MERSEN

Expertise, our source of energy

GLOBAL LINE
OF PREMIUM COMPACT
LOW VOLTAGE SWITCHGEAR

UL LOW VOLTAGE DISCONNECT SWITCHES

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

THE SAFEST WAY TO SWITCH POWER ON AND OFF IN YOUR INDUSTRIAL CONTROL PANELS

You need a range of disconnect switches for your industrial control requirements ranging from "Service Entrance Rated" to motor isolation. You need DIN-rail and direct mountable disconnect switches that conform to UL 508 and UL 98. You need a range of handles, shafts and accessories to select from.

Mersen Electrical Power has now the broadest range of switches in the industry, with a full line of accessories to accommodate virtually any application. This range is global and encompasses both UL and IEC standard products for AC and DC applications. On the UL side, our fusible line of switches now extends to 1200A Class L.

Compact size enables the smallest footprint amongst the competition. Our 40A UL508 switches are only 35mm wide! Comfortable pistol-style handles allow greater leverage and gripping force. Robust design incorporates rugged, pivot-able mounting feet.

Non-Fusible Switches 16A to 1200A, 600VAC

- **Performance:** Higher power ratings than competition, suitable for many applications
- **Size:** Typically has the smallest footprint
- **Flexibility in installation:** Fast and reliable installation every time
- **Environmental impact:** All products conform to RoHS and REACH

Fusible Switches 30A to 1200A, 600VAC

- **Safety:** Safe to install and safe to the user
- **Performance:** Suitable for all locations in low voltage networks
- **Size:** Typically has the smallest footprint
- **Flexibility in installation:** Complete range of accessories which support installation flexibility
- **Environmental impact:** All products conform to RoHS and REACH

PV-Rated Switches 100A to 400A, Up to 1500 VDC

- **Safety:** Touchsafe design with visible contacts
- **Performance:** Higher power ratings than competition, suitable for many applications
- **Size:** Typically has the smallest footprint
- **Flexibility in installation:** Fast and reliable installation every time
- **Environmental impact:** All products conform to RoHS and REACH

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DISCONNECT SWITCHES

UL 508 NON-FUSIBLE

The M-series Load Break Switch is the most compact industrial-grade switch on the market. Capable of making or breaking loads up to 600V (UL), it is suitable as a motor disconnect. Extremely compact and robust, these switches have a variety of mounting options including DIN-rail, base, or door-mounting. A wide assortment of handles, shafts and accessories is available to accommodate any installation requirement.

FEATURES/BENEFITS

- Compact
- Robust
- DIN-rail, base, or door-mounting
- Choice of handles and shafts
- Padlockable
- Side-mount auxiliary contacts and additional poles
- Double-break, silver-plated contacts

APPLICATIONS

- Line of sight disconnect
- Electrical isolation
- Branch-circuit switch
- Motor disconnect

RATINGS (UL):

- **Volts:** 600VAC
- **Amps:** 20, 30, 40, 63, and 80A. Suitable as motor disconnect up to 40hp.

APPROVALS:

- UL 508 listed E196672
- IEC 60947-3

CATALOG NUMBER DESIGNATION			
M **Switch** M = Mersen AC Switch	**80** **Ampacity** 16-80	**3** **Number of Poles**	**Special Configurations** DM: Door Mounting

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UL 508 NON-FUSIBLE DISCONNECT SWITCHES (M163 – M803)

UL 508 Disconnect Switches—Front Operated

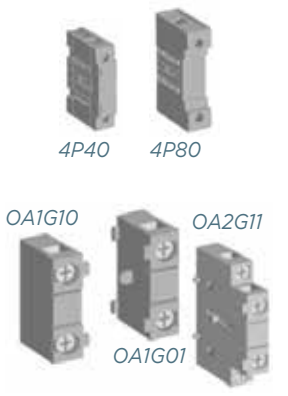
M163

M163DM

M633

M633DM

Switch Body	Ampere Rating	20	30	40	63	80
	Base Part #	M163	M253	M403	M633	M803
	Door-Mounted Version	M163DM	M253DM	M403DM	M633DM	M803DM
Handles and Shafts	**Direct Front Operation Locking Handle**					
		HD40	HD40	HD40	HD125	HD125
	External Front Operation					
	Selector Style NEMA Type 1, 3R, 12	HSBX, HSRX				
	Shaft—SAxxx (xxx = length in mm)	SA85, SA105, SA120, SA130, SA180, SA250				
	Door mounted version (no shaft required)	HSBPDM, HSRPDM			HSBWDM, HSRWDM	
	Pistol Style NEMA Type 1, 3R, 12	HB45, HR45, HB65, HR65, HB80, HR80				
	NEMA Type 4, 4X	HB45X, HR45X, HB65X, HR65X, HB80, HB80X				
	NEMA 4X Stainless Steel	HM65X				
	Shaft— SAxxx (xxx = length in mm)	SPA130, SPA210, SPA290, SPA360, SPA430				
	B=Black, R=Black					
Accessories	**Fourth Poles**					
	Limited to one additional pole per switch	4P40	4P40	4P40	4P80	4P80
	Door mounted switch 4th poles are left-side mounted	4P40DM	4P40DM	4P40DM	4P80DM	4P80DM
	Neutral Poles					
	Limited to one additional pole per switch	NP40	NP40	NP40	NP80	NP80
	Door mounted switch neutral poles	NP40DM	NP40DM	NP40DM	NP80DM	NP80DM
	Terminal Shrouds					
	3-pole	TS40-3	TS40-3	TS40-3	TS63-3	TS63-3
	4-pole (Add this to the 3-pole shroud)	TS40-1	TS40-1	TS40-1	TS63-1	TS63-1
	Auxiliary Contacts*					
	NC Right side mounting	OA1G01	OA1G01	OA1G01	OA1G01	OA1G01
	NO left side mounting	OA1G10	OA1G10	OA1G10	OA1G10	OA1G10
	NO+NC (Mounting on either side)	OA2G11	OA2G11	OA2G11	OA2G11	OA2G11
	*Rated 2A max continous @690VAC					



