

DC MCCB Switch Disconnectors Ex9MSD

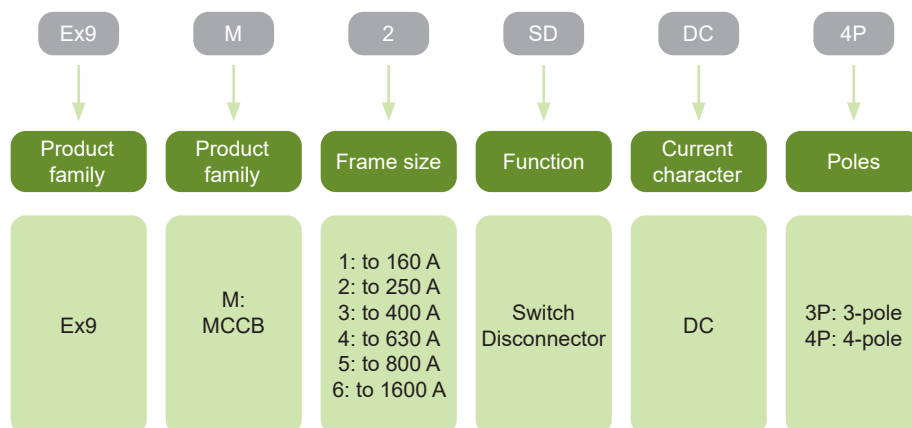


- DC MCCB Switch Disconnectors
- Frame sizes M1-M6
- Rated operating current up to 1600 A
- Tested according to EN 60947-3
- DC current character
- 3 and 4-pole versions
- Rated voltage 750 V DC (3-pole) and 1000 V DC (4-pole)

DC versions of MCCB based Switch Disconnectors Ex9MSD are used as a main switch in DC applications, such as PV installations. Testing according to IEC / EN 60947-3 standards ensures functions and reliability for wide variety of applications.

These switch disconnectors follows the same design pattern than their circuit breaker equivalents. Therefore there is possibility to use the fully compatible range of external and internal accessories including extended rotary handles, auxiliary contacts, tripping units and many others.

