

## Guard Locking

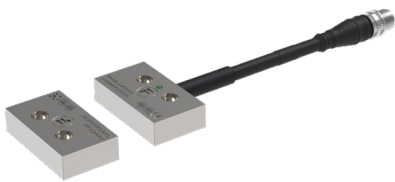
### Q. What is guard locking and when do I need to use it?

**A.** An interlock without guard locking can be opened at any time, an interlock with guard locking remains locked closed until the control system allows it to open – e.g. when the hazard has been stopped.

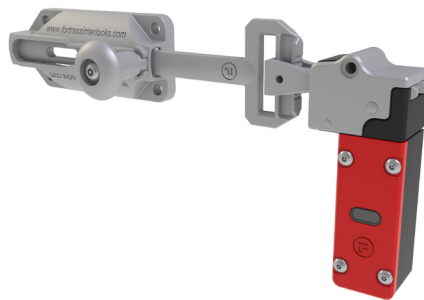
### Interlocks without Guard Locking

Without guard locking a guard can be opened at any time, the interlock must generate a stop command any time that the guard is open. The hazard must cease before it can be reached, if this is not possible with the required location of the guard then guard locking must be used.

Interlocks without guard locking come in a variety of form factors from small non-contact sensors through to robust tongue interlocks with the possibility of safety keys or methods for interlock blocking.



Stainless steel non-contact interlock



Simple guard interlock



Guard interlock with forced extraction safety key, secondary safety key and interlock blocking points

### Interlocks with Guard Locking

Guard locking on the other hand does not allow the guard to be immediately opened but holds it in the locked closed position until the hazard has ceased. The initiation of the stop may be immediate, and the locking released after the run-down time (unconditional unlocking), or it may only be initiated once the process is at a suitable point in its cycle (conditional unlocking) – this will depend on the application. As with interlocks without guard locking, the stop command must be maintained while the guard is open.

In some circumstances, guard locking may be required by the international standard on interlocks in machinery safety, ISO 14119, in order to protect people from hazards:

*“An interlocking device with guard locking shall be used when the overall system stopping performance is greater than or equal to the access time taken by a person to reach the hazard zone”*

I.e. if you are able to reach the hazard before it will be completely safe because there is a run down time (for example mixers which continue to spin after the power is removed) then the guard must be kept locked until the machine is safe.

However, guard locking may also be required to protect machinery/processes or improve productivity, for example:

- The machine could be adversely affected or damaged by stopping at some points in its cycle
- The process can only be conveniently be stopped at certain stages to avoid bad product or lengthy resets
- The process should only be stopped by authorised personnel

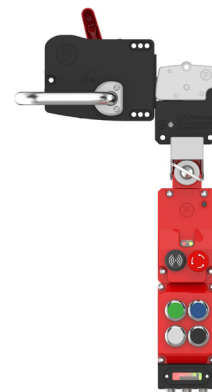
Again, there are a variety of form factors depending on the environment and application, ranging from small and discrete interlocks through to network connected, access control solutions with additional control functionality built in. The same functionality could also be achieved using a trapped key interlocking system if required.



Hygienic guard interlock with guard locking for washdown or food and beverage



Simple guard interlock with guard locking



Network connected interlock with guard locking, safety key, interlock blocking, RFID access control, escape release and additional control functionality

### Further considerations for Guard Locking:

Guard locking will introduce some further options to consider when choosing the best interlocks for an application.

**Supplementary Release of Guard Locking**

A risk assessment may require one or more methods of overriding the locking mechanism. Using one of these methods could result in a considerably longer stopping time than normal and this should be considered in the risk assessment.

*Escape release* – A means of deliberately unlocking the guard locking from the inside of the safeguarded space if someone becomes trapped inside. It is only accessible from inside the safeguarded space and initiates and maintains a stop command.

*Emergency release* – A means of deliberately unlocking the guard locking from outside the safeguarded space without auxiliary means (e.g. for rescue of persons or in the event of a fire). It must be well labelled for emergency use only and have a reset procedure that deters regular use.

*Auxiliary release* – A means of deliberately unlocking the guard locking from outside the safeguarded space that is possible only with a special tool. It must be used in exceptional circumstances only, for example in a power outage if the guard locking is power to unlock.

**Power to the locking mechanism**

*Power-to-Lock* – the locking mechanism will release in a power failure; this could result in a hazardous situation if the run-down time exceeds the access time. Therefore, this solution is not recommended for situations protecting people.

*Power-to-Unlock* – the locking mechanism will not release in a power failure, so it is the preferred solution for situations protecting people. However, an auxiliary release should be considered if access may be required when there is no power to the control system e.g. for commissioning.

**Additional Functionality**

*Proactive Inhibit Functions* – the ability to release safety keys or use interlock blocking to protect personnel in whole body access situations

*Control Functionality* – e.g. buttons and lamps or connections to stack lights or hold-to-run devices

*Access Control* – limit who is able to carry out certain functions and log events to maximise productivity

**Conclusion**

There are a variety of solutions for interlocking a guard, with or without guard locking. The right solution will depend on the application and the risk assessment, if the run-down time of the machine is longer than the time it takes to reach the hazard then guard locking will always be required. It is also important to consider the effect of anybody being able to stop a process at any time by opening the guard, consider guard locking to control the shutdown procedure to protect the process or adding access control to limit and monitor who is able to start the shutdown procedure in order to maximise productivity.

Fortress offers a wide range of customisable solutions for guard interlocks with or without guard locking for any requirement. Please contact us if you have any questions on which interlocks would suit your application.