table Of Figures

1.0 Introduction

1.1 Three Zone Input Card - IN002

The Three Zone Input Card (IN002) is designed to work with two wire device inputs and is capable of driving chamber ionization or optical smoke detectors (see Figure 1). This card is electrically and physically compatible with all other Zero Two Series modules. The outputs from this card include:

- Three SPDT zone Fault Relays and three amber LED indicators (1 each per zone)
- Three SPDT zone Alarm Relays, three open collector alarm outputs, three red LED indicators, and three open collector outputs that follow the logic of the LED indicators (1 each per zone)
- One ready green LED indicator
- One open collector output that changes states with each new alarm condition
- Three zonal 3-position switches (1 each per zone) Normal-Reset-Inhibit

This card is designed to operate using an input voltage range of 20 to 35 VDC with a nominal rating 24 VDC. The two wire inputs to each zone are monitored for shorts, open cicuits and shorts to ground. The alarm output options are DIP switch selectable. The Fault outputs are standard and cannot be changed. The functional tests available on the Model IN002 are an autotest that tests the card's electronics and an LED test that tests all of the front panel LEDs.

This card can be configured at the factory to interface with a 300 ohm Zener Barrier, a 390 ohm Zener Barrier or no Zener Barrier in series with the input device.

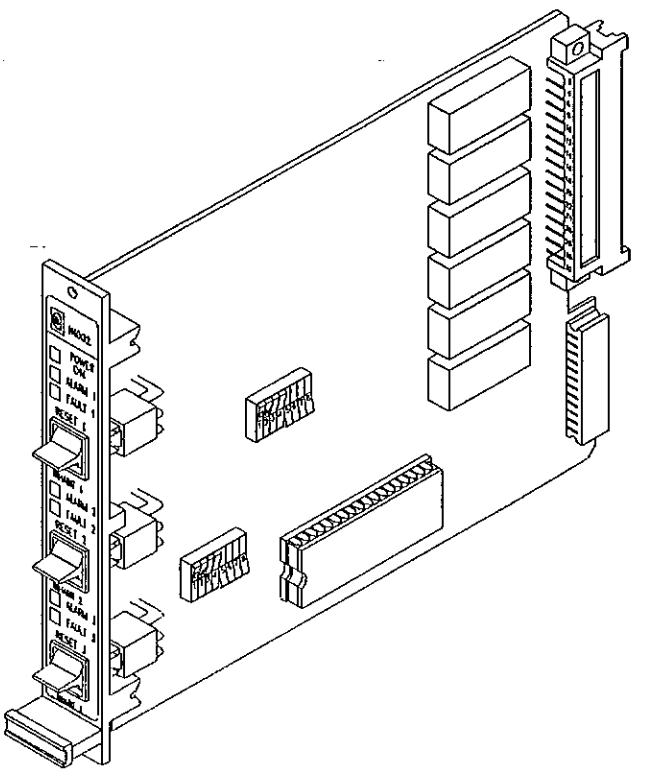


Figure 1

2.0 Installation

2.1 On receipt of your equipment

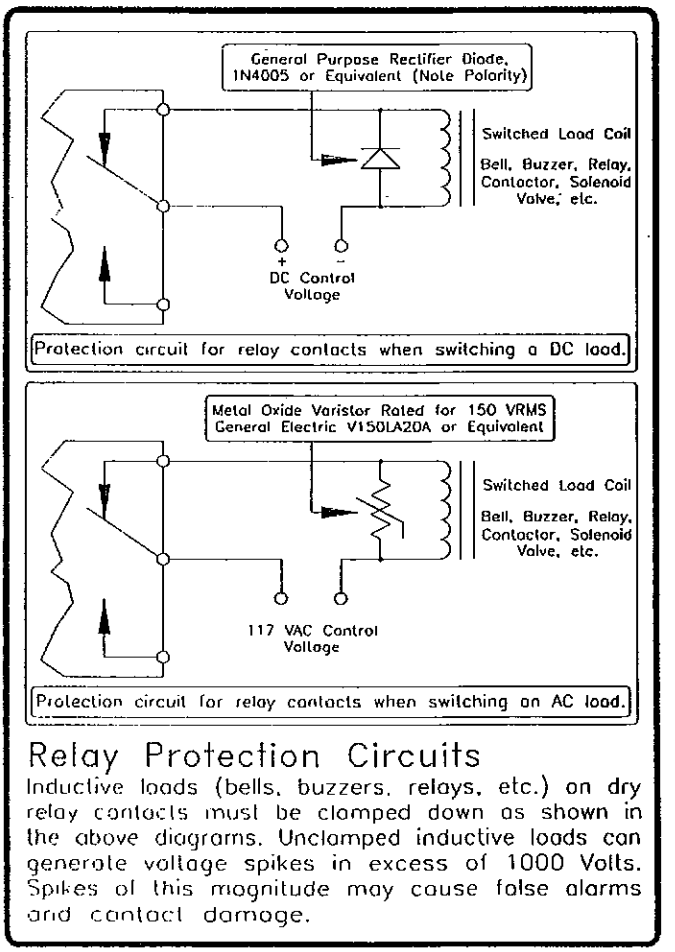
All equipment shipped by General Monitors is pre-packed in shock absorbing containers which provides considerable protection against physical damage. The contents should be carefully removed and checked against the packing slip. If any damage has occurred or there is any discrepancy in the order, please 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.

