

PLC121 LAB 3.1: RELAY BASICS

Student Name: _____

Student ID: _____

LAB OUTCOMES:

Upon completion of this lab procedure, the student should be able to:

1. Identify and explain the parts of a DC relay.
2. Determine what resistance would be measured across the relay components.
3. Explain the operation and application of relay.
4. Explain the operation of a normally-open versus normally-closed contact.
5. Determine when a relay contact has continuity.

LAB PROCESS:

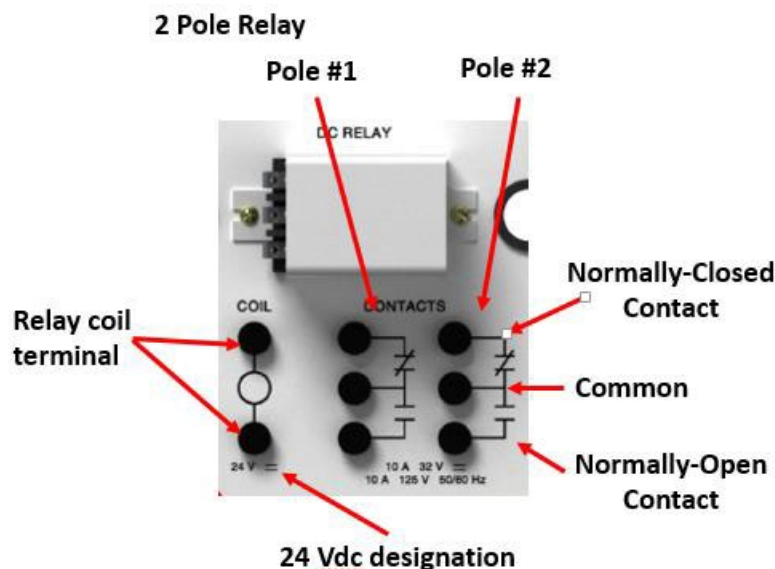
Open the AC/DC Training Unit. Setup the unit on its base, or lay flat on the work table.

Make sure all fault switches are in the 0 position.

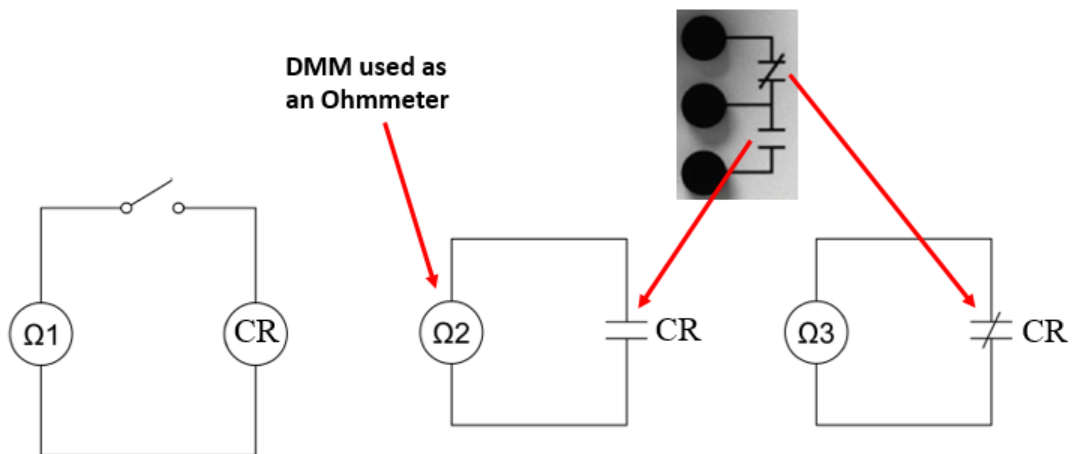
Connect the power cord and turn off the power input switch to make sure the unit is not powered.

Part 1

The following illustration shows the connections for the DC relay. Notice that this 2 pole relay (two separate sets of contacts) has the two poles isolated (not connected electrically).



