

IDEM SKORPION Rotary Trapped Key



The SKORPION Trapped Key System has been developed to provide extremely robust mechanical coded key safeguarding and interlocking for dangerous machinery.

The SKORPION system works on the principle of releasing factory coded mechanical keys in a predetermined sequence to ensure that machine power is isolated before any access can be gained to a dangerous machine or specific hazard.

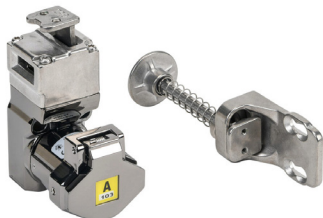
After the machine control has been isolated (that is, after the first key in the system has been turned to the OFF position) the key from the isolator can then be used to release other trapped keys to enable access to the guarded areas.

With this system, safeguarding can be achieved without the need for extensive electrical wiring. This makes the system ideal for use in harsh environments.

When the control switch is used in conjunction with a safety relay/safety controller, the system can be used to achieve up to PLe/Cat 3.



800000-CS-A103



800001-A103



800003-A103



800002-A103



800004-A104



800005-A103

How a Trapped Key System Works

A trapped key guarding system relies on the transfer of keys between a power isolation switch (or control switch) and a locking mechanism fixed on a guard.

The essential feature of the system is that a removable key is literally trapped either in the guard lock or in the control switch. The lock on the guard is arranged so that the key can be released only when the guard has been closed and locked. This allows transfer of the key from the guard to the control switch.

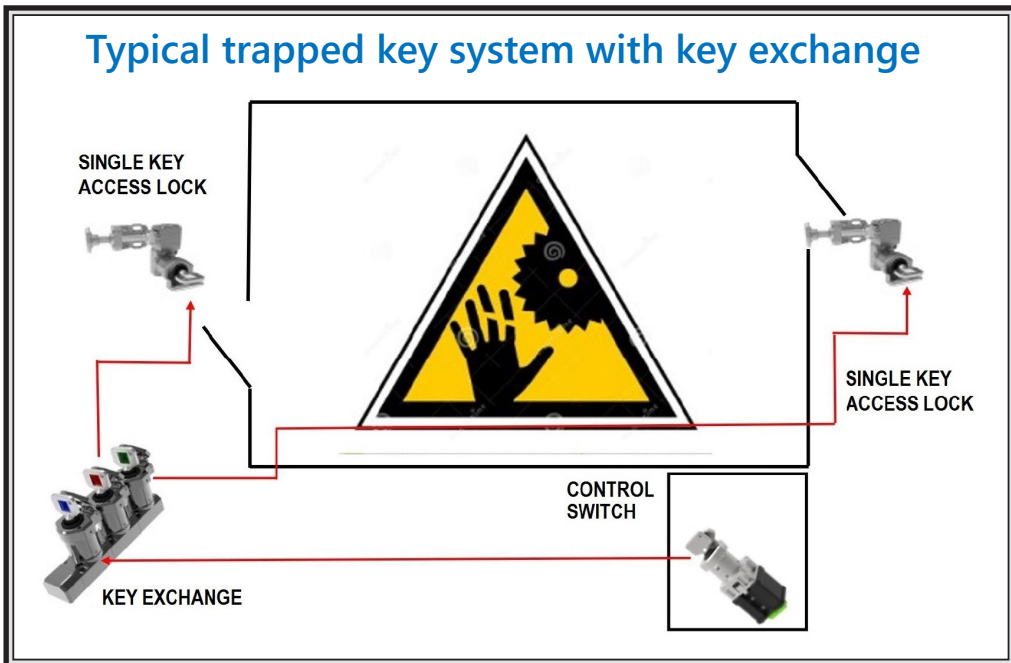
Closing the switch traps the key so that it cannot be removed while the switch is in the ON position.

Where there is more than one guard, the exchange box will accommodate an equivalent number of access keys.

