RMNS

Integrated Low Voltage Switch Equipment



General

RMNS Integrated Low Voltage Switch Equipment(Named as Low Voltage Switchboard for Short in the following text) is a registered product of our company. RMNS low voitage switchboard is improved both in electric part choosing and in structure designing according to the trend of integrated low voltage switch equipment. The electric and mechanical performance of this product can meet the technical level of the original MNS product.

This low voltage Switchboard can serve as control equipment for generating, transmitting, distributing electricity and transducing or consuming power in AC 50–60Hz electric systems which rated operating voltage should not above 660V.

This low voltage Switchboard can operating in general overland cases and can operating in maritime petroleum mining platform and nuclear power plant after special treatment.

This low voltage Switchboard is compliant with IEC439 , the 5th section of VDE0660, the GB7251 integrated low voltage switch equipment standard and JB/T9661 integrated low voltage draw–out switch equipment standard.

Service Environmental Condition

2.1 The ambient temperature is between –5℃ and +40℃, and the mean temperature of 24 hours is not above +35℃.

2.2 Relative humidity is not above 50% when the ambient temperature is not above +40℃. when the temperature is relatively low, higher relative humidity is allowed (For example, the allowed relative humidity is 90% when the ambient temperature is +20℃).

2.3 Altitude is not above 2000m.

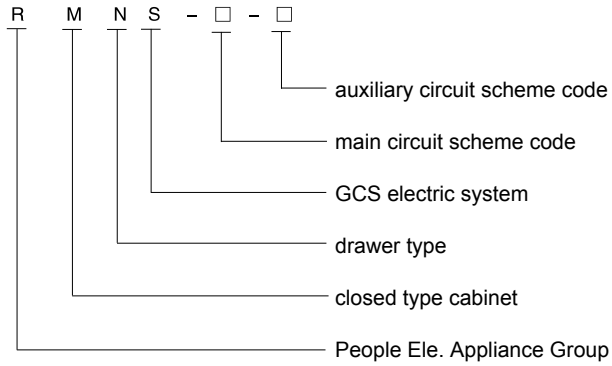
2.4 The temperature for transportation and storage is between–25℃ and +50℃, and a temperature below +70℃ is allowed within 24 hours.

2.5 Seismic intensity is below 9 degree.

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Model No.



Technical Parameters

3.1 RMNS type low-voltage cabinet main technical parameter

Rated operate voltage(V)		380、660
Rated insulation voltage(V)		660
Rated operate current (A)	horizontal busbar	630 ~ 5000
	vertical busbar	800 ~ 2000*
Rated short-time withstand effective value(1s)/peak value(kA)	horizontal busbar	50 ~ 100/105 ~ 250
	vertical busbar	60/130 ~ 150
Protection level		IP30、IP40、IP54**
Dimension(long x width x high,mm)		600×800、1000×600、(1000)×2200

*The rated operational current of the vertical bus bars:

The rated operational current of the single–sided or dual–sided draw–out MCC is 800A, and that of movable type MCC is1000A. The rated operational current of the single–sided 1000mm MCC is 800–2000A.

**Due to the severe reduction of capacity, the IP54 protection degree is not recommended.

3.2 Main technical parameter of product in the cabinet

name	model No.	parameter	name	model No.	parameter
Low-voltage circuit breaker	DW914(AH)	600 ~ 4000A	Fuse type isolater	DCHR1	125 ~ 630A
Low-voltage circuit breaker	RDW17	600 ~ 3900A	Fuse type isolate switch	HH15	125 ~ 800A
Low-voltage circuit breaker	RDM1 RDM2	15 ~ 630A	AC contactor	CJX2–F(RDC6) CJX2(RDC6) CJX8	4.7 ~ 630A
Low-voltage circuit breaker	DZ47–63 S503	10 ~ 63A	Fuse	NGT RT20/NT	4 ~ 630A
Low-voltage circuit breaker	RDM8 LNA	6 ~ 100A	Thermal relay	JRS2 JRS8/NT	16 ~ 370A
Fuse type load switch	SMP	125 ~ 630A	Current transformer	LMK1 LN LMZ2	15 ~ 5000/5A
Fuse type load switch	OESA	63A	capacitor	BSMJ CLMB	~ 400v(△)
Low-voltage circuit breaker	RDSW6(RDW1)	600 ~ 3200A	Low-voltage circuit breaker	M	600 ~ 6300A

