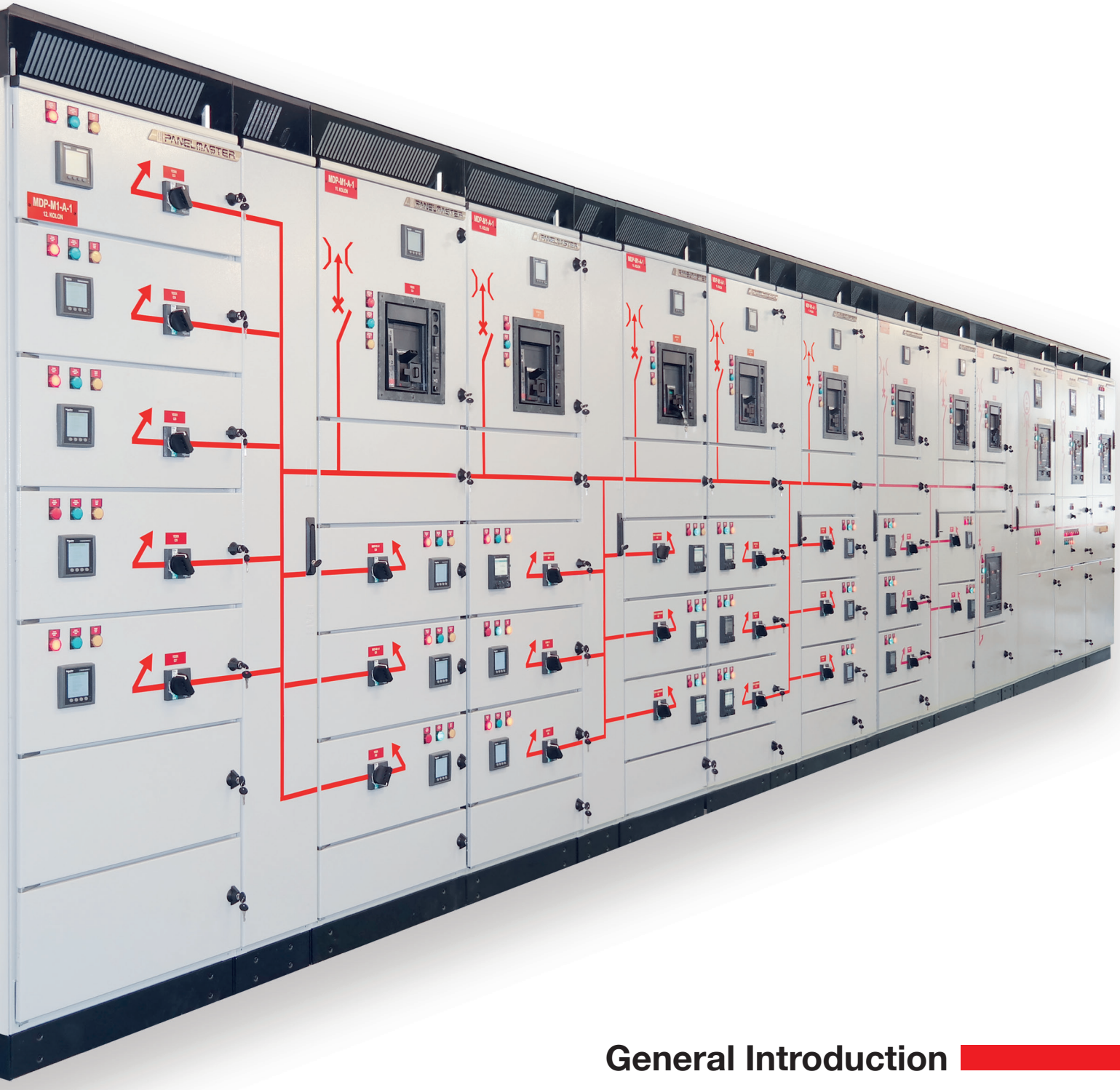
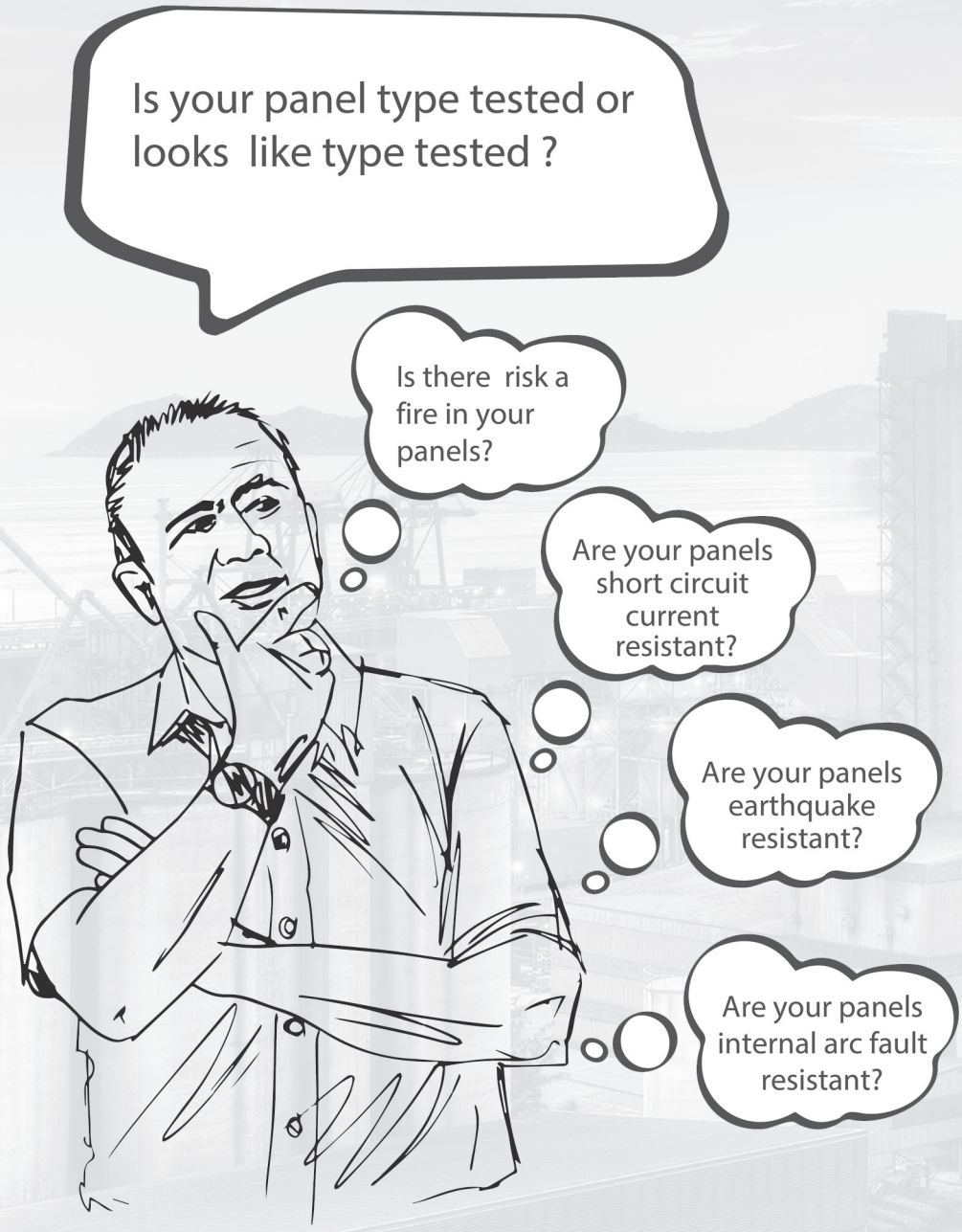
PANELMASTER



