

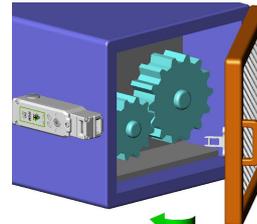


Safety Interlock Switch with Guard Locking

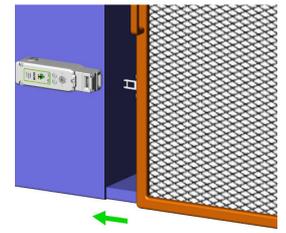
KLP Operating Instructions



Plastic Body



Hinged Guard



Sliding Guard

IMPORTANT NOTE:

Read and understand these instructions before installing, operating, or maintaining this equipment.

The product is designed to be a component of a customised safety orientated control system. It is the responsibility of the user to ensure the correct overall functionality of its systems and machines. IDEM, its subsidiaries and affiliates, are not in a position to guarantee all of the characteristics of a given system or product not designed by IDEM.

Application and Operation:

Safety Interlock Switches with Guard Locking are designed to fit to the leading edge of sliding or hinged guard doors to provide positively operated switching contacts and provide a tamper resistant key mechanism. They are designed to provide robust position interlock detection and holding closed of moving guards. 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 guard is closed and the actuator is inserted into the switch the safety contacts close, the actuator is locked and the machine start circuit can be enabled. When the solenoid is energised the safety contacts are positively opened, the machine stop circuit is broken and the guard door can be opened.

Installation:

1. Installation of all interlock switches must be in accordance with a risk assessment for the individual application. Installation must only be carried out by competent personnel and in accordance with these instructions.
2. M5 mounting bolts must be used to fix the switch and actuator, the tightening torque to ensure reliable fixing is 4.0 Nm. **To prevent loosening of the switch after installation, always fix the M5 mounting bolts with a thread-locking compound or secure using self locking nuts.** Tightening torque for the lid screws, conduit entry plugs and cable glands must be 1.5 Nm to ensure IP seal. Only use the correct size gland for the conduit entry and cable outside diameter. Tightening torque for the connection terminal screws is 0.7 Nm, max conductor size is 1.0 sq.mm. The switch head position can be selected by removing the actuator, loosening the 4 head bolts and then rotating the head to the position required. Re-tighten the head bolts and then check actuator insertion and withdrawal. Tightening torque for the head bolts is 1.5Nm.

3. Always fit a mechanical stop to the guard to prevent damage to the front of the switch. Set the actuator gap to 3mm when the guard is closed and against the stop. (See Fig. A.) Use alignment guides to ensure that the actuator enters the switch without interfering with the sides of the switch aperture. If fitted, ensure access to at least one of the auxiliary release points. The switch can be positioned / shielded to prevent unintended actuation of the auxiliary release. The auxiliary release function is achieved by use of a tool and is to be used in exceptional circumstances. The auxiliary release can be protected by use of a tamper coating to protect against unintended operation. If operated this tamper protection must be restored. Always fit the aperture plug to the unused entry aperture to prevent debris entering the switch mechanism.

4. After installation check operation of all control circuits and the locking function. For applications with a run down time after removing power, ensure that the correct timing allowance has elapsed before energising the solenoid. LED 1 RED will illuminate when power is applied to A1 and A2 (solenoid feed). LED 2 GREEN (if used) will be illuminated when the actuator is locked.

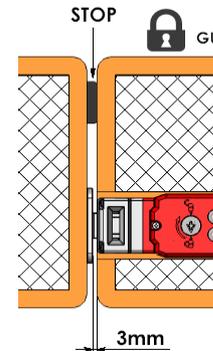
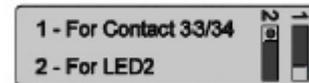


Fig. A

5. IMPORTANT!

At installation choose the status of Terminals 33 and 34 by setting the slide switch inside the switch housing.



If LED2 is used always check for correct .dc polarity.
Terminal 33: 0V.dc Terminal 34: +24V.dc

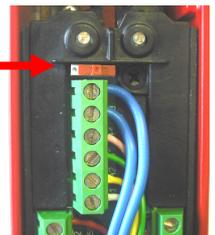


Fig. B



Top or Side
Auxiliary release points (if fitted)

8 actuator entry positions
rotatable head

IMPORTANT

The Risk Assessment for the particular application should include the risk of spare actuators. Spare actuators should not be readily available and must be securely controlled.

Application consideration must be given to the fixing of the actuator which has to be in a way that prevents disassembly by easy means. It should not be possible to operate the manual escape release from outside of the safeguarded area. Measures should be taken to reduce the risk of improper activation.

Ensure that the switch holding force (Fzh) is sufficient to withstand the static forces applied during normal use and dynamic effects caused by bouncing of the guard shall not create an impact reaction force which exceeds the holding force. If the expected impact reaction forces are higher than the specified holding force for the switch, then design measures must be applied to avoid the force.

The safety functions and mechanics must be tested regularly. For applications where infrequent guard access is foreseeable, the system must have a manual function test to detect a possible accumulation of faults.

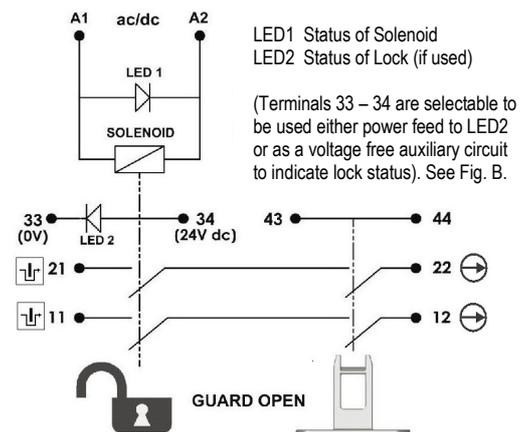
At least once per month for PLe Cat3/4 or once per year for PLd Cat3 (ISO13849-1).

Where possible it is recommended that the control system of the machine demands and monitors these tests, and stops or prevents the machine from starting if the test is not done. (See ISO14119).

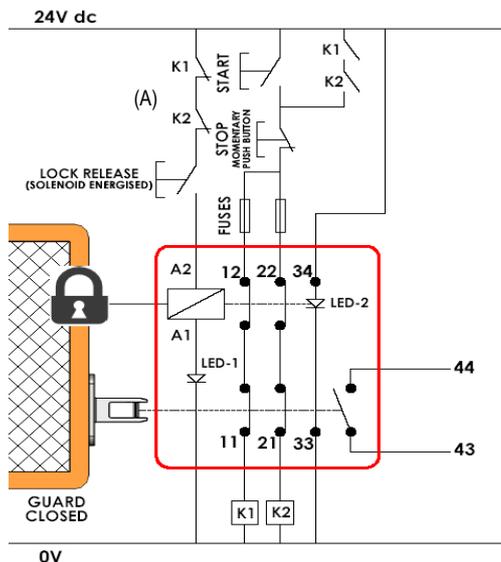
Maintenance:

Every Month: Check the switch actuator and body for signs of mechanical damage and wear. Replace any switch showing damage.

Every 6 Months: Check for mechanical damage to switch body or actuator. Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress. Never attempt to repair any switch. Replace any switch displaying damage. **These requirements form part of the product warranty.**



Safety Interlock Switch with Guard Locking



Application Example: Door Interlock with Guard locking - Dual Channel (non-monitored).

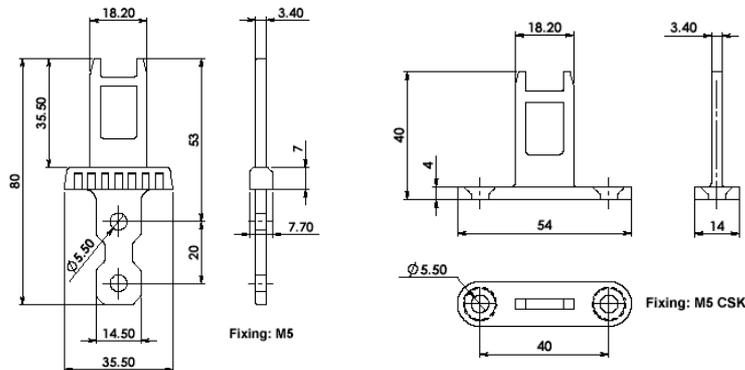
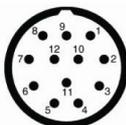
The guard is locked closed until the solenoid is energized. The solenoid can only be energized when the auxiliary contacts (A) of contactors K1 and K2 are closed. When the lock release button is pushed the locking mechanism is released and the switch contacts 11-12 and 21-22 are opened. These contacts 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 machine 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 energized (Lock released).

Quick Connect (QC) M23 12 way Male Plug (Pin view from switch)	Switch Circuit
1 3	A1 A2
4 6	11 / 12
7 8	21 / 22
2 5	43 / 44
9	33
10	34
Earth	12



- Conforming to Standard:** ISO14119, IEC60947-5-1, UL60947-5-1, ISO13849-1
- Safety Classification and Reliability Data:**
 Mechanical Reliability B10d 2.5 x 10⁶ operations at 100mA load
 ISO 13849-1 up to PLe / Cat.4 depending upon system architecture
 EN 62061 up to SIL3 depending upon system architecture
 Safety Data - Annual Usage 8 cycles per hour / 24 hours per day / 365 days
 MTTFd 356 years
- Solenoid Voltage (by part number)** 24V ac/dc or 110V. ac or 230V. ac +/- 10% (12W.)
LED 2 Supply Voltage 24V dc +/- 10%
Safety Contacts 11/12 21/22 Utilization Category AC15 A300 3A.
 Thermal Current (Ith) 5A
- Overload protection fuse (fuse externally)** 10A. (FF).
Auxiliary Contact 33/34 (selectable with LED2) 24V.ac/dc 0.5A. Maximum.
Auxiliary Contact 43/44 230V.ac/dc 0.5A. Maximum.
Rated Insulation Voltage 600VAC
Rated Impulse Withstand Volt 2500VAC
Travel for Positive Opening 10mm
Approach Speed 200mm/m. to 1000mm/s.
Man. Actuation Frequency 2 cycle/sec
Actuator entry minimum radius 175mm Standard 100mm Flexible
Case Material Glass Filled Polyester
Head Material Stainless Steel 316
Actuator Material Stainless steel 316
Enclosure Protection IP67
Operating Temperature -25°C to 40°C
Holding Force F1Max: 2000N. Fzh: 1538N.
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

Actuator insertion (mm)

	6.0	5.0	0 mm
11/12	Open		
21/22	Open		
33/34		Open	
43/44			Open

The NC circuits are closed when the guard is closed and the actuator is present.

All NC contacts are positively operated at withdrawal of actuator

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
 Use one polymeric conduit connection.
 Not suitable for connection to rigid metal conduit.



WARNING: DO NOT DEFEAT, TAMPER, OR BYPASS THE SAFETY FUNCTION. FAILURE TO DO SO CAN RESULT IN DEATH OR SERIOUS INJURY.

AVERTISSEMENT: NE PAS DESACTIVER, MODIFIER, RETIRER, OU CONTOURNER CETI INTERVERROUILLAGE IL PEUT EN RESULTER DES BLESSURES GRAVES DU PERSONNEL UTILISATEUR.

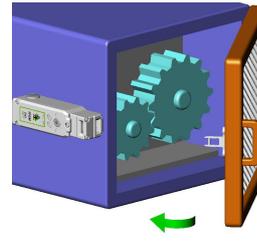
Original Instructions.

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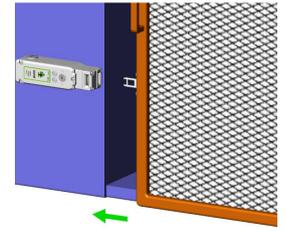


Safety Interlock Switch with Guard Locking

KLM-P2L Operating Instructions



Hinged Guard



Sliding Guard

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Application and 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 will close only when power is applied to the solenoid. This will then allow the machine start circuit to be enabled. When the solenoid power is removed the safety contacts are opened and the machine circuit is broken.

IMPORTANT: Any hazardous motion has to be controlled and a safe condition initiated in the event of power failure.

P2L versions (power to lock) may not be suitable for machines with a running down time.

Installation:

1. Installation of all interlock switches must be in accordance with a risk assessment for the individual application. Installation must only be carried out by competent personnel and in accordance with these instructions.

2. M5 mounting bolts must be used to fix the switch and actuator, the tightening torque to ensure reliable fixing is 4.0 Nm. **To prevent loosening of the switch after installation, always fix the M5 mounting bolts with a thread-locking compound or secure using self locking nuts.**

Tightening torque for the lid screws, conduit entry plugs and cable glands must be 1.5 Nm to ensure IP seal.

Only use the correct size gland for the conduit entry and cable outside diameter.

Tightening torque for the connection terminal screws is 0.7 Nm, max conductor size is 1.0 sq.mm.

The switch head position can be selected by removing the actuator, loosening the 4 head bolts and then rotating the head to the position required. Re-tighten the head bolts and then check actuator insertion and withdrawal.

Tightening torque for the head bolts is 1.5Nm.

3. Always fit a mechanical stop to the guard to prevent damage to the front of the switch.

Set the actuator gap to 3mm when the guard is closed and against the stop. (See Fig. A.)

