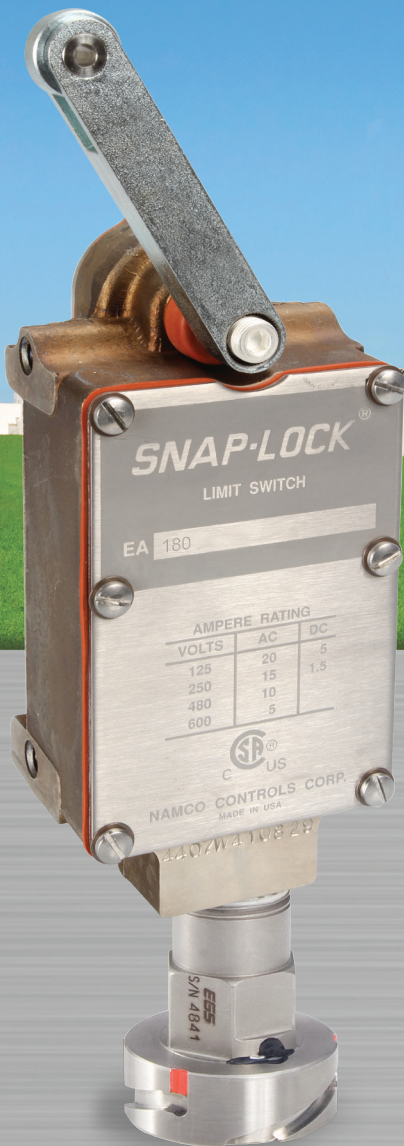


NAMCO

NUCLEAR QUALIFIED POSITION INDICATION SWITCHES



AMPERE RATING		
VOLTS	AC	DC
125	20	5
250	15	1.5
480	10	
600	5	



ENGINEERED WITH

SNAP-LOCK[®]

TECHNOLOGY

Table of Contents

ABOUT NAMCO	3
SNAP-LOCK® TECHNOLOGY	4
SNAP-LOCK® TYPES	5
MAGNETIC PROXIMITY LIMIT SWITCHES	7
EA120 SPDT <i>Designed for Mild Environments and Harsh Environment With & Without Accident Conditions</i>	8
EA120 DPDT <i>Designed for Mild Environments and Harsh Environment With & Without Accident Conditions</i>	12
MECHANICAL LIMIT SWITCHES	17
EA740 <i>Designed for Harsh Environment With Accident Conditions</i>	18
EA180 <i>Designed for Harsh Environment With Accident Conditions</i>	22
EA170 <i>Designed for Harsh Environment Without Accident Conditions</i>	26
NUCLEAR QUALIFIED CONNECTORS	31
EC290 (4-PIN) <i>Used with EA740, EA180, EA170</i>	32
EC290 (9-PIN) <i>Used with EA740, EA180, EA170</i>	33
EC390 (4-PIN) <i>Used with EA120 SPDT in Harsh Environments With Accident Conditions</i>	34
EC390 (6-PIN) <i>Used with EA120 DPDT in Harsh Environments With Accident Conditions</i>	35
EC490 (4-PIN) <i>Used with EA120 SPDT in Mild Environments</i>	36
EC490 (6-PIN) <i>Used with EA120 DPDT in Mild Environments</i>	37
EC590 (4-PIN) <i>Used with EA120 SPDT in Harsh Environments Without Accident Conditions</i>	38
EC590 (6-PIN) <i>Used with EA120 DPDT in Harsh Environments Without Accident Conditions</i>	39
OPERATING LEVERS	41
Style R	42
Style RLO, Style RW, Style RLO	43
Style S, Style SLO, Style TS	44
Style TSO, Style KR, Style KRO	45
Style M, Straight, Offset	46
Adjustable Straight, Adjustable Offset, Rod Lever	47
Style VR, Style YR	48
DEFINITION OF LIMIT SWITCH TERMS	50

About NAMCO

WHAT YOU NEED – WHEN YOU NEED IT

Our team of engineers and sales representatives will assist you every step of the way to be sure you get what you need. Whether it is a pricing quote, expedited delivery, technical support or application assistance, we are here to serve YOU!

INNOVATIVE

NAMCO developed the world's first switch qualified for safety-related applications in nuclear power plants in 1972. With over 100,000 nuclear qualified safety switches installed around the globe, no other manufacturer has more experience in one of the world's most critical applications.

Today, NAMCO continues to strive for innovation. To ensure nuclear plants are less vulnerable in the wake of natural disasters, our non-contact position indication solution addresses the most demanding and evolving requirements in harsh applications. The NAMCO EA120 Series Magnetic Proximity Limit Switch design utilizes our proprietary SNAP-LOCK® technology, which enables us to exceed seismic performance requirements in the smallest footprint.

RELIABLE AND RESPONSIVE

With over 75 years of experience, NAMCO leads the industry by providing SNAP-LOCK® limit switches in the most demanding applications such as steel mills, auto plants, foundries and power plants. SNAP-LOCK® technology provides unparalleled reliability in the toughest environments and in heavy-duty applications. NAMCO switches have the ruggedness to operate under the most severe conditions and have the durability needed for a long, trouble-free operation.

HIGHEST QUALITY MANUFACTURING

NAMCO products are manufactured and tested to the highest quality standards, making them the most reliable on the market. Our commitment to our Quality Program means you, our customer, get world-class products and top-notch customer service.

- QA Program designed to meet 10CFR50 Appendix B and ANSI N45.2, as applicable
- ISO 9001-2008 Certified
- Rigid Nuclear Standard per NRC requirements

APPLICATION SUPPORT

Not sure what you need? Our experienced Engineers and Application Specialist will help you support any application – whether nuclear qualified or balance of plant.

CONTACT US

Contact us at customer.service@sptech.com or 800-390-6405 or 910-862-2511.

NAMCO Customer Service
2100 West Broad Street
Elizabethtown, NC 28337

FAX (910) 879-5486

SNAP-LOCK Technology

The SNAP-LOCK® mechanism is what makes our remote indication devices so unique. Utilizing this technology in our design enables us to produce a robust, highly reliable and trusted product for the nuclear industry.

SNAP:

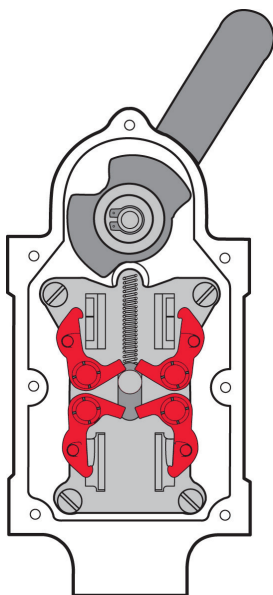
Our solutions have a “snap” action which enables a quick action from one position to another, effectively eliminating deadband. The contacts are forced to be in one position or the other and cannot dwell in-between open or closed.

LOCK:

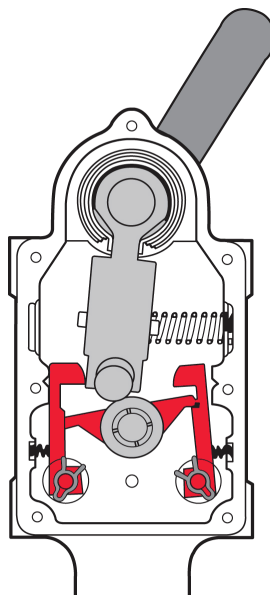
Instead of relying on spring force, each switch has a locking mechanism that mechanically forces the contacts to stay closed until released by the trip lever. This eliminates any possible contact chatter due to vibration or seismic events.

NAMCO utilizes three different SNAP-LOCK® mechanisms detailed in the drawings below. The type of mechanism selected is based on your application.

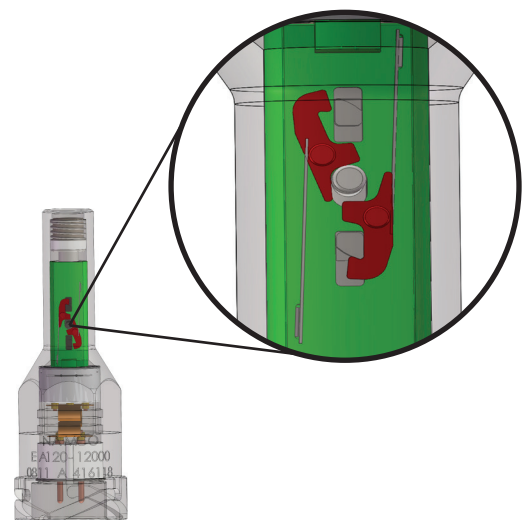
Cam Type



Rocker Type



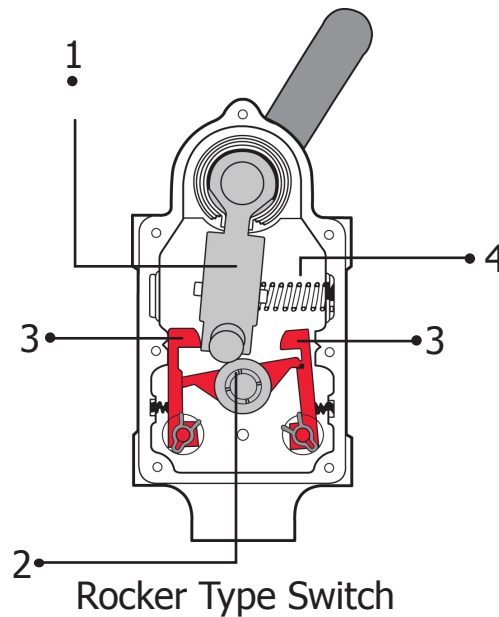
Magnetic Prox Type



SNAP-LOCK® Technology

Rocker Type

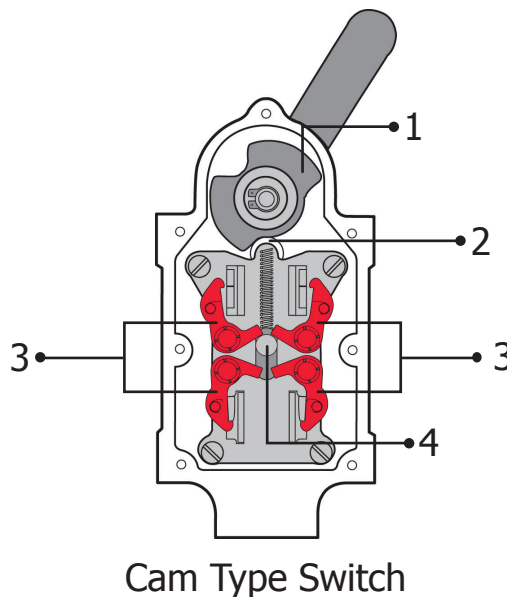
Rotation of the external lever shaft and lever shaft assembly (1) causes the rocker (2) to pivot, shifting and locking the latches (3). The movement of the rocker (2) also transfers contact position in a snap action. Removal of operating force allows the return spring (4) to pivot the lever shaft assembly which returns the rocker and contacts to the initial position in a snap action. Latches (3) are reset at this point.



Rocker Type Switch

Cam Type

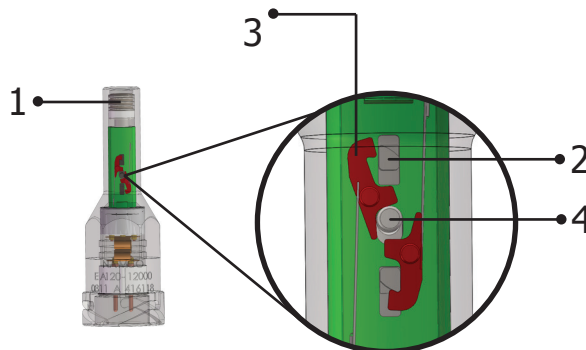
Rotation of the external lever shaft and cam assembly (1) drives the cam follower /shuttle assembly (2), pushing the operating pin (4) allowing one set of latches (3) to release the initial position of the shuttle (2) and the other set of latches (3) to hold the shuttle in the moved position. Movement of the shuttle (2) also transfers contact position in a snap action. Removal of the operating force allows a return spring to move the cam follower/ shuttle assembly (2) and contacts to the initial position in a snap action. Latches (3) are reset to the initial position at this point.



Cam Type Switch

Magnetic Prox Type

Alignment of the target magnet with internal magnet (1) drives the operating pin (4) allowing one latch (3) to release the initial position of the shuttle (2) and the other of latch (3) to hold the shuttle in the moved position. Movement of the shuttle (2) also transfers contact position in a snap action. Removal of the target magnet allows a return spring to move the shuttle assembly (2) and contacts to the initial position in a snap action. Latches (3) are reset to the initial position at this point.



Magnetic Prox Type Switch

Magnetic Proximity Switches

Non-contact magnetic proximity switches are used to detect the position of mechanical motion and provide accurate position indication. An actuator, in the form of a target magnet, passes in front of the proximity switch, engaging the switch, and allowing the internal electrical contacts to change state. The application is never in physical contact with the proximity switch. Applications that typically use limit switches include valve position indication, sorting, level detection and many safety related situations.



NAMCO	Harsh Environment With Accident Conditions		Harsh Environment Without Accident Conditions		Mild Environment	
	Test Conditions		Radiation & Seismic Resistant		Low Dose Radiation & Seismic Resilience	
	EA120 - SP	EA120 - DP	EA120 - SP	EA120 - DP	EA120 - SP	EA120 - DP
Contacts	SPDT	DPDT	SPDT	DPDT	SPDT	DPDT
Connection Options	Flying Leads	Flying Leads	Flying Leads	Flying Leads	Flying Leads	Flying Leads
	QDC	QDC	QDC	QDC	QDC	QDC

Qualifications

- IEEE 323-2003/1983/1974
- IEEE 344-2004/1987/1975
- IEEE 382-2006/1996/1980
- IEEE 383-2003/1974/1972
- IEEE 572-2004/1985
- Westinghouse AP1000
- RCC-E
- IEC 60780 (1998), 60980 (1989), & 60068 (2007)

EA120 SPDT Series

Features

- Non-contact magnetically actuated limit switch – no torque on actuator or valve needed
- Qualified to Westinghouse AP1000 Environmental Parameters
- Manufacturing business system complies with 10CFR50, Appendix B, 10CFR Part 21, and ANSI N45.2
- Proprietary SNAP-LOCK® technology that enables internal latching mechanism to eliminate chatter under seismic or high vibration conditions
- Available with QDC milled onto the Stainless steel housing
- Available with pre-wired flying leads
- Gold-plated, fine silver contacts
- High temperature components



Technical Data

- Single Pole Double Throw (SPDT) Form C contacts, quick make - quick break
- Housing: Stainless steel
- Size: Length: 4" (101.6mm)
Weight: 0.45lbs / 0.2kg (free lead version, excluding pig tails);
0.55lbs / 0.25kg (QDC connector, excluding cable assy)
- PEEK insulated leads

Contact Rating

AC	Volts	120V	240V
	Amps	4A	2A

DC	Volts	24V	48V
	Amps	2A	1A

EA120 SPDT in Harsh Environment With Accident Conditions (LOCA/HELB)

- Operating Temperature:
-4° to 212°F (-20° to 100°C)
- Environmental qualifications:
Qualified for 100 years 112°F (44°C)
60 years 131°F (55°C)
Radiation: 363 MRad gamma
Seismic: 8.8G
Pressure: 104psig (717 KPa) LOCA
Max Temperature: 540°F / 282°C (HELB)
480°F / 249°C (LOCA)

Product (LOCA)	Product (HELB)	Description
EA120-11XXX*	EA120-71XXX*	SPDT w/ Flying Leads
EA120-12000	EA120-72XXX*	SPDT w/ QDC
EC390-44XXX*		Plug In Cable Assy w/ QDC (see pg. 34)
EA120-10001		Target Magnet
EA120-10002		Target Magnet (0.25" Actuation)

*XXX - Designates Lead Length

EA120 SPDT in Harsh Environment Without Accident Conditions

- Operating Temperature: -4° to 212°F (-20° to 100°C)
- Environmental qualifications:
Qualified for 100 years 112°F (44°C)
60 years 131°F (55°C)
Radiation: 363 MRad gamma
Seismic: 8.8G

Product	Description
EA120-51XXX*	SPDT w/ Flying Leads
EA120-52000	SPDT w/ QDC
EC590-44XXX*	Plug In Cable Assy w/ QDC (see pg. 38)
EA120-10001	Target Magnet
EA120-10002	Target Magnet (0.25" Actuation)

*XXX - Designates Lead Length

EA120 SPDT in Mild Environment

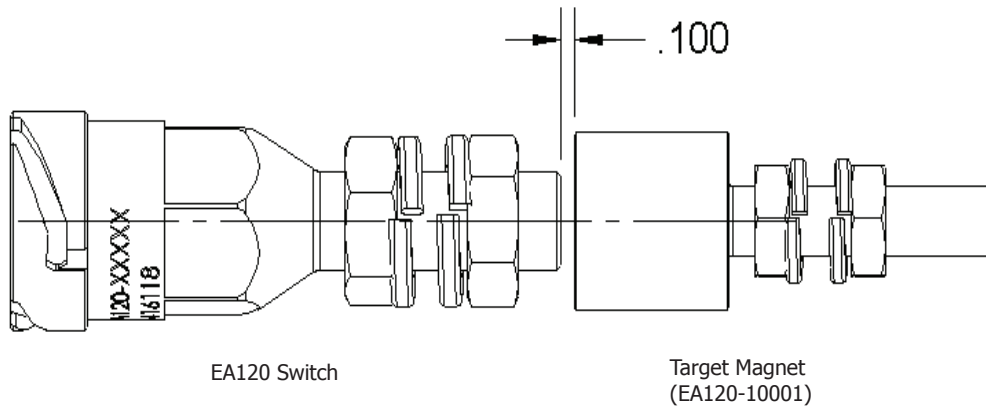
- Operating Temperature: -4° to 212°F (-20° to 100°C)
- Environmental qualifications:
Qualified for 60 years 105°F (40.5°C)
Radiation: < 1 Mrad
Seismic: 8.8G

Product	Description
EA120-31XXX*	SPDT w/ Flying Leads
EA120-32000	SPDT w/ QDC
EC490-44XXX*	Plug In Cable Assy w/ QDC (see pg. 36)
EA120-10001	Target Magnet
EA120-10002	Target Magnet (0.25" Actuation)

*XXX - Designates Lead Length

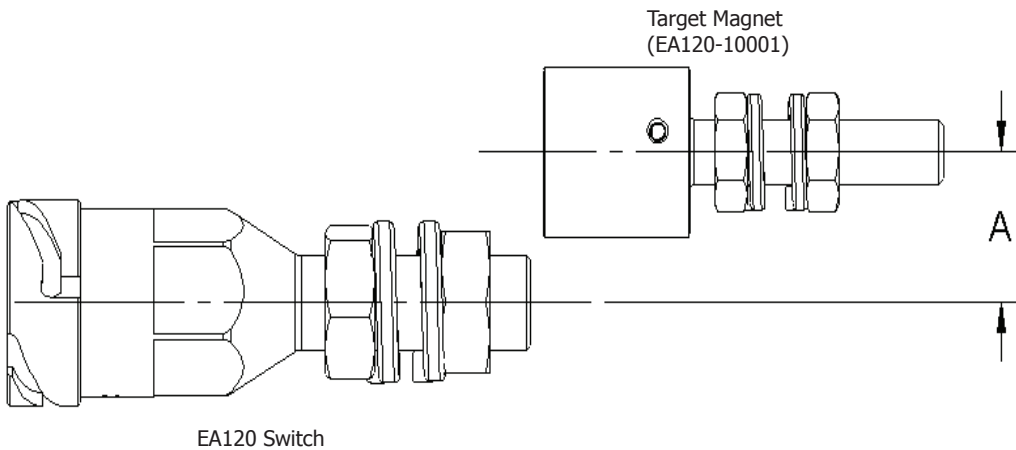
Actuation/Sensing

Target magnet installed within 0.10" (2.54mm) of switch.



