D1P MANUAL POTENTIOMETER
POWER CONTROLLER

TABLE OF CONTENTS

Introduction.....p. 2
Description..... p. 2
Installation .....p. 3
Electrical Connections .....p. 3
Specifications.....p. 5
Ordering Codes……..p. 6
Warranty ..... p. 6
Wiring Diagram .....p. 7
Dimensional drawing.....p. 8 - 11



D1P 20 AMP



D1P 30 AMP

MADE IN USA

NRNT FILE # E350716

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INTRODUCTION

This manual was designed to assist you in installing, operating and maintaining your new power control in a safe manner. By following the instructions in this manual, you will be rewarded many years of trouble-free service from your new D1P. It is essential that you read the captions followed by the safety warnings; they are located throughout the manual and are very easy to identify.

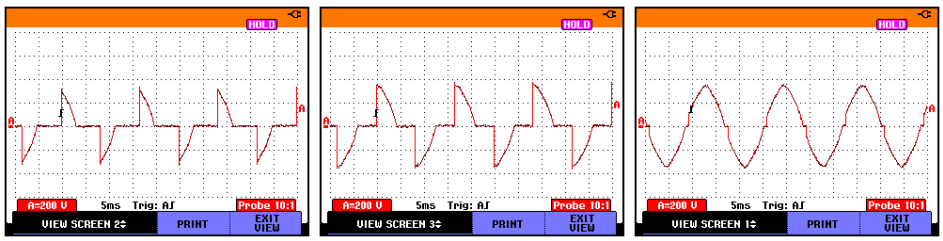
 Indicates important installation, operating, servicing instructions

 Indicates dangerous voltage present and risk of electric shock

DESCRIPTION

The D1P Series is a proportional, infinitely variable power controller capable of delivering 1-97% of the applied line voltage to the directly connected electric heaters. This is accomplished by phase angle firing an industrial sized TRIAC.

Graphs below shows **phase angle fired** voltage output on a 240V power line.



25% output or 60V RMS 50% output or 120V RMS 99.5% output or 238.8V RMS

- **Load Type: Constant Resistance Elements (nichrome, kanthal, calrod)**
- **Load Characteristics: Resistance Nominally Constant (<50% change versus temperature)**
- **Line Power Configuration: Single Phase**
- **Load Configuration: Line-to-Line or Line-to-Neutral**

NOTE: The D1P **will not control** transformers, fans or motors. It is strictly for direct heater control in industrial and commercial processes. Not to be used on high-inrush heaters, T-3 lamps, short wave emitters. Not to be used in any residential or medical facility.

OPERATION

The D1P comes with a 100,000 Ohm panel mount potentiometer on two (2) feet of wire leads, a dial with a 0-100% scale, and knob. By turning the potentiometer clockwise (CW), you increase the output voltage of the D1P to the connected electric heaters, similar to a light dimmer and light bulb. The D1P with PCB option has the potentiometer mounted to the PCB.
Note: A heater load must be connected to the D1P for controller to turn on. The D1P CAN NOT create more voltage or current than what is supplied to it.

INSTALLATION

WARNING: FIRE HAZARD!! Even the best electronic components CAN FAIL SHORTED, KEEPING FULL POWER ON! Provide a SEPARATE (redundant) OVER TEMPERATURE SHUTDOWN MEANS to switch power off if safe temperature is exceeded.

WARNING: HIGH VOLTAGE!! This control must be installed in a GROUNDED enclosure by a qualified electrician. In accordance with all local and national electric codes including NEC and any other applicable codes. Provide a safety interlock on door to remove power before gaining access to device.

**WARNING:** The D1P potentiometer leads are NOT ISOLATED; it is at line voltage potential.

To reduce the risk of electrocution, physically **TURN ALL POWER OFF** to wires that will be connected to the D1P before making any connections. Remember, solid state devices are never “off” unless you physically disconnect the incoming electrical power.

Turning the potentiometer all the way down is NOT off. It is 0% output with a line voltage to ground potential. Breaking contact with the potentiometer leads will not turn the D1P “OFF”. It will drop power to 0%, with a line to ground potential shock hazard.

