

INSTRUCTION MANUAL

OS SERIES



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LIMITED WARRANTY

XP Power LLC ("XP Power") provides a limited warranty in lieu of all other warranties. Buyer's exclusive remedies in the event of a defect are limited to repair, replacement, or at XP Power's discretion, refund of the purchase price. The terms of the limited warranty and the Buyer's remedies are described below.

XP Power warrants its standard power supplies to be free from defect in material and workmanship, and XP Power agrees to repair or replace any power supply which fails to perform in accordance with XP Power's written specification within three years after date of shipment from XP Power.

This limited warranty shall not apply to any power supply which has been:

- (1) Repaired, worked on, or altered by persons unauthorized by XP Power, which in XP Power's sole judgement, adversely affects the performance, stability, or reliability of the power supply.
- (2) Subject to misuse, negligence, or accident; or
- (3) Connected, installed, adjusted, or used otherwise than in accordance with instructions furnished by XP Power.

XP Power reserves the right to make any changes in design or construction of its power supply at any time, without incurring any obligation to make any change whatsoever in units previously delivered.

LIMITATION ON REMEDIES. Buyer's exclusive remedy in the event of a defect in a power supply is limited to the repair or replacement of any defective power supply or to refund of the purchase price at XP Power's sole discretion. Buyer must return the power supply to the XP Power factory, transportation prepaid by the Buyer, within the warranty period for the warranty claim to be effective. **XP Power is not liable to Buyer or to any third party for consequential or incidental damages** under any circumstances, whether due to defect in the power supply, due to delay or failure of delivery, due to a failure of the power supply to perform as specified, or for any other reason or cause. Buyer and XP Power agree that Buyer's sole remedy and XP Power's sole liability to Buyer is limited to repair, replacement, or refund of the purchase price of the power supply as described herein, whether Buyer's claim arises out of contract or tort.

DISCLAIMER OF IMPLIED WARRANTIES. This limited warranty excludes all other warranties and is offered and accepted in lieu of any and all other warranties, whether express or implied, including without limitation the implied warranties of merchantability and fitness for a particular purpose.

The entire contract concerning warranty rights and obligations and concerning Buyer's remedies is embodied in this writing. This writing constitutes the final expression of the parties' agreement, and it is a complete and exclusive statement of the terms of that agreement. No statements or understanding, purporting to modify or vary the terms hereof, shall be binding and cannot be relied upon by Buyer.

SECTION II - GENERAL INFORMATION

UNPACKING AND INSPECTION

First inspect package exterior(s) for evidence of rough handling in transit. If none, proceed to unpack . . . carefully. After removing the supply from its shipping container, inspect it thoroughly for damage.

CAUTION. The power supply Driver is equipped with two front handles. The cabinet which contains the Driver is equipped with two handles, one on each side. Due to the weight of the unit, always lift or carry using a minimum of two handles. Because of potential overbalancing, the cabinet containing the driver should not be lifted or carried with the HV Open Stack Assembly mounted to it.

IMPORTANT! In cases of damage due to rough handling in transit, notify the carrier immediately if damage is evident from appearance of package. Do not destroy or remove any of the packing material used in a damaged shipment. Carrier companies will usually not accept claims for damaged material unless they can inspect the damaged item and its associated packing material. Claims must be made promptly - certainly within five days of receipt of shipment.

CORRESPONDENCE

Each XP Glassman power supply has an identification label on the chassis that bears its model and serial number. When requesting engineering or applications information, reference should be made to this model and serial number. If specific components or circuit sections are involved in the inquiry, also indicate the component symbol number(s) shown on the applicable schematic diagram.

XP GLASSMAN HIGH VOLTAGE

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ACCESSORIES (provided)

QTY	ITEM
4	Driver to HV Stack HV AC Power Cables, (W1 & W2). Two short & two long per Driver/HV Stack Group.
2	Driver to HV Stack Interconnect Cable, (W3). One short & one long per Driver/HV Stack Group.
2	Driver to HV Stack Ground Cable, (W4). One short & one long per Driver/HV Stack Group.
1	Driver to Remote Control Power Cable, (W5).
1	Driver to Remote Control Interconnect Cable, (W6).

SAFETY



This symbol, wherever it appears on the supply, alerts you to the presence of uninsulated dangerous voltages - voltages that may be sufficient to constitute a risk of electrical shock.



