

# **Power Electronics International, Inc.**

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## **SERVICE & ADJUSTMENT REDUCED TORQUE CONTROL NOT FOR HOISTING APPLICATIONS**

### **SINGLE SPEED ADJUSTMENT**

- A. Set the TIME adjustment at the maximum point and the INITIAL TORQUE adjustment at the minimum point (This setting provides the softest start, but the initial torque may be too small to start the motor for the first few cycles).
- B. Set the INITIAL TORQUE adjustment first; usually 1/4 to 1/2 of a turn from the minimum torque setting is adequate.
- C. Decrease the TIME adjustment if the starting is too soft under half load condition

### **TWO SPEED ADJUSTMENT**

Note: For E-Series substitute HI for Accel & LO for Decel

- A. Set the TIME adjustment at the maximum point and the ACCELERATION and DECELERATION INITIAL TORQUE adjustments at the minimum points. (This setting provides the softest start; but the initial torque may be too small to start the motor for the first few cycles).
- B. Set the Acceleration TORQUE adjustment first; usually 1/4 to 1/2 of a turn from the minimum torque setting is adequate.
- C. Then set the DECELERATION TORQUE adjustment by turning it to the minimum torque setting. If the transition from high to low speed is too soft, increase the setting until an appropriate transition is obtained. Usually setting the DECLERATION TORQUE adjustment to mini-

## **SERVICE**

mum is the best setting.  
All readings should be taken with a standard analog type VOM (volt-ohm meter).

### **SINGLE SPEED CONTROLS**

- Step 1) - Disconnect motor from T1, T2 and T3.
- Step 2) - Set INITIAL TORQUE adjustment to minimum and the TIME adjustment to maximum.
- Step 3) - Energize the contactor—for proper operation the following readings should be taken (example) is for a 460 VAC, three-phase system with 115 VAC control voltage standard).
- A. From TL1 to TL2, TL2 to TL3 and TL1 to TL3 460 VAC
- B. Control signal point A & B terminals—115 VAC. It is important that this reading be taken across the A & B screws on the logic box. If no voltage can be read across these two points then check for misplacement of an electrical interlock. The common side of the control signal is sensed through the coil which is NOT ENERGIZED, so do not interlock the common wire out of the

circuit. Simply checking for 115VAC from one screw terminal and the common ground wire is NOT sufficient. Without a proper signal to the A & B terminals (and the HI, LO and COMMON in a two-speed system), the output of the control at T1, T2 and T3 will remain - 0 - VAC. "A, B must only be hooked up to the coils NOT THE CONTROL TRANSFORMER!"

- C. After six seconds take readings at T1, T2 and T3 (with the motor disconnected).
  - 1.) From T1 to T2, T2 to T3, and T1 to T3, the voltage is approximately 80-95% of the line voltage. For the 460 VAC control reading would be approximately 405 VAC.
  - 2.) A -0- VAC output will occur if the proper control signal is not received (see SINGLE SPEED CONTROLS item B and TWO SPEED CONTROLS items A, B and C).
- D. With the TORQUE adjustment at minimum and the TIME adjustment at maximum, read the meter across T1, T2 and T3 (as in C1 above), from the instant the contactor is closed. The meter should move slowly during the first five seconds, then quickly for the last second. The total time to reach 88% of the line voltage should be approximately six to nine seconds. Each phase to phase test should be similar in voltage profile, no matter where the TORQUE and TIME adjustments are set. Due to the dampening factor in all volt-ohm meters, it is difficult to detect the exact voltage level that is associated with a particular torque setting. However, the varying of the TORQUE and TIME settings can be readily identified on the meter. The important point is that all three voltage profiles are the same.
- E. When the SCR Bridge portion of the control is separate from the control box (two piece units—size C and larger) other readings can be taken.
  - 1.) A1 to B1, B1 to C1 and C1 to A1—will give line voltage when the contactor is energized.
  - 2.) A2 to A3, B2 to B3 and C2 to C3 should read .5 to 1.0 volts D.C. after six seconds. A voltage profile similar to the profile described in section SINGLE SPEED CONTROLS item D should be seen after the contactor is switched from an open to a closed position.

### **TWO SPEED CONTROLS**

- Steps #1, #2 and #3 are the same as they are for the SINGLE SPEED CONTROLS. The difference lies with the control signal circuitry. For proper operation check the following control signals across the screws on the box. See section SINGLE SPEED CONTROLS for general testing procedure.
- A. When the contactor is energized for low speed operation the meter will read:
    - 1.) Between HI and COMMON 0 VAC
    - 2.) Between LO and COMMON 115 VAC
    - 3.) Between LO and HI 115 VAC
    - 4.) Between A and B 115 VAC
  - B. When the contactor is energized for high speed operation the meter will read:
    - 1.) Between HI and COMMON 115 VAC
    - 2.) Between LO and COMMON 0 VAC
    - 3.) Between LO and HI 115 VAC
    - 4.) Between A and B 115 VAC
  - C. If another control voltage is used it will appear instead of

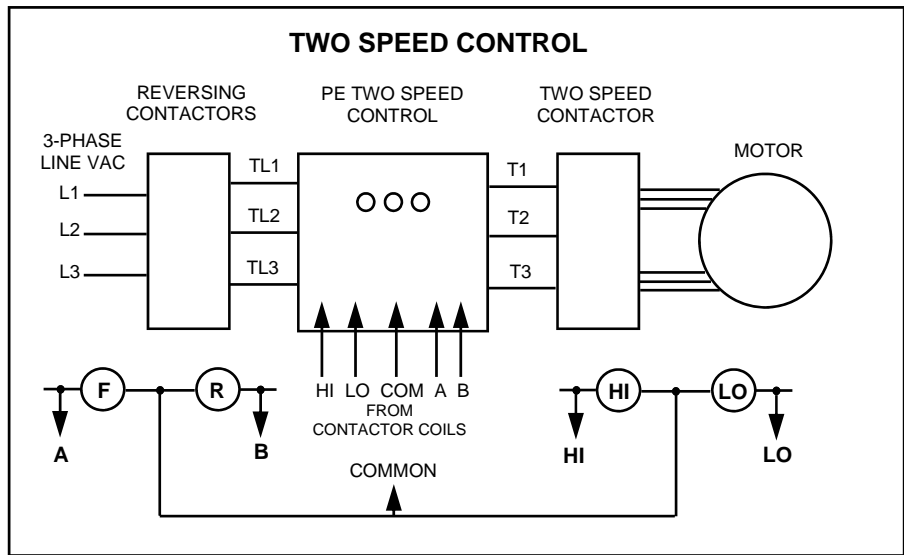
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## Soft-Start Torque Control Wiring Diagrams

<b>Key:</b>	<b>Soft-Start Series:</b> F= FORWARD R=REVERSE	<b>E-Series:</b> U=UP D=DOWN	<b>TL1, TL2, TL3 = Line VAC from contactor</b> <b>T1, T2, T3 = output to motor.</b> <b>L1, L2, L3 = Line VAC</b>
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Terminals A, B and HI, LO and COMMON must be hooked up via the contactor coils only! The signal cannot be taken directly off of the control transformer. These signals are for sensing motor signal transitions and are not used to run the control. The unit will not operate until it senses a signal at the coil.



Note: For E-Series, replace U for F and D or R on each diagram

