WHICH MIDEL FLUID IS RIGHT FOR YOU?

THE MIDEL RANGE OF NATURAL AND SYNTHETIC ESTER TRANSFORMER FLUIDS

MIDEL eN 1204

MIDEL eN 1204 is the premier natural ester transformer fluid, made from sustainable rapeseed crops.

MIDEL eN 1215

MIDEL eN 1215 is our standard natural ester fluid made from soya.

MIDEL 7131

MIDEL 7131 is the world's leading, readily biodegradable synthetic dielectric fluid, used in power and distribution transformers.

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WHICH MIDEL FLUID IS RIGHT FOR YOU?

THE MIDEL RANGE OF NATURAL AND SYNTHETIC ESTER TRANSFORMER FLUIDS

MIDEL eN 1204

The preferred biodegradable natural ester fluid. MIDEL eN 1204 is the premier natural ester transformer fluid. Made from sustainable rapeseed crops, it is readily biodegradable with superior oxidation performance and low pour point. For the best performance from a natural ester fluid, let's talk about how MIDEL eN 1204 can deliver real benefits for your network.

MIDEL eN 1215

MIDEL eN 1215 is our standard natural ester fluid made from soya. It is best suited for temperate climates in non-free breathing transformers. Its high fire point significantly increases the fire safety of your transformers and can reduce the need for fire protection equipment.

MIDEL 7131

MIDEL 7131 is the world's leading, readily biodegradable synthetic dielectric fluid, used in power and distribution transformers including sealed and free-breathing designs, delivering fire safety, environmental protection and cost savings. First produced in the 1970s, MIDEL 7131 meets the need for a safer alternative to mineral oil. Its success is proven up to 433kV and fills transformers in over 70% of countries worldwide.

LET'S WORK TOGETHER TO PROTECT TRANSFORMERS AND THE PEOPLE, ENVIRONMENT AND BUSINESSES AROUND THEM.

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Powering Up

ELECRAMA 2018: Energizing the Future

ELECRAMA, the flagship showcase on the Indian electrical industry and the largest congregation of the power transmission and distribution ecosystem, has made a comeback with measures towards enhancing the sector and equipping it for the future. A snapshot of what is to unfold in the upcoming power-packed days…

The 13th edition of the premier event catering to the electrical and allied industries has unveiled itself for public viewing from today onwards. Organized by Indian Electrical & Electronic Manufacturers' Association (IEEMA), the five-day electrifying show will be spelling everything electrical.

"ELECRAMA is all about being relevant. We have been part of the big changes in the industry as well as across the world. Being a part of ELECRAMA implies being a part of the new era of electricity. Through ELECRAMA 2018, we aim to give a new direction and a new meaning to 'electricity'. It is not a mere exhibition, but we promise it to be an experience," said Vijay Karia, Chairman, ELECRAMA 2018.

ELECRAMA has been consistently proving itself to be an ideal platform for showcasing the latest offerings in equipment and technology of the sector. The current edition of the mega event is, yet again, churning mind boggling numbers: the 80,000 sq mt of exhibition area is host to more than 1100 exhibitors showcasing their products and services to visitors from more than 100 countries, and 2,50,000 anticipated visitor footfalls. There are over eight country pavilions, five new technology areas, and various industry and trade summits.

Source: IEEMA

The exhibits and solutions encompass the entire ecosystem. They are: Generation, Transmission, Distribution, Power Electronics, Renewables, Electromobility, Automation, and Energy Storage. Focus areas comprise new end user segments including Railways and Mass Transmit, Nuclear Energy, and Defence.

"We present to you a new ELECRAMA that will serve as a window to new technologies, best practices, new systems and potential trends in the future of electricity. The transformed ELECRAMA 2018 redefines the electricity space, renewable energy, energy storage, digitalisation of electricity through IoT and AI, and Electric Transportation opportunities," said Karia, Chairman.

"The future is Electric. With everything getting transformed into electrical such as cooking gas, cars etc., the single umbrella industry that will benefit is the Electrical Industry. Hence, we should see many 'Electricorns' in the coming decade just as we saw many 'Unicorns' in the last," said Vikalp Mundra, Vice Chairman, ELECRAMA 2018.

Knowledge Sharing

The event also serves a bigger purpose of being instrumental in edifying the industry members on the latest industry trends and path breaking innovations. This helps in keeping tabs on the rapid developments in the sector that is currently undergoing transformation by shunning old ways and embracing new ones to keep pace with the changing times. The thrust on renewable sources, power storage and smart technologies have ushered in a paradigm shift.

The event has various pavilions of interest. There is a power pavilion, railway pavilion and ETechNxt to showcase the technology of tomorrow. Additionally, there are concurrent events that are not only educative, but also offer business networking opportunities. They are:

World Utility Summit

World Utility Summit is a pioneering thought leadership forum, which attempts to set the agenda for the future, actively playing the role of a key enabler for the eco-system and to develop optimal solutions, technology and products. The theme of the summit is 'Utility of Utilities'. Today utilities are embracing the smart grid technologies, Internet of things (IoT) and usage of real-time data to enhance their performance. Will the convergence of activities of differ-

ent types of industries extend to the utilities themselves? This is the question that the summit will ponder over only to come up with a solution.

ETechNxT

A hybrid-new age platform that combines the experiential elements and conversations, ETechNxT features state-of-the-art showcase of products and solutions from companies and startups on the cutting edge of technology, supported by high-quality conference with tracks on:

- Digital Transformation of Power Delivery
- Energy Storage Systems & Solutions
- Industrial Internet & IoT Solutions for Industry & Buildings
- Showcase for Electricals & Electronics for Electric Mobility.

ChangeXchange 2018

The 4th Reverse Buyer-Seller Meet is being organised together with ELECRAMA 2018, the premier showcase of Indian Electrical Sector and World's largest confluence of the power transmission and distribution community.

