

INDUSTRIAL SAFETY SOLUTIONS



IN PARTNERSHIP WITH





THE IMPORTANCE OF SAFETY

A serious workplace injury or death changes lives forever, for families, friends, communities, and co-workers. Human loss and suffering is immeasurable. Occupational injuries and illnesses can provoke major crises for the families in which they occur. In addition to the major financial burden, they can impose substantial time demands on other family members. Today, when many families are operating with very little free time, resources can be stretched to breaking point.

Every person that leaves for work in the morning should expect to return home at night in good health. Can you imagine the knock on the door to tell you your loved one will never be returning home? Or the phone call to say he's in the hospital and may never walk again? Ensuring that husbands return to their wives, wives to their husbands, parents to their children, and friends to their friends - that is one of the most important reasons to create a safe and healthy work environment. But it isn't the only reason.

REDUCING INJURIES REDUCES COSTS TO YOUR BUSINESS:

If a worker is injured on the job, it costs the company in lost work hours, increased insurance rates, workers compensation premiums and possible litigation. Productivity is lost when other workers have to stop work to deal with the injury. Even after the injured employee has been sent home or taken to the hospital, other employees may be distracted or need to take time off from work to deal with the aftermath of the incident. A single injury can have far-reaching and debilitating effects on your business.

SAFE WORKERS ARE LOYAL WORKERS:

Any business knows that employee debilitation and absenteeism can be major obstacles. When you create a healthy and safe workplace, you reduce those issues in several ways. By budgeting for safety improvements and making safety part of your operational plan, you engender trust. By involving employees in safety decisions, through reporting, committees, walk-throughs and meetings, you show that their opinion matters to you. By following through on their input and improving safety, you prove quite tangibly that you care about their well-being. Workers typically respond by working harder, showing more pride in their jobs and remaining loyal.

SAFETY IMPROVES QUALITY:

Time and again, companies that put safety first turn out higher quality products. In some cases, that's because a safe workplace tends to be a more efficient one, free of debris and tangles of cords. In other cases, it's a matter of focus. By working in a clean, efficient environment, workers are able to reduce distractions and truly focus on the quality of what they do. The result is better products that create customer loyalty, bigger margins and increased sales.

In these ways and others, workplace safety is about much more than legislation. It's about creating the kind of productive, efficient, happy and inspiring workplace we all want to be part of. It's about creating a highly profitable company. That's why it's important.

OUR CORE VALUES

MISSION STATEMENT

Deebar designs and manufactures highly reliable Signalling, Communication, Monitoring Devices, Safety Equipment and Bulk Material Handling Systems for use in harsh environments within the Mining, Power Generation, Automotive and Process Industries and will continually improve its technologies and service by applying creativity to all aspects of its business.

VISION

Deebar intends to continually develop the latest technology for its core client base in which it operates and strives for perfection. In doing so, it will assist in uplifting and improving the quality of life of all its employees & customers.



RELIABILITY & QUALITY

Product reliability is vital and that is what Deebar remains focused on. Centered design, manufacture and service. Along with a comprehensive range of products, Deebar guarantees the highest quality in its products and services.

At Deebar, we are committed to listen to our customers, understand their need and endeavour to deliver results that exceed their expectations. When it comes to products and service we pride ourselves on service and reliability.

Quality means more than providing a product or service, it's a way of doing business and ultimately, a way of ensuring that we satisfy our customers needs.



SAFETY & RESPONSIBILITY

At Deebar, we strive to provide a safe working environment for all our employees and to produce safety enhancing products for all our customers. Safety is a priority to Deebar, this is evident in the wide range of safety related products in our portfolio.

We also consider the broader interests of society and contribute towards the organisation "Sports For All" to create community economic empowerment in urban, semi-urban and rural communities.

The programme focuses on job creation, service delivery to communities and skills development to create a sustainable future for our youth.





MACHINE SAFEGUARDING

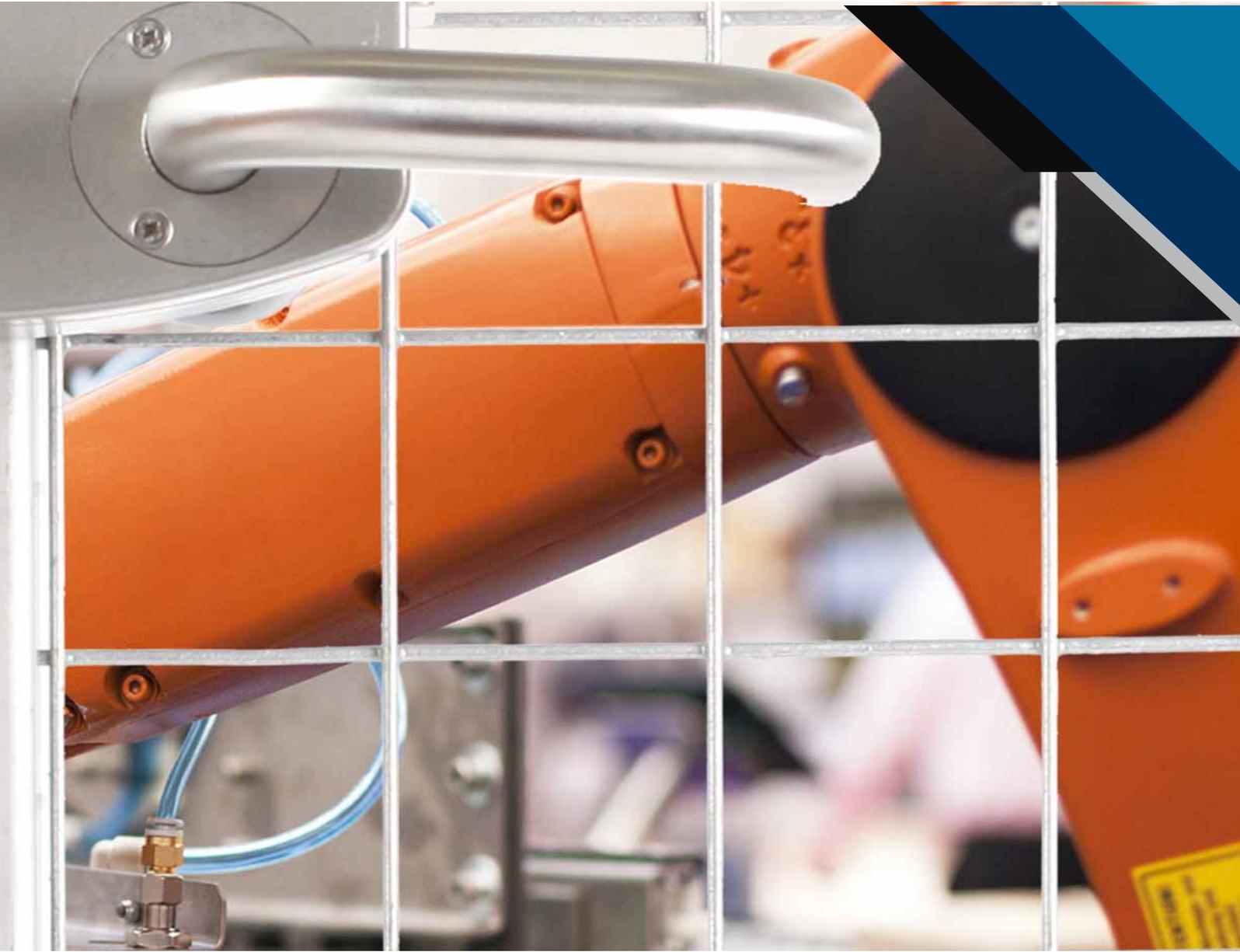
Machine guarding is a safety feature on or around manufacturing and other engineering equipment, consisting of a shield or device covering hazardous areas of a machine to prevent contact with body parts or to control hazards like chips or sparks from exiting the machine.

Machine guarding provides a means to protect humans from injury while working nearby or while operating equipment. It is often the first line of defense to protect operators from injury while working on or around industrial machinery during normal operations.

