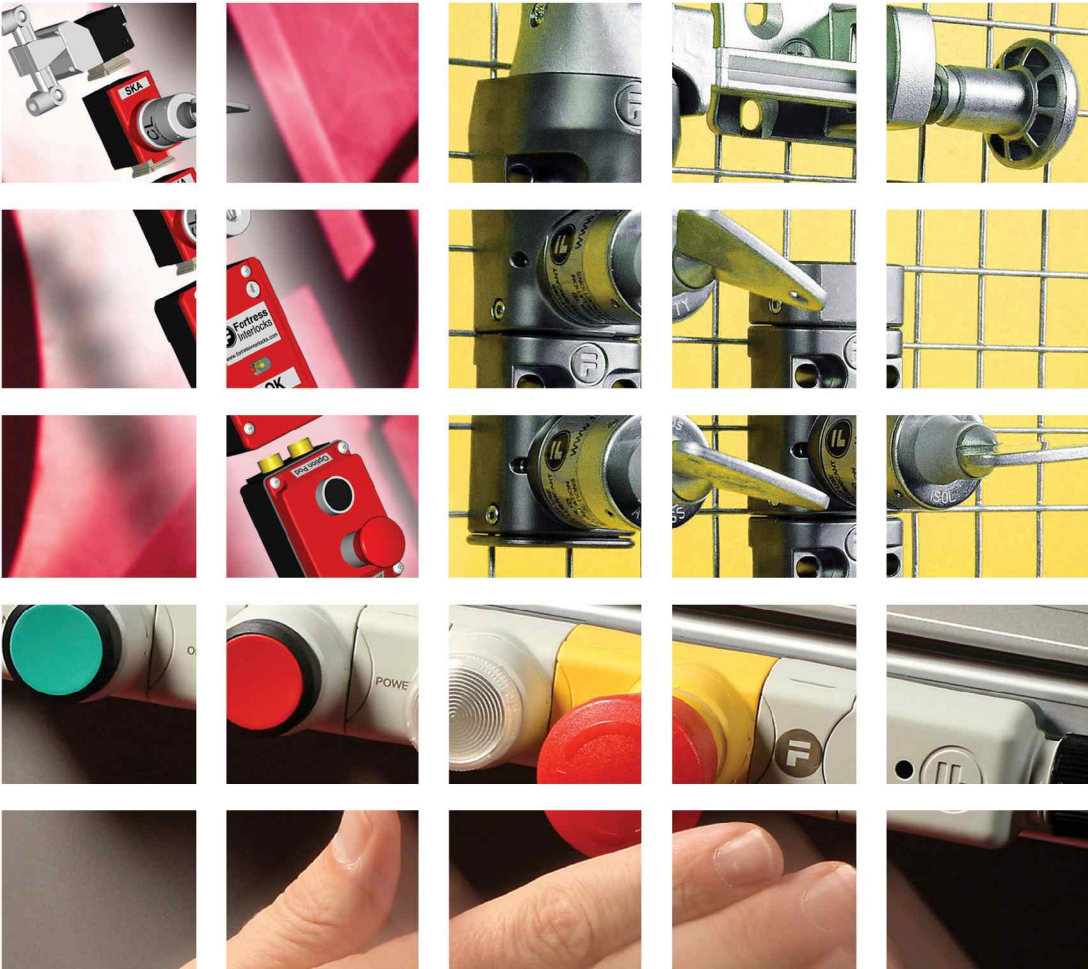# Fortress Interlocks

PROAX TECHNOLOGIES

Visit our website

m Gard — Trapped Key Technology

am Gard — Safety Gate Switch Interlocks

e Gard — Total Access & Control

Product Catalogue

Total Access & Control

"Who we are"

A market leader, Fortress Interlocks design and manufacture safety access & control systems. Fortress offer an unrivalled portfolio suitable for applications across a wide industrial base from power generation and distribution, steel, automotive, recycling, building materials, through safeguarding robots and palletisers.

With in excess of 40 years experience in the safety market, Fortress are renown for their innovative design, robust engineering and reliability.

"What we do"

Fortress help customers protect their human and capital assets. We create safe workplaces where employees are safeguarded from injury and plant is protected from damage.

We are world leaders in access control systems, and our products guarantee that actions and events are undertaken in a pre-determined sequence ensuring a safe working environment.

"Total Access & Control"

With the introduction of **eGard**, Fortress can provide "Total Access & Control", from cost effective general duty access interlocks and simple automation control systems (**eGard**), to the most robust trapped key interlocks (**mGard**) or safety gate switches (**amGard**).

"Why choose Fortress"

Fortress are a solution provider and our extensive product offering and interlocking experience allows us to provide unique solutions for all safeguarding applications. We regularly create bespoke solutions, often by customising our standard products.

Fortress Interlocks
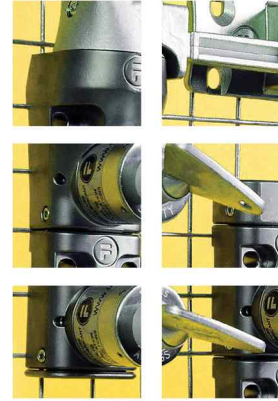## The Global Supplier of Total Access and Control Safety Systems.

NB Our brochure is designed to give an overview of our brand portfolio. For detailed technical information including 2D autocad file downloads, 3D animated product views and specific application information, visit our web site www.fortressinterlocks.com.

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, and is suitable for use up to SIL3 (EN/IEC 62061) Category 4 and PLe (EN/ISO 13849-1).

It is called "Trapped Key" as it works by releasing and trapping keys in a predetermined sequence. After the control or power has been isolated, a key is released that can be used to grant access to individual or multiple doors.

The principles of trapped key technology apply to all industries where it is essential that all energy sources are isolated before gaining access to machinery. Almost all safety issues can simply be solved by selecting the required products in order of the steps shown on this page.

Power/Control Isolation

SE-CLIN-A02022

Identify the energy sources to be isolated and/or any hazard that cannot immediately be isolated such as; heat, pressure, radiation or machine rundown time

Power isolation
- Mechanical Bolt Interlock
- Bolt Interlock with Limit Switch
- Bolt Interlock with Switch
- Breaker Locks

Control isolation
- Key Switches
- Solenoid Controlled Key Switch
- ATEX Key Switch
- ATEX Solenoid Controlled Key Switch
- Solenoid Controlled Key Switch Unit
- Electronic Time Delay Unit
- Voltage Sensing Unit
- Knob and Key Operated Switch Control Unit

Key Exchange

XM4-MLIN

Identify the type and number of access points.

- Key Exchange Units
- Key Exchange Units with Switch

Because of the modular arrangement of **mGard** both key exchange and door lock units can easily be extended with an *extension module (XMA),* for instance when doors are added to the safeguarded area or machine.

The Fortress Trapped Key System allows the safeguarding of potentially hazardous areas without the need for wiring.

All Fortress Interlocks rotary switches have European, Canadian, Chinese and North American approvals.

Door Locks & Actuators

Personal Safety Key

DM2-MLIS-S

Identify the type of access point; part body or full body access doors with or without the use of personal safety keys (to prevent accidental lock in).

- Single Door Interlocks
- Multiple Door Interlocks

- Fixed actuator
- Handle operated actuator
- Spring loaded handle operated actuator
- Self aligning actuator
- Compressible actuator

For dimensional drawings please use the Datasheets/Installation Manuals at **www.fortressinterlocks.com**

mGard Application Example I (safeguarding without rundown time)

By using a trapped key system, this mixer is safeguarded in a pre-determined sequence without the need for wiring. **mGard** products are very robust and ideal for use in harsh conditions, such as heat, vibration, dust and moisture.

1 BM1-CLIN
First the isolation switch is operated into a safe condition. Only in this "off" position it is possible to shoot the bolt of the BM1 bolt-lock to isolate the switch and release the key.
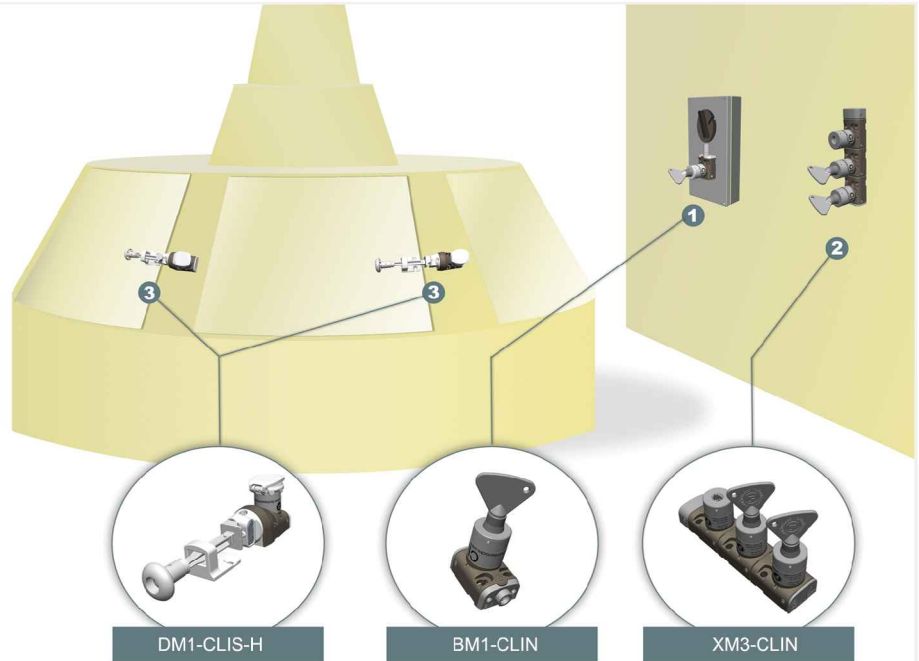
2 XM3-CLIN
The isolation key can now be inserted into the XM3 key exchange box and trapped, allowing the two access keys to be released.

3 DM1-CLIS-H
The two access keys can be inserted into the handle operated door interlocks located on the mixer, enabling the hatches to be opened for maintenance or repair purposes.

Mixer restart is only possible after reversing the sequence.

| DM1-CLIS-H | BM1-CLIN | XM3-CLIN |

mGard Application Example II (safeguarding with rundown time)

This enclosed machine area is safeguarded with the use of a solenoid controlled trapped key interlock system. The modular arrangement allows configurations of virtually any safeguarding application.

1 SS1-CLIN-A02022D024B
After remote request for access and/or rundown time, the solenoid of the SS1 solenoid controlled key switch is energised, releasing the key. After releasing the isolation key, the machine is isolated.

2 XM3-CLIN
The isolation key can be inserted into the XM3 key exchange box to release two access keys.

3 DM1-CLIN-H & DM2-CLIN-H
The access keys can be used to open the doors to the safeguarded area. Full body access doors are equipped with a safety key, that can be taken into the safeguarded area, to prevent accidental lock in.

Machine restart is only possible after reversing the sequence.

| XM3-CLIN | DM2-CLIN-H | DM1-CLIN-H | SS1-CLIN-A02022D024B |
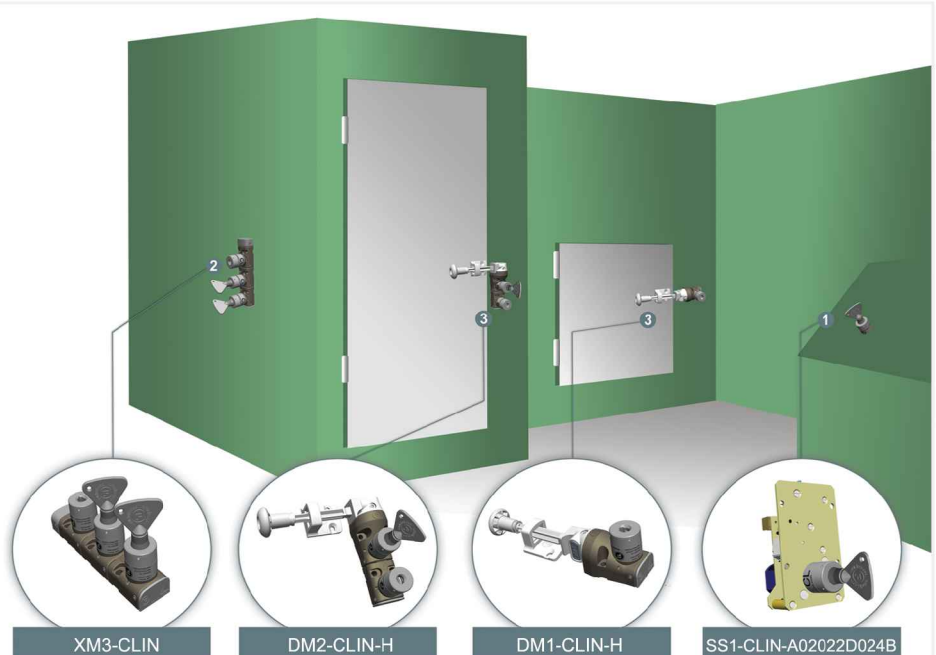
mGard Application Example III (mGard linked to amGard)

By combining the **mGard** range of trapped key interlocks, with the electro mechanical functions of the **amGard** range , additional safety features can easily be integrated to take advantage of the benefits of control isolation/interlocking.

