An electrical panel capable of evolving

Prisma TT

Low voltage factory built assemblies
Make the most of your energy
General

For a dependable electrical installation

Total compatibility between Schneider Electric Switchgear devices and the Prisma TT system is the deciding factor in ensuring operating reliability of an electrical switchboard.

The design of the system has been validated by type tests in compliance with IEC 61439-1 & 2 standard and benefits from experience acquired with Schneider Electric customers over many years.

The Prisma TT functional system is a modular LV switchboard system that can be used to build main and secondary distribution boards and MCCs for industrial, commercial and building installations.

When implemented in compliance with Schneider Electric recommendations, the Prisma TT functional system can be used to build type tested assemblies that comply with international standards IEC 61439-1 & 2.

Total security for users

Prisma TT is built to the highest requirements of IEC 61439-1 & 2 standards ensuring operator safety conforming to Form-2b, 3b, 4b separation. The electrical installation is protected and users may safely operate the system.

Prisma TT adapts easily to all arrangements and all types of layout and location configurations. It meets the most stringent requirements in terms of:

- Personnel and equipment safety
- Easy installation
- Easy, fast operation and maintenance.
- Possibilities for extension or modification.

An electrical installation capable of evolving

Modular in structure, Prisma TT can handle the natural evolution of switchboards and integrate new functions as required. Maintenance operations are fast and easy, thanks to local access to switchgear and the use of standard components.
## Specifications

<table>
<thead>
<tr>
<th>Standards</th>
<th>Type Tested Assemblies (IEC 61439-1 &amp; 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated insulation voltage, $U_i$</td>
<td>Up to 1000 V</td>
</tr>
<tr>
<td>Rated operating voltage, $U_e$</td>
<td>Up to 1000 V</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50 / 60 Hz</td>
</tr>
<tr>
<td>Rated Current, $I_n$</td>
<td>Up to 3200A</td>
</tr>
<tr>
<td>Short-time withstand current, $I_{cw}$</td>
<td>85kA rms / 1s</td>
</tr>
<tr>
<td>Peak withstand current, $I_{pk}$</td>
<td>187 kA</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP54 as per IEC 60529</td>
</tr>
<tr>
<td>Mechanical impact strength</td>
<td>IK 10</td>
</tr>
<tr>
<td>Basic Frames</td>
<td>400, 500, 600, 800 mm wide</td>
</tr>
<tr>
<td>Add on ducts</td>
<td>300, 400 mm wide</td>
</tr>
<tr>
<td>Height</td>
<td>2000 mm standard</td>
</tr>
<tr>
<td>Depth</td>
<td>600, 800, 1000mm</td>
</tr>
</tbody>
</table>

## Salient features

- Main and Sub Main Distribution boards
- Motor Control Centers, Fixed type
- Modular construction
- Forms 1,2b,3b,4b conforming to IEC 61439-1 & 2 standard
- Totally enclosed busbars and busbar risers in compartments separated with metallic partitions
- Front or rear access
- Top or Bottom cable entry
- Adapts all Schneider Electric products
  - Air circuit breakers upto 3200A (Fixed/ Withdrawable)
  - Moulded Case circuit breakers (Fixed/ Plug-in/ Withdrawable)
  - Motor Starters (DOL, YD, Rev)
  - Soft Starters, Variable Frequency Drives
  - Metering and Instrumentation
  - Capacitors
Structure

General Characteristics

Composition
Rigid, folded, electrozinc plated sheet steel re-inforced to withstand the electro-dynamic forces of a short circuit.

- Frames & Mounting Plates : 2mm
- Doors & Covers : 1.5mm
- Gland Plates : 2mm
- Internal separations : 1.5mm
- Built-in base frame/plinth

Prisma TT switchboards have been subjected to numerous tests, notably those required by standard IEC 62262 defining the IK code for withstand to mechanical shocks.

Surface treatment
Anti-corrosion electrophoresis treatment + hot-polymerised polyester epoxy powder.
Colour: RAL 7032

Accessories
All plastic parts are self-extinguishing. In particular, the supports for live metal parts are self-extinguishing at 960°C in compliance with IEC 695.1.1 and NFC 20-455.