This symbol, wherever it appears on the supply, alerts you to important operating and maintenance instructions in the accompanying literature. Read the manual.

TERMS IN THIS MANUAL

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

WARNING! statements identify conditions or practices that could result in injury or loss of life.

WARNING!

If this equipment is used in a manner not specified herein, the protection provided by the equipment may be impaired.

To avoid the risk of shock or fire do not attempt to service the supply beyond that described in these instructions.

To avoid the risk of shock and personal injury, do not remove the product covers while the unit is operating or connected to the AC mains. Wait at least 3 minutes after disconnecting the AC mains power before removing any covers or panels.

Do not handle exposed high voltage terminations or attempt to make or remove any connections to the supply until load and/or supply has been fully discharged (grounded). An unloaded supply may take up to 60 seconds to discharge.

Upon loss of protective ground connection(s), all accessible conductive parts can render an electric shock.

Use only a NRTL listed power cord with a separable mains plug of the proper voltage, rated greater than the input current rating of the unit. For CE compliant supplies used in Europe, the protective conductor/ground wire on the cord must be green/yellow. Use only a cord in good condition.”

To avoid fire hazard, use only fuses of the correct type, voltage rating, and current rating as specified.

To avoid explosion, do not operate this product in an explosive atmosphere.

If liquid is spilled on the supply, shut it off immediately and disconnect it from the AC mains.

Always maintain adequate supply ventilation. All ventilation openings must remain free from obstruction.

Equipment Maintenance

There is no regular maintenance required to be performed on this equipment. Contact the factory if the HV STACK/DRIVER ASSEMBLY performance becomes compromised due to exposure from airborne containments.

User Serviceable Components

Designator: F1 & F2

Located: On Driver rear panel.

Glassman P/N: F005-20

Description: Fuse, cartridge, 20A, 250V, Type T, ¼" x 1 ¼".

WARNING! BEFORE REPLACING ANY FUSES THE POWER SUPPLY MUST BE DISCONNECTED FROM THE MAINS.

TO DISCONNECT THE POWER SUPPLY FROM THE MAINS, THE POWER SUPPLY CORD MUST BE UNPLUGGED OR THE EXTERNAL DISCONNECT SWITCH/BREAKER MUST BE TURNED TO THE OFF (0) POSITION.

(For instructions on changing the polarity in reverse polarity models see POLARITY REVERSAL Section elsewhere in this manual).

CONNECTIONS AND CONTROLS

DRIVER REAR PANEL ELEMENTS

WARNING! Do not make or remove connections to any REAR PANEL connector or any other connector until power is off and the output has discharged.

TB1 AC POWER INPUT

OS units operate off 230 VAC nominal (198-263VAC), 1 phase, 48-63Hz. (Unless ordered with 200V option. See option spec control provided).

WARNING! The TB1-3 ground terminal should always be connected to the AC mains ground.

TB1 is an NRTL approved terminal block rated for 300V, 20 A & 105 Deg. C. For 200 & 230VAC supplies, the power cord provided by the user should be an NRTL approved, 3/C, 14awg, 300VAC, 15 A, 60 Deg. C. **minimum rating.**

The line cord wires should be connected as follows (See OUTLINE & INSTALLATION drawings):

- TB1-1 Line 1 (Brown)
- TB1-2 Line 2 (Blue)
- TB1-3 Ground (Green/Yellow)

Colors indicated are for European CE compliant supplies.

It is recommended that an NRTL approved Separable Plug be installed on the power cord to connect & disconnect from the Mains.

CAUTION

Check to see that your input line voltage and frequency matches the rating of the supply before applying power.

For CE compliant supplies used in Europe:

Permanently connected equipment or equipment where the line cord plug is not readily accessible is required to have a Safety Disconnect switch or circuit-breaker from the supply source. This should be installed in the MAINS SERVICE connected to the unit and meet the following requirements:

- The switch or circuit breaker must meet the relevant requirements of IEC60947-1 & IEC60947-3.
- The switch or circuit breaker should be rated for the load requirements of the supply or supplies connected to it.
- The Disconnect must be in close proximity to the supply and within easy reach of the operator.
- It must be marked as the disconnecting device for the supply or supplies.

