

SKORPION PROVIDES ROBUST MECHANICAL CODED KEY SAFEGUARDING AND INTERLOCKING FOR HAZARDOUS MACHINERY.

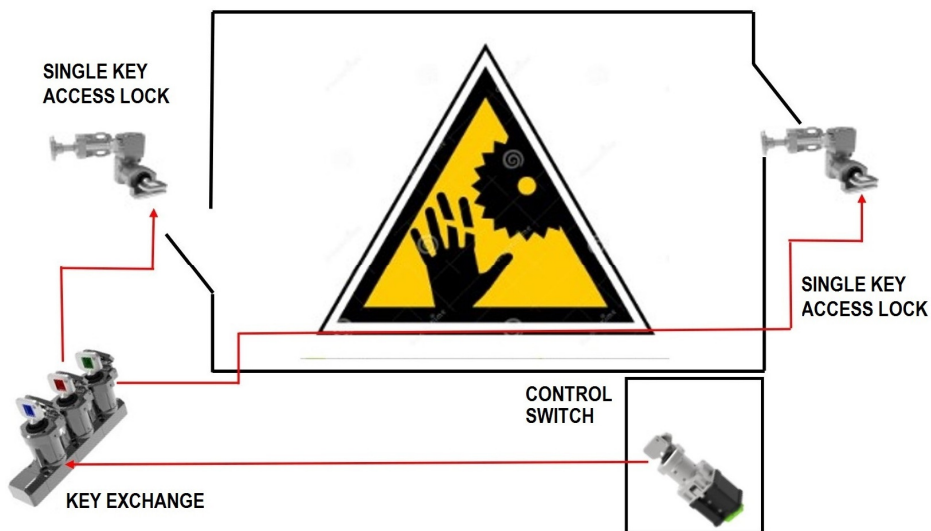
SKORPION relies upon the transfer of coded keys between an electrical control switch and a locking interlock on machine guard. The essential feature of SKORPION is that a removable key is trapped either in the Guard Interlock or the Control Switch. The Interlock on the guard is arranged so that the key can only be released when the guard has been closed and locked. This allows transfer of the key from the guard to the control switch.

Turning the key and closing the Control Switch also traps the key so that it cannot be removed whilst the Control Switch circuit is closed.

When there is more than one guard, a Key Exchange Block can be used. The Key Exchange Block will accommodate an equivalent number of Guard Interlock keys. The first key from the Control switch can be placed into the first position of the Key Exchange Block to release the other Guard Interlock keys.

Only when all the Guard Interlocks are closed and locked and the keys returned to the Key Exchange Block can the first key be returned to the Control Switch.

System Selection and Operating Instructions.



Step 1:

Choose which type of control switch (M-CS or M-CS-SKR). This is the only electrical part of the system. This contains the first key, which is trapped when the machine is running (safety control contacts closed) and can only be turned and removed when the machine has stopped (safety control contacts open).

Type M-CS. The Control Key can be turned and released to switch off the machine safety control contacts.

Used when a machine stops immediately (no hazard present).

Type M-CS-SKR. The Control Key can only be turned and released after the internal solenoid is energised).

Used when a machine has a running down time before any hazard is removed. (The internal solenoid must be controlled by the machine control circuit to ensure that the hazard has ceased and the solenoid is energised).

The CS and CS-SKR are panel mount or use optional plastic enclosure (CS/CS-SKR Enclosure).

Step 2:

Choose first key code (there are several key code variants which can be ordered if more than one system is required).

Step 3:

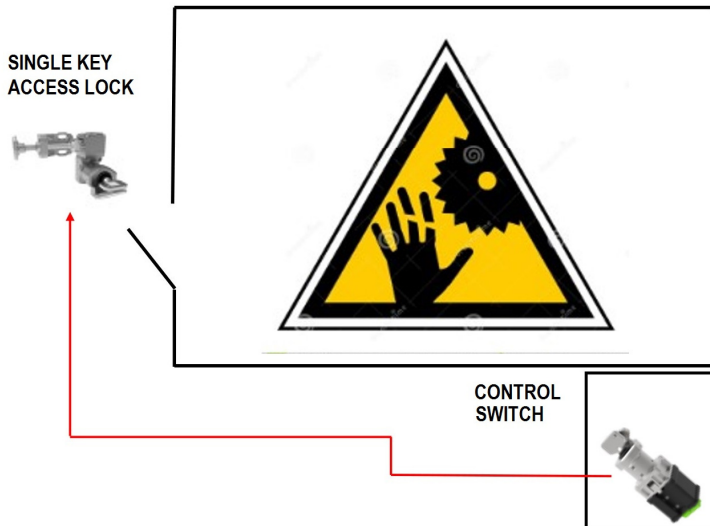
Choose which interlock switch system is needed based upon whole or part body access and the number of guards.