Where a number of operations have to be carried out in a pre-determined sequence, then the transferable key is locked in and exchanged for a different one at each stage.

Features

- No reduction of integrity due to the distance between movable guard and control system.
- High mechanical integrity with robust mountings suitable for all types of guards.
- Eliminates the need for electrical wiring to each movable guard.
- All keys are coded at the factory
- It is virtually impossible to override the system.
- Provides for quick yet safe and reliable access to machinery.
- Can prevent shortcuts and enforce a logical set of procedures.
- Until the control switch key is returned to its original position within the lock, there is no way to enable the machinery to be re-started.



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How to select a trapped key system

You will need to determine four things in order to select the correct trapped key system for your application:

- 1) Do you need a solenoid or a non-solenoid trapped key control switch?
- 2) How many doors or gates do you need to protect.
- 3) Do you need full-body or partial-body access?
- 4) Select a key code

FIRST

Determine whether you need a solenoid or a non-solenoid trapped key control switch by asking, "Does the machine require time to come to a complete stop?"

If **YES**, then you need a solenoid trapped key control switch.

You'll use one of the following:

- [800000-CS-SKR-A101](#)
- [800000-CS-SKR-A102](#)
- [800000-CS-SKR-A103](#)
- [800000-CS-SKR-A104](#)
- [800000-CS-SKR-A105](#)

If **NO**, then you need a non-solenoid trapped key control switch.

You'll use one of the following:

- [800000-CS-A101](#)
- [800000-CS-A102](#)
- [800000-CS-A103](#)
- [800000-CS-A104](#)
- [800000-CS-A105](#)

Pro Tip:

The last four characters are the key code. All components in your system should have the same key code.

If multiple machines will be installed within the same vicinity, then a different key code should be used.

THEN

Determine how many doors or gates you will need to protect in your system. Systems are available to protect up to three doors/gates.

I need to protect...

One door/gate

Two doors/gates

Three doors/gates

Also ask...

Can you step fully into the guard and close the door or gate?

If **YES**, then you need a full-body access system.

If **NO**, then you need a partial body access system.

Now use the following table to select the correct door/gate access for your application:

Key Code	One Door/Gate		Two Doors/Gates		Three Doors/Gates
	Full Body	Partial Body	Full Body	Partial Body	Full Body
A101	-	<u>800001-A101</u>	-	-	-
A102	-	<u>800001-A102</u>	-	-	-
A103	<u>800003-A103</u>	<u>800001-A103</u>	<u>800004-A103</u>	<u>800002-A103</u>	<u>800005-A103</u>
A104	<u>800003-A104</u>	<u>800001-A104</u>	<u>800004-A104</u>	<u>800002-A104</u>	<u>800005-A104</u>
A105	<u>800003-A105</u>	<u>800001-A105</u>	<u>800004-A105</u>	<u>800002-A105</u>	<u>800005-A105</u>

IDEM SKORPION Rotary Trapped Key Gate Interlocks



A complete trap key system includes the control switch as well as a gate interlock system. Depending on the number and type of entries being protected, your system will require certain specific components.

We have made system selection simple by offering various packages based on different system architectures. The tables below will help you select the correct interlock kit for your application.

Note that the use of a control switch is required with any of these interlock kits.

Features

- Die-cast aluminum alloy
- Interlocks are suitable for CIP and SIP cleaning processes and can be high-pressure hosed with detergents at high temperatures.
- High mechanical integrity with robust mountings suitable for all types of guards.
- Eliminates the need for electrical wiring to each movable guard.
- All keys are coded at the factory
- Can prevent shortcuts and enforce a logical set of procedures.
- Until the isolator key is returned to its original position within the lock, there is no way to enable the machinery to be re-started.

