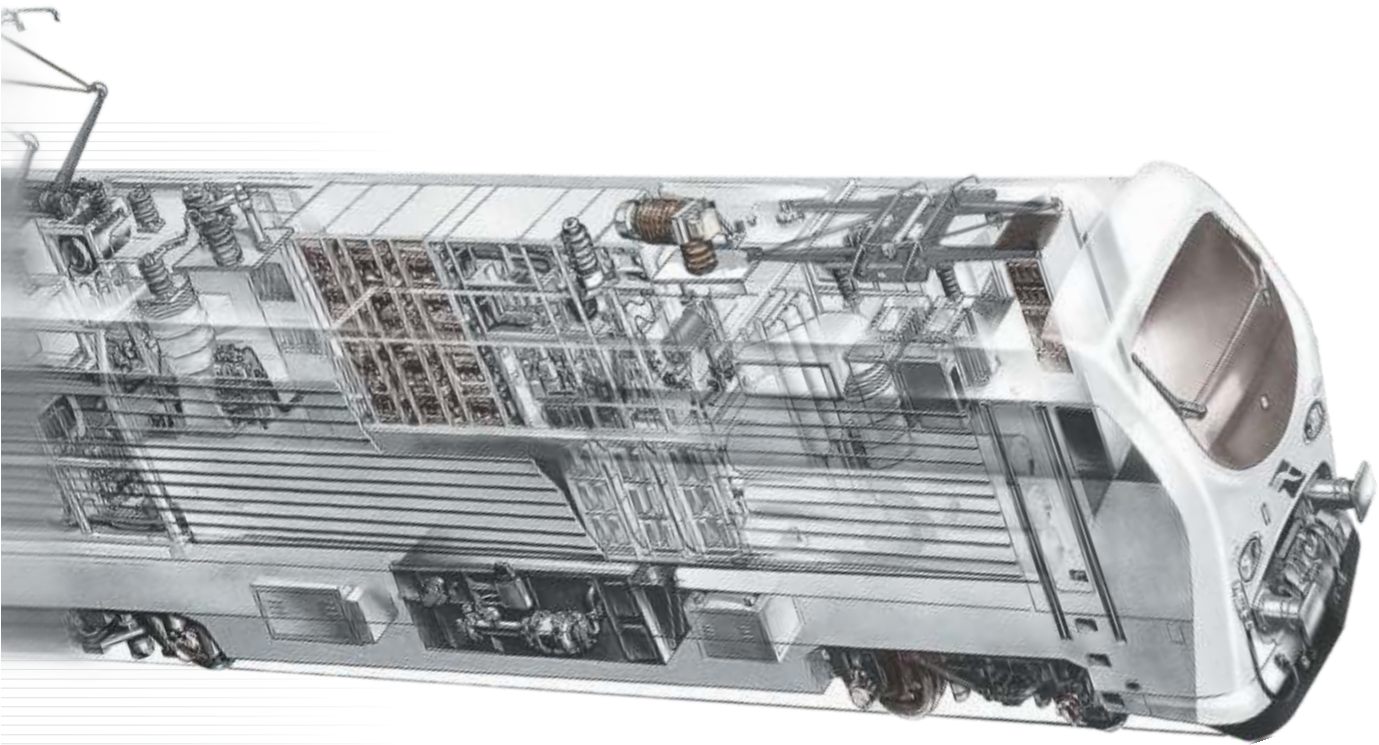




Autometers Alliance Ltd



COMPANY PROFILE



Make in India
Company

www.autometers.com

About Us

Autometers Alliance Ltd is an ISO9001, ISO14001 and ISO45001 certified Indian company manufacturing high technology products to international standards.

The company ranks amongst the country's premier hi-tech engineering solutions provider for Switchgear, Data Acquisition, Power Electronics, Audio & Display Systems, Escalators and UPS Systems for Metro and Railway networks and for industrial applications.

The company has formed strategic alliances with leading OEM's worldwide.



Engineering and R&D



- Research and Development Centre, recognised by Department of Science and Industrial Research (DSIR), Government of India, Ministry of Science and Technology
- Advanced CAD/CAM software for precision mechanical designing including 3D and surface modeling
- In-house multilayer PCB designing employing fine pitch component and BGAs using advanced software tools
- Competence in simulating power electronic products/systems under different network and load conditions to validate designs and integrated system behaviour
- Competence in development of embedded software on different platforms
- Competence in developing microprocessor based products for control / instrumentation, traction electronics, industrial and power electronics applications
- Thermal management and system design capability
- Mould and Die designing competency
- Conversant with International Standards such as IEC, DIN, IEEE, EN, MIL etc. and competent to develop products in compliance



Manufacturing Facility - Electronics



- Comprehensive manufacturing facility for assembly and testing of multilayer PCBs both with surface mount and through-hole technologies
- Surface mount PCB manufacturing line, equipped with Semi-automatic Screen Printer, Fully Automatic "Pick and Place" machine, Programable Reflow Oven, Ultra sonic PCB Cleaner, In-circuit Tester, Customized Automated Test Jigs and Rework Stations
- Through-hole PCB manufacturing line equipped with light guided "Pick and Place" machines, Wave Soldering machine
- ESD - protected Kardex Shuttle Storage systems for storing specialised Electronic components and boards
- Environmental chambers for temperature and humidity cycling
- State-of-art measuring and test equipment like CRO, Harmonic Analyzer, Temperature Scanners, Power supplies, Multi-meters etc.



