



**Key Interlock Switches
DIN Models**



**Key Interlock Switches
NEMA Standard Models**

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Overview	Safety device that is designed to be used with movable guards or covers which must be closed for operational safety. This switch automatically stops the machine when the guard is removed.	Safety device that is designed to be used with movable guards or covers which must be closed for operational safety. This switch automatically stops the machine when the guard is removed.
Applications	Any machine with movable guards installed to protect machine operators from injury.	Any machine with movable guards installed to protect machine operators from injury.
Product Features	<ul style="list-style-type: none"> ■ Meet UL, European and International requirements. ■ Actuating keys are designed to be difficult to defeat, reducing the possibility of tampering. ■ Removal of key positively breaks the N.C. contacts — unit is designed to fail to safe condition. ■ Cost-effective and durable plastic construction. ■ Head can be rotated in any of four positions. ■ Dual entry points for operation key — top or side. ■ Conduit entry. 	<ul style="list-style-type: none"> ■ Meet UL, CSA, European and International requirements. ■ Actuating keys are designed to be difficult to defeat, reducing the possibility of tampering. ■ Removal of key positively breaks the N.C. contacts — unit is designed to fail to safe condition. ■ Rugged cast aluminum body for use in harsh industrial environments. ■ Head can be rotated in any of four positions. ■ Conduit entry.
Contact Ratings	NEMA A600 (UL/CSA Pilot Duty)	NEMA A600 (UL/CSA Pilot Duty)
Enclosure Ratings	NEMA 4, IP65	NEMA 3, 4, 4X, 6P, 13, IP67
Construction	Synthetic Resin	Aluminum Die Cast
Approvals	UL Listed TUV CE	UL Listed CSA Certified TUV CE

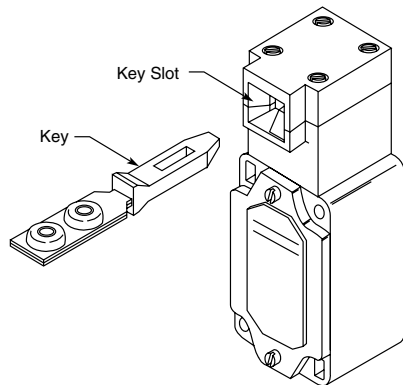
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Safety Interlock Switches

Often the need arises for a device to provide a signal indicating that a door has been closed or that a machine guard is in place before a machine can be turned on or a sequence of operations can begin.

While a standard limit switch would probably be able to do this function, the possibility exists that the unit could be false tripped or false actuated either accidentally or deliberately, thereby posing a danger to the person operating the machine.

In response to this problem, many switch manufacturers offer what is known as a key interlock switch. These switches look and operate similar to standard limit switches except for the operating heads. Instead of a rotary or plunger operating head, there is a key slot.



Actuation of the interlock switch occurs only when the corresponding key is inserted into the key slot. The key is usually mounted on a door or machine guard in such a way that when the door or guard is closed, the key fits into the slot actuating the switch. The special design of the key makes the safety interlock switch extremely difficult to defeat. When inserted into the slot, the key performs three separate mechanical functions.

In addition to being difficult to override, the safety interlock is also designed to fail to a safe mode. If, by chance, the contacts were to become welded together, removal of the key will physically tear the contacts apart, resulting in a safe condition.

Cutler-Hammer Key Interlock Switches by Eaton's electrical business are available in both NEMA and DIN style housings. NEMA Style Key Interlock Switches feature durable metal housings, which removes power to the machine when the guard is opened.

DIN Style Key Interlock Switches feature a reduced size and economical plastic housings. They remove power to the machine when the guard is opened.

Product information for these products begins on **Page 1-4**.

**Key Interlock Switches
DIN Models**

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The Cutler-Hammer® E48 DIN-Style Safety Key Interlock Limit Switch by Eaton's electrical business is designed to be used with movable guards or covers which must be closed for operational safety. The key portion of the switch is affixed to the movable door, cover or other such guard. The switch itself is mounted to a rigid portion of the machine. When the guard is opened, the key is removed from the switch, thereby *positively breaking* the normally closed contacts. This interrupts the control circuit, stopping machine operation.

