INSTRUCTION MANUAL

MK SERIES

XP Power
124 West Main Street, PO Box 317, High Bridge, NJ 08829

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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 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.

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 Power 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	AC input line cord
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 1 minute before disconnecting the HV cable.

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

Use the NRTL listed power cord provided by the manufacturer, or use only a NRTL listed power cord with a separable mains plug rated greater than 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 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.

CONNECTORS, CONTROLS, & INDICATORS

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

J2 AC POWER INPUT

MK units operate off single phase 115 or 230 VAC. Consult model label for correct input voltage.

WARNING! The ground (center) terminal of this input should be connected to the AC outlet ground or other good earth ground.

J2 is an IEC C14 receptacle. Mating line cords are provided for either 115VAC or 230VAC operation. The 115VAC line cord has a plug for a NEMA 5-15 grounded outlet and the 230VAC line cord has a plug for a NEMA 6-15 grounded outlet. In other regions, the appropriate plug or IEC cord set should be substituted.

If the plug is removed from the cord provided, the wires should be connected as follows:

Green/Yellow - Ground
Brown - Line
Blue - Line or Neutral

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

For CE and UKCA compliant supplies used in Europe or the UK:
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.

J3 HIGH VOLTAGE OUTPUT CONNECTOR

WARNING! Do not insert or remove the output cable from this connector until AC power is off and the DC output has discharged. An unloaded supply may take up to 1 minute to fully discharge.

This is the high voltage output of the supply.
(See INTERFACE DIAGRAM FIGURES 7, 8, & 9).

Engage the connector as follows:

Units with SO239 style connector: Insert the high voltage cable provided into the receptacle. Screw the threaded barrel onto the receptacle.

"L" type units < = 5kV: Align plug, push in, and rotate 1/2 turn to engage.

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 7, 8, & 9).

J1 REMOTE CONTROL CONNECTOR

WARNING! Do not make or remove connections to this connector or any other connector until AC power is off and the DC 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 the Control Connector Interface portion of Section II (pages 9 - 11) and Figures 1-9 of the INTERFACE DIAGRAM in Section III. Pin-outs are as follows:

1	GROUND
2	HV ENABLE
3	X1 (NOT USED ON STANDARD MODELS)
4	VOLTAGE MONITOR
5	COMMON
6	VOLTAGE PROGRAM
7	X2 (NOT USED ON STANDARD MODELS)
8	COMMON
9	INTERLOCK
10	CURRENT MONITOR
11	X3 (NOT USED ON STANDARD MODELS)
12	LOCAL CONTROL
13	CURRENT PROGRAM
14	X4 (NOT USED ON STANDARD MODELS)
15	X5 (NOT USED ON STANDARD MODELS)
16	X6 (NOT USED ON STANDARD MODELS)
17	NO CONNECTION
18	COMMON
19	COMMON
20	COMMON
21	NO CONNECTION
22	X7 (NOT USED ON STANDARD MODELS)
23	+10V REFERENCE
24	+10V REFERENCE
25	+10V REFERENCE

LOCAL PROGRAM CONTROL

This 10-turn control provides a 0 to +10V signal for local current or voltage programming. Clockwise rotation increases output. A locking nut is provided to secure the setting.

INSTALLATION

This module is a component type of power supply, and as such, is designed for permanent mounting within larger industrial equipment that will provide adequate fire and shock protection. This supply is not designed for "Bench Top" operation. Refer to the OUTLINE AND INSTALLATION drawing in Section III for mechanical mounting specifications and dimensions.

CAUTION

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", ON THE FRONT PANEL. THE GROUND WIRE OF THE AC LINE CORD MUST ALSO BE GROUNDED.

PER EN61010-1 THE DISCONNECTING DEVICE MUST BE READILY IDENTIFIABLE AND EASILY REACHED BY THE USER. THE DETACHABLE POWER CORD IS THE POWER SUPPLY DISCONNECTING DEVICE. TO DISCONNECT THE POWER SUPPLY FROM THE MAINS, THE POWER SUPPLY CORD MUST BE UNPLUGGED.

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 1 MINUTE TO FULLY DISCHARGE.

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

SUGGESTED INITIAL TURN ON PROCEDURE

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

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 AC input ratings of the power supply as indicated on the model label located on the side of the unit. Make certain that the AC power source matches the rating shown on the model label.**

2. **FOR LOCAL CONTROL:** Using the supplied "D" connector kit, make connections to plug P1 as shown in figure 9 of the INTERFACE DIAGRAM. Connect high impedance digital voltmeters or 1mA analog meters to the CURRENT and VOLTAGE MONITOR outputs (0-+10V = 0 to supply rating). Connect P1 to J1.

   FOR REMOTE CONROL: Using the supplied "D" connector kit, connect external pots or control signals to V-PROGRAM and I-PROGRAM terminals. Connect TTL ENABLE to REFERENCE. Connect INTERLOCK to COMMON. *(See INTERFACE DIAGRAM figures 3, 4 & 8.)*

   Note: Always connect J1-1 (GROUND) to J1-5 (COMMON) unless COMMON needs to "float" for isolation or metering purposes.

3. Connect the high voltage output cable to your HV apparatus and ground the return lead of the load as shown in Figures 8 & 9 of the INTERFACE DIAGRAM. Connect the high voltage cable to the receptacle on the front panel.

   WARNING! Make sure to isolate your HV apparatus/load from any possible contact with other objects and personnel.