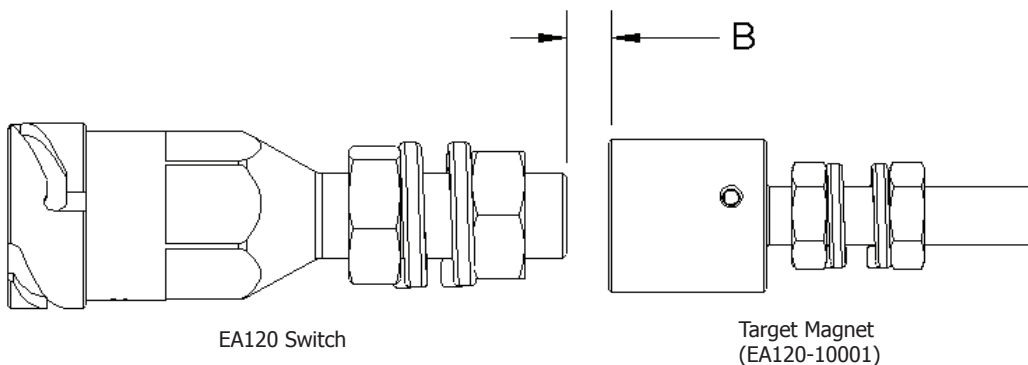
Radial Actuation

Switch trips within 0.20" (5.08mm) from centerline. Switch releases outside 0.60" (15.24mm) from centerline.



Axial Actuation

Switch trips within 0.10" (2.54mm). Switch releases outside of 0.50" (12.7mm)

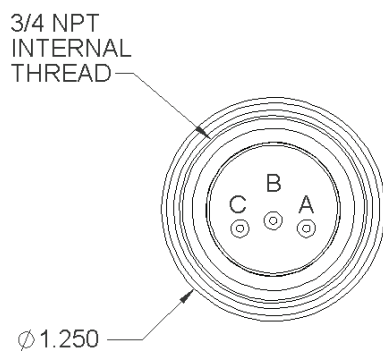


All dimensions given in Inches (mm)

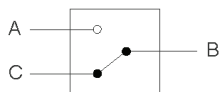
EA120 SPDT Series

Electrical Contact Information

Free-leads option

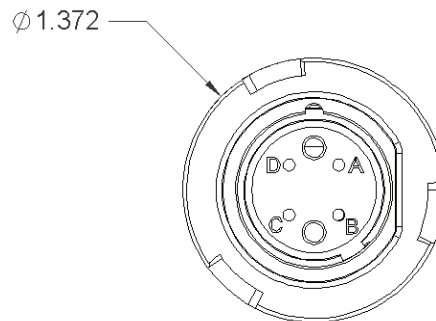


CONTACT CONFIGURATION

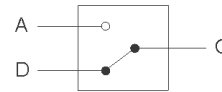


A	Normally Open
B	Common
C	Normally Closed

Quick disconnect option



CONTACT CONFIGURATION



A	Normally Open
B	Reserved
C	Common
D	Normally Closed

Mounting

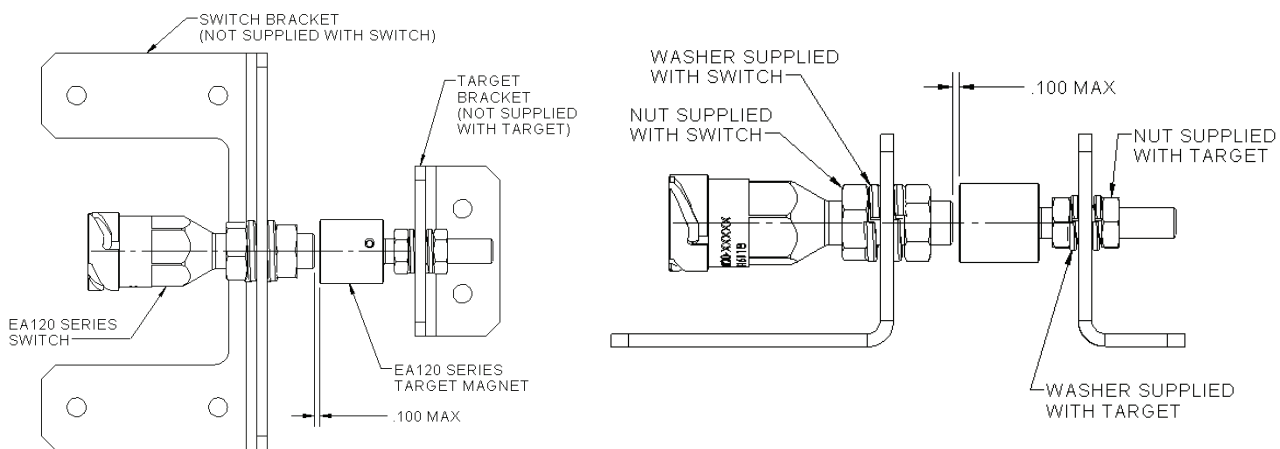
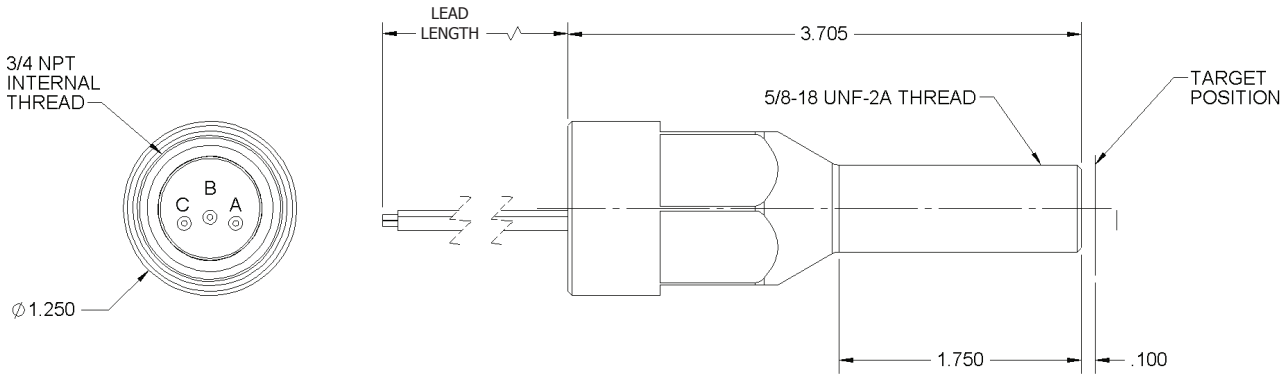


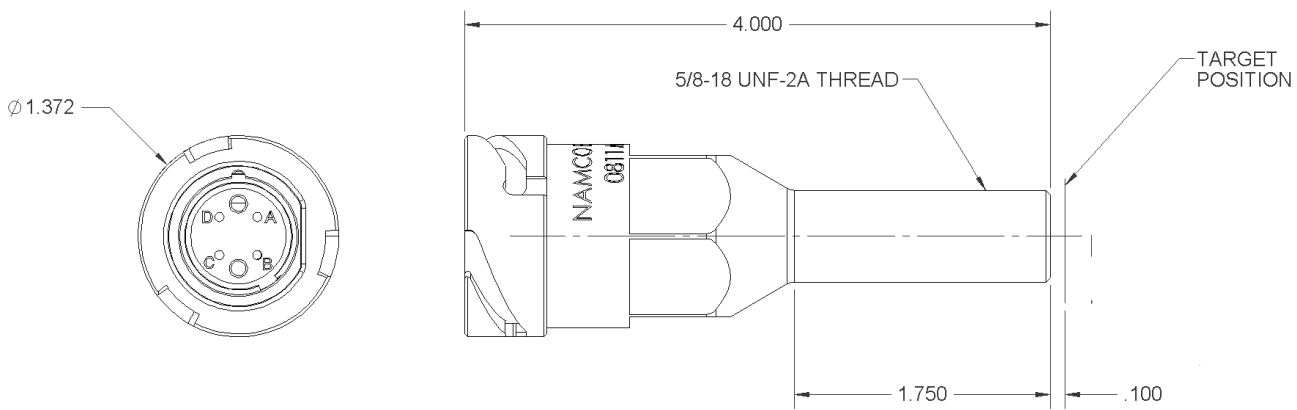
Figure reflects switch in "actuated" position.
 Two 5/8-18 jam nuts and two 5/8" lock washers supplied with switch.
 Target magnet EA120-10001 required for operation (sold separately).
 Average hysteresis: 0.20" (5mm) to 0.40" (10mm)

Outline Drawings

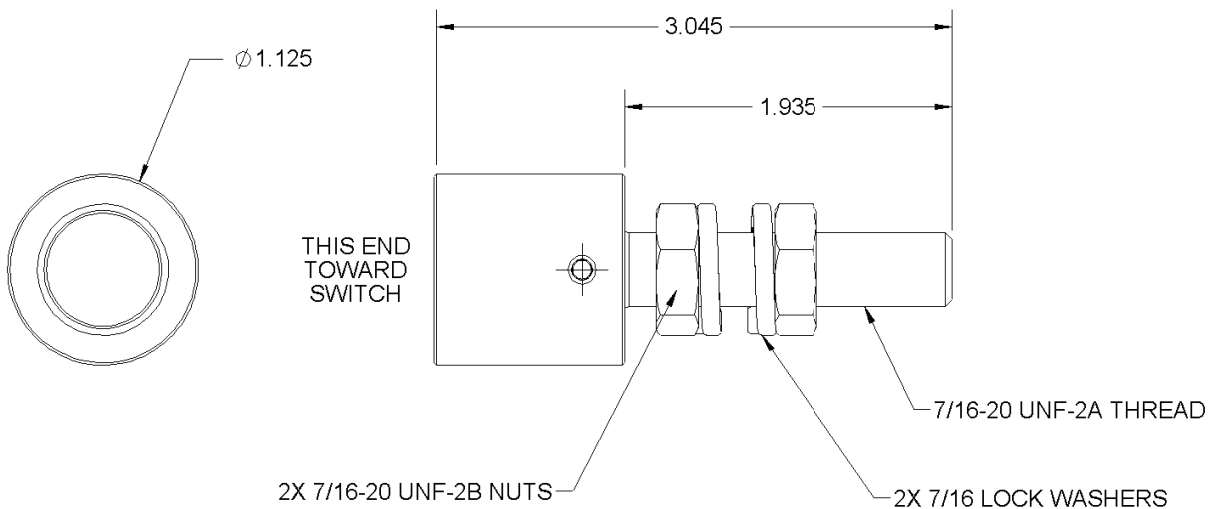
SPDT Flying Leads Model



SPDT Quick Disconnect Model



Target Magnet (EA120-10001)



All dimensions given in Inches (mm)

EA120 DPDT Series

Features

- Non-contact magnetically actuated limit switch – no torque on actuator or valve needed
- Qualified to Westinghouse AP1000 Environmental Parameters
- Manufacturing business system complies with 10CFR50, Appendix B, 10CFR Part 21, and ANSI N45.2
- Proprietary SNAP-LOCK® technology that enables internal latching mechanism to eliminate chatter under seismic or high vibration conditions
- Available with QDC milled onto the Stainless steel housing
- Available with pre-wired flying leads
- Gold-plated, fine silver contacts
- High temperature components



Technical Data

- Double Pole Double Throw (DPDT) Form C contacts, quick make - quick break
- Housing: Stainless steel
- Size: Length: 4" (101.6mm)
Weight: 0.71lbs / 0.3kg (free lead version, excluding pig tails);
1.10lbs / 0.5kg (QDC connector, excluding cable assy)
- PEEK insulated leads

Contact Rating

AC	Volts	120V	240V
	Amps	4A	2A

DC	Volts	24V	48V
	Amps	2A	1A

EA120 DPDT in Harsh Environment With Accident Conditions (LOCA/HELB)

- Operating Temperature: -4° to 212°F (-20° to 100°C)
- Environmental qualification:
 - Qualified for 100 years 112°F (44°C)
 - 60 years 131°F (55°C)
 - Radiation: 307 MRad gamma
 - Seismic: 8.8G
 - Pressure: 104psig (717 KPa) under LOCA condition
 - Max Temperature: 540°F / 282°C (HELB)
 - 480°F / 249°C (LOCA)

Product	Description
EA120-21XXX*	DPDT w/ Flying Leads
EA120-22000	DPDT w/ QDC
EC390-29XXX*	Plug In Cable Assy w/ QDC (see pg. 35)
EA120-10001	Target Magnet
EA120-10002	Target Magnet

*XXX - Designates Lead Length

EA120 DPDT in Harsh Environment Without Accident Conditions

- Operating Temperature: -4° to 212°F (-20° to 100°C)
- Environmental qualification:
 - Qualified for 100 years 112°F (44°C)
 - 60 years 131°F (55°C)
 - Radiation: 307 MRad gamma
 - Seismic: 8.8G

Product	Description
EA120-61XXX*	DPDT w/ Flying Leads
EA120-62000	DPDT w/ QDC
EC590-29XXX*	Plug In Cable Assy w/ QDC (see pg. 39)
EA120-10001	Target Magnet
EA120-10002	Target Magnet

*XXX - Designates Lead Length

EA120 DPDT in Mild Environment

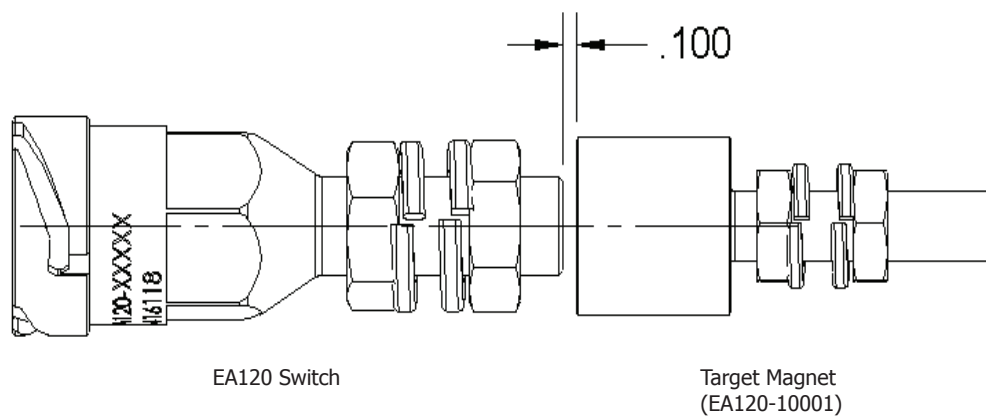
- Operating Temperature: -4° to 212°F (-20° to 100°C)
- Environmental qualification:
 - Qualified for 60 years 105°F (40.5°C)
 - Radiation: < 1 Mrad
 - Seismic: 8.8G

Product	Description
EA120-41XXX*	DPDT w/ Flying Leads
EA120-42000	DPDT w/ QDC
EC490-29XXX*	Plug In Cable Assy w/ QDC (see pg. 37)
EA120-10001	Target Magnet
EA120-10002	Target Magnet

*XXX - Designates Lead Length

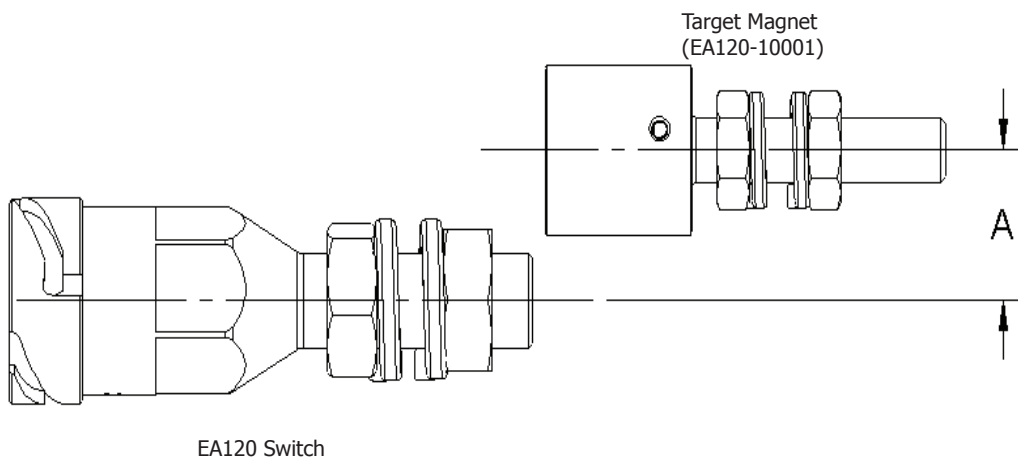
Actuation/Sensing

Target magnet installed within 0.10" (2.54mm) of switch.



