

TECHNICAL MANUAL

D-M-E SMART SERIES CURRENT VOLTAGE MONITOR

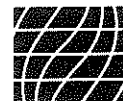
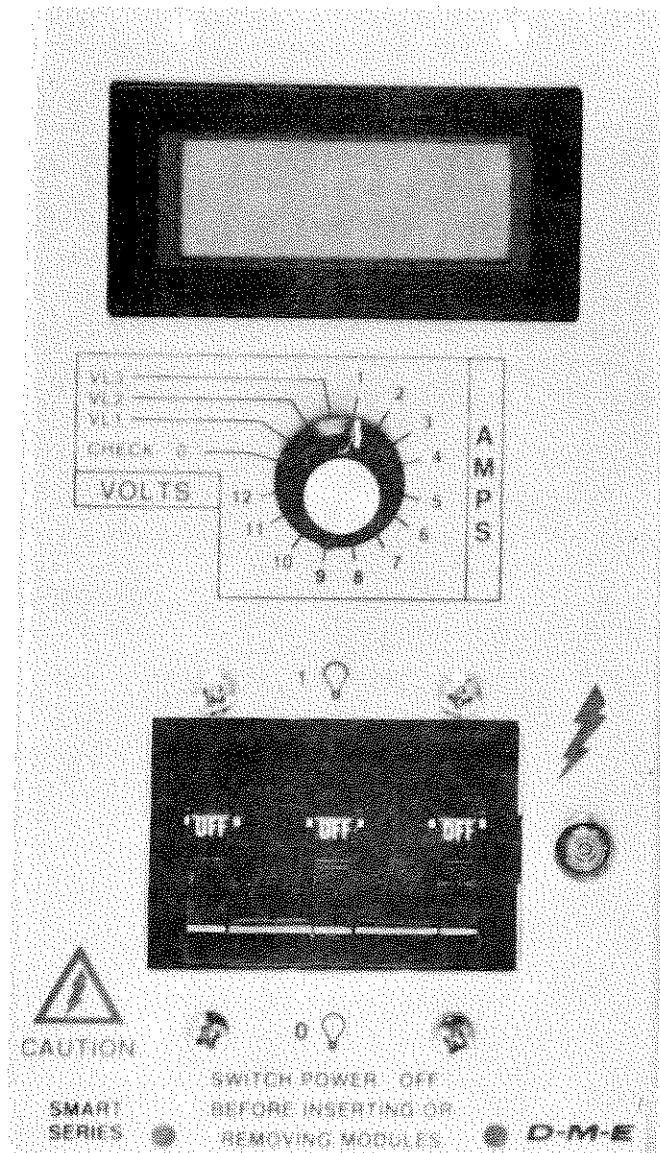


TABLE OF CONTENTS

	Page
Main Frame Disassembly Instructions	1 - 2
Assembly Instructions	2 - 5
Mounting and Installation of Transformer Board	6 - 7
Wiring Transformer Board	8 - 9
Operating Instructions	10
Interconnection Diagram	11
Display Board Schematic	12
Transformer Board Schematics for 5, 8 and 12 Zone	13 - 15

DIGITAL CURRENT VOLTAGE MONITOR KIT INSTALLATION INSTRUCTIONS

MAIN FRAME DISASSEMBLY INSTRUCTIONS:

1. Disconnect main frame from AC power source. **DANGER:** Make sure that your in-plant disconnect mechanism is in the "Off" position and is secured in the "Off" position by a padlock or other means provided by the manufacturer of the disconnect mechanism.
2. Remove all temperature control modules and set aside.
3. Remove main frame back cover, saving all hardware and set aside for reuse later.
4. Remove four screws mounting circuit breaker to circuit breaker panel. Save hardware for reuse later. Remove four screws holding circuit breaker panel to main frame. Save hardware for reuse later. Refer to Figure 1.
5. If neon phase lights are connected to buss strip, unplug wires from buss strip so that panel can be removed. Remove panel and set aside or discard. If phase lights are connected to bottom of circuit breaker, it will be necessary to twist breaker panel around inside the main frame in order to remove nuts and disconnect light wires. This will necessitate popping out the front edge of the upper and lower card guide rails directly adjacent to circuit breaker panel as indicated in Figure 1. When panel is free, set aside or discard.