Installation

- Standard mounting plates and doors available for different products.
- Extendable on either side in the future.
- Modular construction of 50mm modules.
- Suitable for termination by cables or busduct.
- Prefabricated (rationalized dimensions) mounting plates to fix all Schneider Electric products.

Partitioning

The Prisma TT functional system provides a level of protection through internal separation of factory built assemblies conforming to Form-1, 2b, 3b and 4b requirements as per IEC 61439-1 & 2. Cubicles are designed to protect both people and the installation.

Form-4b partitioning also limits the propagation between each of the functional units and busbars (via electric arcs or falling objects such as screw drivers, tools, etc).
Busbars

Busbars are enclosed in fully partitioned metallic compartments consisting of one or more copper bars per phase held by functional supports.

- All Buses and connections are of electrolytic grade, hard drawn, high conductivity tin-plated copper with heat shrinkable PVC sleeves (Options: Bare copper / unsleeved).

- Busbars are braced to withstand the effects of a short circuit and are sized according to:
  - Quantity and size of the bars, a function of the current passing through them.
  - Number of supports, a function of short-circuit current.

- Busbars are totally insulated and isolated for the entire length of the switchboard.

The main busbars distribute the electric current in the switchboard. They are generally positioned at the top of the section.

The distribution busbars carry the electric current to the various functional units. They may be located in the same compartment of each section or at the rear of each section.

### Busbar rating table

<table>
<thead>
<tr>
<th>Current (A)</th>
<th>No. of bars per phase</th>
<th>Busbar size (cross section) in mm</th>
<th>Short circuit rating</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amb Temp 40°C</strong></td>
<td><strong>Amb Temp 50°C</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>700</td>
<td>630</td>
<td>1b</td>
<td>60 x 5</td>
<td>40kA 1sec</td>
</tr>
<tr>
<td>870</td>
<td>800</td>
<td>1b</td>
<td>80 x 5</td>
<td>50kA 1sec</td>
</tr>
<tr>
<td>1180</td>
<td>1070</td>
<td>2b</td>
<td>60 x 5</td>
<td>50kA 1sec</td>
</tr>
<tr>
<td>1510</td>
<td>1370</td>
<td>2b</td>
<td>80 x 5</td>
<td>50kA 1sec</td>
</tr>
<tr>
<td>1010</td>
<td>920</td>
<td>1b</td>
<td>50 x 10</td>
<td>65kA 1sec</td>
</tr>
<tr>
<td>1160</td>
<td>1050</td>
<td>1b</td>
<td>60 x 10</td>
<td>75kA 1sec</td>
</tr>
<tr>
<td>1500</td>
<td>1370</td>
<td>1b</td>
<td>80 x 10</td>
<td>75kA 1sec</td>
</tr>
<tr>
<td>1740</td>
<td>1600</td>
<td>2b</td>
<td>50 x 10</td>
<td>75kA 1sec</td>
</tr>
<tr>
<td>1870</td>
<td>1700</td>
<td>2b</td>
<td>60 x 10</td>
<td>85kA 1sec</td>
</tr>
<tr>
<td>2330</td>
<td>2150</td>
<td>2b</td>
<td>80 x 10</td>
<td>85kA 1sec</td>
</tr>
<tr>
<td>2720</td>
<td>2500</td>
<td>2b</td>
<td>100 x 10</td>
<td>85kA 1sec</td>
</tr>
<tr>
<td>3300</td>
<td>3200</td>
<td>2b</td>
<td>150 x 10</td>
<td>85kA 1sec</td>
</tr>
</tbody>
</table>

Note: 85kA 1sec is equivalent to 50kA 3secs.
Prisma TT
adaptable devices for power distribution

> **Air circuit breakers**
Schneider Electric's Masterpact range of ACBs comply with all major international standards, IEC 60947-2 in particular and meet T2 tropicalisation criteria. Masterpact is a complete range offering a large selection of performance levels that can be incorporated in Prisma TT.

