

## Rotary Disconnects



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## Rotary Disconnects

### Introduction

#### Rotary Disconnects



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##### Description

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#### UL/CSA Standards for Disconnect Switches

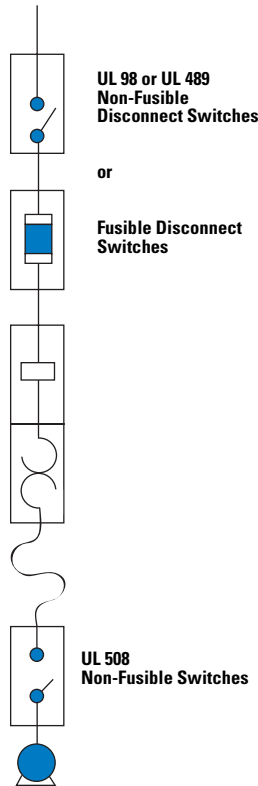
##### UL 98—Enclosed and Deadfront Switches (CSA C22.2 No. 4)

These requirements cover enclosed or deadfront switches, with or without provision for fuses, at 600V or less. These products are used as disconnecting means without restrictions; they are heavy-duty products requiring 2.00 inches (50.0 mm) minimum of creepage distance between phases, which gives maximum safety for users and installation. The short-circuit withstand of those products goes up to 200 kA.

##### UL 489—Molded Case Switches (CSA C22.22 No. 5)

These requirements cover molded case circuit breakers, molded case switches and fused molded case switches, rated at 600V or less and 6000A or less.

#### Typical Control Panel



#### UL Standards for Electrical Machinery

##### UL 508—Industrial Control Equipment (CSA C22.2 No. 14)

These requirements cover manual, magnetic and solid-state starters and controllers, overload relays, pushbuttons, selector switches and control lights.

These products are smaller, requiring only a creepage distance between phases of 0.50 inch (12.7 mm). Their use as a disconnecting means is limited to local disconnection of motors. These products can be used as a disconnect means only when they have been additionally tested "suitable as motor disconnect." This additional testing ensures that the switch has a proper closing capacity on a short circuit. UL® 508 devices cannot be used as main disconnect of an electrical panel, for example, at the entrance of control panels.

A manual motor controller marked "suitable as motor disconnect" shall be installed only on the load side of the branch circuit protective device [UL 508A 30.33 and NEC® 430.109 (6)].

##### NFPA 79 Electrical Standard for Industrial Machinery

The following types of machines are identified as industrial machinery:

- Metalworking machine tools, including machines that cut or form metal
- Plastics machinery
- Wood machinery, including woodworking, laminating and sawmill machines
- Assembly machines
- Material handling machines, including industrial robots and transfer machines
- Inspection and testing machines, including coordinate measuring and in-process gauging machines

### Eaton Solutions for UL 508A and NFPA 79

The changes in UL 508A and NFPA® 79 impact the design and construction of your equipment. Important modifications concern major safety issues, the disconnect means and the interlocking of the enclosure door.

***The disconnect shall be operable independent of the door position.***

The disconnect must be operable, by qualified persons, independent of the door position without the use of accessory tools or devices.

**Note:** NFPA 79; Paragraph 5.3.3.1 (5) T.

An operating mechanism for the disconnecting means shall be operable independent of the door position without the use of accessory tools or devices.

**Note:** UL 508A; Paragraph 66.6.3 c.

***The disconnect means is not closable with the enclosure door open, unless an interlock is operated by deliberate action.***

The interlocking means shall fulfill the following requirement: Prevent closing of the disconnect means while the enclosure door is open, unless an interlock is operated by deliberate action.

**Note:** NFPA 79; Paragraph 6.2.3.1.2.

The disconnecting means is not closable with the enclosure door open, unless an interlock is operated by deliberate action.

**Note:** UL 508A; Paragraph 66.1.5.

### Operable independent of the position of the door



**Door closed:** operation with the external handle through the door.



**Door open:** A robust optional kit with a handle directly fitted on the shaft of the switch allows the operation when the door is open.

### Operated by a deliberate action



① Push

**Door open:** It is necessary to push the handle from OFF to ON. This deliberate action permits the operator to turn and switch ON. This action is necessary as in most cases there is no padlock on the switch when somebody opens the door of an enclosure.



② Turn

**ON to OFF action** permits the operator to turn and switch ON. That is a major safety issue; switching ON directly without any other action is extremely dangerous. The use of a padlock does not comply with the request of the standard; when the panel door is opened, there is generally no padlock, and anybody can turn the switch ON.

# 8.1

## Rotary Disconnects

### Introduction

**The disconnect means shall be able to be locked in the OPEN position independent of the door position.**

The circuit disconnecting device shall be provided with a permanent means, permitting it to be locked in the OFF position only independent of the door position. When locked, remote as well as local closing shall be prevented.

**Note:** NFPA 79; Paragraph 5.3.3.1 (3).

An operating mechanism for the disconnecting means shall be able to be locked in the OFF position independent of the door position. When locked, closing of the disconnect is not possible.

**Note:** UL 508A; Paragraph 66.6.3 d.

#### Locked in the open position independent of the door position



**Door close:** The external through-the-door handle is padlocked when locked closing of the disconnect is not possible.



**Door open:** A strong metallic padlock kit allows up to three padlocks. The padlocking means is easily accessible, when locked closing of the disconnect is not possible.

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**The interlocking of the enclosure door shall be provided with means to defeat the interlock without removing the power.**

The interlocking means required by 66.1.5 shall be provided with all of the following:

- Means to defeat the interlock without removing power, and requires the use of a tool to operate
- Reactivated automatically when all the doors are closed

**Note:** Added 66.1.5.1 effective March 1, 2007. UL 508A; Paragraph 66.1.5.1.

NFPA 79; Paragraph 6.2.3.1.2 states that the [enclosure] interlocking means shall meet the following requirements:

- Use a device or tool to allow qualified persons to defeat the interlock
- Be reactivated automatically when the door is closed

#### Defeat the interlock without removing the power



**A tool allows defeat of the interlock without removing power. The interlocking is reactivated automatically when the door is closed.**

### R5 Series Non-Fusible 16–80A

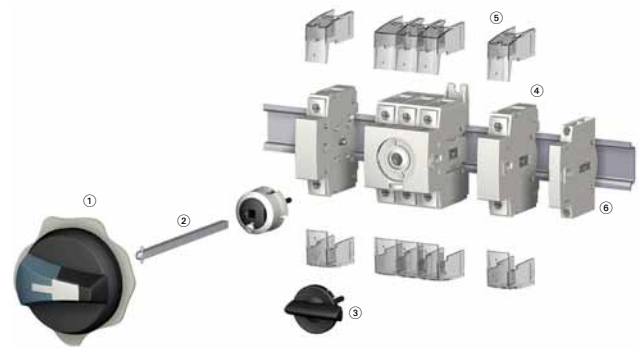


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### Product Description

R5 Series (UL 508 listed) products are manually operated modular switches. Load break switching and isolation provide safety solutions for any low voltage circuit, particularly for machine and control circuits. The R5 Series products are manual motor controllers suitable as motor disconnect.



### Features, Benefits and Functions

- Up to 65 kAIC short-circuit rating
- Direct or external operation
- Compact footprint
- DIN rail or base mount
- Wide range of accessories
- Up to eight-pole or four-pole MTS
- Open and enclosed devices
- Modular design
- Integrated terminals for additional safety
- Padlockable design (direct, toggle and external handles)
- Product can be reverse fed



### Product Identification

- ① External front handle
- ② Shaft extension for external handle
- ③ Direct handle
- ④ Switched fourth-pole module
- ⑤ Terminal shroud
- ⑥ Auxiliary contacts

**Note:** For further details, please see the installation instructions supplied with each device.

### Standards and Certifications

#### Conformity to Standards

- UL 508 listed, Guide NLRV, File E165150
- CSAT C22.2 No.14, File 217736
- IEC 60947-3, EN 60947-3
- CCC
- CE



# 8.2

## Rotary Disconnects

R5 Series (UL 508) Non-Fusible 16–80A

### Product Selection

#### Direct Operation



Switch body + Direct handle

#### External Operation



Switch body + Shaft + External handle

### R5 Series



Ampere Rating	Three-Pole Toggle Switch Only <sup>①</sup>	Three-Pole Rotary Switch Only	Direct Handle	Front and Right External Handle SH00 (Choose one)	Front and Right External Handle SH0 (Choose one)	Shaft for SH0 and SH00—5 x 5 mm—In (mm)
16	—	<b>R5A3016U</b>	<b>DHR5</b>	SH00 Black 3R, 12 <b>SHB00N12</b>	SH0 Black 3R, 12 <b>SHB0N12</b>	2.20 (55.5) <b>SF55SH5X5</b>
25	—	<b>R5A3025U</b>				
30	<b>T5A3030U</b>	<b>R5A3030U</b>				3.50 (90.0) <b>SF90SH5X5</b>
40	<b>T5A3040U</b>	<b>R5A3040U</b>				
60	<b>T5B3060U</b>	<b>R5B3060U</b>		SH00 Red 3R, 12 <b>SHR00N12</b>	SH0 Red 3R, 12 <b>SHR0N12</b>	5.90 (150.0) <b>SF150SH5X5</b>
80	<b>T5B3080U</b>	<b>R5B3080U</b>		SH00 Black 4, 4X <b>SHB00N4X</b>	SH0 Black 4, 4X <b>SHB0N4X</b>	7.90 (200.0) <b>SF200SH5X5</b>
				SH00 Red 4, 4X <b>SHR00N4X</b>	SH0 Red 4, 4X <b>SHR0N4X</b>	12.60 (320.0) <b>SF320SH5X5</b>

### Accessories



Ampere Rating	Switched Fourth-Pole Module	Auxiliary Contacts (Choose one)	Terminal Shrouds	Door Mounting Kit <sup>②</sup>
16	<b>S4PR516</b>	1NO + 1NC <b>AC1NONC</b>	1P <b>TS1R5A</b>	<b>DMK</b>
25	<b>S4PR525</b>			
30	<b>S4PR530</b>		3P <b>TS3R5A</b>	
40	<b>S4PR540</b>	2NO <b>AC2NO</b>		
60			1P <b>TS1R5B</b>	
80			3P <b>TS3R5B</b>	

#### Notes

- ① Toggle version includes direct handle.
- ② Includes shaft and accessory cap.

### Handles

#### Direct Handle



#### Direct Handle

Ampere Rating	Handle Color	Catalog Number
16–80	Black	DHR5

#### Size 00 Handle



#### Door Interlocked External Handle (Defeatable) ①

Ampere Rating	Handle Color	Handle Size	NEMA Type Rating	Catalog Number
<b>Front and Right Side Operation I–0</b>				
16–80	Black	SH00	3R, 12	SHB00N12
16–80	Black	SH00	4, 4X	SHB00N4X
16–80	Red/Yellow	SH00	3R, 12	SHR00N12
16–80	Red/Yellow	SH00	4, 4X	SHR00N4X
16–80	Black	SH0	3R, 12	SHB0N12
16–80	Black	SH0	4, 4X	SHB0N4X
16–80	Red/Yellow	SH0	3R, 12	SHR0N12
16–80	Red/Yellow	SH0	4, 4X	SHR0N4X

#### Size 0 Handle



### Shafts

#### Shaft 5 x 5



#### Shaft Extensions for External Handle

Description	Ampere Rating	Use with Handle Type	Shaft Length In (mm)	Catalog Number
Standard lengths: 55 mm, 90 mm, 150 mm, 200 mm, 320 mm	16–80	SH00/SH0	2.17 (55.0)	SF055SH5X5
	16–80	SH00/SH0	3.54 (90.0)	SF090SH5X5
For 3/4-pole switches: shafts are for external front and side handle	16–80	SH00/SH0	5.91 (150.0)	SF150SH5X5
	16–80	SH00/SH0	7.87 (200.0)	SF200SH5X5
For 6/8-pole switches and changeover switches: shafts are for external front and side handle	16–80	SH00/SH0	12.60 (320.0)	SF320SH5X5

#### Guide Cone



Description	Ampere Rating	Use with Handle Type	Catalog Number
The guide cone facilitates an easier connection between the shaft and a Size 00 or Size 0 external selector handle. It allows the shaft up to 10 mm of vertical play when making the connection	16–80	SH00 and SH0	SFGAB

#### Note

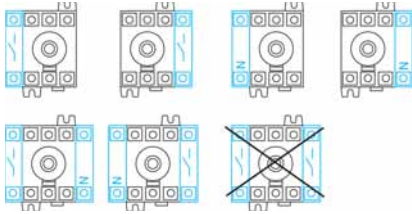
① Allows door to be opened when switch is in the ON position.

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## Rotary Disconnects

R5 Series (UL 508) Non-Fusible 16–80A

### Additional Pole Configurations



### Switched Fourth-Pole Module

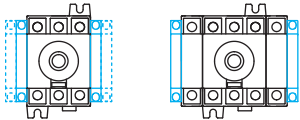


### Switched Fourth-Pole Module

Description	Ampere Rating	Number of Poles	Type	Catalog Number
Add one or two poles and transform:	16	1	Switched	<b>S4PR516</b>
• Three-pole R5 Series load break switch into a four-pole	25	1	Switched	<b>S4PR525</b>
• Six-pole R5 Series switch into an eight-pole	30	1	Switched	<b>S4PR530</b>
• Three-pole changeover switch into a four-pole	40	1	Switched	<b>S4PR540</b>

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### Auxiliary Contact Configurations



### Auxiliary Contact Module



Description	Ampere Rating	Type	Catalog Number
Early-break/same-make and signalization of positions 0 and I by NO + NC or 2NO auxiliary contacts. They can be mounted on the left or on the right side of the device. Two modules maximum.	16–80	1NO + NC	<b>AC1N0NC</b>
	16–80	2NO	<b>AC2NO</b>

### Terminal Shrouds



Description	Ampere Rating	Number of Poles	Position	Catalog Number
Line and load protection against direct contact with the terminals or connection parts: single- or three-pole. Advantage: Perforations allowing thermographic inspection.	16–40	1	Line and load	<b>TS1R5A</b>
	16–40	3	Line and load	<b>TS3R5A</b>
	60–80	1	Line and load	<b>TS1R5B</b>
	60–80	3	Line and load	<b>TS3R5B</b>

### Door/Panel Mounting Kit



Description	Ampere Rating	Number of Poles	Catalog Number
This kit enables direct mounting of the switch on the door panel. Moreover, the connection clamps of the switch are always accessible. The external handle is quick and easy to install due to an internal locking nut mounted on the inside of the enclosure.	16–80	3 and 4	<b>DMK</b> ①

**Note**

① Includes shaft and accessory cap.



## Technical Data and Specifications

## UL 508 (CSA 22.2 No. 14) Manual Motor Controller “Suitable as Motor Disconnect” from 16–80A

Technical Characteristics	16A	25A	30A	40A	60A	80A
Approvals	UL 508/CSA 22.2 No. 14	UL 508/CSA 22.2 No. 14	UL 508/CSA 22.2 No. 14	UL 508/CSA 22.2 No. 14	UL 508/CSA 22.2 No. 14	UL 508/CSA 22.2 No. 14
Short-circuit rating at 600 Vac (kA) ①	10/65	10/65	10/65	10/65	50/65	50/65
Branch circuit fuse type	J	J	J	J	J	J
Maximum fuse rating	60/30A	60/30A	60/30A	60/30A	100/60A	100/60A
<b>Maximum UL Horsepower Ratings/Maximum Motor FLA Current, Three-Phase</b>						
208 Vac	3/10.6	7.5/24.2	7.5/24.2	7.5/24.2	15/46.2	15/46.2
220–240 Vac	5/15	7.5/22	7.5/22	7.5/22	15/42	20/54
440–480 Vac	10/14	15/21	15/21	20/27	30/40	40/52
600 Vac	10/11	20/22	20/22	25/27	30/32	40/41
<b>Connection</b>						
Wire range (AWG), solid, single cable	#14–#10	#14–#10	#14–#10	#14–#10	#14–#10	#14–#10
Wire range (AWG), solid, two cables	2x #12	2x #12	2x #12	2x #12	2x #12	2x #12
Wire range (AWG), stranded, single cable	#14–#4	#14–#4	#14–#4	#14–#4	#14–#1	#14–#1
Wire range (AWG), stranded, two cables	2x (#14–#12)	2x (#14–#12)	2x (#14–#12)	2x (#14–#12)	2x (#10–#6)	2x (#10–#6)
<b>Mechanical Characteristics</b>						
Endurance, number of mechanical cycles	10,000	10,000	10,000	10,000	10,000	10,000
<b>Auxiliary Contacts</b>						
Electrical characteristics	A300	A300	A300	A300	A300	A300

## IEC 60947-3 Characteristics

Technical Characteristics	16A	25A	32A	40A	63A	80A
<b>Rated Operational Currents <math>I_e</math> (A)</b>						
<b>Rated Voltage</b>	<b>Load Duty Category</b>	<b>A/B ②</b>	<b>A/B ②</b>	<b>A/B ②</b>	<b>A/B ②</b>	<b>A/B ②</b>
500 Vac	AC-22 A/AC-22 B	16/16	25/25	32/32	40/40	63/63
500 Vac	AC-23 A/AC-23 B	16/16	25/25	25/25	25/25	63/63
690 Vac	AC-21 A/AC-21 B	16/16	25/25	32/32	40/40	63/63
690 Vac	AC-22 A/AC-22 B	16/16	25/25	32/32	32/40	63/80
690 Vac	AC-23 A/AC-23 B	16/16	25/25	25/25	25/25	40/40
<b>Thermal Current <math>I_{th}</math> at 40°C (A)</b>						
Thermal current $I_{th}$ (40°C) ④	16	25	32	40	63	80
Rated insulation voltage $U_i$ (V)	800	800	800	800	800	800
Rated impulse withstand voltage $U_{imp}$ (kV)	8	8	8	8	8	8
<b>Operational Power in AC-23 (kW)</b>						
At 400 Vac without prebreaking AC in AC-23 (kW) ②③	7.5	11	15	18.5	30	37
At 500 Vac without prebreaking AC in AC-23 (kW) ②③	7.5	11	15	15	30	37
At 690 Vac without prebreaking AC in AC-23 (kW) ②③	7.5	15	18.5	18.5	30	37
<b>Fuse Protected Short-Circuit Withstand (kA rms Prospective)</b>						
Prospective short-circuit current (kA rms) ⑤	50	50	50	50	50	50
Associated fuse rating (A) ⑤	16	25	32	40	63	80
<b>Overload Capacity (<math>U_e</math> 415 Vac)</b>						
Rated short-time withstand current 0.3 s. $I_{CW}$ (kA rms) ⑤	2.5	2.5	2.5	2.5	3	3
Rated short-circuit making capacity $I_{cm}$ (kA peak) ⑤	6	6	6	6	9	9
<b>Connection</b>						
Minimum Cu cable cross section (mm <sup>2</sup> )	1.5	1.5	1.5	1.5	2.5	2.5
Maximum Cu cable section (mm <sup>2</sup> )	16	16	16	16	35	35
Tightening torque minimum/maximum (Nm)	2/2.2	2/2.2	2/2.2	2/2.2	3.5/3.85	3.5/3.85

## Notes

- ① Short-circuit rating achieved when used with respective fuse type and maximum fuse rating.  
 ② A/B: Category with index A = frequent operation; category with index B = infrequent operation.  
 ③ The power value is given for information only; the current values vary from one manufacturer to another.  
 ④ De-rate 1% per °C above 40°C, max. 70°C.  
 ⑤ For a rated operating voltage,  $U_e = 400$  Vac.

