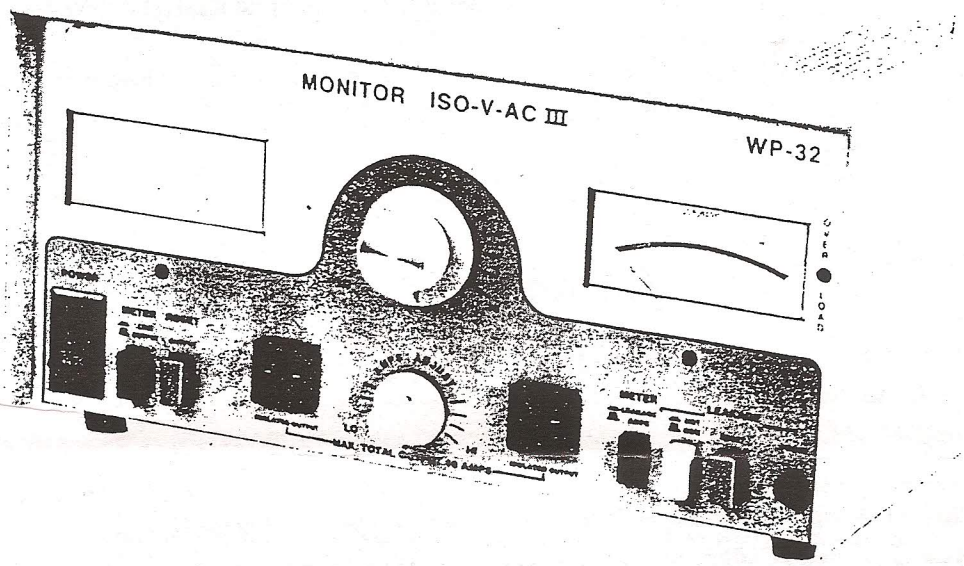
Instruction Manual
for
WP-32
MONITOR ISO-VAC III



VECTOR-VID
INSTRUMENT DIVISION

Safety Precautions

Certain Safety Precautions should be observed when working with electrical equipment or circuits that operate from AC Line Voltages. The WP-32 was designed to provide isolation from the AC Line and eliminate most of the shock hazard normally encountered. However, it is still possible to have high voltages present at the output of the instrument. You should become familiar with the equipment before using it or making any tests with it.

VID Repair Service

Authorized VID Service Depots throughout the United States are available for repair and calibration of VID Electronics Instruments. For up-to-date listings of these depots, contact your VID Distributor, or write to VID Electronics Instruments, 189 Horsham Road, Horsham PA 19044. If it becomes necessary to service this equipment, fill out the Test Equipment Service order form supplied with the instructions.

1. Pack the test equipment carefully. The instrument should be double-packed. It is best to pack the unit in its original carton, or similar container, then "float" this carton in at least a 3-inch layer of suitable packing such as shredded paper, inside the outer carton.
2. A full description of the problem should be included in the request.
3. Include all probes, cables, and test leads used with equipment.

   Attention to these details will help prevent damage in transit and delay in repairs.

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WP-32
MONITOR ISO-V-AC III

Description

The VID WP-32 Monitor ISO-V-AC III is designed to provide isolated AC output variable from 0 to approximately 150 volts. It can supply a continuous 10 amp output current to a maximum of 1300 VA. The output current can be set to the maximum output desired, at which point, a latching relay will open circuit and reduce output volts and amps to zero. Two parallel, three prong AC sockets are provided to allow the operator to use the unit for more than one load.

The WP-32 also includes a leakage tester that can measure AC leakage current in electrical/electronic equipment in order to verify if the leakage is within limits established by UL, CSA. An audible alarm warns of "HOT" chassis or shorts to exposed metal on equipment under test. The WP-32 is supplied with two 3½ meters. One monitors line or output voltage and the other can display output current or leakage.

For safety, the metal case of the WP-32 is connected to the power line ground through the three conductor AC power cord. The AC input is separately fused.