Check the D1P serial tag and verify the correct voltage/ ampere ratings and input control signal for your application. Wiring must be performed in accordance with any and all applicable local and national codes. Use NEC wire code. Ground wire can be attached to D1P heat sink using mounting screw.

The D1P controller must be installed in an enclosure for protection against electrocution.

The D1P chassis heatsink must be mounted flat against the steel or aluminum backplate of your enclosure.

ELECTRICAL CONNECTIONS: See "WIRING DIAGRAM" on Page 6

AC POWER INPUT:

Power input (AC MAINS) is connected to J2 lug labeled "LINE". LINE 2 is connected to the other side of your heater load. Use proper feed and branch protection (fusing) as per NEC and local electrical codes.

We recommend installing your new controller on the positive side of your circuit for 120VAC applications. We would recommend either tinning the end of the wire or using a ferrule to get the best connection.

HEATER LOAD CONNECTION:

J2 Heater Load connections are equally simple; connect the load/ heater to lug labeled "HEATER". Again, the other side of the heater is attached directly to the LINE 2 of the AC power source.

INPUT CONTROL PANEL MOUNT POTENTIOMETER for D1P:

Connect the potentiometer leads to terminals marked **J1**. The wire color is marked on the PCB. If using extension wire, use wire insulated to match the incoming power line.

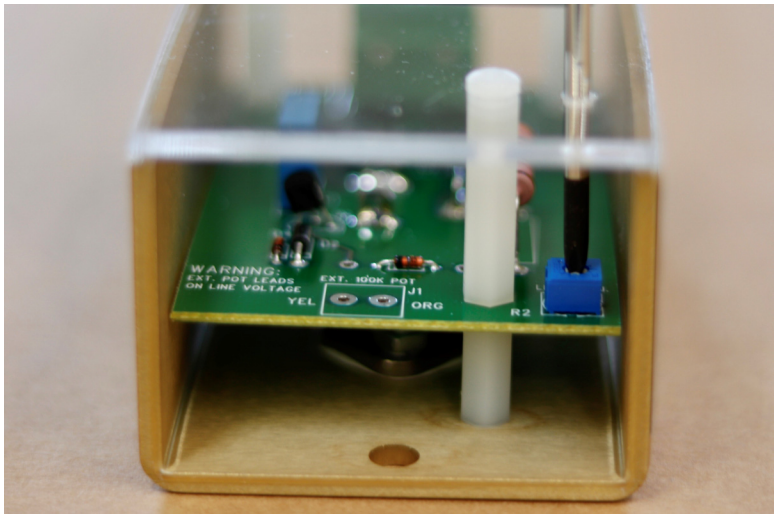
Terminal torque is 5 In-Lbs for the J1 potentiometer wire terminal block.

There is no "click-stop" on the D1P potentiometer. It is a 300° single turn with 4 IN-LBS stop strength.

Do not break the potentiometer leads with contactor or relay. With the low power/high-ohm signal, the contact surfaces in your mechanical switching device can cause a loss of continuity.

INPUT CONTROL POTENTIOMETER for PCB Option:

The power adjustment PCB potentiometer is marked R2 on the PCB.
Using a small screwdriver, turn the R2 potentiometer clockwise to increase power. See photo below.
R2 potentiometer rotation 270°, single turn
Maximum setpoint torque is 3 Oz-In for R2 power adjust potentiometer.
The D1P w/PCB Option is shipped out at 0% output.



Shown with optional plexi-cover

D1P & D1P w/PCB SPECIFICATIONS

INPUT SIGNAL: supplied 100K potentiometer w/2 feet of 600V wire

D1P POTENTIOMETER ROTATION: 240° Single Turn

D1P POTENTIOMETER STOP STRENGTH: 4 IN-LBS (THERE IS NO "CLICK-STOP")

D1P POTENTIOMETER IP RATING: IP 40

D1P PCB POTENTIMETER STOP STRENGTH: 3 IN-OZ (THERE IS NO "CLICK-STOP")

D1P PCB POTENTIOMETER ROTATION: 270° Single Turn

J1 FIELD TERMINAL TORQUE RATING: 5 IN-LBS

J2 FIELD TERMINAL TORQUE RATING: 5 IN-LBS

SUPPLY VOLTAGE: 120-240 VAC, 50/60Hz

POWER CONSUMPTION (max)

