MagneTek Drives & Systems

For use with Lancer I
Variable Frequency Drives.

VOLTAGE PROFILE OPTION PCB

46S02518-0010 SCHEMATIC 45S02518-0010

DESCRIPTION

Variable torque loads, such as centrifugal pumps and blowers, require significantly reduced torque as speed is reduced.

Typically, NEMA B motors can deliver this reduced torque with less magnetic excitation , and hence, lower total current and magnetic losses.

By reducing the volts/hertz ratio applied to the motor as speed is reduced, excitation and associated losses are normally reduced. This results in improved motor and converter efficiency at lower speeds. The improvement obtained is usually greatest with motors having high Full Load Amps/HP (greater than 1.25).

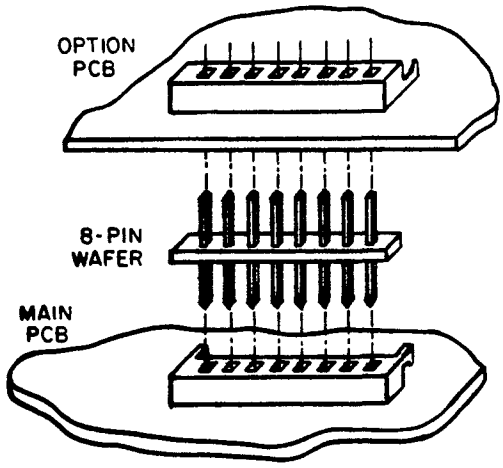
The Voltage Profile option allows adjustment of the volts/Hz control circuit gain such as to reduce the Volts/Hz ratio at lower speeds. To obtain optimum results, the adjustments must be made using the specific motor and loads which will be connected in the installation.

INSTALLATION

The Voltage Profile option PCB mounts to three standoffs located on the bottom of the Inverter Main PCB. Connection is made to the Inverter Main PCB thru 104 CONN. No connections are made to the Rectifier Main PCB. To install the Voltage Profile PCB, first install the standoffs onto the Inverter Main PCB.

Next, insert 8-pin wafer into 104CONN on the Inverter Main PCB (see illustration). Locate the Voltage Profile PCB so that pins on the wafer are lined up with holes on the back of the PCB behind 104CONN. Then push the PCB onto the wafer pins and standoffs.

When the Voltage Profile option is installed, switch 4SS on the Inverter Main PCB must be open (CCW rotation).



If the drive is shipped with the board installed, the switch will be open. The Constant HP option is also designed to be inserted in the same location as the Voltage Profile option. Only one of these two options may be used at a time.

If the Voltage Profile PCB is being added after the drive has been installed, refer to Section 1.2 in the Instruction Manual for instructions on how to update the 53SL number. A simplified diagram in the form of a

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pastie has been included with the Voltage Profile PCB. Modify the Signal Flow Diagrams in the Instruction Manual by pasting the pastie in position on Sheet 5.

ADJUSTMENTS

1. If the drive and motor have been pre-tested as a system at Louis Allis, the required adjustments will have been performed, and no further set-up is required. This system test is performed only if requested on the order. Perform the following steps to adjust the Voltage Profile PCB.

2. Prior to adjustment of the Voltage Profile PCB, perform the basic drive checkout and adjustments in the Instruction Manual.

3. Set the adjustment pots on the Voltage Profile PCB to the following positions:

HIGH SPEED GAIN (1RH) 50%
LOW SPEED GAIN (2RH) ..... Fully CW
FREQUENCY (3RH) ..... Fully CCW

With these settings, the board will have no effect on normal drive operation. The board will normally be shipped with these settings.

4. Instrumentation:

CAUTION

DRIVE SHOULD BE OFF AND INPUT POWER DISCONNECTED PRIOR TO CONNECTING INSTRUMENTS.

a. Set up clamp-on ammeter of suitable range to measure motor current.

b. Set up a voltmeter to measure Output Voltage at the output terminals.

5. Start drive and set for top speed at normal load for that speed. Record Output Voltage. If the voltage varies slightly (normal when near 60HZ output), take the average of the meter excursions.

6. Reduce speed to that at which the system efficiency is to be optimized (60 to 80 percent), but not less than 55 percent. The system should be at the normal load for the speed. Note and record Output Voltage after allowing 30 seconds to stabilize.

7. Slowly reduce the LOW SPEED GAIN (2RH) setting until a minimum motor current reading is obtained, but do not reduce below 50 percent setting. Current should initially reduce as 2RH is turned CCW and should then rise slightly after the minimum. If current does not reduce, then the system cannot benefit from reduced voltage, and the pot settings should be left per initial settings (Step 3).

8. Note the Output Voltage at the minimum current point and record. Calculate:

dv = OV1-OV2
OV1 - Output Voltage from Step 6
OV2 - Output Voltage from Step 8

9. Slowly increase the 2RH setting to increase Output Voltage by 1/4 to 1/3 of dv.

10. Slowly increase the FREQUENCY (3RH) setting until Output Voltage just begins to increase.

11. Now, slowly increase speed to full speed watching Output Voltage. Output Voltage should reach the same voltage recorded in Step 5 at the same speed. If the voltage goes above that previously recorded prior to reaching full speed, turn HIGH SPEED GAIN (1RH) CCW until a proper match is obtained. If the Output Voltage at full speed is below that previously recorded, turn 1RH CW.

12. If the proper voltage match can not be obtained using the full range of 1RH, 3RH must be re-adjusted. Turn 3RH

CW to increase Output Voltage or CCW to decrease Output Voltage.

13. Adjustment is complete. Record pot settings for future use.

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