Type Key

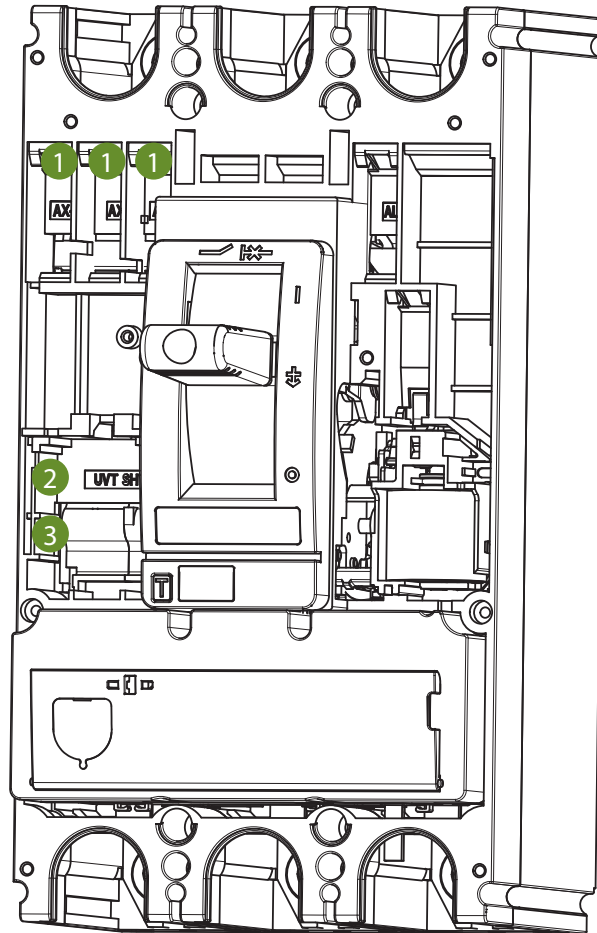


Certification marks



DC MCCB Switch Disconnectors Ex9MSD

Internal accessories Ex9M1-M5 DC SD



1

Auxiliary contact
AX21M

2

Shunt trip release
SHT2*i*
1 unit or UVT2*i*

3

Undervoltage release
UVT2*i*
1 unit or SHT2*i*

Auxiliary contact AX21M

Shunt trip releases SHT2*i*

Undervoltage releases UVT2*i*

DC MCCB Switch Disconnectors Ex9MSD

External accessories Ex9M1-M5 DC SD



Phase barriers
PB2i



Terminal cover set, short
TCV2i



Terminal cover set, long
TCE2i



Remote operator
MOD2i



Direct rotary handle
RHD2i



Extended rotary handle
ERH2i

Phase barriers PHS2i

Terminal cover, short TCV2i

Remote operators MOD2i

Extended rotary handles ERH2i

Terminal cover, long TCE2i

Direct rotary handles RHD2i

DC MCCB Switch Disconnectors Ex9MSD

External accessories Ex9M1-M5 DC SD



Tunnel terminals
MC2i W



Mounting depth spacers
WG i



Screw type terminals
MC2i



Screw terminals
MCS2i



Din rail adapter
DRA2i

Tunnel terminals **MC2i W**

Mounting depth spacers **WG i**

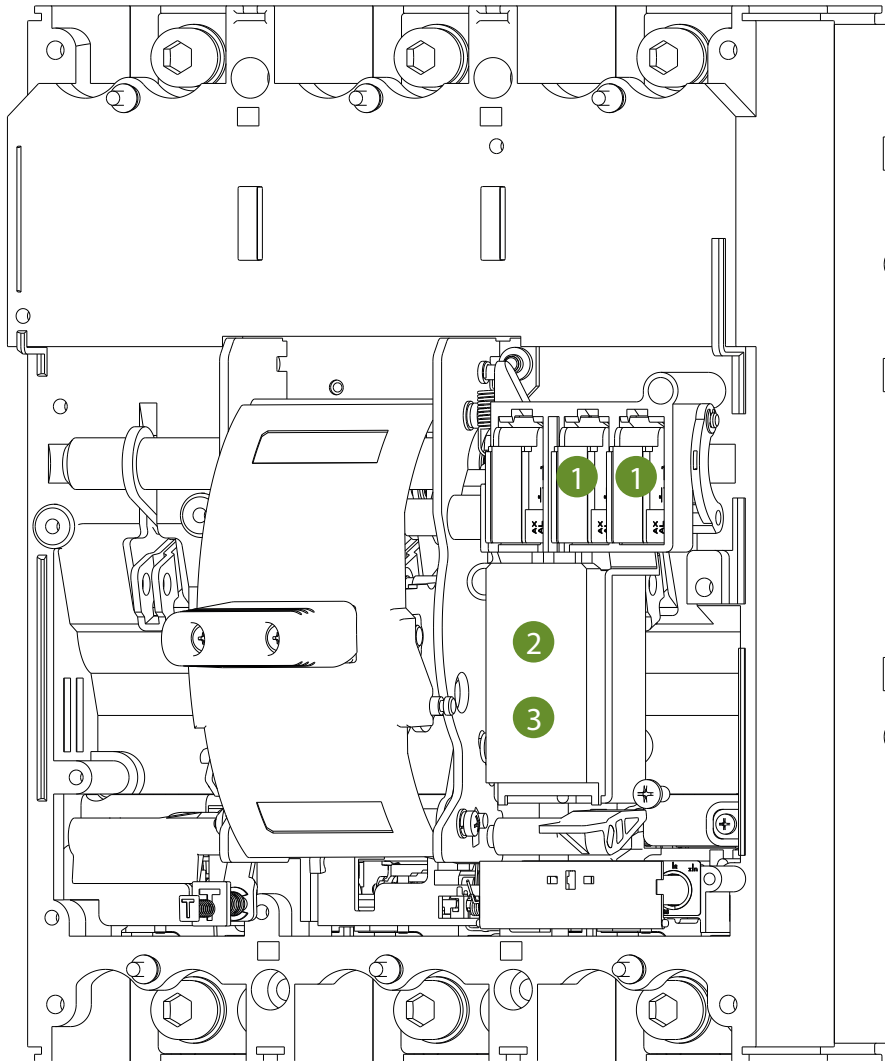
Screw type terminals **MC2i**

Screw terminals **MCS2i**

Din rail **DRA2i**

DC MCCB Switch Disconnectors Ex9M6SD

Internal accessories Ex9M6 DC SD



1

Auxiliary contact
AX21M

2

Shunt trip release
SHT26
1 unit or UVT2*i*

3

Undervoltage release
UVT26
1 unit or SHT2*i*

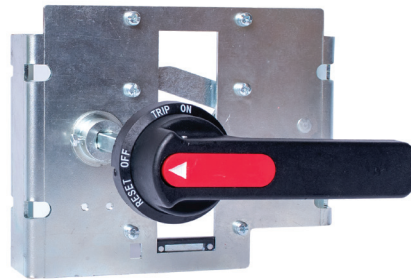
Auxiliary contact AX21M

Shunt trip releases SHT26

Undervoltage releases UVT26

DC MCCB Switch Disconnectors Ex9M6SD

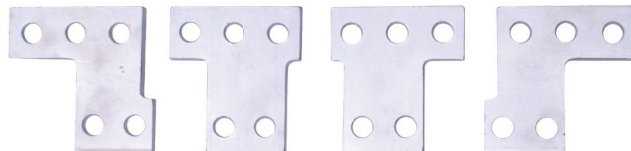
External accessories Ex9M6 DC SD



Extended rotatory
handle
ERH26



Extended handle
LHD26



Front connection
plate
JP26

Extended rotary handles ERH26

Extended handles LHD26

Front connection plate JP26

DC MCCB Switch Disconnectors Ex9MSD

3-pole versions

- Mounting screws, screw type terminals as well as phase barriers in the scope of delivery



Rated current i_n	Frame size	Article No.	Type	Packing
160 A	M1	112799	Ex9M1SD DC 3P	1/8
250 A	M2	112803	Ex9M2SD DC 3P	1/8
400 A	M3	112807	Ex9M3SD DC 3P	1/2
630 A	M4	112811	Ex9M4SD DC 3P	1
800 A	M5	112815	Ex9M5SD DC 3P	1
800 A	M6	112831	Ex9M6SD DC800 3P	1
1 000 A	M6	112825	Ex9M6SD DC1000 3P	1
1 250 A	M6	112827	Ex9M6SD DC1250 3P	1
1 600 A	M6	112829	Ex9M6SD DC1600 3P	1

4-pole versions

- Mounting screws, screw type terminals as well as phase barriers in the scope of delivery



Rated current i_n	Frame size	Article No.	Type	Packing
160 A	M1	112800	Ex9M1SD DC 4P	1/8
250 A	M2	112804	Ex9M2SD DC 4P	1/8
400 A	M3	112808	Ex9M3SD DC 4P	1/2
630 A	M4	112812	Ex9M4SD DC 4P	1
800 A	M5	112816	Ex9M5SD DC 4P	1
800 A	M6	112832	Ex9M6SD DC800 4P	1
1 000 A	M6	112826	Ex9M6SD DC1000 4P	1
1 250 A	M6	112828	Ex9M6SD DC1250 4P	1
1 600 A	M6	112830	Ex9M6SD DC1600 4P	1

Technical Data Ex9M1SD DC

DC Moulded Case Switch Disconnectors up to 160 A

General parameters

Suitable for commercial as well as industrial applications

Internal accessories

Auxiliary contact unit	AX21M	112071
Shunt trip releases	SHT21	101397 — 101405
Undervoltage releases	UVT21	101406 — 101407

Max. number of installed internal accessories is 2 pcs of AX21M and 1 pc of a release (SHT21 or UVT21)

External accessories

Direct rotary handle	RHD21	101410
Extended rotary handle	ERH21	101409
Remote motor operators	MOD21	101411 — 101415
Terminal cover, short	TCV21 3P, 4P	101439, 102372
Terminal cover, long	TCE21 3P, 4P	101440, 102373
Phase barrier	PHS21	112110
Connection terminals	MC21	103705 — 103708
DIN-rail adapter	DRA21	106319

Mounting screws, screw type terminals as well as phase barriers in the scope of delivery

Technical Data Ex9M1 AC SD

DC Moulded Case Switch Disconnectors up to 160 A

Electrical parameters

Tested according to	IEC/EN 60947-3
Rated op. voltage U_e	750 / 1 000 V DC
Rated insulation voltage U_i	1 000 V
Rated impulse withstand voltage U_{imp}	8 kV
Rated frequency	DC
Rated short-time making capacity I_{cm}	2 kA
Rated short-time withstand current I_{cw}	2 kA / 1 s 2 kA / 3 s
Rated current	160 A
Utilization category	DC-22A, DC-23A, DC-PV2
Mechanical service life	15 000 operation cycles
Electrical service life	2 000 operation cycles / 1 000 V DC
Total disconnection time at short circuit	< 2 ms
Line voltage connection	arbitrary above or below