(Whole body access interlocks have an extra access key which can be taken by the operator into a hazardous area (Duel Key)). Only when the access key is returned and replaced into the interlock can the door be re-closed and locked.

System selection

Trapped Key Interlocking

System 1 (1 Door Part Body Access)



Sequence of operation:

Turn the CONTROL SWITCH Key and isolate power to machine safety control circuit.

Remove the Key from the CONTROL SWITCH and insert into the ACCESS LOCK at the guard door.

Turning the key in the ACCESS LOCK allows the guard door to be opened and traps the key so that it cannot be returned to the CONTROL SWITCH until the guard is re-closed and locked.

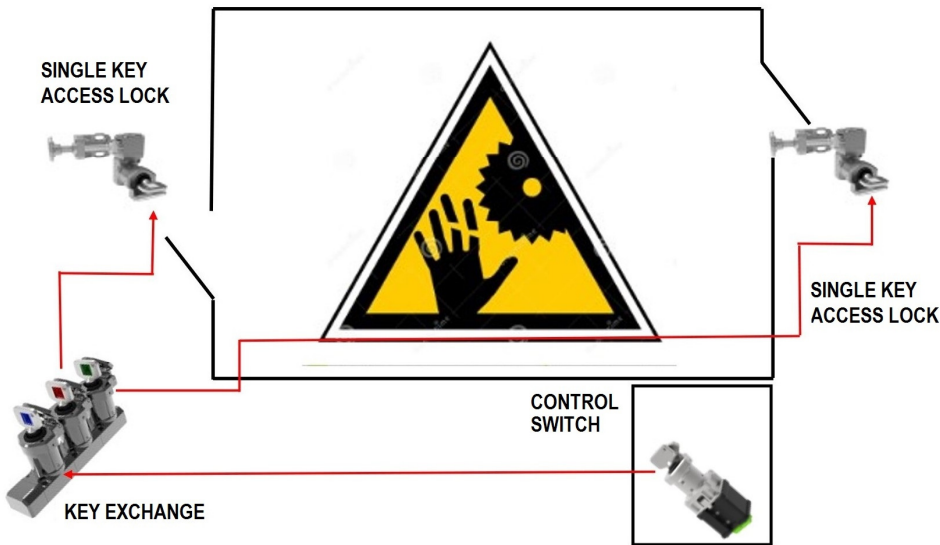
No run down time	Part Numbers required	Description	Includes
No run down - 1 Interlock Part Body Access. Key Code Set A101.	800000-CS-A101	Control Switch A101	(1) M-CS (1) SK-KEY
	800001-A101	1 Door Part Body Access A101	(1) M-HT-S-L
No run down - 1 Interlock Part Body Access. Key Code Set A102.	800000-CS-A102	Control Switch A102	(1) M-CS (1) SK-KEY
	800001-A102	1 Door Part Body Access A102	(1) M-HT-S-L
No run down - 1 Interlock Part Body Access. Key Code Set A103.	800000-CS-A103	Control Switch A103	(1) M-CS (1) SK-KEY
	800001-A103	1 Door Part Body Access A103	(1) M-HT-S-L
No run down - 1 Interlock Part Body Access. Key Code Set A104.	800000-CS-A104	Control Switch A104	(1) M-CS (1) SK-KEY
	800001-A104	1 Door Part Body Access A104	(1) M-HT-S-L
No run down - 1 Interlock Part Body Access. Key Code Set A105.	800000-CS-A105	Control Switch A105	(1) M-CS (1) SK-KEY
	800001-A105	1 Door Part Body Access A105	(1) M-HT-S-L

Run down time on machine	Part Numbers required	Description	Includes
Run down - 1 Interlock Part Body Access. Key Code Set A101.	800000-CS-SKR-A101	Solenoid Control Switch A101	(1) M-CS-SKR (1) SK-KEY
	800001-A101	1 Door Part Body Access A101	(1) M-HT-S-L
Run down - 1 Interlock Part Body Access. Key Code Set A102.	800000-CS-SKR-A102	Solenoid Control Switch A102	(1) M-CS-SKR (1) SK-KEY
	800001-A102	1 Door Part Body Access A102	(1) M-HT-S-L
Run down - 1 Interlock Part Body Access. Key Code Set A103.	800000-CS-SKR-A103	Solenoid Control Switch A103	(1) M-CS-SKR (1) SK-KEY
	800001-A103	1 Door Part Body Access A103	(1) M-HT-S-L
Run down - 1 Interlock Part Body Access. Key Code Set A104.	800000-CS-SKR-A104	Solenoid Control Switch A104	(1) M-CS-SKR (1) SK-KEY
	800001-A104	1 Door Part Body Access A104	(1) M-HT-S-L
Run down - 1 Interlock Part Body Access. Key Code Set A105.	800000-CS-SKR-A105	Solenoid Control Switch A105	(1) M-CS (1) SK-KEY
	800001-A105	1 Door Part Body Access A105	(1) M-HT-S-L

