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Risentric

SHANGHAI RISENTRIC ELECTRIC CO .,LTD

MVnex Armoured Withdrawable AC Metal–Enclosed Switchgear Instruction Manual

Hotline | +86 173 0181 0387

+86 173 0181 0387

info@risentric.com

www.risentric.com

No. 900 Shantong Road, Jinshan District, Shanghai, China

Risentric

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ABOUT RISENTRIC

Shanghai Risentric Electric Co., Ltd. specializes in the research, development, and manufacturing of high- and low-voltage complete switchgear, prefabricated substations, and power transformers, providing comprehensive solutions for power transmission and distribution systems.

COMPANY PROFILE

Shanghai Risentric Electric Co., Ltd., established in 2005, is a national high-tech enterprise specializing in intelligent power transmission and distribution as well as industrial electrical control. The company has been certified to ISO 9001 Quality Management System, ISO 14001 Environmental Management System, and ISO 45001 Occupational Health and Safety Management System, and has been awarded multiple qualifications including “Specialized and Innovative Enterprise.”

All products are designed and manufactured in strict accordance with IEC standards and relevant national regulations. Many products have obtained mandatory certifications such as CCC and CQC, as well as CE certification, ensuring high levels of safety, reliability, and international applicability.

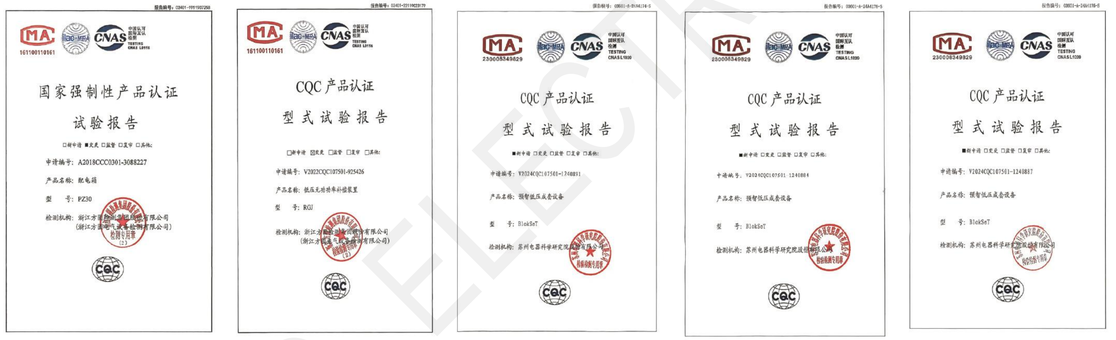
Risentric possesses comprehensive capabilities covering research and development, manufacturing, system integration, and engineering implementation. Its product portfolio includes high- and low-voltage complete switchgear, European- and American-style box-type substations, power transformers, industrial automation control systems, photovoltaic equipment, and related electrical components. These products are widely applied in industries such as power generation, metallurgy, chemical processing, petroleum, transportation, construction, and municipal engineering, continuously delivering stable and reliable products and professional services to customers.

To ensure product quality and manufacturing excellence, the company has introduced advanced flexible production lines from both domestic and international sources, equipped with CNC turret punching machines, CNC bending machines, CNC shearing machines, CNC laser cutting machines, and CNC busbar processing centers, enabling lean manufacturing and full-process quality control.

While continuously strengthening its presence in the domestic market, Risentric actively expands its international business and is committed to becoming a trusted global partner for power transmission, distribution, and industrial electrical solutions.

Technological innovation, quality first, integrity-based service, and win-win cooperation are the core business philosophies of Risentric. The company sincerely welcomes customers worldwide to cooperate and achieve shared success.

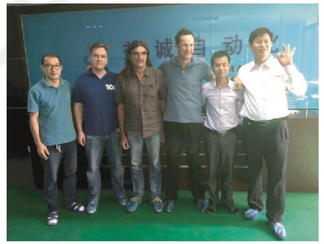
HONORS AND QUALIFICATIONS



OUR PARTNERS

ZF | Schneider Electric | Defond | ABB
MOATECH | BULL公牛 公牛安全插座 | SIEMENS | EUROtronic
SUNON 台湾建准集团 | OMRON 欧姆龙 | CHINT 正泰电器 | HAVELLS
TOSHIBA東芝 | Galanz 格兰仕 | TAILI泰力 | TCL
TONELUCK MICRO | BYD | JINLI | Otter
GLOBAL PMX | PHOENIX MECANO | DELTA | AVC
HAN'S LASER 大族激光 | 徐記 | vtech | Midea
BOLSTER SYSTEMS | | BERPU 贝普 | ZIPPY