# 8.2

## Rotary Disconnects

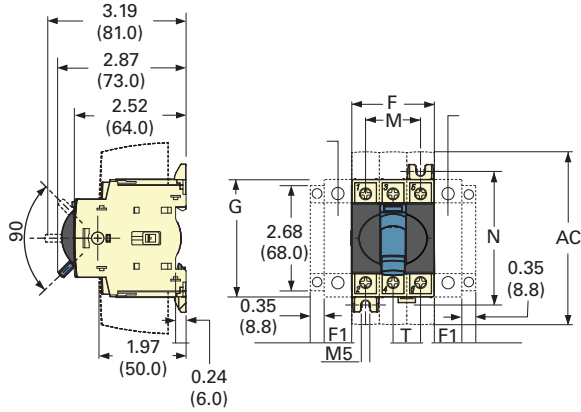
R5 Series (UL 508) Non-Fusible 16–80A

### Dimensions

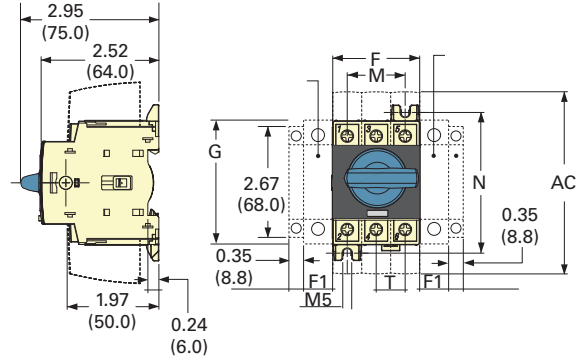
Approximate Dimensions in Inches (mm)

#### R5 Series 16–80A

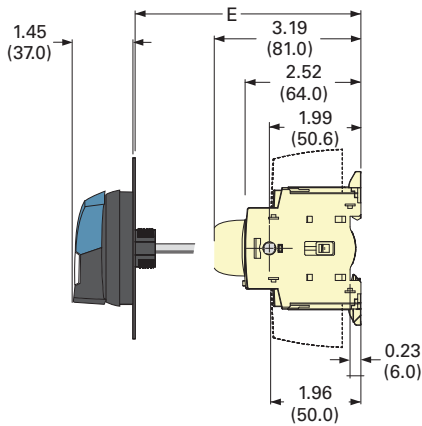
##### Toggle Operation



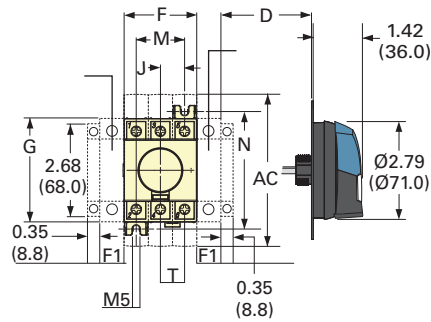
##### Direct Operation with Handle



##### External Front Operation



##### External Side Operation

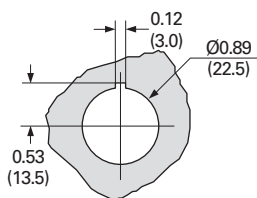


#### R5 Series <sup>②</sup>

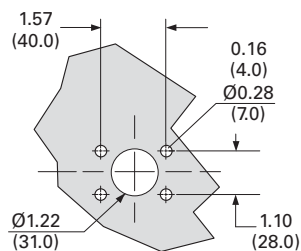
Ampere Rating	Overall Dimensions				Terminal Shrouds	Switch Body				Switch Mounting		Connection Terminal
	D Min.	D Max.	E Min.	E Max.	AC	F	F1	G	J	M	N	T
16–40	1.18 (30.0)	9.25 (235.0)	3.94 (100.0)	14.65 (372.0)	4.33 (110.0)	1.77 (45.0)	0.59 (15.0)	2.68 (68.0)	0.59 (15.0)	1.18 (30.0)	2.95 (75.0)	0.59 (15.0)
63–80	1.18 (30.0)	9.25 (235.0)	3.94 (100.0)	14.65 (372.0)	4.33 (110.0)	2.06 (52.5)	0.69 (17.5)	2.99 (76.0)	0.69 (17.5)	1.38 (35.0)	3.35 (85.0)	0.69 (17.5)

#### Door Drilling—SH00/SHO

##### With Fixing Nut

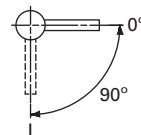


##### With Four Fixing Screws

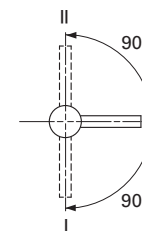


#### Operating Handle—SH00/SHO

##### Front and Right Side Operation



##### Front Operation for R5 Changeover Switches I–0–II or I–I+II–II



#### Notes

- ① One switched fourth-pole module (one per device maximum) or one unswitched neutral pole or one auxiliary contact.
- ② Maximum four additional blocks.

### Non-Fusible 30–100A Compact



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### Non-Fusible 30–100A Compact

#### Product Description

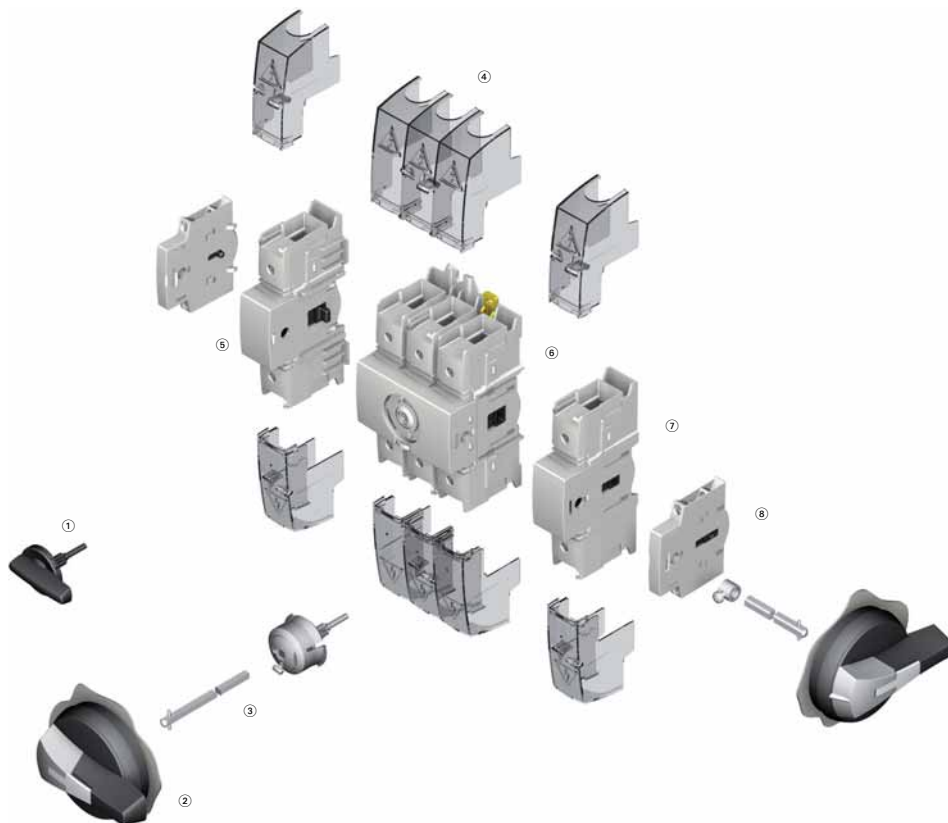
The R9 Series (UL 98 listed) non-fusible 30–100A compact range ensures making or breaking on load and safety isolation for low voltage electrical circuits, particularly for machine control circuits up to 600V.

#### Features, Benefits and Functions

- Rating three-pole from 30A to 100A
- Direct or external operation handle (padlockable in ON position)
- Double breaking per phase

#### Standards and Certifications

- UL 98, File E222859
- CSAT 22.2 No. 4, File 217736
- IEC 60947-3
- EN 60947-3
- CE



#### Product Identification

- ① Direct handle
- ② Door interlocked external handle
- ③ Shaft extension
- ④ Terminal shrouds
- ⑤ Unswitched neutral pole
- ⑥ Switch body
- ⑦ Switched fourth-pole module
- ⑧ Modular type auxiliary contacts

**Note:** For further details, please see the installation instructions supplied with each device.

# 8.3

## Rotary Disconnects

R9 Series (UL 98)

### Product Selection

#### Direct Operation



#### External Operation



### R9 Series 30–100A

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Ampere Rating (Frame)	Number of Poles	Switch Body Only	Direct Handle	Front and Right External Handle SH00 (Choose one)	Front and Right External Handle SH0 (Choose one)	Shaft for SH0 and SH00 Handles—In (mm) (Choose one)	Switched Fourth-Pole Module	Auxiliary Contacts (Choose one)	Terminal Shrouds (Choose one)
30 (C-Frame)	3	<b>R9C3030U</b>	<b>DHR9</b>	SH00 Black 3R, 12 <b>SHB00N12</b>	SH0 Black 3R, 12 <b>SHB0N12</b>	2.20 (55.5) <b>SF55SH5X5</b>	<b>S4PR930</b>	1NO + 1NC <b>AC1NONC</b>	1P <b>TS1R9</b>
60 (C-Frame)	3	<b>R9C3060U</b>		SH00 Red 3R, 12 <b>SHR00N12</b>	SH0 Red 3R, 12 <b>SHR0N12</b>	3.50 (90.0) <b>SF90SH5X5</b>	<b>S4PR960</b>	2NO <b>AC2NO</b>	3P <b>TS3R9CV</b>
100 (C-Frame)	3	<b>R9C3100U</b>		SH00 Black 4, 4X <b>SHB00N4X</b>	SH0 Black 4, 4X <b>SHB0N4X</b>	5.91 (150.0) <b>SF150SH5X5</b>	<b>S4PR9100</b>		
				SH00 Red 4, 4X <b>SHR00N4X</b>	SH0 Red 4, 4X <b>SHR0N4X</b>	7.87 (200.0) <b>SF200SH5X5</b>			
				SH00 Black 4, 4X <b>SHB00N4X</b>	SH0 Black 4, 4X <b>SHB0N4X</b>	12.60 (320.0) <b>SF320SH5X5</b>			
				SH00 Red 4, 4X <b>SHR00N4X</b>	SH0 Red 4, 4X <b>SHR0N4X</b>				

## Handles

### Direct Handle



#### Direct Handle

Ampere Rating	Handle Color	Catalog Number
30–100	Black	DHR9

#### Door Interlocked External Handle <sup>①</sup>

### Size 00 Handle



Ampere Rating	Handle Color	Handle Size	NEMA Type Rating	Catalog Number
<b>Front and Right External Handle</b>				
30–100	Black	SH00	3R, 12	SHB00N12
30–100	Black	SH00	4, 4X	SHB00N4X
30–100	Red	SH00	3R, 12	SHR00N12
30–100	Red	SH00	4, 4X	SHR00N4X
<b>Size 0 Handle</b>				
30–100	Black	SH0	3R, 12	SHB0N12
30–100	Black	SH0	4, 4X	SHB0N4X
30–100	Red	SH0	3R, 12	SHR0N12
30–100	Red	SH0	4, 4X	SHR0N4X

## Shafts

### Shaft 5 x 5



#### Shaft Extensions for External Handle

Description	Ampere Rating	Use with Handle Type	Shaft Length In (mm)	Catalog Number
Standard lengths: 55 mm, 90 mm, 150 mm, 200 mm, 320 mm	30–100	SH00/SH0	2.20 (55.5)	SF55SH5X5
	30–100	SH00/SH0	3.50 (90.0)	SF90SH5X5
Shafts are for external front and right side handles	30–100	SH00/SH0	5.91 (150.0)	SF150SH5X5
	30–100	SH00/SH0	7.87 (200.0)	SF200SH5X5
	30–100	SH00/SH0	12.60 (320.0)	SF320SH5X5

### SFGAB



#### Guide Cone

Description	Ampere Rating	Use with Handle Type	Catalog Number
The guide cone facilitates an easier connection between the shaft and a Size 00 or Size 0 external selector handle. It allows the shaft up to 10 mm of vertical play when making the connection	16–80	SH00 and SH0	SFGAB

#### Note

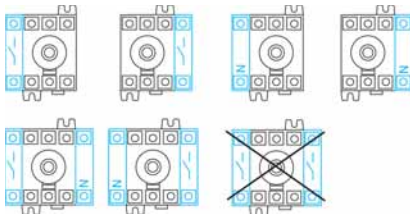
<sup>①</sup> Allows door to be opened when switch is in the ON position.

# 8.3

## Rotary Disconnects

R9 Series (UL 98)

### Additional Pole Configurations



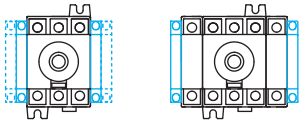
### Switched Fourth-Pole Module



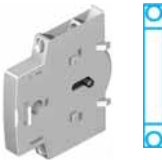
Description	Ampere Rating	Number of Poles	Type	Catalog Number
Transforms a three-pole, R9 Series load break switch into a four-pole	30	1	Switched	<b>S4PR930</b>
	60	1	Switched	<b>S4PR960</b>
	100	1	Switched	<b>S4PR9100</b>

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### Auxiliary Contact Configurations



### Auxiliary Contacts



Description	Ampere Rating	Type	Catalog Number
Early-break/same-make and signalization of positions 0 and I by NO + NC or 2NO auxiliary contacts. They can be mounted on the left or on the right side of the device. Maximum four auxiliary contacts (two modules)	30–100	1NO + 1NC	<b>AC1N0NC</b>
	30–100	2NO	<b>AC2NO</b>

### Terminal Shrouds



Description	Ampere Rating	Number of Poles	Position	Catalog Number
Line and load protection against direct contact with the terminals or connection parts: single- or three-pole Advantage: Perforations allowing thermographic inspection	30–100	1	Line and load	<b>TS1R9</b>
	30–100	3	Line and load	<b>TS3R9CV</b>

## Technical Data and Specifications

### UL and CSA Characteristics

#### UL 98/CSA 22.2 No. 4

Technical Characteristics	30A	60A	100A
Short-circuit rating at 480 Vac (kA) ①	100 kA	100 kA	100 kA
Short-circuit rating at 600 Vac (kA) ①	100 kA	100 kA	25 kA
Fuse type	J	J	J
Maximum fuse rating (A)	30	60	100
<b>Maximum Horsepower Rating/Maximum Motor FLA Three-Phase</b>			
220–240 Vac	10/28	20/54	20/54
440–480 Vac	20/27	40/52	50/65
600 Vac	25/27	50/52	50/52
<b>Maximum Horsepower Rating/Maximum Motor FLA Single-Phase</b>			
120 Vac	2/24	3/34	5/56
240 Vac	5/28	10/50	10/50
<b>Connection</b>			
Solid, 1 wire	#12–10	#12–10	#12–10
Stranded, 1 wire	#12–2/0	#12–2/0	#12–2/0
<b>Auxiliary Contacts</b>			
Electrical characteristic	A300	A300	A300

### IEC 60647-3 Characteristics

Technical Characteristics	32A	63A	100A
<b>Thermal Current <math>I_{th}</math> at 40°C (A)</b>			
Thermal current $I_{th}$ (40°C)	30	60	100
Rated insulation voltage $U_i$ (V)	800	800	800
Rated impulse withstand voltage $U_{imp}$ (kV)	8	8	8
<b>Rated Operation Currents <math>I_e</math> (A)</b>			
<b>Load Duty Category</b>	<b>Rated Voltage</b>	<b>A ②</b>	<b>A ②</b>
400 Vac	AC-22A	32	63
400 Vac	AC-23A	32	63
690 Vac	AC-22A	32	63
690 Vac	AC-23A	32	63
<b>Operational Power in AC-23 (kW)</b>			
At 400 Vac without prebreak AC in AC-23 (kW) ③④	15	30	45
At 500 Vac without prebreak AC in AC-23 (kW) ③④	15	30	45
At 690 Vac without prebreak AC in AC-23 (kW) ③④	18.5	30	45
<b>Overload Capacity (<math>U_e</math> 415 Vac)</b>			
Rated short-time making capacity $I_{cm}$ (kA peak) ⑤	12	12	12
<b>Connection</b>			
Minimum Cu cable cross section (mm <sup>2</sup> )	2.5	2.5	10
Maximum Cu cable section (mm <sup>2</sup> )	70	70	70

#### Notes

- ① Short-circuit rating achieved when used with respective fuse type and maximum fuse rating.
- ② Category with index A = frequent operation.
- ③ A/B: Category with index A = frequent operation; category with index B = infrequent operation.
- ④ The power value is given for information only; the current values vary from one manufacturer to another.
- ⑤ For a rated operating voltage,  $U_e = 400$  Vac.

# 8.3

## Rotary Disconnects

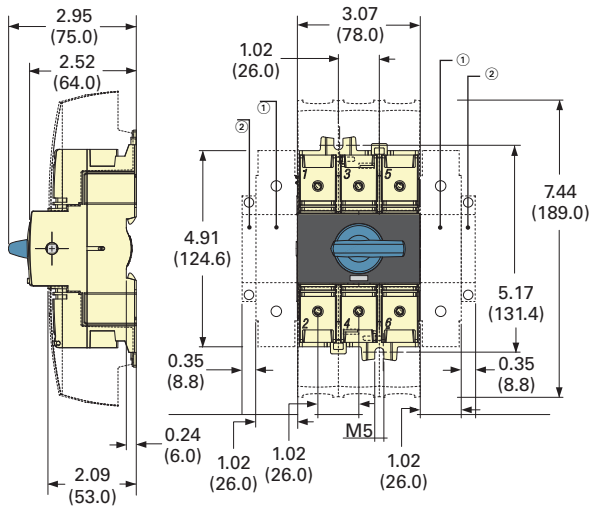
R9 Series (UL 98)

### Dimensions

Approximate Dimensions in Inches (mm)

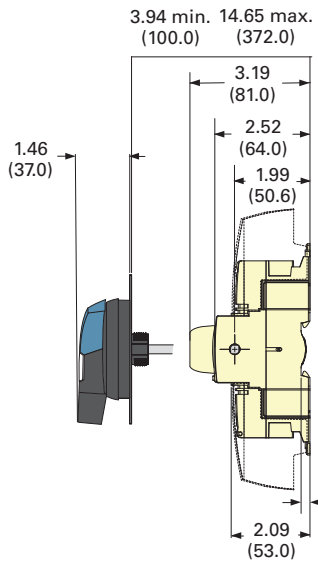
#### R9 Series 30–100A Compact

##### Direct Operation

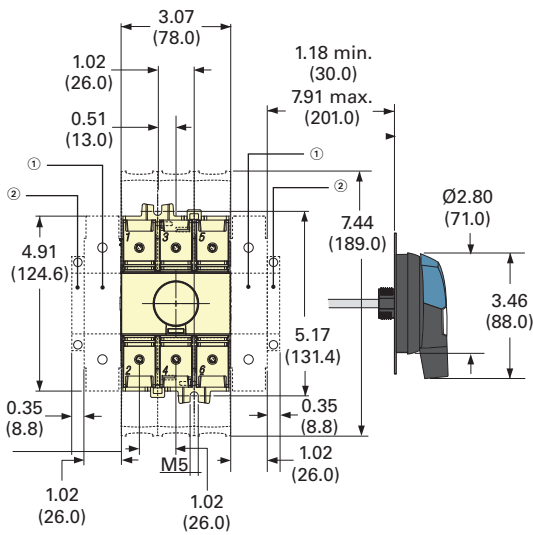


8

##### External Front Operation



##### External Side Operation



#### Notes

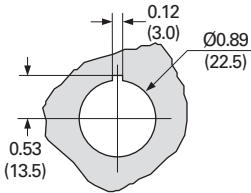
- ① One switched fourth-pole module (one per device maximum) and/or one unswitched neutral pole.
- ② Auxiliary contact.



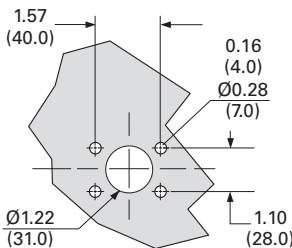
Approximate Dimensions in Inches (mm)

**Door Drilling—SH00/SH0**

**With Fixing Nut**

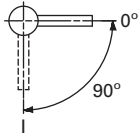


**With Four Fixing Screws**



**Operating Handle—SH00/SH0**

**Front and Right Side Operation**



# 8.3

## Rotary Disconnects

R9 Series (UL 98)

### Non-Fusible 100–1200A



8

### Contents

<i>Description</i>	<i>Page</i>
Non-Fusible 30–100A Compact . . . . .	<b>V5-T8-11</b>
Non-Fusible 100–1200A	
Product Selection . . . . .	<b>V5-T8-19</b>
Accessories . . . . .	<b>V5-T8-20</b>
Technical Data and Specifications . . . . .	<b>V5-T8-22</b>
Dimensions . . . . .	<b>V5-T8-23</b>
Fusible 30–800A . . . . .	<b>V5-T8-26</b>
DC Rated Disconnects . . . . .	<b>V5-T8-45</b>

### Non-Fusible 100–1200A

#### Product Description

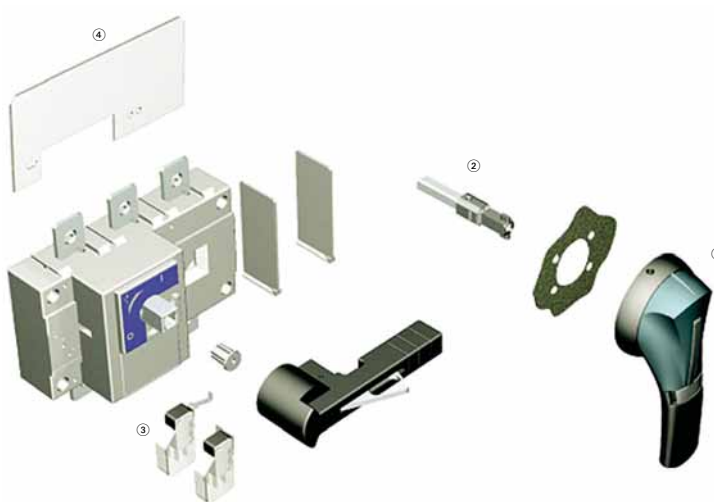
The R9 Series (UL 98 listed) non-fusible 100–1200A are manually operated multipole load-break switches. Quick-make, quick-break design provides safety isolation for any low voltage circuit.