Accessory - Plastic Enclosure for M-CS or M-CS-SKR	Part Number 800050	CS/CS-SKR Enclosure
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Trapped Key Interlocking

System 2 (2 Door Part Body Access)



Sequence of operation:

Turn the CONTROL SWITCH key and isolate power to the machine safety control circuit.

Remove the key from the CONTROL SWITCH and insert into position 1 in the KEY EXCHANGE to enable the release of the keys from positions 2 & 3. These keys are used to open the ACCESS LOCKS fitted at each guard door.

Turning the keys in the ACCESS LOCKS allows the guard doors to be opened and traps the keys so that they cannot be returned to the KEY EXCHANGE until both guards are re-closed and locked.

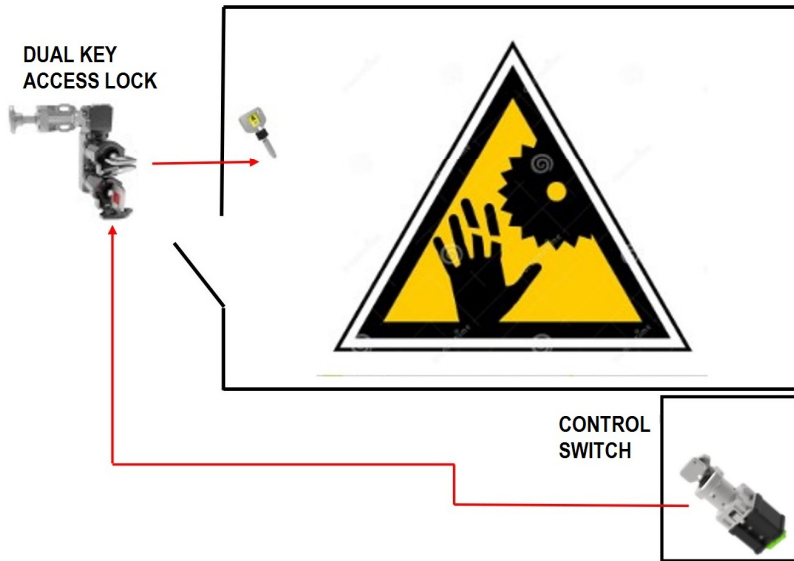
No run down time on machine	Part Numbers required	Description	Includes
No run down - 2 Interlocks Part Body Access. Key Code Set A103.	800000-CS-A103	Control Switch A103	(1) M-CS (1) SK-KEY
	800002-A103	2 Door Part Body Access A103	(2) M-HT-S-L (2) SK-KEY (1) M-KE-NS3
No run down - 2 Interlocks Part Body Access. Key Code Set A104.	800000-CS-A104	Control Switch A104	(1) M-CS (1) SK-KEY
	800002-A104	2 Door Part Body Access A104	(2) M-HT-S-L (2) SK-KEY (1) M-KE-NS3
No run down - 2 Interlocks Part Body Access. Key Code Set A105.	800000-CS-A105	Control Switch A105	(1) M-CS (1) SK-KEY
	800002-A105	2 Door Part Body Access A105	(2) M-HT-S-L (2) SK-KEY (1) M-KE-NS3

Run down time on machine	Part Numbers required	Description	Includes
Run down - 2 Interlocks Part Body Access. Key Code Set A103.	800000-CS-SKR-A103	Solenoid Control Switch A103	(1) M-CS-SKR (1) SK-KEY
	800002-A103	2 Door Part Body Access A103	(2) M-HT-S-L (2) SK-KEY (1) M-KE-NS3
Run down - 2 Interlocks Part Body Access. Key Code Set A104.	800000-CS-SKR-A104	Solenoid Control Switch A104	(1) M-CS-SKR (1) SK-KEY
	800002-A104	2 Door Part Body Access A104	(2) M-HT-S-L (2) SK-KEY (1) M-KE-NS3
Run down - 2 Interlocks Part Body Access. Key Code Set A105.	800000-CS-SKR-A105	Solenoid Control Switch A105	(1) M-CS-SKR (1) SK-KEY
	800002-A105	2 Door Part Body Access A105	(2) M-HT-S-L (2) SK-KEY (1) M-KE-NS3

Accessory - Plastic Enclosure for M-CS or M-CS-SKR	Part Number 800050	CS/CS-SKR Enclosure
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Trapped Key Interlocking

System 3 (1 Door Whole Body Access)



Sequence of operation:

Turn the CONTROL SWITCH key and isolate power to the machine safety control circuit.