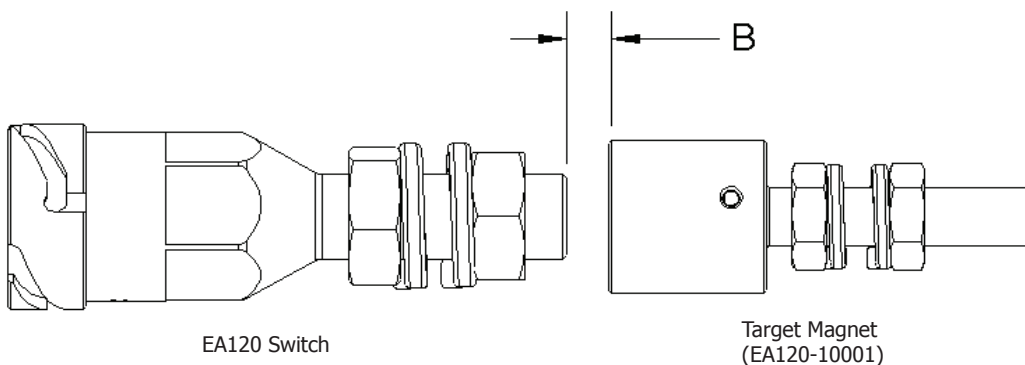
Radial Actuation

Switch trips within 0.20" (5.08mm) from centerline. Switch releases outside 0.70" (17.78mm) from centerline.



Axial Actuation

Switch trips within 0.10" (2.54mm). Switch releases outside of 0.70" (17.78mm)

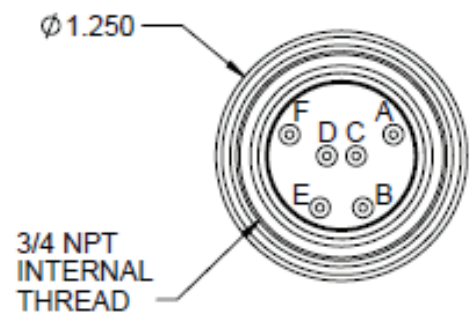


All dimensions given in Inches (mm)

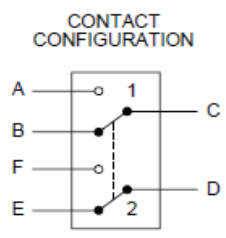
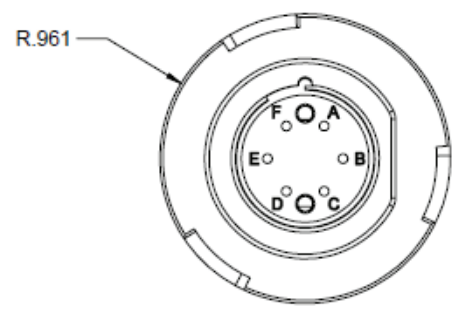
EA120 DPDT Series

Electrical Contact Information

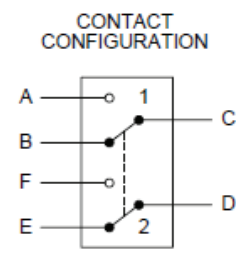
Flying Leads option



Quick disconnect option



A	Normally Open 1
B	Normally Closed 1
C	Common 1
D	Common 2
E	Normally Closed 2
F	Normally Open 2



A	Normally Open 1
B	Normally Closed 1
C	Common 1
D	Common 2
E	Normally Closed 2
F	Normally Open 2

Mounting

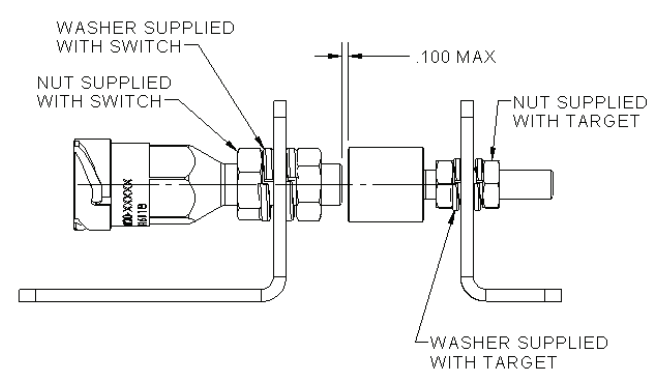
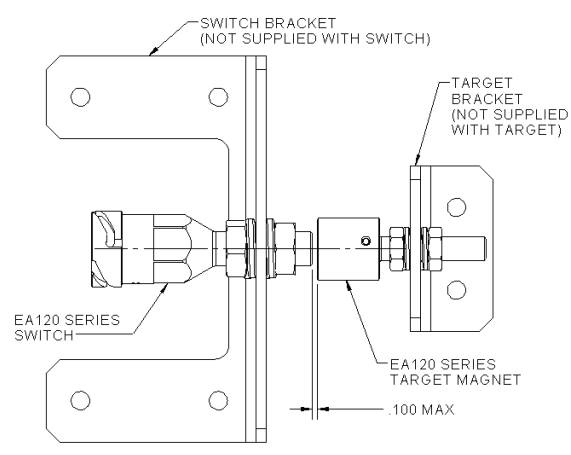
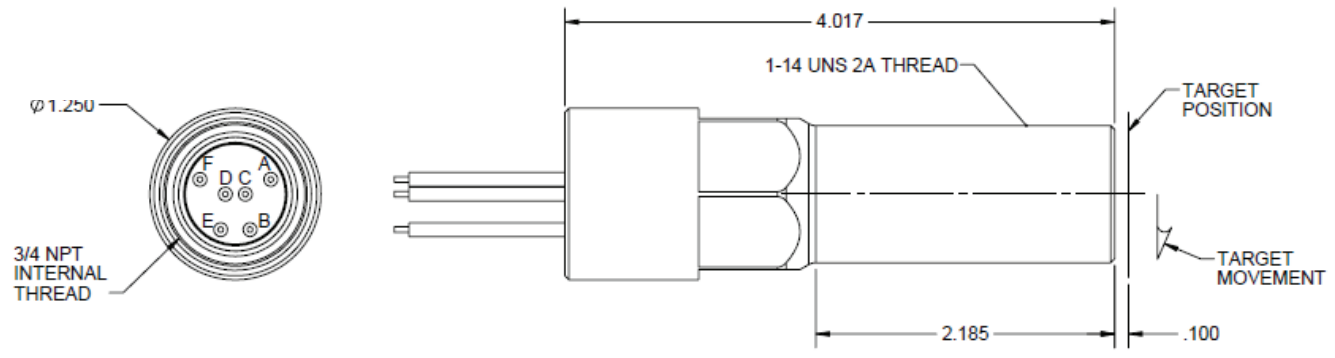


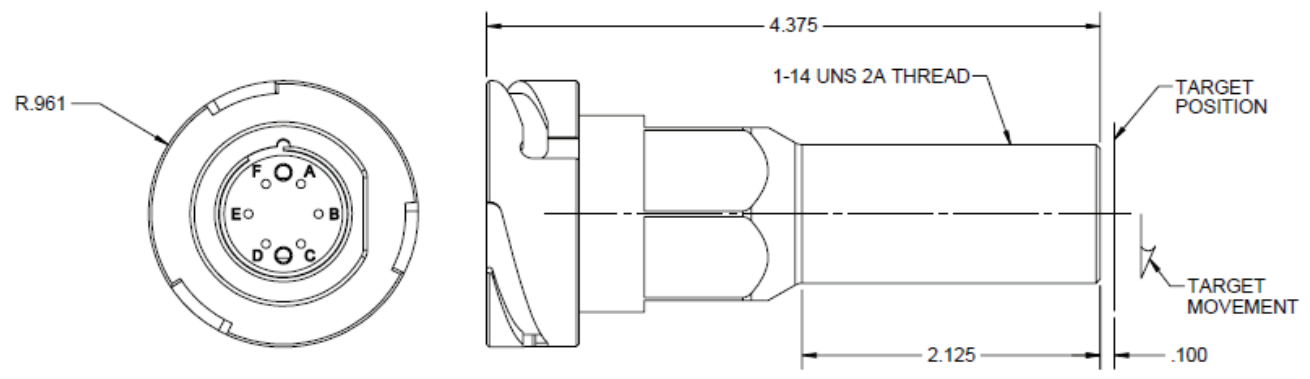
Figure reflects switch in "actuated" position.
 Two 1-14 UNS 2A jam nuts and two 1" lock washers supplied with switch.
 Target magnet EA120-10001 required for operation (sold separately).
 Average hysteresis: 0.20" (5mm) to 0.40" (10mm)

Outline Drawings

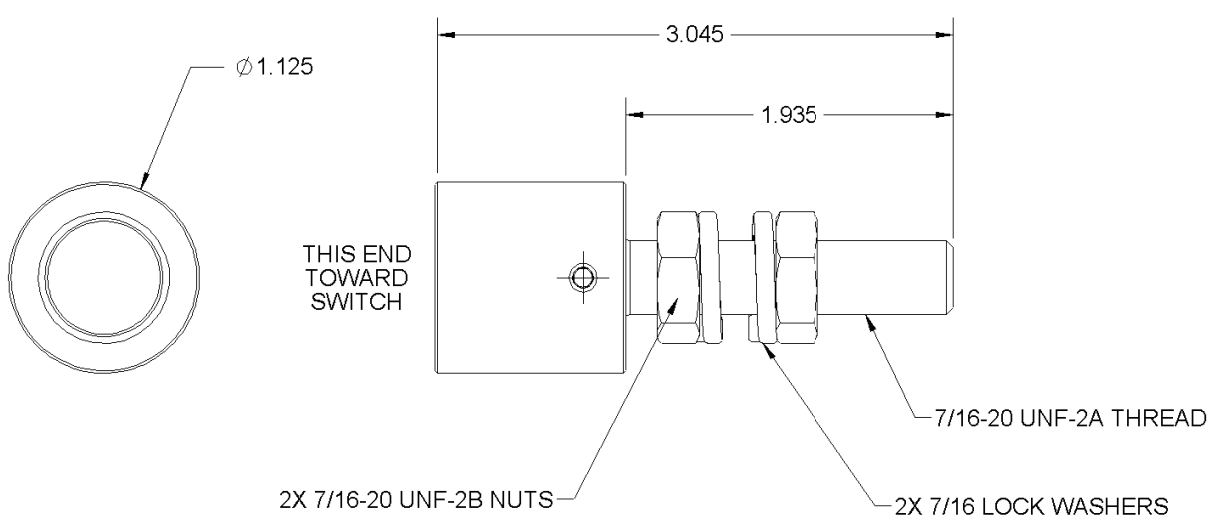
DPDT Flying Leads Model



DPDT Quick Disconnect Model



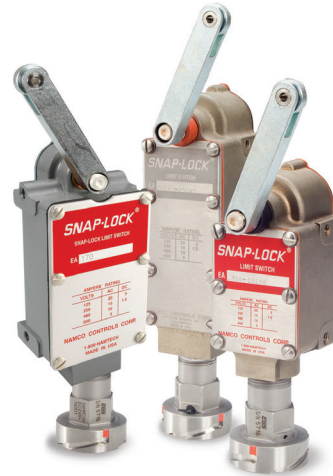
Target Magnet (EA120-10001)








All dimensions given in Inches (mm)

Mechanical Limit Switches

Limit switches are used to detect the position of mechanical motion and provide accurate position indication. An actuator, usually in the form of a lever arm, physically engages the switch, allowing the internal electrical contacts to change state. Applications that typically use limit switches include valve position indication, sorting, level detection and many safety related situations.



NAMCO	Harsh Environment With Accident Conditions			Harsh Environment Without Accident Conditions	
	Test Conditions	LOCA, HELB, Radiation, Siesmic Resistant			Radiation & Siesmic Resistant
Model	EA090	EA180	EA740	EA095	EA170
	Coming Soon! 			Coming Soon! 	
Contacts	SPDT	DPDT	DPDT	SPDT	DPDT
Connection Options	Conduit Opening	NPT Conduit Opening	NPT Conduit Opening	Conduit Opening	NPT Conduit Opening
	Flying Leads	QDC	QDC	Flying Leads	QDC
SNAP-LOCK®	Cam Type	Rocker Type	Cam Type	Cam Type	Rocker Type

Qualifications

- IEEE 323-1974, 1983 & 2003
- IEEE 344-1975, 1987 & 2004
- IEEE 382-1972, 1980, 1996 & 2006
- IEEE 383-1972, 1974 & 2003
- IEEE 572-1985, 2004 & 2006
- Special qualifications for Westinghouse, GE, AECL, B & W, KOPEC and RCC-E design specifications
- IEC 60780 (1998), 60980 (1989), & 60068 (2007)

EA740

Harsh Environment With Accident Conditions

Description

- Double Pole Double Throw (DPDT)
- Cam Type SNAP-LOCK® Technology
- Qualified to IEEE Standards 344-1975, 323-1974, and 382-1972
- Manufactured to a quality assurance program designed to meet the requirements of 10CFR50, Appendix B, and ANSI N45.2, as applicable
- Die-cast bronze housing for corrosion resistance
- Stainless steel top cover and fasteners
- Gold-plated contacts minimize resistance and ensure years of reliable service
- High temperature components
- High temperature lubricants
- Seismic and vibration resistant
- Resists chemical spray
- Three mounting styles (Standard, Long, Wide) available



Technical Data

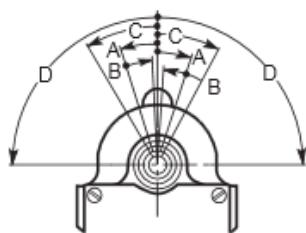
- Two normally open and two normally closed, NEMA for "Z" contact arrangement
- Enclosure meets NEMA 1, 4, and 13 requirements for dust-tight, water-tight and oil-tight applications
- Operating lever is adjustable in 7°30' increments through 360°
- Adequate wiring space for nine conductors
- Operating temperature 21° to 90°C
- Short term exposure to 175°C
- EA740 has 18° pre-travel, maximum travel 90°
- Weight: EA740: 4.3 lbs.
EA740 with receptacle: 5.3 lbs
- DBE maximum test parameters
 - Temperature: 340°F
 - Pressure: 70 PSIG
 - Radiation: 204 megarads gamma

Continuous Current Rating 75-100% Power Factor*

120 VAC	20 AMPS*
250 VAC	15 AMPS*
480 VAC	10 AMPS*
600 VAC	5 AMPS*
125 VDC	5 AMPS
250 VDC	1.5 AMPS

Operational Data

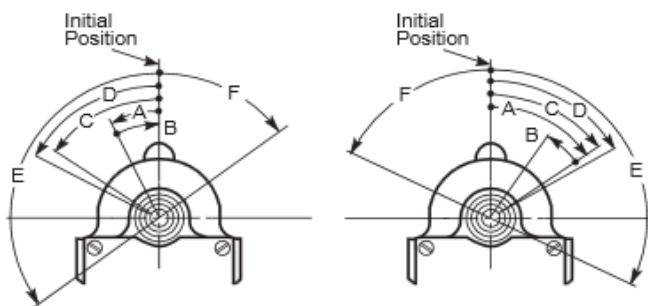
Standard Contacts



- A. Trip Travel18°
- B. Reset Travel14°
- C. Recommended Travel 30°
- D. Total Travel 90°
- E. Torque to Trip (Inch Lbs.)... 27

For CW Switch				For CCW Switch				For CW & CCW Switch			
CW	Initial	G	CCW	CW	Initial	G	CCW	CW	Initial	G	CCW
●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●

Maintained Contacts & Lever Position

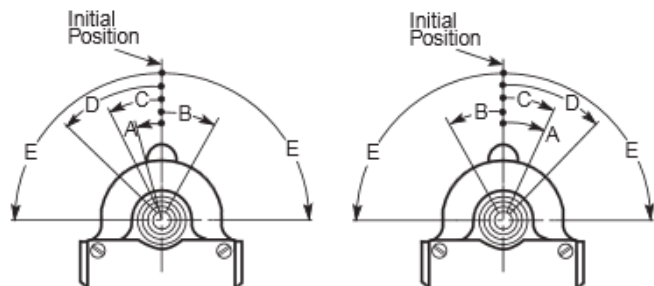


- | | CCW | CW |
|------------------------------------|------|------|
| A. Trip Travel | 25° | 55° |
| B. Reset Travel | 25° | 22° |
| C. Min. Travel to Maintain | 54° | 55° |
| D. Recommended Travel | 60° | 60° |
| E. Total Travel | 124° | 116° |
| F. Overall Travel | 56° | 64° |
| G. Torque to Trip (Inch Lbs.)..... | 12 | 6 |

To change switch orientation from Cam position (left view) to Cam position (right view), separate switch then angle C. Remove lever and reset at initial position.

