

FEBRUARY / MARCH 2018

[View this email in your browser](#)

## February / March 2018 Newsletter

### Machinery Guarding Interlocking Options BS EN ISO 13849 Safety of Machinery Safety Related Parts of Control Systems Excerpts and Explanation

**The most common questions we are asked in relation to interlocking machinery guarding:**

1. What do you mean by control systems and how do we connect them to the machine?
2. Why is there such a difference in the price quoted by Machine Safety and another quotation we have received from a different guarding supplier?
3. Can you explain the different interlocking options with regard to benefit and cost?

Guidance should always be sought from the risk assessment when determining which interlocking option to select. For example the paper draw on your photocopier will be interlocked. What would be the risk and potential harm if that interlock failed? Probably nothing catastrophic, a cut finger maybe. But what about the interlock or existing contactor on your power press? If this fails the possible consequences could be far more severe.

*BS EN 13849 deals with the reliability of safety circuits in relation to their contribution to risk reduction. The more severe a possible injury, the more reliable the safety circuit needs to be.*



**machine**  
safety



[Subscribe](#)
[Past Issues](#)
[Regulations Approved Code of Practice and Guidance](#)

\* Paragraph (1) substituted by SI 2002/2174, regulation 7(c).

## Guidance 18

191 A control system can be defined as: 'a system or device which responds to input signals and generates an output signal which causes the equipment under control to operate in a particular manner.'

192 The input signals may be made by an operator via a manual control, or from the equipment itself, for example from automatic sensors or protection devices (photoelectric guards, guard interlock devices, speed limiters etc). Signals from the equipment may also include information (feedback) on the condition of the equipment and its response (position, whether it is running, speed).

193 Failure of any part of the control system or its power supply should lead to a 'fail-safe' condition. Fail-safe can be more correctly and realistically called 'minimised failure to danger'. This should not impede the operation of the 'stop' or 'emergency stop' controls. The measures which should be taken in the design and

## Electrical Option 1

The new guard is wired into the existing stop circuit.



### Advantages

- Low cost

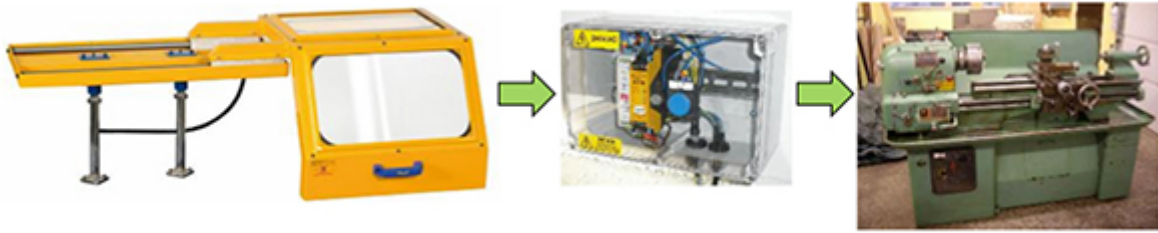
### Disadvantages

- The interlock will be switching the existing AC control circuit voltage.
- No redundancy \* (not fault tolerant).
- No cross monitoring (faults are not detected).
- Isolation of the drive motor is done by the existing contactor, which could be many years old.

\* if only a single contact is used on the interlock switch

## Electrical Option 2

The new guard is wired into the existing stop circuit via a safety relay.



### Advantages

- The interlock will be switching 24VDC rather than the machine's existing AC control circuit.
- Redundancy and cross monitoring are provided, so that faults in the interlock circuit will be detected.

### Disadvantages

- Isolation of the drive motor is done by the existing contactor, which could be many years old.

## Electrical Option 3

The new guard is wired into a new isolation panel containing two power-switching contactors.



### Advantages

- The interlock will be switching 24VDC rather than the machine's existing AC control circuit.
- Redundancy and cross-monitoring is provided so that faults in the interlock and drive motor switching circuits will be detected.
- Complies with current Standards including BS EN 13849 Safety of Machinery – Safety-

### Disadvantages

- Higher cost

[Subscribe](#)[Past Issues](#)

- 
- A certificate of conformity can be issued.
- 

## Safety Control Panel

---

---

## BS EN 13849: 2008 Safety of Machinery – Safety-Related Parts of Control Systems

### Introduction

The following is concerned with the contribution to risk reduction made by taking into consideration the safety-related parts of the control system. The method given here provides only an estimation of risk reduction and is intended as guidance, primarily to machine designers when designing new machines, in determining the PLr for each safety function (eg. an emergency-stop button, door interlock, light curtain etc.)

### Guidance for the selection of parameters S, F and P

#### Severity of injury – S1 and S2

In estimating the risk arising from the failure of a safety function, slight injuries (normally reversible), serious injuries (normally irreversible) and death need to be considered.

processes should be taken into account in determining S1 and S2. For example bruising and/or lacerations without complications would be classified as S1, whereas amputation or death would be S2.

### **Frequency and/or exposure times – F1 and F2**

A generally valid time period to be selected for parameter F1 and F2 cannot be specified. However the following explanation could facilitate making the right decision where doubt exists.

F2 should be selected if people are frequently or continuously exposed to the hazard. It is irrelevant whether the same person or different people are exposed to the hazard on successive exposures (eg. for the use of lifts). The frequency parameter should be chosen according to the frequency and duration of access to the hazard.

### **Possibility of avoiding the hazard – P1 and P2**

It is important to know whether a hazardous situation can be recognised and avoided before leading to an accident. For example an important consideration is whether the hazard can be directly identified by its physical characteristics or recognised only by technical means (eg. indicators). Other important aspects which influence the selection of parameter P include:

- Operation with or without supervision
- Operation by experts or non-professionals
- Speed with which the hazard arises
- Possibility of avoiding the hazard
- Practical safety experiences relating to the process

When a hazardous situation occurs, P1 should only be selected if there is a realistic chance of avoiding an accident or of significantly reducing its effect. P2 should be selected if there is almost no chance of avoiding the hazard.

The underlying principle of this standard is that the more the risk reduction relies on Safety-Related Control Circuits (SRECS), the more the SRECS need to be resistant to faults, such as short circuits, welded contacts etc.

### **Required performance level**

[Subscribe](#)[Past Issues](#)[Required Performance Level](#)[PIR](#)

## Machine Safety exhibiting in April

We will be exhibiting at The Health and Safety Event, the UK's fastest growing event for the health and safety industry, between April 10 and April 12 in Hall 11 at the NEC.

The Health and Safety Event coincides with MACH 2018, taking place at the NEC at the same time, which will enable you to visit them both during one trip.

Please visit us at stand **HS203**. Interlocks, safety control panels and almost everything else related will be on display there, with practical demonstrations by our engineers. We will be more than happy to discuss your requirements and offer our advice.

**REGISTER FREE TODAY FOR THE HEALTH & SAFETY EVENT**

**Subscribe**

**Past Issues**

---

This email was sent to you by [Machine Covers Limited](#).

Contact [info@machinecovers.co.uk](mailto:info@machinecovers.co.uk) or +44 (0)1452 770166 for more information.

---

This email was sent to [natalie@twicreative.com](mailto:natalie@twicreative.com)

[why did I get this?](#) [unsubscribe from this list](#) [update subscription preferences](#)

Machine Covers · Stancombe Works · Stroud Road · Bisley, Gloucestershire GL6 7NQ · United Kingdom