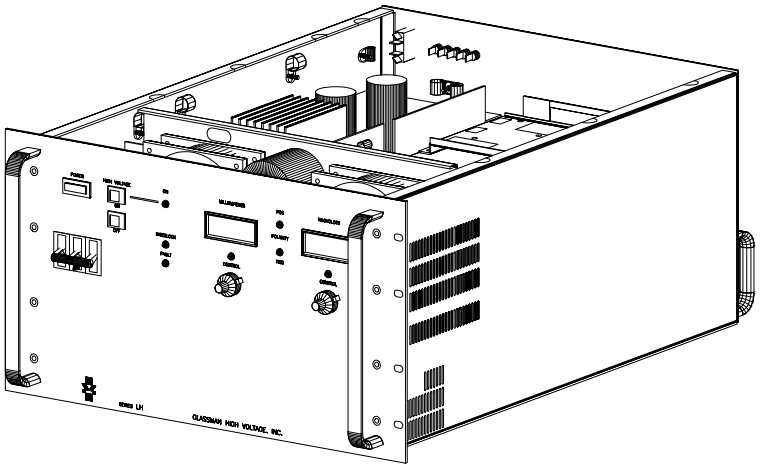
INSTRUCTION MANUAL

LH SERIES



GLASSMAN
HIGH VOLTAGE

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LH SERIES

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.

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. This power supply is equipped with four handles, two front & two rear. Due to the weight of the unit, always lift or carry using a minimum of two handles.

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.

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ACCESSORIES (provided)

QTY	ITEM
1	HV Output cable
1	Subminiature "D" mating connector kit, 25 pin female.

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. Wait at least 2 minutes before disconnecting the HV cable.

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 that the input current rating of the unit. For CE and UKCA compliant supplies used in Europe or the UK, 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.

User Serviceable Components

There are no user-serviceable components. Return supply to factory for replacement of components by qualified technicians.

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

CONNECTIONS AND CONTROLS

REAR PANEL ELEMENTS

(Refer to the Interface Diagram in Section III for Figures 1-10)

TB1 AC POWER INPUT

LH units operate off 208 VAC +/-10%, 3 phase, (Delta or Wye connectable), 48-63Hz. (Unless ordered with 200V or 400V options. See option spec control provided).

WARNING! The TB1-5 ground terminal should always be connected to the AC mains ground or other good earth ground.

TB1 is an NRTL approved terminal block rated for 600V, 20 A & 105 Deg. C. The power cord provided by the user should be an NRTL approved, 4 or 5/C, 12awg, 300VAC, 20 A, 70 Deg. C. minimum rating (for 200 & 208VAC input models). For 400V Option the cord should have a 14awg, 500VAC, 15A, 70 Deg C. minimum rating. The line cord wires should be connected as *follows (See INTERFACE DIAGRAM FIGURES 9 & 10):*

TB1-1 Line 1 (Brown)
TB1-2 Line 2 (Black)
TB1-3 Line 3 (Grey)
TB1-4 Neutral (Blue)
TB1-5 Ground (Green/Yellow)

Colors indicated are for CE and UKCA compliant supplies.

Note: Master/Slave supplies have one additional set of AC input terminals per slave chassis. A separate NRTL approved line cord must be provided for each module.

It is recommended that an NRTL approved Separable Plug be installed on each power cord to connect & disconnect from the Mains. This plug should also be rated for the required Input VAC & Current of the supply.

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

MAINS SERVICE MUST BE PROTECTED WITH FUSES OR CIRCUIT BREAKERS WITH A MAXIMUM RATING OF 100 A FOR 208 VAC MODELS AND 60 A FOR 400 VAC MODELS AND A MINIMUM INTERUPTING CAPACITY OF 5000 A

For CE and UKCA compliant supplies used in Europe or the UK:
Multi-phase equipment is required to have a Safety Disconnect switch or circuit-breaker from the supply source. This should 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) and The Electrical Equipment (Safety) Regulations 2016, SI 2016 No. 1101.

POWER ON INDICATOR

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

JHV1 HIGH VOLTAGE OUTPUT

WARNING! Do not insert or remove the output cable from this connector until AC power is off and the DC output has discharged.

This is the high voltage output of the supply. Engage the connector as follows: Insert the high voltage cable provided into the receptacle. Screw the threaded barrel onto the receptacle.

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 should also be used for the HV load return. *(See INTERFACE DIAGRAM figures 9 and 10).*

S3 CURRENT LIMIT/TRIP SWITCH

This switch allows selection of either CURRENT LIMIT or CURRENT TRIP mode.

TB2 REMOTE INTERFACE TERMINAL STRIP

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

This connector provides inputs and outputs for the remote control functions. For a description of each of these signals and their application see INTERFACE DIAGRAM figures 1-10 and the REMOTE CONTROL INTERFACE section.

J1 REMOTE INTERFACE CONNECTOR

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

This connector provides inputs and outputs for the remote control functions. For a description of each of these signals and their application see INTERFACE DIAGRAM figures 1-10 and the REMOTE CONTROL INTERFACE section.

SLAVE MODULES (MASTER/SLAVE SUPPLIES ONLY):

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 slave module and MUST be connected back to E1 of the master module, either directly or via the E1 ground terminal of the next upstream slave module. See the MASTER/SLAVE SYSTEM SCHEMATIC and the MASTER/SLAVE O & I.

JHV1 HIGH VOLTAGE OUTPUT

WARNING! Do not insert or remove the output cable from this connector until AC power is off and the DC output has discharged.

High voltage output (one additional output per slave for master/slave supplies). Engage the connector as follows: Insert the high voltage cable provided into the receptacle. Screw the threaded barrel onto the receptacle. See the MASTER/SLAVE SYSTEM SCHEMATIC and the MASTER/SLAVE O & I.

J2 MASTER/SLAVE CONNECTOR (OPTION)

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

This connector provides the interface signals needed for parallel operation to J3 of the nearest downstream slave chassis. In the case of the last slave chassis, a terminator plug is installed on J2. For a description of each of these signals and their application see the MASTER/SLAVE SYSTEM SCHEMATIC and the MASTER/SLAVE O & I.

J3 MASTER/SLAVE CONNECTOR (OPTION)

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

This connector provides the interface signals needed for parallel operation from J2 of the master chassis or J2 of the nearest upstream slave chassis. For a description of each of these signals and their application see the MASTER/SLAVE SYSTEM SCHEMATIC and the MASTER/SLAVE O & I.

TB2-2 MASTER/SLAVE CONNECTOR (OPTION)

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

This is the common terminal for the slave module and MUST be connected back to TB2-2 of the master module, either directly or via the TB2-2 common terminal of the next upstream slave module. See the MASTER/SLAVE SYSTEM SCHEMATIC and the MASTER/SLAVE O & I.

JF1, JF2 MASTER/SLAVE GATE TRIGGER CONNCTIONS (TS OPTION)

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

CAUTION
All fiber optic interconnect cables must be properly installed before applying power to the system. Faulty installation may damage the supply.

These connectors provide the fiber optic “”Gate Drive” signals needed for parallel operation to JF3 & JF4 of the nearest downstream slave chassis. In the case of the last slave chassis, protective caps are installed on JF1 & JF2. See the MASTER/SLAVE SYSTEM SCHEMATIC and the MASTER/SLAVE O&I.

JF3, JF4 MASTER/SLAVE GATE TRIGGER CONNCTIONS (TS OPTION)

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

CAUTION
All fiber optic interconnect cables must be properly installed before applying power to the system. Faulty installation may damage the supply.

These connectors receive the fiber optic “Gate Drive” signals needed for parallel operation from JF1 & JF2 of the master chassis or the nearest upstream slave chassis. See the MASTER/SLAVE SYSTEM SCHEMATIC and the MASTER/SLAVE O&I.

FRONT PANEL ELEMENTS

POWER BREAKER

Applies AC power to the unit when in the on ON/1 position (as long as power is present at TB1).

WARNING! Do not apply or remove any connections to this unit when power is on.

POWER INDICATOR

The AC POWER ON indicator lamp will illuminate when power is present and POWER BREAKER is in the ON / 1 position.
WARNING! Do not apply or remove any connections to this unit when power is on.

"NC" OPTION USERS: The front panel elements that follow are not present on "NC" option supplies.

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:

- The FAULT indicator is illuminated.
- There is an open interlock (INTERLOCK indicator is illuminated).

HIGH VOLTAGE OFF PUSH BUTTON

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

- CURRENT TRIP (if enabled by rear panel switch).
- ARC TRIP (if ARC TRIP option is factory installed).

HIGH VOLTAGE ON INDICATOR

Illuminates after the HV ENABLE pushbutton is depressed (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 re-enabled.

FAULT INDICATOR

Illuminates when one or more of the following fault conditions are present:

- One or more cooling fans are slow or inoperative.
- Insufficient AC line voltage is present.
- The power supply temperature is too high.
- An internal bias voltage is low or missing (circuit failure).
- There is a fault in the slave module or open master/slave interconnect.

LOCAL KILOVOLTS & MILLIAMPERES CONTROL

10-turn controls provide a 0-10V signal for local MILLIAMPERE and KILOVOLT programming. Clockwise rotation increases output. A 10- turn dial with brake is provided to secure the settings, if desired.