Use alignment guides to ensure that the actuator enters the switch without interfering with the sides of the switch aperture.

Always fit the aperture plug to the unused entry aperture to prevent debris entering the switch mechanism.

4. After installation check operation of all control circuits and the locking function.

For applications with a run down time after removing power, ensure that the correct timing allowance has elapsed before energising the solenoid.

LED 1 GREEN will illuminate when power is applied to A1 and A2 (solenoid feed).

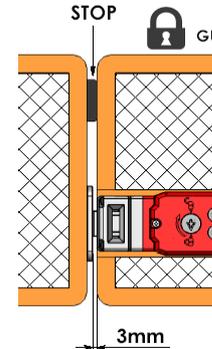
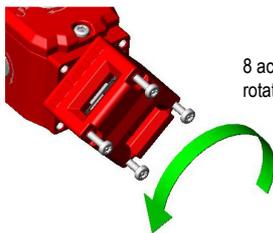


Fig. A



8 actuator entry positions
rotatable head

Internal Terminal Connections:

A1 0V dc
A2 24V.dc

11-12 Safety Circuit 1 – (must always be used)

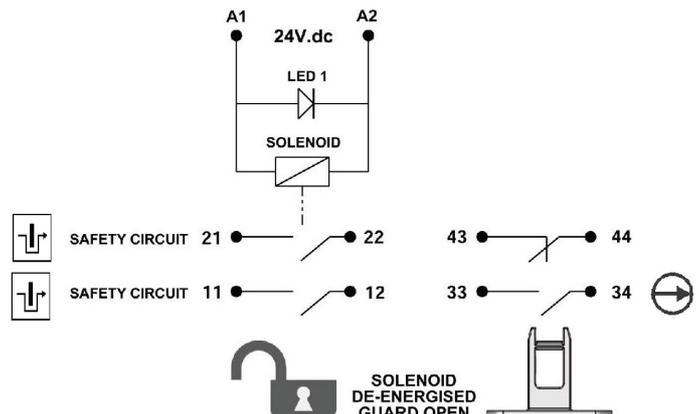
21-22 Safety Circuit 2

33-34 Signal Circuit Guard - (Closed when Guard is closed)

43-44 Signal Circuit Guard - (Closed when Guard is open)

LED Function:

Green Solenoid Energised



Safety Interlock Switch with Guard Locking

IMPORTANT

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Ensure that the switch holding force (Fzh) is sufficient to withstand the static forces applied during normal use and dynamic effects caused by bouncing of the guard shall not create an impact reaction force which exceeds the holding force. If the expected impact reaction forces are higher than the specified holding force for the switch, then design measures must be applied to avoid the force.

The safety functions and mechanics must be tested regularly. For applications where infrequent guard access is foreseeable, the system must have a manual function test to detect a possible accumulation of faults. At least once per month for PLe Cat3/4 or once per year for PLD Cat3 (ISO13849-1). Where possible it is recommended that the control system of the machine demands and monitors these tests, and stops or prevents the machine from starting if the test is not done. (See ISO14119).

Maintenance:

Every Month: Check the switch actuator and body for signs of mechanical damage and wear. Replace any switch showing damage.

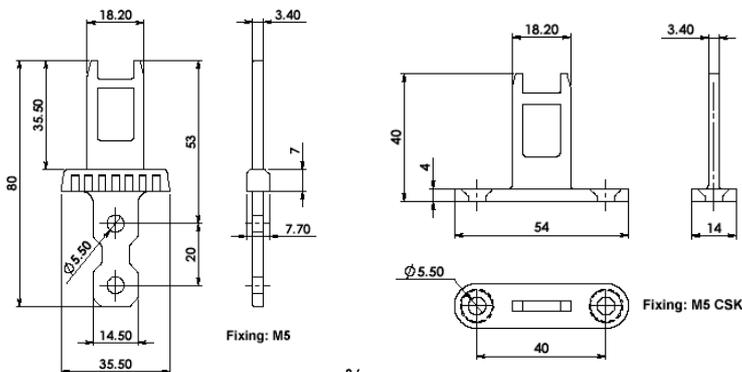
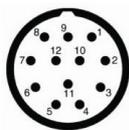
Every 6 Months: Check for mechanical damage to switch body or actuator. Isolate power and remove cover.

Check screw terminal tightness and check for signs of moisture ingress.

Never attempt to repair any switch. Replace any switch displaying damage.

These requirements form part of the product warranty.

Quick Connect (QC) M23 12 way Male Plug (Pin view from switch)	Switch Circuit
1 3	A1 A2
4 6	11 / 12
7 8	21 / 22
2 5	43 / 44
9	33
10	34
Earth	12



Conforming to Standard: ISO14119, IEC 60947-5-1, UL60947-5-1, ISO13849-1

Safety Classification and Reliability Data:

Mechanical Reliability B10d

ISO 13849-1

EN 62061

Safety Data - Annual Usage

Solenoid Voltage (by part number)

Safety Contacts 11/12 21/22 33/34

Overload protection fuse (fuse externally)

Auxiliary Contact 43/44

Rated Insulation Voltage

Rated Impulse Withstand Volt

Travel for Positive Opening

Approach Speed

Man. Actuation Frequency

Actuator entry minimum radius

Case Material

Head Material

Actuator Material

Enclosure Protection

Operating Temperature

Holding Force

Vibration

Conduit Entry

Fixing

2.5 x 10⁶ operations at 100mA load

up to PLe / Cat.4 depending upon system architecture

up to SIL3 depending upon system architecture

8 cycles per hour / 24 hours per day / 365 days

MTTFd 356 years

24V ac/dc (12W.)

Utilization Category AC15 A300 3A.

Thermal Current (Ith) 5A

10A. (FF).

230V.ac/dc 0.5A. Maximum.

600VAC

2500VAC

10mm

200mm/m. to 1000mm/s.

2 cycle/sec

175mm Standard 100mm Flexible

Die Cast painted red

Stainless Steel 316

Stainless steel 316

IP67

-25°C to 40°C

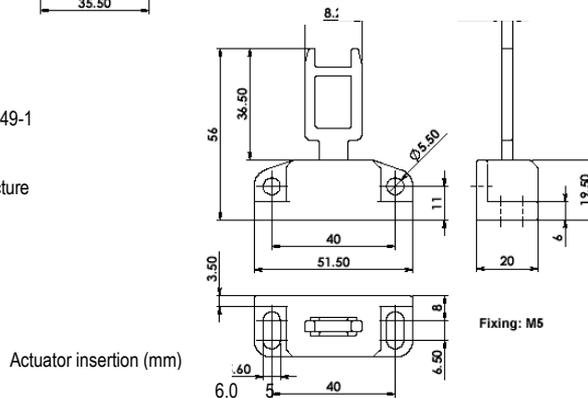
F1Max: 3000N. Fzh: 2307N.

IEC 68-2-6, 10-55Hz+1Hz,

Excursion: 0.35mm, 1 octave/min

Various (See Sales Part Numbers)

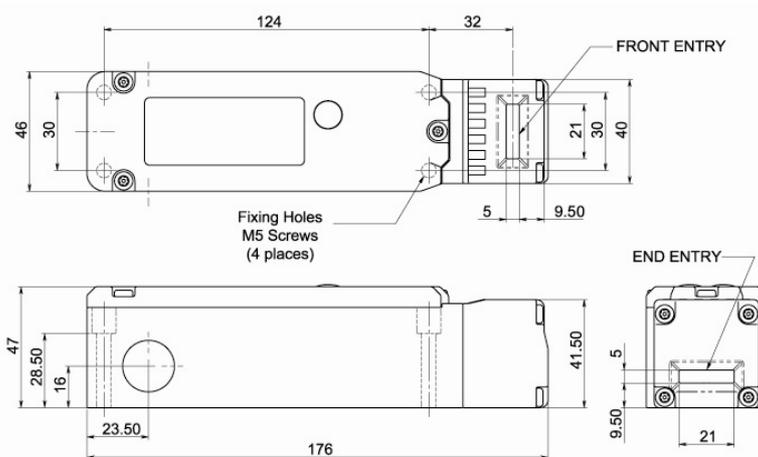
4 x M5



Actuator insertion (mm)

11/12	Open	Solenoid energised
21/22	Open	Solenoid energised
33/34	Open	Tongue Inserted
43/44	Open	Tongue Inserted

Contact 33/34 is positively operated at withdrawal of actuator



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

Use one polymeric conduit connection.

Not suitable for connection to rigid metal conduit.



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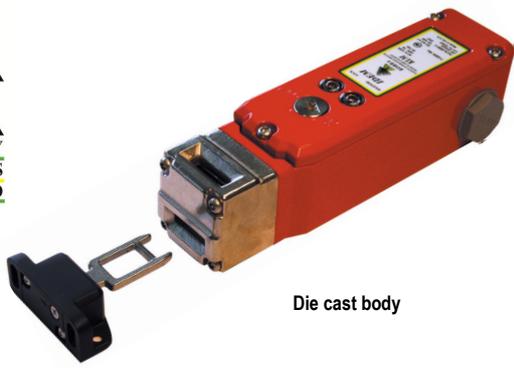
Original Instructions.

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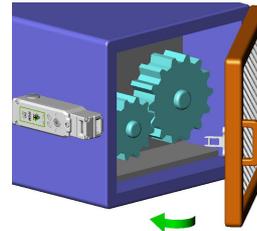


Safety Interlock Switch with Guard Locking

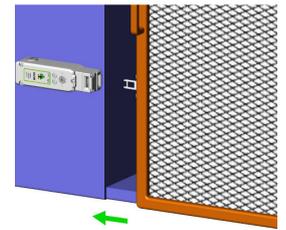
KLM KLM-RR Operating Instructions



Die cast body



Hinged Guard



Sliding Guard

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Installation:

- Installation of all interlock switches must be in accordance with a risk assessment for the individual application. Installation must only be carried out by competent personnel and in accordance with these instructions.
- M5 mounting bolts must be used to fix the switch and actuator, the tightening torque to ensure reliable fixing is 4.0 Nm. **To prevent loosening of the switch after installation, always fix the M5 mounting bolts with a thread-locking compound or secure using self locking nuts.**
Tightening torque for the lid screws, conduit entry plugs and cable glands must be 1.5 Nm to ensure IP seal. Only use the correct size gland for the conduit entry and cable outside diameter.
Tightening torque for the connection terminal screws is 0.7 Nm, max conductor size is 1.0 sq.mm.
The switch head position can be selected by removing the actuator, loosening the 4 head bolts and then rotating the head to the position required. Re-tighten the head bolts and then check actuator insertion and withdrawal. Tightening torque for the head bolts is 1.5Nm.

- Always fit a mechanical stop to the guard to prevent damage to the front of the switch.
Set the actuator gap to 3mm when the guard is closed and against the stop. (See Fig. A.)
Use alignment guides to ensure that the actuator enters the switch without interfering with the sides of the switch aperture.
If fitted, ensure access to at least one of the auxiliary release points.
The switch can be positioned / shielded to prevent unintended actuation of the auxiliary release.
The auxiliary release function is achieved by use of a tool and is to be used in exceptional circumstances.
The auxiliary release can be protected by use of a tamper coating to protect against unintended operation.
If operated this tamper protection must be restored.
Always fit the aperture plug to the unused entry aperture to prevent debris entering the switch mechanism.

- After installation check operation of all control circuits and the locking function. For applications with a run down time after removing power, ensure that the correct timing allowance has elapsed before energising the solenoid.

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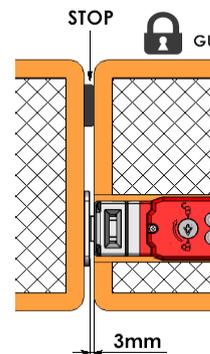
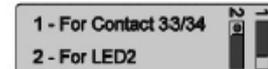


Fig. A

5. IMPORTANT!

At installation choose the status of Terminals 33 and 34 by setting the slide switch inside the switch housing.



If LED2 is used always check for correct .dc polarity.
Terminal 33: 0V.dc Terminal 34: +24V.dc

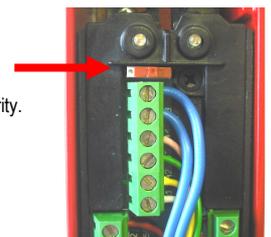


Fig. B

Top or Side
Auxiliary release points (if fitted).



8 actuator entry positions
rotatable head

IMPORTANT

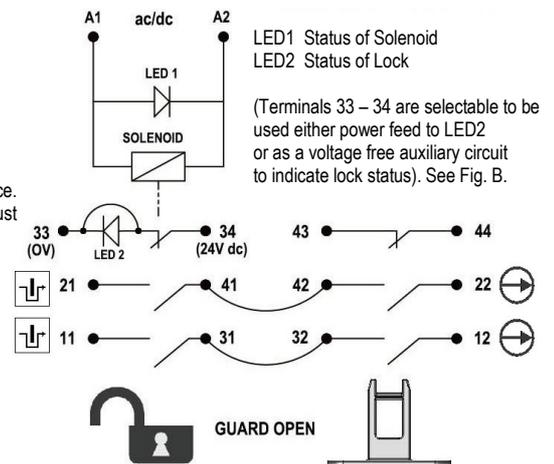
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Ensure that the switch holding force (Fzh) is sufficient to withstand the static forces applied during normal use and dynamic effects caused by bouncing of the guard shall not create an impact reaction force which exceeds the holding force. If the expected impact reaction forces are higher than the specified holding force for the switch, then design measures must be applied to avoid the force.

