

Latching relays

A latching relay is a two-position electrically-actuated switch. It maintains either contact position indefinitely without power applied to the coil. It is controlled by two momentary-acting switches or sensors, one that 'sets' the relay, and the other 'resets' the relay. The latching relay maintains its position after the actuating switch has been released, so it performs a basic memory function.

There are different kinds of latching relays:

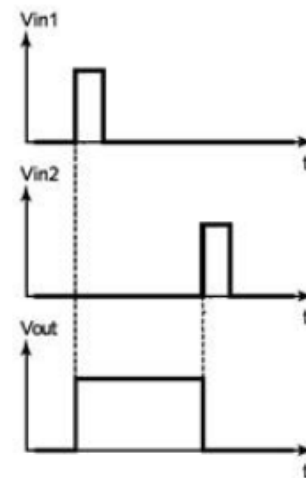
One latching type has two opposing coils with an over-center spring or permanent magnet to hold the contacts in position after the coil is de-energized. A pulse to one coil turns the relay on and a pulse to the opposite coil turns the relay off.

Another latching type has a remanent core that retains the contacts in the operating position by the remanent magnetism in the core. This type requires a current pulse of opposite polarity to release the contacts. A variation uses a permanent magnet that produces part of the force required to close the contact; the coil supplies sufficient force to move the contact open or closed by aiding or opposing the field of the permanent magnet.

Latching can also be achieved mechanically, when returning to the previous state is prevented by means of a mechanical mechanism.

Time chart

A voltage pulse turns the relay on and a voltage pulse turns the relay off.

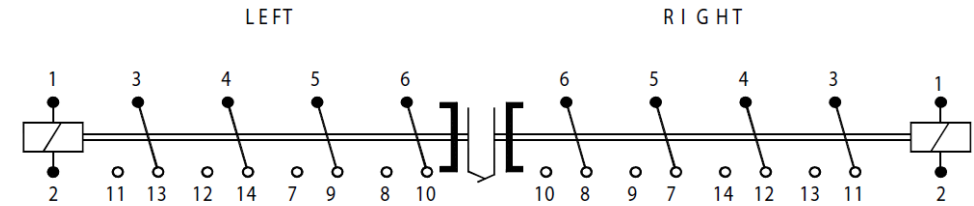


Way of operating Mors Smitt latching relays

Mors Smitt offers 3 different types of latching relays:

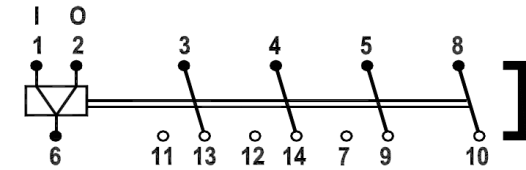
Mechanical latching relay (e.g. KDN relay)

This type of latching relay consists of 2 separate relays with fully separated set and trip circuits. The two separate coils are galvanically isolated. The contacts remain in the last powered position via a mechanical mechanism. The contacts are blocked by this mechanism when the power on the first relay is released. Only when the second relay is powered the mechanism will change position and all contacts of the first relay will go back to their original position.



Fully magnetic latching relay (e.g. BD relay)

This type of latching relay consists of 1 relay with 2 coils with same neutral connection: the first coil is activated via terminals 1 and 6, the second coil is activated via contacts 2 and 6. When connected via 1 and 6, the current and therefore the magnetic field is directed in the other direction compared to the situation when the coil is connected via 2 and 6. The contacts remain in the last powered position via a permanent magnet. As the set coil and trip coil have the same neutral connection, there is no separated set and trip circuit.



Magnetic relay with mechanical tilt mechanism (e.g. KCD or SB relay)

This type of latching relay consists of 2 separate relays with fully separated set and trip circuits. The contacts remain in the last powered position via a permanent magnet. When 1 relay is powered, the coil will push the tilt mechanism away while the non-powered side will attract the tilt mechanism via the permanent magnet, which results in switching the contacts.