IDEM SKORPION Trapped Key Gate Interlock System Selection Guide

Part Number	Price	Access Type	Number of Doors/Gates	Key Exchange	Weight	Drawing
Partial Body, 1 Door/Gate						
800001-A101	\$244.00	Partial body	1	None	3.15 lb [1.43 kg]	PDF
800001-A102	\$244.00	Partial body	1	None	3.15 lb [1.43 kg]	PDF
800001-A103	\$244.00	Partial body	1	None	3.15 lb [1.43 kg]	PDF
800001-A104	\$244.00	Partial body	1	None	3.15 lb [1.43 kg]	PDF
800001-A105	\$244.00	Partial body	1	None	3.15 lb [1.43 kg]	PDF

Partial Body, 2 Doors/Gates						
800002-A103	\$1,085.00	Partial body	2	Yes	13.15 lb [5.96 kg]	PDF
800002-A104	\$1,085.00	Partial body	2	Yes	13.15 lb [5.96 kg]	PDF
800002-A105	\$1,085.00	Partial body	2	Yes	13.15 lb [5.96 kg]	PDF

Whole Body, 1 Door/Gate						
800003-A103	\$517.00	Whole body	1	None	5.05 lb [2.29 kg]	PDF
800003-A104	\$517.00	Whole body	1	None	5.05 lb [2.29 kg]	PDF
800003-A105	\$517.00	Whole body	1	None	5.05 lb [2.29 kg]	PDF

Whole Body, 2 Doors/Gates						
800004-A103	\$1,633.00	Whole body	2	Yes	16.75 lb [7.60 kg]	PDF
800004-A104	\$1,633.00	Whole body	2	Yes	16.75 lb [7.60 kg]	PDF
800004-A105	\$1,633.00	Whole body	2	Yes	16.75 lb [7.60 kg]	PDF

Whole Body, 3 Doors/Gates						
800005-A103	\$2,338.00	Whole body	3	Yes	23.35 lb [10.59 kg]	PDF
800005-A104	\$2,338.00	Whole body	3	Yes	23.35 lb [10.59 kg]	PDF
800005-A105	\$2,338.00	Whole body	3	Yes	23.35 lb [10.59 kg]	PDF

* A control switch with the same key code (the last four characters of the part number) is required.

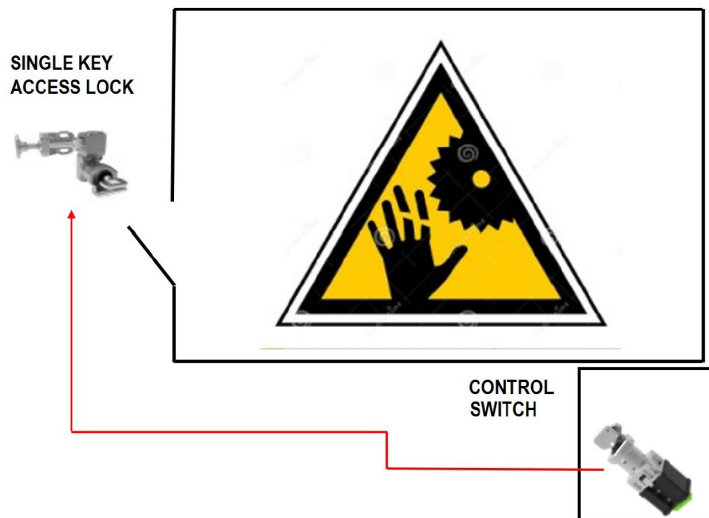
IDEM SKORPION Rotary Trapped Key Gate Interlocks General Specifications

Mechanical Life (B10_d)	1,000,000 cycles
Holding Force	3000N [674.4 lbf]
Temperature	-20 C to 40 C [-4 F to 104 F]
Mounting Specifications	M6 screws (not supplied) should be tightened to 2 N•m [1.5 lb•ft]
Standards	ISO14119, PD/ISO/TS 19837
Agency Approvals	CE

