

# PV-Rated

## Disconnect Switches

### DISCONNECT SWITCHES



Mersen offers a range of DC disconnect switches specially designed for PV applications, in one- and two-circuit configurations for both 1000V and 1500V DC applications. The technology inside the switch and the visible contacts allow a quick, safe, and reliable DC breaking at all current levels up to 1500VDC. The product is ready and simple to install independent of the polarity, with limited power losses, and a smaller footprint than competition.

### APPLICATIONS:

- Medium and large power photovoltaic installations up to 1500VDC
- “Make and break” on load and provide safety isolation at string combiner box level

### RATINGS:

- **Volts:** 1000 and 1500VDC
- **Amps:** IEC: 100 to 500A, UL98: 100 to 400A
- **Short-Circuit Current Rating (SCCR):** 5 to 10kA for higher ratings

### FEATURES/ BENEFITS:

- IEC version and UL version
- Visible contacts
- Compact footprint
- Direct installation for floating polarity configuration
- Jumper bar available for grounded configuration

### APPROVALS:

- UL98B File #E466972 WHVA
- IEC 60947-3 CE



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#### Catalog number designation

<b>MD</b> Switch	<b>100</b> Ampacity	<b>E</b> Type	<b>1</b> Number of Poles/Left of handle	<b>1</b> Number of Poles/Right of handle	<b>—</b> Revision
MD = Mersen DC Switch	100-500A	E = IEC U = UL-listed V = 1500V	1, 2, 3	1, 2, 3	Blank = 0

UL 98B Listed DC Switches



MD100U11



MD100U22



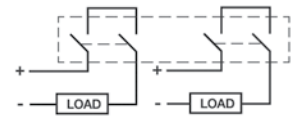
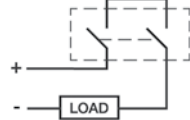
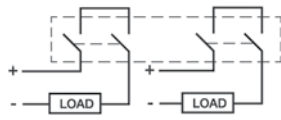
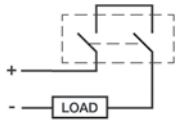
MD250UV12



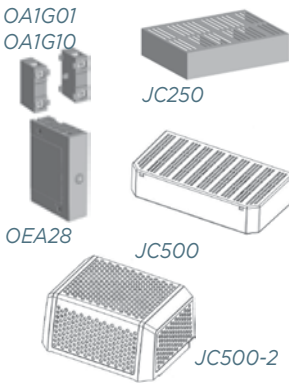
MD400U11







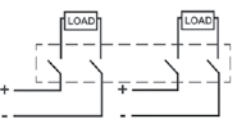
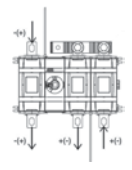
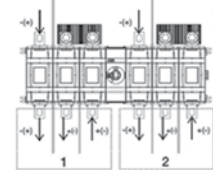




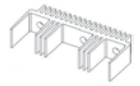

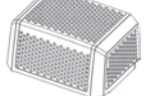
MD400U22



Switch Body	Ampere Rating	100	200	250	320	400
	1000VDC 2-pole Configuration	MD100U11	MD200U11	MD250U11	MD320U11	MD400U11
	1000VDC 2x2-pole Configuration	MD180U22	MD180U22*		MD320U22	MD400U22
	1500VDC 3-pole Configuration			MD250UV12	MD320UV12	MD400UV12
B=Black. Substitute 'R' for 'B' if a red handle is desired. Ex. HR45 *180A Rating						
Handles and Shafts	Direct Front Operation					
	1000VDC	HDD250	HDD250	HDD250	HDD400	HDD400
	1500VDC	HDD400	HDD400	HDD400		
	External Pistol style					
	NEMA Type 1, 3R, 12	HB65, HB80		HB125, HB145		
	NEMA Type 4, 4X	HB65X, HB80X		HB125X, HB145X		
B=Black. Substitute 'R' for 'B' if a red handle is desired. Ex. HR65						
	Shafts					
	Shaft— SPAxxx (xxx = length in mm), SFBxxx (xxx = length in mm)	SPA130, SPA210, SPA290, SPA360, SPA430		SFB185, SFB280, SFB325, SFB395, SFB535		
Accessories	Auxiliary Contacts*					
	NO Right side mounting	OA1G10	OA1G10	OA1G10	OA1G10	OA1G10
	NC left side mounting	OA3G01	OA3G01	OA3G01	OA3G01	OA3G01
	Module for SF aux. contacts	OEA28	OEA28	OEA28	OEA28	OEA28
*Rated 2A max continuous @690VAC						
	Terminal Shroud for Short Circuit Link					
	For MDxxxU11, UV12	JC250	JC250	JC500	JC500	JC500
	For MDxxxU22	JC500-2	JC500-2	JC500-2	JC500-2	JC500-2
	Terminal Shroud for Lugs					
	Kit of 4 Terminal Shrouds					
	1 Terminal Shroud	TDS250S	TDS250S	TDS250S	TDS400	TDS400



