

# Smart Is In the Range



**The entire solution-spectrum of Electrical Standard Products**

# Smart is in the foundation



L&T Electrical & Automation (E&A) is a market leader for electrical distribution, monitoring and control solutions in the low voltage category.

Popular among customers as L&T Switchgear, E&A offers a wide range of low and medium voltage switchgear, motor starters, electrical systems, industrial automation, building electrical solutions, energy management solutions, electrical modernization solutions and metering solutions. Its products and solutions cater to key sectors of economy like industries, utilities, infrastructure, building and agriculture.

E&A's manufacturing operations at Navi Mumbai, Ahmednagar, Vadodara, Coimbatore and Mysuru in India adhere to global practices of excellence and receive support from well-equipped in-house design and development centres as well as tooling facilities that contribute to precision in manufacturing.

# Smart is in the solutions



E&A's range of switchgear offers solutions to many sectors – industrial, residential, mega-retail, airport, smart city, hospitality, power generation, agriculture, transportation, marine... and more.

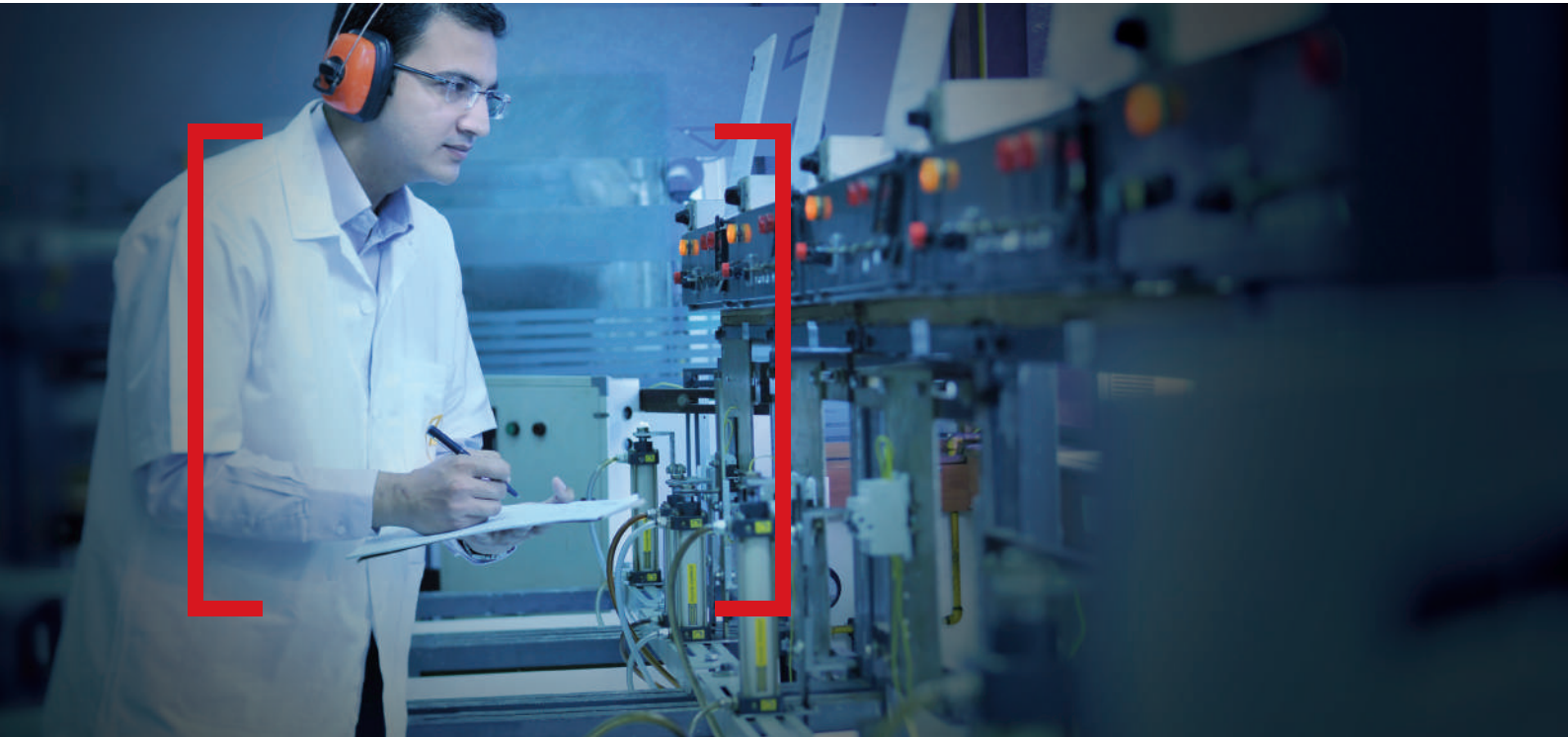
The products in our switchgear range are designed to perform efficiently, even in harsh conditions.

Our switchgear is designed and developed with in-built features to ensure the safety of operator and equipment alike. Our products have features that ensure quality and reliability of power, and efficient management of energy.

Technologically superior, elegantly designed, E&A's switchgear products offer high value.

For you, this means a range that is as wide as your needs.

# Smart is in the quality



E&A adheres to stringent quality systems and processes that meet international standards. This enables us to offer robust products that perform with the highest level of reliability.

Our manufacturing and assembly lines with integral QC process are thoughtfully designed and developed with extensive application of proven tools like 5S, Value Stream Mapping and Poka-yoke including digital interface and automation of key processes. All of these help us manufacture first-time-right products.

Fully equipped testing and inspection laboratories including an NABL accredited type-testing lab extend vital support to our quality management and enhance our confidence in product reliability.

For you, this means quality you can rely upon.



# Smart is in the distribution network



E&A has a strong distribution network with over 700 channel partners located in India and in select countries. Ready access to world-class switchgear, speeds up your project, reducing the downtime.

For you, this means convenience and easy availability of our products.

# Smart is in our design



Comprehensive knowledge and learning in design and development over the last six decades have helped us set up a strong technical base and offer contemporary products that are on par with international quality and reliability.

Based on the feedback of customers like you, our R&D team of 450 engineers continuously researches on improvement and unexplored ideas in switchgear design, embedded design and product engineering.

This enables us to identify gaps in the marketplace and offer you new, innovative products. Unique differentiation in products, achieved through innovation, adds to our knowledge bank. These are protected through continuous filing of Intellectual Property, and help maintain our leadership position in the market.

For you, this means embracing the latest technology.

# Smart is in the manufacturing facilities



Ahmednagar



Mahape



Vadodara

Our strong engineering capability with in-house designing and manufacturing of high precision tools facilitate and support manufacturing operations in an optimised and cost-effective manner.

