CobraTig®150

Calibration Procedure
Document 031-0181 Rev B

CAUTION

Performing the following Tests and Calibration require the operator to be near HIGH VOLTAGES and HIGH CURRENTS. Operator must be familiar with working in this environment and exercise caution during this procedure to avoid any shock hazards.

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1. EQUIPMENT NEEDED

- CobraTig 150 and Orbital Weldhead.
- Calibration Kit (p/n 005-0251)
- 30V / 5A DC External Power Supply and Banana Test Leads
- Digital MultiMeter (Fluke 8060A or Equivalent) and Test Leads
- Water Recirculator
- Small Plastic Flathead Screwdriver
- 1/4" Hex Wrench
- Glyptol Insulating Varnish
- Feeler Gauge
- Wire Brush

External DC Power Supply

Digital Multi-Meter

Glyptol

Calibration Kit

¼ Hex Wrench and Screw Driver

Please read this procedure in its entirety before performing any work

2. EQUIPMENT SETUP

CobraTig150
Determine input power available and wire input power plug accordingly if not already provided that way. See Appendix A for proper configuration of input power and internal jumper selections.
Do not apply power to the CobraTig 150 until directed to do so.

Calibration Weld Box Load
Adjust torch in load box for proper weld gap **(.065~1/10 in)** with feeler gauge and ensure tungsten and plate surface are clean, use wire brush if necessary. Also make sure the tungsten is **1/16 in**.
Do not connect load to CobraTig150 until directed to do so.

3.   COBRATIG-150 CALIBRATION

3.1 Current-Voltage-Demand Offset Adjustment

Before starting Calibration, print out the current Weldhead and Motor Calibration from the calibration menu (Later this can be compared with your new calibration data.)

Meter (DMM) Setting - Scale: mV,   Mode: DC

3.1.1 Using a ¼" hex wrench, remove all the screws from the cover of the CobraTig150. Remove cover by pulling the sides slightly away from the machine, and lifting upward. This is to ensure that the louvers do not catch on any of the components or wires inside.

3.1.2 Locate the test points on the left side of the CobraTig150, on the Power Supply Control Board (second board down from the top.) Place the **Meter GND(-)** lead on **TP1** and the **Meter POS(+)** lead on **TP3.**   (Figure 1)

Fig. 1 – TP3 Voltage adjustment

3.1.3   Apply input power to CobraTig150 and switch power on with breaker on back of unit. Using the small plastic flathead screwdriver, Adjust **R24** (Current Offset) of the Power Supply Control Board until a reading in the range of (**-2 mV to +2mV**) is obtained on meter. (Figure 2)

R24 Location
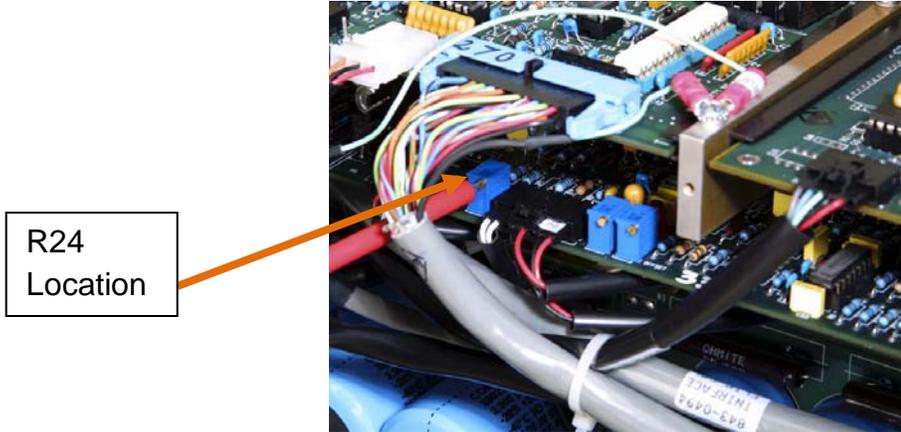
Fig. 2 – Trimpot R24 is used to adjust voltage at TP3

NOTE If your CobraTig has only one Trimpot (instead of three, it is an older model). The one trimpot is **R24**. After completing step 3.1.3, skip ahead to step 3.1.9.