Insert the key into position 1 of the DUAL ACCESS LOCK at the guard door.

Turning the key in the ACCESS LOCK allows a secondary key from position 2 to be released such that an operator can take it inside the guarded area therefore preventing the guard from being locked and the system re-started.

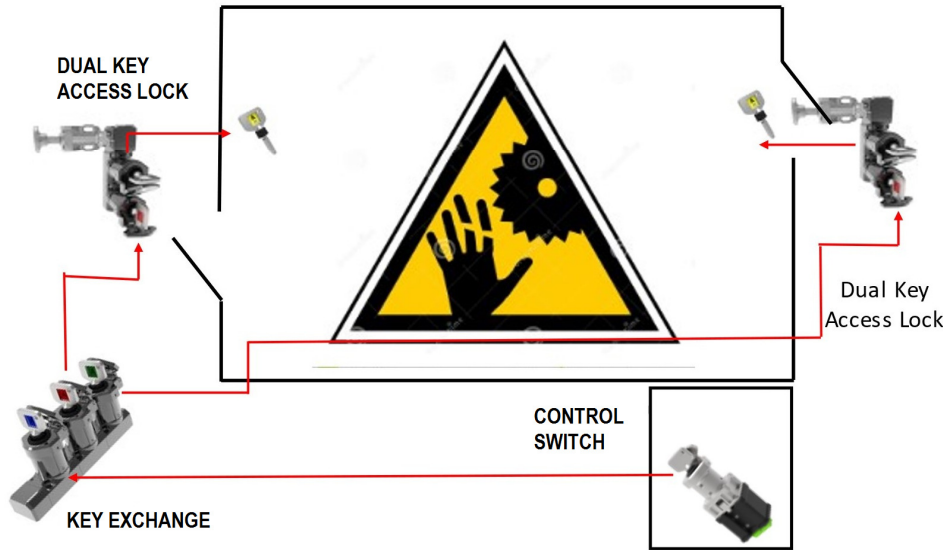
No run down time on machine	Part Numbers required	Description	Includes
No run down – 1 Interlock Whole Body Access. Key Code Set A103.	800000-CS-A103	Control Switch A103	(1) M-CS (1) SK-KEY
	800003-A103	1 Door Full Body Access A103	(1) M-HT-D-L-11 (1) SK-KEY
No run down – 1 Interlock Whole Body Access. Key Code Set A104.	800000-CS-A104	Control Switch A104	(1) M-CS (1) SK-KEY
	800003-A104	1 Door Full Body Access A104	(1) M-HT-D-L-11 (1) SK-KEY
No run down – 1 Interlock Whole Body Access. Key Code Set A104.	800000-CS-A105	Control Switch A105	(1) M-CS (1) SK-KEY
	800003-A105	1 Door Full Body Access A105	(1) M-HT-D-L-11 (1) SK-KEY

Run down time on machine	Part Numbers required	Description	Includes
Run down – 1 Interlock Whole Body Access. Key Code Set A103.	800000-CS-SKR-A103	Solenoid Control Switch A103	(1) M-CS-SKR (1) SK-KEY
	800003-A103	1 Door Full Body Access A103	(1) M-HT-D-L-11 (1) SK-KEY
Run down – 1 Interlock Whole Body Access. Key Code Set A104.	800000-CS-SKR-A104	Solenoid Control Switch A103	(1) M-CS-SKR (1) SK-KEY
	800003-A104	1 Door Full Body Access A104	(1) M-HT-D-L-11 (1) SK-KEY
Run down – 1 Interlock Whole Body Access. Key Code Set A104.	800000-CS-SKR-A105	Solenoid Control Switch A103	(1) M-CS-SKR (1) SK-KEY
	800003-A105	1 Door Full Body Access A105	(1) M-HT-D-L-11 (1) SK-KEY

Accessory - Plastic Enclosure for M-CS or M-CS-SKR	Part Number 800050	CS/CS-SKR Enclosure
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Trapped Key Interlocking

System 4 (2 Door Whole Body Access)



Sequence of operation:

Turn the CONTROL SWITCH key and isolate power to the machine safety control circuit.

Remove the key from the CONTROL SWITCH and insert into position 1 in the KEY EXCHANGE to enable the release of the keys from positions 2 & 3. These keys are used to open the ACCESS LOCKS fitted at each guard door.

