Field of application

RM6 meets all medium voltage secondary distribution needs up to 24kV.

RM6 is a gas-insulated switchboard combining all medium voltage functions to enable the connection, supply and protection of transformers for open ring or radial networks.

Transformer protection can be achieved either:

- By a fuse-switch combination for transformers up to 2 000 kVA
- By a circuit breaker with a protection relay for transformers up to 8 000 kVA

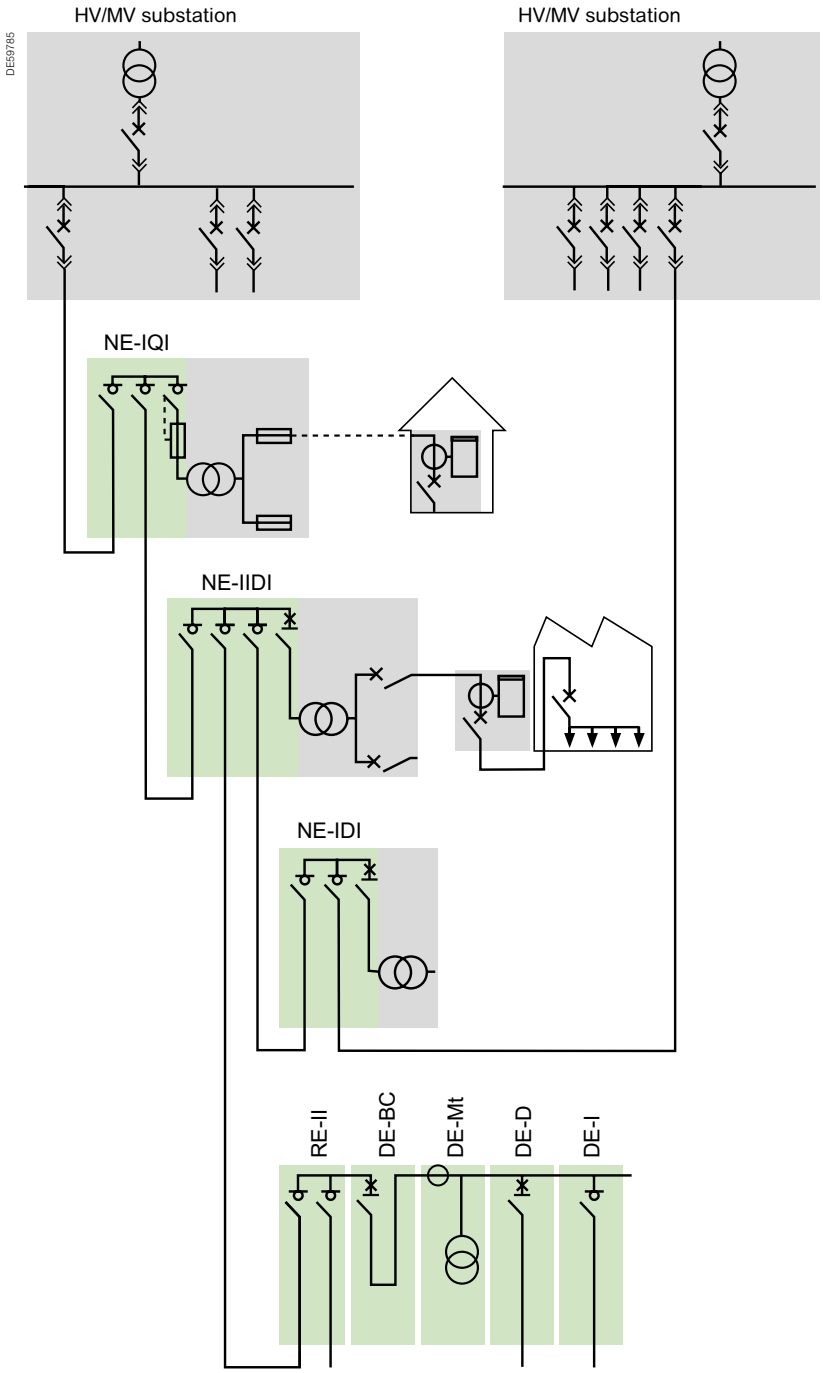
PM103350

PM103309

PE91032

PM103317

DE59785

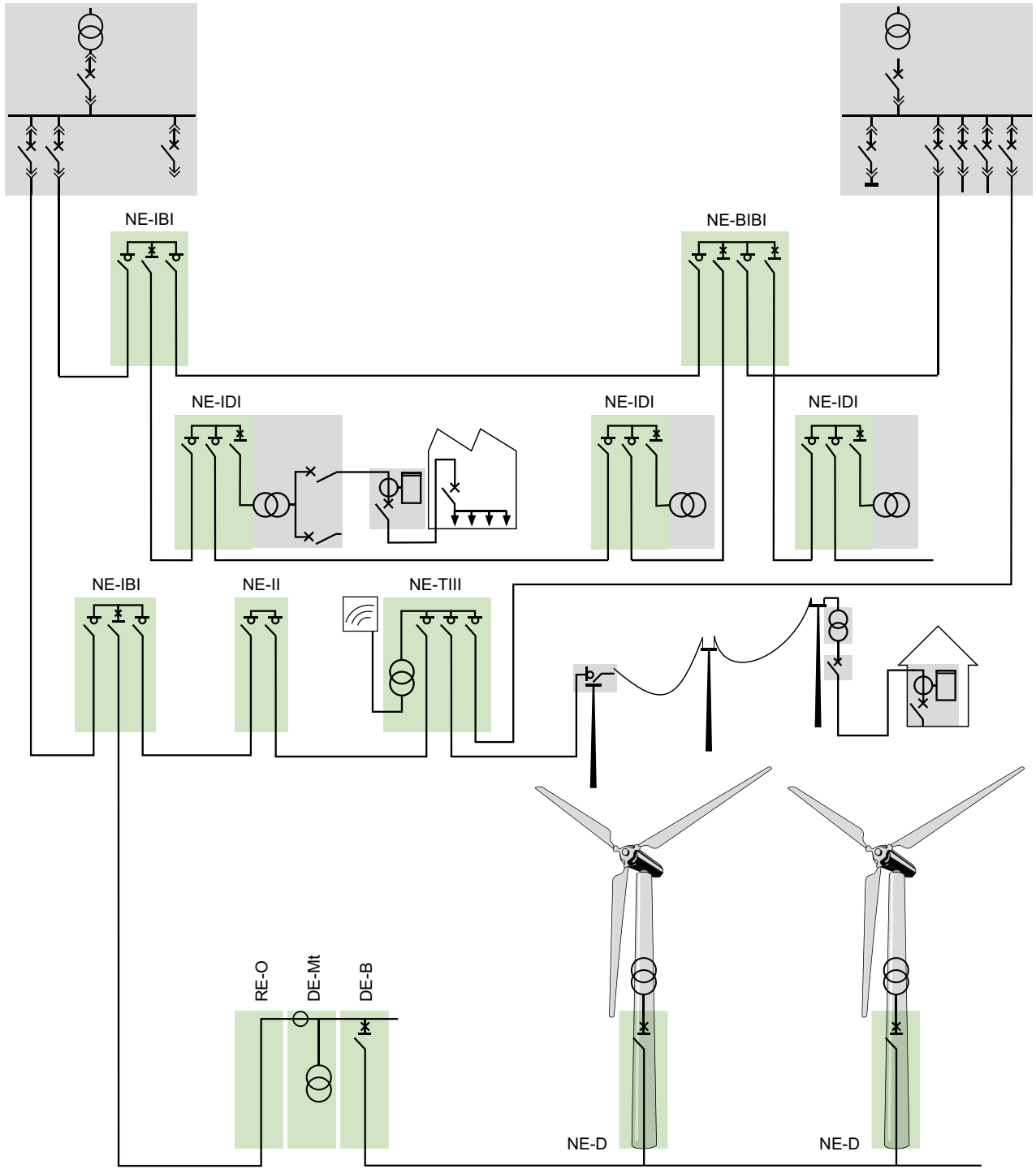


Field of application

RM6 meets all medium voltage secondary distribution needs in more complex network configurations where renewable energy supply sources are involved.

In addition to HV/MV substations, which are used to limit the effects of a fault on the network, operating a distribution network sometimes requires several switching points. RM6 offers solutions for up to five network connections thanks to:

- Line protection with 630A circuit breakers
- Network switching by switch disconnectors
- Integrated power supply remote control devices.



General characteristics

RM6 is an indoor gas-insulated switchgear up to 24kV for secondary distribution networks.

PM107098

RM6 meets the definition of a "sealed pressure system" as laid out by the IEC standard.