Engineer Infinite

IEEE Delhi Section and IEEE UP Section along with IEEMA, Indian Electrical and Electronics Manufacturers Association are jointly organizing an International Conference 'ENGINEER INFINITE' on March 11 & 12, 2018, along with ELECRAMA. The conference will provide an opportunity for researchers, academicians, scientists and professional engineers to present their work, publish their results, exchange ideas and network for scientific and industrial collaborations in an international forum.

"The inclusion of conferences like World Utility Summit (WUS) and ETechNxt, during ELECRAMA 2018, aims to provide an open interaction with world market leaders and experts in energy and power on a single platform. In WUS, the CEO and technical directors of more than 100 power utilities are participating, which will lead to an exchange of best practices giving way to various future trends in technology," said Anil Saboo, Vice Chairman, ELECRAMA 2018.

Source: IEEMA

"We present to you a new ELECRAMA that will serve as a window to new technologies, best practices, new systems and potential trends in the future of electricity. It has something to offer to every stakeholder as a takeaway."

Vijay Karia
Chairman
ELECRAMA 2018

Source: IEEMA

"We should see many 'Electricorns' in the coming decade just as we saw many 'Unicorns' in the last."

Vikalp Mundra
Vice Chairman
ELECRAMA 2018

Source: IEEMA

"ELECRAMA 2018 is a milestone in achieving growth in India's power sector and also a window to the world to showcase its leadership in all forms of energy."

Anil Saboo
Vice Chairman
ELECRAMA 2018

HuMAchine – the future of Human and Machine Interplay

The huMachine is future immersion zone at the heart of eTechNxt platform. It seeks to paint a vision of human-machine interplay in the time horizon of now-till 2030s, on varying scales of personal to planetary level. There will be a mix of live, virtual reality and augmented reality artefacts to bring together around 25 concepts to inform, excite, provoke and involve the audience.

Railway Pavilion

Indian Railways is one of the biggest customer segments of the Indian electrical Industry. It is now embarking on a mega electrification plan to meet its growth targets and also its commitment to increase efficiencies and embrace renewable energy in a big way. A lot of policy level changes have been introduced to include stakeholders from outside the traditional Railway PSU universe in an effort to strengthen capacity building for speeding up the electrification works.

This new development opens new avenues for members of the Indian Electrical Industry and EPC contractors to explore opportunities in the Indian Railway transformation story. To facilitate and channelize this opportunity, ELECRAMA, along with the Indian Railways, has conceptualized RAIL URJA – a dedicated Railway electrification pavilion at ELECRAMA.

The objective of this pavilion is to connect the Railways sector with the electrical industry to drive synergies that are mutually beneficial.

World Contractors Consultants and Channel Partners Congress (W4C)

The conference will feature representatives of global associations -- consultants, contractors, architects, specifiers and PMCs -- to interface with the supplier universe for sharing insights, ideas and challenges that the tomorrow's world requires.

The key agenda areas include: the impact of technology speeding gestation cycles; increased focus on security; integration of IoT; and increasing convergence of utilities.

Surpassing history

Held biennially since 1990 in India, ELECRAMA, in its 12th edition, played host to over 600 buyers from 40 countries, garnering business worth US$400 million over 6000 meetings in a period of 3 days. But the current edition seems to be surpassing it with the kind of overwhelming response the show has already generated.

Lamp lighting ceremony at ELECRAMA-2016

Source: IEEMA

connectwell
THE RIGHT CONNECTION

Coil Actuation
LED Indicator

Easy Legibility
Top Marker

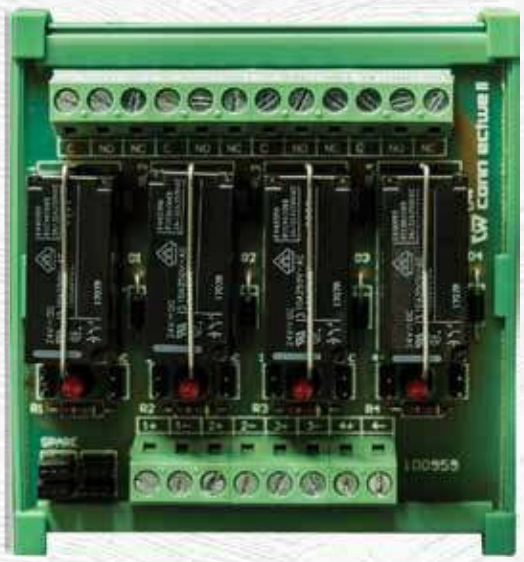
Choice of Pluggable
Solid State or
Electromechanical Relays

Easy Cross Connection
with the use of Plug in
Links at Input or Output

Choice of Screw or
Spring Clamp
Connection

Integrated Input
Protection Circuit

SLIM RELAYS



Space Saving

70%

SLIM

In today's high-tech world it has become inevitable that control panels will progressively reduce in size, forcing us to do a lot more in a lot less space.

Connectwell brings you the right solution to such problems in the form of Slim Relays for switching and control applications. Conventional Relay Modules occupy about 20 mm per channel but with Slim Relays the same can be achieved in just **6 mm**.

This is what we at Connectwell call Sensible Switching ...

CSRxx (Electromechanical) and CSERxx (Solid State) Relay:

	Electro Mechanical Relay	SSR DC In - DC Out	SSR DC In - AC Out
Contact Type	1 CO	1 NO	1 NO
Input Voltages	5 VDC, 24VDC, 12 VUC, 24 VUC, 48-60 VUC,120 VUC, 230 VUC, 230 VAC	24VDC, 24 VUC, 48-60 VUC, 120 VUC, 230 VAC	24VDC, 24 VUC, 48-60 VUC, 120 VUC,230 VAC
Contact Rating	250 VAC / 30 VDC	48 VDC	240 VAC

Come meet us at:

ELECRAMA
we are all about electricity

10th - 14th March 2018
Hall No.: 2, Stall No.: H2J9

CONNECTWELL INDUSTRIES PVT. LTD. | D-7, Phase 2, M.I.D.C., Dombivli - 421 204, India.
Tel.: +91 251 7120 600, 6762 600 | Fax: +91 251 7120 700 | connect@connectwell.com

connectwell.com

Energy Conservation

Charting a roadmap for an electrical future

The Indian power sector today is undergoing an unprecedented transformation, where old practices are giving way to new technologies to ensure a sustainable future. Against this backdrop, the role of ELECRAMA gains immense significance. Here's the industry insiders' take on the event and its contribution in assuring the sector's growth.