Structural introduction

The base frame of the low voltage switchboard is assembled structure. All the parts of the base frame are zincified and assembled by self–locking bolts or 8.8 grade bolts. Then according to the requirement of scheme, other corresponding parts such as door, cover board, clapboard, installation support and bus bars, function units are added to the frame to form a complete LOW VOLTAGE switchboard. The dimension of the parts in the switchboard and the room is modular (modular unit=25mm, the same below)

4.1Power distribution center (PC for short)a. PC board is divided into 4 rooms. The horizontal busbarsroom is at the back of the PC board; the function unit room at the front–top or on the front–left; the cable room at the front–bottom or on the front–right; the control circuit room at the front–top.Isolating measures are as follows: the horizontal bus bars room, the function unit room and the cable room are isolated by melamine phenolic board or steel board. The control circuit room and function unit room are isolated by flame retardant melamine expanded plastic molding case. The left function unit room and the right cable room are isolated by steel board.

b.The frame type breaker in the board can be manually operated without opening the door. Operators can determine whether the breaker is in the testing position or in the operating position by observing the state of the breaker.

c.The main circuit and the auxiliary circuit are separated. The meters, signal lights and buttons of the auxiliary circuit are installed on a plastic board. There is a flame retardant melamine expanded plastic case behind the board to separating the auxiliary circuit from the main circuit.

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4.2 Draw–out motor control center and small current power distribution center (Draw–out MCC for short below)
a.Draw–out MCC cabinet is divided into 3 room i.e. the horizontal bus bars room at the back, the function unit room on the front–left, and the cable room on the front–right. The horizontal bus bars room and function unit room are isolated by flame retardant expanded plastic board. The cable room and the horizontal bus bars room or the function unit room are isolated by steel board.
b.Draw–out MCC has single operating side version and dual operating side version.
c.Draw–out MCC has 5 types of standard drawers. They are 8E/4, 8E/2, 8E, 16E and 24E. The 8E/4 and 8E/2 drawers are made up of molding flame retardant plastic and aluminium alloy (4 8E/4 drawers or 2 8E/2 drawers make a space of 8E height). The total height of the function unit room is 72E.
d.The 5 types of drawers usually have 16 quadric isolating contacts. The contacts of all types of drawers except for 8E/4 can be added up to 32. The terminal of each contact can be connected with 3 wires. Accessories and cold rolling grips for the terminals are applied by the manufacturer.
e.According to the operating procedure of the mechanical interlocking device, the drawers can only be moved when the main circuit and the auxiliary are both disconnected. The draws have 3 positions: moving position, switching position and isolating position. They are denoted by corresponding denotations.
The handle of the mechanical interlocking device and the handle of the main breaker can be locked by three locks.
4.3Movable motor control center and small current power distribution center (Movable MCC for short below)
a.The structural features of the Movable MCC board are the same as the items of a. and b. in section 4.2.
b.The function unit is movable, and it is connected with the vertical bus bars by primary isolating contacts. Even though the corresponding circuit is not disconnected, the function unit can be fetched out and in. The other side of the function unit is fixable.
c.The types of the function unit room of Movable MCC are 3E, 6E, 8E, 16E, 24E, 32E and 40E. The total height of the function unit is 72E.
4.4 Bus bars system
a.Horizontal bus bars(L1, L2, L3): The horizontal bus bars are installed in the isolating bus bars room at the back of the board. They have 2 options of installing positions i.e. the first third of the board height and the second third of the board height. The bus bars can be installed at either top or bottom in the board or in both positions. The 2 bus bars can operate individually or parallelly.
Each bus bars is composed of 2 or 4 or parallel buses. The sizes of the bus sections are $10 \times 30 \times 2$, $10 \times 60 \times 2$, $10 \times 80 \times 2$, $10 \times 60 \times 4$, $10 \times 80 \times 2 \times 2$ or $10 \times 60 \times 4 \times 2$.
b.The vertical bus bars are L type copper bus bars which size are $50 \times 30 \times 5$. They are embedded in the flame retardant plastic function walls, and the protection degree of the electriferous part of them is IP20.
c.The neutral bus bar(N bus bar) and the protecting earth bus bar(PE bus bar): The N bus bar and the PE bus bar are parallelly installed at the bottom of the function unit cabinet and vertically installed in the cable cabinet. The N bus bar and the PE bus bar operate individually if they are insulated, and they form PEN bus bars if they are connected.
4.5 Protecting earth systemThe protecting circuit of the switchboard is composed of PE bus bar (or PEN bus bar) and conductive metal component. The PE bus bar (or PEN bus bar) is individually installed and runs through all the length of the bus bars. All parts of the metal component except for the door and cover board are zincified. The elaborate designed connections of the component can endure a short–circuit current of certain value.
4.6Cable groove of the auxiliary circuitThe cable groove of the auxiliary circuit is installed at the top of the function unit room. Inter–board cable and common power cable can be installed in the groove.
4.7 Isolating measures of the auxiliary circuitIn each circuit of the draw–out MCC scheme, an isolating transformer can be installed according to the requirement of the system. The capacity of the trans former is in accordance with the AC contactor and the specification.