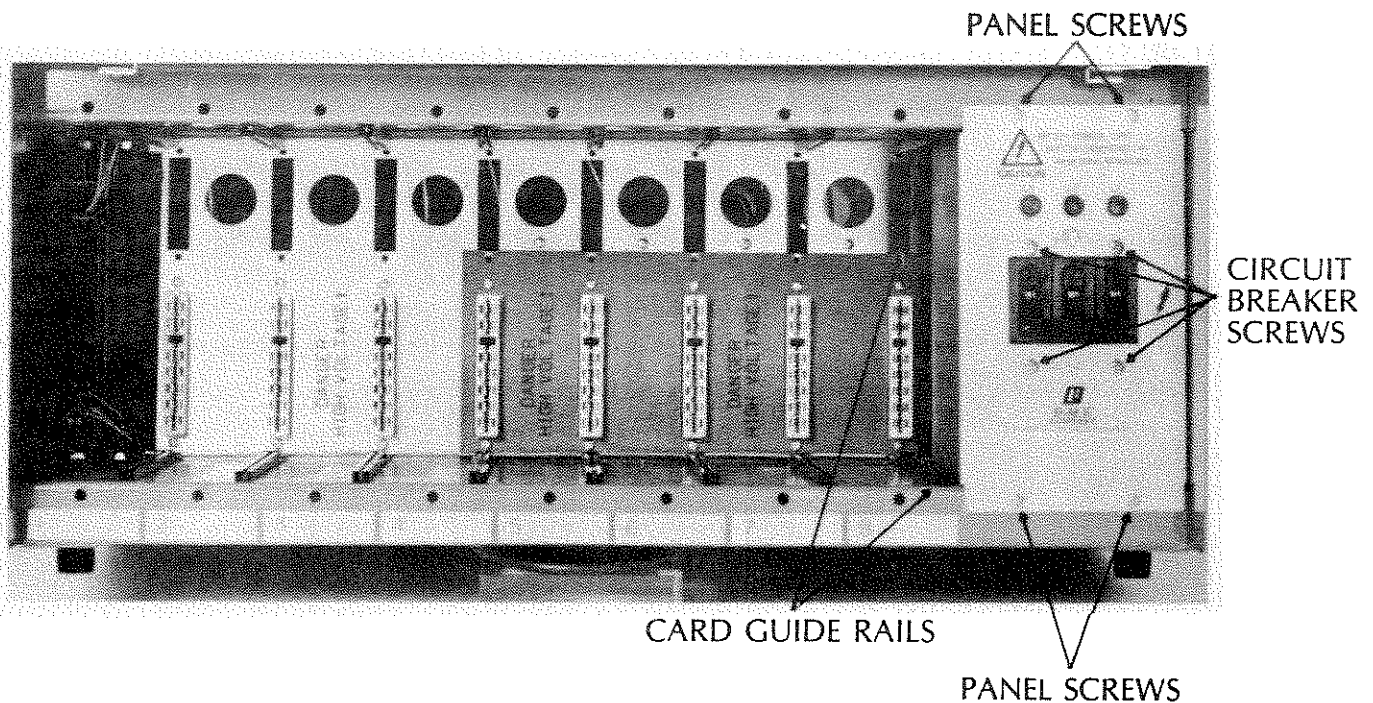


Fig. 1

6. Remove all three lugged #8 wires from bottom of circuit breaker. Note color coding or numbering for future reference.
7. Carefully remove nuts holding down the two outside barrier blocks (bottom outside corners of circuit breaker). Refer to Figure II. Remove barrier blocks and save for modification if necessary.

ASSEMBLY INSTRUCTIONS:

1. Locate two modified barrier blocks supplied with Current Voltage Monitor Kit. Note that barrier blocks supplied with the kit have been modified by removal of the anti-spin tab on the back of the barrier block. This allows the barrier block to be installed in the reverse position which provides the additional insulation required between circuit breaker lugs and bottom of main frame. Position barrier blocks as shown in Figure II and secure in place with previously removed hardware. Care should be taken to assure that the bottom of the barrier blocks remain square with the bottom of the circuit breaker when tightening nuts. If barrier blocks were not supplied with kit, it will be necessary to modify barrier blocks removed in step 7 of Disassembly Instructions. This can be accomplished by filing off the anti-spin tabs on the bottom of the barrier blocks.
2. Re-fasten lugged #8 wires removed in step 6 of Disassembly Instructions. Bend lugs at right angles and position so that wires come up and out. Then secure with appropriate hardware as shown in Figure II. Be sure to observe color coding or wire numbering when reconnecting wires.

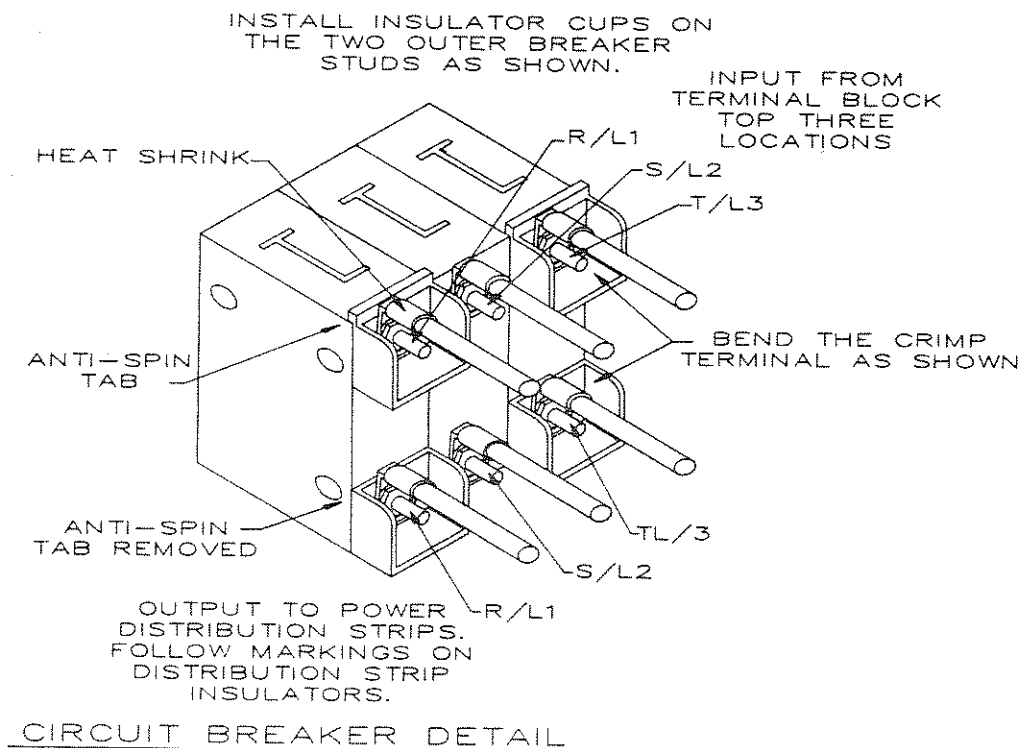


Fig. II

3. Place Current Voltage Monitor face flate assembly in front of circuit breaker. Thread 20 conductor flat ribbon cable through main frame from the front and around input power terminal block. Pull slack out of cable. Also thread neon light wires and phase voltage wires through main frame around input terminal block bracket. Take up extra slack on all wires, making sure that there is no interference with fan blades. Refer to Figure III.
4. Attach wires from neon light to terminal strips RL1 and SL2. **Note:** For export wiring, connect to RL1 and MPN.

