

PV-Rated Disconnect Switches

UL 98 and IEC-Rated DC Switches

Mersen offers a range of DC disconnect switches especially 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.

Highlights:

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

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
SCCR : 5 to 10kA for higher ratings

Catalog Number Designation

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

Approvals:

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



PV-Rated Disconnect Switches

UL98B Listed DC Switches



MD100U11



MD100U22



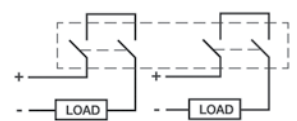
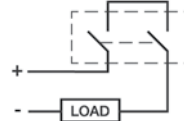
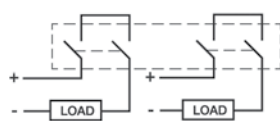
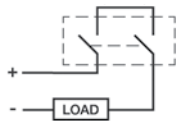
MD250UV12



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	MD180U22	MD320U22	MD400U22
1500VDC 2-pole Configuration			MD250UV12	MD320UV12	MD400UV12

Direct Front Operation

1000VDC	HDD250	HDD250	HDD250	HDD400	HDD400
1500VDC			HDD400	HDD400	HDD400

Handles and Shafts



HDD400



HB125

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
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Auxiliary Contacts*

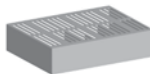
NO Right side mounting	OA1G10	OA1G10	OA1G10	OA1G10	OA1G10
NC left side mounting	OA3G01	OA3G01	OA3G01	OA3G01	OA3G01
Module for SF aux. contacts	OEA28	OEA28	OEA28	OEA28	OEA28

*Rated 2A max continuous @690VAC

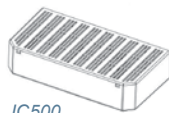
Accessories



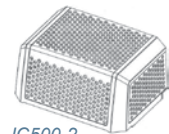
OA1G01
OA1G10



JC250



JC500



JC500-2

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

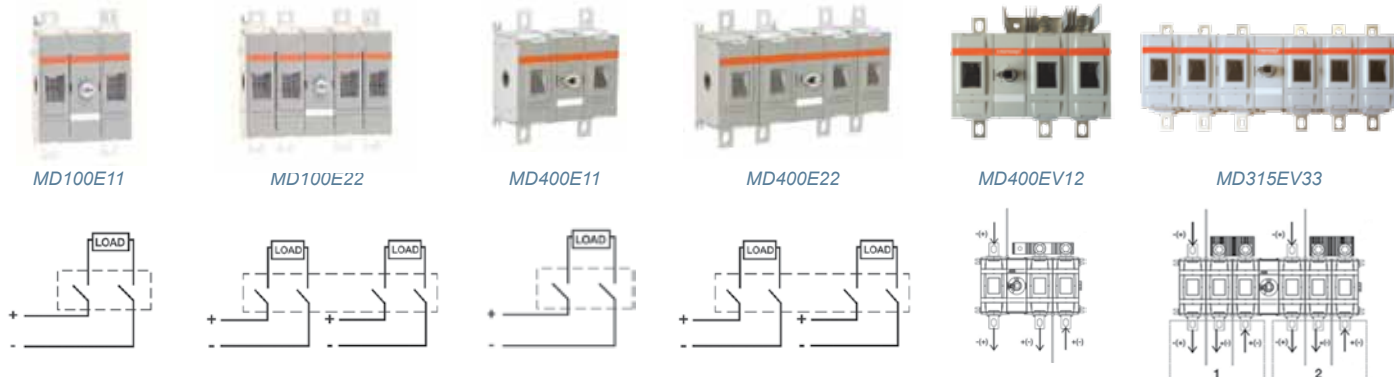
Terminal Shroud for Lugs

Kit of 4 Terminal Shrouds					
1 Terminal Shroud	TDS400	TDS400	TDS400	TDS400	TDS400

A shorter version is available for DC switches up to 250A. 1 piece per package: TDS250S.

PV-Rated Disconnect Switches

IEC-Rated DC Switches



Switch Body

	100	160	200	250	315	400	500
1000VDC 2-pole Configuration	MD100E11	MD160E11	MD200E11	MD250E11	MD315E11	MD400E11	MD500E11
1000VDC 2x2-pole Configuration	MD100E22	MD160E22	MD200E22	MD250E22	MD315E22	MD400E22	MD500E22
1500VDC 3-pole Configuration					MD315EV12	MD400EV12	MD500EV12
1500VDC 2x3-pole Configuration					MD315EV33	MD400EV33	MD500EV33

Handles and Shafts



Direct Front Operation

	HDD250	HDD250	HDD250	HDD250	HDD400	HDD400	HDD400
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External Pistol Style

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

Shafts

Shaft—SPAxxx (xxx = length in mm)	SPA130, SPA210, SPA290, SPA360, SPA430	SFB185, SFB280, SFB325, SFB395, SFB535
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Auxiliary Contacts*

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

Short Circuit Link

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

Terminal Shroud for Short Circuit Link

For JUMP500-2					JC500-2	JC500-2	JC500-2
For JUMP250, JUMP500	JC250	JC250	JC250	JC250	JC500	JC500	JC500

Terminal Shrouds for Lugs

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

Accessories

OA1G01
OA1G10

OEA28

JUMP250

JC250

JUMP500

JC500

JUMP500-2

JC500-2

PV-Rated Disconnect Switches

Technical Data for 1000VDC-rated switches

Technical data in accordance to UL98B 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 temperature	°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
Mechanical endurance	Class of fuse		Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker	Circuit breaker
	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	1500
	Pollution degree 3	V	1500	1500	1500	1500	1500	1500	1500	1500
Rated impulse withstand	50 Hz 1 min	kV								
		kV	12	12	12	12	12	12	12	12
Rated thermal current I _{th}	In open air, normal conditions ¹⁾	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	
	...with minimum cable or bar cross section	Cu	mm ²	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 _{sw}	kA	5	5	5	5	10	10	10	
Rated short circuit making capacity, 1000 V	Peak value I _{cm}	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 ²								
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}	In open air, normal conditions ¹⁾	A	315	400	630					
	In enclosure 40°C	A	315	400	550					
	In enclosure 60°C	A	315	400	440					
	...with minimum cable or bar cross section	Cu	mm ²	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, 1000 V, 1 s	R.M.S. -value I _{sw}	kA	10	10	10					
Rated short circuit making capacity, 1000 V	Peak value I _{cm}	kA	10	10	10					
Power loss / pole	At rated current	W	6	9.7	15.1					
Terminal bolt size	Metric thread diameter 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