RM6 is made up of the following elements:

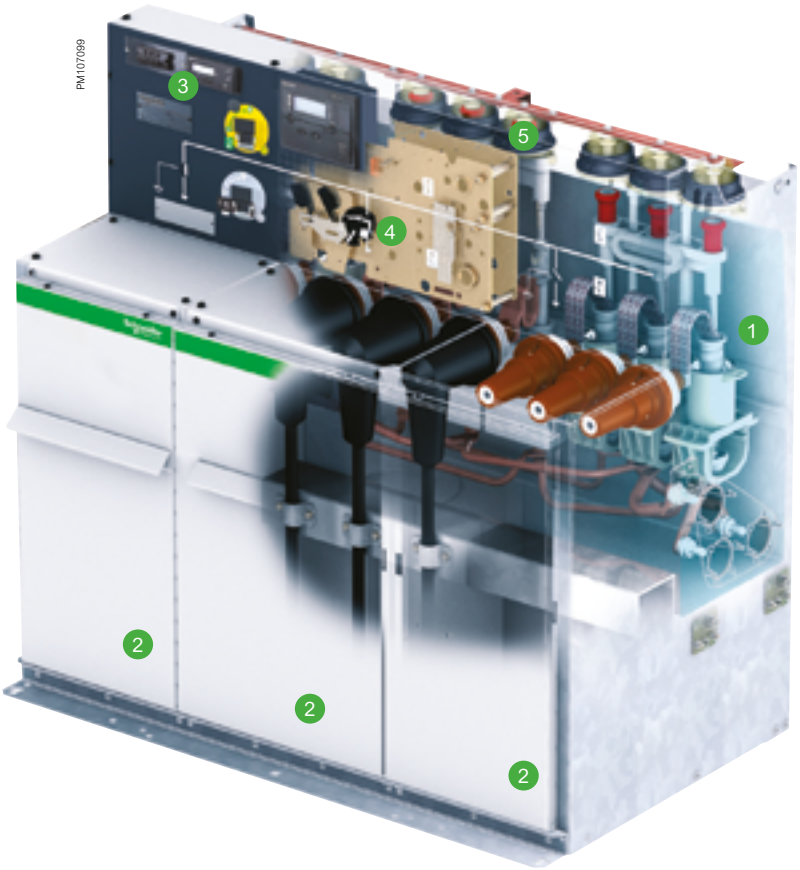
1. A stainless steel tank filled with SF6 gas (at 0.23 bar relative pressure), sealed for life and containing the busbar and all live switching components such as the switch disconnector, the earthing switch, the fuse switch combination or the circuit breaker
2. One to four (five optional) cable compartments with interfaces to connect to the network or the transformer
3. User interface with single line diagram, actuators and LV components
4. Manual or motorized operating mechanism compartments
5. Earthing circuit with visible earthing contacts

Electrical characteristics

Rated voltage		Ur	(kV)	12	17.5	24
Frequency		f	(Hz)		50 or 60	
Insulation level						
Industrial frequency 50 Hz 1 mn	Insulation (1)	Ud	(kV rms)	28	38	50
	Isolation (2)	Ud	(kV rms)	32	45	60
Impulse 1.2/50 µs	Insulation (1)	Up	(kV peak)	75	95	125
	Isolation (2)	Up	(kV peak)	85	110	145
Tank internal arc withstand					20 kA 1 s	
Seismic Withstand	Severity class 2, acceptance class 2 as per IEC62271-210 (2013)					
Vibration Withstand	NF EN60068.2.6.2 (2008) (3)					

(1) Phase-to-phase, phase-to-earth
(2) Across the isolating distance
(3) Please contact Schneider Electric for details