Customer service



To Realize Automation World With High-advanced Technology

Risentric

MVnex Armoured Withdrawable AC Metal-Enclosed Switchgear

PRODUCT INTRODUCTION

The product features a compact design and robust structure, is equipped with an HVX Vacuum Circuit Breaker, and can be optionally fitted with Intelligent Monitoring Functions. It is suitable for power reception and distribution systems with rated voltages of up to 24 kV.
The product is distinguished by high performance, safety interlocking, and flexible configurations (such as MVnex-12, MVnex-24, Compact, Ultra-Compact, Smart variants), enabling it to meet diverse space constraints and operational require-ments. It can also serve as a replacement for legacy switchgear models such as KYN28-12.

Operating Environmental Conditions

- Ambient Air Temperature
  - Minimum temperature: -15 ° C
  - Maximum temperature: +40 ° C
  - 24-hour average temperature: not exceeding +35 ° C
- Altitude: ≤ 1000 m above sea level
- Humidity (Relative Humidity)
  - Daily average: ≤ 95%
  - Monthly average: ≤ 90%

Compliance with Standards

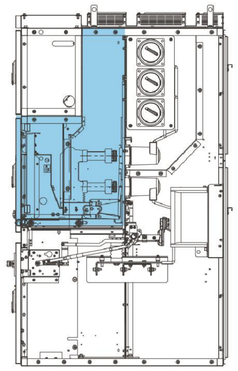
- IEC 60298 and IEC 60694 for Medium-Voltage Switchgear and Controlgear
- IEC 60529 defining Degrees of Protection Provided by Enclosures (IP Code)
- The products also comply with the following Chinese national and industry standards:
- GB 3906 and DL 404 (Electric Power Industry Stan-dard)
- IEC 60694 / GB 11022: Common Specifications for High-Voltage Switchgear and Controlgear
- IEC 60298 / GB 3906: AC Metal-Enclosed Switch-gear and Controlgear
- IEC 60056 / GB 1984: High-Voltage AC Circuit Breakers
- IEC 60470 / GB/T 14808: AC High-Voltage Contac-tors and Contactor-Based Motor Starters

Basic Electrical Parameters

Electrical Characteristics (Comply with IEC 60298 and GB3906)		
Rated Voltage	kV rms	12
Rated Insulation Level		
Power Frequency Withstand Voltage (50 Hz, 1 min)	kV rms	42
Lightning Impulse Withstand Voltage (1.2/50)	kV peak	75
Rated Current		
Busbar	A rms	630-4000
Circuit Breaker	A rms	630-4000
Contactor	A rms	400
Rated Short-Time Withstand Current (4 s)	kA rms	25-31.5-40
Rated Peak Withstand Current	kA peak	63-80-100
Degree of Protection		
Enclosure	IP4X	
Isolating Distance	IP2X	

Rated Parameters	Width (mm)	Height (mm)	Depth (mm)	
			Top Entry	Bottom Entry
400 A (Contactor)	650	2250	1600	1400
630/1250A-31.5kA	650	2250	1600	1400
630/2000A	800	2250	1600	1400
2500/3150A	1000	2250	1600	1400
4000A	1000	2250	1600	1600

STRUCTURE AND COMPONENTS

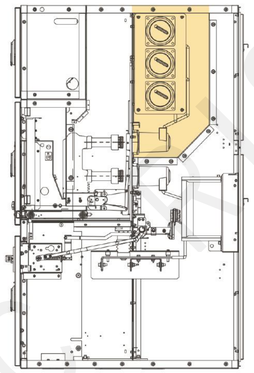


Circuit Breaker Compartment

Withdrawable Units and Earthing Components

Configuration

- Withdrawable Circuit Breaker or Withdrawable Vacuum Contactor
- Standardized Truck System with enhanced compatibility, integrating multiple Interlocking Functions
- Earthing Switch with Making Capacity
- Low-Voltage Plug Connector for connection between the circuit breaker control circuits and the Low-Voltage Compartment

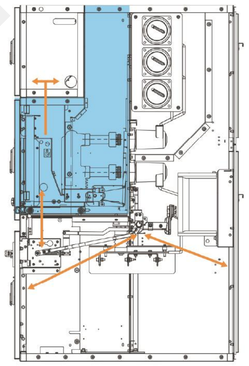


Busbar Compartment

Rectangular flat busbars are used, with no fragile components installed.Therefore, under normal service conditions, this compartment does not require special maintenance.