Workers who feel comfortable that their machinery is safe will be more productive and contribute more to the future of the business. With fewer injuries your business is able to meet quotas and continue to be profitable.

The type of guarding that is used in your plant can vary depending on the type of work performed. Some machines require specialized guards while others can use more standardized solutions.

Your business can become safer and more efficient through the proper use of machine guarding solutions.



PROTECTING PEOPLE, INDUSTRY AND PRODUCTIVITY

FOR ANYONE WHO NEEDS TO PROTECT PEOPLE AND MACHINERY. DEEBAR TOGETHER WITH IT'S VARIOUS RANGES OF INTERLOCKS OFFER RELIABLE, COST EFFECTIVE & CUSTOMISED SOLUTIONS.

IMPORTANCE OF **SAFEGUARDING**

Despite tighter statutory requirements for the guarding of dangerous machinery and an increased awareness for the need to design for operator safety, avoidable industrial accidents continue to occur. In virtually all cases some form of guarding was in use at the time.

This section explains how and where interlocking can be used to augment existing safety systems, and effectively protect personnel. Later sections describe in detail the use of interlocking systems in industry.

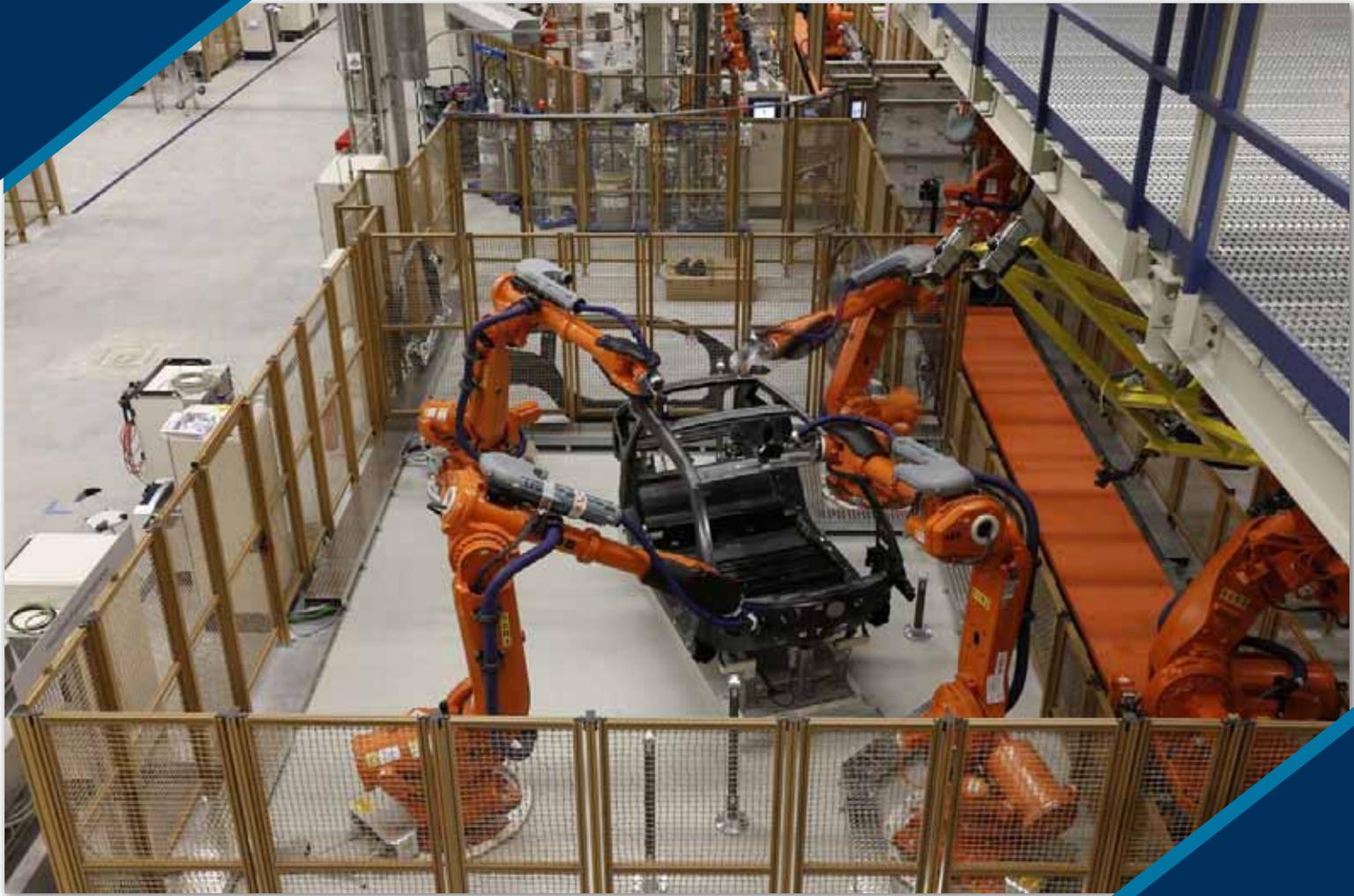
The fundamental principles on which all machine guarding is based, is the construction of a secure barrier to stop a worker being able to come into contact with a dangerous part of a machine.

However, guarding is only effective while machine operation does not require human intervention. To ensure that when workers need to access a machine they do so under safe controlled conditions, further safety measures must be provided.

Even in highly automated environments there is a frequent need for personnel to gain access to machinery. With an assembly robot, for example, in addition to the need for local programming, there are other day-to-day requirements for regular access to the area around the robot.

Maintenance, servicing, cleaning, part loading, fine tuning and in-production adjustments are just some of the circumstances under which workers must enter perimeter guarding.





As soon as a worker needs to access a machine, a new and unpredictable element enters the safety system.

It should be safe to assume that a maintenance engineer will turn a machine off before unlocking the guard and that a simple “work in progress” indicator will ensure that no one inadvertently restores power to the machine while work is being carried out. It should be possible to rely on common sense and safe working practices.

The history of industrial accidents caused by human error indicates that this is not the case.

Ignorance, forgetfulness or haste can instantly negate the most thorough safe working practice regulations.

However, guarding is only effective while machine operation does not require human intervention. To ensure that when workers need to access a machine they do so under safe controlled conditions, further safety measures must be provided.

Even in highly automated environments there is a frequent need for personnel to gain access to machinery. With an assembly robot, for example, in addition to the need for local programming, there are other day-to-day requirements for regular access to the area around the robot.

Maintenance, servicing, cleaning, part loading, fine tuning and in-production adjustments are just some of the circumstances under which workers must enter perimeter guarding.



FORTRESS

INTERLOCKS

Introduction to Fortress:

Fortress designs and manufactures customized safety equipment, protecting lives in hazardous workplaces. Our reputation is as a global provider of robust safety specifications for manufacturing environments.

Why Interlocks? Interlocking is a method of controlling two or more interdependent operations which must take place in a predetermined sequence, if necessary remotely controlled or time delayed. The need for this sequence may be safety to personnel and equipment, or it may be to control processes and productivity.

Over the last 40 years, Fortress has become well known in the industry for innovative design, robust engineering and reliability. Headquarters are in Wolverhampton (UK), with supporting offices and manufacturing facilities in the USA, Netherlands, Australia and China, further supported by a global network of trusted distributors and channel partners.