PM107099

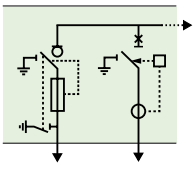


General characteristics

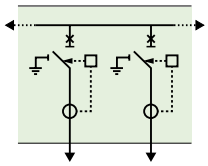
Examples

RM6 2 function combinations

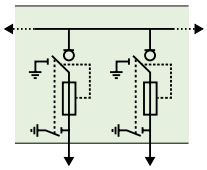
RE-QD



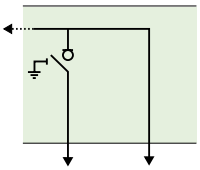
DE-DD



DE-QQ

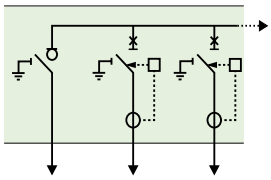


LE-IO

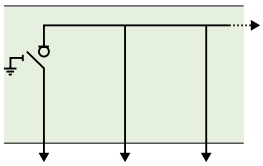


RM6 3 function combinations

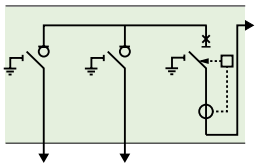
RE-IDD



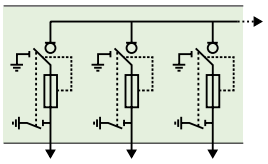
RE-IOO



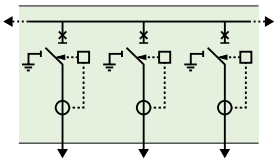
RE-IIBc



RE-QQQ



DE-BBD



General characteristics

Available functions

Basic unit characteristics																				
Rated voltage		(kV)	12	12	12	12	17.5	17.5	17.5	17.5	24	24	24	24	24	24	24	24	24	24
Short-time withstand current		(kA rms)	21	21	25	25	21	21	21	21	12.5	12.5	12.5	16	16	16	20	20	20	20
		Duration (s)	1	1	1	1	1	3	1	3	1	1	1	1	1	1	1	3	1	3
Rated current		(A)	200	630	200	630	200	200	630	630	200	400	630	200	400	630	200	200	630	630
Extensions	**Functions**																			
NE	I					●			●		●	●			●	●			●	
	D		●		●		●				●			●			●			
	P					●			●	●						●			●	
	QI				●		●	●			●			●			●			
	DI				●		●	●			●			●			●			
	PI					●			●	●						●			●	
	II					●			●			●			●	●			●	
	IQI			●		●			●	●		●			●	●			●	●
	IIQI			●		●			●	●		●			●	●			●	●
	QIQI			●		●			●	●		●			●	●			●	●
	IDI					●			●	●		●	●		●	●			●	●
	IIDI					●			●	●		●	●		●	●			●	●
	DIDI					●			●	●		●	●		●	●			●	●
	III					●			●	●		●			●	●			●	●
	IIII					●			●	●		●			●	●			●	●
	IPI					●			●	●						●			●	●
	IIPI					●			●	●						●			●	●
	PIPI					●			●	●						●			●	●
RE	O			●	●		●		●					●		●	●		●	
	IQI		●		●			●	●		●				●	●			●	●
	IIQI		●		●			●	●		●				●	●			●	●
	QIQI		●		●			●	●		●				●	●			●	●
	IDI				●			●	●		●	●			●	●			●	●
	IIDI				●			●	●		●	●			●	●			●	●
	DIDI				●			●	●		●	●			●	●			●	●
	II				●				●		●				●	●			●	
	III				●			●	●		●				●	●			●	●
	IIII				●			●	●		●				●	●			●	●
	IPI				●			●	●							●			●	●
	IIPI				●			●	●							●			●	●
	PIPI				●			●	●							●			●	●
LE	O			●	●		●		●					●		●	●		●	
DE	I				●			●	●		●				●	●			●	●
	PC				●				●							●			●	●
	IC				●				●							●			●	●
	O			●	●		●		●					●		●	●		●	
	Q	●		●		●	●			●				●			●	●		
	D			●		●	●			●				●			●	●		
	P				●			●	●							●			●	●
	IQI		●		●			●	●							●			●	●
	IIQI		●		●			●	●							●			●	●
	IDI				●			●	●				●			●			●	●
	IIDI				●			●	●				●			●			●	●
	III				●			●	●							●			●	●
	IIII				●			●	●							●			●	●
	IPI				●			●	●							●			●	●
	IIPI				●			●	●							●			●	●
	Mt				●				●							●			●	●

N.B.: D and Q functions limited to 200 A

NE: non-extensible, **RE**: right-extensiblet, **LE**: left-extensible, **DE**: double-extensible.

All performances are available for RM6 Free Combination cubicles.

Operating conditions and standards

PM107100

RM6 performance meets the definition of a “sealed pressure system” as laid down in the IEC recommendations.

The RM6 tank is filled with SF6 at 0.23bar relative pressure and sealed for life after filling. Its tightness, which is systematically checked at the factory, gives the switchgear a high life expectancy.