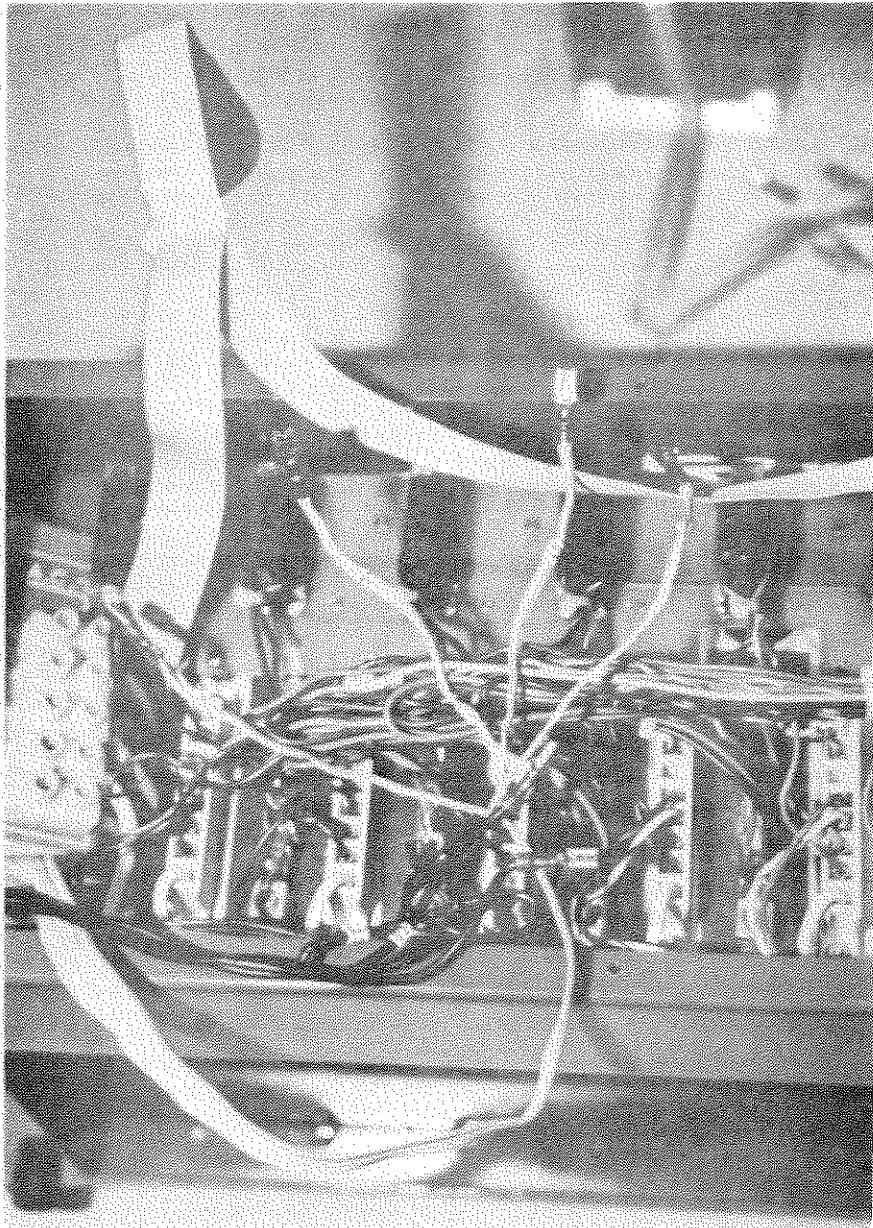


Fig. III

5. For standard 3-phase wiring, attach phase voltage wires to appropriate terminal strip. Wires are marked RL1, SL2, TL3 and MPN. For single phase voltages, connect wire RL1 to terminal strip RL1 and wire with colored stripe to the other side of the incoming line. **Note:** For single phase or export applications, it is necessary to cut the 240V 3-phase jumpers located on back of meter board. Refer to Figure IV for location.
6. Replace four $\frac{1}{4}$ x 6-32 screws mounting circuit breaker to circuit breaker panel which were removed in step 4 of Disassembly Instructions.
7. Replace four $\frac{3}{8}$ x 6-32 self-tapping screws holding circuit breaker panel to main frame which were removed in step 5 of Disassembly Instructions.

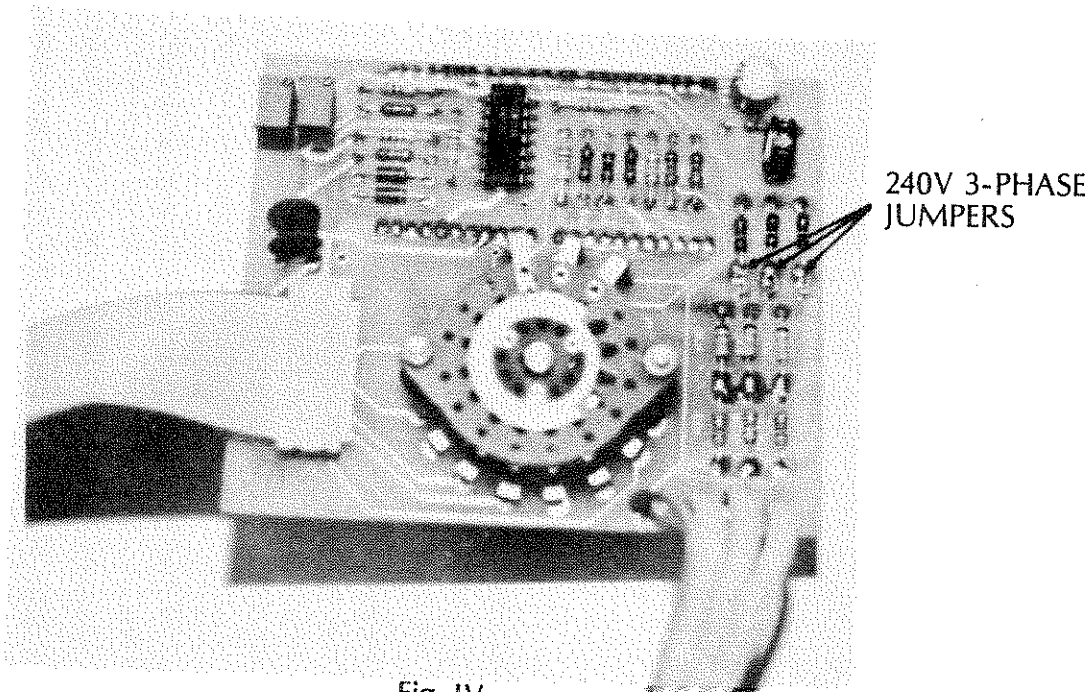


Fig. IV

8. Locate transformer board and connect 20 conductor flat ribbon cable that was previously threaded through the main frame to ribbon cable connector on the transformer board as shown in Figure V. **Note:** Position color stripe on flat ribbon cable over #1 position on ribbon connector as marked on transformer board. With ribbon cable in position over ribbon connector, place the top half of ribbon connector over ribbon cable. Make sure that cable remains flat and square in the connector and using pliers or similar tool, squeeze the two halves of ribbon connector together. Use care not to apply excessive pressure with pliers which may cause damage to the PC board and connector. It is recommended that a scrap piece of wood or cardboard be used to protect the bottom of the PC board from the jaws of the pliers. Work the pliers from end to end on the connector until the two halves of the connector are even and snug.