In this example an mGard solenoid controlled key switch unit is used to safely control the use of amGard switch controlled door locks.

1 SS2-CLIN-A02022D024B

After remote request for access and/or rundown time, the solenoid of the SS2 solenoid controlled key switch is energised releasing the two keys "A". After releasing at least one of these isolation keys, the machine is isolated.

2 AMS1A1STOP024CLIN

The two keys "A" can be inserted into the handle operated door locks, to access the safeguarded area.

This configuration is equipped with two additional safety functions: A Safety switch which monitors the presence of key "A" and a safety key adaptor with safety key "B' to prevent accidental lock in and/or machine restart.

SS2-CLIS-A02022D024B
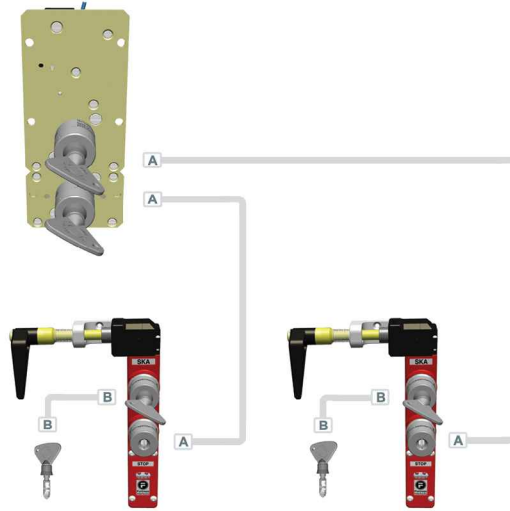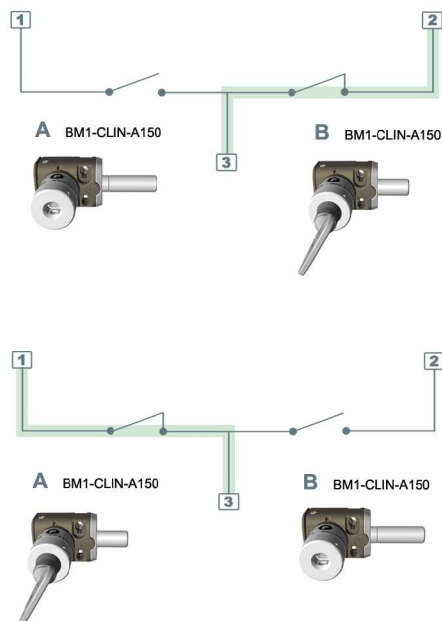
AMS1A1STOP024CLIN   AMS1A1STOP024CLIN

mGard Application Example IV (electrical switch gear interlocking)

To prevent paralleling of incoming or busbar power supplies, **mGard** mechanical trapped key systems are used to control safe operation.

In this application example two incomming supply isolators are fitted with BM1 bolt interlocks, allowing only one isolator to be closed (switched "on") at any time.

Each bolt lock is equipped with a blocking device such that when the bolt is shot, the isolator cannot be closed.

Only one key is supplied with this system in order to prevent parralleling of incoming or busbar power supplies.

A BM1-CLIN-A150   B BM1-CLIN-A150

A BM1-CLIN-A150   B BM1-CLIN-A150

I 401

I 311

Power Isolation

Mechanical Bolt Interlock

BM

The BM is used to interlock circuit breakers, valves earth switches etc. It is used where hazards needs to be indirectly interlocked.

- No product handing issues
- 16mm diameter bolt with 16mm of travel
- Extended bolt lengths available
- Standard operation: Key free, bolt shot (other sequences available)
- Additional modules/keys can be added

This product may not be used as an access lock.

Product Types

N° of Locks	Ref N°
1 » 10	BM1 » BM10

N° of Locks (Full Stainless Steel)	Ref N°
1 » 5	BMS1 » BMS5

Lock Type
For key and lock specifications view page 12

Bolt Lengths	Ref N°
6.35mm	-
50mm extension	50
150mm extension	150

Bolt Interlock with Limit Switch

BML — CCC° UL CSA switch approval

This device is used to interlock circuit breakers, valves, earth switches etc. It additionally provides eletrical indication of the bolt position.
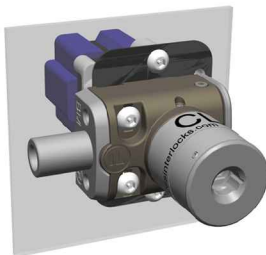
- No product handing issues
- 16mm diameter bolt with 16mm of travel
- Extended bolt lengths available
- Standard operation: Key Free, bolt shot (other sequences available)
- Standard IP67 switch
- Additional modules/keys can be added

This product may not be used as an access lock.

Product Types

N° of Locks	Ref N°
1 » 4	BML1 » BML4

N° of Locks (Full Stainless Steel)	Ref N°
1 » 4	BMSL1 » BMSL4

Switch Current	Ref N°
3A	-

Switch Contacts	Ref N°
1NO / 1NC	-

Lock Type
For key and lock specifications view page 12

Bolt Lengths
See BM specification

Bolt Interlock with Switch

BMR — CCC° c UL us CSA switch approval

This device is used to interlock circuit breakers, valves, earth switches etc. It additionally provides eletrical indication of the bolt position.

- No product handing issues
- 16mm diameter bolt with 16mm of travel standard (extended bolt lengths available)
- Standard operation: Key free, bolt shot (other sequences available)
- Special switch ratings and/or contact arrangements available on request
- Additional modules/keys can be added
- Each key can be monitored using 20A or 32A switches

This product may not be used as an access lock.

Product Types

N° of Locks	Ref N°
1 » 10	BMR1 » BMR10

N° of Locks (Full Stainless Steel)	Ref N°
1 » 5	BMSR1 » BMSR5

Lock type
For key and lock specifications view page 12

Switch Current	Ref N°
20A	020
32A	032
63A	063

Switch Contacts	Ref N°
4NO / 0NC	40
2NO / 2NC	22

Bolt Lengths	Ref N°
See BM specification	

Circuit Breakers

AC090AB

When mounted on the front of the circuit breaker, this lock allows or prevents switching of the breaker.

- All circuit breakers make and type must be specified

Product Types

Breaker Type	Ref N°
ABB (SACE EMAX)	CLIN-AC090AB
Merlin Gerin (Masterpact)	CLIN-MC090MG
Siemens (3WL)	CLIN-X002

Key type
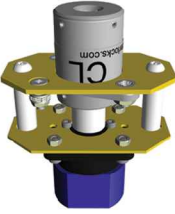For key specifications view page 12

Bolt Interlocks

For isolation of existing machinery or equipment, Fortress bolt interlocks are a simple mechanical solution to guarantee a safe work place, without the need for wiring.
The robust design for both keys and locks can withstand harsh environments, such as dust, moisture and vibration.

Control Isolation

Key Switch

S

CCC · c UL us · SP · switch approval

The S(E) unit is suitable for isolation or switching current and may be used to isolate power to machinery.

- Direct drive operation - positively opens contacts
- The standard sequence is: Key trapped (but not locked) - Power on, Key free - Power off (other sequences to be specified)
- Special switch ratings and/or contact arrangements available on request
- Enclosed version (SE) in Polycarbonate (IP66)

Product Types

Mounting	Ref Nº
Back of Board	S
In Enclosure (IP66)	SE

Lock Type	
For key and lock specifications view page 12	

Switch Current	Ref Nº
20A	A020
32A	A032
63A	A063

Switch Contacts	Ref Nº
4NO / 0NC	40
2NO / 2NC	22

Solenoid Controlled Key Switch

SS

CCC · c UL us · SP · switch approval

The SS unit is used where the key(s) need to remain trapped until an electrical signal has been received.

- Direct drive operation - positively opens contacts
- Suitable for machines with a rundown cycle
- The standard sequence is: Solenoid de-energised - Key trapped, Solenoid energised - Key free, (other sequences available)
- Special switch ratings, solenoid voltage and/or contact arrangements available on request
- Solenoid monitoring contacts as standard
- Enclosed version (SS-F) in Polycarbonate (IP66)

Product Types

Nº of Locks	Ref Nº
1 » 8	SS1 » SS8

Lock type	
For key and lock specifications view page 12	

Switch Current	Ref Nº
20A	A020
32A	A032
63A	A063

Switch Contacts	Ref Nº
4NO / 0NC	40
2NO / 2NC	22

Solenoid Voltage	Ref Nº
24V DC	D024
110V AC / 110V DC	A110 / D110

Mounting	Ref Nº
Back of Board	B
In Enclosure (IP66)	F

ATEX Key Switch

FLP

Ex · II 2GD EExd IIB T4-T6

A key switch for use in areas where explosive/flammable gases or dust particles may be present.

- Direct drive operation - positively opens contacts
- The standard sequence is: Key trapped (but not locked) - Power on, Key free - Power off (other sequences to be specified)
- Special switch ratings and/or contact arrangements available on request

Product Types

Mounting	Ref Nº
In Enclosure (IP65)	FLP

Lock type	
For key and lock specifications view page 12	

Switch Current	Ref Nº
20A	A020
32A	A032
63A	A063

Switch Contacts	Ref Nº
4NO / 0NC	40
2NO / 2NC	22

ATEX Solenoid Controlled Key Switch

EEXSS1

Ex · ATEX Ex II 2G Ex d IIC T6

A solenoid key switch for use in areas where explosive, flammable gases or dust particles may be present.

- Direct drive operation - positively opens contacts
- The standard sequence is: Solenoid de-energised - Key trapped, Solenoid energised - Key free, (other sequences available)
- Special switch ratings, solenoid voltage and/or contact arrangements available on request.
- Solenoid monitoring contacts as standard

Product Types

Mounting	Ref Nº
In Enclosure (IP66)	EEXSS1

Lock type	
For key and lock specifications view page 12	

Switch Current	Ref Nº
20A	A020
32A	A032

Switch Contacts	Ref Nº
4NO / 0NC	40
2NO / 2NC	22

Solenoid Voltage	Ref Nº
24V DC	D024
110V AC / 110V DC	A110 / D110

Solenoid Controlled Key Switch

The device is used where the key(s) need to remain trapped until an electrical signal has been received. (e.g. for machine rundown time or cycle end)

Fortress Interlocks

SLS — Solenoid Controlled Key Switch Unit

CCC® · c(UL)us · (SA) · switch approval

This device ensures that keys may not be released until both the solenoid has been energised and the control power has been isolated.

- Suitable for machines with a rundown cycle
- Fortress key operated override facility for mechanical release of the keys
- LED status indication

Product Types

Nº of Locks (excl. override lock)	Ref Nº
1 » 6	SLS1 » SLS6

Lock type	
For key and lock specifications view page 12	

Switch Current	Ref Nº
10A	A010

Switch Contacts	Ref Nº
2NO / 2NC	22

Solenoid Voltage	Ref Nº
24V DC	D024
110V AC / 110V DC	A110 / D110

TD — Standard / TR — Remotely operated / TS — Key operated — Electronic Time Delay Unit

CCC® · c(UL)us · (SA) · switch approval

The TD unit releases keys at the end of a pre-determined time period.