For CW Switch				For CCW Switch			
CW	Initial	G	CCW	CW	Initial	G	CCW
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●

Maintained Contacts - Lever Returned



- | | CCW | CW |
|------------------------------------|------|-----|
| A. Trip Travel | 16° | 30° |
| B. Reset Travel | 30° | 26° |
| C. Min. Travel to Maintain | 26° | 30° |
| D. Recommended Travel | 45° | 45° |
| E. Total Travel | 90° | 90° |
| F. Torque to Trip (Inch Lbs.)..... | 16.5 | 15 |

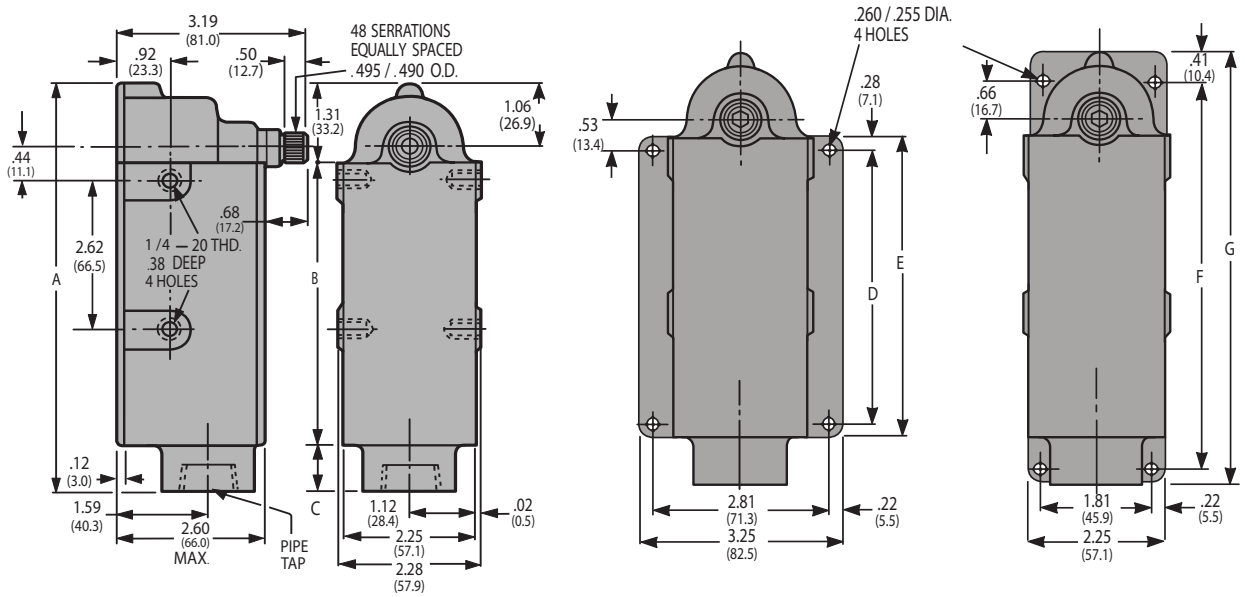
To change switch orientation from Cam position (left view) to Cam position (right view), separate switch then angle B. Remove lever and reset at initial position.

For CW Switch				For CCW Switch			
CW	Initial	G	CCW	CW	Initial	G	CCW
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●

EA740

Harsh Environment With Accident Conditions

Outline Drawings

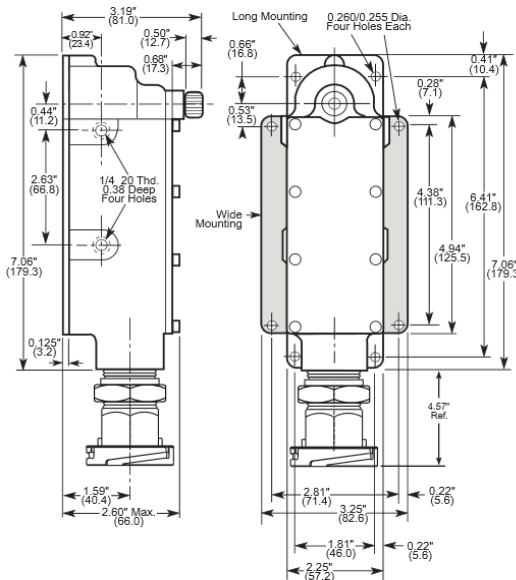


Standard Mounting

Wide Mounting

Long Mounting

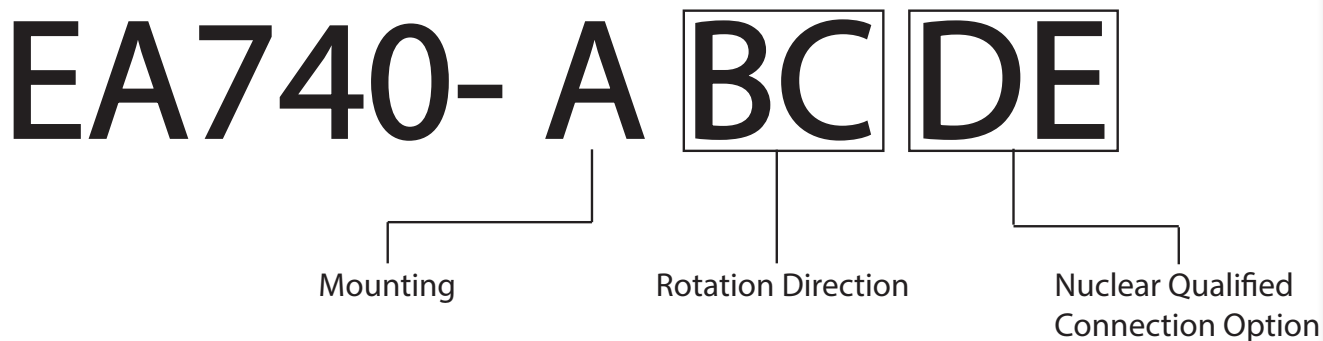
CONTACT SEQUENCE	STANDARD SWITCH				MOUNTING STYLE			
	PIPE TAP SIZE	A	B	C	WIDE		LONG	
					D	E	F	G
2 N.O. - 2 N.C.	1-11 1/2 NPT	7.06	4.94	0.81	4.38	4.94	6.41	7.06



QDC Mounting

All dimensions given in Inches (mm)

Ordering Information

**A: Mounting**

- 2xxxx - Standard Mount
- 5xxxx - Wide Mount
- 8xxxx - Long Mount

BC: Rotation Direction

- x00xx - Clockwise or Counterclockwise Operation
- x01xx - Clockwise and Counterclockwise Operation
- x60xx - Maintained Contact and Lever Position
- x67xx - Maintained Contact, Lever Returned

DE: Nuclear Qualified Connection Option

- xxx00 - Open Conduit Entrance for Clockwise or Maintained operation
- xxx01 - Open Conduit Entrance for Counterclockwise operation
- xxx40 - 9-Pin QDC Clockwise or Maintained operation
- xxx41 - 9-Pin QDC for Counterclockwise operation
- xxx50 - 4-Pin QDC 1NO/1NC Clockwise or Maintained operation
- xxx51 - 4-Pin QDC 1NO/1NC for Counterclockwise operation
- xxx52 - 4-Pin QDC 2NO Clockwise or Maintained operation
- xxx53 - 4-Pin QDC 2NO for Counterclockwise operation
- xxx54 - 4-Pin QDC 2NC Clockwise or Maintained operation
- xxx55 - 4-Pin QDC 2NC for Counterclockwise operation

ex. EA740-20050

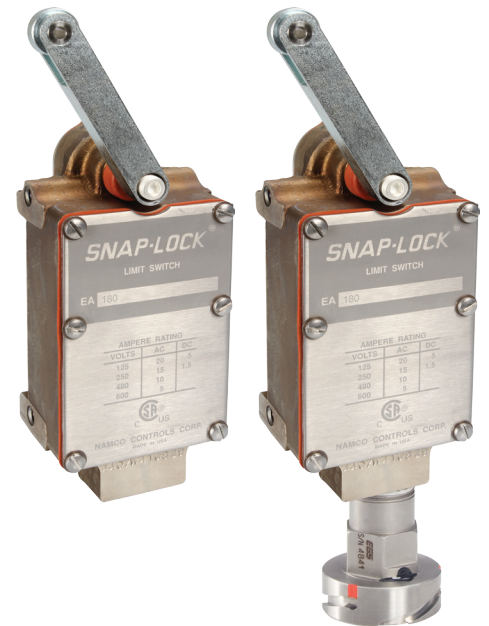
(Standard Mount, Clockwise Operation with 4-Pin QDC 1NO/1NC)

EA180

Harsh Environment With Accident Conditions

Description

- Double Pole Double Throw (DPDT)
- Rocker Type SNAP-LOCK® Technology
- Qualified to IEEE Standards 344-1975, 323-1974, and 382-1972
- Manufactured to a quality assurance program designed to meet the requirements of 10CFR50, Appendix B, and ANSI N45.2, as applicable
- Die-cast bronze housing for corrosion resistance
- Stainless steel top cover and fasteners
- Gold-plated contacts minimize resistance and ensure years of reliable service
- High temperature components throughout
- High temperature lubricants
- Seismic and vibration resistant
- Resists chemical spray
- EA 180 has a positive lever latching mechanism
- Three mounting styles (Standard, Long, Wide) available



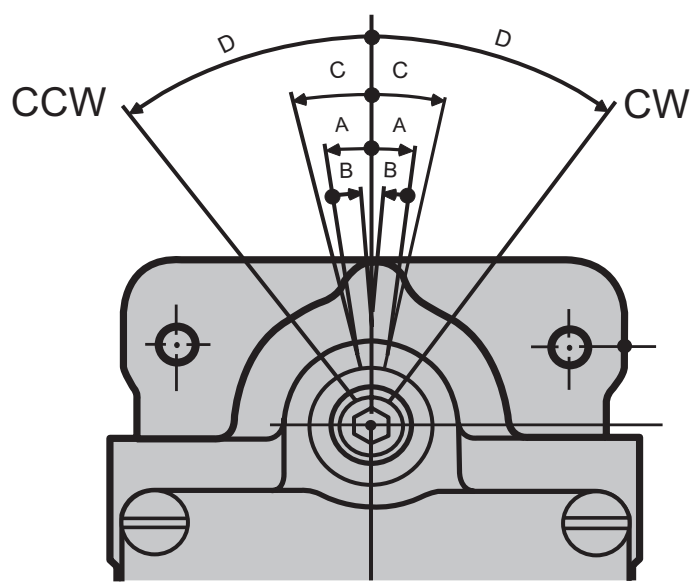
Technical Data

- Two normally open and two normally closed, NEMA for "Z" contact arrangement
- Enclosure meets NEMA 1, 4, and 13 requirements for dust-tight, water-tight and oil-tight applications
- Operating lever is adjustable in 7°30' increments through 173°
- Adequate wiring space for nine conductors
- Operating temperature 0° to 90°C
- Short term exposure to 175°C
- EA 180-302/402 has 10° or 6½ ° pre-travel, maximum travel 37°
- Weight: EA 180-302: 4.5 lbs.; EA 180-402: 5.5 lbs
- DBE maximum test parameters
 - Temperature: 340°F
 - Pressure: 70 PSIG
 - Radiation: 204 megarads gamma

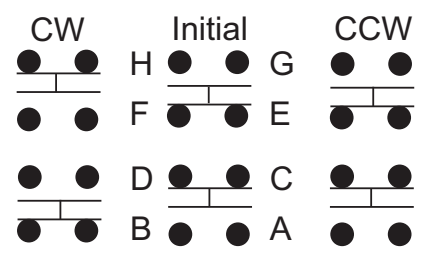
Continuous Current Rating 75-100% Power Factor*

120 VAC	20 AMPS*
250 VAC	15 AMPS*
480 VAC	10 AMPS*
600 VAC	5 AMPS*
125 VDC	5 AMPS
250 VDC	1.5 AMPS

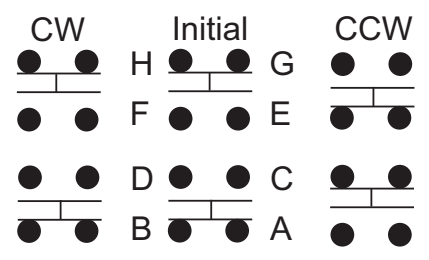
Operational Data



For CW Switch



For CCW Switch



Series EA180 - Standard

- A. Trip Travel 10°
- B. Reset Travel 8°
- C. Recommended Travel 13°
- D. Total Travel 37°
- E. Torque to Trip (Inch Lbs.)..... 21

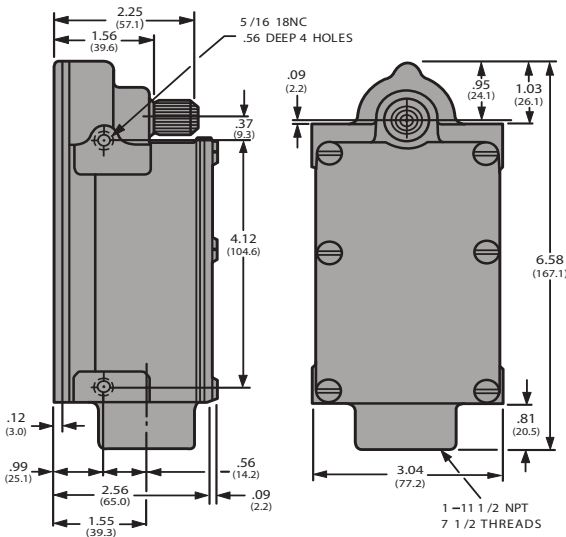
Series EA180 - Short Travel

- A. Trip Travel 6°30'
- B. Reset Travel 4°
- C. Recommended Travel 7°
- D. Total Travel 36°
- E. Torque to Trip (Inch Lbs.) 32

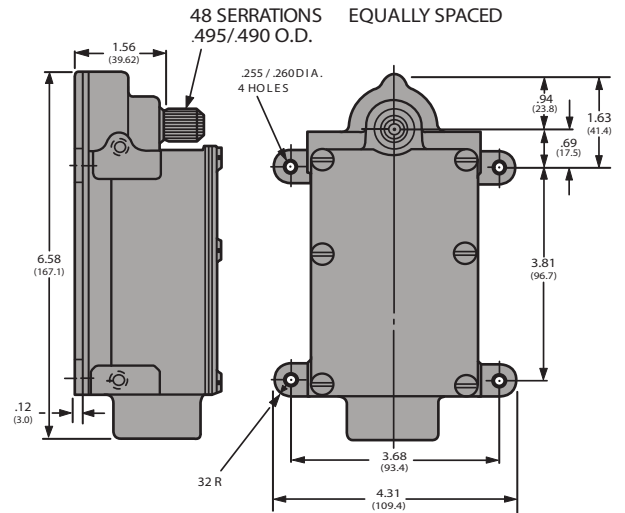
EA180

Harsh Environment With Accident Conditions

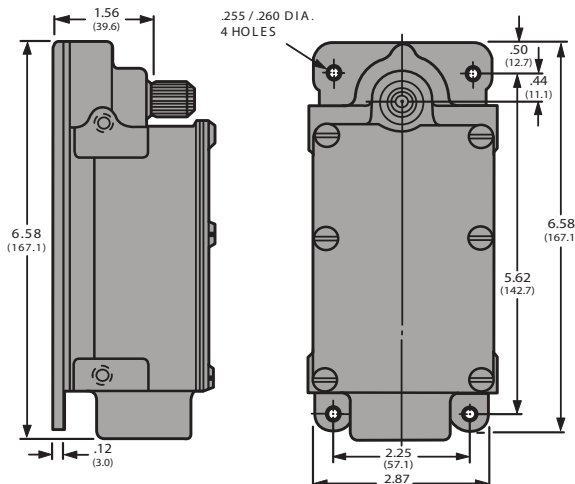
Outline Drawings



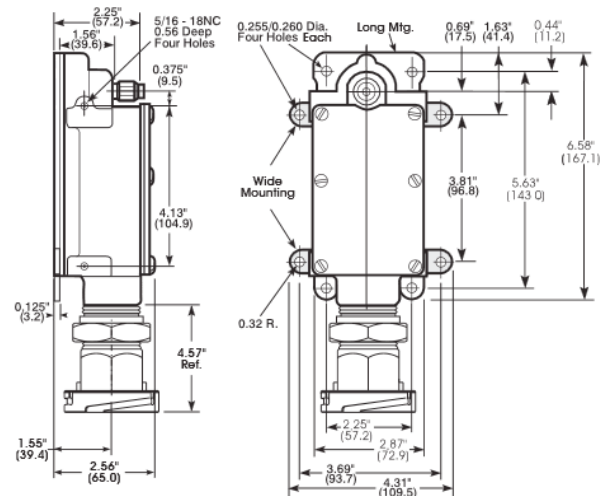
Standard Mounting



Wide Mounting

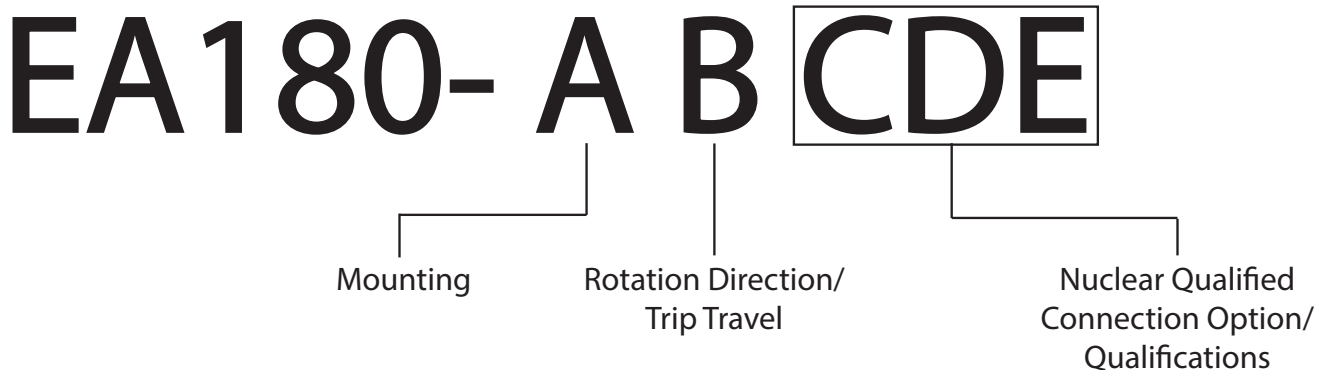


Long Mounting



QDC Mounting

Ordering Information

**A: Mounting**

- 1xxxx - Standard Mount
- 2xxxx - Wide Mount
- 3xxxx - Long Mount

B: Rotation Direction/Trip Travel

- x1xxx - Clockwise & Standard Travel
- x2xxx - Counterclockwise & Standard Travel
- x3xxx - Maintained & Standard Travel
- x4xxx - Clockwise & Short Travel
- x5xxx - Counterclockwise & Short Travel
- x6xxx - Maintained & Short Travel

