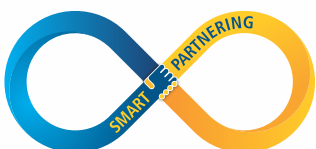


Your Partner in  
**Reliable  
Solutions**  
for **Power  
Distribution**







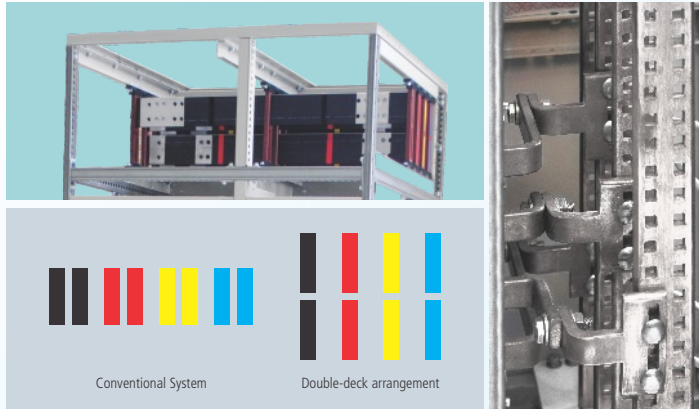
In the infrastructure business, every element of construction, installation and maintenance contributes to a project's long-term profitability. As India's leading switchgear company, we are constantly innovating to help infrastructure developers make the most of their distribution systems. The new Ti range is a product of this quest. It is design verified with aluminium and copper busbars, providing the perfect balance of cost-effectiveness, compactness and safety that infrastructure developers have always looked for.

L&T Electrical and Automation is a part of the multi-billion dollar technology, engineering, construction, manufacturing and services Larsen & Toubro conglomerate. The Company designs, manufactures and markets a wide range of low voltage and medium voltage electrical systems, control and automation systems, electrical products and metering and protection systems. The Ti range with its aluminium and copper busbar options is based on the award winning T-era, and sets yet another benchmark in building electrification solutions.



# THE SUPER SAVER

A combination of choice of aluminium or copper busbars, standardised quality and unique energy saving features make Ti a truly profitable investment.



**Save with aluminium & copper bus bars:** Ti Panels is the range of distribution solutions to offer the option of type-tested aluminium or copper busbar configurations, allowing you to make your installation even more cost-effective, without compromising on safety.

**Saves energy:** In any large building, energy costs often constitute as much as 60% of the total operating cost. The Ti has a unique double-deck busbar arrangement that reduces impedance and heat loss by reducing detrimental factors like proximity and skin effect, thereby saving of energy over conventional systems.

**Standardisation means savings:** The Ti has a compartmentalised design which can be assembled by qualified manufacturers around the world. So, you enjoy the benefits of timely delivery, quick installation and savings – even before you switch the system on.

**Save with concealed hinges:** All doors are provided with the unique concealed hinge design to reduce the downtime during maintenance. Concealment provides better security against unauthorised access to feeders and makes a post maintenance paint touch-up optional.



# VERIFIED SAFE

When dealing with electrical systems, there are no second chances. Ti is equipped with a range of safety features to safeguard your system as well as the people who operate it.

**Design verified for Safety:** Ti is a design verified assembly, in accordance with IEC 61439, assuring you of the highest levels of quality and safety, from design to assembly.

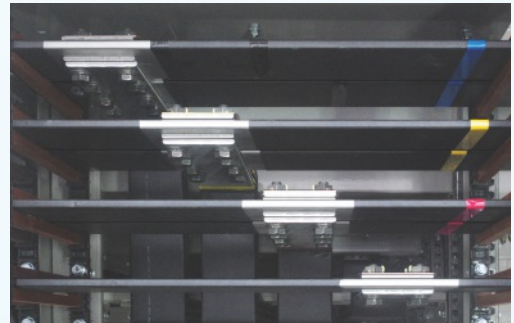
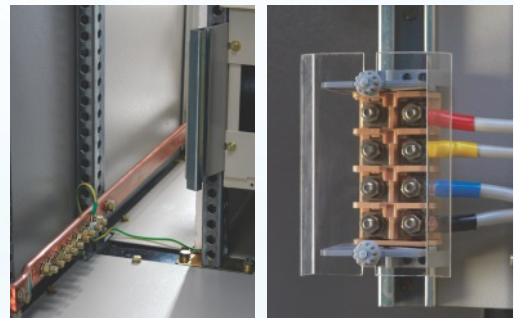
**Safer busbars:** Busbars in the Ti range have higher clearances than those prescribed by global switchboard standards (25 mm – Ph to Ph and 19 mm - Ph to N/Ph to E), offering a superior level of safety.

