

Since 1961

Electrical India

ISSN 0972-3277

India's oldest magazine on power and electrical products industry



Electrical India
Ranked Among
World's Top
100 Publications
in "The Future
of Energy"

**Illuminating Towards
Bright Future**

**Challenges for MV Cable
Distribution Systems**

Underground Cable:
Technological Development
& Market Opportunities

Smart Lighting:
Opportunities & Challenges



Industry-proven Power Quality Solutions

From the switchgear company that **India trusts.**



Capacitor Duty Contactor



Power Capacitor



Thyristor Switching Module



APFC Controller



Active Harmonic Filter



Detuned Harmonic Filter

L&T Electrical & Automation, India's leading switchgear solutions company provides Power Quality management solutions that help industrial and infrastructural installations operate more efficiently.

The L&T PQS advantage:

- **Flexible options:** Widest range of capacitors for every need, with the latest addition of LTXL UltraHeavy duty capacitor in Cylindrical type
- **Optimized range:** Wide range of Capacitor Duty Contactors matching the corresponding capacitor rating to avoid oversizing of contactors
- **Fast capacitor switching** through reliable and compact Thyristor Switching Modules
- **Automatic, smart and optimized power factor control** through modular APFC controllers
- **Consistent power factor management alongwith operator safety** through type tested, customized panel solutions
- **Safeguard equipment** from harmonics related problems through Detuned Harmonic Filters and Active Harmonic Filters.

Customer Interaction Centre (CIC)

BSNL/MTNL (Toll free): 1800 233 5858 Reliance (Toll free): 1800 200 5858
Tel: +91 22 6774 5858 Email: cic@Lntebg.com



L&T Electrical & Automation

Regd. Office: Larsen & Toubro Limited, L&T House, N. M. Marg, Ballard Estate, Mumbai - 400 001, INDIA CIN: L99999MH1946PLC004768

Scan the code to know more about our solutions for harmonic mitigation and their benefits



The Changeover Specialist

Features

- 1.5A - 1600A
- Manual / Automatic
- Modular / Panel mounted version

Comprehensive range of changeover solutions.



SPN ACCLs



TPN ACCLs



Modular changeover switches



Automatic transfer switches (ATS)



Manual changeover switches (MCOS)



MCOS with enclosures

Hager Electro Private Limited
Office No. 504, Pentagon P 1, Magarpatta City,
Hadapsar, Pune-411013 India
Tel: +91 20 41477500 Fax: +91 20 41477510
Toll free no.: 1800 103 5440
Email: hagerwow@hager.co.in
hager.co.in

hager



German Quality



Hello and welcome once again to *Electrical India*.

It was a major historic moment for the Narendra Modi-led government as all Indian villages now have been brought on the power map of the country, thus achieving the commitment of electrifying all Indian villages. Leisang village in the Senapati district of Manipur was the last village to be electrified. While taking a note of the development, PM Narendra Modi tweeted, "28th April 2018 will be remembered as a historic day in the development journey of India. We fulfilled a commitment due to which the lives of

several Indians will be transformed forever! I am delighted that every single village of India now has access to electricity."

The plan of rural electrification included connecting more than 18,000 villages by the April-18. Government data shows that all of India's 597,464 census villages have been electrified. Notably, after the Narendra Modi-led government assumed charge in 2014, there were 18,452 un-electrified census villages. There were various challenges too, as it was found that an additional 1275 villages also didn't have electricity access.

However, a Bloomberg report states that almost 32 million homes are still left in the dark as according to Central Electricity Authority (CEA), a village is now considered electrified only if the Gram Panchayat certifies that the basic infrastructure has been provided to the inhabited area, including Dalit hamlets, and 10 percent of the households are electrified. Though all villages are electrified, only 8 percent of the newly electrified villages have full electricity connections. That means, 92 percent of the houses in the electrified villages have no power.

Even though the villages are electrified; the quality of supply is still an issue. In this context, International Energy Agency says, "In the broader context, any electrification plan, especially for poor people, needs to be sustainable and needs to be affordable for both households and governments."

We look forward to receiving your comments and suggestions and I hope you enjoy reading this issue as much as we have in bringing this to you. Do send me an email at miyer@charypublications.in

Mahadevan

Publisher & Editor-In-Chief

Vol 58. Issue No. 5 • May 2018

Directors

Pravita Iyer
Mahadevan Iyer

Publisher & Editor-In-Chief

Mahadevan Iyer
miyer@charypublications.in

Editorial Department

Associate Editor

Supriya Oundhakar
editorial@charypublications.in

Sub Editor

Dhanya Nagasundaram
edit@charypublications.in

Editorial Co-ordinator

Nafisa Kaisar
nafisa@charypublications.in

Advertising Department

Director Advertisement

Pravita Iyer
pravita@charypublications.in

Advertising Manager

Yasmeen Kazi
yasmeen@electricalindia.in

Advertising Executive

Nafisa Khan
adv@electricalindia.in

Design

Nilesh Nimkar
charydesign@charypublications.in

Subscription Department

Priyanka Alugade
sub@charypublications.in

Accounts Department

Dattakumar Barge
accounts@charypublications.in

Sonali Pugaonkar

mktg@charypublications.in

Digital Department

Ronak Parekh

dgmarketing@charypublications.in

Chary Publications Pvt. Ltd.

906, The Corporate Park, Plot 14 & 15,
Sector 18, Vashi, Navi Mumbai 400703
Phone: 022 2777 7170 / 71

Single Issue: ₹ 100 / Annual Subscription: ₹ 1000

Disclaimer

Electrical India does not take responsibility for claims made by advertisers relating to ownership, patents, and use of trademarks, copyrights and such other rights. While all efforts have been made to ensure the accuracy of the information in this magazine, opinions expressed and images are those of the authors, and do not necessarily reflect the views/ collection of the owner, publisher, editor or the editorial team. Electrical India shall not be held responsible/ liable for any consequences; in the event, such claims are found - not to be true. All objections, disputes, differences, claims & proceedings are subject to Mumbai jurisdiction only.

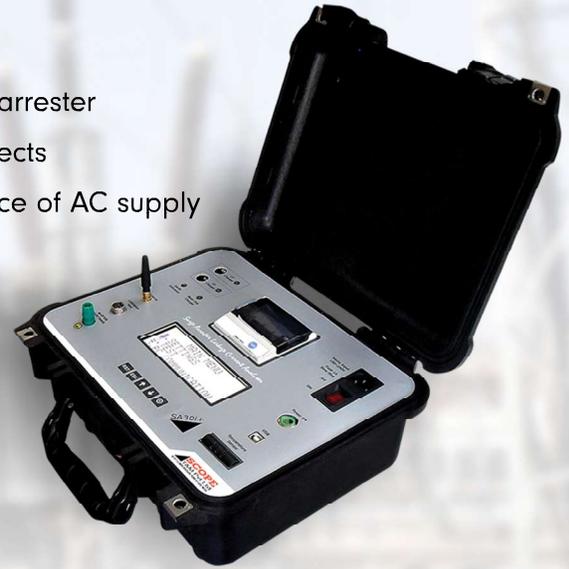
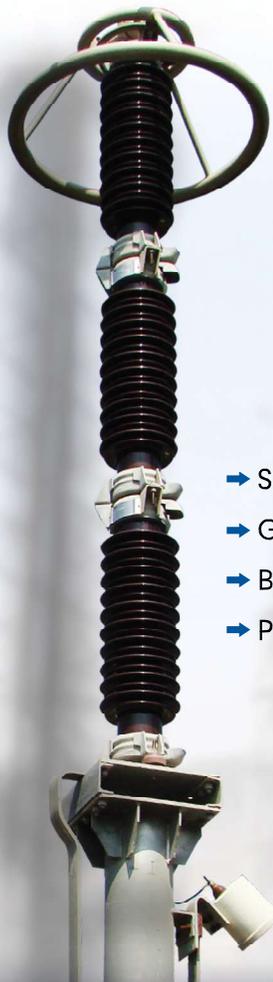
Printed, Published and owned by Mahadevan Iyer from 906, The Corporate Park, Plot 14 & 15, Sector 18, Vashi, Navi Mumbai 400703 and Printed at Print Tech., C-18, Royal Indl Estate, Naigaum Cross Road, Wadala, Mumbai - 400 031. Editor: Mahadevan Iyer



SCOPE

"Best Product Award" in Overall Category at ELECRAMA 2016 for Wireless Leakage Current Analyser... ...SA 30i+

- ➔ Simple tool to assess the residual life of lightning arrester
- ➔ Get early warning of LA failure and cascading effects
- ➔ Battery operation enables measurement in absence of AC supply
- ➔ Proven in EHV switchyards of upto 1200 kV



Now 100 and 200 Amps are portable enough to measure micro-ohms quickly & reliably in EHV Switchyards... ... directly on CRM

- ➔ For Circuit Breaker Contacts, Isolaters & Busbars under live switchyard conditions of upto 765kV
- ➔ Measures micro-ohmic values at 100A/200A DC injection
- ➔ Battery operated, in a rugged IP67 Class moulded case
- ➔ Direct display of micro-ohm value



Corporate Office

402, Aarus Chambers, Annex 'A' S.S.Amrutwar Marg, Worli Mumbai 400013 India

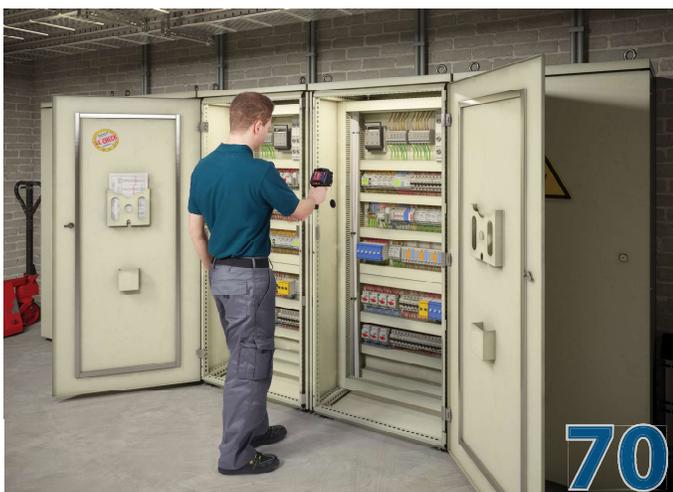
Ph +91-22-4344 4244 Fax +91-22-4344 4242 email: marketing@scopetnm.com Website: www.scopetnm.com

contents

Vol. 58 | No. 5 | May 2018

ARTICLES

- 26** Illuminating Towards Bright Future
– Supriya Oundhakar
- 38** Underground Cable: Technological Development & Market Opportunities
– Ashok Upadhyay
- 50** Smart Lighting: Opportunities & Challenges
– Dr S S Verma
- 60** Challenges for MV Cable Distribution Systems
– Ashok Saigal



FEATURES

- igus Plain Bearings in Roller Chain..... 34
- ABB Launches World's Fastest e-vehicle Charger.... 46
- Practical Tips for Thermography in Preventive Maintenance 70

INTERVIEWS



“We find applications in all stages of value chain of power”

68

Lohit Shringi

Global Market Director, Energy Solutions, Safety & Construction, DuPont



DEPARTMENTS

- Publisher's Letter 04
- News..... 08
- Appointments 20
- Awards 22
- Market Watch 24
- Statistics..... 72
- Product Avenue 76
- Index to Advertisers..... 80

Solutions that fuel progress



Robust electrical and automation systems are the backbone of economic growth and social progress. Your industrial unit must be safeguarded against inconvenient, unwanted breakdowns, while maintaining productivity and efficiency of a high order. This can be done through monitoring, modernisation and upgrade.

Larsen & Toubro offers a comprehensive modernisation and upgrade plan for your electrical and automation system. It includes monitoring and system study to improve power quality, foster better energy management, enhance system reliability and augment safety. L&T also implements the initiatives recommended, and can undertake retrofit and upgrade of critical equipment with minimum shutdown time and at optimum cost.

To modernise your system and maximise your productivity, contact us today.

Customer Interaction Centre (CIC)

BSNL/MTNL (Toll free): 1800 233 5858

Reliance (Toll free): 1800 200 5858 Tel: +91 22 6774 5858

E-mail: cic@Lntebg.com www.Lntebg.com



BHEL commissions 330 MW Kishanganga HEP in J&K

With the commissioning of the third 110 MW hydro generating unit, Bharat Heavy Electricals Limited (BHEL) has successfully commissioned the prestigious 330 MW Kishanganga Hydro-Electric Project (HEP) in Jammu & Kashmir (J&K). The first and second units of the project were also recently commissioned in the month of March, 2018. Notably, all the three units of Kishanganga HEP have been commissioned within a short span of 18 days.

Being developed by NHPC Ltd., the project is located on the river Kishanganga, a tributary of the river Jhelum, in Bandipora district of J&K. The 3x110

MW Kishanganga HEP will be able to generate 1,350 Million Units (MU) of clean electricity annually, facilitating reduction of greenhouse emissions.

BHEL was entrusted with execution of the Electro-Mechanical (E&M) package for the project comprising design, manufacture, supply, installation and commissioning of Vertical Shaft Pelton Turbines and matching synchronous Generators, Controls & Monitoring (SCADA) System along with electrical and mechanical auxiliaries. The equipment was supplied from BHEL's manufacturing units at Bhopal, Jhansi, Rudrapur and Bengaluru. 

GAIL's first Chartered LNG Vessel arrives at Dabhol

India's first LNG Cargo from USA under long term contract of GAIL (India) Limited was received at Dabhol. This marks a new beginning in the Indo-USA energy partnership and trade. Commencement of LNG supplies under the Henry Hub indexed contracts is significant for GAIL and the Indian markets as well. GAIL's first charter hired vessel - MV

Meridian Spirit, arrived after 25 days voyage and docked for unloading in the august presence of Dharmendra Pradhan, Hon'ble Union Minister



Hon'ble Minister, P&NG, receives India's first US LNG cargo

Petroleum & Natural Gas and Skill Development & Entrepreneurship. Patrick Santillo, Minister Counselor for Commercial Affairs, US Embassy and B C Tripathi, CMD, GAIL were also present on this momentous occasion.

Dharmendra Pradhan said that the government was working towards making India a gas based economy.

He added that the arrival of the first

LNG cargo from US was a significant milestone in the direction of realising adequate availability of natural gas through imports from diversified sources. 

Wind Industry to cross 60 GW, ahead of its 2022 target

Indian Wind Turbine Manufacturers Association (IWTMA) revealed that the Indian Wind industry will meet Government's target of 60 GW ahead of 2022 deadline.

The domestic wind market is on a growth path in the competitive bidding regime and there is an increased demand for clean energy, which has now become a reliable, affordable and mainstream source of energy. The industry has regained momentum and there is a clear business visibility of 10 - 12 GW even before the start of this financial year with announcement and plan of bids by Ministry of New



Tulsi Tanti

and Renewable Energy (MNRE).

Tulsi Tanti, Chairman, IWTMA, said, "In FY18, the wind industry witnessed a transition from the Feed-in-Tariff (FiT) to the competitive bidding regime; hence there was a temporary drop in volumes. The industry is now on a growth trajectory with a healthy order pipeline, owing to auctions by Solar Energy Corporation of India (SECI) I, II, III, IV (6,050 MW) and state level bids in Tamil Nadu, Gujarat and Maharashtra (1500 MW). With SECI IV, V and NTPC bids coming up, another 4 GW is expected to be auctioned in this month." 

HIGH QUALITY FOR YOUR MACHINERY



MGM brake motor main features

- TEFC 3-ph asynchronous brake motor (0.09kW-130kW)
- AC 3-ph brake (no rectifier) or DC brake on request
- Oversized brake disc for higher brake torque, longer life and reduced maintenance
- Fine and easy brake torque adjustment (as standard)
- Very quick brake reaction time
- Frequent START/STOP cycle applications
- Manual brake release (as standard)
- Hexagonal hole on non drive end of the shaft for manual rotation
- Single speed or two speeds motors
- All motors designed for inverter duty



VARVEL production lines

- RS-RT worm gearboxes: 28 to 150 mm centres. One stage worm, helical/worm and double worm.
- RD helical gearboxes: 50 to 2300 Nm. Two and three stages.
- RN parallel shaft gearboxes: 180 to 3300 Nm. Two and three stages.
- RO-RV bevel/helical gearboxes: 180 to 3300 Nm. Three stages.
- RG precision planetary gearboxes: 10 to 230 Nm. One and two stages.
- VR dry friction speed variators: IEC63 to IEC90 1 to 5 stepless speed range, 300 to 1500 rpm.
- VS planetary speed variators: IEC71 to IEC112 1 to 5 stepless speed range, 200 to 1000 rpm.



A new generation of electric motors and gearboxes for power transmission quality from the alliance of two dynamic italian companies. For those who want quality.

MGM-VARVEL Power Transmission Pvt Ltd

Ware House No. G3 and G4 • Ground Floor • Indus Valley's Logistic Park • Unit 3 • Mel Ayanambakkam • Vellala Street
Chennai - 600 095 • Tamil Nadu, INDIA • Phone: +91 44 64627008 • info@mgmvarvelindia.com • www.mgmvarvelindia.com

REGIONAL OFFICE: KOHLI TOWERS • 4th Floor, Dapodi • Near Bharat Petrol Pump • Pune - 411012



NSB honours Meritorious Students at its Second Convocation

NTPC School of Business (NSB), held its Second Annual Convocation today to celebrate and honour students of Post Graduate Diploma in Management (Executive) who are all set to contribute to the corporate world. Prof Errol D'souza, Director IIMA, Chief Guest on the occasion awarded Gold and Silver Medal to the meritorious students, Gurudas Mishra from NTPC and K. Rohit from Tata Power, respectively. Speaking on the occasion, Prof D'souza



said that the students have passion and zeal and are ready to take on the challenge of climate change by introducing sustainable practices in the energy sector.

Gurdeep Singh, CMD, NTPC wished the graduating students a happy and bright future. He urged the students to work towards generation of reliable and affordable electricity in a sustainable and environment friendly way and contribute to the energy sector. 

ISA and India sign the Host Country Agreement

The International Solar Alliance (ISA) and the Ministry of External Affairs (MEA), signed the Host Country Agreement recently. The Agreement will give ISA a juridical personality and gives it power to contract, to acquire and dispose off movable and immovable properties, to institute and defend legal proceedings. Under this agreement, ISA shall enjoy such privileges, applicable tax concessions and immunities as are necessary for ISA's Headquarter to independently discharge its function and programmes. ISA shall be deriving its status, privileges and immunities as per Article 10 of Framework Agreement.

The agreement was signed by General (Dr.) V.K. Singh, Minister of State, Ministry of External Affairs and Upendra Tripathy, Interim Director General, ISA in the gracious presence of R K Singh, Union Minister of State (IC) Power and New & Renewable Energy.

R. K. Singh said that ISA has potential to change developmental paradigm in the world. He said that energy will now be available to less developed tropical countries at affordable rates and in an easily deployable manner. The Minister also mentioned that many countries have shown interest to learn from India's experience in renewable energy. 

NPCIL joins hands with NSDC to support Skill India Mission

Aiming to contribute towards economic and sustainable development of the communities, National Skill Development Corporation (NSDC) has signed a memorandum of understanding with Nuclear Power Corporation of India Limited (NPCIL) to provide skill training to 500 youth and women at Kudankulam in Tamil Nadu.

The skill development project will be executed by NSDC through its approved training partners near Kudankulam Nuclear Power Project (KKNPP), the single largest nuclear power station in India, situated



in the Tirunelveli district of the southern Indian state of Tamil Nadu. Under this tripartite agreement between NSDC, NSDF and NPCIL; NSDC will conduct a baseline survey in 19 villages in Tirunelveli district to examine nature and extent of talent gap and will accordingly identify job roles for the training. The skill development project aims to provide gainful employment (wage and self-employment) to nearly 70% of the trained candidates post-training. NPCIL has committed INR 1.74 crore under its CSR contributions towards this project, which is estimated to be complete in 15 months. 

**Trusting in experience.
Benefitting from innovation.
Perfecting explosion protection.**

Maximum security for hazardous areas:
Pepperl+Fuchs supplies the global process
industry with extremely reliable products and
solutions in the field of explosion protection.
Benefit from a comprehensive portfolio and
pioneering Innovations — paving the way
towards fully networked processes for the
applications of the future.

www.pepperl-fuchs.com



91-80-3352 6000

pa-info@in.pepperl-fuchs.com

Your automation, our passion.

 **PEPPERL+FUCHS**

Freyr Energy completes first of its kind solar power project

Freyr Energy, a full service solar provider revealed the completion of 640 KW solar rooftop projects in Manipur. This also includes one of the largest and first of its kind off-grid 100 KW battery powered systems in the country located at Manipur's Central Agricultural University. The inverter maximises solar power generation and helps stabilise power from the grid. It also has the functionality to smartly optimise and export solar power when the cost of grid power is at its highest, and draws power when it is low. The



system helps withstand power fluctuations. Saurabh Marda, Co-Founder & Managing Director, Freyr Energy, said, "It gives us immense pride to have completed the projects successfully within the stipulated timeline of six months. Successful completion of these projects is a testimony to our capability to not only navigate difficult terrain, but also establishes our technical capabilities to bring power through innovative solutions to areas with challenging electrical infrastructure."