CDE: Nuclear Qualified Connection Option/Qualification

- xx302 - Open Conduit Entrance with Generic Gen-2 Nuclear Qualifications
- xx307 - Open Conduit Entrance (Wolsong 2, 3 & 4)
- xx309 - Open Conduit Entrance (ULCHIN 1, 2, 3, 4, 5 & 6; YONGGWANG 5 & 6; Shin-Kori 1 & 2; Shin-Wolsong 1 & 2; BNPP 1, 2, 3, & 4; Shin-Hanul 1 & 2)
- xx402 - 9-Pin QDC with Generic Gen-2 Nuclear Qualifications
- xx501 - 4-Pin QDC with Generic Gen-2 Nuclear Qualifications
- xx502 - 4-Pin QDC with Generic Gen-2 Nuclear Qualifications

ex. EA180-14302

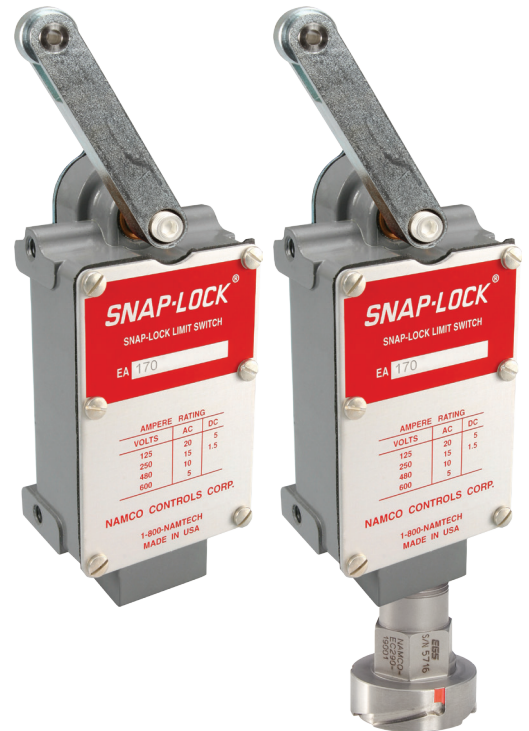
(Standard Mount, Clockwise & Short Travel, Open Conduit Entrance w/ Generic Gen-2 Nuclear Qualifications)

EA170

Harsh Environment Without Accident Conditions

Description

- Double Pole Double Throw (DPDT)
- Rocker Type SNAP-LOCK® Technology
- Qualified to IEEE Standards 344-1975, 323-1974, and 382-1972
- Manufactured to a quality assurance program designed to meet the requirements of 10CFR50, Appendix B, and ANSI N45.2, as applicable
- Die-cast zinc housing for corrosion resistance
- Stainless steel top cover and fasteners
- Gold-plated contacts minimize resistance and ensure years of reliable service
- High temperature components & lubricants
- Seismic and vibration resistant
- Configured for clockwise, counterclockwise or maintained operation
- EA170 has a positive lever latching mechanism
- Three mounting styles (Standard, Long, Wide) available



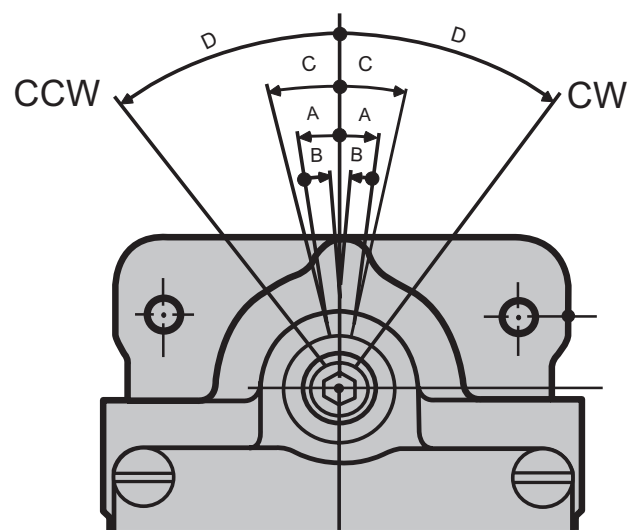
Technical Data

- Two normally open and two normally closed, NEMA for "Z" contact arrangement
- Enclosure meets NEMA 1, 4, and 13 requirements for dust-tight, water-tight and oil-tight applications
- Operating lever is adjustable in 7°30' increments through 173°
- Adequate wiring space for nine conductors
- Operating temperature 0° to 90°C
- EA 170-302/402 has 10° or 6½ ° pre-travel, maximum travel 37°
- Weight: EA 170-302: 3.5 lbs.
EA 170-402: 4.5 lbs

Continuous Current Rating 75-100% Power Factor*

120 VAC	20 AMPS*
250 VAC	15 AMPS*
480 VAC	10 AMPS*
600 VAC	5 AMPS*
125 VDC	5 AMPS
250 VDC	1.5 AMPS

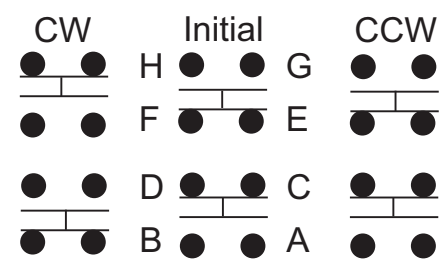
Operational Data



Series EA170 - Standard

- A. Trip Travel 10°
- B. Reset Travel 8°
- C. Recommended Travel 13°
- D. Total Travel 37°
- E. Torque to Trip (Inch Lbs.) 23

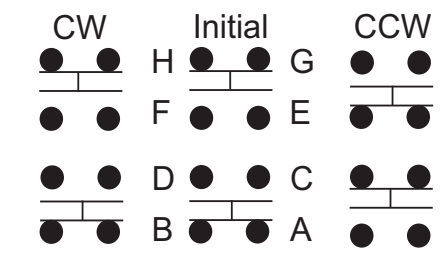
For CW Switch



Series EA170 - Short Travel

- A. Trip Travel 6°30'
- B. Reset Travel 4°
- C. Recommended Travel 7°
- D. Total Travel 36°
- E. Torque to Trip (Inch Lbs.) 32

For CCW Switch



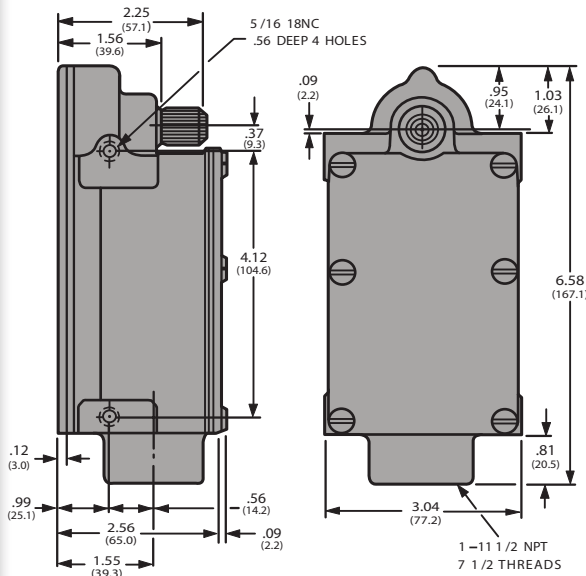
Series EA170 - Reverse Shaft

- A. Trip Travel 10°
- B. Reset Travel 8°
- C. Recommended Travel 13°
- D. Total Travel 38°
- E. Torque to Trip (Inch Lbs.) 23

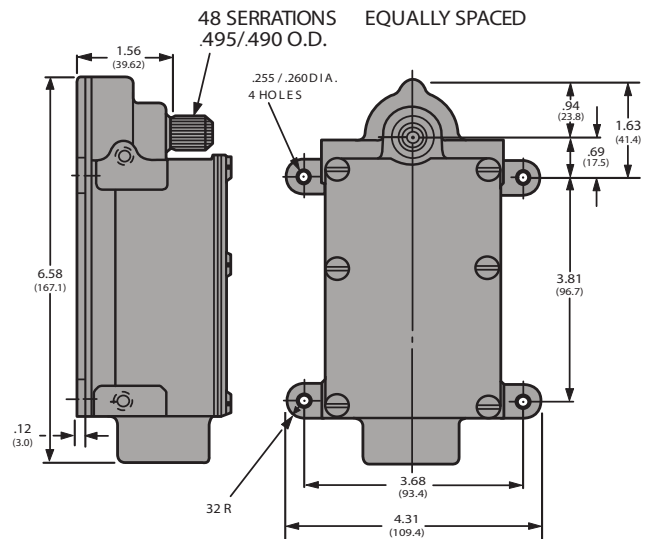
EA170

Harsh Environment Without Accident Conditions

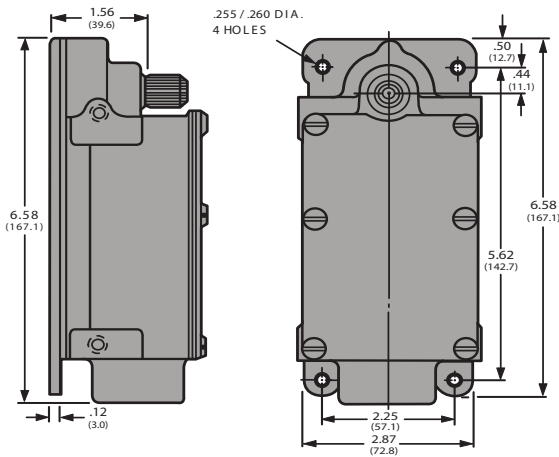
Outline Drawings



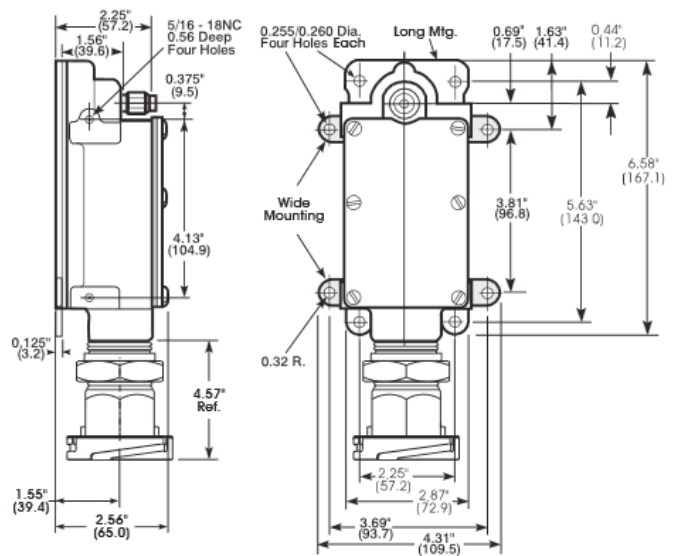
Standard Mounting



Wide Mounting

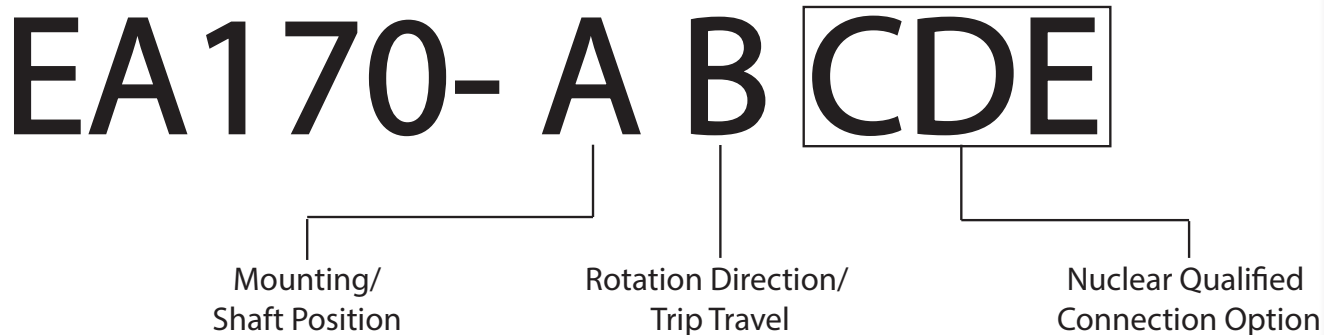


Long Mounting



Quick Disconnect

Ordering Information

**A: Mounting/Shaft Position**

- 1xxxx - Standard Mount & Front Shaft
- 2xxxx - Wide Mount & Front Shaft
- 3xxxx - Long Mount & Front Shaft
- 4xxxx - Standard Mount & Reverse Shaft
- 5xxxx - Wide Mount & Reverse Shaft
- 6xxxx - Long Mount & Reverse Shaft

B: Rotation Direction/Trip Travel

- x1xxx - Clockwise & Standard Travel
- x2xxx - Counterclockwise & Standard Travel
- x3xxx - Maintained & Standard Travel
- x4xxx - Clockwise & Short Travel
- x5xxx - Counterclockwise & Short Travel
- x6xxx - Maintained & Short Travel

CDE: Nuclear Qualified Connection Option

- xx302 - Open Conduit Entrance
- xx402 - 9-Pin Connector

ex. EA170-14302

(Standard Mount & Front Shaft, Clockwise & Short Travel, Open Conduit Entrance)

Nuclear Qualified Connectors

NAMCO nuclear connectors, designed for fast easy disconnect connect operation, dramatically reduce the exposure of personnel to radiation. They maintain the sealed integrity of limit switches by eliminating the need to disassemble and rewire the devices during required maintenance.

All units have a minimum life of 10 years under intense radiation and combine the following product features:

- Qualified to IEEE Standards
323-2003/1983/1974, 344-2004/1987/1975, 382-2006/1996/1980,
383-2003/1974/1972, 572-1985/2004
- Fully submersible, except for EC290 Series
- Connector keyed for quick positive one way connection
- Bayonet style connection, positive visual locking indicator
- Radiation resistant elastomer materials
- Flexible wire to eliminate kinking and fatigue failure
- Manufactured to a quality assurance program designed to meet the requirements of 10CFR50 Appendix B, and ANSI N25.2, as applicable
- Cable lengths available from 20 feet
- Seismic and vibration resistant

EC290-44xxx



Designed for EA180, EA740 & EA170

- Leakproof to DBE environments including LOCA and HELB conditions — e.g., steam, vapors, pressures up to 80 PSIG and chemical sprays
- Four wired pins

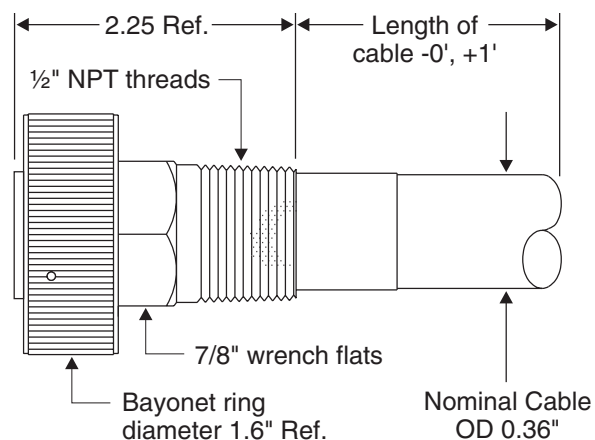
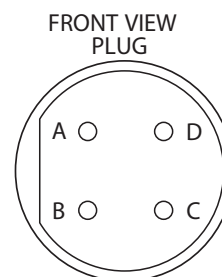
Cable Features

600V/90°C rated 4 conductor 16 AWG stranded nuclear grade cable has excellent resistance to radiation, heat, mechanical abuse, flame, weathering, most oils, acids and alkalis. Cable meet requirements of IEEE Std. 383 type test of Class IE electronic cables.