3.1.4   Leaving the **Meter GND(-)** lead on **TP1**, move the **Meter POS(+)** to **TP7**. (Figure 3)
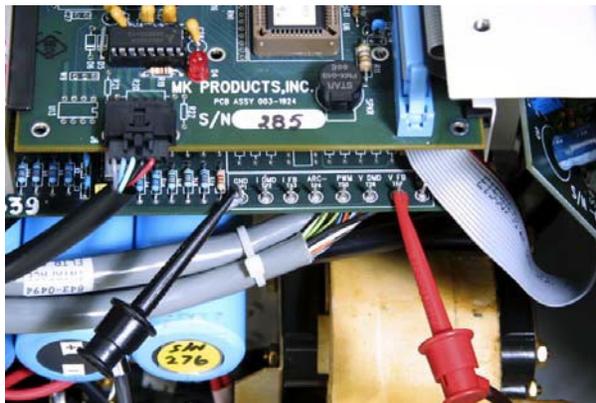
Fig. 3 – TP7 Voltage adjustment

3.1.5   Adjust **R130** (Voltage offset) until a reading in the range of
(**-**2 mV to +2mV) is obtained on meter. (Figure 4)

Fig. 4 – Trimpot R130 is used to adjust voltage at TP7

3.1.6   Leaving the **Meter GND(-)** lead on **TP1**, move the **Meter POS(+)** to
TP8. (Figure 5)
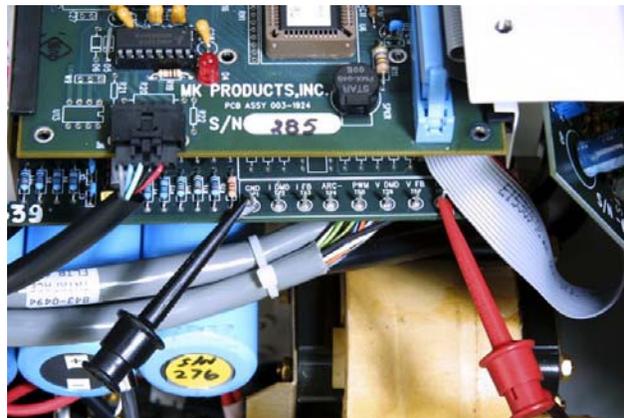
Fig. 5 – TP8 Voltage adjustment

3.1.7   Adjust **R139** (Demand Offset) until a reading in the range of
(**-**2 mV to +2mV) is obtained on meter. (Figure 6)
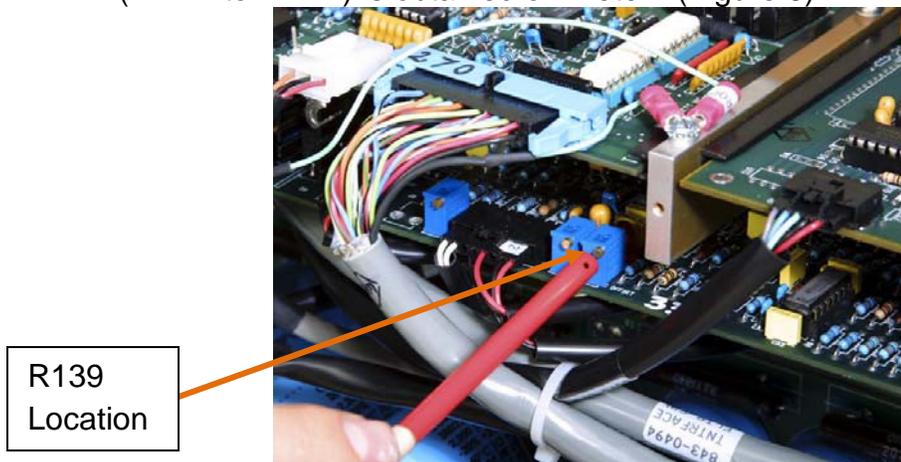
Fig. 6 – Trimpot R139 is used to adjust voltage at TP8

3.1.8   Re-Check all three test points (TP3, TP7, and TP8) to
        verify that the settings are maintained. Make additional
        adjustments if needed.

