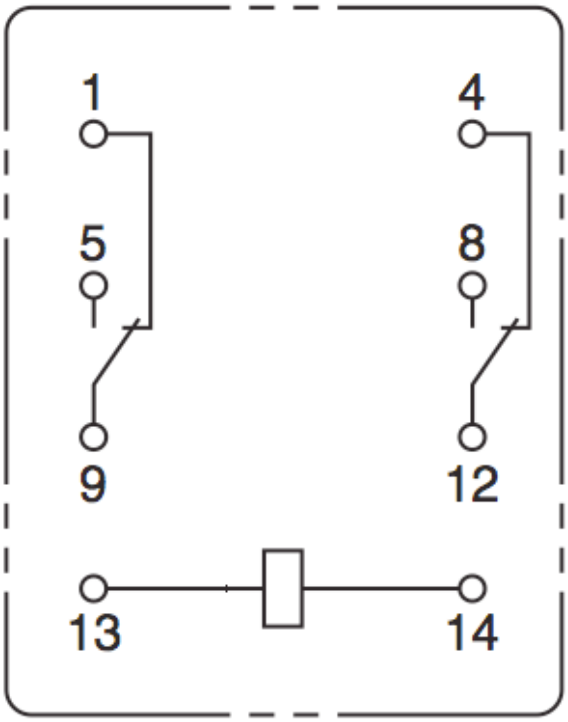
28. Electromechanical Devices - NOTES

While many different things could fit into the category of electromechanical devices we will only talk about relays, solenoids, and pneumatic vales on this page. Many other devices fit into this category but we have discussed them earlier such as motors and switches.

TOPIC 1: Relays

Below is a standard pin diagram of a relay. Most relays that I have come in contact with have two sets of contacts each with both a normally open (NO) contact and a normally closed (NC) contact along with the coil.



From Omron's MY Model Relay Datasheet (MY2 Model)

I have low-voltage switching in my home and I'll use that to explain how this particular relay would be used. In my home, there is only 24V coming into my switches on the wall. This 24V, when the switch is on, is applied to the coil in a relay (pins 13 and 14 above). When the switch is on it triggers the two "flappers" (pin 12 and 9) to switch from a connection to pin 1 and 4 to a connection to pins 9 and 12. When the switch is off the "flappers" return to their drawn position. In my home, pin 8 is connected to 120VAC and pin 12 to my light. When the switch is on, current flows through the relay and causes the "flapper" to connect pins 8 and 12 allow current to flow into the light and when the switch is off the "flapper" goes back to its original position causing pins 8 and 12 to become disconnected, turning off the light.

A relay is always drawn in its un-powered state. Above, the connection between pins 8 and 12 are considered normally open (NO) because when power is not applied (the normal state) the connection is open. The connection between pins 12 and 4 are considered normally (NC) closed because when power is not applied (the normal state) the connection is closed.

TOPIC 2: Solenoids

A solenoid is simply a coil of wire with a movable metal pin in the center. This movable pin is often times connected to a spring. When power is applied to the solenoid the pin in the center is drawn towards the center of the coil. This can be used to strike something mechanical or to throw a switch etc. The spring can be used to create a spring return action. See below at a create application of solenoids.

TOPIC 3: Pneumatic Valves

A pneumatic valve is just an application of a solenoid.

You should now be prepared to answer the following questions.

1. When considering relays, NO stands for _____.

2. When considering relays, NC stands for _____.

3. Which two pins are NC contact connections on the relay pictured in the discussion?

4. Which two pins are for the coil on the relay pictured in the discussion?

5. A spring is typically used in a solenoid to _____.

6. A pneumatic valve is an application of a _____.