Optional Features

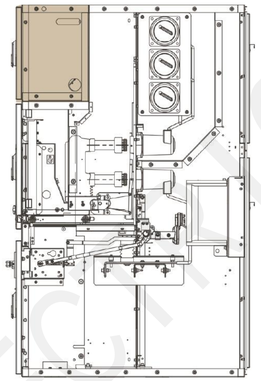
- Inter-panel Partition
- Insulated Busbars and Busbar Joints



Interlocking

The switchgear is equipped with a comprehensive interlocking system designed to prevent incorrect operations by operating personnel.
MVnex provides a high level of operational safety for the following actions:

- Access to the cable compartment
- Insertion and withdrawal of the circuit breaker / contactor
- Operation of the earthing switch
- Opening of the circuit breaker compartment door
- Position adjustment

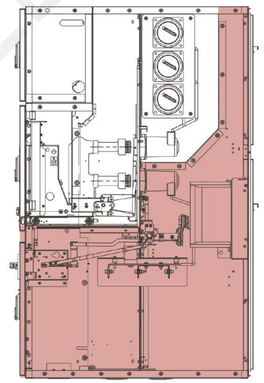


Low-Voltage Compartment – Protection, Control and Command

The low-voltage compartment integrates Schneider Electric protection relays with innovative current sensors, providing a complete range of measurement, protection, and power management functions. The system adopts a standardized design, while offering high-performance and cost-effective solutions tailored to customer requirements.
The installation of Schneider Electric protection devices enhances system reliability and highlights the Schneider Electric brand value.

- Sensors

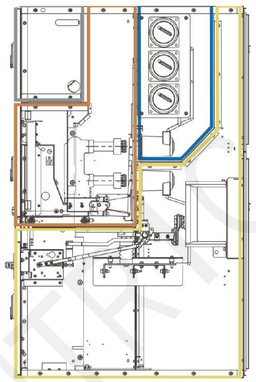
The sensors are mounted on the bushings outside the circuit breaker moving contacts and connected to Schneider Electric multifunction protection relays.
The current measurement range covers 25 A to 4000 A.



Cable Connection Compartment

The cable connection compartment can be easily accessed from both the front and rear sides of the switchgear, facilitating installation and maintenance.

- Cable or busbar connections
- Top or bottom cable entry
- Voltage transformers (VTs)
- Current transformers (CTs), including low-voltage low-capacity CTs or medium-voltage CTs

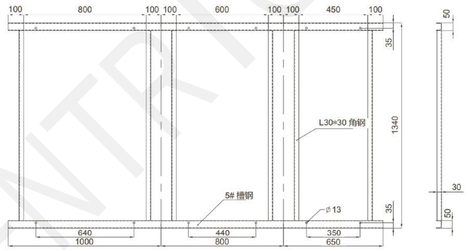


Safety

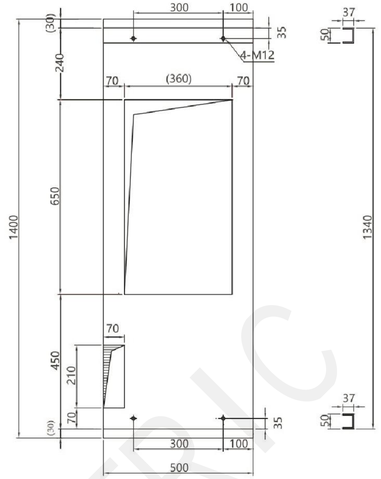
- The overall structural design ensures that overpressure gases generated under fault conditions can be effectively released.
- Each compartment is equipped with an upward-directed pressure relief duct, allowing safe venting of internal arc gases.