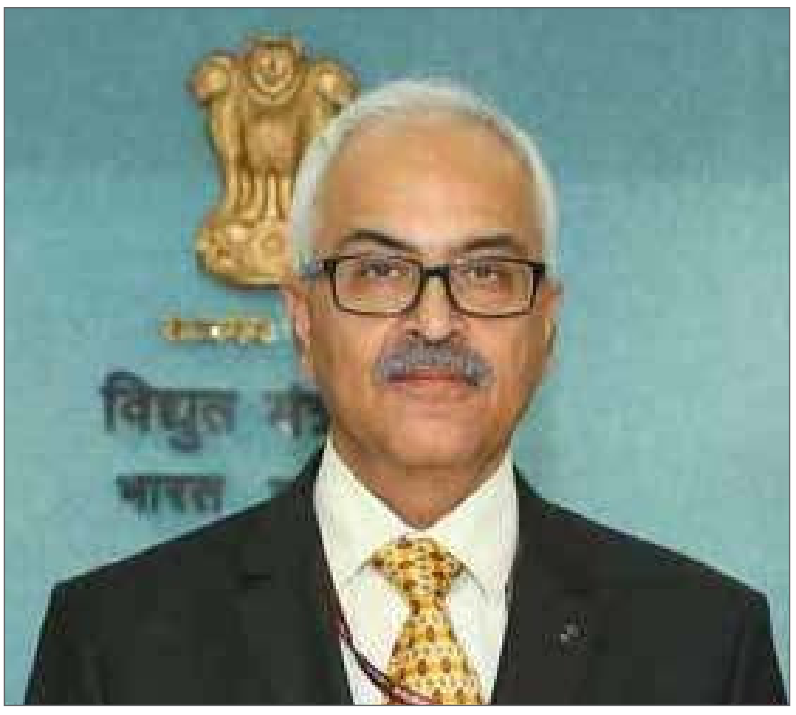
ELECRAMA is the largest exhibition of its kind in electrical, industrial electronics and allied sectors, bringing together manufacturers, traders and users and providing them a platform to deliberate on ways to enhance the competitiveness of the domestic electrical equipment manufacturing industry.

The Electrical Industry has reached an inflection point, where new technologies are going to overpower the current businesses. It is no longer about the Internet, but IoT and IoTT. The experts of the industry will be guiding the insiders as to how they can transform their factories into efficient production units.

ELECRAMA 2018 is a platform where the world of electricity meets the future. I am excited to know that this five-day exhibition will be seeing Power Electronics, Electro-Mobility, Automation and Power Storage as new entrants. The complete digital transformation will bring the exhibitors, stakeholders and visitors not just a platform to share their products, but also provide them with solutions.

I wish the organizers success in their endeavor to bring forth an event of such caliber.

Nitin Gadkari
Union Minister of Road Transport,
Highway & Shipping
Government of India



ELECRAMA brings together the complete spectrum of solutions that powers the planet. Featuring not just equipment and technology, but peerless thought leadership platforms for everything electric – from technical conclaves to industry summits.

It is the largest exhibition of its kind in electrical, industrial electronics and allied sector for convergence of manufacturers, traders and users of the electrical industry providing a platform to deliberate and discuss the roadmap for enhancing the competitiveness of the domestic electrical equipment manufacturing industry.

I am very happy to note that for this edition, the trust is on renewable sources, power storage and smart technologies that will change the paradigm.

I convey my best wishes to the organizers for their sincere efforts and the endeavor for hosting this significant event.

Ajay Bhalla
Secretary, Ministry of Power
Government of India

Welcome to the world of experience!

We present to you a new ELECRAMA that will serve as a window to new technologies, best practices, new systems and potential trends in the future of electricity. It has something to offer to every stakeholder as a takeaway.

The transformed ELECRAMA 2018 redefines the electricity space, renewable energy, energy storage, digitalization of electricity through IoT and AI, and Electric Transportation opportunities.

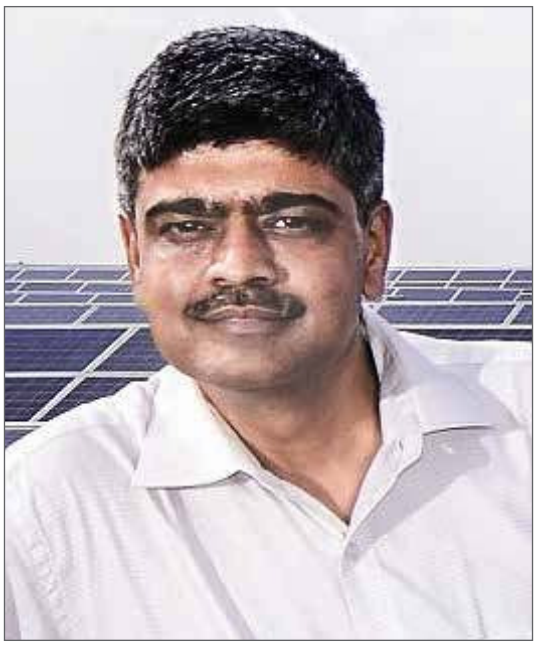
ELECRAMA is all about being relevant. We have been part of the big changes in the industry as well as across the world. Being a part of ELECRAMA implies being a part of the new era of electricity. Through ELECRAMA 2018, we aim to give a new direction and a new meaning to 'electricity'. It is not a mere exhibition, but we promise it to be an experience.