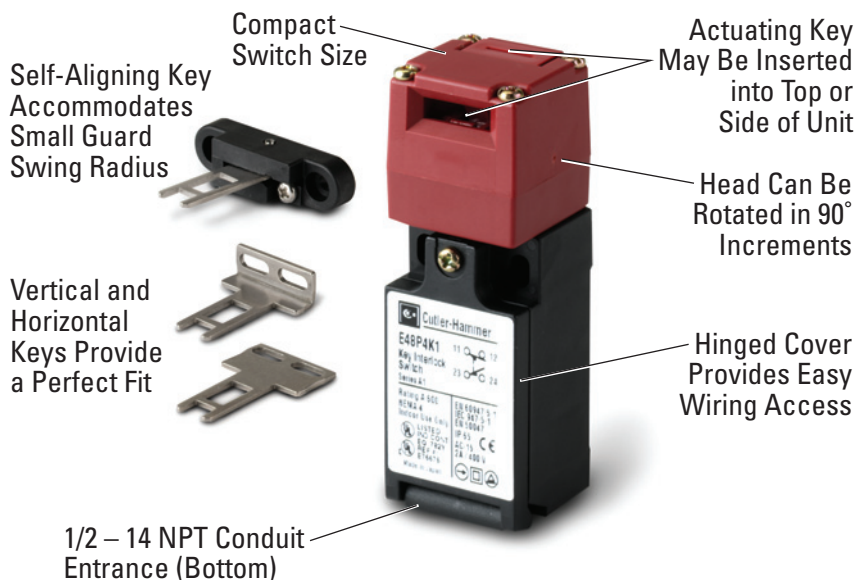
Ratings and Approvals

- UL Listed
- TUV
- IEC 947-5-1
- EN60947-5-1
- NEMA A600 (UL/CSA Pilot Duty)
- Direct Opening N.C. contacts per EN60947-5-1 ⊕
- Double insulation □



For the most current information on this product, visit our web site: www.EatonElectrical.com

Cost-Effective Protection for Operators of Moving Machinery



Product Features

- Head mechanism is designed to be difficult to defeat with common tools
- Three actuating key styles for mounting flexibility
- Choose from 1N.O.-1N.C. or 2N.C. DPDB contacts
- 1/2 – 14 NPT conduit entrance
- Four unique head mounting positions
- Dual entry points for actuating key — top or side
- Tough plastic construction

For Customer Service in the U.S. call 1-877-ETN CARE (386-2273), in Canada call 1-800-268-3578. For Application Assistance in the U.S. and Canada call 1-800-426-9184.

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Model Selection — Key Interlock Switches

Circuit	Contacts	Contact Operation	Legend	Catalog Number
			■ Closed □ Open	
1N.O.-1N.C. DPDB slow action				E48P4K1
2N.C. DPDB slow action				E48P4K0

NOTE: N.O. and N.C. contacts are defined with the key fully engaged in the switch.

■ Stocked product, typical order quantities guaranteed in stock.

Model Selection — Actuating Keys (must be ordered separately)

	Minimum Key Insertion Radius	Catalog Number
Adjustable (Self-Aligning)	7.8 inches (200 mm)	E48KL07
Vertical	7.8 inches (200 mm)	E48KL08
Horizontal	7.8 inches (200 mm)	E48KL09

■ Stocked product, typical order quantities guaranteed in stock.

