



## Electrical equipment of machines

Electrically driven machines must be so designed, constructed and equipped that all risks are maintained at an acceptable level. The specific risks associated with the use of electrical controls are electrocution and fire hazards. Electrical current can have irreversible effects on the nervous system and muscles, apart from heat effects. Overloads may also cause arcing or static charge fire. Our experts ensure that close attention will be focussed on this aspect, and can help test and assess the functionality of the protections.

### Your tailor-made solution

Machines should be equipped to avoid direct contact with live conductors, or with conductive parts that are normally live. You are also required to prevent hazards arising from indirect contact with earth, or with conductive parts that may be live. Since there can be substantial differences between the causes of hazards, and thereby in the technical measures to be taken to prevent these hazards, a distinction is made between different types of safety, for example by specifying the cause of potential hazards.

When a manufacturer launches a machine on the market, it must comply with the European Machinery Directive.

### The European Machinery Directive contains requirements and recommendations relating to the electrical equipment of machines in order to ensure:

- safety of persons and property
- consistency in control commands
- maintenance that can be carried out easily

In order to meet the basic requirements of the Machinery Directive, it is important not only to follow the spirit of the Directive, but to know the standards as well. After all, they are the tools, "the rules of the trade" required to comply with this Directive. The standard applies to the use of electrical and electronic equipment and machine systems that are not carried in the hand during operation, including groups of machines working together in a coordinated manner.

This standard describes the requirements relating to the electrical equipment of machines and systems. It describes measures against direct and indirect contact with live parts, as well as colour coding of conductors and control elements.

### Your result

#### Our services can assure you of the following:

- compliance of the electrical installation with the EN 60204-1 standard
- pre-commissioning inspections of machines as per RGIE
- advice on preparing terms and conditions as appearing on order forms
- testing and trials of safety circuits, emergency stop devices, interlocks, control circuits;
- equi-potential measurements, short circuit current measurements, voltage tests and insulation measurements
- help in evaluating risk assessments, electrical diagrams, external influences
- preparation and assistance in assessing safety circuits as per IEC / EN 61508: Safety Integrity Level (SIL)

### Please note

#### European Directives

98/37/EC - 2006/42/EC: European Machinery Directive

## General Regulations for Electrical Installations (RGIE)

- Art. 270 Pre-commissioning Compliance Inspection of Low Voltage installations
- Art. 271 Inspection visits to low voltage installations
- Art. 7: Electrical equipment for low voltage
- Art. 19: Preconditions for installation of electrical equipment depending on its surroundings
- Art. 268: Duties of the owner or the manager of industrial companies

Royal Decree of 5th May 1995 on introducing machinery into the market.

Royal Decree of 12th August on the use of work equipment.

Royal Decree of 4th December 2012 on the minimum requirements relating to the safety of electrical installations in workplaces.

## Norms and Standards

- IEC-EN-60204-1: Electrical safety of machinery.
- IEC-EN-61508: Functional safety of electrical, electronic, and programmable electronic safety-related systems.

## In which situation?

### This service is primarily intended for:

- industry
- SMEs
- installer
- manufacturers
- machine designers/manufacturers