General Introduction

PANELMASTER



PanelMaster Type Tested Low Voltage Switchboards

PanelMaster low voltage switchboards are designed to fulfil various applications needs. It's unique structure and flexible power modules are type-tested and certified by internationally accepted independent laboratories.

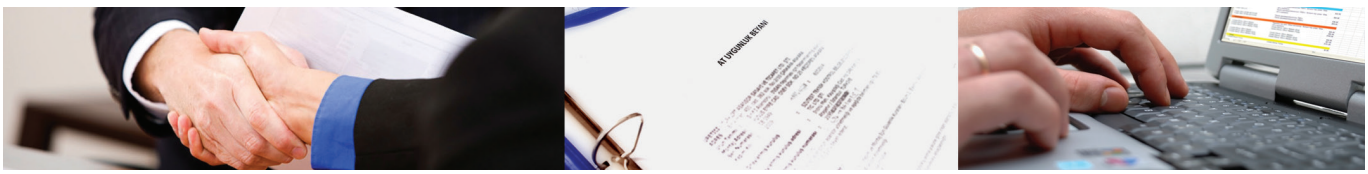
Rated Current (I_n)	: Up to 6800A
Rated Short Time Withstand Current (I_{cw})	: Up to 120 kA -1sec.
Rated Impulse Withstand Voltage (U_{imp})	: Up to 12 kV
Form Separation Classes	: Up to Form 4b
IP Protection Class	: Up to IP55
Protection Class Against Mechanical Impact	: IK10
Framework	: Painted 2mm pre-galvanized steel
Colour	: RAL 7035 epoxy-polyester electrostatic powder paint
Operating Temperature	: -5 °C, +40 °C
Standards and Regulations	: IEC/EN 61439-1/2 Low Voltage Switchgear and Controlgear Assemblies IEC/EN 62208 Empty Enclosures for Low Voltage Switchgear and Controlgear Assemblies IEC/EN 60529 Degrees of Protection Provided by Enclosures (IP Code) IEC/EN 62262 International Standard Degrees of Protection Provided by Enclosures for Electrical Equipment Against External Mechanical Impacts (IK Code) IEC 60068-3-3 "Environmental Testing; Seismic Test Method for Equipments" and IEEE-693/2005 "IEEE Recommended Practice for Seismic Design of Substations" IEC 61641 Internal Arc Test