#### Features, Benefits and Functions

- High thermal and dynamic withstand ratings
- Arduous categories of applications
- High electrical and mechanical endurances

#### Standards and Certifications

- UL 98, File E222859
- CSAT 22.2 No. 4, File 217736
- IEC 60947-3
- EN 60947-3



#### Product Identification

- ① External front handle
- ② Shaft extensions for external handle
- ③ Configurable U-type ACs, for pre-break and signalling or TEST
- ④ Terminal Screens

**Note:** For further details, please see the installation instructions supplied with each device.

### Product Selection

#### Direct Operation



Switch body + Direct handle

#### External Operation



Switch body + Shaft + External handle

### R9 Series Non-Fusible 100–1200A

Ampere Rating (Frame)	Number of Poles	Switch Body Only	Direct Handle	Door Interlocked External Pistol Handle (Choose one)	Shaft Extensions for External Handle—In (mm) (Choose one)	Auxiliary Contacts	Terminal Screens (Choose one)	Terminal Lugs <sup>③</sup>
100 (D-Frame)	3	<b>R9D3100U</b>	<b>DHR9DE</b>	Size 2, Black 1, 3R, 12 Defeatable	7.90 (200.0) <b>SF200PH10X10</b>	1NO + 1NC <b>AC1N0NCDE</b> <b>AC1N0NCDELL</b>	3-pole, Line side only <b>TS3R9DT</b>	<b>LK3R9DL</b>
	4	<b>R9D4100U</b>						<b>LK4R9DL</b>
200 (D-Frame)	3	<b>R9D3200U</b>		<b>PHB2N12F</b>	12.60 (320.0) <b>SF320PH10X10</b>	2NO + 2NC <b>AC2N0NCDE</b> <b>AC2N0NCDELL</b>	3-pole, Load side only <b>TS3R9DB</b>	<b>LK3R9DL</b>
	4	<b>R9D4200U</b>		Size 2, Red 1, 3R, 12 Defeatable <b>PHR2N12F</b>	15.70 (400.0) <b>SF400PH10X10</b>		4-pole, Line or load side <b>TS4R9DTB</b>	<b>LK4R9DL</b>
400 (E-Frame)	3	<b>R9E3400U</b>		Size 2, Black 4, 4X Defeatable <b>PHB2N4XF</b>	19.70 (500.0) <b>SF500PH10X10</b>	1NO AC U Type <b>AC1N0R9</b> <sup>②</sup>	3-pole, Line side only <b>TS3R9ET</b>	<b>LK3R9EM</b>
	4	<b>R9E4400U</b>		Size 2, Red 4, 4X Defeatable <b>PHR2N4XF</b>			3-pole, Load side only <b>TS3R9EB</b>	<b>LK4R9EM</b>
				Size 2, Red 4, 4X Defeatable <b>PHR2N4XF</b>			4-pole, Line or load side <b>TS4R9ETB</b>	
600 (F-Frame)	3	<b>R9F3600U</b>	<b>DHR9FG</b>	Size 3, Black 4, 4X Defeatable <b>PHB3N4XF</b>	7.90 (200.0) <b>SF200PH15X12</b>	1NC AC U Type <b>AC1NCR9</b> <sup>②</sup>	<b>TS3R9F</b> <sup>①</sup>	<b>LK3R9FN</b>
	4	<b>R9F4600U</b>					<b>TS4R9F</b> <sup>①</sup>	<b>LK4R9FN</b>
800 (G-Frame)	3	<b>R9G3800U</b>		Size 3, Red 4, 4X Defeatable <b>PHR3N4XF</b>	12.60 (320.0) <b>SF320PH15X12</b>	1.70 (400.0) <b>SF400PH15X12</b>	<b>TS3R9FFS</b> <sup>④</sup>	<b>LK6R9G</b>
	4	<b>R9G4800U</b>					<b>TS3R9G</b> <sup>①</sup>	<b>LK8R9G</b>
1000 (G-Frame)	3	<b>R9G31000U</b>		Size 4, Black 4, 4X Defeatable <b>PHB4N4XF</b>			<b>TS4R9G</b> <sup>①</sup>	
	4	<b>R9G41000U</b>		Size 4, Red 4, 4X Defeatable <b>PHR4N4XF</b>			<b>TS3R9GFS</b> <sup>④</sup>	
1200 (G-Frame)	3	<b>R9G31200U</b>						
	4	<b>R9G41200U</b>						

#### Notes

- ① Top (line side) supplied as standard.
- ② Auxiliary contact requires holder (catalog number ACHFG) when used on F and G-Frame switches (non-fusible 600–1200A).
- ③ Each catalog number is for line or load side. For both line and load, please order two sets.
- ④ FS suffix = Finger Safe.

# 8.3

## Rotary Disconnects

R9 Series (UL 98)

### Accessories

#### Direct Handle



#### Direct Handle

Description	Ampere Rating	Handle Color	Catalog Number
Front operation	100–400	Black	DHR9DE
	600–1200	Black	DHR9FG

#### PH2 and PH3 Types



#### Door Interlocked External Handle—Front Operation

Description	Ampere Rating	Switch Frame	Handle Type	Handle Color	NEMA Type	Defeatable ①	Catalog Number
The door interlocked external handle includes one lockable handle and one escutcheon.	100–400	D/E	PH2	Black	1,3R,12	Yes	PHB2N12F
	100–400	D/E	PH2	Red	1,3R,12	Yes	PHR2N12F
For Dimensions, see Page V5-T8-23.	100–400	D/E	PH2	Black	4,4X	Yes	PHB2N4XF
	100–400	D/E	PH2	Red	4,4X	Yes	PHR2N4XF
	600–1200	F/G	PH3	Black	4,4X	Yes	PHB3N4XF
	600–1200	F/G	PH3	Red	4,4X	Yes	PHR3N4XF
	600–1200	F/G	PH4	Black	4,4X	Yes	PHB4N4XF
	600–1200	F/G	PH4	Red	4,4X	Yes	PHR4N4XF

#### PH4 Type



#### Shaft Extensions

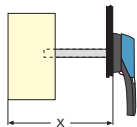


#### Shaft Extensions for External Front Handle

##### Front Operation

Use	Ampere Rating (Frame)	Handle Type	Shaft Length In (mm)	Catalog Number
Standard lengths: 200 mm, 320 mm, 400 mm, 500 mm	100–400 (D-, E-Frame)	PH2	7.90 (200.0)	SF200PH10X10
	100–400 (D-, E-Frame)	PH2	12.60 (320.0)	SF320PH10X10
	100–400 (D-, E-Frame)	PH2	15.70 (400.0)	SF400PH10X10
	100–400 (D-, E-Frame)	PH2	19.70 (500.4)	SF500PH10X10
	600–1200 (F-, G-Frame)	PH3/PH4	7.90 (200.0)	SF200PH15X12
	600–1200 (F-, G-Frame)	PH3/PH4	12.60 (320.0)	SF320PH15X12
	600–1200 (F-, G-Frame)	PH3/PH4	15.70 (400.0)	SF400PH15X12

#### Shaft Length Minimum Dimensions (X)—Inches (mm)



Description	Ampere Rating (Frame)	X	Length	Catalog Number
Standard lengths: • 7.90 (200.6) • 12.60 (320.0) • 5.70 (398.8)	100–400 (D-, E-Frame)	5.31–10.43 (135.0–265.0)	7.90 (200.6)	SF200PH10X10
		5.31–10.43 (135.0–385.0)	12.60 (320.0)	SF320PH10X10
		5.31–10.43 (135.0–465.0)	15.70 (398.8)	SF400PH10X10
		5.31–22.20 (135.0–565.0)	19.70 (500.4)	SF500PH10X10
		600–1200 (F-, G-Frame)	8.70–13.50 (221.0–343.0)	7.90 (200.6)
	600–1200 (F-, G-Frame)	8.70–18.23 (221.0–463.0)	12.60 (320.0)	SF320PH15X12
		8.70–21.38 (221.0–543.0)	15.70 (398.8)	SF400PH15X12

##### Note

① Allow the door to be opened when the switch is in 1 (ON) position.

### Auxiliary Contacts <sup>①</sup>



Description	Ampere Rating (Frame)	Number of AC	AC Type	Catalog Number
100–200A, up to two ACs max. 400A, up to two ACs max.	100–400 (D-, E-Frame)	1NO / 1NC	Standard	<b>AC1N0NCDE</b>
		1NO / 1NC	Low Level <sup>②</sup>	<b>AC1N0NCDELL</b>
		2NO / 2NC	Standard	<b>AC2N0NCDE</b>
		2NO / 2NC	Low Level <sup>②</sup>	<b>AC2N0NCDELL</b>
600–1200A, up to four ACs max.	600–1200 (F-, G-Frame)	1NO	Standard	<b>AC1N0R9 <sup>③</sup></b>
		1NC	Standard	<b>AC1NCR9 <sup>③</sup></b>
Auxiliary contact holder (for use with AC1N0R9 and AC1NCR9)	600–1200 (F-, G-Frame)	—	—	<b>ACHFG</b>

### Terminal Screens



Description	Maximum Ampere Rating (Frame)	Number of Poles	Line/Load Side	Catalog Number	
Line and load protection against direct contact with terminals or connection parts. Line side terminal shrouds are included standard on 600–1200A non-fusible switches. Shrouds are not included on the 100–400A.	100–200 (D-Frame)	3	Line	<b>TS3R9DT</b>	
		3	Load	<b>TS3R9DB</b>	
		4	Line or load	<b>TS4R9DTB</b>	
		400 (E-Frame)	3	Line	<b>TS3R9ET</b>
			3	Load	<b>TS3R9EB</b>
		600 (F-Frame)	4	Line or load	<b>TS4R9ETB</b>
	3		Line or load	<b>TS3R9F</b>	
	800–1200 (G-Frame)	4	Line or load	<b>TS4R9F</b>	
		3	Line or load	<b>TS3R9G</b>	
	4	Line or load	<b>TS4R9G</b>		

### Line and Load Terminal Lugs



Description	Maximum Ampere Rating (Frame)	Number of Poles	Number of Lugs/Pole	Lug Capacity/Phase	Cable Type	Catalog Number
Connection of copper cables on to the terminals (no spade lugs). Each kit includes lugs for line or load side. For line and load side, order two kits.  For Dimensions, see <b>Page V5-T8-23</b> .	100–200 (D-Frame)	3	1	#6–300 kcmil	Cu/Al	<b>LK3R9DL</b>
		4	1	#6–300 kcmil	Cu/Al	<b>LK4R9DL</b>
	400 (E-Frame)	3	1	#2–600 kcmil	Cu/Al	<b>LK3R9EM <sup>④</sup></b>
		4	1	#2–600 kcmil	Cu/Al	<b>LK4R9EM <sup>④</sup></b>
	600 (F-Frame)	3	1	(2) #2–600 kcmil	Cu/Al	<b>LK3R9FN</b>
		4	1	(2) #2–600 kcmil	Cu/Al	<b>LK4R9FN</b>
	800–1200 (G-Frame)	3	2	2x (2) #2–600 kcmil	Cu/Al	<b>LK6R9G</b>
		4	2	2x (2) #2–600 kcmil	Cu/Al	<b>LK8R9G</b>

#### Notes

- ① Early-break/same-make.
- ② Gold plated for minimal resistance—for PLC applications.
- ③ Requires use of ACHFG auxiliary contact holder for F- and G-Frame switches.
- ④ For two-hole lug, consult factory.

## Technical Data and Specifications

### UL and CSA Characteristics

Technical Characteristics		100A	200A	400A	600A	800A	1000A	1200A
Short circuit rating at 600 Vac (kA) <sup>①</sup>		200 kA	200 kA	200 kA	200 kA	200 kA	100 kA	100 kA
Fuse type		J	J	J	J	L	L	L
Maximum fuse rating (A)		100	200	400	600	800	1000	1200
<b>Maximum Horsepower Rating/Maximum Motor FLA Three-Phase</b>								
220–240 Vac		30/80	75/192	125/312	200/480	200/480	200/480	200/480
440–480 Vac		75/96	150/180	250/302	400/477	500/590	500/590	500/590
600 Vac		100/99	200/192	350/336	350/336	500/472	500/472	500/472
<b>Maximum Horsepower Rating/Maximum Motor FLA Direct Current</b>								
125 Vdc	Two-pole in series	10/76	15/112	20/148	20/148	—	—	—
250 Vdc	Three-pole in series	15/55	15/55	50/173	50/173	—	—	—
<b>Connection</b>								
Minimum connection section/AWG		#6	#6	#2	2 x #2	2 x #2	4 x #2	4 x #2
Maximum connection section/AWG		300 kcmil	300 kcmil	600 kcmil	2 x 600 kcmil	2 x 600 kcmil	4 x 600 kcmil	4 x 600 kcmil
<b>Auxiliary Contacts</b>								
Electrical characteristics		A300	A300	A300	A600	A600	A600	A600

### IEC 60947-3 Characteristics

Technical Characteristics		100A	200A	400A	600A	800A	1000A	1200A
Rated insulation voltage $U_i$ (V)		1000	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage $U_{imp}$ (kV)		8	8	8	12	12	12	12
<b>Rated Operational Currents <math>I_e</math> (A)</b>								
Rated Voltage	Load Duty Category	A <sup>②</sup>	A <sup>②</sup>	A <sup>②</sup>	A <sup>②</sup>	A <sup>②</sup>	A <sup>②</sup>	A <sup>②</sup>
400 Vac	AC-22A	100	200	400	630	800	1000	1200
400 Vac	AC-23A	100	200	400	630	800	1000	1000
690 Vac	AC-22A	100	200	400	500	630	630	630
690 Vac	AC-23A	100	200	315	200	400	400	400
<b>Connection</b>								
Minimum Cu cable cross section (mm <sup>2</sup> )		35	70	185	2 x 150	2 x 185	2 x 240	—
Minimum Cu busbar section (mm <sup>2</sup> )		—	—	—	2 x 30 x 5	2 x 40 x 5	2 x 50 x 5	2 x 60 x 5
<b>Operational Power in AC-23 (kW)</b>								
At 400 Vac without prebreaking AC in AC23 (kW) (2 x 3)		51	100	220	355	450	560	560
At 500 Vac without prebreaking AC in AC23 (kW) (2 x 3)		63	140	280	450	560	560	560
At 690 Vac without prebreaking AC in AC23 (kW) (2 x 3)		90	185	185	185	400	400	400
<b>Overload Capacity (<math>U_e</math> 415 Vac)</b>								
Rated short-circuit making capacity $I_{cm}$ (kA peak) <sup>③</sup>		17.6	32	48	48	75	48	75

#### Notes

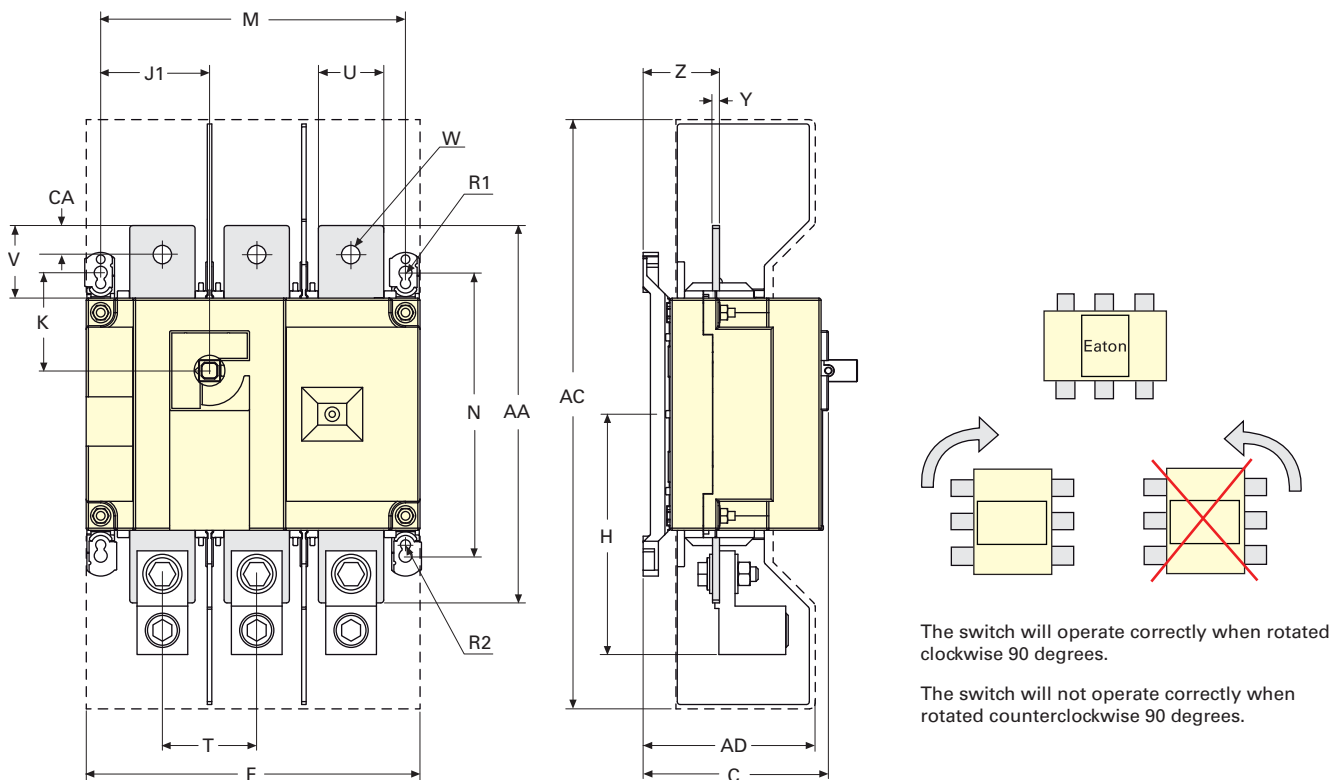
- ① Short-circuit rating achieved when used with respective fuse type and maximum fuse rating.  
 ② Category with index A = frequent operation.  
 ③ For a rated operating voltage,  $U_i = 400$  Vac.

### Dimensions

Approximate Dimensions in Inches (mm)

#### Front Operation—D- and E-Frames

#### R9 Series Non-Fusible 100–400A



Ampere Rating (A)	Overall Dimensions	Terminal Shrouds		Switch Body					
		AC	AD	F 3P	F 4P	H	J1 3P	J1 4P	K
100	3.72 (94.6)	10.10 (256.0)	3.05 (77.5)	7.09 (180.0)	9.06 (230.0)	4.22 (107.0)	2.17 (55.0)	4.13 (105.0)	1.80 (45.6)
200	3.72 (94.6)	10.10 (256.0)	3.05 (77.5)	7.09 (180.0)	9.06 (230.0)	4.22 (107.0)	2.17 (55.0)	4.13 (105.0)	1.80 (45.6)
400	4.92 (128.0)	16.00 (406.0)	4.15 (115.0)	9.05 (230.0)	11.40 (290.0)	6.53 (166.0)	2.95 (75.0)	5.31 (135.0)	2.65 (67.5)

Ampere Rating (A)	Switch Mounting		Connection											
	M 3P	M 4P	N	R1	R2	T	U	V	W	Y	Z	AA	AC	
100	6.30 (160.0)	8.27 (210.0)	5.31 (135.0)	0.35 (9.0)	0.27 (7.0)	1.97 (50.0)	0.98 (25.0)	1.18 (30.0)	0.43 (11.0)	0.14 (3.5)	1.35 (34.4)	6.30 (160.0)	0.60 (15.0)	
200	6.30 (160.0)	8.27 (210.0)	5.31 (135.0)	0.35 (9.0)	0.27 (7.0)	1.97 (50.0)	0.98 (25.0)	1.18 (30.0)	0.43 (11.0)	0.14 (3.5)	1.35 (34.4)	6.30 (160.0)	0.60 (15.0)	
400	8.26 (210.0)	10.60 (270.0)	7.67 (195.0)	0.35 (9.0)	0.27 (7.0)	2.56 (65.0)	1.77 (45.0)	1.97 (50.0)	0.43 (13.0)	0.20 (5.0)	2.08 (53.0)	10.20 (260.0)	0.80 (20.0)	

# 8.3

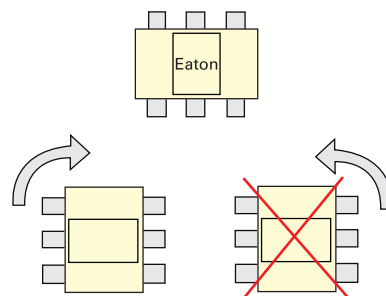
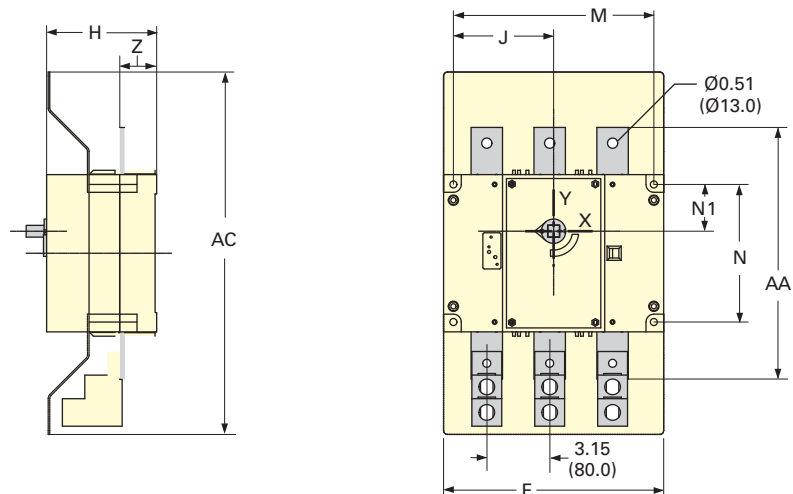
## Rotary Disconnects

R9 Series (UL 98)

Approximate Dimensions in Inches (mm)

### Front Operation—F- and G-Frames

#### R9 Series Non-Fusible 600A

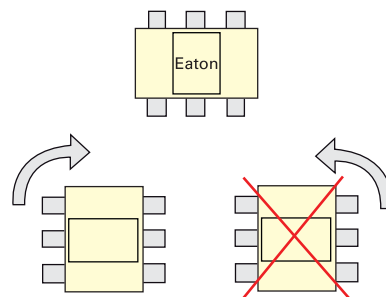
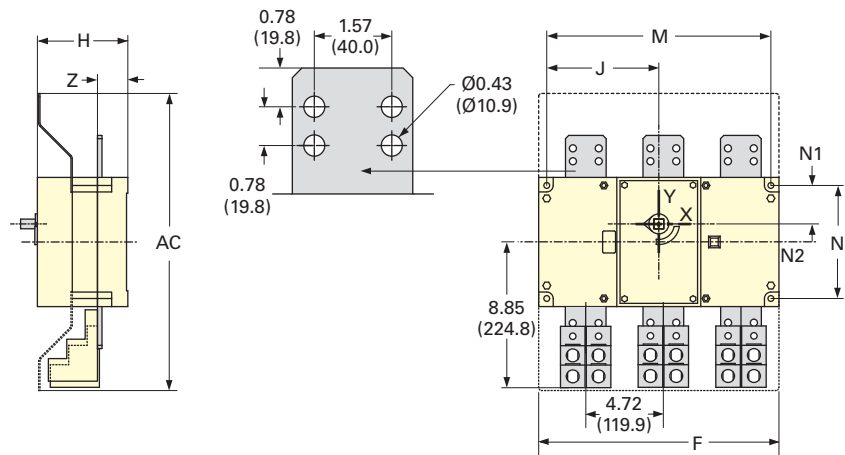


The switch will operate correctly when rotated clockwise 90 degrees.

