D2P MANUAL POTENTIOMETER
SCR POWER CONTROLLER

TABLE OF CONTENTS

Introduction.....p. 2
Description..... p. 2
Installation .....p. 3
Electrical Connections .....p. 3
Specifications.....p. 4
Ordering Codes……p. 4
Warranty ..... p. 5
Wiring Diagram .....p. 6
Dimensional drawing.....p. 6



MADE IN USA

NRNT FILE # E350716

Avatar Instruments, Inc. 16587 Coastal Highway Lewes, DE 19958
Phone: (302) 703-6865 contact@avatarinstruments.com www.scrpower.com

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 D2P. It is essential that you read the captions followed by the safety warnings; they are located through out the manual and are very easy to identify.

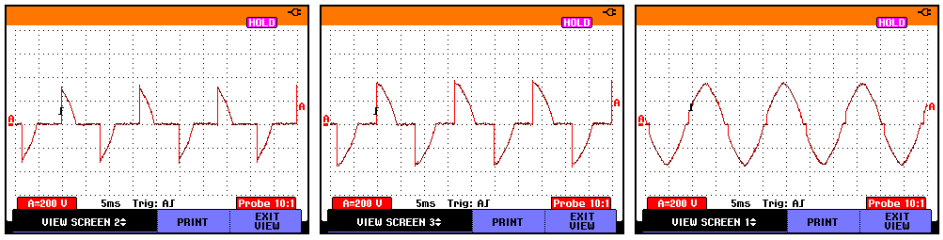
 Indicates important installation, operating, servicing instructions

 Indicates dangerous voltage present and risk of electric shock

DESCRIPTION

The D2P 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 a pair of inversely connected SCR's. The D2P will not control transformers or motors. It is strictly for direct heater control.

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

OPERATION

The D2P 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 CW you increase the output voltage of the D2P to the connected electric heaters, similar to a light dimmer and light bulb. Note: A heater load must be conneceted to the D2P for it to turn on.

**WARNING:** The potentiometer is NOT ISOLATED; it is at line voltage potential. The D2P CAN NOT create more voltage or current than what is supplied to it.

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

INSTALLATION

WARNING: FIRE HAZARD!! Even the best electronic components CAN FAIL SHORTED, KEEPING FULL POWER ON! Provide a completely 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 any and 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.

To reduce the risk of electrocution, **TURN ALL POWER OFF** to wires that will be connected to the D2P before making any connections. The D2P controller must be installed in an enclosure for protection against electrocution. Remember, solid state devices are never "off" unless you physically disconnect the incoming electrical power. **Turning the potentiometer all the way down is <u>NOT</u> off. It is 0% output with a line voltage to ground potential. Breaking contact with the potentiometer leads will not turn the D2P "OFF". It will drop power to 0%, with a line to ground potential shock hazard.**

ELECTRICAL CONNECTIONS: See "WIRING DIAGRAM" on Page 6

Check the Avatar 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 a minimum wire size of 8AWG for a 40 amp D2P and a minimum of 6AWG for a 60 amp D2P. Ground wire can be attached to D2P heat sink using mouting slot screw.

<u>AC POWER INPUT:</u>
Power input (AC MAINS) is connected to lug labeled "LINE 1". LINE 2 is connected to the other side of your heater load. Use proper feed and branch protection as per NEC and local electrical codes.

<u>HEATER LOAD CONNECTION:</u>
Heater Load connections are equally simple; connect the load/ heater to lug labeled "HEATER 1". Again, the other side of the heater is attached directly to the LINE 2 of the AC power source.

<u>INPUT CONTROL POTENTIOMETER for D2P:</u>
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 potentiometer wire terminal block.

Do not break 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 continuinty.

<u>SOFT START OPTION:</u> For use with Tungsten (T-3) lamps. This option provides a two second ramp up function (soft start) to permit control of high inrush lamps. *<u>NOTE:</u>* Never connect cold lamps after start the up of the D2P.

D2P SPECIFICATIONS

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

POTENTIOMETER ROTATION: 300°

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

POTENTIOMETER IP RATING: IP 40

J1 FIELD TERMINAL TORQUE RATING: 5 IN-LBS

SUPPLY VOLTAGE: 120,208-240, 277, 380, and 480 VAC, 50/60Hz

POWER CONSUMPTION (max)
D2P-XX-40:……..48 watts
D2P-XX-60:……. 72 watts

CURRENT RATING (vertically mounted)
D2P-XX-40:…… 40 amps
D2P-XX-60:…… 60 amps

OPERATING TEMPERATURE (ambient):…… 0-50°C/122°F

FUSE REQUIREMENTS (SCR Protection): semi-conductor/ rectifier I^2T @ nameplate rating

FUSE REQUIREMENTS (BRANCH Protecion):…..T Class fusing

RESPONSE TIME: ……10 mS (without soft start)

CONTROL METHOD: ……Phase Angle Fired, proportional

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

WEIGHT: .....2 lbs.

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

Wire Gauge and Torque Specifications for 90ºC Temp Wire			
Power Control Maximum Current Rating/Circuit	Copper Wire Only MINIMUM AWG	Wire Lug Torque Spec. (lbs./in.)	Lug Size
30A	10AWG	35	2 - 14
40A	8AWG	40	2 - 14
60A	6AWG	45	2 - 14

ORDERING CODES

D2P - _____-_____-_____
Voltage Amperes Option

MODEL DESIGNATION SCR CONTROLLER (**D2P**)

VOLTAGE DESIGNATIONS
(12) 120 VAC 50/60Hz
(24) 208-240 VAC 50/60Hz
(27) 277 VAC 50/60Hz
(38) 380 VAC 50/60Hz*
(48) 480 VAC 50/60Hz*

LOAD IN AMPS:
40, 60

OPTIONAL SOFT START: Fixed time of 2 seconds

Example: D2P-24-60-S is a 240VAC, 60 Ampere SCR with soft start.

*For isolated potentiometer, or higher amperages, use Avatar Instruments A Series SCR with MAP card.

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, user error or operation beyond specified rating. Furthermore, fuses and improperly fused SCR's are NOT COVERED by this warranty. Avatar is not responsible for any subsequent or other damage experienced in use of this device.