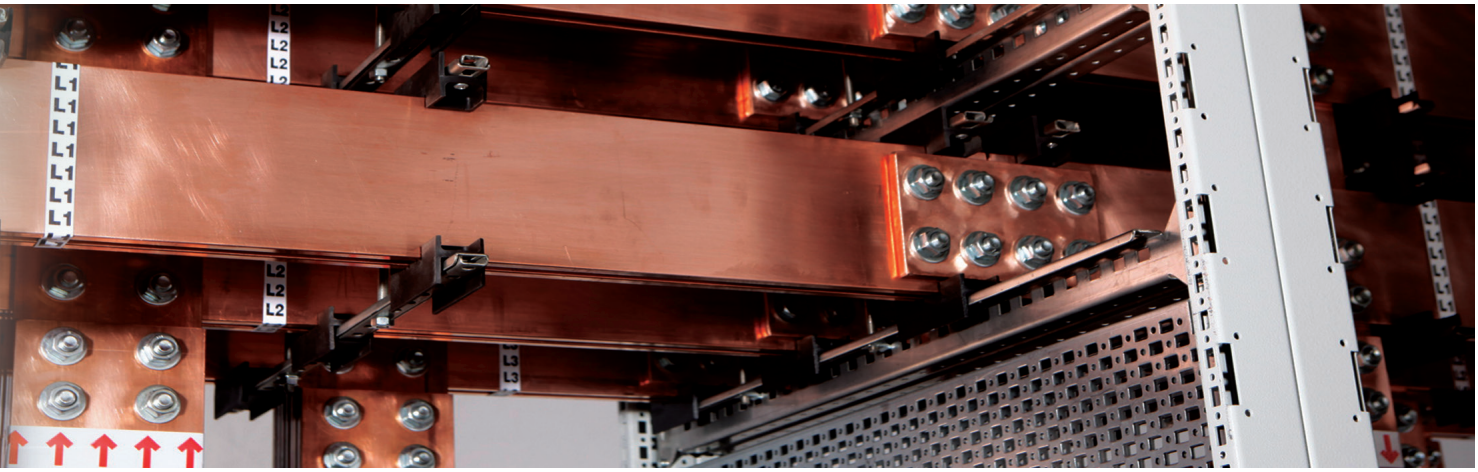
What does type tested enclosure mean ?

In general, all manufacturers must design and manufacture their products in accordance with related standards.This standard for enclosures is IEC 61439-1/2.

A type-tested panel must be proved to be in conformity with this standard or by design verification method.

IEC 61439-1 / 2 defines two different manufacturers, “original manufacturer” and “assembly manufacturer”. In order to make real type test panel, two manufacturers must fulfill their responsibilities according to the standard.

