Edwards Signaling & Security Systems®

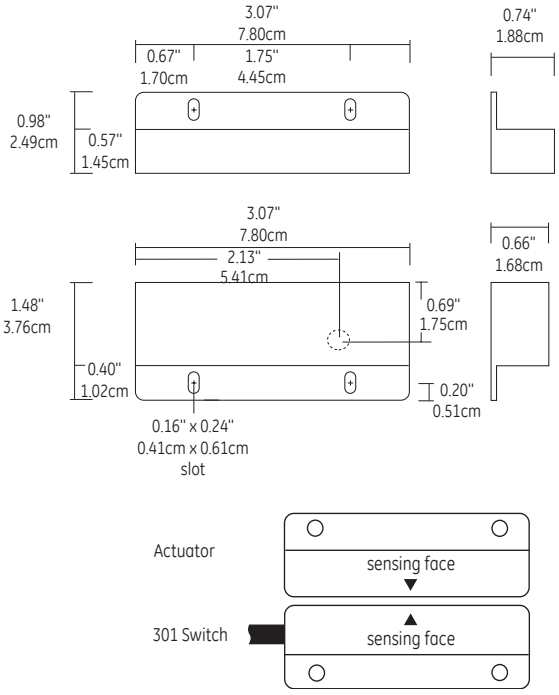
Alert. Warn. Communicate. Protect.

Industrial Contacts

Safety Switch
301-BT GuardSwitch

Applications

Requiring Highly Defeat Resistant Switches



General Specifications

Enclosure	Folded 304 Stainless Steel
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 4, 4X, 5, 12, 12K
Protection Class	IP 66
Response Time (individual circuits)	1 msec The two circuits do not switch simultaneously and depend on the speed of the guard closure. A delay less than 50 msec is typical.
Life Cycles	100,000 Under Full Load;Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	18/4 SJTOW (K) / 0.34" (0.86cm) 22/4 PVC Jacketed (J) / 0.19" (0.48cm) 22/6 PVC Jacketed (J) / 0.21" (0.53cm)
UL/CSA	All Models

c UL us — File E 122942

CSA — LR89176

Electrical Specifications (Applies to all models)

Circuit	Circuit	Contact	Load	MAX Switching	MAX Switching
1	Switch	N.O.	40W/VA	48VAC/VDC	1.0ADC, 0.7AC
2	Tamper	N.C.	10W/VA	48VAC/VDC	0.3A
2	w/optional LED	N.C.	0.1–1.4W	48VDC(3V drop)	30mA
3	Monitor	N.O.	10W/VA	48VAC/VDC	0.3ADC, 0.3AC

Order Information

Part Number	Contact[2] Configuration	Sense Range[3] Minimum	Sense Range[3] Maximum	Break Range	Lead Length
301-BT-12J	DPST:1 N.O., 1 N.C.	0.3"(0.8cm)	0.6"(1.5cm)	1.2"(3.0cm)	12' (3.6m)
301-BT-12K	DPST: 1 N.O., 1 N.C.	0.3"(0.8cm)	0.6"(1.5cm)	1.2"(3.0cm)	12' (3.6m)
301-BLT-12K	DPST: 1 N.O., 1 N.C. w/ LED	0.3"(0.8cm)	0.6"(1.5cm)	1.2"(3.0cm)	12' (3.6m)
301-B3T-20J	TPST:2 N.O., 1 N.C.	0.3"(0.8cm)	0.6"(1.5cm)	1.2"(3.0cm)	12'(3.6m)
301-B3LT-12J	TPST:2N.O., 1 N.C. w/LED	0.3"(0.8cm)	0.6"(1.5cm)	1.2"(3.0cm)	12'(3.6m)

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

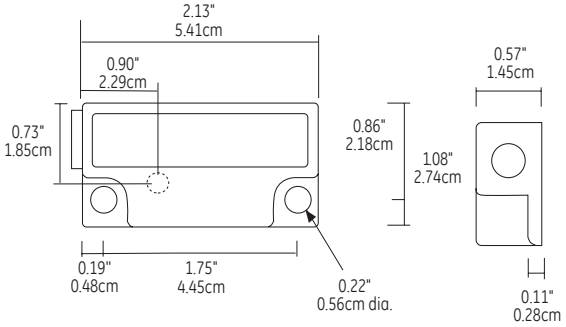
[2] Configuration with actuator away from the switch

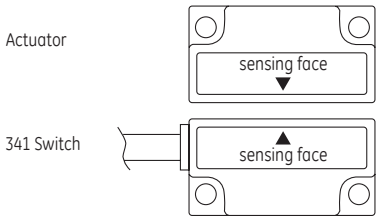
[3] Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

Safety Switch
341-BT GuardSwitch

Applications

Requiring Highly Defeat Resistant Switches





General Specifications

Enclosure	Kynar® Polyvinylidene Flouride with sonic welded lid
Temperature Range	14°F to 150°F (-10°C to 65°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 4, 4X, 5, 12, 12K, 13
Protection Class	IP 67
Response Time (individual circuits)	1 msec The two circuits do not switch simultaneously and depend on the speed of the guard closure. A delay less than 50 msec is typical.
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	18/4 SJTOW (K) / 0.34" (0.86cm) 22/4 PVC Jacketed (J) / 0.19" (0.48cm) 22/6 PVC Jacketed (J) / 0.21" (0.53cm)
UL/CSA	All Models

c UL us File E 122942 LR89176

341-BT-12(J)OR

Electrical Specifications (Applies to all models)

Circuit No.	Circuit Type	Contact Configuration	Load Rating	MAX Switching Voltage	MAX Switching Current
1	Switch	N.O.	10W/VA	48VAC/VDC	0.2A
2	Tamper	N.C.	10W/VA	48VAC/VDC	0.2A
2	w/optional LED	N.C.	0.1–1.4W	48VDC(3V drop)	30mA
3	Monitor	N.O.	10W/VA	48VAC/VDC	0.2A

Order Information

Part Number	Contact[1] Configuration	Sense Range[2] Minimum	Sense Range[2] Maximum	Break[2] Range	Lead Length
341-BT-12J	DPST:1 N.O., 1 N.C.	0.12"(0.3cm)	0.38"(1.0cm)	0.75"(1.9cm)	12' (3.6m)
341-BT-12K	DPST:1 N.O., 1 N.C.	0.12"(0.3cm)	0.38"(1.0cm)	0.75"(1.9cm)	12' (3.6m)
341-BLT-12K	DPST: 1 N.O., 1 N.C. w/ LED	0.12"(0.3cm)	0.38"(1.0cm)	0.75"(1.9cm)	12' (3.6m)
341-B3T-12J	TPST: 2 N.O., 1 N.C.	0.12"(0.3cm)	0.38"(1.0cm)	0.75"(1.9cm)	12' (3.6m)
341-B3LT-12J	TPST: 2 N.O., 1 N.C. w/LED	0.12"(0.3cm)	0.38"(1.0cm)	0.75"(1.9cm)	12' (3.6m)

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

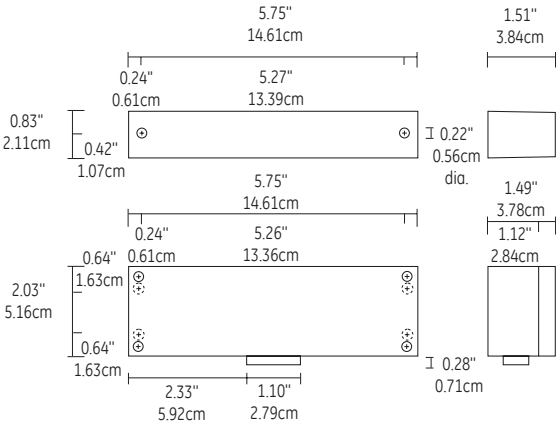
1 Configuration with actuator away from the switch

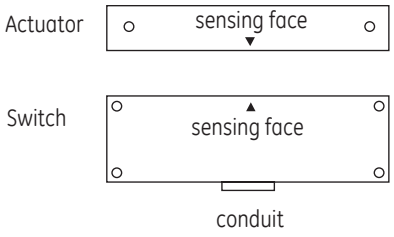
2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

Safety Switch
371-BT GuardSwitch Explosion Proof

Applications

- Requiring Explosion-Proof Enclosure for Hazardous Locations
- UL Enclosure Classified for Use in Hazardous Locations:
  Class I, Group B, C, D
  Class II, Group E, F, G
  Class III, Divisions 1 & 2





General Specifications

Enclosure	UL Explosion Proof Black Anodized, Die Cast Aluminum
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 5
Protection Class	IP 64
Response Time (individual circuits)	1 msec The two circuits do not switch simultaneously and depend on the speed of the guard closure. A delay less than 50 msec is typical.
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Conduit Connection	1/2" Threaded NPT
UL/CSA	All Models

File E 122942 LR89176

Electrical Specifications

Circuit No.	Circuit Type	Contact Configuration	Load Rating	MAX Switching Voltage	MAX Switching Current
1	Switch	N.O.	40W/VA	48VAC/VDC	1.0ADC, 0.7AC
2	Tamper	N.C.	10W/VA	48VAC/VDC	0.3A

Order Information

Part Number	Contact[1] Configuration	Sense Range[2] Minimum	Sense Range[2] Maximum	Break Range	Terminal Type
371-BT	DPST: 1 N.O., 1 N.C.	0.3"(0.8cm)	0.6"(1.5cm)	1.2"(3.0cm)	#6 screws

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

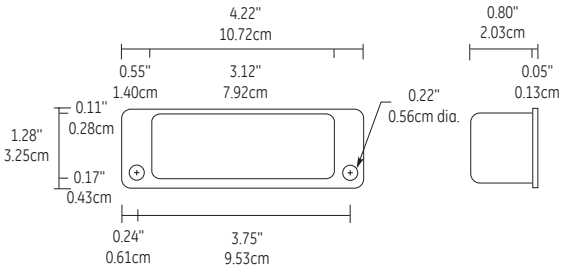
[1] Configuration with actuator away from the switch