D1P-XX-20…….24 watts @ 20 Amps
D1P-XX-30…….36 watts @ 30 Amps

CURRENT RATING

D1P-xx-20 (vertically, flat mounted to metal backplate) 20 Amps
D1P-xx-30 (vertically, flat mounted to metal backplate) 30 Amps

OPERATING TEMPERATURE (ambient):…… 0-40°C/122°F

FUSE REQUIREMENTS (TRIAC Protection): semi-conductor/ rectifier I^2T @ name plate rated amps.
Avatar Fuse Kit # FK20 (20 Amps) & # FK30 (30 Amps) comes with I^2T fuse and fuse block/holder.

FUSE REQUIREMENTS (BRANCH Protection): T Class fusing.
Fuse to heater size. Series JJS, A6T or JLLS.

RESPONSE TIME: ……10 mS

CONTROL METHOD: ……Phase Angle Fired, proportional

OUTPUT VOLTAGE:……..1-97% of supply voltage

WEIGHT: .....1 lbs.

Wire Gauge and Torque Specifications for 90°C Temp Wire.
Use copper wire only.

Wire Gauge and Torque Specifications for 90°C Temp Wire			
Power Control Maximum Current Rating/Circuit	Copper Wire Only MINIMUM AWG	Wire Lug Torque Spec. (lbs./in.)	Lug Wire Size AWG
20A	12AWG	5	10-24
30A	10AWG	5	10-24

ORDERING CODES

D1P - _____-_____-_____
Voltage Amperes Option

MODEL DESIGNATION TRIAC CONTROLLER (**D1P**)

VOLTAGE DESIGNATIONS

(24) 120-240 VAC 50/60Hz
(27) 277 VAC 50/60Hz

LOAD IN AMPS:

20, 30

OPTIONS:

Printed circuit board mounted setpoint potentiometer: Add "**-PCB**" to part number.

Plexiglas cover: Add – "**PLXC**" to part number

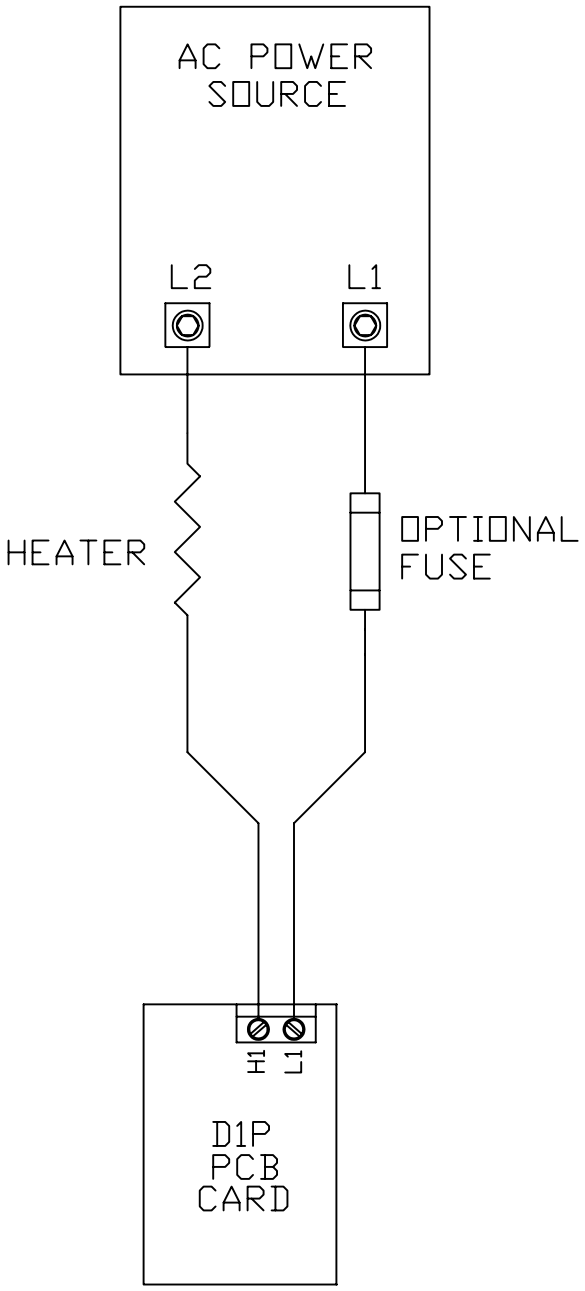
Lower voltage D1P units are available. Contact Avatar with your requirements.