Minimum switching capacity for the auxiliary contacts OA1G01, OA1G10, OA2G11 is 10mA at a voltage of 24V DC

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TECHNICAL DATA ACCORDING TO UL/cULus														
Part Number				**M163**		**M253**		**M403**		**M633**		**M803**	
General Purpose Amp Rating	**pf= 0.7...0.8**	**-40° to 40 °C**	**A**	**20**		**30**		**40**		**60**		**80**	
Maximum Operating Voltage			V	600		600		600		600		600	
Max. horsepower rating / motor FLA current	pf= 0.4...0.5 Three phase	240 V	HP/A	5/15.2		7.5/22.0		10/28.0		15/42.0		20/54.0	
		480 V	HP/A	10/14.0		15/21.0		20/27.0		30/40.0		40/52.0	
		600 V	HP/A	11-0ct		20/22.0		25/27.0		30/32.0		40/41.0	
	Single phase	120 V	HP/A	1/16.0		1.5/20.0		2/24.0		2/24.0		2/24.0	
		240 V	HP/A	2/13.2		3/18.7		5/30.8		7.5/40.0		10/57.5	
Short circuit rating with fuse	Maximum fuse size		A	30	60[2)]	30	60[2)]	30	60[2)]	100	150	100	150
	Fuse type	CC	kA	10		10		10					
	Fuse type	J	kA	10	10	10	10	10	10	100		100	
	Fuse type	T	kA	10	10	10	10	10	10	100		100	
	Fuse type	RK1	kA	10		10		10		10	5	10	5
	Fuse type	RK5	kA	5	5	5	5	5	5		5		5
	Fuse type	L	kA										
	Fuse type	H	kA										
Endurances													
Min. electrical endurance, pf. 0.75...0.8			oper. cycles	6 000		6 000		6 000		6 000		6 000	
Mechanical endurance			operations	20 000		20 000		20 000		20 000		20 000	
Terminal lug kits				Integral		Integral		Integral		Integral		Integral	
Wire range			AWG	18-8		18-8		18-8		14-4		14-4	
Torque		Wire tightening	lb. in	7		7		7		18		18	
		Lug mounting											

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DISCONNECT SWITCHES

UL 98 NON-FUSIBLE

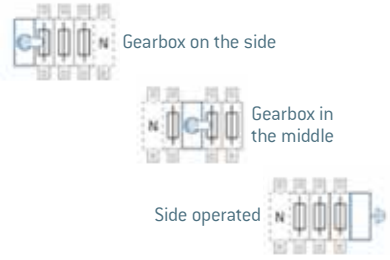
Mersen's non-fusible disconnect switches are listed to UL 98 and bear the CE mark as conformance to IEC 60947-3. They are "service entrance" devices that are capable of fully rated load-break and load-make. All switches over 100A have windows to provide visual indication of the contact status. Engineered to have the smallest footprint, these switches also employ a modular design that enables the handle to be placed amongst the poles or at the ends.

A wide range of ergonomic handles are available, as are all manner of accessories, to accommodate multiple applications.

FEATURES/BENEFITS

- Service entrance rated
- Front or side operation
- Most compact size
- Internally mounted auxiliary contacts
- Flange mounting accessories
- 15-year warranty

CONFIGURATIONS



CATALOG NUMBER DESIGNATION

M	200	U	3	0		
Switch	**Ampacity**	**Type**	**Number of Poles/Left of handle**	**Number of Poles/Right of handle**	**Revision**	**Special Configuration**
M = Mersen AC Switch	**16-1200**	**U** = non-fused UL 98	**1-3**	**Blank** = < 200A non-fused, 0, 2, 3	**Blank** = 0	**F** = Flange-mount Actuation **DM** = Door mounted

RATINGS (UL):

- **Volts:** 600VAC
- **Amps:** 30A, 60A, 100A, 200A, 400A, 600A, 800A, 1200A
- **Short-Circuit Current Rating (SCCR):** Up to 200kA with fuses. Suitable as motor disconnect

APPROVALS:

- All UL switches meet the requirements of UL and CSA
- UL listed guide WHTY, File E191605 for UL 98 (ratings from 30 A to 1200 A)
- IEC 60947-3