2.2 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 will be required for adequate cooling.

2.3 Module Installation

Although the Zero Two Series modules are, to a great extent, immune to electromagnetic interference (EMI), 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. Never attempt to install a module into a chassis that has power applied to it. When connecting inductive loads to dry relay contacts it will be necessary to guard against voltage spikes that could cause false alarms. See figure 2 for Relay Protection Circuits.



Relay Protection Circuits

Inductive loads (bells, buzzers, relays, etc.) on dry relay contacts must be clamped down as shown in the above diagrams. Unclamped inductive loads can generate voltage spikes in excess of 1000 Volts. Spikes of this magnitude may cause false alarms and contact damage.

Figure 2

GENERAL MONITORS
Model IN002

Installation

See Figure 3 for some Typical Open Collector External Circuits.

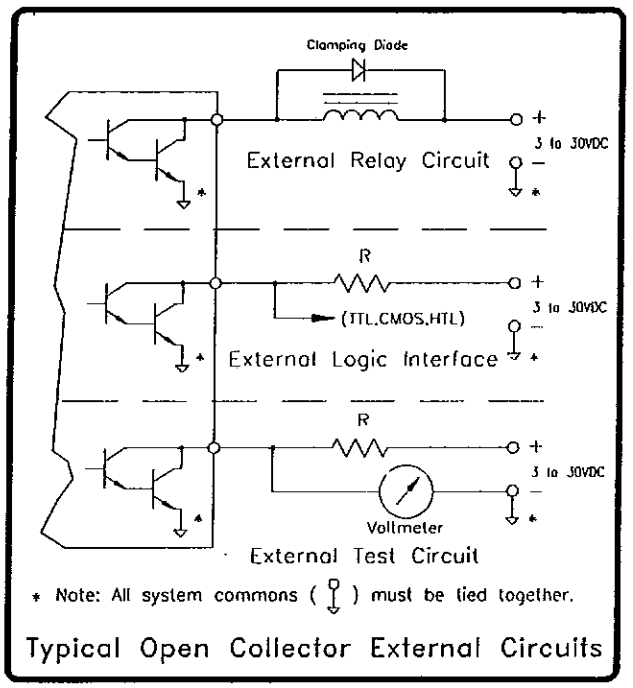


Figure 3

2.4 Terminal Connections

When wiring the terminal connections, it will be necessary to properly strip the wire leads to the proper length (Figure 4).

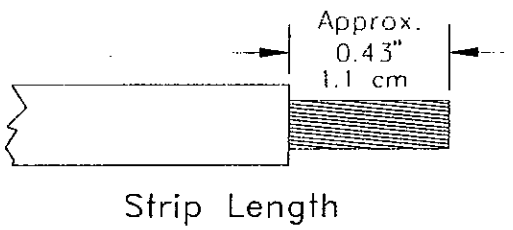


Figure 4

For the gas and flame detection modules, refer to the specific manual for detailed information on terminal connections on those modules.

Refer to Figure 5 for the terminal designations for the Three Zone Input Card (IN002).

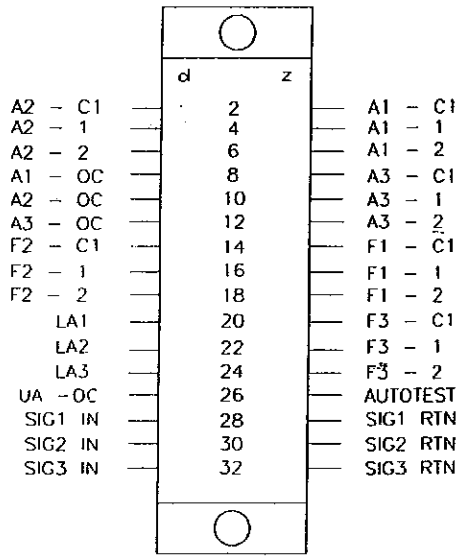


Figure 5

The terminations for the Alarm outputs for zones 1, 2 & 3 are:

Label	Term	Contact
A1-C1	2z	Relay Common
A1-1	4z	Relay Contact
A1-2	6z	Relay Contact
A1-OC	8d	Open Collector Output
LA1	20d	Open Collector Output
A2-C1	2d	Relay Common
A2-1	4d	Relay Contact
A2-2	6d	Relay Contact
A2-OC	10d	Open Collector Output
LA2	22d	Open Collector Output
A3-C1	8z	Relay Common
A3-1	10z	Relay Contact
A3-2	12z	Relay Contact
A3-OC	12d	Open Collector Output
LA3	24d	Open Collector Output

Installation

Three Zone Input Terminations (*continued*)

The terminations for the Fault outputs for zones 1, 2 & 3 are:

Label	Term	Contact
F1-C1	14z	Relay Common
F1-1	16z	Relay Contact
F1-2	18z	Relay Contact
F2-C1	14d	Relay Common
F2-1	16d	Relay Contact
F2-2	18d	Relay Contact
F3-C1	20z	Relay Common
F3-1	22z	Relay Contact
F3-2	24z	Relay Contact

The terminations for the Input signals for zones 1, 2 & 3 are:

Label	Term	Contact
SIG1-IN	28z	Zone 1 Signal Input
SIG1-RTN	28d	Zone 1 Signal Return
SIG2-IN	28z	Zone 2 Signal Input
SIG2-RTN	28d	Zone 2 Signal Return
SIG3-IN	28z	Zone 3 Signal Input
SIG3-RTN	28d	Zone 3 Signal Return

The Unaccept and Autotest terminations are:

Label	Term	Contact
UA-OC	26z	Open Collector Output
AUTOTEST	26d	Autotest termination

The IN002 Alarm Relay contacts:

A1-C1 is Common for A1-1 & A1-2		
Relay State	Normally Open	Normally Closed
Energized	A1-1	A1-2
De-Energized	A1-2	A1-1
A2-C1 is Common for A2-1 & A2-2		
Relay State	Normally Open	Normally Closed
Energized	A2-1	A2-2
De-Energized	A2-2	A2-1
A3-C1 is Common for A3-1 & A3-2		
Relay State	Normally Open	Normally Closed
Energized	A3-1	A3-2
De-Energized	A3-2	A3-1

The Fault outputs are energized and non-latching. There are no DIP switch selectable options for the Fault outputs.

The IN002 Fault Relay contacts:

F1-C1 is Common for F1-1 & F1-2	
Normally Open	Normally Closed
F1-1	F1-2
F2-C1 is Common for F2-1 & F2-2	
Normally Open	Normally Closed
F2-1	F2-2
F3-C1 is Common for F3-1 & F3-2	
Normally Open	Normally Closed
F3-1	F3-2

For Alarm output options see "DIP Switch Selectable Options" in section 3-2.

3.0 Operation

3.1 Three Zone Input Card

3.1.1 Front Panel Description

Each Three Zone Input Card is capable of monitoring up to 3 two-wire devices. If it is desired that fewer than 3 zones be used, the unused zone(s) can be disabled. On the front panel there is a three position switch for each zone. The positions for this switch are **Detector Reset** (up / momentary), **Normal** (middle / stationary), and **Inhibit** (down / stationary). When a zone is continuously monitoring the detector, the switch will be in the **Normal** position. If the detector needs to be reset, push the switch to the **Reset** position. If the detector needs to be disabled for any reason, push the switch to the **Inhibit** position.

3.1.2 Master RESET & LED Test Features

The master RESET is located on the Facilities Module (FM002). This feature is provided so that latched alarm(s) that are no longer valid can be returned to the normal operating state for a non-hazardous condition. An IN002 card that is part of the same system as a Facilities Module (FM002), can be RESET by that Facilities Module. The RESET switch performs another function. If it is depressed and held for two or more seconds all of the front panel LEDs on each card in the system will illuminate for as long as the RESET button is depressed.

3.1.3 Autotest Feature

This feature tests the integrity of the electronics on the IN002 control board. The Autotest feature simulates an increasing hazard. This causes the front panel visual indicators to activate. At the conclusion of this test it will be necessary to reset any latched conditions that may have occurred as a result of performing the Autotest. There is a DIP switch selectable option that allows the user to activate or inhibit the alarm outputs during an autotest. There is a rear terminal contact provided for the Autotest feature. Connect one end of a normally open push button SPST switch to the terminal specified in section 2.4 on page 5. Connect the other end of the switch to system common. To activate the feature simply depress the switch momentarily and the Autotest routine software will be run.

3.1.4 Master ACCEPT

When an alarm occurs the associated LED on the front panel will flash. Pushing the master ACCEPT button on the Facilities Module (FM002) will cause the LED to stop flashing but it will maintain its continuous illumination. This action acknowledges that someone is aware of the alarm condition.