**Zero 'stray-voltage' doors and panels:** The Ti's panel doors are designed to prevent accidental opening. We have also placed earthing contacts on every door and an Earthbar running the length of the switchboard, connected to structural members. These ensure that the outer surfaces do not have stray voltages, as this could harm an operator.

**Best-in class insulation:** The Busbars in the Ti range are equipped with polyester glass supports for insulation. You also have the choice to install heat-shrunk PVC sleeves for extra protection.

**Enhanced ingress protection:** A minimum ingress protection of IP2X is provided even with the doors open to ensure that an operator does not come in contact with live terminals or parts during maintenance.

**No accidental contact:** Rotary knobs ensures that an operator does not come in contact with live terminals or parts during maintenance.





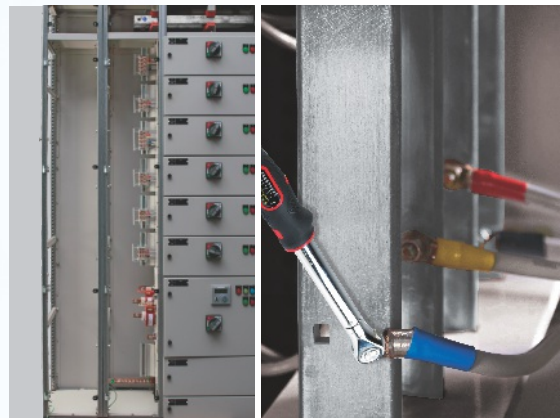
## DESIGNED FOR CONVENIENCE

The Ti range incorporates a number of features that help make installation and maintenance easy.

**Wide Cable Alleys:** The Ti range is equipped with 300 mm wide cable alleys, facilitating easy and quick access at all times. You also have the option to increase the alley width using 300 mm add-on chambers (AOCs)

**Quick Release System:** The Ti range allows quick maintenance through a system that requires just a single spanner to unbolt connections from droppers.

**Easy Access Doors:** The Ti is fitted with hinged doors that open up to an angle of 95°, improving access during installation or maintenance, and saving time during each operation.



# COMPACTNESS SPELLS COST-EFFECTIVENESS

In any urban scenario, space means money. Hence space saving is money saving. Ti offers flexibility and customization to suit your space requirements, ensuring that you maximize value on the space available to you.

**Flexible busbar/cable entry position:** Ti is available with top or bottom busbar/cable entry options.

**Space saving, slim panels:** Ti units start at a depth of 484 mm (with doors) and a width of 440 mm, allowing you to use the space saved for more profitable purposes.

**Compact Feeder modules:** You can choose from a range of full or half-width modules with sizes optimised to achieve compactness without compromising safety and reliability.

**Shared droppers:** An innovative design that allows high current ratings to be delivered to two panels by one set of droppers, drastically reduces panel footprints.