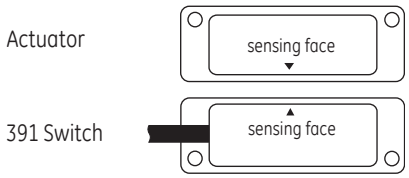
[2] Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

Safety Switch
391-BT GuardSwitch

Applications

Withstands Corrosive and
Extreme Washdown
Environments





General Specifications

Enclosure	Seamless 304 Stainless Steel
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 4, 4X, 5, 12, 12K
Protection Class	IP 67
Response Time (individual circuits)	1 msec The two circuits do not switch simultaneously and depend on the speed of the guard closure. A delay less than 50 msec is typical.
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	18/4 SJTOW (K) / 0.34" (0.86cm) 22/4 PVC Jacketed (J) / 0.19" (0.48cm)
UL/CSA	All Models

File E 122942 LR89176

Electrical Specifications

Circuit No.	Circuit Type	Contact Config.	Load Rating	MAX Switching Voltage	MAX Switching Current
1	Switch	N.O.	40W/VA	48VAC/VDC	1.0ADC, 0.7AC
2	Tamper	N.C.	10W/VA	48VAC/VDC	0.3A
2	w/optional LED	N.C.	0.1–1.4W	48VDC(3V drop)	30mA

Order Information

Part Number	Contact[1] Configuration	Sense Range[2] Minimum	Sense Range[2] Maximum	Break Range	Lead Length
391-BT-12K	DPST:1 N.O., 1 N.C.	0.3"(0.8 cm)	0.6"(1.5cm)	1.2"(3.0cm)	12' (3.6m)
391-BLT-12J	DPST: 1 N.O., 1 N.C. w/ LED	0.3"(0.8cm)	0.6"(1.5cm)	1.2"(3.0cm)	12' (3.6m)

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

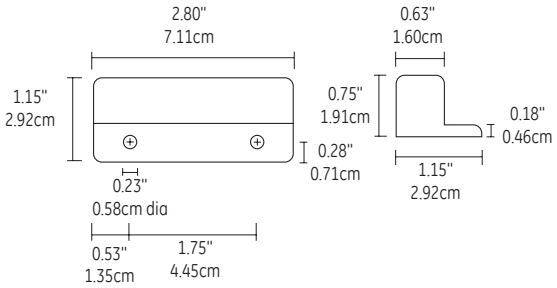
2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

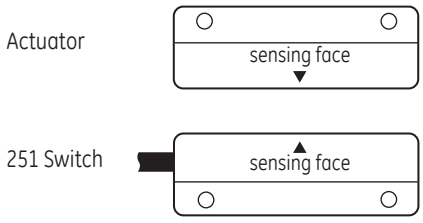
Patented Non-Contact Safety Interlock Switch

251 F7 GuardSwitch

Applications

- Requiring a "Fail-Safe" Switch
- Waste Compactors
- Mixers, Blenders and Dryers
- Packaging Machinery
- Food Products Machinery





General Specifications

Enclosure	Polyurethane Enamel-Coated Aluminum
Temperature Range	-40°F to 150°F (-40°C to 65°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 3, 4, 4X, 5, 6, 12, 12K
Protection Class	IP 67
Response Time	5 msec
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	SJTOW-A (K) 18/3 AWG / 0.33" (0.84cm)
UL/CSA	All Models

Note: The F7 model has a patented "watch-dog" circuit which, when switch failure occurs, the fused watch-dog circuit will draw 4.0 Amps. The voltage supply must have a current capacity of 4.0 Amps. This results in an open, fail-safe condition.

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File E 122942

LR89176

Order Information	Electrical Specifications								
Part Number	Contact[1] Configuration	Load Rating (AC/DC)	Voltage Range (AC/DC)	Switch Current Max. (AC/DC)	Contact Resistance	Sense Range[2] Nominal	Break Range Nominal	Break at Failure Max.	Lead Length
251-F7Z-12K	N.O.	100VA	100-120V AC	0.83A	0.5 Ohms	1.0" (2.5cm)	1.8" (4.5cm)	2.7" (6.8cm)	12' (3.6m)
150-Z	Actuator Only								

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

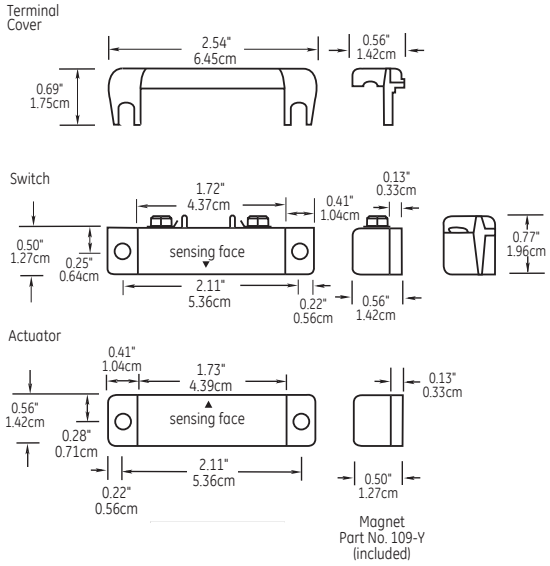
Non-Contact Interlock/Position Switch
109 GuardSwitch

Applications

- Economical Position Sensing
- Terminal Requirement
- Non-Wash Down Environments

General Specifications

Enclosure	ABS Plastic
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1
Protection Class	IP 62
Response Time	1 msec
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Connection	Screw Terminals
UL/CUL	All Models



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File E 122942

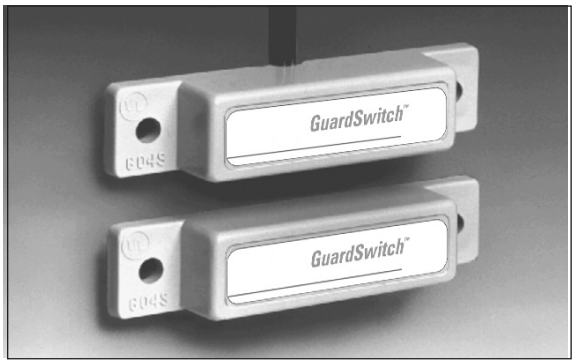
Order Information	Electrical Specifications										
Part Number	Contact[1] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Sense Range[2] Nominal	Break Range Nominal	Terminal Type
109-3Y	N.C.	100VA	84W	120V (@0.8A)	28V (@3.0A)	3.0A (@34V)[3]	3.0A (@28V)[3]	1.0 Ohms	0.5" (1.3cm)	1.2" (3.0cm)	#6 screw
109-6Y	N.O.	25VA	25W	120V (@0.2A)	120V(@0.2A)	1.0A (@25V)	1.0A (@25V)	0.2 Ohms	1.0" (2.5cm)	2.0" (5.0cm)	#6 screw
109-7Y	N.O.	100VA	84W	120V (@0.8A)	28V (@3.0A)	3.0A (@34V)[3]	3.0A (@28V)[3]	1.0 Ohms	0.5" (1.3cm)	1.2" (3.0cm)	#6 screw
109-Y	Actuator Only										

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

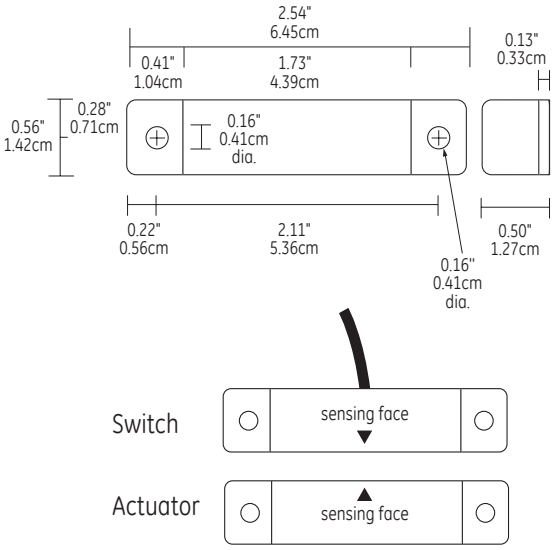
3 Rated at 3.0A for 6,000 cycles only. Other ratings are at 100,000 cycles.



Non-Contact Interlock/Position Switch
111 GuardSwitch

Applications

- Gaming Industry
  - Drop Doors
  - Player Tracking
  - Bill Validators
  - Access Doors
- Farm Equipment
- Emergency Vehicles
- Position Sensing



General Specifications

Enclosure	ABS Plastic
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 3, 4, 4x, 5, 6, 12
Protection Class	IP 67
Response Time	1 msec
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	18/2 (J) / 0.24" (0.62cm)
UL/CSA	All Models

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CSA — LR8917 S

Order Information	Electrical Specifications										
Part Number	Contact[1] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Sense Range[2] Nominal	Break Range Nominal	Lead Length
111-6Y-06J	N.O.	25VA	25W	120V (@0.2A)	120V (@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	1.0" (2.5cm)	2.0" (5.1cm)	6' (1.8m)
111-6Y-12J	N.O.	25VA	25W	120V (@0.2A)	120V (@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	1.0" (2.5cm)	2.0" (5.1cm)	12' (3.6m)
111-7Y-12J	N.O.	100VA	84W	120V (@0.8A)	28V (@3.0A)	3.0A (@34V)[3]	3.0A (@28V)[3]	1.0 Ohms	0.7" (1.8cm)	1.2" (3.0cm)	12' (3.6m)
111-Y	Actuator Only										

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

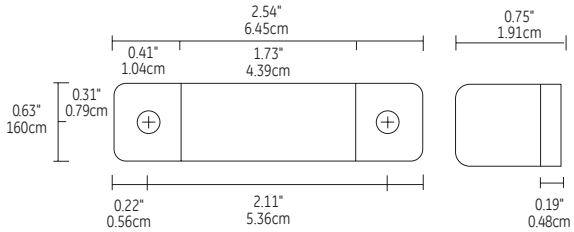
2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

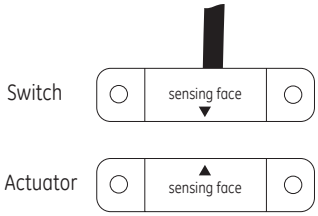
3 Rated at 3.0A for 6,000 cycles only. Other ratings are at 100,000 cycles.

