

Tongue Operated Interlock Switches



IS-1 Plastic

8 actuator entry positions – rotatable head
3 pole contact blocks
32mm wide 97mm long 22mm fixing



KP Plastic

4 actuator entry positions – rotatable head
3 conduit entries
4 pole contact blocks
52mm wide 99mm long 40mm fixing



KM Metal

8 actuator entry positions – rotatable head
4 pole contact blocks
DIN Standard 40mm wide 118mm long 30mm fixing
Die Cast Alloy



2000N.
Holding Force

KLP Lock Plastic

8 actuator entry positions – rotatable head
High holding force: 2000N.
2 lock monitoring safety contacts
DIN fitting 46mm wide 160mm long 30mm fixing
LED 1 status of solenoid applied power
LED 2 status of guard lock
2 Emergency manual release points



3000N.
Holding Force

KLM Lock Metal

8 actuator entry positions – rotatable head
Fitting 46mm wide 176mm long 30mm fixing
2 lock monitoring safety contacts
Die Cast Alloy
High Holding Force: 3000N.
LED 1 status of solenoid applied power
LED 2 status of guard lock
2 Emergency manual release points

Application:

Tongue operated Safety Interlock switches are designed to fit to the leading edge of sliding, hinged or lift off machine guards to provide positively operated switching contacts and provide a tamper resistant, not easily defeatable key mechanism. They are designed to provide robust position interlock detection for moving guards. Depending upon the risk assessment for the application, they can be used independently to provide positive interlocking to IEC-947-5-1 or they can be used in combination with any dual channel safety monitoring relays to provide up to Category 4 to EN 954-1. Where the risk assessment requires the guard to remain locked (e.g. machines which require run down), versions with actuator locking are available to provide robust guard holding until a solenoid voltage is applied to the switch. These switches provide robust holding up to 3000N. and can be used in conjunction with pre-set delay timers to provide the solenoid supply only after the machine has run down.

Operation:

The switch is rigidly mounted to the frame of the guard or machine. The actuator is fitted to the moving part (frame) of the guard and is aligned to the switch entry aperture. The actuator profile is designed to match a cam mechanism within the switch head and provides a positively operated not easily defeatable interlock switch. When the actuator is inserted into the switch the safety contacts close and allow the machine start circuit to be enabled. When the actuator is withdrawn from the switch the safety contacts are positively opened and the machine circuit is broken.

Features:

- Head position adjustment up to 8 actuator entry positions
- High Mechanical Life 1,000,000 cycles
- Rugged plastic or metal bodies - red colour
- Robust Stainless Steel Head Housings available
- Enclosure Protected to IP 66/67 - washdown suitable



Tongue Interlock Safety Switch – Type IS-1

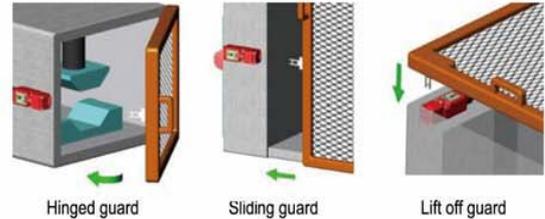


IS-1 Compact Safety Interlock switches are designed to provide robust position interlock detection for moving guards.

They are designed to fit to the leading edge of sliding, hinge or lift off machine guards.

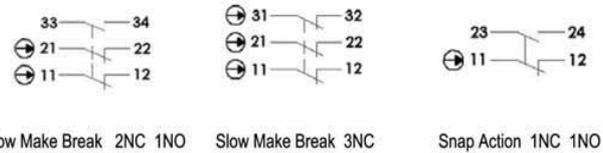
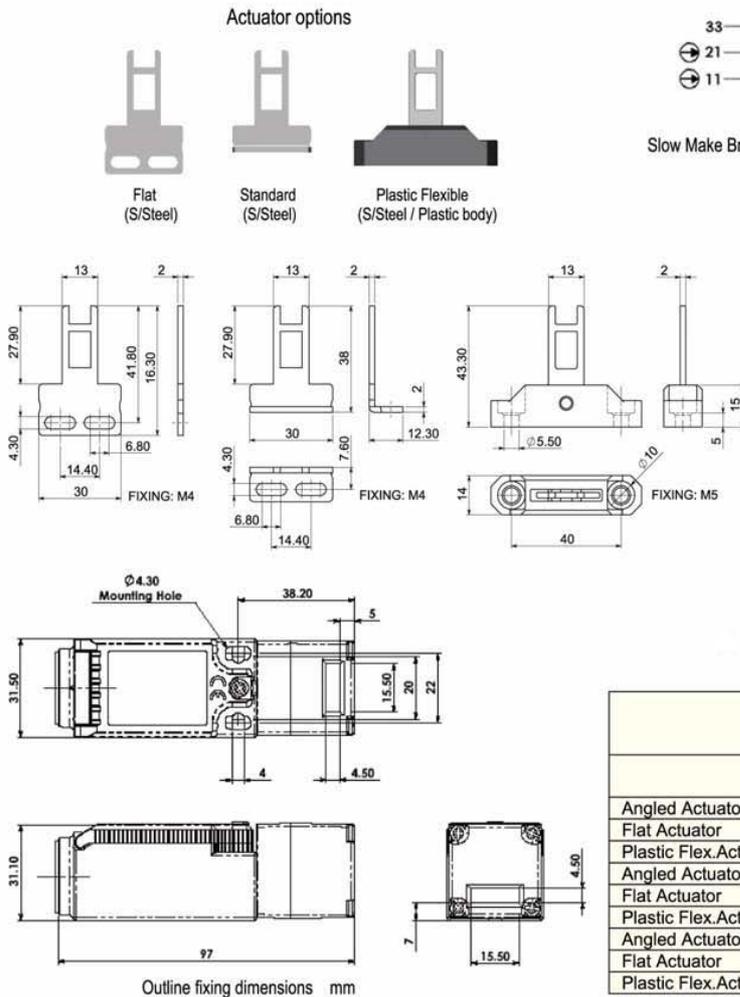
Features:

- Positive opening safety contacts to IEC 947-5-1
- Compact version – fits on 22mm hole centres EN 50047 body
- Head position adjustment to give 8 actuator entry positions
- High Mechanical Life 1,000,000 cycles
- Enclosure Protected to IP 66/67 - washdown suitable
- Conduit entries: M20 ½" NPT or Quick connect



The rugged Stainless Steel actuator profile is designed to match a cam mechanism to provide a positively operated not easily defeatable interlock mechanism.

Contact blocks are replaceable with optional slow or snap break operation.



Conforming to standard EN50047, EN1088, IEC 947-5-1, UL508
 Utilization Category AC15 A300
 Thermal Current (Ith) 10A
 Rated Insulation Voltage 300VAC
 Rated Impulse Withstand Volt 2500VAC
 Insulation Resistance 100MΩmin.(DC500V)
 Contact Resistance 25mΩmax. (initial)
 Travel for Positive Opening 6mm
 Man. Actuation Frequency 2 cycle/sec
 Case Material UL approved glass-filled polyester
 Actuator Material Stainless steel
 Enclosure Protection IP67
 Operating Temperature -25°C to 80°C
 Pollution Degree 3
 Mechanical Life Expectancy 1 x 10⁶ Cycle min.
 Vibration IEC 68-2-6, 10-55Hz+1Hz, Excursion: 0.35mm, 1 octave/min
 Conduit Entry Various (See Sales Part Numbers)
 Fixing 2 x M4

Sales Number				
	Contacts	M20	½"NPT	QC
Angled Actuator	2NC 1NO	IS0001	IS0002	IS0003
Flat Actuator	2NC 1NO	IS0004	IS0005	IS0006
Plastic Flex.Actuator	2NC 1NO	IS0019	IS0020	IS0021
Angled Actuator	3NC	IS0007	IS0008	IS0009
Flat Actuator	3NC	IS0010	IS0011	IS0012
Plastic Flex.Actuator	3NC	IS0022	IS0023	IS0024
Angled Actuator	1NC 1NO Snap	IS0013	IS0014	IS0015
Flat Actuator	1NC 1NO Snap	IS0016	IS0017	IS0018
Plastic Flex.Actuator	1NC 1NO Snap	IS0025	IS0026	IS0027

Hinge Interlock Safety Switch - Type IS-2



Features:

- Positive opening safety contacts to IEC 947-5-1
- Compact version – fits on 22mm hole centres EN50047 body
- Universal Actuator for use with Left Hand, Right Hand and Swing doors
- Opening angle – 180 degrees
- Contact operation at 5 degrees
- High Mechanical Life 1,000,000 cycles
- Rugged plastic body - Enclosure Protected to IP 66/67
- Robust Stainless Steel Actuator
- Conformance to EN 60947-5-1 EN 1088
- Conduit entries: M20 1/2" NPT or Quick connect



Universal fitting – opening angle 180 degrees for swing doors

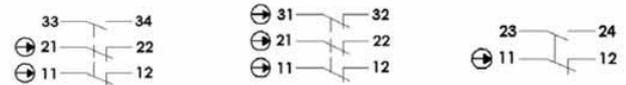
The Compact Hinge Safety Interlock switches are designed to provide robust position interlock detection for moving guards.

They are designed to fit to the hinged axis of machine guard doors.

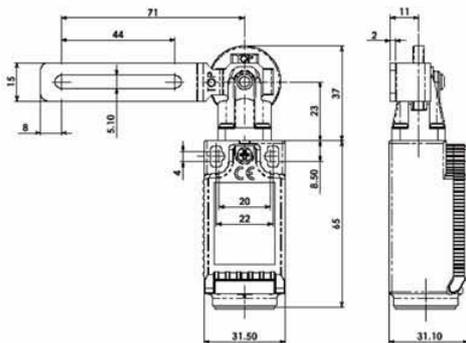
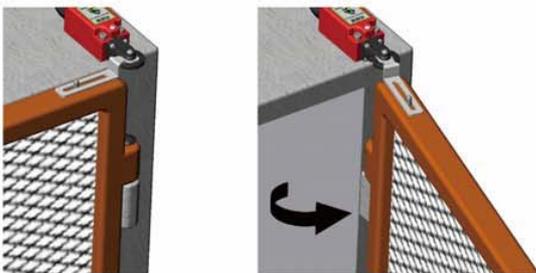
The rugged Stainless Steel actuator profile is designed to fix easily to the guard door frame and provide a positively operated interlock mechanism.