We have state-of-the-art manufacturing facilities at three locations in India (Ahmednagar, Vadodara and Mahape).

E&A manufactures a wide range and variety of Switchgear at these facilities using conventional as well as contemporary processes and exclusive material including packaging items, which are environment friendly.

We have implemented smart manufacturing practices like integrated workstations, error-free assembly and streamlined techniques of production. Adoption of internationally acclaimed tools and techniques, combined with automation and digitization at each stage of manufacturing ensures high level of productivity, quality, reliability, safety and morale. As a testimony to our disciplined and structured working as well as self-reliance, each of our manufacturing facilities is certified for their continued compliance to international standards like ISO 9001, ISO 14001, and OHSAS 18001 for the Quality, Environment, Health and Safety Management Systems respectively. Besides, these facilities have been certified for ISO 50001 and ISO 27001 for their Energy and Information Security Management Systems.

For you, this means international quality products.

# Smart is in knowledge-sharing



Pune



Lucknow



Delhi



Vadodara



Kolkata



Coonoor

## Switchgear Training Centres

As India's leader in low-voltage switchgear, E&A spearheads the cause of generating awareness on electrical best practices.

To enable you to get the best out of your switchgear, we share the knowledge that we have gathered across six decades. We have set up non-profit Switchgear Training Centres at six locations in India – Coonoor, Delhi, Kolkata, Lucknow, Pune and Vadodara. Our courses are designed for all users of switchgear – consultants, electricians, technicians, maintenance supervisors, engineers, as well as other customers and business associates.

Training methods include theory, video, workshops, practical demonstrations and hands-on exercises.

For you, this means higher productivity, higher profits, more safety.



# Smart is in the after-sales service



Our wide range of Electrical Standard Products matches and exceeds global benchmarks for reliability and quality. However, in order to ensure that your business sails smoothly through any electrical turbulence, every element should be in perfect working condition.

At E&A, we offer you the benefit of five decades of experience in providing after-sales service for low voltage distribution systems in every type of industry and commercial complex. With over 100 authorised service centres, equipped with highly-skilled technicians, we offer prompt response to requests that can ensure better functioning of your electrical components.

For you, this means interruption-free operation and peace of mind.

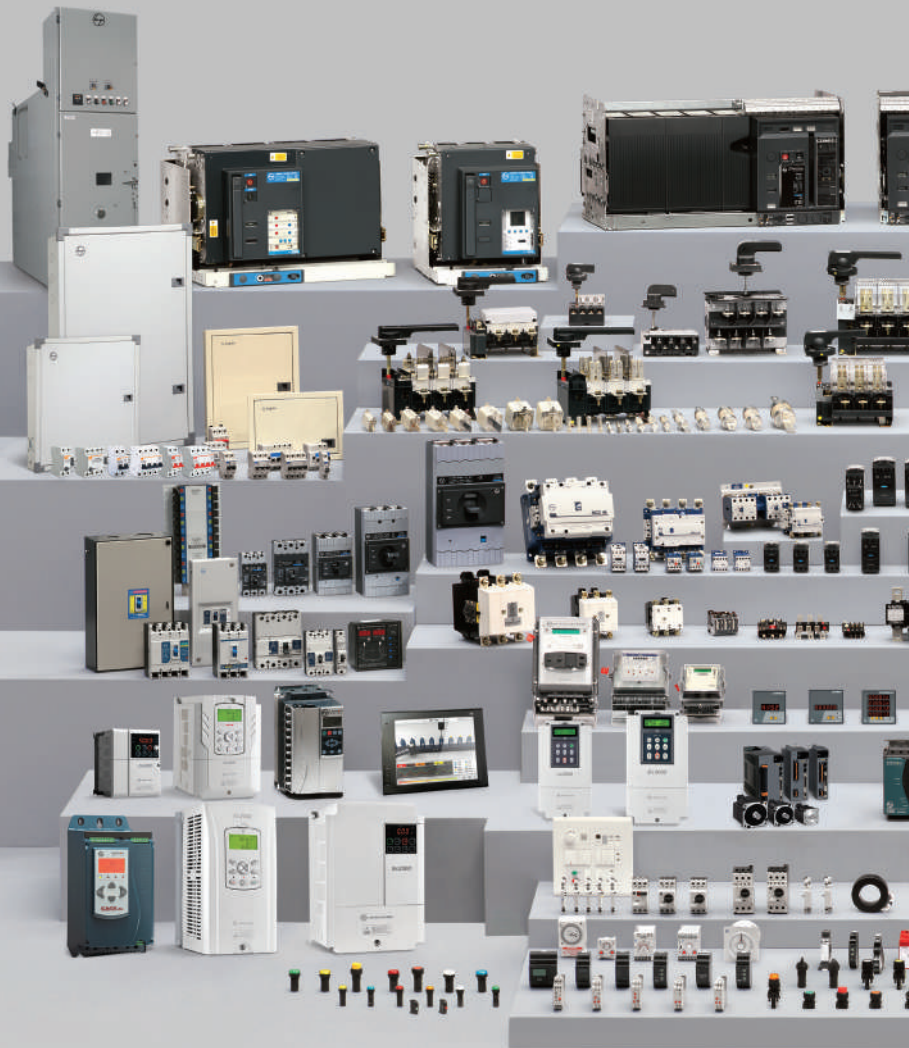
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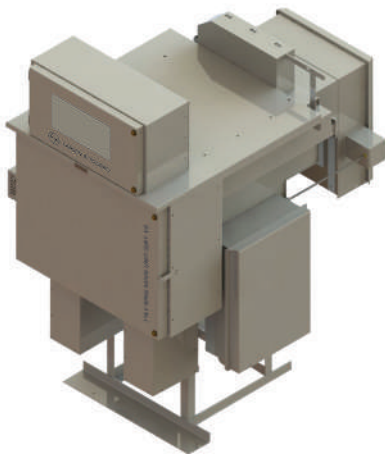


## Power Distribution and Protection



### Air Insulated Switchgear (Medium Voltage)

- Comprehensive range from 630A - 3150A, 12kV-36kV, short circuit rating: 25kA - 50kA for 3 sec
- Internal arc classification AFLR up to 40kA for 1 sec and 50kA for 0.5 sec
- In-built anti-pumping feature
- Indoor type panel with ingress protection rating IP4X and above
- Metal clad, fully compartmentalised panel
- Horizontal isolation, horizontal draw-out and floor rolling trolley type VCB
- Panel readily extendable on both sides
- Loss of service continuity category is LSC2B
- Optional rear door/cover interlock
- True close door operation panel as per IEC 62271-200