OVERALL DIMENSIONS

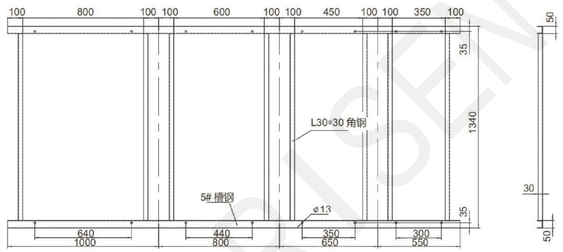
MVnex (Standard Product)



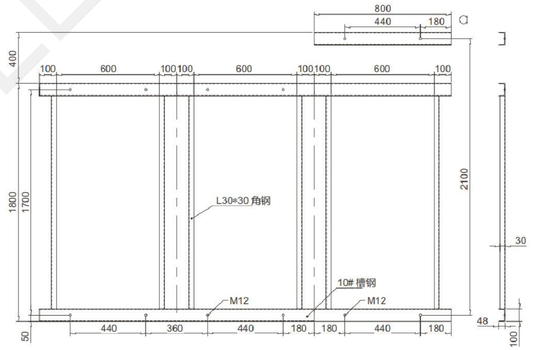
MVnex550 (Ultra-Compact Type)



MVnex550 (Compact Type)

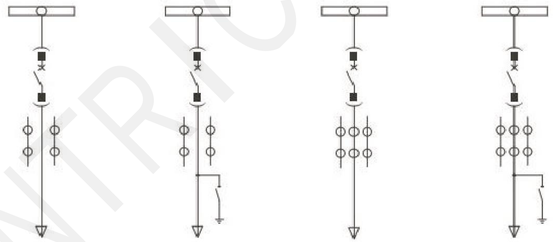


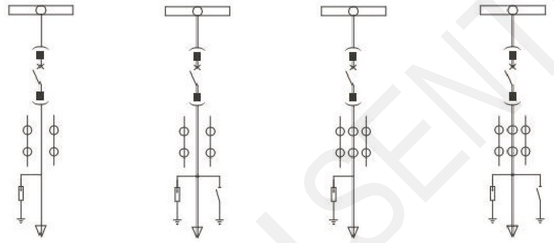
MVnex24kV



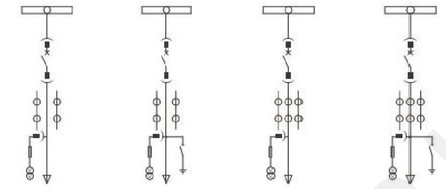
SOLUTION INTRODUCTION

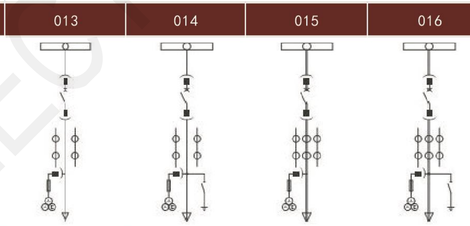
Circuit Breaker Incoming and Outgoing Panel 630 A ～ 4000 A

Main Wiring Diagram / Scheme					
Rated Current (A)		630～4000			
Function		Inlet / Outlet	Inlet / Outlet	Inlet / Outlet	Inlet / Outlet
Primary Main Components	Vacuum Circuit Breaker (HVX)	1	1	1	1
	Earthing Switch (MGES-12)		1		1
	Current Transformer (LZZBJ9-12)	2	2	3	3
	Voltage Transformer (JDZXR-10C)				
	Surge Arrester (YH5WZ-17/45)				
Remarks					

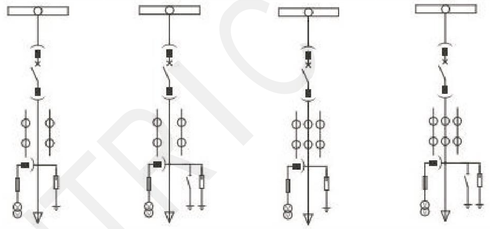
Panel Type No.	005	006	007	008
Main Wiring Diagram / Scheme				
Rated Current (A)	630～4000			
Function	Inlet / Outlet	Inlet / Outlet	Inlet / Outlet	Inlet / Outlet
Primary Main Components: Vacuum Circuit Breaker (HVX)	1	1	1	1
Earthing Switch (MGES-12)		1		1
Current Transformer (LZZBJ9-12)	2	2	3	3
Voltage Transformer (JDZXR-10C)				
Surge Arrester (YH5WZ-17/45)	3	3	3	3
Remarks				