KILOVOLT & MILLIAMPERE CONTROL INDICATORS

These indicators are located above their respective controls. If the KILOVOLTS CONTROL indicator is illuminated, the supply is operating as a constant voltage supply with an output voltage determined by the local KILOVOLTS CONTROL or remote V-PROGRAM signal. If the MILLIAMPERES CONTROL indicator is illuminated, the supply is operating as a constant current supply with the output current determined by the local MILLIAMPERES CONTROL or remote I-PROGRAM signal.

OUTPUT METERS

Digital panel meters display output voltage and current. (Note: Meters operational only when power is applied to the unit. *(See following **WARNING!** Statement.)*

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 2 minutes before making or removing any connections to the supply.

POLARITY INDICATORS

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

SLAVE MODULES (MASTER/SLAVE SUPPLIES ONLY):

POWER INDICATOR

The AC POWER ON indicator lamp will illuminate when power is present at TB1 on the Modules and the slave POWER BREAKER is in the ON / 1 position.

WARNING! Do not apply or remove any connections to this unit when power is on.

CURRENT TEST POINT

A 0 to 10 V service test point for measuring the relative output current of a slave module.

VOLTAGE TEST POINT

A 0 to 10 V service test point for measuring the relative output voltage of a slave module.

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 VOLTAGE TEST POINT. Discharge the output to ground or use an external meter to determine if output has discharged. Or, wait at least 2 minutes before making or removing any connections to the supply.

COMMON TEST POINT

The common return point for the instrument(s) measuring the VOLTAGE and/or CURRENT test points.

FAULT INDICATORS

BIAS INDICATOR

Normally not illuminated when the AC power is applied. Will light if any of the following conditions are present:

- An internal bias voltage is missing.
- Insufficient AC line voltage is present.
- The power supply temperature is too high.

FAN INDICATOR

Illuminates when one or more cooling fans are slow or inoperative.

TRACKING INDICATOR

This indicator will illuminate if the slave module is not tracking the master. The tracking circuit will latch and shutdown the supply if the condition persists for more than approximately 5 seconds. TRACKING shutdown can be reset by toggling the HV ENABLE or by AC power-down, either by the master module POWER BREAKER or by disconnecting the supply from the AC mains. It is normal for this indicator to momentarily illuminate during load or programming transients.

SYSTEM INDICATOR

Illuminates if the master and slave high voltage polarities do not match. (This applies only to reversible power supplies.)

INSTALLATION AND OPERATION

This unit is a component type of power supply, and as such, is designed for permanent mounting within an equipment rack that will provide adequate fire and shock protection. As is the case with most rack mounted equipment, this supply might in some cases be used for "Bench Top" operation.

WARNING!
When used as a "Bench-Top" supply all user controls & monitoring are accessed via the front panel controls. Safety precautions should be taken during the installation to prevent the connections on the rear panel from becoming "Operator Accessible" when power is applied.

Refer to the OUTLINE AND INSTALLATION drawing located in Section III for mechanical mounting specifications and dimensions.

CAUTION
This power supply is equipped with four handles, two front & two rear. Due to the weight of the unit, always lift or carry using a minimum of two handles.

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

WARNING!

NEVER ATTEMPT TO OPERATE THIS UNIT WITHOUT A GOOD EARTH GROUND CONNECTED TO THE GROUND STUD E1 (E1 OF THE MASTER CHASSIS ON MASTER/SLAVE SUPPLIES).

THE GROUND WIRE OF THE AC LINE CORD OR CORDS SHALL BE GROUNDED FROM THE MAINS AC GROUND TO TB1-5 GROUND (AND ON ALL TB1-5 GROUNDS FOR MASTER/SLAVE SUPPLIES).

PER EN61010-1 THE DISCONNECTING DEVICE MUST BE READILY IDENTIFIABLE AND EASILY REACHED BY THE USER. THE EXTERNAL SAFETY DISCONECT (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.

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 2 MINUTES TO FULLY DISCHARGE.

ALWAYS MAKE CERTAIN THAT THE RETURN SIDE OF THE LOAD IS CONNECTED TO E1 GROUND.

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.

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. Check to see that the POWER BREAKER is in the off ("0") position.

3. Check to see that the jumpers are present on TB2 and are connected for local operation *(see INTERFACE DIAGRAM figure 10).*

   USERS WITH "NC" OPTION SUPPLIES: Set TB2 program jumpers for remote operation and connect external pots or control signals to V-PROGRAM terminal (0 - 10VDC = 0 – rated kV output & I-PROGRAM (0-10VDC = 0 – rated mA output) and meters to J1 to simulate the front panel controls and meters described in the following instructions.

4. Connect the high voltage output cable to your HV apparatus and ground the return lead of the load as shown in INTERFACE DIAGRAM figures 9 & 10. Connect the high voltage cable to the receptacle on the rear panel.
   WARNING! Make sure to isolate your HV apparatus/load from any possible contact with other objects and personnel.

   "NC" OPTION USERS: Connect an external kilovolt meter to the high voltage output or monitor the V-MONITOR terminal with a DVM (0 - 10VDC = 0 - rated kV output). Monitor the I-MONITOR terminal with a DVM (0 – 10VDC = 0 – rated mA output).

5. Connect the AC input cable provided by the user to TB1 and to the MAINS power source.

6. **CAUTION:** Rotate KILOVOLTS CONTROL to the fully counterclockwise position (set external pot or control signal on "NC" option units for zero volts programming). This is optional, but desirable so as to prevent damage to external equipment caused by inadvertent overvoltage setting. Not required if correct setting has already been established.

"NC" OPTION USERS: skip step 7

7. Rotate the MILLIAMPERES CONTROL clockwise (or set external pot or control signal on "NC" option units) to a level that is greater than the amount that the connected load will require (any setting above zero if no load is connected).

8. Set the POWER switch on the front panel to the ON / 1 position. The following indicators should be illuminated:
   - POWER
   - HIGH VOLTAGE OFF
   - KILOVOLT CONTROL
   - POS or NEG POLARITY

"NC" OPTION USERS: Skip step 9

9. Activate the high voltage output by depressing HIGH VOLTAGE ON button. The HIGH VOLTAGE ON lamp will illuminate.
10. 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.
11. 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 breaker. 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 2 MINUTES TO FULLY DISCHARGE.

REVERSE POLARITY

Reverse Polarity Supplies ≤6kV (standard):

A polarity card is provided, internal to the unit, to reverse the output polarity of the supply. If it is desired to determine the present setting of the polarity or to change the polarity, follow the procedure below (refer to the AM10-LH parts placement drawing in Section III):

WARNING!

TO AVOID THE RISK OF SHOCK AND PERSONAL INJURY, WAIT AT LEAST 3 MINUTES AFTER DISCONNECTING THE AC MAINS POWER BEFORE REMOVING ANY COVERS OR PANELS.

1. Remove the bottom cover from the power supply.
   BE SURE AC POWER IS DISCONNECTED AND HV IS DISCHARGED!
2. Locate the high voltage board A5-1.
3. Locate the polarity card (A5-2) plugged into the high voltage board and observe that the card is labeled to indicate the installed polarity.
4. If it is desired to change the polarity of the supply, simply unplug the card, flip it over and reinstall it carefully. Make sure the card is fully inserted (seated).
5. Replace the bottom cover.
6. Repeat the above procedure (if applicable) for all slaves in master/slave systems.
   CAUTION: All polarity cards in master/slave systems must be installed for the same polarity. The supplies will not operate if this is not the case.

Reverse Polarity Supplies >6kV (optional):

Two high voltage assemblies are provided with each supply (and slave where applicable); one is mounted in the supply (normally the positive one), the other one is shipped separately. To verify the polarity of the assembly installed, the bottom cover may be removed from the supply. **BE SURE AC POWER IS DISCONNECTED AND HV IS DISCHARGED!** The large white enclosure (the high voltage assembly) will have a label affixed to the top which indicates its polarity.

It is required that the two high voltage assemblies be exchanged to reverse the output polarity. This may be done in the following manner (refer to the AM10-LH parts placement drawing in Section III):

WARNING!
TO AVOID THE RISK OF SHOCK AND PERSONAL INJURY, WAIT AT LEAST 3 MINUTES AFTER DISCONNECTING THE AC MAINS POWER BEFORE REMOVING ANY COVERS OR PANELS.

1. If the supply has been running, the output must be discharged or allowed to bleed down for a few minutes.
2. Disconnect the AC power from the supply.
3. Remove the high voltage cable from the supply.
4. Remove the top & bottom covers from the chassis.
5. Position the unit with the top facing up. Unplug the HV AC cables from A4-J2 & A4-J3.
6. Turn the chassis over so that the bottom is facing up. Unplug and disconnect the cable harness from A5-J1 and A5-J2. Unplug and disconnect the fastons from COMMON (black wires) A5-E22 and A5-E23 and GROUND (green/yellow wire) A5-E24. Dress all loose wires away from the HV assembly.
7. Remove the screws holding the rear panel behind A5 and let the panel hinge back.
8. Carefully pull the HV AC silicone wires up through their guide tubes and let them hang free.
9. A5 is secured to the chassis by means of an angle bracket. Remove the three nuts and associated hardware holding the bracket to the chassis.
10. Remove A5 by lifting straight up. Install the high voltage assembly of opposite polarity in its place.
11. Reassemble the supply in reverse order of disassembly.

