

TECHNO MODULE

MODULAR  
**ELSTEEL**  
ENCLOSURES



# INTRODUCTION

**ELSTEEL is a world leader in the design, development and manufacture of modular panel enclosures.**

This is built on a strong foundation of 30+ years of operations supported by continual investment in research and development. Our objective is as simple as our products: To manufacture the world's best enclosures at the best possible price.

ELSTEEL delivers enclosure solutions for every build. Whether it be a small Terminal Box or the largest custom designed distribution panel for an Olympic Size Stadium, ELSTEEL delivers the solution.





## TECHNO MODULE

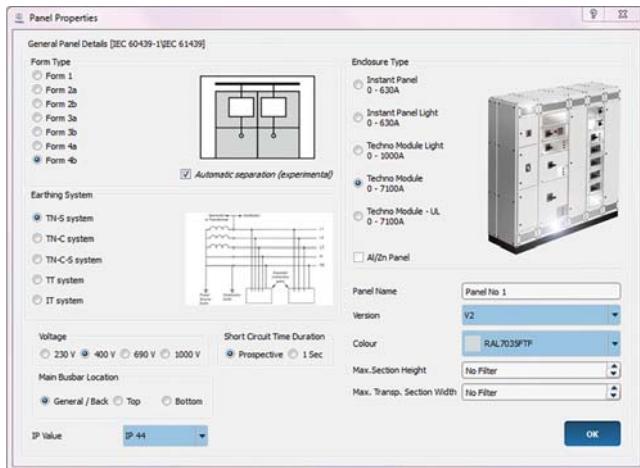
Techno Module is a patented 200mm grid modular system for the switchboard manufacturing industry, successfully tested to IEC 61439-1.

It is the result of many years work in research and development, and continuous testing at recognised test stations around the world.

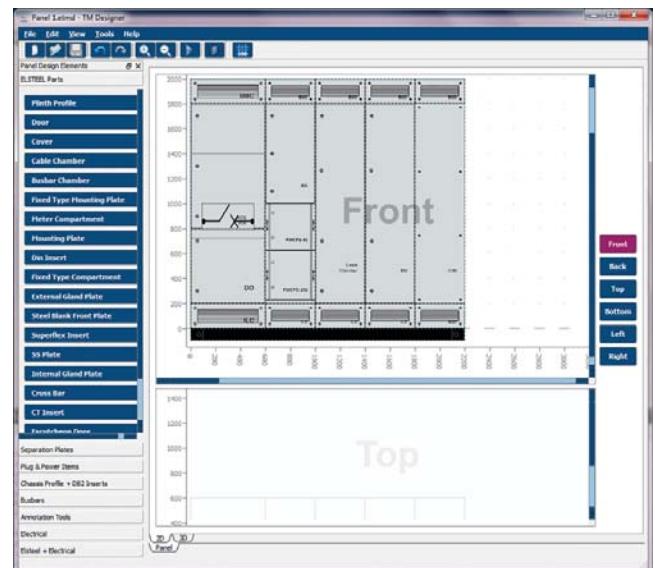
Techno Module is an open system that can accommodate all major brands of breakers, contactors, relays etc.