3.1.5 Detector Mode

In this mode an input related fault can be caused by an open circuited input or a short circuit across the input. An alarm can be caused by one or two of the detectors wired to the input going into alarm as a result of smoke detection. Detector reset is obtained by pushing the proper zone's front panel switch in the upward direction as discussed in section 3.1.1. The amber fault LED will illuminate for as long as the switch is held in this position. There is a DIP switch selectable option on switch SW5 that allows the card to be operated in the Detector Mode of operation. In the Detector Mode the zones can

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Detector Mode (*continued*)
sense one or two detectors. See section 3.2 for specific switch designations.

3.1.6 Callpoint Mode

The callpoints can be DIP switch selected as normally open or normally closed. In the normally open mode a fault can be generated if an open circuit is detected in series with the End of Line Resistor (5.6Kohms) which has been placed across each zone's input. A short circuit across the End of Line Resistor (EOL) and/or shorting the input to ground will also be detected as a fault. A normally open switch is actually a switch in series with a 400 ohm resistor which is placed in parallel with the EOL resistor. Once the switch closes an alarm is generated. In the normally closed mode a fault will be generated if a short circuit is placed across the EOL resistor. An alarm will occur when the normally closed switch (which is in series with the EOL resistor) is opened.

3.1.7 Low Voltage Fault

When the input voltage to the IN002 drops below +18VDC, a fault is generated. During this fault, the three zones will be placed in the inhibit mode. Any existing alarm will be overridden and the card will ignore all external stimulus until the input voltage is restored.

3.2 DIP Switch Selectable Options

The alarm output options are DIP switch selectable. Other DIP switch selectable options include: Autotest with alarm outputs active or inhibited, Detector Reset bypass for each zone (discrete) in the callpoint mode, single or dual detector sensing for each zone (discrete), and Callpoint normally open or normally closed.

DIP switch SW4 provides the user selectable options for the inputs to each of the zones and the reset bypass for zone 3.

SW4 Switch Options		
OPTION	Open	Closed
Zone1, Single Detector Sensing	1	2
Zone1, Two Detector Sensing	2	1
Zone2, Single Detector Sensing	3	4
Zone2, Two Detector Sensing	4	3
Zone3, Single Detector Sensing	5	6
Zone3, Two Detector Sensing	6	5
Reset Bypass - Zone 3		8
POS. 7 NOT USED AT THIS TIME		

DIP switch SW5 provides the user selectable options for the alarm outputs for each zone, the Autotest with alarm output option, the normally open or closed Callpoint option, and the reset bypass for zones 1 and 2.

SW5 Switch Options		
OPTION	Open	Closed
A1 Normally Energized	1	
A1 Normally De-Energized		1
A2 Normally Energized	2	
A2 Normally De-Energized		2
A3 Normally Energized	3	
A3 Normally De-Energized		3
Callpoints	4	
Detectors		4
Autotest with Alarm Outputs	5	
Autotest without Alarm Outputs		5
Callpoint - Normally Open	6	
Callpoint - Normally Closed		6
Reset Bypass - Zone 2		7
Reset Bypass - Zone 1		8

NOTE: *When the IN002 is in the Callpoint Mode, SW4, position 8 and SW5, positions 7 & 8 must be closed.*

4.0 Appendix

4.1 Glossary of Terms

AC - Alternating Current.

Analog - Continuous, without steps.

Ambient Temperature - Surrounding or background temperature.

AWG - American Wire Gauge.

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 to 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. **Groups B, C & D**: refers to the type of gases or vapors; **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.

COM - Common.

DC - Direct Current.

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.

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.

FM - Factory Mutual Research Laboratory.

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.

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.

Potentiometer - An adjustable resistor.

SPDT - Single Pole Double Throw. Each Pole is 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.

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Appendix

4.2 Specifications

4.2.1 System Specifications

Number of channels per module:

FM002	*the far right hand channel is dedicated for this module*
IN002	1 chassis channel per module 3 zones per module

Available chassis:

4 channel rack or panel mounted
8 channel rack or panel mounted
16 channel rack or panel mounted

Approvals status:

CSA, FM & CENELEC approvals pending

Warranty period:

Two Years

4.2.2 Mechanical Specifications

Length:	9.9 inches	251 mm
Height:	6.825 inches	173 mm
Width:		
FM002	3/4 inch	19 mm
IN002	1 inch	25 mm
Weight:		
	11.2 oz	318 grams

4.2.3 Electrical Specifications

Operating voltage:

FM002	24 VDC nominal @ 125mA 20 to 35 VDC Range
IN002	24 VDC nominal @ 100mA 20 to 35 VDC Range

Relay contact ratings:

117 VAC @ 4A, 30 VDC @ 3A
resistive max.

Open collector rating:

Modules with relays:	50mA @ 30VDC
Modules w/o relays:	100mA @ 30VDC

Electrical Classification:

General purpose for use in non-hazardous locations

4.2.4 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

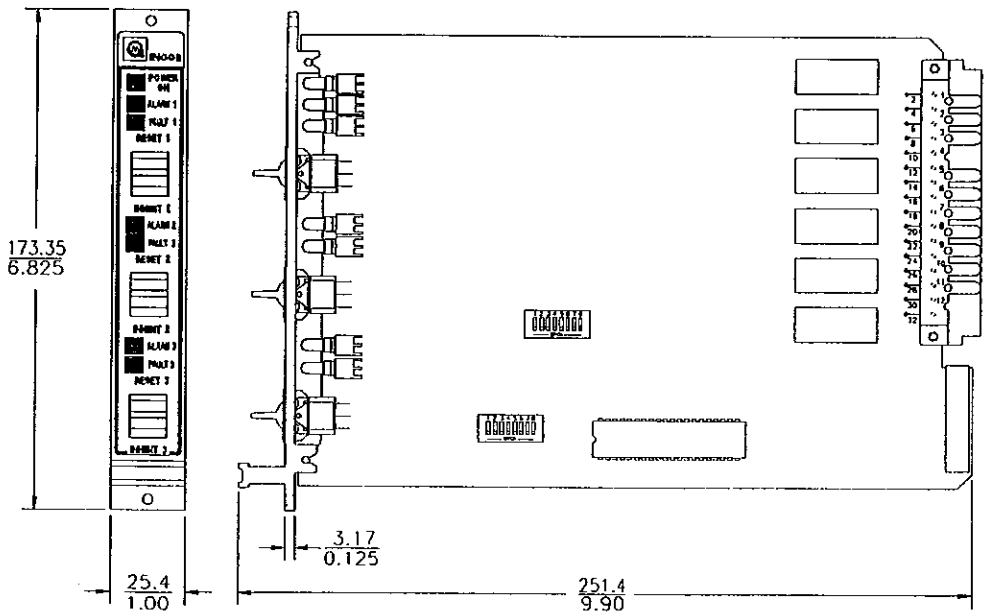
Operating humidity range:

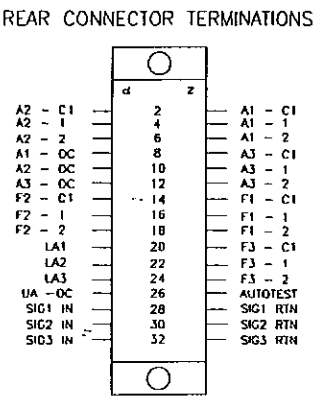
5 to 100% relative humidity
(non-condensing)