### Ring Main Unit (RMU)

- Rating – 11kV, 630A, 21kA for 3 second
- Wide range of combinations of Load Break Switch & VCB
- Both side extensions possible
- Manual or Motorised
- Optional metering cubicle
- Cable termination – rear/side
- Ingress Protection – IP54 (Enclosure), IP67 (SF<sub>6</sub> Gas Tank)
- Internal Arc Tested – 21kA for 1 sec

### Sandwich Busbar Trunking System

- Current Rating: 400A to 6300A (Copper)  
250A to 5000A (Aluminium)
- Rated Insulation voltage: 1100V
- Joints block with Maintenance-free Nut
- Enclosure: GI or Aluminium
- Plug-in boxes with safety interlock
- Robust, safe & reliable solution
  - Class-F insulation with RoHS compliance & UL certification
  - Ingress protection up to IP66
  - Certified for Seismic Zone-V





### Design Verified Panel Assemblies

- Range up to 5000A
- Design verified assembly with Copper and Aluminum busbar system
- Compliance with global standard - IEC 61439-1 & 2
- Withstand capacity (Icw) up to 70 kA for 1 sec
- Available up to form 4B
- Internal arc compliance: 70 kA for 0.5 sec
- Certified for Seismic Zone-V
- Impact resistance compliance - IK10
- Ingress Protection up to IP54

### Air Circuit Breakers

- Range: 400A to 6300A in 3P/4P(100%N), Manual/Electrical version, Fix/Draw-out version, Optional 50%/200% Neutral, 50kA to 100kA, Icu=Ics=Icw for 1sec, operational voltage upto 690V AC
- RoHS Compliant
- Superior Safety Features
  - Arc Chute Interlock ensures ACB closing only when all Arc Chutes are in place
  - Smart racking shutter ensures that ACB is racked-in/out only in "OFF" state
  - In-built Electrical & Mechanical Anti-Pumping prevents multiple breaker closures due to persistent closing commands
  - Releases with Password Protection ensure only authorised person changes the settings
  - Breaker terminal temperature monitoring & protection ensures health of the system
  - Double Short Circuit Protection provides two separate levels of time-based short-circuit protections
  - Variety of locks & Interlocks for versatile applications
- Quick System up-gradation
  - NRYB to RYBN configuration simplifies the bus-duct trunking with cost-effectiveness
  - Modular Plug & Play Communication and Metering Modules offer ease of flexibility, scalability and customisation of electrical systems
  - Basic to Advanced Protection Releases



- Data communication with Power and Harmonics measurement
- High-end release with Unique Touch-Screen Navigation with Fault Waveform Oscillography
- OMEGA for special application of 800V AC/1000V AC Rated voltage application
- ACBs for special applications, viz., Sulphur-Rich Harsh Environments (HE Range) and DG application
- Retrofit solution for CNCS C-Power to Omega ACBs



### Moulded Case Circuit Breakers

- Range : 16A to 1250A, 2P/3P/4P, 10kA to 200kA
- Suitable for 800V AC application
- Plug In, Draw Out version
- RoHS compliant
- No load-line bias, suitable for isolation
- Wide range of protection releases: thermal-magnetic, basic to advanced microprocessor based offering power metering, advanced protections & communication
- Plug & Play Modules:
  - Modbus Communication Module
  - Voltage Module offers host of voltage, energy, power, frequency, power factor, maximum demand protections
  - Panel mounted display module offers comprehensive current, energy, power metering & trip history
- MCCBs for Special Applications : DC, motorized solutions for auto-transfer, motor back-up protection, SD versions for isolation, total selectivity solutions

### Motor Protection Circuit Breakers (MPCB)

- Range: 0.16A to 63A, up to 100 kA breaking capacity
- Short circuit and overload protection
- Positive isolation
- Phase failure sensitive
- Ambient temperature compensated
- In-built Padlock facility
- Smart links available for quick connection
- Wide range of common accessories across the range



### Switch-Disconnecter-Fuse Units

- Range: 32A to 800A, AC-23A in 2P/ 3P/ TPN and 4P versions
- Suitable for Cylindrical/ DIN/Bolted fuse-link
- Available for 220V DC, 400V DC, 415V AC and 690V AC applications
- SDFs & Fuses for special applications: sulphur-rich Harsh Environment (HE)
- Adjustable telescopic shafts
- Door interlock and padlock facility
- High ground clearance and terminal shrouds provide safety to personnel
- Spacious SS enclosure version with inbuilt cable gland plate requires no separate cable end box
- Wide range of accessories

### Fuses

- Range:
  - Cylindrical fuse ranges from 2A to 63A
  - DIN fuse in the range of 63A to 800A in different sizes
  - Bolted fuse links from 2A to 630A – Also suitable for Harsh Environment (HE)
- High breaking capacity: 100kA for DIN type and 80kA for cylindrical and bolted fuse
- Low watt loss leading to Energy Saving
- Range of fuse bases







### Switch-Disconnecter Units

- Range: 32A to 2000A, AC-23A in 2P/ TPN and 4P versions
- Available for 220V DC, 400V DC, 415V AC and 690V AC applications
- Adjustable telescopic shafts
- Door interlock and padlock facility
- High ground clearance and terminal shrouds provide safety to personnel
- Wide range of accessories

### Sub-Main Distribution Boards (SMDBs)

- Ready-to-use solution with MCCB as incomer and multiple MCCBs as outgoing devices
  - Incomer MCCB ratings - 250A, 400A & 630A
  - Outgoing MCCB ratings - 100A & 250A
- Compliance with IEC 61439-2
- DEKRA, ASTA Certified
- Addresses all power distribution requirements up to 630A in 4, 8, 12 & 16 ways
- Short time withstand current (Icw) of 36kA for 1 sec
- Optimum solution for commercial buildings including hotels, hospitals and educational establishments and infra segment



### Protection Relays

- Comprehensive range of motor, feeder, transformer and generator protection relays
- Motor protection relays for conventional MCCs and Smart/ IMCC applications
- Standalone relays for voltage monitoring, over current/earth fault protection and trip circuit supervision
- Flexibility of IDMT curves and time delay settings
- Test feature – helps in better maintenance
- Self-diagnostic feature – ensures complete reliability
- Trip history – helps in fault analysis
- Communication capability – Modbus RTU, Modbus TCP/IP, Profibus