        Notes:
          R24 is used to adjust voltage at TP3
          R130 is used to adjust voltage at TP7
          R139 is used to adjust voltage at TP8

3.1.9   Remove all Meter leads from Test Points in CobraTig150. Use
        Glyptol to seal the trimpot settings when done. (Figure 7)
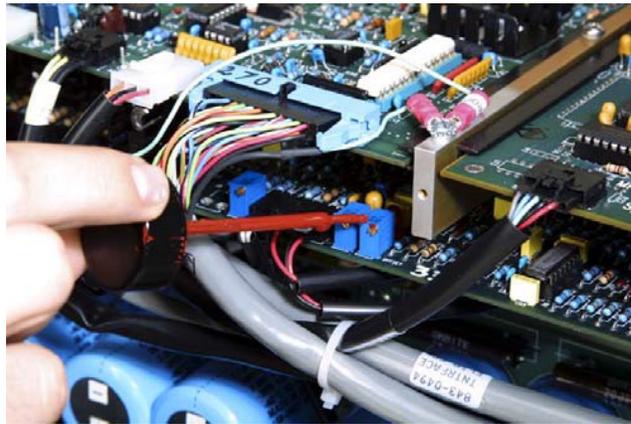
Fig. 7 Use Glyptol to seal three (3) trimpot.

Fig. 8 - Calibration Setup

3.2 **Weldhead Motor Calibration**

The COBRATIG-150 Software allows push-button adjustments of the COBRATIG-150 calibration parameters.

3.2.1   From the MAIN MENU, press the CALIB MENU [F7] key.

3.2.2   From the CALIBRATION MENU, Press the MOTOR CALIB [F6] key. The default settings are High=6 and Low=2. Leave these speeds as they are for most cases.

3.2.3   Then press the START CALIB [F8] key. Verify visually that the weldhead rotor is turning. The CobraTig150 motor compensation circuit will automatically calibrate for that Weldhead connected.

3.3 Arc Voltage Calibration

Connect the DC power supply to the Input Voltage connectors of the Calibration Kit shunt box. **(POS to RED+, NEG to BLACK-)**. Connect voltage meter DMM (Digital Multi Meter) across supply leads to monitor voltage if your DC supply does not have a digital display. **(See Appendix C / Figure 9)**

Meter (DMM) Setting - **Scale: Volts (V), Mode: DC**
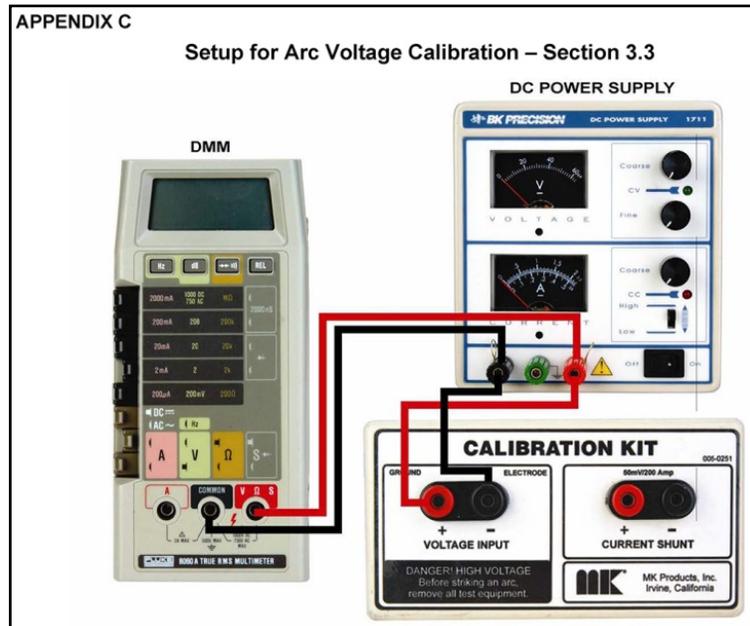
Fig. 9 – Voltage Calibration Setup

3.3.1 From the **MAIN MENU**, Press the **CALIB MENU [F7]** key.

3.3.2 Inject exactly 1.80VDC from the DC power supply with digital display or inject 1.80VDC +/-1% or [1.782VDC to 1.818VDC] from DC power supply without digital display. Then press the **1.8VDC CALIB [F3]** key to accept input.

3.3.3 Inject exactly 18.00 VDC from the DC power supply with digital display or inject 18.00VDC +/-0.5% or [17.9VDC to 18.1VDC] from DC power supply without digital display. Then press the **18VDC CALIB [F4]** key to accept input.

NOTE: Arc Voltage Calibration is updated only after pressing the **18VDC CALIB [F4]** key, aborting at any time before this will cause the Arc Voltage to be un-calibrated.

3.4 Current Calibration

CAUTION: Disconnect DC power supply and/or DMM from their power source until an Arc is established.