Appendix

4.3 Engineering Documentation

Outline & Dimensional Drawing - IN002





DIMENSIONS
mm
INCH

Model IN002 Input Card
Reference 10792 rev. A
Outline & Dimensional Drawing

Figure 6

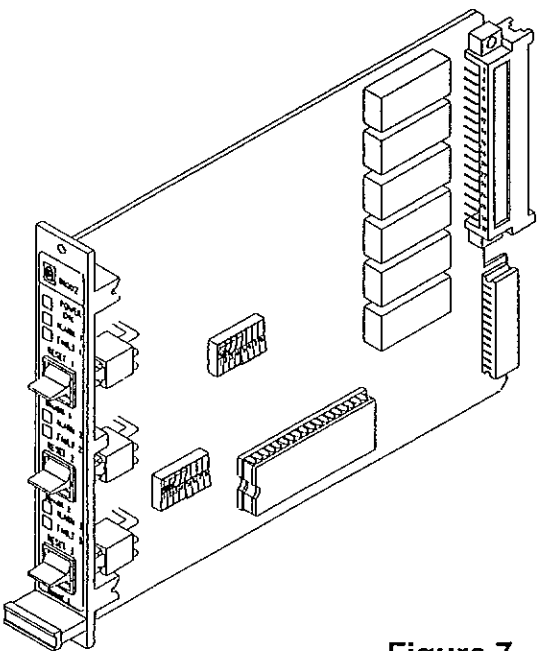


Figure 7

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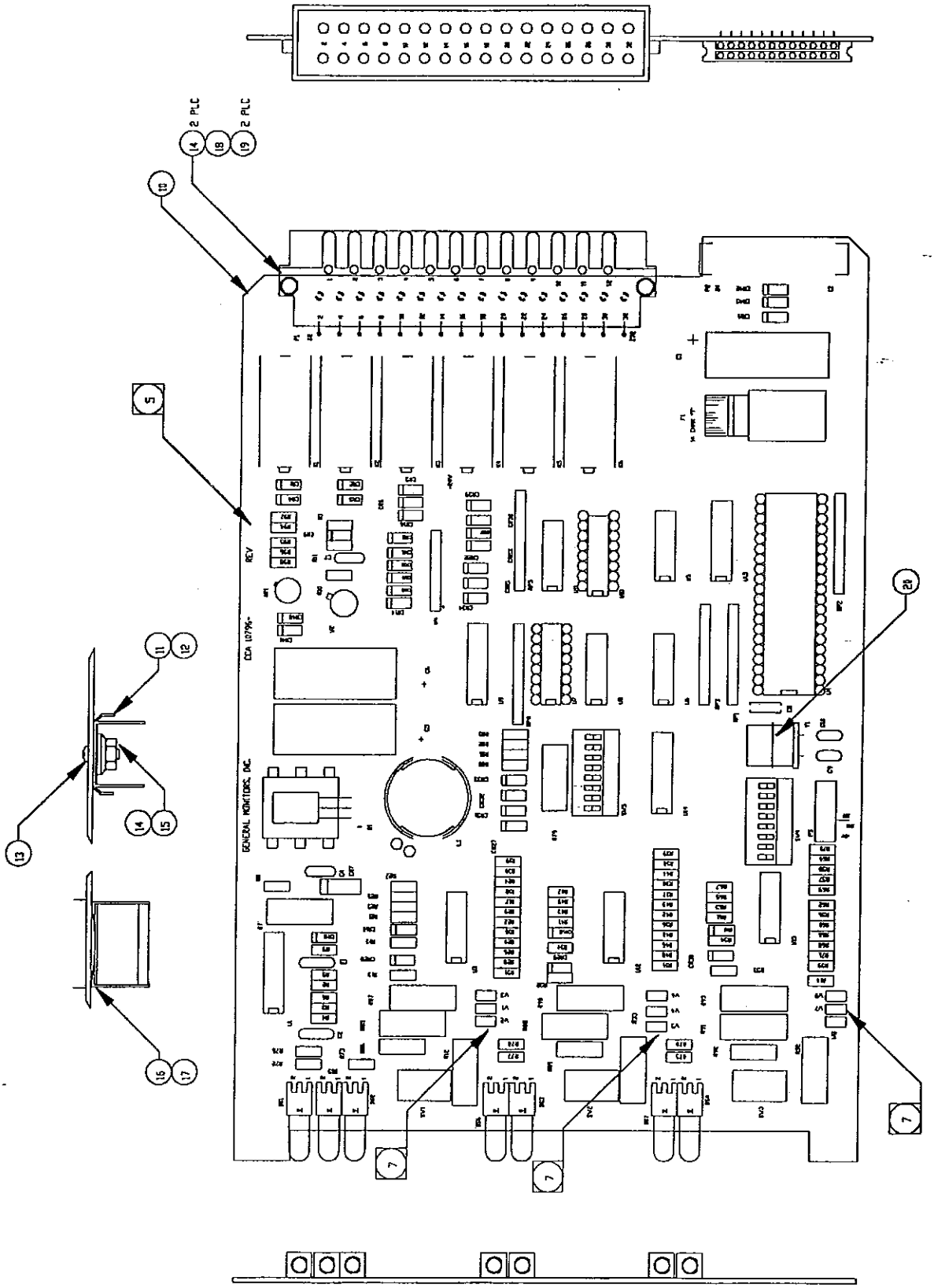
Appendix