Please refer to the Declaration of Conformity located elsewhere in this manual for installation environment conditions required to conform to 2014/35/EU (Low Voltage Directive).

POWER ON INDICATOR

WARNING! When this lamp is illuminated, AC power is on. Do not apply or remove any connections to this unit until AC power is removed and the DC output has discharged.

The AC POWER ON indicator lamp will illuminate when power is present and the Remote Control Assembly Power Switch is on.

E1 **GROUND STUD**

WARNING! Do not operate unit without good external earth ground connected to this point.

This is the main grounding terminal for the supply and **must** be connected to a good external earth ground! This terminal **must** also be used as the ground connection point from the High Voltage Stack Assembly (via W4). See SCHEMATICS, OUTLINE & INSTALLATION and SYSTEM INSTALLATION drawings.

F1**F2** **AC MAINS FUSES**

Replace only with correct size and rating. See User Serviceable Components section elsewhere in this manual.

J1 **SIGNAL INTERFACE CONNECTOR**

This connector and associated cable (W3) carry the current and voltage feedback, polarity, and interlock signals from the HV Stack Assembly to the Driver Assembly. See SCHEMATICS, OUTLINE & INSTALLATION and SYSTEM INSTALLATION drawings.

TB2 **CUSTOMER INTERFACE TERMINAL STRIP**

WARNING! Do not use TB2 connections for main earth ground, High Voltage Stack Assembly or Remote Control Assembly ground connections! E1 ground stud on the rear panel is provided for this purpose.

TB2-1 GROUND **TB2-2** COMMON **TB2-3** INTERLOCK

TB1-4 thru TB1-12 RESERVED

(Explained in greater detail in REMOTE CONTROL AND MONITOR SIGNALS section).

JHV1**JHV2** **HVAC CONNECTORS****CAUTION**

All HVAC interconnect cable plugs must be fully seated properly in JHV1 & JHV2 before applying power to the system. Faulty installation may damage the supply.

These connectors and wires (W1 & W2) deliver the high voltage AC power generated in the Driver Assembly to the High Voltage Stack Assembly. See SCHEMATICS & and SYSTEM INSTALLATION drawings.

J2 **CONNECTOR (OPTIONAL)**

DRIVER FRONT PANEL ELEMENTS

(Refer to the Driver Outline & Installation & System Installation Drawings).

WARNING! Do not make or remove connections to any FRONT PANEL connector or any other connector until power is off and the output has discharged.

POWER ON INDICATOR

WARNING! When this lamp is illuminated, AC power is on.

The AC POWER ON indicator lamp will illuminate when power is present, and the Remote Control Assembly Power Switch is on.

J3 AC INTERFACE CONNECTOR

This connector and associated cable (W5), carry the AC power between the Driver Assembly and the Remote Control Assembly.

J4 REMOTE INTERFACE CONNECTOR

This connector and associated cable (W6), carry the low voltage control signals between the Driver Assembly and the Remote Control Assembly.

REMOTE CONTROL ASSEMBLY REAR PANEL ELEMENTS

(Refer to the Outline & Installation, System Installation and Interface Drawings).

WARNING! Do not make or remove connections to any REAR PANEL connector or any other connector until power is off and the output has discharged.

POWER INDICATOR

WARNING! When this lamp is illuminated, AC power is on. Do not apply or remove any connections to this unit until AC power is removed and the DC output has discharged.

The AC POWER ON indicator lamp will illuminate when power is present and the Remote Control Assembly Power Switch is on.

E1 GROUND STUD

WARNING! Do not operate unit without good external earth ground connected to this point.

WARNING! Do not use this as the power supplies main ground terminal or the load return point.

This is the main grounding terminal for the Remote Control Assembly and MUST be connected to a good earth ground. Connecting it back to E1 of the Driver Assembly is recommended.

J1 AC INTERFACE CONNECTOR

This connector and associated cable (W5), carry the AC power between the Driver Assembly and the Remote Control Assembly.

J2 DRIVER INTERFACE CONNECTOR

This connector and associated cable (W6), carry the low voltage control signals between the Driver Assembly and the Remote Control Assembly.