Fortress' current product portfolio includes:

mGard - The only range of mechanical interlocks independently certified to PLe

amGardpro - Heavy duty safety gate switches with connectivity and trapped key integration certified to PLe

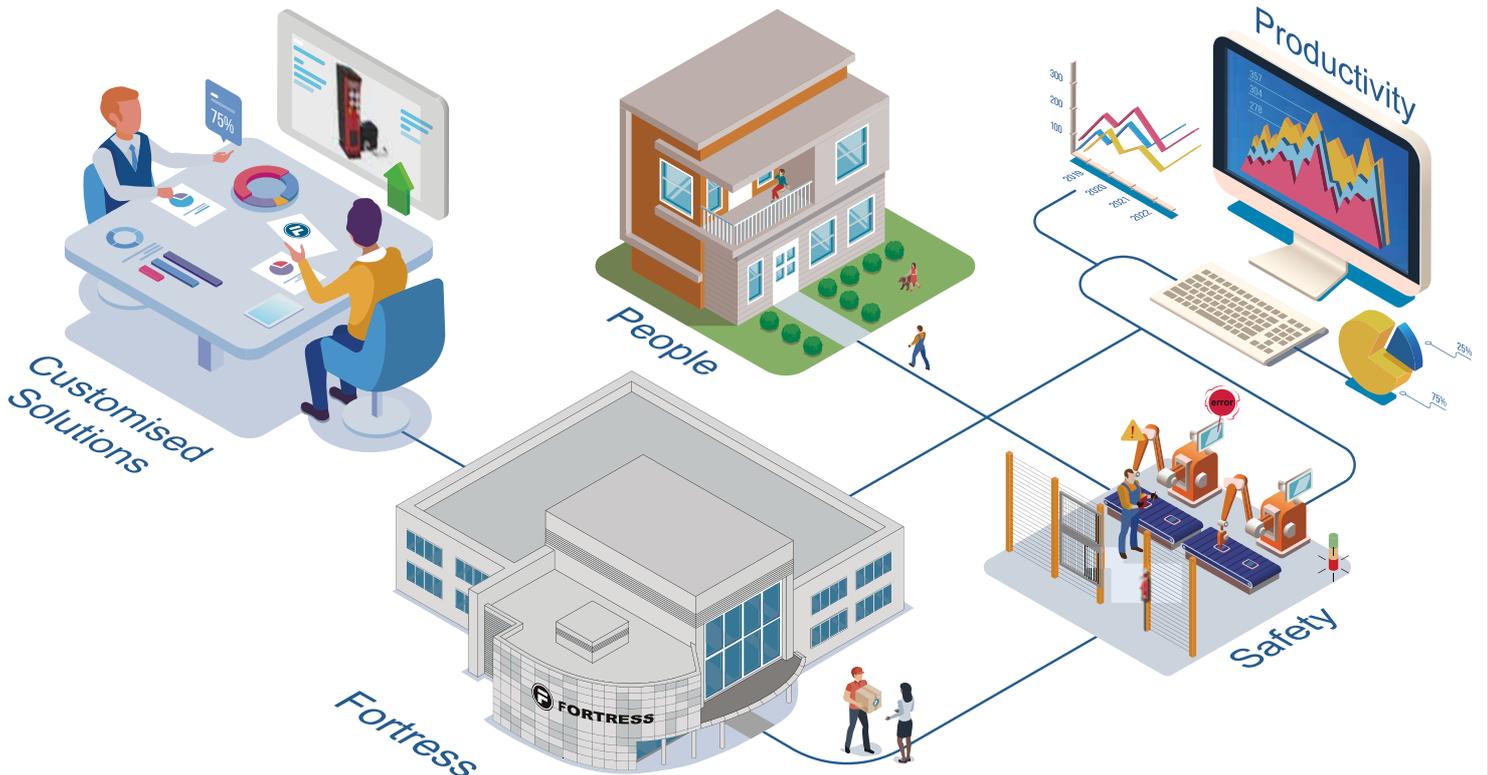
amGardS40 - Stainless steel IP69K safety gate switches independently certified to PLe

tGard - Medium duty interlocks with configurable built-in control functionality independently certified to PLd

ncGard - A range of safety switches with non-contact technology

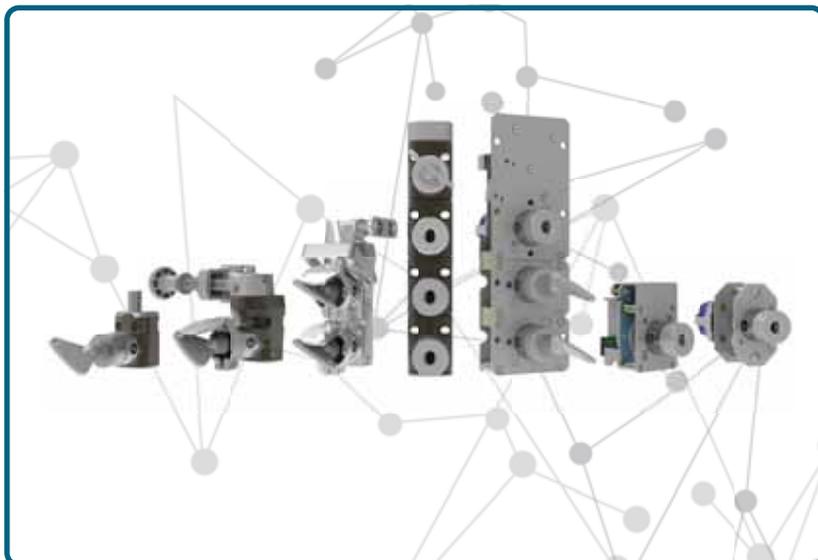


"Safeguarding Your People & Enhancing Productivity With Customised Solutions"



mGard

mGard is the premier range of modular robust trapped key interlocks for heavy duty applications. Trapped key interlocking is a tried and tested method of mechanically safeguarding dangerous machines and hazardous processes.



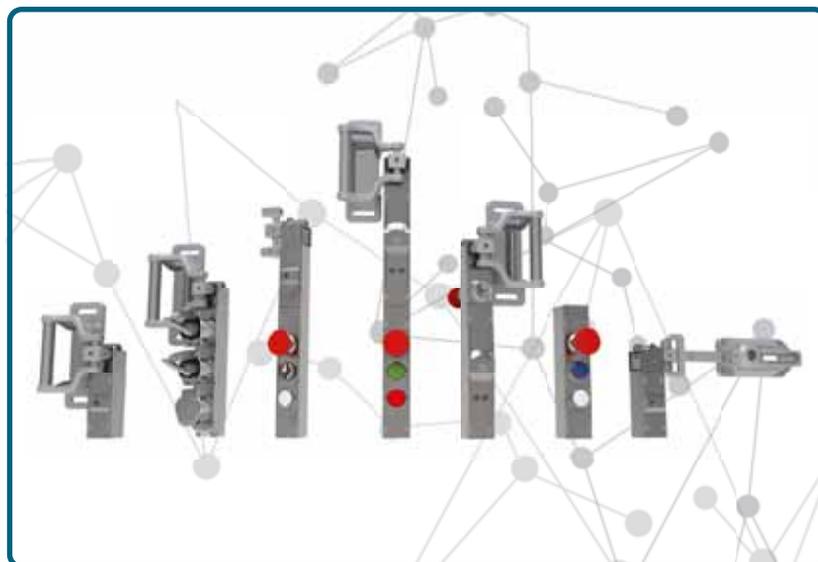
amGard_{pro}

amGardpro is the ultimate range of modular safety gate switch interlocks for heavy duty applications. Its unique modular construction allows easy configuration and provides total electro-mechanical solutions for practically any safeguarding application up to SIL3 (EN/IEC 62061), Category 4 and Ple (EN/ISO 13849-1).