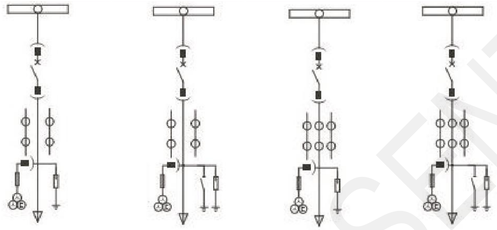
Circuit Breaker Incoming and Outgoing Panel 630 A ～ 4000 A

Panel Type No	009	010	011	012
Main Wiring Diagram / Scheme				
Rated Current (A)	630～4000			
Function	Inlet / Outlet	Inlet / Outlet	Inlet / Outlet	Inlet / Outlet
Primary Main Components: Vacuum Circuit Breaker (HVX)	1	1	1	1
Earthing Switch (MGES-12)		1		1
Current Transformer (LZZBJ9-12)	2	2	3	3
Voltage Transformer (JDZXR-10C)	1	1	1	1
Surge Arrester (YH5WZ-17/45)				
Remarks				

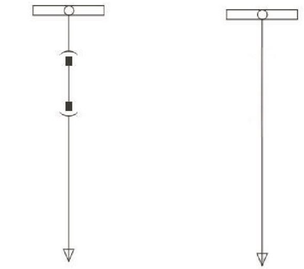
Panel Type No.	013	014	015	016
Main Wiring Diagram / Scheme				
Rated Current (A)	630～4000			
Function	Inlet / Outlet	Inlet / Outlet	Inlet / Outlet	Inlet / Outlet
Primary Main Components: Vacuum Circuit Breaker (HVX)	1	1	1	1
Earthing Switch (MGES-12)		1		1
Current Transformer (LZZBJ9-12)	2	2	3	3
Voltage Transformer (JDZXR-10C)	3	3	3	3
Surge Arrester (YH5WZ-17/45)				
Remarks				

Circuit Breaker Incoming and Outgoing Panel
630 A ～ 4000 A

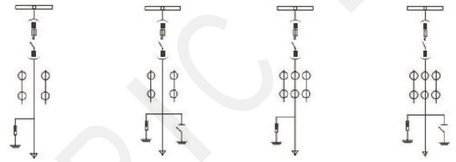
Panel Type No.		017	018	019	020
Main Wiring Scheme					
Rated Current (A)		630~ 4000			
Function		Incoming & Outgoing Feeder	Incoming & Outgoing Feeder	Incoming & Outgoing Feeder	Incoming & Outgoing Feeder
Primary Main Components	Vacuum Circuit Breaker (HVX)	1	1	1	1
	Earthing Switch (MGES-12)		1		1
	Current Transformer (LZZBJ9-12)	2	2	3	3
	Voltage Transformer (JDZXR-10C)	1	1	1	1
	Surge Arrester (YH5WZ-17/45)	3	3	3	3
Remarks					

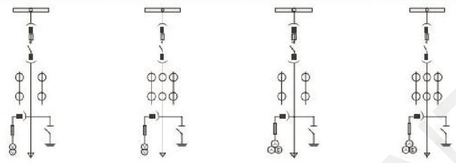
Panel Type No.		021	022	023	024
Main Wiring Scheme					
Rated Current (A)		630~4000			
Function		Incoming & Outgoing Feeder	Incoming & Outgoing Feeder	Incoming & Outgoing Feeder	Incoming & Outgoing Feeder
Primary Main Components	Vacuum Circuit Breaker (HVX)	1	1	1	1
	Earthing Switch (MGES-12)		1		1
	Current Transformer (LZZBJ9-12)	2	2	3	3
	Voltage Transformer (JDZXR-10C)	3	3	3	3
	Surge Arrester (YH5WZ-17/45)	3	3	3	3
Remarks					

Isolating Truck Incoming / Outgoing Panel and Direct Cable Outgoing Panel
630 A ～ 1250 A

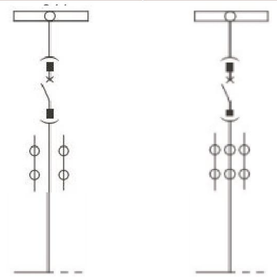
Panel Type No		025	026		
Main Wiring Diagram / Scheme					
Rated Current (A)		630～1250			
Function		Isolation &	Outgoing Feeder		
Primary Main Components	Isolating Truck	1			
	Earthing Switch (MGES-12)				
	Current Transformer (LZZBJ9-12)				
	Voltage Transformer (JDZXR-10C)				
	Surge Arrester (YH5WZ-17/45)				
Remarks					