Figure 9 - Circuit Card Assembly, IN002 Control Board



Appendix

Bill of Materials - IN002 Control Board
Reference # 10796-1

Part #	Description	Item or Reference
10795	Schematic, Control Board	INFO
10796	Circuit Card Assembly	INFO
1398	Label, Bar-Coded, Serialized	
932-002	Conformal Coating	10
948-410	Heatsink	11
931-036	Insulator Pad, .75 x .5 in.	12
12571	Screw, M3x.5x10 Phil Pan Head	13
12516	Nut, M3x.5 Nylon Insert-S-C Lock	14
9419	Washer, Cupped Alum w/TO126	15
928-623	Washer, .840 ±.008 x .025 PP	16
10891-1	Inductor, 2mH with Bracket	17
921-797	Coding Strip, Male	18
12551	Screw, M3x.5x16 Phil Pan Head	19
9416	Buss Wire, 22AWG, Soft Drawn	20
915-159	Capacitor, 1000uf, 50v, Ceramic	C1
915-027	Capacitor, 150pf, 100v	C2
915-017	Capacitor, .01uf, 50v, Ceramic NP	C3
915-033	Capacitor, .1uf, 50v, Ceramic	C4
915-168	Capacitor, 68uf, 60v, Aluminum	C5,6
915-036	Capacitor, 1uf, 50v, Ceramic	C7
915-203	Capacitor, .1uf, 50v, .300 CTRS	C8
915-026	Capacitor, 20pf, 500v	C9,10
948-123	Diode, 400v, 1A Rectifier	CR1,2,3,4,5, 6,11,14,15,16, 19,20,21,22, 23,28,29,30, 31,32,33,34, 35,36,37,38,39
948-035	Diode, Zener Transient Suppr	CR7
948-124	Diode, 100v, 1A Rectifier Rcvry	CR8
948-104	Diode, Signal, 1N4148	CR9
948-030	Diode, 5.1v, 1W, 5%, 1N4733A	CR10,12,13,27
948-322	LED, Green, 90° PC Mounted	DS1
948-323	LED, Amber, 90° PC Mounted	DS2,3,4
948-321	LED, Red, 90° PC Mounted	DS5,6,7
951-013	Fuse, Mini, 5x20mm, 1A @ 250v	F1
921-607	Fuse Holder, PC Mounted w/Cap	F1
945-039	Relays, 24v 4A DPDT 2850 Ohm	K1,2,3,4,5,6
921-862	Connector Plug, PC Mount	P2
921-898	Connector RCPT	P5
921-376	Terminal Block Header	P1
948-238	Transistor, PNP, 4A @ 60v	Q1
947-301	Resistor, 10 Kohms, 1%	R1,13,20,21, 22,23,24,25, 26,27,32,40, 41,42,43,44, 45,46,47,53, 60,61,62,63, 64,65,66,67, 80,81,82,83, 84,85
947-325	Resistor, 20 Kohms, 1%	R2,5
947-328	Resistor, 1 Kohm, 1%	R3,6
947-048	Resistor, 100 Kohms, 1/4 W, 5%	R4
947-203	Resistor, 330 Ohms, 1/4 W, 5%	R7,79
947-012	Resistor, 100 Ohms, 1/4 W, 5%	R8
947-033	Resistor, 5.6 Kohms, 1/4 W, 5%	R9
949-104	Resistor, 34 Kohms, 1%	R10
947-383	Resistor, 11.5 Kohms, 1%	R11
947-492	Resistor, 360 Ohms, 2 Watt, 5%	R12,33,52
947-371	Resistor, 7.5 Kohms, 1%	R14
947-661	Resistor, 26.1 Ohms, 1%	R15,34,54
947-634	Resistor, 105 Ohms, 1%	R16,36,56
949-125	Resistor, 115 Ohms, 1%	R17,37,57
949-126	Resistor, 309 Ohms, 1%	R18,38,58
949-123	Resistor, 71.5 Ohms, 1%	R19,39,59
949-122	Resistor, 10 Mohms, 1%	R28,29,30,31, 48,49,50,51,68, 69,70,71
949-124	Resistor, 133 Ohms, 1%	R72,73,74,75
947-378	Resistor, 243 Ohms, 1%	R76,77,78
947-223	Resistor, 200 Ohms, 1/4 W, 5%	R85,88,91
947-490	Resistor, 110 Ohms, 1/2 Watt	R86,89,92
947-491	Resistor, 510 Ohms, 2 Watt	R87,90,93
947-912	Resistor Network, 4.7 Kohms, SIP	RP4
947-922	Resistor Network, 10 Kohms, S IP	RP1,2,3
951-600	Switch, Eight position DIP	SW4,5
931-366	IC, Switching Ref, 16-pin	U1
931-388	IC, Program Voltage Regulator	U2
931-361	IC, Quad - Op Amps, LM324AN	U3,12,13
921-711	Socket, 40 pin IC, Gold Platted	U4
931-444	IC, Quad - 2 Input XOR Gates	U5,6
931-425	IC, Darlington Transistor Array	U7,9,10
921-793	Socket, 16 pin DIP	U7,10
931-404	IC, Quad - 2 In NOR Gates	U8
931-406	IC, Triple - 3 In OR Gates	U11
931-428	IC, Analog Mux/Dmux Sngl 8 ch	U14
923-001	Crystal, 3.0 Mhz, (-40°C to +70°C)	Y1