# THE TECHNO MODULE DESIGNER

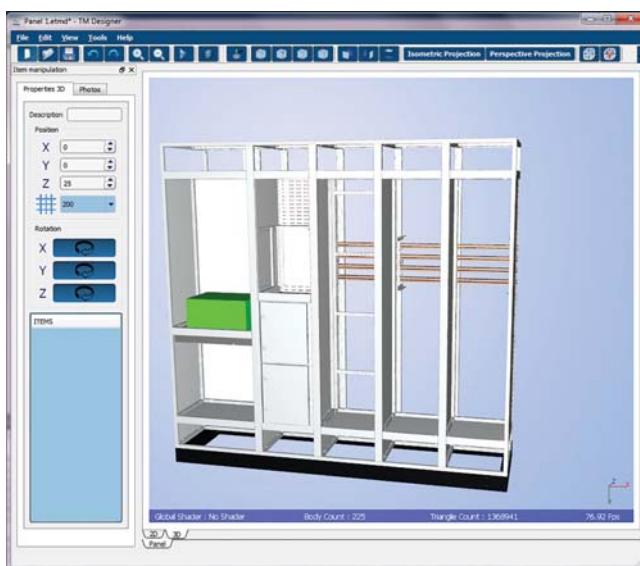
## Panel properties



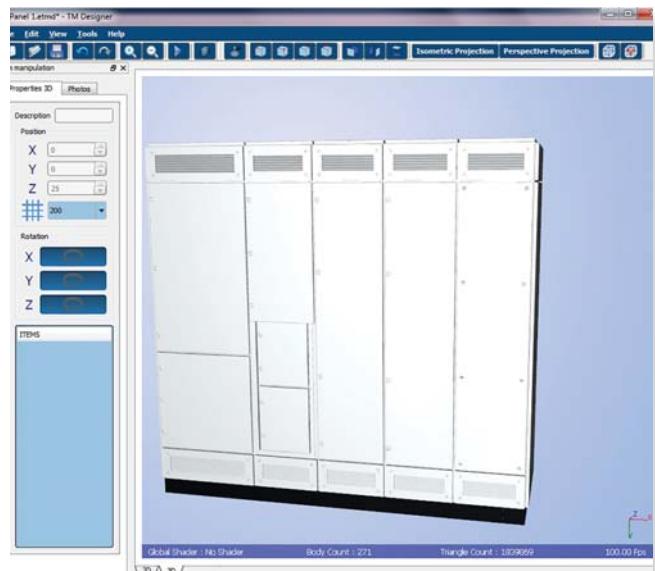
## 2D view



## 3D view-inside view of the panel



## 3D view-outside view of the panel



**The first step in designing a successful distribution board or motor control centre is planning with Techno Module Designer (TMD).**

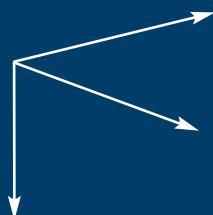
Panel builders spend a lot of time quoting projects with a success rate as little as 5-10%. So in order to save estimating engineers valuable time, allowing them to spend more time with customers, we have created our unique free software. You can design your panels very quickly! Within 5-15 minutes you can draw a distribution panel or MCC, get a BOM including copper requirements and electrical items.

Another great feature is the software creates 3D drawings for each panel. View in TMD or export into other 3D software packages. You can then plan site wide busbar routes for example.

Spend less time calculating and more time selling with TMD!

# FRAME WORK

**The Techno Module system is modular in steps of 200 mm in all three directions.**



That means that there is no limit to the possibilities and positions.

The strong framework is made from 2mm electro galvanised powder coated steel profile.

It forms a 25mm grid and can be arranged in an unlimited number of ways.

It rests on a modular base frame which incorporates all facilities for dividing and transportation.

Smaller panels up to 1250 Amps can be built in the economical Techno Module Light.



# BUSBARS



**Busbar systems use standard  
'off the shelf' 10mm flat bars.**

Either copper or aluminium.

The holders are made from specially formulated plastics, and can be mounted in any position inside the framework.

The busbar holders are made from specially formulated re-enforced self extinguishing plastic and can be mounted in any position within the framework.

During countless type-testing, up to 7100 Amp 100 kA/ 1sec, the holders have been tested rigorously again and again.

Busbar connections are a clamp arrangement, this allows the bars to slide during heating and cooling . This eliminates the risk of connections becoming loose and debris in your panel.

# PLUG & POWER

**Plug & Power is a revolutionary way of making distribution boards and motor control centres.**

The panel board can be rearranged indefinitely while still supplying power to your existing equipment.