   Monitor the V-MONITOR terminal with a DVM
   (0 – 10 VDC = 0 – rated kV output).

   FOR LOCAL CONTROL:

4. **CAUTION:** Rotate the LOCAL CONTROL fully counter-clockwise. 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.

5. Connect the AC input cable provided to J2 and to the power source.

   WARNING! Supply is energized and capable of generating HV immediately upon the application of AC power!

6. Rotate the LOCAL CONTROL clockwise until the VOLTAGE MONITOR indicates the desired output voltage. The CURRENT MONITOR should indicate expected output current as calculated by I=E/R.

7. Remove the AC input power to shut down the supply.

   FOR REMOTE CONTROL:

8. **CAUTION:** Set external V-PROGRAM pot to zero volts. 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.

9. Set I-PROGRAM (LOCAL CONTROL or external pot) to a level that is greater than the amount that the connected load will require (any setting above zero if no load is connected). Note: A setting above zero is required for HV generation even if no load is connected.

10. Connect the AC input cable provided to J2 and to the power source.

    WARNING! Supply is energized and capable of generating HV immediately upon the application of AC power!

11. Rotate external V-PROGRAM pot until VOLTAGE MONITOR indicates desired output voltage. The CURRENT MONITOR should indicate expected output current as calculated by I=E/R.

12. Remove the AC input power to shut down the supply.

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 1 MINUTE TO FULLY DISCHARGE.

CONTROL CONNECTOR INTERFACE

(Refer to the Interface Diagram in Section III for Figures 1-9)

***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 conditions required to conform to **2014/30/EU** and the Electromagnetic Compatibility Regulations 2016, No. 1091.*

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.

J1-9 INTERLOCK

This terminal must be connected to COMMON to enable the supply. If an external interlock is desired, a switch can be connected between the INTERLOCK pin and any COMMON pin. This switch must be closed to make the supply operable. When the external switch is open, the supply is disabled.
WARNING! When the switch is again closed, HV will be generated immediately. *(See INTERFACE DIAGRAM FIG 1).*

If no external interlock is required, this pin can be connected directly to COMMON with a wire jumper. (See INTERFACE DIAGRAM FIGURES 1, 8, & 9).

J1-2 HV ENABLE

This terminal must be connected to a 2.5 - 10V source, positive 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 any +10V REFERENCE pin. *(See INTERFACE DIAGRAM FIGURES 2, 8, & 9)*.

J1-6 **VOLTAGE PROGRAM**
J1-12 **LOCAL CONTROL**

A 0 - 10V positive signal, with respect to COMMON, will program the output voltage proportionally from zero to full output. This input can be programmed in several ways *(See INTERFACE DIAGRAM FIGURES 3, 8, & 9)*:

* A user supplied 0 - +10V signal.

* A user supplied potentiometer (5- 50k ohms, 10k nominal) can be connected between any +10V REFERENCE pin and any COMMON pin, with the wiper connected to the VOLTAGE PROGRAM pin.

* The 0 - +10V signal supplied by the LOCAL CONTROL pin and adjusted by the LOCAL CONTROL.

* The VOLTAGE PROGRAM input may be jumpered to any +10V REFERENCE pin for a fixed output at the maximum rated voltage.

J1-13 **CURRENT PROGRAM**
J1-12 **LOCAL CONTROL**

A 0-10V positive signal, with respect to COMMON, will program the maximum output current proportionally from zero to full rated output. This input can be programmed in several ways *(See INTERFACE DIAGRAM FIGURES 4, 8, & 9)*:

* A user supplied 0 - +10V signal.

* A user supplied potentiometer (5-50k ohms, 10k nominal) can be connected between any +10V REFERENCE pin and any COMMON pin, with the wiper connected to the CURRENT PROGRAM pin.

* The 0 - +10V signal supplied by the LOCAL CONTROL pin and adjusted by the LOCAL CONTROL.

* The CURRENT PROGRAM input may be jumpered to any +10V REFERENCE pin for a fixed output at the maximum rated current.

J1-4 **VOLTAGE MONITOR**

A 0-10V signal, positive with respect to COMMON, and in direct proportion to the output voltage, is available at this pin. A 10k ohm, 1% resistance is in series with this output to protect the internal circuitry. An instrument with a high input impedance (>10M), such as a digital voltmeter, should be used to monitor this output. This will minimize the voltage drop across the 10k resistance. Alternately, a 1mA analog meter can be used, since the 10k resistor provides the proper impedance to drive the meter to full scale at 10V. *(See INTERFACE DIAGRAM FIG. 5)*.

J1-10 **CURRENT MONITOR**

A 0-10V signal, positive with respect to COMMON, and in direct proportion to output current, is available at this pin. A 10k ohm, 1% resistance is in series with this output to protect the internal circuitry. An instrument with a high input impedance (>10M), such as a digital voltmeter, should be used to monitor this output. This will minimize the voltage drop across the 10k resistance. Alternately, a 1mA analog meter can be used, since the 10k resistor provides the proper impedance to drive the meter to full scale at 10V. *(See INTERFACE DIAGRAM FIG. 6)*.