MYSUN commissions Industrial Rooftop Solar Project in Gurugram

MYSUN, one of India's leading rooftop solar platform focused on providing end-to-end solar solutions, has revealed the commissioning of an industrial rooftop solar project for 'Update Prints (India)', a household name in high-tech label printing. The project, 231 kW in capacity, is spread across an area of 2446 square meter. The grid-tied solar system is installed with Net-Metering to ensure maximum savings. Keeping in line with its promise of using only top tier equipment for



the highest reliability and longevity, the plant features top of the spec equipment. MYSUN also revealed that it was able to commission the project before the committed deadline.

The rooftop, located in Gurugram, Haryana is an industrial site which sees a monthly electricity bill of close to Rs 4 lakh, putting it in the tariff band of Rs 8.62 per unit. Update Prints will be saving up to at least 90% on its monthly bills by installing the solar system, which will generate close to 3.5 lakh units per year.

Numeric becomes the first UPS manufacturer to get BIS registration

Numeric, one of the leading UPS manufacturers and power quality solution providers in India becomes the first UPS manufacturer in the country to comply with Bureau of Indian Standards (BIS) registration for 6 - 10 KVA range. The UPS product offerings by Numeric already conform to the international standard-CE.



Palash Nandy

According to the order issued on November 7, 2014, Electronics and Information Technology Goods (Requirements for Compulsory Registration) it is now mandatory for registration of lesser than equal to 10 kVA rating UPS systems as per phase 3 order. As per a government

order dated- August 17, 2017, Numeric UPS rating 6-10kVA were covered in the BIS compulsory registration scheme.

Palash Nandy, CEO, Numeric, said, "We are extremely happy to announce that Numeric is the first UPS manufacturer in India to register with the Bureau of Indian Standards (BIS) in the 6-10KVA of UPS range. UPS has remained a key element in any electrical infrastructure- be it SOHO, Retail, Manufacturing, Health Care, Datacenters, IT/ITES, BFSI, Hotels etc. and our endeavor is to ensure that our customers get best in class products and services."



GreatWhite[®]
THE FUTURE OF BRIGHT

HAR
DESIGN
MEIN
WOW

Add a futuristic look to your living spaces with beautifully designed titanium color switches & accessories. Experience our elegant accented switches, perfectly encapsulated in a flawless glass plate - adorned with a stylish chrome bezel. Sure to make you go wow.



myrah[®]

RB signs 1st PPA in India for 100% Renewable Electricity Plant

RB, (erstwhile Reckitt Benckiser), one of world's leading consumer health and hygiene company, is proud to reveal the commission of its first solar powered factory in India, in the city of Mysore as part of Project Greenathon. The factory running on 'GREEN POWER' forms an extension to RB's continuous efforts to reach its worldwide Sustainability Targets. As of today, the factory meets 75% of the energy needs with solar energy and aims to be the first factory running on 100% green power in India, within couple of years.

This marks RB's first Power Purchase Agreement (PPA) in India which forms a landmark in its

sustainability journey. This initiative will enable reductions in carbon emissions by 80% for the Mysore site over the next 10 years.

RB India's sustainable journey started in early 2016 with searching for the right renewable energy partner to accomplish the project. Keeping in mind the scalability, low risk profile, technology and government supporting framework, solar was found to be a suitable renewable energy option. Once this choice was made, an intensive study of the technology, policies, market research, capable suppliers was made and a frame work for the project implementation strategy was devised and effectively implemented. 

Sterlite Power's OPGW facility receives 17025:2005 accreditation

Sterlite Power's Optical Ground Wire (OPGW) facility in Silvassa has been granted a prestigious accreditation by National Accreditation Board for Testing and Calibration Laboratories (NABL). This is for the first time that an OPGW laboratory in India has received this rating for testing OPGW cables, ACS Wires, Alloy Wires and Optical Fibres. With this rating, products manufactured by Sterlite Power in this facility can be used in user countries without the need for additional re-testing, resulting in cost savings.

Talking about the development, Pratik Agarwal, Group CEO Sterlite Power said, "For India to achieve its 'Make in India' vision and supply products of the



highest standards globally, the country needs 'state of the art' testing facilities. This accreditation is a step forward in that direction and towards playing a greater role in the global markets." 

Vikram Solar's Rooftop Solar project for Indian defence sector

Vikram Solar commissioned a 350 kW Solar Power project at Gun and Shell Factory (GSF) in Cossipore, Kolkata through roof-top installations. This is the first project that has been commissioned by Vikram Solar in the Defence Sector. GSF Cossipore is a unit of the Ordnance Factories Board that manufactures special equipment for the Indian Army. The project is spread across 4180 sq. Meter of roof top area that has 1130 modules powering five different buildings. The solar installation is expected to save 430 Metric Tonnes of Carbon Dioxide emissions.



Neha Agrawal

Business, Vikram Solar, said, "This is indeed a very prestigious project for us. Since we knew that there might be challenges inside GSF, we meticulously planned the operation keeping the guidelines in mind. Our strategic superiority, innovative technological approach, and cumulative experience led us to complete the project as per GSF compliances, upholding quality and performance commitment."

She also added, "Vikram Solar has a prestigious ~60MW (Commissioned + Under execution) Rooftop EPC portfolio comprising of government clients such as ISRO, IOCL, SBI, WBSEDCL, and AAI." 



ISOLGUARD

insulation monitoring device



HOSPITAL SYSTEM HIG95/E

For ungrounded networks



EU bank to help strengthen access to energy in Africa

Vice-President of the European Investment Bank (EIB – the EU bank) Ambroise Fayolle revealed the signature of US\$ 25m in financing with d.light design to strengthen access to energy in Africa via solar kits that do not require a grid, are easy to use and inexpensive for users thanks to a pre-payment system. This EU financing will enable d.light design to develop the installation of solar kits – including not only panels and lamps but also low-energy equipment (radios, TVs, etc.) – in sub-Saharan Africa with the ambitious goal of reaching 10 million solar installations



Ambroise Fayolle

within five years.

Ambroise Fayolle, EIB Vice-President, said, "I am delighted that the EIB has signed this new financing with d.light in Africa for an off-grid solar project that will have a major economic and social impact on people and micro-entrepreneurs. The EU bank is determined to implement the Paris climate agreement and to cooperate to achieve the sustainable development goals, particularly when it comes to ensuring access to affordable, reliable and sustainable energy for all." 

GE Power chosen to lead EPC contract for Ostroleka C, Power Plant

GE Power was informed that it has been chosen as the lead EPC, in consortium with Alstom Power Systems, to build the ultra-supercritical (USC) coal power plant Ostroleka C in Poland. Subject to the financial closure of the project, the plant will start commercial operation within 56 months after the notice to proceed and generate a gross output of 1,000 MW, enough to power 300,000 homes in Poland.

In addition to co-leading the consortium, GE Power will design, manufacture and deliver its market-



leading ultra-supercritical technology components (boiler and steam turbine generator) for this new power plant. With USC technology, the plant will perform to the highest efficiency level possible for a steam power plant in Poland with 46% efficiency, well above the global average of 33% efficiency. Each percentage point improvement in efficiency significantly reduces CO2 emissions from coal power plants by over 2% points. They will also provide advanced environmental control systems such as electrostatic precipitators and wet flue gas desulfurisation plant. 

Siemens and Atos reinforce their strategic cooperation

Siemens and Atos revealed the reinforcement of their strategic co-operation, with plans to accelerate their joint business until 2020 through an ambitious joint go-to-market plan and the strengthening of their joint innovation and investment program. The program has been increased by €100 million, totaling €330 million – more than three times the original sum. This will further support the Siemens and Atos IoT MindSphere-Codex strategic co-operation as well as the joint go-to-market.

The joint innovation and investment program aims to enhance Siemens and Atos' digital strategy and develop joint capabilities in Data Analytics, Artificial Intelligence, advanced IoT & connectivity services,

cyber security and digital service technologies to support the digital transformation of their customers through an end-to-end IoT suite.

Since the start of the partnership in 2011 Siemens and Atos have achieved a joint order intake of €2.5 billion and significantly surpassed all expectations.

At its last meeting on March 9th, the Alliance Board expressed its satisfaction about the performance of the business collaboration, which continues to exceed its objectives.

Atos and Siemens formed a global strategic partnership in summer 2011. As part of this partnership, Siemens contributed its IT solutions and services business to Atos. 



Rigil offers High Quality Heat Shrink Insulation Solutions for **Electrical & Utility Industry.**

Innovative Insulation Ideas...



... Heat Shrink Technology

Product range:

- Heat Shrinkable Anti Tracking Tubing
 - Heat Shrink Busbar Tubing
- Dual Wall Semi conducting/Insulation Heat Shrink Tubing
- High Shrink Ratio Heavy Wall Heat Shrink Tubing
 - Heat Shrinkable Busbar Insulation Tape
 - Heat Shrinkable Moulded Parts

Rigil Techno India Pvt. Ltd.

P-97, South Extension Part II, New Delhi - 110 049, INDIA
Tel.: ++91-11- 41641194 Fax: ++91-11- 41641193 E-mail: info@rigilindia.com

www.rigilindia.com

Trina Solar launches New Smart PV Solution

Trina Solar Limited, one of the leading total solutions providers for solar energy, launched a new smart PV solution, TrinaPro, at its global headquarters in Changzhou, China.

TrinaPro is designed for utility-scale ground mounted PV systems. It is the result of Trina Solar's full cooperation agreement with Huawei Technologies Co., LTD, Sungrow Power Supply Co., LTD, as well as its strategic cooperation agreement with Nclave Renewable S.L., respectively. TrinaPro is the first smart PV solution with an optimised combination of Trina Solar's industry-leading solar modules, state-of-the-art solar tracker systems or floating systems,

and world-class inverters. As a new value-added product, TrinaPro is characterised by premium components, optimised system integration and smart O&M interconnection.

TrinaPro includes both ground-mounted solutions and floating solutions. The ground-mounted solution features a state-of-the-art solar tracker system, which will help improve energy gain by 10%-30%. The floating solution will cover several application scenarios such as reservoirs, lakes, beaches, etc.

With the optimised matching among components and 'Edge Computing' algorithm integration, TrinaPro can improve system stability. 

Vistra Energy completes merger with Dynegy

Vistra Energy Corp., the parent company for TXU Energy and Luminant, revealed it has completed its previously announced merger with Dynegy Inc. The closing of the transaction follows the overwhelming approval from stockholders of both Vistra Energy Corp. and Dynegy Inc. in March, and the receipt of all required regulatory approvals. Vistra Energy Corp. will be the name of the combined company moving forward, and the combined company's stock will continue to trade on the New York Stock Exchange under the current ticker symbol for Vistra Energy.

The combination of Dynegy's generation capacity

and existing retail footprint with Vistra Energy's integrated ERCOT model creates the lowest-cost integrated power company in the industry.

It also positions the combined company as the leading integrated retail and generation platform throughout key competitive power markets in the United States.

With the transaction complete, Vistra Energy now:

- Employs about 6,000 people across 12 states.
- Serves approximately 2.7 million residential customers in five top retail states.
- Serves approximately 240,000 commercial and industrial retail customers. 

Fast-track delivery of Wärtsilä Smart Power Generation plant

The already robust energy service for the Bavaro and Punta Cana region – one of the Caribbean's top tourist destinations – is being further strengthened with the addition of a 50 MW Smart Power Generation plant this year. The Consorcio Energético Punta Cana – Macao (CEPM) placed the order with the technology group Wärtsilä, and the turnkey delivery is being made on a fast-track basis.

Wärtsilä will supply a full Equipment, Procurement and Construction (EPC) delivery that includes a sub-



CEPM contract signing

station. With it, CEPM will increase the number of clients on their Thermal Energy division, providing steam to a number of hotels that use it for air conditioning and laundry, substantially increasing the total efficiency of the

installation.

Fuel flexibility is just one of the many benefits provided by Wärtsilä's Smart Power Generation approach as it can provide fast acting response as an enabler for renewable sources of energy within the system, as well as delivering high efficiency. 



HAVELLS

Presenting Next Generation

HI X SERIES & HI M SERIES MCCBs



Wide range of circuit breakers catering to nearly all applications.

- Range: 16A-800A
- High electrical & mechanical life
- SC Breaking Capacity: $I_{cs}=I_{cu}= 20kA$ to $150kA$
- Rated Operation Voltage/ Insulation Voltage: $690V / 1000V$
- Double Break
- Compact size
- Wide range of accessories
- Thermal & Magnetic Adjustability

www.havells.com
marketing@havells.com

[/havells](https://www.facebook.com/havells)
[/havellsindia](https://www.instagram.com/havellsindia)

[/havellsindia](https://www.youtube.com/havellsindia)
[/havells_india](https://www.instagram.com/havells_india)



HAVELLS
CONNECT

Toll Free No.: 1800 11 0303 (Toll Free), 011-4166 0303 (Landline), 1800 103 1313 (All Connections).
For dealer interested in opening new Havells Galaxy Store, please e-mail at: galaxy@havells.com

*Conditions apply.

Tata Power appoints Praveer Sinha as its new CEO & MD

Tata Power revealed the appointment of Praveer Sinha as the firm's new Chief Executive Officer (CEO) and Managing Director (MD) with effect from 1st May 2018 to oversee the next phase of expansion of India's leading energy and infrastructure player.

Sinha is currently the CEO & Managing Director of Tata Power Delhi Distribution Limited (Tata Power-DDL). Tata Power-DDL is a Public Private Partnership (Joint Venture) between Tata Power and Government of National Capital Territory of Delhi, supplying power to over seven



Praveer Sinha

million people in North and North-West Delhi.

He has over three decades of experience in the power sector and has been credited with transforming the power distribution sector and development and setting up of greenfield and brownfield power plants in India and abroad.

Sinha holds a Master's Degree in Business Law from National Law School, Bengaluru and is also professionally trained as an Electrical Engineer. He is also a member of the Faculty Board at Faculty of Management Studies [FMS].

Schneider Electric appoints Shonodeep Modak as CMO

Schneider Electric revealed the appointment of Shonodeep Modak as Chief Marketing Officer (CMO) for North America, where he will be responsible for the development and implementation of the brand and marketing strategy in the United States, Canada and Mexico.

In this role, Modak will lead the formation, planning and implementation of Marketing to drive the acceleration of Schneider Electric's Brand to Order transformation - to increase brand awareness, digitally engage



Shonodeep Modak

customers and contribute to revenue growth. He will work closely with the North American business leaders, while also leveraging the Global Marketing resources, to build and execute marketing plans that increase business impact for the region.

Modak will join both the Global Marketing and North America Operations Leadership Teams, reporting directly to Annette Clayton, CEO and president, North America Operations and Chris Leong, Chief Marketing Officer.

ENGIE appoints Yoven Moorrooven as CEO for Africa Business Unit

Yoven Moorrooven is appointed CEO of ENGIE's Africa Business Unit as of April 15th, 2018. He succeeds Bruno Bensasson who is leaving the Group. Yoven, a Mauritian national, holds a master's degree in econometrics and a master's degree in banking, finance and commodities. He began his career in 2003 at Gaselys (ex-joint-venture company between Société Générale and Gaz de France).

He spent three years in the company as a market economist and as an originator. In 2006, he moved into investment banking at the Macquarie Bank in



Yoven Moorrooven

London to develop its energy markets division. After five years, he became partner at Macquarie. In 2012, he moved to Deutsche Bank, where he was responsible for the management of its gas, power and coal origination and trading activities in Europe.

Yoven joined ENGIE in 2013. Until 2016, he held the position of head of the International Division within the Global Energy Management Business Unit, responsible for the development of all new energy market activities, and more specifically biomass valorisation in which the Group has acquired a worldwide leadership.



HAVELLS

More power and less energy consumption with Havells IE2 & IE3 motors



IE2 and IE3 Motors are equipped with AEG Technology ranging from 0.12 HP to 470 HP, that are accepted worldwide for utilising energy efficiently. So your savings are generated automatically.

Features:

- All Aluminum Motors come with multi-mount construction and easy change of terminal box position (up to 160 frames)
- 6 Lead Terminal Box • Suitable for standard VFD drives • Low weight-to-output ratio • Better heat dissipation
- Cast iron motors from frame 80 to 355 with good aesthetics and surface finish

Wide range of Motors



Smoke Extraction Motor

Foot Mounted Motor

Flange Motor

Foot cum Flange Motor

Crane Duty Motor

Inverter Duty Motor

Brake Duty Motor

Prima Series



HAVELLS-LAFERT MOTORS

www.havells.com
marketing@havells.com



**HAVELLS
CONNECT**

Toll Free No.: 1800 11 0303 (Toll Free), 011-4166 0303
(Landline), 1800 103 1313 (All Connections).
For dealer interested in opening new Havells Galaxy Store,
please e-mail at: galaxy@havells.com

*Conditions apply.

Canadian Solar wins Project Bond of the Year Award

Canadian Solar has won Environmental Finance's Project Bond of the Year award for its innovative dual-tenor green project bond issuance in Japan. Environmental Finance, an industry leading global publication, recognised best practices and issues that were significant in the development of the green bond sector at its Green Bond Awards 2018. In total, 32 awards have been given out worldwide. Other than Canadian Solar, winners also include Barclays, Republic of France, City of Paris and City of Cape Town.



Dr. Shawn Qu

The world's first dual-tenor bond served as the financing vehicle for Canadian Solar's 19MW Gunma Aramaki Solar Power Plant when it was issued in April 2017. Canadian Solar paved the way for this pioneering structure by combining maturity of 1.5 & 18.7 years within a single-tranche of bond.

Dr. Shawn Qu, Chairman & CEO, said, "We are honoured to receive the Project Bond of the Year Award and to be recognised for delivering world-class global innovation to finance solar investments."

NHPC wins laurels at India Pride Awards 2017-18

NHPC Limited, India's premier hydropower company and its subsidiary NHDC Limited were awarded under various categories at the India Pride Awards 2017-18. NHPC was conferred with 'Excellence in CSR/ Environment Protection and Conservation' award and NHDC was conferred with 'Excellence in Electricity and Power Category' award. The awards were received by Amitabh Srivastav, Chief Engineer (CSR) and B.P. Rao, Chief Engineer (CSR) from NHPC and by A.G. Ansari, CED, NHDC.



The awards were presented by Dharmendra Pradhan, Hon'ble Union Minister of Petroleum and Natural Gas and Skill Development and Entrepreneurship along with Shivraj Singh Chauhan, Hon'ble Chief Minister, Madhya Pradesh at a glittering function at New Delhi on 28th March 2018.

In the picture, Amitabh Srivastav, Chief Engineer (CSR) and B.P. Rao, Chief Engineer (CSR), NHPC are receiving 'India Pride Award' conferred to NHPC by Dharmendra Pradhan.

REC bags two awards at Dainik Bhaskar India Pride Award 2018

Rural Electrification Corporation (REC) Limited is India's leading financier in the power infrastructure space. As a Navratna company under the administrative control of the Ministry of Power, it has been rated 'Excellent' in terms of the MoUs signed with the Government for 22 consecutive years. Domestically, the company holds the highest credit ratings from CRISIL, ICRA, IRRPL and CARE and internationally we are rated at par with the sovereign



ratings. REC received two awards during the 9th edition of India Pride Award organised by Dainik Bhaskar Group at an awards ceremony held on 28th March 2018. Hon'ble Union Minister of Petroleum and Natural Gas, Dharmendra Pradhan, gave away the eminent award to CMD Dr. P. V. Ramesh for 'Excellence in Navratna' and Director Finance Ajeet Agarwal for 'HOD in Finance' category.



HAVELLS

Install Havells APFC Panel & save money by reducing KVAH



Why pay more due to low Power Factor?

Is there still a difference in KVAH and KWH in your Electricity Bill due to low Power Factor?

Features

- Manufactured with highly precise modern **Amada CNC Machine**
- **11 Tank Process** for corrosion proof powder coating
- Ergonomic, compact and robust design
- Designed with **100% Copper Conductor**
- **Heavy Duty Power Capacitor** for long life
- **Advance C-MOS Technology** based micro processor for intelligent power factor control
- **Air Core Reactor** for extra safety from inrush current
- Provision of top and bottom cable entry
- Automatic temp. control through fans and louvers in panel
- Double side earthing connection

www.havells.com
marketing@havells.com



HAVELLS
CONNECT

Toll Free No.: 1800 11 0303 (Toll Free), 011-4166 0303 (Landline), 1800 103 1313 (All Connections).
For dealer interested in opening new Havells Galaxy Store, please e-mail at: galaxy@havells.com

*Conditions apply.

Switchgear Market worth USD 125.10 bn by 2022

The global market is set to witness a significant growth due to the continued growth of construction and developmental activities, increasing access to electricity, and growth of renewable power generation projects...

The switchgear market is expected to grow from an estimated USD 88.71 billion in 2017 to USD 125.10 billion by 2022, at a CAGR of 7.12%, from 2017 to 2022. The global market is set to witness a significant growth due to the continued growth of construction and developmental activities, increasing access to electricity, and growth of renewable power generation projects.

The transmission and distribution utilities segment is expected to hold the largest share of the switchgear market, by end-user, during the forecast period.

The transmission and distribution utilities sub-segment of the end-user segment led the switchgear market in 2016 and is projected to dominate the market during the forecast period. The transmission and distribution utilities segment is also expected to grow at the fastest rate during the forecast period.

The growth of the transmission and distribution utilities segment is primarily driven by increasing investments in sub-station automation, modernization of electric grid, and smart utilities which includes smart grids and smart meters. This would enhance the protection by decreasing energy losses, due to poor operational efficiency of traditional equipment. This would ultimately create new revenue pockets for the switchgear market during the forecast period.

The gas insulated switchgear is expected to hold the largest share of the switchgear market, by equipment, during the forecast period.