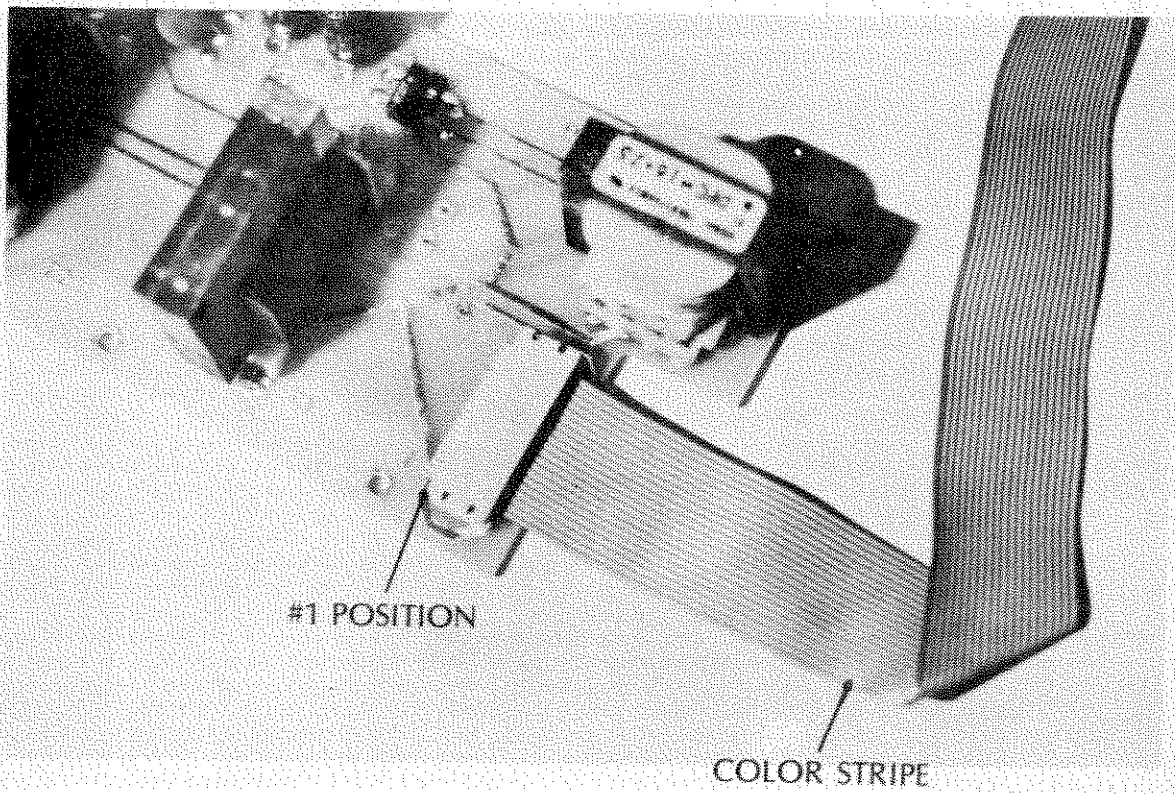


Fig. V

MOUNTING AND INSTALLATION OF TRANSFORMER BOARD:

1. Locate hardware supplied with Current Voltage Monitor Kit. If main frame is equipped with communications board, remove 4-40 nuts from positions shown in Figure VI and replace with $\frac{1}{2}$ x 4-40 standoffs supplied with hardware kit (tighten standoffs securely).
2. If main frame is not equipped with communications board, install $\frac{1}{4}$ x 4-40 screws in hole locations as shown in Figure VI. Install screws from the front of main frame through the connector mounting plate and secure with #4 lock washers and $\frac{1}{2}$ x 4-40 standoffs (tighten standoffs securely). This will provide the required standoff distance for PC board clearance.