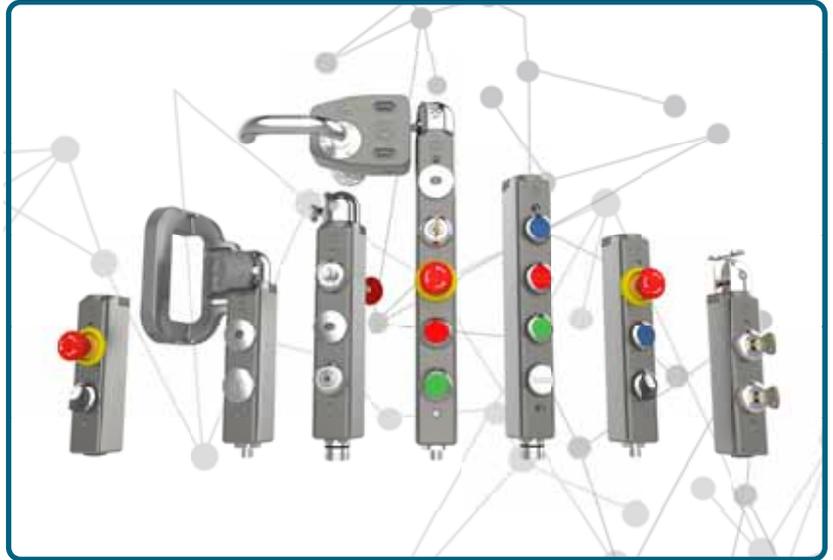
amGard_{S40}

amGardS40 is the latest range of safety interlock switches from Fortress Interlocks. Manufactured in 316 stainless steel, the range is modular in design, allowing a wide range of safety interlock switches to be configured to suit many industrial applications. The range is supplied in enclosures sealed to IP69K making it suitable to be pressure washed at high temperatures.



tGard

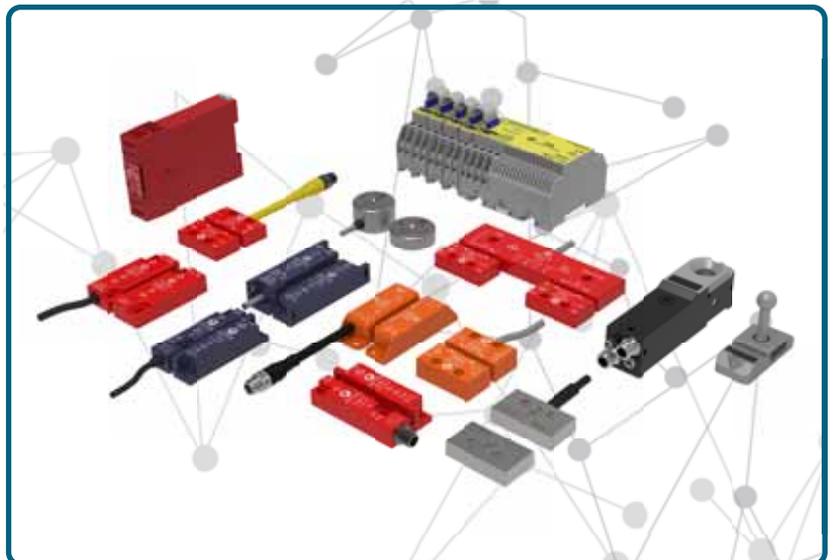
tGard is the new innovative approach to controlling access to hazardous machinery and equipment. It is a compact metal bodied system that enables the configuration of various safety products including electrical safety gate switches, mechanical trapped key interlocks, and electrical operator controls, either as separate devices or integrated into one device.



ncGard

ncGard Non-contact safety switches are ideal for use in applications where precise guidance of guards is difficult. Due to the design they are extremely long-lasting devices that require minimal maintenance. In addition they

are resistant to shock and vibrations and offer a high level of prevention against tampering.

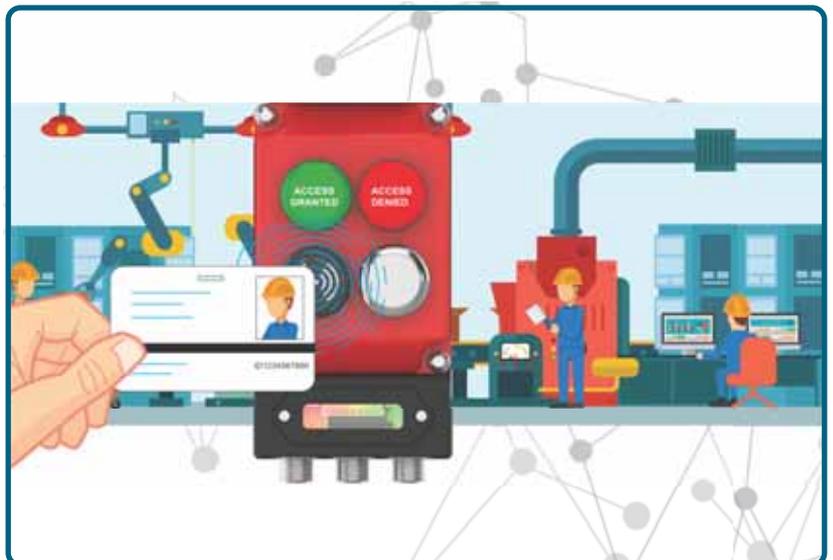


FRANK

Prevents unauthorised access and unauthorised line shut down.

Simple installation and integration to a network, using your existing ID cards.

Easy management of access permissions



Why Interlocks?

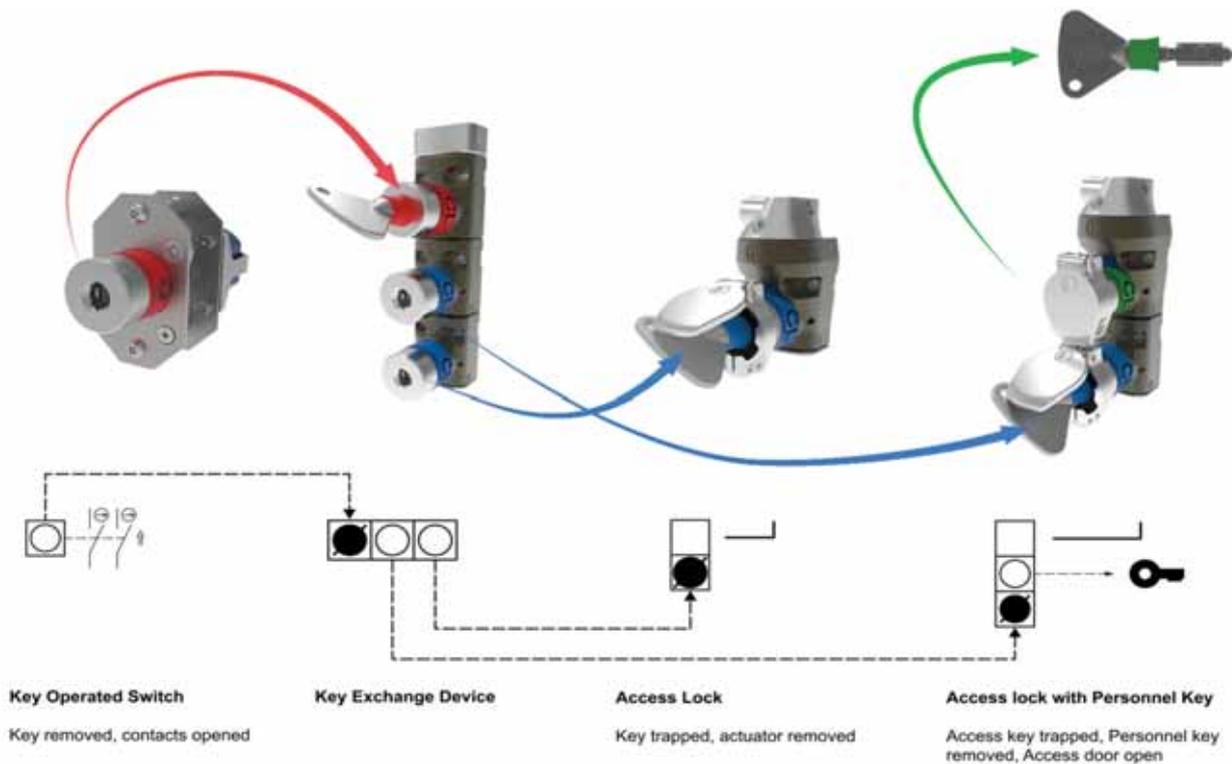
Interlocking is a method of controlling two or more interdependent operations which must take place in a predetermined sequence, if necessary remotely controlled or time delayed. The need for this sequence may be safety to personnel and equipment, or it may be to control processes and productivity.