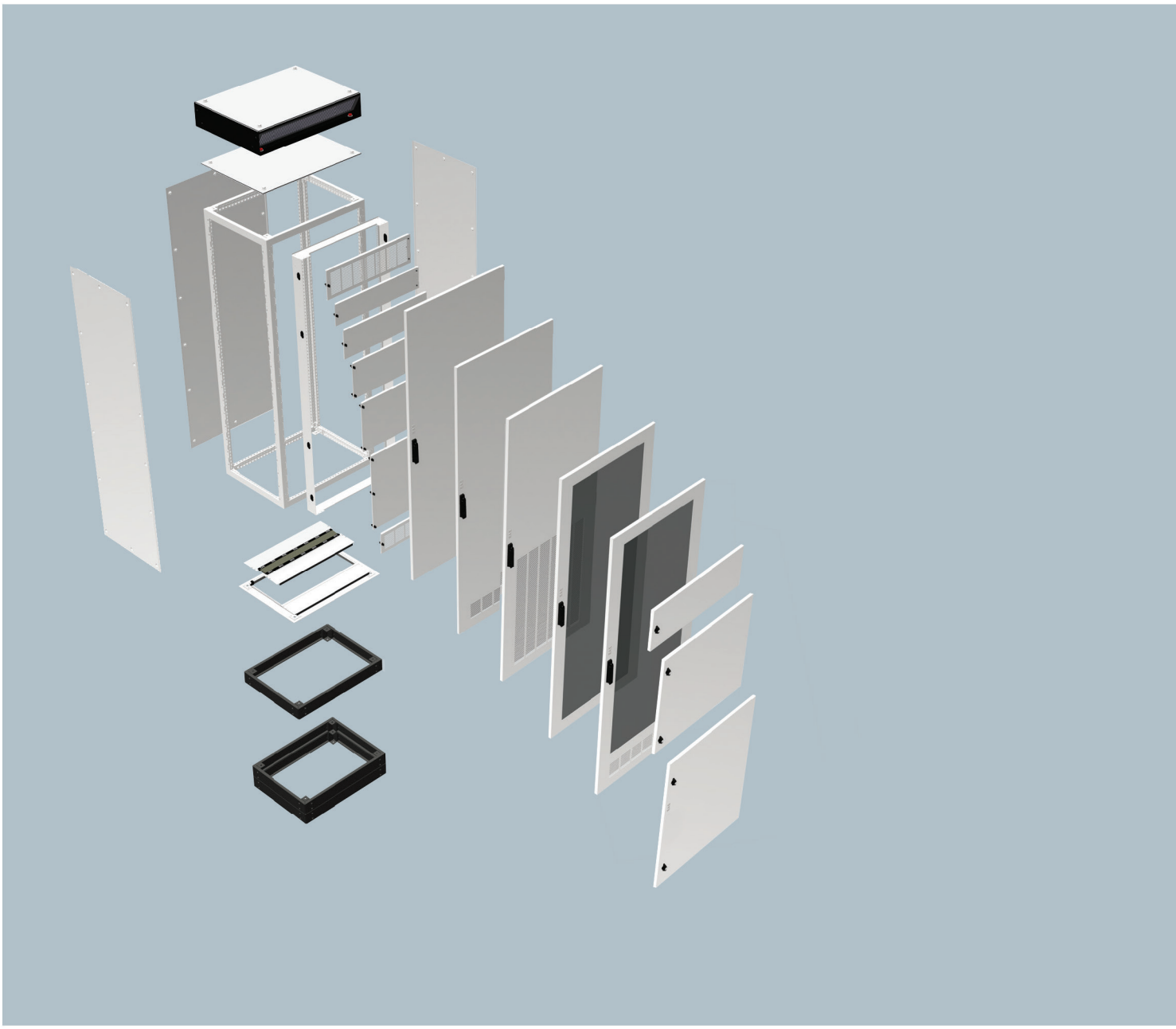




LIST OF DESIGN VERIFICATIONS TO BE PERFORMED

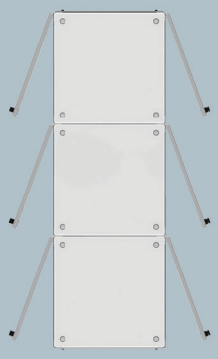
NO	CHARACTERISTIC TO BE VERIFIED	CLAUSES OR SUBCLAUSES	VERIFICATION OPTIONS AVAILABLE		
			TESTING*	COMPARISON WITH A REFERENCE DESIGN	ASSESSMENT
1	Strength of material and parts:	10.2			
	Resistance to corrosion	10.2.2	YES	NO	NO
	Properties of insulating materials:	10.2.3			
	Thermal stability	10.2.3.1	YES	NO	NO
	Resistance to abnormal heat and fire due to internal electric effects	10.2.3.2	YES	NO	YES
	Resistance to ultra-violet (UV) radiation	10.2.4	YES	NO	YES
	Lifting	10.2.5	YES	NO	NO
	Mechanical impact	10.2.6	YES	NO	NO
	Marking	10.2.7	YES	NO	NO
2	Degree of protection of enclosures	10.3	YES	NO	YES
3	Clearances	10.4	YES	NO	NO
4	Creepage distances	10.4	YES	NO	NO
5	Protection against electric shock and integrity of protective circuits:	10.5			
	Effective continuity between the exposed conductive parts of the ASSEMBLY and the protective circuit	10.5.2	YES	NO	NO
	Short-circuit withstand strength of the protective circuit	10.5.3	YES	YES	NO
6	Incorporation of switching devices and components	10.6	NO	NO	YES
7	Internal electrical circuits and connections	10.7	NO	NO	YES
8	Terminals for external conductors	10.8	NO	NO	YES
9	Dielectric properties:	10.9			
	Power-frequency withstand voltage	10.9.2	YES	NO	NO
	Impulse withstand voltage	10.9.3	YES	NO	YES
10	Temperature-rise limits	10.10	YES	YES	YES
11	Short-circuit withstand strength	10.11	YES	YES	NO
12	Electromagnetic compatibility (EMC)	10.12	YES	NO	YES
13	Mechanical operation	10.13	YES	NO	NO