Both consultants and end-users have to accommodate the rapid development in medical equipment, CNC machines and process plants etc, during new investments in construction.

With Plug & Power, consultants are no longer tied to strict specifications.

Last minute modifications can be made at any point during assembly, installation or operation.

Shut-down and out-of-hour labour costs for modifications are now a thing of the past.



**Patented**

# PLUG & POWER

Removable units - when you need to add or replace a breaker on a live panel !

Incoming connections are plug type.

Outgoing connections are fixed type.



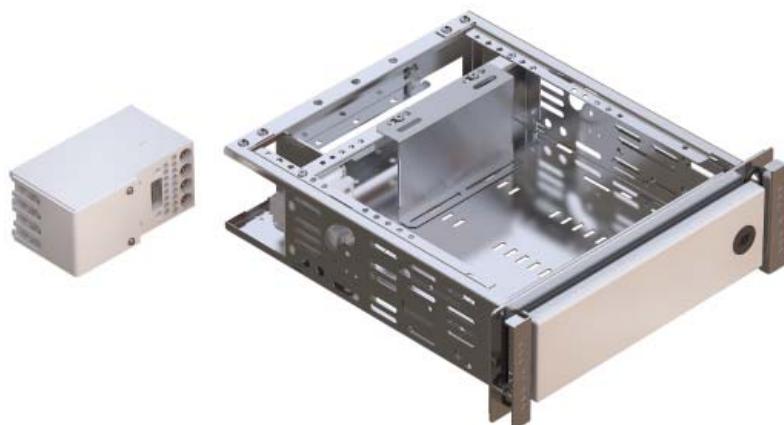
## Specifications of Plug-in

Design verified IEC 61439	Cable termination left or right
Arc fault IEC 61641	Fully insulated busbar optional
Any unit size, fitted anywhere in the system	Dual purpose, breaker or motor starter
No tools needed for insertion or removal of units	Plugs directly to the busbar
New breakers can be added anywhere in the panel	Any breaker brand can be used
	5 pole incoming
Fastest way of construction due to pre-assembled units	Direct on Line or Star Delta Starter
Locked position without screws	Busbar rating 80kA/ 1 sec.
Breakers or starters can be replaced	Delivered as a fully assembled unit

**Fully Withdrawable Units** - Enables very fast replacements in an emergency, reducing production downtime to the very minimum possible!

Incoming connections are plug type.

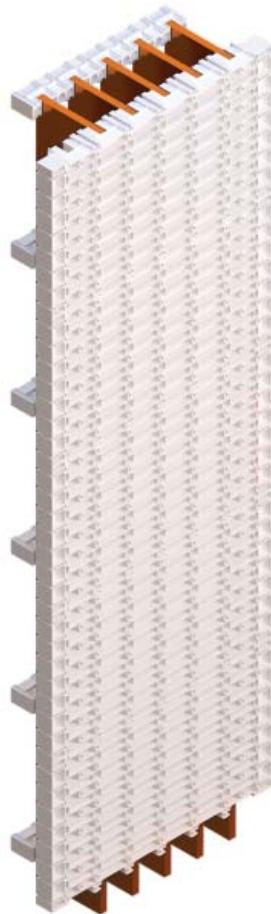
Outgoing connections are plug type.



### **Specifications of Withdrawables**

Design verified IEC 61439	Safety lock while removing the unit
Arc fault IEC 61641	Optional shutters
Any unit size, fitted anywhere in the system	Can have termination left/right or back
All cables are terminated in the side cable compartment	Lockable in 'on' and 'service' position
No tools needed for insertion or removal of units	Fully insulated busbar optional
A unit is replaced in seconds !	Any breaker brand can be used
Heavy duty SS handles and mechanism	5 pole incoming
Pull, plug, release and test functions, all in one handle	Direct on Line or Star Delta Starter
All electrical components can be 'lifted' out of the units	Busbar rating 80kA/ 1 sec.
Plugs directly to the busbar	MODBUS or PROFIBUS
	Delivered as a fully assembled unit

# PLUG & POWER



The vertical busbars are mounted in a flat holder which doubles as a form 4 separation plate and plug-in base. We call it the motherboard. These motherboards are mounted from top to bottom in each section, allowing connections with the bus bars wherever you choose to insert the withdrawable or removable units.