Power dissipation characteristics

I_n	160 A
Pole resistance (mΩ)	0.8
Pole power dissipation (W)	20.5

Mechanical parameters

Device width 3P / 4P	90 mm / 120 mm
Device height	140 mm
Device depth	81.6 mm
Mounting	onto panel
Degree of protection	IP40, IP20 terminals
Terminals	box
Terminal capacity	4 — 95 mm ²
Fastening torque of terminals	8 Nm
Ambient temperature	-40 — +70 °C
Relative humidity	≤ 50 % at 40 °C, ≤ 90 % monthly average
Pollution degree	3
Weight 3P / 4P	1.05 kg / 1.55 kg
Mounting position	vertical, can be rotated by 90° in each axis

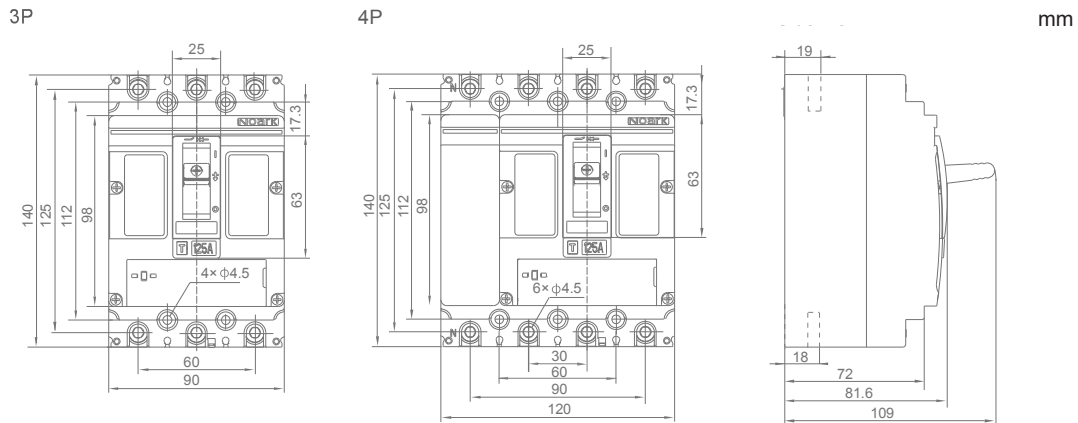
Derating coefficient of technical parameters based on altitude

Altitude	≤ 2 000 m	3 000 m	4 000 m	5 000 m
Derating op. current I_n coefficient	1	0.96	0.93	0.9
Maximum rated op. voltage U_e	1 000 V DC	900 V DC	850 V DC	800 V DC
Rated insulation voltage U_i	1 000 V DC	930 V DC	870 V DC	800 V DC
Rated impulse withstand voltage U_{imp}	8 kV	8 kV	8 kV	8 kV
Dielectric properties ($U_{imp}=8$ kV)	3 110 V DC	2 892 V DC	2 705 V DC	2 488 V DC

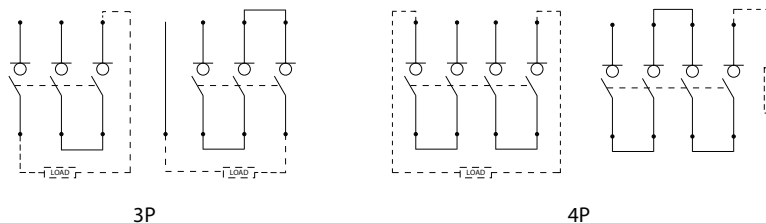
Technical Data Ex9M1SD DC

DC Moulded Case Switch Disconnectors up to 160 A

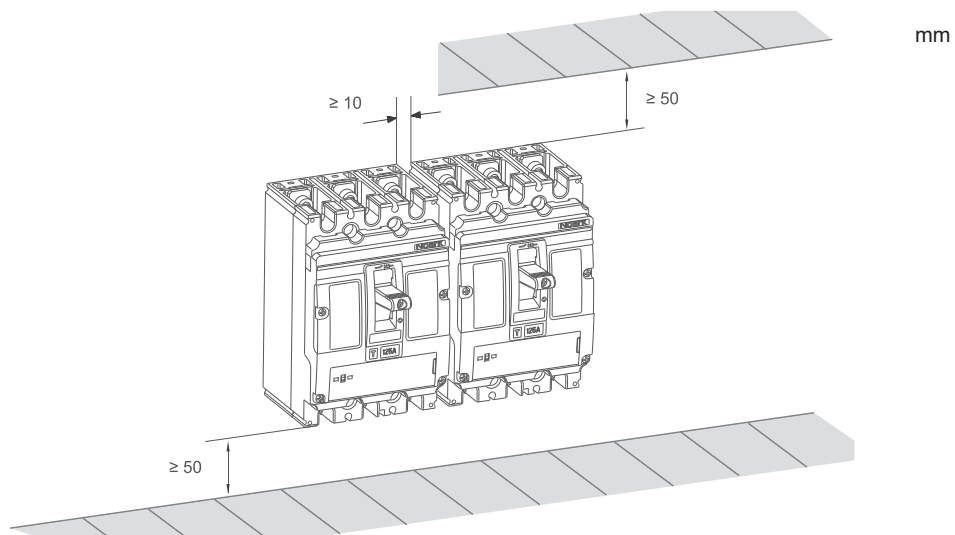
Dimensions



Wiring diagram



Installation space



Technical Data Ex9M2SD DC

DC Moulded Case Switch Disconnectors up to 250 A

General parameters

Suitable for commercial as well as industrial applications

Internal accessories

Auxiliary contact unit	AX21M	112071
Shunt trip releases	SHT22	101416 — 101424
Undervoltage releases	UVT22	101425 — 101426
Max. number of installed internal accessories is 2 pcs of AX21M and 1 pc of a release (SHT22 or UVT22)		

External accessories

Direct rotary handle	RHD22	101429
Extended rotary handle	ERH22	101428
Remote motor operators	MOD22	101430 — 101434
Terminal cover, short	TCV22 3P, 4P	101442, 102374
Terminal cover, long	TCE22 3P, 4P	101443, 102375
Phase barrier	PHS22	112111
Connection terminals	MC22	103709, 103869, 103711, 103713
DIN-rail adapter	DRA22	106320

Mounting screws, screw type terminals as well as phase barriers in the scope of delivery

Technical Data Ex9M2SD DC

DC Moulded Case Switch Disconnectors up to 250 A

Electrical parameters

Tested according to	IEC/EN 60947-3
Rated op. voltage U_e	750 / 1 000 V DC
Rated insulation voltage U_i	1 000 V
Rated impulse withstand voltage U_{imp}	8 kV
Rated frequency	DC
Rated short-time making capacity I_{cm}	3.2 kA
Rated short-time withstand current I_{cw}	3.2 kA / 1 s 3.2 kA / 3 s
Rated current	250 A
Utilization category	DC-22A, DC-23A, DC-PV2
Mechanical service life	15 000 operation cycles
Electrical service life	1 500 operation cycles / 1 000 V DC
Total disconnection time at short circuit	< 2 ms
Line voltage connection	arbitrary above or below