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Maintenance:

- Every Month: Check the switch actuator and body for signs of mechanical damage and wear. Replace any switch showing damage.
- Every 6 Months: Check for mechanical damage to switch body or actuator. Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress. Never attempt to repair any switch. Replace any switch displaying damage. **These requirements form part of the product warranty.**

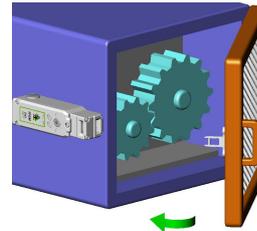


The connections between terminals 31/32 and 41/42 are made using wire links inside the switch (factory fitted). If required by the control circuit, these links are able to be removed at installation to allow individual monitoring of the lock status and actuator status.

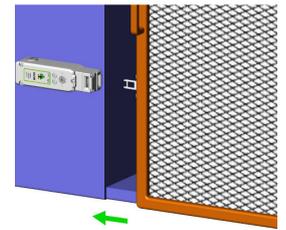


Safety Interlock Switch with Guard Locking

KLP-P2L Operating Instructions



Hinged Guard



Sliding Guard

IMPORTANT NOTE:

Read and understand these instructions before installing, operating, or maintaining this equipment.

The product is designed to be a component of a customised safety orientated control system. It is the responsibility of the user to ensure the correct overall functionality of its systems and machines. IDEM, its subsidiaries and affiliates, are not in a position to guarantee all of the characteristics of a given system or product not designed by IDEM.

Application and 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 will close only when power is applied to the solenoid. This will then allow the machine start circuit to be enabled. When the solenoid power is removed the safety contacts are opened and the machine circuit is broken.

IMPORTANT: Any hazardous motion has to be controlled and a safe condition initiated in the event of power failure.

P2L versions (power to lock) may not be suitable for machines with a running down time.

Installation:

- Installation of all interlock switches must be in accordance with a risk assessment for the individual application. Installation must only be carried out by competent personnel and in accordance with these instructions.
- M5 mounting bolts must be used to fix the switch and actuator, the tightening torque to ensure reliable fixing is 4.0 Nm. **To prevent loosening of the switch after installation, always fix the M5 mounting bolts with a thread-locking compound or secure using self locking nuts.**
Tightening torque for the lid screws, conduit entry plugs and cable glands must be 1.5 Nm to ensure IP seal. Only use the correct size gland for the conduit entry and cable outside diameter.
Tightening torque for the connection terminal screws is 0.7 Nm, max conductor size is 1.0 sq.mm.
The switch head position can be selected by removing the actuator, loosening the 4 head bolts and then rotating the head to the position required. Re-tighten the head bolts and then check actuator insertion and withdrawal.
Tightening torque for the head bolts is 1.5Nm.
- Always fit a mechanical stop to the guard to prevent damage to the front of the switch.
Set the actuator gap to 3mm when the guard is closed and against the stop. (See Fig. A.)
Use alignment guides to ensure that the actuator enters the switch without interfering with the sides of the switch aperture.
Always fit the aperture plug to the unused entry aperture to prevent debris entering the switch mechanism.
- After installation check operation of all control circuits and the locking function.
For applications with a run down time after removing power, ensure that the correct timing allowance has elapsed before energising the solenoid.
LED 1 GREEN will illuminate when power is applied to A1 and A2 (solenoid feed).

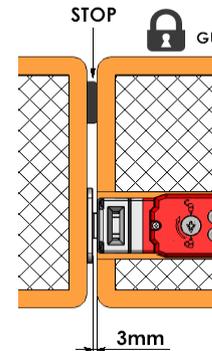
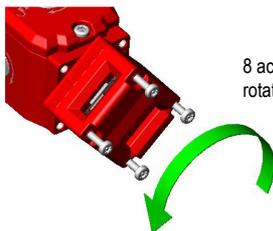


Fig. A



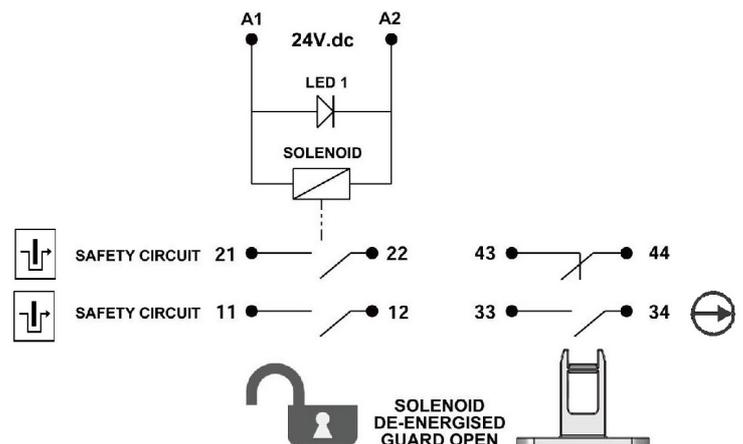
8 actuator entry positions
rotatable head

Internal Terminal Connections:

- A1 0V dc
- A2 24V.dc
- 11-12 Safety Circuit 1 – (must always be used)
- 21-22 Safety Circuit 2
- 33-34 Signal Circuit Guard - (Closed when Guard is closed)
- 43-44 Signal Circuit Guard - (Closed when Guard is open)

LED Function:

- Green Solenoid Energised



SOLENOID
DE-ENERGISED
GUARD OPEN

Safety Interlock Switch with Guard Locking

IMPORTANT

The Risk Assessment for the particular application should include the risk of spare actuators. Spare actuators should not be readily available and must be securely controlled. Application consideration must be given to the fixing of the actuator which has to be in a way that prevents disassembly by easy means.

Ensure that the switch holding force (Fzh) is sufficient to withstand the static forces applied during normal use and dynamic effects caused by bouncing of the guard shall not create an impact reaction force which exceeds the holding force. If the expected impact reaction forces are higher than the specified holding force for the switch, then design measures must be applied to avoid the force.

The safety functions and mechanics must be tested regularly. For applications where infrequent guard access is foreseeable, the system must have a manual function test to detect a possible accumulation of faults. At least once per month for PLe Cat3/4 or once per year for PLD Cat3 (ISO13849-1). Where possible it is recommended that the control system of the machine demands and monitors these tests, and stops or prevents the machine from starting if the test is not done. (See ISO14119).

Maintenance:

Every Month: Check the switch actuator and body for signs of mechanical damage and wear. Replace any switch showing damage.

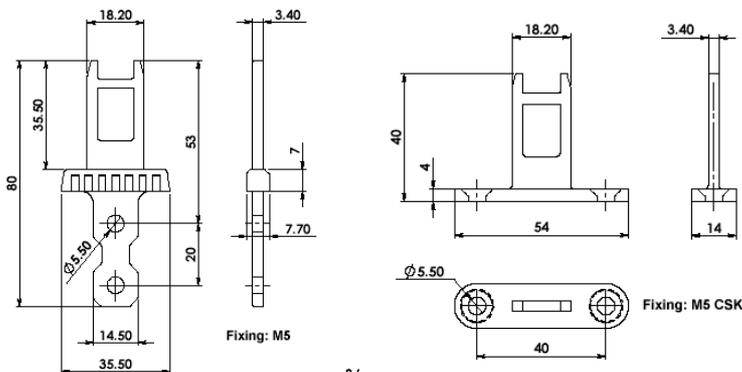
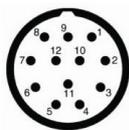
Every 6 Months: Check for mechanical damage to switch body or actuator. Isolate power and remove cover.

Check screw terminal tightness and check for signs of moisture ingress.

Never attempt to repair any switch. Replace any switch displaying damage.

These requirements form part of the product warranty.

Quick Connect (QC) M23 12 way Male Plug (Pin view from switch)	Switch Circuit
1 3	A1 A2
4 6	11 / 12
7 8	21 / 22
2 5	43 / 44
9	33
10	34
Earth	12



Conforming to Standard: ISO14119, IEC60947-5-1, UL60947-5-1, ISO13849-1

Safety Classification and Reliability Data:

Mechanical Reliability B10d

ISO 13849-1

EN 62061

Safety Data - Annual Usage

Solenoid Voltage (by part number)

Safety Contacts 11/12 21/22 33/34

Overload protection fuse (fuse externally)

Auxiliary Contact 43/44

Rated Insulation Voltage

Rated Impulse Withstand Volt

Travel for Positive Opening

Approach Speed

Man. Actuation Frequency

Actuator entry minimum radius

Case Material

Head Material

Actuator Material

Enclosure Protection

Operating Temperature

Holding Force

Vibration

Conduit Entry

Fixing

2.5 x 10⁶ operations at 100mA load

up to PLe / Cat.4 depending upon system architecture

up to SIL3 depending upon system architecture

8 cycles per hour / 24 hours per day / 365 days

MTTFd 356 years

24V ac/dc (12W.)

Utilization Category AC15 A300 3A.

Thermal Current (Ith) 5A

10A. (FF).

230V.ac/dc 0.5A. Maximum.

600VAC

2500VAC

10mm

200mm/m. to 1000mm/s.

2 cycle/sec

175mm Standard 100mm Flexible

Glass Filled Polyester

Stainless Steel 316

Stainless steel 316

IP67

-25°C to 40°C

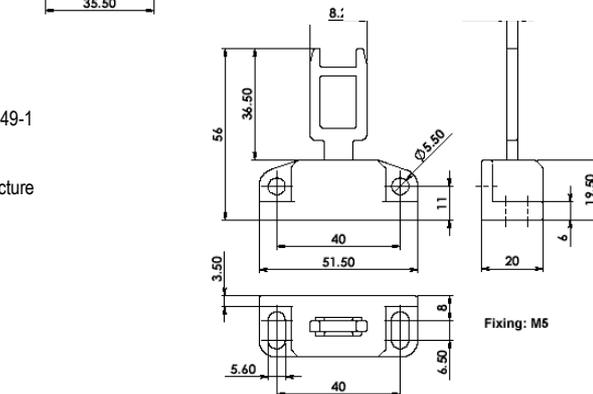
F1Max: 2000N. Fzh: 1538N.

IEC 68-2-6, 10-55Hz+1Hz,

Excursion: 0.35mm, 1 octave/min

Various (See Sales Part Numbers)

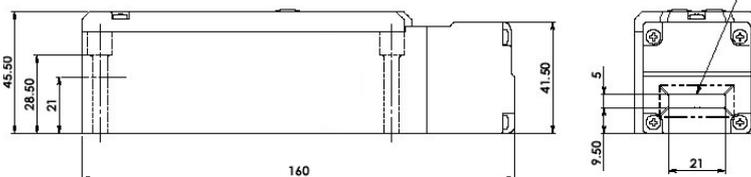
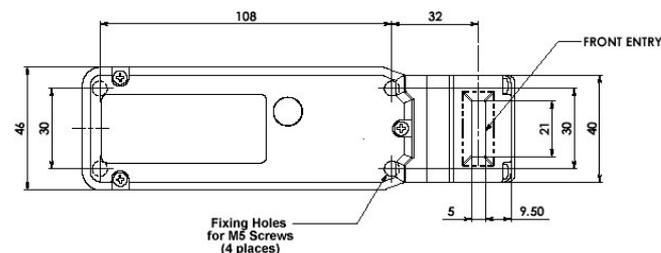
4 x M5



Actuator insertion (mm)

	6.0	5	
11/12	Open		Solenoid energised
21/22	Open		Solenoid energised
33/34	Open		Tongue Inserted
43/44		Open	Tongue Inserted

Contact 33/34 is positively operated at withdrawal of actuator



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

Use one polymeric conduit connection.

Not suitable for connection to rigid metal conduit.



WARNING: DO NOT DEFEAT, TAMPER, OR BYPASS THE SAFETY FUNCTION. FAILURE TO DO SO CAN RESULT IN DEATH OR SERIOUS INJURY.

AVERTISSEMENT: NE PAS DESACTIVER, MODIFIER, RETIRER, OU CONTOURNER CETI INTERVERROUILLAGE IL PEUT EN RESULTER DES BLESSURES GRAVES DU PERSONNEL UTILISATEUR.

Original Instructions.

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Safety Interlock Switch with Guard Locking

KL1-P KL1-SS Operating Instructions



IMPORTANT NOTE:

Read and understand these instructions before installing, operating, or maintaining this equipment.

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Application:

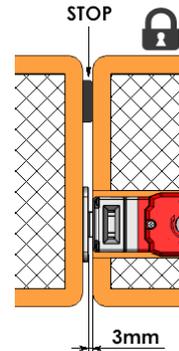
Tongue operated switches are designed to fit to the leading edge of sliding, hinged or lift off machine guards to provide positively operated switching contacts to EN60947-5-1. They are designed to provide robust position interlock detection for moving guards and will remain locked until the solenoid voltage is applied to the switch.