Each section can carry 1250 Amps, allowing sufficient of space for extra units once the panel is installed.

When designing your future Plug & Power panel, we recommend having at least 30% free space for expansion. For example - That extra scanner at the hospital, the new shop unit at the mall, an additional ice-cream factory compressors, or an extra pump on the oil platform. With Plug & Power, it's now easy and quick to add these later, without impacting on production!



Now you have the freedom to Plug in and Power up anything you need, anywhere you like in the panel, at any given time.

Plug & Power has furthermore been designed for quick and easy assembly, saving not only the panel builder a considerable amount of time in the workshop by simply 'plugging-in', but also the company a huge amount of expense. Outgoing distribution or motor starter units can be conveniently pre-assembled on a worktable.

\* Plug & Power is patented and a registered trade name owned by Elsteel.

# **FORM 3 + 4**

**Highest forms of personal safety as well as protection of materials and environment.**

When built in accordance with this standard, it is possible to work in one section of the panel while the rest of the pane is still live.

Internal separation plates prevent foreign objects or particles from transferring from one section of the panel to another (resulting in a short circuit in a compartment that may be live). This prohibits the whole panel from becoming contaminated and complete panel damage.



# ARC FAULTS



**Arc Filters have been included in the design of the separation plate. Once you install the standard chimneys your enclosure is arc safe.**

This means that not flames, gases or solid objects will explode towards the operator who may be standing in front of the panel.

# **TESTING + FINISH**

**Each and every panel is tested by the panel builder/integrator in accordance with specifications from the Constructors Manual, and the routine test specified in IEC 61439-1, before shipment.**