The RM6 is designed in accordance with the following IEC standards used for general operation conditions for indoor switchgear:

IEC 62271-1 (common specifications for high voltage switchgear and controlgear)

Ambient temperature: class –25 °C indoor

- Lower than or equal to 40 °C without derating
- Lower than or equal to 35 °C over 24 hours on average without derating
- Greater than or equal to –25 °C: please contact us for details

Altitude:

- Lower than or equal to 1000 m
- Above 1000 m, and up to 2000 m with direct field connectors
- Greater than 2000 m: please contact us for further details

DE-Mt needs voltage derating after 1000 m.

Please consider altitude and temperature when selecting Q function fuses.

Current derating in accordance with ambient temperature

		(°C)	40	45	50	55	60
Busbars 630 A	Ir	(A)	630	575	515	460	425
Busbars 400 A	Ir	(A)	400	400	400	355	
Functions: I, O, B (with bushing type C)		(A)	630	575	515	460	425
Function D (with bushing type B or C)		(A)	200	200	200	200	200
Function Q		(A)	(3)	(4)	(4)	(4)	(4)

(3) Depends on fuse selection
(4) Please contact us

Functional overview

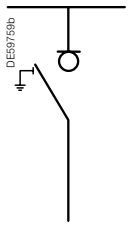
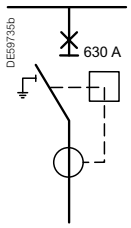
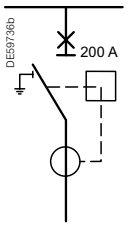
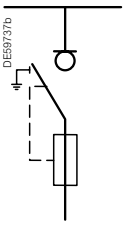
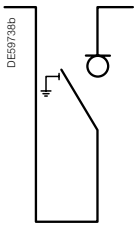
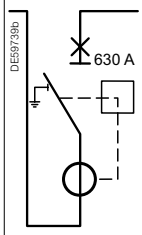
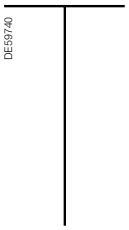
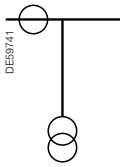
Choice of functional units

A wide choice of RM6 functions

RM6 benefits from a wide choice of MV functions enabling:

- The connection, power supply and protection of transformers on a radial or open-ring network via 200 A circuit breakers with an independent protection chain, or via combined fuse-switches
- The protection of lines by a 630 A circuit breaker
- MV Metering of private MV/LV substations.

The RM6 functions are described in the table below.

Function	Network switch	Line feeder	Transformer feeder		Network coupling		Cable connection	MV metering
Functional unit	I	B	D	Q	IC	BC	O	Mt
Device	630 A switch	630 A circuit breaker	200 A circuit breaker	Combined fuse-switch	Switch	630 A circuit breaker		
Single line diagrams								

PM107091

Scalability of RM6

To support the evolution of your distribution network, RM6 can be extended with a range of functions making it a truly scalable system.

The addition of one or more functional units can be carried out by simply adding modules that are connected to each other via the busbar using dedicated field bushings.

There are different types of extensible RM6:

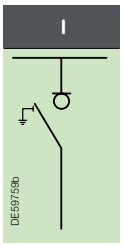
- Right-extensible (-RE type)
- Left-extensible (-LE type)
- Extensible on both sides (-DE type)
- Non-extensible (-NE type)