Wide configuration options

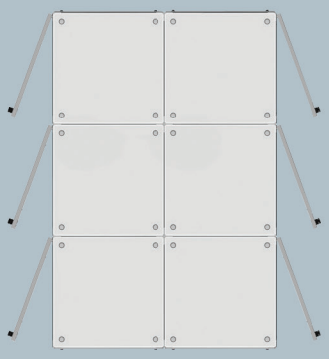


Flexible Configuration

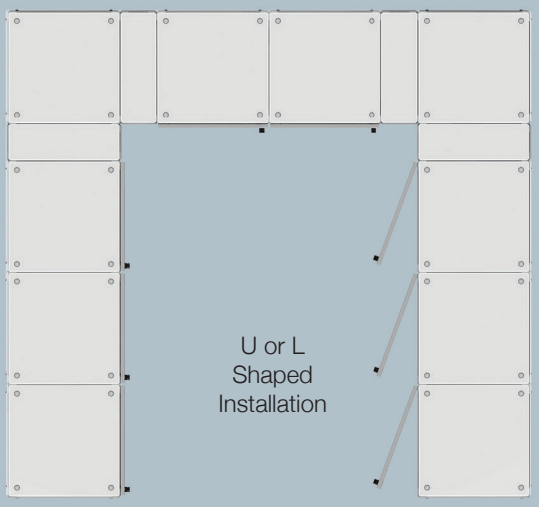
- Plain Door
- Glazed Door
- Partial Door
- Door with Ventilation
- Front and Rear Access
- With Cover Plate
- IP31, IP41, IP55
- With Natural Ventilation Modules