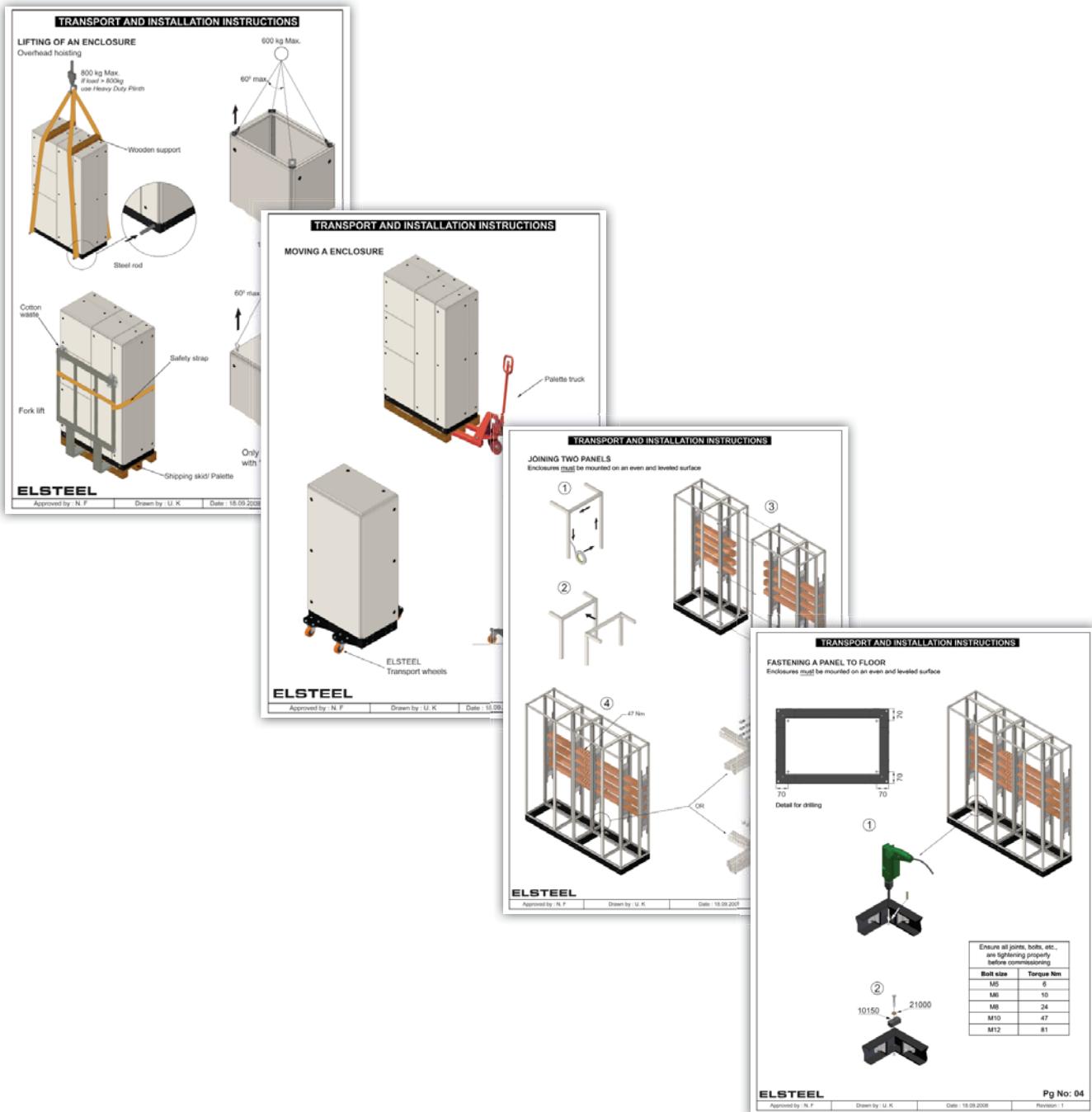
The surface of the panel is powder coated in RAL 7035 fine textured finish. It's easy to maintain and will look 'as new' for many years.

Phosphated and chrome-passivated pretreatment makes the panel suitable for tough climates and conditions. Degree of protection up to IP55.

After commissioning, the panel is easily expanded and breakers or motor starters can be removed or fitted while it is live.



# INSTALLATION COMMISSIONING



Every ELSTEEL enclosure is tested in accordance with IEC 61439-1, not only at the test station but also by the panel builder.

Instructions are delivered with each panel explaining in detail how to transport and start the panel.