**J3
J4 CONNECTOR (OPTIONAL)****S4 CT/CL SWITCH**

Selects current trip or current limit operating modes. Normally, when the output current of the supply reaches the MILLIAMPERE CONTROL set point, a crossover occurs and the supply becomes a current, rather than voltage regulating supply. When S4 is set to the CT (current trip) position, an over current condition will disable the high voltage. The MILLIAMPERE CONTROL indicator will remain lit, and the unit will remain in a current trip condition until either the HIGH VOLTAGE OFF/RESET button is pressed, or the supply is reset by toggling the AC POWER switch off and on.

Note: UNITS SHIP WITH THE S4 SWITCH SET TO CL MODE.

TB1 CUSTOMER INTERFACE TERMINAL STRIP

Provides customer interface connections as follows:

TB1-1 GROUND	TB1-7 I MONITOR
TB1-2 COMMON	TB1-8 I PROGRAM
TB1-3 RESERVED	TB1-9 LOCAL I CONTROL
TB1-4 KV MONITOR	TB1-10 +10 V REFERENCE
TB1-5 KV PROGRAM	TB1-11 HV ENABLE
TB1-6 LOCAL KV CONTROL	TB1-12 HV STATUS

(Explained in greater detail in REMOTE CONTROL AND MONITOR SIGNALS section).

REMOTE CONTROL ASSEMBLY FRONT PANEL ELEMENTS

(Refer to the Outline & Installation Drawing)

POWER SWITCH/INDICATOR

WARNING! When this lamp is illuminated, AC power is on. Do not apply or remove any connections to this unit until AC power is removed and the DC output has discharged.

Turns the supply power on and off (1 = ON, 0 = OFF). The integral indicator will illuminate when the switch is ON and the AC input power is present.

HIGH VOLTAGE ON PUSH BUTTON

WARNING! Enables the high voltage output when actuated. This push-button will NOT activate when one or more of the following conditions are present:

- There is an open interlock (INTERLOCK indicator is illuminated).
- Unit is in CURRENT TRIP mode

HIGH VOLTAGE OFF/RESET PUSH BUTTON

Turns off the high voltage output and resets the following latching faults:

- CURRENT TRIP (if enabled by rear panel switch. See S4 description for an explanation of CURRENT TRIP).

HIGH VOLTAGE ON INDICATOR

Illuminates when the high voltage is enabled (if the INTERLOCK signal is closed).

WARNING! If this indicator is on and the HV ENABLE signal is present, the supply will generate high voltage.

If the INTERLOCK signal is opened, even temporarily, the high voltage will be disabled and the HIGH VOLTAGE ON indicator will extinguish. Once the interlock is closed, the HIGH VOLTAGE ON pushbutton must again be depressed to restart the supply.

INTERLOCK INDICATOR

Illuminates when an open is/was present in the customer interlock circuit. The high voltage output is disabled and cannot be enabled until the open interlock is corrected (closed) and the system is reset.

KILOVOLTS CONTROL

10-turn control provide a 0-10V signal for KILOVOLT programming. Clockwise rotation increases the output voltage regulation point. A 10- turn dial with brake is provided to secure the settings, if desired.

- 0.00 = 0.00kV
- 10.00 = Maximum rated output voltage.

KILOVOLT CONTROL INDICATOR

This indicator is located above the kV control. If the KILOVOLTS CONTROL indicator is illuminated, the supply is operating in voltage regulation mode with an output voltage determined by the KILOVOLTS CONTROL or remote V-PROGRAM signal.

KILIVOLT DIGITAL PANEL METER

Displays output voltage in kilovolts (unless otherwise specified).

Note: Meter is operational only when power is applied to the unit.

WARNING! When system is powered down under light or no load conditions, the output may retain a charge even after power is removed. This charge may not show on the kilovolt meter. Discharge the output to ground or use an external meter to determine if output has discharged. Or, wait at least 60 seconds before making or removing any connections to the supply.

MILLIAMPERE CONTROL

10-turn control provide a 0-10V signal for MILLIAMPERE programming. Clockwise rotation increases output current regulation or current trip point. A 10- turn dial with brake is provided to secure the settings, if desired.

- 0.00 = 0.00mA
- 10.00 = Maximum rated output current.
-

MILLIAMPERE CONTROL INDICATOR

This indicator is located above the mA control. If the MILLIAMPERE CONTROL indicator is illuminated, the supply is operating in current regulation mode with an output current determined by the MILLIAMPERE CONTROL or remote I-PROGRAM signal, or a current trip has occurred. (See S4 description for an explanation of CURRENT TRIP).

