

Mechanically linked contacts and Mirror contacts ?

I- Type of publication

- Typical application
- Best know Method (BKM)
- Troubleshooting guide

- Level 2 use
- Internal use
- Customer

II- Product

- Product range :

- Product family :

III- Introduction

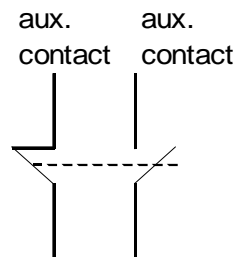
This document aims at explaining the terms “mechanically linked contacts” and “mirror contacts” and the difference between them. Moreover, as these features are described in IEC 60947-5-1 and IEC60947-4-1 standards, the objective of this document is to summarize the requirements and definitions given in the standards and give examples of applications.

TeSys D contactors include both mechanically linked and mirror contacts features and therefore, they can be used for safety related applications and wherever reliability of auxiliary contact state is critical.

IV- Description

■ Mechanically linked contacts (in accordance with IEC 60947-5-1– Annex L)

- **Definition:** a combination of normally open contacts and normally closed contacts designed so that they cannot simultaneously be in the closed position
 - When a normally open contact is closed, none of the normally closed contacts may be closed.
 - When a normally closed contact is closed, none of the normally open contacts may be closed.



- Area of application: mechanically linked auxiliary contacts integrated in control devices where the actuating force is provided internally. Control circuit devices actuated externally (e.g. push-button or limit-switches) do not have an actuating force limited to a maximum value, so they cannot have mechanically linked contact elements.
- Mechanically linked contact elements have previously been referred to as forced contacts, positively activated contacts, or linked contacts, or, in French: "contacts forcés" or in German: "Zwangsgeführte Kontakte".

Symbols used (in accordance with IEC 60947-5-1– Annex L)

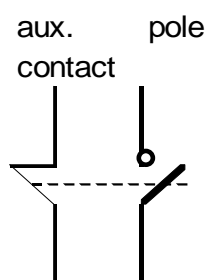


Example of representation of NO and NC contacts which are mechanically linked and NC non-linked contact

■ **Mirror contacts (in accordance with IEC 60947-4-1 Annex F)**

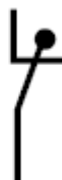
➤ **Definition:**

A normally closed auxiliary contact cannot be in a closed position at the same time as one of the main power contacts (a pole, normally open) on the same contactor. So the “mirror contacts” feature concerns the mechanical link **between the auxiliary contacts and the power contacts of a contactor.**



- These auxiliary contacts are called "mirror contacts" to avoid any confusion with "mechanically linked contacts" which only concern auxiliary contacts (IEC 60947-5-1) However, an auxiliary contact may well conform to both recommendations.
- A typical application of mirror contacts is to have, in the machine control circuit, a highly reliable monitoring of the status of the contactor. However, mirror contact should not be relied upon exclusively as a means to ensure safety.
- Mirror contacts have previously been referred to as positively safety contacts, forced contacts, linked contacts or positively driven contacts.

Symbols used (in accordance with IEC 60947-4-1– Annex F)

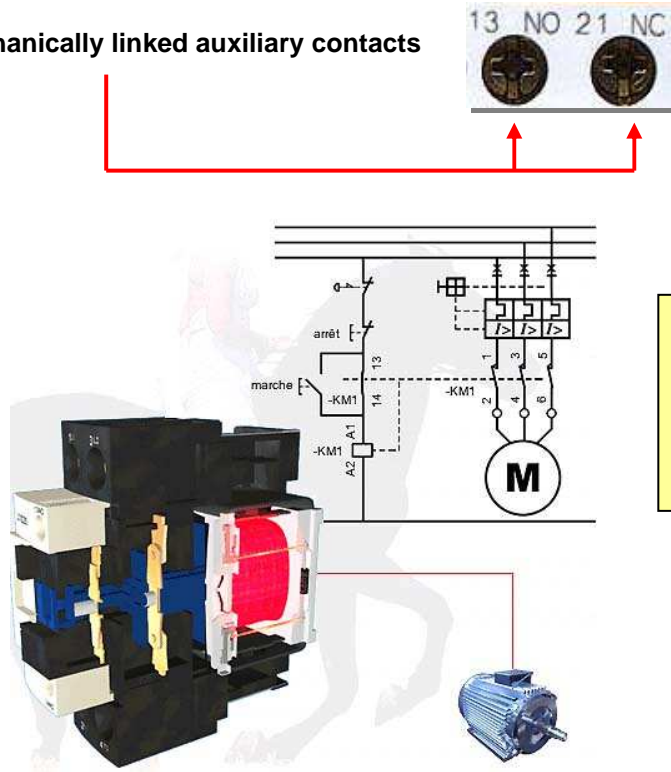


IEC 2136/02

Mirror contact

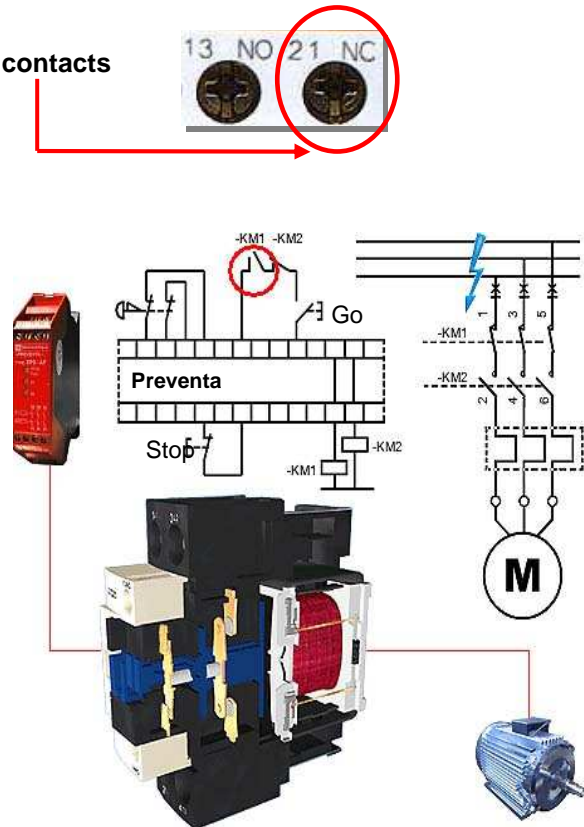
■ Mechanically linked contacts and mirror contacts are included in TeSys D

➤ Mechanically linked auxiliary contacts



NO and NC mechanically linked auxiliary contacts, designed to make it impossible for them both to be closed at the same time.

➤ Mirror contacts



NC mirror contact : auxiliary contact cannot be closed at the same time as a normally open power contact.