WARRANTY

All Avatar Instruments products carry a full ***five year***, warranty from date of purchase, parts and labor warranty against component failure and defects in workmanship. In the event your controller fails to perform properly, **contact Avatar to obtain a return authorization number**. Controllers sent to Avatar for warranty service that have no apparent defect will be treated as a standard repair and a $50.00 charge will be applied. Avatar will repair or replace any unit that failed due to defective parts or assembly. This warranty DOES NOT cover damage due to shipping, abuse, misapplication or operation beyond specified rating. Furthermore, fuses and improperly fused TRIAC's are NOT COVERED by this warranty. Avatar is not responsible for any subsequent or other damage experienced in use of this device.

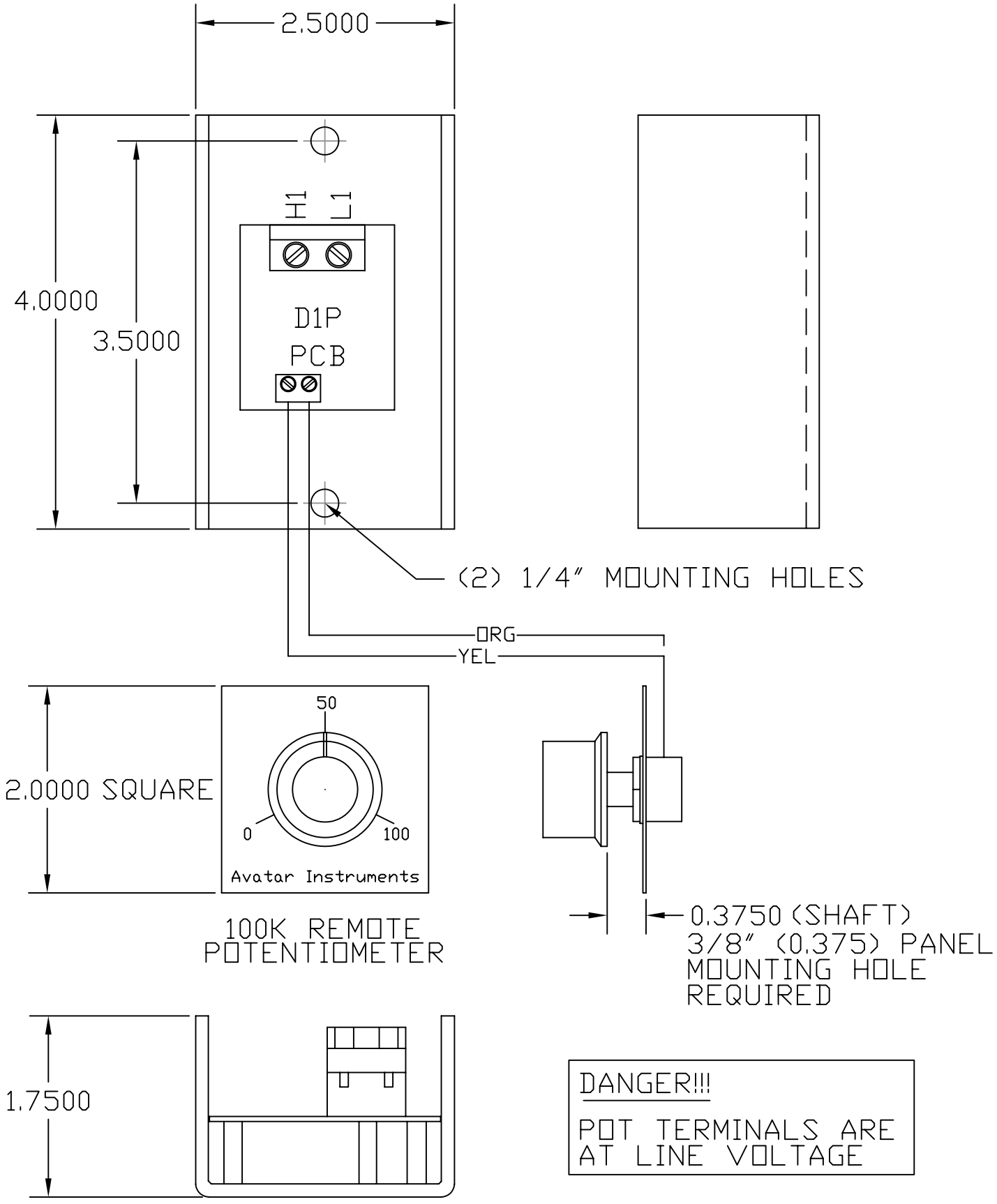
Outside of the warranty period, you will always have the option to have your controller repaired, but you will need to pay for shipping to us, and the amount for return shipping will be included in your repair price. You can contact Avatar Instruments customer service or follow the link on our website at www.avatarinstruments.com to request repairs to your controller.