The arrangement of the primary scheme

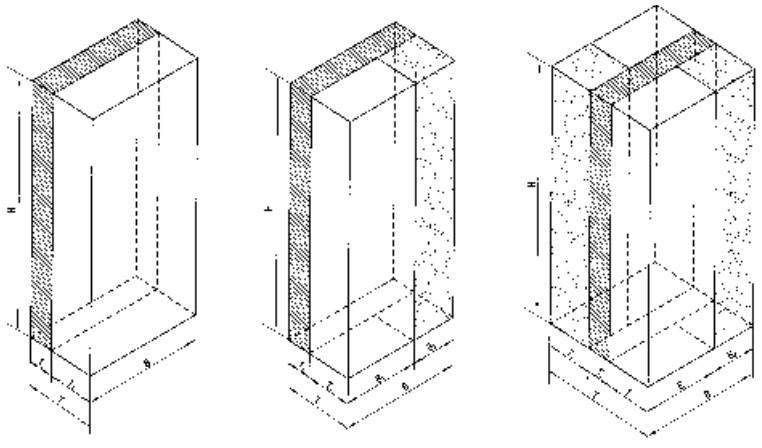
5.1 The total height of the function unit room is 72E.
5.2 The general arrangement principle of the function unit is that the small units is above the big ones in the same switchboard.
5.3 The 8E assembled unit is composed of 4 8E/4 drawers or 2 8E/2 drawers.
5.4 The number of the current transformers in the scheme is the maximum value (In scheme 03–06, 12–17, a current transformer can be added to serve in the reactive power compensation circuit). In actual application, you can install no or fewer current transformer according to the requirement of the system.
5.5 The depth of the switchboard can be 600mm (for mono–side MCC) or 1000mm(PC or dual–side MCC). Arranging PC boards and MCC boards respectively are recommendable.
5.6 When arranging PC and MCC together, the depth of the mono–side MCC should be added up to 1000mm, or the dual–side MCC near the PC should be changed into mono–side operating mode.
5.7 When choosing the bus bars bridge, the width of the bus bars bridge should be equal to that of the switchboard. Therefore, the bus bars bridge should be spanned on switchboards of the same width. The bus bars bridge should not be spanned on the standard MCC. If necessary, spans it according to paragraph 6.6. If the bus bars bridge is spanned on switchboard of a 600mm width, the maximum rated current should not be above 1500A.
5.8 When combining the DCHRI fuse type isolator with other MCC scheme, a 1E space should be kept.
5.9 Between each MCC, spare function unit should be installed. Long–term running function unit or space without function unit is not allowed.