# CERTIFICATION



TEST PERFORMED	CERTIFICATION AUTHORITY	CERTIFICATE REFERENCE
<b>Techno Module Panels Comply to IEC 60439-1 / IEC 61439-1 &amp; 2</b>		
01. 400ADesign Verified with Schneider breakers	ASTA	18361 A
02. 400ADesign Verified with Schneider breakers	ASTA	18047
03. 400Atype tested with LS breakers (Instant Panel Light)	ASTA	17013
04. 800ADesign Verified with Schneider breakers	ASTA	18363 A
05. 800ADesign Verified with Schneider breakers	ASTA	18048
06. 800ADesign Verified with ABB breakers	ASTA	17545
07. Additional temperature rise test for ASTA-17545 test	IPH	3345.2091256.0969
08. 800Atype tested with LS breakers (TM Light Panel)	ASTA	17012
09. 800Atype tested with MG breakers (TM Light Panel)	ASTA	16899
10. 1000ADesign Verified with GE breakers (TM Light Panel)	IPH	1819.2130777.0451
11. 1600ADesign Verified with Schneider breakers	ASTA	18612 A
12. 1600ADesign Verified with Schneider breakers	ASTA	17864
13. 1600ADesign Verified with ABB breakers	ASTA	17544
14. Additional temperature rise test for ASTA-17544 test	IPH	3345.2091255.0986
15. 1600Atype tested with LS breakers	ASTA	17011
16. 1600Atype tested with GE breakers	ASTA	16149
17. 2000Atype tested with Siemens breakers	ASTA	16783
18. 2000ADesign Verified with Terasaki breakers	DEKRA	2148971.101
19. 2500ADesign Verified with GE breakers	IPH	1819.2130776.0500
20. 2500ADesign Verified with ABB breakers	ASTA	18741
21. 2500ADesign Verified with Schneider breakers	ASTA	18362 A
22. 2500ADesign Verified with Schneider breakers	ASTA	18613 A
23. 2500ADesign Verified with Schneider breakers	ASTA	18046
24. 2500ADesign Verified with Schneider breakers	ASTA	17865
25. 2500ADesign Verified with ABB breakers	ASTA	18050
26. Additional Temperature rise test for ASTA-18050 test	IPH	3457.2100397.0221
27. Additional Temperature rise test for ASTA-18050 test	IPH	3457.2100397.1032
28. 2500ADesign Verified with ABB breakers	ASTA	17543
29. Additional temperature rise test for ASTA-17543 test	IPH	3345.2091254.0982
30. 2500Atype tested with LS breakers	ASTA	17010
31. 2500Atype tested with GE breakers	ASTA	16150
32. 2500Atype tested with MG, ABB, Siemens, Jean Moeller breakers	IPH	513.228.6.384
33. 2500Atemperature rise test & short circuit test	IPH	170.265.2.230
34. 3200ADesign Verified with ABB breakers	ASTA	18740
35. 3200ADesign Verified with MG breakers	ASTA	17615
36. 3200ADesign Verified with Terasaki breakers	DEKRA	2148971.100
37. Additional temperature rise test for ASTA-17615 test	IPH	3467.2100399.0218
38. 3200Atype tested (AI Busbar) with ABB breakers	CPRI	S2060728
39. 3200AShort circuit test (AI Busbar) with ABB breakers	CPRI	S2060729
40. 3200Atemperature rise test & short circuit test	ASTA	12798
41. 3500ADesign Verified with Schneider breakers	ASTA	18868
42. 4000ADesign Verified with Schneider breakers	ASTA	18614 A
43. 4000ADesign Verified with Schneider breakers	ASTA	17756
44. 4000ADesign Verified with ABB breakers	ASTA	17542
45. Additional temperature rise test for ASTA-17542 test	IPH	3345.2091253.0999
46. 4000Atype tested with Terasaki breakers	IPH	1819.12065.668
47. 5000Atype tested with ABB & Jean Moeller breakers	IPH	1513.832.0.468
48. 5000Atemperature rise test & short circuit test	ASTA	12890
49. 6300ADesign Verified with ABB breakers	ASTA	17541
50. Additional temperature rise test for ASTA-17541 test	IPH	3345.2091252.1010
51. 6300Atype tested with ABB breakers	IPH	1819.10613.431
52. 7100Atype tested with ABB breakers	IPH	1819.10613.434
53. Short circuit test 80kA/1sec Fully Withdrawable busbar holder (new)	IPH	1819.2130089.0040
54. Short circuit test 80kA/1sec Plug & Power rear busbar holder	IPH	1819.2121286.0680
55. Short circuit test 50kA/3sec for OMH4 busbar holder with 2x10x40 Cu	IPH	1819.209103
56. Short circuit test 65kA/1sec for UBH busbar holder with 1x50x10 Cu	TÜV	19300462 001
57. Short circuit test 63kAfor Power Cassette, FTM & Flexi Cu	TÜV	19300462 004, 005
58. Short circuit test 100kA/1sec for 4x10x150 Cu	ASTA	15216
59. Degree of protection IP55 for TM panels	TESTSAFE	29539
60. 12kV impulse test for OMH4, BH, MAB busbar holders	IPH	1819.2130089.0218