Turning the keys in the ACCESS LOCKS allows the secondary keys from position 2 of each ACCESS LOCK to be released such that operators can take them inside the guarded area therefore preventing the guards from being locked and the system re-started.

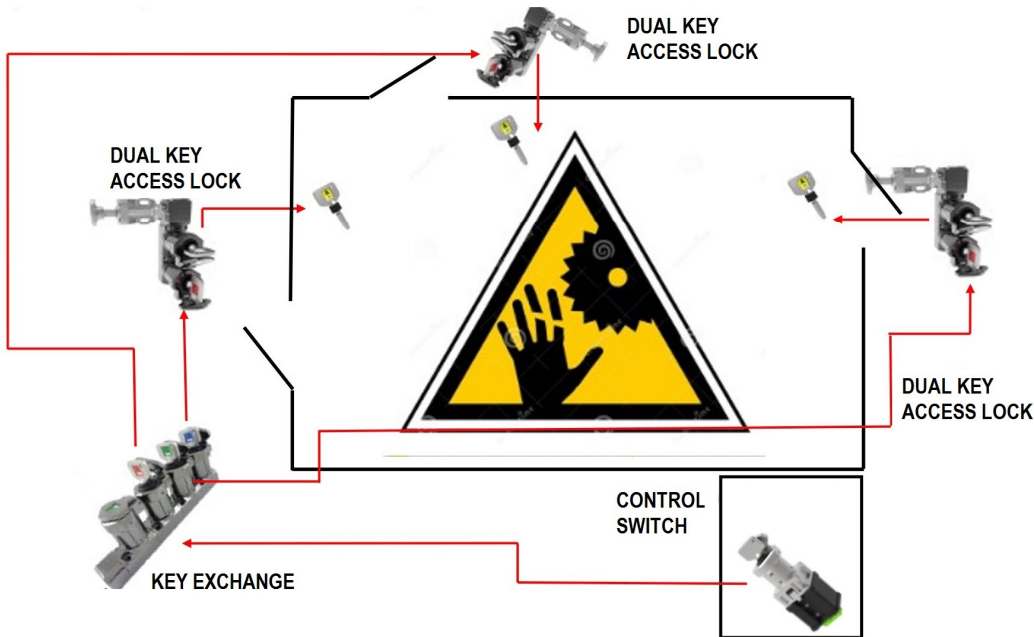
No run down time on machine	Part Numbers required	Description	Includes
No run down – 2 Interlocks Whole Body Access. Key Code Set A103.	800000-CS-A103	Control Switch A103	(1) M-CS (1) SK-KEY
	800004-A103	2 Door Full Body Access A103	(2) M-HT-D-L-11 (4) SK-KEY (1) M-KE-NS3
No run down – 2 Interlocks Whole Body Access. Key Code Set A104.	800000-CS-A104	Control Switch A104	(1) M-CS (1) SK-KEY
	800004-A104	2 Door Full Body Access A104	(2) M-HT-D-L-11 (4) SK-KEY (1) M-KE-NS3
No run down – 2 Interlocks Whole Body Access. Key Code Set A105.	800000-CS-A105	Control Switch A105	(1) M-CS (1) SK-KEY
	800004-A105	2 Door Full Body Access A105	(2) M-HT-D-L-11 (4) SK-KEY (1) M-KE-NS3

Run down time on machine	Part Numbers required	Description	Includes
Run down – 2 Interlocks Whole Body Access. Key Code Set A103.	800000-CS-SKR-A103	Solenoid Control Switch A103	(1) M-CS-SKR (1) SK-KEY
	800004-A103	2 Door Full Body Access A103	(2) M-HT-D-L-11 (4) SK-KEY (1) M-KE-NS3
Run down – 2 Interlocks Whole Body Access. Key Code Set A104.	800000-CS-SKR-A104	Control Switch A104	(1) M-CS (1) SK-KEY
	800004-A104	2 Door Full Body Access A104	(2) M-HT-D-L-11 (4) SK-KEY (1) M-KE-NS3
Run down – 2 Interlocks Whole Body Access. Key Code Set A105.	800000-CS-SKR-A105	Control Switch A105	(1) M-CS (1) SK-KEY
	800004-A105	2 Door Full Body Access A105	(2) M-HT-D-L-11 (4) SK-KEY (1) M-KE-NS3

Accessory - Plastic Enclosure for M-CS or M-CS-SKR	Part Number 800050	CS/CS-SKR Enclosure
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Trapped Key Interlocking

System 5 (3 Door Whole Body Access)



Sequence of operation:

Turn the CONTROL SWITCH key and isolate power to the machine safety control circuit.