The gas insulated switchgear sub-segment of the equipment segment led the switchgear market in 2016 and is projected to dominate the market during the forecast period. Rising energy demand and extension or replacement of old switchgear at sub-stations can drive the gas insulated switchgear

equipment in the switchgear market. However, the circuit breaker sub-segment accounted for the second largest share in 2016 in the switchgear market, based on the equipment segment.

North America: The Leading Market for Switchgear

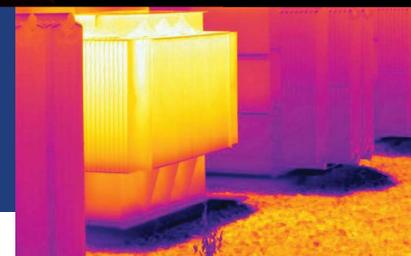
In this report, the switchgear market has been analysed with respect to five regions, namely, Asia Pacific, Europe, North America, the Middle-East and Africa, and South America. The market in Asia Pacific led the global switchgear market in 2016. Increasing grid investments especially, in developing economies, such as China and India and plans for electrification in remote areas in countries, such as Vietnam, Indonesia, and the Philippines are expected to drive the switchgear market in Asia Pacific. Indonesia aims to achieve 90% electrification rate by 2025 and the countries, such as the Philippines and Malaysia have similar plans. Rise in investments in smart grid technologies including distribution grid automation, smart meters, and demand response systems in countries, such as Japan, South Korea, and Australia would create opportunities for the switchgear market in the Asia Pacific region.

To enable an in-depth understanding of the competitive landscape, the report includes profiles of some of the top players in the switchgear market. The key players include ABB Ltd (Switzerland), General Electric Company (US), Siemens AG (Germany), Eaton Corporation plc (Ireland), Hitachi Ltd (Japan), Schneider Electric SE (France), and Mitsubishi Electric Corporation (Japan) among others. The leading players are trying to understand the markets in developing economies and are adopting various strategies to increase their market shares.

Keep your electricity flowing & business growing



Uninterrupted power supply is the goal of every power transmission and distribution company, but many problems lie in the path of achieving it. These problems can lead to unnecessary shutdowns, and can cause huge monetary and man-hour losses. To help power companies achieve highest efficiency, FLIR brings a wide range of thermal imaging cameras and T&M products.



Transformer Thermal Image



FLIR's wide range of products for predictive and preventive maintenance

These products help in detecting hot spots from a safe distance, avoiding unwanted shutdowns, identifying hazardous SF6 gas leakage, monitoring high voltage electrical substations continuously from remote location, etc.

For more information, call us at +91-11-4560 3555 or write to us at flirindia@flir.com.hk

FLIR Systems India Pvt. Ltd.

1111, D Mall, Netaji Subhash Place, Pitampura, New Delhi - 110034 | Fax: +91-11-4721 2006 | www.flir.in

[f/FLIR](#) | [t/FLIR](#) | [y/FLIR](#)



Substation Thermal Image

Images for illustration purpose only.

Illuminating Towards Bright Future

The Electric Lamp and Component Manufacturers Association of India (ELCOMA) shares that the LED market in India is expected to grow to ₹ 216 billion by 2020. This leap will result in the LED market accounting for about 60 per cent of India's total lighting industry (approximately ₹ 376 billion) in 2020...



www.electricalindia.i

Rising global temperature is taking a toll on environment and climate. In this context, the focus is on the reduction of CO2 emissions and greater efficiency. It paves the way for energy efficient and climate protective intelligent solution for

the infrastructure and buildings. Against this backdrop, the global LED lighting industry is expected to grow tremendously, over the long-term. Starting with the first incandescent lamp which was invented by Thomas Edison and Joseph Swan in the 19th century.



LED lighting is enhancing the overall lighting experience with respect to control, monitoring or sensing

Since then there has been noteworthy advancement in different types of bulbs and their efficiencies. Major kinds of lamps or bulbs can be found in different lighting systems like homes, offices, factories, electrical devices etc.

The lighting market in India has been witnessing tectonic shift from using conventional products to LEDs. The government's focus on energy efficiency measures, growing consumer awareness about energy-efficient products, smart cities project and innovative products offered by the industry that are in sync with the overall trend of digitization. That has pushed the growth of the industry over the years. Ultimately, it will also see the rise of prototype designers, electronics manufacturing services (EMS) providers and original equipment manufacturers (OEMs).

"From past few years, LED lights have surfaced as an influential source for lighting. Even though at a nascent stage, LED lights have rapidly gained prominence in the Indian lighting market. Owing to several advantages over conventional lighting technology, LED lights are set for growth over the next few decades," observes Rajesh Uttamchandani, Director,

SYSKA Group. According to a report by TechSci (a global research based consulting firm), the LED lighting market in India is projected to register a CAGR of over 30 per cent during 2016-2021. The Electric Lamp and Component Manufacturers Association of India (ELCOMA) shares that the LED market in India is expected to grow to ₹ 216 billion by 2020. This leap will result in the LED market accounting for about 60 per cent of India's total lighting industry (approximately ₹ 376 billion) in 2020.



"Even though at a nascent stage, LED lights have rapidly gained prominence in the Indian lighting market. Owing to several advantages over conventional lighting technology, LED lights are set for growth over the next few decades."

Rajesh Uttamchandani, Director, SYSKA Group

Government Role

According to PIB report, by 2019, 770 million LED bulbs and 35 million LED streetlights will be deployed to replace conventional lights. Under the Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY), 27.3 million LED bulbs have to be distributed to BPL households. Over 2.1 million conventional streetlights have already been replaced with LED

streetlights across the country, under the Street Lighting National Programme (SLNP).

State	Number of street lights	Energy saved per year (kWh)
Rajasthan	704,891	99,054,808
Delhi	264,185	37,124,579
Andhra Pradesh	586,037	82,352,849
Gujarat	200,536	28,180,321
Goa	94,856	13,329,639

(Source: Press Information Bureau)

Emerging Technology Trends

Recently I had the opportunity to visit HKTDC Spring 2018 International Lighting Show, Hong Kong and we were also invited to cover Light+Building 2018, Frankfurt. These events emphasised the focus on Smart Lighting, Connected Lighting, IoT and Lighting Outlook. While talking about innovations, Biswajit Sengupta, Lighting Consultant, says, "There are a lot of

technological innovations taking place globally like development of light engines which can be retrofitted in HID street light luminaires, heat sinks to increase the reliability and lifetime of LED, drivers, and optic for more efficient lighting. Besides the above there are developments in the field of OLED and LiFi." Following are the emerging lighting technology trends:



Smart lights can also interact with other intelligent devices

Smart Lighting

Apart from energy savings, LED lighting is enhancing the overall lighting experience with respect to control, monitoring or sensing and connectivity coupled with the convenience of longer life and improved aesthetics.

It is a fully automated lighting system. i-lighting is an integrated system with a control module, sensor module and LED driver. The control module is the brain of the system. It contains a microcontroller unit (MCU), which is responsible for synchronising the different



“With emphasis on renewable energy like solar energy, concentration is more on LED lighting as because of its low power compared to conventional lights it is more compatible with solar cells.”

Biswajit Sengupta, Lighting Consultant

For instance, in India, to curb the energy wastage, a team of students from the Indian Institute of Technology Madras (IIT-M) has developed an intelligent lighting system that ensures the street-lights illuminate 100 percent brighter once the sensors on the lighting system detects vehicular movement. Otherwise the lights go dim by 30 percent. It is the first kind of smart technology being implemented for street lighting in the country.

modules and performing some basic computations. The control module also allows street-lights to exchange data between each other and with the cloud.

Tuya Smart made its appearance in the Light+Building in Frankfurt, Germany. At Light+Building, a leading trade fair of the industry, there were over 2,600 exhibitors and more than 210,000 visitors coming from outside Germany. Light + Building represents the world’s largest stage for the lighting market. Tuya Smart is a global

intelligent platform that provides an array of smart lighting solutions for traditional lighting companies. The smart lighting products enabled by Tuya and displayed at the fair in Frankfurt include smart light whose brightness, color and temperature are adjustable, and Bluetooth mesh light matrix on which consumers can play the snake game. The three features of smart lighting, namely voice control, automation and scenario selection are also presented. The smart lighting solution for Tuya can use a variety of networking modes, including WiFi, bluetooth, bluetooth mesh, ZigBee, and so on.

For example, the facial recognition function enabled by Tuya for AI camera allows users to turn on the light with their faces, directly control the speaker on the table, and adjust the color and brightness of the smart light in the room at will. When the user is out of the monitoring scope of the camera for a long time, the camera will identify that the house owner has left, and the light will get dimmer, and finally turned off. This is called mood lighting that has applications in aviation industry and call centres.

Apart from being able to understand instructions, smart lights can also interact with other intelligent devices. In the era of intelligence, lights can do more than lighting. At night, they can help people fall asleep by getting dimmer, while in the morning, they can wake people up by getting brighter. Thanks to the Bluetooth mesh technology, the color and brightness of any of the light in the matrix can be changed as you like.



Official LED & Switchgear Partner



**CHALLENGERS
ARE CHARGED,
ARE YOU?**



India's most efficient
LED Lighting manufacturer
is now official LED & Switchgear
partner for Royal challengers Bangalore



long life

ECO
light
solution



maintenance free



compact & sleek
design

#HPLPowersRCB

hpl@hplindia.com

Customer Care No: 1800 419 0198

www.hplindia.com



Human Centric Lighting

Advantages of Smart Lighting

- Identify faults with street lighting without need of physical inspection.
- Maintain high performance of street lighting.
- Reduce man-power resources and travelling time as routine inspections or maintenance can be reduced.
- On the top of 30 percent power saving in our LED street lighting
- Lighting level of LED road lights could be further dimmed down remotely to suit actual need. Savings in energy consumptions by further 20 percent

While taking a note of IoT in lighting industry, Rajesh Uttamchandani, Director, SYSKA Group, informs, "The advent of high-efficiency LED lighting and the opportunity for wide-scale adoption of connected lighting in cities and businesses complements the dramatic growth in interest in smart sensors, smart buildings and big data technologies. The underlying challenge is how lighting infrastructure, which may have an expected operational lifetime of 15-25+ years, can be adopted in a way that enables current and

future smart city concepts and IoT innovations to be connected and linked. With the rapid development of mobile communications, R&D in sensors, citizen connectivity and services, and 'big data' city initiatives there is a clear recognized need for coordinated city and corporate connectivity. New platforms and protocols will not only need to provide security, but will need to deliver flexibility, adaptability and scalability."

Bluetooth Lighting

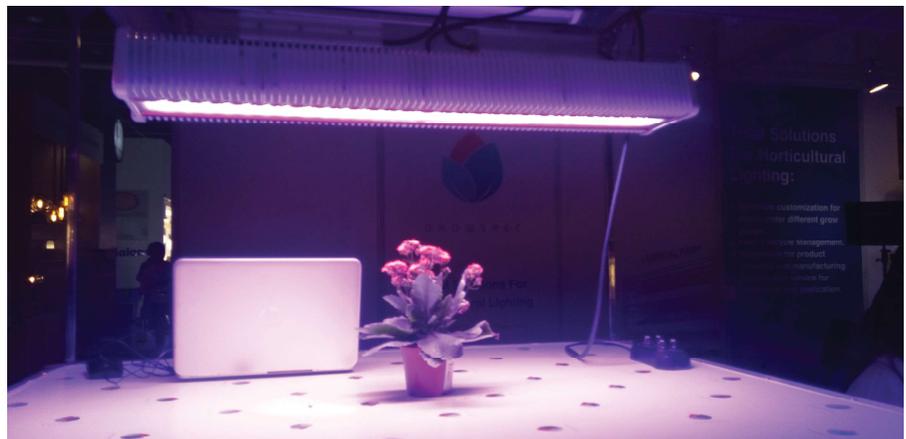
The arrival of Bluetooth mesh, a completely new technology, will change the landscape of lighting IT network. Industry experts claim that Bluetooth mesh will eliminate the need for the traditional lighting

control box. The technology has applications in smart buildings, large buildings, and university campuses. It is a promising technology that enables the luminaires in buildings into a connected grid. In this, hundreds of devices, such as lights, switches and sensors are able to communicate with each other over the long distances. It's a mesh topology, so the enabled luminaires don't need to be in direct radio range as messages are relayed from device to device at the speed of sound.

This new technology will generate new opportunities for lighting manufacturers at a time of increased commoditisation and new functionality, insights and services for building owners. Industry experts believe that with technology the lighting will become a platform to run applications. The lights could track people and objects and lead to applications in dynamic, personalised lighting and asset tracking.

Human Centric Lighting (HCL)

Lighting technologies continue to bring a sea change in our lives,



Horticulture Lighting

INNOVATING AN INDUSTRY

Proven expertise



NOMEX® IN ELECTRIC AND HYBRID ELECTRIC VEHICLES

For 50 years, DuPont™ Nomex® has fueled the electric insulation industry with design, expertise and evaluation technology. It's why Nomex® is trusted around the world to help meet the harsh operating conditions in EVs/HEVs.

With its high-temperature durability, superior mechanical strength and unparalleled chemical stability, Nomex® is the material of choice to improve performance in motors and generators and prevent premature failures.

nomexpaper.dupont.co.in

Copyright © 2017 DuPont. All rights reserved.



Nomex
NEVER QUIT.™



LED has also now hit the road, from Lifi to Wifi connected bulbs.

including greater freedom and flexibility in how lighting is applied and controlled in the workplace. The research is going on the impact of lighting on human beings, with resonance its effect upon emotions, well being and productivity as humans spend most of their time awake indoors. These are apt places to implement Human Centric Lighting (HCL) Solutions.

HCL can improve the workplace experience by thinking about building design in an entirely new way. Workplace lighting can, in addition to providing sufficient light to conduct work-related visual tasks, affect employees' alertness, mood, cognition, sleep-wake pattern and health. The objective of HCL is not only to maximize the value of LED lighting but also adjusting the intensity of the light and colour quality - correlated color temperature (CCT) and color rendering. LED-based HCL is controllable and tunable across a spectrum of CCTs to evoke particular human biological responses and behavior in well-designed indoor environments. For HCL into a building, one requires to install both tunable fixtures and smart lighting controls to drive intensity and CCT.

Horticulture Lighting

Horticulture lighting is gaining momentum, taking the lighting industry one step further. It has brought revolutions in the future of farming with technologies and innovations enabling year-round sustainable fruit, vegetable and flower cultivation. Thanks to the unique properties of LED lighting and major advances in our understanding of plants, we now have exciting possibilities to tune the light to boost yield, customise the plant characteristics and maintain plant health. It stimulates the plants growth in controlled environment.

Future Trends

According to Syska's Uttamchandani, following are the trends to watch in for 2018:

Connectivity: With LEDs comprehensively in the mainstream, the next frontier in lighting is controls. IoT lights: Lighting is an ideal network for internet of things services to be built on - because it is already there in the ceiling of every building, looking down at us, wired up and ready to go. With Alexa and Google Assistant changing the way we perform our daily chores, LED has also now hit the road, from Lifi

to Wifi connected bulbs, you name it and you will have everything performed just at one touch.

Built in light sources: Because LED light sources don't have to be replaced very often, and no standards have emerged for what they should be like, manufacturers have got used to building them into fittings, rather than designing new luminaires around replaceable 'lamps'.

New Power Technologies: Until now, LED luminaires have typically come with a 'driver' that converts the mains electricity supply into a form the light can use. But now new power technologies are appearing, with a range of benefits. Drivers are often the first component of a lighting system to fail. The latest innovation is power-over-Ethernet, which provides electricity through data cables.

Healthier lighting: Light influences how productive we are at work, how well we learn and how quickly we recover from illness.

While taking a note of Indian Lighting industry taking a cue from the global lighting industry, Sengupta hopes, "The future of all lighting solutions point towards LED, which, in very short span has made remarkable progress. And with emphasis on renewable energy like solar energy, concentration is more on LED lighting as because of its low power compared to conventional lights it is more compatible with solar cells." ■



Supriya Oundhakar

Associate Editor,
Electrical India,
Mumbai

Can you look into the Future?
Testo Thermal Imagers can.

Be sure. **testo**



Detect weak spots, wear and production faults before a critical breakdown can even occur.

- Inspection of electrical installations in all voltage ranges
- Maintenance of mechanical systems and components
- Location and archiving of thermal images after an inspection

Would you like to glimpse
into the future?
Call our Thermography Experts.
+91 20 2592 0000

Testo India Pvt Ltd

Head Office:

Plot No. 23, Sind Society, Baner Road, Aundh, Pune - 411007, Maharashtra, India
Tel: +91 20 2592 0000 | Fax: +91 20 2585 0080 | Email: info@testo.in

Regional Offices / Representatives:

Ahmedabad | Baroda | Bengaluru | Chennai | Guwahati
Hyderabad | Indore | Kolkata | Mumbai | New Delhi | Raipur

www.testo.com



MADE IN
GERMANY

S5409AD18PRINT-ADS

igus Plain Bearings in Roller Chain

P4.1 roller chain is for crane and gantry use with optional intelligent wear monitoring.

In order to increase the uptime of crane systems and gantries, igus has now combined its core competencies in the areas of plain bearing technology and energy chains. In the P4.1 roller chain for long travels, newly developed tribologically optimised plain bearings ensure lubrication-free mounting of the individual chain links. This significantly prolongs the service life of the energy chain. Optionally, the P4.1 e-chain can be part of the igus predictive maintenance concept with a new isense wear sensor.

The P4 system has been the solution for demanding applications for many years. The P4 roller chain series has already proven itself in over 1,000 crane and gantry applications worldwide, with travel distances of up to 800 metres, high speeds of more than five metres per second, and several million cycles with low vibration and low noise. Using rollers integrated in the chain link, the friction is reduced to a minimum and the service life prolonged to the maximum.

Due to the offset between upper run and lower run, the plastic rollers are not rolled over, but roll past each other to allow very smooth running. As a result, the coefficient of friction decreases and the drive power is reduced by 57 percent. Users like the world's largest crane manufacturer ZPMC have been relying on the reliable profile roller chain for many years. With the new lubrication-free and maintenance-free plain bearings made of high-performance plastics, igus has now developed the e-chain even further.

New P4.1: Merging of Two core Competences

Since 1964, igus has been developing and producing high-performance plastics for lubrication-free plain

bearings and tough e-chains. Through the experience in both areas and the research of new plastic compounds, igus developers were able to further optimise the P4.1 roller chain in order to significantly increase reliability and availability. There is a bearing point for pivoting in every connection of the chain links. This has now been re-equipped with a maintenance-free tribo-polymer plain bearing, which

more than doubles the service life. In this way, container cranes in ports, for example, can now achieve a service life of more than 15 years or 20,000 plus operating hours, with low maintenance and high reliability. **Intelligent Networking And Predictive Maintenance with isense**

Optionally, the new P4.1 can be equipped with smart monitoring sensors, such as a wear sensor for the newly installed plain bearings. From a defined wear limit, this can issue a signal to the igus icom communication module and maintenance can be planned in advance. Depending on the

customer's requirements, the data of the icom module can be used differently: with a direct integration into the existing software environment and intranet solution for a pure maintenance message or with the connection to the igus data centre for an intelligent and dynamic service life prediction. In this case, the maintenance recommendations via Machine Learning and AI algorithms are constantly compared and defined with the data from many existing applications. Thanks to the intelligent networking of the P4.1 roller chain, the maintenance engineer can access the service life data of the energy chain at any time at any location.



New maintenance-free plain bearings and an intelligent wear sensor ensure a longer service life in the P4.1 roller chain for crane and gantry systems. (Source: igus GmbH)

FROM PRINT WORLD TO THE E-WORLD

ELECTRICAL INDIA ENHANCES LIFE WITH ENGINEERING EFFICIENCY

**BESIDES MONTHLY
MAGAZINE, TAKE ADVANTAGE
OF THE DIGITAL TECHNOLOGY
& READ ELECTRICAL INDIA
MAGAZINE ONLINE, AS WELL AS
WEEKLY E-NEWSLETTER
ON YOUR PC, TABLET OR LAPTOP.**

**FOR SUBSCRIPTION PLEASE
CONTACT PRIYANKA ON
022-27777182/8652142057 OR
Email on sub@charypublications.in**

Please turn back for the subscription form.

**To Advertise, in Electrical India
newsletter/magazine please
contact YASMEEN on
022 2777 7196 / 9867914216
or email on
yasmeen@electricalindia.in**

Since 1961

Electrical India

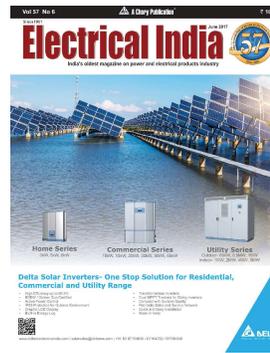
India's oldest magazine on power and electrical products industry

SUBSCRIBE

Since 1961

Electrical India

India's oldest magazine on power and electrical products industry



Subscription Offers

Sub. Period	No. of Issues	Subscription Type					
		Print		Digital		Print+Digital	
		Actual Rate	You Pay	Actual Rate	You Pay	Actual Rate	You Pay
1 Year	12	1200.00	1000.00	1200.00	1000.00	2400.00	1500.00
2 Years	24	2400.00	1750.00	2400.00	1750.00	4800.00	2625.00
3 Years	36	3600.00	2500.00	3600.00	2500.00	7200.00	3750.00
5 Years	60	6000.00	4000.00	6000.00	4000.00	12000.00	6000.00
E-Newsletter							
1 Year	52	N. A.		365.00		N.A	

PLEASE SELECT MODE OF DISPATCH FOR PRINT EDITION -
(1). By REGISTERED PARCEL – Rs. 435/- year (2). By COURIER – Rs. 600/- year
KINDLY ADD POSTAGE CHARGES IN SUBSCRIPTION AMOUNT.