For more certifications and latest updates please see [www.elsteel.com](http://www.elsteel.com)

TEST PERFORMED	CERTIFICATION AUTHORITY	CERTIFICATE REFERENCE
<b>Techno Module Panels with insulated busbar</b> Comply to IEC60439-1 / IEC61439-1&2		
01. Selected Verif. test for Insulated busbar 2x10x40 Cu with OMH4/ MAB	IPH	1819.2120714.0861
02. Selected Verif. test for Insulated busbar 2x10x80 Cu with OMH6	IPH	1819.2120714.0836
03. Selected Verif. test for Insulated busbar 3x10x100 Cu with OMH6	IPH	1819.2120714.0574
04. Selected Verif. test for Insulated busbar 6x10x80 Cu with OMH8	IPH	1819.2120714.0573
05. 12kV impulse test for OMH14 & MABI busbar holders	IPH	1819.2130089.0218
TEST PERFORMED	CERTIFICATION AUTHORITY	CERTIFICATE REFERENCE
<b>Techno Module Panels</b> Comply to other Standards		
01. 400kVAr Capacitor bank with EPCOS according to IEC 61921/ IEC 61489-1	ASTA	18738
02. Internal Arc fault test according to IEC 61641 & AS/NZS 3439.1 : 2002	TCA	102601 102380/ 102378
03. Internal Arc fault test according to AS/NZS 3439.1 : 2002	TÜV	19300462 002 19300462 003 19300462 006 19300462 007
04. Cold & Damp Heat tests according to IEC 60068-2-1 & 60068-2-30 respectively	RST	P50-11-0101e
05. Vibrations test according to IEC 68-2-6 & IEC 68-2-36	VIPAC	302649-01
06. Seismic test according IEC 68-3-3	VIPAC	302649-02
07. Lloyd's Register type approval certificate for marine, offshore and industrial applications of stainless steel enclosure & 19" cabinets	LR	02/70003 (E2)
08. ABS type approval certificate for shipboard and associated marine & offshore installation	ABS	08-SG366750-PDA
09. Russian Maritime Register of Shipping (RS) Type approval certificate for Marine use	RS	10.00001.270
10. Bureau Veritas (BV) Type Approval Certificate for Marine use	BV	22875/A0 BV
11. Det Norske Veritas (DNV) Type Approval Certificate for offshore use	DNV	E-10273
12. Germanischer Lloyd (GL) Type Approval Certificate for offshore use	GL	19479-11 HH
13.  Mark for selected TM Panel components	UL	20130305-E 207550

#### Also by ELSTEEL



Box



TM Light



19" Super Frame

For more certifications and latest updates please see [www.elsteel.com](http://www.elsteel.com)