The switch will not operate correctly when rotated counterclockwise 90 degrees.

Terminal Screens		Switch Body				Switch Mounting			Connection Terminals		
AC	F 3P	F 4P	H	J 2P	J 4P	M 4P	M 4 P	N	N1	AA	Z
18.11 (460.0)	11.02 (280.0)	14.17 (360.0)	5.51 (140.0)	5.00 (127.5)	6.59 (167.5)	10.03 (255.0)	13.19 (335.0)	6.89 (175.0)	2.34 (59.5)	12.6 (320.0)	1.85 (47.0)

#### R9 Series Non-Fusible 800–1200A



The switch will operate correctly when rotated clockwise 90 degrees.

The switch will not operate correctly when rotated counterclockwise 90 degrees.

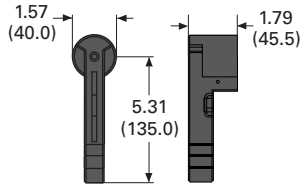
Terminal Screens		Switch Body				Switch Mounting			Connection Terminals		
AC	F 3P	F 4P	H	J 3P	J 4P	M 3P	M 4 P	N	N1	N2	Z
18.12 (460.0)	14.64 (372.0)	19.37 (492.0)	5.51 (140.0)	6.83 (173.5)	9.19 (233.5)	13.66 (347.0)	18.38 (467.0)	6.89 (175.0)	2.34 (59.5)	1.10 (28.0)	1.85 (47.0)



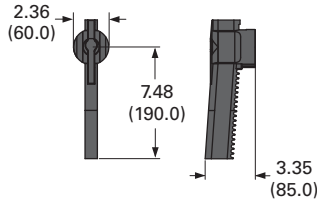
Approximate Dimensions in Inches (mm)

**Direct Handle—Front Operation**

**R9 Series Non-Fusible 400A**

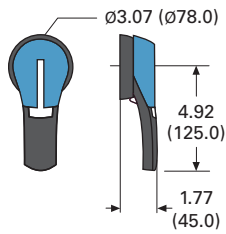


**R9 Series Non-Fusible 600–1200A**

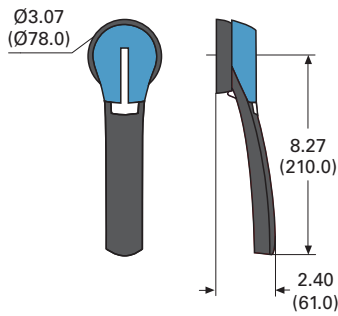


**Door Interlocked External Handle**

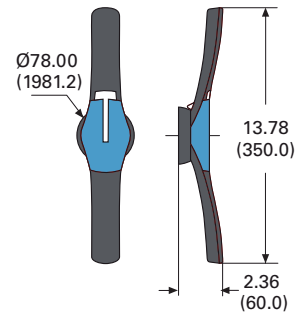
**PH2 Type Handle**



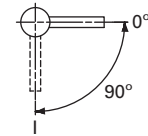
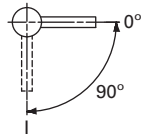
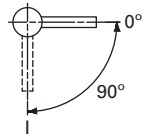
**PH3 Type Handle**



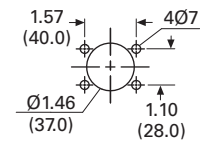
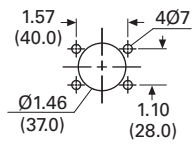
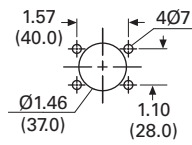
**PH4 Type Handle**



**Direction of Operation**

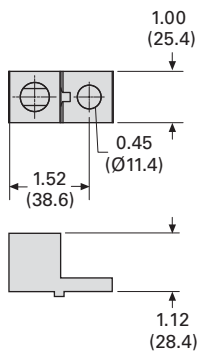


**Door Drilling Templates**

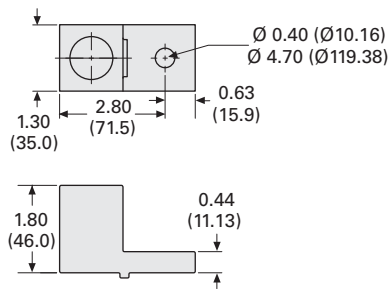


**Top and Bottom Terminal Lugs**

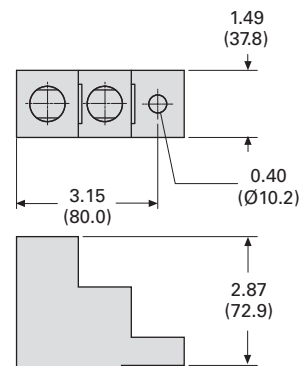
**R9 Series Non-Fusible 100–200A**



**R9 Series Non-Fusible 400A**



**R9 Series Non-Fusible 600–1200A**



# 8.3

## Rotary Disconnects

R9 Series (UL 98)

Fusible 30–800A



### Fusible 30–800A

#### Product Description

R9 Series (UL 98 listed) Fusible 30–800A manual operated multi-pole fusible disconnect switches use double break contacts per pole that ensure complete isolation of the fuse when the switch is in the OFF position.

When installed with fuses, they provide protection for low voltage electrical installations against short circuit and overload.

#### Features, Benefits and Functions

- Load break functionality
- Double break contacts
- Up to 200 kA short-circuit rating with Class CC, J or L fuses
- Compact footprints
- The optional TEST position function (up to 400A) enables testing of the control circuit auxiliaries without switching the main contacts. This function provides a simple alternative to a separately wired pushbutton
- Defeatable pistol handles automatically re-latch when the panel door is closed
- Front or side operation
- Flange operation
- NFPA 79 compliant kits
- Two-, three- and four-pole devices

### Contents

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Non-Fusible 100–1200A .....	<b>V5-T8-18</b>
Fusible 30–800A	
Product Identification .....	<b>V5-T8-27</b>
Product Selection .....	<b>V5-T8-28</b>
Accessories .....	<b>V5-T8-32</b>
Technical Data and Specifications .....	<b>V5-T8-37</b>
Dimensions .....	<b>V5-T8-39</b>
DC Rated Disconnects .....	<b>V5-T8-45</b>

#### Standards and Certifications

- UL 98, File E222859 for 30 to 800A ratings
- UL 489, File E305341 for H-Frame switches
- CSA® 22.2 No. 4, File 217736
- CSA 22.2 No. 5, File 217736, H-Frame only
- IEC 60947-1, EN 60947-1
- IEC 60947-3, EN 60947-3
- NFPA 79



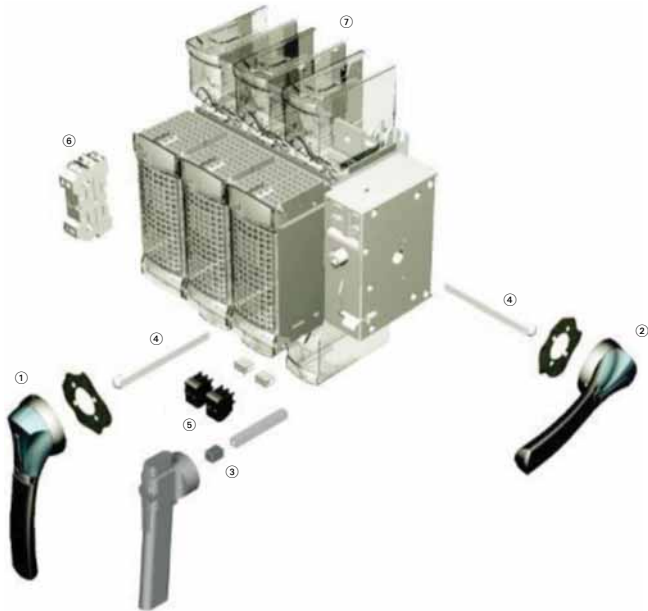
Product Identification

R9 Fusible 30A/CC and 30A/J H-Frame—Direct and External Operation



- ① External front handles
- ② Direct handle
- ③ Shaft extensions for external handles
- ④ Configurable U Type ACs, for pre-break and signaling or TEST

R9 Fusible 30A/J-800A/L (I-N-Frames)—Direct and External Operation



- ① External front handles
- ② External right side handle (not applicable for N-Frame 600/800A)
- ③ Direct handle
- ④ Shaft extensions for external handles
- ⑤ Configurable U Type ACs, for pre-break and signaling or TEST
- ⑥ Side auxiliary contacts
- ⑦ Terminal shrouds

# 8.3

## Rotary Disconnects

R9 Series (UL 98)

### Product Selection

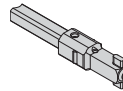
#### Direct Operation



#### External Operation



### Front and Right Side Operation



8

Ampere Rating (Frame) (Fuse Class)	Number of Poles	Switch Body Only	Direct Handle	External Selector Handle (Choose one)	Shaft Extension for Selector Handle Only (Choose one)	External Front Pistol Handle	External Right Side Pistol Handle
30 <sup>①</sup> Compact (H-Frame) (CC)	3	<b>R4H3030FCC</b>	<b>DHR9HC</b>	Black 1,3R,12 <b>SHB0N12HV</b>	7.90 (200.0) <b>SF200SH5X5H</b>	Black 1,3R,12 <b>PHB1N12F</b>	—
30 <sup>①</sup> (H-Frame) (CC)	3 + switched neutral	<b>R4H3030FCCSN</b>		Red 1,3R,12 <b>SHR0N12HV</b>	12.60 (320.0) <b>SF320SH5X5H</b>	Red 1,3R,12 <b>PHR1N12F</b>	
30 <sup>①</sup> Compact (H-Frame) (J)	3	<b>R4H3030FJ</b>	<b>DHR9HJ</b>	Black 4,4X <b>SHB0N4XHV</b>	15.70 (400.0) <b>SF400SH5X5H</b>	Black 4,4X <b>PHB1N4XF</b>	
30 <sup>①</sup> (H-Frame) (J)	3 + switched neutral	<b>R4H3030FJSN</b>		Red 4,4X <b>SHR0N4XHV</b>		Red 4,4X <b>PHR1N4XF</b>	
30 (I-Frame) (CC)	3 4	<b>R9I3030FCC</b> <b>R9I4030FCC</b>	<b>DHR9J2M</b>	—	—		
30 (J-Frame) (J)	2 3 4	<b>R9J2030FJ</b> <b>R9J3030FJ</b> <b>R9J4030FJ</b>				Black 4,4X (w/ TEST Position) <b>PHB1N4XFT</b>	Black 4, 4X <b>PHB1N4XS</b>
60 <sup>①</sup> (J-Frame) (J)	2 3 4	<b>R9J2060FJ</b> <b>R9J3060FJ</b> <b>R9J4060FJ</b>				Red 4,4X (w/ TEST Position) <b>PHR1N4XFT</b>	Red 4, 4X <b>PHR1N4XS</b>

**Note**

① 100 kA short-circuit rating.

### Front and Right Side Operation, continued



Ampere Rating (Frame) (Fuse Class)	Number of Poles	Switch Body Only	Shaft Extensions for Pistol Handle Only In (mm) (Choose one)	NFPA 79 Kit	Auxiliary Contacts (Choose one)	S Type Auxiliary Contacts (Choose one)	Terminal Shrouds
30 Compact (H-Frame) (CC)	3	<b>R4H3030FCC</b>	7.90 (200.0) <b>SF200PH5X5</b>	<b>NFPA79H</b>	1 AC NO <b>AC1NOR9</b>	—	Integral to switch
30 (H-Frame) (CC)	3 + switched neutral	<b>R4H3030FCCSN</b>	12.60 (320.0) <b>SF320PH5X5</b>		1 AC NC <b>AC1NCR</b>		
30 Compact (H-Frame) (J)	3	<b>R4H3030FJ</b>	15.70 (400.0) <b>SF400PH5X5</b>				
30 (H-Frame) (J)	3 + switched neutral	<b>R4H3030FJSN</b>					
30 (I-Frame) (CC)	3	<b>R9I3030FCC</b>	7.90 (200.0) <b>SF200PH10X10</b>	<b>NFPA79JKL</b>		1 AC NO + NC <b>AC1N01NCJ2N</b>	
	4	<b>R9I4030FCC</b>					
30 (J-Frame) (J)	2	<b>R9J2030FJ</b>	12.60 (320.0) <b>SF320PH10X10</b>			2 AC NO + NC <b>AC2N02NCJ2N</b>	
	3	<b>R9J3030FJ</b>					
	4	<b>R9J4030FJ</b>	15.70 (400.0) <b>SF400PH10X10</b>				
60 <sup>Ⓢ</sup> (J-Frame) (J)	2	<b>R9J2060FJ</b>	19.70 (500.0) <b>SF500PH10X10</b>			1 AC NO + NC w/ TEST <b>AC1N01NCJ2NT</b>	
	3	<b>R9J3060FJ</b>					
	4	<b>R9J4060FJ</b>				2 AC NO + NC w/ TEST <b>AC2N02NCJ2NT</b>	

**Note**

Ⓢ 100 kA short-circuit rating.

# 8.3

## Rotary Disconnects

R9 Series (UL 98)

### Front and Right Side Operation, continued



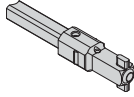
8

Ampere Rating (Frame) (Fuse Class)	Number of Poles	Switch Body Only	Direct Handle (Black)	External Front Pistol Handle (Choose one)	External Right Side Pistol Handle (Choose one)
60 ① (K-Frame) (J)	2	<b>R9K2060FJ</b>	<b>DHR9J2M</b>	Black 1,3R,12 <b>PHB2N12F</b>	Black 4, 4X <b>PHB2N4XS</b>
	3	<b>R9K3060FJ</b>		Red 1,3R,12 <b>PHR2N12F</b>	Red 4, 4X <b>PHR2N4XS</b>
	4	<b>R9K4060FJ</b>		Black 4,4X <b>PHB2N4XF</b>	Red 4,4X <b>PHR2N4XF</b>
100 (K-Frame) (J)	2	<b>R9K2100FJ</b>	<b>DHR9J2M</b>	Black 4,4X <b>PHB2N4XF</b>	Red 4, 4X <b>PHR2N4XS</b>
	3	<b>R9K3100FJ</b>		Red 4,4X <b>PHR2N4XF</b>	Red 4, 4X <b>PHR2N4XS</b>
	4	<b>R9K4100FJ</b>		Black 4,4X <b>PHB2N4XF</b>	Red 4, 4X <b>PHR2N4XF</b>
200 (L-Frame) (J)	2	<b>R9L2200FJ</b>	<b>DHR9J2M</b>	Red 4,4X <b>PHR2N4XF</b>	Red 4, 4X <b>PHR2N4XS</b>
	3	<b>R9L3200FJ</b>		Black 4,4X <b>PHB2N4XF</b>	Red 4, 4X <b>PHR2N4XF</b>
	4	<b>R9L4200FJ</b>		Red 4,4X <b>PHR2N4XF</b>	Red 4, 4X <b>PHR2N4XF</b>
400 (M-Frame) (J)	3	<b>R9M3400FJ</b>	<b>DHR9J2M</b>	Black 4,4X (w/ TEST Position) <b>PHB2N4XFT</b> ②	Red 4, 4X <b>PHR2N4XF</b>
	4	<b>R9M4400FJ</b>		Red 4,4X (w/ TEST Position) <b>PHR2N4XFT</b> ②	Red 4, 4X <b>PHR2N4XF</b>
	4	<b>R9M4400FJ</b>		Black 4,4X <b>PHB2N4XF</b>	Red 4, 4X <b>PHR2N4XF</b>
600 (N-Frame) (J)	2	<b>R9N2600FJ</b>	<b>DHR9N</b>	Black 4, 4X <b>PHB3N4XF</b>	Red 4, 4X <b>PHR3N4XF</b>
	3	<b>R9N3600FJ</b>		Red 4,4X <b>PHR3N4XF</b>	Red 4, 4X <b>PHR3N4XF</b>
	4	<b>R9N4600FJ</b>		Black 4,4X <b>PHB3N4XF</b>	Red 4, 4X <b>PHR3N4XF</b>
800 (N-Frame) (L)	2	<b>R9N2800FL</b>	<b>DHR9N</b>	Red 4,4X <b>PHR3N4XF</b>	Red 4, 4X <b>PHR3N4XF</b>
	3	<b>R9N3800FL</b>		Black 4,4X <b>PHB3N4XF</b>	Red 4, 4X <b>PHR3N4XF</b>
	4	<b>R9N4800FL</b>		Red 4,4X <b>PHR3N4XF</b>	Red 4, 4X <b>PHR3N4XF</b>

**Notes**

- ① 200 kA short-circuit rating.
- ② Requires test handle.

### Front and Right Side Operation, continued



Ampere Rating (Frame) (Fuse Class)	Number of Poles	Switch Body Only	Shaft Extensions for External Handle In (mm) (Choose one)	NFPA 79 Kit	Auxiliary Contacts (Choose one)	Auxiliary Contacts (Choose one)	Terminal Shrouds
60 ① (K-Frame) (J)	2	<b>R9K2060FJ</b>	7.90 (200.0)	<b>NFPA79JKL</b>	1 AC NO <b>AC1N0R9</b>	1 AC NO + NC <b>AC1N01NCJ2N</b>	Integral to switch
	3	<b>R9K3060FJ</b>	Pistol <b>SF200PH10X10</b>				
	4	<b>R9K4060FJ</b>					
100 (K-Frame) (J)	2	<b>R9K2100FJ</b>	12.60 (320.0)	<b>NFPA79N</b>	1 AC NC <b>AC1NCR9</b>	2 AC NO + NC <b>AC2N02NCJ2N</b>	
	3	<b>R9K3100FJ</b>	Pistol <b>SF320PH10X10</b>				
	4	<b>R9K4100FJ</b>	15.70 (400.0)				
200 (L-Frame) (J)	2	<b>R9L2200FJ</b>	Pistol <b>SF400PH10X10</b>			1 AC NO + NC w/ TEST <b>AC1N01NCJ2NT</b> ②	<b>TSR9L2</b>
	3	<b>R9L3200FJ</b>					<b>TSR9L3</b>
	4	<b>R9L4200FJ</b>	19.70 (500.0) Pistol <b>SF500PH10X10</b>				<b>TSR9L4</b>
400 (M-Frame) (J)	3	<b>R9M3400FJ</b>				2 AC NO + NC w/ TEST <b>AC2N02NCJ2NT</b> ②	<b>TSR9M3</b>
	4	<b>R9M4400FJ</b>					<b>TSR9M4</b>
600 (N-Frame) (J)	2	<b>R9N2600FJ</b>	7.90 (200.0)	<b>NFPA79N</b>		1 AC NO + NC <b>AC1N01NCJ2N</b>	<b>TSR9N2</b>
	3	<b>R9N3600FJ</b>	Pistol <b>SF200PH12X12</b>				<b>TSR9N3</b>
	4	<b>R9N4600FJ</b>					<b>TSR9N4</b>
800 (N-Frame) (L)	2	<b>R9N2800FL</b>	12.60 (320.0) Pistol			2 AC NO + NC <b>AC2N02NCJ2N</b>	<b>TSR9N2</b>
	3	<b>R9N3800FL</b>	<b>SF320PH12X12</b>				<b>TSR9N3</b>
	4	<b>R9N4800FL</b>	15.70 (400.0) Pistol				<b>TSR9N4</b>
			19.70 (500.0) Pistol <b>SF500PH12X12</b>				

#### Notes

① 200 kA short-circuit rating.

② Requires test handle.