Subscription / Renewal Form

To,
The Subscription in-charge
ELECTRICAL INDIA
 Email: sub@charypublications.in

Are you a Subscriber,
 Please submit your Subscription no:

Yes, I would like to Subscribe/renew **Electrical India** / **EI e-Newsletter** for _____ years at ₹ _____.

PAYMENT DETAILS :

Cheque / DD No. _____ Dated _____ Drawn on Bank _____
 _____ Branch _____ in favour of Chary Publications Pvt. Ltd.

Bank details for NEFT / RTGS / IMPS : Account Name: Chary Publications Pvt. Ltd.

Bank Name: Bank of India Branch: Chembur, Mumbai - 400 071 Account Type: Current Account
IFSC Code: BKID0000009 Bank A/C Number: 000920110000322 SWIFT CODE :BKIDINBBCHM

Name: _____
 Company: _____ Designation: _____
 Address: _____
 _____ City: _____ Pin: _____
 Telephone: _____ Mobile: _____
 Email: _____
 Signature: _____

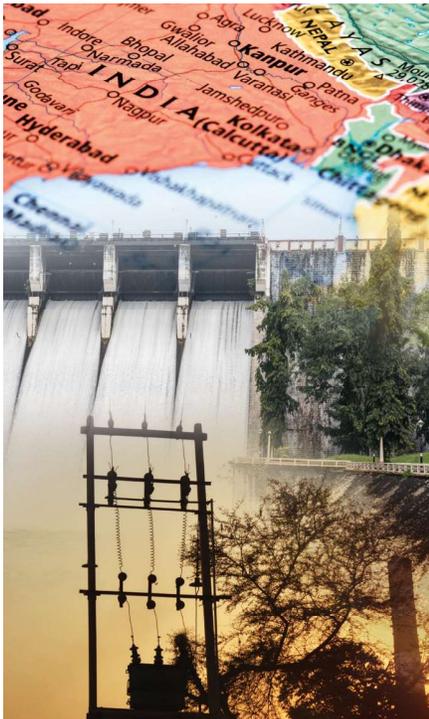
Stamp

 **Chary Publications Pvt. Ltd.**

905-906, The Corporate Park, Plot No. 14 & 15, Sector 18, Opp. Sanpada Railway Station, Vashi, Navi Mumbai - 400 703.
 Phones: +91 22 27777 170 / 171 • Email: sub@charypublications.in • Contact : Priyanka Alugade • +91 22 27777182 / +91 8652142057

SYNTHETIC AND NATURAL ESTER TRANSFORMER FLUIDS

The **MIDEL** family of ester transformer fluids - delivering fire safety and environmental protection to India's power sector.



MIDEL 7131

The world-leading fire safe, biodegradable, synthetic organic transformer fluid, MIDEL 7131 has exceptionally high moisture tolerance, enabling it to extend cellulose insulation life. It is used in a wide range of transformers up to 433kV. Perfectly suited for non-breathing and free-breathing transformers (due to its excellent oxidation stability), MIDEL 7131 offers the ability to safely increase transformer loading or reduce transformer size.



MIDEL eN 1204

MIDEL eN 1204 is a natural ester liquid (rapeseed) with a high fire point that significantly increases fire safety and reduces the need for fire protection equipment. It is sustainably sourced and readily biodegradable, enabling reductions in containment measures. MIDEL eN 1204 has a pour point around 13°C lower than the soya-based natural ester, making it ideal for cooler climates.



MIDEL eN 1215

MIDEL eN 1215 is an excellent dielectric fluid because it has a high fire point, making it demonstrably safer than mineral oil. Environmentally friendly, MIDEL eN 1215 is made from renewable vegetable oil (soya), and is also non-toxic and readily biodegradable. In addition, MIDEL eN 1215 offers superior moisture tolerance and has the potential to increase the lifetime of cellulose based solid insulation, which in turn can extend transformer life.

Underground Cable: Technological Development & Market Opportunities

Underground cables offer an affordable and justifiable solution for critical parts and in some cases the entire length of power transmission and distribution lines. With appropriate technology used in appropriate places, the environment impact of underground cables can be minimized...



Picture Credit: www.ateent.at.rnll

www.electricalindia.in

Electric power is transmitted and distributed either by overhead system or by underground cables. A cable is basically an insulated conductor and is used for underground transmission and distribution of electricity. Cable is an assembly consisting of one or more conductors with their own insulations, individual coverings, assembly protection and protective coverings. Insulation is used to cover the conductor and provides

isolation from the surroundings. Underground cables are generally used in densely populated areas such as cities and metros, where there is high density of automobiles; high rise commercial, residential buildings and places where vital installations of uninterrupted power supply such as water supply system, hospitals and IT services etc. Underground Cables (UG) are also preferred in industries, substations, railways and road crossings, servicing of residential installations and other locations.

UG cables help in ensuring uninterrupted power supply, which are uncommon in the overhead (OH) system. The main hindrance in ensuring uninterrupted power supply in the

OH system is the unavailability of space in developed urban areas. Falling of tree branches on the OH lines and short circuiting of conductors due to heavy winds and gales, rains, accidents due to bare conductors, failure of supporting structures, etc. Underground cables offer an affordable and justifiable solution for critical parts and in some cases the entire length of power transmission and distribution lines. With appropriate technology used in appropriate places, the environment impact of underground cables can be minimized. Underground cables help in ensuring uninterrupted power supply that are uncommon in overhead systems.

UG cables are employed for transmission and distribution of electric power where it becomes impracticable to make use of overhead construction. Such locations may be congested areas where right of way cost would be excessive or local ordinances prohibit overhead lines for reason of safety, or around plants and substations or crossings of wide bodies of water which for various reasons would not permit the overhead crossings. The type of cables used will depend upon voltage and service requirement. Recent improvements in design and manufacturing have led to the development of cables suitable for use at high voltages. This has made it possible to use UG cables for



Jointing Kits, End Terminations and Tap-Off Connectors for LT, 11K and 33 KV



Clockwise from Top Left:
1. Frontec Silicon MVT
2. Frontec Porcelain MVI
3. Frontec Termination Installed at Gateway Towers
4. Frontec MV Tapoff
5. Frontec End Termination



manufactures Heat Shrink items from the granules stage. Some of the products in our range are:
MV TERMINATIONS
MV STRAIGHT JOINTS
MV TEE CONNECTORS
HEAT SHRINK TUBING
HEAT SHRINK COMPONENTS



0-9711361331 ; 0124-651331 ; mail@frontec.co.in ; www.frontec.co.in

Frontec Heat Shrink
Making reliable "connections" since 1987

Frontier Technologies Pvt Ltd
Khandsa Road PO Narsinghpur
Gurgaon 122 004, Haryana, INDIA

transmission of electric power for short or moderate distances.

Advance design and technology trends in cables are centred on reducing the right-of-way requirement as well as increasing the current carrying capacity of transmission and distribution lines. As space is often constrained in urban areas, transmission and distribution utilities increasingly installing compact transmission and distribution lines, which have lower RoW requirements and small sized towers. Further, new conductors are being deployed for carrying higher currents while allowing higher temperature ratings. The initial heavy cost is the only factor which discouraged the use of underground cables for the purpose of transmission and distribution of electric power.

Characteristics & Design

Cables are designed and manufactured as per voltage, current to be carried, operating maximum temperature and purpose of applications desired by customer. Cables are designed according to number of conductors they contain and their size. The larger the diameter, the greater the wire's capacity is to carry current. The most commonly used metal for wires is copper due to its efficiency as a conductor. Underground cables consist of one central core or a number of cores of tinned stranded copper conductors (sometimes use of aluminum conductor is also made) insulation from each other by paper or varnished cambric or vulcanized bitumen or impregnated paper. Insulation should possess high resistance, high dielectric

strength, high mechanical strength and long durability. A metallic sheath of lead or alloy or of aluminum is provided around the insulation to protect it against ingress of moisture.

Electrical cables can be made more flexible by stranding the wires. Electrical cables are also used for wiring in households for solving the purpose of lighting for power and control circuits that are permanently installed. Cables are securely fastened and organized by using cable trays, cable ties or cable lacing. To limit the spread of fire along cable jacketing use of cable coating materials with jacketing having inherently fire retardant is used. The plastic covering on metal clad cables is stripped off at installation to reduce the fuel source for fires. Inorganic coatings and boxes around cables also safeguard the nearby areas from the fire threat associated with unprotected cable jacketing. This fire protection also traps heat generated from conductor losses so the protection needs to be thin.

Technological Trends

Several technologies have been introduced to enable utilities to augment their capacities without battling right-of-way (RoW) clearances. An emerging technology trend has been the adoption of underground cables. For high voltage transmission network, cross-linked polyethylene (XLPE) and Gas Insulated Cables (GILs) have been developed.

Cross-linked Polyethylene (XLPE)

Cross-linked polyethylene (XLPE), high-density polyethylene,

aerial bunched cables and spacer cable system are the most commonly used covered cables. XLPE cables use cross linked polyethylene as the main insulating material and can operate at higher temperatures, both for normal loading and under short circuit conditions. Extruded XLPE cables are increasingly being deployed by utilities such as PGCIL for setting up transmission infrastructure in difficult terrains.

XLPE cables use cross-linked polyethylene as the main insulating material. Cross-linking inhibits the movement of molecules under the stimulation of heat and this gives these cables greater stability at high temperature, as compared to thermoplastic materials. XLPE cables can operate at higher temperatures, both for normal loading and under short-circuit conditions. These cables have a higher current rating than an equivalent polyvinyl chloride counterpart. XLPE-insulated cables are also useful in direct current power transmission. Traditional DC power cables include oil filled or mass impregnated non-drain cables that have limitations for long distance power transmission. While the former requires frequent oil refilling, the later type suffers from the low operating temperature. Extruded XLPE cables are increasingly being deployed in new underground transmission throughout the world. Extruded XLPE cables have a high transmission capacity, which is not limited by route length.

Gas Insulated Cables (GILs)

Gas insulated lines are also gaining momentum in the international market, through the



UNI[★]STAR[®]

Leading India to
the World...

UNI[★]STAR

...in Extra High Voltage
(EHV) Cables upto
400kV class

1st company in India to successfully
Type Test 400 kV XLPE cable

Cable System Type Tested at
IPH- Berlin (CESI) as per IEC: 62067

Manufactured using VCV technology

All variants of Metallic Sheath - Extruded
Aluminium, Lead Sheath and Poly Al Sheath

Only company in India to manufacture
Extra High Voltage cables with Continuous
Seamless Extruded Aluminium Sheath

IS / ISO 9001: 2000



Universal Cables Limited

Regd. Office & Works:
P. O. Birla Vikas, Satna – 485 005 (M.P.)
Tel.: (07672) 257121-27, 414000
Fax: (07672) 257129
E-mail: sales@unistar.co.in

MARKETING OFFICES

Mumbai – (022) 44422200 • Fax: 22027854
Allahabad – (0532) 2423646 • Fax: 2423132
Bangalore – (080) 23612484 • Fax: 23619981
Baroda – (0265) 2791794 • Fax: 2793128
Chennai – (044) 23746623-24 • Fax: 23746625

Kolkata – (033) 22805043-44 • Fax: 22805046
New Delhi – (011) 45538800 • Fax: (011) 26779031
Hyderabad – (040) 23550183 / 23608218 • Fax: 23553272
Goa – (0832) 2782829 / 2782613 • Fax: 2782614

www.unistar.co.in

domestic market is yet to witness their widespread adoption. GILs serve as a viable alternative to overhead lines where RoW is not available for the transmission of electricity. This is primarily because GILs can be installed under the ground as well as in tunnels and trenches. Moreover, the resistive losses of GILs are lower than overhead lines and they offer greater reliability with no risk of fire. GILs have nitrogen and sulphur hexafluoride as the insulating medium. It comprises aluminum conductors supported by sealed tubes pressurised with gas nitrogen and sulphur hexafluoride in 80:20 proportion as the main insulation. These lines are ideally suited for metropolitan areas and cities where there is limited RoW for overhead lines. GILs can also be installed in agricultural areas and the ground above is still viable for growing crops. The installation of vertical GILs is popular in hydropower plants as there is no fire hazard associated with them.

GILs come with several benefits. Firstly, the resistive losses of GILs are lower than of overhead lines and other types of underground cables due to the larger size of conductors and lower resistance. Secondly, these lines offer greater reliability with no risk of fire and have electromagnetic fields that are 15 to 20 times smaller than those of conventional power transmission systems. Moreover, GILs are unaffected by high temperatures, high solar radiation and pollution. Issues related to GILs include deterioration in the insulation properties owing to particle contamination and limited

protection from seismic activities / earthquakes and limited maturity of the technology.

Hybrid Cable

Hybrid optical and electrical cables are used in wireless outdoor fiber to-the-antenna (FTTA) applications. The optical fibers carry information and the electrical conductors are used to transmit power. These cables are placed in several environments example to serve antenna mounted on poles or towers. In order to increase the current carrying capacity and scale down the transmission and distribution losses, utilities are turning to high temperature superconductors. As compared to conventional conductors cable, these conductors cables have 5 to 10 times the current carrying capacity, are compact in size and have a lower RoW requirement.

Demand Drivers

The development and strengthening of the country's transmission and distribution network has always been a key focus area. To this end, number of government initiatives and programmes have been undertaken such as the Deendayal Upadhyay Gram Jyoti Yojana (DDUGJY), the Integrated Power Development Scheme (IPDS) and the recently launched Sahaj Bijli Har Ghar Yojana (Saubhagya). All these schemes have created a market for cables and conductors in the country.

Overall, the cables and conductors industry has grown significantly in the past few years with investments infused in the power and infrastructure sectors

by the government. While the cable segment witnessed a positive growth, the conductor segment experienced sluggish demand last year. One of the major drivers for the cable industry is the need of integration of the new renewable-based capacity being added in the grid. With the development of large-scale renewable energy plants and solar parks, there is a need to lay down lines in order to connect them to the existing grid. For wind power plant customers generally require flexible and UV protected cable with mechanical tough sheath.

Meanwhile, investment in the coming years will continue to be driven by the Central Government through schemes such as DDUGJY, IPDS and Saubhagya. Even though the DDUGJY scheme is nearing its target, the focus on household electrification through Saubhagya will continue to sustain the demand in the cable and conductors segment. Further, with most of the states adopting Ujwal Discom Assurance Yojana, the state discoms are expected to improve their T&D infrastructure through renewed capital expenditure.

Apart from the impetus provided by the government, another key driver for the growth of the cable segment is the shift towards high voltage transmission lines. This demand is essentially driven by the creation of high voltage long distance corridors to deliver electricity to high demand regions and the development of green energy corridors for integrating the increasing share of renewable energy into the grid. The future growth in the cable segment is



Innovative Cable Solutions



105 °C LV & MV XLPE Cables



No worries for cable overloading

Apar Industries Ltd, a Rs 5,000 Cr (USD 800 million) company has presence in Transformer/Specialty Oils, Overhead ACSR/AAAC & HTLS conductors and a wide range of Electrical & Telecom cables.

Apar offers several innovative products, one of them being higher temperature rated XLPE cables. If the ambient temperature is about 48-50 °C during summer (like in North India), or

say 50-55 °C in desert areas, then 90 °C rated XLPE cables need to be de-rated significantly, or a higher cross section is used.

Thanks to new development of 105 °C rated XLPE LV and MV cables, you can now safely relax and need not worry about any overload conditions during summer. The product is ideal for Solar industry, north based Utilities in India and Middle East region.

ELECTRICAL

- PVC Cables upto 3.3 kV
- XLPE Cables upto 66 Kv
- LT & HT ABC Cables
- Instrumentation Cables
- Concentric Cables
- Flexible Cables & Wires
- FR/FRLS/LSOH
- Fire Survival Cables
- Under water Cables

E-BEAM

- Ship Wiring Cables
- Locomotive Cables
- Solar PV Cables
- Wind Mill Cables
- Control & Flexible Cables
- PVC Winding Wires
- Automotive Wires
- Specialty Cables

ELASTOMER

- Trailing Cables
- Locomotive Cables
- Ship Wiring Cables
- Wind Mill Cables
- Welding Cables
- Mining Cables
- LFH Cables & Wires
- Fire Survival Cables
- EPR, Silicon & EVA Cables

TELECOM

- Optical Fiber Cables
- Armoured Optic Fibre Cables
- Torpedo Cables
- Tow Cables
- Indoor Telephonic Cables
- Composite Cables with OFC
- Fire Survival Cables OFC
- Cat 3/Cat 5 LAN Cables
- Railway signaling Cables

APAR INDUSTRIES LTD. (UNIT: UNIFLEX CABLES)

12/13, Jyoti Wire House, 1st Floor, 23A, Shah Industrial Estate, Off. Veera Desai Road, Andheri (W),
Mumbai – 400 053 (India), Phone: +91-22-26740001 / 26740002 / 26740003
Fax: +91-22-26740600 | E-Mail: info.cable@apar.com

likely to be driven by 132 kv and 400 kv lines. Underground cabling too is gaining increased acceptance among state and central transmission utilities as it provides greater safety as compared to overhead cables. The increase in govt infrastructure spending, particularly, under the smart cities mission, is expected to propel the demand and present new opportunities in the cable segment.

Challenges

The biggest challenge for players in the cables segment is input price volatility. Delay in the execution of projects is another major impediment. Most projects get delayed due to the requirement of multiple clearances and approvals, and the shortage of manpower. Obtaining a RoW clearance is particularly, difficult given the space constraints in cities. Thus, it is important for the government to develop mechanism to facilitate a single window clearance for all the players.

One issue that is often voiced by some players is that there is a lack of a level playing field in the industry. The tenders released by utilities often specify a pre-qualification criterion pertaining to a particular manufacturing process in the tender that tends to restrict wider participation, especially, from the smaller manufacturers. Lack of standardization of the end product is also a challenge for the sector. The cables market is largely unorganized, as a result of which several manufacturers do not comply with product guidelines and the end result is an asymmetric product quality. There is, therefore, a need to develop standard

guidelines for the industry as a whole. Moreover, the cable segment is dependent on imports from other countries and is thus highly sensitive to exchange rate variations.

Operating Limitations

Cables require high charging current and reactive power for operation. The reactive power is capacity in nature and can affect at lightly loaded conditions due to Ferranti effects of rising of sending end voltage of the cable. Flow of charging current causes heating of cables and reduces the current carrying capability. Sometimes, higher dielectric loss may further rise in the temperature. Switching of cable capacitive current may give rise to over voltages at receiving end. Use of UG cables is also limited due to large charging current for long distance transmission. UG cables expensive compared to overhead lines and difficulty in fault detection. Restoration of power supply takes longer time during breakdown in underground cables.

Benefits

The underground cables have several advantages such as less liable to damage through storms, lightning, low maintenance cost, less chances of faults, smaller voltage drop and better general appearance. Cables system provides high reliability, least interruptions due to line faults and good safety. In addition to this, the I²R losses are quite low compared to OH system due to the absence of steel wires. Its advantages such external protection is provided against mechanical injury, moisture entry and chemical reactions. Less

subjected to damage from severe weather conditions. Underground cables pose no hazard to low flying aircraft or to wildlife. UG cables have much less danger of conductor theft, illegal connections, sabotage, and damage from armed conflict. Most of the distribution utilities are using cables for reduction of AT&C losses.

Way Forward

With the growth of smart grid technologies and the increase in renewable energy capacity, specialized cables are being designed. For instance, medium voltage smart cables, which integrate optical fiber cable with power cables, are preferred for smart grid applications. Similarly, specialized DC cables in which installation is crossed linked through electron beam irradiation are being deployed for solar power projects.

Conclusion

Underground cables offer an affordable and justifiable solution for critical parts and in some cases the entire length, of overhead high voltage power lines. The type of cable to be used at a particular location is determined by the mechanical considerations and the voltage at which it is required to operate. The cables market looks positive owing to the continuing investments by the government through its various schemes and increasing renewable energy capacity addition. ■



Ashok Upadhyay

Dy. Director (Generation)
M. P. Electricity
Regulatory Commission,
Bhopal (MP)

INDIA'S NEW SPOTLIGHT FOR EVALUATION OF LIGHTING



Electrical Research and Development Association proudly announces the establishment of new State-of-the-Art C-Type Goniophotometric Laboratory to serve the Indian lighting community by providing complete SSL testing services in accordance with IS 16106 / IES LM-79-08

Key Features:

- Size: Up to 1600mm (Diagonal) objects can be tested
- Weight: Up to 50kg of test objects
- Photometry Tests performed on:
 - Indoor Luminaire
 - Road & Street Light Luminaire
 - Flood Light / Spot Light Luminaire
- Accuracy: 0.8% (Photometric & Calorimetric), 0.1% (Electrical)
- Traceability: METAS, Switzerland



Type 'C' Goniophotometer

Accreditations:



Supporting Government of India's '**UJALA**' Yojana

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

Toll Free No: 1800 233 2668 | E-mail: bd@erda.org | Web: www.erda.org

Hammond Power Solutions among 5,000+ Exhibitors at Hannover Messe

Hammond Power Solutions (HPS) will be participating at Hannover Messe in Hannover, Germany, April 23-27, 2018. Hannover Messe is the world's leading trade fair for industrial technology. Over 220 thousand attendees from all over the globe take advantage of the synergies that Hannover Messe has to offer including research and development, industrial automation, IT, Industry supply, production technologies and energy services.