Specifications

Input ..... 110 to 130 VAC 60 Hz

Output Isolated Voltage ..... 0 to 150 VAC
(120 VAC Input)

Output Isolated Current ..... 0 to 10.0 Amps Maximum

Total Maximum Output ..... 1300 VA (Resistive Load)

Output Isolation ..... Less than 0.1MA (Meet ANSI Spec.C101.1, 1971)

Leakage Range 0-2 5MA

Meters ..... Two 3½" Taut Band

Meters Accuracy ..... ±3% of full scale on voltage
±2% of full scale on current and leakage

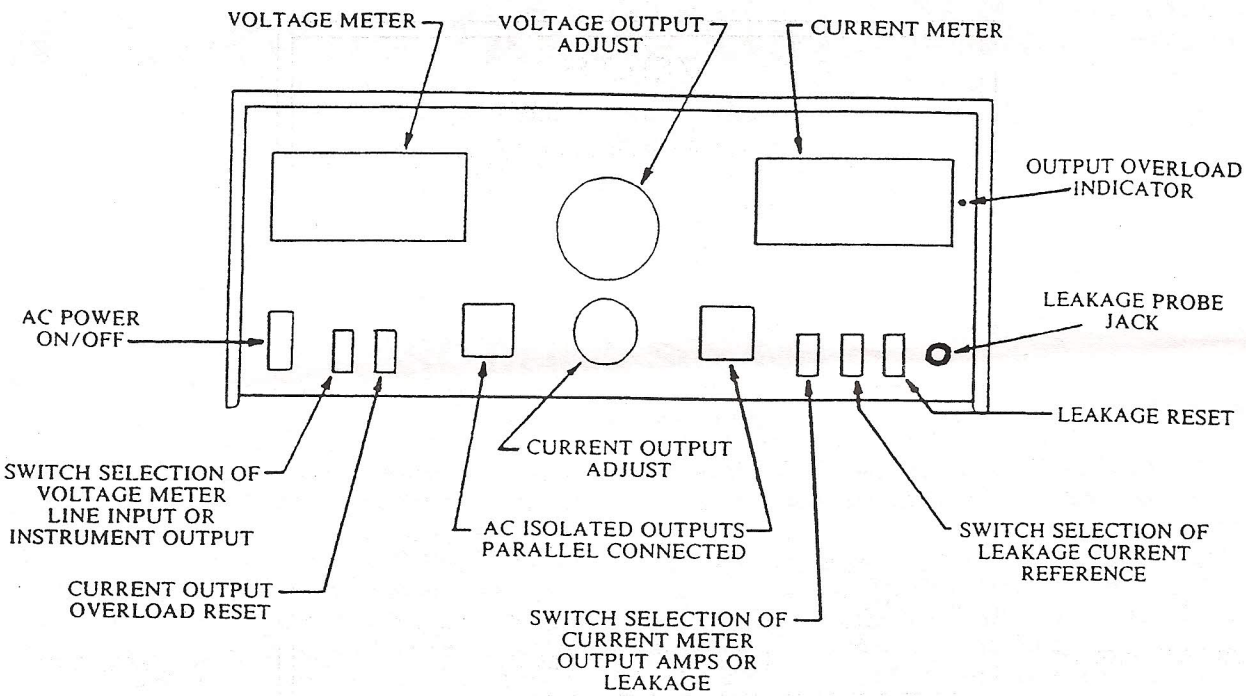
Protection ..... AC Input-Fuse
AC Output-Adjustable current relay with manual Reset.

Temperature Rise ..... 10°C (50°F)
(Outside case, full load 130V, 10A)

Dimensions (HWD) ..... 7"x 14"x 12½"
(17.8cm x 35.6cm x 31.8cm)

Weight ..... 42.8 lbs. (19.4kg)

Function of Controls



Operation

Refer to the functions of controls diagram. The WP-32 is two instruments in one. It is a variable isolated AC source and a leakage tester. When using the instrument for isolation, plug the equipment under test into one of the parallel connected isolated outputs. Set the maximum desired output current (up to 10 Amps) with the current adjust control. Set the output voltage as required (0-150 VAC) and read the output voltage on the voltage meter when the voltage meter switch is in the output position. If the load current exceeded the maximum desired output the overload L.E.D. will light and the output will automatically turn off. The instrument can be reset by depressing the reset output button. Output current can be read when the current meter switch is in the Amps position.