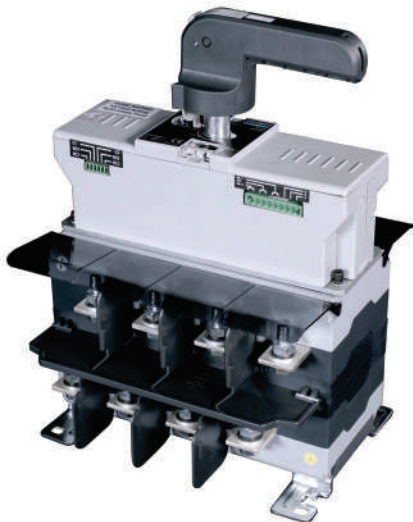


# Power Control



### Automatic Source Transfer Solutions

- Automatic Source Transfer Controller for changeover of power supply on interruption
- Source changeover on power failure, phase sequence change, frequency change, phase loss, asymmetry or low/high voltage
- Can be used for utility-utility, utility-genset or genset-genset changeovers
- With LCD display for monitoring of parameters
- Programmable inputs and outputs
- Range of automatic source transfer solutions with ACBs, Motorised MCCBs, Motorised Changeover, Contactors



### Changeover Switches

- Range: 63A to 2000A, AC-23A, 4P in manual/auto-manual motorised/SD versions
- High mechanical & electrical life
- High short time current withstand capacity
- Site convertible fuse version for open execution
- Site convertible dual-shaft position (centre & side)
- Phase barrier, source separator & terminal shrouds as standard, enhancing safety
- Staggered terminals for ease of termination
- Flip-able handle for ease of operation
- Spacious SS enclosure version requires no separate cable gland box
- Padlocking to avoid unauthorised access

### Four-pole contactors

- Range: 16A to 800A AC-1 duty
- Coils suitable for 50 Hz as well as 60 Hz. AC/DC coil options available
- Suitable for auto transfer solutions
- Wide operating band to sustain supply fluctuations
- Compact mechanical interlock arrangement up to 80A
- Suitable for DGs up to 575 kVA







### 3-Pole Power Contactors

- Range: 6A to 820A AC-3 duty with coils suitable for AC 50/60 Hz and DC
- Vacuum Contactors with high electrical life
- RoHS compliant
- In-built surge suppressor - prevent voltage surges in control supply
- Terminal shrouds for power terminals are finger-proof
- Compact dimensions: Saves precious panel space
- Low VA consumption - reduces cost of control transformer
- DIN rail mounting up to 110A for faster installation
- Box clamps - enable lugless termination for faster installation
- Four terminal coil – for ease of control wiring and faster installation
- Smart links for quick connection and faster installation
- Accessories – mechanical latch, Add-on blocks, MIL kit, Connecting Links
- Spares for entire range

### Thermal & Electronic Overload Relays

- Range: 0.2A - 650A
- Single Phasing protection
- Locked rotor and ground fault protection
- Selectable trip class options available
- Visual status indication
- Sealable transparent cover to avoid tampering
- Built-in 'START' and 'OFF/RESET' push buttons
- Auto and manual reset modes
- Ambient temperature compensation: -5°C to +55°C
- Start, Trip and Alarm contacts
- Accessories like Mechanical Reset Cord, Separate mounting kit



### iMCC (Intelligent Motor Control Center) Relays

- Current & voltage-based metering and protection in a single compact unit
- Enhanced motor control, interlocking and logic building
- OLED Display: 170° viewing angle, brighter pixelation
- Metering, event recording and trip recording helps in fault analysis, ensure lower down time & increase plant efficiency
- Communication capability: Modbus RTU, Modbus TCP/IP, Profibus
- 6 DI & 4 DO in base unit
- In-built analog output & RTD/PTC inputs
- Conformal coating

## Single-Pole & Two-Pole contactors

### Single-Pole contactors

- Range 25A-40A AC-3
- Suitable for wide range of single-phase applications

### Two-Pole Contactors

- Available up to 650A AC-3 duty and 800A AC1 duty
- Suitable for single phase pumps, heaters, rectifiers, air conditioners and wide range of 1-Ø applications
- High temperature withstand capability
- Protection of coil from humid environment
- Wide operating band to sustain supply fluctuations



## Control Contactors

- Wide range of control voltages, AC 50 / 60 Hz and DC coil options
- RoHS compliant
- In-built surge suppressor – prevents voltage surges in control supply
- Terminal shrouds are finger-proof
- Four terminal coil – for ease of control wiring and faster installation
- Common accessories and spares such as power contactors

## Industrial Starters

- Range: 10 HP to 400 HP in DOL and Star-delta version
- In-built single-phase and overload protection
- IP54 degree of protection
- Flush-mounted lockable push-button to prevent inadvertent operation
- Suitable for aluminum terminations
- Standard knock-outs for ease of cable entry







## Automation Solutions



### AC Drives x2000 series

- Range covers from 0.1 to 450kW in 1Ph. & 3Ph. 230V & 415V
- HD ratings designed for 50°C ambient temperature
- Built-in PLC functionality
- Application specific models & optional accessories
- Built-in RS485 modbus Port with various other communication options
- New series with DIN rail mounting
- Default conformal coating complying to IEC-60721-3-3



### Soft starters

- Range: 23A to 1600A
- Electronic motor overload protection
- Built in bypass contactor for ratings from 23A to 1000A
- Adaptive acceleration & deceleration profiles for pumps to reduce pressure surges on pipes & valves
- 99 event logs with time stamp and last 8 trips logs
- Detachable LCD display with run and fault simulation modes
- Powerthrough function to run soft starter even when one arm of SCRs is shorted
- Communication options available MODBUS, Profibus, DeviceNet, MODBUS TCP/IP
- Suitable for centrifugal loads such as pumps, fans & non-centrifugal loads such as conveyors, compressors, band saws, crushers, bow thrusters

### PLC

- Range: up to 352 local I/O points and up to 5728 remote I/O points
- Processing speed: 0.06us/step
- Built-in Function: RTC, HSC, PTO, PID, Interrupt, Analog I/O
- Various communication Interface: Built-in USB/RS-232C/RS-485/Ethernet, optional other communication modules
- Built-in Web-server, E-mail
- EtherCAT based motion control modules with Virtual Axis
- Built-in SD Card interface
- Smart Remote IO





## HMI

- Range: Text display 4" to 15" TFT color LCD
- Large memory: Up to 128 MB display data and 1MB back-up memory
- Various communication interface: Ethernet/RS-232C/RS-422/485
- USB host and device
- SD memory card interface
- Web server/data monitoring
- Remote controlling and monitoring
- Presence sensor (within 1m)
- Sound output

## Servo

- Range: Capacity: 0.1kW to 15kW
- Voltage: 200 Vac/400 Vac; Speed: 1500 rpm/3000 rpm; Control: Pulse/Analog or Network
- Absolute encoder (standard)
- 1.6 kHz Frequency response
- Serial communication (RS-422/485, Modbus)
- Supports various operation modes (CSP, CSV, CST, PP, PV, PT, HM, IP, etc.)
- 4-step notch filter
- 2-step vibration suppression filter at the load position
- FFT function for real-time frequency analysis
- Scalable analog output









A black and white photograph of an industrial facility, likely a food processing plant, featuring large stainless steel tanks and green pipes. A dark rectangular box with a red border is overlaid on the image, containing the text "Power Quality Solutions".