Operation:

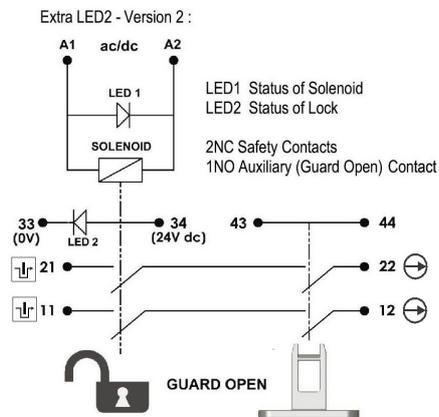
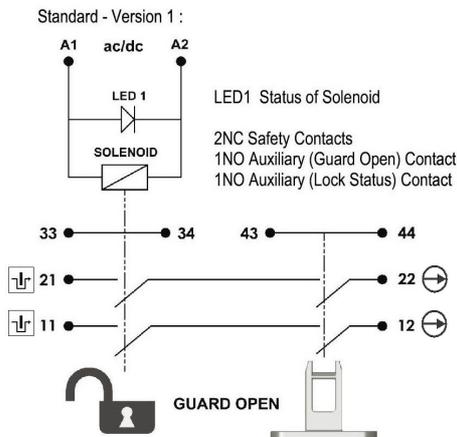
The switch is rigidly mounted to the frame of the guard or machine. The actuator is fitted to the moving part (frame) of the guard and is aligned to the switch entry aperture. The actuator profile is designed to match a cam mechanism within the switch head and provides a positively operated switch. When the actuator is inserted into the switch the safety contacts close and allow the machine start circuit to be enabled. When the solenoid is energised the safety contacts are positively opened and the machine circuit is broken.

Installation:

- Installation of all switches must be in accordance with a risk assessment for the individual application. Installation must only be carried out by competent personnel and in accordance with these instructions.
- M5 mounting bolts must be used to fix the switch and actuator, the tightening torque to ensure reliable fixing is 4.0 Nm. Tightening torque for the lid screws, conduit entry plugs and cable glands must be 1.0 Nm to ensure IP seal. Only use the correct size gland for the conduit entry and cable outside diameter. Note: For 1/2" NPT versions, the gland thread length must be limited to 10mm maximum. Tightening torque for the connection terminal screws is 0.7 Nm, max conductor size is 1.0 sq.mm. The switch head position can be selected by loosening the 4 head bolts and then rotating to the position required. Tightening torque for the head bolts is 1.5Nm. Always check for correct 24V.dc polarity to LED 2 (if fitted).
- Always fit a mechanical stop to the guard to prevent damage to the front of the switch. Set the actuator gap to 3mm when the guard is closed and against the stop. (See Fig. A.) Use alignment guides to ensure that the actuator enters the switch without interfering with the sides of the switch aperture. If fitted, ensure access to at least one of the auxiliary release points. The switch can be positioned / shielded to prevent unintended actuation of the auxiliary release. The auxiliary release function is achieved by use of a tool and is to be used in exceptional circumstances. The auxiliary release can be protected by use of a tamper coating to protect against unintended operation. If operated this tamper protection must be restored. Always fit the aperture plug to the unused entry aperture to prevent debris entering the switch mechanism.
- After installation check operation of all control circuits and the locking function. For applications with a run down time after removing power, ensure that the correct timing allowance has been made before energising the solenoid. LED1 will illuminate when power is applied to A1 and A2 (solenoid feed). LED2 GREEN (if used) will be illuminated when the actuator is locked.



(Fig. A)



WARNING: DO NOT DEFEAT, TAMPER, OR BYPASS THE SAFETY FUNCTION. FAILURE TO DO SO CAN RESULT IN DEATH OR SERIOUS INJURY.

AVERTISSEMENT: NE PAS DESACTIVER, MODIFIER, RETIRER, OU CONTOURNER CETI INTERVERROUILLAGE IL PEUT EN RESULTER DES BLESSURES GRAVES DU PERSONNEL UTILISATEUR.

Original Instructions.

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Safety Interlock Switch with Guard Locking

IMPORTANT

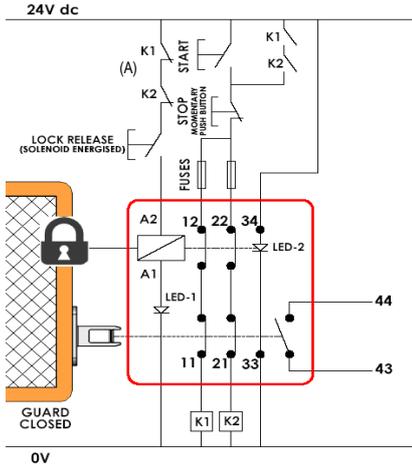
The Risk Assessment for the particular application should include the risk of spare actuators. Spare actuators should not be readily available and must be securely controlled. Application consideration must be given to the fixing of the actuator which has to be in a way that prevents disassembly by easy means.

Ensure that the switch holding force (Fzh) is sufficient to withstand the static forces applied during normal use and dynamic effects caused by bouncing of the guard shall not create an impact reaction force which exceeds the holding force. If the expected impact reaction forces are higher than the specified holding force for the switch, then design measures must be applied to avoid the force.

The safety functions and mechanics must be tested regularly. For applications where infrequent guard access is foreseeable, the system must have a manual function test to detect a possible accumulation of faults. At least once per month for PLe Cat3/4 or once per year for PLd Cat3 (ISO13849-1). Where possible it is recommended that the control system of the machine demands and monitors these tests, and stops or prevents the machine from starting if the test is not done. (See ISO14119).

Maintenance:

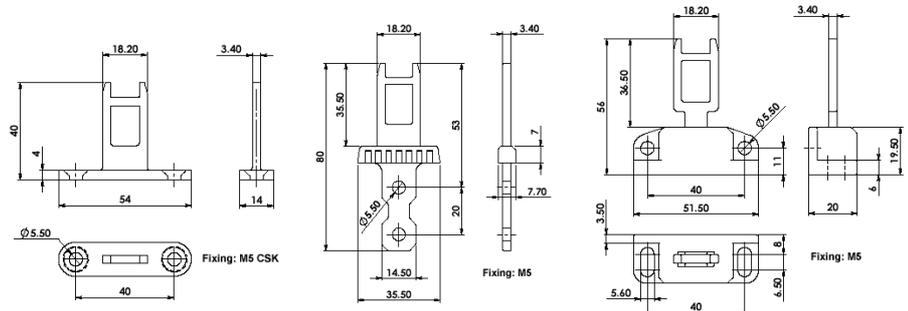
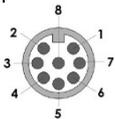
- Every Month: Check the switch actuator and body for signs of mechanical damage and wear. Replace any switch showing damage.
- Every 6 Months: Check for mechanical damage to switch body or actuator. Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress. Never attempt to repair any switch. Replace any switch displaying damage.
- These requirements form part of the product warranty.**



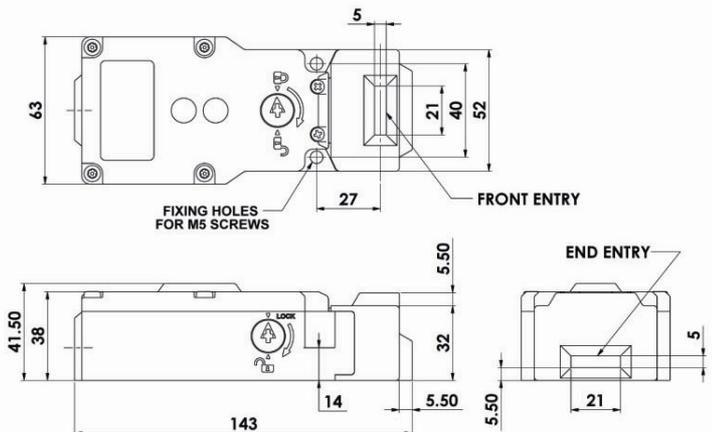
Application Example: Dual Channel (non-monitored).

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 machine 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 (Lock released).

Quick Connect (QC) M12 8 Way Male (on Flying Lead 250mm) Pin view from switch	Switch Circuit
2 7	A1 A2
4 6	11 / 12
8 5	21 / 22
3 1	43 / 44



Conforming to Standard:	
ISO14119, IEC 60947-5-1, UL60947-5-1, ISO13849-1	
Safety Classification and Reliability Data:	
Mechanical Reliability	B10d
	ISO 13849-1
	EN 62061
Safety Data - Annual Usage	
Solenoid Voltage (by part number)	24V ac/dc or 110V. ac or 230V. ac +/- 10% (12W.)
LED 2 (if fitted) Supply Voltage	24V dc +/- 10%
Safety Contacts	11/12 21/22
Utilization Category	AC15 A300 3A.
Thermal Current (Ith)	5A
10A. (FF).	
Overload protection fuse (fuse externally)	24V.ac/dc 0.5A. Maximum.
Auxiliary Contact 33/34	230V.ac/dc 0.5A. Maximum.
Auxiliary Contact 43/44	
Rated Insulation Voltage	600VAC
Rated Impulse Withstand Volt	2500VAC
Travel for Positive Opening	10mm
Approach Speed	200mm/m. to 1000mm/s.
Man. Actuation Frequency	2 cycle/sec
Actuator entry minimum radius	175mm Standard 100mm Flexible
Case Material	KL1-P Polyester KL1-SS S/Steel 316
Head Material	Stainless Steel 316
Actuator Material	Stainless steel 316
Enclosure Protection	IP67 (KL1-SS IP69K)
Operating Temperature	-25°C to 40°C
Holding Force	KL1-P F1Max: 1400N. Fzh: 1076N.
	KL1-SS F1Max: 2000N. Fzh: 1538N.
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



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. Use one polymeric conduit connection. Not suitable for connection to rigid metal conduit. KL1-SS Earth bonding terminal inside enclosure if required, use 16-12AWG conductors).

Kobra – Tongue Switches with Guard Locking – Type KLTM-P2L

Data Sheet

KLTM-P2L

Power to Lock



IMPORTANT NOTE:

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Application:

Tongue operated Solenoid 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 key mechanism.

They are designed to provide robust position interlock detection for moving guards and will remain locked until the solenoid voltage is removed from the switch.

IMPORTANT: Any hazardous motion has to be controlled and a safe condition initiated in the event of power failure.

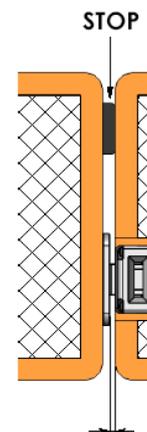
P2L versions (power to lock) may not be suitable for machines with a running down time.

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 will close only when power is applied to the solenoid. This will then allow the machine start circuit to be enabled. When the solenoid power is removed the safety contacts are opened and the machine circuit is broken.

Installation:

- Installation of all IDEM interlock switches must be in accordance with a risk assessment for the individual application. Installation must only be carried out by competent personnel and in accordance with these instructions.
- M5 mounting bolts must be used to fix the switch and actuator, the tightening torque to ensure reliable fixing is 4.0 Nm. Tightening torque for the lid screws, conduit entry plugs and cable glands must be 1.5 Nm to ensure IP seal. Only use the correct size gland for the conduit entry and cable outside diameter. Tightening torque for the connection terminal screws is 0.7 Nm, max conductor size is 1.0 sq.mm.
- Always fit a mechanical stop to the guard to prevent damage to the front of the switch. Set the actuator gap to 3mm when the guard is closed and against the stop, (See Fig.A). Use alignment guides to ensure that the actuator enters the switch without interfering with the sides of the switch aperture. Always fit the aperture plug to the unused entry aperture to prevent debris entering the switch mechanism.
- Always use the circuits 11-12 and 21-22 to ensure monitoring of the lock.
- After installation check operation of all control circuits and the locking function. LED 1 will illuminate when power is applied to A1 and A2 (solenoid feed).



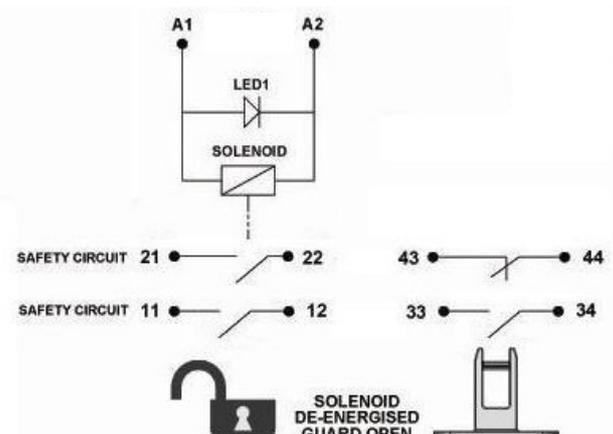
3mm Fig. A

Internal Terminal Connections:

A1	0V dc	
A2	24V dc	
11-12	Safety Circuit 1	(Closed when guard is closed and solenoid energised)
21-22	Safety Circuit 2	(Closed when guard is closed and solenoid energised)
33-34	Signal Circuit Guard	(Closed when Guard is closed)
43-44	Signal Circuit Guard	(Closed when Guard is open)

LED Function:

Green Solenoid Energised



Kobra – Tongue Switches with Guard Locking – Type KLTM-P2L

IMPORTANT

The Risk Assessment for the particular application should include the risk of spare actuators. Spare actuators should not be readily available and must be securely controlled. Application consideration must be given to the fixing of the actuator which has to be in a way that prevents disassembly by easy means.