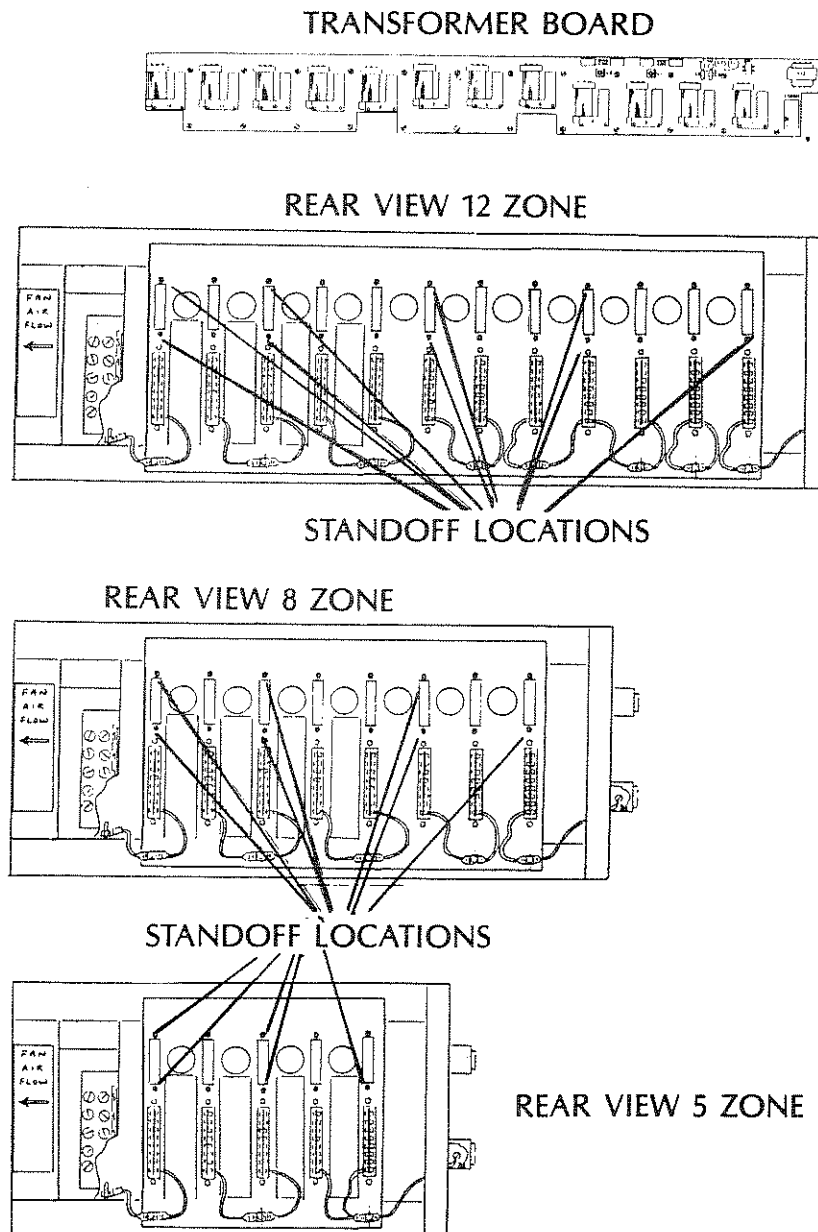


Fig. VI

3. Position transformer board over the standoffs so that mounting holes are properly aligned as shown in Figure VII. Secure transformer board to standoffs using #4 lock washers and $\frac{1}{4}$ x 4-40 screws supplied with hardware kit. Locate three adhesive flat ribbon cable clips provided in hardware kit and position along inside top lip of main frame cover. **Note:** Before installing, be sure position selected allows for free unobstructed operation of clip. After position is selected, remove paper from adhesive strip and stick in place. Position ribbon cable inside clips. Fold cable to take up excess slack and secure in place by latching hinged cover on plastic clips.
4. Locate two #16 AWG black power supply wires supplied with hardware kit and connect one end of each wire to transformer board using the quick slide connectors provided. Connect the other end of wires to terminal strips RL1 and SL2 respectively. **Note:** For export wiring, power supply wires must be connected to MPN and RL1 or damage will result.
5. Cut all tie wraps on input power wire harness. This harness can be identified by tracing wires back to input terminal strips RL1, SL2 and TL3. The input wire harness is used here because the wires have the necessary additional length to allow them to be looped around their appropriate current transformer cores.

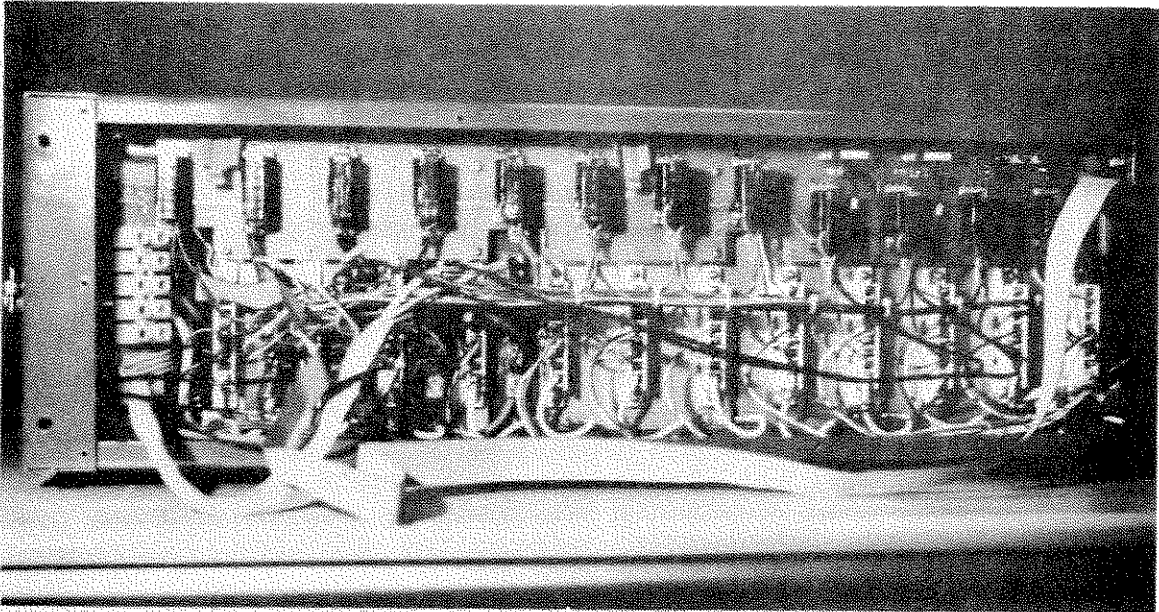


Fig. VII

WIRING TRANSFORMER BOARD:

1. Loop brown/white wire (brown wire with white tracer) from edge card connector #1 around core of current transformer #1 as shown in Figure VIII. Make loop as tight as possible and secure with T & B tie wrap supplied with hardware kit.
2. Continue looping input wires from each zone edge card connector around appropriate current transformer core. Use table below to match zone number/-wire color to appropriate current transformer:

Zone	Color	Transformer
1.....	Brown/White	T1
2.....	Red/White	T2
3.....	Orange/White	T3
4.....	Yellow/White	T4
5.....	Green/White	T5
6.....	Blue/White	T6
7.....	Violet/White	T7
8.....	Gray/White	T8
9.....	Black/White	T9
10.....	Black/Orange	T10
11.....	Brown/Red	T11
12.....	Red/Green	T12