MILLIAMPERE DIGITAL PANEL METER

Displays output current in milliamperes (unless otherwise specified).
Note: Meter is operational only when power is applied to the unit.

POLARITY (POS & NEG) INDICATORS

Indicates the output polarity of the supply with respect to ground of the high voltage output.

HV STACK ASSEMBLY ELEMENTS

WARNING!

DO NOT HANDLE THE LOAD OR EXPOSED HIGH VOLTAGE TERMINATIONS OR ATTEMPT TO MAKE OR REMOVE ANY CONNECTIONS TO THE SUPPLY UNTIL AC POWER IS OFF AND THE LOAD AND/OR SUPPLY HAS BEEN DISCHARGED (GROUNDED). AN UNLOADED SUPPLY MAY TAKE UP TO 60 SECONDS TO FULLY DISCHARGE.

E1 GROUND STUD

WARNING! Do not attempt to operate unit without good earth ground connected to this point on the High Voltage Stack!

This is the main grounding terminal for the High Voltage Stack Assembly and MUST be connected (via W4) back to E1 of the Driver Module. E1 must also be used as the main connection point for the users load return. See SCHEMATICS and OUTLINE & INSTALLATION drawings.

E2 HIGH VOLTAGE DC OUTPUT

Located on top of the HV Stack Assembly, this is the high voltage output terminal for the users load connection. See the SCHEMATICS and OUTLINE & INSTALLATION drawings.

JHV1**JHV2 HVAC CONNECTORS****CAUTION**

All HVAC interconnect cable plugs must be fully seated properly in JHV1 & JHV2 before applying power to the system. Faulty installation may damage the supply.

These connectors and wires (W1 & W2) deliver the high voltage AC power generated in the Driver Assembly to the HV Stack Assembly. See SCHEMATICS & and OUTLINE & INSTALLATION drawings.

J1 SIGNAL INTERFACE CONNECTOR

This connector and associated cable (W3) carry the current and voltage feedback, polarity, and interlock signals from the HV Stack Assembly to the Driver Assembly. See SCHEMATICS and OUTLINE & INSTALLATION drawings.

J2 CONNECTOR (OPTIONAL)

This is an unused “Reserved” connector location.

W1**W2****W3 OPEN STACK INTERCONNECT CABLES**

An additional set of interface cables is provided for the open stack. Use of this longer set of cables facilitates operating the power supply with the HV Open Stack Assembly located safely away from the Driver chassis (e.g. for test purposes).

INSTALLATION AND OPERATION

This unit is a component type of power supply, and as such, is designed for permanent mounting within equipment that will provide adequate fire and shock protection. This supply might in some cases be used for “TEST” operations with the HV Open Stack Assembly located safely away from the Driver chassis.

WARNING!

If configured as a “TEST” operation supply, all user controls & monitoring should continue to be accessed via the Remote Control Assembly which MUST be located a safe distance from the HV Open Stack Assembly. Using the extra set of longer interconnect cables, the HV Open Stack Assembly must also be positioned a safe distance from the Driver Assembly. Safety precautions should be taken during the installation to prevent the connections on the Driver rear panel from becoming “Operator Accessible” when power is applied. ALL HV Open Stack connections & ANY part of the HV Open Stack Assembly or the users load must be located a safe distance from the “Operator”!

Refer to the SYSTEM SCHEMATIC, OUTLINE AND INSTALLATION and SYSTEM OUTLINE & INSTALLATION drawings located in Section III for assembly instructions as well as mechanical mounting specifications and dimensions.

CAUTION

This power supply Driver is equipped with two front handles. The cabinet which contains the Driver is equipped with two handles, one on each side. Due to the weight of the unit, always lift or carry using a minimum of two handles. Because of potential overbalancing, the cabinet containing the driver should not be lifted or carried with the HV Open Stack Assembly still mounted to it.

Care should be taken when mounting this supply not to block or otherwise impede airflow at inlet and exhaust areas.

The High Voltage Stack/Driver Assembly should not be installed in a location where it would be prone to exposure by conductive dust or airborne containments.

WARNING!

NEVER ATTEMPT TO OPERATE THIS UNIT WITHOUT A GOOD EARTH GROUND CONNECTED TO THE DRIVER CHASSIS GROUND STUD E1.