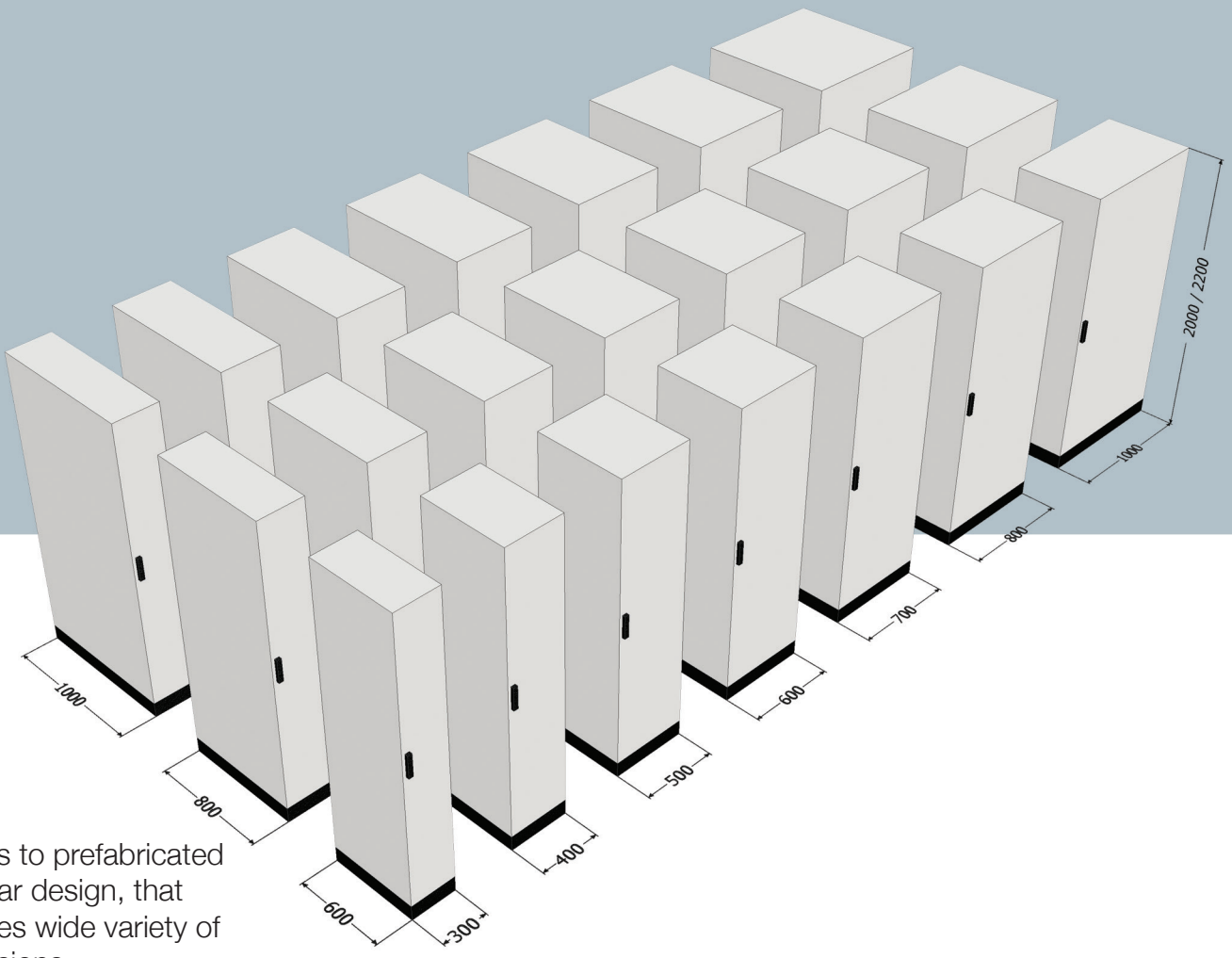
Front & Rear Door



Back to Back Installation



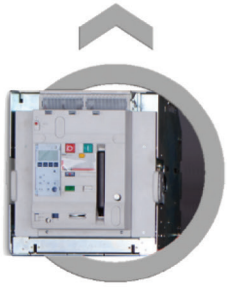
U or L
Shaped
Installation



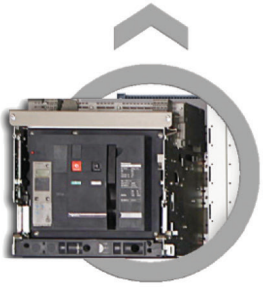
Thanks to prefabricated modular design, that provides wide variety of dimensions.

Freedom of switchgear brand selection

HD HYUNDAI ELECTRIC



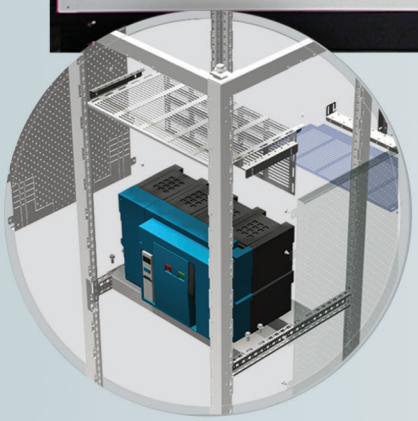
legrand®



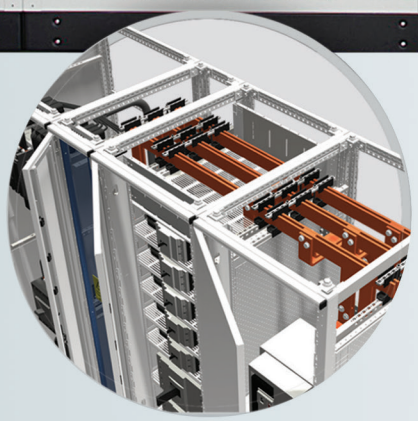
Schneider Electric

SIEMENS

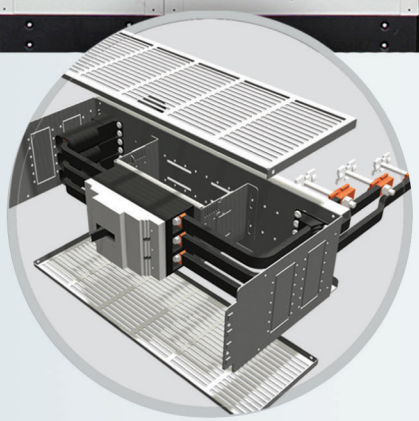
Type-Tested Modular Panel Design



ACB Separation Module



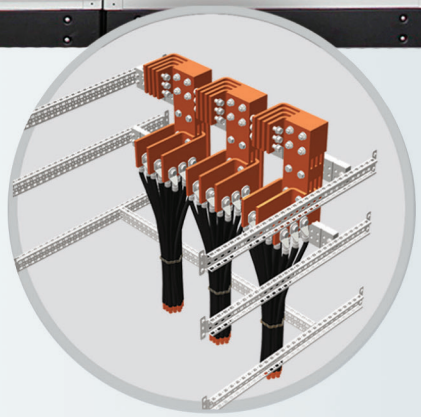
Main Busbar Separation Module



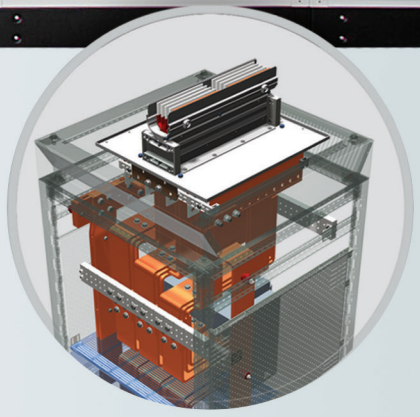
Horizontal MCCB Separation Module

The modular PanelMaster system can be adapted to any project.