WARNING! For continued safety A5-E22, A5-E23 & A5-E24 must be properly reinstalled!

12. Repeat the above procedure (if applicable) for all slaves in master/slave systems.

CAUTION:

- Nuts holding the brackets to the chassis must be installed and must be tight to provide proper grounding for A5.
- Be careful when reinstalling A5-J1 & A5-J2. Be sure that plugs and jacks are properly aligned and mated.
- All high voltage assemblies installed in master/slave systems must be of the same polarity. The supplies will not operate if this is not the case.

WARNING!
DO NOT HANDLE 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 2 MINUTES TO FULLY DISCHARGE.

REMOTE CONTROL AND MONITOR SIGNALS (Refer to customer interface drawing)

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

For CE and UKCA compliant supplies used in Europe or the UK:** Please refer to the EMC addendum **located** elsewhere in this manual for shielding, terminating filtering conditions required to conform to **2014/30/EU and the Electromagnetic Compatibility Regulations 2016, No. 1091.

CONTROL CHASSIS TB2 CONNECTIONS:

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

WARNING! Do not use TB2 connections for main earth ground or load return! E1 ground stud on the rear panel is provided for this purpose.

TB2-1 GROUND

This is the instrumentation ground connection. This terminal should not be used as the main connection to earth ground. Use the main ground terminal, "E1", for that purpose. TB2-1 is normally connected to the adjacent COMMON terminal unless a floating COMMON is desired *(see TB2-2)*. If a floating COMMON is employed, E1 should be used as the load return *(see INTERFACE DIAGRAM figure 7).*

TB2-2 COMMON

This terminal is the instrumentation/measurement return. Normally, COMMON is maintained at ground potential via a jumper to the GROUND terminal. In this configuration, MONITOR RETURN or PROGRAM RETURN may be connected to either COMMON or GROUND. If desired for supplies > 6 kV or </= 6 kV with the "FG" option, the user may remove this jumper and allow COMMON to "float". This may be done for isolation or for the purpose of inserting a current monitoring device. The load return must be connected to E1 GROUND.

When COMMON is floating, it is internally clamped (with diodes) to GROUND. Thus, the inserted drop should not exceed 200 mV for </= 6 kV units with the "FG" option, or 2.0 V for units > 6 kV or erroneous readings may be obtained. In this configuration, the load return must be connected to E1 GROUND and all program/monitor returns must be connected to COMMON. In addition, instrument returns to COMMON must be isolated from GROUND *(see INTERFACE DIAGRAM figures 7, 9 & 10).*

TB2-3 INTERLOCK

This 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. 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.
WARNING! Except on "NC" option supplies which will re-enable immediately!
(See INTERFACE DIAGRAM figure 1).

LOCAL/REMOTE PROGRAM SELECTION

TB2-4 V-REMOTE
TB2-5 V-PROGRAM
TB2-6 LOCAL V CONTROL
TB2-7 I-REMOTE
TB2-8 I-PROGRAM
TB2-9 LOCAL I CONTROL

Two terminal block jumpers are provided for selection of remote or local programming as follows:

TB2-5 to TB2-4	Output voltage is programmed by signal on J1-8.
TB2-5 to TB2-6	Output voltage is programmed by front panel control.
TB2-8 to TB2-7	Output current is programmed by signal on J1-9.
TB2-8 to TB2-9	Output current is programmed by front panel control.

See INTERFACE DIAGRAM figures 9 & 10.

TB2-10 HV ENABLE
TB2-11 +15 V

TB2-10 (HV ENABLE) and TB2-11 (+15 V) are normally connected to enable the supply locally. If remote HV ENABLE is desired, remove this jumper and apply a HV enable signal at J1-1 to enable the *supply (see INTERFACE DIAGRAM figure 2).*

TB2-12 RESERVED

These terminals are reserved for special options or expansion of features.

CONTROL CHASSIS J1 CONNECTIONS:

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

WARNING! Do not use J1 connections for main earth ground or load return! E1 ground stud on the rear panel is provided for this purpose.

J1-10 PROGRAM RETURN

J1-14 MONITOR RETURN

These pins are the analog programming and monitoring returns The PROGRAM RETURN and the MONITOR RETURN are separate independent floating returns. When instruments are attached to these returns they will "float" to the level of the ground or common potential at the measuring or programming instrument. The differential amplifier circuitry employed automatically adjusts the program and monitor signals to compensate for the difference between COMMON and the ground or common potential at the instrument. This results in a reduction of AC noise and DC offset components between the power supply and the measuring and/or programming instrument *(see INTERFACE DIAGRAM figures 3, 4, 5, 6 & 9).*

> ***CAUTION:*** *Do not allow PROGRAM RETURN or MONITOR RETURN to exceed more than a ±3 V difference with respect to supply COMMON.*
> *RETURNS MUST BE CONNECTED TO A LOW IMPEDANCE SOURCE TO INSURE ACCURATE READINGS.*

J1-5 COMMON

J1-15 COMMON

These signal commons are provided as a return for TTL HV ENABLE and if desired, a connection point to reference any of the following signals:

- PROGRAM RETURN
- MONITOR RETURN
- I/V MODE STATUS
- HV STATUS
- FAULT STATUS

See INTERFACE DIAGRAMS.

J1-7 GROUND

This connection is for instrumentation grounding. This connection can be used to ground the shield of the CUSTOMER INTERFACE cable. This connection should NOT be used as the main connection to earth ground. Use the ground terminal, E1 for that purpose *(see INTERFACE DIAGRAM figure 9).*

J1-11 +10 V REFERENCE

This output is an ultra-stable, positive 10 V reference that is supplied for user programming applications. Maximum current drain should be limited to 4 mA.

It is suggested that if this output is to be used for programming, that the PROGRAM RETURN be connected to COMMON. This reference is regulated to COMMON not the PROGRAM RETURN and may cause an error in programming level equal to the differential between the commons. An external reference regulated to PROGRAM COMMON may be used if required *(see INTERFACE DIAGRAM figures 3, 4 & 9).*

J1-1 HV ENABLE

For this input to function, the connection from TB2-10 to TB2-11 must be removed. The HIGH VOLTAGE ON switch will not generate HV unless there is a "HIGH" (+2.5 V to +5 V) signal present at this connection. (Since the input is clamped to a zener diode through a 10 k ohm impedance, any voltage from 5 to 15 V is acceptable for enabling this input.) A "LOW" (V = 0 to 2.0 V) or disconnect will turn the high voltage off. (This will also reset CURRENT TRIP if enabled.) See INTERFACE DIAGRAM figure 2.

Unlike the front panel push-buttons, the signal applied to the HV ENABLE input must be a constant, not momentary signal. An example of how the HV ENABLE signal operates the high voltage follows:

1. AC power is applied to the supply with HV ENABLE "LOW". Supply is now in standby mode.
2. The HIGH VOLTAGE ON switch is actuated. The supply is no longer in standby, but the HV generation is inhibited by the HV ENABLE signal.
3. A "HIGH" signal is sent to the HV ENABLE input, turning on the high voltage.
4. Sometime later, with the supply set for current trip (rear panel CURRENT switch in TRIP position), an overcurrent occurs and he HV latches off. The supply is now in current trip mode as indicated by the illumination of the MILLIAMPERE/AMPERE CONTROL lamp.
5. The "HIGH" signal at the HV ENABLE input is brought "LOW", resetting the current trip circuit as indicated by the MILLIAMPERE/AMPERE CONTROL lamp extinguishing and the KILOVOLT CONTROL lamp illuminating. The HV remains off due to the HV ENABLE "LOW".
6. A high signal is again applied to the HV ENABLE input and the high voltage output returns.

J1-8 V PROGRAM

This input becomes active when TB2-5 is connected to TB2-4; the front panel KILOVOLT CONTROL is then disabled. A 0 to +10 V signal with respect to PROGRAM RETURN at this input will program the output voltage proportionally from zero to full output *(see INTERFACE DIAGRAM figures 3, 9 & 10).* There are several ways to program this input:

- A user supplied 0 to +10 V signal (such as a D to A converter).
- A user supplied potentiometer (5 to 50 k ohms, 10 k nominal) can be connected between the +10 V REFERENCE and PROGRAM RETURN with the wiper connected to V PROGRAM and the PROGRAM RETURN connected to COMMON.
- The V PROGRAM input may be jumpered to the +10 V REFERENCE and the PROGRAM RETURN connected to COMMON for a fixed output at the maximum voltage. A resistor divider could also be used to program any fixed voltage.

  CAUTION: *The PROGRAM RETURN should always be terminated by a low impedance source to within ±3 V of ground at the programming source. Leaving the PROGRAM RETURN "floating" will introduce noise and offsets on the programming signal.*

J1-9 I PROGRAM

This input becomes active when TB2-4 is connected to TB2-3; the front panel MILLIAMPERE/AMPERE CONTROL is then disabled. A 0 to +10 V signal with respect to PROGRAM RETURN, at this input will program the output voltage proportionally from zero to full output *(see INTERFACE DIAGRAM figures 4, 9 & 10).* There are several ways to program this input:

- A user supplied 0 to + 10 V signal (such as a D to A converter).
- A user supplied potentiometer (5 TO 50 k ohms, 10 k nominal) can be connected between the +10 V REFERENCE and PROGRAM RETURN with the wiper connected to I PROGRAM and the PROGRAM RETURN connected to COMMON.
- The I PROGRAM input may be jumpered to the +10 V REFERENCE and the PROGRAM RETURN connected to COMMON for a fixed output at the maximum voltage. A resistor divider could also be used to program any fixed voltage.