# 8.3

## Rotary Disconnects

R9 Series (UL 98)

### Accessories

#### NFPA 79 Compliant

#### “Flange” Handle for Flange-Operated Switches



Description	Ampere Rating (Frame)	Handle Type	NEMA Type	Catalog Number
For side-operated switches only. Provides heavy-duty flange style operation. Meets both UL 508A and NFPA 79 requirements. Please order cable or rod link between handle and switch.	30–400 (J-, K-, L-, M-Frame)	Standard handle	1, 3, 3R, 4, 12	<b>FHS</b> ①
	30–400 (J-, K-, L-, M-Frame)	Chrome-plated handle	1, 3, 3R, 4, 4X, 12	<b>FHCP</b> ①

#### Cable Operator

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**Mechanism for Flange Handle**



Description	Ampere Rating (Frame)	NEMA Type	Cable Length In (mm)	Catalog Number
Link between “Flange” handle and side-operated switches. Please order mechanism and “Flange” handle.	30–400 (J-, K-, L-, M-Frame)	Mechanism for “Flange” handle	—	<b>CFM1</b>
			36.00 (914.4)	<b>CFC36</b>
			60.00 (1524.0)	<b>CFC60</b>
			120.00 (3048.0)	<b>CFC120</b>

#### Rod Operator



Description	Ampere Rating (Frame)	For Enclosure Depth In (mm)	Catalog Number
Link between “Flange” handle and side-operated switches. Mechanism included. Please order “Flange” handle.	30–400 (J-, K-, L-, M-Frame)	8.00–24.00 (203.2–609.6)	<b>RFM1</b>

#### NFPA 79 “Through the Door” Kit



Description	Ampere Rating (Frame)	Catalog Number
For front-operated switches only. Meets both UL 508A and NFPA 79 requirements. Kit includes mechanism, shaft and internal handle. Please also order a “PH” type external pistol handle.	30 (H-Frame)	<b>NFPA79H</b>
	30–400 (J-, K-, L-, M-Frame)	<b>NFPA79JKL</b>
	600–800 (N-Frame)	<b>NFPA79N</b>

**Note**

① Defeatable.



### Direct Handle



Description	Ampere Rating (Frame)	Fuse	Catalog Number
Front operation. Black.	30 (H-Frame)	CC	<b>DHR9HC</b>
	30 (H-Frame)	J	<b>DHR9HJ</b>
	30 (I-Frame)	CC	<b>DHR9J2M</b>
	30–400 (J-, K-, L-, M-Frame)	J	<b>DHR9J2M</b>
	600–800 (N-Frame)	J/L	<b>DHR9N</b>

### S0 Type Handle



### Door Interlocked External Front Handles

Description	Ampere Rating (Frame)	Handle Type	NEMA Type	Color	Standard Catalog Number
The handle locking function of the front external operation handle prevents the user from opening the door of the enclosure when the switch is in the ON position, and when the switch is padlocked in the OFF position (PH1, PH2 and PH3 type handles only). Opening the door when the switch is in the OFF position is possible by defeating the locking function with the use of a tool (authorized persons only). The locking function is restored when the door is closed back.	30 (H-Frame)	S0	1, 3R, 12	Black	<b>SHB0N12HV</b>
	30 (H-Frame)	S0	1, 3R, 12	Red/yellow	<b>SHR0N12HV</b>
	30 (H-Frame)	S0	4, 4X	Black	<b>SHB0N4XHV</b>
	30 (H-Frame)	S0	4, 4X	Red/yellow	<b>SHR0N4XHV</b>
	30–60 (H-, I-, J-Frame)	PH1	1, 3R, 12	Black	<b>PHB1N12F</b>
	30–60 (H-, I-, J-Frame)	PH1	1, 3R, 12	Red/yellow	<b>PHR1N12F</b>
	30–60 (H-, I-, J-Frame)	PH1	4, 4X	Black	<b>PHB1N4XF</b>
	30–60 (H-, I-, J-Frame)	PH1	4, 4X	Red/yellow	<b>PHR1N4XF</b>
	30–60 (H-, I-, J-Frame)	PH1	4, 4X	Black	<b>PHB1N4XFT</b> ①
	30–60 (H-, I-, J-Frame)	PH1	4, 4X	Red/yellow	<b>PHR1N4XFT</b> ①
	60–400 (K-, L-, M-Frame)	PH2	1, 3R, 12	Black	<b>PHB2N12F</b>
	60–400 (K-, L-, M-Frame)	PH2	1, 3R, 12	Red/yellow	<b>PHR2N12F</b>
60–400 (K-, L-, M-Frame)	PH2	4, 4X	Black	<b>PHB2N4XF</b>	
60–400 (K-, L-, M-Frame)	PH2	4, 4X	Red/yellow	<b>PHR2N4XF</b>	
60–400 (K-, L-, M-Frame)	PH2	4, 4X	Black	<b>PHB2N4XFT</b> ①	
60–400 (K-, L-, M-Frame)	PH2	4, 4X	Red/yellow	<b>PHR2N4XFT</b> ①	
600–800 (N-Frame)	PH3	4, 4X	Black	<b>PHB3N4XF</b>	
600–800 (N-Frame)	PH3	4, 4X	Red/yellow	<b>PHR3N4XF</b>	

### PH1 Type Handle



### PH2 Type Handle



### PH3 Type Handle



### Right Side External Handles

Ampere Rating (Frame)	Handle Type	NEMA Type	Color	Standard Catalog Number
30–60 (J-Frame)	PH1	4, 4X	Black	<b>PHB1N4XS</b>
30–60 (J-Frame)	PH1	4, 4X	Red/yellow	<b>PHR1N4XS</b>
60–400 (K-, L-, M-Frame)	PH2	4, 4X	Black	<b>PHB2N4XS</b>
60–400 (K-, L-, M-Frame)	PH2	4, 4X	Red/yellow	<b>PHR2N4XS</b>

#### Note

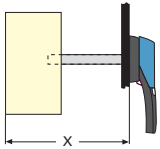
① Includes TEST position.

#### Shaft Extensions for External Handles



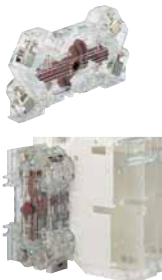
Ampere Rating (Frame)	Handle Type	Shaft Length In (mm)	Catalog Number
30 (H-Frame)	SH0	7.90 (200.0)	SF200SH5X5H
30 (H-Frame)	SH0	12.60 (320.0)	SF320SH5X5H
30 (H-Frame)	SH0	15.70 (400.0)	SF400SH5X5H
30 (H-Frame)	PH1	7.90 (200.0)	SF200PH5X5
30 (H-Frame)	PH1	12.60 (320.0)	SF320PH5X5
30 (H-Frame)	PH1	15.70 (400.0)	SF400PH5X5
30–400 (I-, J-, K-, L-, M-Frame)	PH2	7.90 (200.0)	SF200PH10X10
30–400 (I-, J-, K-, L-, M-Frame)	PH2	12.60 (320.0)	SF320PH10X10
30–400 (I-, J-, K-, L-, M-Frame)	PH2	15.70 (400.0)	SF400PH10X10
30–400 (I-, J-, K-, L-, M-Frame)	PH3	19.70 (500.0)	SF500PH10X10
600–800 (N-Frame)	PH3	7.90 (200.0)	SF200PH12X12
600–800 (N-Frame)	PH3	12.60 (320.0)	SF320PH12X12
600–800 (N-Frame)	PH3	15.70 (400.0)	SF400PH12X12
600–800 (N-Frame)	PH3	19.70 (500.0)	SF500PH12X12

#### Handle Types SH and PH, X Minimum Dimensions



Ampere Rating (Frame)	Dimensions X In (mm)	Handle Type	Shaft Length In (mm)	Catalog Number
30 (H-Frame)	4.02–9.65 (102.0–245.0)	SH0	7.90 (200.0)	SF200SH5X5H
30 (H-Frame)	4.02–14.37 (102.0–365.0)	SH0	12.60 (320.0)	SF320SH5X5H
30 (H-Frame)	4.02–17.52 (102.0–445.0)	SH0	15.70 (400.0)	SF400SH5X5H
30 (H-Frame)	4.02–9.65 (102.0–245.0)	PH1	7.90 (200.0)	SF200PH5X5
30 (H-Frame)	4.02–14.37 (102.0–365.0)	PH1	12.60 (320.0)	SF320PH5X5
30 (H-Frame)	4.02–17.52 (102.0–445.0)	PH1	15.70 (400.0)	SF400PH5X5
30–100 (I-, J-, K-Frame)	5.30–9.06 (135.0–230.0)	PH2, PH3	7.90 (200.0)	SF200PH10X10
200 (L-Frame)	5.70–9.06 (145.0–230.0)	PH2, PH3	7.90 (200.0)	SF200PH10X10
400 (M-Frame)	7.87–10.24 (200.0–260.0)	PH2, PH3	7.90 (200.0)	SF200PH10X10
30–100A (I-, J-, K-Frame)	5.30–13.78 (135.0–350.0)	PH2, PH3	12.60 (320.0)	SF320PH10X10
200 (L-Frame)	5.70–13.78 (145.0–350.0)	PH2, PH3	12.60 (320.0)	SF320PH10X10
400 (M-Frame)	7.87–14.96 (200.0–380.0)	PH2, PH3	12.60 (320.0)	SF320PH10X10
30–100 (I-, J-, K-Frame)	5.30–16.93 (135.0–430.0)	PH2, PH3	15.70 (400.0)	SF400PH10X10
200 (L-Frame)	5.70–16.93 (145.0–430.0)	PH2, PH3	15.70 (400.0)	SF400PH10X10
400 (M-Frame)	7.87–18.10 (200.0–460.0)	PH2, PH3	15.70 (400.0)	SF400PH10X10
30–100 (I-, J-, K-Frame)	5.30–20.87 (135.0–530.0)	PH2, PH3	19.70 (500.0)	SF500PH10X10
200 (L-Frame)	5.70–20.87 (145.0–530.0)	PH2, PH3	19.70 (500.0)	SF500PH10X10
400 (M-Frame)	7.87–22.05 (200.0–560.0)	PH2, PH3	19.70 (500.0)	SF500PH10X10
600–800 (N-Frame)	10.63–11.97 (270.0–304.0)	PH3	12.60 (320.0)	SF320PH12X12
600–800 (N-Frame)	10.63–16.69 (270.0–424.0)	PH3	12.60 (320.0)	SF320PH12X12
600–800 (N-Frame)	10.63–19.84 (270.0–504.0)	PH3	15.70 (400.0)	SF400PH12X12
600–800 (N-Frame)	10.63–23.78 (270.0–604.0)	PH3	19.70 (50.00)	SF500PH12X12

### Auxiliary Contacts—NO + NC ①



Description	Ampere Rating (Frame)	Number of ACs	Operating Current I <sub>o</sub> (Amperes)		Catalog Number
			Nominal Current (Amperes)		
For the R9 Series Fusible 30–800A, indication of the O and I positions by 1 to 4 NO + NC auxiliary contacts. Electrical principle: Cabling by terminal cage with #16 AWG maximum. High electrical characteristics: A600/D600	600–800 (N-Frame)	1NO + 1NC	10		<b>AC1N01NCJ2N</b> ②
	600–800 (N-Frame)	2NO + 2NC	10		<b>AC2N02NCJ2N</b> ②
	30–400 (I–M-Frame)	1NO + 1NC (w/ TEST)	10		<b>AC1N01NCJ2NT</b>
	30–400 (I–M-Frame)	2NO + 2NC (w/ TEST)	10		<b>AC2N02NCJ2NT</b>

### Auxiliary Contacts—NO or NC ③



Description	Ampere Rating (Frame)	Number of ACs	Catalog Number
The different functions (pre-break, 0 and 1 indication, TEST feature) are easily configurable with pegs (one or two pegs per position). Two superposed auxiliary contacts maximum. For 30A/CC (H-Frame), maximum of four ACs. For 30A/J (H-Frame), maximum of two ACs. For 30 to 100A/J (I, J and K-Frame), maximum of four ACs. For 200 to 600A/J (L and M-Frame), maximum of eight ACs. Cabling to the control circuit by terminals with a maximum section of 2 x 2.5 mm <sup>2</sup> . Electrical characteristics: A300	<b>NO Auxiliary Contact</b>		
	30–600 (H–M-Frame)	1	<b>AC1N0R9</b>
	<b>NC Auxiliary Contact</b>		
	30–600 (H–M-Frame)	1	<b>AC1NCR9</b>

### Characteristics for Pre-Break Auxiliary Contacts

Ampere Rating	Contact Type	Nominal Current Amperes	Operating Current I <sub>o</sub> (Amperes)			
			250 Vac AC-13	400 Vac AC-13	24 Vdc DC-13	48 Vdc DC-13
30–800	NO + NC	10	6	4	5	3

### Terminal Shrouds



### Terminal Shrouds

Description	Ampere Rating (Frame)	Number of Poles	Catalog Number
Line or load side protection against direct contact with terminals or the connection parts	30–100 (H-, I-, J-, K-Frame)	2/3/4	Integral to switch
	200 (L-Frame)	2	<b>TSR9L2</b>
	200 (L-Frame)	3	<b>TSR9L3</b>
	200 (L-Frame)	4	<b>TSR9L3</b>
	400 (M-Frame)	2	<b>TSR9M2</b> ④
	400 (M-Frame)	3	<b>TSR9M3</b> ④
	400 (M-Frame)	4	<b>TSR9M4</b> ④
	600–800 (N-Frame)	2	<b>TSR9N2</b>
	600–800 (N-Frame)	3	<b>TSR9N3</b>
	600–800 (N-Frame)	4	<b>TSR9N4</b>

#### Notes

- ① Same-make/same-break auxiliary contacts.
- ② Auxiliary contacts without "Test" cannot be used on I–M-Frame switches.
- ③ Early-break/same-make auxiliary contacts.
- ④ For replacement only. Both line and load side terminal shrouds are included with 400A switch.

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## Rotary Disconnects

R9 Series (UL 98)

### Line and Load Terminal Lugs



Description	Ampere Rating (Frame)	Fuse	Number of Lugs	Lug Capacity/Phase	Cable Type	Catalog Number
Connection of bare copper cables on to the terminals (no spade lugs).	30 (H-, I-Frame)	CC/J	—	#14–#10	Cu	Integral to switch
	30 (H-, I-Frame)	CC/J	—	#14–#10	Cu	Integral to switch
	30–60 (J-Frame)	J	—	#10–#6	Cu	Integral to switch
	60–100 (K-Frame)	J	—	#12–#1	Cu	Integral to switch
	200 (L-Frame)	J	2	#6–300 kcmil	Cu/Al	<b>LK2R9DL</b>
	200 (L-Frame)	J	3	#6–300 kcmil	Cu/Al	<b>LK3R9DL</b>
	200 (L-Frame)	J	4	#6–300 kcmil	Cu/Al	<b>LK4R9DL</b>
	400 (M-Frame)	J	3	(2) #2–600 kcmil	Cu/Al	<b>LK3R9FN</b>
	400 (M-Frame)	J	4	(2) #2–600 kcmil	Cu/Al	<b>LK4R9FN</b>
	600–800 (N-Frame)	J/L	2	(2) #2–600 kcmil	Cu/Al	<b>LK2R9FN</b>
	600–800 (N-Frame)	J/L	3	(2) #2–600 kcmil	Cu/Al	<b>LK3R9FN</b>
	600–800 (N-Frame)	J/L	4	(2) #2–600 kcmil	Cu/Al	<b>LK4R9FN</b>

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### Shorting Links



Ampere Rating (Frame)	Fuse	Pack Quantity	Catalog Number
60 (J-, K-Frame)	J	3	<b>SLJK360</b>
100 (K-Frame)	J	3	<b>SLK3100</b>
200 (L-Frame)	J	3	<b>SLL3</b>
400 (M-Frame)	J	3	<b>SLM3</b>
600–800 (N-Frame)	J/L	3	<b>SLN3</b>

## Technical Data and Specifications

### UL and CSA Characteristics

#### R9 Series Fusible 30–800A

Description	30A	30A	30A	30A	60A	60A	100A
<b>General Use Ratings</b>							
Switch frame	H	H	I	J	J	K	K
600 Vac (A)	30	30	30	30	60	60	100
600 Vdc (A)	—	—	—	—	—	—	—
<b>Short-Circuit Ratings</b>							
Short-circuit rating at 600 Vac (kA)	100	100	100	200	100	200	200
Fuse type	CC	J	CC	J	J	J	J
Maximum fuse rating (A)	30	30	30	30	60	60	100
<b>Maximum Horsepower Rating/Maximum Motor FLA Three-Phase</b>							
220–240 Vac	7.5/22	7.5/22	7.5/22	7.5/22	15/42	15/42	30/80
440–480 Vac	15/21	15/21	15/21	15/21	30/40	30/40	60/77
600 Vac	20/22	20/22	20/22	20/22	50/52	50/52	75/77
<b>Maximum Horsepower Rating/Maximum Motor FLA Single-Phase</b>							
220–240 Vac	—	—	3/17	3/17	10/50	10/50	10/50
440–480 Vac	—	—	7.5/21	7.5/21	10/26	10/26	10/26
600 Vac	—	—	10/20	10/20	10/20	10/20	10/20
<b>Maximum Horsepower Rating/Maximum Motor FLA DC</b>							
125 Vdc <sup>①</sup>	3/25	3/25	3/25	3/25	5/40	5/40	7.5/58
250 Vdc <sup>②</sup>	5/20	5/20	5/20	5/20	10/38	10/38	20/72
<b>Mechanical Characteristics</b>							
Endurance (number of operating cycles)	10,000	10,000	10,000	10,000	10,000	10,000	10,000
<b>Terminal Lugs</b>							
Type	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Minimum conn. section	#14	#14	#14	#10	#10	#12	#12
Maximum conn. section	#10	#10	#10	#6	#6	#1	#1

#### Notes

- ① Two-pole in series.
- ② Three-pole in series.

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## Rotary Disconnects

R9 Series (UL 98)

### R9 Series Fusible 30–800A, continued

Description	200A	400A	600A	800A
<b>General Use Ratings</b>				
Switch Frame	L	M	N	N
600 Vac (A)	200	400	600	800
600 Vdc (A)	—	—	600 <sup>②</sup>	800 <sup>②</sup>
<b>Short-Circuit Ratings</b>				
Short-circuit rating at 600 Vac (kA)	200	200	200	200
Fuse type	J	J	J	L
Maximum fuse rating (A)	200	400	600	800
<b>Maximum Horsepower Rating/Maximum Motor FLA Single-Phase</b>				
220–240 Vac	—	—	—	—
440–480 Vac	—	—	—	—
600 Vac	—	—	—	—
<b>Maximum Horsepower Rating/Maximum Motor FLA Three-Phase</b>				
220–240 Vac	60/154	125/312	200/480	200/480
440–480 Vac	125/156	250/302	500/590	500/590
600 Vac	150/144	350/336	500/472	500/472
<b>Maximum Horsepower Rating/Maximum Motor FLA DC</b>				
125 Vdc <sup>①</sup>	—	20/148	—	—
250 Vdc <sup>②</sup>	—	50/173 <sup>②</sup>	—	—
<b>Mechanical Characteristics</b>				
Endurance (number of operating cycles)	8000	6000	5000	5000
<b>Terminal Lugs</b>				
Type	Option	Option	Option	Option
Minimum conn. section	#6	#2	2x#2	2x#2
Maximum conn. section	3/0	300 kcmil	2 x 600 kcmil	2 x 600 kcmil

#### Notes

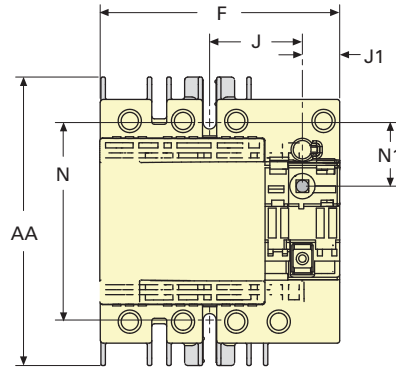
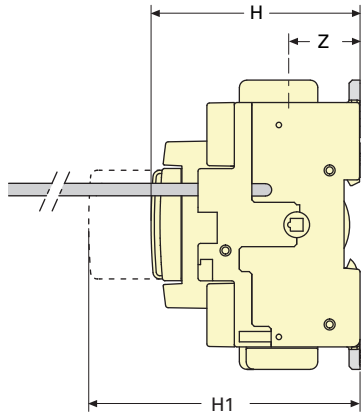
- ① Two-pole in series.
- ② Three-pole in series.