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The figure and installation dimension

The general dimension of the cabinet is showed in fig.1. The general dimension of NMNS draw–out MCC(or PC) is showed in fig.2–5. The installation dimension is showed in fig.6.



(a) (b)

	Dimension (mm)					
H	B	B^1	B^2	T	T^1	T^2
2200	600			1000		
2200	800			1000	750	250
2200	1000			1000	750	250
2200	1000	600	400	600	400	200
2200	1000	600	400	1000	750	250
2200	1000	600	400	1000	400	600
2200	1000	600	400	1000	400	200

Function unit room Cable compartment room Horizontal busbar compartment room

a.One-side operate cabinet
b.Two-side operate cabinet

fig.1 The general dimension of RMNS low voltage switchboard frame

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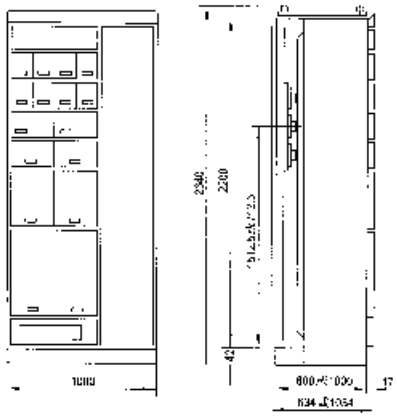


fig.2 Draw–out MCC
(Cabinet operated on mono–side)

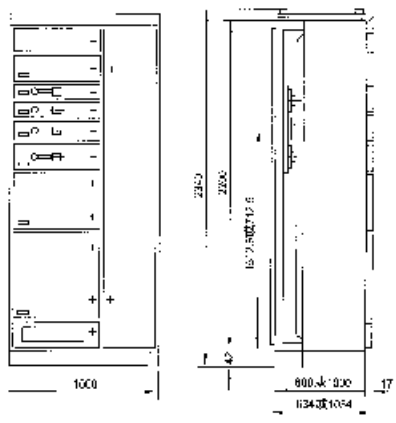


fig.3 Movable MCC
(Cabinet operated on mono–side)

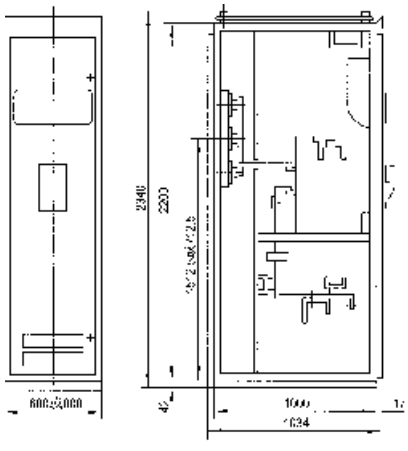


fig.4 PC (DW914)