CAUTION: *The PROGRAM RETURN should always be terminated by a low impedance source to within ±3 V of ground at the programming source. Leaving the PROGRAM RETURN "floating" will introduce noise and offsets on the programming signal.*

J1-12 V MONITOR

This output is a 0 to 10 V signal, positive with respect to MONITOR RETURN, and in direct proportion to the output voltage.

A 10 k ohm limiting impedance protects the internal circuitry. Thus, the instrument monitoring this output should have an input impedance greater than 10 megohms, otherwise, the accuracy of the measurement will be degraded. It is also acceptable to use a 1 mA full scale analog meter for monitoring purposes *(see INTERFACE DIAGRAM figure 5).*

CAUTION: *The MONITOR RETURN should always be terminated by a low impedance source to within ±3 V of ground at the monitoring instrument. Leaving the MONITOR RETURN "floating" will introduce noise and offsets on the monitor signal. It is suggested when a high impedance instrument is employed, that a small bypass capacitor (such as 0.01 uF) be added at the instrument between the V MONITOR line and MONITOR RETURN, to reduce any high frequency noise that may be picked up on the line.*

J1-13 I MONITOR

This output is a 0 to 10 V signal, positive with respect to MONITOR RETURN, and in direct proportion to the output current. A 10 k ohm limiting impedance protects the internal circuitry. Thus, the instrument monitoring this output should have an input impedance greater than 10 megohms, otherwise, the accuracy of the measurement will be degraded. It is also acceptable to use a 1 mA full scale analog meter for monitoring purposes *(see INTERFACE DIAGRAM figure 6).*

> ***CAUTION:*** *The MONITOR RETURN should always be terminated by a low impedance source to within ±3 V of ground at the monitoring instrument. Leaving the MONITOR RETURN "floating" will introduce noise and offsets on the monitor signal. It is suggested when a high impedance instrument is employed, that a small bypass capacitor (such as 0.01 uF) be added at the instrument between the V MONITOR line and MONITOR RETURN, to reduce any high frequency noise that may be picked up on the line.*

STATUS MONITOR SIGNALS

J1-2 HV STATUS
J1-3 FAULT STATUS
J1-4 I/V MODE STATUS

CAUTION: Status monitor signals should only be measured using high input impedance circuits, >100k ohms. Connecting low impedance inputs may cause device failure or false indications on the front panel CURRENT CONTROL and FAULT lamps.

Three status monitor signals are provided as defined in the table below:

TERMINAL	STATUS SIGNAL	LOGIC LOW	LOGIC HIGH
J1-2	HV STATUS	Approx. 0 VDC: Supply is not generating high voltage	Approx. 18 VDC: Supply is generating high voltage
J1-3	FAULT STATUS	Approx. 0 VDC: No FAULT is present	Approx. 18 VDC: A FAULT has occurred. (See FAULT indicator for list of conditions which cause a fault.)
J1-4	I/V MODE STATUS	Approx. 0 VDC: Supply is operating in CURRENT LIMIT or CURRENT TRIP mode (as determined by the rear panel CURRENT TRIP/LIMIT switch)	Approx. 15 VDC: Supply is operating in voltage regulation mode.

As an illustration of how FAULT STATUS and HV STATUS signals differ, consider the following scenario:

1. Initially, there is no AC power applied and all status signals are "LOW".
2. AC power is applied with a "HIGH" on the HV ENABLE (with HV ENABLE jumper set for remote operation). There is no change to the status signals (assuming there are no faults).
3. The HIGH VOLTAGE ON push-button is pressed, causing the generation of HV and the HV STATUS signal to go "HIGH".
4. Sometime later, a fan fails inside the unit causing a fault and shutting off the high voltage. The FAULT STATUS signal goes "HIGH" to indicate the presence of a fault and the HV STATUS signal goes "LOW" indicating the absence of HV at the output.
5. An attempt is made to restart the HV by depressing the HV on switch and toggling the HV ENABLE signal, but the fault prevents the HV from being enabled and there is no effect on the HV STATUS signal.
6. The supply is powered down and the defective fan is replaced.
7. AC power is applied with a "LOW" HV ENABLE signal. The FAULT STATUS signal is "LOW" because there is no longer a fan fault.
8. The HIGH VOLTAGE ON button is pressed causing the HIGH VOLTAGE ON lamp to illuminate. However, the HV STATUS signal does not go "HIGH" and no HV is generated because the HV ENABLE is still low.
9. Upon bringing the HV ENABLE signal "HIGH", HV is generated and the HV status signal goes "HIGH".

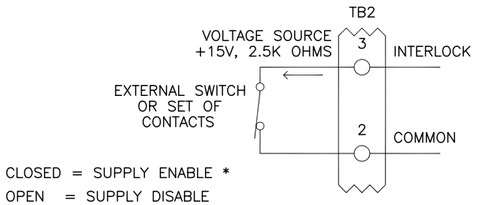
See INTERFACE DIAGRAM figure 8.

J1-6 RESERVED

This connection is reserved for special options or future expansion of features.

REV	BY	DESCRIPTION	DATE	APPROVED
A	AH	ECN 7668: MISC FIXES	012403	HMD
B	TJP	ECN 10613: FIGURE 7 E1 FIXES	081015	HMS
C	JAG	ECN 11016: ADDED "FG" OPTION NOTES.	031017	

REMOTE INTERLOCK — FIGURE 1

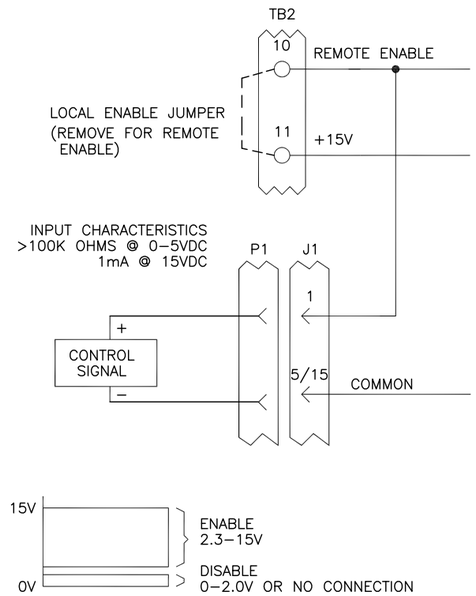


CLOSED = SUPPLY ENABLE *
OPEN = SUPPLY DISABLE

* (REFER TO INSTRUCTION MANUAL TEXT)

REMOTE HV ENABLE — FIGURE 2

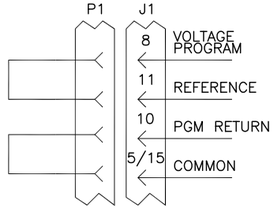
(LOCAL ENABLE JUMPER REMOVED)



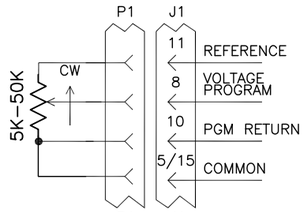
REMOTE VOLTAGE PROGRAM — FIGURE 3

(TB2 REMOTE V–PROGRAM JUMPER: TB2–5 TO TB2–4)

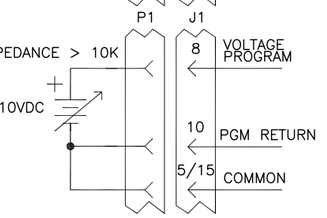
VOLTAGE PROGRAM TO MAXIMUM BY CONNECTING TO REFERENCE TERMINAL AND RETURN TO COMMON



REMOTE VOLTAGE PROGRAMMED BY ATTACHING A 5K TO 50K POTENTIOMETER BETWEEN REFERENCE AND RETURN WITH THE WIPER ARM TO VOLTAGE PROGRAMMING.



THE SUPPLY MAY BE PROGRAMMED WITH A REMOTE 0–10VDC VOLTAGE WHICH IS POSITIVE WITH RESPECT TO PROGRAM RETURN.

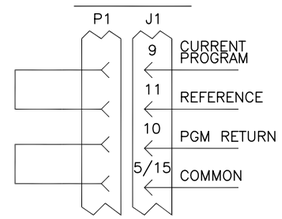


VOLTAGE AND CURRENT PROGRAM SIGNALS ARE DIFFERENTIAL WITH PROGRAM RETURN ISOLATED FROM COMMON. IT IS RECOMMENDED THAT PROGRAM RETURN BE CONNECTED TO COMMON AT THE PROGRAM SOURCE. MAXIMUM COMMON MODE IS 3VDC.