### Dimensions

Approximate Dimensions in Inches (mm)

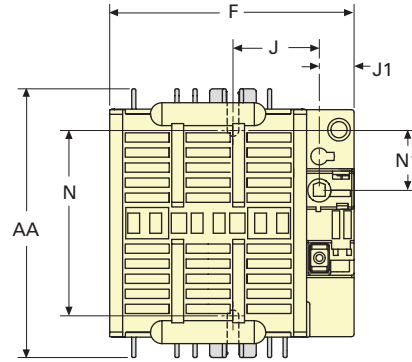
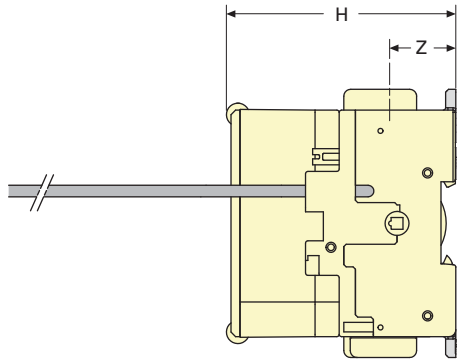
#### Front Operation

#### R9 Series Fusible 30A/CC—H-Frame



Switch Body				Switch Mounting		Connection Terminals		
F	H	H1	J	J1	N	N1	AA	Z
3.78 (96.0)	3.28 (83.3)	5.19 (131.8)	1.47 (37.3)	0.59 (15.0)	3.13 (79.5)	1.00 (25.4)	4.56 (115.8)	1.12 (28.4)

#### R9 Series Fusible 30A/J—H-Frame



Switch Body				Switch Mounting		Connection Terminals	
F	H	J	J1	N	N1	AA	Z
4.13 (104.9)	3.89 (98.8)	1.47 (37.3)	0.59 (15.0)	3.30 (83.8)	1.00 (25.4)	4.56 (115.8)	1.12 (28.4)

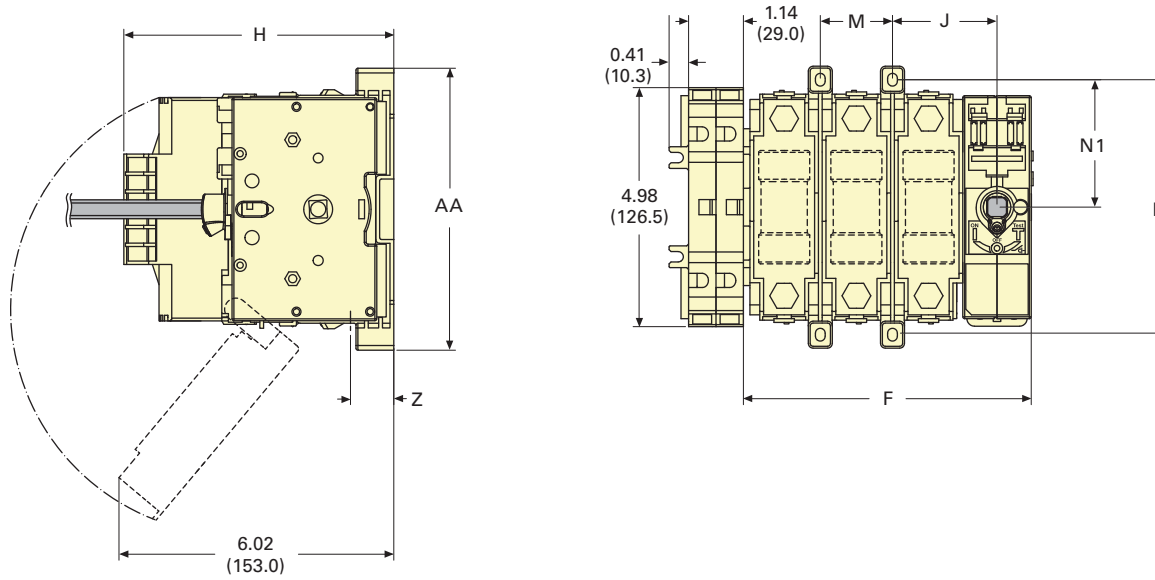
# 8.3

## Rotary Disconnects

R9 Series (UL 98)

Approximate Dimensions in Inches (mm)

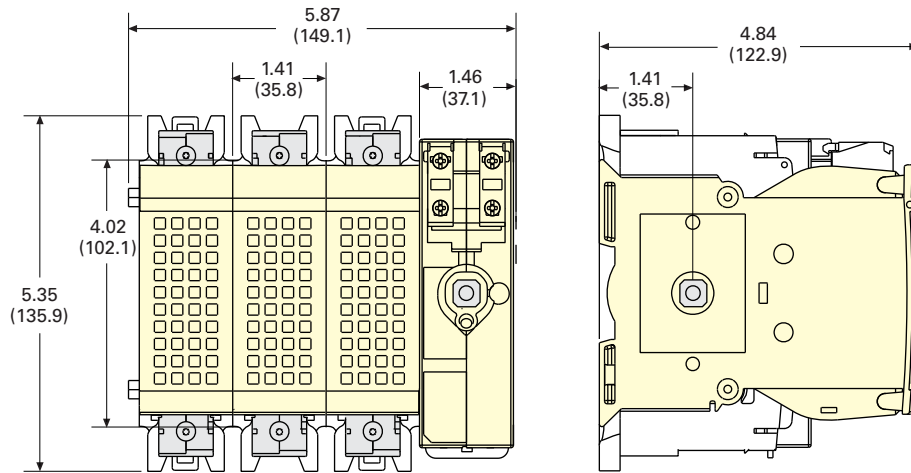
### R9 Series Fusible 30A/CC—I-Frame



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Ampere Rating (Fuse)	Switch Body		Switch Mounting				Connection Terminals		
	F 3P	F 4P	H	J	M	N	N1	AA	Z
30 (CC)	4.92 (125.0)	6.06 (154.0)	3.89 (99.0)	1.77 (45.0)	1.14 (29.0)	5.31 (135.0)	2.63 (66.5)	5.87 (149.0)	1.21 (31.0)

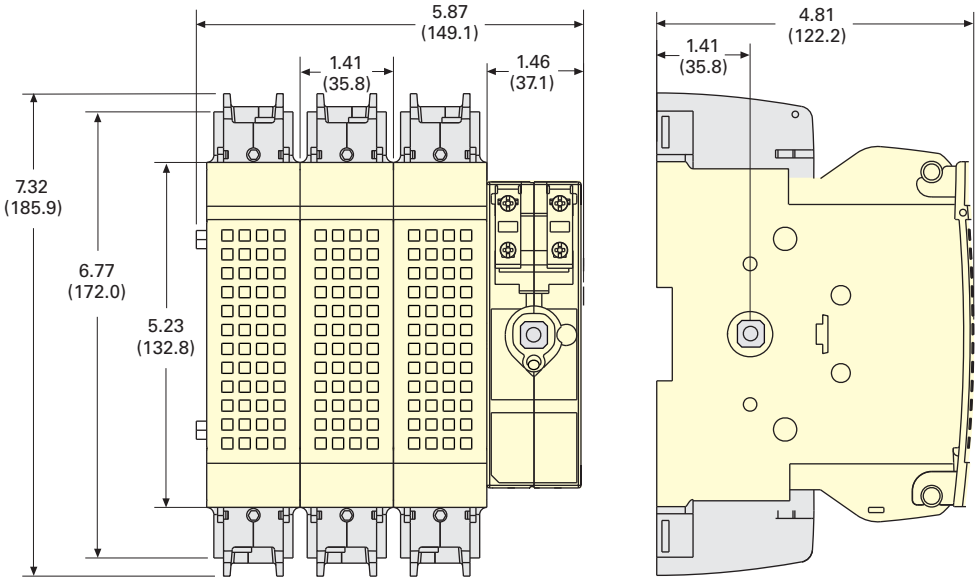
### R9 Series Fusible 30A/J and 60A/J (100 kA)—J-Frame



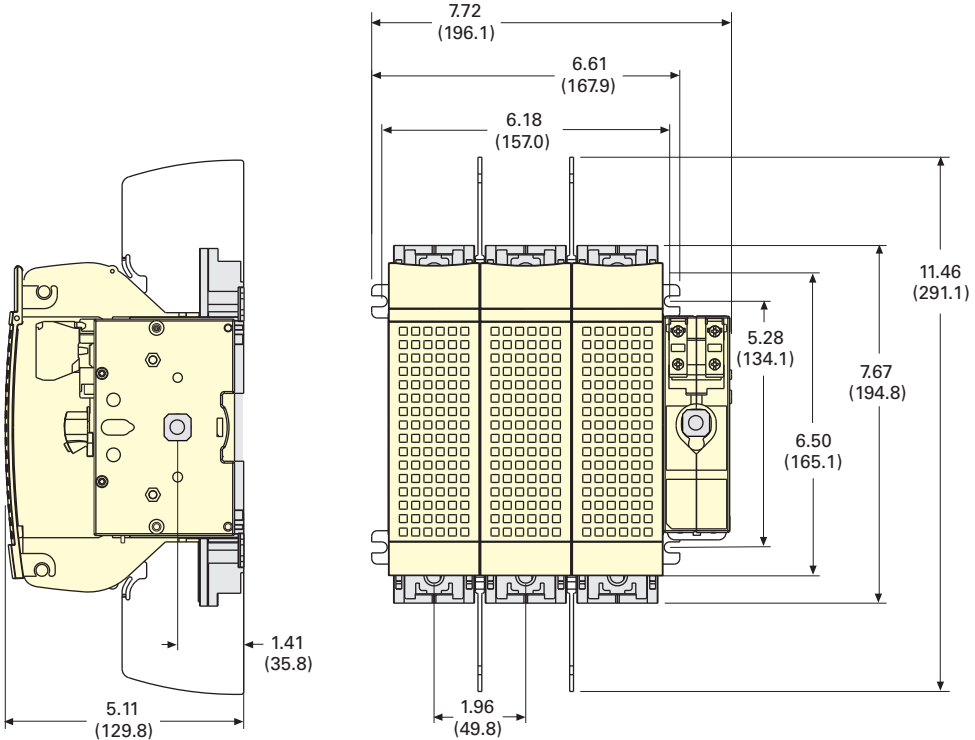


Approximate Dimensions in Inches (mm)

R9 Series Fusible 60A/J (200 kA) and 100A/J—K-Frame



R9 Series Fusible 200A/J—L-Frame



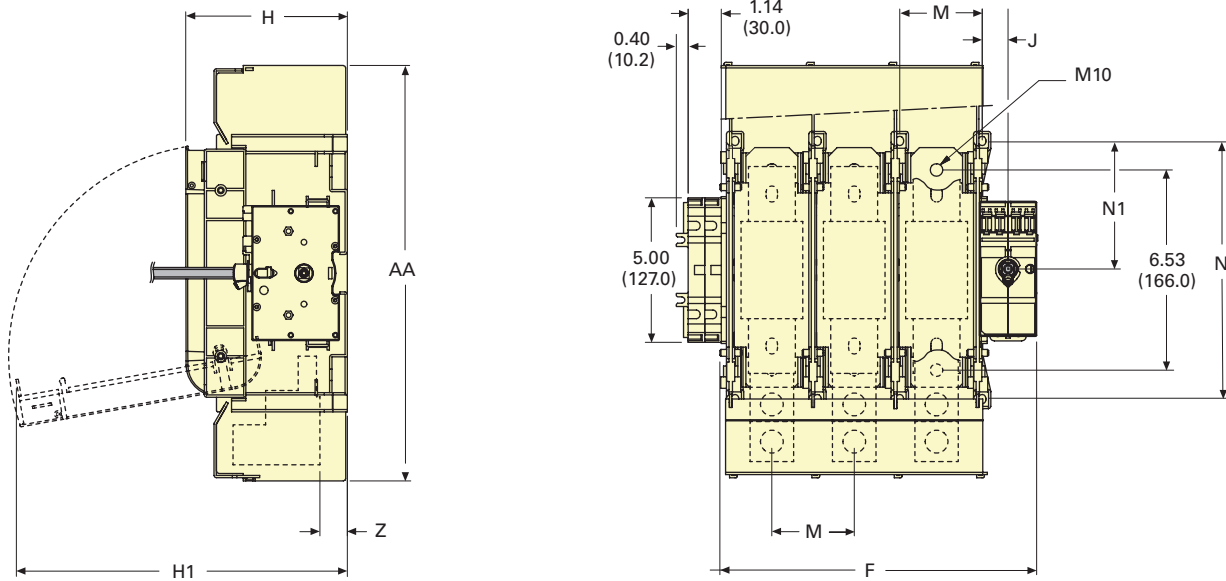
# 8.3

## Rotary Disconnects

R9 Series (UL 98)

Approximate Dimensions in Inches (mm)

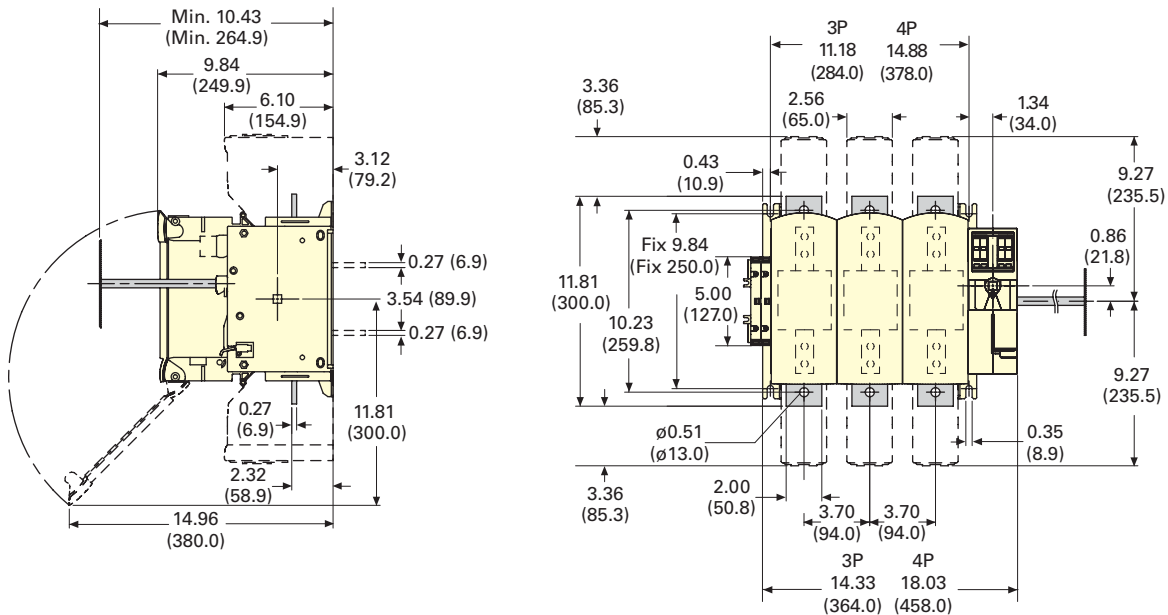
### R9 Series Fusible 400A/J—M-Frame



8

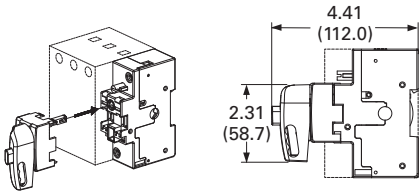
Switch Body				Switch Mounting				Connection Terminals	
F3P	F4P	H	H1	J	M	N	N1	AA	Z
10.80 (276.0)	13.70 (348.0)	5.56 (141.5)	11.41 (290.0)	0.88 (22.5)	2.84 (72.0)	8.83 (224.0)	4.41 (112.0)	14.31 (363.5)	1.06 (27.0)

### R9 Series Fusible 600–800A J/L—N-Frame

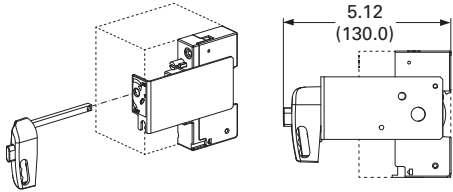


Approximate Dimensions in Inches (mm)

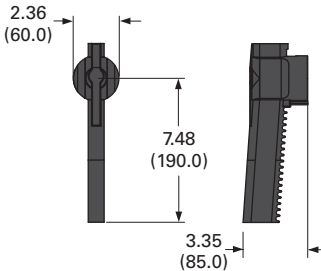
30CC (H-Frame)



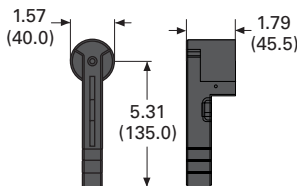
30J (H-Frame)



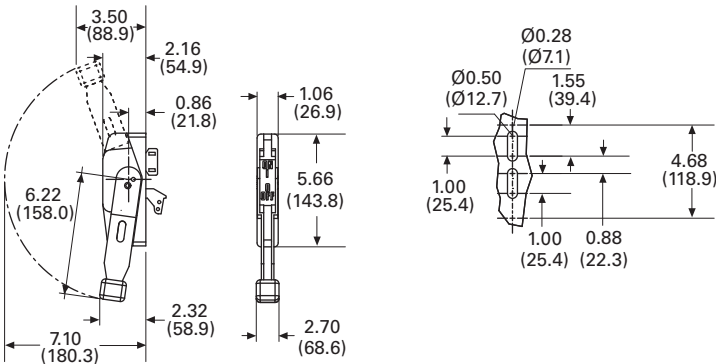
30J to 400J



600J and 800L



Flange Handle



# 8.3

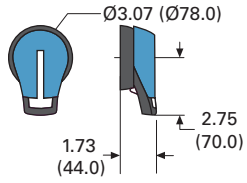
## Rotary Disconnects

R9 Series (UL 98)

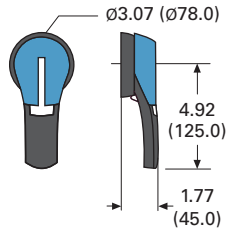
Approximate Dimensions in Inches (mm)

### Door Interlocked External Handle

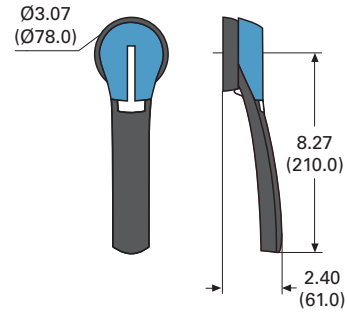
#### PH1 Type Handle



#### PH2 Type Handle

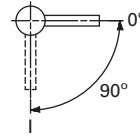
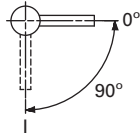
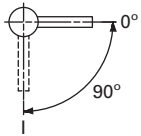


#### PH3 Type Handle

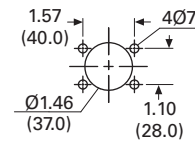
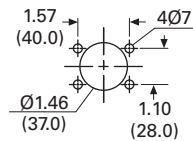
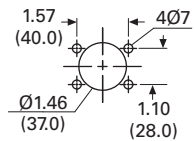


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### Direction of Operation

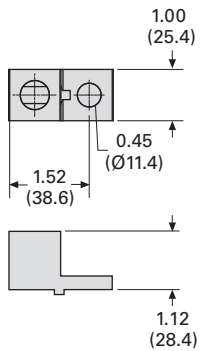


### Door Drilling Template

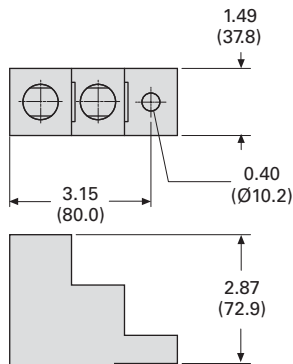


### Line and Load Side Lugs

#### 200A (L-Frame)



#### 400–800A (M- and N-Frames)



**DC Rated Disconnects**



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Fusible 30–800A . . . . .	<b>V5-T8-26</b>
<b>DC Rated Disconnects</b>	
Product Selection . . . . .	<b>V5-T8-46</b>
Accessories . . . . .	<b>V5-T8-47</b>
Technical Data and Specifications . . . . .	<b>V5-T8-49</b>
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**DC Rated Disconnects**

**Product Description**

**UL listed disconnect switches 600 Vdc for photovoltaic applications 100 to 400A**

R9 Series (UL 98 listed) DC rated disconnects are manually operated multi-pole load break switches. They provide safety isolation for any low voltage circuit in a photovoltaic application.