Specifications

Description	Specification
Ambient Temperature	Operation and Storage: -22° to 158°F (-30° to 70°C) minimum temperature is based upon absence of freezing water or moisture
Enclosure Ratings	NEMA 4, IP65 conforming to IEC 529. Care must be taken that contaminants do not enter the actuating key area as this may prevent the switch from performing to specifications
Ambient Humidity	95% maximum, non-condensing
Weight	76 grams (0.17 lb)
Housing Material	Synthetic resin
Vibration Resistance	10G in both vertical and horizontal axis (from 10 to 500 Hz) conforming to IEC 68-2-27
Shock Resistance	30G in both vertical and horizontal axis conforming to IEC 68-2-27
Mechanical Life	1 million operations minimum
Electrical Life	150,000 operations minimum
Short Circuit Protection	Recommended: 10A fuse (type gl or gG) (IEC 269)
Rated Insulation Voltage	400V (EN 60947-5-1)
Electric Shock Protection	Insulation Class II (IEC 536)
Operating Force (extraction)	14.7 N (3.30 lbf)
Release Force (insertion)	29.4 N (6.60 lbf)
Total Travel	1.10 inch minimum (28 mm)
Pretravel	0.24 ± 0.10 inches minimum (6 ± 3 mm)
Direct Opening Force	58.8 N (13.2 lbf) minimum
Operating Speed	0.04 to 20 inches/second (1 to 500 mm/second)
Operating Frequency	30 operations/minute maximum

Rated Voltage	Current			Maximum VA	
	Thermal Continuous	Make	Break	Make	Break
120V AC	10A	60A	6.0A	7200 VA	720 VA
240V AC	10A	30A	3.0A	7200 VA	720 VA
480V AC	10A	15A	1.5A	7200 VA	720 VA
600V AC	10A	12A	1.2A	7200 VA	720 VA

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NEMA Standard Models****Contents**

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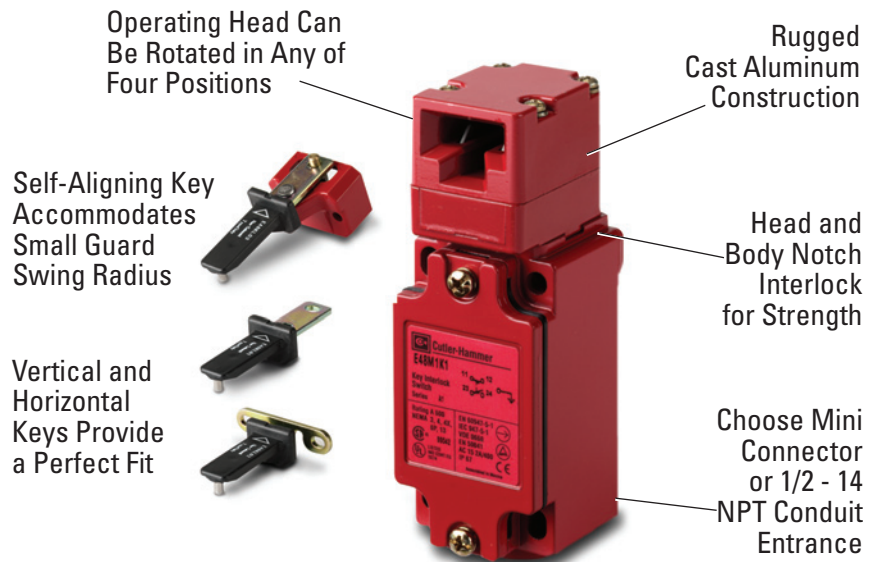
The Cutler-Hammer® E48 Safety Key Interlock Limit Switch by Eaton's electrical business is designed to be used with movable guards or covers which must be closed for operational safety. The key portion of the switch is affixed to the movable door, cover or other such guard. The switch itself is mounted to a rigid portion of the machine. When the guard is opened, the key is removed from the switch, thereby *positively breaking* the normally closed contacts. This interrupts the control circuit, stopping machine operation.