WIRING DIAGRAM
D1P - 20 & 30 AMP



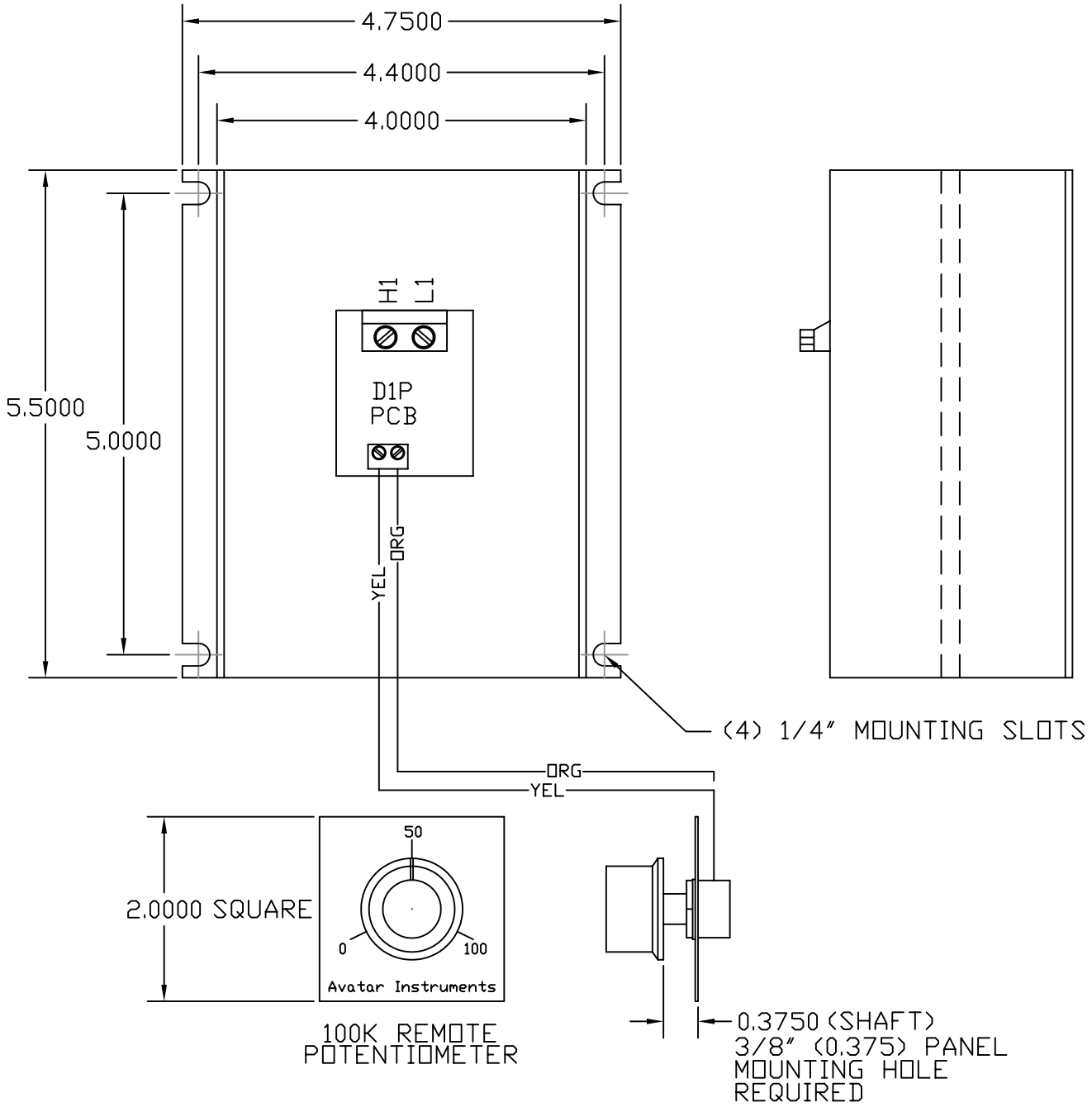
PHYSICAL DIMENSIONS

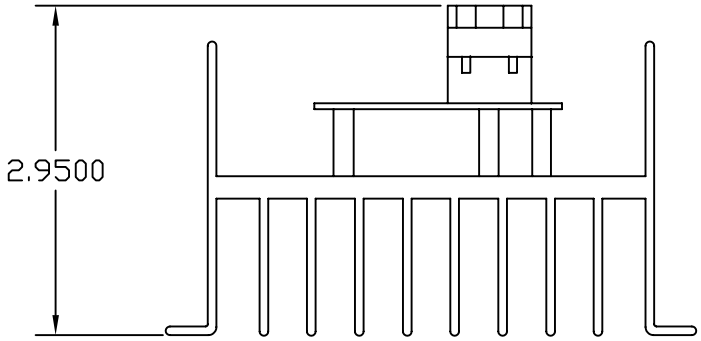
D1P - 20 AMP
with remote setpoint potentiometer