"Our participation in this event enables us to reach a targeted, global audience which supports our strategy as we expand our market coverage. We view this trade fair as a unique forum to reach out to the market from a global perspective while displaying our transformer and reactor capabilities," stated Michael Frayne, Director of Marketing.



HPS will showcase a variety of magnetic products including cast resin, multi-pulse and encapsulated transformers as well as a water-cooled reactor. HPS invites attendees to visit them in Hall 13, Stand D29 to learn about how transformers and reactors can help solve problems within electrical systems, while improving efficiency, power quality and profitability. 

General LED Announces Acquisition of Acolyte Group

General LED Holdings, LLC (General LED) announced it completed the acquisition of the Acolyte Group (Acolyte), a New York, NY based provider of fully-integrated LED lighting systems. Acolyte offers ribbon lighting and other architectural lighting products for a variety of indoor and outdoor applications.

Founded in 2003 and headquartered in San Antonio, General LED is a tier one designer and manufacturer of AgiLight®-branded LED lighting solutions. The company's patented lighting products are used in various applications of illuminated signs and architectural lighting. General LED serves a diverse range of end markets, represented by some of the most recognizable retail and corporate brands in the world. The company is able to serve top global brands due to a diverse product portfolio, established reputation for quality, innovative designs and global supply chain capabilities.

"We are very excited to join the General LED team," said J R Guerrieri, Founder & CEO of Acolyte. "General

LED's global platform will enable Acolyte to continue its strong growth track by opening exciting new markets and sales channels and to extend its global reach in service, sales and tech support worldwide to better serve our customers."

"We believe the acquisition of Acolyte is very strategic as it adds a key product line of linear LED and architectural products, where we see a lot of demand from current and prospective customers. Furthermore, the two companies have highly-complimentary geographic footprints and supply chains, which will provide additional synergies," said Steven Moya, CEO and President of General LED. General LED is a portfolio company of The CapStreet Group ("CapStreet"). "This acquisition is an exciting and important step in the evolution of General LED," said Adrian Guerra, Principal at CapStreet. "We look forward to making additional acquisitions to further leverage the significant investments made in the company's global platform and information technology systems." 

HEY!

YOUR SEARCH
| ENDS HERE



WOULD YOU LIKE

to know more about the HVAC and R (heating, ventilation, air-conditioning and refrigeration) industry.

JUST FLIP OVER AND WE HAVE A
SUBSCRIPTION FORM FOR YOU.

BESIDES MONTHLY
MAGAZINE TAKE
ADVANTAGE OF THE
DIGITAL TECHNOLOGY
& READ COOLING INDIA
MAGAZINE ONLINE, AS
WELL AS FORTNIGHTLY
E-NEWSLETTER ON YOUR
PC, TABLET OR LAPTOP.



PRIYANKA

022-2777182 / 8652142057
sub@charypublications.in



Cooling India

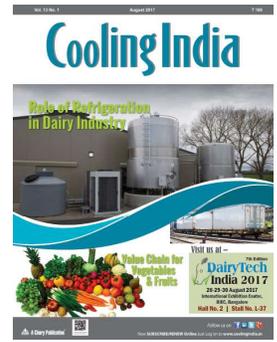
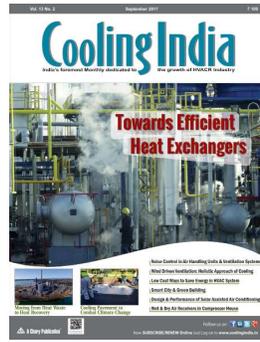
India's foremost Monthly dedicated to the growth of HVACR Industry

YOU CAN ALSO
SUBSCRIBE **ONLINE**
www.coolingindia.in

SUBSCRIBE

Cooling India

India's foremost Monthly dedicated to the growth of HVACR Industry



Subscription Offers

Sub. Period	No. of Issues	Subscription Type					
		Print		Digital		Print+Digital	
		Actual Rate	You Pay	Actual Rate	You Pay	Actual Rate	You Pay
1 Year	12	1200.00	1000.00	1200.00	1000.00	2400.00	1500.00
2 Years	24	2400.00	1750.00	2400.00	1750.00	4800.00	2625.00
3 Years	36	3600.00	2500.00	3600.00	2500.00	7200.00	3750.00
5 Years	60	6000.00	4000.00	6000.00	4000.00	12000.00	6000.00
E-Newsletter							
1 Year	24	N. A.		365.00		N.A	

PLEASE SELECT MODE OF DISPATCH FOR PRINT EDITION -

(1). By REGISTERED PARCEL - Rs. 435/- year (2). By COURIER - Rs. 600/- year

KINDLY ADD POSTAGE CHARGES IN SUBSCRIPTION AMOUNT.

Subscription / Renewal Form

To,
The Subscription in-charge
COOLING INDIA
 Email: sub@charypublications.in

Are you a Subscriber,
 Please submit your Subscription no:

Yes, I would like to Subscribe/renew Cooling India / CI e-Newsletter for _____ years at ₹_____.

PAYMENT DETAILS :

Cheque / DD No. _____ Dated _____ Drawn on Bank _____
 _____ Branch _____ in favour of Chary Publications Pvt. Ltd.

Bank details for NEFT / RTGS / IMPS : Account Name: Chary Publications Pvt. Ltd.

Bank Name: Bank of India Branch: Chembur, Mumbai - 400 071 Account Type: Current Account
 IFSC Code: BKID0000009 Bank A/C Number: 000920110000322 SWIFT CODE :BKIDINBBCHM

Name: _____

Company: _____ Designation: _____

Address: _____

_____ City: _____ Pin: _____

Telephone: _____ Mobile: _____

Email: _____

Signature: _____

Stamp



905-906, The Corporate Park, Plot No. 14 & 15, Sector 18, Opp. Sanpada Railway Station, Vashi, Navi Mumbai - 400 703.
 Phones: +91 22 27777 170 / 171 • Email: sub@charypublications.in • Contact : Priyanka Alugade • +91 22 27777182 / +91 8652142057

ALTANOVA

GROUP

Advanced testing and monitoring solutions

AQUILA



PD SCOPE



FOR

HV & MV CABLES

WORLD CLASS CABLE TESTING & MONITORING SOLUTIONS

Our expertise helps you monitor & maintain your cable's health and makes them last longer.

ALTANOVA, apart from providing FAT consulting & spot testing during operation, also offers for HV & MV cable sequential or simultaneous off-line testing or on-line monitoring at every joint and the terminations of the cable.

Our world class technology easily detects Partial Discharges (PD) and assesses the condition of HV & MV Cable Systems and keeps the degradation processes under effective control.

At **ALTANOVA**, we ensure that you work towards business growth with enough time to do what you should be doing, while we take care of all your Electrical Assets...



Regional Office: C-33, Ground Floor, Sector-2, Noida-201301, Uttar Pradesh, India
Telephone: +91 120 4543853 / 54 / 4222712; **Fax:** +91 120 4574772
Website: www.altanova-group.com, **Email:** info.asia@altanova-group.com

TECHMP

Smart Lighting: Opportunities & Challenges

Lighting plays an important role in our well-being and use of smart lighting system adds elegance, ambience, convenience and energy efficiency to any place...



www.electric

Lighting is a vital part of life at home. It makes our homes safer, cozier and more welcoming. Lighting plays an important role in our well-being

and use of smart lighting system adds elegance, ambience, convenience and energy efficiency to any place. Warm, dimmed light creates a calming atmosphere

which encourages socializing and relaxation. At present, incorporating smart lighting in homes is easier than to think. The kits are ready right out-of-the-box, with light sources and steering devices pre-paired. All we need to do is install the smart bulbs. Smart lighting is getting smarter. Create a range of pre-set moods for all activities, from weeknight cooking to weekend movie marathons, we can create a pre-set lighting mood for each activity. By setting a 'rise and shine' timer, we can wake up gently to softly brightening light. Smart lighting dimming kit white spectrum changes the room and atmosphere from reading light to dancing light and back again with a simple click on the remote control. Smart lighting, for instance, gives flexibility because we can control it

with timers, plus can set schedules and monitor bulb status remotely, etc. There are four reasons why you should use smart lighting. First and foremost it can save money on a utilities bill. That's because a smart lighting network is very energy efficient; it allows us to calibrate when exactly a light should be on. Smart lights can also simplify our life. When preparing to travel, we won't have to physically alter the settings of each smart light or check to see if it is off before we leave., we can do all this remotely, from a far.

Segments of Smart Lighting System

Smart lighting incorporates many technologies so that either indoor or outdoor lights will work automatically under certain

conditions. Different smart lighting networks do different things, but some of the more popular solutions feature smart lights that are capable of instantly switching on when someone enters a room or changing colour when something occurs. Different types of smart lighting systems are available with all know how of their working, and the many products we can buy in market today.

Home Automation: enables to have automatic, electronic, and even remote control of the home as well as the devices, fixtures, accessories, and appliances inside. Several manufacturers have already developed smart products for homes and various control systems that enable their automation. Smart lighting networks fit into the home



One-stop and cost-effective lighting solutions for India, backed by German standards of quality.

Testing and certification of your lighting products can be expensive and time consuming, especially when you need to comply with multiple national and international standards of quality and safety. Our internationally recognized test marks and one-stop, affordable range of services give you a competitive advantage at home and abroad, no matter the size of your business.

- Testing services for lamps, lights and LEDs.
- Faster access to global markets, encompassing Indian regulations such as: BIS, BEE & WPC.
- Testing for electrical, photometry & photo-biological safety as per 2014/35/EU, DIN EN 60598, DIN EN 62471 and IEC/TR 62778.
- State-of-the-art EMI/EMC & wireless labs covering all your testing and certification needs.

Email us at info@ind.tuv.com
to schedule a no-obligation call from our experts.
Email subject line: P03/EI/052018

www.tuv.com/in



Automated Illumination

Smart lighting system segmented by product types, light source, communication technology, and applications is summarized as:

Product type	Light Source	Communication Technology	Protocols	Applications
<ul style="list-style-type: none"> - Smart Bulbs - Fixtures - Control Systems - Drivers and ballasts - Switches and dimmers - actuators - Sensors - Microcontrollers - Transmitters and receivers 	<ul style="list-style-type: none"> - Light Emitting Diode - Fluorescent Lamps - High-Intensity Discharge Lamps 	<ul style="list-style-type: none"> - Wired - Digital Addressable Lighting Interface - Powerline Communication - Power Over Ethernet - Wired Hybrid - Others 	<ul style="list-style-type: none"> - Wireless - Zigbee - Bluetooth - EnOcean - Wi-Fi - Li-Fi 	<ul style="list-style-type: none"> - Indoor Lighting - Commercial - Industrial - Residential - Others - Outdoor Lighting - Highway & Roadway Lighting - Architectural Lighting - Lighting for Public Places

automation trend and will change the way of lighting our home, forever.

Networks & Controls: Often allow lights to interact with each other, so that they can be calibrated en masse, or even individually through a remote control setup. Smart lighting networks vary drastically, but generally, their lights can either work independently or together when connected. There are two main types of smart lighting networks: sensor-integrated and non-sensor integrated. Sensor-integrated lights feature sensors that enable them to recognise people and daylight, among other things. These lights automatically send data to the smart lighting network, which sets specific parameters for each light. Although non-sensor integrated lights don't have sensors, they're still considered smart, because we can program them. There are two main ways of controlling smart lights: control hubs and smart devices. We can use tablets, smartphones, laptops,

and even desktop computers (as long as both the device and the smart lights are connected to Wi-Fi or Bluetooth) to remotely configure and manage smart lighting. In some situations, typically, in larger buildings, there is a dedicated control hub that maintains the smart lighting network.

Moving Heads: A moving head has the ability to change colours and patterns. It has a wide range of mobility options, such as circular, pan and tilt. The newer moving heads can rotate between 360- 180 degrees. They are visually more interesting to guests and offer a larger range of movement and lighting output than scanners.

Scanners: Scanners also have the ability to change colours and patterns but unlike moving heads, they have limited mobility of its head. Instead, it features a moving mirror that gives the fixture the ability to project patterns and colours throughout the room. There are many debates whether scanners are better than moving heads or vice versa. Scanners are

faster than moving head fixtures. However, moving heads will capture the interest of your guests with its moving function. In today's market, intelligent lighting is manufactured with LED technology.

Role of LEDs: Energy savings, exciting new designs, better light quality, lower environmental impact and a 20-year lifespan; new LED lighting is so much better than old incandescent lighting. So, we've switched our entire lighting range to LEDs. This really does mean everything, from bright and accurate kitchen lighting through to warm and cozy bedroom lighting with LED bulbs for all existing light fittings. To reduce your energy consumption without making sacrifices. To make living a sustainable life at home easier, beautiful and more affordable, LEDs are an easy way to make a big difference. Energy efficiency, viability, and sustainability were the questions the LED lighting industry addressed over the last decade. With Solid-State Lighting successfully established for indoor,



TRUEPOWER
EARTHINGS PVT LTD

An ISO 9001:2000 Certified Company

SAFETY BEYOND IMAGINATION

- ★ CHEMICAL EARTHING
- ★ ESE LIGHTNING ARRESTER
- ★ COPPER BONDED ROD
- ★ EARTH PIT COVER
- ★ POLY PLASTIC EARTHING
- ★ PIT COVER
- ★ SPIKE LIGHTING ARRESTER



MAINTENANCE FREE CHEMICAL EARTHING

Approved by:



True Power Earthings Pvt. Ltd.

Office No. 15, 2nd Floor, Ankur Chambers,
Opp. Prakash Dept Store,
Tapkir Galli, Next to Vasant Talkies, Pune - 411002
Ph : 9370335298 / 020-65400097
Email : pune@truepowerearthings.in

www.truepower.co.in, www.truepowerearthings.com

outdoor and roadway lighting, the industry is poised to take LED to new dimensions. Within the smart lighting market, light emitting diodes (LEDs) are expected to remain the largest market and are expected to witness the highest growth over the forecast period. Declining cost of LEDs, low maintenance, and high energy efficiency are expected to spur the growth of this segment.

Smart Cities with Smart Lighting: Sensor technology is developing at a phenomenal rate, battery powered sensors can now last upto 10 years and be deployed in challenging locations to help deploy smart city solutions almost anywhere. Solutions such as smart lighting, where traditional legacy lights are replaced with LED lamps can generate significant savings on energy bills and maintenance costs, and deliver a potential return on investment in less than eight years. The upgraded street lighting assets can then be further used to support other Smart City initiatives such as a WiFi mesh network; smart parking and air quality monitoring. Devices that can power themselves, by tapping into sunlight, vibrations or heat, are also under development. Moving beyond the functionality of products to meaningful applications providing value for citizens and society requires a change in paradigm that affects all participants. Cities strive to improve quality of life for their citizens and see opportunities in new information and communication technology-based technologies. Public lighting and public lighting infrastructure can

play a significant role as a stepping stone to achieve the ambitions of cities to become 'smart cities'. New technologies, like LED lighting and data science, do not only contribute to energy saving, but at the same time provide opportunities for value adding services.

Opportunities

There are several case studies where light has for example prevented crime, increased number of people going out, leading to more customers for local businesses and so on. Now it is a good time for new startups who wants to improve their city by using old technology and inventing new, in order to find smart ways of using light. Trends and opportunities in the smart lighting systems arise by products (smart bulbs, fixtures, control systems), by light source (light emitting diode, fluorescent lamps, high-intensity discharge lamps, and others), by application (indoor lights and outdoor lights), by communication technology (wired and wireless) and by region. Opportunities of smart lighting are quality of lighting that addresses human health benefits, digital signage and agricultural lighting and can be summarized as:

- Get started with the magic of smart lighting in just one room, or brighten up the entire house.
- Make your house appear occupied while you are away. Choose a light for early mornings, another for late evenings and a third for cooking or working.
- Raise or dim any light in the room or the entire house with a single touch, using just our

voice or using remote control or App.

- Having lighting responding automatically to how we live. It is not just smart, it is brilliant.
- With smart lighting, we can change the atmosphere in our home with the touch of a button. Turn on/off, dim, adjust colour temperature and more from anywhere in the home – without rewiring.
- Wireless lighting provides sophisticated style in sleek color configurations, guaranteed to complement the beauty of your home.
- Customizable buttons allow you to control more than just lighting—including music, movies and more—with a simple press.
- Motion sensors provide hands-free illumination and automatically turn off lights when no one is in the room. Button customization enables one-touch control of lighting of course, but also entertainment, security, climate and more.
- Smart lighting knows no boundaries—from under roof to under the stars. Activate a lighting scene that lights up the deck and emphasizes water features in the backyard. Exterior lighting can turn on-and-off in unison with the sunrise and sunset. Set perimeter lights to flash if the alarm system is triggered, drawing attention to unusual activity.
- Smart lighting solution, with its comprehensive capabilities, can detect dusk and dawn, conserve energy and provide huge value

Largest Test Lab. Widest Choice. 36 Month Guarantee.

zero

... zero Downtime ... From #1 in moving cables.



34 M strokes tested*



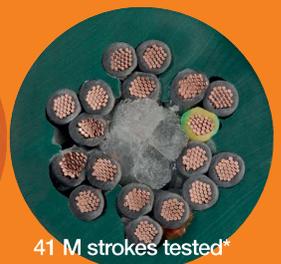
138 M strokes tested*



27 M strokes tested*



26 M strokes tested*



41 M strokes tested*



20 M strokes tested*



22 M strokes tested*



76 M strokes tested*



66 M strokes tested*



65 M strokes tested*



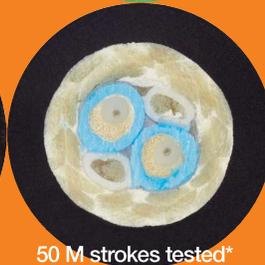
53 M strokes tested*



97 M strokes tested*



138 M strokes tested*



50 M strokes tested*



22 M strokes tested*



Zero Downtime solutions for your toughest moving cables: 1244 cables from stock make chainflex® the largest motion cable range - for torsion, motor, servo, hybrid, control, data, BUS, ethernet and FOC cables. chainflex® cables are developed and tested in the industry's largest test lab. With 600 parallel tests on 2750 m², 1.4 million electric measurements and 2 billion cycles per year, you find cables that solve your toughest "zero downtime" challenge. And with up to 7 motion quality classes, you find just the right cable for your application - for less money. Calculate life online and order today with a 36 month guarantee.

igus.in
plastics for longer life®

* All test reports and more here: www.igus.in/chainflextests

Automated Illumination

to the customers in terms of cost-cutting and operating efficiency.

- Sophisticated solution continuously monitors the operation of luminaries (Indoor & outdoor) by a centralized monitoring system, which helps in reducing the energy consumption, maintenance and manpower cost and increasing efficiency.

Challenges

There are always challenges in creating and implementing smart solutions that are truly serving the needs of people and making the place attractive to live. Emerging challenges include connectivity, interoperability, data security, non-visual effects of lighting and spectral and light dosage for plant and poultry growth. Questions have arisen with respect to potential health implications of blue-rich, solid-state or compact fluorescent lighting. Short-wavelength visible light at very high intensities can be phototoxic to the retina, and the newly discovered retinal cells that influence circadian rhythm are

strongly blue-sensitive. Night shift workers have a higher cancer risk, and some scientists have suggested a possible link to lighting at work that could indirectly impact cancer risk by disruption of human circadian (day-night) regulation. Changing fixture and control technologies — coupled with integration expectations and energy management demands — leaves many lighting designers hesitant to fully embrace lighting controls. Relying on manufacturers and engineers for all things “controls” related, the lighting designer can ignore a vital tool in the design and weaken their position with their clients when problems occur. Most of us take for granted that our city lights will illuminate the streets — but good-quality city lighting can also create a feeling of safety, allowing citizens to enjoy life and make the most of everything a city has to offer. Cities need to remain attractive and safe places for residents and visitors, to develop as centers of economic growth. But this must be balanced by the harsh reality of budget constraints and the requirement

to lower our carbon footprint by using fewer resources.

Future

The future of the smart lighting market looks promising with opportunities in the residential and commercial sectors. The global smart lighting market is expected to reach an estimated USD 17.7 billion by 2022 and is forecast to grow at a CAGR of 23.9% from 2017 to 2022. The major drivers of growth for this market are development of smart cities, increasing usage of wireless technology, and increasing awareness of energy saving. Emerging trends, which have a direct impact on the dynamics of the smart lighting industry, include growing demand for Internet of Things (IoT) technology and emergence of light fidelity (Li-Fi) technology in the field of smart lighting market. ■



Dr S S Verma

Department of
Physics, S.L.I.E.T.,
Longowal, Distt.-
Sangrur (Punjab)

Let people not Forget you
Standout from the crowd...

Attract More Business by advertising in

FOR DETAILS CALL :
Ad Department (022-27777180)
(022 2777 7184) & (+91 22 2777 7196)

Since 1951
Electrical India
India's oldest magazine on power and electrical products industry

THE IMPOSSIBLE IS OFTEN

THE TASKS UNTRIED

BESIDES BI-MONTHLY MAGAZINE TAKE ADVANTAGE OF THE DIGITAL TECHNOLOGY & READ **LIGHTING INDIA** MAGAZINE ONLINE, AS WELL AS FORTNIGHTLY E-NEWSLETTER ON YOUR PC, TABLET OR LAPTOP.

To **Subscribe** & Be Updated
Please fill the form (P.T.O.)