Switch head can be rotated through 90 degree increments to provide ease of mounting in 4 positions.

Contact blocks are replaceable with optional slow or snap break operation.



Slow Make Break 2NC 1NO Slow Make Break 3NC Snap Action 1NC 1NO



Outline fixing dimensions mm

- Conforming to standard EN50047, EN1088, IEC 947-5-1, UL508
- Positive Opening Operation NC Contact
- Utilization Category AC15 A300
- Thermal Current (Ith) 10A
- Rated Insulation Voltage 300VAC
- Rated Impulse Withstand Volt 2500VAC
- Insulation Resistance 100MΩmin.(DC500V)
- Contact Resistance 25mΩ max. (initial)
- Actuator Rotation for Positive Opening 7 degrees 0.5Nm
- Man. Actuation Frequency 2 cycle/sec
- Case Material UL approved glass-filled polyester
- Actuator Material Stainless steel
- Enclosure Protection IP67
- Operating Temperature -25°C to 80°C
- Pollution Degree 3
- Mechanical Life Expectancy 1 x 10⁶ Cycle min.
- Electrically Life Expectancy 150,000 Cycle min.
- Vibration IEC 68-2-6, 10-55Hz+1Hz, Excursion: 0.35mm, 1 octave/min
- Conduit Entry Various (See Sales Part Numbers)
- Fixing 2 x M4

Sales Number				
	Contacts	M20	1/2"NPT	QC
Universal Actuator	2NC 1NO	IS2001	IS0002	IS2003
Universal Actuator	3NC	IS2004	IS2005	IS2006
Universal Actuator	1NC 1NO Snap	IS2007	IS2008	IS2009

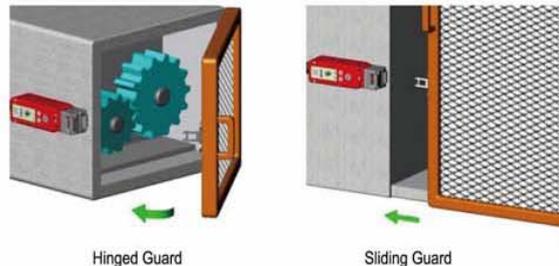
Tongue Switches with Guard Locking - Type LP



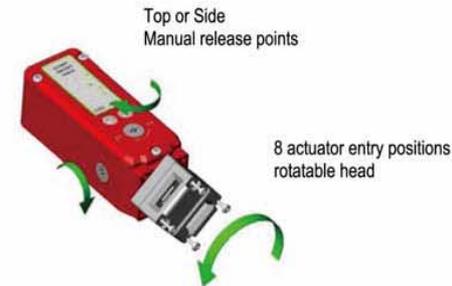
Features:

- Rugged polyester housing – IP67 enclosure protection
- Stainless Steel Head
- Provides Guard Holding up to 2000N. (200Kg.)
- Spring to Lock - Solenoid operated to release
- Conduit entry M20 or ½" NPT

Standard (S/Steel) Flat (S/Steel) Heavy Duty Flexible (S/Steel / Metal Body)



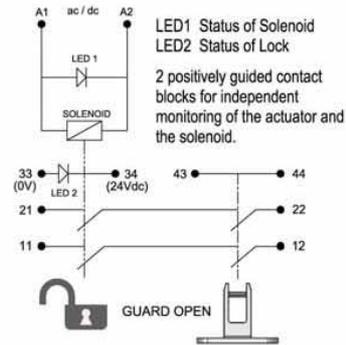
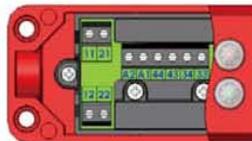
Push to release hand operated guards after solenoid energisation.



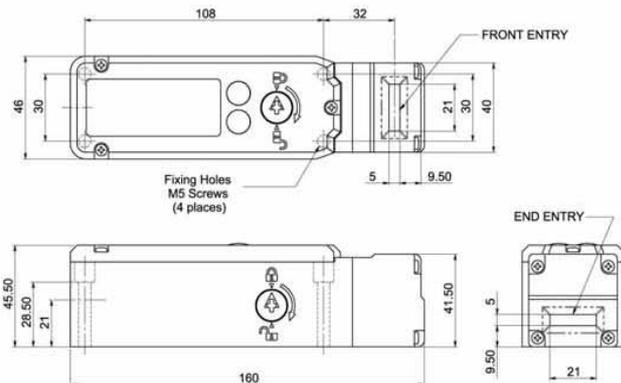
Actuator insertion

	9.0	8.0	0 mm
11/12	Open		
21/22	Open		
33/34			Open
43/44			Open

Spring to lock when actuator is inserted. Energise solenoid to unlock.