PV-Rated Disconnect Switches

UL 98B DC-rated Non-Fused switches

Part #	Description	Ref #
MD100U11	DC Switch 100A UL 2p	X1043231
MD180U22	DC Switch 180A UL 4p	Y1043232
MD200U11	DC Switch 200A UL 2p	Z1043233
MD250U11	DC Switch 250A UL 2p	A1043234
MD250U22	DC Switch 250A UL 4p	B1043235
MD320U11	DC Switch 320A UL 2p	C1043236
MD320U22	DC Switch 320A UL 4p	D1043237
MD400U11	DC Switch 400A UL 2p	E1043238
MD400U22	DC Switch 400A UL 4p	F1043239
MD250UV12	DC Switch 250A UL 1500V 3p	L1050926
MD320UV12	DC Switch 320A UL 1500V 3p	M1050927
MD400UV12	DC Switch 400A UL 1500V 3p	N1050928

IEC DC-rated Non-Fused switches

Part #	Description	Ref #
MD100E11	DC Switch 100A IEC 1000V 2p	G1043217
MD160E11	DC Switch 160A IEC 1000V 2p	H1043218
MD200E11	DC Switch 200A IEC 1000V 2p	J1043219
MD250E11	DC Switch 250A IEC 1000V 2p	K1043220
MD100E22	DC Switch 100A IEC 2x1000V 4p	L1043221
MD160E22	DC Switch 160A IEC 2x1000V 4p	M1043222
MD200E22	DC Switch 200A IEC 2x1000V 4p	N1043223
MD250E22	DC Switch 250A IEC 2x1000V 4p	P1043224
MD315E11	DC Switch 315A IEC 1000V 2p	Q1043225
MD400E11	DC Switch 400A IEC 1000V 2p	R1043226
MD500E11	DC Switch 500A IEC 1000V 2p	S1043227
MD315E22	DC Switch 315A IEC 2x1000V 4p	T1043228
MD400E22	DC Switch 400A IEC 2x1000V 4p	V1043229
MD500E22	DC Switch 500A IEC 2x1000V 4p	W1043230
MD315EV12	DC Switch 315A IEC 1500V 3p	C1050918
MD400EV12	DC Switch 400A IEC 1500V 3p	D1050919
MD500EV12	DC Switch 500A IEC 1500V 3p	E1050920
MD315EV33	DC Switch 315A IEC 2x1500V 6p	F1050921
MD400EV33	DC Switch 400A IEC 2x1500V 6p	G1050922
MD500EV33	DC Switch 500A IEC 2x1500V 6p	J1050924

Handles

Part #	Description	Ref #
HB65	Handle black 65mm IP65 NEMA 3R	W1043368
HB65X	Handle black 65mm IP65 NEMA 4X	X1043369
HB95	Handle black 95mm IP65 NEMA 3R	N1043913
HB95X	Handle black 95mm IP65 NEMA 4X	P1043914
HB125	Handle black 125mm IP65 NEMA 3R	A1043372
HB125X	Handle black 125mm IP65 NEMA 4X	B1043373
HR65	Handle red 65mm IP65 NEMA 3R	G1043378
HR65X	Handle red 65mm IP65 NEMA 4X	H1043379
HR95	Handle red 95mm IP65 NEMA 3R	S1043917
HR95X	Handle red 95mm IP65 NEMA 4X	T1043918
HR125	Handle red 125mm IP65 NEMA 3R	K1043381
HR125X	Handle red 125mm IP65 NEMA 4X	L1043382
HDD250	Handle direct MD100-250	G1047794
HDD400	Handle direct MD315-500	H1047795

Shafts

Part #	Description	Ref #
SFB280	Shaft SwitchFuse 12x12x280mm	F1043423
SFB325	Shaft SwitchFuse 12x12x325mm	G1043424
SFB395	Shaft SwitchFuse 12x12x395mm	H1043425
SPA130	Shaft pistol handle 6x6x130mm	V1043919
SPA210	Shaft pistol handle 6x6x210mm	P1043431
SPA290	Shaft pistol handle 6x6x290mm	Q1043432
SPA360	Shaft pistol handle 6x6x360mm	W1043920
SPA430	Shaft pistol handle 6x6x430mm	X1043921

Terminal Shrouds

Part #	Description	Ref #
TS250-14	Term.shrd 250A switch 1p L/4	A1043464
TDS400	Term.shrd MD250-500 1p L/1	A1045534
TDS250S	Term.shrd MD100-250 1p S /1	Z1045533

Jumpers

Part #	Description	Ref #
JUMP250	Jumper bar for 250A DC switch	F1043469
JUMP500	Jumper bar for 500A DC switch	G1043470
JUMP500-2	Jumper bar for 1500V E33	S1051300
JC250	Jumper cover for JUMP250	H1043471
JC500	Jumper cover for JUMP500	J1043472
JC500-2	Jumper cover for JUMP500-2	V1051302