For Reference-

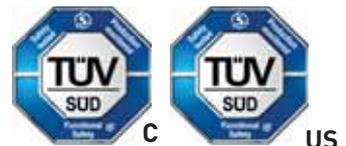
- ISO 14119 is the interlocking standard that forms part of the machinery directive.
- ISO/TS 19837:2018 is the technical specification relevant to trapped key interlocking.

Why Mechanical?

- One power isolator can be used for multiple doors through the use of a key exchange unit.
- This reduces any fault masking risks and wiring installation required.
- In addition mechanical interlocking is the only method of safeguarding solutions for multiple energy sources.
- Personnel keys can be used to prevent unexpected start up of machinery as per ISO 14118, removing the necessity for escape functions.



mGard is the only range of trapped key interlocks 3rd party approved as being capable of meeting PLe and is perfect for heavy duty applications. Fortress' mGard is suitable for use up to SIL3 (EN/IEC 62061), Category 4 and PLe (EN/ISO 13849-1).



Trapped key interlocking is a tried and tested method of mechanically safeguarding dangerous machines and hazardous processes. Mechanical keys eliminate most of the electrical wiring associated with other types of interlocks making it cost effective to install and maintain.



amGardpro is the ultimate range of modular safety gate interlocks for heavy duty applications with a retention force of 10,000N. Its unique modular construction allows easy configuration; providing electro-mechanical solutions for practically any safeguarding application up to SIL3 (EN/IEC 62061), Category 4 and PLe (EN/ISO 13849-1).

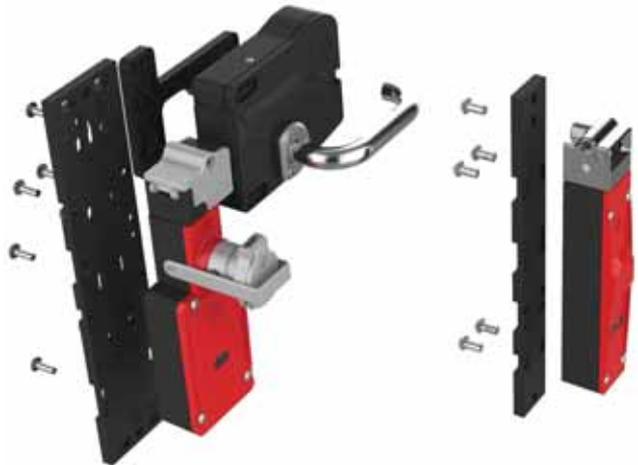
proNet is an addition to the amGardpro range that adds an Ethernet based networking capability.

Slimline pro houses the solenoid locking functionality in a body just 40mm wide.



FRANK is the integration of existing site RFID access cards as part of a software based access approval system for manufacturing areas. Data is collected in the Fortress system for data insights that can support efficiency analysis.

Mounting Plates ensure most of our configured amGardpro safety gate interlocks can be easily and simply fitted to machine guarding. The units arrive pre-fitted when the mounting plate and/or actuator plate suffix 'MPB1' is added to the configured part number.



Mechanical Life
1,000,000 Cycles

External Certifications
CAT.4 PLe

Robustness
10kN Retention Force

Customisable

Networking Capability
EtherNet/IP
PROFINET
CANopen

Quick Disconnect options

Environmental Resistance
Sealed to IP65 & IP67

DUST WATER

RFID Access Control
FRANK

amGardS40 Stainless Steel Modular Gate Switches

amGardS40 is the latest range of safety interlock switches from Fortress Interlocks. Manufactured in 316 stainless steel, the range is modular in design, allowing a wide range of safety interlock switches to be configured to suit many industrial applications. The choice of configurations include:

- Solenoid Locking Safety Switches
- Solenoid Locking Safety Switches with internal release
- Solenoid Locking Safety Switches with “safety keys” (for personal protection)
- Solenoid Locking Safety Switches with machines control
- Non Solenoid Tongue Switches
- Non Solenoid Tongue Switches with machine control
- Mechanical Trapped Key Interlocks
- Machine Control Stations

The range is supplied in enclosures sealed to IP69K making it suitable to be pressure washed at high temperatures and has a retention force of 10,000N (greatest on the market) so it is ideal for ensuring guard doors are held closed until machines and/or processes are in safe condition. Each module has a slim body design of 40mm so that it can be easily fitted to 50mm guarding sections or areas where space is limited.

The rugged design and strength capability makes the S40 range an ideal choice for applications in the Food & Beverage, Pharmaceutical, Chemical and Construction Materials industries.

The graphic below shows the modules currently available in the range.

amGard S40 Range						
	S40 Slidebar	S40 Hinged Handle	SS40 Tongue Actuator		S40 Cap	S40 Slimline Head
Actuators				Head Modules		
Adaptors	S40 IR Adaptor 	S40 E Adaptor 	S40 Lock Adaptor 			
Electrical Switching / Locking	S40 Stop 	S40 Lok 	S40 Foot 			
Option Pod	S40 Option Pod 					

tGard is a compact metal bodied system that enables the configuration of various safety products including electrical safety gate switches (with or without guard locking), mechanical trapped key interlocks, and electrical operator controls either as separate devices or any combination of these three functions in one unit.

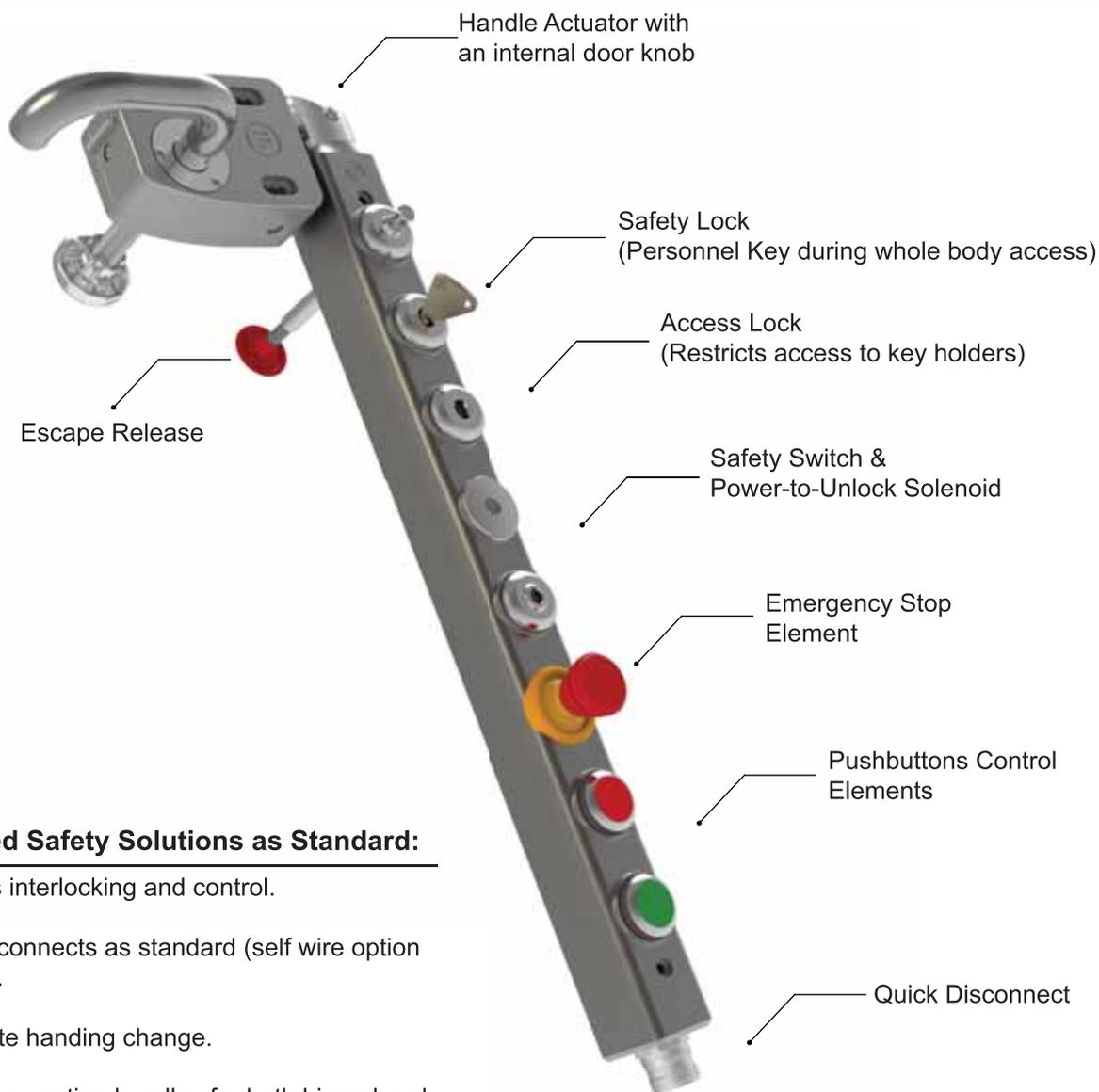
tGard offers “a customised safety solution, as standard”. Each order is defined by a range of tGard elements that include selector switches, safety switches (solenoid and non-solenoid), personnel keys, emergency release, pushbuttons, E-Stops, indicator lamps and a choice of operating handles for both hinged and sliding guard doors.