Remove the key from the CONTROL SWITCH and insert into position 1 in the KEY EXCHANGE to enable the release of the keys from positions 2, 3 & 4. These keys are used to open the ACCESS LOCKS fitted at each guard door.

Turning the keys in the ACCESS LOCKS allows the secondary keys from position 2 of each ACCESS LOCK to be released such that operators can take them inside the guarded area therefore preventing the guards from being locked and the system re-started.

No run down time on machine	Part Numbers required	Description	Includes
No run down – 3 Interlocks Whole Body Access. Key Code Set A103.	800000-CS-A103	Control Switch A103	(1) M-CS (1) SK-KEY
	800005-A103	3 Door Full Body Access A103	(3) M-HT-D-L-11 (6) SK-KEY (1) M-KE-NS4
No run down – 3 Interlocks Whole Body Access. Key Code Set A104.	800000-CS-A104	Control Switch A104	(1) M-CS (1) SK-KEY
	800005-A104	3 Door Full Body Access A104	(3) M-HT-D-L-11 (6) SK-KEY (1) M-KE-NS4
No run down – 3 Interlocks Whole Body Access. Key Code Set A105.	800000-CS-A105	Control Switch A105	(1) M-CS (1) SK-KEY
	800005-A105	3 Door Full Body Access A105	(3) M-HT-D-L-11 (6) SK-KEY (1) M-KE-NS4

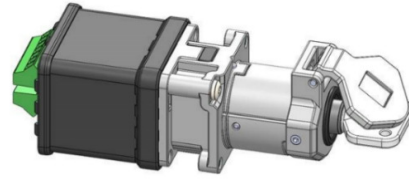
Run down time on machine	Part Numbers required	Description	Includes
Run down – 3 Interlocks Whole Body Access. Key Code Set A103.	800000-CS-SKR-A103	Solenoid Control Switch A103	(1) M-CS (1) SK-KEY
	800005-A103	3 Door Full Body Access A103	(3) M-HT-D-L-11 (6) SK-KEY (1) M-KE-NS4
Run down – 3 Interlocks Whole Body Access. Key Code Set A104.	800000-CS-SKR-A104	Solenoid Control Switch A104	(1) M-CS (1) SK-KEY
	800005-A104	3 Door Full Body Access A104	(3) M-HT-D-L-11 (6) SK-KEY (1) M-KE-NS4
Run down – 3 Interlocks Whole Body Access. Key Code Set A105.	800000-CS-SKR-A105	Solenoid Control Switch A105	(1) M-CS (1) SK-KEY
	800005-A105	3 Door Full Body Access A105	(3) M-HT-D-L-11 (6) SK-KEY (1) M-KE-NS4

Accessory - Plastic Enclosure for M-CS or M-CS-SKR	Part Number 800050	CS/CS-SKR Enclosure
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SKORPION TRAPPED KEY INTERLOCK SYSTEMS

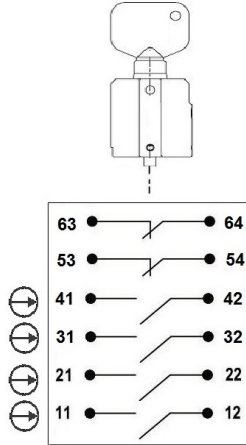
Operating Instructions



Control Switches Types M-CS and M-CS-SKR

Type M-CS

The M-CS is a Trapped Key operated control switch designed to turn off machine control circuits on machines without run down time. The Key is trapped when the main control contacts are closed (machine able to run). Turning the key opens the main control contacts and allows the key to be removed.



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).

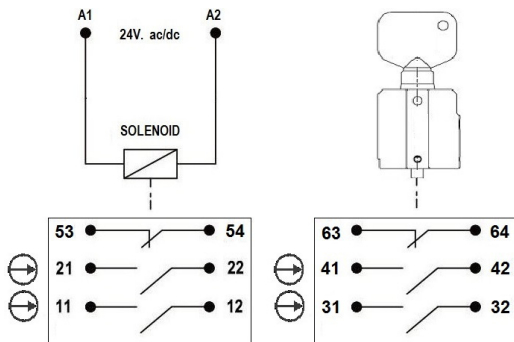
Turning the key:

11/12, 21/22, 31/32, 41,42 will open (control contacts).
53/54, 63/64 will close (auxiliary contacts).
Key can be removed.

Type M-CS-SKR

The M-CS-SKR is a Trapped Key operated control switch designed to turn off machine control circuits after the internal solenoid is energised. This allows for a run down time to elapse after turning off the machine control circuit. The Key is trapped when the M-CS-SKR control contacts are closed (machine able to run) and can only be released when the internal solenoid in the CS-SKR is energised. This then enables the key to be turned and released and the remaining control contacts opened. The key can then be removed and taken to a Key Exchange block or direct to an interlock switch.