# Power Quality Solutions



### Capacitor Duty Contactors

- Range : 3 to 100 kVAr
- With de-latching resistors to limit capacitor in-rush current
- Separate termination of damping resistors – avoids damping resistor becoming loose
- In-built surge suppressor – prevents voltage surges in control supply and protects APFC relay contacts
- Encapsulated resistor assembly to prevent flash over of resistors
- Terminal shrouds are finger-proof
- Common accessories and spares as power contactors



### Thyristor Switching Module

- Range: 10, 25 and 50 kVAr ratings
- Without fan for greater reliability
- High Peak Inverse Voltage (PIV) – 2.2 kV
- Lower operating losses reduce energy consumption
- With in-built auto thermal cut-off for thermal protection

### Detuned Reactors

- Range: 5 kVAr to 100 kVAr
- Copper and Aluminum wound reactors
- Lower operating losses – 3 to 5 W/kVAR
- High linearity - 1.8 times the rated current, 200% linearity also available
- With in-built thermal cut off







### Power Factor Correction Capacitors

- Range: Standard Duty, Heavy Duty, Super Heavy Duty and Ultra Heavy Duty Capacitors
- Available up to 50 kVAr, 440V, 480V and 525V AC
- Safety Features – Over pressure disconnecter, self-healing, finger-proof terminals
- Operating losses – less than 0.45 W/kVAr
- Ultra-Heavy Duty Capacitors with Max ambient temperature up to 70°C
- Ultra-Heavy Duty Capacitors with operating life up to 3 lakh hours

### etaSYS Standard APFC Panels

- Range : 20 to 500 kVAr covers the typical requirement of APFC panel ratings
- Offers optimal step resolution which would be suitable to all types of industries/buildings
- Pre-selected switchgear with accurate ratings offers reliable operation, protection and isolation
- Accurate combination of capacitor and reactor offers better protection against harmonics
- IP42 panels



### Active Harmonic Filters

- Range: 30A to 600A in 3-Ph 3-W and up to 300A in 3-Ph 4-W versions
- Mitigates 2nd to 50th order Harmonics
- Reduces THD within IEEE limits
- Improves power factor
- Load balancing and neutral current reduction
- Any number of units can be connected in parallel
- 7 inch TFT touch screen for monitoring and diagnostics
- Modular design for easy maintenance and upgradation
- Various alarms for easy diagnostics

### Automatic Power Factor Controller - etaCON M

- No. of steps available: up to 14
- Available in 96x96 mm and 144 x 144 mm size
- CT secondary - 1A/5A site selectable
- Packed with intelligent algorithm – optimises step usage and ensures stable operation
- Automatic recognition of current flow direction – saves the effort put into detection and correction of CT polarity at site
- Capacitor over-current and panel over-heating protection
- Capacitor health monitoring
- Expandable with the help of modules
- Various alarms for easy diagnostics
- Suitable for LV as well as HT side sensing
- Communication-capable
- Individual harmonic distortion values available up to 15th harmonic

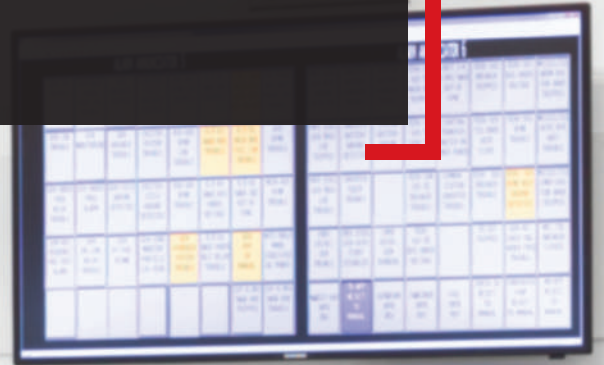


### Automatic Power Factor Controller - etaSMART

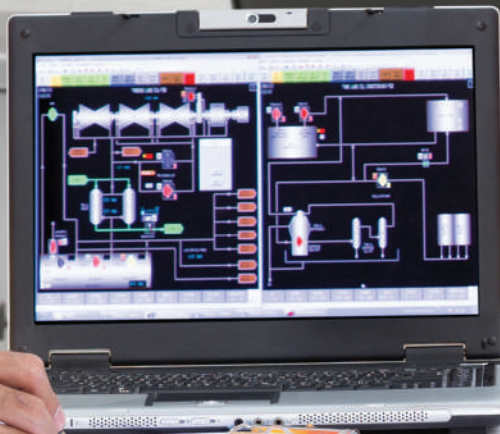
- Available upto 16 steps
- Available in 96x96 mm and 144x144 mm sizes
- Manual & Automatic both operations available
- CT secondary 1A/5A site selectable
- Automatic detection of CT polarity
- Capacitor health monitoring
- Various alarms for easy diagnostics
- Ambient temperature monitoring via internal sensor



# Power Monitoring



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### Single Function Meters

- Single function meter 1-Ph/3-Ph – Voltmeter, Ammeter; Frequency meter, VAF meter
- Accuracy Class 1 and Class 0.5 in LED and LCD display
- Field programmable CT/PT ratio
- Site selectable 1A/5A
- In-built selector switch for 3-phase models
- Site selectable for 3-Ph 4-W, 3-Ph 3-W, 1-Ph



### Multifunction Meters

- Available with multiple parameters including Basic, Power, Energy, THD, Max Demand, Import-Export
- Four row LED and LCD versions
- Accuracy Class 1, 0.5, 0.5S, 0.2, 0.2S
- Site selectable for 3-Ph 4-W, 3-Ph 3-W, 1-Ph
- Data logging provision
- Individual harmonics for voltage and current available up to 31st harmonics
- Analog and digital inputs and outputs available
- Time-of-day provision
- RS-485, Ethernet option
- MD controller with 4 relay outputs for proper load control

### Energy Meters

- Accuracy Class 1 and Class 0.5 in LED and LCD display
- True RMS measurement
- Positive energy accumulation even with CT polarity reversal, reverse lock programmable
- User programmable password protection
- CT/PT ratio can be site programmable
- Old register to store the previously cleared energy value and its corresponding load hours
- Site selectable 1A/5A
- Sealing arrangement provision
- RS-485 option