tGard’s metal body includes through-holes for quick installation on aluminium profiles, flat surfaces, doors and even back of panels without the need for mounting plates.

It is IP65 as standard and has been designed to be fully compliant with the machinery safety standards.



tGard Configuration Example



Customised Safety Solutions as Standard:

- Combines interlocking and control.
- Quick Disconnects as standard (self wire option available).
- Fast on site handing change.
- Choice of operating handles for both hinged and sliding guard doors.

MAGNETIC SAFETY SWITCHES

- Non-Contact Operation
- IP67 Fully Sealed, Washdown
- ABS 2A Switching Capability
- Large Range of Sizes

The FMF range are magnetically operated safety switches.

Easy to install and maintain, the FMF are fully encapsulated non-contact switches ideal for long term use in harsh / wet environment.



CODED MAGNETIC SAFETY SWITCHES

- Non-Contact Operation
- Solid State Coded Magnetic
- IP67 Fully Sealed, Washdown
- ABS or Stainless Steel
- Dual Colour LED Indication

Fortress FE range are magnetically coded, solid state non-contact safety switches for use in machine guarding applications.

The solid state design is even more tolerant to shock and vibration making for a more reliable machine.



INDIVIDUALLY CODED OR ONE GENERIC CODE

- Non-Contact Operation
- Volt Free Contacts (Not OSSD)
- LED Guard Indication
- IP67 / IP69K Fully Sealed
- RFID Technology

Based on RFID technology, the FR and FS type switches are designed to provide a higher level of security when machine guarding. Unlike the competition, the FR and FS safety switches feature volt free contacts making them compatible with most safety relays on the market.

These switches also feature LED guard indication, an ingress protection rating of IP69K and multiple housings to suit most applications.



Orange: Individually Coded



Blue: One Generic Code

SAFETY RELAYS

FEM1

- Category 4 SIL3 PL-e Expandable Safety Relay
- Monitors up to 30 2 N/C Safety Devices
- Guard Fault Indication
- Eliminate Fault Masking
- Volt Free Indication Contacts

FRL1

- Industry Standard Safety Relay
- 24V AC/SC Supply
- Dual Channel Output
- Automatic / Manual-Monitored Reset
- 2 N/C Safety Output / 1 N/C Aux Output



The FEM1 is designed to operate and monitor any device with normally closed outputs. Using the FEX1 extender module, you can monitor up to 30 individual inputs. This product is ideal for anyone looking to eliminate fault masking and achieve a CAT4 SIL3 PL-e safety rating.



BENEDICT

GMBH

telux



BENEDICT produces Low Voltage Switchgear that distinguish themselves from their competitors through their special features. Decades of experience in Research and Development are the basis for the excellent reliability of the Contactors, Thermal Overload Relays, Motor Starters, Motor Circuit Breakers, Load Disconnectors, Cam Switches, Push Buttons and Pilot Lights.

From a single product to a complete application solution, the Benedict range fully addresses the demands of factory automation and control environments. Benedict's extensive product range offers everything to meet the needs of today's OEMs, panel builders and end users.



With humble beginnings in the early 1920's, Benedict & Jäger has been a trusted brand globally for nearly 100 years. Low voltage control gear is what we do. We invite you to give us a call to discuss your requirements.

THE BETTER CONTACT, RELIABLE AND SAFE

LOW VOLTAGE SWITCHGEAR

From a single product to a complete application solution, the Benedict range fully addresses the demands of factory automation and control environments. Benedict extensive product range offers everything to meet the needs of today's OEMs, panel builders and end users.

TELUX ROTARY CAM SWITCHES



Telux switches, offer endless possibilities for custom rotary cam switches. From simple on-off switches, to complex custom multi-step switches, we can help build the perfect switch for your application.

An effectively limitless number of configurations including the typical.

Change Over Switches, Star Delta Switches, Isolator Switches, Motor Control Switches, Multi Step Switches and On/Off Switches.

Advantages:

- Drive shaft made of solid aluminium.
- Customized versions promptly available.
- Assembled locally avoiding delays.

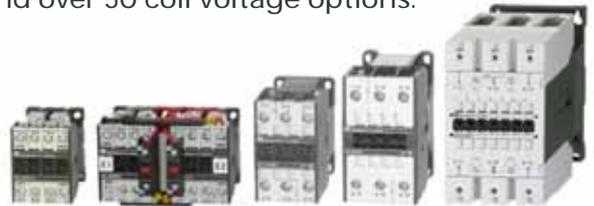
PUSH BUTTONS & PILOT LIGHTS

Benedict offers a broad selection of pushbuttons, selector switches and signal lamps in both 22mm and 30mm. Variations include illuminated actuators, emergency stop buttons and monoblock LED's, but the options are endless.



CONTACTORS

Benedict contactors are engineered to operate under the toughest conditions including heat, cold, dust, sand, high humidity and shock. Our compact, IEC style contactors offer maximum performance with a minimal footprint. With UL ratings from 5A to 1215A (covering up to 900 hp) and over 50 coil voltage options.



AC MAIN & DISCONNECT SWITCHES

Where highest safety and current carrying capacity are required, Main Switches and Disconnect Switches by Benedict come into use. Compact designs and box terminals for large cable cross-sections guarantee versatile applications.





VALVE INTERLOCKS

Valve Interlocks Overview

Protection



Valves play an important role in many industrial production lines and energy networks and perform essential functions regarding safety and process control systems. The correct setting and operation of valves is crucial for ensuring the operational safety of entire installations.

Valve interlock systems provide a fail-safe system for the controlled opening and closing of valves. They are used whenever a specific opening and closing sequence for several valves is involved for the purpose of accident prevention, protection of materials, or guaranteeing process safety.



Valve interlocks from Haake Technik are made of AISI316 stainless steel. Lever operated ball, plug and butterfly valves, gate and globe valves, shut-off and slide valves, and gear box operated valves. All possible sizes and dimensions can be accommodated by using standard and customer specific adaptors. The HSV range of Interlocks can also be retrofitted.

One unique feature of the Haake Technik range of interlocks is that the customer also has the possibility to combine the valve interlocks with the Haake Technik HST range door interlocks.

Keys

The valve interlocks as well as the keys are made of stainless steel. Individual coding guarantees the highest level of safety. It is not possible to have copies made of the keys (as can be done with simple padlock keys), due to the unique design and coding of each key.



The coded keys have been designed with ergonomics in mind and offer ease of use due to their shape, even when wearing heavy-duty safety gloves.

There is no up or down position of the key. The coded keys can therefore be inserted into the lock from either direction. Inserting a key by just a few millimeters into the lock is sufficient to know that there is a correct match of key and lock.

Coloured tagging makes it easy to match the keys within the corresponding interlocks. Up to four lines of text are available for customer-specific engravings.