The CS-SKR solenoid control can be used in conjunction with delay timers to allow a delay before the solenoid is energised therefore allowing for any machine run down



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 24V.dc to A1 and A2:

Energises 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).

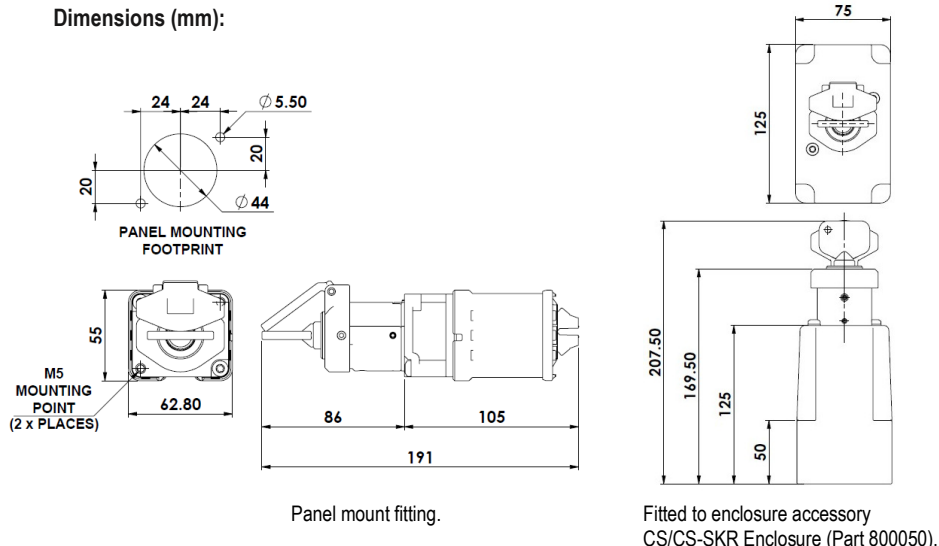
Technical specifications:

Standards: UL60947-5-1, ISO14119, PD/ISO/TS 19837
Insulating housing: Polyester
Construction: Die-Cast and Stainless Steel
Operating Temperature: -20C. to +40C.
Mechanical Life (B10d): 1,000,000 cycles
Output Contacts: Rated 240V. 3A. (A300)
Solenoid Voltage: 24V.dc (+/- 10%) Class 2 (M-CS-SKR types).
Plastic Enclosure (if used): Polycarbonate.

Information with regard to UL Standards:

Type 1 enclosure. Maximum temperature 40°C.
Use 16-28AWG stranded copper conductors (rated 90°C).
Terminal Torque 6 lb ins. (0.7Nm).
Intended for same polarity use. A300 Pilot Duty. 240V. 3A.
PF 0.38 or greater, tested for 6,000 cycles endurance.
For use in NFPA 79 Applications only (or equivalent).
For use on a Flat Surface of a Type 1 Enclosure.

Dimensions (mm):



Panel mount fitting.

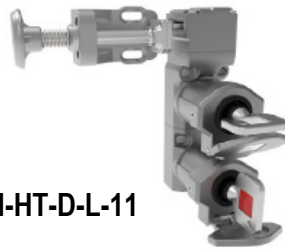
Fitted to enclosure accessory CS/CS-SKR Enclosure (Part 800050).