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Appendix

Final Assembly - IN002

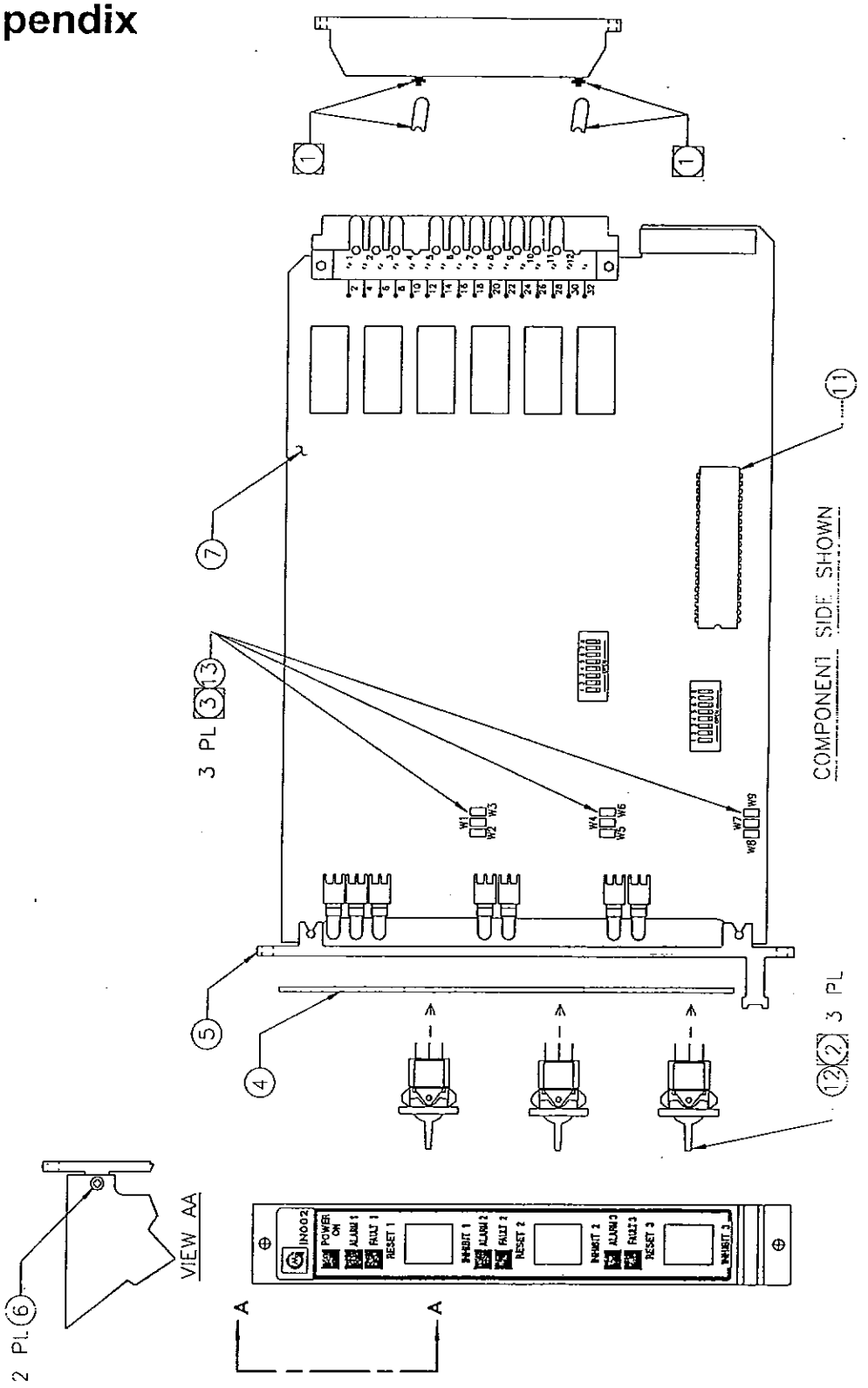

Figure 9

Appendix

Bill of Materials - IN002 Final Assemblies

Reference # 10790-1 (w/300 Ohm Zener)

Part #	Description	Item or Reference
10790	IN002 Input Card	INFO
10791	Outline & Rear Term Drawing	INFO
1567	Label, Config. 1.2"x0.2"	
10793-1	Front Panel Inlay	4
10800-1	Front Panel, Machined	5
9420	Screw, M3x16 Slot Torx Pan	6
10796-1	CCA Control Board - IN002	7
10813-1	Inlay Handle	8
10284-45	Microcomputer, Programmed	11
951-340	Switch, Rocker, DPDT, Black	12
921-518	Jumper, Test Point, .100 Spacing	13 W1,4,7

Reference # 10790-3 (w/o Zener Barrier)

Part #	Description	Item or Reference
10790	IN002 Input Card	INFO
10791	Outline & Rear Term Drawing	INFO
1567	Label, Config. 1.2"x0.2"	
10793-1	Front Panel Inlay	4
10800-1	Front Panel, Machined	5
9420	Screw, M3x16 Slot Torx Pan	6
10796-1	CCA Control Board - IN002	7
10813-1	Inlay Handle	8
10284-45	Microcomputer, Programmed	11
951-340	Switch, Rocker, DPDT, Black	12
921-518	Jumper, Test Point, .100 Spacing	13 W3,6,9

Reference # 10790-2 (w/390 Ohm Zener)

Part #	Description	Item or Reference
10790	IN002 Input Card	INFO
10791	Outline & Rear Term Drawing	INFO
1567	Label, Config. 1.2"x0.2"	
10793-1	Front Panel Inlay	4
10800-1	Front Panel, Machined	5
9420	Screw, M3x16 Slot Torx Pan	6
10796-1	CCA Control Board - IN002	7
10813-1	Inlay Handle	8
10284-45	Microcomputer, Programmed	11
951-340	Switch, Rocker, DPDT, Black	12
921-518	Jumper, Test Point, .100 Spacing	13 W2,5,8

Appendix

4.4 Ordering Information

For pricing and availability of the Model IN002, contact the General Monitors' factory direct.