J1-5, 8, 18, 19, & 20 **COMMON**

These pins are for instrumentation/measurement return. Normally, the COMMON is operated at ground potential by means of a jumper to GROUND. In this condition, instrument returns and the load return may be connected to either COMMON or GROUND. If desired, the user may remove this jumper and allow the COMMON to "float". This may be done for isolation or for the purpose of inserting a current monitoring device. When COMMON is floating, it is clamped internally by a bidirectional Zener diode. Thus, the inserted drop should not exceed 5.0V or erroneous readings will be obtained. In this configuration, the load return must be connected to GROUND and all instrument/programming returns must be connected to COMMON. In addition, instrument returns to COMMON must be isolated from GROUND. *(See INTERFACE DIAGRAM FIGURES 7, 8, & 9)*.

J1-1 **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. This terminal is normally connected to the adjacent COMMON pin unless a floating COMMON is required (see J1- 5, 8, etc.). If a floating COMMON is employed, this connection (or E1) can be used as the load return. *(See INTERFACE DIAGRAM FIGURES 7, 8, & 9)*.

J1-23, 24 & 25 **+10V REFERENCE**

The signal available at these pins is an ultra-stable, positive with respect to COMMON, 10V reference voltage, supplied for user programming applications. The combined maximum current drawn should be limited to 5mA. *(See INTERFACE DIAGRAM FIGURES 3, 4, 8, & 9).*

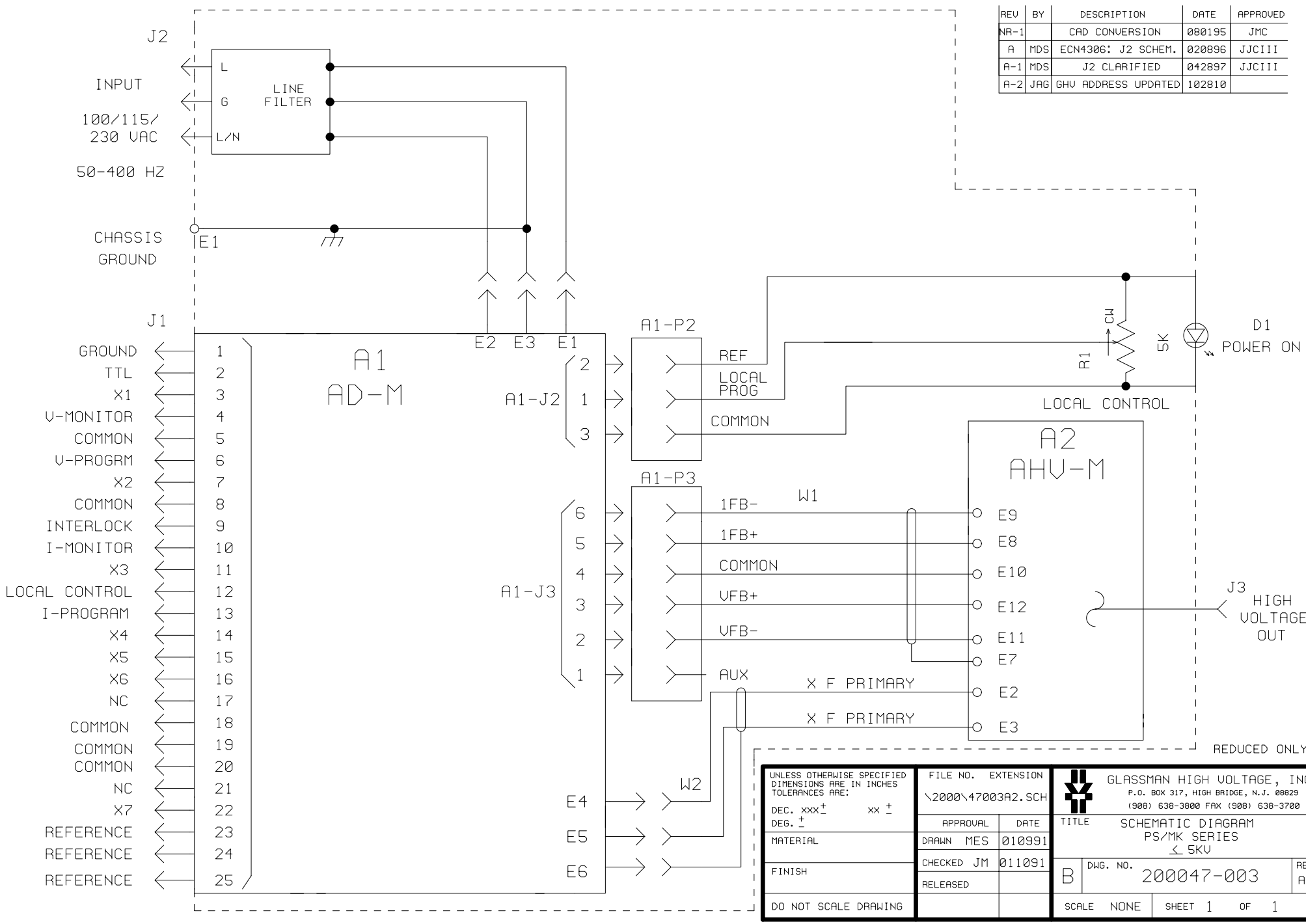
J1-3 **X1**
J1-7 **X2**
J1-11 **X3**
J1-14 **X4**
J1-15 **X5**
J1-16 **X6**
J1-22 **X7**

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

NOTE REGARDING INTERFACE DIAGRAM:

Figure 8 is just one example of the many wiring configurations possible.