IDEM SKORPION Rotary Trapped Key

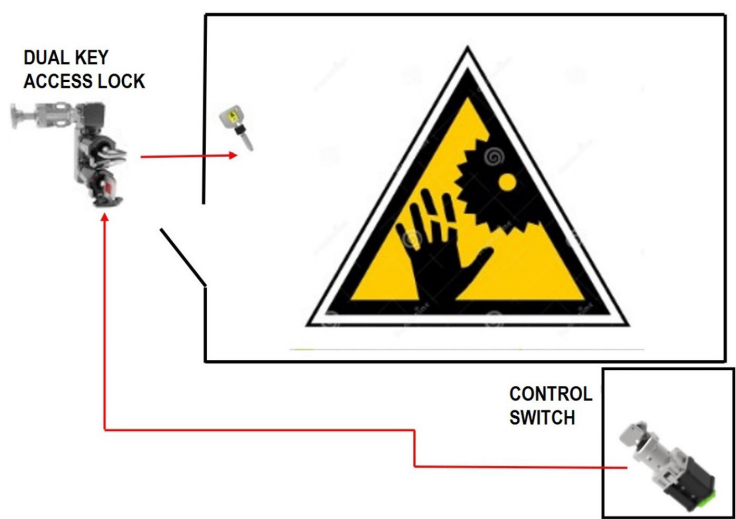


Examples of trapped key systems



One Door/Gate With Only Partial Body Access	
Required Components	
If machine DOES NOT have run-down time	If machine DOES have run-down time
(1) 800000-CS-A101	(1) 800000-CS-SKR-A101
(1) 800001-A101	(1) 800001-A101

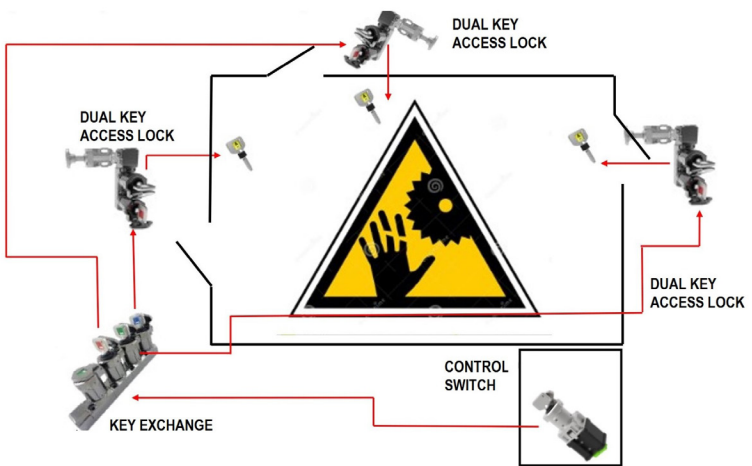
NOTE:
In order to avoid cross-controlling when multiple machines are in close proximity, A101 can be replaced with A102, A103, A104 or A105.



One Door/Gate With Whole Body Access	
Required Components	
If machine DOES NOT have run-down time	If machine DOES have run-down time
(1) 800000-CS-A103	(1) 800000-CS-SKR-A103
(1) 800003-A103	(1) 800003-A103

NOTE: In order to avoid cross-controlling when multiple machines are in close proximity, A103 can be replaced with A104 or A105.

If whole body access is allowed, then the operator should remove a key from the access lock and retain the key while inside to prevent someone else from shutting the door and turning on the machine.



Three Doors/Gates With Whole Body Access	
Required Components	
If machine DOES NOT have run-down time	If machine DOES have run-down time
(1) 800000-CS-A103	(1) 800000-CS-SKR-A103
(1) 800005-A103	(1) 800005-A103

NOTE: In order to avoid cross-controlling when multiple machines are in close proximity, A103 can be replaced with A104 or A105.