Ensure that the switch holding force (Fzh) is sufficient to withstand the static forces applied during normal use and dynamic effects caused by bouncing of the guard shall not create an impact reaction force which exceeds the holding force. If the expected impact reaction forces are higher than the specified holding force for the switch, then design measures must be applied to avoid the force.

The safety functions and mechanics must be tested regularly. For applications where infrequent guard access is foreseeable, the system must have a manual function test to detect a possible accumulation of faults. At least once per month for PLe Cat3/4 or once per year for PLd Cat3 (ISO13849-1). Where possible it is recommended that the control system of the machine demands and monitors these tests, and stops or prevents the machine from starting if the test is not done. (See ISO14119).

Maintenance:

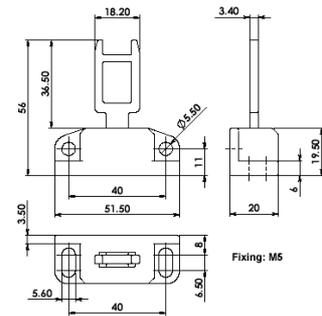
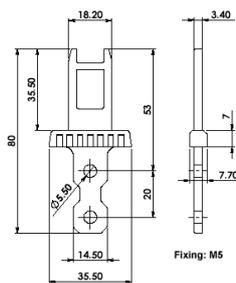
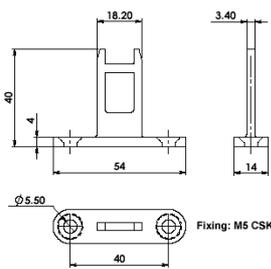
Every Week: Check the switch actuator and body for signs of mechanical damage and wear. Replace any switch showing damage.

Every 6 Months: Check for mechanical damage to switch body or actuator. Isolate power and remove cover.

Check screw terminal tightness and check for signs of moisture ingress.

Never attempt to repair any switch. Replace any switch displaying damage.

These requirements form part of the product warranty.



Conforming to Standard: ISO14119, IEC 60947-5-1, UL60947-5-1, ISO13849-1

Safety Classification and Reliability Data:

Mechanical Reliability B10d
ISO 13849-1
EN 62061

Safety Data - Annual Usage
PFHd
Proof Test Interval (Life)

35 years

MTTFd
356 years

Solenoid Voltage (by part number)
24V ac/dc (12W.)

Safety Contacts 11/12 21/22 33/34
Utilization Category AC15 A300 3A.

Thermal Current (Ith) 5A

Overload protection fuse (fuse externally)
10A. (FF).

Auxiliary Contact 43/44
230V.ac/dc 0.5A. Maximum.

Rated Insulation Voltage
600VAC

Rated Impulse Withstand Volt
2500VAC

Travel for Positive Opening
10mm

Approach Speed
200mm/m. to 1000mm/s.

Man. Actuation Frequency
2 cycle/sec

Actuator entry minimum radius
175mm Standard 100mm Flexible

Case Material
Die Cast painted red

Head Material
Stainless Steel 316

Actuator Material
Stainless steel 316

Enclosure Protection
IP67

Operating Temperature
-25°C to 40°C

Holding Force
F1Max: 3000N. Fzh: 2307N.

Vibration
IEC 68-2-6, 10-55Hz+1Hz,

Excursion: 0.35mm, 1 octave/min

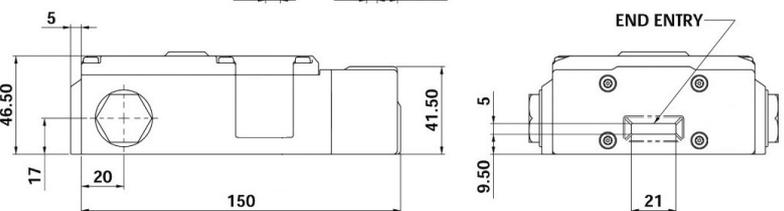
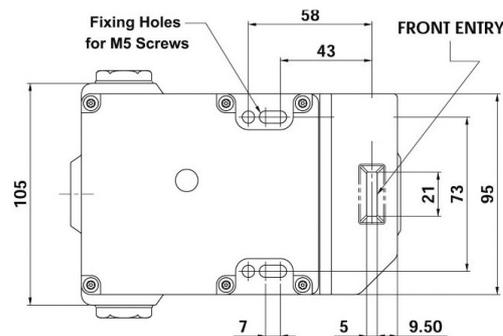
Conduit Entry
Various (See Sales Part Numbers)

Fixing
4 x M5

Actuator insertion

8.0 6.0 0 mm

11/12	Open	
21/22	Open	
43/44	Closed	



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

Use one polymeric conduit connection.

Not suitable for connection to rigid metal conduit.



WARNING: DO NOT DEFEAT, TAMPER, OR BYPASS THE SAFETY FUNCTION. FAILURE TO DO SO CAN RESULT IN DEATH OR SERIOUS INJURY.

AVERTISSEMENT: NE PAS DESACTIVER, MODIFIER, RETIRER, OU CONTOURNER CETI INTERVERROUILLAGE IL PEUT EN RESULTER DES BLESSURES GRAVES DU PERSONNEL UTILISATEUR.

Original Instructions.

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Tongue Switch with Guard Locking KLTM & KLT-SS Operating Instructions



KLTM



KLT-SS

Application:

The RAMZLOCK KLTM and KLT-SS Safety Interlock switch is designed to fit to the leading edge of machine guard doors to provide robust guard locking. They are designed to provide robust position interlock detection for moving guards and will remain locked until the solenoid voltage is applied to the switch. They can be used in conjunction with delay timers to provide the solenoid energisation only after a pre-determined time has run down.

Operation:

The switch is rigidly mounted to the fixed 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 mechanical tongue actuator profile is designed to match a cam mechanism within the switch head and provides a positively operated not easily defeatable mechanical interlock. Only when the actuator is correctly aligned can the safety contacts close and allow the machine start circuit to be enabled. When the solenoid is energised the safety contacts are positively opened and the machine circuit is broken. The risk assessment for the particular application should include the risk of spare actuators. Spare actuators should not be readily available and must be securely controlled.

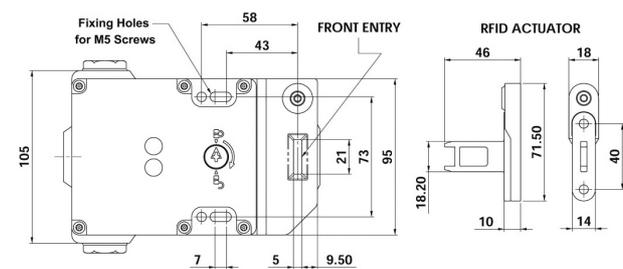
Installation:

1. Installation of all IDEM interlock switches must be in accordance with a risk assessment for the individual application. Installation must only be carried out by competent personnel and in accordance with these instructions.
2. M5 (or appropriate) mounting bolts must be used to fix the switch and actuator mounting plates. The tightening torque to ensure reliable fixing is 4.0 Nm. Tightening torque for the lid screws and cable glands must be 1.5 Nm to ensure the IP seal.
3. Ensure that the switch holding force (Fzh) is sufficient to withstand the static forces applied during normal use and dynamic effects caused by bouncing of the guard shall not create an impact reaction force which exceeds the holding force. If the expected impact reaction forces are higher than the specified holding force for the switch, then design measures must be applied to avoid the force.
4. Always fit a mechanical stop to the guard to prevent damage to the front of the switch. Use alignment guides to ensure that the actuator enters the switch without interfering with the sides of the switch aperture. Ensure access to at least one of the manual release points (if fitted). Always fit the aperture plug to the unused entry aperture to prevent debris entering the switch mechanism.
5. After installation check operation of all control circuits and the locking function. For applications with a run down time after removing power, ensure that the correct timing allowance has been made before the solenoid is energised.
6. **IMPORTANT:** At installation choose the status of Contacts 33 and 34 by setting the slide switch inside the switch housing.

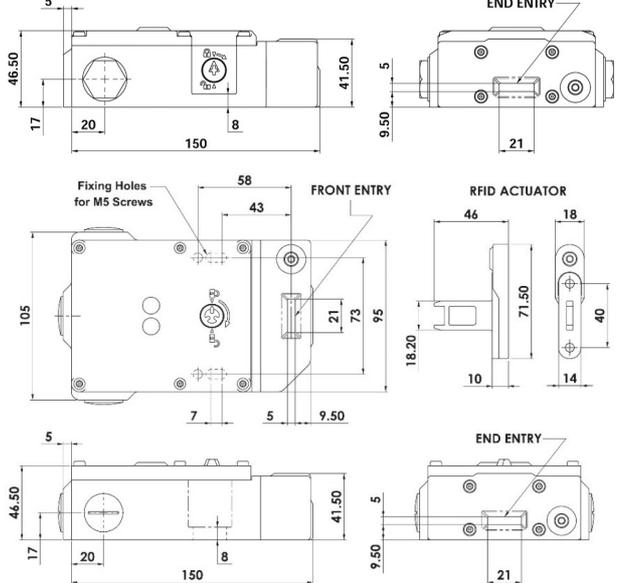
1	
2	

1 - For Contact 33/34
2 - For LED2

If LED2 is used always check for correct .dc polarity.
Contact 33: 0V.dc Contact 34: +24V.dc
7. **IMPORTANT:** The safety functions and mechanics must be tested regularly. For application where infrequent guard access is foreseeable, the system must have a manual function test to detect a possible accumulation of faults. At least once per month for PLe Cat 3/4 or once per year for PLd Cat 3 (ISO13849-1). Where possible it is recommended that the control system of the machine demands and monitors these tests, and stop or prevents the machine from starting if the test is not done. It is the responsibility of the user to ensure the correct overall functionality of its systems and machines.



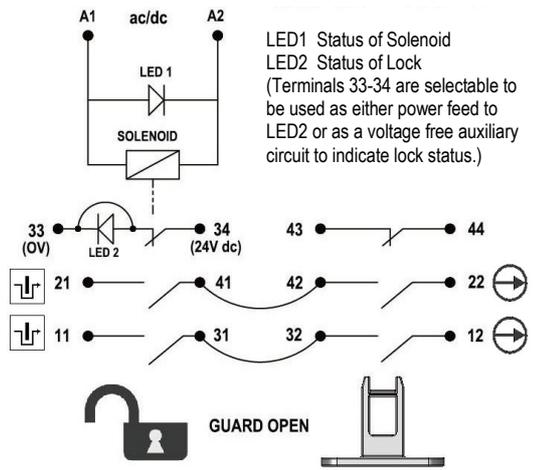
KLTM



KLT-SS

LED Functions:

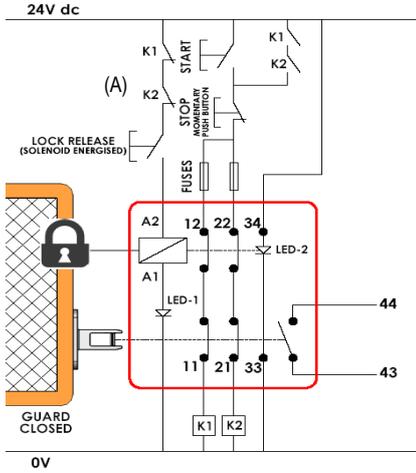
LED1	Red	Solenoid Energised
LED2 (if used)	Green	Guard Locked



Tongue Switch with Guard Locking

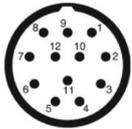
Maintenance:

- Every Month: Check the switch actuator and body for signs of mechanical damage and wear. Replace any switch showing damage.
- Every 6 Months: Check for mechanical damage to switch body or actuator. Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress. Never attempt to repair any switch. Replace any switch displaying damage.
- These requirements form part of the product warranty.**

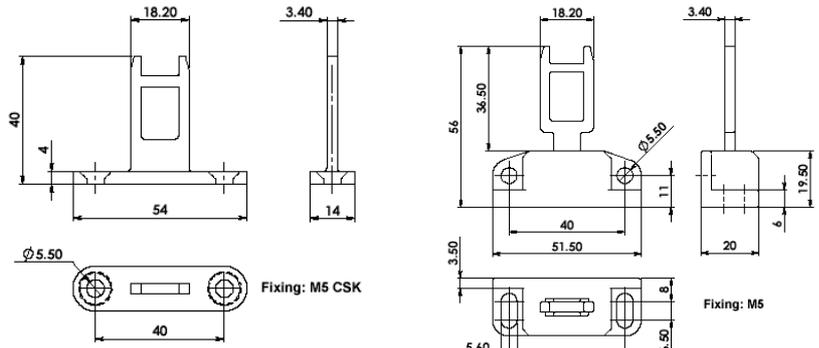


Application Example: Door Interlock with Guard locking - Dual Channel (non-monitored).

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 machine 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 (Lock released).