Ratings and Approvals

- UL Listed
- CSA Certified
- TUV
- IEC 947-5-1
- EN60947-5-1
- NEMA A600 (UL/CSA Pilot Duty)
- Direct Opening N.C. contacts per EN60947-5-1 →




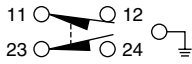
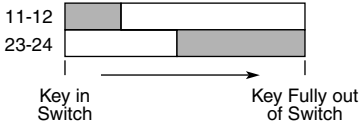
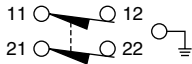
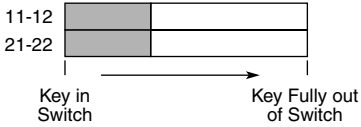
For the most current information on this product, visit our web site: www.EatonElectrical.com

**Heavy-Duty Safety Interlock Switch
for Reliable Machine Operator Protection****Product Features**


- Three simultaneous mechanical actions occur when the key is inserted into the operating head to make it difficult to defeat with common tools
- Rugged cast aluminum body stands up to harsh industrial environments
- Three actuating key styles for mounting flexibility including a self-aligning version
- Choose from 1N.O.-1N.C. or 2N.C. DPDB contacts
- Operating head and switch body interlock for strength and a sure fit
- Four unique head mounting positions
- 1/2 – 14 NPT conduit entrance
- All models meet UL, CSA, European and International requirements

For Customer Service in the U.S. call **1-877-ETN CARE (386-2273)**,
in Canada call **1-800-268-3578**.
For Application Assistance in the U.S. and Canada
call **1-800-426-9184**.




Model Selection — Key Interlock Switches

Circuit ①	Contacts	Contact Operation 	Wiring Type (Connectors Only)	Catalog Number
				1/2 – 14 NPT Conduit Entrance
1N.O.-1N.C. DPDB slow action			Normal	E48M1K1
2N.C. DPDB slow action			Normal	E48M1K0

① N.O. and N.C. contacts are defined with the key fully engaged in the switch.

 Stocked product, typical order quantities guaranteed in stock.

Model Selection — Actuating Keys (must be ordered separately)

	Minimum Key Insertion Radius	Catalog Number
Horizontal 	47 inches (1200 mm)	E48KL01
Vertical 	47 inches (1200 mm)	E48KL02
Adjustable 	5.9 inches (150 mm)	E48KL03

 Stocked product, typical order quantities guaranteed in stock.

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Specifications

Description	Specification
Ambient Temperature	Operation: -40° to 176°F (-40° to 80°C) minimum temperature is based upon absence of freezing water or moisture
Enclosure Ratings	NEMA Type 3, 4, 4X, 6P, 13. IP67 conforming to IEC 529 NOTE: Care must be taken that contaminants do not enter the actuating key area as this may prevent the switch from performing to specifications.
Ambient Humidity	95% maximum, non-condensing
Housing Material	Die-cast aluminum
Vibration Resistance	10G in both vertical and horizontal axis (from 10 to 500 Hz) conforming to IEC 68-2-27
Shock Resistance	30G in both vertical and horizontal axis conforming to IEC 68-2-27
Mechanical Life	1 million operations minimum
Electrical Life	500,000 operations minimum (10A, 250V AC resistive load)
Short Circuit Protection	Recommended: 10A fuse (type gl) (IEC 269)
Rated Insulation Voltage	600V AC (IEC 946-5-1)
Electric Shock Protection	Insulation Class I (IEC 536)
Operating Force (extraction)	4.4 ft-lb minimum (19.6 N)
Release Force (insertion)	4.41 ft-lb minimum (19.6 N)
Total Travel	0.91 inch minimum (23 mm)
Pretravel	0.39 ± 0.20 inches minimum (10 ± 5 mm)
Direct Opening Force	4.41 ft-lb minimum for safe operation (19.6 N)
Operating Speed	0.1 mm/s to 0.5 m/s
Operating Frequency	30 operations/minute maximum

Rated Voltage	Current			Maximum VA	
	Thermal Continuous	Make	Break	Make	Break
120V AC	10A	60A	6.0A	7200 VA	720 VA
240V AC	10A	30A	3.0A	7200 VA	720 VA
480V AC	10A	15A	1.5A	7200 VA	720 VA
600V AC	10A	12A	1.2A	7200 VA	720 VA