India has a huge potential in terms of absorption of technologies, and with 'Digital India', 'Make In India' and other programs of the Government helping push the industry, we will place India as a leader in this sphere.

ELECRAMA, this time, will undergo a complete digital transformation and will be full of surprises for the visitors, exhibitors, and stakeholders. A fresh and progressive step in the event is the participation of the young generation in this age-old industry through ETechNxt. It is a start-up pavilion being introduced for the first time in association with TIE and NASSCOM.

We are, in equal measure, proud and thankful to the Government of India for its extension of support to ELECRAMA and to Uttar Pradesh for being our Partner State.

Vijay Karia
Chairman
ELECRAMA 2018



Electricorns in Making

Future is Electric. Do we ever notice how Electricity is penetrating our day to day lives. Just think of the number of plug sockets in a room. With the number of devices we need to charge these days, we almost always are in dearth of them. Today, one can have a pure Electric Kitchen replacing even the cooking gas. Thanks to e-mobility for indicating that gas (Petrol/Diesel) used for transportation will also be replaced in the future. The Driverless technology will change not only Auto, but also many industries. Li-Ion storage will lay the path for this disruption, and the convergence of IoT will make it a superhighway. The one single umbrella industry that will benefit is the Electrical Industry. Hence, we should see many 'Electricorns' in the coming decade just as we saw many 'Unicorns' in the last.

This ELECRAMA provides you a complete experience of this changing scenario. Many co-current talks ranging from technical to economical to financial to commercial have been planned.

Vikalp Mundra
Vice Chairman
ELECRAMA 2018

Empowering MSEMs

ELECRAMA's 13th edition will surpass all its previous editions because of its growing coverage of all power and energy sectors and a huge spectrum of stakeholders worldwide. ELECRAMA is providing the platform to our MSME units to reach buyers across the globe, which shall boost their exports owing to the opportunity to interact with more than 650 foreign buyers from 70 countries during RBSM meet at the expo. The event offers them exposure to new technology for them to upgrade their products to world standards. This can aid in enhancing India's share in the export of electrical products across the globe at minimum of 1% to more than 5% by 2025.

The inclusion of conferences like World Utility Summit (WUS) and ETechNxt, during ELECRAMA 2018, aims to provide an open interaction with world market leaders and experts in energy and power on a single platform. In WUS, the CEO and technical directors of more than 100 power utilities are participating, which will lead to an exchange of best practices giving way to various future trends in technology.

ELECRAMA 2018 is a milestone in achieving growth in India's power sector and also a window to the world to showcase its leadership in all forms of energy.

Anil Saboo
Vice Chairman
ELECRAMA 2018

World Utility Summit

World Utility Summit

March 11 – 13, 2018

World Utility Summit (WUS) is a pioneering thought leadership forum, which attempts to set the agenda for the future, actively playing the role of a key enabler for the ecosystem and to develop optimal solutions, technology and products.

Theme:
Utility of Utilities

Today utilities are embracing the smart grid technologies, Internet of things (IoT) and usage of real-time data to enhance their performance. Will the convergence of activities of different types of industries extend to the utilities themselves?

WUS-2018, which is spread over three days from March 11 – 13, 2018, will provide common ground for electricity, water and gas Utility personnel to discuss with Industries, Consultants, Service Providers, Researchers and Regulators and re-define the 'Utility of Utilities' in the changing business environment.

This event is being held concurrent to ELECRAMA 2018, the world's largest electrical transmission and distribution industry exhibition.

eTECHnxt #changethepowergame

ETechNxT

March 10 – 14, 2018

India is rapidly transforming. Aspirations are evolving faster than before. The Electricity domain is getting intertwined with digital/internet tech (including IoT & AI), Industry 4.0, energy storage, transportation, electrification and evolution of next gen consumer behavior. Renewable energy is getting a new boost with massive developments in energy storage. Smart Software-based solutions are enabling optimum usage. And Renewables are increasingly being looked at as vital components in e-transportation charging networks. This is opening up new opportunities for the existing players in the Renewable electricity domain.

A hybrid new-age platform that combines the experiential elements and conversations, ETechNxT features state-of-the-art showcase of products and solutions companies and startups on the cutting edge of technology, supported by high-quality conference with tracks on:

- Digital Transformation of Power Delivery
- Energy Storage Systems & Solutions
- Industrial Internet & IoT Solutions for Industry & Buildings
- Showcase for Electricals & Electronics for Electric Mobility.

eTechNxT as a platform is now formally and actively supported by key partner organisations, namely IEEE, IET, India Energy Storage Alliance (IESA), India Electronics & Semiconductor Association (IESA), NASSCOM IoT CoE, Society of Indian Automobile Manufacturers (SIAM), SMEV & TiE.

This coming together of thought leadership from diverse industry segments onto a unique cross-industry platform is the first of its kind and reaffirms the broader vision of eTechNxT to act as a catalyst for accelerating growth.

CHANGE X CHANGE 2018

ChangeXchange 2018

March 10 – 14, 2018

ChangeXchange 2018 – the 4th Reverse Buyer-Seller Meet at ELECRAMA 2018 is the biggest meeting place of international buyers who plan to source electrical products and equipment from India. It is organized concurrently with ELECRAMA 2018, the premier showcase of Indian electrical sector and world's largest confluence of the power transmission and distribution community. Held biennially since 1990 in India, the 12th edition of ELECRAMA 2016 had 600+ buyers from 40 countries and generated business worth US$400 million over 6000 meetings in a period of 3 days.

The event is being organized by IEEMA which represents the entire Indian electrical and industrial electronics industry. Indian Electrical & Electronics Manufacturers' Association (IEEMA) is the apex industry association of manufacturers of electrical, industrial electronics and allied equipment in India.