- Direct drive operation - positively opens contacts
- Suitable for machines with a rundown cycle
- Enclosures in Polycarbonate (IP65) as standard
- Special switch ratings, solenoid voltage and/or contact arrangements available on request
- Solenoid monitoring contacts as standard
- Remotely (TR) and key operated (TS) version available on request

Product Types

Nº of Locks	Ref Nº
1 » 3	TD1 » TD3

Lock type	
For key and lock specifications view page 12	

Switch Current	Ref Nº
20A	A020
32A	A032
63A	A063

Switch Contacts	Ref Nº
4NO / 0NC	40
2NO / 2NC	22

Solenoid Voltage	Ref Nº
24V DC	D024
110V AC / 110V DC	A110 / D110

Time Delay Up To	Ref Nº
5 Min	05
30 Min	30

VS — Voltage Sensing Unit

CCC® · c(UL)us · (SA) · switch approval

Releases key(s) after zero voltage detection of the induced voltage (Back EMF) of a motors windings.

- Direct drive operation - positively opens contacts
- Permits access as soon as the machine comes to rest
- No additional "timer safety margin" required
- Suitable for machines with a rundown cycle
- Enclosures in Polycarbonate (IP65) as standard
- Special switch ratings, solenoid voltage and/or contact arrangements available on request
- Solenoid monitoring contacts as standard

Product Types

Nº of Locks	Ref Nº
1	VS1

Lock type	
For key and lock specifications view page 12	

Switch Current	Ref Nº
20A	-

Switch Contacts	Ref Nº
2NO / 2NC	-

Solenoid Voltage	Ref Nº
24V AC	024
110V AC	110
230V AC	230

ODS — Knob operated / ODL — Key operated — Knob/Key Operated Switch Control Unit

CCC® · c(UL)us · (SA) · switch approval
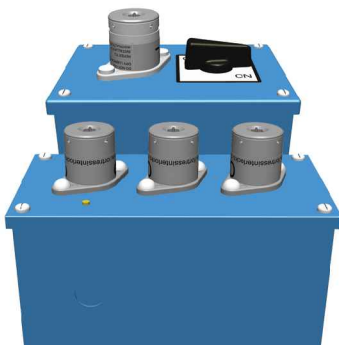
The ODS Releases key(s) after switching the knob into a visible off position.

The ODL is a 'key bank' with a switch. It incorporates one or more rotary switches and any combination of trapped or freed keys.

- Direct drive operation - positively opens contacts
- Mild steel enclosure as standard
- Stainless steel enclosure as standard in combination with CLSS or MLSS lock types
- Special switch ratings and/or contact arrangements available on request

Product Types

Operation Type	Ref Nº
Knob operated	ODS
Key operated	ODL

Nº of Locks Released or Trapped	Ref Nº
1 » 8	OD(S/L)1 » OD(S/L)8

Lock type	
For key and lock specifications view page 12	

Vertical/Horizontal	Ref Nº
Vertical	V1
Horizontal	H1

Linking System	Ref Nº
Cams (stainless steel)	C(S)
Runnerbar (stainless steel)	R(S)

Mounting	Ref Nº
Back of Board	B
In Enclosure	F

Switch Current	Ref Nº
20A	A020
32A	A032
63A	A063
150A (ODS only)	A150

Switch Contacts	Ref Nº
4NO / 0NC	40
2NO / 2NC	22

Key Exchange

XM — Modular Key Exchange Unit

The XM unit is used to exchange one or more keys for a number of other keys. This device forms the link betweeen isolation devices and access locks.

- No product handing issues
- Extremely varied combination of isolation/access keys possible
- Sequential or Non-sequential key operation
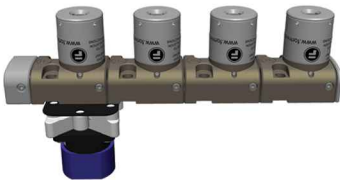- Simply add modules to existing configurations

Product Types

Nº of Locks	Ref Nº
2 » 10	XM2 » XM10

Nº of Locks (Full Stainless Steel)	Ref Nº
2 » 5	XMS2 » XMS5

Lock type
For key and lock specifications view page 12

XMR — Modular Key Exchange Unit with Switch

switch approval

Besides exchanging one or more keys for a number of other keys the XMR is additionlly fitted with rotary switch(es) that can be used for power or control isolation.

- No product handing issues
- Extremely varied combination of isolation/access keys possible
- Sequential or Non-sequential key operation
- Simply add modules to existing configurations
- Enclosed version (XMR-E) in Polycarbonate (IP67)
- Each key/lock can be fitted with a 20A or 32A rotary switch

Product Types

Nº of Locks	Ref Nº
1 » 10	XMR1 » XMR10

Nº of Locks (Full Stainless Steel)	Ref Nº
1 » 5	XMSR1 » XMSR5

Lock type
For key and lock specifications view page 12

Switch Current	Ref Nº
20A	A020
32A	A032
63A	A063

Switch Contacts	Ref Nº
4NO / 0NC	40
2NO / 2NC	22

Mounting	Ref Nº
Sealed Enclosure (IP67)	-E
Back of Board	-P

Door Locks

DM1 — Single Door Interlock

- No product handing issues:
  4 head rotation angles with an adjustment of 360º at 90º increments with +/- 5º fine adjustment. Two actuator entry points
- All DM locks have stainless steel heads
- Tamper resistant head mechanism
- Choice of actuators

Product Types

Nº of Locks	Ref Nº
1	DM1

Nº of Locks (Full Stainless Steel)	Ref Nº
1	DMS1

Lock type
For key and lock specifications view page 12

DM — Multiple Modular Door Interlock

- No product handing issues:
  4 head rotation angles with an adjustment of 360º at 90º increments with +/- 5º fine adjustment. Two actuator entry points
- Extremly varied combination of isolation/access keys possible
- Sequential or Non-sequential key operation
- Simply add modules to existing configurations
- All DM locks have stainless steel heads
- Tamper resistant head mechanism
- Choice of actuators

Product Types

Nº of Locks	Ref Nº
2 » 10	DM2 » DM10

Nº of Locks (Full Stainless Steel)	Ref Nº
2 » 5	DMS2 » DMS5

Lock type
For key and lock specifications view page 12

DM Handing Options

The DM and DMS modules benefit from a revolutionary new head design. With six actuators to choose from, the head features a choice of four head rotation angles and two actuator entry points with an adjustment of 360° at 90° increments with +/- 5° fine adjustment.

Actuators

Fixed Actuator

DM-F   * -F in part N°

- For use with all DM type locks
- Ideal for most aligned guarding doors
- Compact (fits within DM body's space envelope)
- Version with chain available (DM-F-chain)

Handle Operated Actuator

DM-H   * -H in part N°

- For use with all DM type locks
- Suitable for use where secondary action is required
- Overcomes misalignment
- Vertical adjustment: +/- 6mm
- Rotational adjustment of bracket, to suit all four DM handing options
- Detent holds actuator in place when the door is open

Spring Loaded Handle Operated Actuator

DM-A   * -A in part N°
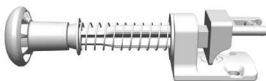
- For use with all DM type locks
- Suitable for use where secondary action is required
- Overcomes misalignment
- Vertical adjustment: +/- 6mm
- Rotational adjustment of bracket, to suit all four DM handing options
- Detent holds actuator in place when the door is open

Self Aligning Actuator

DM-S   * -S in part N°

- For use with all DM type locks
- Ideal for small radius hinged doors
- Horizontal adjustment: +/- 7.50mm
- Vertical adjustment: +/- 3.75mm
- Rotational adjustment: any angle in 360°
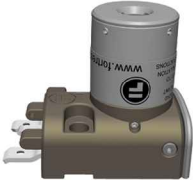
Compressible Actuator

DM-C   * -C in part N°
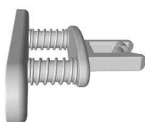
- For use with all DM type locks
- Ideal to absorb vibration on hatches/doors
- Can be used on small radius hinged doors
- Suitable for situations where the door is likely to be slammed

Accessories

Extension Module

XMA

- For adding lock units onto existing BM, BMR, XM, XMR, DM and DMR configurations

Product Types

Housing Material	Ref N°
Standard	XMA
Full Stainless Steel	XMSA

Lock type	
For key and lock specifications view page 12	

Back of Board Mounting Kit

MBOB

- To provide back of board mounting possibilities for BM, BMR, XM, XMR, DM and DMR configurations

Not suitable for use onto full stainless steel configurations

Product Types

Housing Material	Ref N°
Standard	MBOB

Lock and Key Specifications

Fortress locks have over 200,000 different lock combinations. Besides the standard basic (CL) it is also possible to have a master series (ML) lock. The ML lock which can be operated by a special cut master key (MLK-SUGS) that fits any mastered lock in a specific mastered lock series. For ease of use all Fortress locks provide key insertion in two orientations.
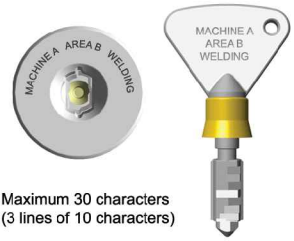
Lock and key engravings

Each different key combination is allocated with an engraved code onto the lock and key, of up to maximum 30 characters (3 lines of 10 characters). This engraving code is used to identify locks and keys and is recorded in a database for continuous cross reference. Required engraving details. are therefore to be provided with each order.

Standard

CLIN lock
Standard CL lock no dustcover

CLIS lock
Standard CL lock with stainless steel dustcover

CLSS lock
Full Stainless Steel CL lock with stainless steel dustcover

CLK-SUS
Standard key for use on all CL lock types

CLK-LP
Standard low profile key for use on all CL lock types

Master

MLIN lock
Masterable ML lock no dustcover

MLIS lock
Masterable ML lock with stainless steel dustcover

MLSS lock
Full Stainless Steel masterable ML lock with stainless steel dustcover

MLK-SUGS
Standard cut key for use on all ML type locks

MLK-SUCM
Master cut key for use on all ML lock types

As an option Fortress locks can also be supplied with Padlockable dustcovers, that incorporates two padlock holes which can be fitted with lockout hasps and scissor hasps between 3mm and 8mm in diameter as shown below.

Dustcover Options

CLDC Stainless Steel Dustcover

PLDC Stainless Steel Padlockable Dustcover

LOS3 Lock-Out Scissor Hasp
LOS3C Lock-Out Scissor Hasp c/w Cable

Key and lock engravings

MACHINE A AREA B WELDING

MACHINE A AREA B WELDING

Maximum 30 characters
(3 lines of 10 characters)

mGard Range Card

Power Isolation

Mechanical Bolt Interlock
BM	BM1 » BM10 (Standard)
BMS	BMS1 » BMS5 (Full Stainless Steel)
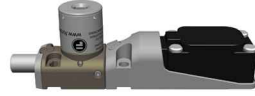
Bolt Interlock with Limit Switch
BML	BML1 » BML4 (Standard)
BMSL	BMSL1 » BMSL4 (Full Stainless Steel)
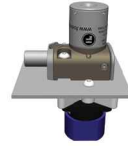
Bolt Interlock with Switch
BMR	BMR1 » BMR10 (Standard)
BMSR	BMSR1 » BMSR5 (Full Stainless Steel)

Circuit Breakers
CLIN-AC090AB	ABB (SACE EMAX)
CLIN-MC090MG	Merlin Gerin (Masterpact)
CLIN-X002	Siemens (3WL)

Control Isolation
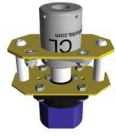
Key Switch
S	Back of Board
SE	In Enclosure
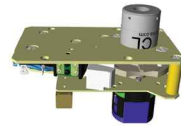
Solenoid Controlled Key Switch
SS-B	SS1-B » SS8-B (Back of Board)
SS-F	SS1-F » SS8-F (In Enclosure)

ATEX Key Switch
FLP	In Enclosure

ATEX Solenoid Controlled Key Switch
EEXSS1	In Enclosure

Solenoid Controlled Key Switch Unit
SLS	SLS1 » SLS6

Electronic Time Delay Unit
TD	TD1 » TD3
TR	TR1 » TR3
TS	TS1 » TS3

Voltage Sensing Unit
VS	In Enclosure

Knob Operated Switch Control Unit
ODS	ODS1 » ODS8 (In Enclosure)
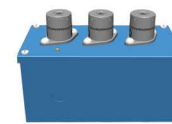
Key Operated Switch Control Unit
ODL	ODL1 » ODL8 (In Enclosure)

Key Exchange

Modular Key Exchange Unit
XM	XM2 » XM10 (Standard)
XMS	XMS2 » XMS5 (Full Stainless Steel)

Modular Key Exchange Unit with Switch(es)
XMR	XMR1 » XMR10 (Standard)
XMSR	XMSR1 » XMSR5 (Full Stainless Steel)

Accessories

Extension Module
XMA	Standard
XMSA	Full Stainless Steel

Back of Board Mounting Kit
MBOB	

Dustcovers
CLDC	Stainless Steel Dustcover
PLDC	Padlockable Dustcover

Lock-Out Hasps
LOS3	Scissor Hasp
LOS3C	Scissor Hasp c/w cable

Door Locks

Single Door Interlock
DM1	Standard
DMS1	Full Stainless Steel

Multiple Modular Door Interlock
DM	DM2 » DM10 (Standard)
DMS	DMS2 » DMS5 (Full Stainless Steel)

Actuators

Fixed Actuator
DM-F	

Handle Operated Actuator
DM-H	

Spring Released Handle Operated Actuator
DM-A	

Self Aligning Actuator
DM-S	
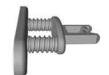
Compressible Actuator
DM-C	

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

By its unique design concept, **amGard** offers a fully integrated safety switch controlled closing and/or locking system, designed for strength and reliability in hazardous operating conditions.