- Conforming to standard EN1088, IEC 947-5-1, UL508
- Solenoid Voltage 24V ac/dc or 110V. ac or 230V. ac
- LED 2 Supply Voltage 24V dc
- Utilization Category AC15 A300 3A.
- Thermal Current (Ith) 10A
- Rated Insulation Voltage 600VAC
- Rated Impulse Withstand Volt age 2500VAC
- Travel for Positive Opening 10mm
- Man. Actuation Frequency 2 cycle/sec
- Actuator entry minimum radius 175mm Standard 60mm Heavy Duty
- Case Material UL approved glass-filled polyester
- Actuator Material Stainless steel
- Enclosure Protection IP67
- Operating Temperature -25°C to 60°C
- Mechanical Life Expectancy 1 x 10⁶ Cycle min.
- Vibration IEC 68-2-6, 10-55Hz+1Hz, Excursion: 0.35mm, 1 octave/min
- Conduit Entry Various (See Sales Part Numbers)
- Fixing 4 x M5



Sales Number				
	Solenoid Voltage	M20	½"NPT	QC
LP Switch	24V. ac/dc	LP1001	LP1002	LP1003
LP Switch	110V. ac	LP1004	LP1005	LP1006
LP Switch	230V. ac	LP1007	LP1008	LP1009
Actuator	Standard	Add A to Sales Part Number		
Actuator	Flat	Add F to Sales Part Number		
Actuator	Heavy Duty Flexible	Add HF to Sales Part Number		

Ordering Example: LP ½" NPT 24V. Solenoid with Heavy Duty Flexible Actuator

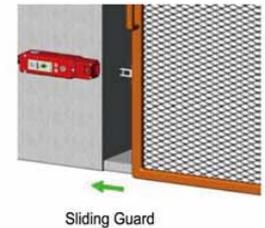
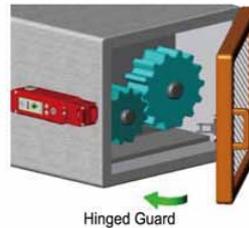
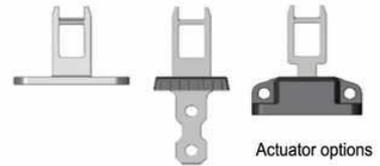
Part No. LP1002-HF

Tongue Switches with Guard Locking - Type LM



Guard locking up to 3000N.

Standard (S/Steel) Flat (S/Steel) Heavy Duty Flexible (S/Steel / Metal Body)



Push to release hand operated guards after solenoid energisation.

Features:

Die Cast Metal Housings – painted Red

Stainless Steel Head available

Provides Guard holding up to 3000N. (300Kg.)

Solenoid operated release – choice of 24V, 110V, or 230V. ac/dc

2 diagnostic LED's LED1 Status of solenoid LED2 Status of Lock

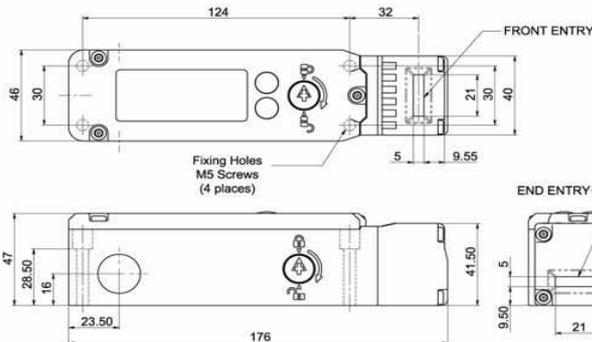
3 Conduit entries M20 or 1/2" NPT or quick connect versions

2NC Safety circuits (Series connection – Solenoid / Actuator)
1NO Auxiliary circuit

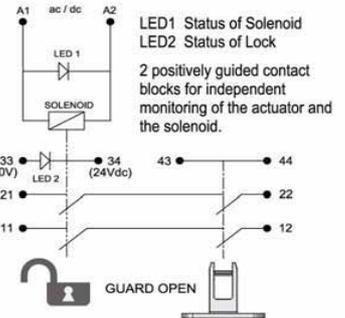
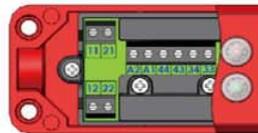


Actuator insertion

	9.0	8.0	0 mm
11/12	Open		
21/22	Open		
33/34		Open	
43/44			Open



Spring to lock when actuator is inserted. Energise solenoid to unlock.

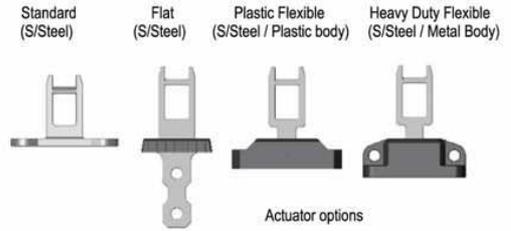


- Conforming to standard EN1088, IEC 947-5-1, UL508
- Solenoid Voltage 24V ac/dc or 110V. ac or 230V. ac
- LED 2 Supply Voltage 24V dc
- Utilization Category AC15 A300 3A.
- Thermal Current (Ith) 10A
- Rated Insulation Voltage 600VAC
- Rated Impulse Withstand Volt age 2500VAC
- Travel for Positive Opening 10mm
- Man. Actuation Frequency 2 cycle/sec
- Actuator entry minimum radius 175mm Standard 60mm Heavy Duty
- Case Material Die Cast - Painted red
- Actuator Material Stainless steel
- Enclosure Protection IP67
- Operating Temperature -25°C to 60°C
- Mechanical Life Expectancy 1 x 10⁶ Cycle min.
- Vibration IEC 68-2-6, 10-55Hz+1Hz, Excursion: 0.35mm, 1 octave/min
- Conduit Entry Various (See Sales Part Numbers)
- Fixing 4 x M5