Power dissipation characteristics

I_n	250 A
Pole resistance (mΩ)	0.4
Pole power dissipation (W)	25

Mechanical parameters

Device width 3P / 4P	105 mm / 140 mm
Device height	157 mm
Device depth	96.5 mm
Mounting	onto panel
Degree of protection	IP40, IP20 terminals
Terminals	box
Terminal capacity	10 — 120 mm ²
Fastening torque of terminals	25 Nm
Ambient temperature	-40 — +70 °C
Relative humidity	≤ 50 % at 40 °C, ≤ 90 % monthly average
Pollution degree	3
Weight 3P / 4P	1.85 kg / 2.5 kg
Mounting position	vertical, can be rotated by 90° in each axis

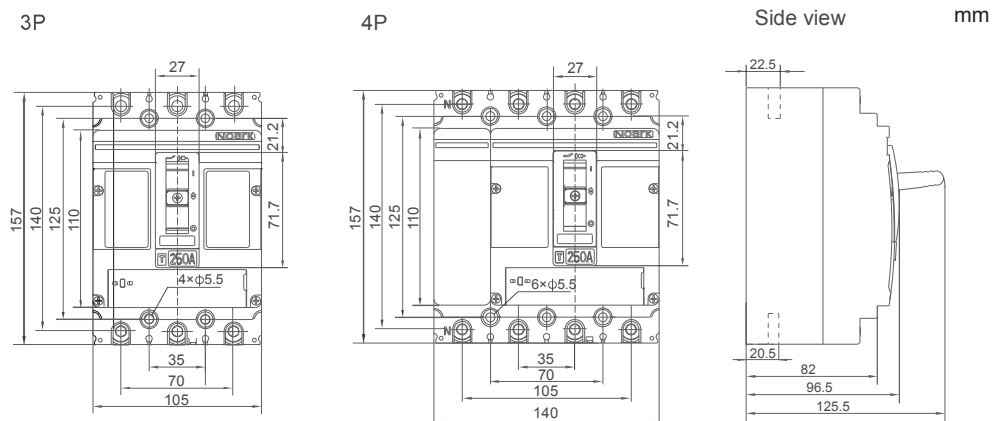
Derating coefficient of technical parameters based on altitude

Altitude	≤ 2 000 m	3 000 m	4 000 m	5 000 m
Derating op. current I_n coefficient	1	0.96	0.93	0.9
Maximum rated op. voltage U_e	1 000 V DC	900 V DC	850 V DC	800 V DC
Rated insulation voltage U_i	1 000 V DC	930 V DC	870 V DC	800 V DC
Rated impulse withstand voltage U_{imp}	8 kV	8 kV	8 kV	8 kV
Dielectric properties ($U_{imp}=8$ kV)	3 110 V DC	2 892 V DC	2 705 V DC	2 488 V DC

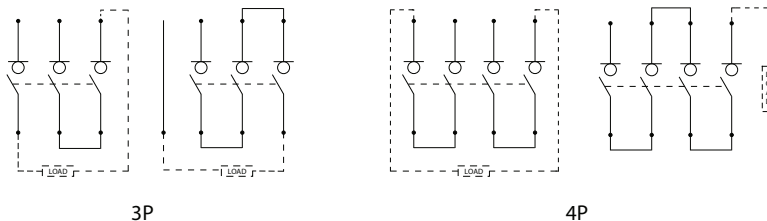
Technical Data Ex9M2SD DC

DC Moulded Case Switch Disconnectors up to 250 A

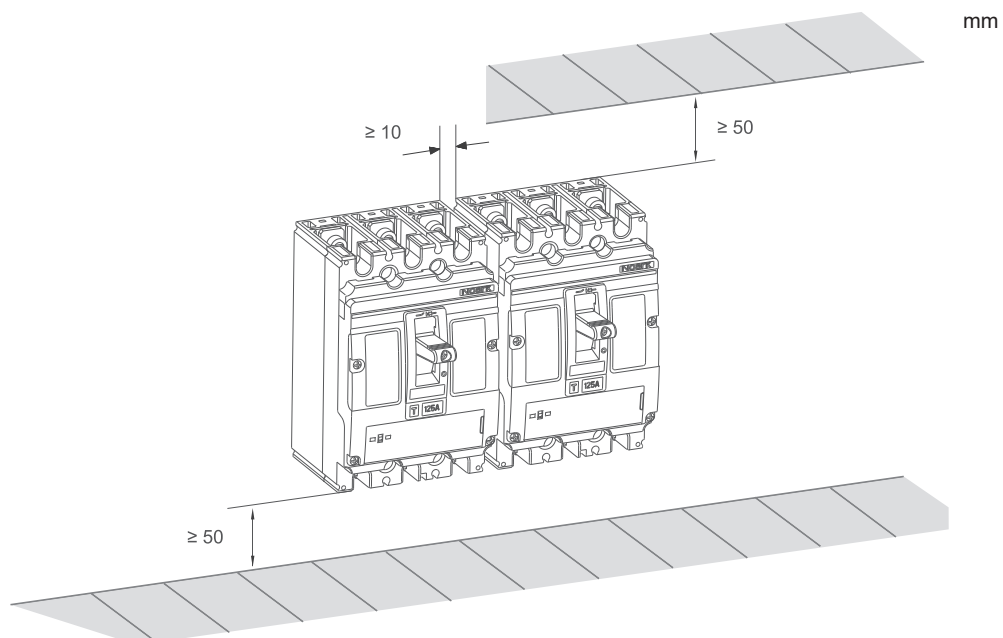
Dimensions



Wiring diagram



Installation space



Technical Data Ex9M3SD DC

DC Moulded Case Switch Disconnectors up to 400 A

General parameters

Suitable for commercial as well as industrial applications

Internal accessories

Auxiliary contact unit	AX21M	112071
Shunt trip releases	SHT22	101416 — 101424
Undervoltage releases	UVT22	101425 — 101426
Max. number of installed internal accessories is 2 pcs of AX21M and 1 pc of a release (SHT22 or UVT22)		

External accessories

Direct rotary handle	RHD23	101483
Extended rotary handle	ERH23	101482
Remote motor operators	MOD23	101484 — 101488
Terminal cover, short	TCV23 3P, 4P	101489, 102376
Terminal cover, long	TCE23 3P, 4P	101490, 102377
Phase barrier	PHS23	112112
Connection terminals	MC23	103715 — 103722

Mounting screws, screw type terminals as well as phase barriers in the scope of delivery