Figure 9 shows the minimum number of connections to completely enable the supply. In this configuration, the output voltage is adjusted by the LOCAL CONTROL and the current limit is fixed at the maximum rated output current. No external INTERLOCK or HV ENABLE signals are required.



REV	BY	DESCRIPTION	DATE	APPROVED
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A-1	MDS	J2 CLARIFIED	042897	JJCIII
A-2	JAG	GHV ADDRESS UPDATED	102810	

REDUCED ONLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DEC. XXX ± XX ±
DEG. ±
MATERIAL
FINISH
DO NOT SCALE DRAWING

FILE NO. EXTENSION
\2000\47003A2.SCH

APPROVAL	DATE
DRAWN MES	010991
CHECKED JM	011091
RELEASED	

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

TITLE
SCHEMATIC DIAGRAM
PS/MK SERIES
≤ 5KV

B | DWG. NO. 200047-003 | REV. A-2

SCALE NONE | SHEET 1 OF 1

REV	BY	DESCRIPTION	DATE	APPROVED
NR-1		CAD CONVERSION	073195	JMC
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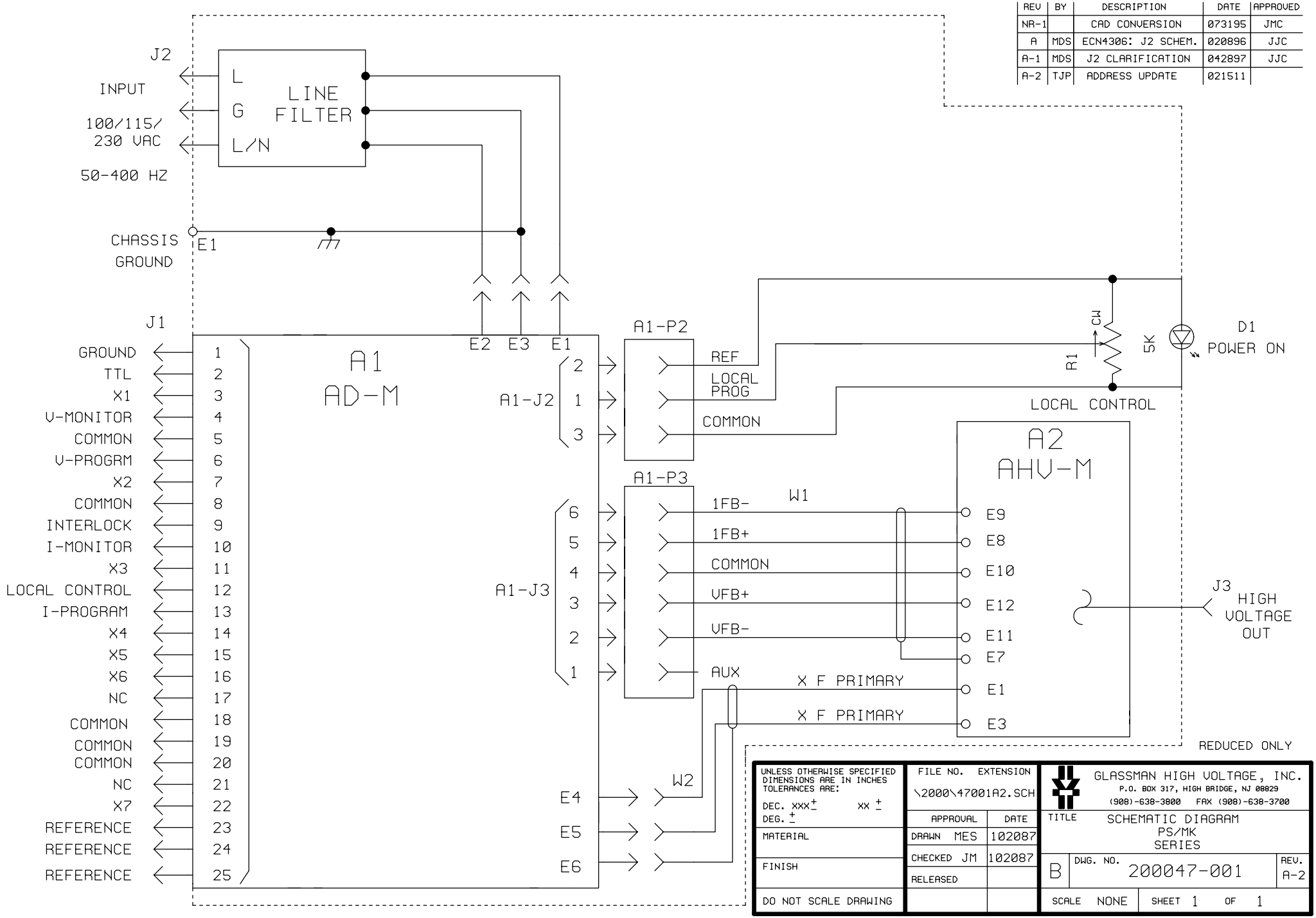
A-1	MDS	J2 CLARIFICATION	042897	JJC
A-2	TJP	ADDRESS UPDATE	021511	