# MATERIAL SPECIFICATION

Base Frame	
Base Frame	2mm mild steel powder coated in black (RAL 9005)
Corners	Aluminium die casted powder coated in Light grey (RAL 7035) Fine tex.
Corner Bar / Cross Bar	Electro galvanized 2mm powder coated in Light grey (RAL 7035) Fine tex.
Doors / Covers	Mild steel 1.5mm powder coated in Light grey (RAL 7035) Fine tex.
Doors with window	Mild steel 1.5mm powder coated in Light grey (RAL 7035) Fine tex. & 4mm Tempered Tinted glass
Door Stabilisor	Mild steel 20x20x1.5 square pipe powder coated in Light grey (RAL 7035) Fine tex.
Door with cable glands	Mild steel 1.5mm powder coated in Light grey (RAL 7035) Fine tex.
Mounting Plate	Mild steel 2mm powder coated white (RAL 9010) / 2mm Alu-zinc
Separation Plates	Mild steel (2x2, 2x4, 2x6, 4x4, 4x6,) 1 mm painted white (RAL 9010)
Flat Cover	Mild steel 1.5mm painted in Light grey (RAL 7035) Fine tex.
Panel Assembly Kit	Mild steel 3mm zinc plated
Cable Holder	Mild steel 1.5mm painted white (RAL 9010) for up to 600mm and Mild steel 2mm painted white (RAL 9010) for 600mm & above
Lifting Eyes (14380)	Mild steel 3mm powder coated in black (RAL 9005)
Lifting Eyes (14390)	Mild steel 3mm zinc plated
Wall Mounting Brackets	Mild steel 3mm powder coated in Light grey (RAL 7035) Fine tex.
Transport Wheel Holder	Mild steel 3mm powder coated in black (RAL 9005)
Busbar Holder	Self extinguishing fibre material / reinforced PC
Fish Plate	Copper 10mm
H to V connectors	Copper 10mm
Busbar tap off - 21000	Dia 10mm zinc plated
- 21010 & 21020	Copper 5mm
- 21030	Mild steel 3mm zinc plated
Bracket for earth conductor	Mild steel 3mm zinc plated
Copper Spacer	Copper Dia 30
Instant Pane - Casing	Mild steel 1.5mm powder coated in Light grey (RAL 7035) Fine tex.
- Doors	Mild steel 1.5mm powder coated in Light grey (RAL 7035) Fine tex.
- Mounting Plate	Mild steel 2mm powder coated in white (RAL 9010) / Alu-zinc 2mm

For more certifications and latest updates please see [www.elsteel.com](http://www.elsteel.com)

# REFERENCES

Customer	Product	Country
Olympic Stadium	Main Distribution Panel	Australia
British Aerospace	Main Distribution Panel	Australia
Colt Telecom	Techno Module	Belgium
NATO Headquarters	Techno Module MCC	Belgium
Ministry of Defence	Motor Control Center	Dubai
Giga Gold Refinery	2500A LV Panels	Dubai
Jebel Ali Air Port	Main Distribution	Dubai
Nordbahnhof Berlin	NSHV and GHV	Germany
Alcatel Stuttgart	NSHV and GHV	Germany
National Hospital	4000A Switchboard	Iceland
Eskifjord Ltd	2500A Switchboard	Iceland
Hyundai Motor India Ltd	Techno Module	India
Nokia Mobile Phone Facility Project	Techno Module	India
Toyota Kirloskar Motor Pvt Ltd	PCC Panels - Techno Module	India
Radisson Hotel	Techno Module/ Form 4	Jordan
Amman East Station	Form 4 Motor Control Center D/O	Jordan
Central Bank of Kenya	Main Board/ Sub Boards	Kenya
Commercial Bank of Africa	Main Board/ Sub Boards	Kenya
Multilinx Factory	Distribution Boards	Maldives
SAVANNAH Sugar Estate	Techno Module and MCC	Mauritius
Ulvesund Elektro AS	1600A Main Panels	Norway
Power Plant Mar Kraftwerk	Motor Control Center	Norway
Qatar International Stadium	Distribution Panel	Qatar
West Bay Cooling System - Phase 1	Form 4 Panel 7000A	Qatar
SAB Miller Beer Factory	Motor Control Center WWT Plant	Romaina
Hydro Tech Engineering	Motor Control Center WWT Plant	Romaina
Esso Deepwater Ltd	Generator Control Panel	Singapore
Shang Ri La Hotel	Techno Module	Singapore
Greenpoint Stadium (2010 World Cup)	Techno Module	South Africa
Coca Cola Dar Es Salaam	Techno Module	South Africa
Barcelona Air Port	Form 4 Motor Control Center	Spain
Jerez Air Port	Form 4 Motor Control Center	Spain
Manchester Air Port	Form 4 Motor Control Center	UK
Nokia	Main Switchboard	UK
International Air Port Doha	Techno Module MCC	UAE
Fujairah	Techno Module MCC	UAE
Brodosplit Shipyard	Marine Panel 6300A	Croatia

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