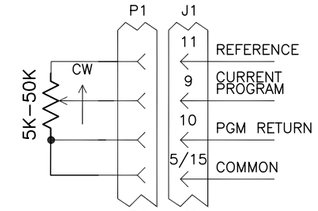
REMOTE CURRENT PROGRAM — FIGURE 4

(TB2 REMOTE I–PROGRAM JUMPER: TB2–8 TO TB2–7)

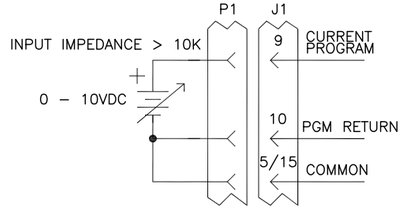
CURRENT PROGRAM TO MAXIMUM BY CONNECTING TO REFERENCE TERMINAL AND RETURN TO COMMON



REMOTE CURRENT PROGRAMMED BY ATTACHING A 5K TO 50K POTENTIOMETER BETWEEN REFERENCE AND RETURN WITH THE WIPER ARM TO CURRENT PROGRAMMING.

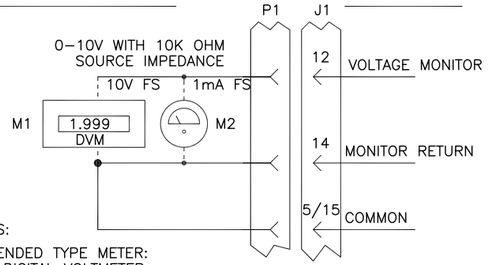


THE SUPPLY MAY BE PROGRAMMED WITH A REMOTE 0–10VDC VOLTAGE WHICH IS POSITIVE WITH RESPECT TO PROGRAM RETURN.



VOLTAGE AND CURRENT PROGRAM SIGNALS ARE DIFFERENTIAL WITH PROGRAM RETURN ISOLATED FROM COMMON. IT IS RECOMMENDED THAT PROGRAM RETURN BE CONNECTED TO COMMON AT THE PROGRAM SOURCE. MAXIMUM COMMON MODE IS 3VDC.

VOLTAGE MONITOR — FIGURE 5



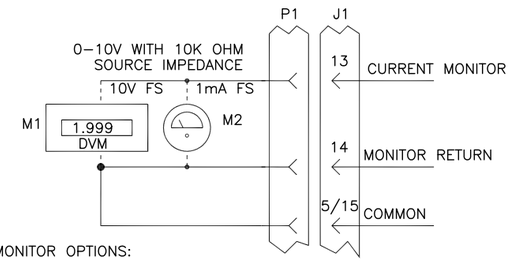
KV MONITOR OPTIONS:

M1 – RECOMMENDED TYPE METER:
0 – 10VDC DIGITAL VOLTMETER
0 – 10V IS DIRECTLY PROPORTIONAL TO 0 – MAX KV RATING

M2 – ALTERNATE TYPE METER:
0 – 1mA FULL SCALE CURRENT METER
0 – 1mA IS DIRECTLY PROPORTIONAL TO 0 – MAX KV RATING

MONITOR SIGNALS ARE DIFFERENTIAL WITH MONITOR RETURN ISOLATED FROM COMMON. IT IS RECOMMENDED THAT THEY BE CONNECTED TO COMMON AT THEIR LOAD. MAXIMUM COMMON MODE IS 3VDC.

CURRENT MONITOR — FIGURE 6



MA MONITOR OPTIONS:

M1 – RECOMMENDED TYPE METER:
0 – 10VDC DIGITAL VOLTMETER
0 – 10V IS DIRECTLY PROPORTIONAL TO 0 – MAX mA RATING

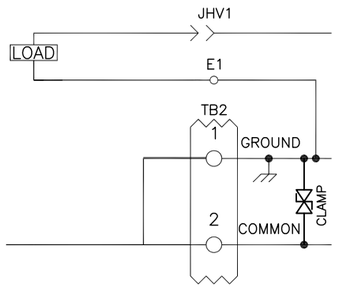
M2 – ALTERNATE TYPE METER:
0 – 1mA FULL SCALE CURRENT METER
0 – 1mA IS DIRECTLY PROPORTIONAL TO 0 – MAX mA RATING

MONITOR SIGNALS ARE DIFFERENTIAL WITH MONITOR RETURN ISOLATED FROM COMMON. IT IS RECOMMENDED THAT THEY BE CONNECTED TO COMMON AT THEIR LOAD. MAXIMUM COMMON MODE IS 3VDC.

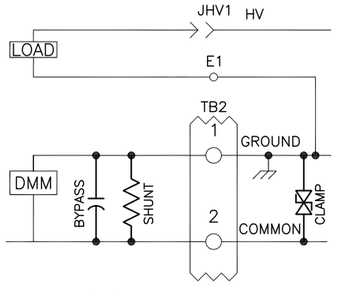
1. THESE DIAGRAMS ARE PROVIDED AS A SUPPLEMENT TO THE INSTRUCTION MANUAL TEXT, NOT AS A SUBSTITUTE. READ INSTRUCTION MANUAL TEXT CAREFULLY BEFORE MAKING CONNECTIONS.
2. TERMINAL NUMBERS SEPARATED BY A "/", SUCH AS 9/22, MEANS EITHER TERMINAL MAY BE USED FOR THE CONNECTION.

COMMON AND GROUND — FIGURE 7

SYSTEM COMMON AND GROUND ARE NORMALLY TERMINATED TOGETHER. IN THIS CONFIGURATION, SIGNAL RETURNS CAN BE CONNECTED EITHER TO GROUND OR COMMON. LOAD RETURN MUST BE CONNECTED TO E1 GROUND.

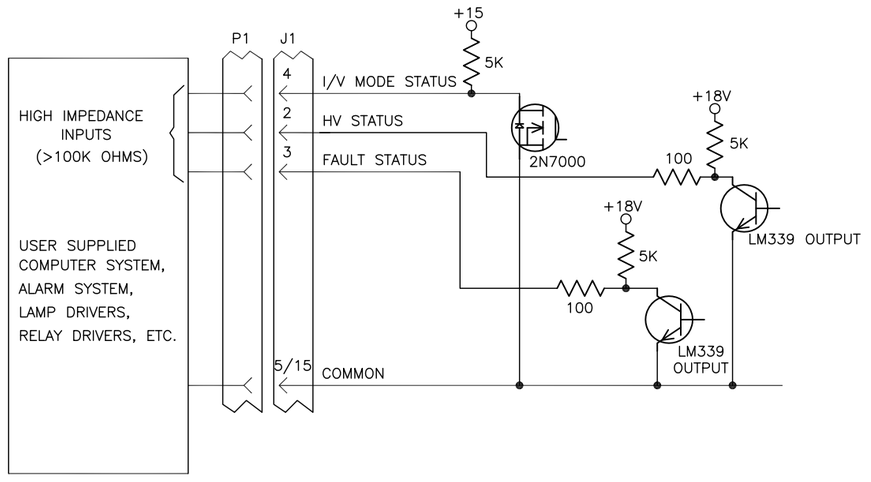


TO "FLOAT" COMMON FOR ISOLATION OR MEASUREMENT PURPOSES, REMOVE COMMON AND GROUND CONNECTION ON TB1. FOR THIS CONFIGURATION INSTRUMENT RETURNS MUST BE TIED TO COMMON, AND LOAD RETURN MUST BE CONNECTED TO E1 GROUND. INSTRUMENT RETURNS MUST BE FLOATING WITH RESPECT TO GROUND. SINCE COMMON IS INTERNALLY CLAMPED TO GROUND WITH A BIDIRECTIONAL ZENER, THE DROP ACROSS THE SHUNT SHOULD BE < 2V FOR MODELS >6KV AND <0.2V FOR MODELS </=6KV WITH "FG" OPTION TO MAINTAIN ACCURACY.



NOTE:
1. COMMON AND GROUND ISOLATION REQUIRES THE "FG" OPTION FOR </=6KV MODELS.