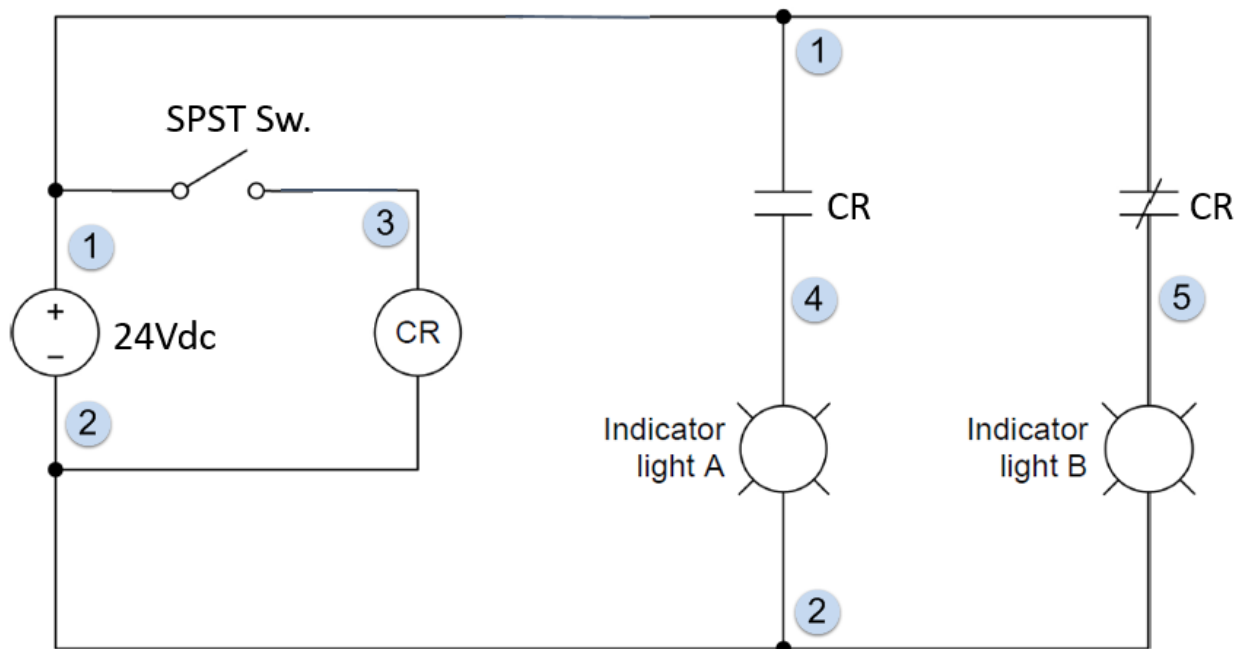
1. Use the DMM as an Ohmmeter to measure the resistance of the following devices.



2. What is the measured resistance of the relay coil if the SPST switch is closed? _____
3. What is the measured resistance of the Normally-Open contact of the relay? _____
4. What is the measured resistance of the Normally-Closed contact of the relay? _____

Part 2

Wire the following circuit on the AC/DC training system.



1. Power on the "Power Input" switch (lower right) to power the training unit.
2. Open the SPST switch, so CR coil is not energized.

Which indicator light is on? _____

What is the voltage between nodes 2 & 3? _____

What is the voltage between nodes 5 & 2? _____

3. Turn on the SPST switch, energizing the CR coil.

Which indicator light is on? _____

What is the voltage between nodes 2 & 3? _____

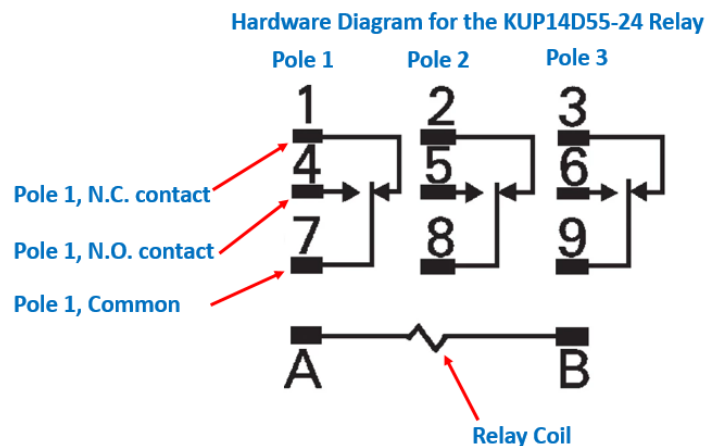
What is the voltage between nodes 4 & 2? _____

What is the voltage between nodes 5 & 2? _____

Part 3

The part number for the DC relay on the AC/DC training unit is a Potter Brumfield, part number: KUP14D55-24. The following is graphic and the diagram for the contacts and coil, so a user will be able to determine what connections to wire to, based on an electrical print.

Picture of the KUP14D55-24 Relay, found on the web



1. Go out to the internet with your portable device or with a computer connected to the college network to find the "cut sheet" (information on the specifications of the device) for the KUP14D55-24 relay (Google it).
2. What should the resistance of the coil if measured with an Ohmmeter? _____

3. How much current are the contacts rated for? _____
4. What is the voltage rating on the contacts (switching voltage)? _____
5. How much current should the coil pull? _____ Verify this with Ohm's Law.
6. On the parameter "Contact Form", what does the designation 3PDT mean?

Questions

1. How many poles does the KUP14D55-24 relay have?
2. How many poles of the relay is wired to the AC/DC training unit?
3. What resistance should you read across a NO contact, if a relay is pulled in?
 - a) 0 Ohms
 - b) Infinity Ohms
 - c) 475 Ohms
4. What resistance should you read across a NC contact, if a relay is pulled in?
 - a) 0 Ohms
 - b) Infinity Ohms
 - c) 475 Ohms
5. What resistance should you read across a NO contact, if a relay is not pulled in?
 - a) 0 Ohms
 - b) Infinity Ohms
 - c) 475 Ohms
6. What resistance should you read across a NC contact, if a relay is not pulled in??
 - a) 0 Ohms
 - b) Infinity Ohms
 - c) 475 Ohms

The outcomes of this exercise (listed on page 1) specifies the skills that the Student must demonstrate to the Instructor. Once the Instructor is satisfied with the demonstration of Knowledge & Skills by the individual student, they will sign this document (for the student), then enter a 100% into the Hands-On Lab grade in Sakai.

I verify that this student has completed all of the requirements of this Hands-On Assessment:

Student Name: _____

Faculty Signature: _____ Date: _____

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