Valve Interlocks

HSV-Q valve interlocks are utilised for lever-actuated valves such as ball valves, shut-off valves and plug valves. All types of valves that operate with a 90° or 180° rotation can be fitted with HSV-Q valve interlocks.

Standard delivery includes stainless steel lever that is available in different lengths. The interlock can be perfectly aligned at different positions on the valve to guarantee optimal access to the key slots.

Valves that are already in operation can also be fitted retrospectively with HSV-Q valve interlocks without damaging or changing the valve fittings or seals.

During the installation of the HSV-Q, the valve body remains unchanged; the existing lever is replaced as part of the valve interlock assembly includes a replacement lever which corresponds to the size of the original lever. The valve interlock can be supplied with either one or two operating keys depending on the type of system control required.



HSV-R valve interlocks are utilized for valves actuated by handwheels such as slide valves, gate valves, or gearbox operated valves. The number of rotations required for opening or closing varies depending on the type of valve. For this reason, the HSV-R valve interlocks are equipped with a count-release mechanism that adapts the locking action to the number of rotations required for the corresponding final position. In this way, any valve position can be set as the locked open or closed position.

The valve interlock assembly includes a replacement hand wheel that corresponds to the size of the original hand wheel. The valve interlock can be supplied with either one or two operating keys depending on the type of system control required.



The Continuous Closing feature (patent pending) enables a further rotation of the handwheel to the closed position without the need to insert the close key. This feature is crucial if the valve is leaking and the close key is trapped in another valve.

HSV-AT anti-tamper locks protect against unauthorised actuation of valves, vandalism or theft. This type of technology is currently used in petrochemical, gas and water treatment plants around the world.

A mechanism in the body of the lock ensures that the lock rotates freely around the internal drive spindle of the body. No force is transferred to the spindle in this state and the valve cannot be operated. The coded key has to be inserted to engage the drive spindle and hence to open or close the valve.

HSV-AT anti-tamper locks are suitable for any type of valve (ball, butterfly, gate, globe, gearbox driven, slide valves etc) and come equipped with either a lever or a hand wheel.





Castell

Trapped key interlocking ensures that a process is followed and cannot be circumvented or short cut. The transfer of a key ensures that wherever personnel find themselves, in either starting or shutting down operations, they can be assured that they are safe. There are three simple steps in using trapped key components in an integrated safety system, what is being isolated, how many access points are there and what type of access is required. A key is used to start the process and remains trapped whilst the machine is running. The only way to remove the key is to isolate the hazard. This key is then used to gain access to the dangerous area and remains trapped in position while the gate or door is opened. The key can only be removed when the gate or door has been shut. In this way the key is either trapped when the machine is running and access cannot be gained, or the key is trapped while access is gained and the machine cannot be started.

The three points of trapped key interlocking

- 1** Isolation
- 2** Key Exchange
- 3** Access Control



Designing interlock components into an integrated safety system

To design interlock components into an integrated safety system there are a number of key questions that need to be addressed.

- What is the operational flow to start and stop equipment?
- What is being isolated?
- Is there more than one system that needs to be isolated to make access safe?
- Is there a time delay required for safe access?
- How many access points are there?
- What is the type of access? Full body or part body?
- Severity of the possible injuries?
- What is the possibility of avoiding the hazard?
- What is the nature of the hazard?
- What energy sources are present?
- What is the operating environment?
- Use risk assessments as a guide to how the integrated safety system functions.

Today's production environment is very demanding. Pressures on supply chain efficiency and output are major considerations when developing manufacturing systems, Castell's approach to delivering solutions for machine guarding applications is to ensure that fast safe access can be gained. This means that efficiency is maintained whilst safety is not compromised.

Through this approach and the design of innovation products Castell's systems can be found in a vast range of applications across the globe. Working closely with industry Castell has ensured that products are available with the correct specifications, such as materials and finishes, to ensure a reliable operation for the environment.



Some of the areas where Castell products can be found are:



- Food and Beverage
- Aggregates and Mining
- Pharmaceutical and Chemical
- Paper, Pulp and Wood
- Steel, Aluminum and Precious Metal
- Automotive and Electronics
- Water and Recycling

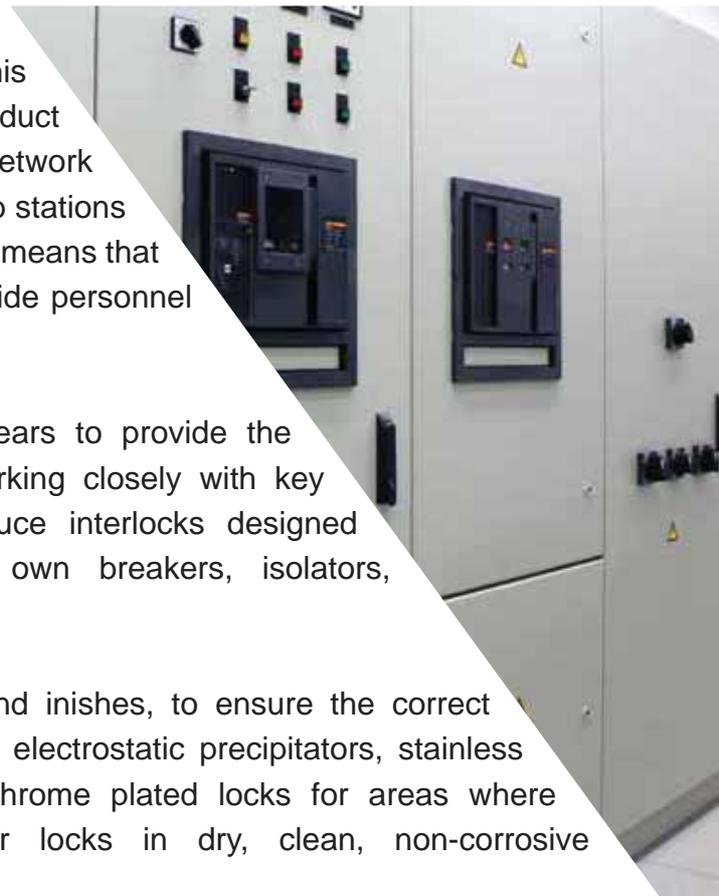
Typical application areas:

Robot cells | Conveyors | Palletizers | Gas Turbines | Freezer Rooms | Automated Warehouse | Power Press | Spray Booths
Industrial Mixers | Pressure Vessels | Recycling | Rotating Machinery | Mixers and Blenders | Crushers | Bottling | Packaging

The original Castell interlock concept dates from 1922 and was developed for the electrical switchgear industry. This remains today a very important part of the Castell product portfolio. Castell delivers solutions across the electrical network from power stations to transmission equipment and from sub stations to incomer rooms. The ability to work across HV, MV and LV means that a Castell system can be used as a single solution to provide personnel safety and ensure equipment is used in the correct mode.

Our range of products has been developed over 90 years to provide the industry with interlocks of high quality and integrity. Working closely with key switchgear manufacturers has enabled Castell to produce interlocks designed specifically for use on the leading manufacturers own breakers, isolators, disconnectors and earth mechanisms.

Castell products are available in a range of materials and finishes, to ensure the correct specification interlocks. High temperature locks for use on electrostatic precipitators, stainless steel and weatherproof locks for use in sub-stations, chrome plated locks for areas where aesthetics are important and brass as standard for locks in dry, clean, non-corrosive environments.



Castell products are used in the following areas:



- Wind Turbine Isolation & Earthing
- Rail Electrification Systems
- Electrostatic Precipitators
- UPS Systems
- LV Distribution & Busbar Systems
- HV Transmission & Distribution Sub Stations
- Transformer Isolation & Earthing Systems

SwitchgearCastell has developed products to suit the following companies' equipment:
ABB | Alstom | Terasaki | Schneider Electric | Siemens | Hawker Siddeley | George Ellison

Product Overview

Isolation

Power Isolation



Control Switching



Motion Sensing



Solenoid Controlled Switching



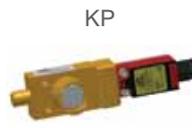
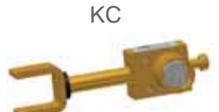
Time Delay Interlocking



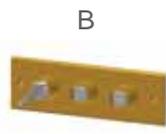
Valve Interlocking



Mechanical Isolation



Key Exchange Boxes



Part Body Access



Full Body Access



Key Exchange

Access Control



Salvo™

Efficient & Safe Loading



Salvo Efficient & Safe Loading

Salvo prevents the accidental drive-away of a vehicle during loading or unloading of goods at a loading bay.

