

### DC Rated Disconnects



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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.

### 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)



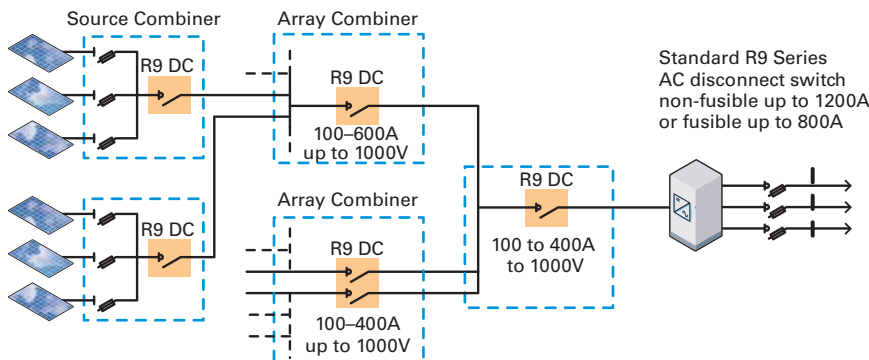
### Note

① Q4 2010

### Features, Benefits and Functions

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

### Simplified Large Photovoltaic System Layout



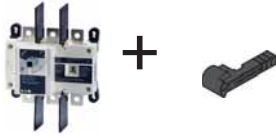
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## Rotary Disconnects

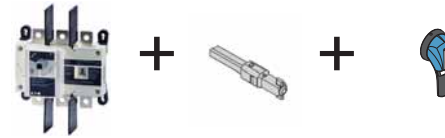
R9 Series (UL 98)

### Product Selection

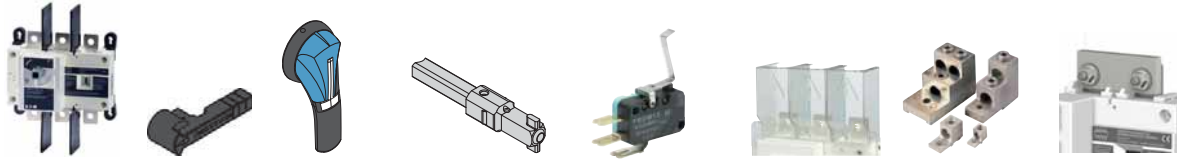
#### Direct Operation



#### 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.

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## Rotary Disconnects

R9 Series (UL 98)

### Line and Load Terminal Lugs



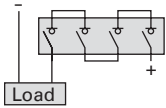
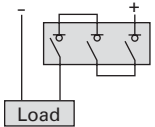
### Line and Load Terminal Lugs

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>

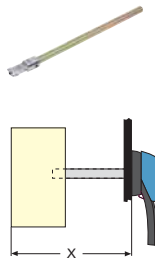
### Jumpers for Connecting Poles in Series

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 In (mm)	Handle	Shaft Length In (mm)	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