

## Overview

Whilst safety related control systems can be used to isolate all power to actuators, this is sometimes neither necessary nor desirable. For example, the action of dumping hydraulic accumulators every time a machine was accessed to load a component would waste energy without necessarily improving safety. This fact sheet discusses acceptable alternatives. This is not a comprehensive list, as there are many variations but shows some alternatives.

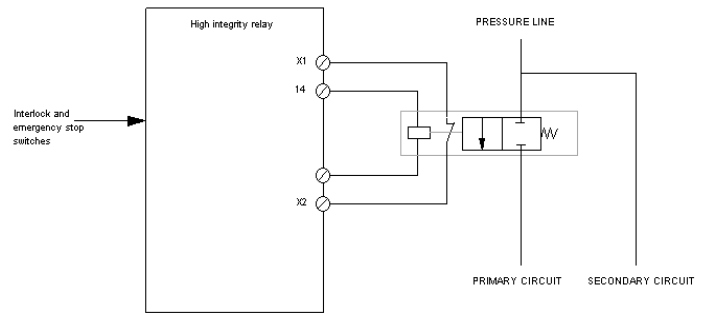
## Acceptable alternatives

### Secondary hydraulic circuit

The pressure feed to the primary hydraulic circuit, which has the capability of causing harm, is blocked by the valve as described in fact sheet 002.

Where there is a secondary circuit, then the feed for this may be taken upstream of the valve, providing the following criteria are met:

- Secondary circuit does not have the capability of causing harm
- Secondary circuit is required during the period when the primary circuit must be isolated.



### Different circuits for guards and emergency stops

Common practice is to connect the guard interlocks and emergency stops to the same connections on the high integrity relay, as shown to the right.

This is perfectly acceptable from the safety point of view but means that all interventions into the protected area are treated as an emergency stop, normally isolating all power and dissipating stored energy.

An acceptable, but more costly arrangement, is to have additional high integrity relay(s) as shown below. One relay is used for emergency stops and is used to isolate all power and dump stored energy. The other relay is used to isolate the power actuators which have the capability of causing harm to someone in the protected zone.