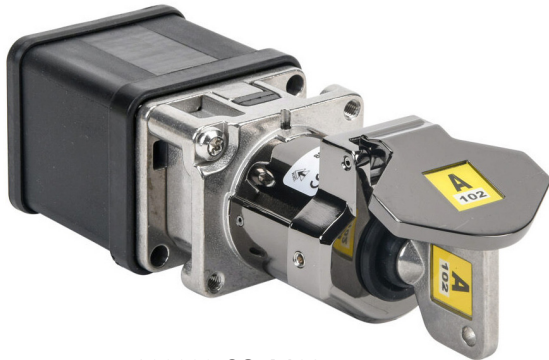
If whole body access is allowed, then the operator should remove a key from the access lock and retain the key while inside to prevent someone else from shutting the door and turning on the machine.

IDEM SKORPION Rotary Trapped Key Control Switch



Control Switch Without Solenoid

Used to immediately turn off machine control circuits



80000-CS-A102

Features

- No solenoid
- 4 normally open (NO) contacts
- 2 normally closed (NC) contacts
- Die-cast aluminum alloy

Control Switch Without Solenoid Selection Guide

Part Number	Price	Description	Key Code	Drawing
800000-CS-A101	\$223.00	IDEM SKORPION Series control switch and key	A101	PDF
800000-CS-A102	\$223.00	IDEM SKORPION Series control switch and key	A102	PDF
800000-CS-A103	\$223.00	IDEM SKORPION Series control switch and key	A103	PDF
800000-CS-A104	\$223.00	IDEM SKORPION Series control switch and key	A104	PDF
800000-CS-A105	\$223.00	IDEM SKORPION Series control switch and key	A105	PDF

IDEM SKORPION Rotary Trapped Key Control Switches General Specifications

Mechanical Life (B10_d)	1,000,000 cycles
Electrical Output Contacts	Rated 240V 3A (A300)
Temperature	-20 C to 40 C [-4 F to 104 F]
Wire Size	16-28 AWG
Terminal Torque	6 lb•in (0.7 N•m)
Ingress Protection	IP50 (IP51 with 800050 enclosure)
Weight	2.5 lb [1.13 kg]
Standards	UL60947-5-1, ISO14119, PD/ISO/TS 19837
Agency Approvals	UL and CE

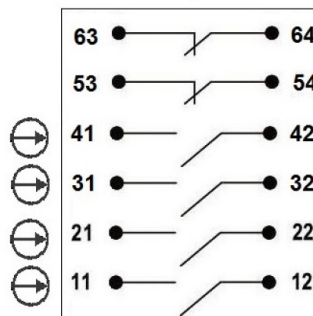
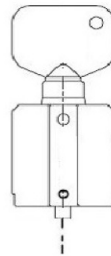
Connection Diagram

Machine Able to Run Condition:

- Key inserted and turned to trapped position
- 11/12, 21/22, 31/32, 41/42 are closed (control contacts)
- 53/54, 63/64 are open (auxiliary contacts)

Machine In Safe Condition:

- Turning the key will cause the following to occur
- 11/12, 21/22, 31/32, 41/42 will open (control contacts)
- 53/54, 63/64 will close (auxiliary contacts)
- Key can be removed



IDEM SKORPION Rotary Trapped Key Solenoid Control Switch



Control Switch With Solenoid

Used to turn off machine control circuits after the internal solenoid is energized.

The solenoid version is often used in systems that require the operator to "Request to Enter" from the HMI or a pushbutton. This would cause the machine to come to a controlled stop and then unlock the trapped key.



800000-CS-SKR-A102

Features

- A solenoid to prevent the key from being turned
- 4 normally open (NO) contacts
- 2 normally closed (NC) contacts
- Die-cast aluminum alloy

Control Switch With Solenoid Selection Guide

Part Number	Price	Description	Key Code	Drawing
800000-CS-SKR-A101	\$431.00	IDEM SKORPION Series solenoid control switch and key	A101	PDF
800000-CS-SKR-A102	\$431.00	IDEM SKORPION Series solenoid control switch and key	A102	PDF
800000-CS-SKR-A103	\$431.00	IDEM SKORPION Series solenoid control switch and key	A103	PDF
800000-CS-SKR-A104	\$431.00	IDEM SKORPION Series solenoid control switch and key	A104	PDF
800000-CS-SKR-A105	\$431.00	IDEM SKORPION Series solenoid control switch and key	A105	PDF