- Rated Current up to 6800 A
- Short Circuit Current up to 120 kA
- Operating Voltage up to 690V
- Rated impuls withstand voltage up to 12 kV
- Up to Form 4B
- Protection class up to IP55



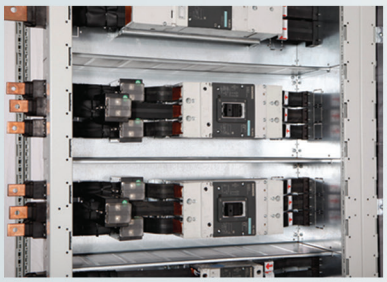
Cable Connection



Busbar Trunking Connection

Horizontal and Vertical Application for MCCB's

Vertical MCCB Application



Horizontal MCCB Application

Partial Door Application

Partial Door Application provides aesthetic appearance.

The Advantages of PanelMaster

1

Freedom of choice for switchgear brands

Type-tests for 8 different switchgear brands were conducted at PanelMaster. That makes it possible to choose between the switch brands that are most commonly used.

2

Flexible design for all kinds of projects with type-tested modules

With its modular structure-tested design, ACB modules, MCCB modules, busbar connection modules, main busbar and distribution busbar modules are tested separately in different current and mounting configurations. The extreme conditions type-test methods were used for these tests.

- With the partitioning of Form 4b (with the least air circulation)
- In IP55 protection class (at the level where the outside air flow is the least)
- The switches are installed in the upper part of the panel where the heat will be greatest
- When the busbars trunkings are connected.

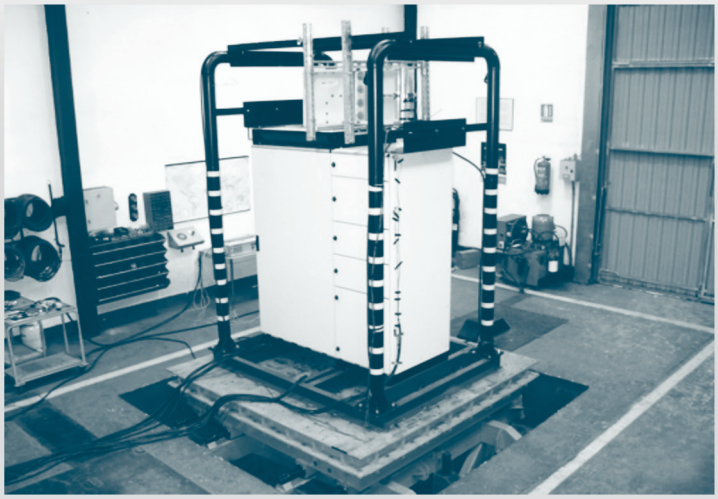
3

Project-based control and licensing

Project-based control and licensing in low voltage type test panel systems is a privileged solution performed only in PanelMaster type test panel system.

If requested by the customer, EAE Elektroteknik A.Ş. checks the compliance of the panels with PanelMaster design and application rules on a project basis.

If there are no nonconformities in the panels according to the design and application rules as a result of the controls, PanelMaster badges with serial numbers are attached to the panels and licensed.



Seismic test in accredited laboratory with busbar trunking module for Richter scale 7 and above

4 High reliability guaranteed by seismic testing

With the busbar trunking connection on a panel group with 6300 A inputs and various compact switch outputs, PanelMaster successfully passed a severe seismic test 7 and higher on a Richter magnitude scale (0.66g in both horizontal and vertical directions according to IEC 60068-3-3 and IEEE 693).

5 High protection against internal arc faults

PanelMaster has been subjected to internal arc tests at a current level of 65 kA and certified according to IEC 61641 standards.

High protection against arc faults is realized with arc stoppers and flow stopper plates.

What are EAE solutions?

EAE Elektroteknik A.Ş. offers solutions to our customers with a wide range of products depending on the current up-to-date international standards in the area of low voltage panel systems with the PanelMaster and E-Kabin brands. Considering the local and international market needs, products tested under the most difficult conditions specified in the relevant standards provide ease of application at every stage of the project.

1

Low voltage type-tested enclosure systems - PanelMaster

PanelMaster low voltage panel systems are type tested panel systems in accordance with IEC 61439-1 / 2 standards. PanelMaster which has a distinctive position in the type-tested panel market with its high technical values, aesthetic appearance and wide configuration options, has been specially developed by EAE Elektroteknik A.Ş. considering local and international market needs.