Non-Contact Interlock/Position Switch
115 GuardSwitch

Applications

- Packaging Industry
- Farm Equipment
- Waste Compactors
- Emergency Vehicles
- Position Sensing





General Specifications

Enclosure	Nylon 6/6
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 3, 4, 4X, 5, 6, 12, 12K
Protection Class	IP 67
Response Time	1msec; 10 msec (150VA)
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	18/2 SJTOW (K) / 0.30" (0.76cm) 18/3 SJTOW (K) / 0.33" (0.84cm) 18/4 SJTOW (K) / 0.34" (0.86cm)
UL/CSA	All Models

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CSA — LR8917 S

Order Information	Electrical Specifications										
Part Number	Contact[1] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Sense Range[2] Nominal	Break Range Nominal	Lead Length
115-3Y-12K	N.C.	100VA	84W	120V(@0.8A)	28V(@3.0A)	3.0A (@34V)[3]	3.0A (@28V)[3]	1.0 Ohms	0.7" (1.8cm)	1.2" (3.0cm)	12'(3.6m)
115-4Y-12K	SPDT	100VA	84W	120V(@0.8A)	28V(@3.0A)	3.0A (@34V)[3]	3.0A (@28V)[3]	1.0 Ohms	0.7" (1.8cm)	1.2" (3.0cm)	12'(3.6m)
115-6Y-06K	N.O.	25VA	25W	120V(@0.2A)	120V(@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	1.0" (2.5cm)	2.0" (5.1cm)	6'(1.8m)
115-6Y-12K	N.O.	25VA	25W	120V(@0.2A)	120V(@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	1.0" (2.5cm)	2.0" (5.1cm)	12'(3.6m)
115-7Y-06K	N.O.	100VA	84W	120V(@0.8A)	28V(@3.0A)	3.0A (@34V)[3]	3.0A (@28V)[3]	1.0 Ohms	0.7" (1.8cm)	1.2" (3.0cm)	6'(1.8m)
115-7Y-12K	N.O.	100VA	84W	120V(@0.8A)	28V(@3.0A)	3.0A (@34V)[3]	3.0A (@28V)[3]	1.0 Ohms	0.7" (1.8cm)	1.2" (3.0cm)	12'(3.6m)
115-8Y-06K	N.O.	150VA	NA	120V(@1.25A)	NA	1.25A(@120V)[4]	NA	NA	1.0" (2.5cm)	1.5" (3.8cm)	6'(1.8m)
115-8Y-12K	N.O.	150VA	NA	120V(@1.25A)	NA	1.25A(@120V)[4]	NA	NA	1.0" (2.5cm)	1.5" (3.8cm)	12'(3.6m)
115-8Y-12K-SER25[5]	N.O.	150VA	NA	120V(@1.25A)	NA	1.25A(@120V)[4]	NA	NA	1.0" (2.5cm)	1.5" (3.8cm)	12'(3.6m)
115-6Y-06K-D6	2 N.O.	25VA	25W	120V(@0.2A)	100V(@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	1.0" (2.5cm)	2.0" (5.1cm)	6'(1.8m)
115-6Y-12K-D6	2 N.O.	25VA	25W	120V(@0.2A)	100V(@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	1.0" (2.5cm)	2.0" (5.1cm)	12'(3.6m)
115-Y	Actuator Only										

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

3 Rated at 3.0A for 6,000 cycles only. Other ratings are at 100,000 cycles.

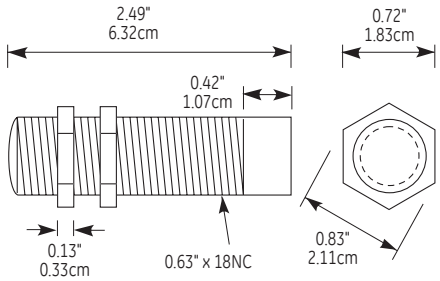
4 Can withstand inrush surge up to 4 amps. Voltage Drop 1.5V, minimum switch current of 30mA.

5 SER25 — Maximum 25 switches in series, triac output.

Non-Contact Interlock/Position Switch
125 GuardSwitch

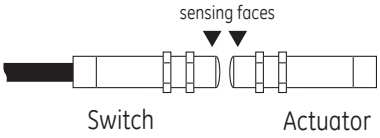
Applications

- Food Processing
- Textile Machines
- Elevator Lifts
- Position Sensing
- Proximity Switches



General Specifications

Enclosure	Nickel-plated Aluminum
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 3, 4, 4x, 5, 6, 12
Protection Class	IP 67
Response Time	1 msec; (150VA)
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	18/2 SJTOW (K) / 0.30" (0.76cm)
UL/CSA	All Models



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File E 122942

Order Information	Electrical Specifications									
Part Number	Contact[1] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Sense Range[2] Nominal	Break Range Nominal	Lead Length
125-7Y-06K	N.O.	100VA	84W	120V(@0.8A)	28V(@3.0A)	3.0A(@34V)[3]	3.0A(@28V)[3]	1.0 Ohms	0.5" (1.3cm)	0.9" (2.3cm)	6'(1.8m)
125-Y	Actuator Only										

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

3 Rated at 3.0A for 6,000 cycles only. Other ratings are at 100,000 cycles.

4 Can withstand inrush surge up to 4 amps. Voltage Drop 1.5V, minimum switch current of 30mA.

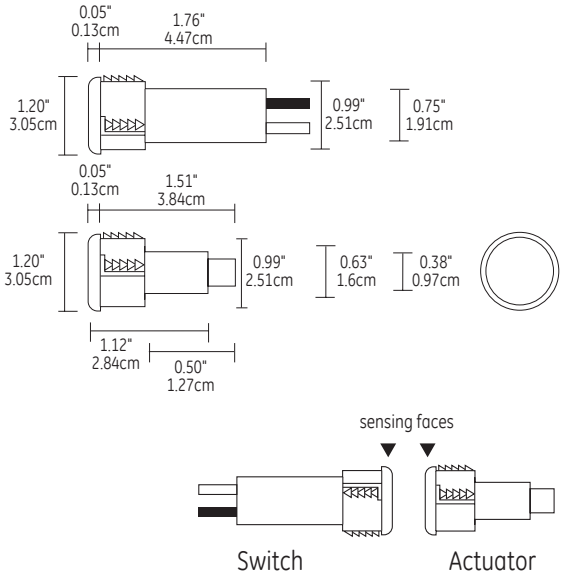
Magnetic Door Position Switch
126 GuardSwitch

Applications

- Closet Door Switch
- Environmental Controls

General Specifications

Enclosure	ABS Plastic with Protective Nylon
Switch Sleeve	
Temperature Range	-40°F to 180°F (-40°C to 80°C)
NEMA Rating	1, 2, 3, 4, 4x, 5, 6, 12
Protection Class	IP 67
Response Time	10 msec
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	12 AWG (AX) / 0.13" (0.33cm) Flex Conduit (X) / 0.58" (1.5cm)
UL/CSA	All Models



File E 122942

New York
Calendar # 40018

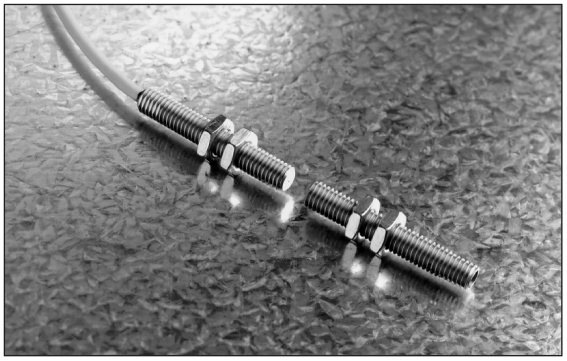
Order Information	Electrical Specifications		AC ONLY					
Part Number	Contact[1] Config.	Load Rating (AC)	Switching Voltage Maximum (AC)	Switching Current[3] Maximum (AC)	Voltage Drop	Sense Range[2] Nominal	Break Range Nominal	Lead Length
126-EY-01AX	N.C.	150VA	120V AC	1.25A	1.5V	1.0" (2.5cm)	1.5" (3.8cm)	1' (0.3m)
126-EY-06X	N.C.	150VA	120V AC	1.25A	1.5V	1.0" (2.5cm)	1.5" (3.8cm)	6' (1.8m)

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

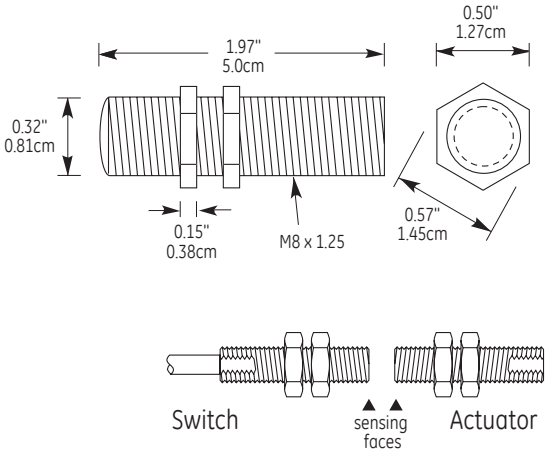
3 Can withstand inrush surge up to 4 amps. Voltage Drop 1.5V, minimum switch current of 30mA.