3.4.1 Connect leads from the DMM **(POS to RED+) (NEG to BLACK-)** to the Current Shunt of the Calibration Kit Shunt Box, make sure meter is off until weld arc is started. Verify that the Calibration Kit is connected to the CobraTig150 weld terminals. **(See Appendix D)**

3.4.2 From the CALIBRATION MENU, press the **CURRENT START [F7]** key to start the Current Calibration sequence. Once an Arc is established, turn the DMM back on.
Meter (DMM) Setting -   Scale: mV,   Mode: DC

3.4.3 The current output should now be at approximate 10 Amps. Adjust the output current as read across the Calibration Kit shunt with the DMM by pressing **ADJUST UP [F5]** or **ADJUST DOWN [F10]** keys until it is in the range of (2.50mV to 2.59mV). _The voltage reading should be as close to 2.59mV as possible without going over_. Then press the **10A CALIB [F8]** key to accept when right.

3.4.4 The current output should now be at approximate 80 Amps. Adjust the output current as read across the Calibration Kit shunt with the DMM by pressing **ADJUST UP [F5]** or **ADJUST DOWN [F10]** keys until it is _in the range of 19.97mV to 20.034mV_. Then press the **80A CALIB [F9]** key to accept when right.

Repeat 3.4.3 ~ 3.4.4 for second time, unit should acknowledge completion.

NOTE: The Current Calibration is updated only after pressing the **80A CALIB [F9]** key the second time. Aborting at any time before this will cause the Weld Current to be un-calibrated.

3.4.5 Press **the MAIN MENU [F2]** key. Press the **PRINT MENU [F6**] key. Press **CALIB REPORT [F9]** key. Save the printout for reference.

Disconnect all Test Equipment from CobraTig150, your MK Welder is now calibrated and ready to weld.

APPENDIX A-1

Setup for using 100 VAC (Japan)

With an input of 100 VAC, you must use the single phase plug (5-15P).
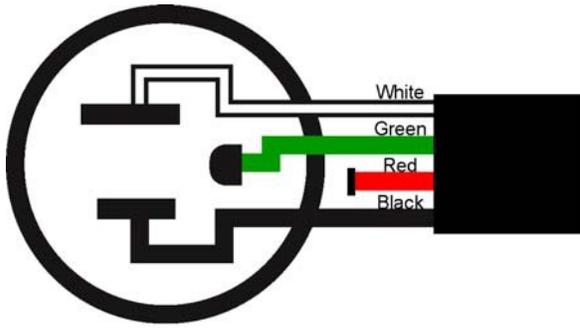
5 - 15P
15 Amps - Single Phase

You must connect the jumper inside the CobraTig 150 to the appropriate terminals, and make sure it is facing the correct way. You must also connect the voltage selector lead to it's appropriate terminal. The correct settings for 100 VAC are shown below with the jumper in the 1,2,3 position (w/ the 100/120 Volts side facing out) and the voltage selector wire in the 5 position for 100V.
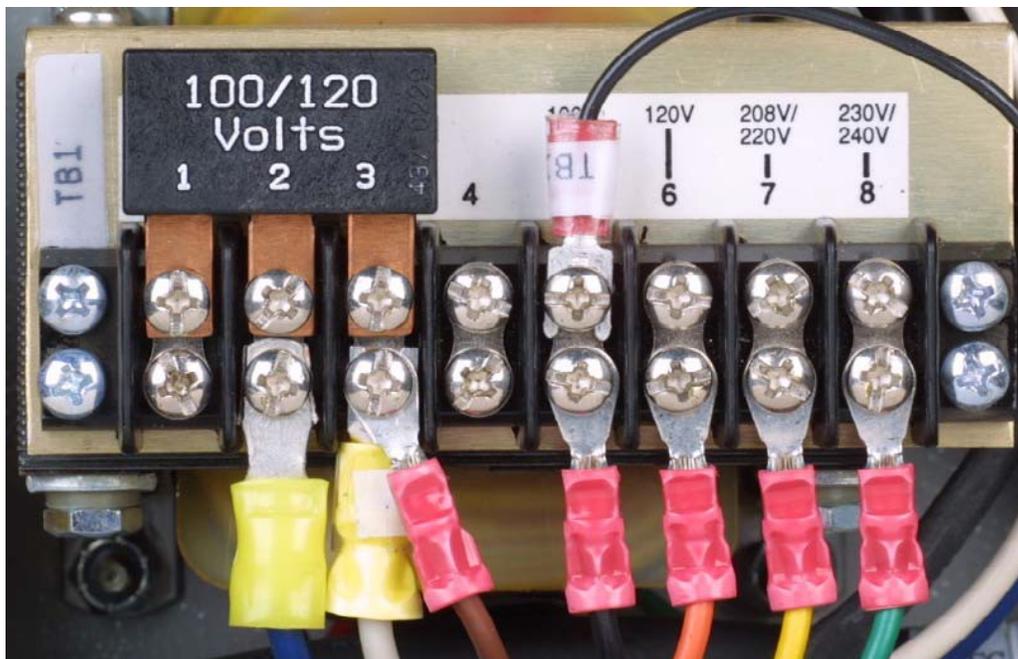
FIG 10 – 100VAC Line Input Setup