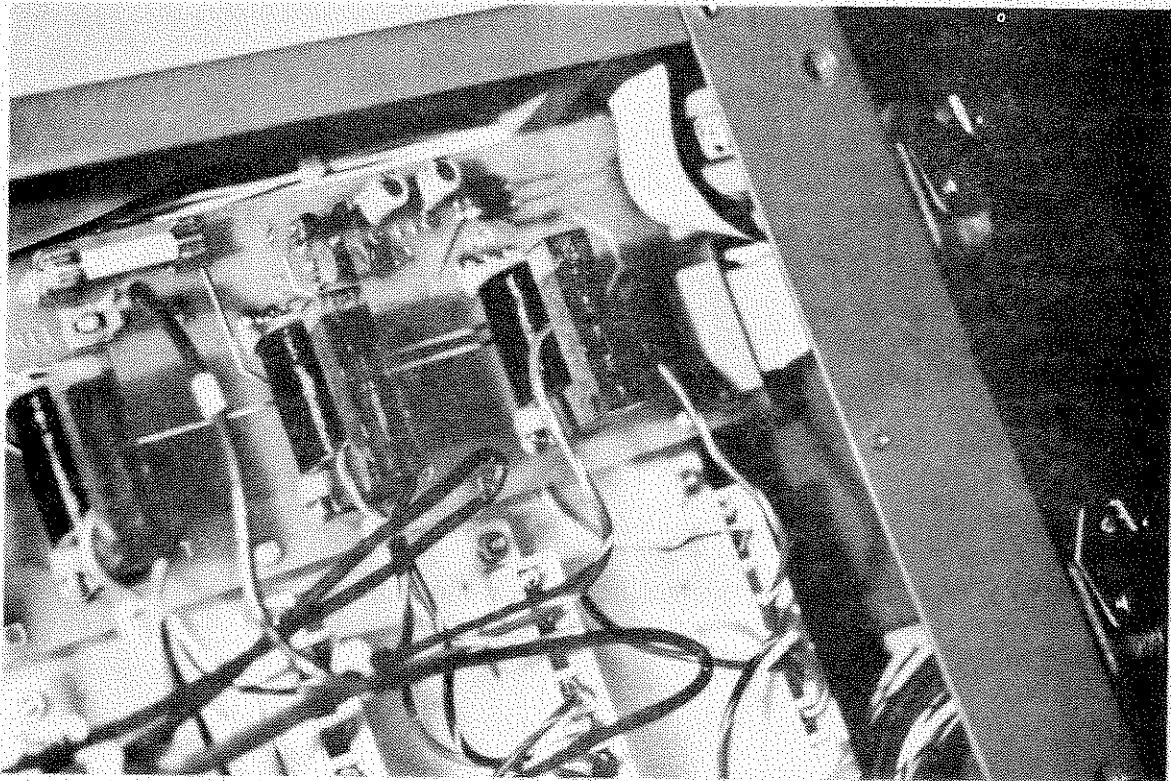


Fig. VIII

3. Make sure all wires are looped around the appropriate transformer core and that power supply wires from transformer board are connected as explained in step 4 of Mounting and Installation of Transformer Board Instructions.
4. Make sure phase voltage wires coming from front panel meter board are connected to the appropriate power distribution terminal strips, MPN, RL1, SL2 and TL3 respectively or as discussed in step 5 of Assembly Instructions. Also make sure that wires from neon light mounted on front panel are connected to RL1 and SL2 or RL1 and MPN for export wiring.
5. Dress all wires so that they lay with the remaining wire bundle running through the mid section of the main frame. Refer to Figure IX. Fold any excess length of wire into a neat bundle and tie wrap bundle together.
6. Replace main frame rear cover which was removed in step 3 of Disassembly Instructions.
7. Reinsert modules into appropriate zone locations in the main frame and reconnect AC power.

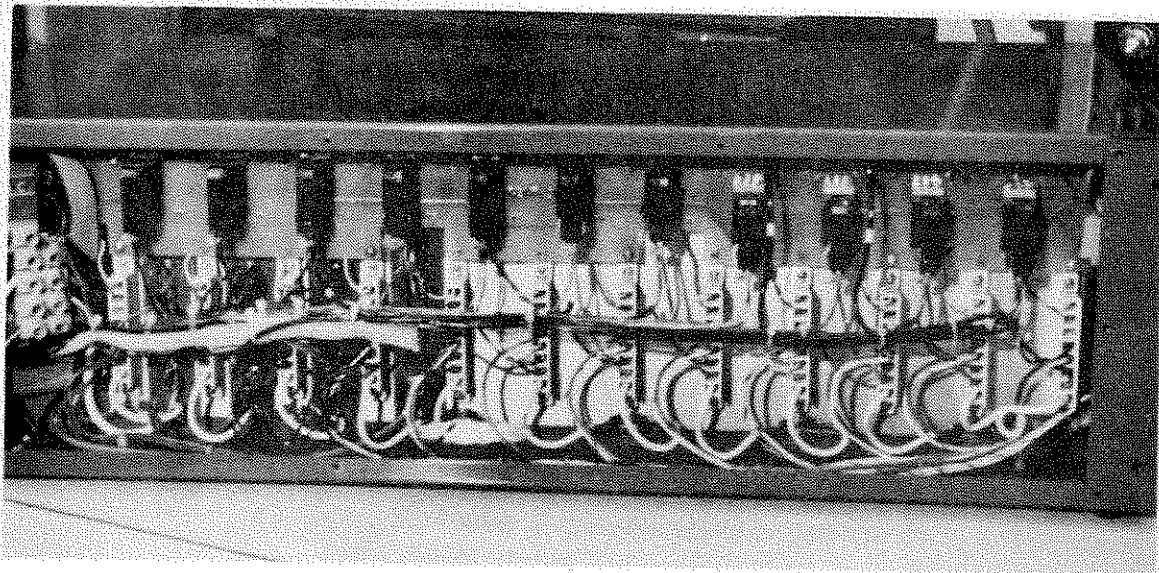
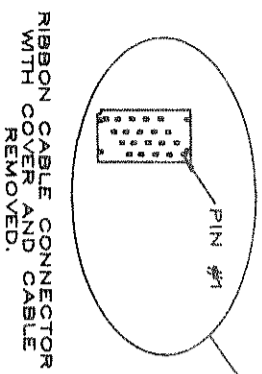
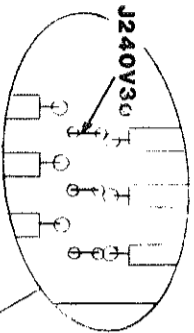