Handle Interlocks Types M-HT-S-L and M-HT-D-L-11

Key Exchange Blocks Types M-KE-NS



M-HT-S-L



M-HT-D-L-11



M-KE-NS

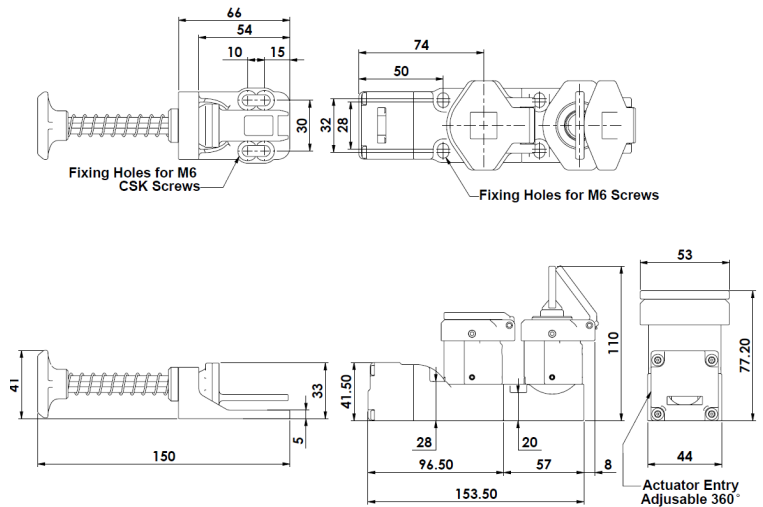
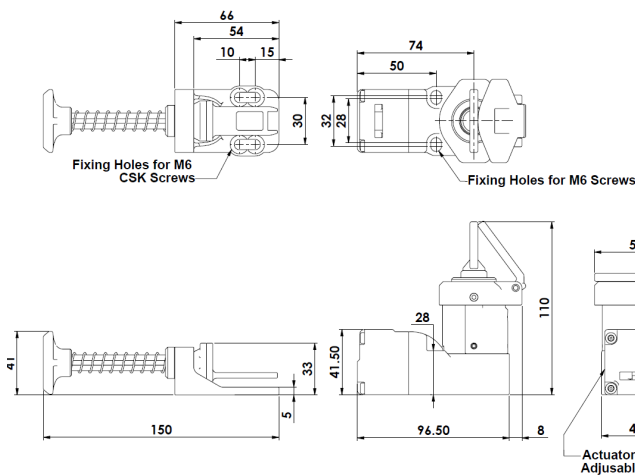
Operating Principle – Single Key (M-HT-S-L):

The single key interlock is used as part of a trapped key interlock system to ensure that a guard or door is locked closed under normal operating conditions and can only be operated when a key from either the isolator or key exchange block is inserted into the interlock device. Once the key has been inserted and turned then the interlock actuator can then be released and the guard or door opened. Whilst the actuator is released and the guard is open, the key cannot be removed from the interlock and returned to either a key exchange block or direct to an M-CS or M-CS-SKR control switch. Only when the actuator is re-inserted into the interlock, can the key be turned and released allowing it to be returned to the key exchange block or directly to an M-CS or M-CS-SKR control switch.

Operating Principle – Dual Key (M-HT-D-L-11):

The dual key interlock has two operating keys and is used as part of a trapped key interlock system to ensure that a guard or door is locked closed under normal operating conditions and can only be operated when a key from either the M-CS or M-CS-SKR control switch or key exchange block is inserted into the interlock device. Once the first key has been inserted and turned then the second key can be released, as well as the actuator. This enables the guard or door to be opened allowing access into the guarded area. The operator can take and retain the second key into the guarded area to ensure that the interlock sequence may not be reversed. Only when the second key is returned to the dual key interlock and the actuator re-inserted can the first key be removed ensuring the door or guard is locked closed. The first key may then be returned to either the key exchange block or direct to the M-CS or M-CS-SKR control switch.

Dimensions (mm):



Technical specifications:

Standards: ISO14119, PD/ISO/TS 19837
 Construction: Die-Cast and Stainless Steel
 Holding Force: 3000N. (F1 Max.) 2307N.(Fzh).
 Mechanical Life (B10d): 1,000,000 cycles
 Operating Temperature: -20C. to +40C.

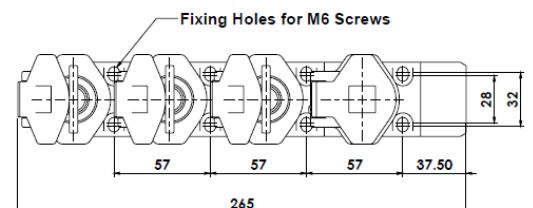
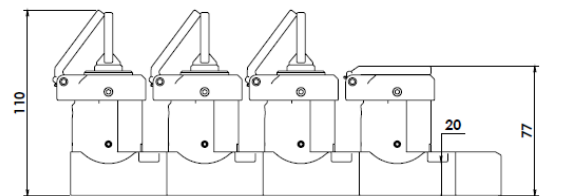
INSTALLATION: Installation must only be carried out by competent personnel and in accordance with these instructions and the relevant standards.
 Always use correct size metal mounting screws (M6). Tightening torque 2Nm.

IMPORTANT: ALWAYS OBSERVE ELECTRICAL RATINGS.

IMPORTANT: KEY CODE CONTROL IS THE RESPONSIBILITY OF THE END USER.

MAINTENANCE: Every month: Check all circuits and interlocks for correct function. If the key or housing display signs of mechanical damage then remove and replace. IDEM will not accept responsibility for failure of the switch functions if the installation and maintenance requirements are not implemented.

THESE INSTRUCTIONS FORM PART OF THE PRODUCT WARRANTY.



Note: Mounting Hole Spacing for M-KE-NS3 / NS4 are the same.