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UL 98 DISCONNECT SWITCHES

M100U3

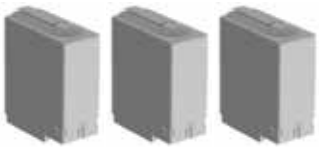
M200U30 with HD250 Direct Handle

M200U30

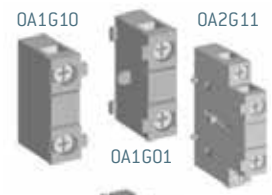
SWITCH BODY	AMPERE RATING	30	60	100	200
	Base Part #	M30U3	M60U3	M100U3	M200U
	3-pole configurations				12, 30
	For Flange-mount Actuation	M30U3F	M60U3F	M100U3F	
	For Door-mounting	M30U3DM	M60U3DM	M100U3DM	
HANDLES AND SHAFTS	**DIRECT FRONT OPERATION LOCKING HANDLE**				
		HD125	HD125	HD125	HD250
	EXTERNAL FRONT OPERATION				
	Selector Style	HSBX, HSRX			N/A
	Shaft—SAxxx (xxx = length in mm)	SA85, SA105, SA120, SA130, SA180, SA250			N/A
	Door mounted version (no shaft required)	HSBWDM, HSRWDM			N/A
	Pistol Style NEMA Type 1, 3R, 12	HB45, HR45, HB65, HR65, HB80, HR80			
	NEMA Type 4, 4X	HB45X, HR45X, HB65X, HR65X, HB80X, HR80X			
	NEMA 4X Stainless Steel	HM65X			
	Shaft— SAxxx (xxx = length in mm)	SPA130, SPA210, SPA290, SPA360, SPA430			
	B=Black, R=Black				
ACCESSORIES	**FOURTH POLES**				
		4P60	4P60	4P125	4P250
	NEUTRAL POLES				
		NP60	NP60	NP125	
	TERMINAL SHROUDS				
	3-pole	TS125-3	TS125-3	TS125-3	TS250-13
	4-pole	TS125-1	TS125-1	TS125-1	TS250-14
	Shrouds with "-3" suffix are single shrouds that cover all three terminals. Shrouds with "-13" or "-14" are single pole shrouds with 3 or 4 per				
	AUXILIARY CONTACTS*				
	Normally Closed	OA1G01	OA1G01	OA1G01	OA3G01
	Normally Open	OA1G10	OA1G10	OA1G10	OA1G10
	NO+NC	OA2G11	OA2G11	OA2G11	
	Module for 8 aux. contacts	N/A	N/A	N/A	OEA28
	*Rated 2A max continous @690VAC				
	FLANGE OPERATION				
	Flange bracket assembly	Incl with M30U3F**	Incl with M60U3F**	Incl with M100U3F**	FOM4
	Rod Flange handle NEMA 12	FHR12	FHR12	FHR12	NA
	Rod Flange handle NEMA 4X	FHR4X	FHR4X	FHR4X	NA
	Rod, 16 inch	RODNF16	RODNF16	RODNF16	NA
	Rod, 24 inch	RODNF24	RODNF24	RODNF24	NA
	Cable Flange Handle, NEMA 12	NA	NA	NA	FHC12
	Cable Flange Handle, NEMA 4X	NA	NA	NA	FHC4X
	Cable for FHC handles	NA	NA	NA	CABLE36*

HSBX HD250 HB65

4P125 4P250



TS250-13



OA1G10 OA2G11 OA1G01

OEA28

Other cable lengths available: 48", 60", 72", 84", 96", 108". For example, CABLE108. **These switches have not been tested to conform to UL standards

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UL 98 NON-FUSIBLE DISCONNECT SWITCHES

UL LISTED FRONT OPERATED

M400U30

M600U30

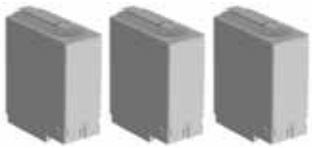
M200U30

Switch body	**Ampere Rating**	**400**	**600**	**800**	**1200**
	Base Part #	M400U	M600U	M800U	M1200U
	3-pole configurations	30, 12	30, 12	30, 12	30
Handles and Shafts	**Direct Front Operation Locking Handle**				
		HD400	HD800	HD800	HD1000
	External Front Operation				
	Pistol Style NEMA Type 1, 3R, 12	HB125, HB145, HB274			
	NEMA Type 4, 4X	HB125X, HB145X, HB274X			
	NEMA 4X Stainless Steel	HM125X, HM175X			
	Shaft— SAxxx (xxx = length in mm)	SFB185, SFB280, SFB325, SFB395, SFB535			
	Alignment Ring (optional, for pistol-style handle)	ALRX10			
	B=Black. Substitute 'R' for 'B' if a red handle is desired. Ex. HR125				
Accessories	**Fourth Poles**				
		4P400	4P800	4P800	4P1250
	Terminal Lugs				
	6 per package	LUG400 #2 - 600MCM	LUG800 2 x #2 600MCM	LUG800 2 x #2 600MCM	LUG1200 4 x #2 600MCM
	Terminal Shrouds				
	3-pole	TS400-13	TS600-3	TS800-3	TS1600-13
	4-pole	TS400-14			TS1600-14
	Shrouds with "-3" suffix are single shrouds that cover all three terminals. Shrouds with "-13" or "-14" are single pole shrouds with 3 or 4 per				
	Auxiliary Contacts*				
	Normally Open	OA1G10	OA1G10	OA1G10	OA1G10
	Normally Closed	OA3G01	OA3G01	OA3G01	OA3G01
	Module for 8 aux. contacts	OEA28	OEA28	OEA28	OEA28
	*Rated 2A max continous @690VAC				