Quick Connect (QC) M23 12 way Male Plug (Pin view from Switch)	Switch Circuit
1 3	A1 A2
4 6	11 / 12
7 8	21 / 22
2 5	43 / 44
9	33
10	34
12	Earth

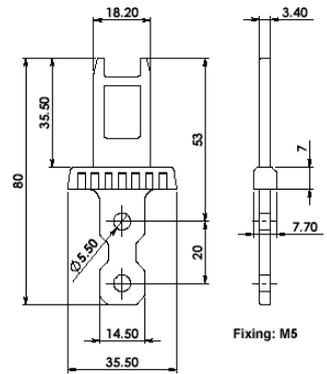


Actuator insertion

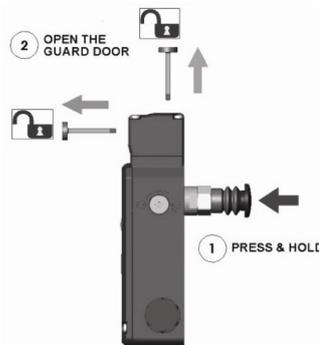
	6.0	5.0	0 mm
11/12	Open		
21/22	Open		
33/34			Open
43/44			Open

Information with regard to UL Standards:

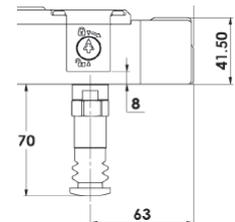
Type 1 enclosure. Maximum temperature 40°C. Use 16-28AWG stranded copper conductors (rated 90°C). Terminal Torque 6 lb ins. (0.7Nm). Intended for same polarity use. A300 Pilot Duty. 240V. 3A. PF 0.38 or greater, tested for 6,000 cycles endurance. Use one polymeric conduit connection. Not suitable for connection to rigid metal conduit. (Earth bonding terminal inside enclosure if required).



- Conforming to Standard:** ISO14119, IEC60947-5-1, UL60947-5-1, ISO13849-1
- Safety Classification and Reliability Data:**
- Mechanical Reliability B10d 2.5 x 10⁶ operations at 100mA load up to PL_e / Cat.4 depending upon system architecture
 - ISO 13849-1 up to SIL3 depending upon system architecture
 - EN 62061 8 cycles per hour / 24 hours per day / 365 days
 - Safety Data - Annual Usage PFHd 3.44 x 10⁻⁸
 - Proof Test Interval (Life) 35 years
 - MTTFd 356 years
 - Solenoid Voltage (by part number) 24V ac/dc or 110V. ac or 230V. ac +/- 10% (12W.)
 - LED 2 Supply Voltage 24V dc +/- 10%
 - Safety Contacts 11/12 21/22 Utilization Category AC15 A300 3A. Thermal Current (Ith) 5A
 - 10A. (FF).
 - 24V.ac/dc 0.5A. maximum.
 - 230V.ac/dc 0.5A. maximum.
 - Rated Insulation Voltage 600VAC
 - Rated Impulse Withstand Volt 2500VAC
 - Travel for Positive Opening 10mm
 - Approach Speed 200mm/m. to 1000mm/s.
 - Man. Actuation Frequency 2 cycle/sec
 - Actuator entry minimum radius 175mm Standard 100mm Flexible
 - Case Material Die cast metal
 - Head Material Stainless Steel 316
 - Actuator Material Stainless steel 316
 - Enclosure Protection IP67
 - Operating Temperature -25°C to 40°C
 - Holding Force F1Max: 3000N. Fzh: 2307N.
 - 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
- Overload protection fuse (fuse externally)
- Auxiliary Contact 33/34 (selectable with LED2)
- Auxiliary Contact 43/44



Where the Risk Assessment for the application permits, a non latching escape rear release versions (-RR) enables quick release of the switch lock in case of emergency. The switch can be mounted such that access to the release button is available from inside the active guard area. Pressing and holding the release button will release the lock mechanism and open the lock monitoring contacts, whilst the guard can be pushed open. Measures should be taken to reduce the risk of improper activation.



WARNING: DO NOT DEFEAT, TAMPER, OR BYPASS THE SAFETY FUNCTION. FAILURE TO DO SO CAN RESULT IN DEATH OR SERIOUS INJURY.

AVERTISSEMENT: NE PAS DESACTIVER, MODIFIER, RETIRER, OU CONTOURNER CETI INTERVERROUILLAGE IL PEUT EN RESULTER DES BLESSURES GRAVES DU PERSONNEL UTILISATEUR.

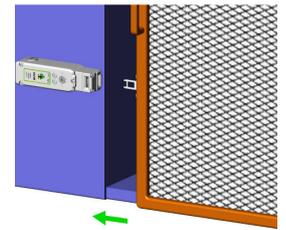
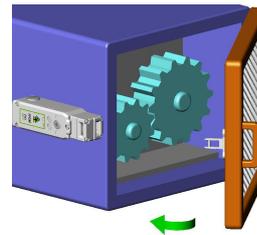
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Safety Interlock Switch with Guard Locking

KL3-SS KL3-SS-RR Operating Instructions



IMPORTANT NOTE:

Read and understand these instructions before installing, operating, or maintaining this equipment.

The product is designed to be a component of a customised safety orientated control system. It is the responsibility of the user to ensure the correct overall functionality of its systems and machines. IDEM, its subsidiaries and affiliates, are not in a position to guarantee all of the characteristics of a given system or product not designed by IDEM.

Application and Operation:

Safety Interlock Switches with Guard Locking are designed to fit to the leading edge of sliding or hinged guard doors to provide positively operated switching contacts and provide a tamper resistant key mechanism. They are designed to provide robust position interlock detection and holding closed of moving guards. 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 guard is closed and the actuator is inserted into the switch the safety contacts close, the actuator is locked and the machine start circuit can be enabled. When the solenoid is energised the safety contacts are positively opened, the machine stop circuit is broken and the guard door can be opened.

Installation:

- Installation of all interlock switches must be in accordance with a risk assessment for the individual application. Installation must only be carried out by competent personnel and in accordance with these instructions.

- M5 mounting bolts must be used to fix the switch and actuator, the tightening torque to ensure reliable fixing is 4.0 Nm. **To prevent loosening of the switch after installation, always fix the M5 mounting bolts with a thread-locking compound or secure using self locking nuts.**

Tightening torque for the lid screws, conduit entry plugs and cable glands must be 1.5 Nm to ensure IP seal. Only use the correct size gland for the conduit entry and cable outside diameter.

Tightening torque for the connection terminal screws is 0.7 Nm, max conductor size is 1.0 sq.mm.

The switch head position can be selected by removing the actuator, loosening the 4 head bolts and then rotating the head to the position required. Re-tighten the head bolts and then check actuator insertion and withdrawal.

Tightening torque for the head bolts is 1.5Nm.

- Always fit a mechanical stop to the guard to prevent damage to the front of the switch. Set the actuator gap to 3mm when the guard is closed and against the stop. (See Fig. A.) Use alignment guides to ensure that the actuator enters the switch without interfering with the sides of the switch aperture. If fitted, ensure access to at least one of the auxiliary release points.

The switch can be positioned / shielded to prevent unintended actuation of the auxiliary release.

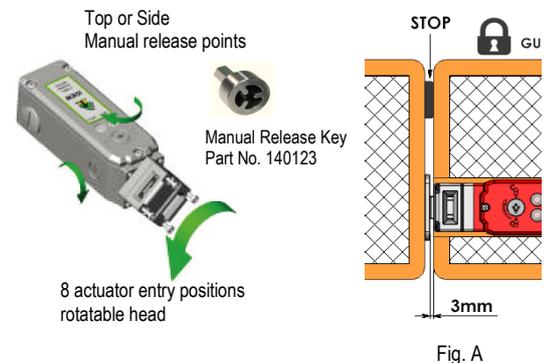
The auxiliary release function is achieved by use of a tool and is to be used in exceptional circumstances.

The auxiliary release can be protected by use of a tamper coating to protect against unintended operation.

If operated this tamper protection must be restored.

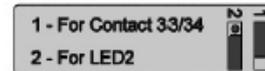
Always fit the aperture plug to the unused entry aperture to prevent debris entering the switch mechanism.

- After installation check operation of all control circuits and the locking function. For applications with a run down time after removing power, ensure that the correct timing allowance has elapsed before energising the solenoid. LED 1 RED will illuminate when power is applied to A1 and A2 (solenoid feed). LED 2 GREEN (if used) will be illuminated when the actuator is locked.

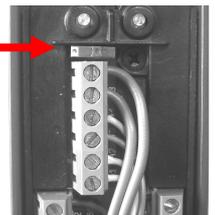


5. IMPORTANT!

At installation choose the status of Terminals 33 and 34 by setting the side switch inside the switch housing.



If LED2 is used always check for correct .dc polarity. Terminal 33: 0V.dc Terminal 34: +24V.dc



IMPORTANT

The Risk Assessment for the particular application should include the risk of spare actuators.

Spare actuators should not be readily available and must be securely controlled.

Application consideration must be given to the fixing of the actuator which has to be in a way that prevents disassembly by easy means. If fitted, it should not be possible to operate the manual escape release from outside of the safeguarded area. Measures should be taken to reduce the risk of improper activation.

Ensure that the switch holding force (Fzh) is sufficient to withstand the static forces applied during normal use and dynamic effects caused by bouncing of the guard shall not create an impact reaction force which exceeds the holding force. If the expected impact reaction forces are higher than the specified holding force for the switch, then design measures must be applied to avoid the force.

The safety functions and mechanics must be tested regularly. For applications where infrequent guard access is foreseeable, the system must have a manual function test to detect a possible accumulation of faults.

At least once per month for PLe Cat3/4 or once per year for PLd Cat3 (ISO13849-1).

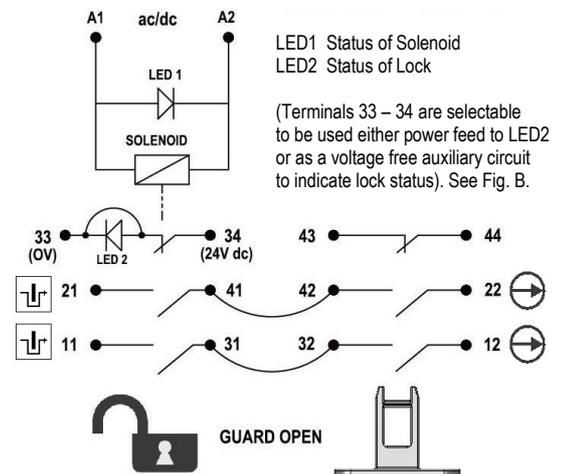
Where possible it is recommended that the control system of the machine demands and monitors these tests, and stops or prevents the machine from starting if the test is not done. (See ISO14119).

Maintenance:

Every Month: Check the switch actuator and body for signs of mechanical damage and wear. Replace any switch showing damage.

Every 6 Months: Check for mechanical damage to switch body or actuator. Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress. Never attempt to repair any switch. Replace any switch displaying damage.

These requirements form part of the product warranty.

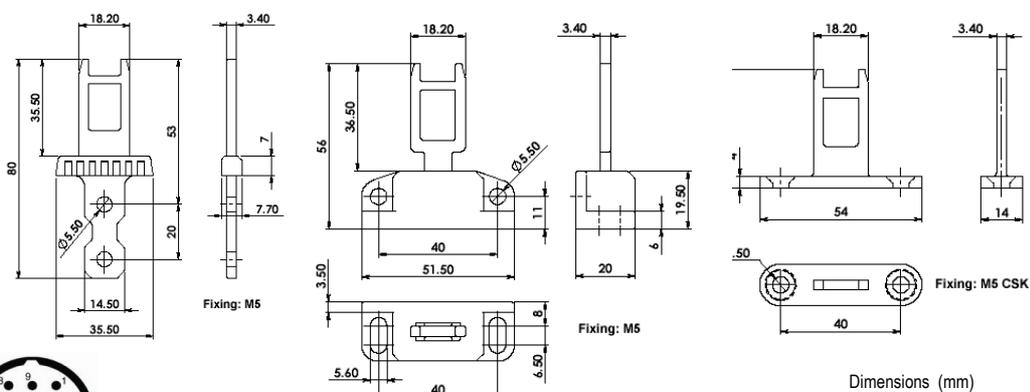
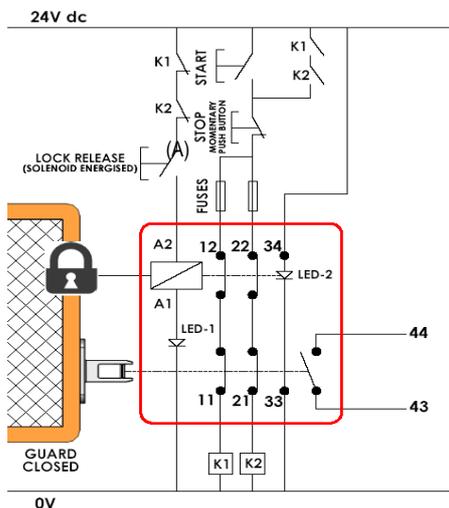


The connections between terminals 31/32 and 41/42 are made using wire links inside the switch (factory fitted). If required by the control circuit, these links are able to be removed at installation to allow individual monitoring of the lock status and actuator status.

Safety Interlock Switch with Guard Locking

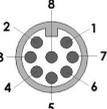
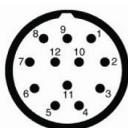
Application Example: Door Interlock with Guard locking - Dual Channel (non-monitored).

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 machine 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 (Lock released).