When the instrument is to be used for leakage testing, the equipment under test must be plugged into one of the isolated outputs. Only one device can be tested at a time. To perform the test, place the current meter switch in the Leakage position. Touch the leakage probe to the other isolated output "HOT" (small blade). Place the leakage HOT/COM switch in the COM position. At this point an alarm will sound. This is normal. With the alarm sounding observe the reading on the current meter, and adjust the voltage output control until the pointer is set at the "CAL" mark. Remove the leakage probe and depress the leakage reset switch. The instrument is now calibrated and ready for use.

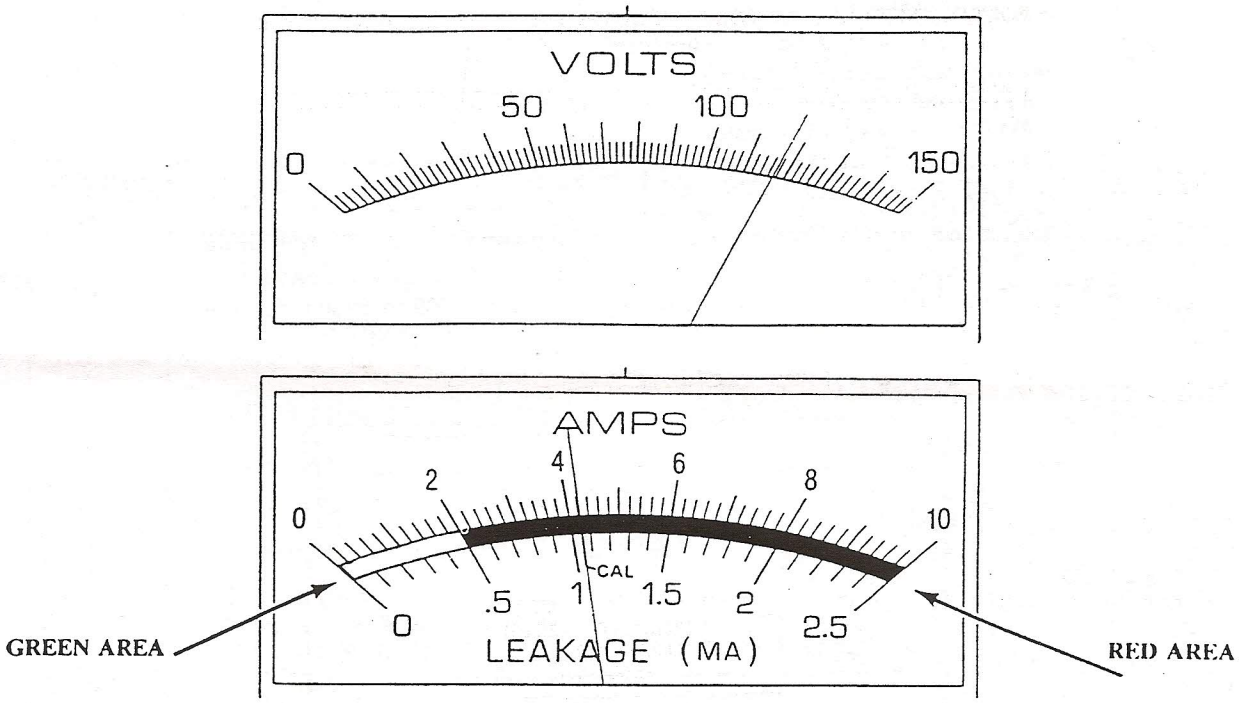
Touch the probe to all exposed metal parts making sure the probe top pierces any dirt or corrosion. Read the amount of leakage on the current meter. It should remain in the GREEN area (less than 0/5 MA). Place the HOT/COM switch in the HOT position and repeat the test. Some leakage may be observed in these tests. But the meter pointer should not extend into the RED area. If the meter reading is in the RED area unplug the device under test and do not apply power again until the cause of the leakage can be determined and corrected.

NOTE: *Never attempt to check leakage of any device that is connected directly to the AC power line.*

CAUTION:

If both outputs of the WP-32 are used at the same time, it is possible that a dangerous potential could appear netween equipment chassis. Therefore, extreme caution should be exercised in this mode of operation.