SFB135

HD800

4P400



TS250-13

OA1G10 OA3G01 OEA28

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TECHNICAL DATA ACCORDING TO UL/cULus								
Part Number				**M30U3**	**M60U3**	**M100U3**	**M200Uxx**	
General Purpose Amp Rating	**pf= 0.7...0.8**	**-5° to 40 °C**	**A**	**30**	**60**	**100**	**200**	
Maximum Operating Voltage			V	600	600	600	600	
Max. horsepower rating / motor FLA current	pf= 0.4...0.5 Three phase	240 V	HP/A	10/28.0	20/54.0	30/80.0	75/192.0	
		480 V	HP/A	20/27.0	40/52.0	50/65.0	150/180.0	
		600 V	HP/A	30/32.0	40/41.0	50/52.0	200/192.0	
	Single phase	120 V	HP/A	2/24.0	3/34.0	5/56.0		
		240 V	HP/A	5/28.0	7.5/40.0	15/68.0		
Short circuit rating with fuse	Maximum fuse size		A	60	150	150	200	400
	Fuse type	CC	kA					
	Fuse type	J	kA	50	50	50	200	65
	Fuse type	T	kA	50	50	50		
	Fuse type	RK1	kA					
	Fuse type	RK5	kA					
	Fuse type	L	kA					
	Fuse type	H	kA					
Maximum General Use, DC Ratings								
Current rating		at 250 VDC	A				200	
		at 600 VDC	A				100	
DC horsepower rating for 4-pole switch		at 600 VDC	HP				50	
DC horsepower rating for 2-pole switch	In open air	at 125 VDC	HP				20	
	In enclosure[2]	at 250 VDC	HP				-	
DC short circuit rating for 4-pole switch	with circuit breaker		kA				10	
DC short circuit rating for 2-pole switch	with circuit breaker at 250 VDC		kA				14	
	with circuit breaker at 600 VDC		kA				10	
	with class J fuse at 250 VDC		kA				100	
	... with fuse size		A				200	
endurances								
Min. electrical endurance, pf. 0.75...0.8			oper. cycles	6 000	6 000	6 000	6 000	
Mechanical endurance			operations	20 000	20 000	20 000	20 000	
Terminal lug kits				Integral	Integral	Integral	LUG-200	
Wire range			AWG	14-4	14-4	8-1/0	4-300MCM	
Torque		Wire tightening	lb. in	55	55	55	275	
		Lug mounting					72	
TECHNICAL DATA ACCORDING TO IEC 60947-3								
Rated insulation voltage and rated operational voltage AC20/DC20		Pollution degree 3	V	750	750	750	1 000	
Dielectric strength		50 Hz 1min.	kV	6	6	6	10	
Rated impulse withstand voltage			kV	8	8	8	12	
Rated operational current, AC-22A		up to 415 V	A	40	63	100	250	
		440...500 V	A	40	63	100	250	
		690 V	A	40	63	100	250	
Rated operational current, AC-23A		up to 415 V	A	40	63	80	250	
		440 V	A	40	63	65	250	
		500 V	A	40	63	60	250	
		690 V	A	40	63	40	250	
Rated conditional short-circuit current I_p (r.m.s.) and corresponding max. allowed cut-off current $\hat{i}_c$. The cut-off current $\hat{i}_c$ refers to values listed by fuse manufacturers	I_p (r.m.s.)	50 kA	kA	16.5	16.5	16.5		
	Max. fuse size gG/aM	415 V	A	125/125	125/125	125/125		
	I_p (r.m.s.)	10 kA	kA	8.2	8.2	8.2		
	Max. fuse size gG/aM	690 V	A	125/100	125/100	125/100		
(single phase test acc. to IEC60269)	I_p (r.m.s.)	50 kA	kA	10	10	10	35	
	Max. fuse size gG/aM	690 V	A	63/63	63/63	63/63	355/315	
	at prospective SC-current	80 kA	kA				40.5	
	Max. fuse size gG/aM	690 V	A				355/315	
Rated short-time withstand current	r.m.s. -value I_{cw}	690 V, 1 s	kA	2.5	2.5	2.5	8	
Rated short circuit making capacity	Peak value I_{cm}	690 V/500 V	A	3.6	3.6	3.6	30	
Power loss / pole	At rated operational current		W	0.7	1.6	4.0	6.5	
Mechanical endurance	Divide by two for operation cycles		Oper.	20 000	20 000	20 000	20 000	
Weight without accessories		3-pole	kg	0.36	0.36	0.36	1.2	
		4-pole	kg	0.50	0.50	0.50	1.5	

1) UL Listed switches are also CSA Approved. 2) Fuse size 70A for RK5.

