

Calibration of Avatar A3P 3 Phase, Phase Angle Power Controller

WARNING: HIGH VOLTAGE CAN KILL !!! DO NOT ATTEMPT CALIBRATION UNLESS YOU ARE EXPERIENCED WITH 480 VAC POWER!!

Re-calibration should only be required if a 4N25 Optocoupler or trim pot has been replaced or the calibration trim pots have been "played with". Avatar has seen units that have survived fork lift truck accidents, years of Texas heat and lightning strikes come back in perfect calibration.

GENERAL CALIBRATION: This procedure must be performed in the sequence outlined below, failure to do so may result in heater damage.

Basic Requirements:

Three phase power, 4-20mA adjustable current source with current meter connected in series with mA output, isolated DC voltmeter (handheld, battery powered), small slotted screwdriver used to adjust trim pots, three phase/ three wire heater load or equal wattage light bulbs wired in a delta or wye configuration.

NOTE: a load must be connected to the heater terminals for the unit to operate properly. SCR's will not turn on without current load.

Zero Calibration:

1. Set all "ZERO" trim pots to there full CCW position.
2. Connect DC voltmeter between "HTR 1" and "LINE 1" (+ lead to "HTR 1", - lead to "LINE 1").
3. Connect milliamp source to blue terminal block.
4. Adjust milliamp source to 4.5 mA (maintain this level until step 9).
5. Connect heater to "HTR" terminals and apply power to "LINE" terminals.
6. While monitoring the DC voltmeter, adjust "phase 1" "ZERO" trim pot CW to the point where the DC voltage just starts to decrease.
7. Repeat steps 2 and 6 for "phase 2" and "phase 3" "ZERO" trim pots.

Span Calibration:

Span calibration should ideally be calibrated as close to full output as possible. However, not all heaters and processes are capable of withstanding full line voltage without overheating or melting. Therefore, it is very important to refer to the table below when performing step 9.

8. Set all "SPAN" trim pots to there full CCW position.
9. Adjust milliamp source for correct milliamp output (see table below).
10. If unit has voltage limit option (indicated by "VL" or "VL25" in the model number), turn voltage limit trim pot full CW.
11. Connect DC voltmeter between "HTR 1" and "LINE 1" (+ lead to "HTR 1", - lead to "LINE 1").
12. Using the SCR voltage drop table below, adjust "phase 1" "SPAN" trim pot to display proper voltage on DC voltmeter.
13. Repeat steps 11 and 12 for "phase 2" and "phase 3" "SPAN" trim pots.
14. If unit is equipped with voltage limit option, this pot must be reset to prevent heater damage.

% OF LINE VOLTAGE PERMISSIBLE FOR HEATERS	SET MILLIAMP SOURCE FOR:	FOR 240VAC LINE, ADJUST SPAN FOR:	FOR 380VAC LINE, ADJUST SPAN FOR:	FOR 480VAC LINE, ADJUST SPAN FOR:
100%	20 mA	10VDC	22VDC	28VDC
75%	16 mA	34VDC	60VDC	76VDC
50%	12 mA	77VDC	132VDC	165VDC
SHADED AREA = SCR VOLTAGE DROP				

Special Cases:

The built in voltage compensation in the Avatar A3P controls will reduce but not eliminate line voltage unbalances. The A3P will not compensate for resistance and therefore wattage tolerances in heaters. If one heater bank is running noticeably cooler, first check for dropped line or blown fuse. (Heaters can get 1/2 voltage from remaining 2 lines). If everything else is O.K. as a last resort span trimming can be advanced to compensate, but should not be done if something else has failed.

Quick trimming of visible radiant heaters can be done if no meters are available and all heater banks can be seen. Turn manual or temperature control down to a slight glow. If some banks are darker try each Zero Trim to see which is controlling that heater. Adjust that Zero Trim CW, and if need be turn other Zero Trims CCW. Now set the input control to near MAX and look at heaters from a distance. If any are lower or higher experimenting with the Span trim adjustments to even the light output.

DISABLING SOFT START OPTION

If you have an A3P with the optional soft start, and need to disable this option, please make sure you do not have any heaters with an inrush. Tungsten, molybdenum and graphite will need a soft start option to reduce the inrush currents generated by these types of heaters.

To disable the soft start, remove the 1000uF/6.3V capacitor next to the blue 2 point terminal for the 4-20 mA Input. See figure 2. This capacitor can be pulled off with a pair of pliers.

Warning: Do not remove the 100uF/35V capacitor on the board. Both capacitors are clearly marked. The 1000uF is a bit larger.

If you are unsure about Check with Avatar before you attempt this modification.

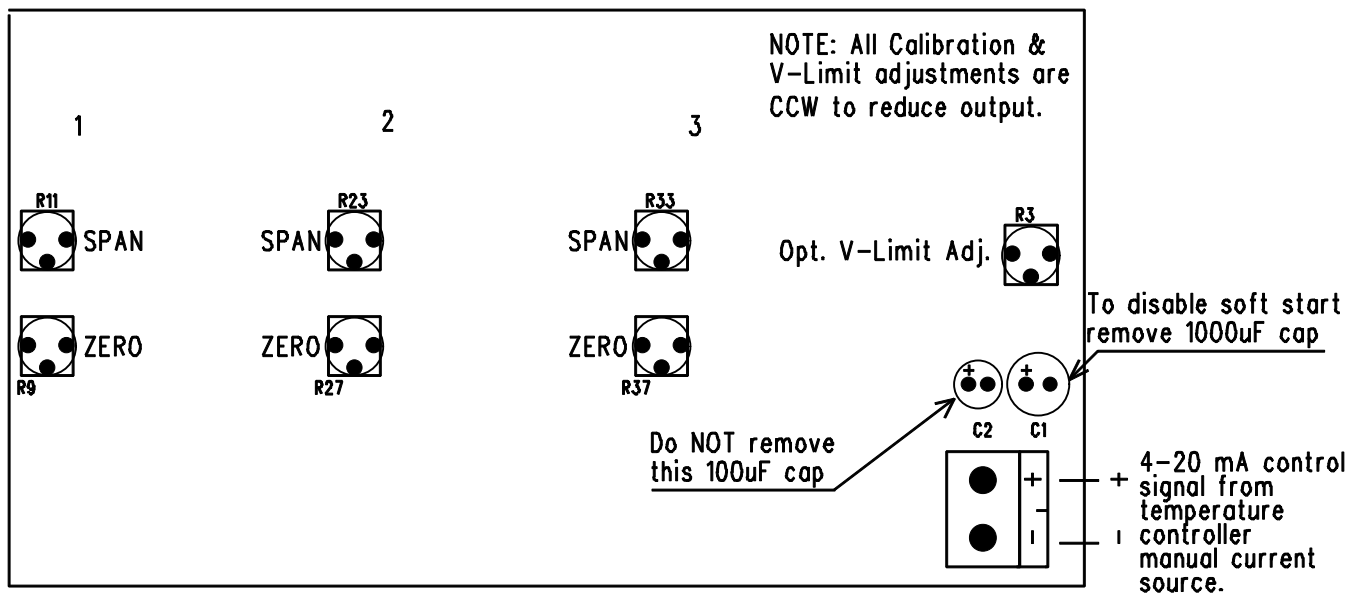


figure 2