1 Overview

The CONTACTRON 4-in-1 motor starter is a safety rated, reversing motor starter. This product is commonly used to replace redundant emergency stop contactors in safety circuits. This document highlights the recommended wire connections.

The CONTACTRON 4-in-1 is typically installed with a safety relay. A safety relay can monitor the condition of the emergency stop or safety guard connected to it, preventing operation in the event of component failure. Using a safety relay with the motor starter allows the configuration to comply with:

- Safety Category 3 in compliance with EN 954-1.
- Performance level “e” (PLe) in compliance with ISO 13849-1.
- Safety Integrity Level (SIL) 3 in compliance to IEC 61508.

2 Emergency stop application breaking forward, reverse and logic return

Figure 1 shows a dual channel emergency stop application for safety category 3, PLe and SIL 3 degrees of safety. This circuit breaks the motor forward “L”, motor reverse “R” and the return for the control inputs to open the motor control circuit.

This same circuit can be applied to a safety door/gate or another safety guard presenting two, normally closed contacts to the application. If a solid state safety device, such as a light curtain, needs to be monitored, then a different safety relay needs to be selected.
NOTE:
With new standards in place and the obsolescence of the safety category standard (EN 954-1) scheduled, using the CONTACTRON 4-in-1 devices instead of contactors in safety circuits will provide the highest degree of safety. The CONTACTRON 4-in-1 is certified for use in the PLe, SIL 3 environments.

All performance level and SIL data is available for CONTACTRON 4-in-1 products to determine the required degree of safety. If contactors are to be used in a safety circuit, this data must be calculated.

If a safety relay is not used, the CONTACTRON 4-in-1 motor starter can be stopped using the terminals shown in the two previous examples. However, associated responsibility for determining the safety category (PL, SIL) is the responsibility of the designer/installer.