Technical Data Ex9M3SD DC

DC Moulded Case Switch Disconnectors up to 400 A

Electrical parameters

Tested according to	IEC/EN 60947-3
Rated op. voltage U_e	750 / 1 000 V DC
Rated insulation voltage U_i	1 000 V
Rated impulse withstand voltage U_{imp}	12 kV
Rated frequency	DC
Rated short-time making capacity I_{cm}	5 kA
Rated short-time withstand current I_{cw}	5 kA / 1 s 5 kA / 3 s
Rated current	400 A
Utilization category	DC-22A, DC-23A, DC-PV2
Mechanical service life	15 000 operation cycles
Electrical service life	1 500 operation cycles / 1 000 V DC
Total disconnection time at short circuit	< 2 ms
Line voltage connection	arbitrary above or below

Power dissipation characteristics

I_n	400 A
Pole resistance (m Ω)	0.15
Pole power dissipation (W)	24

Mechanical parameters

Device width 3P / 4P	140 mm / 185 mm
Device height	255 mm
Device depth	118.5 mm
Mounting	onto panel
Degree of protection	IP40, IP20 terminals
Terminals	M10 screws
Busbar thickness	≤ 8 mm
Busbar width	≤ 30 mm
Cable lug width	≤ 30 mm
Fastening torque of terminals	25 Nm
Ambient temperature	-40 — +70 °C
Relative humidity	≤ 50 % at 40 °C, ≤ 90 % monthly average
Pollution degree	3
Weight 3P / 4P	5 kg / 6.5 kg
Mounting position	vertical, can be rotated by 90° in each axis

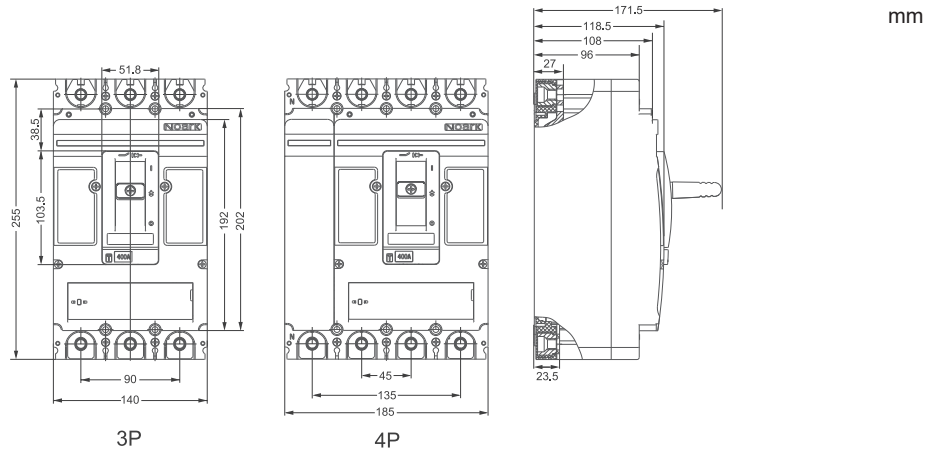
Derating coefficient of technical parameters based on altitude

Altitude	$\leq 2\ 000$ m	3 000 m	4 000 m	5 000 m
Derating op. current I_n coefficient	1	0.96	0.93	0.9
Maximum rated op. voltage U_e	1 000 V DC	900 V DC	850 V DC	800 V DC
Rated insulation voltage U_i	1 000 V DC	930 V DC	870 V DC	800 V DC
Rated impulse withstand voltage U_{imp}	12 kV	10 kV	8 kV	8 kV
Dielectric properties ($U_{imp}=12$ kV)	3 600 V DC	3 350 V DC	3 110 V DC	2 985 V DC

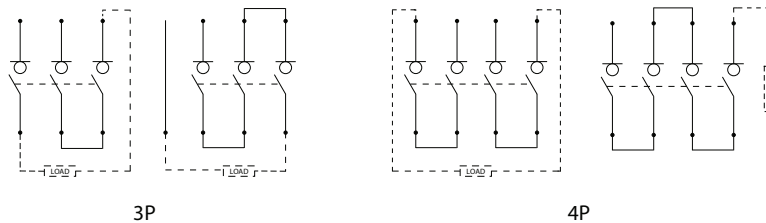
Technical Data Ex9M3SD DC

DC Moulded Case Switch Disconnectors up to 400 A

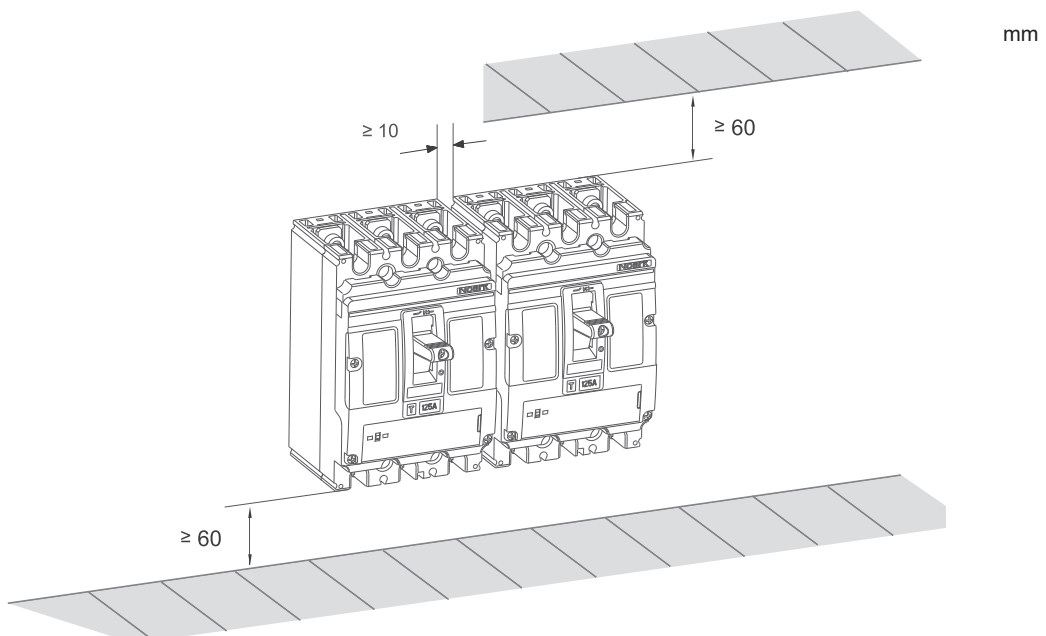
Dimensions



Wiring diagram



Installation space



Technical Data Ex9M4SD DC

DC Moulded Case Switch Disconnectors up to 630 A

General parameters

Suitable for commercial as well as industrial applications

Internal accessories

Auxiliary contact unit	AX21M	112071
Shunt trip releases	SHT24	103723 — 103730
Undervoltage releases	UVT24	103722 — 103740

