With special functions

Design

The 3TK28 10 safety relays with special functions operate with internal contactor relays with positively-driven contacts.

In a redundant circuit, operation of the internal controls is monitored. If a safety relay fails, it will always switch to the de-energized and consequently safe state. The fault is detected and the safety relay can no longer be switched on.

Enabling contacts (FK)

Safety related operation must be performed by safe output contacts, known as enabling contacts. Enabling contacts are always NO contacts and switch without delay.

Signaling contacts (MK)

NC contacts are used as signaling contacts but they are not permitted to perform functions with relevance for safety. An enabling contact can also be used as a signaling contact. A signaling contact cannot, however, be used as an enabling contact.

Expansion units

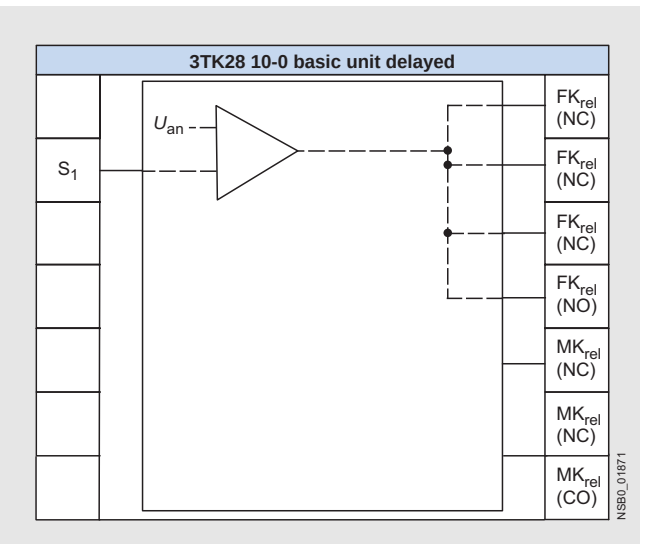
If the enabling contacts of the basic unit are inadequate, expansion units can be used. An expansion unit has 4 enabling contacts. Expansion units are not allowed to be operated separately in safety-related switching circuits; they must be combined with a basic unit. One enabling contact of the basic unit is required for connecting an expansion unit. The category of a control system with expansion unit corresponds to that of the basic unit.

Function

3TK28 10-0 standstill monitor

The 3TK2810-0 safe standstill monitor measures a voltage of the decelerating motor, which is induced by residual magnetism, at 3 terminals of the stator winding. When the induction voltage approximates to 0, the monitor interprets this to mean that the motor has stopped and the output relay is activated. To be able to adapt the monitor to different motors and applications, it is possible to adjust the voltage threshold U_{an} below which the 3TK2810-0 detects a stoppage. Also adjustable is the length of time over which U_{an} must be undershot in order for a stoppage to be detected and the output circuit enabled (downtime t_s).

The device also detects wire breaks between the measuring inputs L1/L2/L3. If a wire break is detected, the output relay will adopt the safe position (the same as with a running motor).



Legend

Sensor interface

S_x:	Sensor input

Actuator interface

FK_{rel}:	Enabling circuit, relay contact (floating)
MK_{el}:	Signaling circuit, solid-state output (non-floating)
MK_{rel}:	Signaling circuit, relay contact (floating)
NO:	NO contact
NC:	NC contact
CO:	Changeover contact