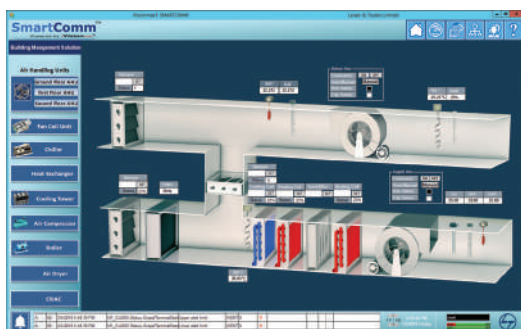


### Dual Source Meters

- Accuracy Class 1 and Class 0.5 in LED and LCD display
- Separate registers for EB and DG energy and load hours
- Automatic switching of display based on input source as EB or DG through DG sensing input
- Site selectable for 3-Ph 4-W, 3-Ph 3-W, 1-Ph
- RS-485 option

### SmartComm Energy Management Solution

- Glimpse of entire energy consumption in the plant on a dashboard
- Quick understanding of energy consumption of today compared to yesterday, this month consumption compared to last month as well as Y-o-Y energy comparison
- Easy navigation through the modules
- All parameters in the device can be monitored from the software
- Multiple combination of devices and parameters for analysis
- Various spreadsheet reports with charts
- Specific energy consumption report
- Access to features defined by user levels
- E&A meters preconfigured in the software
- Provision for auto emails and SMS
- Provision for Breaker status monitoring of ON, OFF, TRIP and RTC status along with control through UNCO module.



### SmartComm Integrated Solution

Integration | Monitoring | Protection | Control | Reporting

- Real-time communication for Monitoring, Control & Diagnostics generates immediate reports
- Single platform integrating entire range of E&A communicable products with option of integrating third party products
- Supports multiple protocols and drivers like Modbus TCP/IP, Modbus RTU, BACnet, IEC 61850, DeviceNet, Profibus & ProfiNet
- Customised SLD Creation by user based on IEC 617-2-8 symbol library
- Graphical or mimic view for enabling operator level users to understand reports easily
- Real-time & historical trends for user-selectable parameters
- Fully customized reports with user-created templates
- System provides various alarms & events – alerts & acknowledgement
- Email/SMS facility for predetermined events/schedules/alarms user management

## Single & Three-Phase Direct / Whole Current Meters

- 5-30A, or 10-60A
- Accuracy Class 1.0 as per IS 13779
- Compact in size and high surge withstand capability
- LCD display
- Both options-with & without internal battery
- Optical port to download data from meter memory
- Last 12 months KWh available in meter memory
- Optional RS-485 Modbus in 3-Ph direct current meter (in specific model)



## Three-Phase CT & CT/PT Operated Trivector Meters

- CTR- /5A or /1A, PTR- /110V or /240V
- 3-Ph 4-W meter suitable for 3-Ph 3-W system also
- Accuracy Class 0.5s or 0.2s as per IS 14697
- Both versions are available - DLMS & NON DLMS
- Optical port to download data from meter memory
- All three vectors of power & energy
- LCD display
- Additional communication port RS-485 Modbus/DLMS/IEC1107 or RS-232 with IEC1107

### Three-Phase ABT (Availability based tariff) Meters

- 3-Ph 4-W
- Accuracy 0.2s as per IS 14697
- CTR /1A or /5A & PTR- /110V
- Additional communication port RS-485 Modbus/DLMS/ IEC 1107 or RS-232 with IEC 1107
- Approved in Power Grid Corporation of India







### Single & Three-Phase Prepaid Meters

- Current range 10-60A
- Accuracy Class 1.0
- Applicable standard - IS 15884 and Standard Transfer Specification (STS)
- Optional consumer interface unit with USB dongle token carrier
- Trip on over draw of current or Maximum Demand
- RS-485 port to connection of CIU
- Recharge coupon-based or mobile app based





# Panel Accessories



### Push Buttons/ Actuators/ LED indicators

- Compact and aesthetically appealing
- Ø16 mm & Ø22.5 mm LED Indicators
- LED indicators with operating life of more than 1 lakh illumination hours
- Actuators & contact blocks
- Push button station
- Patented integral actuator with in-built Panel mounted buzzer - 80 dB



### Timers, Time Switches, Hour Meters & Supply Monitors

- **Electronic timers**
  - ON delay, Cyclic, OFF delay • Star Delta, Multifunction
  - Asymmetrical ON/OFF • Motor restart control timers
  - Auto reset synchronous timers
- **Time switches**
  - Analog time switches • Digital time switches • Astronomical time switches • Electromechanical / Digital Hour Meters / Counters
- **Supply monitors**
  - Single phasing preventor • UV + OV relay • Phase asymmetry, Phase sequence monitoring • Earth Leakage Relay with CBCT - wide selectable range of 30mA to 30A • Current Monitoring Relay
  - PTC thermistor Relay • Frequency monitoring Relay

### Rotary Switches

- Range: AC: 6A - 800A, DC: 16A - 500A
- Standard and customised switches
- Flexibility of operating positions and switching angles
- Multistep programming switches
- Versatile mounting options, i.e. front mounting, rear mounting DIN 35 and enclosure mounting
- Padlocking switches for safety
- Range of load break switches available up to 125 A







### Cable Ducts

- Range: 15 x 15 mm to 150 x 150 mm
- Manufactured from FRLS and special impact rigid Polyvinyl chloride
- ROHS-compliant
- Available in zero halogen low smoke variant
- High dielectric strength and withstands temperature up to 600°C
- Unique cover locking design prevents popping up of wires while removing cover
- Elongated slots at the bottom allow flexible mounting
- Material: High impact, self-extinguishing, warp-proof rigid PVC