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TECHNICAL DATA ACCORDING TO UL/cULus							
Part Number				**M400U**	**M600U**	**M800U**	**M1200U**
General Purpose Amp Rating	**pf= 0.7...0.8**	**-5° to 40 °C**	**A**	**400**	**600**	**800**	**1200**
Maximum Operating Voltage			V	600	600	600	600
Max. horsepower rating / motor FLA current	pf= 0.4...0.5 Three phase	240 V	HP/A	125/312.0	200/480.0	200/602	200/602
		480 V	HP/A	250/302.0	450/515.0	500/590	500/590
		600 V	HP/A	350/338.0	500/472.0	500/472	500/472
	Single phase	120 V	HP/A				
		240 V	HP/A				
Short circuit rating with fuse	Maximum fuse size		A	600	600 800	800	1200
	Fuse type	CC	kA				
	Fuse type	J	kA	100	100		
	Fuse type	T	kA		100		
	Fuse type	RK1	kA				
	Fuse type	RK5	kA		100	100	100
	Fuse type	L	kA				
	Fuse type	H	kA				
Maximum General Use, DC Ratings							
Current rating		at 250 VDC	A	400	600		
		at 600 VDC	A	200	200		
DC horsepower rating for 4-pole switch		at 600 VDC	HP	50	-		
DC horsepower rating for 2-pole switch	In open air	at 125 VDC	HP	40	-		
	In enclosure[2]	at 250 VDC	HP	50	50		
DC short circuit rating for 4-pole switch	with circuit breaker		kA	10	10		
DC short circuit rating for 2-pole switch	with circuit breaker at 250 VDC		kA	14	18		
	with circuit breaker at 600 VDC		kA	10	10		
	with class J fuse at 250 VDC		kA	100	100		
	... with fuse size		A	400	500		
Endurances							
Min. electrical endurance, pf. 0.75...0.8			oper. cycles	1 000	1 000	500	500
Mechanical endurance			operations	16 000	10 000	6000	6000
Terminal lug kits				LUG400	LUG800	LUG800	LUG1200
Wire range			AWG	2 - 600MCM	2 x 2 - 600MCM	2 x 2 - 600MCM	4 x 2 - 600MCM
Torque		Wire tightening	lb. in	375	55	500	500
		Lug mounting		240	480	480	450-670
TECHNICAL DATA ACCORDING TO IEC 60947-3							
Rated insulation voltage and rated operational voltage AC20/DC20		Pollution degree 3	V	1 000	1 000	1 000	1 000
Dielectric strength		50 Hz 1min.	kV	10	10	10	10
Rated impulse withstand voltage			kV	12	12	12	12
Rated operational current, AC-22A		up to 415 V	A	400	800	1600	1600
		440...500 V	A	400	800	1600	1600
		690 V	A	400	800	1600	1600
Rated operational current, AC-23A		up to 415 V	A	400	800	1250	1250
		440 V	A	400	800	1250	1250
		500 V	A	400	800	1250	1250
		690 V	A	400	800	1250	1250
Rated conditional short-circuit current I_p (r.m.s.) and corresponding max. allowed cut-off current $\hat{i}_c$. The cut-off current $\hat{i}_c$ refers to values listed by fuse manufacturers	I_p (r.m.s.)	50 kA	kA				
	Max. fuse size gG/aM	415 V	A				
	I_p (r.m.s.)	50 kA	kA				
	Max. fuse size gG/aM	690 V	A				
(single phase test acc. to IEC60269)	I_p (r.m.s.)	50 kA	kA	50.5	71.5		
	Max. fuse size gG/aM	690 V	A	500/500	800/1 000		
	at prospective SC-current	80 kA	kA	59	83.5		
	Max. fuse size gG/aM	690 V	A	500/500	800/1 000		
Rated short-time withstand current	r.m.s. -value I_{cw}	690 V, 1 s	kA	15	20	50	50
Rated short circuit making capacity	Peak value I_{cm}	690 V/500 V	A	65	80	110	110
Power loss / pole	At rated operational current		W	10	40	29	48
Mechanical endurance	Divide by two for operation cycles		Oper.	26 000	10 000		
Weight without accessories		3-pole	kg	2.2	5.2	15.2	15.2
		4-pole	kg	2.8	6.4		

1) UL Listed switches are also CSA Approved. 2) Fuse size 70A for RK5.

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DISCONNECT SWITCHES

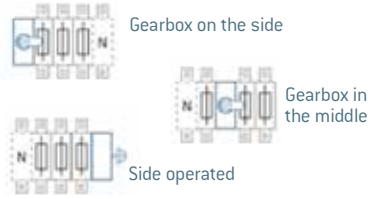
UL 98 FUSIBLE

Mersen's fusible disconnect switches are listed to UL 98 and bear the CE mark as conformance to IEC 60947-3. They are "service entrance" devices capable of fully rated load-break and load-make. While long-term safety, reliability, and functionality are always paramount in the design of our products, these switches are also engineered to have the smallest footprint. The modular design allows placement of the handle anywhere amongst the poles. The fuse doors cannot open when the switch is in the "ON" position, and all switches are double-break, which isolates both fuse clips from voltage during fuse replacement. The switches' "Test" position allows actuation of the auxiliary contacts without main power. Power taps enable energizing a CPT or surge device without the need for a separate terminal block. A wide range of ergonomic handles are available, as are all manner of accessories.

FEATURES/BENEFITS

- Multiple Configurations
- Power taps
- Adjustable shaft depth
- Fuse monitoring
- Interlocked fuse doors

CONFIGURATIONS



CATALOG NUMBER DESIGNATION

M	60	J	3	0	—	S
Switch	**Ampacity**	**Type**	**Number of Poles/Left of handle**	**Number of Poles/Right of handle**	**Revision**	**Special Configuration**
M = Mersen AC Switch	**30-1200**	**CC** = CC fused **J** = J fused **L** = L fused	**1, 2, 3, 4, etc. (N = Neutral)**	**Blank** = < 200A non-fused, 0, 2	**Blank** = 0	**S** = side-operated **N** = Non-fused switched Neutral **F** = Rod-Flange Actuated

RATINGS UL:

- **Volts:** 600VAC
- **Amps:** 30, 60, 100, 200, 400, 600, 800, and 1200A
- **Short-Circuit Current Rating (SCCR):** Up to 200kA with Class CC, J, or L Fuses

APPROVALS:

- All UL Fusible Disconnect Switch switches meet UL & CSA requirements
- UL listed guide WHTY, File E191605 for UL 98 (ratings from 30A to 1200A)
- IEC 60947-3

