



MOTOR CONTROL DIAGRAM CHALLENGE 3

Tool & Supplies List

- (1) Paper
- (1) Pencil

Contest Instructions

This Challenge has two parts:

1. Create a control drawing that will start, stop, and jog a motor.
 - Indicate the following:
 - Green pilot light to indicate the motor is running;
 - Amber pilot light indicating that the motor is being jogged; and
 - Red pilot light indicating that the motor is not running.
 - Use no more than two control relays (CR1 and CR2) with no more than three normally open (N.O.) contacts and no more than three normally closed (N.C.) contacts for each control relay.
 - Use one N.C. momentary pushbutton for the stop button, one N.O. momentary pushbutton for a start, and one N.O. momentary pushbutton for Jog.
 - The motor contactor has a magnetic coil (M), overload contact s(O.L.), two sets of N.O., and two sets of N.C. auxiliary contacts.
 - Label all components and number all wires. The control power will be 120 volts, and the drawing needs to be in ladder format with all components in a de-energized state.
2. Answer the following three questions:
 - A. Which one of the following choices is the correct connection for a delta nine lead low voltage motor connection?
 - a. ___ L1-T1, L2-T2, L3-T3, T4-T7, T5-T8, T6-T9
 - b. ___ L1-T1-T4, L2-T5-T2, L3-T6-T3, T7-T8-T9
 - c. ___ L1-T7-T6-T1, L2-T4-T8-T2, L3-T3-T9-T5
 - d. ___ L1-T7-T1, L2-T8-T2, L3-T3-T9, T4-T5-T6
 - e. ___ L1-T1-T6-T7, L2-T2-T5-T8, L3-T3-T9-T4
 - B. A three phase capacitor bank is connected to the load side of a motor overload device which supplies a three phase motor. Which one of the following statements is NOT correct for the installation?
 - a. The motor current will remain the same
 - b. The motor voltage will remain approximately the same
 - c. The capacitor is installed for power factor correction
 - d. The current thru the overloads will increase
 - e. The current thru the overloads will decrease
 - C. What is the current of a three-phase, 150 HP motor operating at an efficiency of 96%, power factor of 73%, and a voltmeter reads 462 Volts?

Submit one document in .jpg, .png, or .pdf, format with a clearly visible diagram and the answers to A, B, C written below the diagram to <https://www.idealnationals.com/content/idealnationals/en/wired-to-win.html>.



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FAQs

How do I submit my entry?

Please take a picture of the diagram and answers with your phone and upload it via the form idealnationals.com/wire-to-win page

How and when will I be scored?

The 5 highest points will be declared the winners. Winners will be selected from student and professional categories and notified via email and posted on idealnationals.com/wired-to-win.

Who can I contact with questions?

Send your question(s) to nationals@idealindustries.com.

Scoring

The drawing will be judged based upon (each question is worth 10 points):

Correct working operation =	10 points
Proper labeling of components =	10 points
Appropriate symbols per CSA standards =	10 points
Correct wire numbering =	10 points
Overall neat and professional drawing =	10 points
Total Score =	80 points

Tiebreakers will be determined by the competitor who submits first within the submission window.