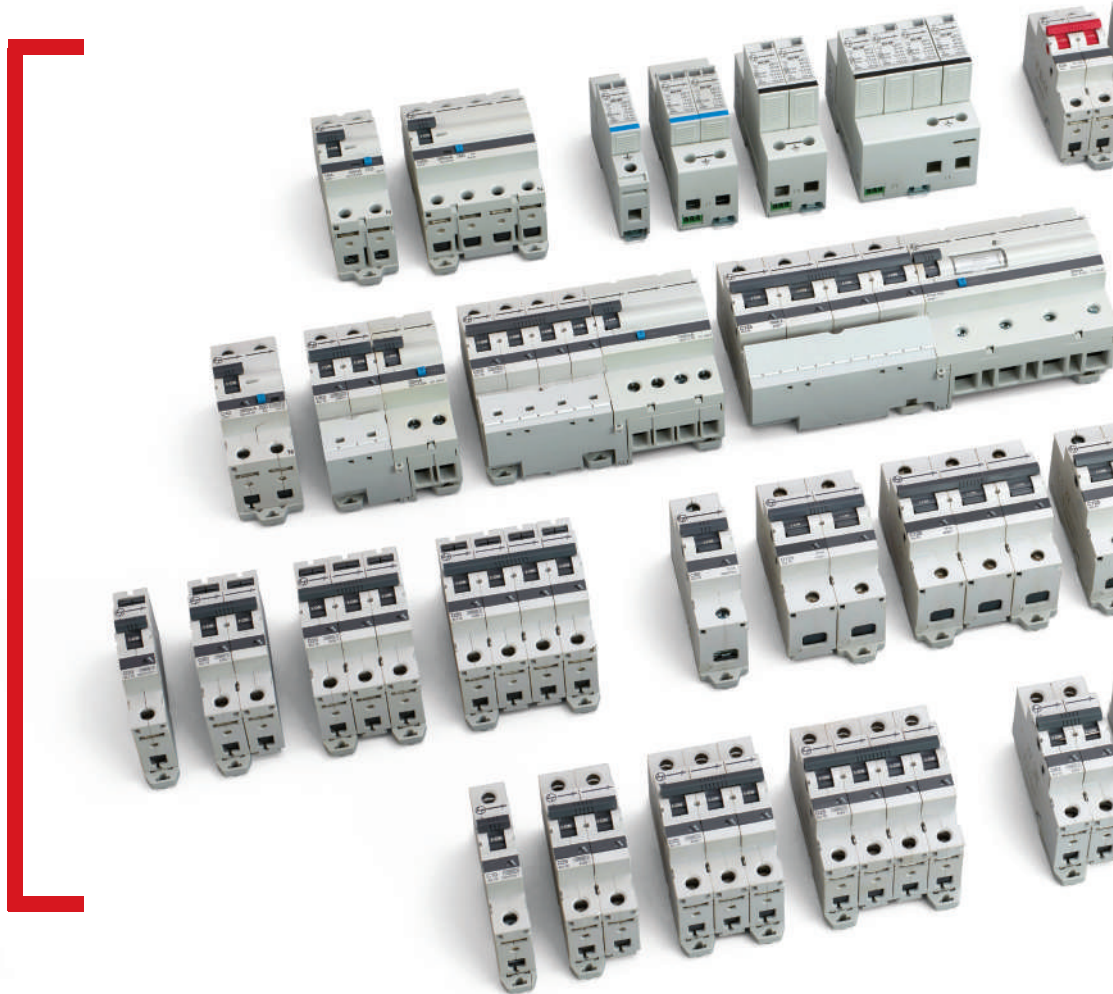




# Final Distribution Products







### Final Distribution Products

- **Unique short circuit fault indicator (in MCBs, RCBOs) for easy diagnosis and to save downtime**
- **Products with communication capability for smart systems**
  - Remote status indication: ON, OFF, TRIP
  - Remote control of load
  - Real-time energy monitoring
- **RoHS-compliant**

### Protection

#### - MCBs

- Range: 0.5A to 125A
- With 6kA, 10kA & 15kA breaking capacities
- Low watt loss that saves money and natural resources
- Quick connect MCBs – with spring loaded terminals – to reduce installation time

#### - RCCBs

- Range: 16A to 100A
- With sensitivities from 10mA to 500mA
- Type AC – for standard installations
- Type Adi – With added Immunity – for installations with pulsating DC along with transients and harmonics

#### - RCBOs

- Range: 6A to 63A
- For 3-in-1 protection: Overload + Short circuit + Earth Leakage
- Short circuit breaking capacity of 10kA
- With sensitivities from 10mA to 300mA
- Available in both Type AC and Type Adi

#### - SPDs (Surge Protection Devices)

- For protection against lighting and switching surges
- Available in Type 1+2 and Type 2
- Remote signalling facility to indicate SPD status





## Control

### - Isolators

- 25A to 125A, AC-22A
- Short time withstand of 20In for 1 second

### - Manual Changeover Switches

- 25A, 40A, 63A, AC-22A
- Three positions with Centre OFF

### - ACCL (Automatic Changeover with Current Limiter)

- Generator side - 1.5A to 30A / Electricity Board side - 30A

### - Modular Contactors

- Provide remote switching and automatic control of electric devices and equipment
- 25A, 40A, 63A
- Multiple combinations of NO and NC contacts

### - Time Switches

- Analogue, Digital and Astro versions

## Monitoring

### - Accessories

- Auxiliary Contact – for ON/OFF status indication
- Selectable AUX/TAC – for either ON/OFF or TRIP status indication
- Undervoltage Release
- Overvoltage Release
- Shunt Release
- Padlocks

### - Energy Meters

- For sub-metering purpose with Class 1 accuracy
- Single-Phase and Three-Phase versions
- Communication capable with RS485 and WiFi Modules

### - Indicating Lights

- Modular design, suitable for DIN rail mounting
- Available in Red, Yellow, Blue, Green, R-Y-B in one module

## Distribution Boards

- Perfect blend of superior aesthetics, contemporary feel and subtle presence that gels harmoniously with a décor
- Wide range with standard and customised offering
  - SPN I TPN • Per Phase Isolation (PPI) • VTPN- MCB, MCCB Incomer • Phase Segregated • Phase Selector • Flexi
  - Enclosures • Plug & Sockets • Cable End Boxes
- Specially designed 'user interface points' offer:
  - Total safety: Shrouded N-bars, insulated bus bars, star washers for effective earthing
  - Installation convenience: Separately packed door-frame-shield, removable chassis, anti-insertion marking to achieve perfect fit for flush-mounted DBs, door reversibility
  - Ease of operation and maintenance: Cement spill protector to avoid cement splashes, retainer screws for shield, holding knobs on shield for easy removal
- RoHS compliant
- Compliance with IEC 61439-2, IS 8623
- Specially designed DB range suitable for Aluminium Shuttering (Mivan) construction