PLEASE TURN BACK FOR THE SUBSCRIPTION FORM.

Come Join us in endeavour to bring the lighting industry to you, on the most read media platform of **LIGHTING INDIA**.

"WE TRAVEL AROUND THE WORLD TO GET NEWS, PRODUCTS & PROJECTS FOR YOU, SO THAT YOU CAN KEEP PACE WITH THE REST OF THE WORLD "



CHARY PUBLICATIONS PVT LTD.

905-906, THE CORPORATE PARK PLOT NO. 14 & 15, SECTOR - 18, OPP. SANPADA RAILWAY STATION, VASHI, NAVI MUMBAI - 400 703. FOR SUBSCRIPTION PLEASE CONTACT PRIYANKA ON 022-27777182/8652142057 OR EMAIL ON sub@charypublications.in

Read and advertise in India's foremost magazine on LIGHTING INDUSTRY.

SUBSCRIBE

Lighting India



Subscription Offers

Sub. Period	No. of Issues	Subscription Type					
		Print		Digital		Print+Digital	
		Actual Rate	You Pay	Actual Rate	You Pay	Actual Rate	You Pay
1 Year	6	750.00		750.00		1500.00	1125.00
2 Years	12	1500.00	1350.00	1500.00	1350.00	3000.00	2025.00
3 Years	18	2250.00	2000.00	2250.00	2000.00	4500.00	3000.00
5 Years	30	3750.00	3000.00	3750.00	3000.00	7500.00	4500.00
E-Newsletter							
1 Year	24	N. A.		365.00		N.A	

MAGAZINE WILL BE SENT BY REGISTER PARCEL --Rs.220/YEAR

KINDLY ADD POSTAGE CHARGES IN SUBSCRIPTION AMOUNT

Subscription / Renewal Form

To,
The Subscription in-charge
LIGHTING INDIA
 Email: sub@charypublications.in

Are you a Subscriber,
 Please submit your Subscription no:

Yes, I would like to Subscribe/renew Lighting India / LI e-Newsletter for _____ years at ₹_____.

PAYMENT DETAILS :

Cheque / DD No. _____ Dated _____ Drawn on Bank _____
 _____ Branch _____ in favour of Chary Publications Pvt. Ltd.

Bank details for NEFT / RTGS / IMPS : Account Name: Chary Publications Pvt. Ltd.

Bank Name: Bank of India Branch: Chembur, Mumbai - 400 071 Account Type: Current Account

IFSC Code: BKID0000009 Bank A/C Number: 000920110000322 SWIFT CODE :BKIDINBBCHM

Name: _____

Company: _____ Designation: _____

Address: _____

_____ City: _____ Pin: _____

Telephone: _____ Mobile: _____

Email: _____

Signature: _____

Stamp



905-906, The Corporate Park, Plot No. 14 & 15, Sector 18, Opp. Sanpada Railway Station, Vashi, Navi Mumbai - 400 703.
 Phones: +91 22 27777 170 / 171 • Email: sub@charypublications.in • Contact : Priyanka Alugade • +91 22 27777182 / +91 8652142057



YOUR RELIABLE PARTNER FOR ALL CABLES AND CONDUCTORS NEEDS

We are the India's Leading manufacturer of Cables & Conductors. For over 30 Years, we are continuously expanding our presence in Indian and Overseas market to Electricity Boards, Government and Private Power Utilities, Private Contractors & Various EPC Companies. Our Organizational Philosophy is backed by Product Excellence, Customer delight technological advancements and an environmentally friendly approach.

Manufacturer & Exporters of:

- 66 KV XLPE Power Cables
- HT & LT Aerial Bunched Cables
- HT & LT XLPE UG Power Cables
- LT PVC Power & Control Cables
- FR/FRLS/LSZH Cables
- Airdac, Communication and Concentric Cables
- Solar Power Cables
- Bare & Insulated Copper Conductors
- ACSR, AAA, AA, AL59 & HTLS Conductors
- Railway Signalling, Power & Quad Cables



Dynamic Cables Ltd.

(A Govt. Recognised Export House)
AN ISO 9001:2015 & OHSAS 18001:2007 Certified Company

Registered Office: F-260, Road No.13, V.K.I.Area, Jaipur- 302013, Rajasthan, India
Ph: +91-141-2332388, 2262589, 4042005 | **Fax:** +91-141-2330182
E-mail: info@dynamiccables.co.in | **Website:** www.dynamiccables.co.in

— Supporting —



Challenges for MV Cable Distribution Systems

11 and 33 KV cables are referred to as 'Medium Voltage' (MV) Cables. And in this change in nomenclature lie the roots of the challenges that face MV cable distribution systems that have not yet received the attention they deserve, with the exception of a few well-managed and progressive urban utilities...



Not too long ago power distribution in India referred to a low voltage network connecting to the residential consumer's house. Even cables rated 11 KV were referred to as "High Voltage Cables". Today, the term 'High Voltage' is reserved for cables at 66 KV and higher, while 11 and 33 KV cables are referred to as 'Medium Voltage' (MV) cables. And in this change in nomenclature lie the roots of the challenges that face MV Cable distribution systems

that have not yet received the attention they deserve, with the exception of a few well-managed and progressive urban utilities.

Growth of MV Distribution systems

There are two trends that characterise the changes taking place. Firstly, there is a demand of larger quantity of power by the domestic consumers, and secondly, the move away from uninsulated systems to safer and more reliable insulated systems. Domestic consumers form the largest number of connection points for any power distribution system. With increasing urbanisation in India, the second

category that demands high amounts of power is commercial establishments.

Domestic network planning was, and continues to be, based on very frugal estimates of power consumption by domestic users. Many rural connections are still estimated at 1 KW per dwelling unit. This does not adequately consider that rising living standards indicate a high probability of the rural household using a room heater or geyser for hot water for bathing in winter, or an iron for ironing clothes, in addition to lights, fans, TV and in all probability a refrigerator. In urban areas, the planning is also frequently inadequate or outdated. In DLF

Gurgaon, an upcoming residential suburb outside Delhi, the system was originally conceived as being required to cater to a load of 5KW per plot. This did not envision the possibility of multiple dwelling units on one plot, or that each dwelling unit may have two air-conditioners running simultaneously in two bedrooms during summer. Nor did it take into account that bare LT lines running along the streets conflicted with the announced intention of having "green" colonies with massive tree plantation plans that would foul with the uninsulated lines. In light of these developments, LT distribution networks are no longer adequate to cater to the

KUSAM-MECO[®]
An ISO 9001:2015 Company

BATTERY QUALITY ANALYZER MODEL - KM 900

**Single, Quick Testing Total Battery Quality Analysis Solution
Super Tool for UPS Battery field Management**

Battery Health Analysis Testing at System Loading condition
Impedance, Voltage, Temperature, Current and Capacity measurements
(simultaneously or independently)

High Performance Battery Quality Analyzer Data Logger with Trend Analysis
Abundant Data Logging and Accurate Trend Analysis is available backed by Internal SD Card stored up to 7.5 million data in Text or Graphic mode

FEATURES

- The Battery Quality Analyzer is designed for measuring the internal resistance, open-circuit voltage, and terminal temperature of secondary batteries, including Lead Storage Cells (Lead -Acid batteries), nickel-cadmium batteries, lithium-ion batteries and nickel-metal hydride batteries.
- AC four-terminal method to measure the internal resistance by eliminating lead resistance and contact resistance to get the accurate results.
- Multiple display to show the internal resistance, voltage and temperature or voltage, current and temperature of the battery simultaneously.
- It has 99 sets of composite comparator function, which can be set at resistance and voltage values to get the reliable detection of battery deterioration.
- Pin type lead, which can easily contact the battery electrodes supplied as standard to get more accurate 4-terminal measurement.
- Clamp adaptor for DC current or AC current measurements.

TO VIEW THE FULL RANGE OF OUR PRODUCTS VISIT : www.kusamelectrical.com



G-17, Bharat Industrial Estate, T. J. Road, Sewree (W), Mumbai - 400015, India.
Tel. : 022 - 2412 4540, 2418 1649, 2775 0662, 2775 0292 Fax : 022-2414 9659 E-mail : sales@kusam-meco.co.in

needs of the distribution systems. These LT systems are being supplemented, and in many cases replaced, by medium voltage networks. Old 11 KV substations are being replaced by 33 KV or 66 KV substations. At the next level the distribution is being done at 11KV for most low density residential areas. Furthermore, the coming of small guest houses with one or two dozen air-conditioned rooms on offer has led to many of them having small 11 KV transformers to feed the load. For higher density residential and commercial high-rises, the supply is often at 33 KV to a dedicated sub-station on the premises. All this points to the inevitable proliferation and growth of Medium Voltage distribution systems.

Expectations from Distribution Systems

The demand for delivering increased power is accompanied by the requirement to deliver it in a reliable and unobtrusive and environment friendly manner. Power outages for any reason are no longer acceptable to consumers and frequently make news headlines. Excess availability of power on the grid which is forcing the backing down of some generating stations and being publicised by the Power Ministry is a game changer. Apart from consumers questioning the deficiency of service quality, even regulatory agencies have begun to study the model of penalties on utilities for such deficiencies as are already in place in many parts of the developed world. Under this concept, consumers would be

entitled to a deduction from their electricity bills for outages. With system voltages increasing from LT to 11 and 33 KV the number of customers being affected and the consequential liability to utilities will increase tremendously.

The other expectation is for the system to be environment friendly and aesthetically unobtrusive. Cutting of trees to clear the way for power lines is already an issue between utilities and forest and environment departments. In one state, the utility confessed that it sends out its men on weekends when the Forest Department is expected to be dormant. But environment activists are not. They protest such tree cutting. The problem will only become more acute as the voltage level rise from 1.1 KV to 11 KV will require larger clearances.

The uncontrolled use of 11 KV cable strung haphazardly along roads in ugly festoons may be the norm in Govt PWD departments and highway authorities but is unacceptable to private developers who suffer loss of saleability and price if aesthetics are not taken into consideration. It is only a matter of time before the government departments are forced to also respond to similar expectations that the general public will have from them, just as they will no longer quietly accept poor quality roads.

Installation, Maintenance and Operation

Since MV cable distribution networks appear to be inevitable, it becomes necessary to ensure that they are given due attention at the stages of planning,

installation, maintenance and operation. Unfortunately, this is not the current state of affairs. The concept of a distribution design department is absent in most discoms. The challenge is to increase the knowledge about MV Cables and their use beginning from design concept and extending through Specification, Execution, and System Operation. Each of these areas gets less attention than it merits.

Cable Selection

System design as a whole is a vast subject well beyond the scope of a short article or paper. So, let us look at cable selection. Most cable companies put out a reference book of cable data which lists the various parameters of cables, and also often include notes on installation guidelines. In purchase tenders this information is also captured in the "Guaranteed Technical Particulars" (GTP). Unfortunately, these generally remain with the Purchase Department and are not accessible to the field users.

In one instance, the author was called to troubleshoot an 11 KV AB cable network. The line was 26 km long, and carried power from a 5 MW Mini Hydel plant to a grid sub-station. The first issue related to the frequent breakdowns. It was found that the electricity inspector had stipulated single end earthing. The contractor had earthed the screen and armour of the entire length of the 26 km at one end only. Naturally, the screen voltage rise at the far end was excessive, and this could be easily established by calculation. It took some convincing to explain that the

TOGETHER
LET'S STRENGTHEN
THE POWER
INFRASTRUCTURE
OF INDIA

CABLE
ARMOUR WIRE
RCA/FCA

POWER
TRANSMISSION
ACSR WIRE

STRANDED STEEL WIRE
STAY WIRE



SME
INDIA 100
AWARD

II Rank
in Engineering Category

SELECTED in TOP 100 SME
from 64000 Companies



We just don't draw **wires**,
We draw **customer satisfaction**.



H.D. WIRES
PVT. LTD.

17-20, Sanwer Road, Sector E, Industrial Area, Indore - 452 015.

Ph.: 91-731-4211199 Mob.: 9999099016, 9404370343

Telefax: 91-731-4211111 • Email : sales@hdwires.com



Field Training on Jointing

electrical inspector's requirement could be met by sectionalising the run into lengths of about two km each & earthing each section at one end. This was easily achieved by using MVT tap off connectors to join the phase conductors of each section to the next. An additional advantage was that in case of a fault, the individual sections could be easily isolated to localise the section that had developed the fault.

The other issue was that the voltage at the receiving end was below acceptable levels, and on this basis the cable was declared to be sub-standard. A simple calculation of the load current and application of ohms law for the length and conductor resistance showed that the receiving end voltage was exactly what was predicted by the calculations! (Surprisingly this led to a charge by the utility, which had designed the

system and specified the cable cross-section based only on basis of current carried, that the contractor should have pointed this out earlier!)

In addition, many utilities have faced the problem of improper selection and specification of cable sheaths in MV AB Cables. In Gulbarga the PE Jacket of 11 KV AB Cables cracked within two to three years and the cables had to be abandoned. A CPRI study revealed that the cause was that the PE used for the jacket had not been UV stabilized, and that the specifications had not called for it to be UV Resistant.

Cable Installation

Ensuring proper cable installation will be the biggest challenge as the distribution network moves to MV Cables, whether it is an underground or aerial installation. MV cables are

more sensitive, both due to their more complex design and higher voltage levels as compared to LV Cables. In LV Cables, the insulation is more based on mechanical considerations than electrical. In contrast, MV cables have insulation thickness dependent on electrical stress. Hence, the electrical safety margin inherent in MV Cables is much lower than in LV cables. They have to be handled and installed with far greater care than permissible with LT cables.

IS 1255 lays down the recommended Code of Practice for Installation of Cables. Yet, few Field Installation Supervisors are aware of it, and fewer have read it. At a CPRI training session on Good Installation Practices with about 40 Field Supervisors attending, the Author asked how many had read it. Only four hands went up!

Basic recommended practices for cable pulling, laying on sieved sand or soil and at specified depths are often ignored. In several cases cables have been direct buried, and then roads constructed over them without protective ducts or pipes to provide protection during road construction or from subsequent traffic vibration. In Maharashtra a 4 km 33 KV Cable had to be abandoned due to this oversight.

In another incident with the same installation contractor, a cable fault was detected in the region of a straight joint. Suspicion turned to the joint having failed. The repair team found the joint healthy, and the cable had burst because of over-bending nearby. Against a recommended minimum bending radius of 1.8 mtrs based

both on IS 1255 and GTP recommendations, the cable had been bent into a loop with a diameter of two metres and had burst at one point on the loop.

In case of MV AB cables, the problems are more frequent as the contractors are frequently those previously installing bare conductor networks. They are neither familiar with nor sensitive to the more careful handling MV cables require in comparison to ACSR conductors. Dragging on the ground or pulling with excessive force that may not damage ACSR can greatly weaken a MV cable and cause frequent faults and significant shortening of the service life of the cable.

Clearly, there is a need to both provide greater design input, and

to train the Field Supervisors. Both of these factors will become more important as more MV Cables become part of the network. Cable and accessory manufacturers can play a crucial role. While a few cable accessory manufacturers do offer these services (either gratis or on a paid basis) by and large the cable companies pay scant attention to how the cables are installed and used once they leave the factory.

Importance of Quality

In most MV cable networks, the area of greatest concern is the jointing. The cable is made and tested in the factory before despatch. In case of jointing, the installation or fitting is done in the field. However, the reliability of the

system is as much dependent on the jointing as it is on the quality of the cable.

The quality of accessories can be checked prior to allowing despatch to the site through pre-despatch inspection. The pre-despatch tests are generally a few short term tests that test material properties, but time constraints do not allow simulation of performance over the desired 30 years life of the system. For such longer term, evaluation reliance is placed on one-time type tests.

Unfortunately, there is no easy way to correlate the quality of the material submitted for qualifying Type Testing with those actually supplied later. It is always open to unscrupulous manufacturers to source components from a high-



Quality and reliability is our tradition

KYORITSU



The perfect tool for **ENERGY SAVING** and **POWER QUALITY** control

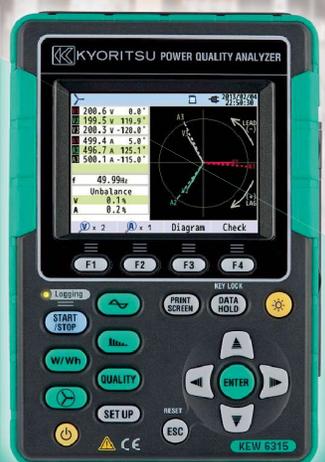
KEW 6315

POWER QUALITY ANALYZER

- Simultaneous Power & PQ measurements
- Measurement with high accuracy
 - ±0.3%rdg (energy) • ±0.2%rdg (voltage/ current)
- Remote monitoring on PC and Android device
- Various Clamp Current Sensors
 - 1000mA Range up to 3000A Range
 - Earth leakage measurements
- Energy consumption check on site

KEW 6305

- Does Not Have PQ parameters



TRUE RMS
USB
Bluetooth
1P2W
1P3W
3P3W
3P4W

IEC 61000-4-30
Class S

EN50160

IEC 61010-1
CAT IV/300V

Power & Energy

Power Quality

Waveform

Vector and Wiring check

Print Screen

Harmonics Analysis

Wiring Check
Check the test environment...
 Wiring check..... OK
 Self diagnosis..... OK
 Sensor identification... OK
 Name

3 Phase System Testing

Model Set

Quick Start Guide

Guide start

Connect to the circuit

Wring check

Select interval

Set recording time

Start recording

Special Offers

True Digital Multimeter KEW 1021R
PROMO PRICE ₹ 6,655/- (till stocks last)

1000 Aac Digital Clamp Meter KEW 2117R
PROMO PRICE ₹ 4,600/- (till stocks last)

Digital Multimeter KEW 1009
PROMO PRICE ₹ 2,777/- (till stocks last)

India Service Centre

REPAIR & CALIBRATION CENTER INDIA


KYORITSU
 Kyoritsu KEW India Instruments Pvt. Ltd.
 E: info.ei@kew-india.co.in
 W: www.kew-ltd.co.in



EVA Insulator deterioration after 2 years

quality manufacturer to qualify their product, and later supply inferior materials from a lower priced and lower quality manufacturer. For this reason, it is important to distinguish between assemblers and manufacturers. The Department of Telecom has gone some distance in doing this by restricting purchases to those who manufacture sleeves from granule stage. This can be taken further by insisting that the moulded parts at least must be embossed with the manufacturers name or logo, and easily counterfeited printing of name is not sufficient.

The latest version of the Indian Standard has also addressed some of these issues by recording key properties of track resistant, stress control and insulating materials. It still remains for users to make it a practice to check that the material supplied is not lower than a reasonable margin (say 20 percent?) of the values recorded in the Type Test Report.

Specifications also need to be drawn up with care. In particular, outdoor use materials face an even more severe service condition. Use of certain materials at 11 & 33 KV like EVA which are normally not used for insulators have shown rapid deterioration within two to three years in hot and humid climates compared to their Silicon counterparts and even when compared to the traditional red anti-track heat shrink compounds which are subjected to 1000 hour salt fog tests before adoption in outdoor cable terminations. It is clearly better to specify porcelain, silicon or proven anti-track materials such as are used in outdoor terminations for use in MV Insulators or MV Tee connectors.

Many product warranties which are limited to “twelve months after installation, or eighteen months after supply” allow such products to continue to be used. Longer guarantees which are now becoming more common such as five years help screen out such

inferior products. In one major utility in North India the very poor performance of a 33 KV straight joint has resulted in the manufacturer being virtually black-listed, with collateral damage to credibility of other non-multinational manufacturers.

Even when the best of materials are used, the impact of the uncontrolled environment in which the work is to be done and the variability of skill of the installer and quality of workmanship are critical. Unfortunately the abolition of the cadre of Cable Jointers in most Govt utilities has led to the proliferation of self-proclaimed jointers being used by most private contractors. Part of the responsibility rests with accessory manufacturers who have propagated the myth that installation of heat shrink, cold shrink, or push on joints does not require special skills. This is a dangerous half-truth. The skill required to prepare a cable for jointing is high and requires extensive training and the prospective jointer must be subjected to careful checking. There are high levels of faults in jointing at 11 KV when inadequately skilled jointers are used, and these will only become more the norm as 33 KV distribution cables become more widespread.

On the other hand, careful training and evaluation can dramatically reduce failures. In a major RAPDRP program involving over 5,000 terminations and joints our company decided to carry out extensive checking, evaluation and training of the jointers, as well as the field supervising engineers. As

a result, the five-year period passed off with negligible warranty claims. Most significant was a bunch of failures at the tail end of the project from one location. Investigation revealed that the trained jointers had been moved to another project site, and the high number of failures were due to newer unevaluated jointers being used.

This underscores the need for procurement to take into account not just the upfront cost of the product, but the value of the service being provided to ensure the proper use of the product.

Investment in tools and tackle will need to be increased as the requirements of better quality of workmanship and greater volumes increase. Traditional methods of cable stripping using just a knife and a piece of glass will need to be phased out in favour of more sophisticated cable stripping tools. These are available for the crucial stripping of the cable semi-con, as well as for removing insulation without nicking the conductor. Dimension sensitive mechanical crimping tools are also being replaced by hydraulic tools which are based on the force of crimping. Metallic screen connections using binding wire and impractical soldering can be replaced by constant force springs as is common in Europe.