PHYSICAL DIMENSIONS

D1P - 30 AMP
with remote setpoint potentiometer



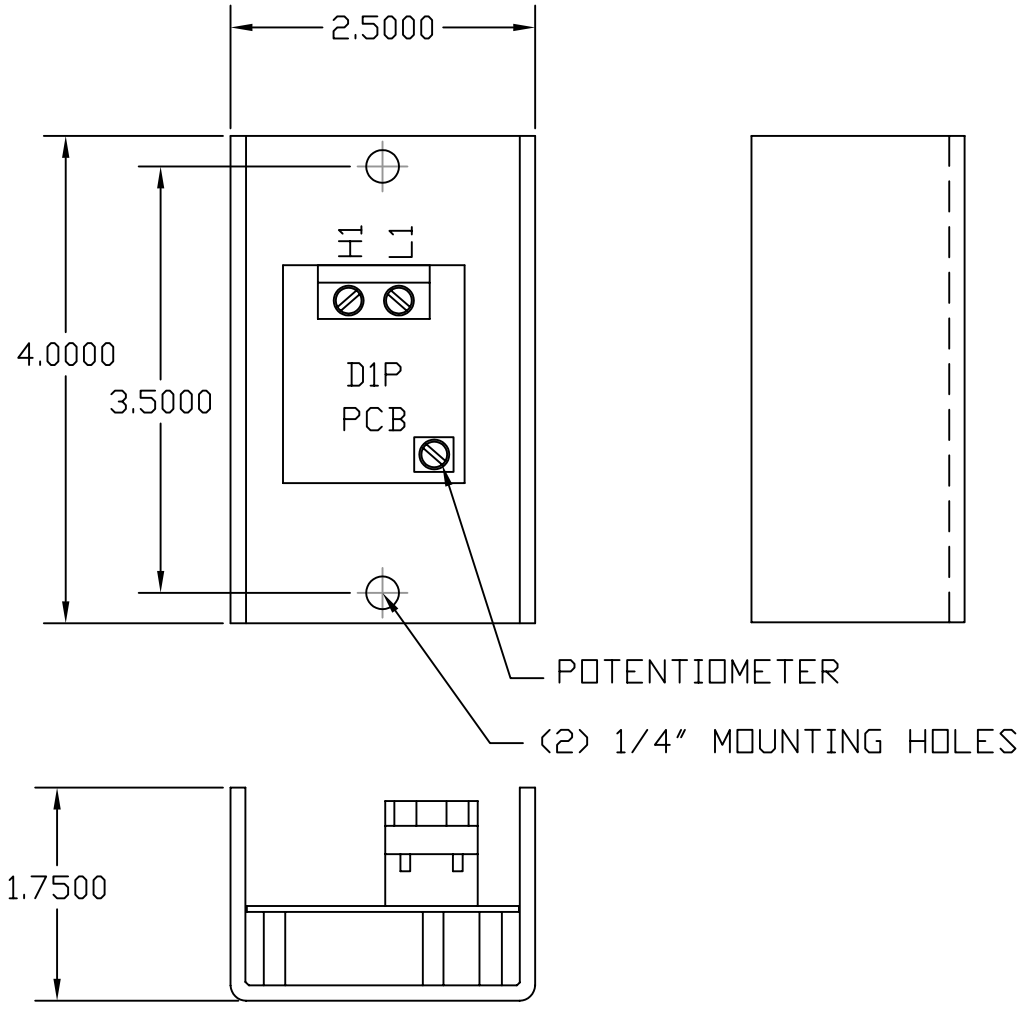


DANGER!!!

POT TERMINALS ARE AT LINE VOLTAGE

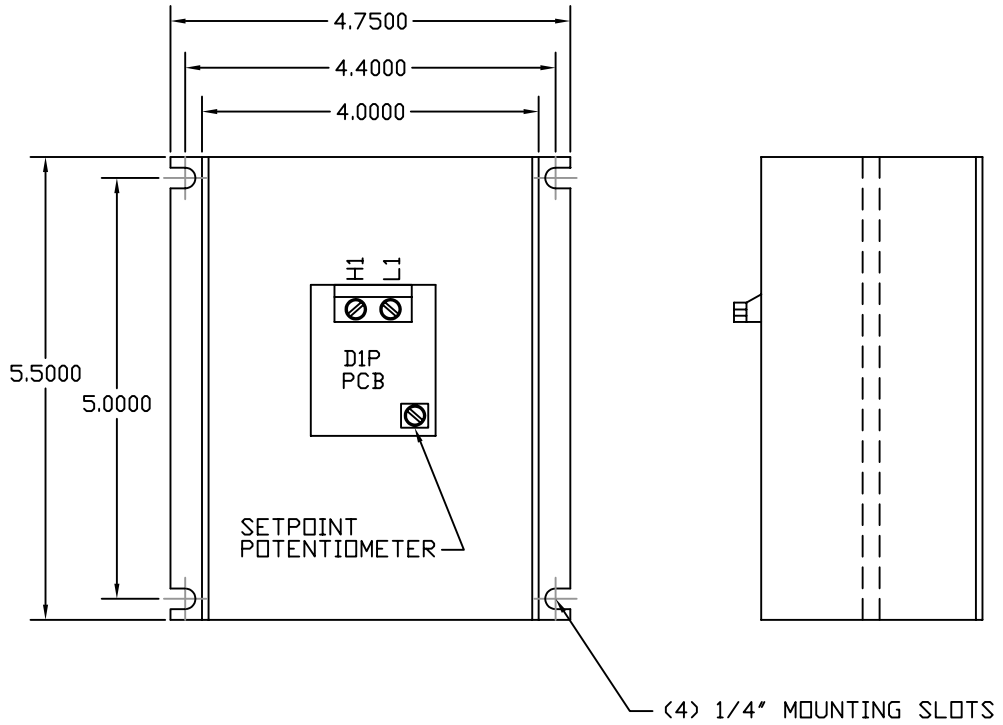
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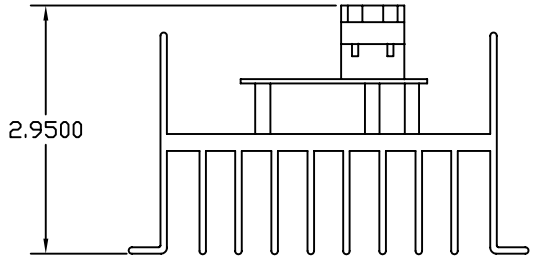
D1P - 20 AMP
with integral setpoint potentiometer



PHYSICAL DIMENSIONS

D1P - 30 AMP
with integral setpoint potentiometer







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