- Rating from 800A to 3200A
- Breaking capacity from 40 to 150 kA rms (Ics = 100% Icu)
- Operational voltage: 690V AC
- 3 or 4 Poles, Fixed or Withdrawable versions
- Stored energy operating mechanism – charged either manually or electrically.
- Microprocessor based MICROLOGIC electronic control units: wide range with multiple functions and serial communication (Modbus RS485) capabilities in all ranges.
- Common auxiliaries (Shunt opening release, Under voltage release, Auxiliary/Fault contacts, etc), accessible from the front, mounted in a separate compartment insulated from power circuits.
- Source change-over mechanisms.

> **Moulded case circuit breakers**
Schneider Electric’s Compact range of MCCBs comply with all major international standards, IEC 60947-2 in particular and meet T2 tropicalisation criteria. Compact is a complete range offering a large selection of performance levels that can be incorporated in Prisma TT.

- Rating from 16A to 3200A
- Breaking capacity from 25 to 150 kA rms
- Operational voltage: 690V AC
- 3 or 4 Poles, Fixed, Plug-in or Withdrawable versions
- Trip units – 100A to 250A, Thermal magnetic or Electronic type. 400A and above – Electronic type, Wide range with multiple functions.
- Common auxiliaries (Shunt opening release, Under voltage release, Auxiliary/Fault contacts, etc), accessible from the front, mounted in a separate compartment insulated from power circuit.
- Earth leakage function with various options–Add-on VIGI module or ELR+Toroid or with trip unit.
- Source change-over mechanisms (up to 1250A).

> **Power factor correction**
Power factor correction Capacitor Banks can be built with Prisma TT using Schneider Electric’s VARPLUS-2 range of Capacitors, VARLOGIC Power factor regulator or by using pre-assembled VARPACT modules. It is possible to build Standard Capacitor Banks as well as Detuned Capacitor Banks up to 720 kVAR.

Note: For further technical details on the above products and for details on other products please refer relevant product catalogues.

> **Miniature circuit breakers**
Schneider Electric’s MULTI-9 range of MCBs comply with all major international standards, IEC 60947-2 and IEC 60898 in particular. Multi-9 is a modular width concept range and is the most comprehensive universal circuit protection range on offer. Multi-9 also includes the widest range of control command products for remote control, time programming, measurements, etc. Auxiliaries such as shunt trips, under voltage releases, all adaptable in the field without any special tools and without interrupting supply. Ratings: 0.5A – 125A, 3kA to 50kA
Prisma TT
adaptable devices for industrial control

Protection co-ordination
In Motor control and protection, IEC 60947-4 standard defines co-ordination between the circuit breaker, contactor and thermal relay in the event of an electrical fault. The standard defines various types of coordination by conducting tests at different current levels.

Type-2 co-ordination
Only minor welding of the contactor or starter contacts is permissible and the contacts must be easily separated.

Following Type-2 co-ordination tests, the switchgear and controlgear functions must be fully operational.

The breaking capacity of the assembly is determined by the test conclusions.

Type-1 co-ordination
Deterioration of the contactor and the relay is acceptable under two conditions:

→ No danger to operating personnel.

→ No damage to any components other than the contactor and the relay.

→ The breaking capacity of the assembly is that of the short-circuit protective device, i.e., circuit breaker.

Motor Starters
Conventional motor starters such as Direct-On-Line, Star-Delta and Reversing can be adapted in Prisma TT functional system.

Schneider Electric offers Type-2 co-ordinated solutions with different types of starters as listed below.

Contactors:
Two ranges of Schneider Electric contactors are available for motor control:

- Tesys-D2 series, from 9A to 95A (AC-3 duty)
- Tesys-F series, from 115A to 780A (AC-3 duty)

Motor protection relays:
Schneider Electric’s range of motor protection relays include both thermal bi-metallic type and Electronic/Intelligent relays.

- Tesys-LRD relays offer thermal bi-metallic protection
- Tesys-U is a micro-processor based range of electronic protection relays with Communication capabilities. Tesys-U relays up to 32A is a complete motor starter offering all 3 functions of Circuit breaker, Contactor and Protection relay in One Device (this single device offers Total Co-ordination which requires the device to be put back in service immediately following fault clearance without the need to perform any maintenance works).
- Tesys-T is a micro-processor based range offering comprehensive motor protection up to 800A that can be configured as DOL, Wye-Delta, Reversing, Two-Speed, Dahlander Starter with Communication capabilities.
Soft Starters
Schneider Electric’s Altistart-48 is a microprocessor based 6-thyristor soft start–soft stop unit for the controlled starting and stopping of 3-phase asynchronous squirrel-cage motors. It has been developed and performance tested in accordance with international standards and recommendations relating to industrial electrical controlgear.