Contactor Outgoing Panel
400 A

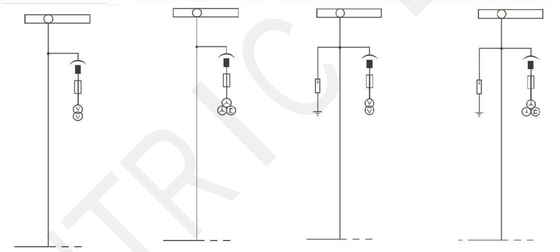
Panel Type No		005	006	007	00B
Main Wiring Diagram / Scheme					
Rated Current (A)		400			
Function		Inlet / Outlet	Inlet / Outlet	Inlet / Outlet	Inlet / Outlet
Primary Main Components	Contactor (CVX)	1	1	1	1
	Earthing Switch (MGES-12)		1		1
	Current Transformer (LZZBJ9-12)	2	2	3	3
	Voltage Transformer (JDZXR-10C)				
	Voltage Transformer (JDZXR-10C)				
	Surge Arrester(YH5WZ-17145)	3	3	3	3
Remarks					

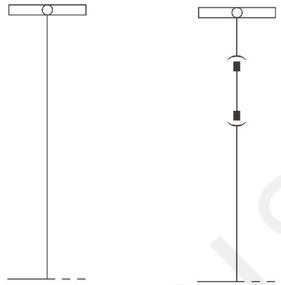
Panel Type No		010	012	014	016
Main Wiring Diagram / Scheme					
Rated Current (A)		400			
Function		Inlet / Outlet	Inlet / Outlet	Inlet / Outlet	Inlet / Outlet
Primary Main Components	Contactor (CVX)	1	1	1	1
	Earthing Switch (MGES-12)	1	1	1	1
	Current Transformer (LZZBJ9-12)	2	3	2	3
	Voltage Transformer (JDZXR-10C)			3	3
	Voltage Transformer (JDZXR-10C)	1	1		
	Surge Arrester(YH5WZ-17145)				
Remarks					

Bus Coupler Panel
630 A ～ 4000 A

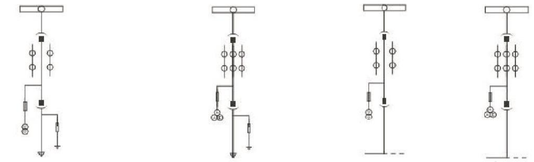
Panel Type No		041	042		
Main Wiring Diagram / Scheme					
Rated Current (A)		630～4000	630～4000		
Function		Bus Tie	Bus Tie		
Primary Main Components	Vacuum Circuit Breaker (HVX)	1	1		
	Earthing Switch (MGES-12)				
	Current Transformer (LZZBJ9-12)	2	3		
	Voltage Transformer (JDZXR-10C)				
	Surge Arrester (YH5WZ-17/45)				
Remarks					

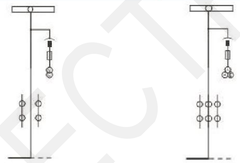
Raising Panel
630 A ～ 4000 A

Panel Type No		047	048	049	050
Main Wiring Diagram / Scheme					
Rated Current (A)		630～4000			
Function		Riser Panel	Riser Panel	Riser Panel	Riser Panel
Primary Main Components	Vacuum Circuit Breaker (HVX)				
	Earthing Switch(MGES-12)				
	Current Transformer (LZZBJ9-12)				
	Voltage Transformer (JDZXR-10C)	2	3	2	3
	Surge Arrester(YH5WZ-17/45)			3	3
Remarks					

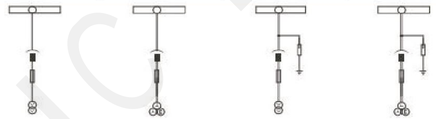
Panel Type No		051	052		
Main Wiring Diagram / Scheme					
Rated Current (A)		630～4000			
Function		Riser Panel	Riser Panel		
Primary Main Components	Isolating Truck		1		
	Earthing Switch(MGES-12)				
	Current Transformer (LZZBJ9-12)				
	Voltage Transformer (JDZXR-10C)				
	Surge Arrester(HY5WS-17/50)				
Remarks					

