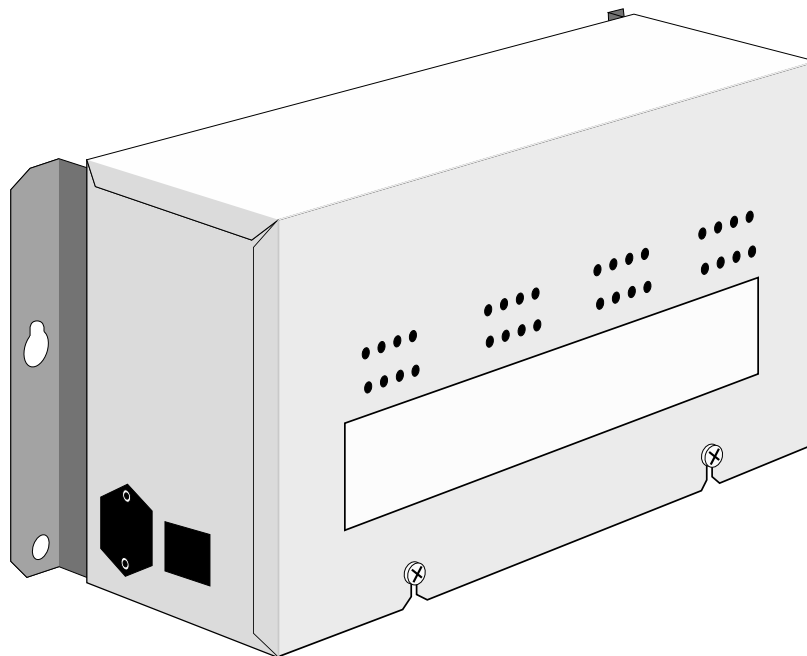


**SERVICE
MANUAL**

PA0242 Distribution Box



CAUTION

Some of the procedures in this manual may involve the removal and reconnection of components (connectors, etc.) to isolate a problem. For personal safety, as well as protection of the equipment and components, always remove power from the equipment before removal or reconnection of any component. Use of an Anti-Static Wrist Band is recommended when servicing this equipment.

OVERVIEW

The PA0242 Distribution Box houses the passive opto-coupled loop from the controller, twelve dispenser current loops, power supply, and the automatic isolation circuitry. The two-wire circuit carries the data from the controller to the dispensers by encoding data into current pulses.

There are twelve individual current loops for the dispensers. Each loop has both current regulator and automatic isolation circuitry associated with it. The dispenser loop drive is configured in a star drive and operates at 45mA from a 12V regulated power supply. Only one dispenser is allowed per current loop.

RELATED DOCUMENTS

MDE-2382: PA0242 Installation Manual

RECOMMENDED TOOLS

Flat Tip Screwdriver (small, less than 1/8")
 Cross Tip Screwdriver
 Nut Driver (5/16" and 1/4")
 Long Nose Pliers
 Volt-Ohm Meter

POWER SUPPLY

The PA0242 contains its own power supply, and regulates the power to the loop current drivers. Two power supplies are available, one for 115VAC operation and one for 230VAC operation.

INCOMING DATA FROM CONTROLLER

The Distribution Box accepts current loop signals from a controlling device, which are isolated by opto-coupled isolators. The Distribution Box converts these signals into control voltages for driving the dispensing unit current loops. The data from dispenser current loops is converted to a control voltage which, in turn, controls the current isolators. Three status LEDs are provided. CR7 indicates the lines from the controller are connected with reversed polarities. The second LED (CR12) lights up if the transmit line is sending out a signal to the individual dispenser loop supplies. The third LED (CR8) lights up if the individual dispenser loops are sending data to the controller.

DISPENSER CURRENT LOOP

The current regulator section ensures that approximately 45mA flows through the dispenser loop when the transmit line has a high potential. When the transmit line potential drops to a low state, the current regulator section restricts the current flow through the dispenser loop. The opto-couplers in the dispenser decode the low current state as a space. Thus, serial data is transmitted from the controller, through the loop supply, to twelve current regulator sections, where the data is transmitted by current pulses through the dispenser loops to the dispensers. At the end of a data word, the current regulator is turned on and the current flows through the dispenser loop. The dispensers communicate to the controller by breaking the dispenser loop. When a dispenser is polled, the dispenser returns a message by breaking the loop or creating pulses.

