

Test Your Motor Control IQ

This quiz will help test your knowledge of a duplex pump controller circuit and better prepare you for your next troubleshooting challenge.

By Larry Baran, Motor IQ Columnist

Let's see if you can anticipate on paper what the voltage readings should be if you were troubleshooting this duplex pump controller circuit. Assume you are using an AC voltmeter to make the readings, and A, B, C, D, E, and F are the reference points for the voltage readings. Note: The control transformer secondary voltage is 120VAC.

For each set of conditions below, fill in the correct voltage readings in the corresponding tables. The readings will be 480V, 120V, or 0V. Assume SW2 is always open, and SW1 is closed for Conditions 2, 4, 5, and 6. Have fun, and don't cheat!

Conditions

1. Power (480V) is on; DISC is open; coils M1, M2 and CR are off; motors are off; and contacts OL1 and OL2 are closed.

L1-L3	F1-F3	H1-H4	X2-X1	X2-A	X2-B	X2-C	X2-D	X2-E	X2-F

2. Power (480V) is on; DISC is closed; coil M2 is off; motor 1 is on; and contacts OL1 and OL2 are closed.

L1-L3	F1-F3	H1-H4	X2-X1	X2-A	X2-B	X2-C	X2-D	X2-E	X2-F

3. Power (480V) is on; DISC is closed; coils M1 and M2 are off; coil CR is on; and contacts OL1 and OL2 are closed.

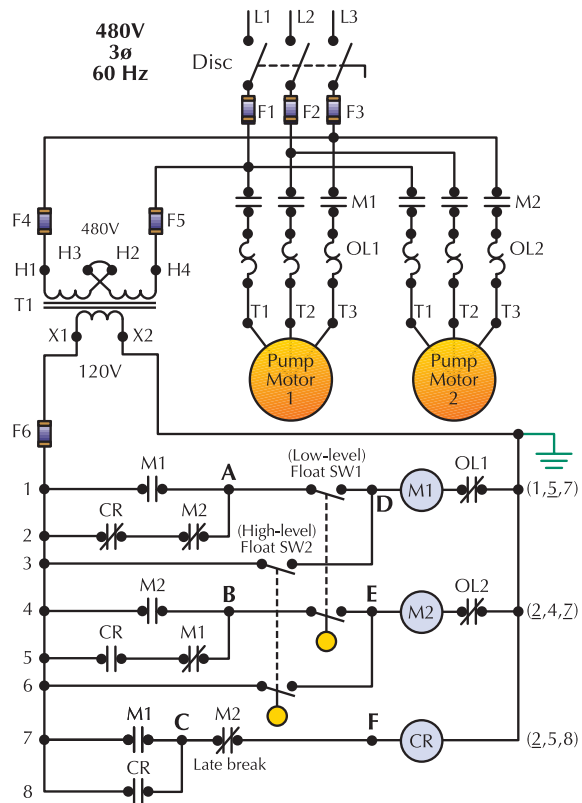
L1-L3	A-D	B-E	C-F	X2-A	X2-B	X2-C	X2-D	X2-E	X2-F

4. Power (480V) is on; DISC is closed; coil M1 is off; coil M2 is on; motor 2 is on; and contacts OL1 and OL2 are closed.

L1-L3	A-D	B-E	C-F	X2-A	X2-B	X2-C	X2-D	X2-E	X2-F

5. Power (480V) is on; DISC is closed; coil M2 is on; motor 2 is on; and contact OL1 is open.

L1-L3	A-D	B-E	C-F	X2-A	X2-B	X2-C	X2-D	X2-E	X2-F



6. Power (480V) is on; DISC is closed; coils M1 and CR are on; motor 1 is on; and contact OL2 is open.

L1-L3	A-D	B-E	C-F	X2-A	X2-B	X2-C	X2-D	X2-E	X2-F

Answers

- 6. 480, 0, 0, 0, 120, 120, 0, 120, 0, 120
- 5. 480, 0, 0, 0, 120, 0, 0, 120, 0, 120
- 4. 480, 0, 0, 0, 120, 0, 0, 120, 0, 120
- 3. 480, 0, 120, 0, 0, 120, 120, 0, 0, 120
- 2. 480, 480, 480, 120, 120, 0, 120, 120, 0, 120
- 1. 480, 0, 0, 0, 0, 0, 0, 0, 0, 0

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