THE GROUND WIRE OF THE AC LINE CORD SHALL BE GROUNDED FROM THE MAINS AC GROUND TO TB1-3 GROUND.

PER EN61010-1 THE DISCONNECTING DEVICE MUST BE READILY IDENTIFIABLE AND EASILY REACHED BY THE USER. THE EXTERNAL SAFETY DISCONNECT (CIRCUIT BREAKER OR SWITCH) INSTALLED BY THE USER, IS THE POWER SUPPLY DISCONNECTING DEVICE. TO DISCONNECT THE POWER SUPPLY FROM THE MAINS, THE CIRCUIT BREAKER OR SWITCH MUST BE TURNED OFF. ALTERNATIVELY (IF SAFELY ACCESSIBLE) THE POWER CORD MAY BE UNPLUGGED.

MAKE SURE THAT ALL INTERCONNECT CABLES AND GROUNDS ARE PROPERLY INSTALLED BETWEEN THE HV OPEN STACK ASSEMBLY AND DRIVER CHASSIS & BETWEEN THE DRIVER CHASSIS AND REMOTE CONTROL ASSEMBLY.

THE REMOTE CONTROL ASSEMBLY AND ALL REMOTE USER CONTROLS AND MONITORING MUST BE LOCATED A SAFE OPERATING DISTANCE FROM THE DRIVER/HV STACK ASSEMBLY. ALL PARTS OF THE DRIVER/HV STACK ASSEMBLY AND THE USER LOAD CANNOT BE "OPERATOR ACCESSIBLE" WHEN IN OPERATION.

READ AND FULLY UNDERSTAND THE OPERATING INSTRUCTIONS BEFORE APPLYING POWER TO THIS UNIT.

THIS EQUIPMENT EMPLOYS VOLTAGES THAT ARE DANGEROUS. EXTREME CAUTION MUST BE EXERCISED WHEN WORKING WITH THIS EQUIPMENT.

DO NOT HANDLE THE LOAD OR EXPOSED HIGH VOLTAGE TERMINATIONS OR ATTEMPT TO MAKE OR REMOVE ANY CONNECTIONS TO THE SUPPLY UNTIL THE LOAD AND/OR SUPPLY HAS BEEN DISCHARGED (GROUNDED). AN UNLOADED SUPPLY MAY TAKE UP TO 60 SECONDS TO FULLY DISCHARGE.

THE LOAD RETURN SHALL BE CONNECTED TO E1 OF THE HV STACK ASSEMBLY.

INITIAL TURN ON

WARNING! This procedure should only be attempted by qualified personnel who are knowledgeable in methods of safely testing and operating high voltage power supplies and related high voltage equipment. The following steps to connect and operate this equipment should be carried out only after the unit has been placed or mounted in position.

It is suggested that the operator become familiar with the operation of the unit under local control via the Remote Panel Assembly and then add the other remote functions as desired. Thus, the initial turn on sequence described below assumes that there are no signals applied to the customer interface connector TB1 of the Remote Assembly and that the , I-PROGRAM, V-PROGRAM, and HV ENABLE jumpers on TB1 are installed for local operation (as shipped from the factory).

The COMMON/GROUND jumper and the INTERLOCK jumper must be installed from TB2-1 to TB2-2 and TB2-2 to TB2-3 of the Driver chassis.

WARNING!

PLEASE VERIFY THE FOLLOWING:

1. That the AC power is disconnected from the unit, either by the disconnecting of the appropriate line cord plug/receptacle combination or by setting the External Safety Disconnect (circuit breaker or safety switch) to OFF.
2. That a good earth ground is connected to the ground stud, E1, as described in the WARNING! statement that follows.
3. That all inter-chassis wires and cables have been installed in accordance with the schematic/interface drawings supplied.
4. That the Remote Control Assembly switches and controls are set as follows:

POWER ON Switch	Off / 0 (REMOTE CONTROL (ASSEMBLY))
KILOVOLT CONTROL	Counterclockwise
MILLIAMPERE/AMPERE CONTROL	As required for load, 1.00 = 10 % of rating 5.00 = 50 % of rating, etc.