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IEC-RATED DC SWITCHES								
								
MD100E11	MD100E22	MD400EV12	MD400E22	MD400EV12	MD315EV33			
								
<b>Switch Body</b>	<b>Ampere Rating</b>	100	160	200	250	315	400	500
	1000VDC 2-pole Configuration	MD100E11	MD160E11	MD200E11	MD250E11	MD315E11	MD400E11	MD500E11
	1000VDC 2x2-pole Config.	MD100E22	MD160E22	MD200E22	MD250E22	MD315E22	MD400E22	MD500E22
	1500VDC 3-pole Configuration					MD315EV12	MD400EV12	MD500EV12
	1500VDC 2x3-pole Config.					MD315EV33	MD400EV33	MD500EV33
<b>Handles and Shafts</b>	<b>Direct Front Operation</b>							
		HDD250	HDD250	HDD250	HDD250	HDD400	HDD400	HDD400
	<b>External Pistol Style</b>							
	NEMA Type 1, 3R, 12	HB65, HB80				HB125, HB145		
	NEMA Type 4, 4X	HB65X, HB80X				HB125X, HB125X		
	B=Black. Substitute 'R' for 'B' if a red handle is desired. Ex. HR65							
	<b>Shafts</b>							
	Shaft — SPAxxx (xxx = length in mm)	SPA130, SPA210, SPA290, SPA360, SPA430				SFB185, SFB280, SFB325, SFB395, SFB535		
<b>Accessories</b>	<b>Auxiliary Contacts*</b>							
	NO Right side mounting	OA1G10	OA1G10	OA1G10	OA1G10	OA1G10	OA1G10	OA1G10
	NC left side mounting	OA3G01	OA3G01	OA3G01	OA3G01	OA3G01	OA3G01	OA3G01
	Module for SF aux. contacts	OEA28	OEA28	OEA28	OEA28	OEA28	OEA28	OEA28
	*Rated 2A max continuous @690VAC							
	<b>Short Circuit Link</b>							
	For MDxxxE22 and EV33					JUMP500-2	JUMP500-2	JUMP500-2
	For MDxxxE11, E22, EV12**	JUMP250	JUMP250	JUMP250	JUMP250	JUMP500	JUMP500	JUMP500
	**Shipped with one link per circuit							
	<b>Terminal Shroud for Short Circuit Link</b>							
	For JUMP500-2					JC500-2	JC500-2	JC500-2
	For JUMP250, JUMP500	JC250	JC250	JC250	JC250	JC500	JC500	JC500
	<b>Terminal Shrouds for Lugs</b>							
	Kit of 4 Terminal Shrouds	TS250-14	TS250-14	TS250-14	TS250-14			
	1 Terminal Shroud					TDS400	TDS400	TDS400
	A shorter version is available for DC Switches up to 250A. 1 piece per package: TDS250S							

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TECHNICAL DATA FOR 1000VDC-RATED SWITCHES

Technical data in accordance to UL 98B for switch-disconnectors  
(Suitable for use in photovoltaic systems in accordance with article 690 of the NEC)

Switch Size			MD100U	MD200U	MD250U	MD315U	MD400U	MD250UV12	MD320UV12	MD400UV12
Voltage Rating		VDC	1000	1000	1000	1000	1000	1500	1500	1500
Current Rating		A	100	200 1)	250	320	400	250	320	400
Rated Ambient Temp.		°C	-20...+50	-20...+50	-20...+50	-20...+50	-20...+50	-20...+50	-20...+50	-20...+50
Short Circuit Rating		kA, 1000V	5	5	10	10	10	10	10	10
	Class of Fuse		Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker
Mechanical Endurance (Divide by 2 for operation cycles) Oper.			4000	4000	2000	2000	2000			
Terminal Lugs			LUG200	LUG200	LUG400	LUG400	LUG400	LUG400	LUG400	LUG400
Wire Range		MCM	#4-300	#4-300	#2-600	#2-600	#2-600	#2-600	#2-600	#2-600
Technical data according to IEC		Same as type	MD160E	MD250E	MD315E	MD400E	MD500E	MD315EV12	MD400EV12	MD500EV12

1) For 4 pole switches [double circuit use], the current rating at 1000 VDC is 180 A.