Metering Panel
630 A ～ 4000 A

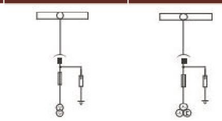
Panel Type No		027	02B	043	044
Main Wiring Diagram / Scheme					
Rated Current (A)		630～1250			
Function		Metering & Outgoing Feeder	Metering & Outgoing Feeder	Metering & Isolation	Metering & Isolation
Primary Main Components	Vacuum Circuit Breaker (HVX)				
	Earthing Switch (MGES-12)				
	Current Transformer (LZZEJ9-12)	2	3	2	3
	Voltage Transformer (JDZXR-10C)	2	3	2	3
	Surge Arrester (YH5WZ-1745)	3	3	3	3
Remarks					

Panel Type No		045	046		
Main Wiring Diagram / Scheme					
Rated Current (A)		630～4000			
Function		Metering & Bus Coupler	Metering & Bus Coupler		
Primary Main Components	Isolating Truck				
	Earthing Switch (MGES-12)				
	Current Transformer (LZZEJ9-12)	2	3		
	Voltage Transformer (JDZXR-10C)	1	3		
	Surge Arrester (YH5WZ-1745)	3	3		
Remarks					

Busbar Voltage Transformer Panel

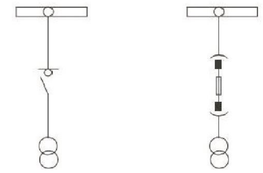
Panel Type No	053	054	055	056
Main Wiring Diagram / Scheme				

Rated Current (A)		630～1250			
Function		PT Panel	PT Panel	PT Panel	PT Panel
Primary Main Components	Vacuum Circuit Breaker (HVX)				
	Earthing Switch (MGES-12)				
	Current Transformer (LZZEJ9-12)				
	Voltage Transformer (JDZXR-10C)	2	3	2	3
	Surge Arrester(YH5WZ-17/45)			3	3
Remarks					

Panel Type No	057	058		
Main Wiring Diagram / Scheme				

Rated Current (A)		630～1250			
Function		PT Panel	PT Panel		
Primary Main Components	Isolating Truck				
	Earthing Switch (MGES-12)				
	Current Transformer (LZZBJ9-12)				
	Voltage Transformer (JDZXR-10C)	2	3		
	Surge Arrester(YH5WZ-1745)	3	3		
Remarks					

Station Service Transformer Panel

Panel Type No	061	062		
Main Wiring Diagram / Scheme				

Rated Current (A)		630～1250A			
Function		Auxiliary Transformer Panel	Auxiliary Transformer Panel		
Primary Main Components		Load Switch	Fuse Truck		
	Load Switch(ISARC2-12G)	1			
	Current Transformer (LZZBJ9-12)				
	Transformer	1	1		
	Surge Arrester (YH5WZ-17/45)				
Remarks					

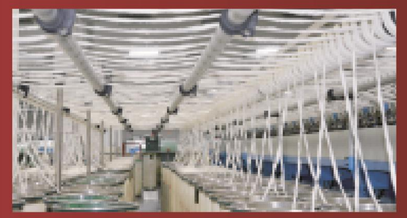
INSTALLATION AND WIRING

●Typical Layout of the Switchgear Room

Based on the technical characteristics of the MVnex switchgear, it is recommended to leave adequate clearance between the rear covers of the switchgear and the wall, as well as between the side panels and the wall, to serve as maintenance access passages.

●Installation of Switchgear Foundation

The construction of the switchgear foundation shall comply with the relevant provisions of the Technical Code for Power Construction and Acceptance.Regardless of the selected incoming and outgoing cable arrangement, it is recommended that the switchgear foundation be constructed using prefabricated steel channel sections.During civil design, the foundation elevation shall take into account the height of the foundation frame channel steel, with a slight allowance reserved (see Figure 2).Along the longitudinal direction of the foundation frame, anchoring steel plates shall be embedded at intervals of 1 - 1.5 m.The extension dimensions of the foundation frame channel steel shall match those of the switchgear base frame.The total length of the foundation frame shall be determined according to the switchgear layout and the number of panels installed in each row.During foundation frame embedding, leveling and alignment shall be performed. The allowable deviation of levelness and straightness shall not exceed 1 mm per meter, and the total deviation shall not exceed 2 mm.The top surface of the foundation frame shall be approximately 3 - 5 mm higher than the finished floor level of the switchgear room.



Commissioning and Acceptance

●Pre-energization:Verify consistency between drawings and component nameplates, check the tightening torque of busbar connections and correctness of wiring, and confirm that protective sealing meets the specified requirements.