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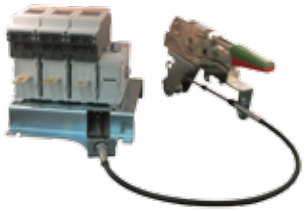
UL LISTED FRONT AND SIDE OPERATED

M30CC12
30A, CC fused, 3-pole with pole on left side of handle and 2 poles on right side

M60J30
60A, J fused, with 3 poles on left side of handle

M200J30 with HDF200
200A, J fused, 3 poles on left side of direct handle

Switch Body	Ampere Rating	30	60	100	200
	Base Part #	M30	M60	M100	M200
	Fuse Type	CC, J	J	J	J
	3- and 4-pole configurations	12, 22, 30F, 30S	12, 22, 22N, 30, 30F, 30S, 40, 40N	12, 22, 22N, 30, 30F, 30S, 40, 40N	30, 40
	S = Side operated F = Rod-Flange actuated (Direct Side Operated Handles are included with 'S' option)				
Handles and Shafts	**Direct Front Operation**				
		HDF30	HDF200	HDF200	HDF200
	External Front Operation - Pistol style				
	NEMA Type 1, 3R, 12, IP65	HB45	HB65, HB80		
	NEMA Type 4, 4X	HB45X	HB65X, HB80X		
	NEMA 4X Stainless Steel	HM65X			
	B=Black. Substitute 'R' for 'B' if a red handle is desired. Ex. HR45				
	Shafts				
	Shaft— SPAxxx (xxx = length in mm)	SPA130, SPA210, SPA290, SPA360, SPA430			
Accessories	**Terminal Lugs**				
	6 per package	Integral	Integral	LUG100 (#14 - 2/0)	LUG200 (#6 -300MCM)
	Terminal Shrouds				
	3-pole (3 single shrouds per package)	Integral	Integral	TSF160-13	TSF200-13
	4-pole (4 single shrouds per package)			TSF160-14	TSF200-14
	Shrouds with "-3" suffix are single shrouds that cover all three terminals. Shrouds with "-13" or "-14" are single pole shrouds with 3 or 4 per				
	Auxiliary Contacts*				
	NO	OA1G10, w/OSZ4	OA1G10	OA1G10	OA1G10
	NC	OA3G01, w/OSZ4	OA3G01	OA3G01	OA3G01
	NO, between poles	OA4B1C	N/A	N/A	N/A
	Mounting plate OA1G10/OA3G01	OSZ4	Not needed	Not needed	Not needed
	Module for 8 aux. contacts	OEA28	OEA28	OEA28	OEA28
	*Rated 2A max continous @690VAC				
	Flange Operation for Cable Actuation				
	Cable Flange Handle, NEMA 12	FHC12	FHC12	FHC12	FHC12
	Cable Flange Handle, NEMA 4X	FHC4X	FHC4X	FHC4X	FHC4X
	Bracket Assembly	FOM2	FOM3 for M60J12, FOM4 for M60J30	FOM4	FOM4
	Cable for FHC handles	CABLE36*	CABLE36*	CABLE36*	CABLE36*
	*Other cable lengths available: 48", 60", 72", 84", 96", 108". For example, CABLE108.				
	Flange Operation for Rod Actuation*				
	Flange bracket assembly	Incl with M30x30F	Incl with M60J30F	Incl with M100J30F	NA
	Rod Flange handle NEMA 12	FHR12	FHR12	FHR12	NA
	Rod Flange handle NEMA 4X	FHR4X	FHR4X	FHR4X	NA
	Rod, 16, 21, 26 inch (ex. ROD16)	RODxx	RODxx	RODxx	NA
	*These products have not been tested for UL Compliance				



FOM4, FHC12, and CABLE36 with M200J30

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UL LISTED FRONT AND SIDE OPERATED

M400J30
400A, J fused, 3-pole with 3 poles on left side of handle

M800L30
800A, L fused, with 3 poles on left side of handle

Switch Body	Ampere Rating	400	600	800	1200
	Base Part #	M400	M600	M800	M1200
	Fuse Type	J	J	L	L
	3- and 4-pole configurations	12, 30, 40	12, 30, 40	12, 30, 40	30, 40
Handles and Shafts	**Direct Front Operation**				
		HDF400	HDF800T	HDF800T	HD1250T
	External Front Operation				
	NEMA Type 1, 3R, 12	HB125, HB145, HB274			
	NEMA Type 4, 4X	HB125X, HB145X, HB274X			
	NEMA 4X Stainless Steel	HM125X, HM175X			
	B=Black. Substitute 'R' for 'B' if a red handle is desired. Ex. HR125				
	Shafts				
	Shaft— SFBxxx (xxx = length in mm)	SFB185, SFB280, SFB325, SFB395, SFB535			
Accessories	**Terminal Lugs**				
	6 per package	LUG400 #2 - 600MCM	LUG800 2 x #2 600MCM	LUG800 2 x #2 600MCM	LUG1200 4 x #2 600MCM
	Terminal Shrouds				
	3-pole	TSF400-3	TSF600-3	TSF600-3	TSF1200-3
	Suffix "-3" indicates a single piece 3-pole shroud; Suffix "-13" indicates three individual single pole shrouds per package.				
	When a switch is to be installed with lugs and terminal shrouds, a TSFXXX-3 (single piece, 3-pole) model of shroud is recommended.				
	Auxiliary Contacts*				
	Normally Open	OA1G10	OA1G10	OA1G10	OA1G10
	Normally Closed	OA3G01	OA3G01	OA3G01	OA3G01
	Module for 8 aux. contacts	OEA28	OEA28	OEA28	OEA28
	*Rated 2A max continous @690VAC				