Meter Scales



Circuit Description

Refer to the schematic diagram on page 7 when reading the following circuit description.

When switch S1 is closed current from the AC power source flows through F1 and the primary winding of T1. T1 supplies the control and the main output power that provides the necessary AC line isolation for the output. The secondary of T1 is connected directly to T2. T2 is a variable transformer (voltage adjust control) that allows the output to be set from 0-150 VAC.

Output current from T2 flows through the normally closed contacts of relay 101 and then through R101 & R131. The voltage developed across R101 and R131 is directly proportional to output current. This AC voltage is fed through R102 to the inverting input of U101A.

U101A is an absolute value full wave rectifier. The output at the cathode of CR107 is a positive DC voltage equal to the average AC input, multiplied by the overall gain of U101A which is about 0.8. R104 and C106 provide filtering at the non-inverting input of U101B. The gain of U101B is set by R109 so that when S103 is in the Amps position M2 is calibrated on the Amp scale of the meter.

The same voltage that drives the meter is fed through CR108 to the inverting input of voltage comparator U102. On the non-inverting input of U102 a voltage reference is established by R1 which is the current adjust control. R110 and Zener Drode CR109 supply a regulated voltage across R1.

Whenever the voltage at the inverting input of U102 is more positive than the non-inverting input, the comparator switches state and drives current through R113, RLY 101, R114, and overload indicator CR1, causing the relay contacts to open and interrupt output power. CR110 and R112 latch the comparator on, until the reset switch S102 is depressed.

The operation of the leakage test function is the same as for current measurement. U103A, U103B, and U104 operate in the same manner as U101A, U101B, and U103 respectively.

The input from the leakage probe is coupled through RLY 102 and then to the parallel combination of C104 and R126/R127. This input circuit impedance is 1500 OHMS at 0.5 MA as required by the ANSI specifications. If leakage is greater than 2.5 MA, RLY 102 is activated, which in turn sounds an alarm and places R128 in series with the input probes. R128 is a calibration resistor used to set output voltage in the leakage test mode. (Refer to operation instructions.) S104 references the leakage test circuit to either side of the AC output.

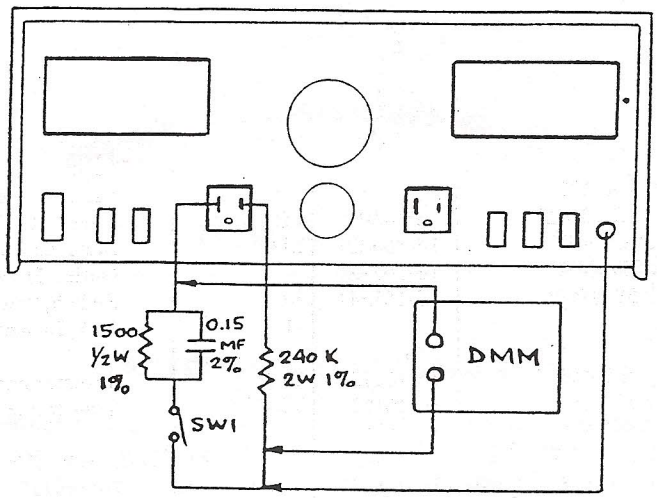
Control coils of T1, CR101, CR102, C101, and C102 provide DC voltage for operation of all control circuitry.

Calibration

EQUIPMENT REQUIRED

3½ digit DMM .1% accuracy
AC Ammeter 0-10 Amps .5% accuracy
400-600 watt load (lightbulbs)
SPST Switch
1500 Ohm ½ watt 1% resistor
240 K Ohm 2 watt 1% resistor
0.15 MF 2% capacitor

1. Connect the 400-600 watt load through the Ammeter to the output of the WP-32.
2. Observe the reading on the Ammeter and adjust R109 to obtain the same reading on the WP-32 Ammeter.
3. Connect the equipment as shown below.



4. With SW1 open adjust the output voltage of the instrument for a reading of 0.75 volts on the DMM.
5. Close SW1 and adjust R127 for 0.375 volts on the DMM.
6. Repeat steps 4 and 5 until voltage requirements are met.
7. With SW1 open and the DMM reading 0.75 volts adjust R121 for a 0.5 MA reading on the leakage scale of the WP-32.