Sales Number				
	Solenoid Voltage	M20	1/2"NPT	QC
LM Switch	24V. ac/dc	LM2001	LM2002	202003
LM Switch	110V. ac	LM2004	LM2005	202006
LM Switch	230V. ac	LM2007	LM2008	202009
Actuator	Standard	Add A to Sales Part Number		
Actuator	Flat	Add F to Sales Part Number		
Actuator	Heavy Duty Flexible	Add HF to Sales Part Number		
Stainless Steel Head Version		Add SS to Sales Part Number		

Ordering Example: LM M20 230V. Solenoid with Heavy Duty Flexible Actuator and Stainless Steel Head
Part No. LM2007-HF-SS

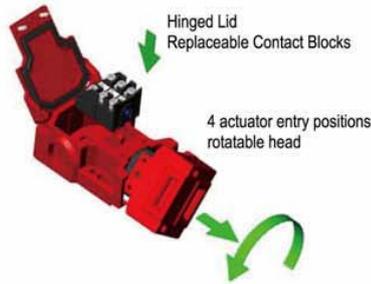
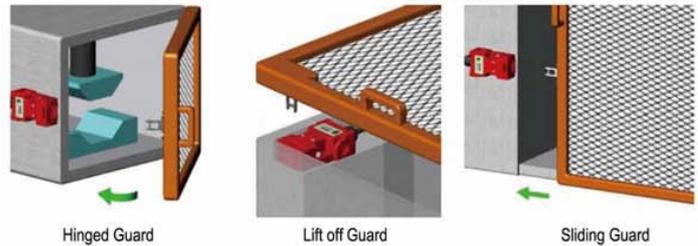
Tongue Switches – Type K



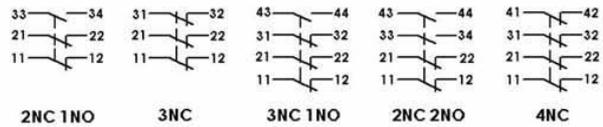
Features:

- High specification polyester body material
- 3 conduit entries M20 or 1/2" NPT
- IP67 enclosure protection – hinged lid
- Replaceable 3 or 4 pole contact blocks
- Explosion proof contact block versions
- Quick connect versions

The switch head can be rotated through 180 degrees to provide ease of mounting and offer 4 different actuator entry positions



Contact blocks provide positively operated safety contacts to IEC 947-5-1 with optional Explosion proof versions.

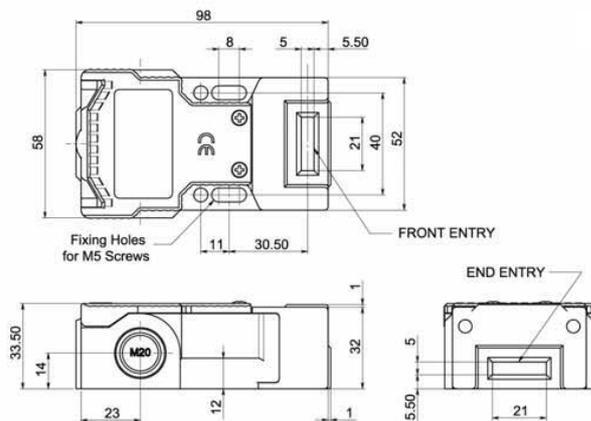


- Conforming to standard Utilization Category Thermal Current (Ith) Rated Insulation Voltage Rated Impulse Withstand Voltage Contact Resistance Travel for Positive Opening Man. Actuation Frequency Case Material Actuator Material Actuator entry minimum radius Enclosure Protection Operating Temperature Mechanical Life Expectancy Vibration Conduit Entry Fixing
- EN1088, IEC 947-5-1, UL508 AC15 A300 3A. 10A 600VAC 2500VAC 25mΩ max. (initial) 8mm 2 cycle/sec UL approved glass-filled polyester Stainless steel 175mm Standard 60mm Flexible IP67 -25°C to 80°C 1 x 10⁶ Cycle min. IEC 68-2-6, 10-55Hz+1Hz, Excursion: 0.35mm, 1 octave/min Various (See Sales Part Numbers) 2 x M5

Contact operation at withdrawal of actuator

2NC 1NO	7.8	7.0	0 mm	NC (1NO)	7.8	7.0	0 mm
11/12	Open			11/12	Open		
21/22	Open			21/22	Open		
33/34			Open	31/32	Open		
				43/44			Open

4NC	7.0	0 mm	2NC 2NO	7.8	7.0	0 mm
11/12	Open		11/12	Open		
21/22	Open		21/22	Open		
31/32	Open		33/34			Open
41/42	Open		43/44			Open