5. That the rear Remote Control Assembly switches/jumpers are set as follows:

V-PROGRAM JUMPER	LOCAL (TB1-5 TO TB1-6)
I-PROGRAM JUMPER	LOCAL (TB1-8 TO TB1-9)
HV ENABLE JUMPER	LOCAL (TB1-10 TO TB1-11)

CURRENT SWITCH LIMIT (up)

6. That the Driver rear panel jumpers are set as follows:

COMMON/GROUND JUMPER	LOCAL (TB2-1 TO TB2-2)
INTERLOCK JUMPER	LOCAL (TB2-2 TO TB2-3)

ATTACH LOAD AS FOLLOWS (optional):

1. Connect the load return to the ground stud E1 on the HV Stack Assembly.
2. Connect the HV end of the load to the “push to insert” connector E2, located on the top toroid of the HV Open Stack Assembly.

WARNING!

NEVER ATTEMPT TO OPERATE THIS UNIT WITHOUT A GOOD EARTH GROUND CONNECTED TO THE DRIVER GROUND STUD E1.

POWER UP SEQUENCE:

1. **CAUTION: Check the input voltage rating on the rear or side panel nameplate of the power supply and make certain that this is the rating of the available power source.**
2. Make appropriate line cord connections to the power source.
3. Set the POWER switch on the Remote Control Assembly to the ON / 1 position. The following indicators should be illuminated:
 - POWER
 - KILOVOLT CONTROL
 - POS or NEG POLARITY
4. Activate the high voltage output by depressing HIGH VOLTAGE ON button. The HIGH VOLTAGE ON lamp will illuminate.
5. Rotate KILOVOLT CONTROL clockwise until the KILOVOLT digital panel meter indicates the desired voltage. If the MILLIAMPERE/AMPERE CONTROL indicator illuminates before the desired voltage is achieved, the supply has gone into constant current mode (current limit) and the setting of the MILLIAMPERE/AMPERE CONTROL will have to be increased to supply the required current to the load, at the desired kV level.

6. The high voltage can be turned off by depressing the HIGH VOLTAGE OFF push-button. The supply will go into the standby mode (HIGH VOLTAGE ON lamp off). The high voltage can also be turned off by shutting down the supply with the POWER switch. When the supply is again powered up, the unit will go into the standby mode.

WARNING!

DO NOT HANDLE THE LOAD OR EXPOSED HIGH VOLTAGE TERMINATIONS OR ATTEMPT TO MAKE OR REMOVE ANY CONNECTIONS TO THE SUPPLY UNTIL THE LOAD AND/OR SUPPLY HAS BEEN DISCHARGED (GROUNDED). AN UNLOADED SUPPLY MAY TAKE UP TO 60 SECONDS TO FULLY DISCHARGE.

REVERSE POLARITY SUPPLIES

Two separate HV Stack Assemblies - one for each polarity - are shipped with the power supply. A label affixed to each high voltage indicates its polarity. Connect the HV Stack Assembly of the desired polarity as shown in the SYSTEM INSTALLATION drawing and OUTLINE & SYSTEM WIRING diagram.

REMOTE CONTROL AND MONITOR SIGNALS

NOTE: It is recommended that shielded cable(s) be used for these connections and that the shield be terminated to ground.

*For CE compliant supplies used in Europe:
Please refer to the EMC addendum located elsewhere in this manual for shielding, terminating filtering conditions required to conform to 2014/30/EU.*

WARNING! Do not make or remove connections to any REMOTE CONTROL/MONITOR connector until AC power is off and the output has discharged.

**DRIVER CHASSIS TB2 CONNECTIONS:
(Refer to Interface drawings)**

WARNING! Do not use TB2 connections for main earth ground, High Voltage Stack Assembly or Remote Control Assembly ground connections! E1 ground stud on the rear panel is provided for this purpose.

TB2-1 GROUND

This is a ground connection which can be used to ground the shield of a shielded interlock cable if used. This terminal should not be used as the main connection to earth ground. Use the main ground terminal, "E1", for that purpose.

TB2-2 COMMON

This terminal is the INTERLOCK return. COMMON is internally wired to GROUND. This terminal must be connected to INTERLOCK for the high voltage to be enabled.

TB2-3 INTERLOCK

This INTERLOCK terminal must be connected to COMMON for the high voltage to be enabled. The supply is shipped with this terminal tied to the adjacent COMMON terminal by means of a terminal jumper. This jumper may be removed and a pair of wires may be installed in its place, which then may be connected to a switching device, such as a door interlock switch.