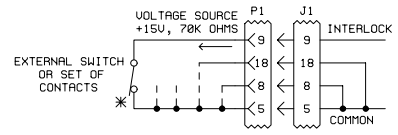


REDUCED ONLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DEC. XXX ± XX ± DEG. ±	FILE NO. EXTENSION \2000\47001A2.SCH	GLASSMAN HIGH VOLTAGE, INC. P.O. BOX 317, HIGH BRIDGE, NJ 08829 (908)-638-3800 FAX (908)-638-3700
MATERIAL	APPROVAL / DATE	TITLE: SCHEMATIC DIAGRAM PS/MK SERIES
FINISH	DRAWN MES 102087	B DWG. NO. 200047-001 REV. A-2
DO NOT SCALE DRAWING	CHECKED JM 102087	SCALE NONE SHEET 1 OF 1
	RELEASED	

REV	BY	DESCRIPTION	DATE	APPROVED
A		ECN 1671	050488	DWS
A-1	TJM	REDRAWN	072100	JMC
B	TJM	ECN 7446: FIGURE 7 P1 WAS P2	031802	

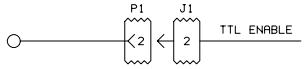
REMOTE INTERLOCK — FIGURE 1



CLOSED = SUPPLY ENABLE
OPEN = SUPPLY DISABLE

✳ USE COMMON CONNECTION ON P1-5, -8, -18, -19 OR -20

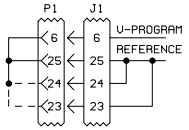
REMOTE TTL ENABLE — FIGURE 2



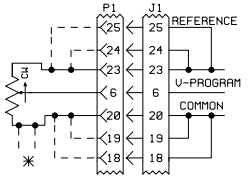
TTL COMPATIBLE
I - HIGH VOLTAGE ENABLE (MIN 2.5VDC, MAX 10VDC)
O - HIGH VOLTAGE DISABLE (MIN 0V, MAX 1.5VDC)
INPUT CHARACTERISTICS >200K OHMS (0-5V); 0.5mA @ 10VDC

VOLTAGE PROGRAM — FIGURE 3

VOLTAGE PROGRAM TO MAXIMUM BY CONNECTING TO REFERENCE TERMINAL.

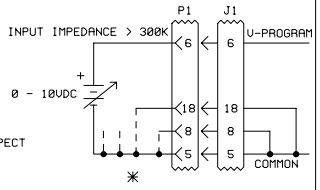


REMOTE VOLTAGE PROGRAMMED BY ATTACHING A 5K TO 50K POTENTIOMETER BETWEEN REFERENCE AND COMMON, WITH THE WIPER ARM TO VOLTAGE PROGRAMMING.



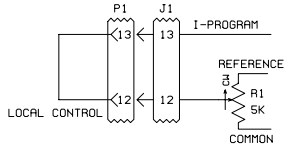
✳ USE COMMON CONNECTION ON P1-5, -8, -18, -19 OR -20

THE SUPPLY MAY BE PROGRAMMED WITH A REMOTE 0-10VDC VOLTAGE WHICH IS POSITIVE WITH RESPECT TO SYSTEM COMMON.

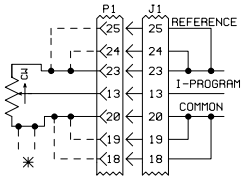


CURRENT PROGRAM — FIGURE 4

LOCAL ADJUSTABLE CURRENT PROGRAMMING.

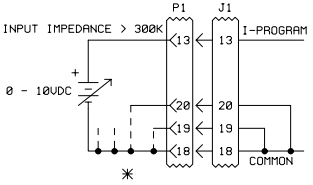


REMOTE CURRENT PROGRAMMED BY ATTACHING A 5K TO 50K POTENTIOMETER BETWEEN REFERENCE AND COMMON, WITH THE WIPER ARM TO CURRENT PROGRAMMING.

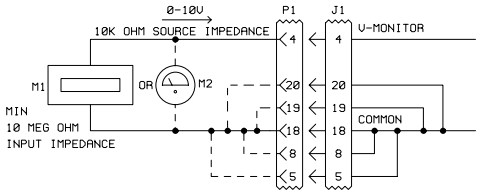


✳ USE COMMON CONNECTION ON P1-5, -8, -18, -19 OR -20

THE SUPPLY MAY BE PROGRAMMED WITH A REMOTE 0-10VDC VOLTAGE WHICH IS POSITIVE WITH RESPECT TO SYSTEM COMMON.



VOLTAGE MONITOR — FIGURE 5



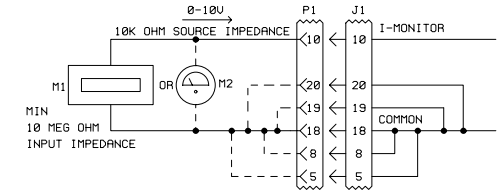
USE COMMON CONNECTION ON P1-5, -8, -18, -19 OR -20

V-MONITOR OPTIONS:

M1 - RECOMMENDED TYPE METER:
0 - 10VDC VOLTMETER >/= 10 MEG OHM IMPEDANCE
0 - 10V IS DIRECTLY PROPORTIONAL TO 0 - MAX KV MODULE RATING

M2 - ALTERNATE TYPE METER:
0 - 1mA CURRENT METER
0 - 1mA IS DIRECTLY PROPORTIONAL TO 0 - MAX KV MODULE RATING

CURRENT MONITOR — FIGURE 6



USE COMMON CONNECTION ON P1-5, -8, -18, -19 OR -20

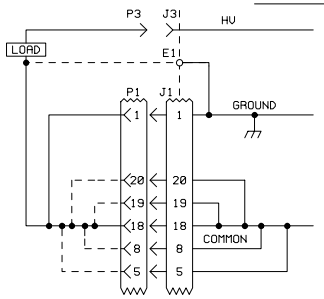
I-MONITOR OPTIONS:

M1 - RECOMMENDED TYPE METER:
0 - 10VDC VOLTMETER >/= 10 MEG OHM IMPEDANCE
0 - 10V IS DIRECTLY PROPORTIONAL TO 0 - MAX OUTPUT CURRENT MODULE RATING

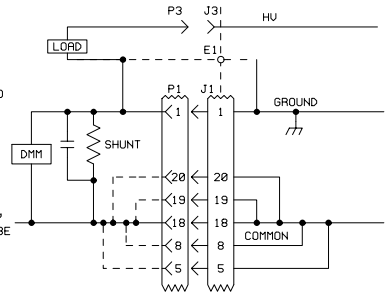
M2 - ALTERNATE TYPE METER:
0 - 1mA CURRENT METER
0 - 1mA IS DIRECTLY PROPORTIONAL TO 0 - MAX OUTPUT CURRENT MODULE RATING

COMMON AND GROUND — FIGURE 7

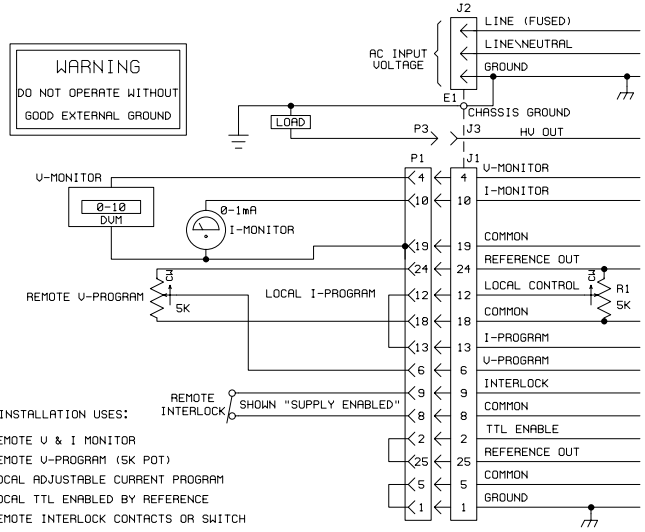
SYSTEM COMMON AND GROUND ARE NORMALLY TERMINATED TOGETHER. IN THIS CONFIGURATION, SIGNAL RETURNS AND LOAD RETURN CAN BE CONNECTED EITHER TO GROUND OR COMMON.



TO "FLOAT" COMMON FOR ISOLATION OR MEASUREMENT PURPOSES, REMOVE COMMON TO GROUND CONNECTION ON P1. FOR THIS CONFIGURATION, INSTRUMENT RETURNS MUST BE TIED TO COMMON AND LOAD RETURN MUST BE CONNECTED TO GROUND. INSTRUMENT RETURNS MUST BE FLOATING WITH RESPECT TO GROUND. SINCE COMMON IS INTERNALLY CLAMPED TO GROUND WITH A BI-DIRECTIONAL ZENER DIODE, THE DROP ACROSS THE SHUNT SHOULD BE < 15V TO MAINTAIN ACCURACY.



A TYPICAL MK INSTALLATION ✳ — FIGURE 8

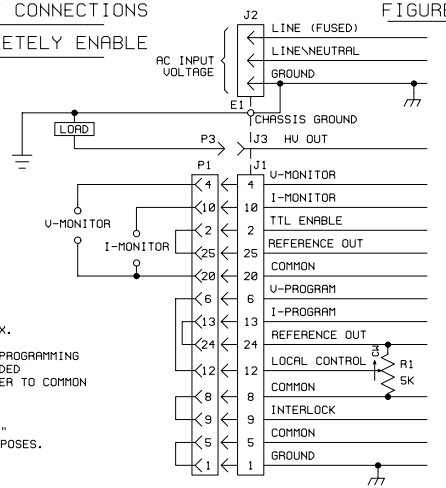


✳ THIS INSTALLATION USES:

- ✳ REMOTE V & I MONITOR
- ✳ REMOTE V-PROGRAM (5K POT)
- ✳ LOCAL ADJUSTABLE CURRENT PROGRAM
- ✳ LOCAL TTL ENABLED BY REFERENCE
- ✳ REMOTE INTERLOCK CONTACTS OR SWITCH
- ✳ HIGH VOLTAGE RETURN GROUNDED
- ✳ GROUND CONNECTED TO COMMON

MINIMUM NUMBER OF CONNECTIONS IN ORDER TO COMPLETELY ENABLE THE MK SUPPLY ✳ — FIGURE 9

WARNING
DO NOT OPERATE WITHOUT
GOOD EXTERNAL GROUND



✳ MINIMUM CONNECTIONS:

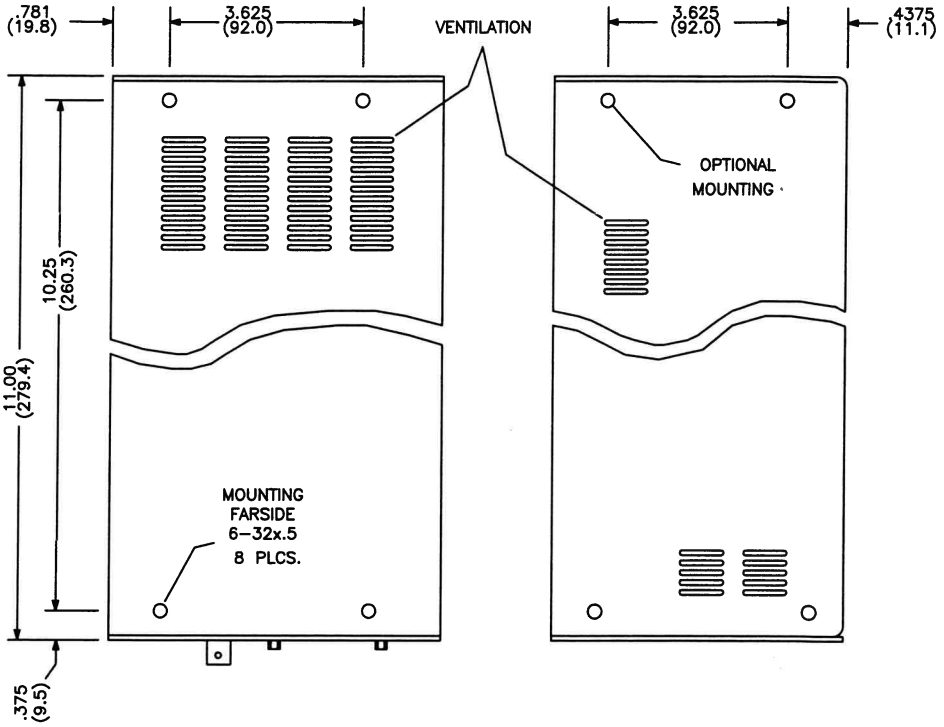
- ✳ FIXED CURRENT LIMIT AT MAX.
- ✳ TTL ENABLED BY REFERENCE
- ✳ LOCAL ADJUSTABLE VOLTAGE PROGRAMMING
- ✳ HIGH VOLTAGE RETURN GROUNDED
- ✳ INTERLOCK ENABLED BY JUMPER TO COMMON

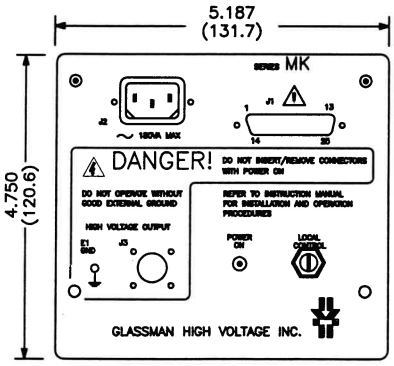
NOTE:
TERMINATE COMMON TO GROUND UNLESS COMMON NEEDS TO "FLOAT" FOR ISOLATION OR METERING PURPOSES.

REDUCED ONLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DEC. XXX± XX± DEG. ±	FILE NO. EXTENSION \4000\41002B.SCH	GLASSMAN HIGH VOLTAGE, INC. P.O. BOX 317, HIGH BRIDGE, NJ 08829 (908) 638-3800 FAX (908) 638-3700
	APPROVALS / DATE	TITLE: INTERFACE DIAGRAM MK SERIES
MATERIAL	DRAWN MES 102287	
FINISH	CHECKED JM 102287	D — DWG. NO. 400041-002 — REV. B
DO NOT SCALE DRAWING	RELEASED	SCALE NONE — SHEET 1 OF 1

REV	BY	DESCRIPTION	DATE	APPROVED
A	MDS	ECN 4738: CE MARKINGS ADDED	112096	DWS
B	MDS	ECN 4809: 180VA WAS 150VA	013197	JMO
B–1	AH	REDRAWN IN .DWG FORMAT	030201	EJM
C	JAG	ECN 10333: UPDATED J2 INFO	080714	





NOTE !

ALLOW MINIMUM .35 (9mm) CLEARANCE FOR PROPER COOLING.

J1 25 PIN (D–SUB) CONNECTOR; MATING CONNECTOR SUPPLIED.

J2 INPUT RECEPTACLE C14 PER: IEC 60320; MATED LINE CORD SUPPLIED.

J3 G.H.V. RG59U CONNECTOR; 10 FT. MATED CABLE SUPPLIED.

J1 LEGEND

1.	GROUND	6.	VOLTAGE PROGRAM	12.	LOCAL CONTROL	19.	COMMON
2.	TTL	7.	X2	13.	CURRENT PROGRAM	20.	COMMON
3.	X1	8.	COMMON	14.	X4	21.	N.C.
4.	VOLTAGE MONITOR	9.	INTERLOCK	15.	X5	22.	X7
5.	COMMON	10.	CURRENT MONITOR	16.	X6	23.	REF.
		11.	X3	17.	N.C.	24.	REF.
				18.	COMMON	25.	REF.