HB125
HDF400
SFB135

OA1G01
OA1G10

OEA28

TSF400-13

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TECHNICAL DATA ACCORDING TO UL/cULus							
General Purpose Amp Rating	**pf= 0.7...0.8**	**-5° to 40 °C**	**A**	**30**	**60**	**100**	**200**
Maximum Operating Voltage			VAC	600	600	600	600
			VDC	250	250	250	250
Max. horsepower rating / motor FLA current	pf= 0.4...0.5 Three phase	240 V	HP/A	7.5/22.0	15/42.0	30/80.0	60/154.0
		480 V	HP/A	15/21.0	30/40.0	60/77.0	125/156.0
		600 V	HP/A	20/22.0	50/52.0	75/77.0	150/144.0
	Single phase	120 V	HP/A	2/24.0			
		240 V	HP/A	3/17.0			
Short circuit rating with fuse, 3- and 4- pole types			kA	200	200	200	200
	UL/CSA fuse size		A	30	60	100	200
	UL/CSA fuse type			J/CC	J	J	J
Endurances							
Min. electrical endurance, pf. 0.75...0.8			oper. cycles	6000	6000	6000	6000
Mechanical endurance			operations	20 000	20 000	20 000	16 000
Terminal lug kits				Integral	Integral	LUG100	LUG200
Wire range			AWG	#18-8	#14-4	#14-2/0	#4-300MCM
Torque		Wire tightening	lb. in	17	30/355	120	275
		Lug mounting	lb. in	N/A	N/A	50	72
TECHNICAL DATA ACCORDING TO IEC 60947-3							
Rated insulation voltage	Pollution degree 3		V	1 000	1 000	1 000	1 000
Dielectric strength		50 Hz 1min.	kV	10	10	10	10
Rated impulse withstand voltage			kV	12			12
Rated thermal current in ambient 40 °C /	In open air		A/W	32/3.5	63/7.5	160/12	200/17
max. fuse power dissipation[1)]	In enclosure[2)]		A/W	32/3.5	63/7.5	160/10, 135/12	200/15
...with minimum cable cross section		Cu	mm^2	6	16	70	95
Rated operational current, AC-23A		up to 500 V	A	32	63	160	200
		690 V	A	32	63	160	200
Rated operational current, AC-23[3)]	The kW-ratings are accurate for three-phase 1500 R.P.M. standard asynchronous motors.	230 V	kW	7.5	18.5	45	60
		400 V	kW	15	30	75	110
		415 V	kW	15	30	75	110
		500 V	kW	18.5	37	90	132
		690 V	kW	22	55	132	200
Rated breaking capacity in category AC-23		up to 500 V	A	256	504	1280	1600
		690 V	A	256	504	1280	1600
Rated short-time withstand current, 1 s	r.m.s. -value	690 V, 1 s	kA	1	2.5	5	8
Power loss / pole	With rated current, without fuse		W	2	4	9	8
Weight without accessories	3-pole switch fuses		kg	0.7	1.3	1.5	2.6
	4-pole switch fuses		kg	0.9	1.6	1.8	
Built-in terminal size		Cu	mm^2	0.75...10	2.5...25		
Terminal bolt size (included)	Metric thread diameter x length		mm			M6x20	M8x25
Fuse-links bolts tightening torque			Nm			4	4

*) = Utilization category B

1) Ambient temperature 60°C: derating 20%

2) Mounting on "ceiling": derating 10%. Mounting on wall, horizontal fuses: derating 8%.

3) Some fuses limit these figures further. Starting current characteristics must be considered separately.