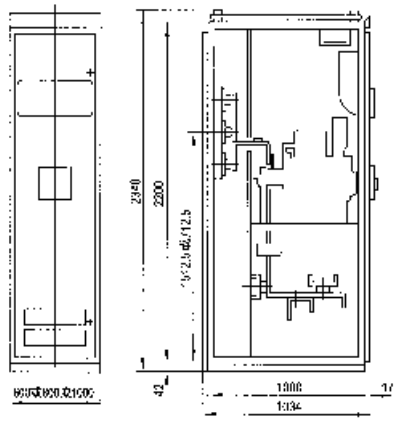
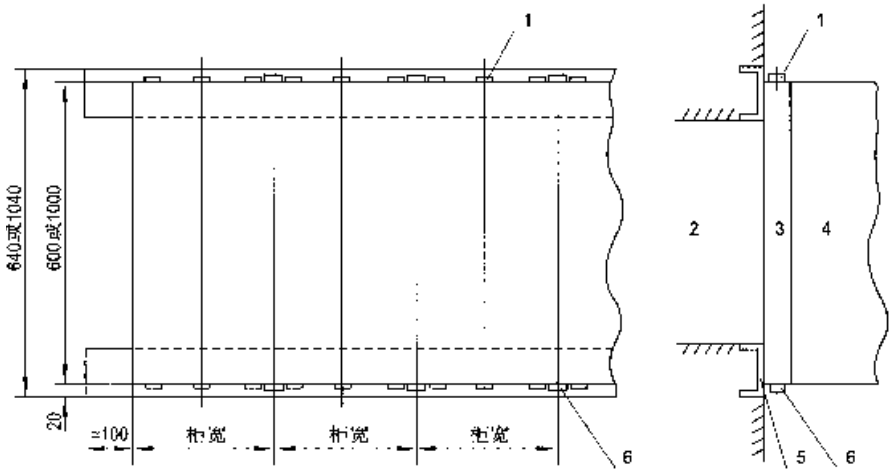


fig.5 PC (RDW17–630–3205)

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1.Welding position 2. Cable groove 3. The bottom of the cabinet 4.Switchboard

5.10# channel steel 6.Connection board

fig.6 The installation dimension of RMNS low voltage switchboard.

Drawer type MCC cabinet operate note

7.1 drawer bottom should enter to conductor accurately,than push it into cabinet,otherwise,the drawer would damage or cannot be pull out.
7.2 8E/4 and 8E/2 drawer panel has the signal and instructions,see Fig7. In the Fig, the arrow from break position"O" to operate position "I" means: First push the operate handle inside,then rotate the handle from "O" to "I".And when return it without push, just rotate the handle from "I" to "O",the handle would be popped out.
7.3 8E ~24E drawer panel has the signal and instructions,see Fig8. When the handle reach to operate position,mechanism unlock Mechanical lock for switch,so the Main switch can operate to breaking and making circuit,but when Main switch closed,the interlock mechanism cannot be operated.
7.4 There is a plastic cover at the lower right corner of signal, is the unlock mechanism of the door.
Operate instruction: when the drawer is at operate position,if need to open the door, the cover should be pull out at first,then use screw-driver to remove the lock to open the door. The cover should be put back unless protect level would lower.