Max. number of installed internal accessories is 2 pcs of AX21M and 1 pc of a release (SHT24 or UVT24)

External accessories

Direct rotary handle	RHD24	103742
Extended rotary handle	ERH24	103741
Remote motor operators	MOD24	103743 — 103747
Terminal cover, short	TCV24 3P, 4P	103748, 103750
Terminal cover, long	TCE24 3P, 4P	103749, 104855
Phase barrier	PHS24	112113
Connection terminals	MC24 W2	106314

Mounting screws, screw type terminals as well as phase barriers in the scope of delivery

Technical Data Ex9M4SD DC

DC Moulded Case Switch Disconnectors up to 630 A

Electrical parameters

Tested according to	IEC/EN 60947-3
Rated op. voltage U_e	750 / 1 000 V DC
Rated insulation voltage U_i	1 000 V
Rated impulse withstand voltage U_{imp}	12 kV
Rated frequency	DC
Rated short-time making capacity I_{cm}	14 kA
Rated short-time withstand current I_{cw}	8 kA / 1 s 8 kA / 3 s
Rated current	630 A
Utilization category	DC-22A, DC-23A, DC-PV2
Mechanical service life	10 000 operation cycles
Electrical service life	1 000 operation cycles / 1 000 V DC
Total disconnection time at short circuit	< 2 ms
Line voltage connection	arbitrary above or below

Power dissipation characteristics

I_n	630 A
Pole resistance (m Ω)	0.08
Pole power dissipation (W)	31.8

Mechanical parameters

Device width 3P / 4P	195 mm / 260 mm
Device height	300 mm
Device depth	142 mm
Mounting	onto panel
Degree of protection	IP40, IP20 terminals
Terminals	M12 screws
Busbar thickness	≤ 10 mm
Busbar width	≤ 50 mm
Cable lug width	≤ 50 mm
Fastening torque of terminals	30 Nm
Ambient temperature	-40 — +70 °C
Relative humidity	≤ 50 % at 40 °C, ≤ 90 % monthly average
Pollution degree	3
Weight 3P / 4P	9.5 kg / 12.5 kg
Mounting position	vertical, can be rotated by 90° in each axis

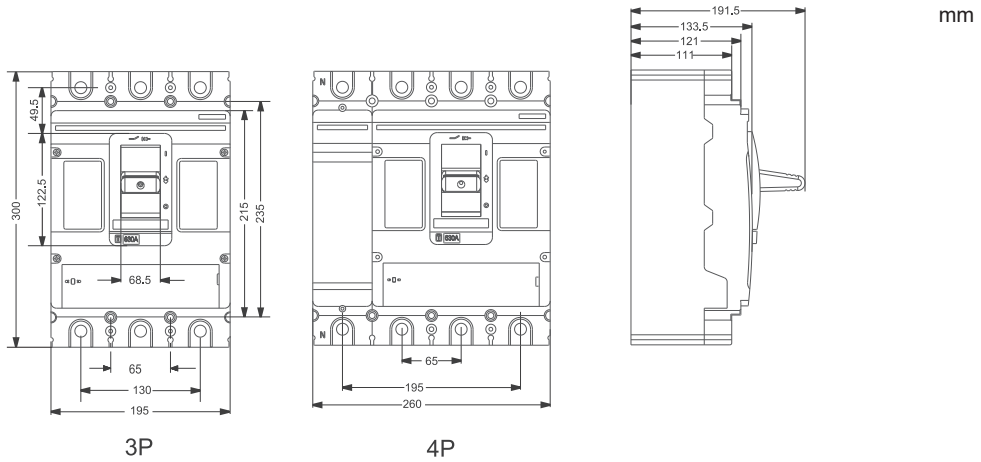
Derating coefficient of technical parameters based on altitude

Altitude	$\leq 2\ 000$ m	3 000 m	4 000 m	5 000 m
Derating op. current I_n coefficient	1	0.96	0.93	0.9
Maximum rated op. voltage U_e	1 000 V DC	900 V DC	850 V DC	800 V DC
Rated insulation voltage U_i	1 000 V DC	930 V DC	870 V DC	800 V DC
Rated impulse withstand voltage U_{imp}	12 kV	10 kV	8 kV	8 kV
Dielectric properties ($U_{imp} = 12$ kV)	3 600 V DC	3 350 V DC	3 110 V DC	2 985 V DC

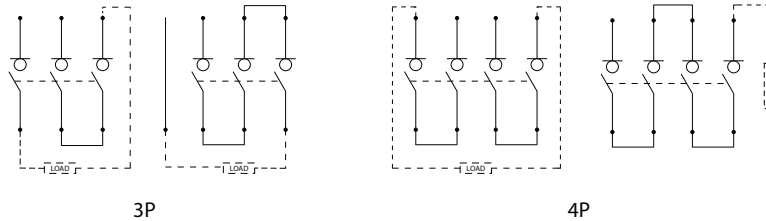
Technical Data Ex9M4SD DC

DC Moulded Case Switch Disconnectors up to 630 A

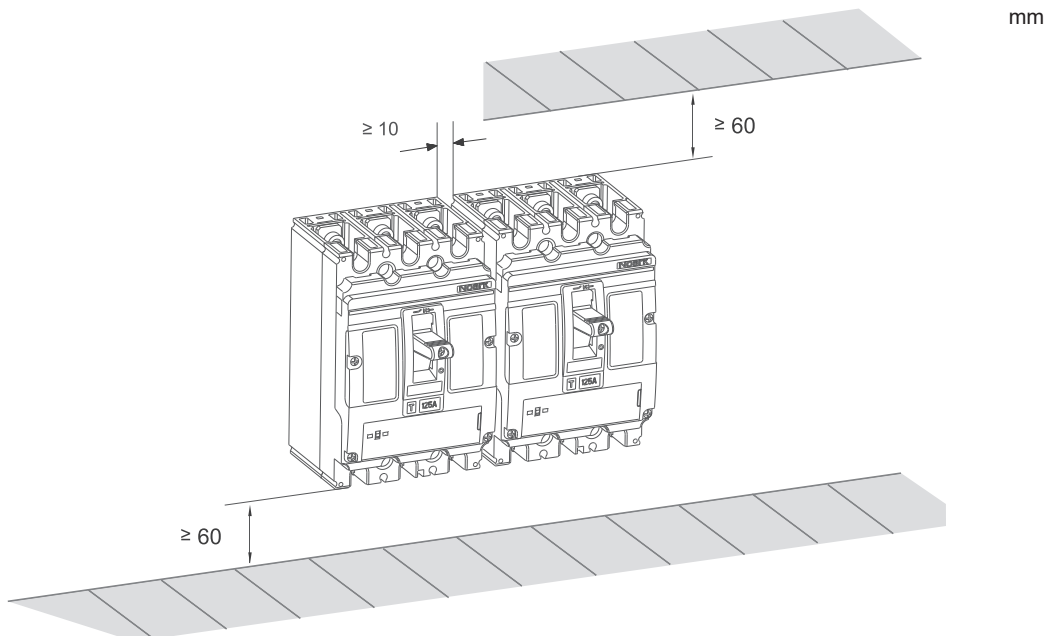
Dimensions



Wiring diagram



Installation space



Technical Data Ex9M5SD DC

DC Moulded Case Switch Disconnectors up to 800 A

General parameters

Suitable for commercial as well as industrial applications

Internal accessories

Auxiliary contact unit	AX21M	112071
Shunt trip releases	SHT24	103723 — 103730
Undervoltage releases	UVT24	103722 — 103740