Non-Contact Interlock/Position Switch
128C GuardSwitch

Applications

- Semi-conductor Equipment
- Packaging Machinery
- Farm Implement
- Conveyers
- Position Sensing
- Economical Proximity Switch Replacement



General Specifications

Enclosure	Stainless Steel Threaded Barrel with 2 Jam Nuts
Dimensions	M8 dia. x 1.25 Thread x 50mm Long
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 3, 4X, 5, 6, 12, 12K
Protection Class	IP 67
Response Time	1 msec
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	22/2 Jacketed / 0.24" (0.62cm)
UL/CSA	All Models

c UL us File E 122942 LR89176

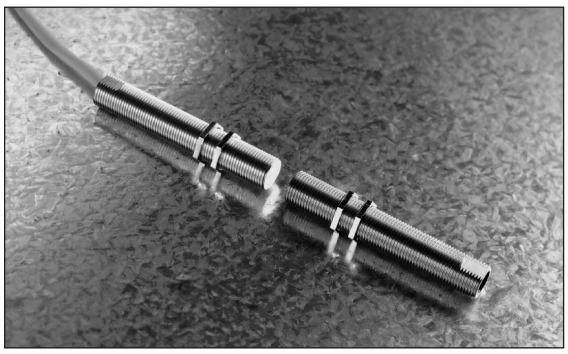
Order Information	Electrical Specifications				ACTUATOR SOLD SEPARATELY			
Part Number	Contact[1] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Lead Length
128C-6N-06J	N.O.	25VA	25W	120V(@0.2A)	120V(@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	6'(1.8m)
128C-6N-12J	N.O.	25VA	25W	120V(@0.2A)	120V(@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	12'(3.6m)

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

[1] Configuration with actuator away from the switch

Sense range[2]			
Actuator Options	Make, Min.	Break, Max.	Actuator Description
128C-U	0.15	1.00	Alnico Magnet in M8x1.25x50 stainless steel threaded barrel w/2 jam nuts
129-X	0.35	1.35	Alnico Magnet in M12x1x70 stainless steel threaded barrel w/2 panel nuts
1057	0.85	2.15	Bare Alnico Magnet 3/8" dia. x 1-1/2" long
1830	0.15	0.65	Rare Earth 0.375" dia. x 0.12" thick w/#4 countersink hole
IND1835	0.40	1.00	Rare Earth 0.6" dia. x 0.12" thick w/#4 countersink hole

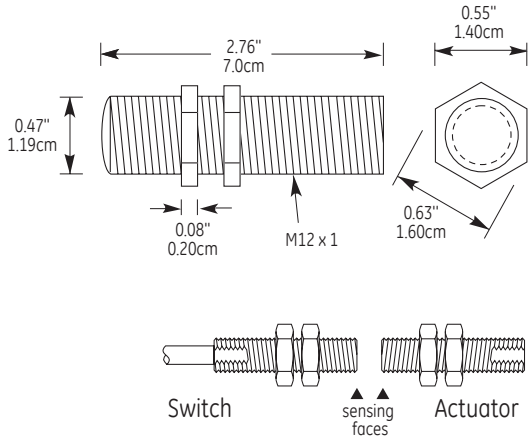
[2] Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.



Non-Contact Interlock/Position Switch
129 GuardSwitch

Applications

- Position Sensing
- Semi-conductor Equipment
- Economical Proximity Switch Replacement
- Packaging Machinery
- Farm Implement
- Conveyers



File E 122942

LR89176

General Specifications

Enclosure	Stainless Steel Threaded Barrel Panel Nuts
Dimensions	M12 dia. x 1 Thread x 70mm Long
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 3, 4X, 5, 6, 12, 12K
Protection Class	IP 67
Response Time	1 msec
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	22/2 Jacketed (J) / 0.24" (0.62cm) 22/4 Jacketed (J) / 0.19" (0.48cm)
UL/CSA	All Models

Order Information	Electrical Specifications					ACTUATOR SOLD SEPARATELY			
Part Number	Contact[1] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Lead Length
129-6N-12J	N.O.[2]	25VA	25W	120V(@0.2A)	120V(@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	12'(3.6m)
129-6N-12J-D6	N.O.[2]	25VA	25W	120V(@0.2A)	120V(@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	12'(3.6m)
129-6N-12J-DG	N.O.[2]	25VA	25W	120V(@0.2A)	120V(@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	12'(3.6m)

[1] Configuration with actuator away from the switch [2] D6=DPST: 2 N.O., DG=DPST: 1 N.O., 1 N.C. 15VA [3] Rated at 3.0A for 6,000 cycles only. Other ratings are at 100,000 cycles

Sense range[4]					
Actuator Options	129-6 -DG Make, Min.	129-6 -DG Break, Max.	129-6 -D6 Make, Min.	129-6 -D6 Break, Max.	Actuator Description
128C-U	0.25	0.80	0.15	1.00	Alnico Magnet in M8x1.25x50 stainless steel threaded barrel w/2 jam nuts
129-X	0.45	1.10	0.35	1.35	Alnico Magnet in M12x1x70 stainless steel threaded barrel w/2 panel nuts
1057	0.90	1.75	0.85	2.15	Bare Alnico Magnet 3/8" dia. x 1-1/2" long
1830	0.25	0.55	0.15	0.65	Rare Earth 0.375" dia. x 0.12" thick w/#4 countersink hole
IND1835	0.50	0.85	0.40	1.00	Rare Earth 0.6" dia. x 0.12" thick w/#4 countersink hole

[4] Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

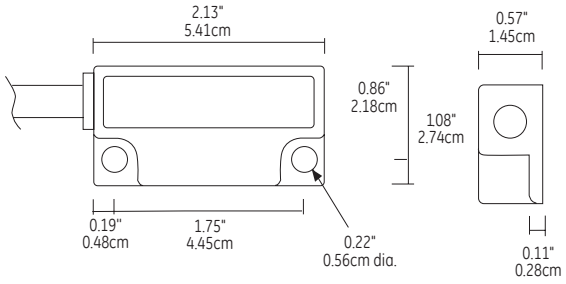
Non-Contact Interlock/Position Switch
141 GuardSwitch

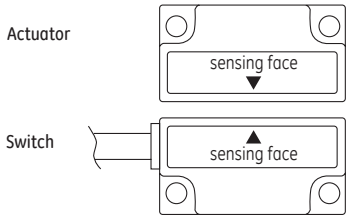
Applications

- Commercial Dishwashing Machine
- Parts Cleaning Machines
- Chemical Environments

General Specifications

Enclosure	Kynar® Polyvinylidene Flouride with sonic welded lid
Temperature Range	14°F to 150°F (-10°C to 65°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 3, 4, 4X, 5, 6, 12, 13
Protection Class	IP 67
Response Time	10 msec
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	18/2 SJTO / 0.29" (0.74cm)
UL/CSA	All Models





File E 122942

File LR 89176

Order Information	Electrical Specifications						
Part Number	Contact[1] Config.	Load Rating Max.(AC/DC)	Switching Voltage Max.(AC/DC)	Switching Current Max.(AC/DC)	Sense Range[2] Nominal	Break Range Nominal	Lead Length
141-8Y-06M	N.O.	150VA/NA	120V(@1.25A)/NA	1.25A[4]/NA	1"(2.5cm)	1.2"(3cm)	6'(1.8m)
141-Y	Actuator Only						

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

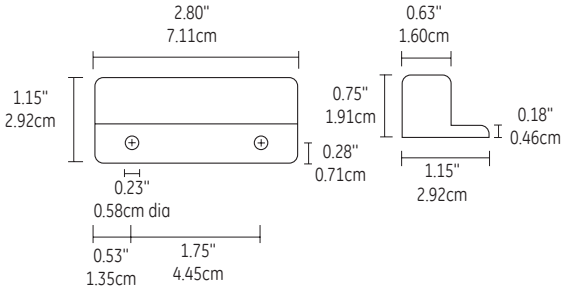
2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

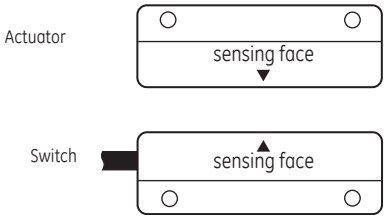
3 Can withstand inrush surge up to 4 amps, voltage drop 1.5V, minimum switch current of 30 mA, triac output.

Non-Contact Interlock/Position Switch
151 & 153 GuardSwitch

Applications

- Packaging Machines
- Food Processing Machines
- Waste Compactors
- Mixers, Blenders, and Dryers





General Specifications

Enclosure	Polyurethane Enamel-Coated Aluminum
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	4, 4X, 5, 6, 12, 12K
Protection Class	IP 67
Response Time	1 msec; 10 msec (150VA)
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit Load
Types/O.D. (0.76cm)	18/2 SJTOW (K) / 0.30"
(Armored cable available)	18/4 SJTOW (K) / 0.34" (0.86cm)
UL/CSA	All Models

File E 122942 LR89176

Order Information **Electrical Specifications**

Part Number[1]	Contact[2] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Sense Range[3] Nominal	Break Range Nominal	Lead Length
151-6Z-06K	N.O.	25VA	25W	120V (@0.2A)	120V (@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	1.5" (3.8cm)	2.0" (5.1cm)	6' (1.8m)
151-6Z-12K	N.O.	25VA	25W	120V (@0.2A)	120V (@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	1.5" (3.8cm)	2.0" (5.1cm)	12' (3.6m)
151-7Z-06K	N.O.	100VA	84W	120V (@0.8A)	28V (@3.0A)	3.0A (@34V)[4]	3.0A (@28V)[4]	1.0 Ohms	1.2" (3.0cm)	1.8" (4.6cm)	6' (1.8m)
153-7Z-06K	N.O.	100VA	84W	120V (@0.8A)	28V (@3.0A)	3.0A (@34V)[4]	3.0A (@28V)[4]	1.0 Ohms	1.2" (3.0cm)	1.8" (4.6cm)	6' (1.8m)
151-7Z-12K	N.O.	100VA	84W	120V (@0.8A)	28V (@3.0A)	3.0A (@34V)[4]	3.0A (@28V)[4]	1.0 Ohms	1.2" (3.0cm)	1.8" (4.6cm)	12' (3.6m)
153-7Z-12K	N.O.	100VA	84W	120V (@0.8A)	28V (@3.0A)	3.0A (@34V)[4]	3.0A (@28V)[4]	1.0 Ohms	1.2" (3.0cm)	1.8" (4.6cm)	12' (3.6m)
151-7Z-06K-D3	DPST,N.O.,N.C.	100VA	84W	120V (@0.8A)	28V (@3.0A)	3.0A (@28V)[4]	3.0A (@28V)[4]	1.0 Ohms	1.2" (3.0cm)	1.8" (4.6cm)	6' (1.8m)
150-Z	Actuator Only										