INTRODUCTION

JUMPER SETTINGS

The following functional descriptions are for the jump jacks of the distribution board.

JP1 has four pins labeled B, A, C. 

The normal setting is one jumper in Position A. With the jumper in this position, the console loop to the PA0242 is enabled.

Jumpers B and C are used only for test purposes and must be installed after J905 is disconnected from P905.

Test Procedure

1. Disconnect D-Sub (connector) J905. AC power applied.
2. Remove JP1 from position "A". Place jumpers on JP1B and JP1C.
3. Short pins 6 and 7 at P905.
4. Observe LEDs:
CR12 On = Console/Controller interface OK
Pump NOR LED on = Jumper in ISO position
Pump ISO LED on = Jumper in NOR position; Pump circuit OK

NORMAL/ISOLATE JUMPERS

All Normal/Isolate Jumpers are installed in the Isolate mode. When a dispenser is connected, the jumper must be moved to the Normal position. Indicators, located directly behind connectors P901A, P901B and P902A, should be ON if:

1. The dispenser loop has continuity.
2. The console/controller loop is working properly, CR1 is on.

The following table is the configuration as sent from factory:

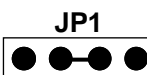
JP-A Installed
JP-2 Thru JP13 In Isolate Position

The following lists the jumper numbers versus dispenser loop position numbers. (The dispenser position numbers have no relationship to actual dispenser addresses. A dispenser address can be on any position.)

Jumper	Loop Position	Jumper	Loop Position
JP2	1	JP8	7
JP3	2	JP9	8
JP4	3	JP10	9
JP5	4	JP11	10
JP6	5	JP12	11
JP7	6	JP13	12

JP2 through JP13 MUST be changed to Normal for each dispenser loop position installed.

The normal condition for Jumper 1 is as follows:

A = Console data loop communication enable 

GENERAL SERVICE TIPS

If problems are encountered at start-up, check initial installation first (cabling, connections, etc.). Try to isolate the problem to the PA0242 Distribution Box.

RECOMMENDED SPARE PARTS

In some cases, the most feasible means of determining if a particular subassembly is malfunctioning is to substitute a known good subassembly. Therefore, a technician undertaking the diagnosis and repair of this equipment should have parts on hand for replacement. The parts listed below are the recommended minimum for each service truck. If multiple sites are maintained, quantities may need to be increased, depending upon distance from depot stocking parts and other variables.