## Wiring accessories – Oris, enGem, entice & englaze

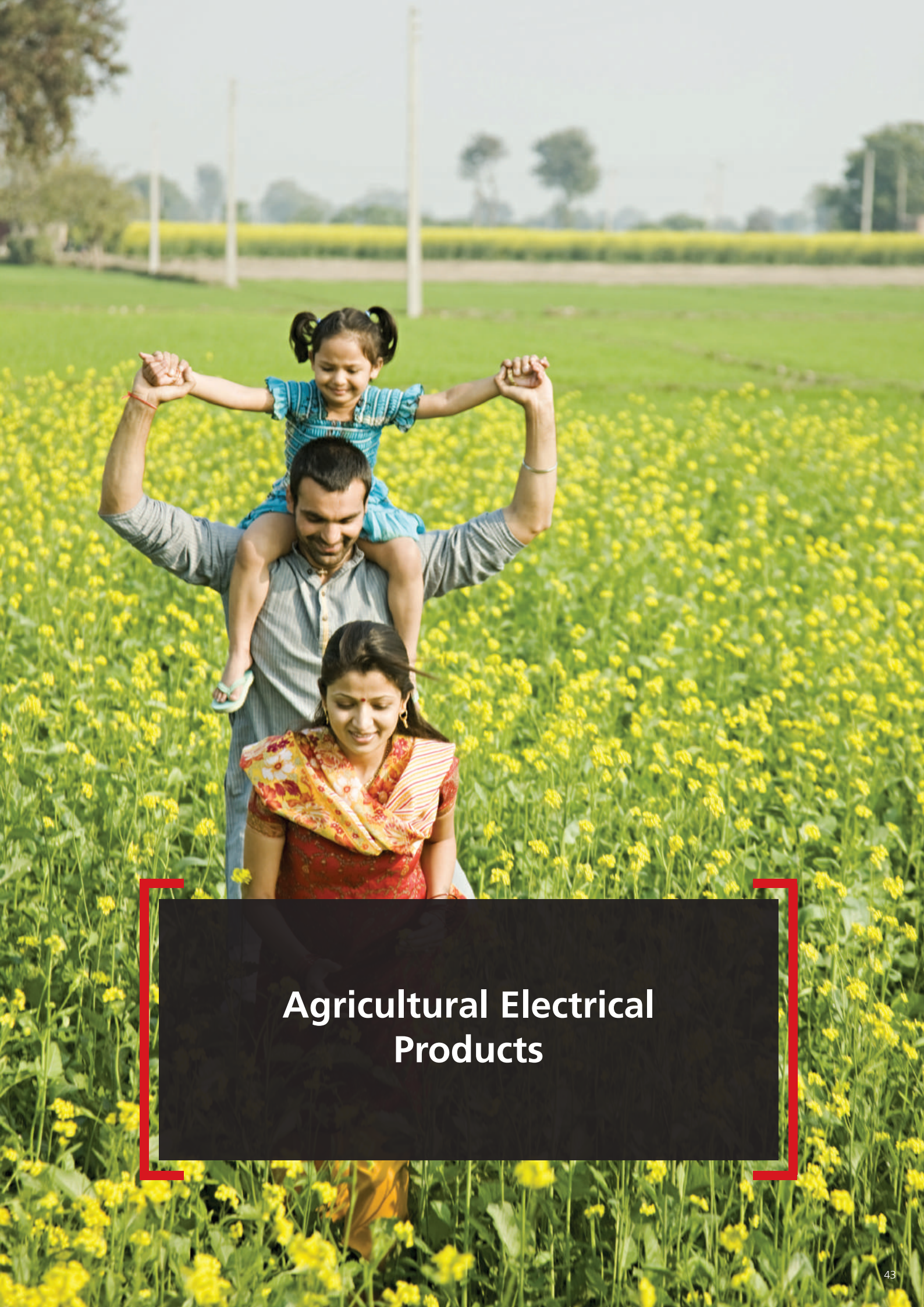
- Four ranges – Oris, Engem, Entice & Englaze
- High grade polycarbonate material for higher durability and safety
- Ribless design – No dust collection between switches
- Stylish rounded contours and glossy finish – Easy to clean
- Vertical mounting option – flexibility to mount in narrow spaces
- "Intelli - i" Night locator – helps to locate switches in the dark
- Long life – Up to 3 lakh switching operations assured
- 360° fan regulator knob – prevent knob breakage
- Multimedia smart connectors range – HDMI, USB, VGA and RCA connectors
- Modular USB chargers – charge your mobiles in faster & convenient way
- Range includes – switches, sockets, fan regulators, bell pushes, motor starter, data sockets, modular plates, USB charger, multimedia connectors, plug tops, spike guards, door bells, lamp holders and hotel range
- englaze available in Metal, Wood, Glass & antibacterial plastic plates

## Wires & Flexible Cables

- House wires available in Flame Retardant (FR), Flame Retardant Low Smoke (FRLS), Zero Halogen Flame Retardant (ZHFR) insulations from 0.5 sq mm to 16 sq mm
- Flexible cables range from 0.5 sq mm to 400 sq mm, single-core to four-core







## Agricultural Electrical Products



## Starters

- Direct-On-Line Starter range 0.5 HP to 20 HP
- Star-Delta starter ranges 6 HP to 35 HP
- 1-Phase starter ranges 0.125 HP to 3 HP
- Semi-Automatic Star-Delta and Fully-Automatic Star-Delta configurations available
- Wide band coil for low voltage operation range of 180V to 440V
- Wide range of spares



## Controllers

- 3-phase Controller ranges from 3 HP to 75 HP
- Auto re-start feature on power restoration
- Adjustable ON delay time up to 5 minutes for starting the pump after restoration of the power
- Quick protection against single phasing condition
- Unique Dual Meter – voltage and ampere readings in one meter
- 1-Phase controllers ranges from 0.5 HP to 7.5 HP with start and run MFD Capacitors
- Wide range of spares

## SMART Controller

- Available in DOL and Star Delta (With or without WLC)
- In-built anti-theft protection, gives emergency alert to your mobile when someone steals your pump, cable or controller
- Anti-theft feature is active even if no power for 48 hours
- Complete operation (Remote ON/OFF, parameter setting, monitoring and troubleshooting) through SMS or Mobile App
- Remote ON/OFF operation and pump status through missed call and IVRS
- Available in Hindi, Gujarati, Marathi, Tamil, Telugu, Kannada, Malayalam, Bengali, Oriya, Punjabi and English
- Complete and accurate protection for your pump, cable and controller
- Microcontroller based technology
- Works in all season and all condition







### GSM Based Starter Solution

- GSM based module for operation of starters and controllers from remote location
- Communication with IVRS in regional languages
- 3 users can control the starter and controller through their mobiles
- Power fail and feedback SMS in regional languages
- 4 different 'times of day' can be set in a day for pump operation
- Controls daily operations of pump for pre-defined periods avoiding wastage of water & electricity
- Ease of operation through M-POWER+ mobile app

### Flat Cables

- For submersible pump applications
- Thin and thick - insulation options
- Range from 1 sq mm to 35 sq mm, 3 core



### Power factor Correction Capacitor

- Range: 1kVAR to 20kVAR
- Available as box capacitor, cylinder capacitor and cylinder capacitor with clamps
- With pressure switch disconnector for protection against over current or overvoltage







## Application Software

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