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 The part number 153 is the same as 151 in all respects except the cable exits 151 left and 153 right.
2 Configuration with actuator away from the switch
3 Proximity of ferrous materials usually reduces sense range – typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

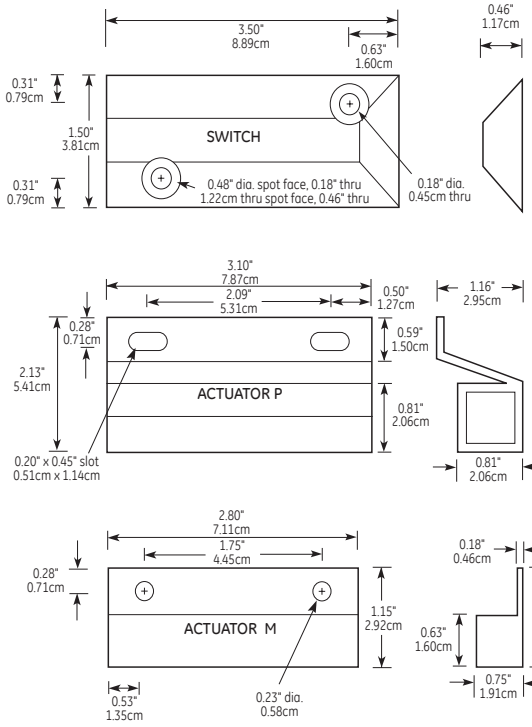
Non-Contact Interlock/Position Switch
166 GuardSwitch

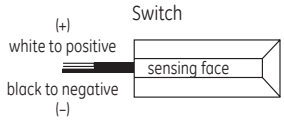
Applications

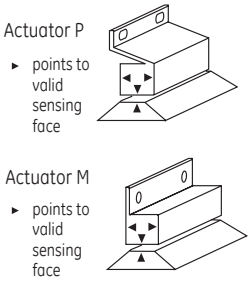
- Low Profile Requirements
- Overhead Doors
- Boom Trucks
- Emergency Vehicles
- Rugged Outdoor Use

General Specifications

Enclosure	Epoxy-coated aluminum
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 3, 4, 4X, 5, 6, 12
Protection Class	IP 67
Response Time	1 msec
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	18/2 SJTOW (K) / 0.30" (0.76cm)
UL/CSA	All Models







File E 122942 LR 89176

Order Information	Electrical Specifications		DC ONLY					
Part Number	Contact[1] Config.	Load Rating (DC)	Switching Voltage Maximum (DC)	Switching Current Maximum (DC)	Voltage Drop	Sense Range[2] Nominal	Break Range Nominal	Lead Length[3]
166-RM-06K	N.C.	100W	24V (@4.0A)	5.0A (@20V)	1.5V	1.6" (4.0cm)	2.1" (5.3cm)	6' (1.8m)
166-RN-06K[4]	N.C.	100W	24V (@4.0A)	5.0A (@20V)	1.5V	Switch Only	Switch Only	6' (1.8m)

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

Note: This switch cannot be used for AC applications. In DC applications it is polarity sensitive white to positive, black to negative.

1 Configuration with actuator away from the switch

2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

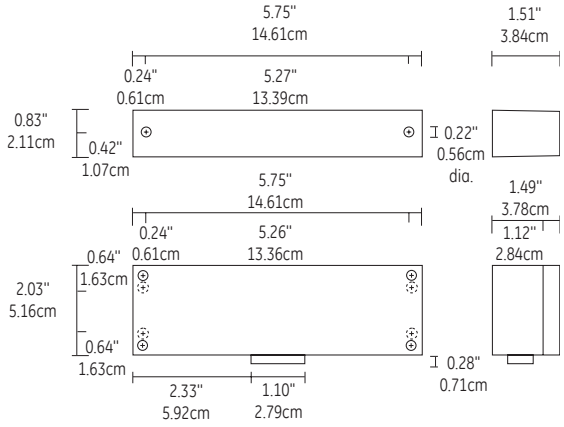
3 Armored cable available

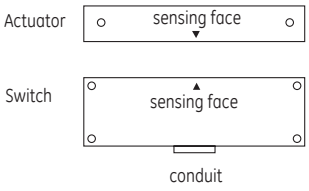
4 Switch only

Non-Contact Interlock/Position Switch
171 GuardSwitch Explosion Proof

Applications

- Explosive Environments
  - Automotive Paint Companies
  - Industrial Paint Companies
  - Grain Mills
  - Chemical/Toxic Environments
  - Fertilizer Manufacturers
- Enclosure UL classified for hazardous locations classes:
  Class I, Group B, C, D
  Class II, Group E, F, G
  Class III, Divisions 1 & 2





General Specifications

Enclosure	UL Explosion proof, Die Cast Aluminum
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 5
Protection Class	IP 64
Response Time	1 msec; 10 msec (150VA)
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Conduit Connection	1/2" Threaded NPT
UL	Enclosure Only

UL LISTED

Order Information	Electrical Specifications										
Part Number	Contact[1] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Sense Range[2] Nominal	Break Range Nominal	Terminal Type
171-6Z	N.O.	25VA	25W	120V(@0.2A)	100V(@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	1.5"(3.8cm)	2.4"(6.1cm)	#6 Screw

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

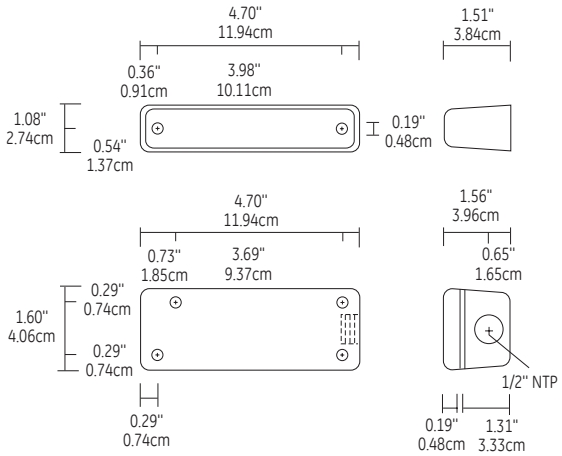
Non-Contact Interlock/Position Switch

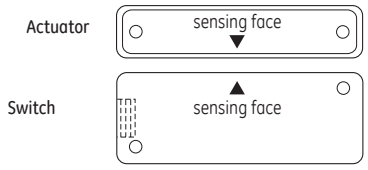
181 GuardSwitch

1/2" Conduit Enclosure

Applications

- Requiring Conduit Connection
- Non-wash Down Environment
- Heavy-duty Housing





General Specifications

Enclosure	Coated aluminum
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 5
Protection Class	IP 64
Response Time	1 msec; 10 msec (150VA)
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Conduit Connection	1/2" Threaded NPT

Order Information	Electrical Specifications									
Part Number	Contact[1] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Sense Range[2] Nominal	Break Range Nominal	Terminal Type
181-7Z	N.O.	100VA	84W	120V(@0.8A)	28V(@3.0A)	3.0A (@34V)[3]	3.0A (@28V)[3]	1.0 Ohms	1.4" (3.5cm)	1.8" (4.6cm)	#6 Screw

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

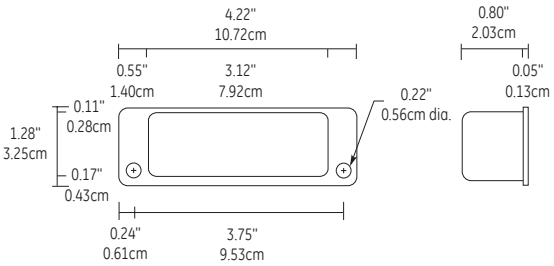
1 Configuration with actuator away from the switch

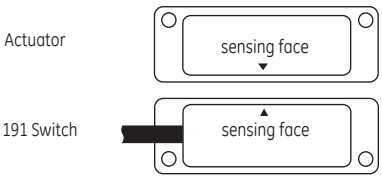
2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.z

Non-Contact Interlock Position/Switch
191 GuardSwitch

Applications

- USDA approved
- Food Processing Machines
- Chemical Industry Machinery
- Wash-down Environments





General Specifications

Enclosure	Seamless 304 Stainless Steel
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 3, 4, 4X, 5, 6, 12, 12K
Protection Class	IP 67
Response Time	1 msec; 10 msec (150VA)
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	18/2 SJTOW (K) / 0.30" (0.76cm) 18/4 SJTOW (K) / 0.34" (0.86cm)
UL/CSA	All Models

File E 122942 LR89176

Order Information	Electrical Specifications										
Part Number	Contact[1] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Sense Range[2] Nominal	Break Range Nominal	Lead Length
191-6Z-12K	N.O.	25VA	25W	120V (@0.2A)	120V (@0.2A)	0.7A (@35V)	1.0A (@25V)	0.2 Ohms	1.0" (2.5cm)	2.0" (5.1cm)	12' (3.6m)
191-7Z-06K	N.O.	100VA	84W	120V (@0.8A)	28V(@3.0A)	3.0A (@34V)	3.0A (@28V)[3]	1.0 Ohms	0.5" (1.3cm)	1.8" (4.6cm)	6' (1.8m)
191-7Z-12K-D3	DPST[3]	100VA	84W	120V (@0.8A)	28V(@3.0A)	3.0A (@34V)	3.0A (@28V)[3]	1.0 Ohms	0.5" (1.3cm)	1.8" (4.6cm)	12' (3.6m)
191-7Z-12K	N.O.	100VA	84W	120V (@0.8A)	28V(@3.0A)	3.0A (@34V)	3.0A (@28V)[3]	1.0 Ohms	0.5" (1.3cm)	1.8" (4.6cm)	12' (3.6m)