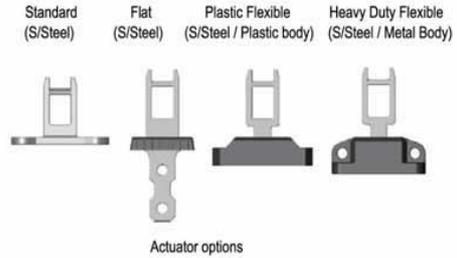


Sales Number				
	Contacts	M20	1/2"NPT	QC
KSwitch	2NC 1NO	K0001	K00002	K00003
KSwitch	3NC	K0004	K00005	K00006
KSwitch	3NC 1NO	K0007	K00008	K00009
KSwitch	2NC 2NO	K0010	K00011	K00012
KSwitch	4NC	K0013	K00014	K00015
KSwitch	1NC 1NO EX	K0016	3m. 4 core Ex	
KSwitch	2NC EX	K0019	3m. 4 core Ex	
Actuator	Standard	Add A to Sales Part Number		
Actuator	Flat	Add F to Sales Part Number		
Actuator	Plastic Flexible	Add PF to Sales Part Number		
Actuator	Heavy Duty Flexible	Add HF to Sales Part Number		

Ordering Example: K M20 3NC 1NO with Heavy Duty Flexible Actuator

Part No. K00004-HF

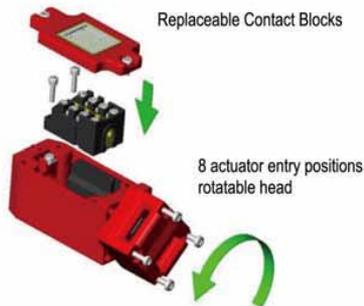
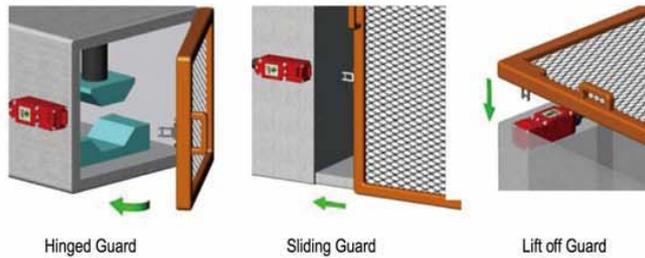
Tongue Switches - Type KM



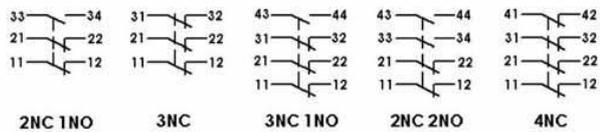
The switch head can be rotated through 180 degrees to provide ease of mounting and offer 4 different actuator entry positions

Features:

- Die Cast Metal Housings – painted Red
- Conduit entry M20 or 1/2" NPT
- IP67 enclosure protection
- 3 or 4 pole contact blocks



Contact blocks provide positively operated safety contacts to IEC 947-5-1 with optional Explosion proof versions.



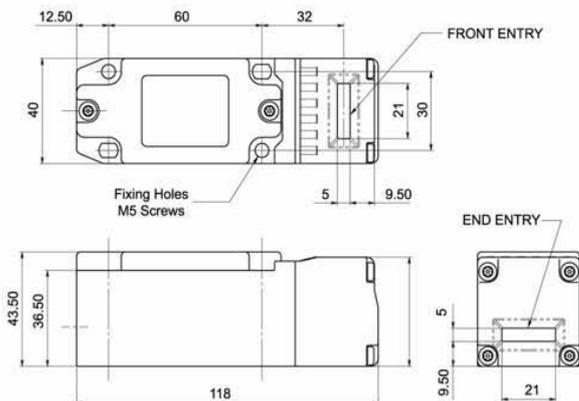
Contact operation at withdrawal of actuator

2NC 1NO	7.8	7.0	0 mm	3NC (1NO)	7.8	7.0	0 mm
11/12	Open			11/12	Open		
21/22	Open			21/22	Open		
33/34			Open	31/32	Open		
				43/44			Open

4NC	7.0	0 mm	2NC 2NO	7.8	7.0	0 mm
11/12	Open		11/12	Open		
21/22	Open		21/22	Open		
31/32	Open		33/34			Open
41/42	Open		43/44			Open



- Conforming to standard EN1088, IEC 947-5-1, UL508
- Utilization Category AC15 A300 3A.
- Thermal Current (Ith) 10A
- Rated Insulation Voltage 600VAC
- Rated Impulse Withstand Voltage 2500VAC
- Contact Resistance 25mΩ max. (initial)
- Travel for Positive Opening 8mm
- Man. Actuation Frequency 2 cycle/sec
- Case Material Die-Cast Painted Red
- Head Material Die-Cast Painted Red or Stainless Steel
- Actuator Material Stainless steel
- Actuator entry minimum radius 175mm Standard 60mm Flexible
- Enclosure Protection IP67
- Operating Temperature -25°C to 80°C
- Mechanical Life Expectancy 1 x 10⁶ Cycle min.
- Vibration IEC 68-2-6, 10-55Hz+1Hz, Excursion: 0.35mm, 1 octave/min
- Conduit Entry Various (See Sales Part Numbers)
- Fixing 4 x M5