Fig. IX

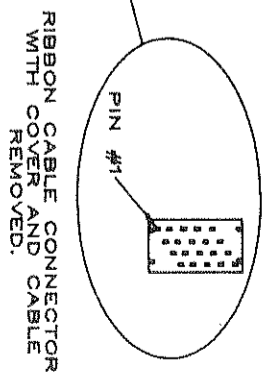
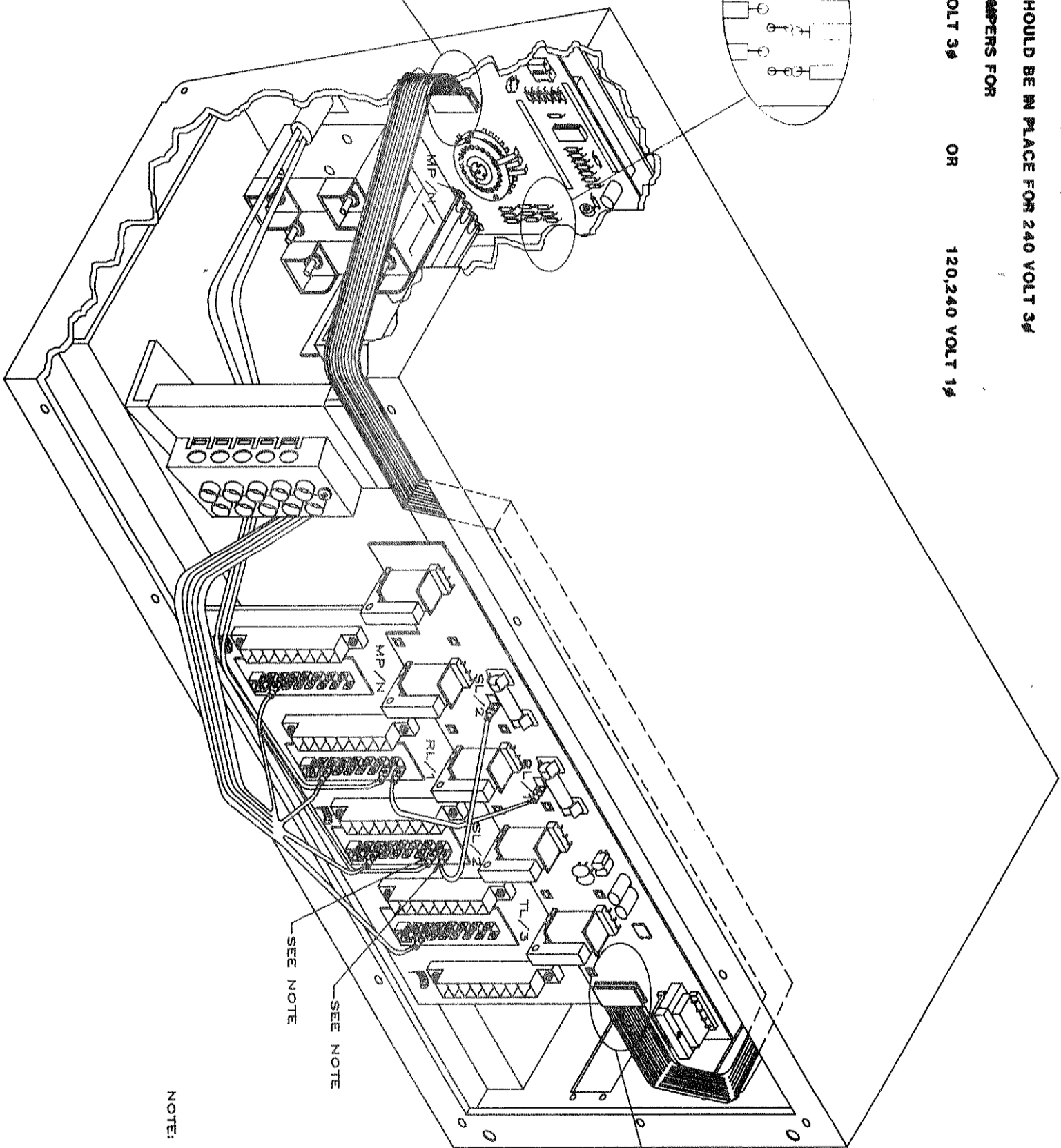
OPERATING INSTRUCTIONS:

1. Turn circuit breaker to the "On" position. The amber neon light on the front panel should illuminate, indicating that power is applied to the modules and the current voltage monitor.
2. Rotate the selector switch on the current voltage monitor to the Check "0" position. Allow several seconds for the display to stabilize. Reading on the display should be "000."
3. Rotate selector switch to the "VL1" position. The display should indicate phase 1 voltage. "VL 2" would show phase 2 voltage, "VL3" would show phase 3. Note that while the selector switch is in the "Volts" position, a "V" is displayed to the right of the numbers. Rotating the switch to the #1 position selects the "Amps" function of the meter. Note that the "V" that was displayed in the "Volts" position disappears and an "A" indicating "Amps" is now displayed to the right of the numbers. The #1 position displays the current flowing to the load from zone #1; likewise the remaining numbered positions will select the "Amps" function for each zone respectively.

J240V3~~0~~ CONSISTS OF 3 JUMPERS
 JUMPERS SHOULD BE IN PLACE FOR 240 VOLT 3~~0~~
 REMOVE JUMPERS FOR
 415-380 VOLT 3~~0~~ OR 120,240 VOLT 1~~0~~



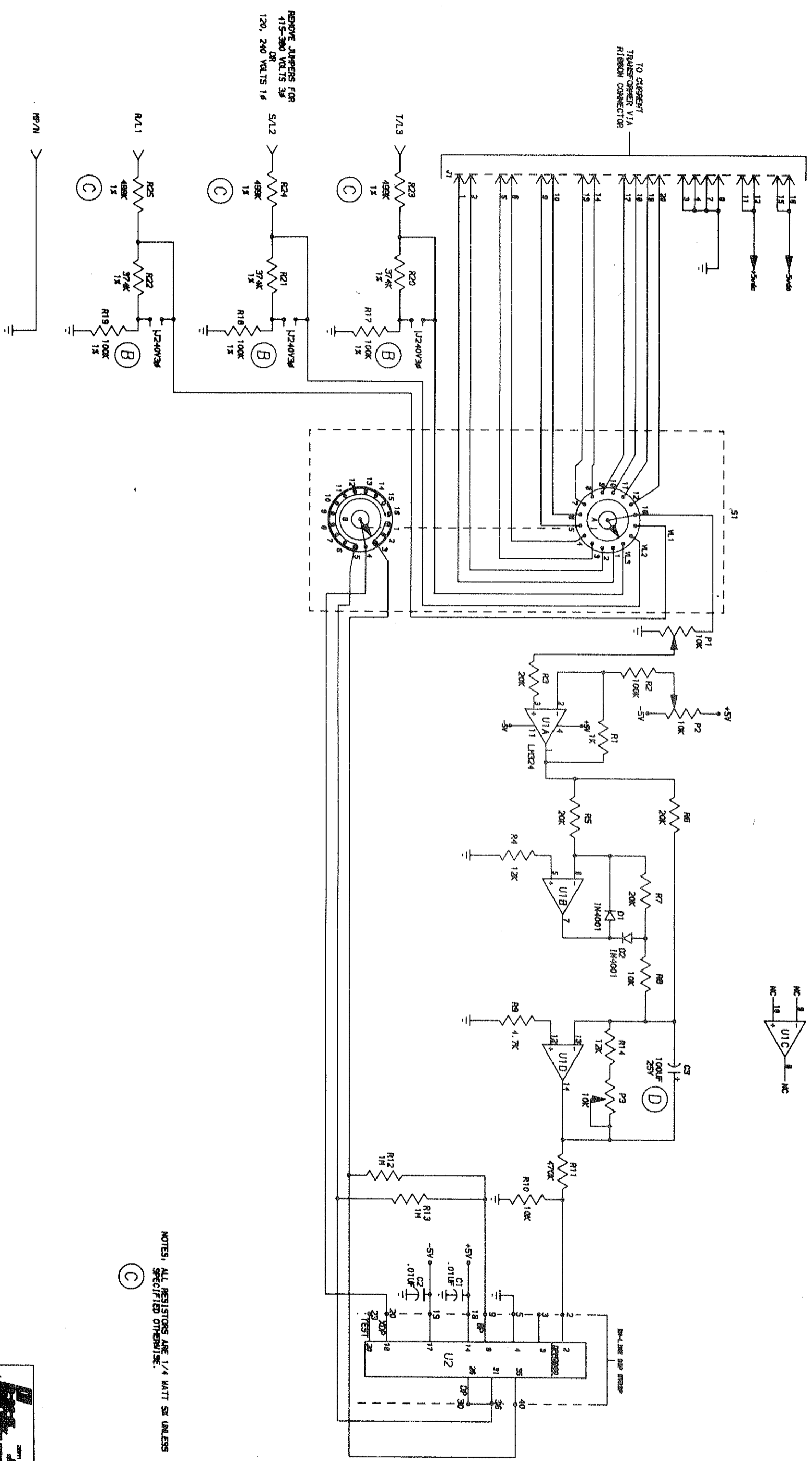
RIBBON CABLE CONNECTOR WITH COVER AND CABLE REMOVED.