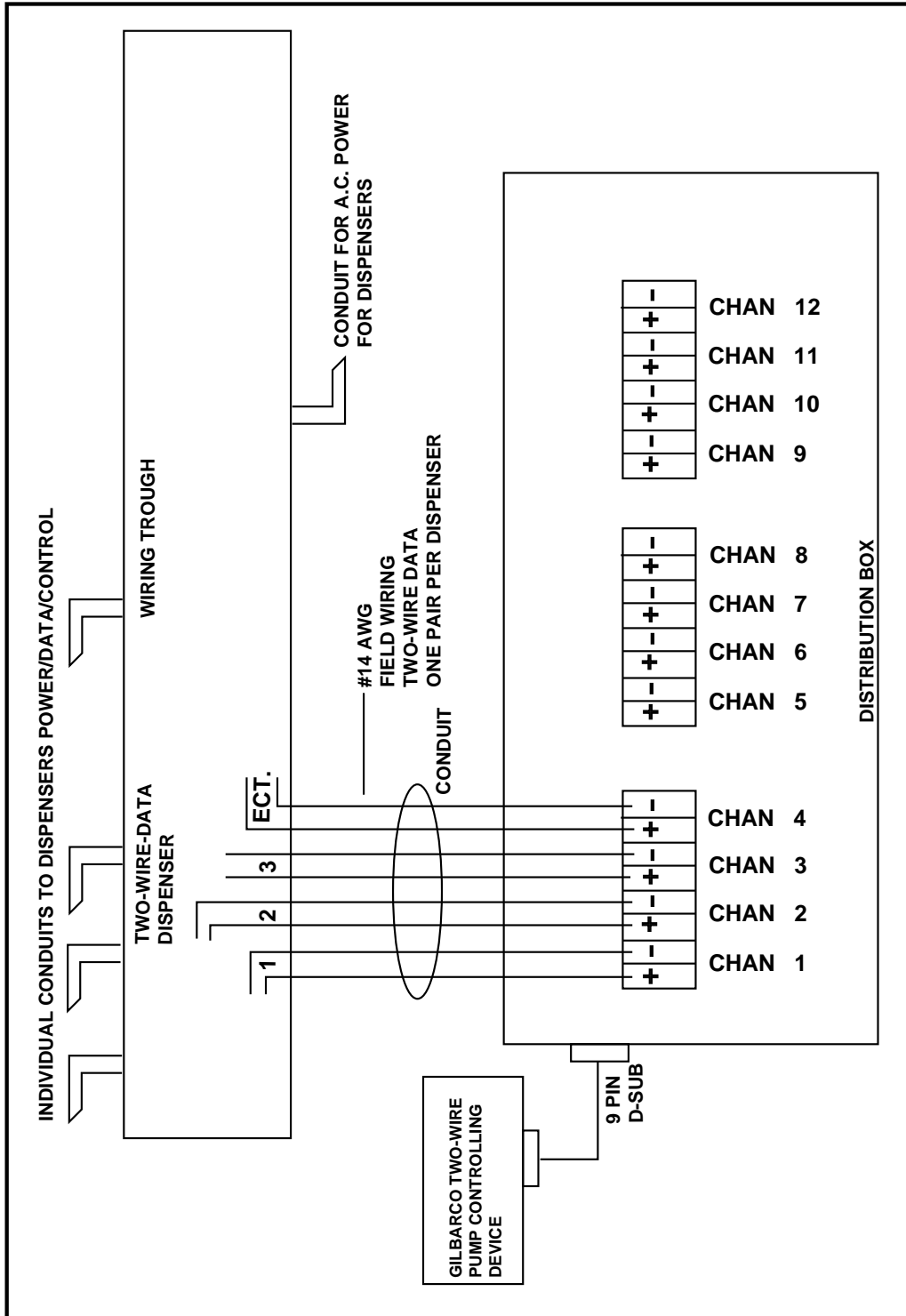
<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
T16960-G1S	DISTRIBUTION BOARD	1
Q12108-07	FIELD WIRE CONNECTORS	4
Q12005-01	AC INPUT FUSE	5

VOLTAGE TEST POINTS

The voltage test points identified below should be helpful in servicing and troubleshooting the PA0242 if problems arise.

GROUND	TP3
+5VDC	TP2
12VDC	TP1

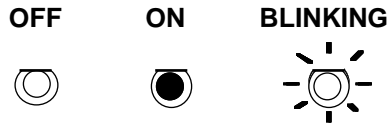
FIGURE 1: DISTRIBUTION BOX DIAGRAM

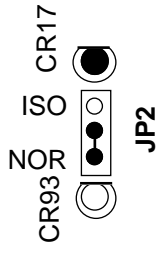


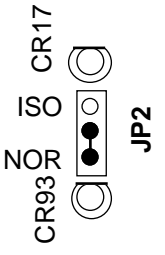
TROUBLESHOOTING GUIDE

This Troubleshooting Guide should help in resolving most problems, but cannot include all possible symptoms and causes. It is essential to read all symptoms related to a problem before replacing a component. CR93 and CR17 are used as a reference. There are two LED's and a set of jumpers for each channel.