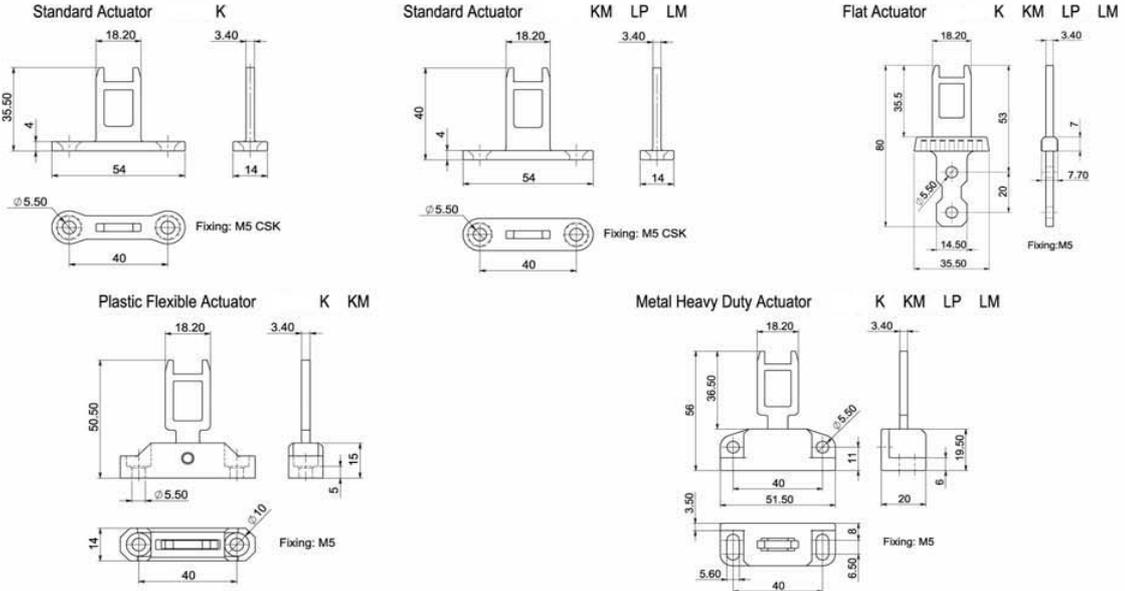


Sales Number

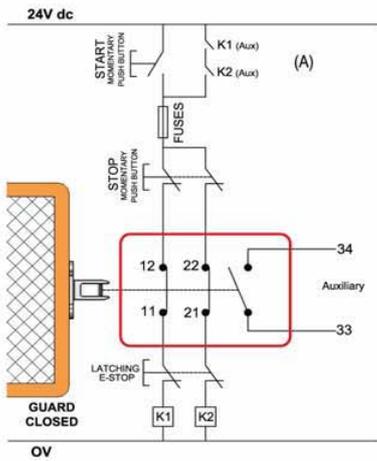
	Contacts	M20	1/2"NPT	QC
KM Switch	2NC 1NO	KM 3001	KM 3002	KM 3003
KM Switch	3NC	KM 3004	KM 3005	KM 3006
KM Switch	3NC 1NO	KM 3007	KM 3008	KM 3009
KM Switch	2NC 2NO	KM 3010	KM 3011	KM 3012
KM Switch	4NC	KM 3013	KM 3014	KM 3015
KM Switch	1NC 1NO EX	KM 3016	3m. 4 core Ex	
KM Switch	2NC EX	KM 3019	3m. 4 core Ex	
Actuator	Standard	Add A to Sales Part Number		
Actuator	Flat	Add F to Sales Part Number		
Actuator	Plastic Flexible	Add PF to Sales Part Number		
Actuator	Heavy Duty Flexible	Add HF to Sales Part Number		
Stainless Steel Head Version		Add SS to Sales Part Number		

Tongue Switches

Actuator Dimensions



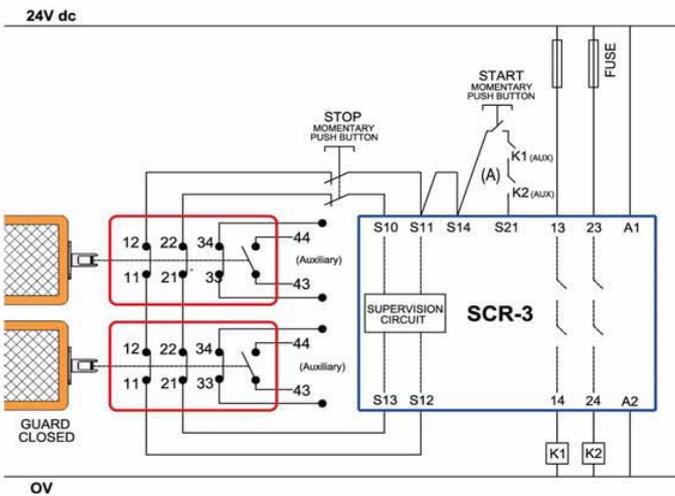
Application examples – Tongue Switches



Guard Door Interlock – Dual Channel non monitored



This system shows interlock switch circuits 11-12 and 21-22 configured to allow direct feed to contactor coils K1 and K2. This provides Dual Channel wiring and a check of the contactor feedback circuits through the auxiliary contacts of K1 and K2. Opening the Interlock switch or depressing the E Stop will isolate power to the contactor coils. Re-start can only occur providing the Guard is closed, the E Stop is reset and contactor auxiliary contacts (A) are open. System is shown with machine stopped, guard closed and the contactors able to be energised.