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

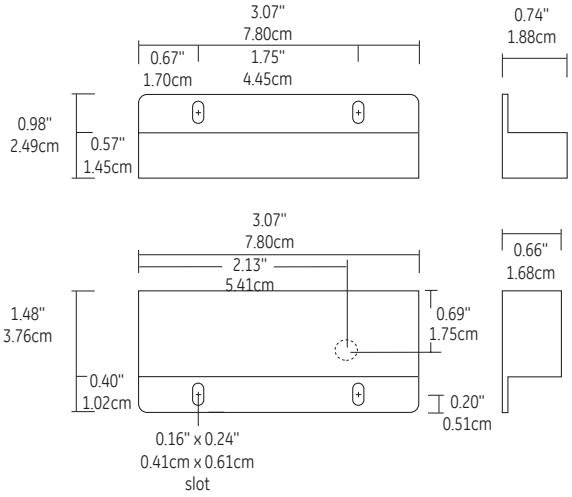
2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

3 DPST: 1 N.O., 1 N.C

Interlock Switch
301 GuardSwitch

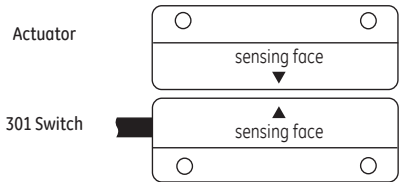
Applications

- Requiring Highly Defeat Resistant Switches
- Grinder Machines
- Augur Machines
- Chopper Machines



General Specifications

Enclosure	Folded 304 Stainless Steel
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 4, 4X, 5, 12, 12K
Protection Class	IP 66
Response Time	1 msec (5.4 VA); 10 msec (150VA)
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	SJTOW (K) 18/2 AWG / 0.30" (0.76cm) SJTOW (K) 18/4 AWG / 0.34" (0.86cm)
UL/CSA	All Models



File E 115761 LR89176

Order Info. Electrical Specifications

Part Number	Contact[1] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Sense Range[2] Max.	Sense Range[2] Min.	Break Range	Lead Length
301-CT-06K	N.O.	2.5VA	2.5W	30V(@0.08A)	30V(@0.08A)	0.18A(@13.8V)	0.18A(@13.8V)	0.5 Ohms	0.75"(1.9cm)	0.375"(1.0cm)	1.2"(3.0cm)	6' (1.8m)
301-CT-12K	N.O.	2.5VA	2.5W	30V(@0.08A)	30V(@0.08A)	0.18A(@13.8V)	0.18A(@13.8V)	0.5 Ohms	0.75"(1.9cm)	0.375"(1.0cm)	1.2"(3.0cm)	12' (3.6m)
301-CT-12K-CD	DPST	2.5VA		30V(@0.08A)	30V(@0.08A)	0.18A(@13.8V)	0.18A(@13.8V)	0.5 Ohms	0.75"(1.9cm)	0.375"(1.0cm)	1.2"(3.0cm)	12' (3.6m)
301-DT-06K[4]	N.O.	150VA	NA	120V @1.25A	NA	1.25A(@120V[3])	NA	NA	0.75"(1.9cm)	0.375"(1.0cm)	1.2"(3.0cm)	6' (1.8m)
301-DT-12K[4]	N.O.	150VA	NA	120V @1.25A	NA	1.25A(@120V[3])	NA	NA	0.75"(1.9cm)	0.375"(1.0cm)	1.2"(3.0cm)	12' (3.6m)

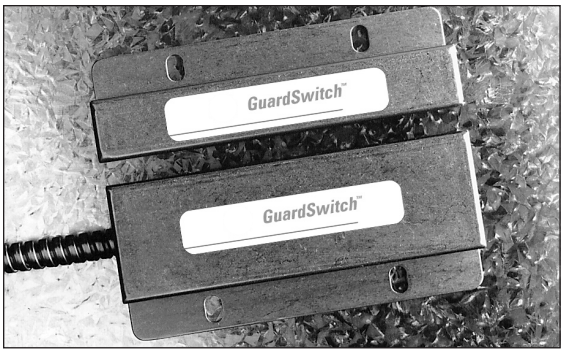
Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

3 Can withstand inrush surge up to 4 amps. Voltage drop is 1.5V, minimum switch current, 30 mA, triac output.

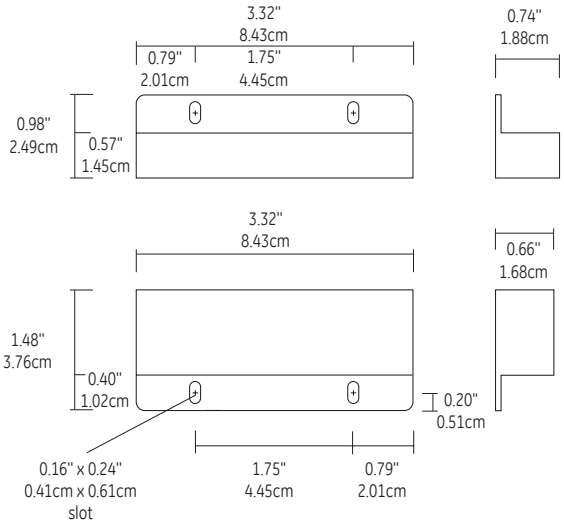
4 Do not exceed 10 switches in series.

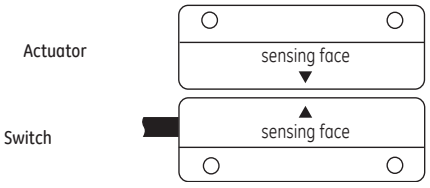


Interlock Switch
302 GuardSwitch

Applications

- Requiring Highly Defeat Resistant Switches
- Grinder Machines
- Augur Machines
- Chopper Machines





General Specifications

Enclosure	Folded 304 Stainless Steel
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 4, 4X, 5, 12, 12K
Protection Class	IP 66
Response Time	1 msec (5.4VA); 10 msec (150VA)
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	Armored Cable (A) 3/16" Stainless Steel with two 18/2 AWG wires / 0.28" (0.59cm)
UL/CSA	All Models

File E 115761 LR89176

Order Info. Electrical Specifications

Part No.	Contact[1] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Sense Range[2] Max.	Sense Range[2] Min.	Break Range	Lead Length
302-DT-06A[4]	N.O.	150VA	NA	120V @1.25A	NA	1.25A(@120V[3])	NA	NA	0.75"(1.9cm)	0.375"(1.0cm)	1.2"(3.0cm)	6' (1.8m)

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

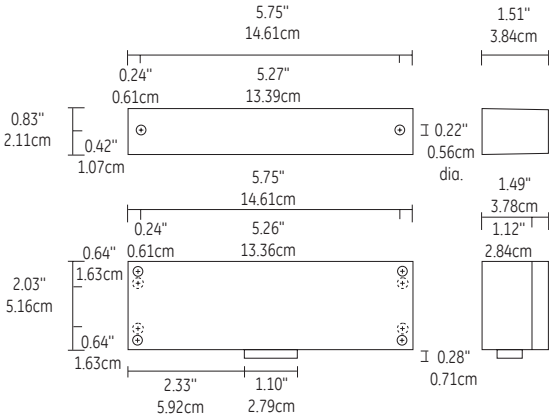
3 Can withstand inrush surge up to 4 amps. Voltage drop is 1.5V, minimum switch current, 30 mA, triac output.

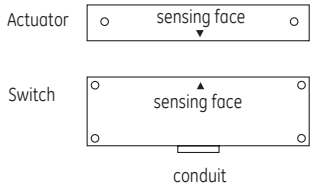
4 Do not exceed 10 switches in series.

Interlock Switch
371 GuardSwitch Explosion Proof

Applications

- Explosive Environments
  - Automobile Paint Booths
  - Industrial Paint Booths
  - Chemical/Toxic Environments
  - Fertilizer Manufacturers
  - Grain Mills
- Requiring Highly Defeat Resistant Switches
- Enclosure UL classified for hazardous locations classes:
  Class I, Group B, C, D
  Class II, Group E, F, G
  Class III, Divisions 1 & 2





General Specifications

Enclosure	UL Explosion Proof, Black Anodized Die Cast Aluminum
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 5
Protection Class	IP 64
Response Time	1 msec (5.4VA); 10 msec (150VA)
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Conduit Connection	1/2" Threaded NPT
UL	All Models

File E 22942

Order Info.	Electrical Specifications											
Part No.	Contact[1] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Sense Range[2] Max.	Sense Range[2] Min.	Break Range	Terminal Type
371-CT	N.O.	2.5VA	2.5W	30V(@0.08A)	30V(@0.08A)	0.18A(@13.8V)	0.18A(@13.8V)	0.5 Ohms	0.5"(1.3cm)	0.25"(0.635cm)	1.2"(3.0cm)	#6 Screws
371-DT[4]	N.O.	150VA	NA	120V(@1.25A)	NA	1.25A(@120V)[3]	NA	NA	0.5"(1.3cm)	0.25"(0.635cm)	1.2"(3.0cm)	#6 Screws

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

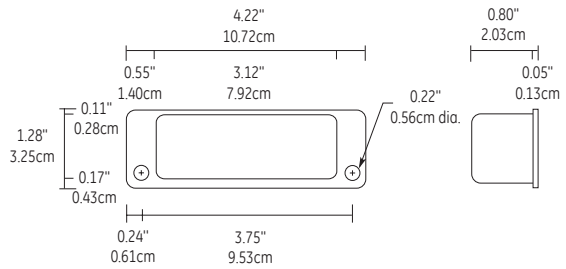
3 Can withstand inrush surge up to 4 amps. Voltage drop is 1.5V, minimum switch current, 30 mA, triac output.