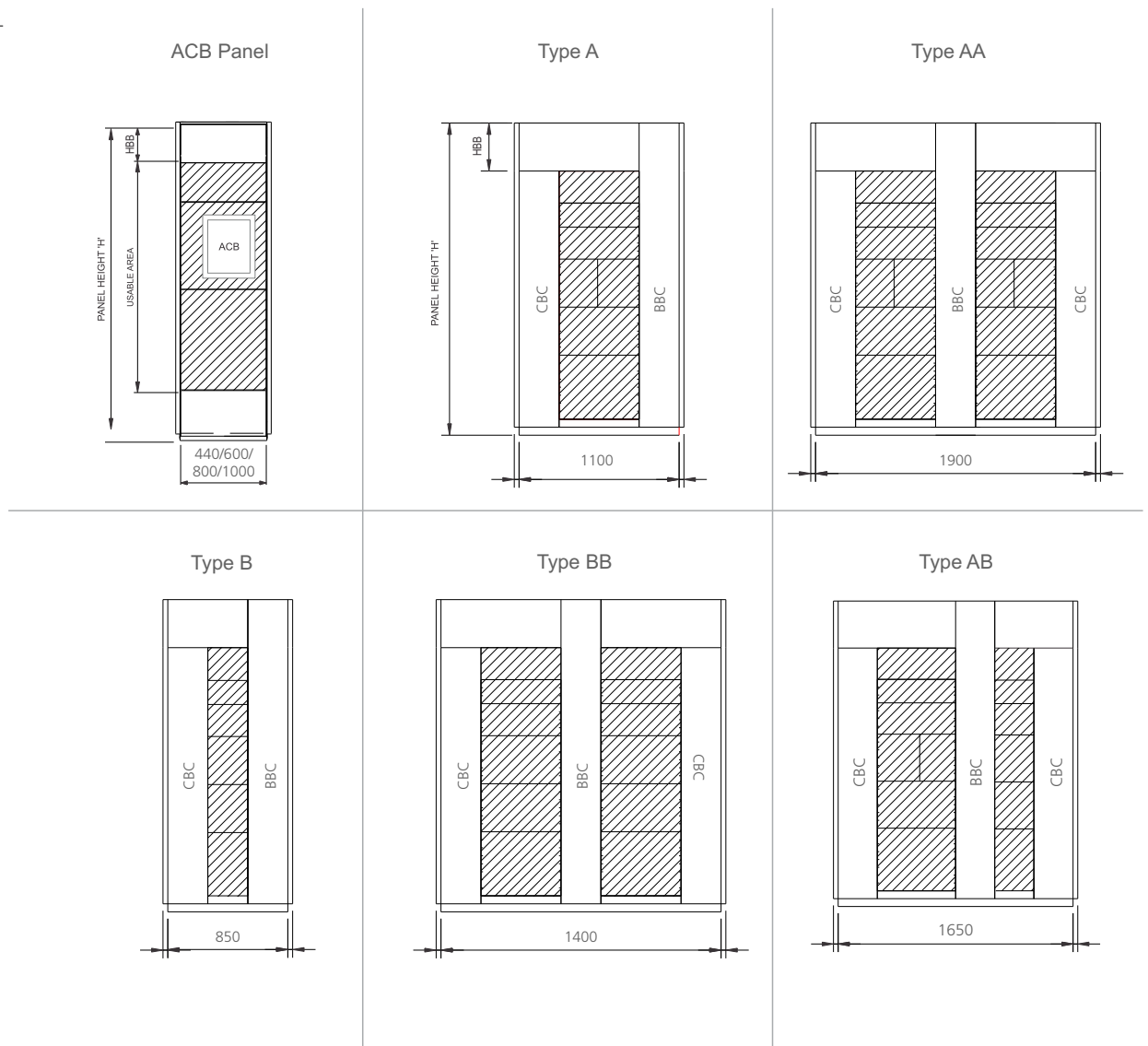
**Flexible panel configurations:** Feeder heights (200 mm onwards), panel heights (1800-2400 mm), width, depth and busbar configuration can be optimised for space.

**Double-front arrangement:** Connect even more electrical loads with a minimal change in dimensions.




# CONFIGURATIONS

## PANEL TYPES



FRONT VIEW

CBC - cable chamber (width = 300 mm), BBC - busbar chamber (width = 300 mm)

Panel Height 'H'	 Usable Area					
	ACB section			Outgoing section		
	210HBB	310HBB	410HBB	210HBB	310HBB	410HBB
1800	1220	1120	1020	1460	1360	1260
2000	1420	1320	1220	1660	1560	1460
2200	1620	1520	1420	1860	1760	1660
2400	1820	1720	1620	2060	1960	1860

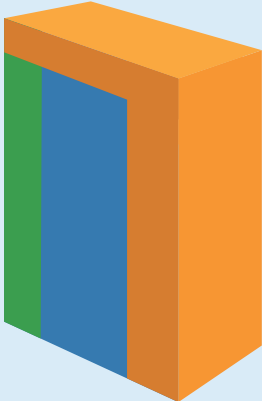
\*HBB - Horizontal Bus Bar



# TYPICAL ARRANGEMENTS



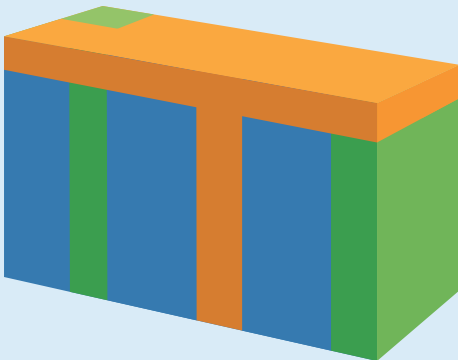
ACB panel



Outgoing section with front cable entry



Outgoing section (double front arrangement)