Functional overview

I, Ic functions

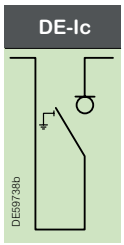
I function

- Network points with switch disconnector



DE-Ic function

- Bus coupler by switch disconnector



Rated voltage		Ur	kV	12	17.5	24			
Rated frequency		Fr	Hz	50 or 60	50 or 60	50 or 60			
Insulation level									
Industrial frequency 50Hz/1min	Phase-to-phase, phase-to-earth	Ud	kV rms	28	38	50			
	Across isolating distance	Ud	kV rms	32	45	60			
Lightning impulse withstand	Phase-to-phase, phase-to-earth	Up	kV peak	75	95	125			
	Across isolating distance	Up	kV peak	85	110	145			
Rated current		Ir	A	630	630	400	400	630	630
Rated current busbars		Ir	A	630	630	400	400	630	630
Rated peak current		Ip	kA	62.5	52.5	31.25	40	40	50
Short-time withstand current		It	kA rms	25	21	12.5	16	16	20
		tk	s	1	1 or 3	1	1	1	1 or 3
Breaking capacity	Active load	Iload	A	630	630	400	400	630	630
	Earth fault	Ief1	A	320	320	320	320	320	320
	Cable charging	Icc	A	110	110	110	110	110	110
Making capacity of switch and earthing switches		Ima	kA peak	62.5	52.5	31.25	40	40	50
Bushing (1)			Type	C	C	B or C	B or C	C	C
Mechanical endurance	Switch disconnector	M1	Number of openings	1000	1000	1000			
	Earthing switch	M0	Number of openings	1000	1000	1000			
Electrical endurance	Switch disconnector	E3	Number of CO at rated current	100	100	100			
			Number of short-circuit making operations	5	5	5	5	5	2
	Earthing switch	E2	Number of CO at rated current	100	100	100			
			Number of short-circuit making operations	5	5	5	5	5	2

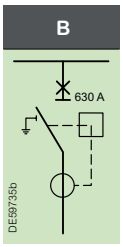
(1) No bushing for IC function

Functional overview

B, D, BC functions

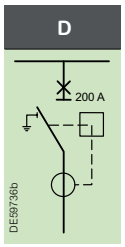
B function

- Network points with 630 A disconnecting circuit breaker (line protection feeder)



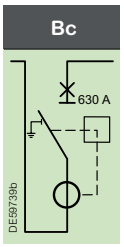
D function

- Transformer feeder 200 A with disconnecting circuit breaker



DE-Bc function

- Bus coupler by 630 A circuit breaker



Rated voltage		Ur	kV	12		17.5		24										
Rated frequency		Fr	Hz	50 or 60		50 or 60		50 or 60										
Insulation level																		
Industrial frequency 50Hz/1min	Phase-to-phase, phase-to-earth	Ud	kV rms	28		38		50										
	Across isolating distance	Ud	kV rms	32		45		60										
Lightning impulse withstand	Phase-to-phase, phase-to-earth	Up	kV peak	75		95		125										
	Across isolating distance	Up	kV peak	85		110		145										
Rated current		Ir	A	200	630	200	630	200	630	200	630	200	200	200				
Rated current busbars		Ir	A	630		630		630		630		400	400	630				
Short-time withstand current		It	kA rms	25		21(1)		16		20		12.5	16	12.5				
		tk	s	1		1 or 3		1		1 or 3		1	1	1				
No-load transformer breaking capacity		I3	A	-	16	-	16	-	16	-	16	16	16	16				
Short-circuit breaking capacity		Isc	kA	25		21		16		20		12.5	16	12.5				
Making capacity		Ima	kA peak	62.5		52.5		40		50		31.25	40	31.25				
Operating sequence				O – 3min- CO – 3min - O														
Bushing(2)			Type	C		C		C		C		A	BorC	A				
Mechanical endurance	Circuit breaker	M1	Number of openings	2000		2000		2000										
	Earthing switch	M0	Number of openings	1000		1000		1000										
Electrical endurance	Circuit breaker	E2	Number of short-circuit breaking operations	3		3		3										
			Number of short-circuit making operations	2		2		2										
	Earthing switch	E2	Number of CO at rated current	100		100		100										
			Number of short-circuit making operations	5		5		5		2		5	5	5				

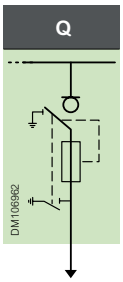
(1) 17.5 kA for DE-Bc
(2) No bushing for DE-Bc function