4) Approval pending

5) 30 lb.in with cable size #14-10, 35 lb.in with cable size #8-4

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TECHNICAL DATA ACCORDING TO UL/cULus							
General Purpose Amp Rating	**pf= 0.7...0.8**	**-5° to 40 °C**	**A**	**400**	**600**	**800**	**1200**
Maximum Operating Voltage			VAC	600	600	600	600
			VDC	250	250	250	250
Max. horsepower rating / motor FLA current	pf= 0.4...0.5 Three phase	240 V	HP/A	125.0/312.0	200/480.0	250/602.0	250/602.0
		480 V	HP/A	250.0/302.0	400/477.0	500/590.0	500/590.0
		600 V	HP/A	350.0/336.0	500/472.0	500/472.0	500/472.0
	Single phase	120 V	HP/A				
		240 V	HP/A				
Short circuit rating with fuse, 3- and 4- pole types			kA	200	200	200	200
	UL/CSA fuse size		A	400	600	800	1200
	UL/CSA fuse type			J	J	L	L
Endurances							
Min. electrical endurance, pf. 0.75...0.8			oper. cycles	1 000	1 000	500	500
Mechanical endurance			operations	12 000	4 000	3 000	2 000
Terminal lug kits				LUG400	LUG800	LUG800	LUG1200
Wire range			AWG	#2-600MCM	(2)#2-600MCM	(2)#2-600MCM	(4)#2-600MCM
Torque		Wire tightening	lb.in	375	500	500	500
		Lug mounting	lb.in	240	480	480	480
TECHNICAL DATA ACCORDING TO IEC 60947-3							
Rated insulation voltage	Pollution degree 3		V	1 000	1 000	1 000	1 000
Dielectric strength		50 Hz 1min.	kV	10	10	10	10
Rated impulse withstand voltage			kV	12	12	12	12
Rated thermal current in ambient 40 °C /	In open air		A/W	400/45	630/60	800/65	1250/110
max. fuse power dissipation[1]	In enclosure[2]		A/W	400/30	570/50	720/55	1000/85
...with minimum cable cross section		Cu	mm^2	240	2x185	2x240	2x400
Rated operational current, AC-23A		up to 500 V	A	400	630	800	1000 *]
		690 V	A	400	630	800	1000 *]
Rated operational current, AC-23[3]	The kW-ratings are accurate for three-phase 1500 R.P.M. standard asynchronous motors.	230 V	kW	132	200	250	315 *]
		400 V	kW	220	355	450	560 *]
		415 V	kW	230	355	450	560 *]
		500 V	kW	280	450	560	710 *]
		690 V	kW	400	630	710	1000 *]
Rated breaking capacity in category AC-23		up to 500 V	A	3200	6400	6400	8000
		690 V	A	3200	6400	6400	8000
Rated short-time withstand current, 1 s	r.m.s. -value		kA	14	20	20	
Power loss / pole	With rated current, without fuse		W	30	46	75	75
Weight without accessories	3-pole switch fuses		kg	5.7	11.5	11.5	29
	4-pole switch fuses		kg				
Built-in terminal size		Cu	mm^2				
Terminal bolt size (included)	Metric thread diameter x length		mm	M10x30	M12x40	M12x40	M12x50
Fuse-links bolts tightening torque			Nm	20	40	40	40

*) = Utilization category B

1) Ambient temperature 60°C: derating 20%

2) Mounting on "ceiling": derating 10%. Mounting on wall, horizontal fuses: derating 8%.

3) Some fuses limit these figures further. Starting current characteristics must be considered separately.

4) Approval pending

5) 30 lb.in with cable size #14-10, 35 lb.in with cable size #8-4

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DISCONNECT SWITCHES

UL 98B 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.

FEATURES/BENEFITS

- 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
- **Short-Circuit Current Rating (SCCR):** 5 to 10kA for higher ratings

APPROVALS:

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

CATALOG NUMBER DESIGNATION

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

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PV-RATED DISCONNECT SWITCHES

UL 98B Listed DC Switches

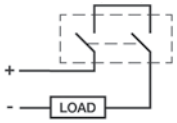

MD100U11

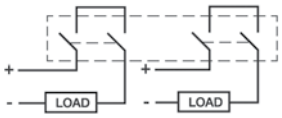

MD100U22

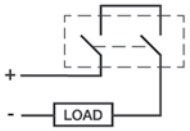

MD250UV12

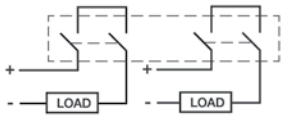

MD400U11


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 continous @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


HDD400

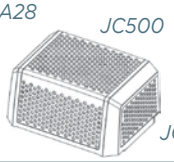

HB125

OA1G01
OA1G10


JC250


OEA28


JC500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UL 98B Listed DC Switches

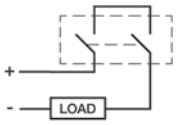

MD100U11

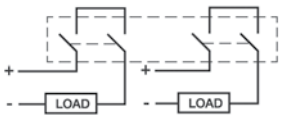

MD100U22

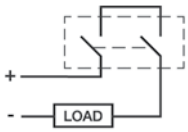

MD250UV12

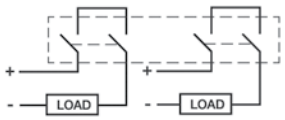

MD400U11


MD400U22







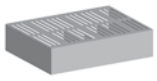


Switch Body	Ampere Rating	100	200	250	320	400
	1000VDC 2-pole Configuration	MD100U11	MD200U11	MD250U11	MD320U11	MD400U11
	1000VDC 2x2-pole Configuration	MD180U22	MD180U22*		MD320U22	MD400U22
	1500VDC 3-pole Configuration			MD250UV12	MD320UV12	MD400UV12
	B=Black. Substitute 'R' for 'B' if a red handle 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 continous @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


HDD400

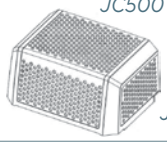

HB125

OA1G01
OA1G10


JC250


OEA28


JC500


JC500-2

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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}	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
...with minimum cable or bar cross section	In enclosure 60°C	A	100	160	200	250	315	400	440
	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^{cw}		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
...with minimum cable or bar cross section	In enclosure 60°C	A	315	400	440
	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, 1500 V, 1 s	R.M.S. -value I_{cw}	kA	10	10	10
Rated short circuit making capacity, 1500 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 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

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NORTH AMERICA

USA
Mersen USA
374 Merrimac Street
Newburyport, MA 01950
T : 978 462 6662

CANADA
Mersen Canada
6200 Kestrel Road
Mississauga, ON L5T 1Z1
T : 416 252 9371

EUROPE

FRANCE
Mersen France SB S.A.S.
15 rue Jacques de Vaucanson
F-69720 Saint-Bonnet-de-Mure
T : +33 4 72 22 66 11

ASIA

CHINA
Mersen Shanghai
No.55-A6. Shu Shan Road
Songjiang 201611 Shanghai
T : +8621 67602388

EP.MERSEN.COM

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