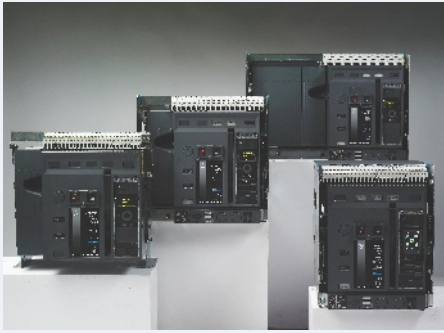
ACB section coupled with outgoing section

- Feeders
- Cable alley
- Busbar

# SPECIFICATIONS

		Standards	IEC 61439 - 1&2
Insulation characteristics	Clearance		> 20 mm
	Creepage distances		> 20 mm
	Overvoltage category		II / III / IV
	Pollution degree		3
	Field condition		Inhomogeneous (non-uniform)
Electrical characteristics	Voltage ratings	Rated operational voltage ( $U_e$ )	415-690 VAC, 24-220 VDC
		Rated insulation voltage ( $U_i$ )	690 V
		Rated impulse withstand voltage ( $U_{imp}$ )	6 / 8 kV
		Rated frequency ( $f_n$ )	50 / 60 Hz
	Current ratings	<b>Main Horizontal busbars:</b>	
		Rated current ( $I_{nA}$ )	up to 5000 A
		Rated peak withstand current ( $I_{pk}$ )	up to 154 kA
		Rated short-time withstand current ( $I_{cw}$ )	up to 70 kA, 1s
		<b>Vertical Distribution busbars :</b>	
		Rated current ( $I_{nA}$ )	up to 3000 A
Rated short-time withstand current ( $I_{cw}$ )		up to 70 kA, 1s	
Mechanical Characteristics	Degree of protection	In accordance with IEC 60529:	
		External	IP- 42 / IP-5X*
		Internal	IP 2X
	Forms of separation	as per IEC 61439 - 2	Form 3b / 4b
	Dimensions	Height (mm)	1800, 2000, 2200, 2400
		Width (mm)	440, 600, 800, 1000 (ACB section)*
			850, 1100, 1400, 1650, 1900 (Outgoing section)*
		Depth (mm)	440, 600, 900, 1000, 1100 (ACB section)*
			440, 600 (Outgoing section)*
	Surface Treatment	Structure	Powder coated
		Internal Components	Powder coated
		External Components	Powder coated
	Resistance to Corrosion	Damp heat cycling test	IEC 60068-2-30
Salt mist test		IEC 60068-2-11	
Plastic components	Flame retardant, self-extinguishing, Halogen-free	IEC 60695-2-10, IEC 60695-2-11	

\*Customized solution can be offered on request.



ACBs



MCCBs



SDFUs

# THE PERFECT MATCH FOR YOUR Ti SYSTEM

L&T is India's leading switchgear company and offers the widest range of electrical standard products, compliant with Indian and global standards. Our in-house design and testing facilities enable us to create customised solutions which combine type-tested Ti switchboards with a wide range of perfectly-matched L&T switchgear configurations. All, so that you can achieve the highest levels of cost and design optimisation possible with your Ti system.

## Type-tested L&T switchgear to match your Ti system.

Air Circuit Breakers	Moulded Case Circuit Breakers	Switch Disconnecter Fuse Units
<p>400A to 6300A in three optimized frame sizes</p> <p>Short circuit breaking capacities up to 100 kA</p> <p>50/100/200% Neutrals available</p> <p>Common height and depth across the range</p> <p>Arc chute interlocking</p> <p>No derating at higher ambients</p> <p>Energy saving pole design</p> <p>Independent locking of ON/OFF buttons</p> <p>Tool-less fixing of Voltmetric releases</p> <p>Display of complete accessory information on front facia</p>	<p>20A to 1250A in 3/4 pole variants</p> <p>Positive isolation</p> <p>Short circuit breaking capacities up to 100 kA</p> <p>Microprocessor, Thermal Magnetic and Magnetic based releases</p> <p>Wide range of snap accessories</p> <p>Ergonomic design</p> <p>User friendly features</p>	<p>32A to 800A</p> <p>DP/TP/TPN versions available</p> <p>Suitable for DIN, BS and Cylindrical type fuses</p> <p>High Short circuit rating of fuses (100kA)</p> <p>Full AC23A utilization category</p> <p>Positive isolation of fuses</p> <p>Separate arcing and current carrying zones</p> <p>Quad break contact system</p> <p>High clearance and creepage distances</p> <p>Built in isolable or add-on switched neutral</p>

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