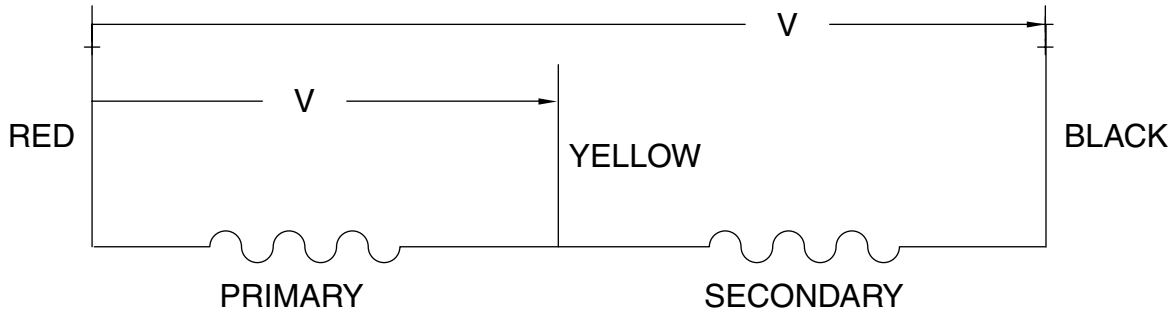
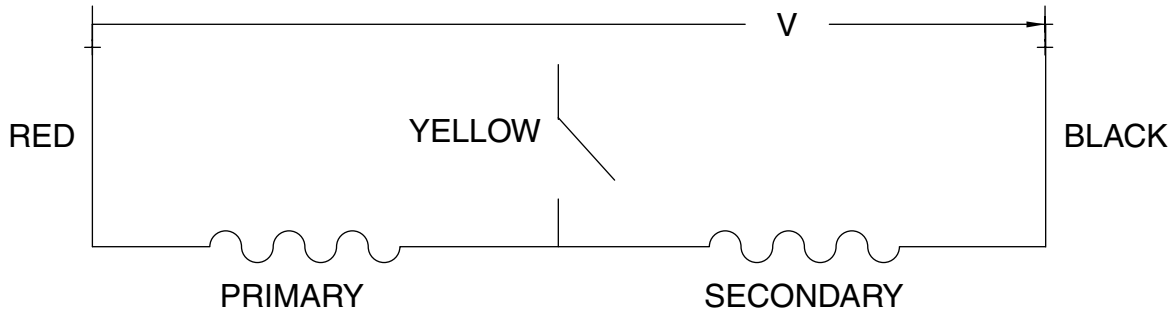
Double Wound Coils

The double wound coils consist if two coil windings within the same encapsulation. The windings are the primary, which consists of a heavy wire coil with relatively few turns and a low resistance and a secondary coil winding of many turns of fine wire with a high resistance. To open the valve, power is initially applied across the primary winding (red to yellow) and the combination of primary and secondary circuits in series (red to black) as shown schematically:



The high current through the primary circuit generates a strong magnetic field that actuates the valve. This current is sufficiently high that the coil would overheat if the current were allowed to continue for more than a few minutes. After a fraction of a second, (the delay is caused by the dropout time of the relay) the yellow lead is disconnected and the voltage remains applied only across the combination of the primary and secondary windings in series. The low current through both windings produces a lower strength magnetic field that is sufficient to hold the valve open. The low current produces only modest heating of the coil allowing the valve to remain actuated open continuously. This steady state condition is shown schematically:



Current production of these coils utilizes a fiberglass wrapping that is dipped in a resin to affect a seal. This insulation is rated class H that means that it can withstand a 180° C temperature rise continuously. The double wound coils require the use of a time delay relay to disconnect the primary coil winding after the valve has actuated. This delay is on the order of ½ second. In some cases the customer supplies this timing device and Circle Seal does offer a normally closed relay for this purpose. It is ordered as a separate line item as follows:

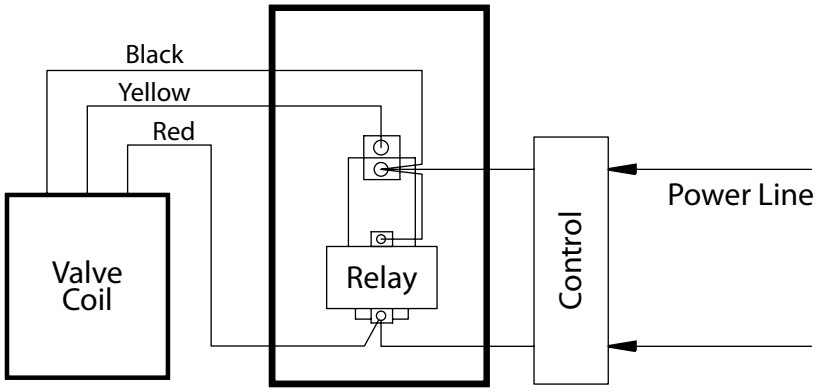
R–*x x x*

The voltage is coded in the same manner as the valve catalog number that the relays are used with. The following voltages are available:

100 VAC 60 Hz, 110 VAC 50 Hz, 115 VAC 60 Hz, 200 VAC 60 Hz, 220 VAC 50 Hz, 230 VAC 60 Hz,

460 VAC 60 Hz, 24 VDC, 32 VDC, 48 VDC, 125 VDC, and 250 VDC.

The relays are an encapsulated mercury tube design and are supplied mounted in a NEMA 1 electrical enclosure



Mount Vertically
Yellow Lead = Strong Primary Circuit.
Relay Drop Out Breaks
Yellow Lead Continuity

Wiring diagram for the relay