STATUS SIGNALS — FIGURE 8

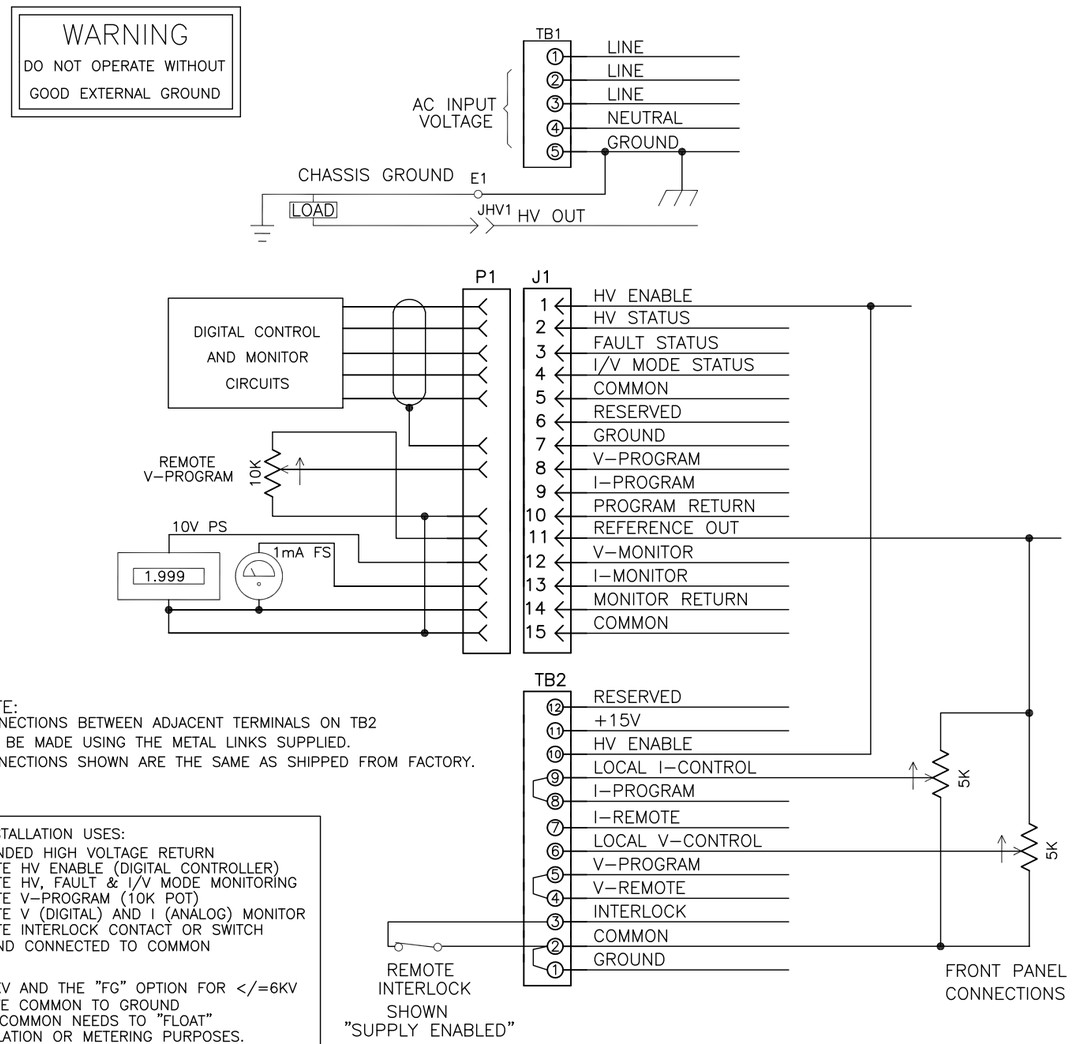


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DEC. XXX± XX± DEG. °	FILE NO. EXTENSION \2002\06001C.DWG	GLASSMAN HIGH VOLTAGE, INC. P.O. BOX 317, HIGH BRIDGE, N.J. 08829 (908) 638–3800 FAX (908) 638–3700
MATERIAL	APPROVALS / DATE	TITLE: REMOTE CONTROL INTERFACE LH SERIES
FINISH	DRAWN AH 051502	D DWG. NO. 200206–001 REV. C
DO NOT SCALE DRAWING	CHECKED SD 051702	SCALE NONE SHEET 1 OF 2
	RELEASED	

REV	BY	DESCRIPTION	DATE	APPROVED

A TYPICAL LH INSTALLATION

FIGURE 9



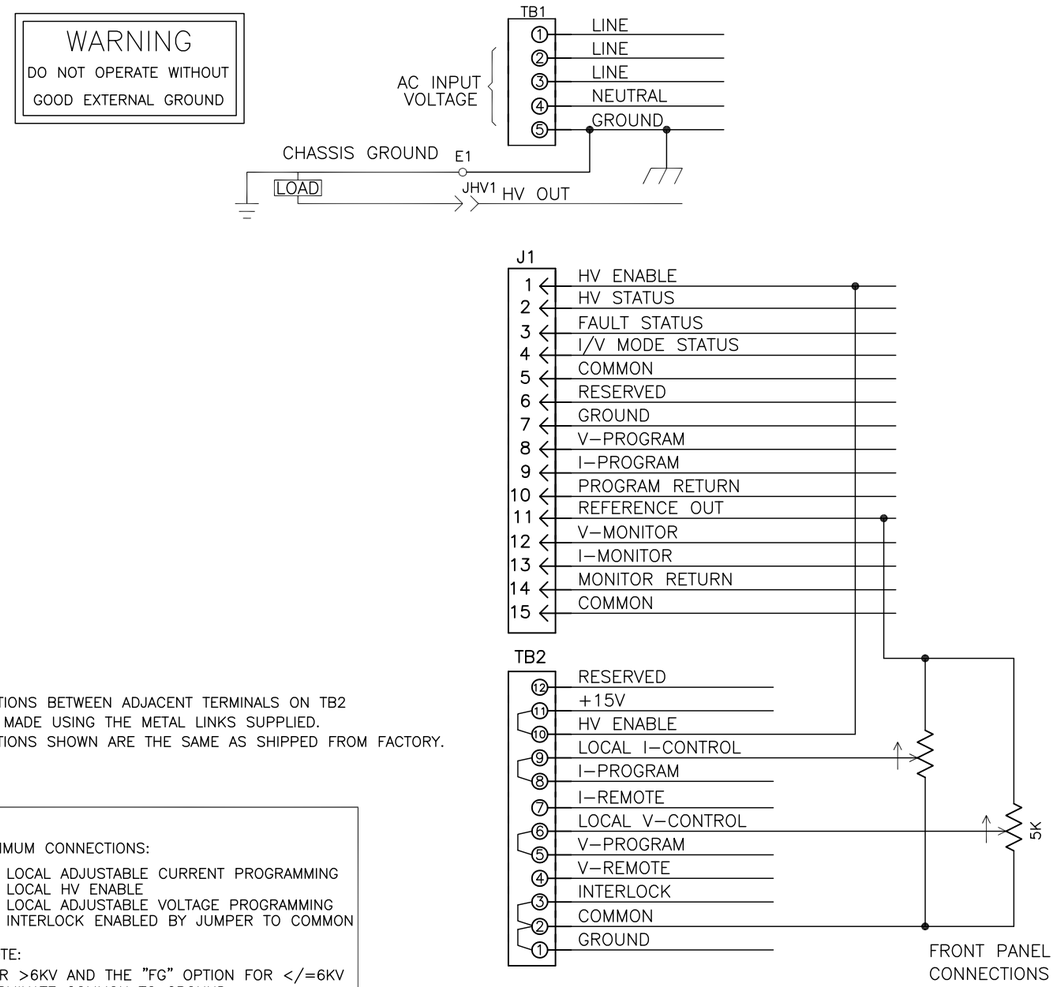
NOTE:
CONNECTIONS BETWEEN ADJACENT TERMINALS ON TB2
CAN BE MADE USING THE METAL LINKS SUPPLIED.
CONNECTIONS SHOWN ARE THE SAME AS SHIPPED FROM FACTORY.

THIS INSTALLATION USES:
* GROUNDED HIGH VOLTAGE RETURN
* REMOTE HV ENABLE (DIGITAL CONTROLLER)
* REMOTE HV, FAULT & I/V MODE MONITORING
* REMOTE V–PROGRAM (10K POT)
* REMOTE V (DIGITAL) AND I (ANALOG) MONITOR
* REMOTE INTERLOCK CONTACT OR SWITCH
* GROUND CONNECTED TO COMMON

NOTE:
FOR >6KV AND THE "FG" OPTION FOR </=6KV
TERMINATE COMMON TO GROUND
UNLESS COMMON NEEDS TO "FLOAT"
FOR ISOLATION OR METERING PURPOSES.

MINIMUM NUMBER OF CONNECTIONS IN ORDER TO COMPLETELY ENABLE THE LH SUPPLY. *

FIGURE 10



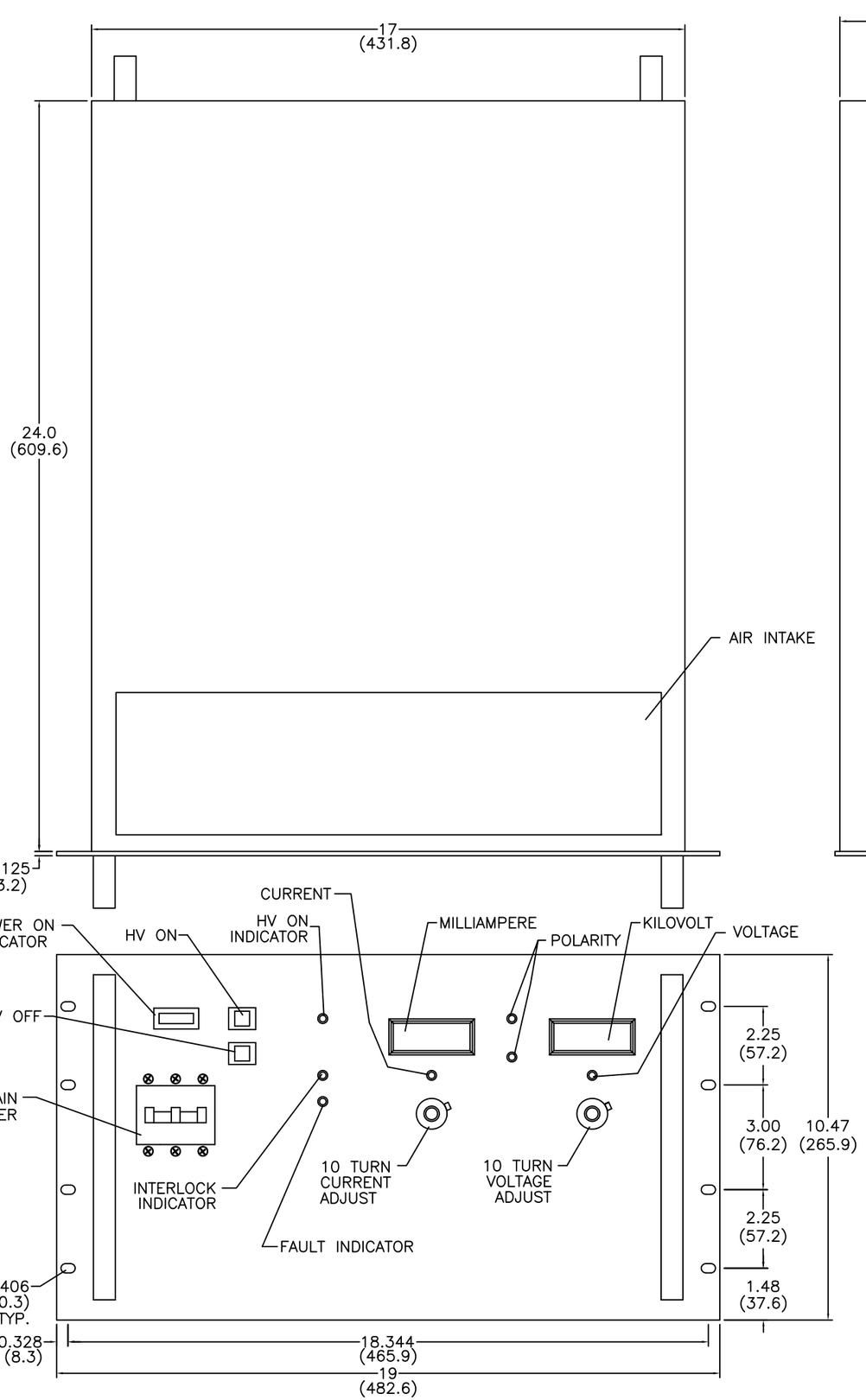
NOTE:
CONNECTIONS BETWEEN ADJACENT TERMINALS ON TB2
CAN BE MADE USING THE METAL LINKS SUPPLIED.
CONNECTIONS SHOWN ARE THE SAME AS SHIPPED FROM FACTORY.

