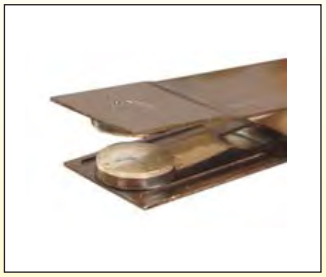
2. ELECTRICAL CONTACTS

As numerous mechanisms exist, we decided not to distinguish on the basis of constructive technique, but according to their operation speed, which is the key element.

2.1 ELECTRICAL CONTACTS SYSTEMS

2.1.1 SLOW BREAK

In slow break contacts both sides deviate slowly at speeds of the order of 1/10 mm per second.
In the normal atmosphere, then an electrical arc occurs when the contacts are close together.
The duration of this arc is a function of voltage.
For voltages up to 24V DC or 110VAC, the duration of this arc is short, less than 0.1s.
For higher voltages, the arc lasts much longer, producing premature fusion of the contact, and many radio interference.
This is why it is not recommended, despite the mechanical advantages (simplicity, low cost, high precision), to use slow break (or slow make) contact in 230V electrical circuits , for fast cycling applications.

2.1.2 SNAP ACTION

On snap action contacts, the gap between contacts occurs at much higher speed, of about 1m per second (100,000 times faster than a slow break contact). The contacts spacing to extinguish the electrical arc is reached in less than 1/1000 sec. There is no radio interference, and the contact does not substantially deteriorate.
This type of contact is mechanically much more complicated, more expensive, and does not allow small differential control. It is particularly suitable for control devices in 240V or 400V.
Several techniques are used to get a snap action:

- The oldest is the use of magnets on the contact blades. The magnetic field decreases with the 4th power of distance. The attraction between the two blades thus takes a very short distance. This system is highly reliable, but not currently used due to the large number of components that it requests.
It was used extensively on the needle contacts on barometers, manometers, thermometers with a circular dial, and was the first snap action system to be used in thermostats
- The most common today is the energy storage blade, whose drawings have been are simplified in recent years, largely due to the improvement of beryllium copper alloys, and new design concepts.