The **amGard** system replaces all adaptions normally fitted within a guarding system. Additional arrangements like actuators/operators, catches, internal release functions, trapped key functions and deadlocks are no longer needed. All of these separate functions are or can simply be incorporated into the **amGard** configurations

Head Modules	**Head Modules, Actuators & Cap**
	Handle Actuator & Head
	Tongue Actuator & Head
	Lock-Out Clips
	Slidebars
	Mechanical Cap (for non door lock configurations)

Adaptors & Foot

Safety Key Adaptor
Access Key Adaptor
Internal Release Adaptor
Padlock Adaptor
Foot (to terminate mechanical lock)

Electrical Switching / Locking

Safety Switch Bodies
Solenoid Controlled Lock Bodies
Explosion Proof Switch Bodies

AS-interface versions available
European, Canadian and North American approvals

Option PODs

Key Switch Option Pod
Indicator Lamp Option Pod
Pushbutton Option Pod

AS-interface versions available
European, Canadian and North American approvals

Select and Configure your Solutions

The basic assemblies ATSTOP, ATLOK and AMSTOP, AMLOK are only a selection of the configurations to suit basic heavy duty safety gate switch requirements. By selection of optional modules these configurations can easily be extended with the required functions.

amGard composes dual channel safety circuits to allow cross monitoring, the robust stainless steel actuator with a self-adjusting operation provides a long life cycle and reduction of down time and maintenance. Specially designed for harsh environments, the **amGard** range is ideal for use in areas with dust and moisture and is tested to over 1,000,000 operations.

amGard trapped key modules are fully interchangeable with the Fortress **mGard** range of trapped key interlocks.

amGard Application Example I

This example shows the safeguarding of robot areas in which **amGard** products offer a combined mechanical and electrical solution.

1 CPS2LOK024024B CLIN

By pressing the access request button, the machine or installation is shut down, by the machine control system.

The solenoid, controlled by the machine control system restricts the release of keys A until the guarded area or machine is safe to enter (indicated by the yellow status LEDs).

Energising the solenoid breaks the dual safety circuits to prevent unexpected re-start.

Both safety keys A can now be released indicated by the red status LED.

2 AM & SBNS1A1FOOT CLIN

Keys A can be used to unlock the door locks and release the safety keys B. These can be taken inside the guarded area to prevent personnel being trapped and/or an accidental machine restart.

By reversing this compulsory procedure the machine can safely be restarted.

AMS1A1FOOT CLIN

SBNS1A1FOOT CLIN
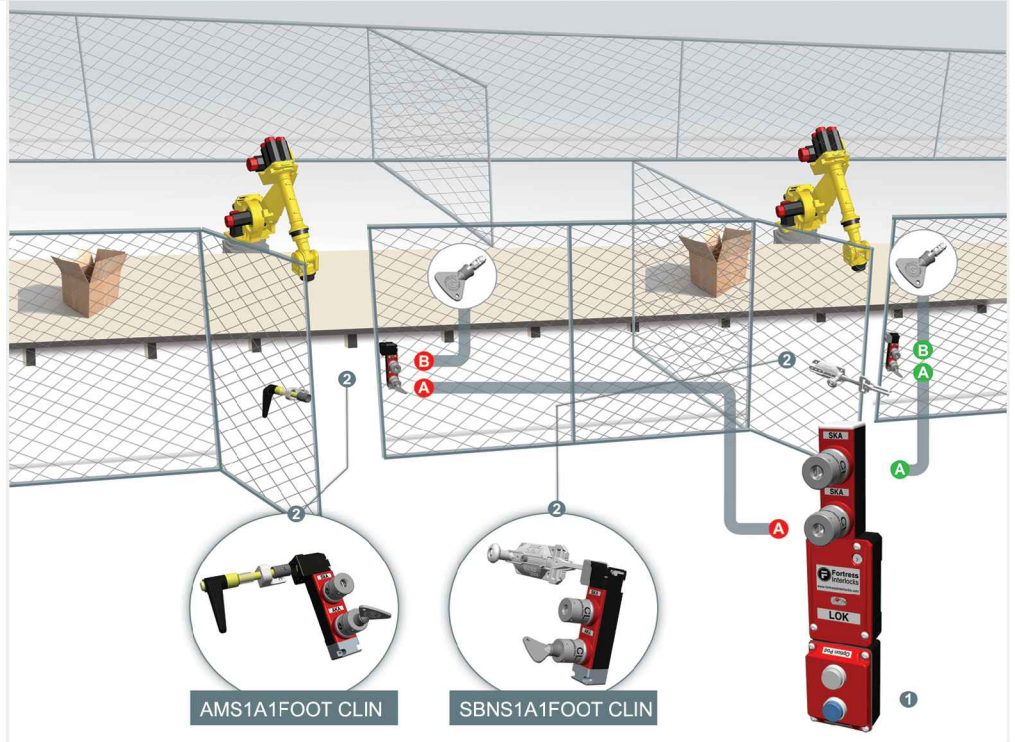
amGard Application Example II

This example shows the safeguarding of a potentially dangerous area with a teach mode function inside.

1 SBNLOK024024K CLIN

Removal of the key from one of the pods at the doors selects machine stop at the end of a run down cycle. The solenoid is then energised by the machine control system and access can be gained.

The operator can take the safety key into the potentially hazardous area preventing restart.

2 PODK CLIN

By inserting one of the keys in the stand alone pod inside the guarded area safe programming can be initiated

3 SBILOK024024IRK CLIN

The LOK internal release option can be used to unlock the door from inside a guarded area should personnel become trapped. By pushing the button on the rear of the unit, the tongue is released from the actuator head and the door can be opened from the inside. This also breaks both safety circuits, which than have to be manually reset before the machine can re-start.

SBNLOK024024K CLIN

PODK CLIN

SBILOK024024IRK CLIN
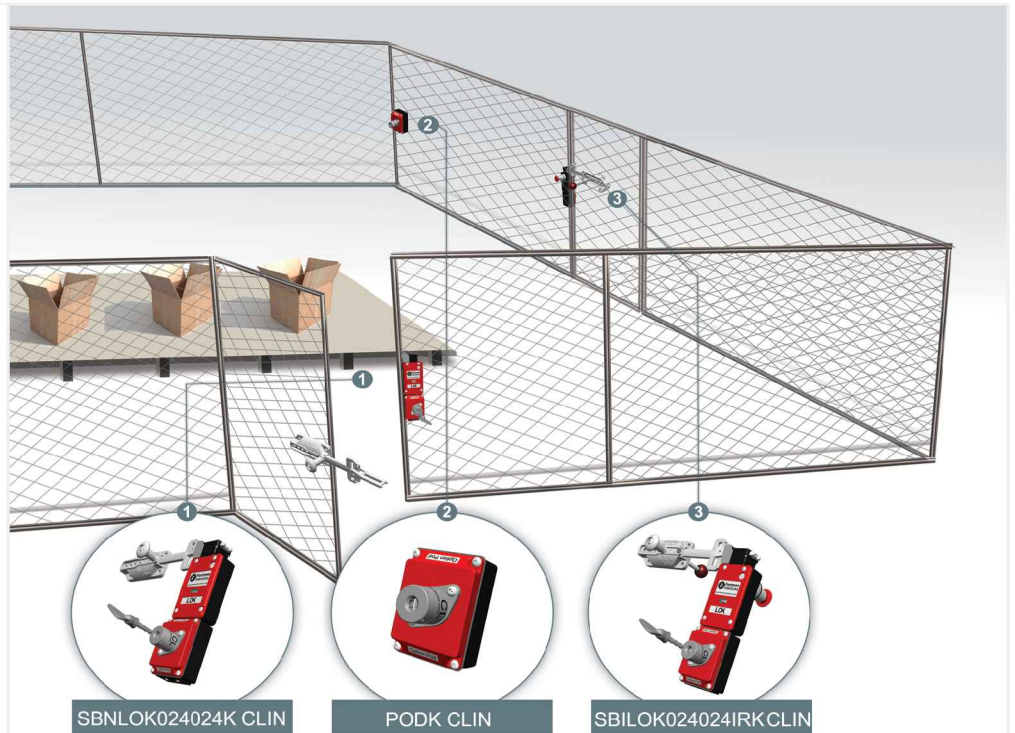
Head Modules & Actuators

Add-Ons

AM
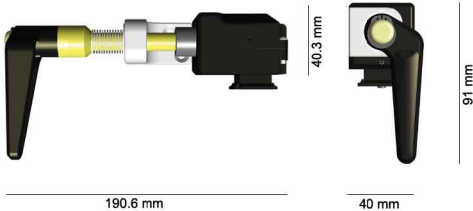
AM Handle Actuator & Head

- Heavy duty handle unit
- 4 position fixing at 90° increments
- Operating handle can be rotated in 45° increments
- Allows for guard misalignment
- Retention force 2500N
- Can be fitted with lock-out devices for additional safety

40.3 mm | 91 mm

190.6 mm | 40 mm

Head (AMH) and Handle (AMK) also available separately.

AM Lock-Out Clip

Once inserted into the head and padlocked in position, it blocks the handle entry preventing the door being closed and the machine from being restarted.

AML

AT
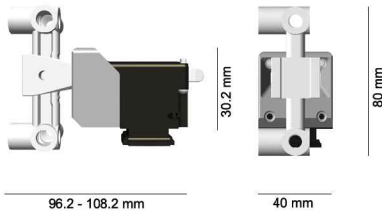
AT Tongue Actuator & Head

- Heavy duty tongue unit
- Ideal for fast, frequent access
- 4 position fixing at 90° increments
- Misalignment tolerance of +/- 12mm
- Retention force 2500N
- Can be fitted with lock-out devices for additional safety

30.2 mm | 80 mm

96.2 - 108.2 mm | 40 mm

Head (ATH) and Tongue (ATK) also available separately.

AT Lock-Out Clip

Once inserted into the head and padlocked in position, it blocks the tongue entry preventing the door being closed and the machine from being restarted.

ATL

Slidebar

SBN no spring & no internal release
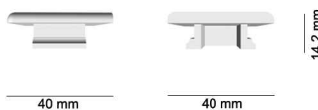**SBS** spring loaded
SBI internal release
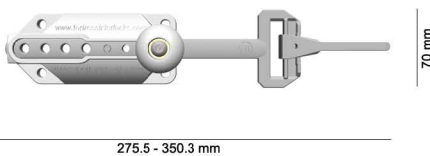
- Used in conjunction with the "ATH head"
- Particulary useful for applications using small radius, hinged doors
- Stainless steel casting
- Built in lock-out facility to accommodate a maximum of 4 padlocks with up to 8 mm diameter shackles

70 mm

275.5 - 350.3 mm

Spring loaded version (SBS) is advised when exposed to vibration

---

Cap

CP

Suitable for use with the adaptor products

- Protects the unit from debris
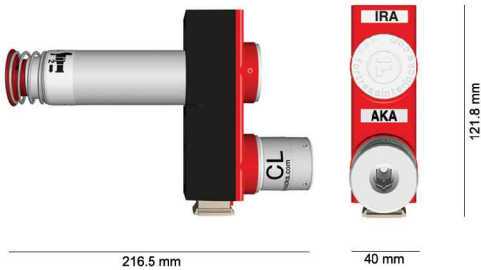- Removable to enable reconfiguration

14.2 mm

40 mm | 40 mm

Hinged door equipped with SBISTOP024 configuration

Adaptors

**IRA**

Internal Release Adaptor

IRA
AKA
121.8 mm
CL
216.5 mm
40 mm

Overrides the safety or access key mechanism and provides a means of escape from inside the guarded area.