2

Low Voltage Empty Enclosure Systems - E-Kabin

E-Kabin branded low voltage switchboards are tested and certified in accordance with IEC 62208 standards. In E-Kabin system, there is a variety of products including indoor type, outdoor type, wall mounting type and stand alone type. E-Kabin brand offers a wide range of configuration options to its users with its standard manufacturing and custom made manufacturing capability.

PANELMASTER

LOW VOLTAGE TYPE TESTED ENCLOSURE SYSTEMS

- Type-tested in accordance with IEC 61439-1/2
- Rated Current up to 6800 A
- Short Circuit Current up to 120 kA
- Operating Voltage up to 690V
- Protection class up to IP55
- Up to Form 4B

Ekabin

EMPTY ELECTRICAL ENCLOSURES AND ACCESSORIES

- Compliance to IEC 62208 standard
- Protection class up to IP66
- Mechanical strength up to IK10 level.
- The ability to provide solutions for all indoor and outdoor applications

NOTES :

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TYPE 3 (850 mm)

ACB Form Separation Modules - SB :

TYPE 1 (650 mm)

Cable Connection Terminals :

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Busbar Hole Templates :

Length Additional

12 - 50 mm arası

Corner Additional

12 - 50 mm arası

b	d	e1	e2	e3	Sc
12	6,6	7,5			
20	9	10			
25	11	12,5			
30	11	15			
40	14	20			
50	14	25			
60	14	17	26	26	
80	14	20	40	40	
100	14	20	40	50	
120	14	20	40	60	
160	14	20	40	40	

PANELMASTER

MCCB Form Separation Modules - SM :

PMSM 35 06 K1 2B 3 70

Module Height · Insulator Type · Enclosure Width · Pole Number · SM Cover Type · Form Class

Form Separation Modules for Horizontal MCCB - SM

H / W	Form Class	3 Pole 150 mm (up to 250 A)	3 Pole 200 mm (up to 400 A)	3 Pole 250 mm (up to 630 A)	3 Pole 250 mm (up to 1600 A)	4 Pole 200 mm (up to 250 A)	4 Pole 250 mm (up to 630 A)	4 Pole 350 mm (up to 1600 A)
600	2B	PMSM1509K12B335	PMSM2009K12B345	PMSM2509K12B345	PMSM2509K12B370	PMSM2009K12B435	PMSM2509K12B445	PMSM3509K12B470
	4B	PMSM1509K14B335	PMSM2009K14B345	PMSM2509K14B345	PMSM2509K14B370	PMSM2009K14B435	PMSM2509K14B445	PMSM3509K14B470
800	2B	PMSM1509K12B335	PMSM2009K12B345	PMSM2509K12B345	PMSM2509K12B370	PMSM2009K12B435	PMSM2509K12B445	PMSM3509K12B470
	4B	PMSM1509K14B335	PMSM2009K14B345	PMSM2509K14B345	PMSM2509K14B370	PMSM2009K14B435	PMSM2509K14B445	PMSM3509K14B470
1000	2B	PMSM1510K12B335	PMSM2010K12B345	PMSM2510K12B345	PMSM2510K12B370	PMSM2010K12B435	PMSM2510K12B445	PMSM3510K12B470
	4B	PMSM1510K14B335	PMSM2010K14B345	PMSM2510K14B345	PMSM2510K14B370	PMSM2010K14B435	PMSM2510K14B445	PMSM3510K14B470

Note 1: SM module set is contains input and output insulators.

Note 2: There are K1 type module codes in above table. It must choose K0 and K2 type modules according to form separation class. (Sample: PMSM1509K02B335)

Note 3: In form 2B enclosure must be use 1 piece K2 type SM module and for other MCCB must be K0 type modules.

Note 4: In form 4B enclosure must be use 1 piece K2 type SM module and for other MCCB must be K1 type modules.

Note 5: For the with motor MCCBs it must add "M" to end of codes. (Sample: PMSM1509K02B335M)

Note 6: In the partly door application only U2 type SM module must use for all form separation class enclosure. (Sample: PMSM1506U2B335)

Note 7: For up to 630 A MCCB Enclosure width must be minimum 600 mm; for above 630 A MCCBs enclosure width must be minimum 700 mm.

Note 8: In the partly door application don't use 200 mm SM module.

Note 9: For each SM module must choose MCCB riser according to MCCB dimension.

Note 10: If SM module bigger than MCCB; must use suitable insulator according MCCB. (35 mm for up to 250 A , 45 mm for up to 630 A, 70 mm for up to 1600 A)

SM module for without motor' MCCB

SM module for with motor' MCCB

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