IDEM SKORPION Rotary Trapped Key Control Switches General Specifications

Mechanical Life (B10_d)	1,000,000 cycles
Electrical Output Contacts	Rated 240V 3A (A300)
Solenoid Operating Voltage	24V+/- 10% Class 2
Temperature	-20 C to 40 C [-4 F to 104 F]
Wire Size	16-28 AWG
Terminal Torque	6 lb•in (0.7 N•m)
Ingress Protection	IP50 (IP51 with 800050 enclosure)
Weight	2.5 lb [1.13 kg]
Standards	UL60947-5-1, ISO14119, PD/ISO/TS 19837
Agency Approvals	UL and CE

Connection Diagram

Machine Able to Run Condition:

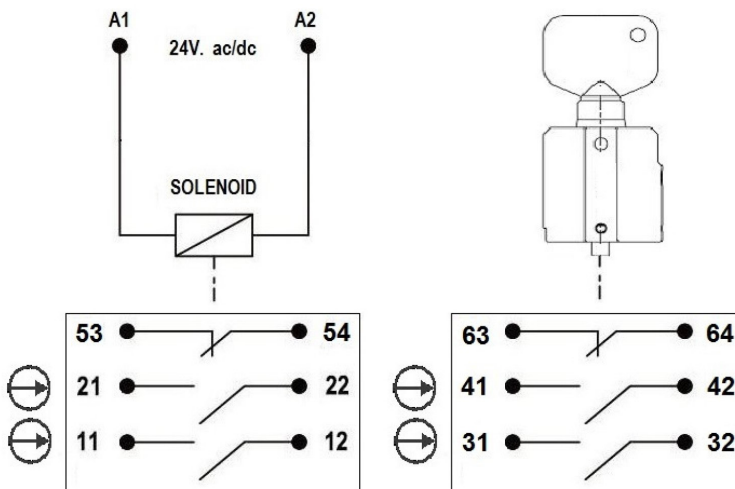
- No power applied to A1 and A2
- Key inserted and turned to trapped position
- 11/12, 21/22, 31/32, 41/42 are closed (control contacts)
- 53/54, 63/64 are open (auxiliary contacts)

Applying 24VDC to A1 and A2:

- Energizes the solenoid
- 11/12 and 21/22 will open (control contacts)
- 53/54 will close (auxiliary contacts)
- Key can be turned and removed

Turning and Removing the Key:

- 31/32 and 41/42 will open (control contacts)
- 63/64 will close (auxiliary contacts)



IDEM SKORPION Rotary Trapped Key Control Switch Enclosure



Enclosure for Control Switch

IDEM provides an optional polycarbonate enclosure for all of its control switches.

- IP51 with control switch installed
- Pre-drilled holes for convenient installation



800050

IDEM SKORPION Enclosure Selection Guide

Part Number	Price	Description	Material	For use with	Weight	Drawing
800050	\$72.00	Control switch enclosure	Polycarbonate	800000-x control switches	0.8 lb [0.36 kg]	PDF



800050 with **800000-CS-SKR-A104** mounted inside.

Safety Products



Warning: Safety products sold by AutomationDirect are Safety components only. The purchaser/installer is solely responsible for the application of these components and ensuring all necessary steps have been taken to assure each application and use meets all performance and applicable safety requirements and/or local, national and/or international safety codes as required by the application. AutomationDirect cannot certify that our products, used solely or in conjunction with other AutomationDirect or other vendors' products, will assure safety for any application. Any person using or applying any products sold by AutomationDirect is responsible for learning the safety requirements for their individual application and applying them, and therefore assumes all risks, and accepts full and complete responsibility, for the selection and suitability of the product for their respective application.

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