ELECRAMA has special hosted buyer packages for buyers from countries of Africa, ASEAN, CIS, SAARC, and the Middle East.

ENGINEER∞ energising india. energising the future

Engineer Infinite

March 11 – 12, 2018

IEEE Delhi Section and IEEE UP Section along with IEEMA, Indian Electrical and Electronics Manufacturers Association are jointly organizing an International Conference, 'ENGINEER INFINITE' on March 11 & 12, 2018, along with ELECRAMA.

The conference will provide an opportunity for researchers, academicians, scientists and professional engineers to present their work, publish their results, exchange ideas and network for scientific and industrial collaborations in an international forum.

The prime objective of this international conference is to connect the electrical and electronics industries to research and bring new technologies and products to markets that are "NxT"

The theme of the conference is 'Showcase of Technology Next' which is focused on the following four tracks:

- Power Electronics & Digital Transformation of Power Delivery
- Energy Storage Systems and Solutions
- IoT, AI and Electricity
- e-Transportation

ELECRAMA Startup Awards 2018:
A boost to young companies

ELECRAMA has created eTechNxt, which, among other things, will be a pathfinder for the electrical and electronics industry in India. eTechNxT @ ELECRAMA 2018 presents the Start Up awards for the most disruptive and potentially game changing start-ups in the ecosystem that directly impact the electrical and electronics sector.

It has selected a prestigious Grand Jury comprising Anil Sardana, CEO and MD, Tata Power; Ashish Chauhan, CEO, Bombay Stock Exchange; Deepak Premnarayen, Chairman, ICS Group; Nishith Desai, Founder, Nishith Desai and Associates; and TV Ramachandran, President, India Broad Band Forum.

Process of curation

The process of curation for the final entries to be presented to the Grand Jury by the IET is envisaged in the following steps, as follows:

Nomination criteria: Companies being nominated for the awards must be early stage companies. Some criteria they need to have worked out are: Completed Proof of Concept; rolled out a minimum viable product; achieved indicative traction as proof of market acceptability; and in some cases, as companies being nominated may have significant hardware and developmental pieces to their businesses, discretionary nominations may be made for companies with only Proof of Concept.

Companies being nominated must be active on the edge of the grid. Here is what they should have achieved:

- Must be contributing directly to the energy sector or the engineering sector
- They must have significant energy relationship by way of conservation, stop loss or efficiency
- Companies should be active in the eMobility sector either by way of vehicles or infrastructure or energy storage
- Must have a significant engineering component by way of integrated IoT hardware
- Must be active in the areas of cleantech or natural resource conservation
- Must have prospects as well as intentions of high social impact with significant role for IoT, hardware and engineered products viz. HealthTech.

Nominations are being sought from entities affiliated to IEEMA and the ELECRAMA exhibition as well as by national bodies active in the startup space that have the pedigree, the penetration and the experience to discover, evaluate and nominate such entries.

Nominations are primarily invited from The Indus Entrepreneur – Bengaluru Chapter, NASSCOM, STARTup Community, and Siemens.

Submission of nominations

Associate bodies are requested to submit nominations with complete contact details and relevant commentary on what brings the nominated company past the nomination threshold.

The nominated companies are requested to submit details of their products and businesses to the curation committee through the respective nominating agencies.

The basic minimum information sought includes:

- A business deck – describing the company, the product, the team, the journey and the projected future path.
- A business plan detailing stage of business, business conducted so far, business visibility and a plan for business over the coming 2-3 years with supporting facts.
- An executive summary.

Evaluation process

The complete submissions once received are evaluated by the Curation team for the level of information completeness before being shared with the evaluators. In case information is found to be lacking in detail, requests are raised with the nominating agency for more information. Assessment of shared material is usually followed – where possible – with a telephonic interaction with the founding team and the assigned point of contact with the founders. Where deemed required, it is envisaged that the curation team may even conduct physical interviews on-site with nominated teams. However, given the short timelines and the complexity of logistics, it may not be possible for the curation team to conduct personal interviews in this edition of the awards.

Assessment

The assessment formula for shared material – evaluation on two main criteria with equal weightage assigned to each are as follows:

Business: Assessed on the following criteria with equal weightage assigned to each, as factors for potential success:

- Relevance – to the criteria enumerated above (Companies being nominated must be active on the edge of the grid).
- Viability – as a business within the operating paradigm in terms of both technology application as well as business use case.
- Credibility – of the founding team, the advisory support team and the business itself.
- Scalability – both from the technical and the business perspective.
- Global application – not just India centric, but the business must have the capability to operate in the global paradigm.

Potential impact: Since Impact is a main concern for the awards, potential impact is assigned weight equivalent to all the five criteria chosen under business evaluation.

And last, points scored by the assessed teams will be totaled and teams with the highest total will be presented to the Grand Jury for final deliberation.

Award Winners

Winner: Artem
First Runnerup: Altigreen
Second Runnerup: EcoMitram
Impact Award: Cygen Healthcare
Popular Choice Award: Automation of Things

Energy Conservation

Larsen & Toubro
www.lntebg.com
Hall & Stall: H2 / A-7

L&T's Ti Panel: A Smart Solution for Energy Management and Distribution System

At any large installation like IT parks, airports, data centres and high-end infra buildings, the energy cost often contributes to as much as 60 percent of the total operating cost. This puts the onus on switchboard manufacturers to continuously innovate design panels with energy saving features.

In a tropical country like India where most of the regions experience high ambient temperature along with heat and dust, there is a need for designing panels where heat losses in busbars are minimized, and the system runs cooler as well as saves energy. This will also help in prolonging the life of panels.

As a manufacturer of repute for Low Voltage (LV) Switchboards, L&T Electrical & Automation has set new standards of reliability, quality, service and convenience in low-voltage power distribution. A culmination of experience and expertise, these world-class switch-boards are designed to suit a wide range of applications.