Max. number of installed internal accessories is 2 pcs of AX21M and 1 pc of a release (SHT24 or UVT24)

External accessories

Direct rotary handle	RHD24	103742
Extended rotary handle	ERH24	103741
Remote motor operators	MOD24	103743 — 103747
Terminal cover, short	TCV24 3P, 4P	103748, 103750
Terminal cover, long	TCE24 3P, 4P	103749, 104855
Phase barrier	PHS24	112113
Connection terminals	MC24 W2	106314

Mounting screws, screw type terminals as well as phase barriers in the scope of delivery

Technical Data Ex9M5SD DC

DC Moulded Case Switch Disconnectors up to 800 A

Electrical parameters

Tested according to	IEC/EN 60947-3
Rated op. voltage U_e	1 000 V DC
Rated insulation voltage U_i	1 250 V
Rated impulse withstand voltage U_{imp}	12 kV
Rated frequency	DC
Rated short-time making capacity I_{cm}	17 kA
Rated short-time withstand current I_{cw}	10 kA / 1 s 10 kA / 3 s
Rated current	800 A
Utilization category	DC-22A, DC-23A, DC-PV2
Mechanical service life	10 000 operation cycles
Electrical service life	1 000 operation cycles / 1 000 V DC
Total disconnection time at short circuit	< 2 ms
Line voltage connection	arbitrary above or below

Power dissipation characteristics

I_n	800 A
Pole resistance (mΩ)	0.08
Pole power dissipation (W)	51.2

Mechanical parameters

Device width 3P / 4P	195 mm / 260 mm
Device height	300 mm
Device depth	142 mm
Mounting	onto panel
Degree of protection	IP40, IP20 terminals
Terminals	M12 screws
Busbar thickness	≤ 10 mm
Busbar width	≤ 50 mm
Cable lug width	≤ 50 mm
Fastening torque of terminals	30 Nm
Ambient temperature	-40 — +70 °C
Relative humidity	≤ 50 % at 40 °C, ≤ 90 % monthly average
Pollution degree	3
Weight 3P / 4P	9.5 kg / 12.5 kg
Mounting position	vertical, can be rotated by 90° in each axis

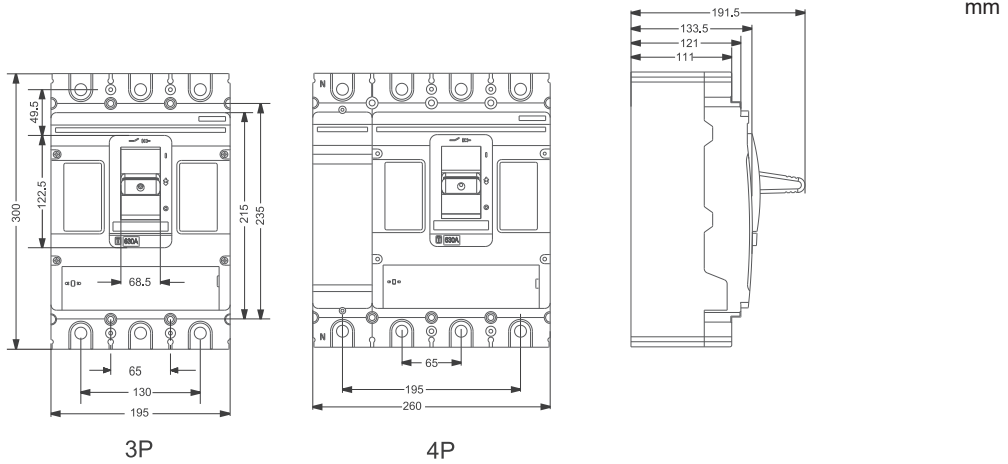
Derating coefficient of technical parameters based on altitude

Altitude	≤ 2 000 m	3 000 m	4 000 m	5 000 m
Derating op. current I_n coefficient	1	0.96	0.93	0.9
Maximum rated op. voltage U_e	1 000 V DC	900 V DC	850 V DC	800 V DC
Rated insulation voltage U_i	1 000 V DC	930 V DC	870 V DC	800 V DC
Rated impulse withstand voltage U_{imp}	12 kV	10 kV	8 kV	8 kV
Dielectric properties ($U_{imp} = 12$ kV)	3 600 V DC	3 350 V DC	3 110 V DC	2 985 V DC