REDUCED ONLY

IN
(MM)

NET WEIGHT:
11 POUNDS; 5kg

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE :
DEC. XXX ± .005 XX ± .01
DEG. ±

THIRD ANGLE PROJECTION

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\4011\94003C.DWG

APPROVALS		DATE
DRAWN	JHK	121490
CHECKED	JMC	012991
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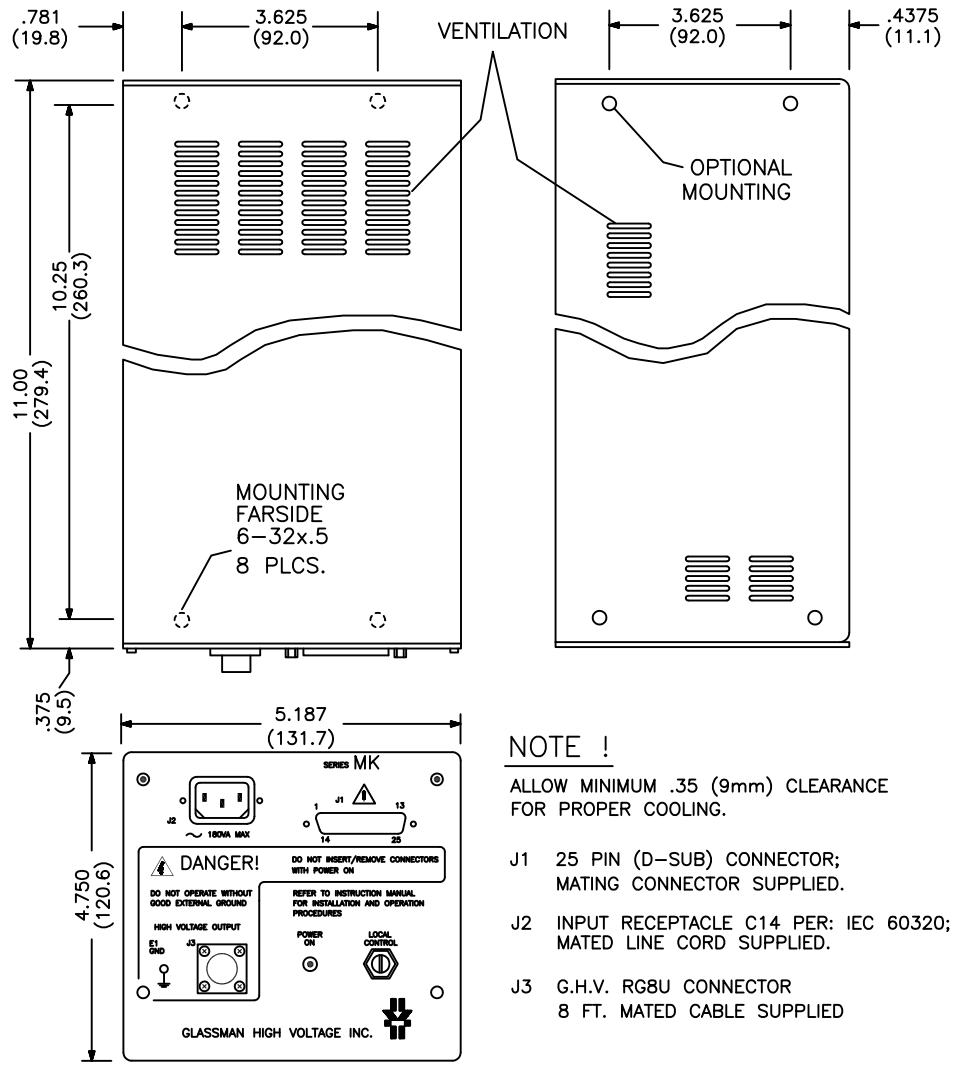
TITLE
OUTLINE AND INTERFACE
SERIES MK

A | DWG.NO. 401194–003 | REV. C

SCALE NONE | SHEET 1 OF 1

REV	BY	DESCRIPTION	DATE	APPROVED
NR–1		CAD CONVERSION	080195	JMC
A	MDS	ECN 4738: CE MARKINGS ADDED	112096	DWS
B	MDS	ECN 4809: 180VA WAS 150VA	013197	JMO
B–1	AH	ADDED WEIGHT	030201	EJM
C	TJM	ECN 7446: J1–5 WAS MISSING	031502	JJC3
D	JAG	ECN 10333: UPDATED J2 INFO	080714	



NOTE !

ALLOW MINIMUM .35 (9mm) CLEARANCE FOR PROPER COOLING.

J1 25 PIN (D–SUB) CONNECTOR; MATING CONNECTOR SUPPLIED.

J2 INPUT RECEPTACLE C14 PER: IEC 60320; MATED LINE CORD SUPPLIED.

J3 G.H.V. RG8U CONNECTOR 8 FT. MATED CABLE SUPPLIED

J1 LEGEND

1.	GROUND	6.	VOLTAGE PROGRAM	12.	LOCAL CONTROL
2.	TTL	7.	X2	13.	CURRENT PROGRAM
3.	X1	8.	COMMON	14.	X4
4.	VOLTAGE MONITOR	9.	INTERLOCK	15.	X5
5.	COMMON	10.	CURRENT MONITOR	16.	X6
		11.	X3	17.	N.C.
				18.	COMMON
				19.	COMMON
				20.	COMMON
				21.	N.C.
				22.	X7
				23.	REF.
				24.	REF.
				25.	REF.

IN
(MM)

NET WEIGHT:
11 POUNDS; 5kg

REDUCED ONLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE :
DEC. XXX ± .005 XX ± .01
DEG. ±

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

FILE NO. EXTENSION
\4011\94001D.DWG

APPROVALS	DATE
DRAWN JMC	101087
CHECKED JMC	101087
RELEASED	

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TITLE
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SERIES MK

A | DWG.NO. 401194–001 | REV. D

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