Source: Larsen & Toubro

Ti range of LV Switchboards

The Ti range of LV Switchboards is designed to perform all important functions of power distribution, protection of equipment and control of processes. The Ti range is a design-verified product complying with the latest IEC 61439 standards with aluminum and copper busbars.

L&T's range of Ti panels has a unique double deck main busbar arrangement that helps in the reduction of heat losses by minimizing proximity and skin effects due to eddy current and, thereby, saves a lot of energy in comparison with the conventional system.

Uninterrupted and smooth operations in an industry largely depend on the performance of these switchboards. Besides reliability and quality, safety in operation forms a major concern while designing switchboards. This demands innovative and cost-effective measures in designing and manufacturing LV Switchboards.

The smart and communicating Ti Switchboard offers an Ethernet TCP / IP connection to link with the local area network (LAN) of communication installed in the building and a simple communication architecture to deliver the following:

- Online energy consumption monitoring (Cloud connectivity)
- Real-time access to energy consumption, energy quality, network status and a simple control of devices through local communicating interfaces
- Data collection and transmit CSV file to FTP server.

The smart panel is a combination of hardware and software devices for protection, control and energy management. It is configurable, user-friendly and capable of communicating power system values and data via Ethernet communication and other devices. The smart panel encompasses a variety of devices and equipment for power distribution, protection and process control, monitoring and communication etc.

Conclusion

At L&T Electrical & Automation, it is believed that specifications and standards do not ensure customer delight. It is essential that a Switchboard manufacturer contributes his experience to device and implement good engineering practices which lead to a more reliable, safe and easy to maintain Switchboard. This alone will give the customer a pleasant surprise when he starts using the Ti Switchboard.

More from L&T's stable

Capacitor

L&T's super heavy duty capacitor is designed and developed to meet reactive power requirements of modern day industries having higher harmonics. These metalized polypropylene capacitors range from 3-33 kVAr with cylindrical type construction. They can withstand peak inrush current of 350 times the rated and overload withstand capacity of 2.5 times the rated current. They have better harmonic withstand capability and long life with necessary safety features like over pressure dis-connector and self-healing technology.

Soft Starter

EMX3 series soft starters come with a total motor starting solution, combining high-level of functionality with flexibility and ease of use. For advanced applications, an extensive range of functions makes the EMX3 suitable for nearly all motor starting and control requirements. It has the following features:

- Advanced soft start and soft stop control
- Protection functions operate even when bypassed
- External input/output for remote management
- Fully programmable auto start and auto stop
- LCD display for programming and monitoring.

iMMR Relay

This is Intelligent Motor Control Centre (IMCC) Relay, designed as a reliable building block for low voltage, contactor-controlled motor starter feeders in switchgear assemblies. With the ability to quickly gather, organize and analyse information from operations, the smart iMMR Relay allows to:

- Maximize your asset availability and reduce downtime
- Enable an energy management strategy
- Protect your personnel and assets
- Further benefits can be gained from wide communication capabilities that include Modbus RTU, Profibus

L&T Switchgear

Soft Starter

TSx2000 provides protection against harsh environmental conditions by restricting entry of foreign substances such as fine dust and high-pressure water spray.

It satisfies IEC 60529 standard IP66 Drive and NEMA standard type 4X for indoor use. It comes in the range of 0.75kW to 22kW. Its features include:

- Built-in Dis-connector Switch V/F, Sensorless Vector Control, Slip compensation
- Starting Torque: 150% at 3 Hz for V/F, 200% at 0.5Hz for Vector Control
- Conformal Coating complying to IEC 60721-3-3 class 3C2
- Built-in RS485 Modbus
- Peer to Peer Communication to share I/Os
- In-built PLC functionality

Multifunction Meters (MFM) – 5000 Series

- Datalog (8 MB)
- Bi-directional (Import - Export)
- 128 samples/ cycle
- Analog I/O, digital I/O variants available
- Meter with Ethernet port available

Parameters:

- V, A, F, kW, KVA, kVAr, kWh, kVAh, kVArh, PF, Runhr, Onhr, Interrupts, Phase angle, THD, Neutral current, Max Demand (with RTC)
- Events (high-low) with time stamp
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Switchgears & Busbars

Powered up

C&S Electric's offerings at ELECRAMA can boggle the mind of any visitor.

ELECRAMA 2018 is indeed attracting some of the leading companies in the power sector. The government's focus on transmission and distribution is changing the landscape of products catering to the power sector as larger projects are set to be awarded. Importantly, companies that hitherto focused on exports are also vying to be a part of ELECRAMA. C&S Electric Ltd, a leading electrical and electronic equipment manufacture, is India's largest exporter of industrial switchgear & power busbar products. Its products are used in applications ranging from power generation, transmission and distribution, protection and final consumption.

C&S Electric has the following business verticals: low voltage switchgear, medium voltage switchgears, power busbars, LED lighting, solar EPC, and DG sets.

Equipment galore

When you have been operating in the market since 1966 and have offered impeccable service, you are bound to be a recognized and respected brand the world over. With over 600 stockists, C&S Electric sells in over 85 countries. Footprints around the world include an acquisition of a Dutch busbar company 'Etacom', a market leader in the field of cast-resin enclosed busbars in 2011. This made the company a leading busbar company in the world. It also has a plant in China, which after obtaining CCC approval of its switchgear range of products, has begun sales in the local Chinese markets.

Such moves prompted the company to increase the headcount and today, C&S Electric employs over 4,000 people including 400 engineers, and has 17 state-of-the-art manufacturing plants in India, China and Belgium.

But it is not sitting on its laurels. The company plans to launch a number of products in LV & MV Switchgear segments and LED Flood Light Products.