Features
- Control of operating characteristics during starting and stopping
- Thermal overload protection
- Mechanical protection of the driven machine by the elimination of torque surges and reduction of inrush current.
- Reduction of losses in the motor
- Power Rating : 2.2kW to 800kW
- Voltage rating: 208 to 500V
- Starting method : By Torque Control
- Stopping method: Free Wheel, Stop controlled by torque ramp, braked stop

Options
- Communication: ModBus, Uni-Telway

Variable Frequency Drives
Schneider Electric’s ALTIVAR Variable speed controllers are compact and robust microprocessor based AC Drives for all types of high power 3-phase asynchronous motors. The Altivar drives with its different models incorporates the latest technological developments and its innovative functions meet the requirements of the most common applications such as: HVAC, Pumping, Conveying, Grinding, Lifting, etc.

Features
- Starting and speed control
- Inversion of the operating direction
- Deceleration, Acceleration, Stopping
- Motor and speed control protection
- Dynamic braking
- Integrated PID controller
- Jog operation, Flying restart
- Power Rating : 0.1kW to 630kW
- Voltage rating: 208 to 500V

Options
- Communication: ModBus, ModBus Plus, Profibus
- Line Chokes

Note: For further technical details on the above products and for details on other products please refer relevant product catalogues.
The Prisma TT functional system: the safety of tested switchboards

A dual guarantee

The Prisma TT switchboard, tested and produced according to international standards, offers its operator a dual guarantee:

- Use of dependable components, with platform tested assemblies.
- Rigorous final inspection and testing.

Schneider Electric commits its responsibility by 11 type tests conducted in the test laboratory, on the entire factory-built assembly. Schneider Electric’s franchised panel builder also attests to the quality of workmanship. Schneider Electric’s franchised panel builder also attests to the quality of workmanship by carrying out the 9 individual routine tests specified in the IEC standard. These 20 tests guarantee the switchboard’s operational safety, as well as the safety of people and equipment right from the commissioning phase of the switchboard and throughout its service life.

20 tests to certify installation quality

Schneider Electric commits its responsibility to the following type tests:

1. Verification of temperature-rise limits.
2. Verification of the dielectric properties.
3. Verification of the short-circuit withstand strength.
4. Verification of the effectiveness of the protective circuit.
5. Verification of clearance & creepage distances.
6. Verification of mechanical operation.
7. Verification of the degree of protection.
8. Resistance to corrosion.
9. Verification of resistance of insulating materials to normal heat.
10. Verification of resistance of insulating materials to abnormal heat and fire.
11. Lifting test.

Schneider Electric’s franchised panel builder attests the quality of workmanship by carrying out the 9 individual routine tests specified in the IEC standard:

1. Checking the degree of protection.
2. Checking of clearances and creepage distances.
3. Checking of protective measures and of the electrical continuity of the protective circuit.
5. Checking of the internal electric circuits and connections.
6. Checking of the terminals for external conductors.
7. Checking of mechanical operation.
8. Dielectric test.

IEC standards 61439-1 & 2 define 11 type tests and 9 individual routine tests which offer the best long term safety and reliability to an electrical installation.

11 type tests conducted in the laboratory on typical assemblies + 9 routine tests carried out by the franchised panel builder on every new assembly = 100% validated switchboards
With our network of sales offices and partners in the Gulf, we are able to assess individual requirements and combined with the expert support of our product specialists, will develop the most effective and economical answer taking relevant regulations and standards fully into account.

To access the expertise of Schneider Electric group, please contact the sales office in your region or contact the Customer Care Center.

Customized service for high performance installations
Schneider Electric is your partner working side-by-side with customers on their projects around the world providing customized services such as design/implementation/operation and training.

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Customer Care Center

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