APPENDIX A-2
Setup for using 120 VAC

With an input of 120 VAC, you can use either a 15 Amp single phase plug (5-15P), or a 30 Amp single phase plug (L5 – 30P).
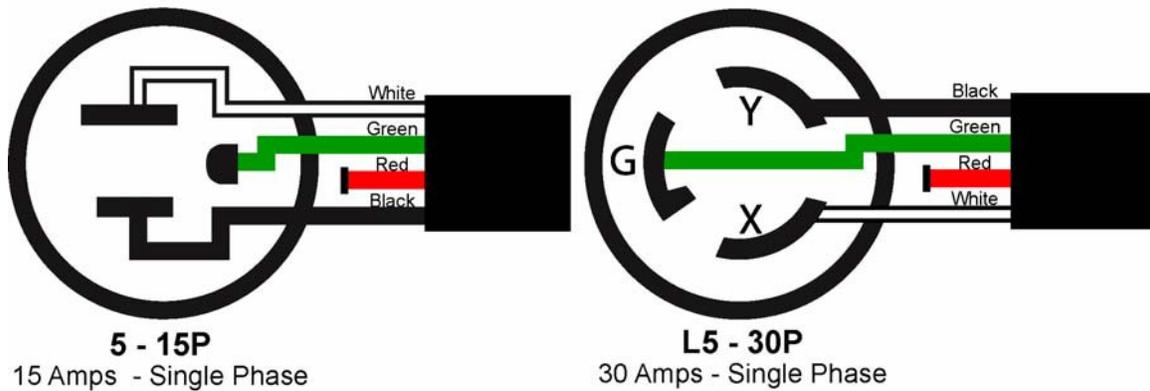
5 - 15P
15 Amps - Single Phase

L5 - 30P
30 Amps - Single Phase

You must connect the jumper inside the CobraTig 150 to the appropriate terminals, and make sure it is facing the correct way. You must also connect the voltage selector lead to it's appropriate terminal. The correct settings for 120 VAC are shown below with the jumper in the 1,2,3 position (w/ the 100/120 Volts side facing out) and the voltage selector wire in the 6 position for 120V.
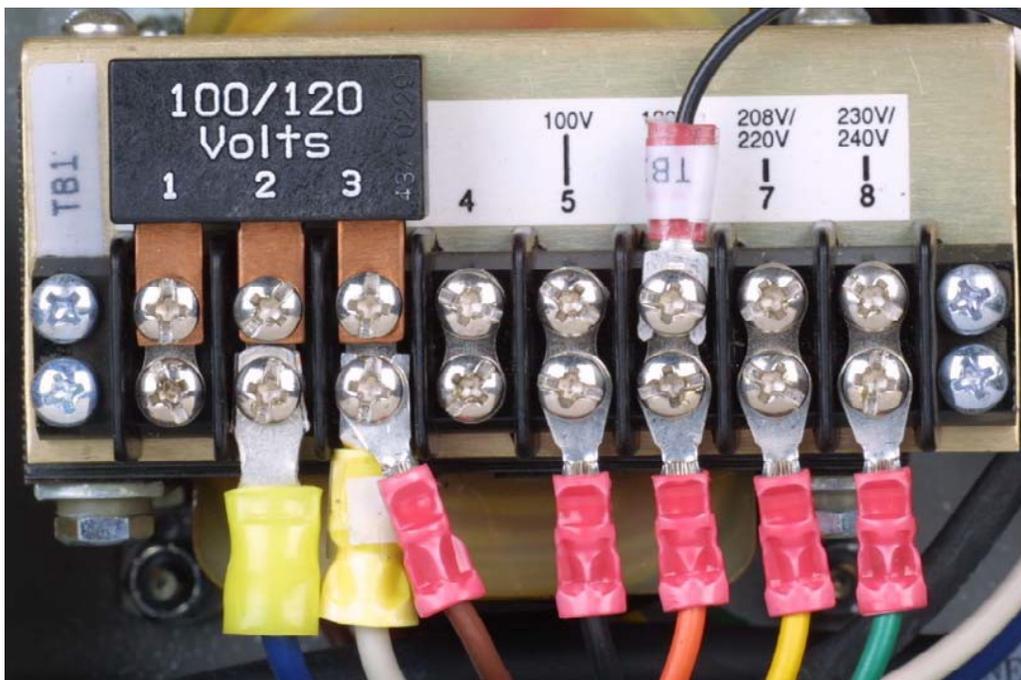
FIG 11 – 120VAC Line Input Setup