Plug-In Cable

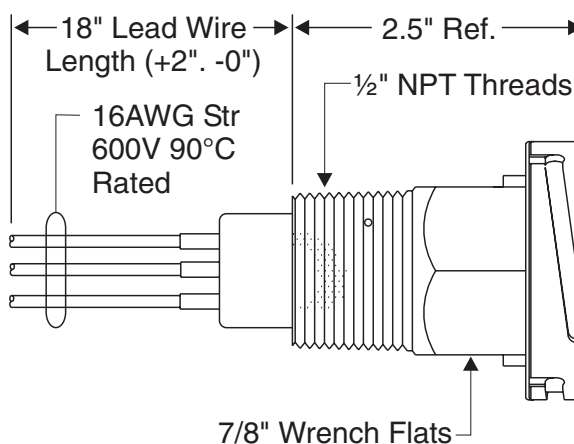
Cable lengths should be ordered with specific cable lengths between 20 and 100 feet lengths as follows:

Plug-In Cables	
Length	EC290-
20 ft. (6.1m)	44020
25 ft. (7.6m)	44025
30 ft. (9.1m)	44030
35 ft. (10.7m)	44035
50 ft. (15.2m)	44050
100 ft. (30.5m)	44100



EC290-34001

Mating Connector



EC290-29xxx



Designed for EA180, EA740 & EA170

- Leakproof to DBE environments including LOCA and HELB conditions — e.g., steam, vapors, pressures up to 80 PSIG and chemical sprays.
- Nine wired pins: Eight leads plus ground wire for EA740 EA180/EA170 Series.

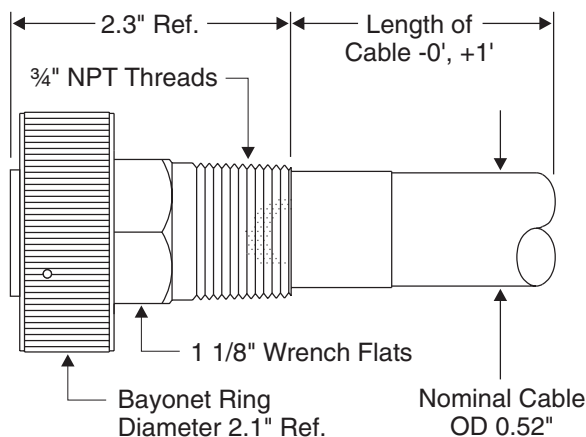
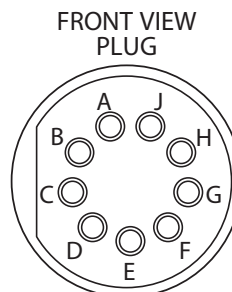
Cable Features

600V/90°C rated 9 conductor 16 AWG stranded nuclear grade cable has excellent resistance to radiation, heat, mechanical abuse, flame, weathering, most oils, acids and alkalis. Cable meet requirements of IEEE Std. 383 type test of Class IE electronic cables.

Plug-In Cable

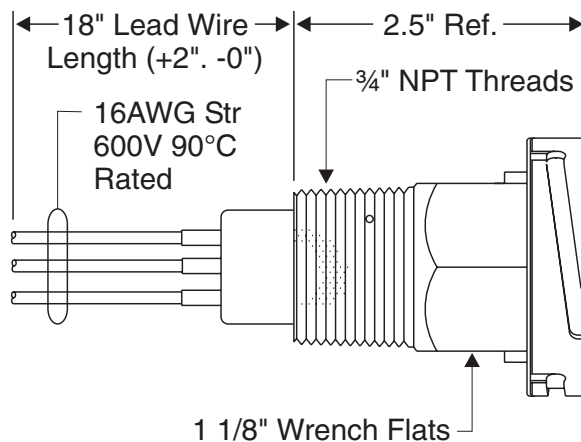
Cable lengths should be ordered with specific cable lengths between 20 and 100 feet lengths as follows:

Plug-In Cables	
Length	EC290-
20 ft. (6.1m)	29020
25 ft. (7.6m)	29025
30 ft. (9.1m)	29030
35 ft. (10.7m)	29035
50 ft. (15.2m)	29050
100 ft. (30.5m)	29100



EC290-19001

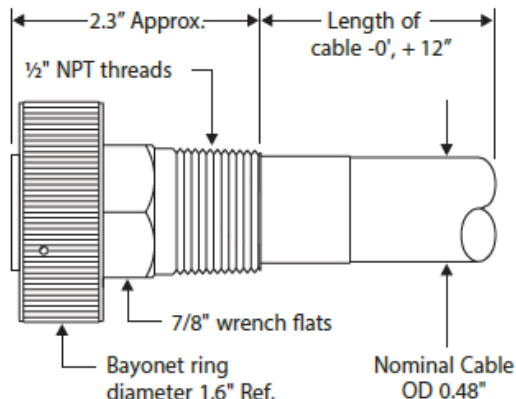
Mating Connector



EC390-44xxx

Designed for use with EA120 SPDT for Harsh Environments With Accident Conditions

- Four wired pins



Features

Cable Features

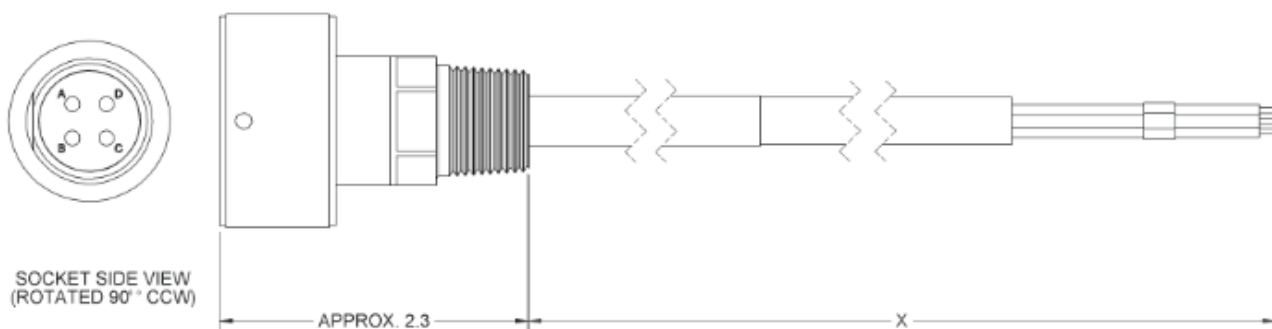
600V/90°C rated 4 conductor 16 AWG stranded nuclear grade cable has excellent resistance to radiation, heat, mechanical abuse, flame, weathering, most oils, acids and alkalis. Cable meet requirements of IEEE Std. 383 type test of Class IE electronic cables.

Plug-In Cable

Cable lengths should be ordered with specific cable lengths between 20 and 100 feet lengths as follows:

Plug-In Cables	
Length	EC390-
20 ft. (6.1m)	44020
25 ft. (7.6m)	44025
30 ft. (9.1m)	44030
35 ft. (10.7m)	44035
50 ft. (15.2m)	44050
100 ft. (30.5m)	44100

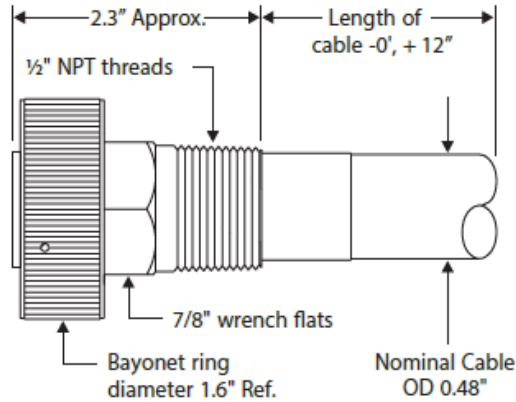
Connection



EC390-29xxx

Designed for use with EA120 DPDT for Harsh Environments With Accident Conditions

- Six wired pins



Features

Cable Features

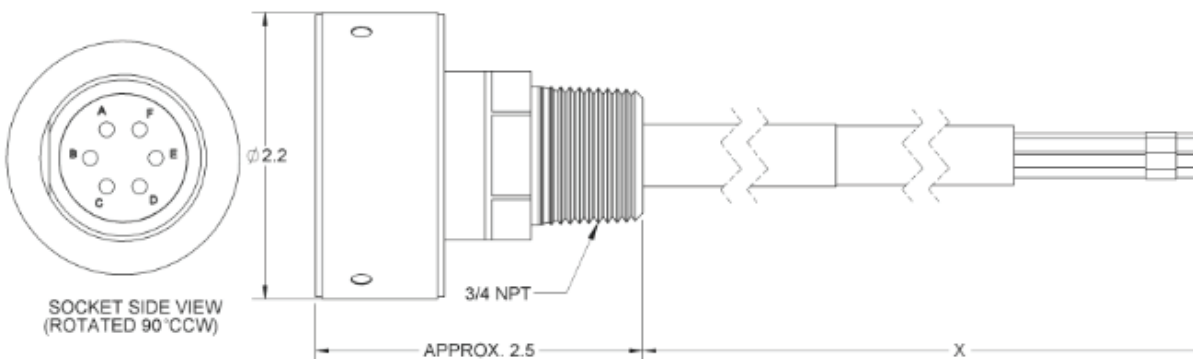
600V/90°C rated 6 conductor 16 AWG stranded nuclear grade cable has excellent resistance to radiation, heat, mechanical abuse, flame, weathering, most oils, acids and alkalis. Cable meet requirements of IEEE Std. 383 type test of Class IE electronic cables.

Plug-In Cable

Cable lengths should be ordered with specific cable lengths between 20 and 100 feet lengths as follows:

Plug-In Cables	
Length	EC390-
20 ft. (6.1m)	29020
25 ft. (7.6m)	29025
30 ft. (9.1m)	29030
35 ft. (10.7m)	29035
50 ft. (15.2m)	29050
100 ft. (30.5m)	29100

Connection



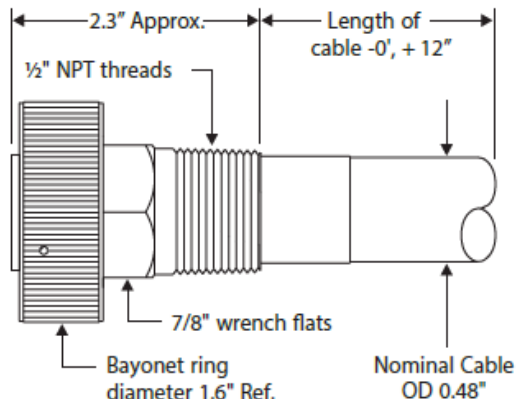
NUCLEAR QUALIFIED CONNECTORS

1-800-390-6405 or 1-910-862-2511

EC490-44xxx

Designed for use with EA120 SPDT for Mild Environments

- Four wired pins



Features

Cable Features

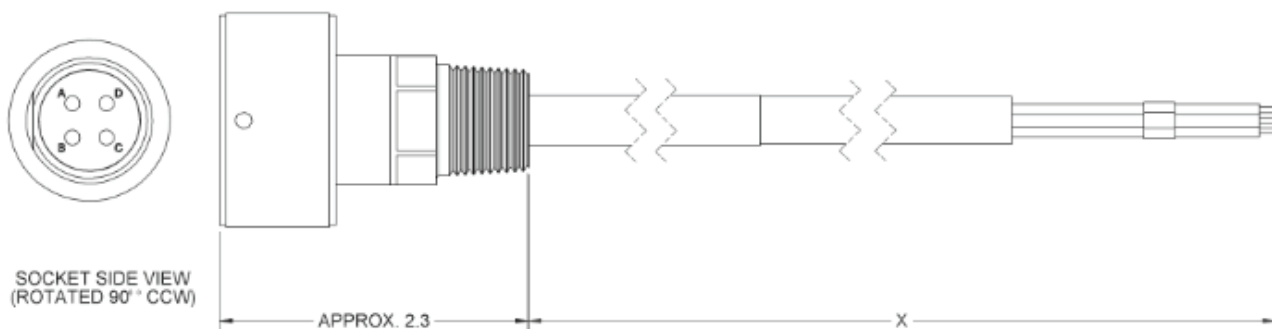
600V/90°C rated 4 conductor 16 AWG stranded nuclear grade cable has excellent resistance to radiation, heat, mechanical abuse, flame, weathering, most oils, acids and alkalis. Cable meet requirements of IEEE Std. 383 type test of Class IE electronic cables.

Plug-In Cable

Cable lengths should be ordered with specific cable lengths between 20 and 100 feet lengths as follows:

Plug-In Cables	
Length	EC490-
20 ft. (6.1m)	44020
25 ft. (7.6m)	44025
30 ft. (9.1m)	44030
35 ft. (10.7m)	44035
50 ft. (15.2m)	44050
100 ft. (30.5m)	44100

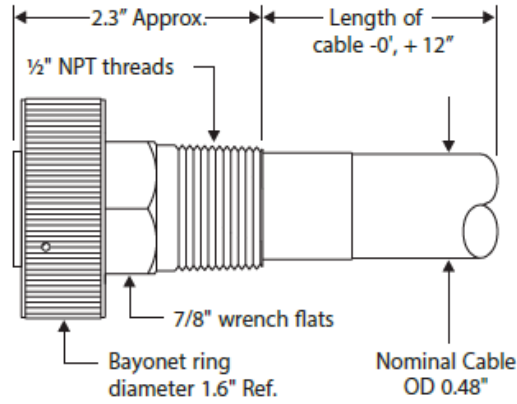
Connection



EC490-29xxx

Designed for use with EA120 DPDT for Mild Environments

- Six wired pins



Features

Cable Features

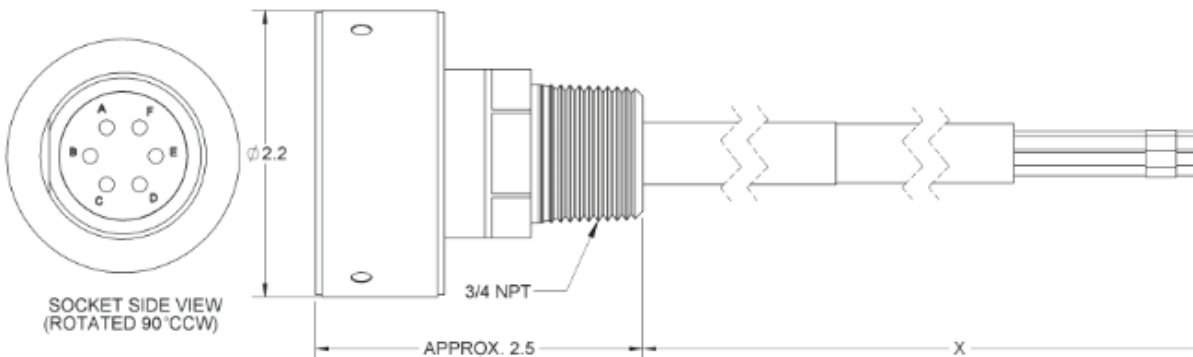
600V/90°C rated 6 conductor 16 AWG stranded nuclear grade cable has excellent resistance to radiation, heat, mechanical abuse, flame, weathering, most oils, acids and alkalis. Cable meet requirements of IEEE Std. 383 type test of Class IE electronic cables.

Plug-In Cable

Cable lengths should be ordered with specific cable lengths between 20 and 100 feet lengths as follows:

Plug-In Cables	
Length	EC490-
20 ft. (6.1m)	29020
25 ft. (7.6m)	29025
30 ft. (9.1m)	29030
35 ft. (10.7m)	29035
50 ft. (15.2m)	29050
100 ft. (30.5m)	29100

Connection



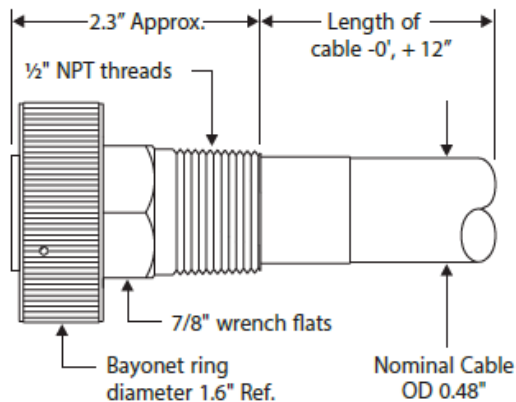
NUCLEAR QUALIFIED CONNECTORS

1-800-390-6405 or 1-910-862-2511

EC590-44xxx

Designed for use with EA120 SPDT for Harsh Environments Without Accident Conditions

- Four wired pins



Features

Cable Features

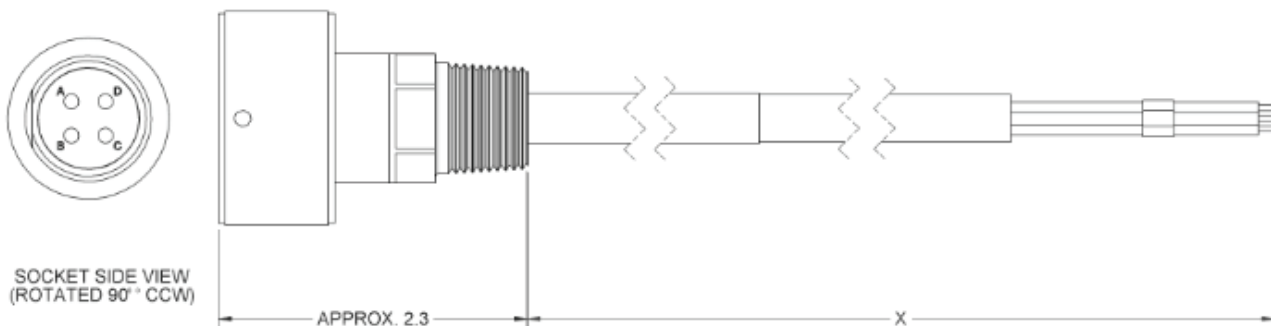
600V/90°C rated 4 conductor 16 AWG stranded nuclear grade cable has excellent resistance to radiation, heat, mechanical abuse, flame, weathering, most oils, acids and alkalis. Cable meet requirements of IEEE Std. 383 type test of Class IE electronic cables.