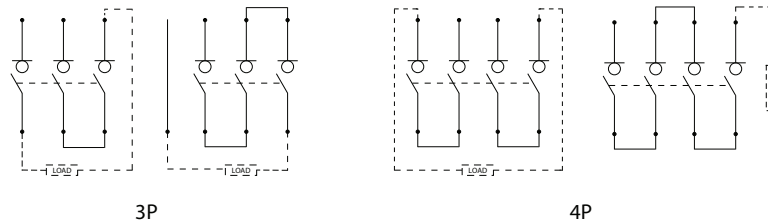
Technical Data Ex9M5SD DC

DC Moulded Case Switch Disconnectors up to 800 A

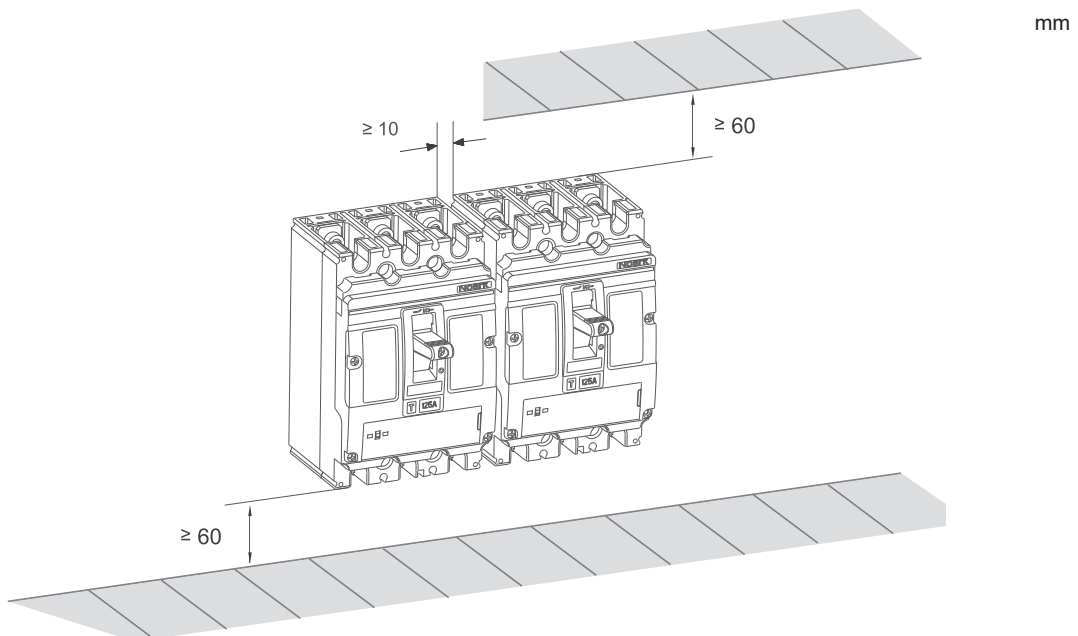
Dimensions



Wiring diagram



Installation space



Technical Data Ex9M6SD DC

DC Moulded Case Switch Disconnectors up to 1 600 A

General parameters

Suitable for household as well as industrial applications

Internal accessories

Auxiliary contact unit	AX21M	112071
Shunt trip releases	SHT26	110460 — 110467
Undervoltage releases	UVT26	110468 — 110469

Max. number of installed internal accessories is 2 pcs of AX21 and 1 pc of a release (SHT26 or UVT26)

External accessories

Extended handle	LHD26	110698
Extended rotary handle	ERH26	108846
Front connection plate	JP26	110694 — 110697

Mounting screws, screw type terminals as well as phase barriers in the scope of delivery

Technical Data Ex9M6SD DC

DC Moulded Case Switch Disconnectors up to 1 600 A

Electrical parameters

Tested according to	IEC/EN 60947-3
Rated op. voltage U_e	750 / 1 500 V DC
Rated insulation voltage U_i	1 500 V
Rated impulse withstand voltage U_{imp}	12 kV
Rated frequency	DC
Rated short-time making capacity I_{cm}	19.2 kA
Rated short-time withstand current I_{cw}	19.2 kA / 1 s
Rated current	800 / 1 000 / 1 250 / 1 600 A
Utilization category	DC-22A, DC-22B
Mechanical service life	6 000 operation cycles
Electrical service life	1 000 operation cycles / 1 000 V DC
Total disconnection time at short circuit	< 2 ms
Line voltage connection	arbitrary above or below

Power dissipation characteristics

I_n	800 A	1 000 A	1 250 A	1 600 A
Pole resistance (m Ω)	0.08	0.08	0.04	0.04
Pole power dissipation (W)	51.2	80.0	62.5	102.4

Mechanical parameters

Device width 3P / 4P	210 mm / 280 mm
Device height	286 mm
Device depth	191 mm
Mounting	onto panel
Degree of protection	IP40, IP20 terminals
Terminals	M10 screws
Busbar thickness	\leq 10 mm
Busbar width	\leq 50 mm
Cable lug width	\leq 50 mm
Fastening torque of terminals	25 — 30 Nm
Ambient temperature	-40 — +70 °C
Relative humidity	\leq 50 % at 40 °C, \leq 90 % monthly average
Pollution degree	3
Weight 3P / 4P	13 / 17 kg
Mounting position	vertical, can be rotated by 90° in each axis

Derating coefficient of technical parameters based on altitude

Altitude	\leq 2 000 m	3 000 m	4 000 m	5 000 m
Derating op. current I_n coefficient	1	0.96	0.93	0.9
Maximum rated op. voltage U_e	1 000 V DC	900 V DC	850 V DC	800 V DC
Rated insulation voltage U_i	1 000 V DC	930 V DC	870 V DC	800 V DC
Rated impulse withstand voltage U_{imp}	12 kV	10 kV	8 kV	8 kV
Dielectric properties ($U_{imp}=12$ kV)	3 600 V DC	3 350 V DC	3 110 V DC	2 985 V DC

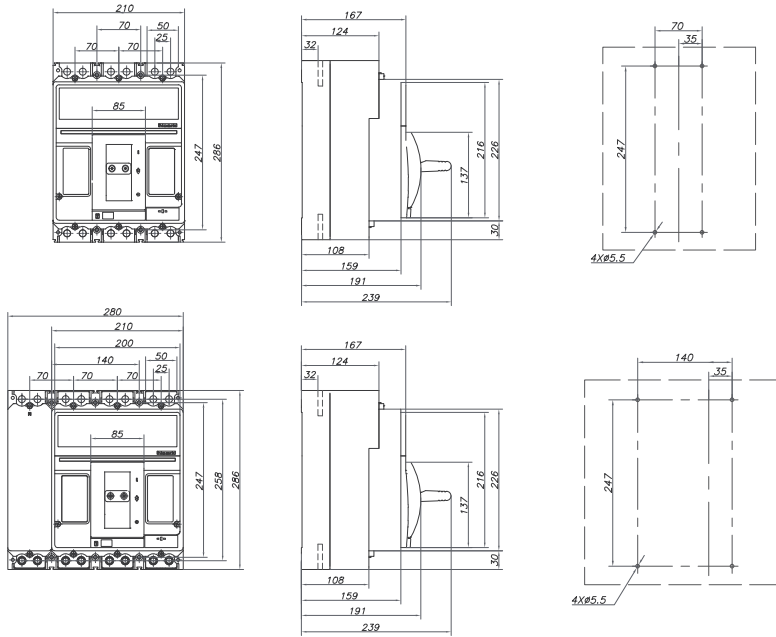
Technical Data Ex9M6SD DC

DC Moulded Case Switch Disconnectors up to 1 600 A

Dimensions

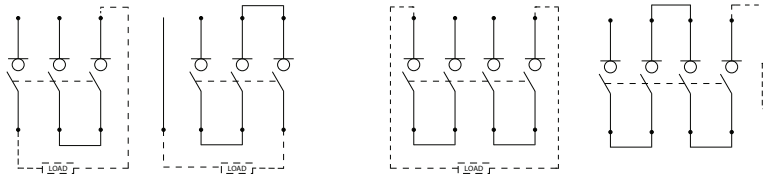
mm

3P



4P

Wiring diagram



3P

4P

Installation space

mm