Quick Connect (QC) M23 12 way Male Plug (Pin view from switch)	Switch Circuit
1 3	A1 A2
4 6	11 / 12
7 8	21 / 22
2 5	43 / 44
9	33
10	34
Earth	12

Quick Connect (QC) M12 8 Way Male (on Flying Lead 250mm) Pin view from switch	Switch Circuit
2 7	A1 A2
4 6	11 / 12
8 5	21 / 22
3 1	43 / 44



Conforming to Standard: ISO14119, IEC60947-5-1, UL60947-5-1, ISO13849-1

Safety Classification and Reliability Data:

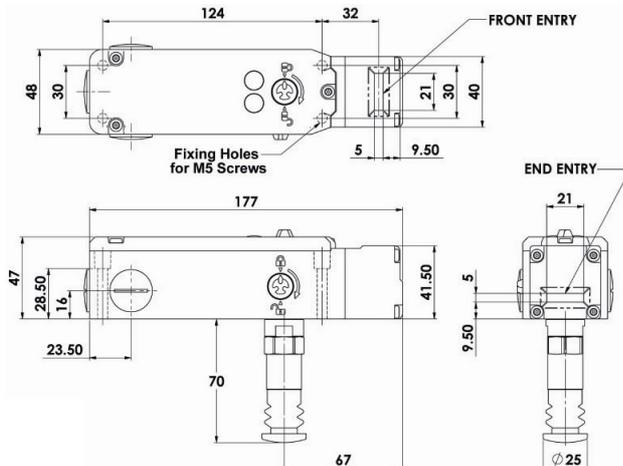
Mechanical Reliability B10d
ISO 13849-1
EN 62061
Safety Data - Annual Usage

Solenoid Voltage (by part number)
LED 2 Supply Voltage
Safety Contacts 11/12 21/22

Overload protection fuse (fuse externally)
Auxiliary Contact 33/34 (selectable with LED2)
Auxiliary Contact 43/44
Rated Insulation Voltage
Rated Impulse Withstand Volt
Travel for Positive Opening
Approach Speed
Man. Actuation Frequency
Actuator entry minimum radius
Case Material
Head Material
Actuator Material
Enclosure Protection
Operating Temperature
Holding Force
Vibration
Conduit Entry
Fixing

2.5 x 10⁶ operations at 100mA load up to PLE / Cat.4 depending upon system architecture up to SIL3 depending upon system architecture
8 cycles per hour / 24 hours per day / 365 days
MTTFd 356 years
24V ac/dc or 110V. ac or 230V. ac +/- 10% (12W.)
Utilization Category AC15 A300 3A.
Thermal Current (Ith) 5A
10A. (FF).
24V.ac/dc 0.5A. maximum.
230V.ac/dc 0.5A. maximum.
600VAC
2500VAC
10mm
200mm/m. to 1000mm/s.
2 cycle/sec
175mm Standard 100mm Flexible
Stainless Steel 316
Stainless Steel 316
Stainless steel 316
IP67 IP69K
-25°C to 40°C
F1Max: 3000N. Fzh: 2307N.
IEC 68-2-6, 10-55Hz+1Hz,
Excursion: 0.35mm, 1 octave/min
Various (See Sales Part Numbers)
4 x M5

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. Use one polymeric conduit connection. Not suitable for connection to rigid metal conduit. (Earth bonding terminal inside enclosure if required).

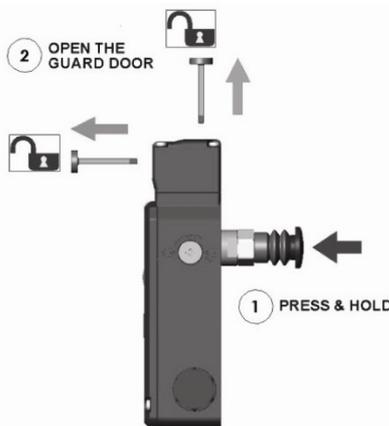


Actuator insertion (mm) 0 mm

11/12	Open	
21/22	Open	
33/34		Open
43/44		Open

The NC circuits are closed when the guard is closed and the actuator is present.

All NC contacts are positively operated at withdrawal of actuator



KL3-SS--RR Rear Escape Release version

Where the Risk Assessment for the application permits, a non latching manual escape release version (KL3-SS-RR) enables quick release of the switch lock in case of emergency. The switch can be mounted such that access to the release button is available from inside the active guard area. Pressing and holding the release button will release the lock mechanism and open the lock monitoring contacts, whilst the guard can be pushed open. Measures should be taken to reduce the risk of improper activation.



WARNING: DO NOT DEFEAT, TAMPER, OR BYPASS THE SAFETY FUNCTION. FAILURE TO DO SO CAN RESULT IN DEATH OR SERIOUS INJURY.

AVERTISSEMENT: NE PAS DESACTIVER, MODIFIER, RETIRER, OU CONTOURNER CETI INTERVERROUILLAGE IL PEUT EN RESULTER DES BLESSURES GRAVES DU PERSONNEL UTILISATEUR.

Original Instructions.

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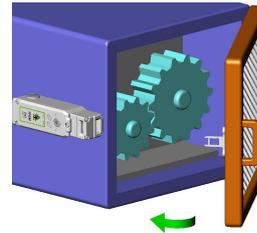


Version with REQUEST button
(Momentary Push Button with
1 set of changeover contacts
in Lid Assembly)

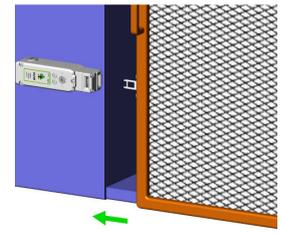


Stainless Steel 316

Safety Interlock Switch with Guard Locking KL4-SS Operating Instructions



Hinged Guard



Sliding Guard

IMPORTANT NOTE:

Read and understand these instructions before installing, operating, or maintaining this equipment.

The product is designed to be a component of a customised safety orientated control system. It is the responsibility of the user to ensure the correct overall functionality of its systems and machines. IDEM, its subsidiaries and affiliates, are not in a position to guarantee all of the characteristics of a given system or product not designed by IDEM.

Application and Operation:

The KL4-SS Safety Interlock Switch with Guard Locking is designed to fit to the leading edge of sliding or hinged guard doors to provide positively operated switching contacts and provide a tamper resistant key mechanism. The KL4-SS is designed to provide robust position interlock detection and holding closed of moving guards. 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 guard is closed and the actuator is inserted into the switch the safety contacts close, the actuator is locked and the machine start circuit can be enabled. When the solenoid is energised the safety contacts are positively opened, the machine stop circuit is broken and the guard door can be opened.

Installation:

- Installation of all interlock switches must be in accordance with a risk assessment for the individual application. Installation must only be carried out by competent personnel and in accordance with these instructions.
- M5 mounting bolts must be used to fix the switch and actuator, the tightening torque to ensure reliable fixing is 4.0 Nm. **To prevent loosening of the switch after installation, always fix the M5 mounting bolts with a thread-locking compound or secure using self locking nuts.**
Tightening torque for the lid screws, conduit entry plugs and cable glands must be 1.5 Nm to ensure IP seal. Only use the correct size gland for the conduit entry and cable outside diameter.
Tightening torque for the connection terminal screws is 0.7 Nm, max conductor size is 1.0 sq.mm.
The switch head position can be selected by removing the actuator, loosening the 4 head bolts and then rotating the head to the position required. Re-tighten the head bolts and then check actuator insertion and withdrawal.
Tightening torque for the head bolts is 1.5Nm.
The switch is supplied with removable conductor links fitted 41/42 and 31/32. If required by the control circuit these may be removed to offer independent monitoring of the solenoid locking function or the actuator.
- Always fit a mechanical stop to the guard to prevent damage to the front of the switch.
Set the actuator gap to 3mm when the guard is closed and against the stop. (See Fig. A.)
Use alignment guides to ensure that the actuator enters the switch without interfering with the sides of the aperture. Ensure access to at least one of the manual release points.
Always fit the aperture plug to the unused entry aperture to prevent debris entering the mechanism.
- After installation check operation of all control circuits and the locking function.
For applications with a run down time after removing power, ensure that the correct timing allowance has been before energising the solenoid.
LED 1 RED will illuminate when power is applied to A1 and A2 (solenoid feed).
LED 2 GREEN (if used) will be illuminated when the actuator is locked.

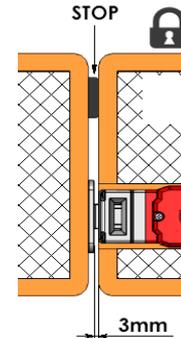


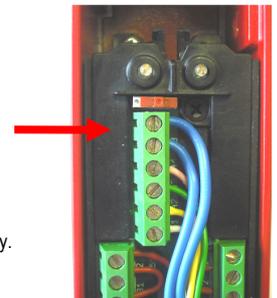
Fig. A

5. IMPORTANT!

At installation choose the status of Terminals 33 and 34 by setting the slide switch inside the switch housing.



If LED2 is used always check for correct .dc polarity.
Terminal 33: 0V.dc Terminal 34: +24V.dc



Top or Side
Manual release points



8 actuator entry positions
rotatable head



Manual Release Key
Part No. 140123

IMPORTANT

The Risk Assessment for the particular application should include the risk of spare actuators. Spare actuators should not be readily available and must be securely controlled.

Application consideration must be given to the fixing of the actuator which has to be in a way that prevents disassembly by easy means. If fitted, it should not be possible to operate the manual escape release from outside of the safeguarded area. Measures should be taken to reduce the risk of improper activation.

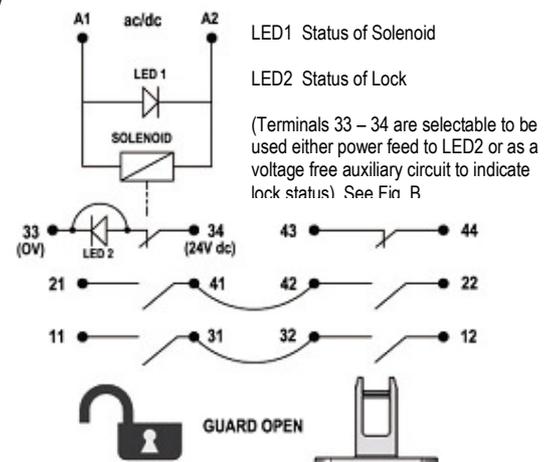
Ensure that the switch holding force (Fzh) is sufficient to withstand the static forces applied during normal use and dynamic effects caused by bouncing of the guard shall not create an impact reaction force which exceeds the holding force. If the expected impact reaction forces are higher than the specified holding force for the switch, then design measures must be applied to avoid the force.

The safety functions and mechanics must be tested regularly. For applications where infrequent guard access is foreseeable, the system must have a manual function test to detect a possible accumulation of faults.

At least once per month for PLe Cat3/4 or once per year for PLd Cat3 (ISO13849-1). Where possible it is recommended that the control system of the machine demands and monitors these tests, and stops or prevents the machine from starting if the test is not done. (See ISO14119).

Maintenance:

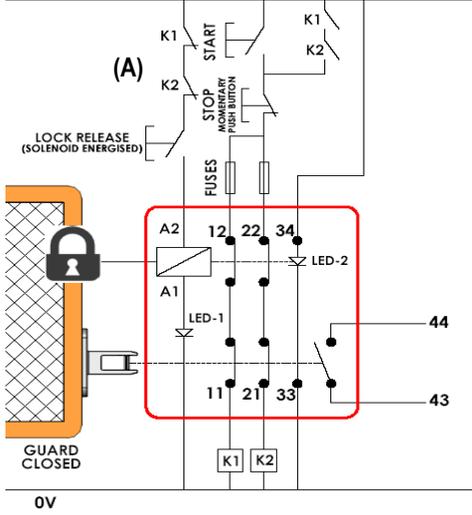
- Every Month: Check the switch actuator and body for signs of mechanical damage and wear. Replace any switch showing damage.
- Every 6 Months: Check for mechanical damage to switch body or actuator. Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress. Never attempt to repair any switch. Replace any switch displaying damage. **These requirements form part of the product warranty.**



The connections between terminals 31/32 and 41/42 are made using wire links inside the switch (factory fitted). These links are able to be removed at installation to allow individual monitoring of the lock status and tongue status.

Safety Interlock Switch with Guard Locking

24V dc



Application Example: Door Interlock with Guard locking - Dual Channel (non-monitored).

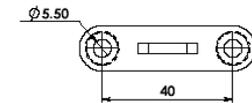
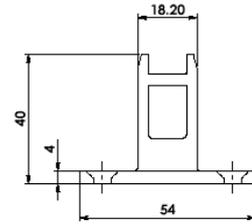
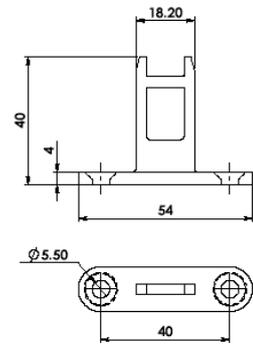
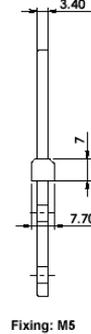
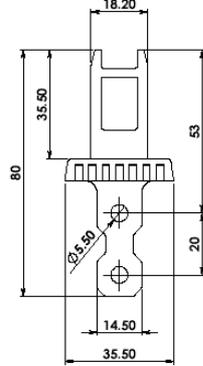
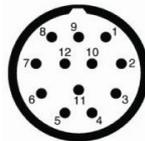
The guard is locked closed until the solenoid is energized. The solenoid can only be energized when the auxiliary contacts (A) of contactors K1 and K2 are closed. When the lock release button is pushed the locking mechanism is released and the switch contacts 11-12 and 21-22 are opened. These contacts 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 machine 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 (Lock released).