**Features, Benefits and Functions**

- Switching technology
- Up to 600 Vdc according to UL 98 / CSA
- Up to 1000 Vdc according to IEC 947-3

**Application Description**

**In three- and four-pole versions from 100 to 400A**



**Standards and Certifications**

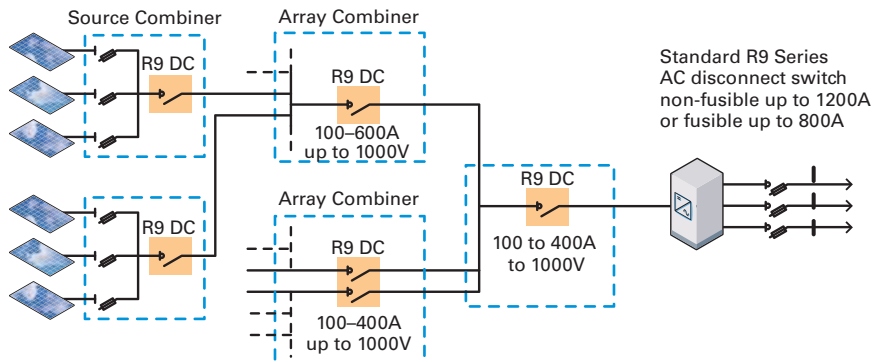
- UL 98, cULus®, File E222859
- CSA 22.2 No. 4, File 217736 ①
- IEC 60947-3
- EN 60947-3
- IEC 60-364-7-712 (Rules for the installations and sites special—photovoltaic applications)



**Note**

① Q4 2010

**Simplified Large Photovoltaic System Layout**



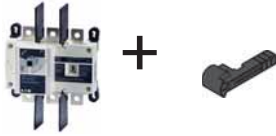
# 8.3

## Rotary Disconnects

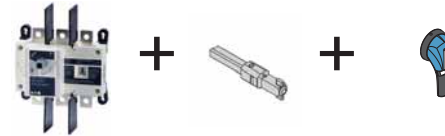
R9 Series (UL 98)

### Product Selection

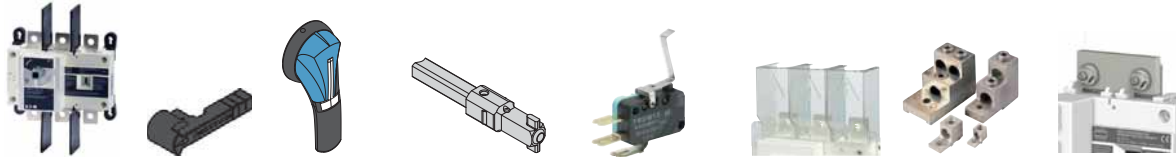
#### Direct Operation



#### External Operation



#### Front Operation—Three- and Four-Pole



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Amperage Rating	Number of Poles	Switch Body	Direct Handle	External Handle (Choose one)	Shaft for External Handle In (mm) (Choose one)	Auxiliary Contacts (Choose one)	Terminals Shroud	Terminal Lugs	Jumpers for Connecting Poles in Series
100	3	<b>R9D3100UDC</b>	<b>DHR9DE</b>	S2 Type	7.90 (200.0)	C Type	3P ②	3P ④	2 pieces
	4	<b>R9D4100UDC</b>		Black 1, 3R, 12 ① <b>PHB2N12F</b>	<b>SF200PH10X10</b>	1st Contact NO+NC <b>AC1NONCDE</b>	<b>TS3R9DT</b>	<b>LK3R9DL</b>	<b>DCJUMP2</b>
200	3	<b>R9D3200UDC</b>		Red/Yellow 1, 3R, 12 ① <b>PHR2N12F</b>	12.60 (320.0)	C Type 2nd Contact NO+NC <b>AC2NONCDE</b>	3P ③	4P ④	3 pieces
	4	<b>R9D4200UDC</b>		<b>SF320PH10X10</b>	15.7 0 (400.0)		<b>SF400PH10X10</b>	<b>TS3R9DB</b>	<b>LK4R9DL</b>
400	3	<b>R9E3400UDC</b>		Black 4, 4X ① <b>PHB2N4XF</b>			3P ②	3P ④	2 pieces
	4	<b>R9E4400UDC</b>		Red/Yellow 4, 4X ① <b>PHR2N4XF</b>			<b>TS3R9ET</b>	<b>LK3R9EM</b>	<b>DCJUMPE2</b>
							3P ③	4P ④	3 pieces
							<b>TS3R9EB</b>	<b>LK4R9EM</b>	<b>DCJUMPE3</b>
							4P ④		
							<b>TS4R9ETB</b>		

#### Notes

- ① Defeatable handle.
- ② Top (line side).
- ③ Bottom (load side).
- ④ Top or bottom (line or load side).

## Accessories

### Direct Handle



### Direct Handle

Description	Ampere Rating	Handle Color	Catalog Number
Front operation	100–400	Black	DHR9DE

### PH2 Type Handle



### Door Interlocked External Handle Front Operation—1-0, Three- and Four-Pole

Ampere Rating	Handle	Handle Color	NEMA Type	Catalog Number
100–400	PH2 Type	Black	1, 3R, 12	PHB2N12F ①
100–400	PH2 Type	Red/yellow	1, 3R, 12	PHR2N12F ①
100–400	PH2 Type	Black	4, 4X	PHB2N4XF ①
100–400	PH2 Type	Red/yellow	4, 4X	PHR2N4XF ①

### Auxiliary Contacts



Description	Ampere Rating	Number of AC	Type	Catalog Number
Early-break/same-make and signaling of positions 0 and 1: 1 to 2NO/NC auxiliary contacts 1 to 2 low level NO/NC auxiliary contacts Characteristics: NO/NC AC: IP2 with front and side operation Connection to the control circuit: By 6.35 mm fast-on terminal Electrical characteristics: 30,000 operations; A300	<b>NO/NC Contact for Three and Four Poles</b>			
	100–400	1 AC NO + NC	C Type	AC1NONCDE
	100–400	2 AC NO + NC	C Type	AC2NONCDE
	<b>Low Level NO/NC Contact for Three and Four Poles</b>			
	100–400	1 AC NO + NC	C Type	AC1NONCDELL
	100–400	2 AC NO + NC	C Type	AC2NONCDELL

### Terminal Screens



Description	Ampere Rating	Number of Poles	Position	Catalog Number
Line or load side protection against direct contact with terminals or connection parts	<b>Three- and Four-Pole</b>			
	100–200	3	Top (line)	TS3R9DT
	100–200	3	Bottom (load)	TS3R9DB
	100–200	4	Top or bottom (line or load)	TS4R9DTB
	400	3	Top (line)	TS3R9ET
	400	3	Bottom (load)	TS3R9EB
	400	4	Top or bottom (line or load)	TS4R9ETB

#### Note

① Order two sets for line and load sides.

# 8.3

## Rotary Disconnects

R9 Series (UL 98)

### Line and Load Terminal Lugs



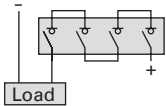
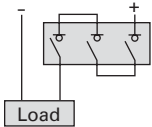
### Line and Load Terminal Lugs

Description	Ampere Rating	Connection Type	Number of Cables per Terminal	Lugs per Kit	Cable Type	Catalog Number
Connection of bare copper cables onto the terminals	100–200	6–300 kcmil	1	2	Cu/Al	<b>LK2R9DL</b>
	100–200	6–300 kcmil	1	4	Cu/Al	<b>LK4R9DL</b>
	400	2–600 kcmil	1	2	Cu/Al	<b>LK2R9EM</b>
	400	2–600 kcmil	1	4	Cu/Al	<b>LK4R9EM</b>

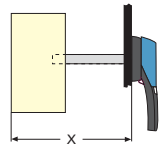
### Jumpers for Connecting Poles in Series

Description	Ampere Rating	Kit of	Figure	Number of Poles in Series	Catalog Number
The jumpers will make easy the connection of the poles in series, allowing the following configurations: ①	100–200	2 pieces	1	3	<b>DCJUMP2</b>
	100–200	3 pieces	2	4	<b>DCJUMP3</b>
	400	2 pieces	1	3	<b>DCJUMPE2</b>
	400	3 pieces	2	4	<b>DCJUMPE3</b>

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### Shaft Extensions for External Front Dimensions (X) – Inches (mm)



Description	Ampere Rating	Dimension X	Handle	Shaft Length	Catalog Number
Standard lengths: 7.9 inches/200 mm 12.6 inches/320 mm 15.7 inches/400 mm	<b>For Three- and Four-Pole</b>				
	100–400	135–265 (3429.0–6731.0)	PH2 Type	7.90 (200.0)	<b>SF200PH10X10</b>
	100–400	135–385 (3429.0–9779.0)	PH2 Type	12.60 (320.0)	<b>SF320PH10X10</b>
	100–400	135–465 (3429.0–11811.0)	PH2 Type	15.70 (400.0)	<b>SF400PH10X10</b>

**Note**

① For other connections, refer to installation instructions.



## Technical Data and Specifications

### 100–400A

#### Characteristics According to UL 98

Thermal Current $I_{th}$ at 40°C (A)		Ampere Rating		
		100	200	400
<b>General Use Purpose Ampere Rating</b>				
Rated voltage	In series	A	A	A
600 Vdc	3P	100	200	400
<b>Overload Capacity</b>				
Prospective short-circuit current (kA rms)		20	20	20
Type of fuse		A70P100	A70P200	LDC
Fuse rating		100	200	400
<b>Connection Terminals</b>				
Minimum connection section/AWG		#6	#6	#2
Maximum connection section/AWG		300 kcmil	300 kcmil	600 kcmil
<b>Auxiliary Contacts</b>				
Electrical characteristics		A300	A300	A300

#### Characteristics According to IEC 60947-3

Thermal Current $I_{th}$ at 40°C (A)		Ampere Rating		
		160	250	630
<b>Rated Operational Currents <math>I_e</math> (A), DC-22 B</b>				
Rated voltage	In series	A	A	A
750 Vdc	3P	160	250	400
750 Vdc	4P	—	—	—
1000 Vdc	4P	160	250	400

# 8.3

## Rotary Disconnects

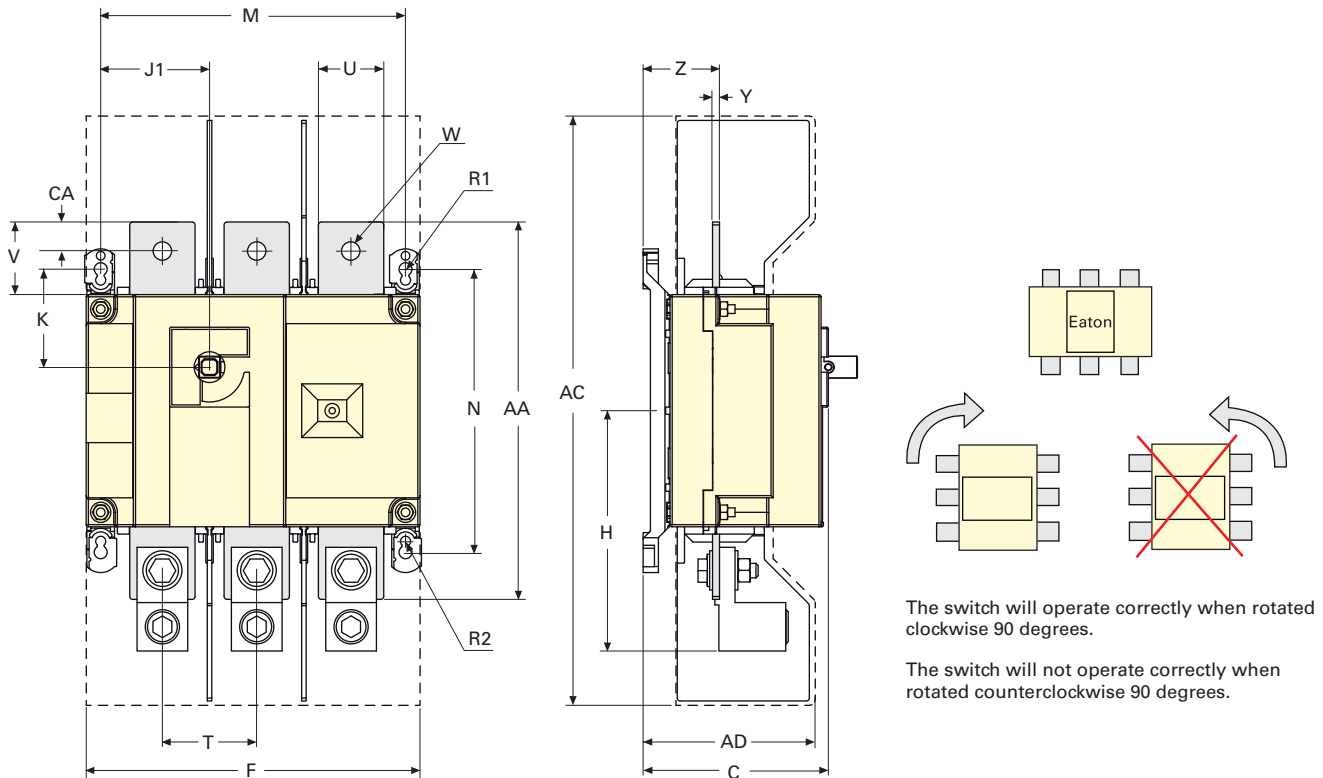
R9 Series (UL 98)

### Dimensions

Approximate Dimensions in Inches (mm)

#### R9 Series DC Rated Disconnects 100–400A

#### Front Operation



The switch will operate correctly when rotated clockwise 90 degrees.

The switch will not operate correctly when rotated counterclockwise 90 degrees.

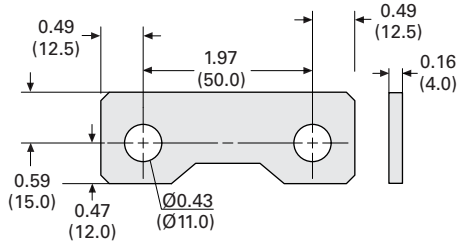
#### R9 Series DC Rated Disconnects

Ampere Rating	C	AC	AD	F 3P	F 4P	H	J1 3P	J1 4P	K	M 3P	M 4P
100–200	3.72 (94.5)	10.10 (256.5)	3.05 (77.5)	7.09 (180.1)	9.06 (230.0)	4.22 (107.2)	2.17 (55.1)	4.13 (104.9)	1.80 (45.7)	6.30 (160.0)	8.27 (210.1)
400	4.92 (125.0)	16.00 (406.4)	4.51 (114.5)	9.05 (230.0)	11.40 (290.0)	6.53 (166.0)	2.95 (75.7)	5.31 (134.9)	2.65 (67.3)	8.26 (209.8)	10.60 (269.2)

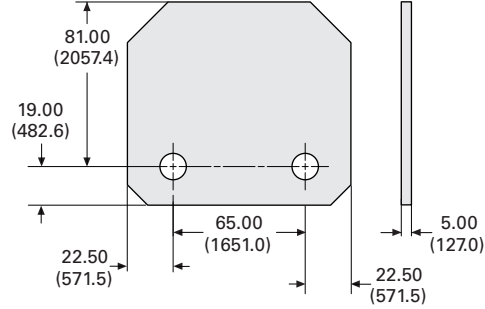
Ampere Rating	N	R1	R2	T	U	V	W	Y	Z	AA	CA
100–200	5.31 (135.0)	0.35 (8.9)	0.27 (6.9)	1.97 (50.0)	0.98 (24.9)	1.18 (30.0)	0.43 (10.9)	0.14 (3.6)	1.35 (34.3)	6.30 (160.0)	0.60 (15.2)
400	7.60 (193.0)	0.35 (8.9)	0.27 (6.9)	2.56 (65.0)	1.77 (45.0)	1.97 (50.0)	0.43 (10.9)	0.20 (5.1)	2.08 (52.8)	10.20 (259.1)	0.80 (20.3)

Approximate Dimensions in Inches (mm)

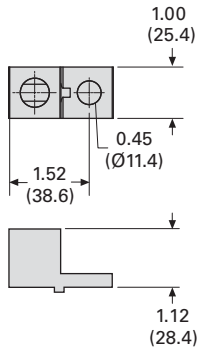
**Jumpers**  
**100–200A**



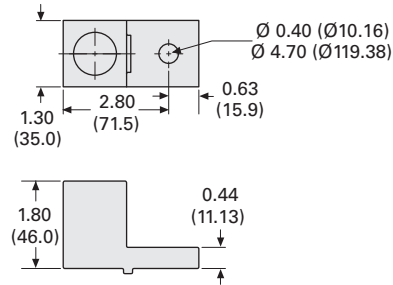
**400A**



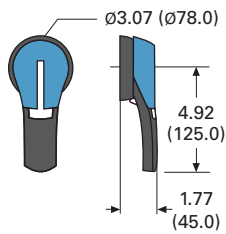
**Terminal Lugs**  
**100–200A**



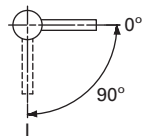
**400A**



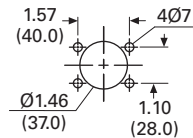
**Door Interlocked External Handle—100 to 400A, Three- and Four-Pole**  
**PH2 Type Handle**



**Direction of Operation**



**Door Drilling Template**



# 8.4

## Rotary Disconnects

### Manual Transfer/Double Throw Switches

#### Manual Transfer Switches



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#### Product Description

R9 Series (UL 98 listed) non-fusible disconnects are heavy-duty manual transfer switches, they transfer load manually between two low voltage circuits and provide safety disconnection.

These switches are extremely durable and are tested and approved for use in the most demanding applications as resistive load or total system applications.

- Three load break positions (I, O, II)
- On load switching
- Direct or external handle
- 480 Vac total system
- 600 Vac resistive load

#### Standards and Certifications

- UL 98, cULus, File E222859
- UL1008 (600–1200A)
- CSA 22.2 No. 4, File 217736
- IEC 60947-3
- EN 60947-3
- CE

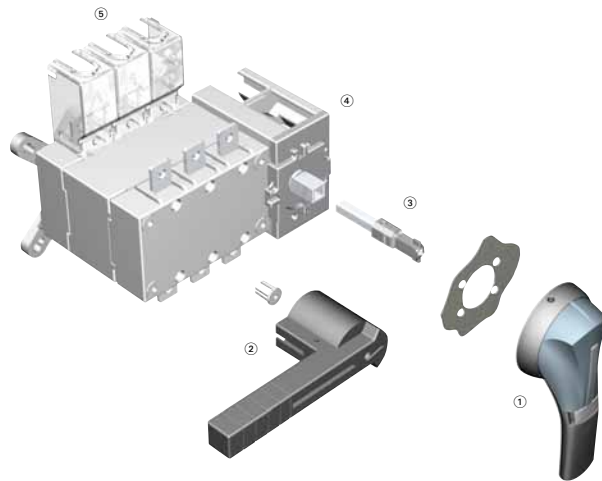


#### Contents

##### Description

Manual Transfer/Double Throw Switches

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Product Selection . . . . .	<b>V5-T8-53</b>
Accessories . . . . .	<b>V5-T8-54</b>
Technical Data and Specifications . . . . .	<b>V5-T8-56</b>
Dimensions . . . . .	<b>V5-T8-57</b>

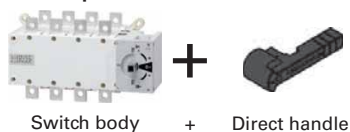


#### Product Identification

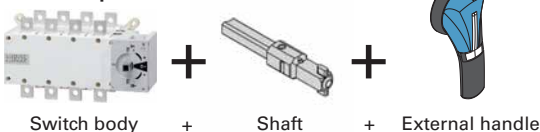
- ① External front handle
- ② Direct handle
- ③ Shaft extension for external handle
- ④ Pre-break ACs (standard on 600–1200A)
- ⑤ Terminal screen

### Product Selection

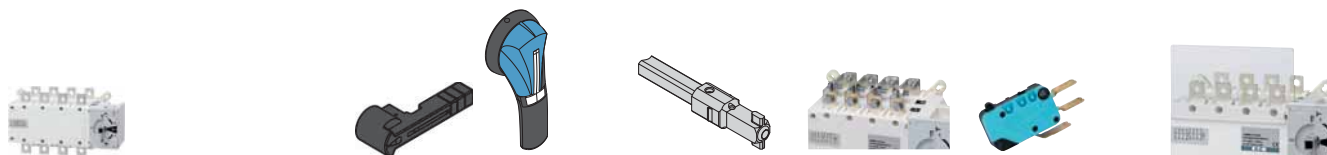
#### Direct Operation



#### External Operation



### Manual Transfer/Double Throw Switches—UL 98 Standard ①



Ampere Rating	Number of Poles	Switch Body Only ①	Direct Handle (Black)	External Three-Position Handle (Choose one)	Shaft Extensions for External Handle In (mm) (Choose one)	Bridging Bars	Auxiliary Contacts	Terminal Screens ②
100	3	<b>RMTS3100U</b>	<b>DHMTSSL</b>	Size 2, Black I–O–II Type 4/4X <b>PHB2N4X3P</b>	7.90 (200.6)	<b>3P BB3P200</b>	<b>NO/NC AC1NONCMTS400</b>	<b>3P TS3MTS200TB</b>
	4	<b>RMTS4100U</b>			<b>SF200PH10X10</b>			
200	3	<b>RMTS3200U</b>		Size 2, Red I–O–II Type 4/4X <b>PHR2N4X3P</b>	12.60 (320.0)	<b>4P BB4P200</b>	Low level <b>AC1NONCMTS400LL</b> ③	<b>4P TS4MTS200TB</b>
	4	<b>RMTS4200U</b>			15.70 (398.8) <b>SF400PH10X10</b>			
400	3	<b>RMTS3400U</b>		Size 3, Black I–O–II Type 4/4X <b>PHB3N4X3P</b>	7.90 (200.6)	<b>3P BB3P400</b>	<b>NO/NC contact standard</b>	<b>3P TS3MTS400TB</b>
		4			<b>RMTS4400U</b>			
	4	<b>RMTS3400U</b>			12.60 (320.0)	<b>4P BB4P400</b>		<b>4P TS4MTS400TB</b>
		<b>RMTS4400U</b>			15.70 (398.8) <b>SF320PH15X12</b>			
600	3	<b>RMTS3600U</b>	<b>DHMTSDL</b>	Size 4, Black I–O–II Type 4/4X <b>PHB4N4X3P</b>		<b>3P BB3P600</b>		<b>3P TS3MTS600</b>
	4	<b>RMTS4600U</b>			<b>SF320PH15X12</b>			
800	3	<b>RMTS3800U</b>	<b>DHMTSDLM</b>	Size 4, Red I–O–II Type 4/4X <b>PHR4N4X3P</b>		<b>3P BB3P1200</b>		<b>3P TS3MTS1200</b>
	4	<b>RMTS4800U</b>			<b>SF400PH15X12</b>			
1200	3	<b>RMTS31200U</b>				<b>4P BB4P1200</b>		<b>4P TS4MTS1200</b>
	4	<b>RMTS41200U</b>						

#### Notes

- ① All ratings, 100–1200A, are UL 98 listed. Switches rated 600–1200A are UL 1008 listed as well.
- ② Line or load (top or bottom); for both line and load, order two kits.
- ③ Low level auxiliary contact—gold plated for minimal resistance—for PLC applications.