RIBBON CABLE CONNECTOR WITH COVER AND CABLE REMOVED.

NOTE: FOR EXPORT SHIPMENTS, THESE CONNECTIONS ARE AT MP/N.

REV	DATE	BY	CHK
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			
51			
52			
53			
54			
55			
56			
57			
58			
59			
60			
61			
62			
63			
64			
65			
66			
67			
68			
69			
70			
71			
72			
73			
74			
75			
76			
77			
78			
79			
80			
81			
82			
83			
84			
85			
86			
87			
88			
89			
90			
91			
92			
93			
94			
95			
96			
97			
98			
99			
100			

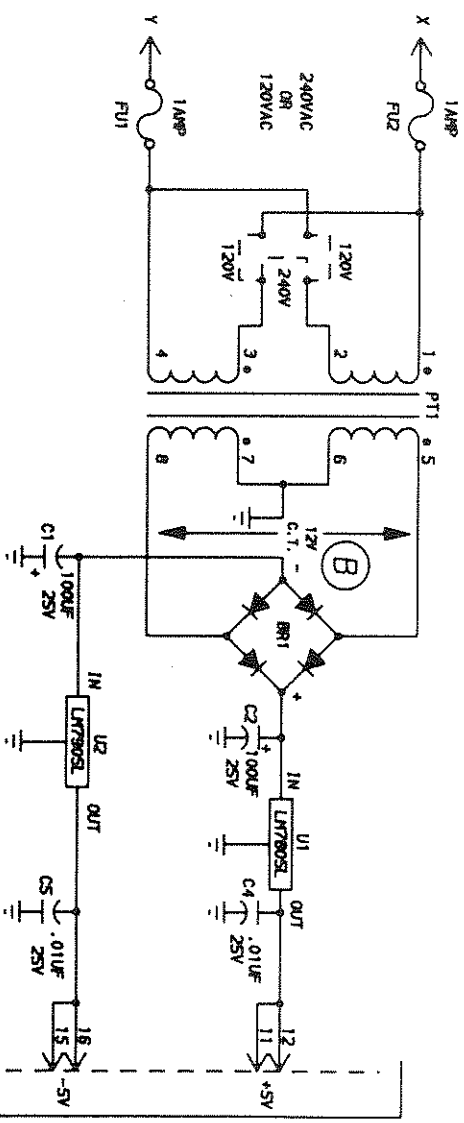


NOTES: ALL RESISTORS ARE 1/4 WATT 5% UNLESS SPECIFIED OTHERWISE.

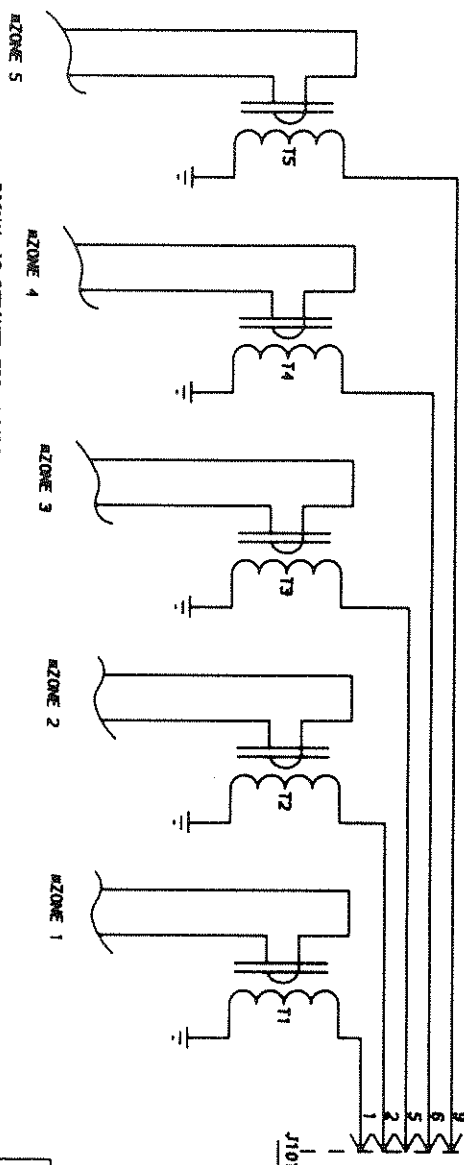
REV	DATE	BY	CHK
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			
51			
52			
53			
54			
55			
56			
57			
58			
59			
60			
61			
62			
63			
64			
65			
66			
67			
68			
69			
70			
71			
72			
73			
74			
75			
76			
77			
78			
79			
80			
81			
82			
83			
84			
85			
86			
87			
88			
89			
90			
91			
92			
93			
94			
95			
96			
97			
98			
99			
100			

REV.	DATE	BY	CHK
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			

WIRING STYLE VARIATIONS	
WIRING STYLE	CONNECT X, R, Y TO
A	R/L1 - S/L2
B	HP/N - R/L1
C	HP/N - R/L1
D	R/L1 - S/L2
D	HP/N - R/L1
D	R/L1 - S/L2
D	HP/N - R/L1
D	R/L1 - S/L2



TO DISPLAY BOARD
VIA
RIBBON CABLE



■ SIGNAL IS DERIVED FROM LOOPING THE INPUT POWER LEAD FROM EACH ZONE THROUGH THE OPEN CORE. SEE INTERCONNECT DRAWING FOR WIRING.

REV.	DATE	BY	CHK
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			

2011 INTERCONNECT DRAWING
ED-0039-SC-007-B