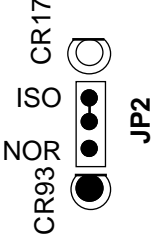
EXAMPLE LEDS AND WHAT THEY MEAN

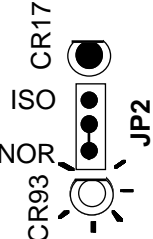


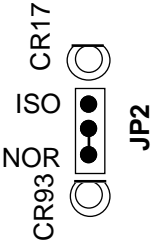
<p>1. Indicates current loop pair has continuity. (CR17-ON)</p> <p>Causes:</p> <ol style="list-style-type: none"> 1. Shorted data pair. 2. Pump terminated to data pair. 	<p>Example:</p> 
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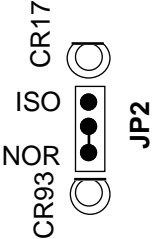
<p>2. Indicates current loop pair open. (CR17-OFF)</p> <p>Causes:</p> <ol style="list-style-type: none"> 1. Open data wire. 2. LED burned out. 3. Defective current loop interface at the dispenser. <p>NOTE: Varies with type of dispenser. Refer to dispenser Service Manuals.</p> <ol style="list-style-type: none"> 4. No dispenser terminates to data pair with jump jack in normal position. 	<p>Example:</p> 
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TROUBLESHOOTING (CONT.)

<p>3. Indicates communication status and isolation normal status. (CR93-Solid ON)</p> <ol style="list-style-type: none"> 1. Indicates data loop isolation in effect. 2. Normal indication for unused channel. 	<p>Example:</p> 
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<p>INDICATION: Rapid "Blinking" (CR93) Solid On (CR17)</p> <ol style="list-style-type: none"> 1. Normal data loop operation. 	<p>Example:</p> 
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<p>INDICATION: LED OFF (CR93)</p> <ol style="list-style-type: none"> 1. Must be considered with status of CR17. <p>NOTE: Loop status circuit will not indicate reversed polarity. (Modular dispenser will).</p> <ol style="list-style-type: none"> 2. If CR17 is ON, continuity to the dispenser is complete. 3. If CR17 is OFF, the current loop to the dispenser is open. 	<p>Example:</p> 
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<p>INDICATION: A. Loop Open (CR17- OFF). B. No Data Transmission (CR93-OFF).</p> <p>CAUSE:</p> <ol style="list-style-type: none"> 1. No power to dispenser. 2. Data wire to dispenser open. 3. Channel blown. 4. No pump termination to data pair with jump jack in normal. 	<p>Example:</p> 
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TROUBLESHOOTING (CONT.)

INDICATION:	A. Loop continuity (CR17-ON). B. No data transmission to that channel position (CR93-OFF).	Example:	<p>The diagram shows a vertical strip with four positions: CR17, IS, O, and NO. CR17 has a solid black circle (ON). IS and O are empty. NO has a solid black circle (ON). Below the strip is a circular component labeled CR93 with a dashed line around it, indicating it is OFF. The entire assembly is labeled JP2.</p>
CAUSE:	1. Shorted data wires. 2. Dispenser communication failure. 3. Dispenser is in standalone mode. 4. Channel blown.		

SYMPTOM:	No communication to console for that channel.	Example:	<p>The diagram shows a vertical strip with four positions: CR17, IS, O, and NO. CR17 has a solid black circle (ON). IS and O are empty. NO has a solid black circle (ON). Below the strip is a circular component labeled CR93 with a dashed line around it and a small '1' next to it, indicating it is BLINKING. The entire assembly is labeled JP2.</p>
INDICATION:	A. Loop continuity (CR17-ON). B. Data transmission present (CR93-BLINKING).		
CAUSE:	1. Channel blown. 2. Two dispensers addressed the same. 3. Pump select button on console broke.		

INDICATION:	A. Loop continuity (CR17-ON). B. Isolation jumper blocks data transmission from dispenser to console, even though the pump may be transmitting. (CR93-ON)	Example:	<p>The diagram shows a vertical strip with four positions: CR17, IS, O, and NO. CR17 has a solid black circle (ON). IS and O are empty. NO has a solid black circle (ON). Below the strip is a circular component labeled CR93 with a solid black circle inside it, indicating it is ON. The entire assembly is labeled JP2.</p>
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FIGURE 2: T16960-G1S DISTRIBUTION BOARD