Plug-In Cable

Cable lengths should be ordered with specific cable lengths between 20 and 100 feet lengths as follows:

Plug-In Cables	
Length	EC590-
20 ft. (6.1m)	44020
25 ft. (7.6m)	44025
30 ft. (9.1m)	44030
35 ft. (10.7m)	44035
50 ft. (15.2m)	44050
100 ft. (30.5m)	44100

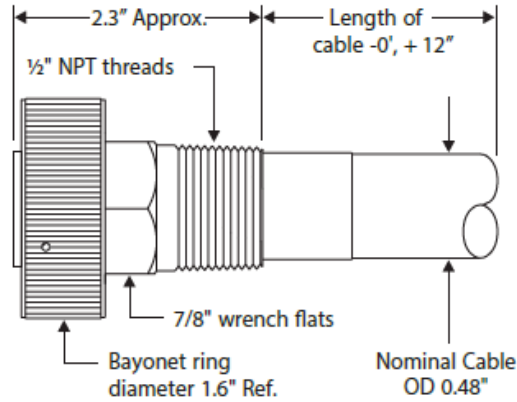
Connection



EC590-29xxx

Designed for use with EA120 DPDT for Harsh Environments Without Accident Conditions

- Six wired pins



Features

Cable Features

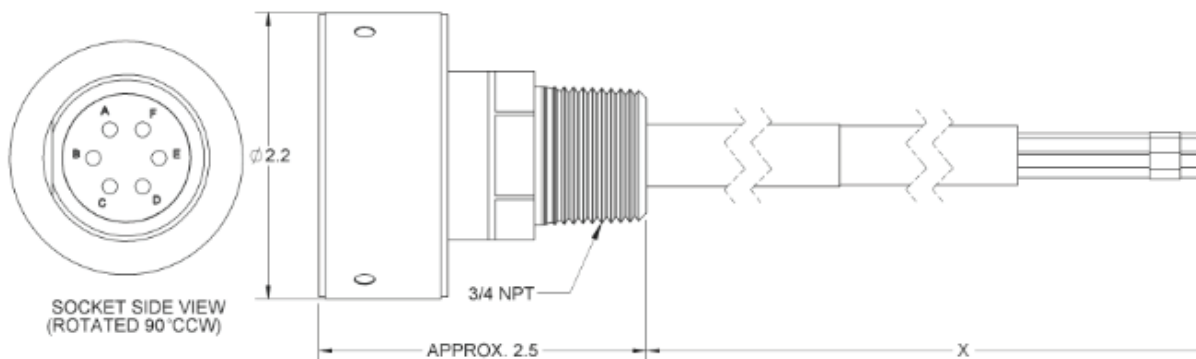
600V/90°C rated 6 conductor 16 AWG stranded nuclear grade cable has excellent resistance to radiation, heat, mechanical abuse, flame, weathering, most oils, acids and alkalis. Cable meet requirements of IEEE Std. 383 type test of Class IE electronic cables.

Plug-In Cable

Cable lengths should be ordered with specific cable lengths between 20 and 100 feet lengths as follows:

Plug-In Cables	
Length	EC590-
20 ft. (6.1m)	29020
25 ft. (7.6m)	29025
30 ft. (9.1m)	29030
35 ft. (10.7m)	29035
50 ft. (15.2m)	29050
100 ft. (30.5m)	29100

Connection



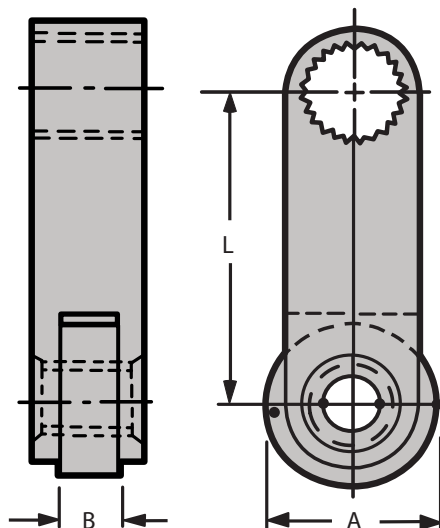
Operating Levers

Please select the operating lever for your application with regards to dimensions and materials required.

Requests for operating levers not shown should include lever style and all specific information as to limit switch number, dimensions, materials, etc.

Depending upon your application, levers are available in cold rolled steel, stainless steel, or bronze. Rollers are available in steel, nylon, beryllium copper, stainless steel or steel ball bearings. Please consult materials column of the lever of your choice.

This style and size operating lever is considered standard for the majority of snap-lock switch installations. The EL010-53420 (D1260) lever is steel with a nylon roller and a stainless steel roller pin. Like all Snap-Lock levers, the serrated mounting hole matches the serrated lever shaft of the switches to provide fixed adjustment of the lever in 7.5° increments.



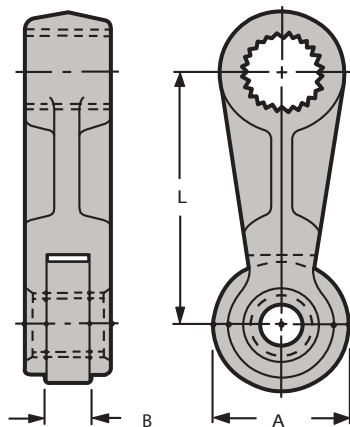
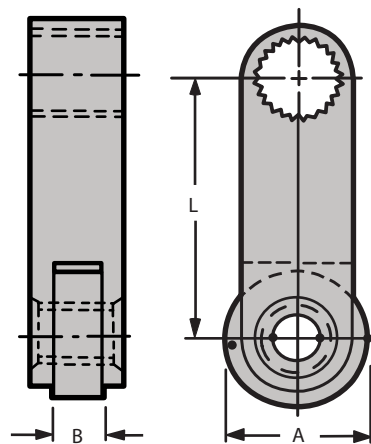
Style R

ORDERING NUMBERS		L	A	B	MATERIAL	
PART NUMBER	REFERENCE				LEVER	ROLLER
EL060-50320	D1260BA	3/4	3/4	1/4	C.R.S	C.R.S
EL060-51319	—	1	3/4	1/4	C.R.S	Bryl. Cop.
EL060-52321	D1260GQ	1-1/4	3/4	1/4	C.R.S	C.R.S
EL060-53923	D1260BH	1-1/2	1-1/4	1/4	C.R.S	C.R.S
EL010-53338	DS1260	1-1/2	3/4	1/4	STEEL	C.R.S
EL060-53300	—	1-1/2	3/4	1/4	BRASS	Bryl. Cop.
EL010-53336	—	1-1/2	3/4	1/4	STEEL	S.S.
EL010-53337	—	1-1/2	3/4	1/4	STEEL	Bryl. Cop.
EL060-53401	D1260RF	1-1/2	9/32	9/32	BRASS	NYLON
EL060-53402	—	1-1/2	7/8	9/32	BRASS	Bryl. Cop.
EL010-53420	D1260	1-1/2	7/8	9/32	STEEL	NYLON
EL010-53429	D1260Y	1-1/2	7/8	9/32	STEEL	B.B.
EL060-53536	D1260Z	1-1/2	1	1/4	C.R.S	C.R.S
EL060-53926	D1260CL	1-1/2	1-3/8	1/4	C.R.S	C.R.S
EL060-55327	D1260E	2	3/4	1/4	C.R.S	C.R.S
EL060-55300	—	2	3/4	1/4	C.R.S	Bryl. Cop.
EL060-55520	D1260AC	2	1	1/4	C.R.S	C.R.S
EL060-55601	—	2	1	1/4	C.R.S	Bryl. Cop.
EL060-55530	D1260RT	2	1	1/4	BRASS	Bryl. Cop.
EL060-55927	D1260GT	2	1-1/2	1/4	C.R.S	C.R.S
EL060-50321	D1260BC	2-1/8	3/4	1/4	C.R.S	C.R.S
EL060-50501	D1260B	2-1/8	1	1/4	C.R.S	C.R.S
EL060-50334	D1260M	2-1/4	3/4	1/4	C.R.S	C.R.S
EL060-59300	D1260KC	2-3/8	3/4	1/4	C.R.S	C.R.S
EL010-56427	D1260KC	2-1/2	7/8	9/32	STEEL	NYLON
EL010-56334	DS1260K	2-1/2	3/4	1/4	STEEL	C.R.S
EL010-55421	D1260DF	2-1/2	1	1/4	C.R.S	C.R.S
EL060-56500	D1260RR	2-1/2	1	1/4	BRASS	Bryl. Cop.
EL060-56920	D1260CP	2-1/2	1-1/2	1/4	C.R.S	C.R.S
EL060-50322	D1260BD	2-3/4	3/4	1/4	C.R.S	C.R.S
EL060-57300	—	2-3/4	3/4	1/4	C.R.S	Bryl. Cop.
EL010-58300	—	3	3/4	1/4	STEEL	Bryl. Cop.
EL010-58337	DS1260L	3	3/4	1/4	STEEL	C.R.S
EL060-58305	—	3	3/4	1/4	BRASS	Bryl. Cop.
EL010-58400	—	3	7/8	9/32	STEEL	Bryl. Cop.
EL010-58423	D1260L	3	7/8	9/32	STEEL	NYLON
EL010-58451	—	3	7/8	9/32	STEEL	C.R.S
EL060-58401	—	3	7/8	9/32	BRASS	NYLON
EL060-58403	D1260VQ	3	7/8	9/32	S.S.	Bryl. Cop.
EL010-58521	D1260CJ	3	1	1/4	STEEL	C.R.S
EL010-58522	—	3	1	1/4	C.R.S	Bryl. Cop.
EL010-58923	D1260CN	3	1-1/4	1/4	STEEL	C.R.S
EL060-58923	—	3	1-1/4	1/4	BRASS	STEEL
EL010-58900	D1260VR	3	1-1/2	1/4	STEEL	NYLON
EL010-58920	D1260AE	3	1-1/2	1/4	STEEL	C.R.S
EL060-58320	D1260BB	3-1/2	3/4	1/4	C.R.S	C.R.S
EL060-58431	D1260AP	3-1/2	1	1/4	C.R.S	C.R.S
EL060-58932	—	3-1/2	3/4	1/4	BRASS	Bryl. Cop.
EL060-58930	—	3-1/2	1-1/2	1/4	BRASS	Bryl. Cop.
EL060-58326	D1260C	4	3/4	1/4	C.R.S	C.R.S
EL060-58304	D1260WD	4	3/4	1/4	C.R.S	Bryl. Cop.
EL060-50523	D1260BL	4	1	1/4	C.R.S	C.R.S
EL060-58925	—	4	1-1/4	1/4	BRASS	Bryl. Cop.
EL060-58920	D1260AB	4	1-1/2	1/4	C.R.S	C.R.S
EL060-58901	—	4	1-1/2	9/32	C.R.S	NYLON
EL060-50335	D1260N	5	3/4	1/4	C.R.S	C.R.S
EL060-50925	D1260BW	5	1-1/2	1/4	C.R.S	C.R.S
EL060-50305	D1260CQ	6	3/4	1/4	C.R.S	C.R.S
EL060-50338	—	6	3/4	1/4	C.R.S	Bryl. Cop.
EL060-50930	D1260JE	6	1-1/4	1/4	C.R.S	C.R.S
EL060-50703	D1260KD	6	3	1/4	C.R.S	C.R.S

Style R

Regular Straight Type

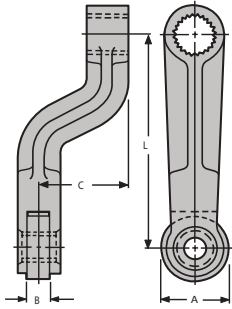
For series: EA170, EA180, EA740, EA090, EA095



Style RLO

Regular Lever Offset Type

For series: EA170,EA180, EA740, EA090, EA095



ORDERING NUMBERS		L	A	B	C	MATERIAL	
PART	REFERENCE					LEVER	ROLLER
* EL020-53326	D1260GX	1-1/2	3/4	1/4	1-1/4	Mang. Br.	STEEL
* EL020-53325	D1260GU	1-1/2	3/4	1/4	1-3/16	Mang. Br.	STEEL
EL020-55327	D1260HZ	2	3/4	1/4	1-1/8	Mang. Br.	STEEL
EL020-55300	D1260JD	2	3/4	1/4	1-1/2	Mang. Br.	STEEL
* EL020-56321	D1260DW	2-1/2	3/4	1/4	2-1/4	Mang. Br.	STEEL
EL020-56421	D1260DG	2-1/2	1	1/4	1	Mang. Br.	STEEL
EL020-58922	D1260FT	3	1-1/4	1/4	1-1/4	Mang. Br.	STEEL
EL020-58923		3	1-1/4	1/4	1-1/4	Mang. Br.	S.S.
EL020-59900	D1260AY	5-1/2	1-1/2	1/4	1-3/4	C.R.S.	STEEL

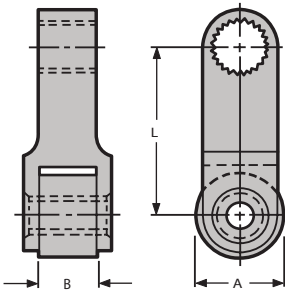
Offset lever with straddle-supported roller.

*On Series EA170/180, Lever will not clear top of switch when mounted with Roller facing rear.

Style RW

Wide Roller Regular Type

For series: EA170, EA180, EA740, EA090, EA095



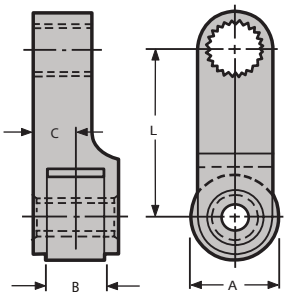
ORDERING NUMBERS		L	A	B	MATERIAL	
PART	REFERENCE				LEVER	ROLLER
EL070-53501	D1260AJ	1-1/2	1	1/2	C.R.S.	Bryl. Cop.
EL070-50507	D1260CY	1-5/8	1	1/2	C.R.S.	Bryl. Cop.
EL070-56921	D1260DY	2-1/2	1-1/4	1/2	C.R.S.	STEEL
EL060-00024	D1260AL	3	1-1/2	1/2	C.R.S.	STEEL
EL060-50921	D1260BE	4	1-1/4	1/2	C.R.S.	STEEL

Machined lever with wide roller straddle-supported directly in line with the serrated mounting hole.

Style RWO

Wide Roller Offset Type

For series: EA170, EA180, EA740, EA090, EA095



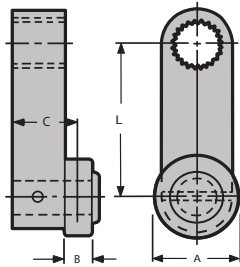
ORDERING NUMBERS		L	A	B	C	MATERIAL	
PART	REFERENCE					LEVER	ROLLER
EL080-53329	D1260R	1-1/2	3/4	1/2	3/8	Mang. Br.	STEEL
EL080-53321	D1260CS	1-1/2	3/4	1-1/8	3/4	Mang. Br.	STEEL
EL080-53932	D1260P	1-1/2	1-1/2	1/2	3/8	C.R.S.	STEEL
EL080-55323	D1260FR	2	3/4	1/2	3/8	C.R.S.	STEEL
EL080-54905	D1260DD	2	1-1/2	1/2	3/8	C.R.S.	C.R.S.
EL080-56301	D1260AH	2-1/2	3/4	1/2	3/8	C.R.S.	STEEL
EL080-56305		2-1/2	3/4	1/2	3/8	C.R.S.	Bryl. Cop.
EL080-58322	D1260GN	3	3/4	1/2	3/8	C.R.S.	STEEL
EL080-58901	D1260DE	3	1-1/2	1/2	3/8	C.R.S.	STEEL
EL080-58906	D1260DZ	3-1/2	1-1/2	1/2	3/8	C.R.S.	STEEL
EL080-58909	D1260HA	4	1-1/2	1/2	3/8	C.R.S.	STEEL
EL080-50924	D1260BS	6	1-1/2	1/2	3/8	C.R.S.	STEEL

Lever provides straddle-type support for wide roller, which is offset from serrated lever hub. Side toward switch is machined straight.