- If incorporated into a STOP body the internal release mechanism puts the machine into a stop
- Always in combination with A1, S1, LO or LT
- Up to 5 key adaptors in one configuration

For key and lock specifications view page 22.
Keys must be ordered separately.
Cannot be used in combination with LOK type bodies.

S1

Safety Key Adaptor

SKA
60 mm
87.8 mm
40 mm
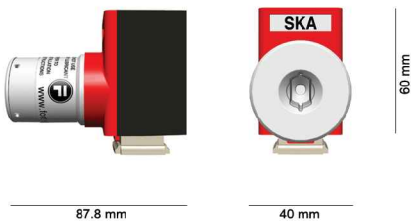
This unit ensures that machine/process cannot be restarted without returning the key(s). It can furthermore prevent personnel being accidentally locked inside a guarded area.

- Can be stacked or combined with other adaptors
- Provides unique link to mGard range
- Up to 5 key adaptors (S1»S5) in one configuration

For key and lock specifications view page 22.
Keys must be ordered separately.

A1

Access Key Adaptor

AKA
60 mm
87.8 mm
40 mm
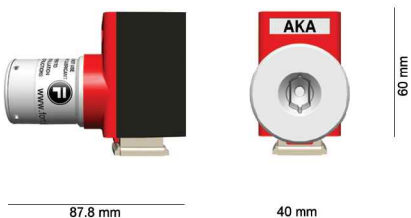
Ideally suited for authorised access only, or linked access to other machinery.

- Ensures a specific sequence of operation
- Can be stacked or combined with other adaptors
- Provides unique link to mGard range
- Up to 5 key adaptors (A1»A5) in one configuration

For key and lock specifications view page 22.
Keys must be ordered separately.

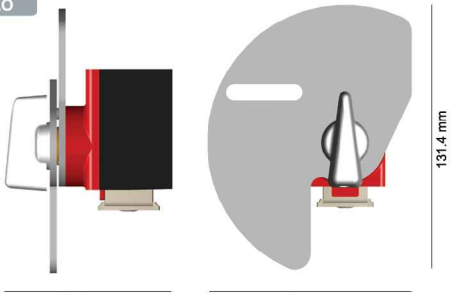### amGard Application Example III

Safeguarding an area where there is no fencing (e.g. an area protected by a light curtain) or, the guarding has mechanical door locks.

This **amGard** configuration enables personnel to work inside potentially dangerous areas (CPS3LOK02024B CLIN). When no fencing exists personnel always remains responsible for their own safety and the posession of the safety key is their safety guarantee.

Access is requested by pressing the red button on the Option POD module. When the area is safe to enter, the solenoid controlled safety switch is energised and the safety keys can be released in sequence. Personnel can keep these keys with them, to prevent machine restart, or use these to open the mechanical door locks (in case of a fenced area). Only when all keys are back in the safety key adaptors can the machine be restarted.

Single Lock-Out Padlock Adaptor

LO

Provides padlocking only in one position.

- Provides a link with other lock-out tag-out safety procedures
- Accomodates up to 5 padlocks with 7.5mm diameter shackles
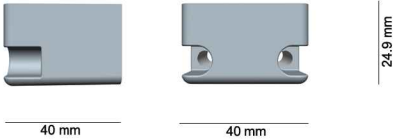- Facilitates enhanced supervisor security

131.4 mm

76.6 mm   101.4 mm

Dual Lock-Out Padlock Adaptor

LT

This unit is equipped with two padlock positions for use as a voluntary lock-out facility.

- Provides a link with other lock-out tag-out safety procedures
- Accommodates one padlock with 8mm diameter shakles
- Enables quick and easy access

60 mm

76.6 mm   74 mm

Foot
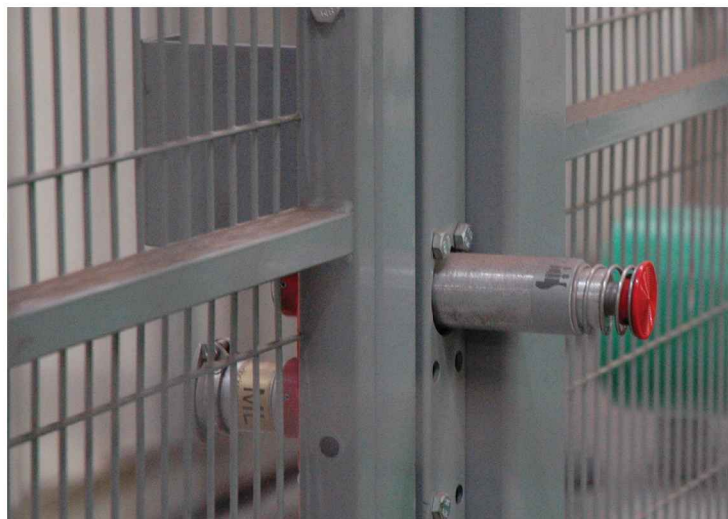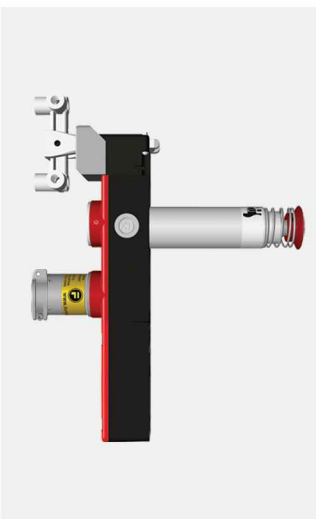
FOOT

To terminate all non-switch configurations.

- Secures unit firmly to mounting surface
- Removable to allow for modification

24.9 mm

40 mm   40 mm

amGard Application Example IV

ATIRA1STOP024 MLIS, a tongue operated safety switch with internal release function requiring access key to be inserted to safely enter the guarded area.

Electrical Switching/Locking

Base units are the electromechanical elements of the heavy duty modular **amGard** range that interface with safety relays and PLC's providing controlled access to machinery or a guarded area. Tested to over 1 million operations these units contain dual channel safety circuitry making them suitable for use in applications up to SIL3 (EN/IEC 62061) Category 4 and PLe (EN/ISO 13849-1).

STOP

Safety Switch Body

The STOP unit breaks the dual safety circuits to select machine stop and/or monitoring access.

- Ideal for quick access to machines with no or short run-down cycles
- Non-solenoid controlled
- LED indicators for status identification
- European, Canadian and North American approvals

STOP AS-i is supplied in a LOK size housing type.

100 mm / 40 mm / 40 mm

Product Types

Control	Ref Nº
24V AC/DC	STOP024
110V AC	STOP110
230V AC	STOP230
AS-Interface	STOPASI

LOK power to unlock
LOKPL power to lock

Solenoid Controlled Lock Body

Energising (LOK) or de-energising (LOKPL) the solenoid breaks the dual safety circuits to prevent access until machine/area is safe.

- Ideal for machines with run-down cycles
- LED indicators for status identification
- Solenoid override facility for increased safety in the event of power failure (not applicable for the power to lock version)
- Split voltage available on request
- European, Canadian and North American approvals

130 mm / 43 mm / 80 mm

Product Types

Control / Solenoid	Ref Nº LOK
24V AC/DC / 24V AC/DC	LOK024024
110V AC / 110V AC	LOK110110
230V AC / 230V AC	LOK230230

Control / Solenoid	Ref Nº LOKPL
24V AC/DC / 24V AC/DC	LOK024024PL
110V AC / 110V AC	LOK110110PL
AS-i "power to unlock"	LOKASI
AS-i "power to lock"	LOKASIPL

LOKIR power to unlock
LOKPLIR power to lock

Solenoid Safety Switch with Internal Release

This unit is equipped with an additional internal release button for a mechanical override function of the solenoid switch.

- LED indicators for status identification
- Prevents access until machine is safe
- Solenoid override facility for increased safety in the event of power failure (not applicable for the power to lock version)
- Split voltage available on request
- European, Canadian and North American approvals

130 mm / 102.8 mm / 80 mm

Product Types

Control / Solenoid	Ref Nº LOKIR
24V AC/DC / 24V AC/DC	LOK024024IR
110V AC / 110V AC	LOK110110IR
230V AC / 230V AC	LOK230230IR

Control / Solenoid	Ref Nº LOKPLIR
24V AC/DC / 24V AC/DC	LOK024024PLIR
110V AC / 110V AC	LOK110110PLIR
AS-i "power to unlock"	LOKASIIR
AS-i "power to lock"	LOKASIPLIR

STOPTX ATEX certified
STOPXP UL/CSA certified

II 2G c

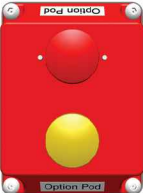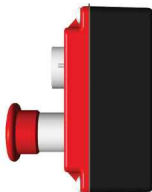### Explosion Protected Safety Switch Body

STOPTX : ATEX certified product. Heavy duty explosion protected safety gate switch. Suitable for zone 1 & 2 environments.

STOPXP : UL / CSA certified product. Heavy duty explosion protected safety gate switch. Suitable for zone 1 & 2 environments.

171 mm / 72.9 mm / 76 mm

Option PODs

Option PODs provide an added control feature for assembled **amGard** units. There are 3 standard types, each serving a specific purpose. Other combinations are available on request.

Key Switch Option POD

PODK

ASi available

The removal of the key enables the machine to stop at the end of a rundown cycle. The PODK can additionally be used separately for teach mode activation.

- Contains 2NO/2NC contact arrangement
- Switch rating 3A
- Provides a request to stop/start
- Can be used as a "stand alone" key switch
- European approval

For key and lock specifications view page 22.
Keys must be ordered separately.

112.5 mm

90.8 mm   82.5 mm

Product Types

Description	Ref Nº
Stand alone	PODK
For mounting to LOK module	LOKPODK
Mounted to LOK module	K
AS-Interface	PODKASI

Indicator Lamp Option POD

PODL

ASi available

Ideal complimentary module where multiple interlocks are used for enhanced identification of status.

- Easy, clear identification of machine status
- Can be modified to suit one or two lamps
- Standard colours are red and yellow, other colours are available to suit
- Illuminated push buttons on request
- Combination lamp & pushbuttons units available on request
- European approval

112.5 mm

63 mm   82.5 mm

Product Types

Description	Ref Nº
Stand alone	PODL
For mounting to LOK module	LOKPODL
Mounted to LOK module	L
AS-Interface	PODLASI

Pushbutton Option POD

PODB

ASi available

Ideal for use as an emergency stop or request to start/stop.

- Request start/stop at the gate
- Can be modified to suit one or two pushbuttons
- Easy, reliable interface with machine controls
- European approval

No Emergency-Stop available in AS-I version

112.5 mm

92 mm   82.5 mm

Product Types

Description	Ref Nº
Stand alone	PODB
For mounting to LOK module	LOKPODB
Mounted to LOK module	B
AS-Interface	PODBASI

amGard Application Example V

ATLOK024024K CLIN

Removal of the key from the pod selects machine stop at the end of a run down cycle. When the solenoid within the connected gate switch has been energised access can be gained. The operator can take the safety key into the hazardous area preventing restart and/or enable teach mode function by using a stand alone Pod (PODK).

This key can also create a link to the Fortress **mGard** range. By inserting this key into **mGard** mechanical door locks used to lock doors inside the guarded area.

AMLOK024024 & ATLOK024024

The solenoid controlled safety switch body (LOK) can be equipped with two different head types, creating door/hatch lock configurations that restrict access to the safeguarded area until it is safe to enter.

AMLOK → ATLOK

LOK

AMSTOP024 & ATSTOP024

The safety switch body (STOP) can be equipped with two different head types. These configurations select machine stop and detect the position of doors/hatches that gives access to the safeguarded area or machine.

