

How to Be Safe During Maintenance Activities - Preventing A Machine Restarting

Emergency stop devices are placed around machines and plant equipment, but the use of an emergency stop alone does not prevent the machine restarting when maintenance activities are performed. A lesser known international standard sets out requirements for preventing machine restart and ensuring maintenance members are kept safe.

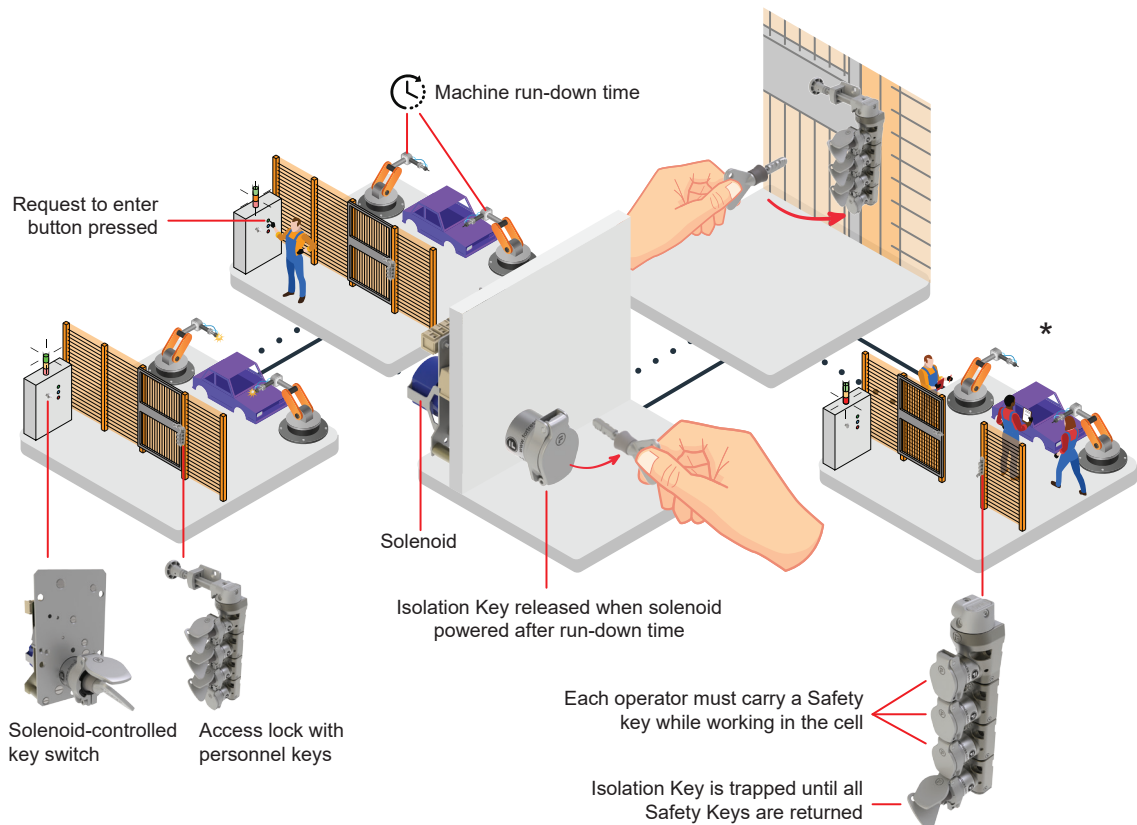
Manufacturers of safety devices and designers of safeguarding for machinery continue to develop products and solutions to protect operators who need whole body access to machinery. Detecting and tracking operators within the safeguarded space has long been a key goal in protecting people and has seen a focus on presence sensing technology in recent years. However, presence sensing is only one way to provide safety when inside the safeguarded space.

ISO 14118 (2018) Safety of Machinery – Prevention of unexpected start-up was updated in 2018 but was first published as EN1037 in 1995 at a time when many machinery safety standards were being written in Europe. This document sets out to provide the requirements that allow operators to safely carry out tasks within the safeguarded space. It guides the reader through the identification of power supplies, stored energy sources and external influences.

Performance Levels and Safety Integrity Levels are not within the scope of ISO14118 and instead the standard focuses on locking energy sources in the isolated and dissipated state. This is important when access to the machine may be for maintenance purposes and requires safeguarding devices and even fixed guarding to be removed or negated.

Trapped key interlock systems provide a means of ensuring procedures are followed correctly and safely and also provide an operator entering the safeguarding space with their own safety guarantee.

Trapped key interlocks can be applied to all energy supplies, electrical, pneumatic, hydraulic, stored, etc and the removal of the key from the trapped key device locks that energy supply in the isolated state. This key can then be used to access the safeguarded space safely where it can be trapped in an access point lock. This prevents its removal and return to the energy supplies trapped key device



In more complex applications the flexibility of trapped key interlocking systems allows multiple energy sources to be locked in the isolated state and access through multiple doors to the safeguarded space. This can all be achieved sequentially to ensure the isolation procedures are adhered to. Trapped key interlocking devices used to lock energy sources in the isolated state are directly referred to in ISO14118 (2018) in paragraph 5.3.

Whilst Categories, Performance Levels and Safety Integrity Levels are outside of the scope of ISO 14118 (2018) this does not mean that devices within the safety related part of the control system cannot be used to maintain a stop command and section 6.3 provides guidance on this. As mentioned earlier, it is important to note that an emergency stop must not be used as a means of preventing unexpected start up. (See ISO14118 (2018) paragraph 6.3.2 Note)

Where whole body access to the safeguarded space is designed in, trapped key interlock systems can utilise a “personnel key”. This is a key that operator takes inside the safeguarded space and whilst it is in their possession it ensures no one else can initiate a machine restart. Fortress trapped key systems can be designed with a feature to force the removal of a personnel key, thus ensuring an operator must take the key from a lock, before entry to the safeguarded space. As any Fortress representative or partner to demonstrate the ‘extracted key’ function for more information.

Multiple personnel keys or lockout devices can then be utilised if the intention is that more than one operator enters the safeguarded space. The recent publication of ISO/TS 19837 (2018) Safety of machinery — Trapped key interlocking devices — Principles for design and selection provides more guidance on “personnel keys”.