Quick Connect (QC) M23 12 way Male Plug (Pin view from switch)	Switch Circuit
1 3	A1 A2
4 6	11 / 12
7 8	21 / 22
2 5	43 / 44
9	33
10	34
Earth	12



Conforming to Standard: ISO14119, IEC60947-5-1, EN62024-1, ISO13849-1, EN62061, UL508

Safety Classification and Reliability Data:

Mechanical Reliability B10d
ISO13849-1
EN62061

2.5 x 10⁶ operations at 100mA load
up to PLe depending upon system architecture
up to SIL3 depending upon system architecture
8 cycles per hour / 24 hours per day / 365 days
MTTFd 356 years

Safety Data – Annual Usage

Solenoid Voltage (by part number) 24V ac/dc or 110V ac or 230V ac
Solenoid Wattage 12W
LED 2 Supply Voltage 24V dc
Utilization Category AC15 A300 3A
Thermal Current (Ith) 5A
Rated Insulation/Withstand Voltages 600VAC/2500VAC
Travel for Positive Opening 10mm
Actuator Entry Minimum Radius 175mm Standard 100 Heavy Duty
Maximum Approach/Withdrawal Speed 600mm/s
Body Material Stainless Steel 316
Enclosure Protection IP69K/IP67
Operating Temperature -25C to 55C
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

Actuator insertion (mm)

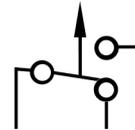
6.0 5.0 0mm

11/12	Open	
21/22	Open	
33/34		Open
43/44		Open

REQUEST BUTTON VERSION: (MOMENTARY ACTION)

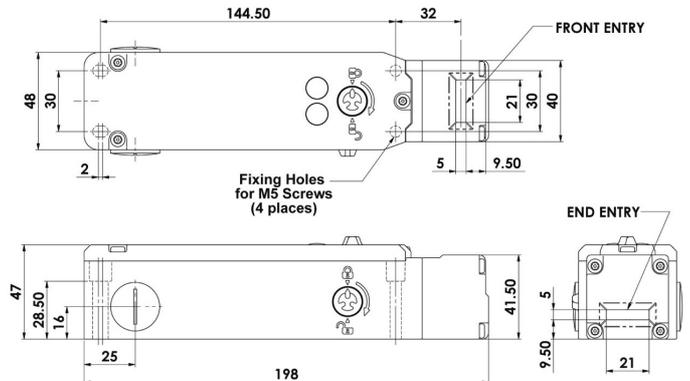
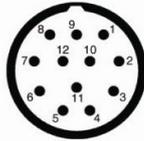
Note:

Pins 9 and 10 can be internally re-wired for use with circuit 43/44.



Wire colours (NC/NO):
Black = common
Brown = NC
Blue = NO

Quick Connect (QC) M23 12 way Male Plug (Pin view from switch)	Switch Circuit
1 3	A1 A2
4 6	11/12
7 8	21/22
2	Request button (Common) (Black wire)
5	Request button (NO) (Blue wire)
9	33
10	34
11	Request button (NC) (Brown wire)
12	Earth



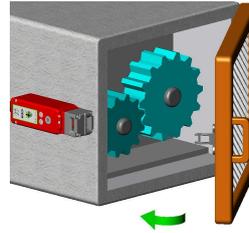
Original Instructions.

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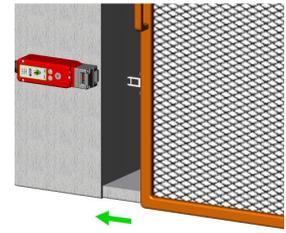


Kobra - Tongue Switches with Guard Locking - Type KL3-SS-P2L

Power to Lock Operating Instructions



Hinged Guard



Sliding Guard

Application:

Tongue operated Solenoid 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 key mechanism.

They are designed to provide robust position interlock detection for moving guards and will remain locked until the solenoid voltage is removed from the switch.

They are not suitable for machines with a running down time.

It is the responsibility of the user to ensure the correct overall functionality of its systems and machines. IDEM, its subsidiaries and affiliates, are not in a position to guarantee all of the characteristics of a given system or product not designed by IDEM.

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 will close only when power is applied to the solenoid. This will then allow the machine start circuit to be enabled. When the solenoid power is removed the safety contacts are opened and the machine circuit is broken.

Installation:

- Installation of all IDEM interlock switches must be in accordance with a risk assessment for the individual application. Installation must only be carried out by competent personnel and in accordance with these instructions.
- M5 mounting bolts must be used to fix the switch and actuator, the tightening torque to ensure reliable fixing is 4.0 Nm. Tightening torque for the lid screws, conduit entry plugs and cable glands must be 1.5 Nm to ensure IP seal. Only use the correct size gland for the conduit entry and cable outside diameter. Tightening torque for the connection terminal screws is 0.7 Nm, max conductor size is 1.0 sq.mm. The switch head position can be selected by loosening the 4 head bolts and then rotating to the position required. Tightening torque for the head bolts is 1.5Nm.
- Always fit a mechanical stop to the guard to prevent damage to the front of the switch. Set the actuator gap to 3mm when the guard is closed and against the stop. (See Fig.A). Use alignment guides to ensure that the actuator enters the switch without interfering with the sides of the switch aperture. Always fit the aperture plug to the unused entry aperture to prevent debris entering the switch mechanism.
- Always use the circuits 11-12 and 21-22 to ensure monitoring of the lock.**
- After installation check operation of all control circuits and the locking function. LED 1 will illuminate when power is applied to A1 and A2 (solenoid feed).

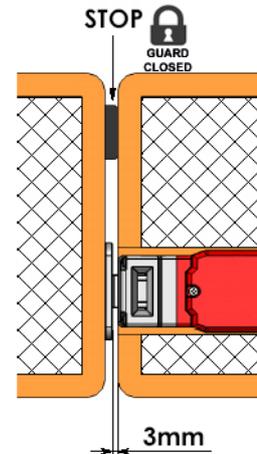
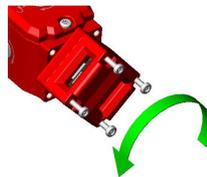


Fig. A

8 actuator entry positions
rotatable head



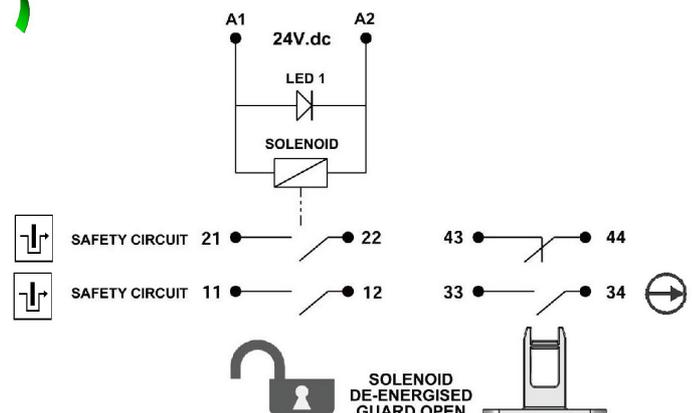
Internal Terminal Connections:

A1 0V dc
A2 24V dc

- 11-12 Safety Circuit 1 – (must always be used)
- 21-22 Safety Circuit 2
- 33-34 Signal Circuit Guard - (Closed when Guard is closed)
- 43-44 Signal Circuit Guard - (Closed when Guard is open)

LED Function:

Green Solenoid Energised



Kobra - Tongue Switches with Guard Locking - Type KL3-SS-P2L

IMPORTANT

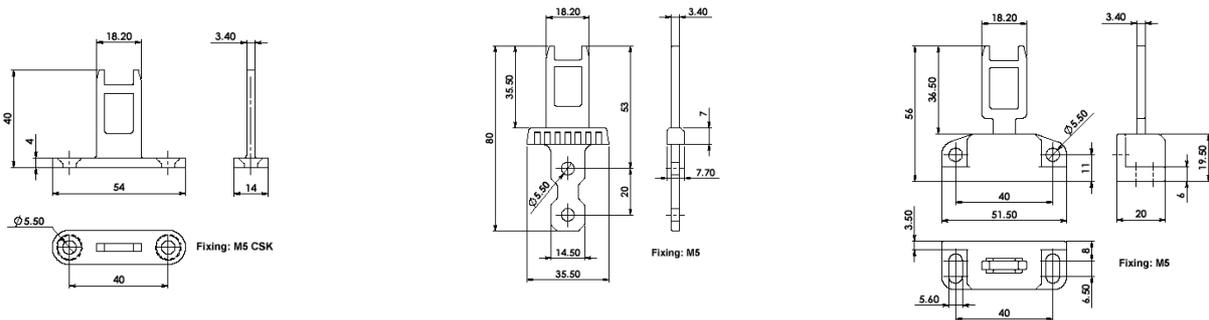
The Risk Assessment for the particular application should include the risk of spare actuators. Spare actuators should not be readily available and must be securely controlled. Application consideration must be given to the fixing of the actuator which has to be in a way that prevents disassembly by easy means.

Ensure that the switch holding force (Fzh) is sufficient to withstand the static forces applied during normal use and dynamic effects caused by bouncing of the guard shall not create an impact reaction force which exceeds the holding force. If the expected impact reaction forces are higher than the specified holding force for the switch, then design measures must be applied to avoid the force.

The safety functions and mechanics must be tested regularly. For applications where infrequent guard access is foreseeable, the system must have a manual function test to detect a possible accumulation of faults. At least once per month for PLe Cat3/4 or once per year for PLd Cat3 (ISO13849-1). Where possible it is recommended that the control system of the machine demands and monitors these tests, and stops or prevents the machine from starting if the test is not done. (See ISO14119).

Maintenance:

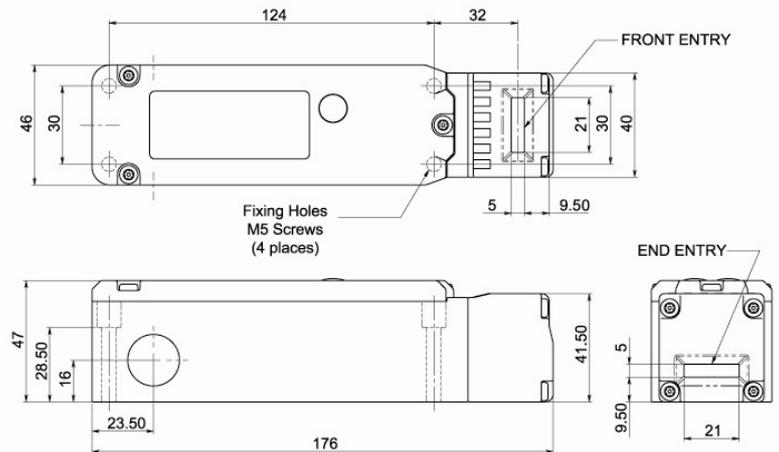
- Every Week: Check the switch actuator and body for signs of mechanical damage and wear. Replace any switch showing damage.
- Every 6 Months: Check for mechanical damage to switch body or actuator. Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress. Never attempt to repair any switch. Replace any switch displaying damage.
- These requirements form part of the product warranty.**



Actuator insertion:

11/12	Open	Solenoid energised
21/22	Open	Solenoid energised
33/34	Closed	Locked
43/44	Closed	Open Tongue Inserted

Conforming to Standard:	ISO14119, IEC60947-5-1, UL60947-5-1, ISO13849-1
Safety Classification and Reliability Data:	
Mechanical Reliability B10d	2.5 x 10 ⁶ operations at 100mA load
ISO 13849-1	up to PLe / Cat.4 depending upon system architecture
EN 62061	up to SIL3 depending upon system architecture
Safety Data - Annual Usage	8 cycles per hour / 24 hours per day / 365 days
PFHd	3.44 x 10 ⁻⁸
Proof Test Interval (Life)	35 years
MTTFd	356 years
Solenoid Voltage (by part number)	24V ac/dc (12W.)
Safety Contacts 11/12 21/22 33/34	Utilization Category AC15 A300 3A.
	Thermal Current (Ith) 5A
Overload protection fuse (fuse externally)	10A. (FF).
Auxiliary Contact 43/44	230V.ac/dc 0.5A. Maximum.
Rated Insulation Voltage	600VAC
Rated Impulse Withstand Volt	2500VAC
Travel for Positive Opening	10mm
Approach Speed	200mm/m. to 1000mm/s.
Man. Actuation Frequency	2 cycle/sec
Actuator entry minimum radius	175mm Standard 100mm Flexible
Case Material	Stainless Steel 316
Head Material	Stainless Steel 316
Actuator Material	Stainless steel 316
Enclosure Protection	IP67
Operating Temperature	-25°C to 40°C
Holding Force	F1Max: 3000N. Fzh: 2307N.
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



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
Use one polymeric conduit connection.
Not suitable for connection to rigid metal conduit.

Original Instructions.

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WARNING: DO NOT DEFEAT, TAMPER, OR BYPASS THE SAFETY FUNCTION. FAILURE TO DO SO CAN RESULT IN DEATH OR SERIOUS INJURY.

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