APPENDIX A-3
Setup for using 230/240 VAC

With an input of 230/240 VAC, you can use either a single phase (L6-30P) plug or a three phase (L15 – 30P) plug.
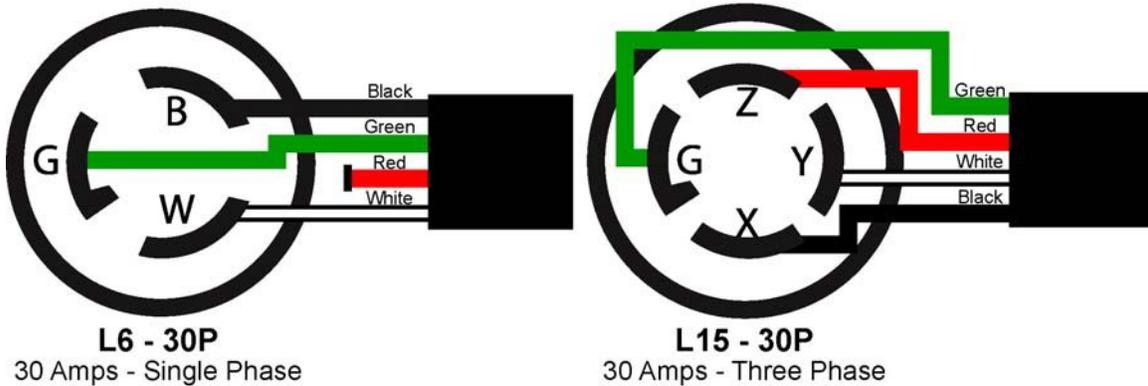
L6 - 30P
30 Amps - Single Phase

L15 - 30P
30 Amps - Three Phase

You must connect the jumper inside the CobraTig 150 to the appropriate terminals, and make sure it is facing the correct way. You must also connect the voltage selector lead to it's appropriate terminal. The correct settings for 230/240 VAC are shown below with the jumper in the 1,2,3 position (w/ the 230/240 Volts side facing out) and the voltage selector wire in the 8 position for 230V/240V.
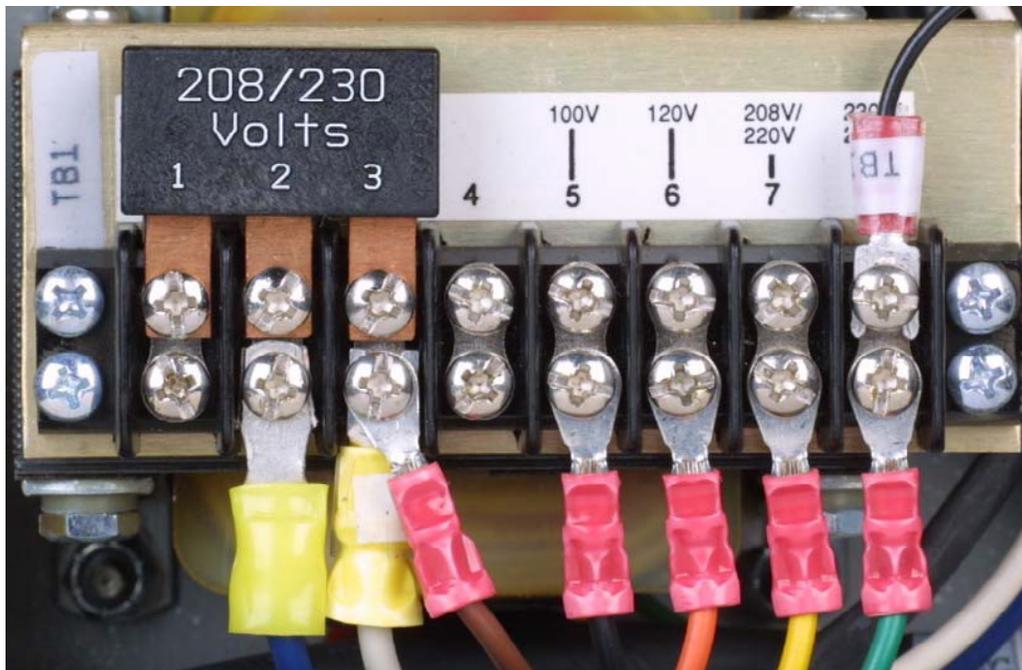
FIG 12 – 230/240VAC line Input Setup

