

## Appendix D    PP124/PP224 Power Pack



## **Appendix D: PP124/PP224 Power Pack**

### **Supplemental User's Manual**

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Do not touch test leads while test is in progress!



**User's Manual D-1**

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## Introduction

The use of the 24 KV power pack incorporates a system of two separate units: a 12 KV host unit and the PP124R/PP224R power pack. The 12KV half of the system is capable of stand alone operation for surge or DC Hipot test functions. The power pack relies on the 12 KV host unit to provide triggering and readout functions and **cannot operate alone**.

Instructions for stand alone operation of the 12 KV host unit should be reviewed in the front of this manual before attempting operation with the 24 KV power pack. This will provide instruction on how to correctly read the voltage off the **CRT** display, lead hook up, and other important safety information.



### CAUTION!



**NEVER ATTEMPT TESTING A LOAD WITH BOTH 12KV AND POWER PACK TEST LEADS ATTACHED TO LOAD AT SAME TIME!**

**NOTE:** The ground fault system on the 12 KV host unit will render it inoperative without a proper ground. When the host unit is connected to the PP124/224 units, the inoperable condition will also affect the power pack unit due to a loss of the surge enable signal.



**THESE INSTRUMENTS SHOULD NEVER BE USED WITHOUT A GROUNDED SUPPLY.**

## Caution Notes

- **User safety demands that the unit output NEVER be activated without unit connection to a winding load of some type.** Please refer to the host unit instructions in the beginning of this manual for connection procedures to various windings.
- **REMEMBER** the host unit's Volts/Division switch affects only the display amplitude on the CRT. *It does not control or limit the output voltage of the host unit or power pack in any way! All settings are 2X when operating with the power pack!*



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## Initial Set-Up

These instructions refer to the PP124, 120 VAC tester. Instructions are identical for the PP224, 240 VAC tester.

1. Follow roll around instrument stand set up instructions carefully and complete stand assembly. Hardware and assembly instructions are included with the stand.
2. With stand complete, place the PP124 onto the stand lower rails and slide back to the rail stops. Next, place the host 12 KV unit onto the stand upper support rails and slide back to rail stops.
3. Using the short AC line cord of power pack front panel, make connection to the 12 KV host unit power entry receptacle.
4. Connect the interconnect cable between the two units. This cable has two nine (9) pin circular connectors, which are polarized for fail-safe connection. Connector receptacles are located on the front panels of both units.

### **Units are now ready for operation.**

5. Connect the AC power cord to the power pack front panel receptacle and then to an appropriate AC power source. For 220/240 Volt Power Packs, please see the note at the end of this manual concerning AC line cord connectors (**Lead Connections** on page D-8).

The host unit is equipped with a ground fault monitor and indicator. This circuitry should not hinder operation on a GFI protected AC power circuits.

If you find that a problem exists, the internal ground monitoring circuit may be disabled. Please call Baker Instrument Company Service Department 800-752-8272 for assistance. The ground fault monitor must also be disabled in the event that the unit is to be operated on a transformer isolated AC circuit. Failure to do so will cause a loss of ground indication, disabling the high voltage power section of the unit.

**Please assure safe operating practices whenever disabling the ground monitor circuit! It is advised that some type of external grounding strap be used.**



## Power Pack Operation

1. Power-up the 24 KV power pack and host unit (observe host unit set-up procedures in the manual).

### Surge Testing

2. Set the 12 KV host unit **FUNCTION** control switch to **AUX (AUXILIARY)** position.
3. Press the Hipot Internal/External signal switch in on the host unit front panel (the switch should now be illuminated).
4. Assure power pack **OUTPUT** control is at minimum. (Full counter-clockwise setting).
5. Connect power pack leads to appropriate load (see **Lead Connections** on page D-8 for proper test lead connection).

**OPERATION NOTE:** The power pack leads are hard wired leads. The **TLS (Test Lead Select)** switch is an option for this unit. There are two (2) Red **HOT** leads and two (2) Black **GROUND** leads. Normal connection to a three phase winding would be two **RED** leads and one **BLACK** lead to the three leads of the motor. Three phase testing requires that the user manually switch the lead positions between tests.



## CAUTION!



**HIGH VOLTAGE ACTIVATION IS NEXT. ENSURE THAT ALL PERSONNEL ARE AWAY FROM THE DEVICE UNDER TEST AND ARE NOT IN CONTACT WITH EITHER THE LOAD OR TEST LEADS!**

6. Start test by depressing the power pack **PTT** switch (or **Foot Switch**) and slowly raising the power pack **OUTPUT** control. A pattern should be immediately visible on the **CRT** display screen of the host unit. If not, recheck connections and all switch settings. Also assure that the interconnect cable has been attached and is secure.



## \*\*IMPORTANT\*\*



The 12 KV host unit, as mentioned before, serves as the readout for the power pack. Volts/Division settings of the host unit are **DOUBLED** when operating the power pack, making the settings 500, 1000, 2000 and 5000 Volts/Division on the display screen.