Functional overview

Q function

Q function

- Transformer feeder with fuse-switch protection



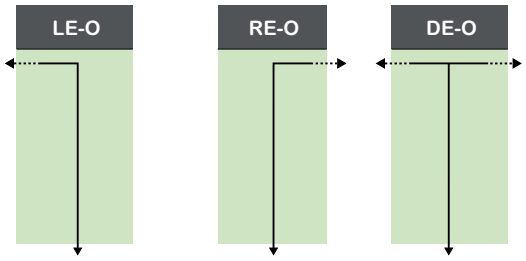
Rated voltage		Ur	kV	12		17.5	24			
Rated frequency		Fr	Hz	50 or 60		50 or 60	50 or 60			
Insulation level										
Industrial frequency 50Hz/1min	Phase-to-phase, phase-to-earth	Ud	kV rms	28		38	50			
	Across isolating distance	Ud	kV rms	32		45	60			
Lightning impulse withstand	Phase-to-phase, phase-to-earth	Up	kV peak	75		95	125			
	Across isolating distance	Up	kV peak	85		110	145			
Rated current		Ir	A	200	200	200	200	200	200	200
Rated current busbars		Ir	A	630	630	630	400	400	630	630
Short-time withstand current		It	kA rms	21	25	21	12.5	16	16	20
		tk	s	1	1	1 or 3	1	1	1	1 or 3
No-load transformer breaking capacity		I3	A	16	16	16	16	16	16	16
Short-circuit breaking capacity		Isc	kA	21	25	21	12.5	16	16	20
Making capacity		Ima	kA peak	52.5	62.5	52.5	31.25	40	40	50
Bushing			Type	A	A	A	A	A	A	A
Mechanical endurance	Switch disconnector	M1	Number of openings	1000		1000	1000			
	Earthing switch	M0	Number of openings	1000		1000	1000			
Electrical endurance	Switch disconnector	E2	Number of CO at rated current	100		100	100			
			Number of short-circuit making operations	5		5	5			2
	Earthing switch	E2	Number of CO at rated current	100		100	100			
			Number of short-circuit making operations	5		5	5			2

Functional overview

O function

O function

- Cable connection



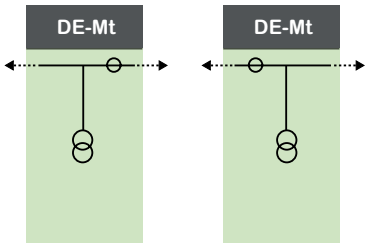
Rated voltage	Ur	kV	12	12	17.5	17.5	24	24	24
Rated current busbars	Ir	A	630	630	630	630	630	630	630
Rated current	Ir	A	200	630	200	630	200	630	630
Short-time withstand current	Ik	kA rms	25	25	21	21	16	16	20
	tk	Duration (s)	1	1	3	3	1	1	1 or 3
Bushing			C	C	C	C	C	C	C

Functional overview

DE-Mt function

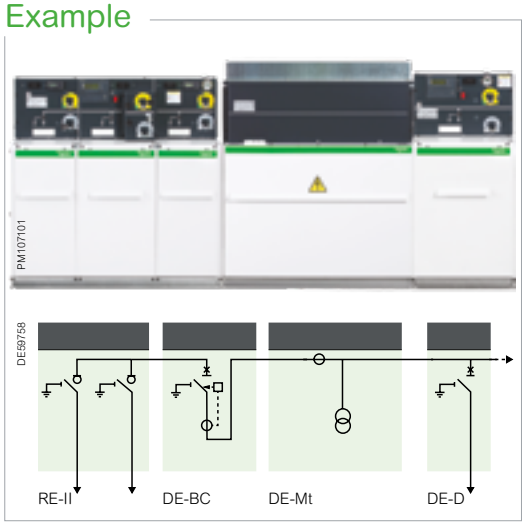
DE-Mt function

- Air-insulating metering panel for MV power billing
- Internal Arc withstand
- Connected by busbar to RM6 functions



Rated voltage	Ur	kV	12	17.5	24
Rated current busbars	Ir	A	630	630	630
Rated current	Ir	A	630	630	630
Short-time withstand current	Ik	kA rms	25	21	16 or 20
	tk	Duration (s)	1	1 or 3	1 or 3
Cubicle internal arc withstand			16 kA 1 s	16 kA 1 s	16 kA 1 s

Example



Voltage transformers

Schneider Electric models or DIN 42600 type section 9.
2 phase-phase VT, 2 phase-earth VT, 3 phase-earth VT.
Optional fuse protection.

Current transformers

Schneider Electric models or DIN 42600 type section 8.
2 CT or 3 CT. CTs can be right or left-fitted.

A clear separation between MV and LV

All measures are taken to avoid operating on the MV compartment.
The secondary CT and VTs are cabled to the customer terminal in an LV compartment to enable:

- Connection to a remote power meter (in another room)
- Or connection to the LV cabinet mounted on the LV compartment (option).

Option: an LV cabinet

- Placed on top of the LV compartment
- Allows installation of active or reactive power meters, of all auxiliaries to monitor current, voltage and consumed power
- Cabinet door key locks available (Type R7)