AMSTOP → ATSTOP

STOP
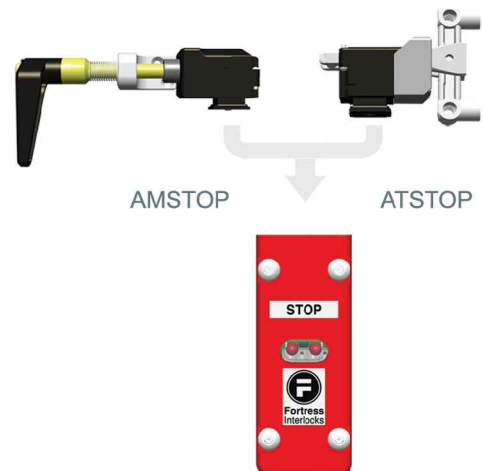
AmGard Technical Specifications

Materials	Zinc Alloy to BSEN12844, Stainless Steel to BS3146
Paint Finish	Gloss Powder Coat on Passivated Base Material
Colour	Red, Black and Stainless Steel
Ingress Protection	IP67 (DIN 400050)
Operating Force	0.5N (AT), 0.1Nm (AM)
Retention Force Locked	2500N *(for all door lock configurations)*
Maximum Approach Speed	20m/minutes *(for door lock configurations)*
Mechanical Life	>1,000,000 Switching Cycles
Maximum Frequency of Ops	7,200/hour
Ambient Temperature	-5ºC to + 40ºC (mean over 24 hrs = +35ºC)
Maximum Wire Cross-Section to fit connector	2.50mm2
Connector Type	Spring Activated Vibration Proof Block
Switch Conformance	DIN VDE 0660 Part 206 & IEC 647-5-1

Switching Specifications

Switching Principal	Positive Break (safety circuits)
Switch Circuit Current	3A
Switching Voltage	230V AC Max
Switching Contact Element	4NC/2NO (LOK), 2NC/1NO (STOP) and 2NO/2NC (PODK)
Isolating Distance	2 x 2mm per Switch Element
Contact Material	90% Silver and 10% Nickel
Utilisation Category	AC 15 or DC 13
Control Voltage	24V AC/DC, 110V AC or 230V AC
Insulating Resistance	20M 0hm
Insulating Voltage	2500V AC
Solenoid Power Rating	12W (current at Nominal 24V DC = 500mA. Quasient current = 350mA)
Solenoid Rating (Duty Cycle)	100%
Solenoid Voltage	24V AC/DC, 110V AC and 230V AC
Solenoid Voltage Tolerance	90% to 110% of nominal

Lock and Key Specifications

Fortress locks have over 200,000 different lock combinations. Besides the standard basic (CL) it is also possible to have a master series (ML) lock. The ML lock which can be operated by a special cut master key (MLK-SUGS) that fits any mastered lock in a specific mastered lock series. For ease of use all Fortress locks provide key insertion in two orientations.

Lock and key engravings

Each different key combination is allocated with an engraved code onto the lock and key, of up to maximum 30 characters (3 lines of 10 characters). This engraving code is used to identify locks and keys and is recorded in a database for continuous cross reference. Required engraving details are therefore to be provided with each order.

Standard

CLIN lock
Standard CL lock no dustcover

CLIS lock
Standard CL lock with stainless steel dustcover

CLSS lock
Full Stainless Steel CL lock with stainless steel dustcover

CLK-SUS
Standard key for use on all CL lock types

Master

MLIN lock
Masterable ML lock no dustcover

MLIS lock
Masterable ML lock with stainless steel dustcover

MLSS lock
Full Stainless Steel masterable ML lock with stainless steel dustcover

MLK-SUGS
Standard cut key for use on all ML type locks

MLK-SUCM
Master cut key for use on all ML lock types

As an option Fortress locks can also be supplied with Padlockable dustcovers, that incorporates two padlock holes which can be fitted with lockout hasps and scissor hasps between 3mm and 8mm in diameter as shown below.

Dustcover Options

CLDC Stainless Steel Dustcover

PLDC Stainless Steel Padlockable Dustcover

LOS3 Lock-Out Scissor Hasp
LOS3C Lock-Out Scissor Hasp c/w Cable

Key and lock engravings

Maximum 30 characters (3 lines of 10 characters)

Sample Configurations

ATA1STOP024 CLIS
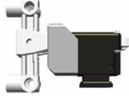
A tongue operated access lock with control switch to safeguard a hatch. Access is only possible after isolation of the machine power, where the access key is released after the machine is switched off.

SBILOK024024IR

A solenoid controlled safety switch with internal release function and a slidebar operated actuator for effective access.

The high ingress protection class (IP67) makes amGard most suitable for any outdoor use (when mounted correctly).

Head Modules

Cap
CP

Handle Actuator & Head
AM

AM Lock-Out Clip
AML

Tongue Actuator & Head
AT

AT Lock-Out Clip
ATL

Slidebar
SBN	No Spring & no Internal Release
SBS	Spring Loaded
SBI	Internal Release

Adaptors

Safety Key Adaptor
SKA

S1 — S1 » S5

Access Key Adaptor
AKA

A1 — A1 » A5

Single Lock-Out Padlock Adaptor
LO

Dual Lock-Out Padlock Adaptor
LT

Internal Release Adaptor
IRA

Foot
FOOT

Electrical Switchig / Locking

Safety Switch Body
ASi available

STOP

Fortress Interlocks

Solenoid Controlled Switch Body
ASi available

Fortress Interlocks
www.fortressinterlocks.com

LOK

LOK	Power to Unlock
LOKPL	Power to Lock

ASi available

LOKIR	Internal Release & Power to Unlock
LOKPLIR	Internal Release & Power to Lock

Explosion Protected Safety Switch Body
CE 〈Ex〉 II 2G c

Stop T6

STOPXP	UL/CSA certified
STOPTX	ATEX certified

Option PODs

Key Switch Pod
ASi available

Option Pod

PODK

Pushbuttons Pod
ASi available

Option Pod

PODB

Indicator Lamps Pod
ASi available

Option Pod

PODL

eGard is the new totally modular approach to controlling access to hazardous machinery and equipment. A compact access and control system has been developed that enables a selection of configurations including mechanical trapped key interlocks, electrical safety gate switch interlocks and electrical operator controls, either as separate devices or intergrated into one device.

The system features patented mechanical and electrical connections between every module. It simply clips together and the internal network is self-configuring. With over 4,000 billion possible combinations of modules it can be easily customised for every access and control application. The **eGard** product range is defined into three sections: head modules, core modules and base modules.

Head Modules
Actuator Heads
Actuators & Handles
Cap

Mechanical Interlocking
Safety Key Adaptors
Access Key Adaptors

Electrical Locking / Switching
Safety Switch
Solenoid Controlled Locks
Runner Bar Switch

Blank Extension Module

Pushbuttons & Selector Switches
Pushbuttons
Illuminated Pushbuttons
2 Position Selector Switches
2 Position Illuminated Selector Switches
3 Position Selector Switches
Mushroom Buttons

Lamps

Emergency Stops
Start / Re-Start Buttons
Reset Buttons

Connectors

ASi available

Cables & Accessoires

Module Configuration & Assembly:
A module stack consists of a head module (actuator head or cap), at least one core module (switches, buttons or lamps) and a base module for data-transfer to the PLC-control. Base modules are also available for AS-interface fieldbus systems. Maximum number of modules = 11 (including head and base).

Mounting Principle:
This mechanical and electrical combinable **eGard** closure-system configured, for PLC-systems, consists of connectable modules with different functions and can be used on hinged and sliding doors or just as a control configuration. The stacks can be mounted directly onto a flat surface, doors or extruded profiles, without the need for mounting plates or brackets.

Configuration and Wiring Setup:
The wiring is configuration specific. The **eGard** range incorporates safety circuits and standard I/O (input / output) in a single product. The safety and control circuits are separate through all of the modules and are terminated in the head module. The control circuits form an internal network.

Base connector selection:
There is a selections of different base modules, that enable the connection of just the safety circuits (4-pole) or both, safety and control circuits (14-pole) up to 8 I/O. Alternatively a 4-pole ASi-connector can be used for bus-systems (max. 4 I and 4 O). **eGard** configurations are suitable for use in up to SIL3 (EN/IEC 62061), Category 4 and PLe (EN/ISO 13849-1).

Connection:
Depending on the type and amount of core modules 4- or 14-pin ready made cables can easily be connected to the base module.

Material and Surface Versions:
Module housings made of plastic PBT and 304 stainless steel internals. Upper part light grey coloured, lower part dark grey coloured.

Protection Class:
The protection class conforms to IP65 when correctly mounted.

- Locking, switching and machine controls in one configuration with one Pre-wired connector
- From conventional I/O to AS-i bus by just changing the base module
- Simple to add modules to existing configurations
- All **eGard** mechanically tested to 1 million operations
- Type tested and approved by TÜV Rheinland Group
- All electrical **eGard** modules are CE-marked

eGard Application Examples

eGard offers the possibility to configure solutions to safeguard, regulate access and control of machinery and/or guarded areas, as is shown in the automated production line example, below.

1 HMSBEUSSP4LCBC-AH
Handle operated door lock with a safety key, a solenoid controlled safety switch, an access request button and an indication lamp (for full body access doors).

2 HCSNSSBS
The safety key from configuration 1 can be inserted in the key switch module to activate a teach mode function.

3 HMSSBS-AH
Handle operated door lock with safety switch, that terminates the machine after opening the door (for part body access doors).

4 HCEMBB
A monitored emergency stop.
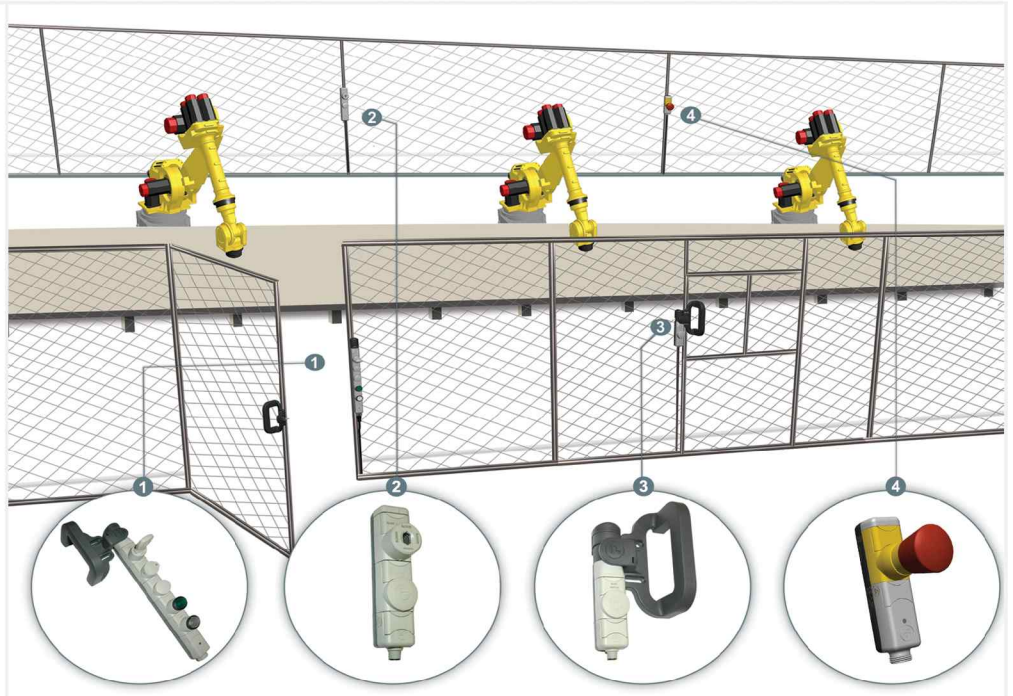
Trapped Key Interlocking Principles

A simple mechanical system of interlocking, without need for wiring to the access gates, keys are trapped and freed in a defined logic sequence, for machine controls, as well as allowing access when the guarded area or machine is safe to enter.

Area A / door 1

Area A / door 2

Area B / door 1

Area B / teach mode
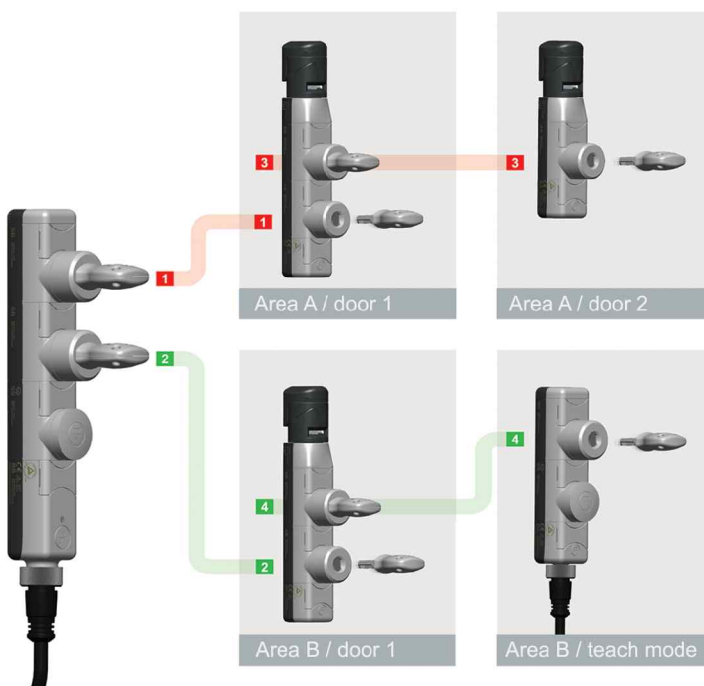
By turning key 1 or 2 in the key controlled switch configuration, the dual safety circuits are broken and the machine stopped.