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7. The display may require adjustment for optimum clarity, sweep and positioning. Make any adjustments required prior to continuing the test.

**NOTE:** Due to 30 Hz triggering, the display will appear to flicker. This is normal.

8. Determine your test voltages and adjust the **Volts/Div** setting so that the waveform is fully displayed on the **CRT** without going off the screen.
9. When the test is completed, release the **PTT** switch of the power pack and return the **OUTPUT** control to its minimum setting.
10. Reposition one Hot (**RED**) and the Ground (**BLACK**) test lead, previously connected to the leads of the windings. Refer to **Lead Connections** on page D-8 for lead connections. Compare all phases against each other as is done by a **TLS (Test Lead Select)** switch, #1 vs #2, #2 vs #3, and #3 vs #1. By switching one hot and the ground lead each time the operator can make all of these comparisons. The operator may find it advisable to mark or identify the stator leads at the time of or prior to the first test.

## DC Hipot Testing

11. Set the 12 KV host unit **FUNCTION** knob to the 100 micro-amps per division setting. Move the trace to the lower portion of the display.
12. Press the Hipot Internal/External signal switch in on the host unit front panel (the switch should illuminate). This monitors DC Hipot voltage and current from the 24 KV power pack.
13. Connect the Red Lead #1 (far left lead of the power pack) to the windings to be tested, and the two (2) Black **GROUND** Leads to the iron or core material. Red Lead #2 should be left unconnected.
14. Begin testing by depressing the power pack **PTT** switch and slowly raising the **OUTPUT** control.

The **CRT** display for the DC Hipot is a "split screen" display. The left half of the host unit **CRT** trace shows the voltage of the test, while the right half monitors the charging and leakage current levels.

As the voltage is increased, seen by the left half trace rising slowly up, the current will rapidly rise on the right side showing charging current. When the **OUTPUT** is held at a given voltage setting, the right half will then fall and remain at a level showing the leakage current.

**THIS TEST SHOULD BE INTERRUPTED ANY TIME A FAST, SHARP RISE IN THE CURRENT IS OBSERVED.**



The over-current Hipot trip levels are ten (10) times the Micro-amps/Div settings. They are 10, 100, and 1000 micro-amps. Releasing the **PTT** button will reset the over-current trip to begin testing again.

15. Adjust the Volts/Div and Micro-amps/Div knobs to best monitor the voltage and current levels. Measure the voltage and leakage current levels according to the volts/div and micro-amps/div settings. Dividing the current measurement into the voltage measurement conveniently gives a resistance measurement in mega-ohms.
16. Upon completion of the test, return the **OUTPUT** control to **MIN** and release the **TEST** button.

**ALWAYS ALLOW A SUFFICIENT TIME FOR THE WINDING UNDER TEST TO COMPLETELY DISCHARGE BEFORE DISCONNECTING THE TEST LEADS.**

**RECOMMENDED PRACTICE IS TO DISCHARGE THE WINDING FOR A TIME AT LEAST FIVE TIMES THE DURATION OF THE DC HIPOT TEST FOR HIGH VOLTAGE WINDINGS.**

For use of the 12 KV host unit, the operator need not disconnect the two units. Simply place the 12 KV host unit **FUNCTION** switch back to the **SURGE** or **HIPOT** position and return the Hipot Internal/External signal switch to **INTERNAL** (out position). The host unit is now ready to operate alone.



## CAUTION!



**Disconnect the unit's test leads not being used from the load.  
NEVER USE THE HOST UNIT'S GROUND LEADS FOR GROUNDING  
DURING THE 24KV POWER PACK TEST!**

**REMEMBER:** For R and S series tester stand alone operation of the host unit, the Volts/Div settings are now as read on the 12 KV unit panel, 250, 500, 1000 and 2500 Volts/Division). The Test Lead Select switch of the host unit again becomes operational.



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## Lead Connections

RED = HOT LEAD

BLK = GROUNDED LEAD

### Three Phase Motor: Wye Connected

	Motor Leads			
Compare Phases	L1	L2	L3	Frame
1-2	RED	RED	BLK	BLK
2-3	BLK	RED	RED	BLK
3-1	RED	BLK	RED	BLK

### Three Phase Motor: Delta Connected

(Phase A = L1 - L2, Phase B = L2 - L3, Phase C = L3 - L1)

	Motor Leads			
Compare Phases	L1	L2	L3	Frame
A - B	RED	BLK	RED	BLK
B - C	RED	RED	BLK	BLK
C - A	BLK	RED	RED	BLK

## Note Regarding 220/240 VAC Units

220/240VAC input units may require the user to supply an appropriate AC connector for mating to the power source. These units are designed for use on a single (1) phase, 220/240VAC power source. **Split phase AC power sources will not work.** Color codes for the AC line cord supplied are as follows:

<b>Brown:</b>	<b>AC line HOT</b>
<b>Blue:</b>	<b>AC line NEUTRAL</b>
<b>Green/Yellow:</b>	<b>AC line GROUND (earth)</b>