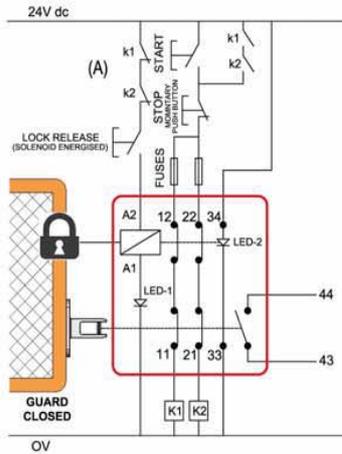
Guard Door Interlocks – Dual Channel monitored



The above system can be enhanced by alternatively connecting the switch circuits 11-12 and 21-22 to an SCR-3 Safety Relay to monitor for wiring short circuits. This provides Dual Channel monitoring and a check of the contactor feedback circuits through the auxiliary contacts (A) of K1 and K2. The SCR-3 monitors the switch and the contactors K1 and K2 and provides its own self-monitoring via force guided internal relays. System is shown with machine stopped, guards closed and the contactors able to be energised.

Tongue Switches

Application examples – Tongue Switches with Guard Locking



Door Interlock with Guard locking -Dual Channel non monitored

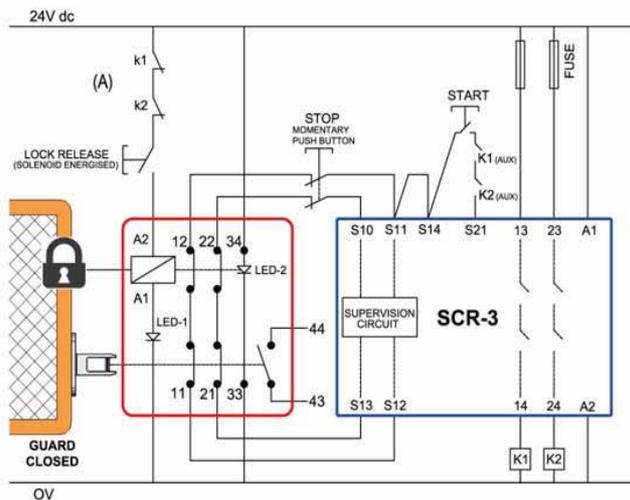
The guard is locked closed until the solenoid is energized. The solenoid can only be energized when the auxiliary contacts (A) of contactors K1 and K2 are closed. When the lock release button is pushed the locking mechanism is released and the switch contacts 11-12 and 21-22 are opened. These contacts are in series with contactor coils of K1 and K2 and will prevent re-start whilst the guard is open.

If after pressing the Stop button either contactor K1 or K2 stays closed the motor will stop but the solenoid cannot be energized or the guard opened.

LED 1 provides visual indication of solenoid power applied.

LED 2 provides visual indication of guard locked and machine able to start.

System is shown with machine stopped, guard closed and locked, and the solenoid able to be energised.



Door Interlock with Guard locking -Dual Channel monitored

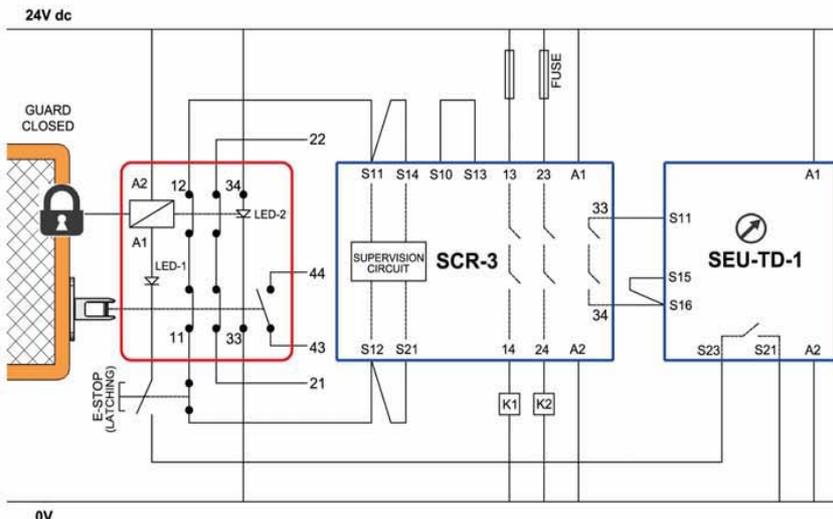


The above system can be enhanced by alternatively connecting the switch circuits 11-12 and 21-22 to an SCR-3 Safety Relay to monitor for wiring short circuits.

This provides Dual Channel monitoring and a check of the contactor feedback circuits through the auxiliary contacts (A) of K1 and K2. The SCR-3 monitors the switch and the contactors K1 and K2 and provides its own self-monitoring via force guided internal relays.

System is shown with machine stopped, guard closed and locked, and the solenoid able to be energised.

Door Interlock with Guard locking -Single Channel monitored. Time delayed guard opening.



For systems requiring run down after activating a stop, a time delay can be added by connecting the delayed output from an SEU-TD-1 to the solenoid feed.

The output contacts 33-34 of the SCR-3 provide the input to the SEU-TD-1. Pressing the E Stop causes the SCR-3 contacts to open immediately and isolate power to contactors K1 and K2. Also the input to the SEU-TD-1 will be opened and activate the pre-set time delay contacts. Only when the time delay has lapsed will the SEU-TD-1 allow power to the solenoid and enable the guard to be opened.

Providing that the guard is closed and locked and the E Stop is reset the machine will start when 24V.dc is applied.