# 8.4

## Rotary Disconnects

### Manual Transfer/Double Throw Switches

#### Accessories

##### Direct Handle



Ampere Rating	Handle Color	Handle Type	Catalog Number
100–400	Black	Single lever	DHMTSSL
600	Black	Double lever	DHMTSDL
800–1200	Black	Double lever	DHMTSDLM

# 8

##### PH2 and PH3 Type



##### External Handle

Description	Ampere Rating	Handle Type	Handle Color	NEMA Type	Lockable in the "3" Positions	Catalog Number
The handle locking function prevents the user from opening the door of the enclosure when the switch is in the "ON" position.	100–200	PH2	Black	4, 4X	Yes	PHB2N4X3P
	100–200	PH2	Red/Yellow	4, 4X	Yes	PHR2N4X3P
Opening the door when the switch is in the "ON" position is possible by defeating the locking function with the use of a tool (authorized persons only). The locking function is restored when the door is once again closed.	400	PH3	Black	4, 4X	Yes	PHB3N4X3P
	400	PH3	Red/Yellow	4, 4X	Yes	PHR3N4X3P
	600–1200	PH4	Black	4, 4X	Yes	PHB4N4X3P
	600–1200	PH4	Red/Yellow	4, 4X	Yes	PHR4N4X3P

##### PH4 Type



##### Shaft Extension



Ampere Rating	Handle Type	Length In (mm)	Catalog Number
100–800	PH1	7.90 (200.6)	SF200PH10X10
125–800	PH1	12.60 (320.0)	SF320PH10X10
100–200	PH2	15.70 (398.8)	SF400PH10X10
630–1200	PH2, PH3	7.90 (200.6)	SF200PH15X12
600–1200	PH2, PH3	12.60 (320.0)	SF320PH15X12
400–1200	PH2, PH3	15.70 (398.8)	SF400PH15X12
800–1200	V1	12.60 (320.0)	SF320V1
800–1200	V1	15.70 (398.8)	SF400V1

### Bridging Bars



Description	Ampere Rating	Number of Bridging Bars	Catalog Number
Creation of a common point, above or below the switch, between positions I and II.	100–200	3	<b>BB3P200</b>
	100–200	4	<b>BB4P200</b>
	400	3	<b>BB3P400</b>
	400	4	<b>BB4P400</b>
	600	3	<b>BB3P600</b>
	600	4	<b>BB4P600</b>
	800–1200	3	<b>BB3P1200</b>
	800–1200	4	<b>BB4P1200</b>

### Terminals Protection Screen



Description	Ampere Rating	Number of Poles	Catalog Number
Top or bottom (line or load) protection against direct contacts with terminal or connecting parts.	100–200	3	<b>TS3MTS200TB</b>
	100–200	4	<b>TS4MTS200TB</b>
	400	3	<b>TS3MTS400TB</b>
	400	4	<b>TS4MTS400TB</b>
	600	6	<b>TS3MTS600</b>
	600	4	<b>TS4MTS600</b>
	800–1200	3	<b>TS3MTS1200</b>
	800–1200	4	<b>TS4MTS1200</b>

### Mounting Spacers



Description	Ampere Rating	Number of Poles	Catalog Number
Raises the device's terminals 10 mm away from the bottom of the enclosure or frame on which the device is mounted.	100–400	1 set of 2 spacers	<b>MSP400</b>

### Auxiliary Contacts



Description	Ampere Rating	Contact(s)	Catalog Number
Early-break/same-make and signalization per position 1 and 2. Electrical characteristics: A300.	100–400	1NO/NC per position 1 and 2	<b>AC1N0NCMTS400</b>
	100–400	1NO/NC per position 1 and 2 low level	<b>AC1N0NCMTS400LL</b> ①
	600–1200	1NO/NC per position 1 and 2	Standard

### Line and Load Terminal Lugs



Description	Ampere Rating	Connection Type	Number of Poles	Number of Cables/Lug	Lugs per Kit	Cable Type	Catalog Number
Connection of bare copper cables onto the terminals (without spade lugs).	100–200	6–300 kcmil	3	1	3	Cu/Al	<b>LK3R9DL</b>
	100–200	6–300 kcmil	4	1	4	Cu/Al	<b>LK4R9DL</b>
	400	4–600 kcmil	3	1	3	Cu/Al	<b>LK3R9EM</b>
	400	4–600 kcmil	4	1	4	Cu/Al	<b>LK4R9EM</b>
	600	2x (#2–600 kcmil)	3	2	3	Cu/Al	<b>LK3R9FN</b>
	600	2x (#2–600 kcmil)	4	2	4	Cu/Al	<b>LK4R9FN</b>
	800–1200	2x (#2–600 kcmil)	3	2	6	Cu/Al	<b>LK6R9G</b>
	800–1200	2x (#2–600 kcmil)	4	2	8	Cu/Al	<b>LK8R9G</b>

**Note**

① Gold plated for minimal resistance—for PLC applications.

## Technical Data and Specifications

### UL 1008 Characteristics

Description	100A	200A	400A	600A	800A	1200A
Operation voltage	600	600	600	600	600	600
Short-circuit rating at 600 Vac (kA) <sup>①</sup>	100	100	65	100	100	100
Type of fuse	J	J	J	L	L	L
Maximum fuse rating (A)	200	400	600	800	1000	1600
Short-circuit rating with circuit breaker (kA/ms)	10/25	10/25	14/50	35/50	35/50	35/50
<b>Operational Power/Current Maximum Operational Three-Phase</b>						
240 Vac total system (A)	100	100	250	400	700	700
240 Vac resistive load (A)	100	200	400	600	800	1200
480 Vac total system (A)	100	100	125	350	600	600
480 Vac resistive load (A)	100	200	400	600	800	1200
600 Vac resistive load (A)	100	200	400	400	800	1200
<b>Mechanical Endurance</b>						
Endurance (number of operating cycles)	6050	6050	6050	6050	3550	3550
<b>Connection Terminals</b>						
Minimum connection section/AWG	#6	#6	#4/2 x #6	2x #2	4x #2	4x #2
Maximum connection section/AWG	300 kcmil	300 kcmil	600 kcmil/2x 350 kcmil	2x 600 kcmil	4x 600 kcmil	4x 600 kcmil

### UL 98/CSA 22.2 No. 4 Characteristics

Description	100A <sup>②</sup>	200A <sup>②</sup>	400A <sup>②</sup>	600A	800A	1200A
Short-circuit rating at 600 Vac (kA)	200	200	200	200	100	100
Type of fuse	J	J	J	J	L	L
Maximum fuse rating (A)	100	200	400	600	800	1200
<b>Maximum Motor, hp/FLA Three-Phase Motor Maximum</b>						
220–240 Vac	30/80	75/192	125/312	200/480	200/480	200/480
440–480 Vac	75/96	180/180	250/302	400/477	500/590	500/590
600 Vac	100/99	200/192	350/336	350/336	500/472	500/472
<b>Maximum Motor Power, hp/DC FLA Motor Maximum</b>						
125 Vdc <sup>③</sup>	7.5/58	15/112	20/148	20/148	—	—
250 Vdc <sup>④</sup>	20/72	40/140	50/173	50/173	—	—
<b>Mechanical Characteristics</b>						
Endurance (number of operating cycles)	10,000	8000	6000	6000	3500	3500
Operating torque (lbs.in/Nm)	88.5/10	88.5/10	128.3/14.5	327.5/37	442.5/50	442.5/50
<b>Auxiliary Contacts</b>						
Electrical characteristics	A300	A300	A300	A300	A300	A300

#### Notes

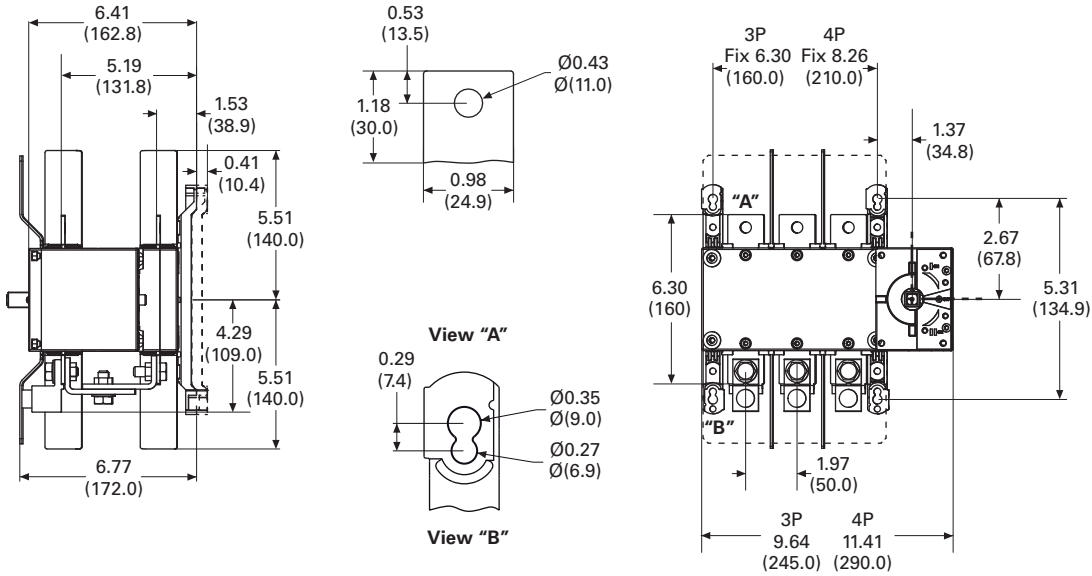
- ① Short-circuit rating achieved when used with respective fuse type and maximum fuse rating.
- ② Only UL 98 listed. For UL 1008 availability, contact Eaton.
- ③ Two-pole in series.
- ④ Three-pole in series.



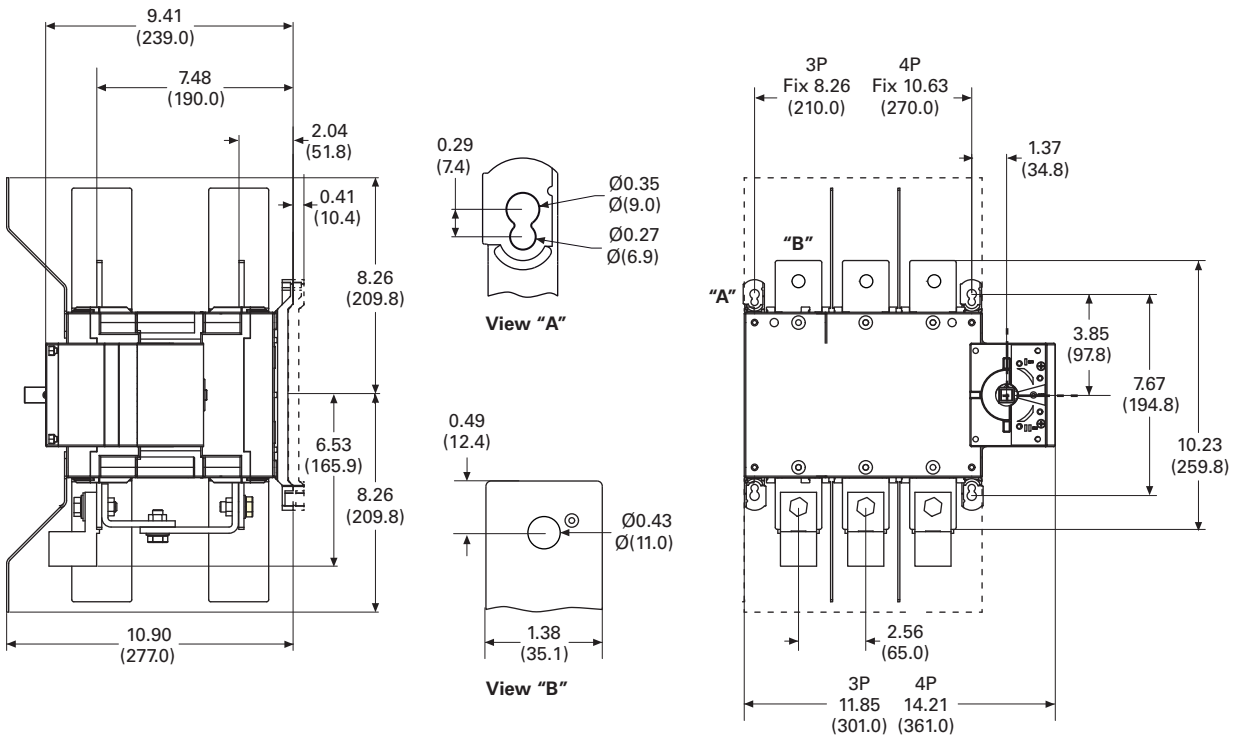
### Dimensions

Approximate Dimensions in Inches (mm)

#### 100 to 200A



#### 400A



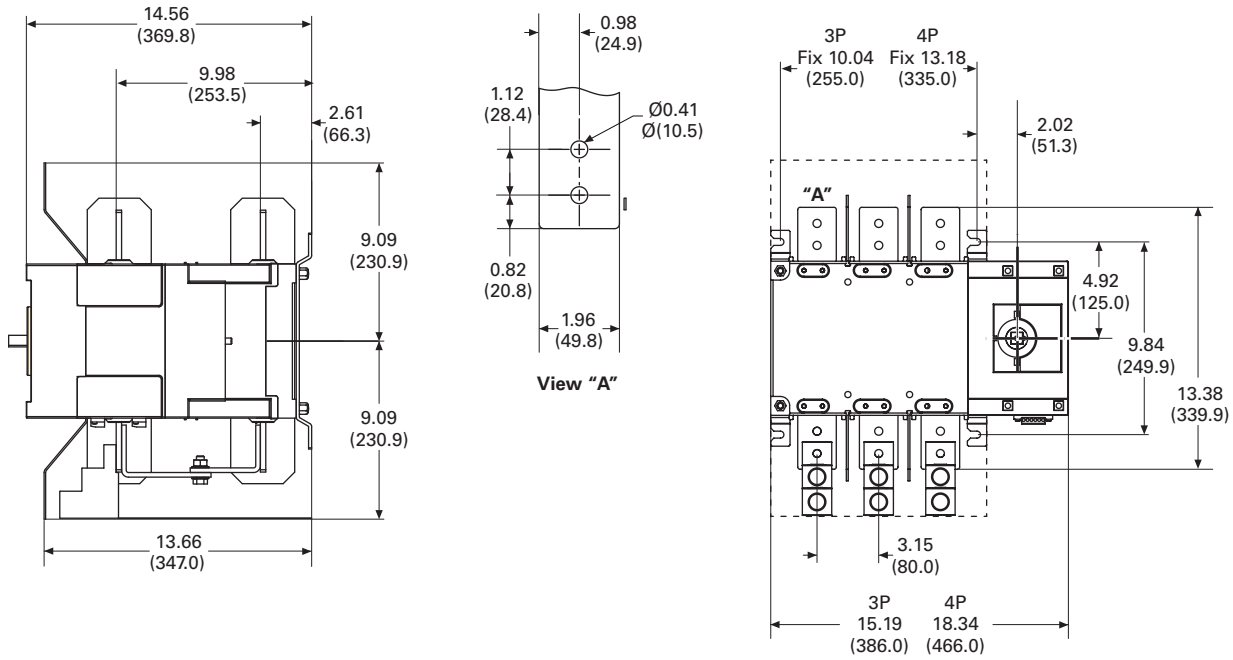
# 8.4

## Rotary Disconnects

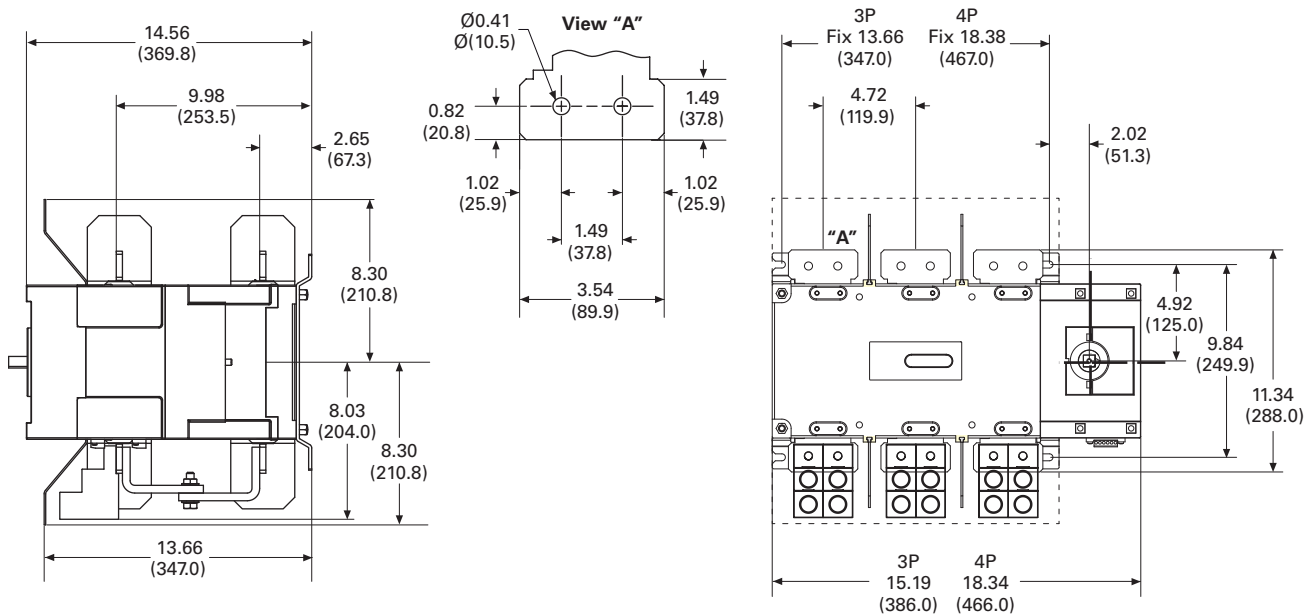
### Manual Transfer/Double Throw Switches

Approximate Dimensions in Inches (mm)

#### 600A



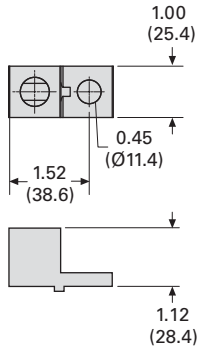
#### 800 to 1200A



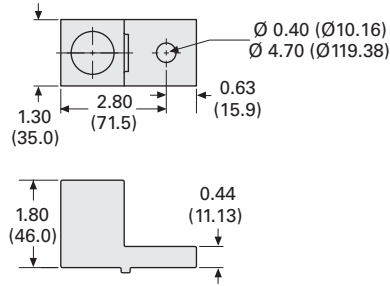
Approximate Dimensions in Inches (mm)

### Terminal Lugs

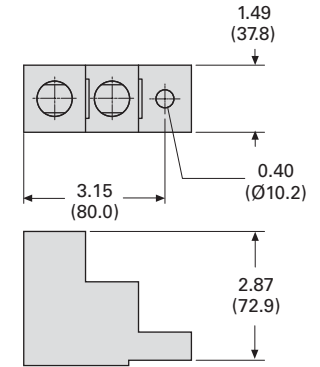
#### 100–200A



#### 400A

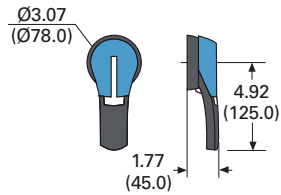


#### 600–1200A

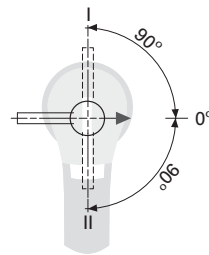


#### 100–200A

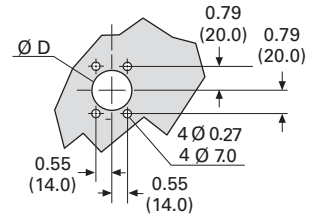
#### PH2 Type



#### Direction of Operation

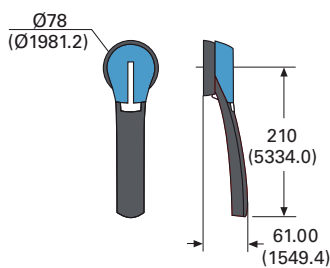


#### Door Drilling Template

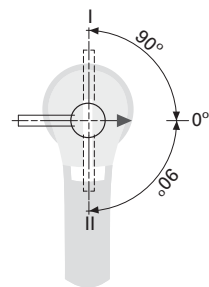


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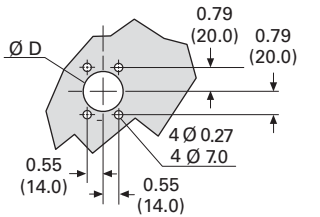
#### PH3 Type



#### Direction of Operation

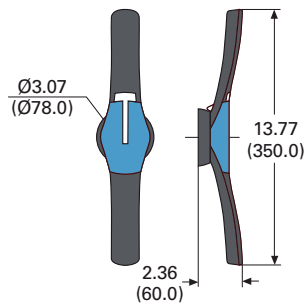


#### Door Drilling Template

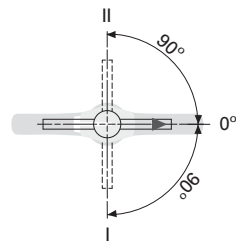


#### 600–1200A

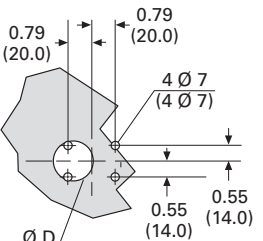
#### PH4 Type



#### Direction of Operation



#### Door Drilling Template



# 8.4

## Rotary Disconnects

Manual Transfer/Double Throw Switches

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