When the unit is in the standby mode, an open circuit at the INTERLOCK terminal will cause the INTERLOCK lamp to light. The interlock circuit will not allow the high voltage to be activated by the front panel HIGH VOLTAGE ON button on the Remote Control Assembly. When the INTERLOCK terminal is again connected to COMMON, the system will revert back to the normal standby condition. If the high voltage is already enabled, an open circuit at the INTERLOCK terminal will disable the high voltage. Even if the open interlock is reconnected, the high voltage will remain off until a HIGH VOLTAGE ON command is received by the front panel HIGH VOLTAGE ON button on the Remote Control Assembly.

**REMOTE CONTROL ASSEMBLY TB1 CONNECTIONS:
(Refer to Interface and Remote Control O & I drawings)**

WARNING! Do not use the TB1 ground connection as the power supplies main ground terminal, the load return point or as the ground connection between the Remote Control Assembly & the Driver.

TB1-1 GROUND

This is an instrumentation GROUND connection. This terminal should not be used for the main GROUND connection between the Remote Control Assembly and the Driver. Use E1 on the rear panel for that purpose.

TB1-2 COMMON

This is a signal COMMON and can be used for any signal or monitor returns.

TB1-3 RESERVED

This terminal is reserved for special options or expansion of features.

TB1-4 V-MONITOR

A 0-10V positive signal (with respect to COMMON), in direct proportion to the output voltage, is available at this terminal. An internal 10k ohm, 1%, limiting resistance protects the circuitry. Therefore, it is recommended that a digital voltmeter be used to monitor this output. It is also acceptable to use a 1mA DC full scale instrument (i.e. analog meter) for monitor purposes.

TB1-5 V-PROGRAM**TB1-6 LOCAL V-CONTROL**

A positive 0-10V signal (with respect to COMMON) at TB1-5 will program the output voltage proportionally from zero to rated output. This input can be programmed in several ways:

- * A user supplied 0 to +10V signal.
- * A user supplied potentiometer (5-50k ohms, 10k nominal) can be connected between the 10V REFERENCE and COMMON, with the wiper connected to the V-PROGRAM terminal.
- * The 0 to +10V signal available at TB1-6, and adjusted by the local (front panel) KILOVOLTS control.
- * The V-PROGRAM input may be jumpered to the REFERENCE voltage terminal for a fixed output at the maximum voltage.

TB1-7 I-MONITOR

A 0-10V signal, positive with respect to COMMON, and in direct proportion to the output current, is available at this terminal. An internal 10k ohm, 1%, limiting resistance protects the circuitry. Therefore, it is recommended that a digital voltmeter be used to monitor this output. It is also acceptable to use a 1mA DC full scale instrument (i.e. analog meter) for monitor purposes.

TB1-8 I-PROGRAM**TB1-9 LOCAL I-CONTROL**

A 0-10V positive signal (with respect to COMMON) at TB1-8 will program the output current proportionally from zero to full output. This input can be programmed in several ways:

- * A user supplied 0 to +10V signal.
- * A user supplied potentiometer (5-50k ohms, 10k nominal) can be connected between the 10V REFERENCE and COMMON, with the wiper connected to the I-PROGRAM terminal.
- * The 0 to +10V signal available at TB1-9, adjusted by the local (front panel) MILLIAMPERES control.
- * The I-PROGRAM input may be jumpered to the REFERENCE for a fixed current limit at the maximum rated current.

TB1-10 REFERENCE

The output of this terminal is an ultra-stable, positive, 10V reference voltage (with respect to COMMON) that is supplied for user programming applications. Maximum current drain from this point should be limited to 4mA.

TB1-11 HV ENABLE

This terminal must be connected to a positive 2.5-15V source (with respect to COMMON) to enable the supply. A 0-1.5V signal at this input will disable the supply. When no external control is required this input can be jumpered to the 10V REFERENCE terminal.

TB1-12 SIGNAL HV STATUS

This signal reflects the status of the high voltage output. A "high" signal indicates that the high voltage is on. A "low" indicates that the high voltage is off. This signal is an open drain output with a 1k pull-up resistor to +5V. Sink current should be limited to 50mA @ 0.4V.