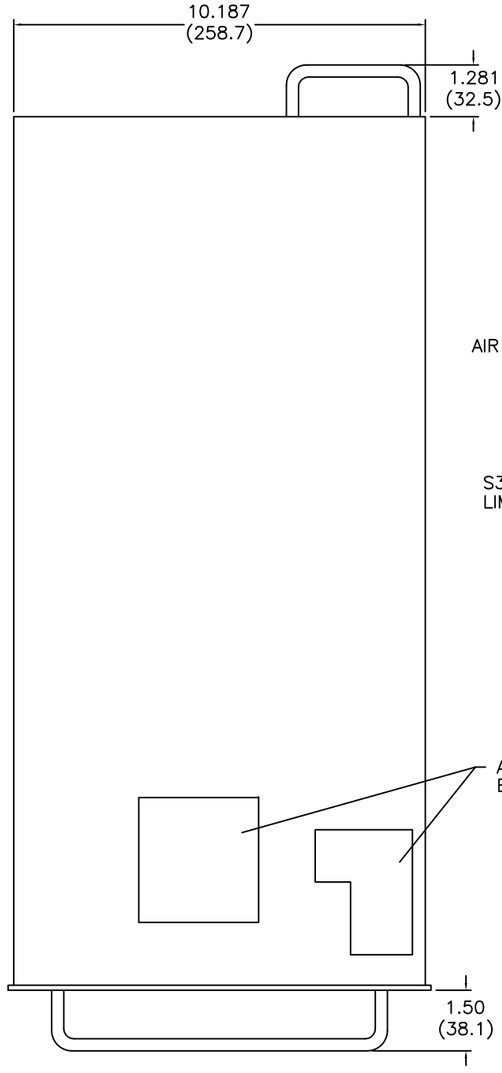
*
MINIMUM CONNECTIONS:
* LOCAL ADJUSTABLE CURRENT PROGRAMMING
* LOCAL HV ENABLE
* LOCAL ADJUSTABLE VOLTAGE PROGRAMMING
* INTERLOCK ENABLED BY JUMPER TO COMMON

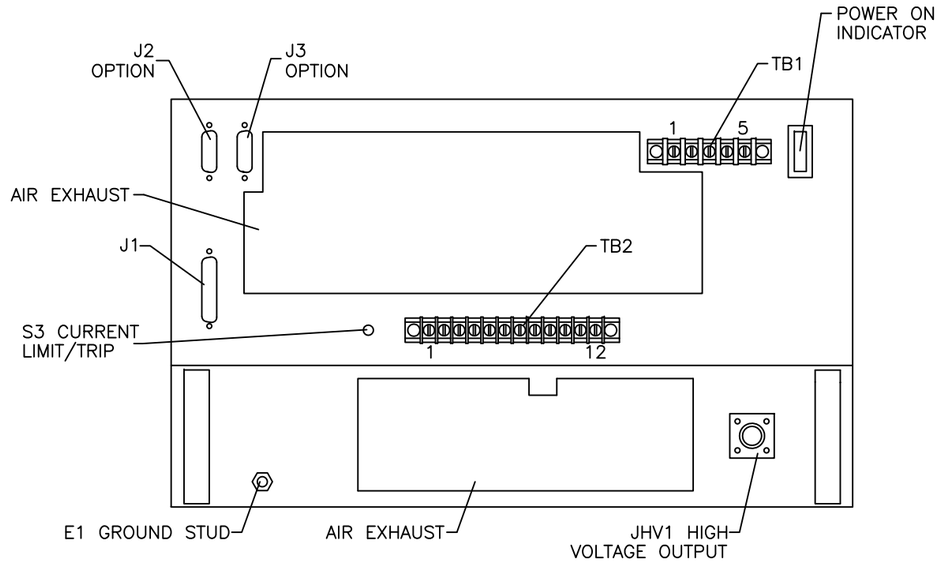
NOTE:
FOR >6KV AND THE "FG" OPTION FOR </=6KV
TERMINATE COMMON TO GROUND
UNLESS COMMON NEEDS TO "FLOAT"
FOR ISOLATION OR METERING PURPOSES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DEC. XXX± XX± DEG. %	FILE NO. EXTENSION \2002\06001C.DWG	GLASSMAN HIGH VOLTAGE, INC. P.O. BOX 317, HIGH BRIDGE, N.J. 08829 (908) 638–3800 FAX (908) 638–3700
MATERIAL	APPROVALS / DATE	TITLE: REMOTE CONTROL INTERFACE LH SERIES
FINISH	DRAWN AH 051502	D DWG. NO. 200206–001 REV. C
DO NOT SCALE DRAWING	CHECKED SD 051702	SCALE NONE SHEET 2 OF 2
	RELEASED	

REV	BY	DESCRIPTION	DATE	APPROVED
NR–1	TJM	ADDED 16–25 IN J1 LEGEND	060403	JJC
A	EJM	ECN 9054: S3 WAS S4	081007	BWB
B	TJP	ECN 10613: TB1 LEGEND ERROR	080715	







TB1: AC INPUT
187–230 VAC
340–460 VAC
48–63 HZ
3 PHASE

TB1 LEGEND

1 LINE
2 LINE
3 LINE
4 NEUTRAL
5 GROUND

TB2 LEGEND

1 GROUND	7 I–REMOTE
2 COMMON	8 I–PROGRAM
3 INTERLOCK	9 LOCAL I–CONTROL
4 V–REMOTE	10 HIGH VOLTAGE ENABLE
5 V–PROGRAM	11 +15V
6 LOCAL V–CONTROL	12 RESERVED

J1 LEGEND

1 HIGH VOLTAGE ENABLE	9 I–PROGRAM
2 HIGH VOLTAGE STATUS	10 PROGRAM RETURN
3 HIGH VOLTAGE FAULT	11 +10V REFERENCE
4 MODE STATUS	12 V–MONITOR
5 COMMON	13 I–MONITOR
6 RESERVED	14 MONITOR RETURN
7 GROUND	15 COMMON
8 V–PROGRAM	16–25 RESERVED

IN
(MM)