Style S

Side Roller Type

For series: EA170, EA180, EA740, EA090, EA095



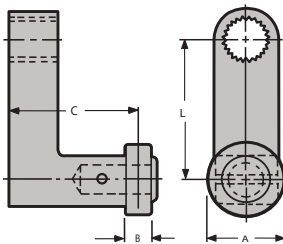
ORDERING NUMBERS		L	A	B	C	MATERIAL	
PART	REFERENCE					LEVER	ROLLER
EL150-53303	—	1-1/2	3/4	3/4	7/8	C.R.S	Bryl. Cop.
EL150-53301	D1260A	1-1/2	3/4	1/4	5/8	C.R.S	STEEL
EL150-53300	D1260DU	1-1/2	3/4	3/4	7/8	C.R.S	STEEL
EL150-53901	D1260HV	1-1/2	1-1/4	1/4	5/8	C.R.S	STEEL
EL150-55300	—	2	3/4	1/2	3/4	C.R.S	Bryl. Cop.
EL150-55303	D1260DT	2	3/4	1/4	5/8	C.R.S	STEEL
EL150-55301	D1260JJ	2	3/4	1/2	3/4	C.R.S	C.R.S.
EL150-56300	D1260DX	2-1/2	3/4	1/4	5/8	C.R.S	C.R.S.
EL150-56500	—	2-1/2	1	1/2	3/4	C.R.S	S.S.
EL150-57300	D1260DO	2-3/4	3/4	1/4	5/8	C.R.S	C.R.S.
EL150-58901	—	4	1-1/4	1/4	5/8	BRONZE	NYLON
EL150-58902	—	4	1-1/4	1/4	5/8	BRONZE	STEEL

Side supported roller offset on front side of lever machined with straight side.

Style SLO

Wide Roller Regular Type

For series: EA170, EA180, EA740, EA090, EA095



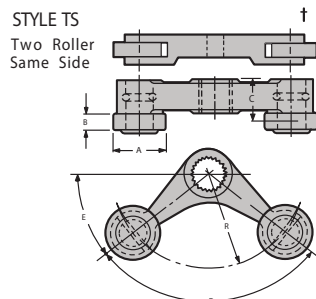
ORDERING NUMBERS		L	A	B	C	MATERIAL	
PART	REFERENCE					LEVER	ROLLER
EL090-53324	D1260GZ	1-1/2	3/4	1/4	1	BRONZE	STEEL
EL090-53336	—	1-1/2	3/4	1/4	1-3/8	BRONZE	NYLON
EL090-53321	D1260CT	1-1/2	3/4	1/4	1-3/8	BRONZE	STEEL
EL090-53322	—	1-1/2	3/4	1/4	1-3/8	BRONZE	Bryl. Cop.
EL090-53328	D1260GV	1-1/2	3/4	1/4	2	BRONZE	STEEL

Right angle offset lever has side-supported roller mounted

Style TS

Two Roller Same Side

For series: EA170, EA180, EA740, EA090, EA095



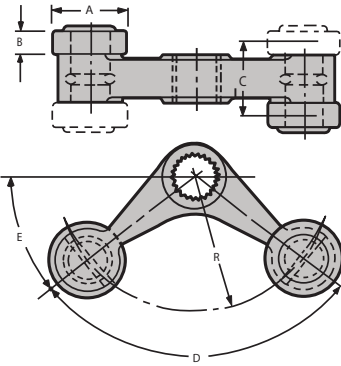
ORDERING NUMBERS		R	A	B	C	D	E	MATERIAL	
PART	REFERENCE							LEVER	ROLLER
EL040-50327	D1260CM	1-3/8	3/4	1/4	5/8	107°34'	36°	BRONZE	STEEL
EL040-50328	D1260JQ	1-3/8	3/4	1/2	3/4	107°34'	36°	BRONZE	STEEL
EL040-58904	D1260JH	3	1-1/2	1/2	3/4	150°	15°	BRONZE	STEEL
EL040-58905	—	3	1-1/2	1/2	3/4	150°	15°	BRONZE	Bryl. Cop.

Angle type rocker arm has both side-supported rollers mounted on

Style TSO

Two Roller Opposite Side

For series: EA170, EA180, EA740, EA090, EA095



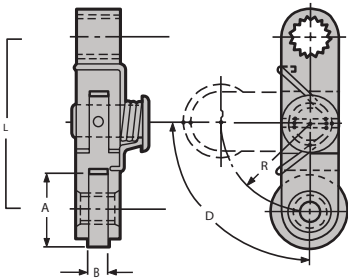
ORDERING NUMBERS		R	A	B	C	D	E	MATERIAL	
PART	REFERENCE							LEVER	ROLLER
EL030-50301	D1260AA	1-3/8	3/4	1/4	3/4	107°34'	36°13'	BRONZE	STEEL
EL030-50302	D1260DH	1-3/8	3/4	1/2	1	107°34'	36°13'	BRONZE	STEEL
EL030-52322	D1260DQ	1-1/2	3/4	3/4	1 1/4	90°	45°	BRONZE	STEEL

Angle type rocker lever has side-supported rollers mounted on opposite sides.

Style KR

Knee Action Straight Type

For series: EA170, EA180, EA740, EA090, EA095



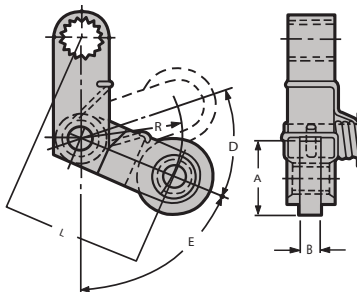
ORDERING NUMBERS		R	A	B	D	L	MATERIAL	
PART	REFERENCE						LEVER	ROLLER
EL100-55401	D1260JM	1	7/8	1/4	90°	2	STEEL	STEEL
EL100-55402	—	1	7/8	1/4	90°	2	STEEL	Bryl. Cop.
EL100-55403	—	1	7/8	1/4	90°	2	STEEL	S.S.

Single-loaded lever with straddle-supported roller. Used where switch action is required in one direction only – return movement of actuating mechanism does not operate the switch.

Style KRO

Knee Action Offset Type

For series: EA170, EA180, EA740, EA090, EA095



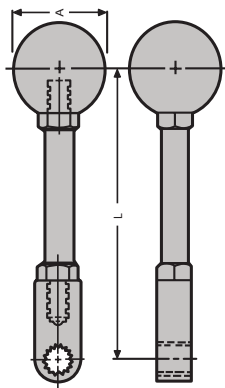
ORDERING NUMBERS		R	A	B	D	E	L	MATERIAL	
PART	REFERENCE							LEVER	ROLLER
EL110-50401	D1260JV	1-1/8	7/8	1/4	41°30'	67°30'	1-7/8	STEEL	STEEL

Spring-loaded offset lever with straddle-supported roller. Used where switch action is required in one direction only – return movement of actuating mechanism does not operate switch.

Style M

Manual Type

For series: EA170, EA180, EA740, EA090, EA095



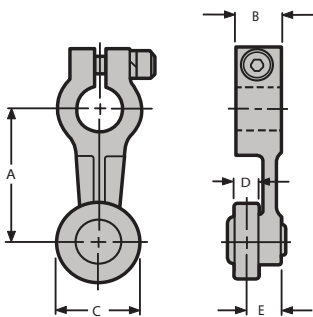
Steel shaft with bakelite knob.

ORDERING NUMBERS		L	A	MATERIAL	
PART NUMBER	REFERENCE			LEVER	KNOB
EL050-58900	D1260EP-3	3	1-3/8	STEEL	BAKELITE
EL050-59901	D1260EP-1	4	1-3/8	STEEL	BAKELITE
EL050-59900	D1260EP-1	6-1/3	1-3/8	STEEL	BAKELITE

Straight

Straight

For series: EA740, EA090, EA095

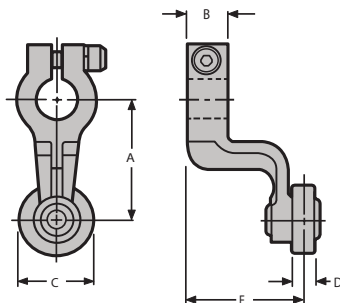


ORDERING NUMBERS		A	B	C	D	E	MATERIAL	
PART	REFERENCE						LEVER	ROLLER
EL010-62401	SL-160	1-1/2	1/2	7/8	9/32	25/64	ZINC	STEEL
EL010-63414	SL-160K	1-1/2	1/2	7/8	9/32	25/64	ZINC	S.S.
EL010-63415	SL-160N	1-1/2	1/2	7/8	9/32	25/64	ZINC	NYLON

OFFSET

Offset

For Series: EA740, EA090, EA095

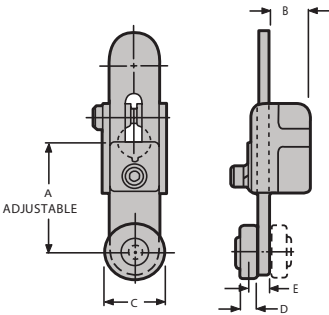


ORDERING NUMBERS		A	B	C	D	E	MATERIAL	
PART	REFERENCE						LEVER	ROLLER
EL020-63412	SL-160C	1-1/2	1/2	7/8	9/32	1-7/16	ZINC	STEEL
EL020-63414	2L-160L	1-1/2	1/2	7/8	9/32	1-7/16	ZINC	NYLON
EL020-63415	SL-160S	1-1/2	1/2	7/8	9/32	1-7/16	ZINC	S.S.

Adjustable Straight

Adjustable Straight

For series: EA740, EA090, EA095

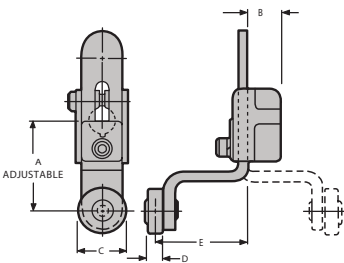


ORDERING NUMBERS		A	B	C	D	E	MATERIAL	
PART	REFERENCE						LEVER	ROLLER
EL120-60400	SL-170A	1-3/4-3	21/32	7/8	9/32	11/32	STEEL	STEEL
EL120-60600	SL-170C	1-7/8-3	21/32	2	9/32	11/32	STEEL	STEEL
EL120-69415	SL-170K	1-3/4-3	21/32	7/8	9/32	11/32	STEEL	NYLON
EL120-69421	SL-170R	3-3/4-5	21/32	7/8	9/32	11/32	STEEL	STEEL
EL120-60601	—	3-3/4-5	21/32	2	9/32	11/32	STEEL	STEEL

Adjustable Offset

Adjustable Offset

For series: EA740, EA090, EA095



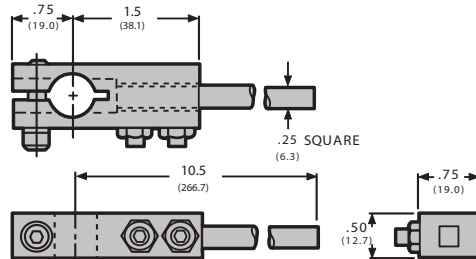
ORDERING NUMBERS		A	B	C	D	E	MATERIAL	
PART	REFERENCE						LEVER	ROLLER
EL130-64410	SL-170	1-3/4-3	21/32	7/8	9/32	1-25/32	STEEL	STEEL
EL130-69410	SL-170D	1-3/4-3	21/32	7/8	9/32	1-25/32	STEEL	NYLON
EL130-69412	SL-170F	1-3/4-3	21/32	7/8	9/32	2-3/8	STEEL	STEEL
EL130-69413	SL-170G	1-3/4-3	21/32	7/8	9/32	3-1/2	STEEL	STEEL
EL130-69414	SL-170J	1-3/4-3	21/32	7/8	9/32	15/16	STEEL	STEEL
EL130-69411	SL-170E	1-3/4-3	21/32	7/8	9/32	1-9/32	STEEL	STEEL
EL130-20401	—	1-3/4-3	21/32	7/8	17/64	3-1/2	STEEL	NYLON

*Roller mounted on opposite side.

Rod Lever

Rod Lever

For series: EA740, EA090, EA095

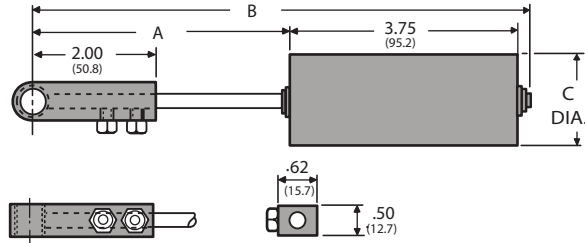


ORDERING NUMBERS		A	B	C	D	E	MATERIAL
PART	REFERENCE						
EL140-69917	SL170 M-1	OTHER ROD LENGTHS AVAILABLE TO SUIT REQUIREMENTS				STEEL ROD	

Style VR

Belt Mis-Alignment Lever - Adjustable

For series: EA170, EA180, EA740, EA090, EA095

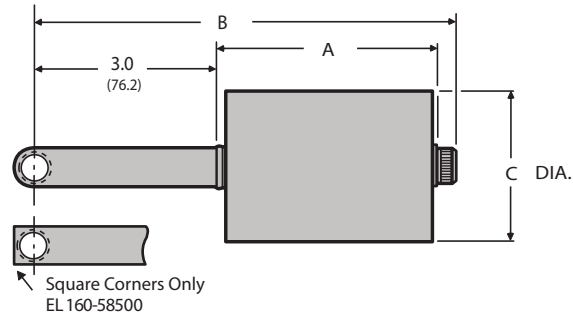


ORDERING NUMBERS	"A" (Adjustable)	"B" Max.	"C" Dia.	MATERIAL	
				LEVER	ROLLER
EL140-58500	4.33/3.75"	8.38"	1.50"	STEEL	DELTRIN
EL140-58600	4.38/3.75"	8.38"	2.50"	STEEL	DELTRIN

Style YR

Belt Mis-Alignment Lever

For series: EA170, EA180, EA740, EA090, EA095



ORDERING NUMBERS	"A"	"B" Max.	"C" Dia.	MATERIAL	
				LEVER	ROLLER
EL160-58500	2.24"	5.64"	1.25"	STEEL	NYLON
EL160-58600	3.50"	6.90"	2.50"	STEEL	NYLON

Definition of Limit Switch Terms

Actuator – Mechanism of the switch or switch enclosure which operates the contacts, i.e. lever arm, plunger, wobble stick and target magnet.

Break – To open an electrical circuit.

Cam – Machine part or component that applies force to switch actuator causing actuator to move as intended.
See also "Dog".

Cam Track – Distance from switch mounting surface to a specified point on actuator.

Differential Travel – Distance or angle from the operating position to the reset position.

Direct-Acting Contacts – Contacts are moved directly by the operating shaft. In general should only be used where movement of actuator must break welded contacts, as in a crane safety limit switch.

Dog – Machine part or component that applies force to switch actuator causing actuator to move as intended. See also "Cam".

Double Break – Contacts open circuit at two points.

Double Pole Double Throw (DPDT) – Switches which make and break two separate circuits. This circuit provides a normally open and normally closed contact for each pole.

Free Position – Position of actuator when no external force (other than gravity) is applied on the actuator. See also "Initial Position" and "Normal Position".

Initial Position – Position of switch actuator when no external force (other than gravity) is applied on the actuator. See also "Free Position" and "Normal Position".

Maintained Contact Switch – Designed for applications requiring sustained contact after actuator has been released, but with provision for resetting.

Make – To close or establish an electrical circuit.

Momentary Contact Switch – A switch which returns from the operated condition to normal condition when actuating force is removed. See also "Spring Return".

Neutral Position limit Switch – Lever arm type switch with two sets of contacts, one of which operates when the shaft is rotated clockwise and the other of which operates when the shaft is rotated counter-clockwise.

Normal Position – Position of switch actuator when no external force (other than gravity) is applied to actuator. See also "Free Position" and "Initial Position".

Normally Closed Contact (N.C.) – Contacts that move to the closed position when no external force is on the actuator.

Normally Open Contacts (N.O.) – Contacts that move to the open position when no external force is on the actuator.

Operating Force – Amount of force applied to the actuator to cause contact operation.

Operating Position – Position of the actuator at which the contacts move to the operated position. See also "Trip Position".

Overtravel – Movement of the actuator beyond the operating position.

Pilot Duty Rating – Rating of contacts when making and breaking inductive loads such as coils and solenoids.

Pole – Parts necessary to control one conductor of a circuit.

Precision Snap Acting Switch – An electromechanical switch having predetermined and accurately controlled characteristics and having a spring loaded quick make and break contact action.

Pretravel – Distance or angle through which the actuator moves from the normal position to the operating position.

Reset Position – Position of actuator at which contacts return to the normal position. See also "Releasing Position".

Releasing Position – Position of actuator at which contacts return to the normal position. See also "Reset Position".

Repeat Accuracy – Ability of a switch to repeat its characteristics precisely from one operation to the next operation. See also "Repeatability".

Repeatability – Ability of a switch to repeat its characteristics precisely from one operation to the next operation. See also "Repeat Accuracy".

Single Pole Double Throw (SPDT) – Switches which make and break one circuit. Circuit provides one normally open and one normally closed contact.

Slow Make & Break Contacts – The speed of contact transfer is direct dependent on the speed of the operating shaft.

Snap Action – Rapid motion of the contacts from one position to another position or their return. This action is relatively independent of the rate of travel of the actuator.

Snap Back – Sudden return of actuator to normal position.

Spring Return Switch – A switch which returns from operated condition to normal condition when actuating force is removed. See also "Momentary Contact Switch".

Trip Position – Position of the actuator at which the contacts move to the operated position. See also "Operating Position".

Total Travel – Distance from actuator free position to over-travel limit position.

SNAP-LOCK[®]

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