Key 1 can be used to open door 1 of the safeguarded area A.

Key 2 can be used to open door 1 of the safeguarded area B.

Key 3 is a safety key that keeps key 1 trapped in the door lock preventing machine restart and can also be used to open a door inside area A.

Key 4 is a safety key that prevents machine restart and can also be used to start machine teachmode inside area B. using a key controlled switch configuration.

Trapped Key Interlock Interfacing

Interfacing trapped key interlocks with safety gate switch and/or control functions does offer unique and new methods to improve, optimise, and rationalise the implementation of all these safety related functions into one system.

General Guidelines

- A configuration must be made up of one head module, at least one core module and one base module
- Configuration sequence is: head module, safety locks, access locks, solenoid, safety switches, control modules and base.
- Maximum number of modules = 11 (including head & base)

Head Modules

Actuator Head

HF incl. fixed actuator

HM head only

For gate switch and door lock configurations.

- Rotatable through 360 degrees
- Top and side entry
- Operating force 5 to 10N
- Retention force 1000N

Cap

HC

Used to terminate all non door lock or gate switch configurations.

- Used in mechanical exchange box, machine control or key switch configurations.

Actuators

Fixed Actuator

AF fixed actuator

AG actuator used in handles

- Fixed actuator suitable for mounting for either sliding or hinged doors.

Must be used in combination with a HM head module.

Handle Actuators

AH hinged door actuator

AS sliding door actuator
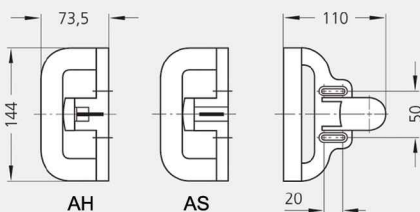
- Handle actuators suitable for bracketless mounting for either sliding or hinged doors.

Must be used in combination with a HM head module.

Handles for hinged and sliding doors:

73,5   110   144   50   20

AH   AS   AH   AS

Mechanical Interlocking

Mechanical lock modules – for use in trapped key configurations (e.g. key switches, exchange boxes and door locks). It can also be used in conjunction with safety gate switches to add further levels of access control (e.g. modular safety keys to prevent accidental lock in of personnel in full body access applications or additional key transfer).

Access Key Module

AB standard lock

QB master lock

For access (premission) functions.

• Robust radial disc tumbler lock
• >3000 combinations
• 10 mastered combinations (can be used with all 3000 individual combinations)
• No key included
• Max No of mechanical locks = 6

Safety Key Module

SB standard lock

GB master lock

To prevent accidental lock in of personnel.

• Robust radial disc tumbler lock
• >3000 combinations
• 10 mastered combinations (can be used with all 3000 individual combinations
• Key included
• Max No of mechanical locks = 6

Keys

KS standard key

KM master key

Master key can only be used in combination with masterable lock modules.

Electrical Locking / Switching

eGard offers four different electrical locking/switching modules. The safety switch module, is driven by either the operation of the head module (removal of actuator or handle) or a mechanical lock. The module is for instance used to switch "off" an installation when opening the door. The solenoid controlled lock is also able to lock a door or trap a key until the area is safe to enter. The runner bar switch only detects the operation of the head module or mechanical lock and translates this into a I/O signal.

Safety Switch

SS

Can be driven by either the operation of the head module (removal of actuator) or a mechanical lock.

• Operates on dual safety circuits
• 2 force break positive by guided NC safety contacts
• Uses none of the I/O pins

Solenoid Controlled Lock

EU power to unlock

EL power to lock

To electrically lock a door or trap a mechanical key. This module restricts access until it is safe.

• Both have a single sensor to monitor when the module is locked
• Uses 1 output and 1 input pin
• A high output indicates that the solenoid has succesfully locked the runnerbar by energising the solenoid

Runner Bar Switch

RB

Runner bar monitoring switch available. Can be driven by either the runner bar operation of the head module (removal of actuator) or a mechanical lock.

- 1 output indicating the runner bar position (each runner bar status module uses 1 output pin)

0   1

Extension Blank Modules

Blank Extension Module

EB

Additional blank module for extending a configuration.

Generally used for spacing between core modules.

Pushbutton Modules

Pushbuttons - Flat

PG green **PY** yellow
PR red
PW white
PB black
PZ blue

- Uses 1 output pin
- Output goes high when pushbutton is pressed

Other colours are available on request.

0   1

Pushbuttons - Flat Illuminated

P1 red **P7** white
P2 yellow
P3 green
P4 clear
P6 blue

- Uses 1 output pin and 1 input pin
- Output goes high when pushbutton is pressed
- Lamp illuminates when input is high

Other colours are available on request.

1   1

Pushbuttons - 40mm Mushroom

M1 **MB** black
M2 **MR** red
M3 **MY** yellow
MG green

non-latching
latching

- Uses 1 output pin
- Output goes high when pushbutton is pressed
- Non-latching - spring return to original position
- Latching - stay in each switch position

Other colours are available on request.
Red mushroom buttons cannot be used in the USA.

0   1

eGard simply clips together and provides a vast number of options. Modules such as stop and start switches and indicator lights can be included in the one unit, with or without gate switch modules. This eliminates much of the wiring and connection time involved with control panels. Ease of installation also provides a huge cost saving for specifiers.

Selector Switches

2 Position Selector Switches

2A	2D	black
2B	2E	red
2C	2F	green
2G	2H	white

non-latching
latching

- Output goes high when selector switch is turned
- Each 2 position selector switch uses 1 output pin
- Non-latching - spring return to original position
- Latching - stay in each switch position

Other colours are available on request.

0   1

3 Position Selector Switches

3A	3D	black
3B	3E	red
3C	3F	green
3G	3H	white

non-latching
latching

- Output goes high when selector switch is turned
- Each 3 position selector switch uses 2 output pins
- Non-latching - spring return to original position
- Latching - stay in each switch position

Other colours are available on request.

0   2

2 Position Illuminated Selector Switches

2J	2N	red
2K	2O	green
2L	2P	white

non-latching
latching

- Output goes high when selector switch is turned
- Each 2 position illuminated selector switch uses 1 input pin and 1 output pin
- Non-latching - spring return to original position
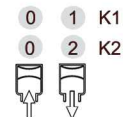- Latching - stay in each switch position

Other colours are available on request.

1   1

Ronis Key Switch

| K1 | 2 position |
| K2 | 3 position |

- 2 position switch uses 1 output pin
- 3 position switch uses 2 output pins
- Including Ronis key
- Latching - stay in each switch position

    K1 : Siemens 3SB30 00-4AD01
    K2 : Siemens 3SB30 00-4DD01

0   1   K1
0   2   K2

BKS ET Key Switch

| K3 | 2 position |
| K4 | 3 position |

- 2 position switch uses 1 output pin
- 3 position switch uses 2 output pins
- Excluding BKS ET key
- Latching - stay in each switch position
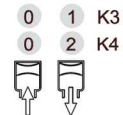
    K3 : Siemens 3SB30 00-5AE31 (E2 : Volkswagen)
    K4 : Siemens 3SB30 00-5AE51 (E7 : Volkswagen)

0   1   K3
0   2   K4

Lamps

LED Lamps

LB	blue	LY	yellow
LC	clear
LG	green
LR	red
LW	white
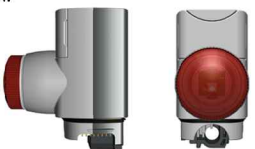
- LED status indicator
- Each lamp uses 1 input pin

Other colours are available on request.

1   0

Emergency Stops / Start Re-Start

Twist Release Emergency Stop

EM **ES** 40mm
ED **EC** 30mm

no monitoring
monitoring

- 2 force break NC Safety contacts (uses none of the I/O pins for safety function)
- Monitored version (EM) also has 1 monitoring contact and thos uses 1 output pin
- 30mm or 40mm button

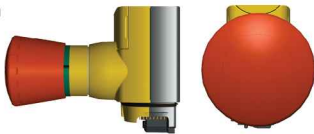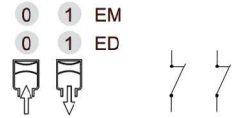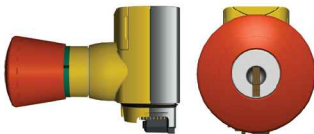*Standard twist release operates on dual safety contacts.*

0 1 EM
0 1 ED

Emergency Stop with Key Operated Reset

EK no monitoring
EJ monitoring

- 2 force break positive make NC Safety contacts (uses none of the I/O pins)
- Monitored version (EK) also has 1NO monitoring contact, uses 1 output pin
- With Ronis key operated reset function
- 40mm button

Twist release after use of the reset key.

0 1 EJ

Start Re-start Key Switch

SC

- Start restart key switch, operating on safety circuits
- Uses 1 NO and 1 NC
- For safety relay re-set
- With Ronis key operated reset function
- Latching - stay in each switch position

Cannot be used in combination with any other module that acts on the safety circuits.

Start Re-start

SR blue
ST black
SX red
SY white
SZ yellow

- Start restart pushbutton, operating on safety circuits
- Uses 1 NO and 1 NC
- For safety relay re-set

Cannot be used in combination with any other module that acts on the safety circuits.

Connectors

Foot

BF

For terminating mechanical configurations (no wiring).

Safety Only Connector

BS

4 pin M12 for connecting dual safety circuits (uses none of the I/O)

Fortress Interlocks

Safety & Control Connectors

BB 2 I/O sourcing output
BC 8 I/O sourcing output
BD 2 I/O sinking output
BE 8 I/O sinking output

- All versions connect dual safety circuits and either up to 2 inputs/outputs or up to 8 inputs/outputs
- 14 pin connector
- 24 Vdc supply

AS-Interface Connectors

BA AS-I safety & control
BG AS-I control only
BH AS-I safety only

BA   4 pin M12 base for connecting dual safety circuits and up to 4 inputs and up to 4 outputs.

BG   4 pin M12 base for connecting controls only up to 4 inputs and up to 4 outputs (uses one address).

BH   4 pin M12 base for connecting dual safety circuits only (uses one address).

Cables & Accessories

4 Pin Cables

24 2m
54 5m
14 10m
04 20m

- Single ended straight connector an cable
- 4 pin M12

14 Pin Cables

21 2m
51 5m
10 10m
20 20m

- Single ended straight connector
- 14 pin

Marked Legend Plates

VG landscape grey
VY landscape yellow
HG portrait grey
HY portrait yellow
DG image grey
DG image yellow

ACCESS REQUEST

E-STOP

- Grey (or yellow for emergency stop modules)
- For vertically mounted configuration (landscape legend plate) up to 3 lines of 17 digits long and 3mm high
- For horizontally mounted configuration (portrait legend plate) up to 2 lines of 11 digits long and 3mm high
- Both portrait and landscape legend plates are also available with an image (DWG format)

Fortress Interlocks

Designation	Hmax (mm)
Key Modules	100
Solenoid Locks	55
Safety Switch	48
Runner Bar	48
Emergency Stops	100
Ronis/BKS Key modules	96
Pushbuttons	59
Mushroom Buttons	76
Selector Switches	76
Lamps	63
Connectors/Heads	35

HC head module has no mounting holes

Assembly & Mounting of Modules *

1. The upper module will be connected to the lower module by simply clicking together.

2. Inserting the joining tube through the middle bore secures the module connection.

3. After connecting all modules according to step 2 the configuration can be mounted e.g. on a grooved profile by slot nuts and cap head screws M5. (or alternatively bolting on flat surface)

4. Finally the cover caps will be pushed on the connecting bores of the module housings.

* **To assure IP 65, all modules must be fixed**.
* **All fixings must be used and tightened to the torque setting specified in the installation instructions.**
* **Complete ordered configurations are supplied fully assembled.**
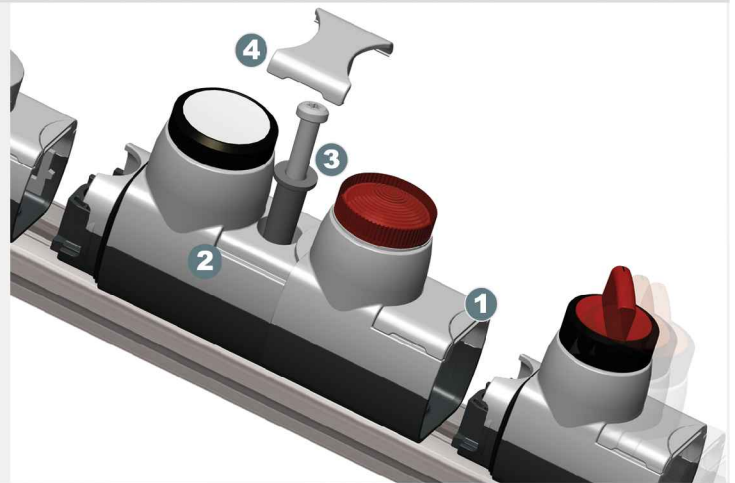
Configuration Rules

1. A configuration must be made up of one head module, at least one core module and one base module.

2. Maximum No of modules = 11 (including head & base).

3. Configuration sequence is: head module, safety locks, access locks, solenoid, safety switches, control modules and base.