4 Do not exceed 10 switches in series.

Interlock Switch
391 & 393 GuardSwitch

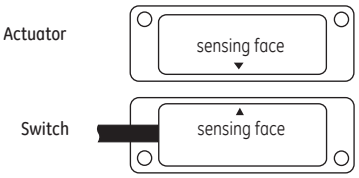
Applications

- USDA Approved Housing
- Food Processing Machines
- Rugged, Seamless SS Housing
- Requiring Highly Defeat Resistant Switches
- Wash-down and Corrosive Environments



General Specifications

Enclosure	304 Seamless Stainless Steel
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Environmental	Hermetically Sealed Contact Switch Encapsulated in Polyurethane
Response Time	1 msec (5.4VA); 10 msec (150VA)
NEMA Rating	1, 2, 3, 4, 4X, 5, 6, 12, 12X
Protection Class	IP 67
Life Cycles	100,000 Under Full Load; Up to 200,000,000 Under Dry Circuit
Lead Types/O.D.	SJTOW (K)/18/2, 0.30" (0.76cm)
UL/CSA	All Models



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LR89176

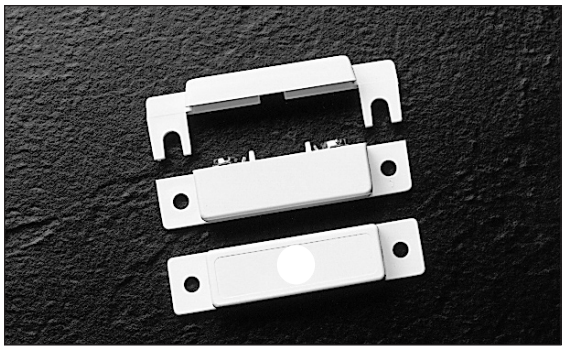
Order Info.	Electrical Specifications												
Part No.[1]	Contact[2] Config.	Load Rating AC	Load Rating DC	Switching Voltage, Max. AC	Switching Voltage, Max. DC	Switching Current, Max. AC	Switching Current, Max. DC	Contact Resistance	Sense Range[3] Max.	Sense Range[3] Min.	Break Range	Lead Length
391-DT-12K[5]	N.O.	150VA	NA	120V @1.25A	NA	1.25A(@120V[4])	NA	NA	0.8"(2cm)	0.1"(0.25cm)	1.2"(3.0cm)	12' (3.6m)

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 The part number 391 and the 393 are the same in all respects except the cable exits 391 left and 393 right.

2 Configuration with actuator away from the switch

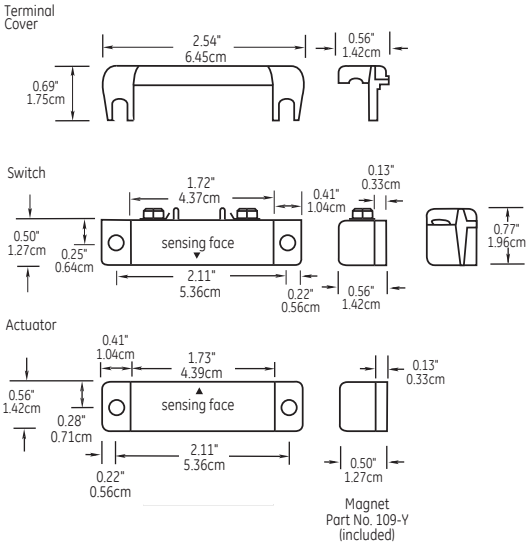
3 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects.



Screw Terminal
60 Series

Applications

- Easy clamping terminals speed installation
- Convenient surface mounting
- Built-in resistors available; consult factory
- Cover, spacer, screws included



General Specifications

Enclosure	ABS Plastic
Temperature Range	-40°F to 150°F (-40°C to 65°C)
Environmental	Hermetically Sealed Reed Switch
NEMA Rating	1
Protection Class	IP 62
Response Time	1 msec max.
Life Cycles	100,000 Under Full Load, 10,000,000 Under Dry Circuit
Connection	#6 screw terminal
Color Choices	Natural(N), Mahogany(M), Grey(G)
UL/ULC Listed	All Models

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Order Info.	Electrical Specifications						
Part Number	Contact[1] Configuration	Load Rating (AC/DC)		Switching Voltage (AC/DC)	Switching Current (AC/DC)	Contact Resistance	Housing Color
60	N.O.	7.5W/VA	100V	0.5A	0.2 Ohms	0.8" (1.9cm)	Gray
61	SPDT	3W/VA	30V	0.25A	0.2Ohms	0.8" (1.9cm)	Gray
62	N.C.	3W/VA	30V	0.25A	0.2 Ohms	0.8" (1.9cm)	Gray
63	N.O.	7.5W/VA	100V	0.5A	0.2 Ohms	0.8" (1.9cm)	White
64	SPDT	3W/VA	30V	0.25A	0.2 Ohms	0.8" (1.9cm)	White
65	N.O.	7.5W/VA	100V	0.5A	0.2 Ohms	0.8" (1.9cm)	White

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications. As measured on a nonferrous surface. Gap distances are nominal make distance ± 20%. Gap Specifications are for switch to make. Break distance is approximately 1.1 to 1.5 times make.

Magnets & Accessories

Ceramic
1/2" dia. x 1/4" thick

Part Number 1802

Rare Earth
Mini-Max standard gap
3/8" dia. x 1/8" thick

Part Number 1830
(Order in Mult. of 10)

Part Number IND1830
(Order Individually)

Rare Earth
Mini-Max wide gap
5/8" dia. x 1/8" thick

Part Number 1835
(Order in Mult. of 10)

Part Number IND1835
(Order Individually)

3/8" dia. x 2 1/2" L

Part Number 1923

Appendix

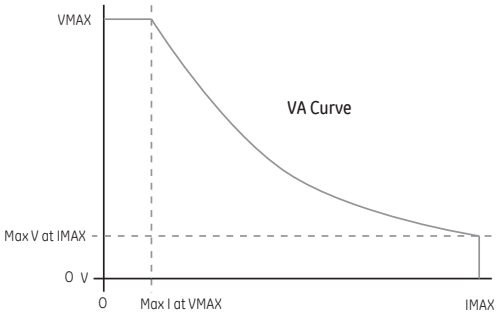
Maximum VA Rating

Most Edwards products are based on reed switch technology. Reeds are fast mechanical switches which are magnetically actuated. Inherent in their design are contacts in close proximity. This facilitates the "magnetic circuit" necessary for actuation. It also puts strict limitations on the amount of power which a given switch can handle. The power rating curve of a generic reed switch has the shape shown in figure 1.

V max is the ABSOLUTE MAXIMUM allowable voltage which the switch can EVER see (including switching transients). Above this level internal arcing will occur and damage the switch. However, there are conditions where a voltage less than V max will overload the switch. See VA rating below.

I max is the ABSOLUTE MAXIMUM allowable current which the switch can EVER carry (including switching transients). Above this level serious degrading of reed contacts which can cause the switch to stick closed, producing an extreme safety hazard for interlock applications. Remember also, there are conditions where currents less than I max will overload the switch. See VA rating below.

Figure 1



Example

Switch Rating: 15 VA, 120 V, 0.5A

Maximum Current at 120 Volts:

$$A = {}^{VA}/_{V} = {}^{15}/_{120} = 0.125 \text{ A}$$

Maximum Voltage at 0.5 Amps:

$$V = {}^{VA}/_{A} = {}^{15}/_{0.5} = 0.125 \text{ A}$$

VA Curve

This curve indicates the power limitation for the load which a given switch can handle, and cuts a big chunk out of the square defined by V max and I max:

V max can only be approached if the current is severely limited.

I max can only be approached if the voltage is severely limited.

The load power rating for GE Interlogix Industrial switches is always stated in Volt-Amps. In DC applications Volts times Amps always yields power in Watts. However, in AC applications this is true only with a unity Power Factor. In general, for AC applications apparent power exceeds real power. Real Power is measured in Watts. Apparent Power is measured in Volt-Amps.

Appendix

Recommended Protection Circuits

Figure 1

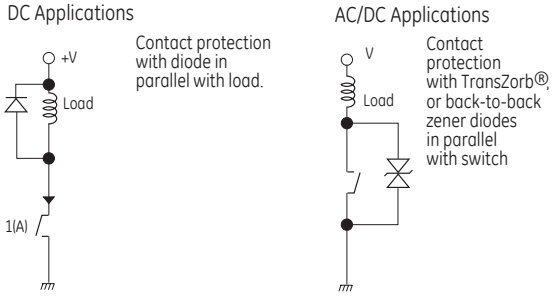


Figure 2

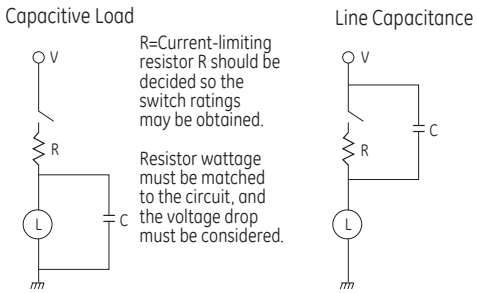
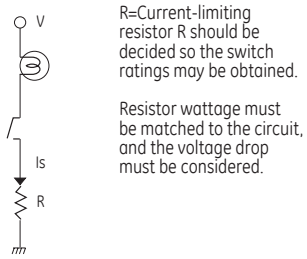


Figure 3



Protection Circuits — Inductive Loads

If the GuardSwitch™ is applied in a circuit that has an inductive electromechanical device such as a relay, solenoid, or contactor, the energy stored in that device will provide an inverse voltage to the GuardSwitch™ when the interlock opens. If this inductive back EMF exceeds the electrical rating of the switch, a protection circuit is required to prevent premature interlock failure. Two recommended protection circuits for inductive loads are shown in Figure 1.

Protection Circuits — Capacitance Loads

Capacitive loads or long cable runs that exceed 50 feet are prone to high inrush currents, which if they exceed the electrical rating of the switch, will cause premature interlock failure. This inrush can be reduced by a resistor as shown in the circuits in Figure 2.