Conclusion

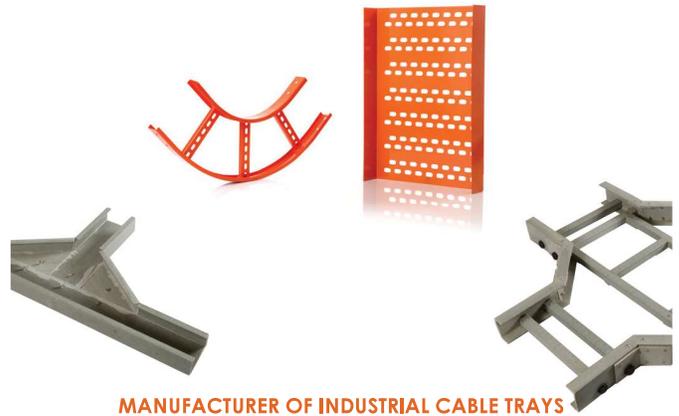
The abandoning of 11 KV MV cable systems in Haryana is entirely due to poor performance not attributable to the concept, but the unplanned and uncontrolled manner in which it was executed. If care is not taken, the entire move towards a more extensively cabled Distribution system can be similarly abandoned in favour of a lower tech but easier to install bare network, which is acknowledged to be less stable than insulated cable networks, provided they are properly installed.

As the MV cable and accessory manufacturers look at the tempting increase in demand that is inevitable they need to be sensitive to their responsibility to provide higher reliability, not just for the benefit of the user, but also in their self-interest. ■



Ashok Saigal

Managing Director and Co-founder of Frontier Technologies, Gurgaon



**MANUFACTURER OF INDUSTRIAL CABLE TRAYS
PRODUCTS FOR ELECTRICAL APPLICATIONS**



Shade No. 01, Gat No. 607, Radhika Ware House, Pune Satara Road,
Before Kailas Bhel, Velu Phata, Tal - Bhore, Pune - 412205, Maharashtra, India.
+91 77750 95888 | +91 88888 57479
shardacabletrays15@gmail.com | sales@shardacabletrays.com
www.saicabletrayindia.com | www.frpcabletrays.com



HPS harnesses our global operations to provide VPI, Cast Resin, and Oil Filled transformers and reactors for solar projects anywhere. HPS is a major supplier of key electrical components used in renewable energy infrastructure.

Our experience in the solar industry, diverse product breadth, and custom capabilities provide you with a reliable magnetic solution tailored to your needs.



power to perform





“We find applications in all stages of value chain of power”

Nomex® is an insulation material. Every electrical equipment needs insulation material be it generators, motors, transformers, or even household appliances. We find relevance in all the rotating machinery, generators, rotators and rotating traction motors, informs **Lohit Shringi, Global Market Director, Energy Solutions, Safety & Construction, DuPont** in an interaction with Supriya Oundhakar...

Kindly take us through the journey of DuPont.

Founded more than 200 years back, DuPont, is an American conglomerate that initially manufactured gunpowder. After 50-60 years of the company's existence, during the era of manmade materials, the company reinvented themselves from being an explosives manufacturer to more of a materials science. As a result, DuPont invented and developed a lot of new products like nylon, polyester, Neoprene that is a synthetic rubber. Polyester, Teflon brought a sea change in our lives. Now, again we are in the process of reinventing ourselves. So, recently we merged with Dow Chemical Company to create DowDuPont Inc. We are trying to firm our foothold in speciality chemicals, industrial biosciences etc. I represent Energy Solutions business which is a part of **Safety & Construction, DuPont**. In this, we have products and services like

Nomex® and Kelvar® that has applications in body armours for soldiers and law enforcement officers. DuPont developed the products like Tyvek® having applications in processed protection like pharmaceutical industry which is highly sensitive to contamination. Nomex® protects equipment by enhancing its life and reliability against high temperature and overloads.

Do you manufacture Nomex® in India? Do you have R&D in India?

We do not manufacture Nomex® in India. We are a global company. So, we have global scales. So, it is manufactured in US and Japan. We have distributed research and development. The way we divide research is in two parts. One is the basic materials science, the invention of new materials and invention of what the next Nomex® would look like. The second apart of research is application development. We

have application development research, which are there in all countries and India is a prominent country where we have invested into application research many years back. R&D for materials is primarily in US and Japan.

How would you differentiate the Indian markets from American markets while talking about Nomex®?

Fundamentally, Indian and American markets are not very different. I think it is the stage of evolution that is different. So, the American markets are much more matured. They adopted these technologies and the designs. I think India is witnessing the phase of technology evolution now. So, the nature of the market is not very different. However, the stage of evolution is slightly different in American and Indian markets.

But Indian markets are price sensitive.

I would say it is value sensitive. People are willing to pay the price as long as they understand the value. There are lot of incidences and examples which I can provide where people have to be taught the value and Once the potential clients understand the value, they quickly adopt it.

What are application areas of Nomex®?

Nomex® is an insulation material. Every electrical equipment needs insulation material be it generators, motors, transformers, or even household appliances. These are the various applications. We find relevance in all the rotating machinery, generators, rotators and rotating traction motors. We also find relevance in the transformer space. So, we find applications in all stages of value chain of power. So, we have presence in generators in power generation in generators. Nomex® has applications in transmission transformers, distribution transformers. Nomex® is used when power is consumed in terms of rotating machinery.

What kind of technological innovation would you like to incorporate in this product to make it more energy efficient and sustainable?

Nomex® really brings two very important values to the industry. One is about enhancing the reliability of the equipment. We are trying to introduce new technologies which will enable our participation in the

distribution transformers area. Again fundamental value, we bring is safety and reliability. The company is in process of designing products that allows transformers to be overloaded without an impact on the material degradation for a relatively long period of time. We want to make sure that when the transformers are overloaded, the materials inside the transformer do not lose their properties. Thus, it enhances the life of the equipment making it more sustainable.

Do you have any plans to set up manufacturing hub in India?

We support 'Make in India' by making sure that the latest technologies and latest application development technologies are available to our Indian customers. As of now, we do not have plans to set up a Nomex® paper plant in India. However, our idea of 'Make in India' is to support latest innovation in technologies in India which enables our customers to explore new areas.

What is your outlook for this sector?

I think we are very bullish. We are continuing to see a very sustainable growth in this area. So, we see growth coming into two parts, one is the normal organic growth which will happen because as a result of infrastructure build up in power, roads and ports. For example, we foresee growth in solar batteries. We also see electrical vehicles as a tipping point. The growth

Fundamentally, Indian and American markets are not very different. I think it is the stage of evolution that is different. So, the American markets are much more matured. They adopted these technologies and the designs. I think India is witnessing the phase of technology evolution now. So, the nature of the market is not very different.

will come from these innovations in new technologies. In solar segment, India is following the other developed countries in the world. So, in terms of transformers, motors, India has made progress. In terms of solar and electrical vehicle, India is also matching the speed and pace of the western world. I think this new domain will drive growth for us. So, we expect to register double digit growth rate in India for next five years.

Do you have any expansion plans?

It is a continuous process. We really do not get into yearly milestone in terms of expansion. If there is an opportunity, the company will make investments. India is a special focus at the global leadership. 

Practical Tips for Thermography in Preventive Maintenance

Optimise processes, reduce costs and ensure system availability with Testo Thermal Imagers.



When it comes to maintaining electrical and technical systems, thermography has proved to be an indispensable aid. With the help of infrared radiation, it is not only the function and condition of electrical and mechanical systems that can be monitored reliably. Weak spots and wear can also be detected at an early stage and non-destructively and thus remedy can be provided in good time. Furthermore, thermography provides services for quality control and fill level measurement in production plants. In facility management, for example, it enables optimum control of heating systems as well as simple and safe testing of electrical systems.

No wonder then that the use of thermography is required in various standards and guidelines and companies need to assess regularly the equipment and facilities thermographically. Companies that refrain from regular thermographic inspections will subject to considerable financial and legal risks in case of personal injury and property damage. This article will throw light on application of thermography and demonstrate how can one significantly improve

maintenance processes and system availability with the aid of thermal imagers.

Thermography for more safety and efficiency

Plant operation and safety, operating costs, and energy consumption – facility managers have to keep an eye on a number of factors and improve the efficiency and processes at the same time.

Inspecting electrical systems

Overheated connections in a control cabinet indicate potential or actual defects. Testo thermal imager can detect anomalies such as these without contact and during operation before downtimes can even occur.

Discover the energy-saving potential

A thermal imager allows concealed weak spots, thermal bridges, mould or faulty installation to be detected in a building. Especially in existing buildings, a thermal imager can be used to uncover large potential energy-savings fast and easily.

Easier preventive maintenance

Unscheduled costly system downtimes can be prevented to a large extent by checking electrical installations, control cabinets and mechanical components. Carrying out thermographic inspection a second time reduces a system's failure by around 80 percent and provides an added safeguard against fire.

Defining the scope of inspection

Before beginning the inspection tour, the thermographer or plant manager needs to define a few aspects to include:

How extensive does the inspection need to be? At what intervals are the tours to take place? And which thermal imager meets the requirements?

Defining priority criteria

Identifying the risk doesn't mean it is automatically eliminated. When and how a problem is resolved – immediately, as fast as possible, at the next opportunity – is decided by the thermographer or plant manager. On the one hand, rectifying all identified thermal anomalies immediately would be too inefficient and costly. On the other hand, a

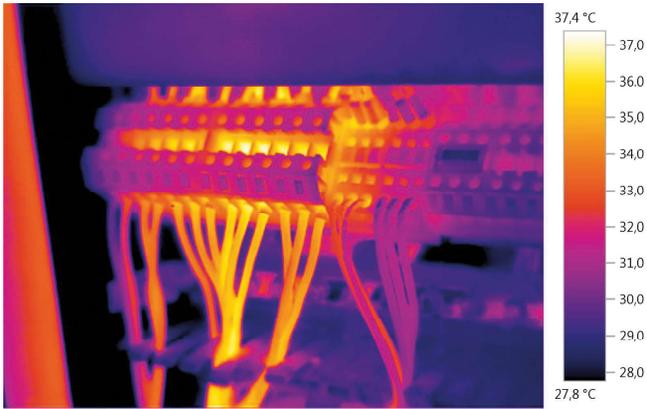


Image 2: Overheated connections in a control cabinet

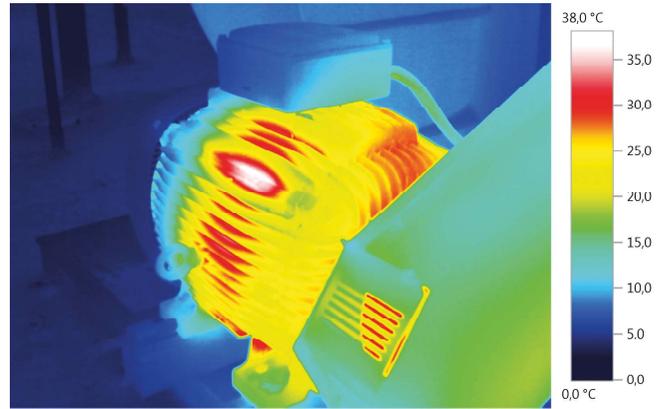


Image 3: Temperature distribution in an engine

component's temperature limit also depends on its function. So, it is advisable to classify the inspection results, for example, into three priority classes:

Class A (red): Severe problem requiring quick action.

Class B (orange): Problem to be resolved within a week.

Class C (yellow): Problem to be resolved the next time the system is scheduled to be shut down.

The applicable standard regulations, type of system, and previous experiences are primarily referred to in determining these priority levels. The aim has to be efficient operation of a system with as little interruption as possible while ensuring work, equipment and environmental safety.

Challenges & Advantages

- **Delta T calculation:** The Delta T function allows temperature values from two measuring points of choice to be directly compared and the differential temperature to be read (testo 868, 871 and 872).
- **IFOV warner:** The IFOV warner automatically shows the measurement spot size on the thermal image at any distance to the measuring object. This prevents measurement errors. The measuring object must be within the IFOV rectangle (with testo 868, 871 and 872).

- **ScaleAssist:** The testo ScaleAssist optimally adjusts the thermal image scale automatically, creating of objectively comparable and error-free thermal images of the heat-insulating characteristics of buildings (with testo 868, 871 and 872).
- **App:** The testo Thermography App enables use of a smartphone or tablet as a second display. It helps to quickly creat & send reports online (testo 868, 871, 872).
- **Connectivity:** In conjunction with testo 770-3 clamp meter and testo 605i thermohygrometer, even more informative thermal images can be created. Their measurements are easy to send to the thermal imager via Bluetooth so that moist surfaces or the load in the control cabinet can be detected fast (testo 871 and 872).
- **Fully radiometric video:** The measurement data can be exported in different formats for live images and measurements in real time. By setting upto 15 measuring points, a differential temperature diagram can be presented (with testo 885 and 890).
- **Focal distance:** Thanks to a minimal focal distance of 10 cm, temperature distribution and development can be detected accurately even on small electronic components (with testo 875, 885 and 890).
- **Ergonomics:** The thermal imagers are not only ergonomic and safe to hold. Buttons and menus are also created and arranged in such a way that the instrument can be intuitively operated with just one hand. Even measurements on caged machines are easy to perform. The thermal imager testo 885 features a rotatable screen and handle which allows it to see behind the grid and take measurements (with testo 885 and 890). 



Source: testo.com

Location-wise Summary of All India Installed Capacity (in MW) of Power Stations as on 28-02-2018

Region	Ownership/Sector	Modewise breakup							Grand Total
		Thermal				Nuclear	Hydro	RES	
		Coal	Gas	Diesel	Total				
Northern									
1	STATE SECTOR	17098.00	2879.20	0.00	19977.20	0.00	7859.05	678.36	28514.61
2	PVT SECTOR	14450.00	558.00	0.00	15008.00	0.00	2514.00	11613.33	29135.33
3	CENTRAL SECTOR	11265.00	2344.06	0.00	13609.06	1620.00	8266.22	329.00	23824.28
Total of Northern		42813.00	5781.26	0.00	48594.26	1620.00	18639.27	12620.69	81474.22
Western									
4	STATE SECTOR	22280.00	2849.82	0.00	25129.82	0.00	5391.00	311.18	30832.00
5	PVT SECTOR	43551.00	4676.00	0.00	48227.00	0.00	481.00	18366.61	67074.61
6	CENTRAL SECTOR	13820.00	3280.67	0.00	17100.67	1840.00	1520.00	661.30	21121.97
Total of Western		79651.00	10806.49	0.00	90457.49	1840.00	7392.00	19339.09	119028.58
Eastern									
7	STATE SECTOR	6820.00	100.00	40.05	6960.05	0.00	4458.25	230.36	11648.66
8	PVT SECTOR	7505.00	0.00	0.00	7505.00	0.00	399.00	810.06	8714.06
9	CENTRAL SECTOR	17420.00	0.00	0.00	17420.00	0.00	1005.20	15.10	18440.30
Total of Eastern		31745.00	100.00	40.05	31885.05	0.00	5862.45	1055.52	38803.01
Southern									
10	STATE SECTOR	17832.50	791.98	287.88	18912.36	0.00	11727.70	518.02	31158.08
11	PVT SECTOR	9590.00	5322.10	473.70	15385.80	0.00	0.00	28539.99	43925.79
12	CENTRAL SECTOR	11690.00	359.58	0.00	12049.58	3320.00	0.00	491.90	15861.48
Total of Southern		39112.50	6473.66	761.58	46347.74	3320.00	11727.70	29549.91	90945.35
North Eastern									
13	STATE SECTOR	0.00	457.95	36.00	493.95	0.00	422.00	254.25	1170.20
14	PVT SECTOR	0.00	24.50	0.00	24.50	0.00	0.00	22.45	46.95
15	CENTRAL SECTOR	500.00	1253.60	0.00	1753.60	0.00	920.00	5.00	2678.60
Total of North Eastern		500.00	1736.05	36.00	2272.05	0.00	1342.00	281.70	3895.75
ALL INDIA									
16	STATE SECTOR	64030.50	7078.95	363.93	71473.38	0.00	29858.00	1992.17	103323.54
17	PVT SECTOR	75096.00	10580.60	473.70	86150.30	0.00	3394.00	59352.44	148896.74
18	CENTRAL SECTOR	54695.00	7237.91	0.00	61932.91	6780.00	11711.42	1502.30	81926.63
Total of ALL INDIA		193821.50	24897.46	837.63	219556.59	6780.00	44963.42	62846.90	334146.91

Break up of RES all India as on 31-12-2017 is given below (in MW):

Small Hydro Power	Wind Power	Bio-Power		Solar Power	Total Capacity
		BM Power/Congen	Waste to Energy		
4418.15	32848.46	8413.80	114.08	17052.41	62846.90

Source: www.cea.nic.in



SUBSCRIBE MEDICAL EQUIPMENT AND AUTOMATION MAGAZINE

 **HELLO**

Are you inquisitive to know,
when you have an ailment and you have been prescribed
tests and surgeries.....



WHAT HAPPENS TO YOUR BODY??
HOW DO THE MACHINES WORK??
WHAT DO THE EXPERTS HAVE TO SAY ABOUT IT??



**Your search
ends here...**

To **Subscribe** flip this page and we have a detailed subscription form for you to fill and send to us or To subscribe online simply go to our website : www.charypublications.in

SUBSCRIBE

MedicalEquipment & Automation



Subscription Offers

Sub. Period	No. of Issues	Subscription Type					
		Print		Digital		Print+Digital	
		Actual Rate	You Pay	Actual Rate	You Pay	Actual Rate	You Pay
1 Year	6	750.00		750.00		1500.00	1125.00
2 Years	12	1500.00	1350.00	1500.00	1350.00	3000.00	2025.00
3 Years	18	2250.00	2000.00	2250.00	2000.00	4500.00	3000.00
5 Years	30	3750.00	3000.00	3750.00	3000.00	7500.00	4500.00

MAGAZINE WILL BE SENT BY REGISTER PARCEL --Rs.220/YEAR
KINDLY ADD POSTAGE CHARGES IN SUBSCRIPTION AMOUNT

Subscription / Renewal Form

To,
The Subscription in-charge
MEDICAL EQUIPMENT AND AUTOMATION
 Email: sub@charypublications.in

Are you a Subscriber,
 Please submit your Subscription no:

Yes, I would like to Subscribe/renew **Medical Equipment & Automation** for _____ years at ₹ _____.

PAYMENT DETAILS :

Cheque / DD No. _____ Dated _____ Drawn on Bank _____
 _____ Branch _____ in favour of **Chary Publications Pvt. Ltd.**

Bank details for NEFT / RTGS / IMPS : **Account Name: Chary Publications Pvt. Ltd.**

Bank Name: Bank of India Branch: Chembur, Mumbai - 400 071 Account Type: Current Account
IFSC Code: BKID0000009 Bank A/C Number: 000920110000322 SWIFT CODE :BKIDINBBCHM

Name: _____

Company: _____ Designation: _____

Address: _____

_____ City: _____ Pin: _____

Telephone: _____ Mobile: _____

Email: _____

Signature: _____

Stamp

 **Chary Publications Pvt. Ltd.**

905-906, The Corporate Park, Plot No. 14 & 15, Sector 18, Opp. Sanpada Railway Station, Vashi, Navi Mumbai - 400 703.
 Phones: +91 22 27777 170 / 171 • Email: sub@charypublications.in • Contact : Priyanka Alugade • +91 22 27777182 / +91 8652142057

Solutions For A Wired World



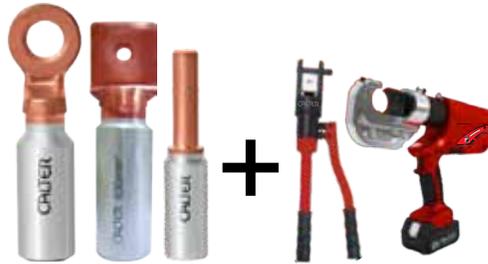
CABLES • CONNECTORS • TOOLS



Ring Main Unit

Bimetallic terminals for connecting power cables with aluminium conductors to copper terminals and bus bars on equipments are made by STI. A bimetallic terminal consists of copper palm integrated to an aluminium barrel by process of friction welding. Aluminium conductors of a power cable is connected to bimetallic terminal inside the aluminium barrel and secured by compression (crimping) tools. Bimetallic terminals eliminate burn out of copper terminals crimped to aluminium conductors. To bushing of Ring Main Units (RMUs) and to copper bus bars.

Ask For **Calter Bimetals** & Compliment With Range Of **Calter Tools** For A **Secure Connection**



Recently completed project in South Gujarat

Successfully Supplying To Major Utilities **Without Any Failures** Across The Globe For The **Last 7 Years!!**

Find full range of products on : www.calter.com or you can call us : 022 6153 2425



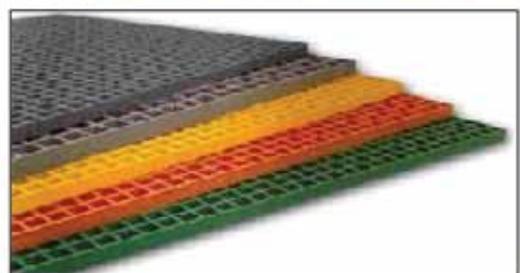
WELCOME WORLD ENGINEERING SERVICES

Design, Engineering, Manufacturing, Export of Cable Tray, Raceways, Grating, Earthing Materials & Lightning Protection System for Pan India / Other Country. Pick for best @ Mobile No. +91 9811237211 / 9811600086 • email: rajeev@welcomeworldeng.com

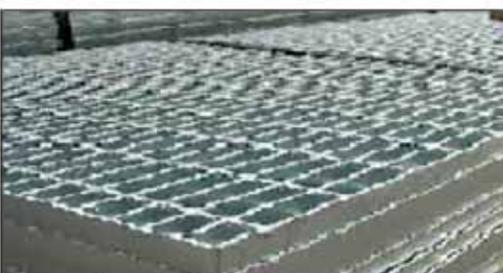
Welcome World Concept of Safety & Electrical Engineering up to next level



Cable Tray & Accessories



FRP Grating



Hot Dip Galvanized Grating



Earthing Materials & Lightning

'KUSAM-MECO' Solar Power Meter

KUSAM-MECO has Introduced new professional grade Solar Power Meter Model - KM-SPM-11 which can measure the solar light intensity & solar radiation.