THIS COMPLETES THE CALIBRATION PROCEDURE.

Troubleshooting

Normal Troubleshooting Techniques can be used to locate defective components in the WP-32. Refer to the schematic diagram as well as the circuit description section as an aid for Troubleshooting. Below are some possible problems that may occur.

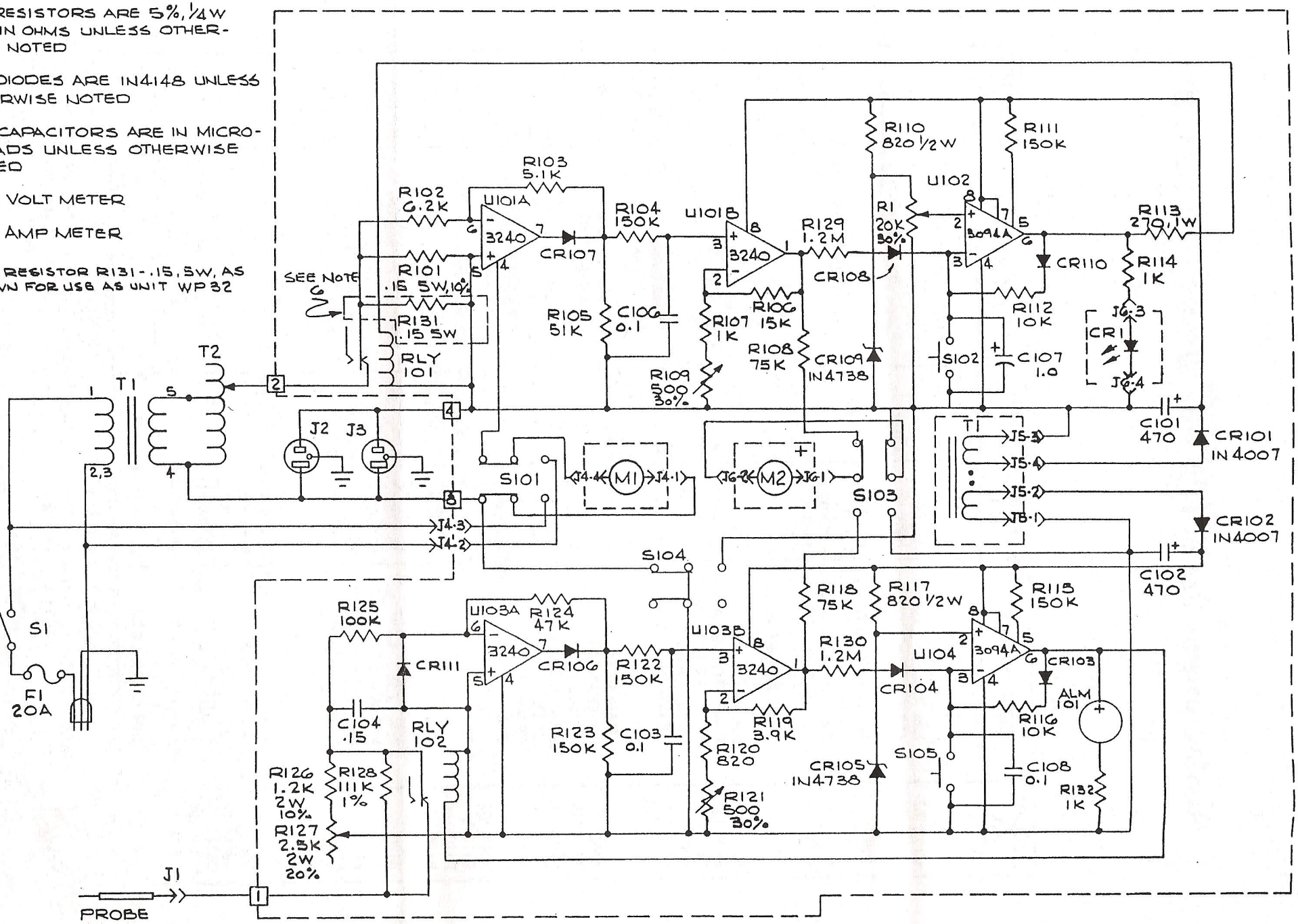
1. **No output** — Check F1, S1, T1, T2, RLY 101, and R101.
2. **No meter indication** — Check F1, T1, CR101, CR102, all integrated circuits.
3. **No leakage test** — Check RLY 102, U103, U104, CR105 and associated circuits.
4. **Not able to reset output** — Remove load, check RLY 101, R1, CR109, S102, U101, and U102.