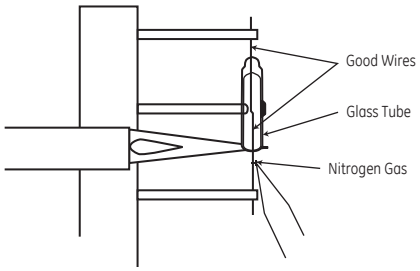
Protection Circuits — Lamp Loads

Tungsten lamp loads are a less obvious source of transient surges, yet are equally damaging to the interlock. Cold lamp filaments can have a resistance 10 times smaller than already glowing filaments, causing an inrush 10 times greater than the steady state current. If the inrush load exceeds the electrical rating of the GuardSwitch™, a protection circuit such as illustrated in Figure 3 should be used. Triac (-8, -18, -E, -DT) switches can switch up to 150 VA without added protection.

Appendix

Reed Switch Assembly

Figure 1



Reed assembly begins with the special forming of the magnetic wires to give them the proper shape and flexibility. Next, the blades are plated with rhodium, ruthenium, tungsten, or gold to give them a very hard surface with good electrical conductivity. Two of the reed wires are then critically positioned in a small glass tube. A nitrogen gas stream is directed through the tube as heat is applied to the upper end of the tube. The heat melts the tip of the tube around the wire to form a seal. The heat is moved to the other end of the tube and it too is melted to form the second seal. The second seal secures the second wire and forms a hermetic seal with the glass tube filled with nitrogen. See Figure 1.

Reed Switch Types

There are three different types of reed switches in general use. They are, Form A (two wire, normally open), Form B (two wire, normally closed) and Form C (three wire, normally open and normally closed). Form C reeds are also called single pole-double throw (SPDT) switches.

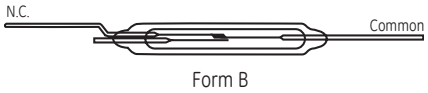
Form A-Normally Open (N.O.)

Figure 2

Form A reeds are switches that are normally open when there is no magnetic field near them and closed when a magnet is in proximity. The "normally open" title is the common electrical description for switches whose non-actuated condition is open (switch contacts are not touching and no electrical current can flow.) See Figure 2.

Form B-Normally Closed (N.C.)

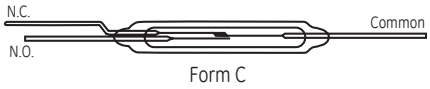
Figure 3



Form B reeds are switches that are normally closed when there is no magnetic field near and open when a magnet is in proximity. The "normally closed" title is the common electrical description for switches whose non-actuated condition is closed. See Figure 3.

Form C-Single Pole Double Throw (SPDT)

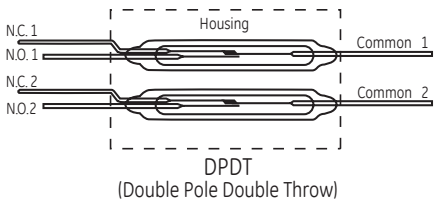
Figure 4



Form C reeds are switches that can be either normally open or normally closed. Form C switches have three wires: the center or Common wire, the normally closed wire and the normally open wire. In the non-actuated condition, current flows in the common wire and out the closed wire as noted in Form B above. In the operated condition the common element switches from the closed wire to the open wire allowing current to flow from common to the normally open wire as noted in the Form A description above. See figure 4.

Double Pole Double Throw-DPDT

Figure 5



Double Pole Double Throw contacts are created by assembling two Form C reeds in the same switch housing. DPDT contacts can be used in circuits to perform separate functions at the same time. The two switches have independent sense ranges. Usually one contact is connected to the safety circuit and the second switch is connected to an indicator or status light. See Figure 5.

Appendix

Reed Switch Assembly

Reed Switch Sensitivity

The gap distance noted for a reed contact is the distance between the actuating magnet and the contact when the reed operates. Gap distance is defined by the size of the magnet and reed sensitivity. Reed sensitivity is measured in terms of how much magnetism it takes to operate the switch and is measured in ampere turns. To explain, electrical current flowing through wire creates a magnetic field around the wire. When this wire is wrapped around a reed switch the magnetism is felt by the reed proportional to the number of turns around the reed. Therefore, amps in the wire times the number of turn equals amp-turns. Standard reed sensitivities are 10 to 70 amp-turns for safety and position switches. Wide gap contacts have reed sensitivities of 6 to 10 amp-turns. In the last few years reed switch manufacturers have been able to supply reliable Form A reeds that meet the wide gap sensitivity requirements which has allowed lower cost wide gap contacts. Reed manufacturers have not been able to manufacture high sensitivity Form C reeds therefore, wide gap and SPDT contacts are created by performing a wide gap operation during contact assembly. The wide gap operation is accomplished by gluing a small magnet to the reed to give it a boost in sensitivity. Wide gapping a reed causes the contact to become polarity sensitive. When mounting a wide gap Form B and C contacts the installer must insure that the actuator magnet is installed observing proper polarity.

Other terms that are associated with switch gap are make, break and differential.

Switch “make” is the term used to note switch actuation and usually applies to the gap distance between the switch and magnet when the switch operates.

Switch “break” is the term used to note switch deactivation or “drop out”. Break also is used on reference to switch-magnet gap when the switch opens.

“Differential” is distance between switch gap at make and the switch gap at break. This is also known as the hold distance or hysteresis and it can be a significant distance with some wide gap contacts.

How Temperature Affects Reeds

A general rule to remember in considering temperature affects on reeds contacts is: As temperature increases magnetism decreases. As temperature decreases magnetism increases. In very hot conditions switch gaps are reduced. In most situations this is not a problem because safety and position contacts are mounted inside and are protected from temperature extremes. In high temperatures reed contacts perform well if they are set up at mid gap distance while ambient temp is 50 to 90 degrees F. Caution should be used when installing coded magnet switches in potential high temperature environments because the gap tolerance for coded magnet switches is narrow, sometimes only 0.4 inches. Loss of magnetism here will cause false signals or improper operation.

Appendix

Figure 6

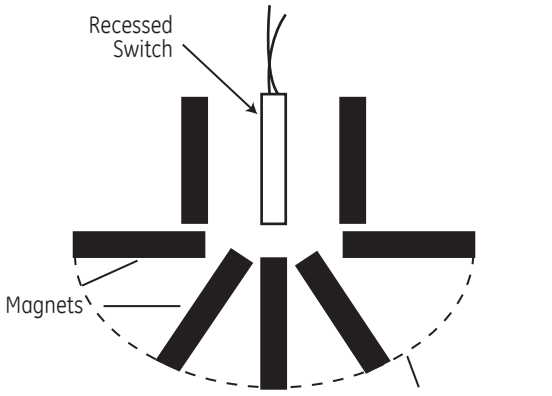


Figure 1
Acceptable Magnet Mounting Positions

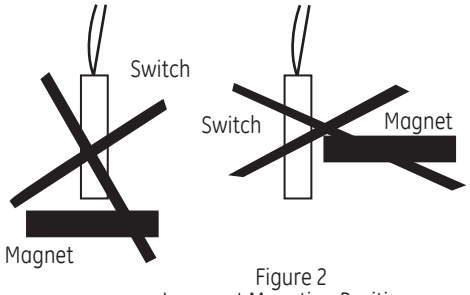
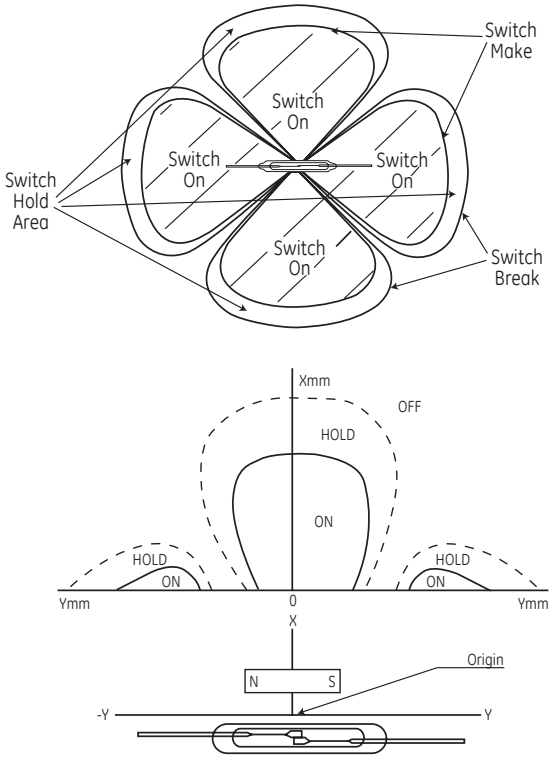


Figure 2
Incorrect Mounting Positions

Figure 7



Reed Switch Assembly

In cold conditions standard contacts work very well, even below -40°F. Wide gap and high sensitivity switches however will latch in extremely cold conditions. In temperatures below freezing the wide gap magnet in the switch increases in magnetism and can cause the reed to remain closed when the control magnet is withdrawn. Use non-biased, standard gap contacts where temperatures are likely to go below 20°F.

Magnet-Switch Orientation

There are several ways of arranging switch and magnet orientation to fit installation needs and there are some mounting arrangements that must be avoided. Surface mounted contacts are normally mounted side by side and recessed contacts are usually mounted end to end. With both mounting methods it is important to observe the proper magnet-switch polarity.

In these examples the magnet movement relative to the contact position causes the switch to operate. Figure 6 demonstrates correct and incorrect magnet positions with respect to Series 100 contact. Avoid contact mounting where the switch and magnet are positioned to form a "T". In this orientation the center of the magnet and/or the center of the switch has zero magnetism and the switch will not work.

Figure 7 is a clover leaf diagram of magnetic operational zones around a reed switch. Each leaf represents an area where a magnet can be positioned to operate the switch. Please note that the make and break zones are different in that the magnet must be close to cause switch make but once made, the switch will stay operational beyond the make distance, out to the break distance.

Warning

Warnings

Nominal sense range is measured on a non-ferrous surface. Proximity of ferrous material usually reduces sense range—typically by 50%. The shape of the material and type of material can cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.

All electrical ratings are individual maximums. Exceeding any one specification (including inrush) may result in switch failure. In selecting a part number, the transient surges from coils, contactors, motors, solenoids and tungsten loads must be considered.

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