APPENDIX A-4
Setup for using 208/220 VAC

With an input of 208/220 VAC, you can use either a single phase (L6-30P) plug or a three phase (L15 – 30P) plug.
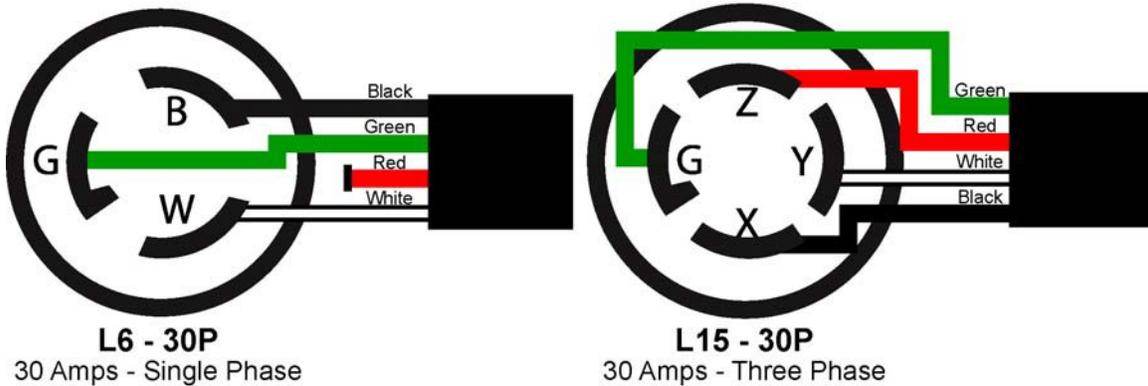
L6 - 30P
30 Amps - Single Phase

L15 - 30P
30 Amps - Three Phase

You must connect the jumper inside the CobraTig 150 to the appropriate terminals, and make sure it is facing the correct way. You must also connect the voltage selector lead to it's appropriate terminal. The correct settings for 208/220 VAC are shown below with the jumper in the 1,2,3 position (w/ the 208/220 Volts side facing out) and the voltage selector wire in the 7 position for 208V/220V.
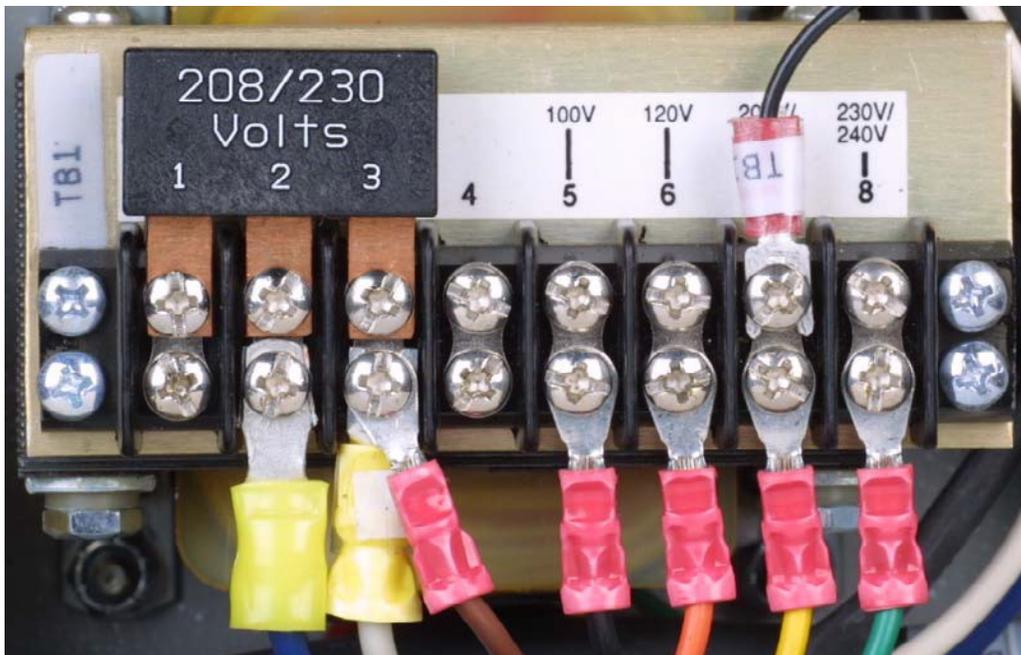
FIG 13 – 208VAC/220VAC Line Input Setup