TECHNICAL DATA ACCORDING TO IEC 60947 FOR SWITCH-DISCONNECTORS

Switch Size		A	MD100E	MD160E	MD200E	MD250E	MD315E	MD400E	MD500E
Rated Insulation voltage $U_i$	Pollution degree 2	V	1500	1500	1500	1500	1500	1500	1500
	Pollution degree 3	V	1500	1500	1500	1500	1500	1500	1500
Rated impulse withstand	50 Hz 1 min	kV							
		kV	12	12	12	12	12	12	12
Rated thermal current $I_{th}$ ...with minimum cable or bar cross section	In open air, normal conditions <sup>1)</sup>	A	100	160	200	250	315	400	630
	In enclosure 40°C	A	100	160	200	250	315	400	550
	In enclosure 60°C	A	100	160	200	250	315	400	440
	Cu	mm <sup>2</sup>	35	70	95	120	185	240	240
Rated operational current / poles in series DC-21B	1000	V	100 / 2	160 / 2	200 / 2	250 / 2	315 / 2	400 / 2	500 / 2
			100 / 2x2	160 / 2x2	200 / 2x2	250 / 2x2	315 / 2x2	400 / 2x2	500 / 2x2
Rated short-time withstand current, 1000 V, 1 s, R.M.S. -value $I_{sc}^{1000}$		kA	5	5	5	5	10	10	10
Rated short circuit making capacity, 1000 V, Peak value $I_{sm}$		kA	5	5	5	5	10	10	10
Power loss / pole	At rated current	W	2	4	6	9,5	6	9,7	15,1
Cable size	Cu	mm <sup>2</sup>							
Terminal bolt size	Metric thread diameter x length	mm	M8x25	M8x25	M8x25	M8x25	M10x30	M10x30	M12x40
Terminal tightening torque	Counter torque required	Nm	15-22	15-22	15-22	15-22	30-44	30-44	50-75

1) Normal conditions defined in IEC 60947-1-6.1

TECHNICAL DATA ACCORDING TO IEC 60947 FOR 1500VDC-RATED SWITCHES

Switch Size		A	MD315EV12	MD400EV12	MD500EV12	
Rated Insulation voltage $U_i$	Pollution degree 2	V	1500	1500	1500	
	Pollution degree 3	V	1500	1500	1500	
		kV	12	12	12	
Rated thermal current $I_{th}$ ...with minimum cable or bar cross section	In open air, normal conditions <sup>1)</sup>	A	315	400	630	
	In enclosure 40°C	A	315	400	550	
	In enclosure 60°C	A	315	400	440	
	Cu	mm <sup>2</sup>	185	240	240	
Rated operational current / poles in series DC-21B	1000	1 circuit	V	315 / 2	400 / 2	500 / 2
	1000	2 circuits	V	315 / 2	400 / 2	500 / 2
	1000	3 circuits	V	315 / 2	400 / 2	500 / 2
	1500	1 circuit	V	315 / 3	400 / 3	500 / 3
	1500	1 circuit	V	315 / 4	400 / 4	500 / 4
	1500	2 circuits	V	315 / 3	400 / 3	500 / 3
Rated short-time withstand current, 1500 V, 1 s	R.M.S. -value $I_{sc}^{1500}$	kA	10	10	10	
Rated short circuit making capacity, 1500 V	Peak value $I_{sm}$	kA	10	10	10	
Power loss / pole	At rated current	W	6	9,7	15,1	
Terminal bolt size	Metric thread dia. x length	mm	M 10x30	M 10x30	M 12x40	
Terminal tightening torque	Counter torque required	Nm	30-44	30-44	50-75	

1) Normal conditions defined in IEC 60947-1-6.1