4. The start / restart (SR, ST, SW, SX, SY & SZ) module cannot be used in stacks with another module that works on the safety circuits.

5. All eGard configurations are suitable for use in Installation Category 4 (to EN954-1) applications apart from ones combining an e-stop and a gate switch having an ES and SS in same stack (this is Installation Category 3 to EN954-1).

Electrical Guidelines

Control modules with inputs/outputs (I/O) can be configured in any order in the stack (the internal eGard network is self configuring). Table 1 shows how many I/O connections can be made using the different types of connector, and table 2 shows each core modules I/O requirements.

Ref N°	Description	Max I/O	Connects safety circuits
BS	Safety Only	Zero	Yes
BB	Safety and Control sourcing	Max 2 I/O	Yes
BC	Safety and Control sourcing	Max 8 I/O	Yes
BD	Safety and Control sinking	Max 2 I/O	Yes
BE	Safety and Control sinking	Max 8 I/O	Yes
BA	Safety and Control AS-I	Max 4I & 4O	Yes
BH	Safety Only AS-I	Zero	Yes
BG	Control Only AS-I	Max 4I & 4O	No

Table 1: max I/O connections per base connector type

Fortress Interlocks

I/O relative to eGard		inputs (I)	outputs (O)	connects to safety circuits
Head Modules	HF, HM, HC	0	0	-
Mechanical Interlocking	AB, SB	0	0	-
Safety Switches	SS	0	0	Yes
Solenoid Controlled Locks	EU, EL	1	1	-
Runner Bar Modules	RB	0	1	-
Blank Extension Modules	EB	0	0	-
Pushbuttons Flat	PB, PG, PR, PW, PZ, PY	0	1	-
Pushbuttons Flat Illuminated	P1 - P7	1	1	-
2 Position Selector Switches	2A - 2H	0	1	-
3 Position Selector Switches	3A - 3H	0	2	-
2 Position Illuminated Selector Switch	2J, 2K, 2L, 2N, 2O, 2P	1	1	-
2 Position Key Switch	K1, K3	0	1	-
3 Position Key Switch	K2, K4	0	2	-
Pushbutton 40mm Mushroom	M1, M2, MB, MR, MG	0	1	-
Lamps	LR, LG, LC, LB, LW, LY	1	0	-
Emergency Stop	ES, EC	0	0	Yes
Monitored Emergency Stop	EM, ED	0	1	Yes
Key Operated E-stop	EK	0	0	Yes
Monitored Key Operated E-stop	EJ	0	1	Yes
Start / Re-start Buttons	SR, ST, SW, SX, SY, SZ	0	0	Yes
Key Operated Start / Re-start Buttons	SC	0	0	Yes
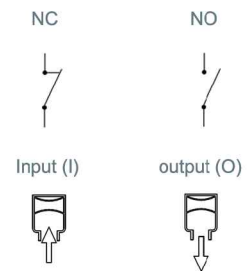
Table 2: Core module I/O requirements

Designation

NC   NO

Input (I)   output (O)

Technical Information

| Base Modules	Max. current
4 pole	200 mA
14 pole	200 mA
4 pole AS-i	75 mA
Temperature Range	-5... + 40 C°
Operating Voltage	24V DC (Not AS-I)

Max. Relative Humidity	93(+/-3)% without any dew on the device
Ingress Protection	IP65

Creating a Part Number

An **eGard** configuration part number can simply be created by adding up the single used module part numbers in sequence from head to base. The legend plates, cables, and door actuators must be ordered separately and are not part of the configuration part number. Below an example of how to create an **eGard** part number:

The complete part number of the example configuration is: HFSBELSSPGPWBC - 51
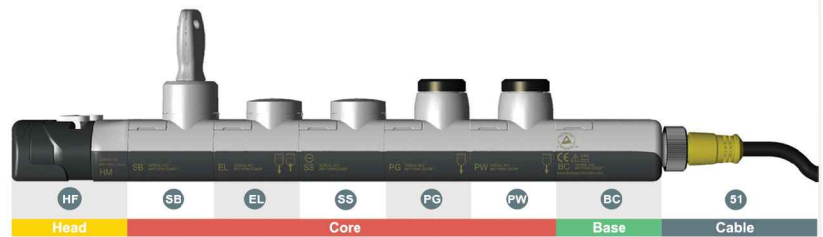
Wiring Schemes

By using the **eGard** configurator (www.fortressinterlocks.com) you are able to simply extract a wiring diagram of each configuration. You can also contact our Technical Sales department for any assistance. Shown below is a wiring diagram for both the 14 pin (safety & control) and the 4 pin (safety only and AS-I) connector.

I/O Assigned from base upwards	Wire Colours	Connector Pins
+24 V	Brown	4
0 V	Blue	6
Safety circuit 1	White	10
Safety circuit 1	Grey	13
Safety circuit 2	Brown/Yellow	5
Safety circuit 2	Brown/Green	12
I/O 0	Red/Blue	11
I/O 1	White/Yellow	3
I/O 2	White/Green	2
I/O 3	Grey/Pink	1
I/O 4	Pink	9
I/O 5	Green	8
I/O 6	Yellow	7
I/O 7	Red	14

Table 3: BC 14 Pin Control & Safety Connector wiring scheme

14 pin
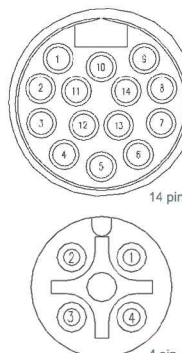
4 pin

I/O Assigned from base upwards	Wire Colours	Connector Pins
Safety circuit 1	Brown	1
Safety circuit 2	White	2
Safety circuit 1	Blue	3
Safety circuit 2	Black	4

Table 4: BS 4 Pin Control only Connectors wiring scheme

Pins	Description
1	AS-I +
2	-
3	AS-I -
4	-

Table 5: 4 Pin AS-i connector wiring scheme

eGard Range Card

Head

Head/Cap

Ref N°

- **HF** Head incl. Fixed Actuator
- **HM** Head Only
- **HC** Cap

Handles & Actuators

- **AF** Fixed Actuator
- **AG** Actuator used in Handles
- **AH** Hinged Door Handle
- **AS** Sliding Door Handle

Core

Mechanical Interlocking

Ref N°

Access Module no Key
- **AB** Standard Lock
- **QB** Master Lock

Safety Module with Key
- **SB** Standard Lock
- **GB** Master Lock
- **KS** Standard Key
- **KM** Master Key

Electrical Locking/Switching

Solenoid Controlled Lock
- **EU** Power to Unlock
- **EL** Power to Lock
- **SS** Safety Switch
- **RB** Runner Bar Switch

Extension Blank Module

- **EB** Extension Blank Module

Pushbuttons

Ref N°

Flat
- **PG** green
- **PY** yellow
- **PR** red
- **PB** black
- **PW** white
- **PZ** blue

Flat Illuminated
- **P1** red
- **P4** clear
- **P2** yellow
- **P6** blue
- **P3** green
- **P7** white

40mm Mushroom Latching
- **M1** black
- **M2** red
- **M3** yellow

40mm Mushroom Non-Latching
- **MB** black
- **MR** red
- **MY** yellow
- **MG** green

Lamps

- **LB** blue
- **LR** red
- **LC** clear
- **LW** white
- **LG** green
- **LY** yellow

Start / Re-Start

- **SC** Start /Re-Start Key Switch

Start / Re-Start for Safety Relay Reset
- **SR** blue
- **ST** black
- **SY** white
- **SX** red
- **SZ** yellow

Selector Switches

Ref N°

2 Position Latching
- **2A** black
- **2B** red
- **2C** green
- **2G** white

2 Position Non-Latching
- **2D** black
- **2E** red
- **2F** green
- **2H** white

3 Position Latching
- **3A** black
- **3B** red
- **3C** green
- **3G** white

3 Position Non-Latching
- **3D** black
- **3E** red
- **3F** green
- **3H** white

2 Position Illuminated Latching
- **2J** red
- **2K** green
- **2L** white

2 Position Illuminated Non-latching
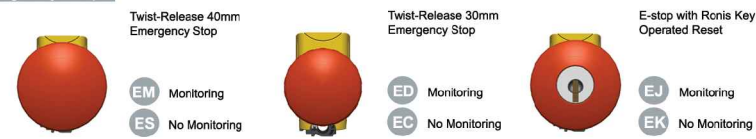- **2N** red
- **2O** green
- **2P** white

Selector Switches

part n°

Ronis Key Switch Latching
- **K1** 2 Position
- **K2** 3 Position

BKS ET Key Switch Latching (E2, E7 Volkswagen)
- **K3** 2 Position (E2)
- **K4** 3 Position (E7)

Emergency Stops
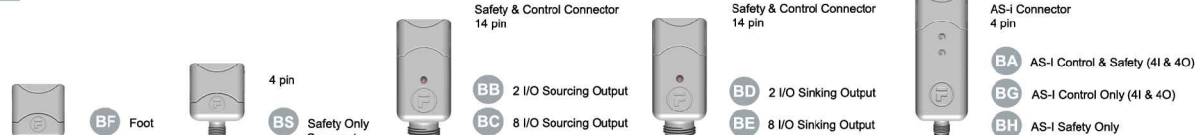
Twist-Release 40mm Emergency Stop
- **EM** Monitoring
- **ES** No Monitoring

Twist-Release 30mm Emergency Stop
- **ED** Monitoring
- **EC** No Monitoring

E-stop with Ronis Key Operated Reset
- **EJ** Monitoring
- **EK** No Monitoring

Base

Connectors

Ref N°

- **BF** Foot
- **BS** Safety Only Cconnector *(4 pin)*

Safety & Control Connector 14 pin
- **BB** 2 I/O Sourcing Output
- **BC** 8 I/O Sourcing Output

Safety & Control Connector 14 pin
- **BD** 2 I/O Sinking Output
- **BE** 8 I/O Sinking Output

AS-i Connector 4 pin
- **BA** AS-I Control & Safety (4I & 4O)
- **BG** AS-I Control Only (4I & 4O)
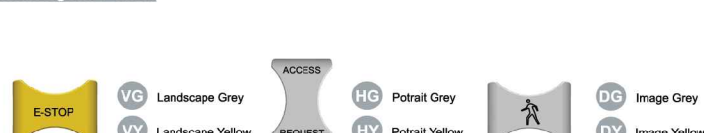- **BH** AS-I Safety Only

Cables & Access

Cables

Ref N°

4 pin M12
- **24** 2m
- **14** 10m
- **54** 5m
- **04** 20m

14 pin
- **21** 2m
- **10** 10m
- **51** 5m
- **20** 20m

Marked Legend Plates

E-STOP
- **VG** Landscape Grey
- **VY** Landscape Yellow

ACCESS REQUEST
- **HG** Potrait Grey
- **HY** Potrait Yellow

- **DG** Image Grey
- **DY** Image Yellow

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