●Parameter settings:Set the circuit breaker trip current, thermal overload relay setting current, and protection device operating thresholds according to load requirements.

●Functional tests:

●Opening and closing test:Manually / electrically operate all switching devices to verify flexible and reliable opening and closing.

●Protection test:Simulate short-circuit, overload and other fault conditions to verify accurate operation of protection devices.

●Unit changeover test:Carry out three-position changeover tests for withdrawable / removable units to verify the effectiveness of interlocking functions.

●Documentation and records:Prepare and archive the “Commissioning Record”, “Terminal Schedule”, “Factory / Site Acceptance Checklist”, “Test Report”, and other relevant documents.

Operation and Service

●Automatic / Manual mode:Automatic mode is adopted during normal operation, with protection devices performing automatic monitoring and operation; switch to manual mode during inspection or maintenance.

●Operating procedure:When operating withdrawable / removable units, strictly follow the principle of “open before close”, and proceed to the next operation only after confirming the correct position indication.

●Shutdown operation:Disconnect all functional unit switching devices first, then open the incoming circuit breaker, apply lockout and tagout (LOTO), and carry out maintenance only after voltage verification and earthing in accordance with procedures.

Maintenance (Recommended)

●Quarterly:Clean dust from inside the cabinet and from the surfaces of components, check the status of indicator lamps and position indication windows, and perform spot checks on circuit temperature rise.

●Semi-annually:Re-tighten busbar and terminal connection bolts, check the operational flexibility of switching device mechanisms, and confirm the reliability of earthing connections.

●Annually:Carry out comprehensive functional tests and protection setting verification, inspect insulation condition and sealing performance, replace aged or damaged components, and archive maintenance records.

Risentric

The company is equipped with advanced flexible sheet metal processing production lines, busbar processing production lines, and state-of-the-art manufacturing and testing equipment. By adopting modern information technology, it has fully implemented the CIMS (Computer Integrated Manufacturing System) and PDM (Product Data Management) systems.

Common Faults and Troubleshooting

Fault Type	Fault Phenomenon	Corrective Measures
Withdrawable Unit Movement Fault	The withdrawable unit cannot be smoothly racked in or out, with jamming or abnormal movement.	Straighten or replace deformed guide rails, remove debris from the guide rails, and inspect and replace damaged rollers.
Busbar Connection Overheating	Infrared temperature measurement shows abnormal temperature rise at busbar joints, with a burnt odor.	Tighten bolts to the specified torque using a torque wrench, clean contact surfaces, and apply conductive grease.
Control Circuit Fault	Indicator lamps do not illuminate, abnormal voltage, or circuit breaker fails to open or close.	Identify and replace blown fuses, clean or replace relays, and repair or replace cables.
Interlocking Device Failure	Violation of the “five-prevention” functions, such as incorrect operation of the cabinet door when energized.	Inspect, repair, or replace damaged mechanical components, and troubleshoot and repair electrical interlocking circuits.
Protection Device Maloperation	Circuit breaker trips incorrectly during normal operation.	Verify and adjust protection settings, implement anti-interference measures, and inspect and replace damaged components.

“ Science, truth-seeking, and continuous improvement ”

Packing and Accompanying Documents

- Switchgear Cubicle: 1 set (configured according to the selected model, dimensions, and series).
- Documents Supplied:Primary and secondary wiring diagrams, certificate of conformity, factory inspection report, terminal and circuit list, component manuals, and type test report.
- Accessories:Installation fasteners, spare fuses, and tool kit (supplied as required).

Ordering Information

- Rated Parameters:Rated voltage, rated current, number of poles, short-time withstand current, and degree of protection.
- Enclosure Configuration:Series designation, enclosure dimensions, color, compartmentalization form, and type and quantity of functional units.
- Component Selection:Models and ratings of circuit breakers, contactors, thermal overload relays, surge protective devices (SPD), and other components.
- Installation and Wiring:Incoming and outgoing cable direction, cable specifications, grounding requirements, and configuration of anti-condensation devices.
- Optional / Extended Functions:Arc flash monitoring system, intelligent power distribution management unit (PMU), and communication functions.
- Brand Preference:Customer-specified component brands or standard configuration.

100+ Over 100 professionals

20+ 20 years of manufacturing experience

20000+ Factory footprint 20000 square meter

2000+ Number of satisfied customers 2000+