The Salvo links the articulated trailer to the loading bay door during the loading or unloading of goods.

The Salvo comprises of two sections:

- The lock that controls the movement of the articulated trailer Salvo Susie
- The lock that controls the opening of the loading bay door SCP+

Additionally, a data gathering and analysis software can be added to the system - Salvo DockMonitor.

The Salvo Susie is fitted to the emergency air line coupling when the trailer has been reversed into position at the bay. After successful fitment, a Salvo coded key is released from the Salvo Susie, locking the unit firmly onto the coupling. The coded Salvo key can only be released once the Salvo Susie has been fitted to the brake coupling. The coded Salvo key is then taken to the corresponding loading bay door and used to open the door.

The secret of the Salvo system is that only one Salvo key exists per bay, thus ensuring that the door can only be opened ONCE the trailer has been secured in place. To ensure the integrity of the system, each bay will have a different code.

Salvo Susie 2 3 4

The Salvo Susie is a key operated mechanical lock designed to fit on to all UK trailer, emergency brake line connectors. Its purpose is to prevent re-connection of the air brake hose, thereby immobilising the trailer. When fitted, the Salvo Susie can only be removed with the permit Salvo key.

Salvo Control Panel 5

The Salvo Control Panel (SCP+) is the main interface between the Salvo couplings and associated bay door controls. The SCP+ comprises of a wall mounted panel with easy to use Castell interlock key switch to allow operation of the bay. There is also panel indication to indication status and operation. Installation is via plug in terminals on the inside door of the panel. 6 When bay door is open, the Salvo key is trapped in the SCP+.

Salvo Wireless DockMonitor 7

Wireless technology now removes the expensive and cumbersome fit of hard wiring.

Using the latest wireless technology, Salvo Wireless DockMonitor can measure, display and record data that will enable you to access and monitor live bay usage information. This enables you to spot and implement efficiencies in your business avoiding the unnecessary costs associated with expansion or additional resources.



The driver reverses the vehicle onto the loading bay as normal.



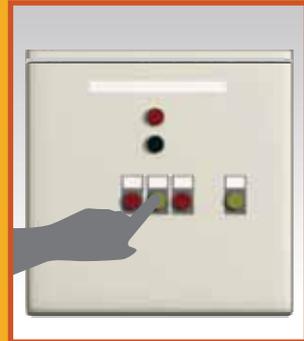
The Salvo Susie is collected from the storage area. (Usually located next to the bay area.)



The Salvo Susie is then taken to the brake line coupling end of the trailer.



Salvo Wireless DockMonitor



The Salvo Susie is placed over the emergency airline coupling releasing the trapped Salvo key and locking the Salvo Susie on. The trailer brakes are locked on. The Salvo key is then taken back to the Salvo Control Panel (SCP+) at the loading bay.

When the Salvo key is inserted and turned in the Salvo Control Panel (SCP+) the loading bay becomes energised (with no key inserted the bay door will not open).

The loader can now operate the loading bay door and dock leveller. When the bay door is open the Salvo key is trapped in the Salvo Control Panel (SCP+).

TECHNICAL INFORMATION OVERVIEW

Pressure Equivalent Table

P.S.I	bar	kPa		
1	0.06	6.89		
5	0.34	34.48	1kPa	= 0.01 bar
10	0.68	68.96	1MPa	= 10.00 bar
20	1.37	137.93	1kg/cm ²	= 1.00 atm
30	2.06	206.89		
50	3.44	344.82	1PS.I	= 6.895 kPa
75	5.17	517.24	1kPa	= 0.145 PS.I
100	6.89	689.65	1kg/cm ²	= 14.223 PS.I
125	8.62	862		
150	10.34	1034		
175	12.06	1206		
200	13.79	1379		
250	17.24	1724		
300	20.68	2068		

Cable Ratings

3 & 4 Core Copper PVC/SWA/PVC 600/100V Cables - SABS 1507/1990

Cable Size	PROPERTIES				Gland Size		
	Current Ratings		Volt Drop		3 Core	4 Core	5 Core
(mm ²)	Ground A	Ducts A	Air A	(mV/A/m)			
1.5	23	18	18	25.080	0	0	0
2.5	30	24	24	15.363	0	0/1	2
4	38	31	32	9.561	1	1	2
6	48	39	40	6.391	1	2	3
10	64	52	54	3.793	2	2	
16	82	67	72	2.390	2	2/3	
25	126	101	113	1.515	3	3	
35	147	120	136	1.097	3	3/4	
50	176	144	167	0.817	4	4	
70	215	175	207	0.576	4	4/5	
95	257	210	253	0.427	4/5	5	
120	292	239	293	0.348	5	5/6	
150	328	369	336	0.294	5	6	
185	369	303	384	0.250	6	6	
240	422	348	447	0.211	6	7	
300	472	397	509	0.189	6/7	7	

Utilization Categories IEC 947-4-1

Category	A.C. Contractors / Relays	Category	A.C. Switches / Isolators
AC-1	Non-inductive or slightly inductive loads, resistance furnaces	AC-20	Connecting and disconnecting under no-load conditions
AC-2	Slip-ring motors: Starting, plugging	AC-21	Switching of resistive loads including moderate overloads
AC-3	Squirrel-cage motors: Starting, switching off motors during running	AC-22	Switching of mixed resistive and inductive loads including moderate overloads
AC-4	Squirrel-cage motors: Starting, plugging, inching	AC-23	Switching of motor loads or other highly inductive loads
AC-11	Electromagnets for contractors, valves, solenoid actuators		

IP Rating for Enclosures

1st Digit	Protection from Solid Objects	2nd Digit	Protection from Moisture
0	No Protection	0	No Protection
1	Protected against Solid objects larger thanØ 50mm	1	Protected against Dripping Water
2	Protected against Solid objects larger thanØ 12mm	2	Protected against Dripping Water when tilted up to 15°
3	Protected against Solid objects larger thanØ 2.5mm	3	Protected against Spraying Water
4	Protected against Solid objects larger thanØ 1mm	4	Protected against Splashing Water
5	Protected against Dust	5	Protected against Water Jets
6	Dust Tight (Total Protection)	6	Protected against Heavy Seas / Powerful Water Jet
EXAMPLE		7	Protected against Temporary Immersion
Protection against dust		8	Protected against Continuous Submersion
			



Branches

- Johannesburg
- Rustenburg
- Northwest



Distributors

- Kuruman (Voltex)
- Port Elizabeth (Rubicon)
- Richard's Bay (Magnet)
- Steelpoort / Kathu (Electro Diesel)
- Welkom (Welkom Winder Services)
- Zambia (Botech)



DEEBAR[®] (Pty) Ltd
ELECTRICAL & MECHANICAL ENGINEERING

"ENSURING YOUR SAFETY"

JOHANNESBURG

P.O. Box 40325
Cleveland 2022
Gauteng
South Africa
15 Main Reef Road
Primrose Ext.1
Germiston 1401

Tel: (011) 873 - 4332/3/4/5
(011) 825 - 5045/6
Fax: (011) 825 6984
E-Mail: sales@deebar.co.za
Web Page: www.deebar.co.za

RUSTENBURG

11 ACBO Industrial Park
Rustenburg 0299

Tel: (014) 596 - 5141/6734
Fax: (014) 596 - 5898
E-Mail: rust@deebar.co.za

NORTH WEST

25 Neethling Street
Stilfontein 2551

Tel: (018) 484 - 1864/5
Fax: (018) 484 - 1869
E-Mail: northwest@deebar.co.za

www.deebar.co.za