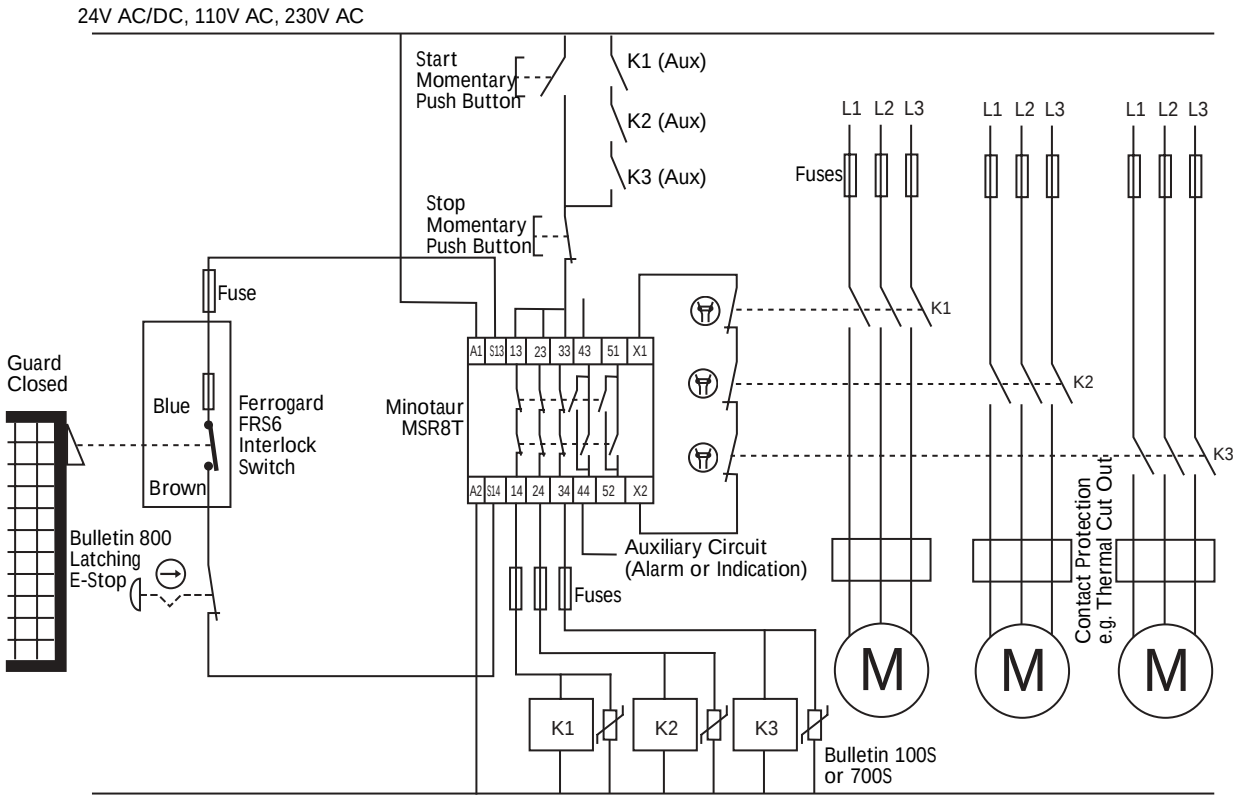

Circuit Status

Circuit shown with guard door closed and ready for motor starting.

Operating Principle

This is a single channel system with monitoring of the contactors. It uses a Minotaur MSR8T monitored safety relay to distribute the signal from the interlock and E-Stop switches to three contactors.
Opening the guard or operating the E-Stop device will open the input circuits (S13-S14) to the Minotaur MSR8T. The output circuits (13-14, 23-24 & 33-34) will cause the contactors to isolate to power to the respective motors.

Fault Behaviour and Detection

The integrity of the circuit depends on the suitability of the components (conformity with standards, tried and tested principles, etc.) and the nature of the wiring installation (use of protective conduit, short wiring runs, no movement of wiring, etc.).
The Minotaur MSR8T provides an ensured switching action. Contactor monitoring is provided via terminals X1-X2. When more than one contactor is used, if one of the contactors sticks ON, the restarting of the other two will be prevented by the Minotaur.
The MSR8T can be configured with two contactors in series to control one motor and if either contactor sticks ON, the motor will stop on command due to the other contactor but the MSR8T will not reset.
Safety critical single faults within the Minotaur MSR8T itself will be detected. It does not detect some faults at its input circuit and therefore it is possible for a single fault to cause a loss of safety function.

Comments

This type of system is widely used where an intermediate relay is required between the Interlock switch or E-Stop device and the contactor(s). An ordinary relay would not be suitable for this purpose because of its failure modes. This is typically the case where multiple motors are being switched or a higher current switching capacity is required. It is suitable in applications that have low to medium risk and where the wiring can be properly protected.