A much needed product for checking the correct angle for installing the Solar Panels so as to get the maximum power generated from the solar panel. The KM-SPM-11 has a 3½ digits 2000 counts LCD display. The sampling time is approx 0.25 second. The angular accuracy is cosine corrected to < 5 % for angles < 60°.

It has End mount light sensor. for easy measurement & sensing. It has an extended measurement range of 2000 W/m² 634/ BTU / (ft *h) with very high accuracy within ± 10 W/m² or ± 5 % whichever is greater in sunlight.



It has high Resolution of 0. 1 W/m , 1 BTU / (ft *h).

It main application is for use in solar radiation measurement for measuring the effectiveness of solar film, solar Power research physics and optical, laboratories, identify high performance windows, Car windows light intensity measurement, measurement of the sun's transmission through transparent & film glass, for energy saving.

It has data hold / max / min function. Users can select either power or transmission function depending on the requirement.

The instrument is very handy and light in weight (approx 150g).

For further information: www.kusam-meco.co.in

Kyoritsu's 2300R

Kyoritsu, Japan a frontline global presence in Electrical Test & Measurement Equipment since 1940, is specialized expertise in low voltage test & measurement. In India, the company has been present for many decades already, offering world class products optimized for Indian needs at 'just right prices'. Many of these products have for long been the choice equipment of every Indian electrical installation professional.

Kyoritsu's 2300R true RMS reading is an essential feature for accurate measurement. Non contact voltage function indicates the presence of AC voltage by warning the user with an audible signal. Set the DC current



range to zero in one touch with the zero adjust function.

Kyoritsu's 2300R key features are:

- True RMS reading is an essential feature for accurate measurement
- Non contact voltage function indicates the presence of AC voltage by warning the user with an audible signal
- Set the DC current range to zero in one touch with the zero adjust function
- Auto power off
- Data Hold (AC A/DC A only)
- Designed to international safety standard IEC61010-1 CAT.3 300V
- Kyoritsu Products are readily available in India & have complete Service & Calibration Support Setup too.

For further information: www.kew-ltd.co.in

Become the new face of growing Technology!

Print + Digital + eNewsletter

Electrical India
India's oldest magazine on power and electrical products industry

FOR DETAILS CALL :
Ad Department (022-2777180)
(022 2777 7184) & (+91 22 2777 7196)

- # Technological updates
- # Trending news from the industries.
- # Versatile topics covered
- # Wide exposure
- # Eminent writers from the industries.

REDUCE FAILURE RATE OF ELECTRICAL EQUIPMENTS

&
SAVE ENERGY
by installing
**JINDAL'S INDUSTRIAL ROBOT
AUTOMATIC VOLTAGE CONTROLLER**
A breakthrough in energy conservation

**5 Years
Guarantee**



CAPACITY :
50 TO 100 KVA



CAPACITY :
150 TO 3000 KVA



AN ISO 9001:2009
CERTIFIED COMPANY

GENERAL TREND OF VOLTAGE DURING DAY TIME



NOTE : We can provide you the computerized printout of voltage variation at your premises by installing the Data Loggers



JINDAL ELECTRIC & MACHINERY CORPORATION

C-57, Focal Point, Ludhiana (India) Tel : +91-161-2670250, 2676890, 2676968 Mobile : 98140 84948, 98142 28100
E-mail : jemc@jindalelectric.com Website : www.jindalelectric.com



150W Sine-wave Inverter

- Input:**
- Solar Panel Voltage : Max 24 V DC, 60 W
 - Auxiliary Supply Input : 18 V - 24 V DC

- Battery:**
- 12 V DC Lead-Acid Max 40 Ah
 - Charging Current: 0.1 to 6 A

- Environmental:**
- 45 Degrees Ambient with upto 95% non-condensing relative humidity

- Features:**
- MPPT Algorithm for Solar Panel Power Conversions
 - 32 Bit Micro-processor Based Design for Reliable Operation
 - Input Over Voltage, Output Over Load Protection
 - Precise Three Stage Battery Charging for Extended Battery Life
 - Battery Over Charge and Deep Discharge Protection
 - Easy Fault Diagnosis with Status LEDs
 - Automatic Internal Cooling for Extended Operation in Extreme Environments
 - Pure Sine Wave Output For Trouble Free Operation of Connected Appliances
 - Output Short Circuit Protection
 - Battery Low Indication, Battery Full Charge Indications
 - Low Power Consumption

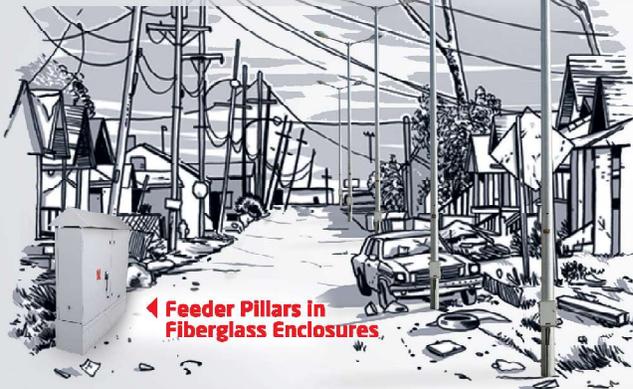
- Output:**
- 230 V AC, 50 Hz, ±5%
 - Rated Wattage: 150 W Internally Limited
 - 12V DC Output



Ganesh Electronics & Electricals
A/101, Shree Labh Apt, Tulsi Bag Compound, TPS-III, Opp. Bhatia Hill, LT Road, Borivali (W), Mumbai 400 082
email: swarnlite@gmail.com jibibi1963@gmail.com
Phone: 022-65731411 M: 98690 20685
www.swarnlite.com

Contact:
Mumbai : Ajit 98690 20685
Kolhapur : Nishant 77989 49333
Sangli : Nitin 86001 04108
GSTN: 27AAOFG6152B1ZH

**Resistance To All
But Growth**



← Feeder Pillars in Fiberglass Enclosures

Fiberglass Poles



SumiP Fiberglass Poles & Enclosures are solid, resilient and built for a very long run. They are highly resistant to unpredictable weather conditions, temperature and calamities but always reassure growth.

POLE POWER

- Lightweight
- Non-conductive
- Corrosion resistant
- Low maintenance
- High strength
- Aesthetic
- Economical

ENCLOSURE EDGE

- Impact Resistant
- Fire Resistant
- UV protection
- High weather resistant
- Corrosion & chemical resistant
- Excellent insulating properties
- Wide operating temperature range



Sumip Composites Pvt. Ltd.
Ahmedabad - 382213 Gujarat (India).
Ph: +91 9925003594
E-mail: marketing@sumip.com
Web: www.sumip.com

Follow us on
f in

Visit our stall at
STALL NO. S 28



Sun Power. Infinite Opportunities!
June 14-16, 2018
Chennai Trade Centre,
Chennai, India.

Visit our stall at
STALL NO. H2 X13



29th August to 1st September, 2018
BCEC, Goregaon (E), Mumbai

ABB Launches World's Fastest e-vehicle Charger

Commercial launch of the Terra HP fast charger places ABB at the forefront of EV-charging technology



By operating at powers of up to 350 kilowatts, the newest model from ABB, Terra High Power charger, adds up to 200 kilometers of range to an electric vehicle in just eight minutes. The new charger is ideally suited for use at highway rest stops and petrol stations. ABB chargers are being installed around the world, and they have recently been selected for use by Electrify America, the biggest electric vehicle infrastructure project to date in the United States. With more than 6,500 DC fast charging stations installed in 60 countries, ABB is a global leader in DC fast charging.

ABB's product portfolio, which includes charging technologies for electric cars, buses and trucks, as well as solutions for the electrification of ships, railways and cableways, firmly establishes it as a global champion in e-mobility. To further showcase its e-mobility leadership through its partnership with Formula E, the world's first fully electric international FIA motorsport series, a Formula E race car, and driving simulators will be on display to visitors to the ABB booth.

B&R, a leading solutions provider for machine and factory automation worldwide, will be participating for the first time at the ABB booth, after being acquired in July 2017, and now integrated into ABB's Industrial Automation division as its global Machine &

Factory Automation business unit. Demonstrating its commitment to helping the international community address the opportunities and challenges of artificial intelligence and industrial automation, ABB will announce at the Hannover Messe a ground-breaking report with The Economist Intelligence Unit: 'The Automation Readiness Index: Who Is Ready for the Coming Wave of Innovation?' The report finds that even the best-prepared countries must develop more effective education policies and training programs.

Additional pioneering technologies across utilities, industries, and transport & infrastructure, highlight ABB's ability to bring electricity from any power plant to any plug and automate industries from natural resources to finished products. Other innovative solutions that will be on display at Hannover Messe:

- B&R's ACOPOStrak, the intelligent, flexible transport system that's setting a new standard for smart-factory motion control in the era of mass customization, and B&R's Orange Box, an advanced analytics solution for brownfield assets.
- The EVLunic AC wallbox, available with from 4.6 kW to 22 kW of charging power, serving as a high quality, cost effective e-car charging point for home and business use.
- ABB Ability™ Power Transformer, with smart devices built into every ABB transformer to enable customers.
- ABB Ability™ Digital Powertrain, which ensures efficient operation of powertrain equipment, including drives, motors, bearings and pumps.
- ABB Ability™, the unified, cross-industry digital capability that empowers customers to know more, do more and do better – together. The complete list of 210 solutions is available in the new ABB Ability™ Solutions Catalogue, which is being launched at the event.

Building Energy's Pact with SA Energy Ministry

The projects will reduce CO₂ emissions in excess of 526.700 tons and will create over 6.014 new jobs during the construction...

Building Energy, a multinational company operating as a global integrated Independent Power Producer (IPP) in the Renewable Energy Industry, on 4 April 2018 signed Power Purchase Agreements in Johannesburg with the South African state-owned utility Eskom Holdings SOC Ltd to build, own and operate a 147 MW wind plant in Roggeveld and a 4,7 MW mini hydroelectric plant in Free State. The deals were made official with the presence of South African Energy Minister Jeff Radebe and Matteo Brambilla, Building Energy Managing Director Africa and Middle East.



South African Energy Minister Jeff Radebe and Matteo Brambilla, Building Energy Managing Director Africa and Middle East during signing the deal.

The company had been awarded preferred bidder status under Round 4 of the South African Department of Energy Renewable Independent Power Producer Procurement (REIPPP) Programme for the wind and hydro projects in April 2015. These agreements signed, will be the official start for the construction of the wind farm in Roggeveld, in the Laingsburg area, straddling the border between the Northern and Western Cape Provinces and the small-hydroelectric plant in Kruisvallei, in the Free State Province.

The overall investment in the construction of the two plants amounts to 324 million Euros. The Roggeveld wind farm will generate around 613 GWh per year. The energy generated will satisfy the energy needs of roughly 49.200 households every year while avoiding the emission of about 502.900 tons of CO₂ emissions. Construction work is scheduled to begin in 2018 and the commercial operation date is foreseen to be in April 2021.

Instead Kruisvallei small-hydroelectric plant will generate around 28 GWh of energy annually, catering to the energy needs of more than 2.330 households. In addition to covering the community's energy needs, the plant will save atmospheric emissions of more than 23.800 tons of CO₂ per year, creating more than 714 jobs during construction phase, with another 720 long-term jobs created during the operation.

Previously, Building Energy had already been awarded an 81 MWp solar farm in Kathu, in the first

round of the REIPPP programme, which has been operating since August 2014 and is one of the largest solar PV plants on the continent. From its Cape Town office, the company manages and coordinates over 40 projects that are operational or under development in Africa and the Middle East across the technologies of solar PV, wind and small-scale hydroelectric energy, including inter alia projects in South Africa, Uganda, Mali, Malawi, Cameroon, Tunisia, Botswana, Zambia and Cote D'Ivoire.

"We are delighted to have signed the agreement at the presence of Minister of Energy of South Africa, – said Matteo Brambilla, Building Energy Managing Director Africa and Middle East – for the construction of the Roggeveld plant, which represents our first wind farm in South Africa. We are also excited to develop two of the 2.3GW of renewable energy projects allocated by South African Government in the first major investment deal under President Cyril Ramaphosa".

Schneider Electric to buy Larsen & Toubro's Electrical & Automation Business

Schneider Electric, partnering with Temasek, has reached an agreement to buy Larsen & Toubro's Electrical & Automation business and will combine it with its Low Voltage & Industrial Automation Products business in India

Schneider Electric, the global leader in digital transformation of energy management and automation announces the signing of an agreement with Larsen and Toubro Ltd. (L&T), a leading conglomerate in India to buy its Electrical and Automation business (L&T E&A)¹ and combine it with Schneider Electric India's Low voltage and Industrial Automation Products business² (the Combined Business). Temasek, an investment company headquartered in Singapore, will invest in the combined business and will hold 35% of it.

L&T E&A is a recognized player in the Energy Management and Industrial Automation business in India led by an experienced management team. It offers low and medium voltage switchgear, electrical systems & equipment, energy management, metering and industrial automation solutions. It benefits from an extensive ecosystem of partners covering more than 260 cities in India. It has an efficient local manufacturing footprint with five manufacturing locations in India along with robust local R&D capabilities. The company is also present in the Middle-East and South-East Asia markets. L&T E&A has over 5,000 employees, excluding Marine Switchgear and Servowatch Systems.

India is the third largest economy in Asia Pacific and sixth largest in the world with c.US\$ 2.6 trillion GDP. It is also the fastest growing large economy globally with an expected 2018 GDP growth rate of 7.4% (based on IMF data). With strong growth in the buildings and infrastructure segments coupled with growth in industrial manufacturing driven notably by the Indian Government's program to develop

industries through 'Make in India', the market is expected to grow high-single digit to double-digit³ for energy management offers and double-digit³ for industrial automation offers over the coming years. The combined business of Schneider Electric's Low Voltage and Industrial Automation Product business and L&T E&A will be uniquely positioned to benefit from these trends.

Schneider Electric is committed to investing in India's growth, with its businesses being present in India since 1963. With this transaction, India will become the third largest country for Schneider Electric in terms of revenues (c. €1.6bn), at par with France.

Jean-Pascal Tricoire, Schneider Electric, Chairman and CEO stated, "By bringing together the Low Voltage and Industrial Automation Products Business of Schneider Electric India and L&T E&A, we are creating an innovative company in Energy Management and Industrial Automation in one of world's largest and fastest growing economies - India. Our market reach in India will be further strengthened by the extensive ecosystem of partners of E&A and we will harness the strengths of both organizations to address the electrical and automation requirements of India and global market. India will become our third largest business in the world, and one of our four major R&D and manufacturing global hubs. Our combined company will actively contribute to make India green, digital, and reinforce its role as a center for R&D and manufacturing. We are pleased to partner with Temasek which brings a tremendous expertise of Asian markets."



Forthcoming Events At A Glance

National

AUTOMATION EXPO 2018

Venue: BCEC, Goregaon (East), Mumbai
Date: 29 August - 01 September 2018
Website: www.automationindiaexpo.com/

Power Gen India

Venue: Pragati Maidan, New Delhi
Date: 17-19 May 2018
Website: www.power-genindia.com

Renewable Energy India 2018

Venue: India Expo Mart, Noida
Date: 20-22 September 2018
Website: www.automationindiaexpo.com/

International

Kenya Power & Energy Expo 2018

Venue: KICC Nairobi Kenya Expo Group, Dubai, UAE
Date: 29-31 May 2018
Website: www.expogr.com/kenyaenergy

POWER-GEN & DistribuTECH Africa

Venue: Sandton Convention Centre, Johannesburg, South Africa
Date: 19-20 July 2018
Website: http://www.wire-southeastasia.com/

Global Power & Energy Exhibition (GPEX)

Venue: Barcelona, Spain
Date: 17-20 September 2018
Website: https://gpexevent.com/

Attn: Advertisers

Dear Valued Advertisers,
Effective 1st July 2017 Goods and Service Tax Act (GST) is applicable on
i) Advertisements in Print Media @ 5%
ii) Advertisements on Websites @ 18 %
For any clarification, please contact our accounts department on 022 - 27777 175 or email : accounts@charypublications.in

Company Name	Page No.
Allied power Solutions	15
Apar Industries Ltd.	43
Calter Ltd_STI Industries	75
Dynamic Cables Pvt. Ltd.	59
E I Dupont India Pvt. Ltd.	31
Electracon Paradise Ltd.	IBC
Electrical Research & Development Association	45
Flir Systems India Pvt. Ltd.	25
Frontier Technologies Pvt. Ltd.	39
Ganesh Electronics & Electricals	77
Greatwhite Global Pvt. Ltd.	13
H. D. Wires Pvt. Ltd.	63
Hager Electro Pvt. Ltd.	3
Hammond Power Solutions	67
Havells India Ltd.	19, 21, 23
HPL Electric & Power Ltd.	29
Igus India Pvt. Ltd.	55
Isa Advance Instruments (I) Pvt. Ltd.	49
Jindal Electric & Machinery Corporation	77
Kusam Electricals Pvt. Ltd.	61
Kyoritsu Kew India Instruments Pvt. Ltd.	65
Larsen & Toubro Ltd.	IFC, 7
M&I Material India Pvt. Ltd.	37
Mgm Varvel Power Transmission Pvt. Ltd.	9
Nextgen Equipment Pvt. Ltd.	82
Pepperl+Fuchs (India)	11
Rigil Techno (I) Pvt. Ltd.	17
Scope T&M Pvt. Ltd.	5
Sharda Cable Trays Pvt. Ltd.	67
Sterlite Power	BC
Sumip Composites Pvt. Ltd.	77
Testo India Pvt. Ltd.	33
True Power Earthings Pvt. Ltd.	53
TÜV Rheinland (India) Pvt. Ltd	51
Universal Cables Ltd	41
Welcome Group	75

Electrical Test & Measuring Solutions



Contact Resistance Meter 200A



Turns Ratio Meter



Winding Resistance Meter



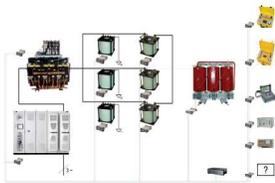
Digital Micro Ohm Meter



M/s Raytech GmbH, Switzerland



Current Transformer Tester



Automatic Transformer Test System



M/s Epro Gallsbach GmbH, Austria



ETL Prüftechnik, Germany



75 KV AC High Voltage Test Set



Cast Resin Standard PT Standard CT



Battery Analyzer



Automatic Portable HV Tester

OUR PRODUCT RANGE

Winding Resistance Meter
Turns Ratio Meter
Digital Microhm Meter
Contact Resistance Meter
Current Transformer Tester

Standard Current Transformer
Standard Voltage Transformer
Transformer Loss Measuring System
Automatic Transformer Test System
Online DGA

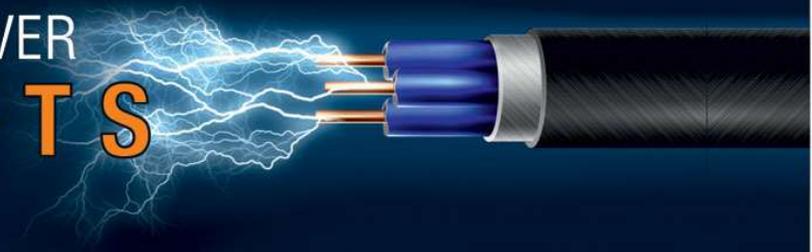
Static Frequency Converter (EPS)
Mobile EPS
High Voltage PD Filters
Coupling Capacitor/ HV Dividers
Online PD Test System

Oil BDV Test Set
AC HV Test Set
AC / DC HV Test Set
Battery Analyzer

Corporate Office: 35-B, Ashiana Duplex, Tandalja, Vadodara – 390012 , Gujarat

Ph : +91 9979888269, +91 9374904404, +91 9811004404 Email : info@ngepl.com

THE POWER OF SILVER CONTACTS



MAKING THINGS WORK, WITH THE RIGHT SILVER CONTACTS



CONTACT ASSEMBLIES



SILVER CONTACT TIPS
(AgC, AgCdO, AgNi, etc.)



SILVER WIRE



**ELECTRACON
PARADISE**
LIMITED

CONTACT MATERIALS
PURE SILVER (Ag999)
SILVER COPPER (AgCu)
SILVER TIN OXIDE (AgSnO₂)
SILVER NICKEL (AgNi)
SILVER GRAPHITE (AgC)
SILVER CADMIUM OXIDE (AgCdO)

A - 7, (G.F.) Mayapuri Industrial Area, Phase-2, New Delhi - 110 064 (INDIA)

☎ +91 8800138383 • +91-11-28115275/5475 • +91-11-45017688

E-mail: sales@paradiseind.com • Website: www.electracon.in • www.paradiseind.com



EMPOWERING HUMANITY BY ADDRESSING THE TOUGHEST CHALLENGES OF ENERGY DELIVERY

 **Sterlite Power**

www.sterlitepower.com