NET WEIGHT:
60 POUNDS; 27.22kg

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE :
DEC. XXX ± XX ±
DEG. ±

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

FILE NO. EXTENSION \2014\69004B.DWG

APPROVALS	DATE
DRAWN EJM	012403
CHECKED JMC	013003
RELEASED	

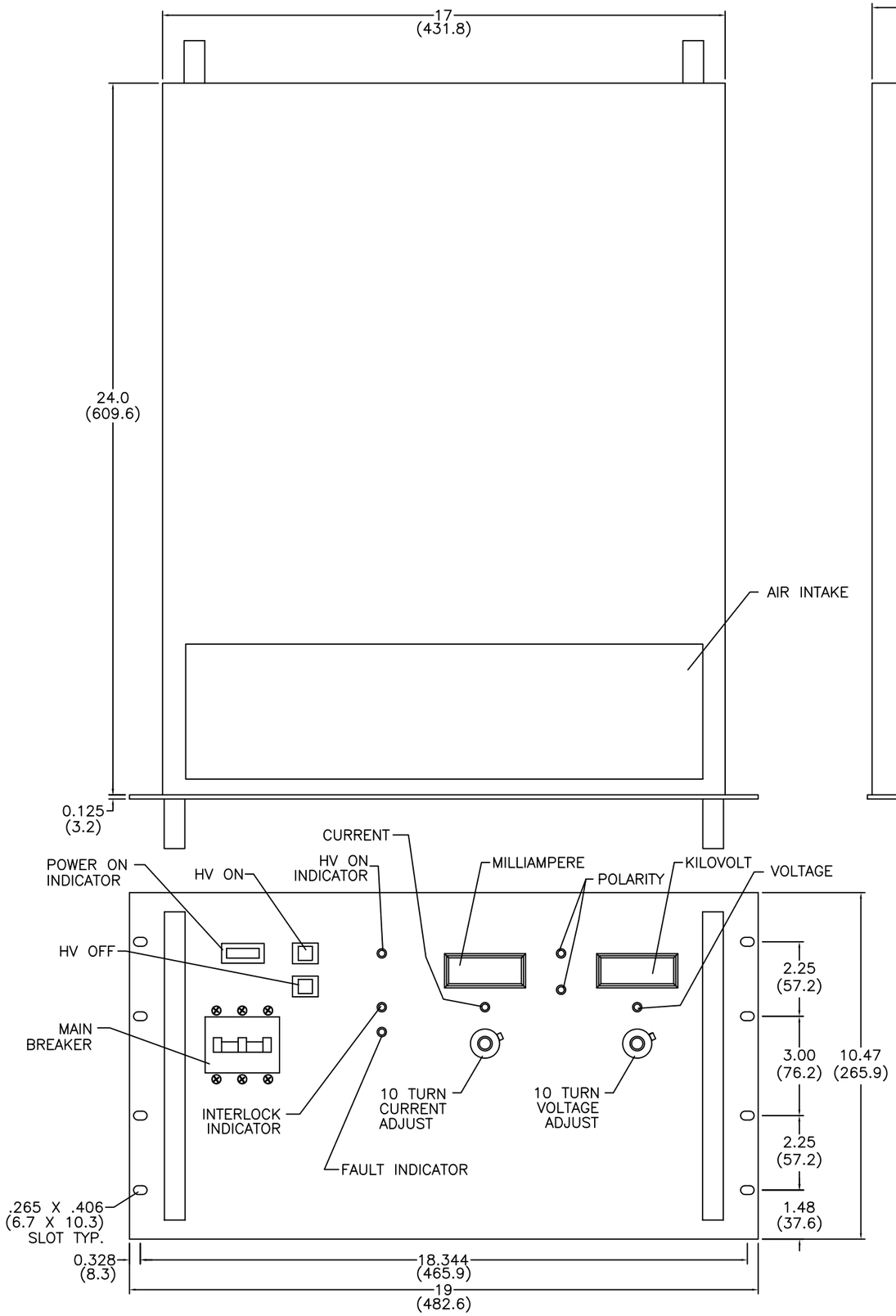
GLASSMAN HIGH VOLTAGE, INC.
P.O. BOX 317, HIGH BRIDGE, N.J. 08829
(908) 638–3800 FAX (908) 638–3700

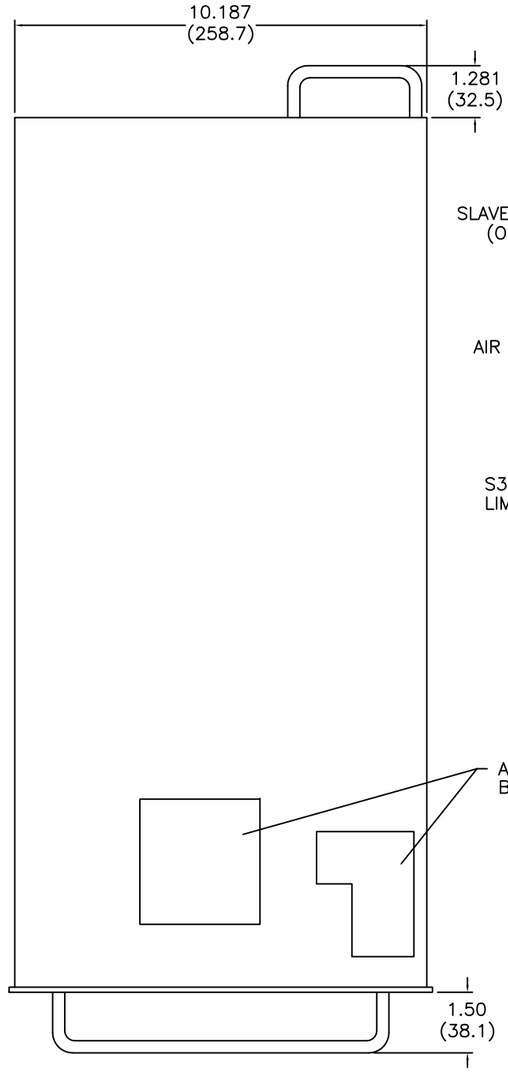
TITLE
OUTLINE & INSTALLATION
AM10–LH, DIGITAL, 1–6KV

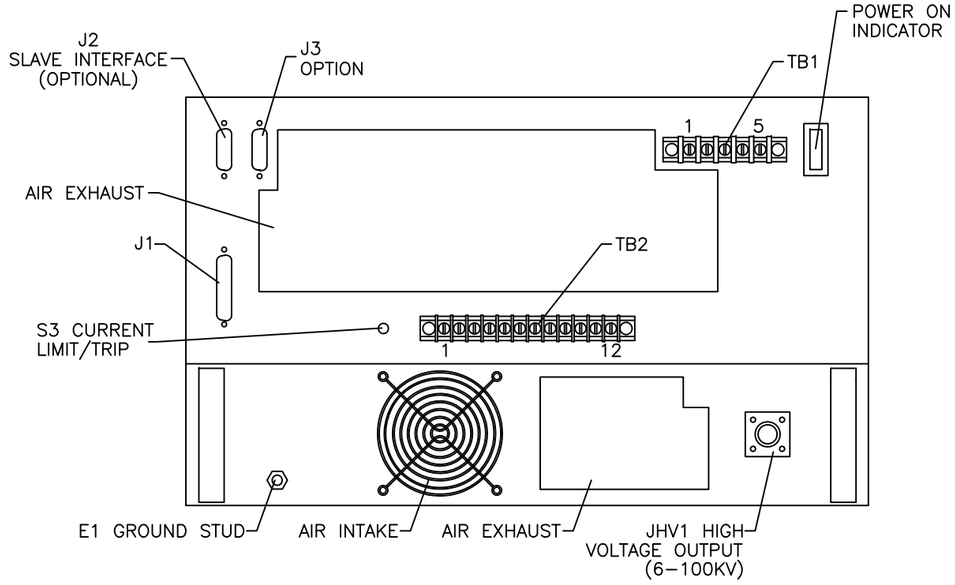
D DWG.NO. 201469–004 REV. B

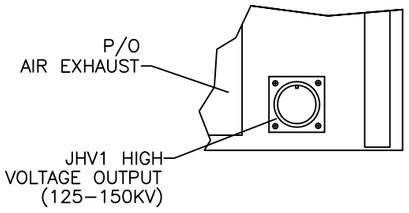
SCALE NONE SHEET 1 OF 1

REV	BY	DESCRIPTION	DATE	APPROVED
A	AH	ECN 7480: PROTOTYPE UPDATES	042202	BA
A–1	TJM	FIXED J2 DESCRIPTION	033103	JMC
A–2	AH	ADDED J1 16–25	060603	JMC
B	EJM	ECN 9054: S3 WAS S4	081007	BWB
C	TJP	ECN 10613: TB1 LEGEND ERROR	080715	J.M.
C1	EJM	125–150KV SHOWN	072016	









TB1: AC INPUT
187–230 VAC
340–460 VAC
48–63 HZ
3 PHASE

TB1 LEGEND
1 LINE
2 LINE
3 LINE
4 NEUTRAL
5 GROUND

JHV1: HV OUTPUT
70–100KV: AMPHENOL 83–1R–RFX OR EQUIVALENT
125–150KV: TYPE MS 3102A–18 OR EQUIVALENT

TB2 LEGEND

1 GROUND	7 I–REMOTE
2 COMMON	8 I–PROGRAM
3 INTERLOCK	9 LOCAL I–CONTROL
4 V–REMOTE	10 HIGH VOLTAGE ENABLE
5 V–PROGRAM	11 +15V
6 LOCAL V–CONTROL	12 RESERVED

J1 LEGEND

1 HIGH VOLTAGE ENABLE	9 I–PROGRAM
2 HIGH VOLTAGE STATUS	10 PROGRAM RETURN
3 HIGH VOLTAGE FAULT	11 +10V REFERENCE
4 MODE STATUS	12 V–MONITOR
5 COMMON	13 I–MONITOR
6 RESERVED	14 MONITOR RETURN
7 GROUND	15 COMMON
8 V–PROGRAM	16–25 RESERVED

IN
(MM)

NET WEIGHT:
60 POUNDS; 27.22kg

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE :
DEC. XXX ± XX ±
DEG. ±

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

FILE NO. EXTENSION
\2014\69001C1.DWG

APPROVALS	DATE
DRAWN EJM	030702
CHECKED JMC	032802
RELEASED	

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(908) 638–3800 FAX (908) 638–3700

TITLE
OUTLINE & INSTALLATION
AM10–LH, DIGITAL

D DWG.NO. 201469–001 REV. C–1

SCALE NONE SHEET 1 OF 1