Replacement Parts List For WP-32 ISO-V-AC III

SYMBOL NO.	DESCRIPTION	PART NO.	SYMBOL NO.	DESCRIPTION	PART NO.
	CAPACITORS			**INTEGRATED CIRCUITS**	
C101, 102	Elec. 470uf, 50V Axial	9404-027	U101, 103 A B	CA3240AE	14-032402
C103, 106, 108	Mylar .1uf 10% 100V	9605-151	U102, 104	CA3094A	14-030942
C104	MF .15uf 10% 200V	9540-019			
				MISCELLANEOUS	
C107	Tant. 1uf 25V	1223-001			
C105	Res CF1-2k 5% 1/2W	16-221221		Cord, Power 3 cond.	9632-026
				Strain Relief	9632-021
	RESISTORS		F1	Fuse Holder	9632-054
				Fuse 20A 3AG	9166-305
R1	Res, Var 20k 20%			Panel, Dress	9632-060
R101, 131	Power .15Ω 10% 5W	9630-106	M1	Meter AC Voltage	9630-052
R102	CF 6.2k 5% 1/4W	16-166221	M2	Meter Current Leakage	9632-053
R103	CF 5.1k 5% 1/4W	16-165121		Outlet, 115V	9630-013
R104, 111 115, 122, 123	CF 150k 5% 1/4W	16-161541	S1	Switch, Power	9632-117
			J1	Jack, Banana	25-900003
R105	CF 51k 5% 1/4W	16-165131	T1	Transformer, Power	9632-087
R106	CF 15k 5% 1/4W	16-161531	T2	Transformer, Variac	9632-055
R108, 118	CF 75k 5% 1/4W	16-167531			
R109, 121	VAR 500Ω 30%	9355-146		Bracket, Variac	9632-061
R110, 117	CF 820Ω 5% 1W	16-228211		Cover	9632-070
R112, 116	CF 10k 5% 1/4W	16-161031		Knob, Current	9630-035
R113	CF 330Ω 5% 2W	16-283310		Knob, Voltage	9630-036
R114, 107	CF 1k 5% 1/4W	16-161021			
R119	CF 3.9k 5% 1/4W	16-163921	ALM101	Alarm, Piezo	9603-313
R120	CF 820Ω 5% 1/4W	16-168211			
R124	CF 47k 5% 1/4W	16-164731	S101, S102	Switch Push 2 Station	9630-317
R125	CF 100k 5% 1/4W	16-161041	S103, S104, 105	Switch Push 3 Station	9630-318
R126	Power 1.5k 10% 2W	16-271220			
R127	VAR WW 2.5k 20% 2W	9540-031			
R128	MF 111k 1% 1/4W	16-561111	RLY102	Relay SPDT Leakage	9630-312
R129, 130	CF 1.2MΩ 5% 1/4W	16-161251	RLY101	Relay SPDT Overload	9630-314
	DIODES				
CR1	LED 5082-4855	9450-128			
CR101, 102	Power 1N4007	11-040071			
CR103, 104, 106, 107, 108, 110, 111	SIG 1N4148	11-041481			
CR105, 109	Zener 1N4738A 8.2V	11-047381			

NOTES

1. ALL RESISTORS ARE 5%, 1/4W AND IN OHMS UNLESS OTHERWISE NOTED
2. ALL DIODES ARE IN4148 UNLESS OTHERWISE NOTED
3. ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE NOTED
4. M1 - VOLT METER
5. M2 - AMP METER
6. ADD RESISTOR R131 - .15, 5W, AS SHOWN FOR USE AS UNIT WP32



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189 HORSHAM ROAD
HORSHAM, PA 19044
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