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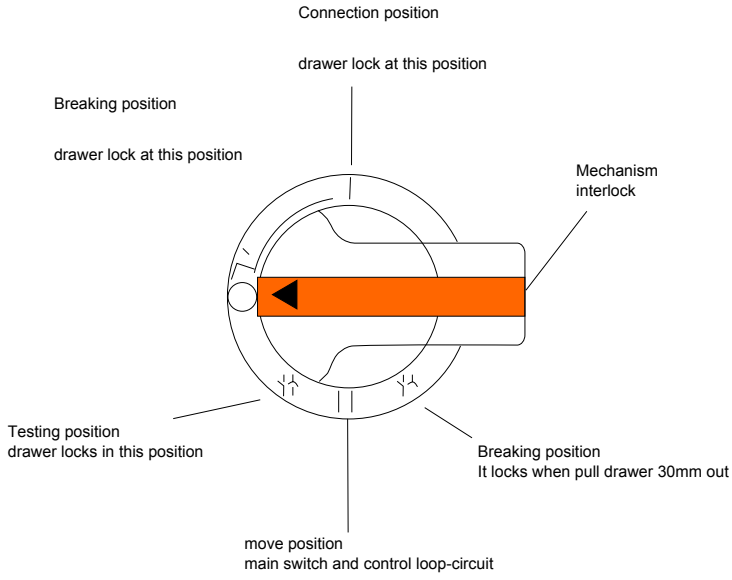
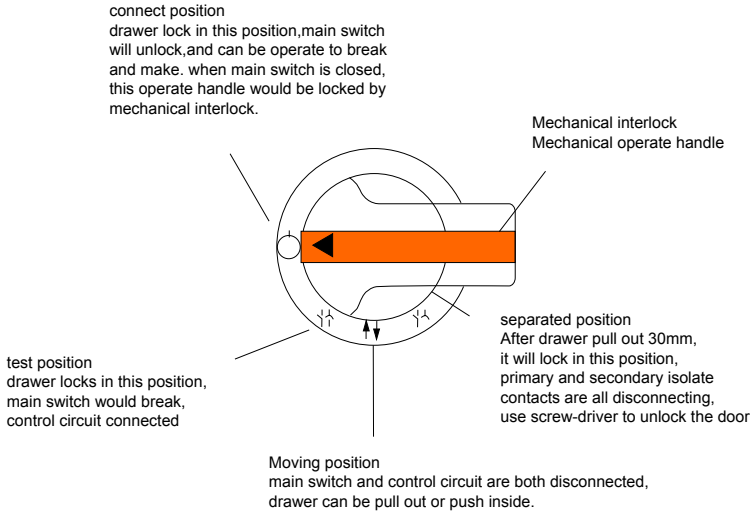


Fig7 8E/4 and 8E/2 drawer operate handle position diagram

–fig.7 The position of 8E–24E drawers' handle



–fig.7 The position of 8E–24E drawers' handle

Operating specification of draw–out MCC

7.1 The drawers should be pushed into the switchboard after inserting oriented part below its bottom. Or the drawers will be damaged or cannot be pulled out.
7.2 The signature on the panel of 8E/4 and 8E/2 drawers and its function is showed in fig.7. The arrow from the switching position “O” to the operating position “I” in the diagram represents that: Push the handle and rotate it from the position “O” to “I”. The reverse procedure need not to push the handle and only need to rotate it from the position “I” to “O”. When the handle reach the position “O”, release it and it will rebound.
7.3 The signature on the panel of 8E–24E drawers and its function is showed in fig.8. When the handle reaching the operating position, the machine relieve the lock of the switch and the main switch can be switched on or switched off. However, if the main switch is switched on, the handle of the interlock machine is disabled.
7.4 At the right–bottom corner of the signature there is a small plastic cover. It is the unlocking machine of the door. The unlocking procedure is as follows: when the drawer is in the operating position, pull out the cover, insert a screwdriver into the hole and move the lock down. Thus the door is unlocked. Make sure to cover the small plastic cover after closing the door, or the original protecting degree will be damaged.

Information for order

Please offer the following information when ordering the equipment:
8.1 The primary circuit scheme and the mono–wiring diagram of the system.
8.2 The secondary circuit scheme or the wiring diagram.
8.3 The arrangement diagram of the switchboard and the planar arrangement diagram of the distribution room
8.4 The planar arrangement diagram of the electrical equipment in each switchboard
8.5 Offer the operating current and the short–time current of the horizontal bus bars and choose the size of the bus bars. The sizes of the standard bus bars of the manufacturer are $10\times30\times2$, $10\times60\times2$, $10\times80\times2$, $10\times60\times4$, $10\times80\times2\times2$, $10\times60\times2\times4$. If not specified, the size of the bus bars is chose by the manufacturer.
8.6 Offer the name of each circuit, and the names of the circuits are limited to 10 letters. If the names are not given, the manufacturer will offer blank plate.
8.7 If you want to give name to the control switches, transfer switches and buttons of the auxiliary circuit, you should offer the corresponding information.
8.8 The testing position of the drawers is formed by position switch. If you want to posses the testing position, please add this contact to the system.

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