LV Switchgear: In LV Switchgear, C&S Electric is launching its new range of ACBs with a current range of 630A~2500A with microprocessor-based thermal, short time, instantaneous and ground fault protection features. The product finds application in process industries, steel mills, cement industries, power plants, NTPC, electricity boards, smart cities and power distribution. The company is also introducing 3P & 4P Winbreak1 MCCB Series in the range of 16A~125A. The product range finds its target markets in power distribution, electricity boards, residential and commercial buildings.

Power Contactors: Along with ACBs & MCCBs, C&S Electric is displaying the Power Contactors in rating from 1250A to 2600A, AC1 ratings. The light-weight, compact design contactors are UL approved and come with high mechanical and electrical life. The Power Contactors are available with AC DC coil and can operate up to 1000V rated voltage without derating. The product finds applications in wind energy panels and solar panels up to 2.8 MW.

DOL and Star Delta Starters: Then there is the launch of DOL and Star delta starters (up to 12.5HP) motors with smart electronic controller for submersible pump applications. The starters can be operated through remote location by mobile phone using SMS, missed call, IVRS and manual options. The starters provide protection against under- and over-voltage, overloading, single phasing, phase imbalance, locked rotor, dry run, etc. It has function of metering and monitoring of phase voltage, phase current, system power factor and active energy etc. and communicating features through GSM and GPRS.

Self-Powered Relay for RMU: In protection and measurement devices range, the company is launching its self-powered relay for RMU. The self-powered relay will be equipped with features of working at low load currents of 5 percent. Working at such low load currents is challenging and this makes the product unique to offer in the global market. It will have disturbance recording /event recording features with advance communications like IEC-103. Self-powered relay will go to RMU manufacturers across the globe.

The mainstay of power

C&S Electric believes that vendors must offer a range that will attract exhibitors to come to their stall. It is for this reason that the company in MV switchgear is focusing on solutions for the power distribution network which are smart, automation-ready and meeting local utility conditions.

Ring Main Unit: The company is exhibiting Ring Main Unit (RMU) which is a passive device, integrated with an intelligent FRTU and modem to make it ready for DMS (Distribution Management System). Target markets for these are private and public DISCOMs operating in urban areas and especially in Smart City projects. The RMU is a factory-built and tested solution of RMU, FRTU and modem to site, thus making it easier for utilities to install and commission, eliminating integration issues that arise out of multiple vendors. This will help utilities in quick identification and isolation of faults in the network, thus improving reliability and availability of power.

Floodlight Series Orion-H: Then there is the lighting that forms an integral part of C&S Electric. It is launching a new floodlight series Orion-H. The super high wattage LED comes with super throw and finds application in high masts and towers, ports and jetties, airports, inland ports, container yards, silo and storage yards, sports stadium, architectural façade, and any areas with restricted, mounting and long throw requirements. With New Orion-H series, the company aims to provide LED retrofit solution for existing conventional 2x400W, 1000W, 2000W MH/HPSV floodlights with heavy maintenance, non-availability of spares & heavy electricity bills.

MB Series: In Power Busbars, C&S Electric is introducing Track Busways - MB Series, and Metabar from 250A to 400A. Its unique open channel system allows plug-in boxes to be placed anywhere along the length of system. The plug-ins are provided with interlock feature that ensure polarities do not mismatch. It is equipped with inbuilt internal earth bar. With MB Series, C&S Electric aims to introduce a unique solution to get rid of complex laying of multiple wires and renders the flexibility of connecting plug-in at any desired location on busway, matching to equipment location.

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Terminal Blocks and Connectors

Wire Connection Technology for Control Panels

An insight into Terminal Blocks and Connectors that help us understand their value in the electrical energy.

Terminal Blocks and Connectors are to the electrical industry what fasteners are to the mechanical industry as a whole. Terminal Blocks by definition provide a safe, efficient and reliable way to connect, disconnect and test various connections in control panels. An electrical system no matter how advanced, will be only as reliable as its each connection and here is exactly where Quality Terminal Blocks matter.

Terminal Blocks can be classified based on their insulation materials or based on their wire connection technology and lastly based on their specific function.

Some examples of classification of Terminal Blocks based on the above three criteria are shown below:

Based on Insulation Material	Based on Connection Technology	Based on Functions
Melamine	Stud / Lug Type	Simple Feed Through
Polyamide	Screw Clamp	Multiple Connection
Ceramic	Spring Clamp	Distribution
	Push In Spring Type	Electronic Indication
		Fuse Type
		Earth / Grounding Type
		Disconnect & Test

Evolution of Terminal Blocks:

Drivers for the evolution of Terminal Blocks have been:

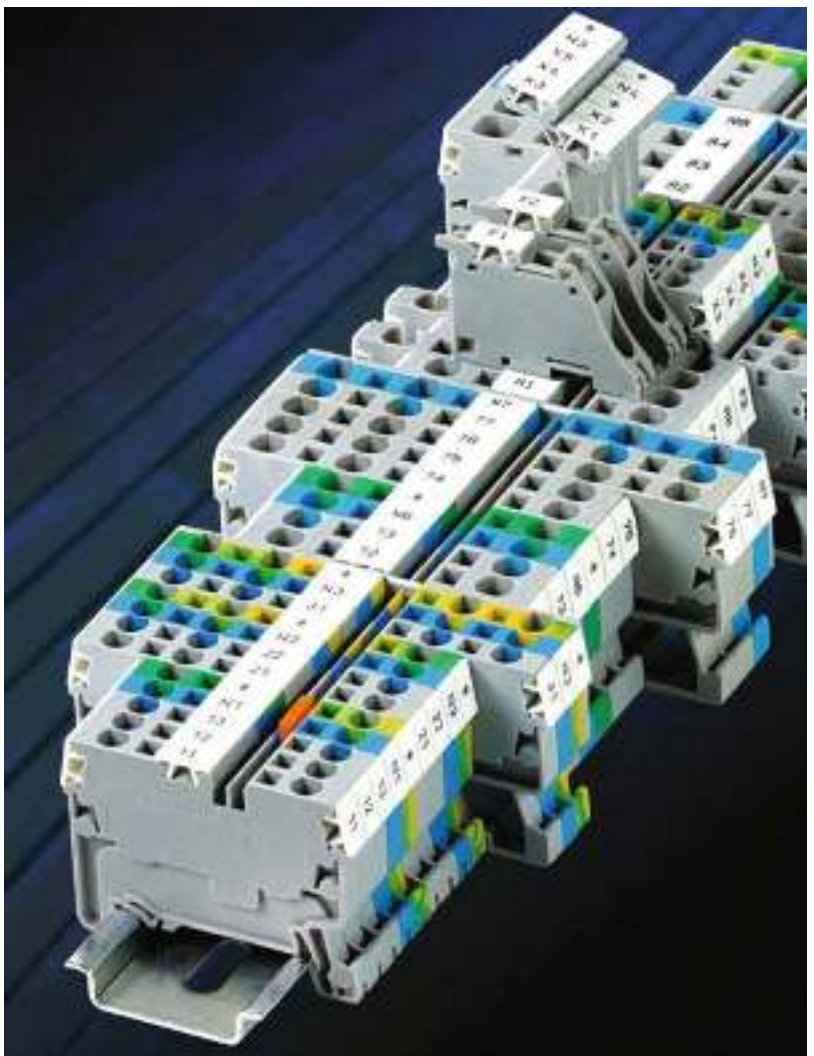
- Life and reliability of product in field
- Speed of creating connections
- Space constraints in control panels
- Complexity in connection requirements of electrical apparatus
- Need for reduction in components and spares carried

Evolved needs of human and apparatus safety

A Terminal Block or any generic Connector consists largely of three areas that manufacturers tend to focus on: the Insulation Part, the Conducting Part and the Wire Clamping Part. It is exactly in these areas by means of changes in materials, design and manufacturing processes that Terminal blocks have evolved.

A few good examples of how Terminal Blocks and Accessories have evolved in response to impetuses from the market are:

High Density Connections to save Control Panel Space: Terminal Blocks are now designed to have multiple levels often with cross connection to enable a very high wiring density. There are some Terminal Blocks which have as many as Eight Feed through levels which do not even look like conventional DIN Terminal Blocks.



Source: Connectwell Industries Pvt Ltd

Single Terminal Block with multiple functions: The modern electrical wiring often requires functions like Safety, Connection and Disconnection all built into a single connection point. This has given rise to Terminal Blocks which incorporate functions such as Feed Through, Disconnect & Test, Earth and Fuse into a single Terminal Block and allows for complex and dense electrical wiring.

Reduction in wiring time of Control Panels while ensuring reliability: With the constant need to become more efficient and save on costs, the control panel manufacturers are always on the look out to optimize their labor costs by reducing time lost in wire termination. Push-In type Terminal Blocks, which do not require a screw driver or tool for insertion of wires into Terminal Blocks, have evolved in response to this exact need. Using these, Control Panel manufacturers have witnessed substantial reduction in wire termination time while ensuring that reliability of the connection is maintained.

Reduction in Customer Inventory: Common Cross Connecting Accessories, which can be configured for the number of poles of connection and can be used across Terminal Blocks of various types, have evolved in response to the need from customers to reduce their inventory levels for accessories of Terminal Blocks.

Increased Safety in Connections: Terminal Blocks are now increasingly designed with higher safety levels and also higher electrical ratings to ensure protection of the electrical systems where they are utilized while also providing safety to human beings involved in wiring and maintenance of Control Panels.

Also Terminal Blocks now have the provision for accommodating various accessories designed for increasing safety levels which include:

Additional Safety Indication Accessories, built to advertise risks.

Accessories to clearly polarize Terminal Blocks to prevent wrong connections.

Accessories to physically separate groups of Terminal Blocks to prevent wrong wiring.

Additional points to mark Terminal Blocks at various angles to ensure correct wiring.

Standards Guide Quality, while Technology Enables Lower Costs

Terminal Block Design and Development is mainly driven by standards to ensure quality performance, safety and universal acceptance of products. Standards from UL and IEC are utilized for design and development, while third party approvals like UL, CSA, VDE, CE, ATEX etc. from reputed organizations ensure that manufacturers adhere to the standards.

However, in these tough times, where every Industry demands lower cost from all component suppliers, high volume products like Terminal Blocks witness the maximum pressure.

To meet these expectations of customers towards lower costs while not compromising on quality, Terminal Block Manufacturing has become an extremely high technology process which has ensured repeatability of quality of products over millions of pieces, and hence ensuring overall lower costs.

Design and Development, for example, keeps evolving and becoming a leaner process with stringent focus on parameters like time to market. The entire development process today is aided by various software, which includes not just conventional CAD – CAM, but also more advanced tools like FEA, Simulations, Prototyping using 3D Printing etc. With little room for error, optimization of PLM cycles has also become a constant endeavour.

Manufacturing now is heavily aided by technology to ensure consistent high-quality, high-volume, high-speed manufacturing. Best in class Plastic and Metal Processing Machines and SPMs are no longer a luxury, but a necessity to meet the above stringent goals. Even functions like Product Assembly – no matter how simple – cannot be carried out manually, and, in fact, require High Speed Assembly Lines which also Test every single product for Performance Consistency while they get assembled.

Times of Specialization and Value Adds

As Control Panel Manufacturing becomes more and more competitive with stringent focus on Costs and Turnaround Times, it is no longer adequate for Control Panel builders to merely focus on Component Costs alone.

As a step in this direction, Terminal Block Manufacturers and other component manufacturers have been providing Custom-Built Assemblies to Control Panel builders which helps them save on: Labor costs, Inventory costs, Cost of Error

Most importantly when Control Panel builders source custom assemblies, they become free to focus on their own product and build more complex and better Value Added Control Panels.

Keep your electricity flowing & business growing

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