APPENDIX B

Setup for Calibration

Setup for Arc Voltage Calibration – Section 3.3
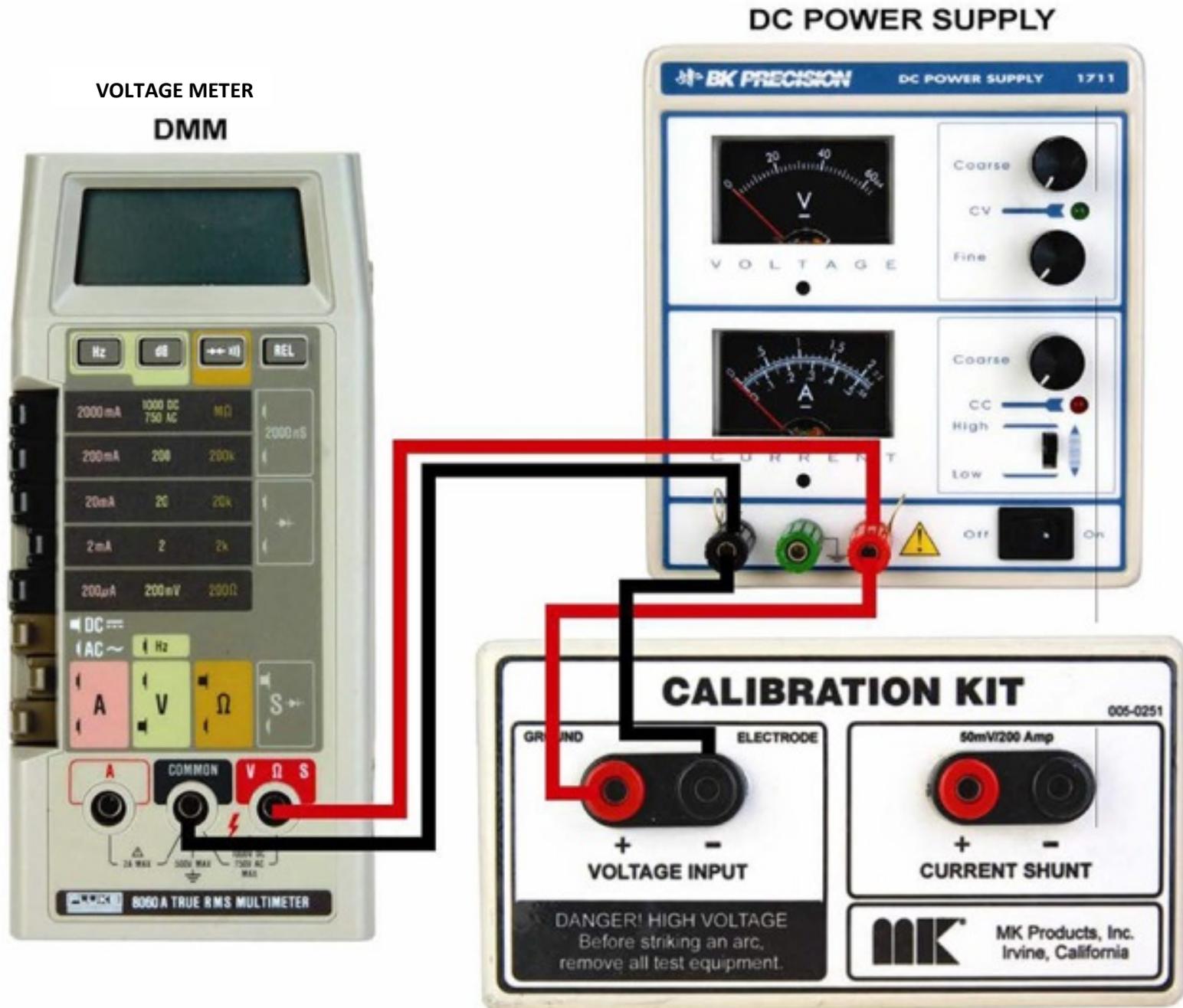
Setup for Current Calibration – Section 3.4

DMM

Input/Shunt Box