Manufacturing Facility - Electrical



- Well-equipped manufacturing and testing facilities for assembly and testing of Power Electronics equipment upto 500 kVA
- Complete manufacturing and testing facilities for assembly and testing of HT/LT Switchgear products and Electrical Panels
- Complete manufacturing and testing facilities for making and testing of Wire Harness, both power and control
- Single phase variable voltage source upto 300 kVA
- Variable voltage DC source upto 50 kW
- Resistive & inductive loading facilities
- High voltage test setup upto 100 kV
- Facilities for manufacturing of Coils and Bushings using customized CNC winding machines
- AC high current source upto 1000 Amp
- Shielded tand and partial discharge test facilities
- Specialized Endurance test setup for various products



Manufacturing Facility - Mechanical



- Well-equipped CNC Machine Shop with modern machines for production of precision mechanical components and prototypes, with consistent accuracy index
- CNC Machine Shop includes CNC Machining Centers, CNC Lathe Machines, Gear Hobbing Machines, Jig Boring Machine, Multi-spindle Drilling Machine, Cylindrical Grinding Machine, Vibro-benz Vibratory De-burring Machine, Ultrasonic Cleaning Machine etc.
- Tool room capability
- Tool design and manufacturing capability
- Heat treatment facility

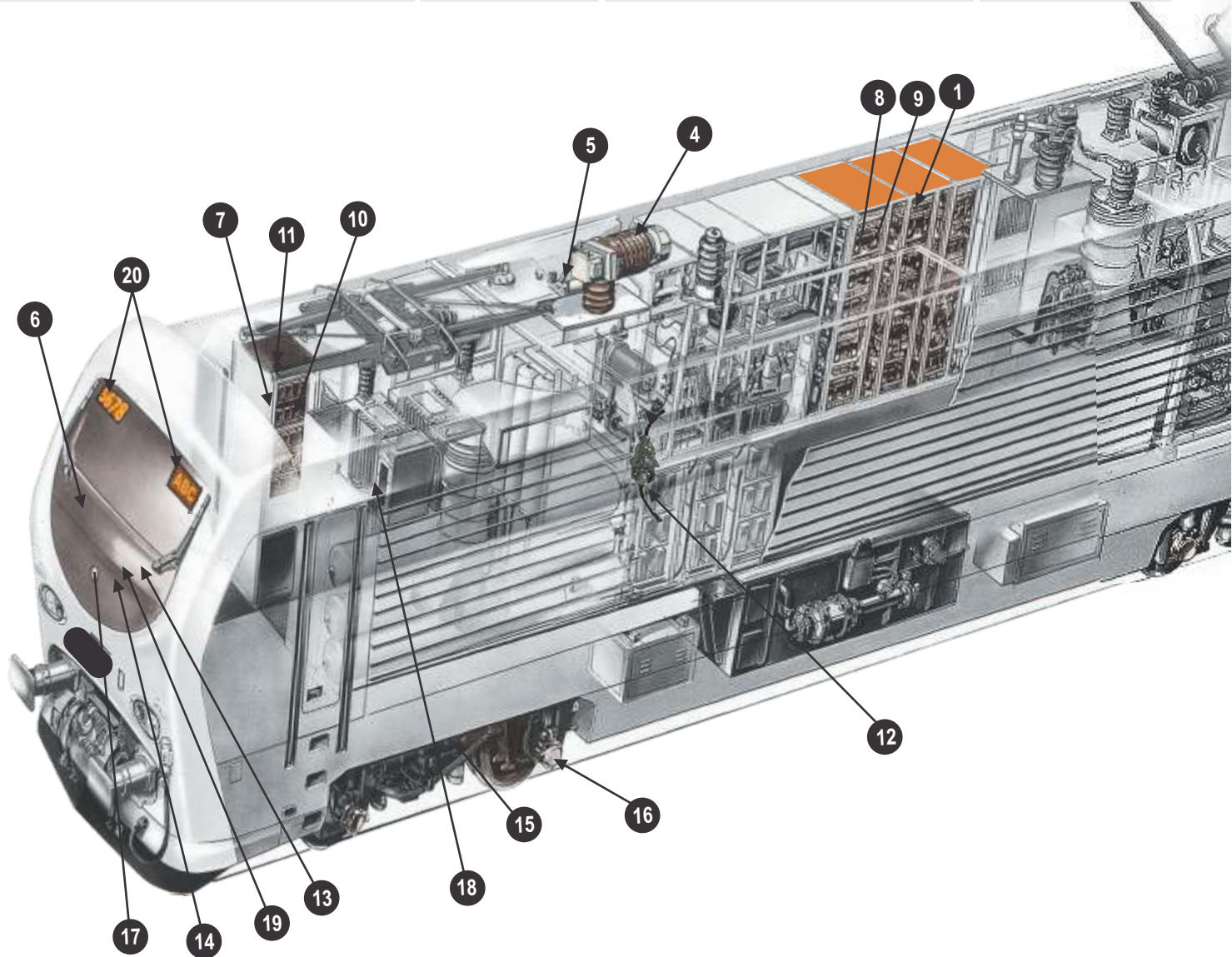


Quality Assurance

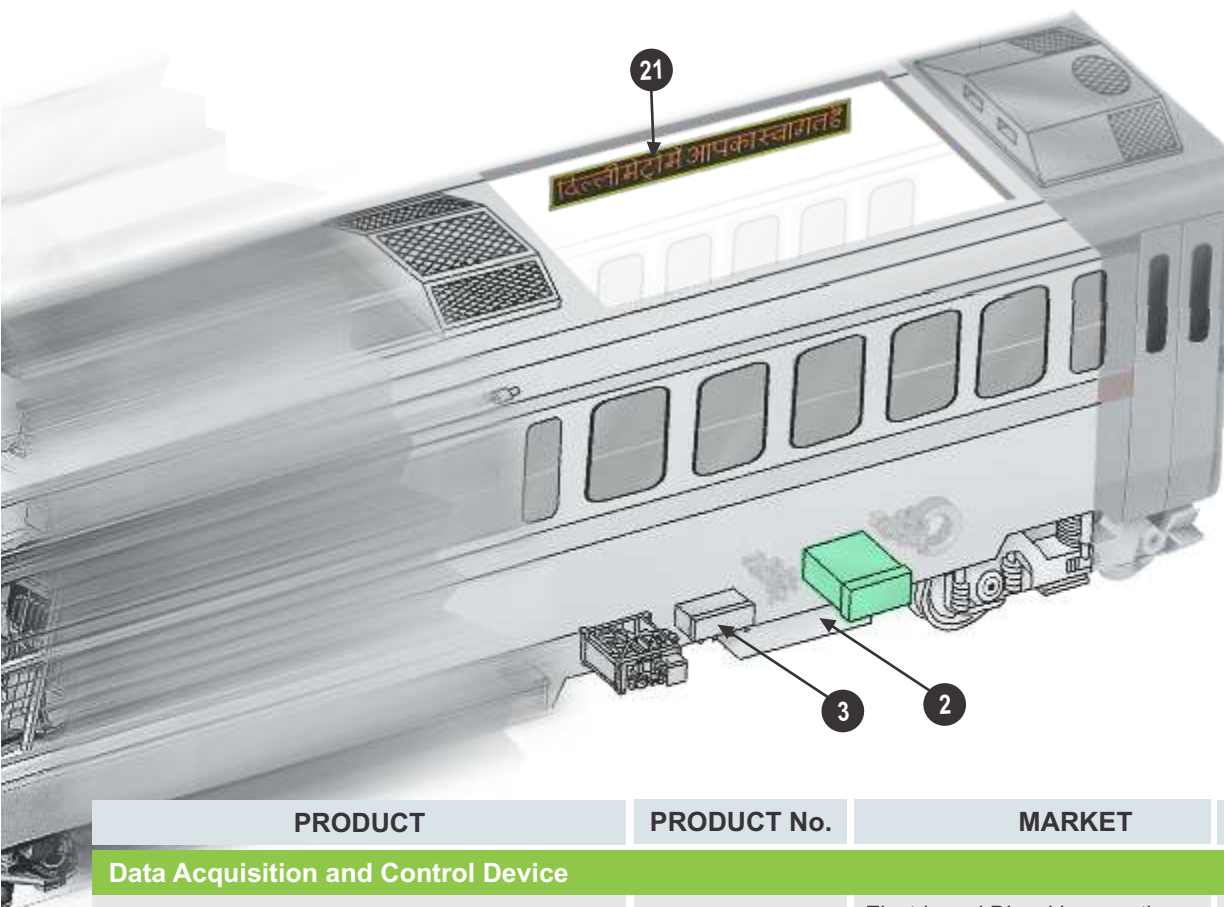
- ISO 9001 certified since 1994
- In-house calibration facility (having traceability) with National accredited test labs and full compliance with National and International Standards
- Continuous vendor evaluation and assessment using an in-house developed software for decision support
- Quality assurance and enhancement plans for all products according to International quality standards and collaborators / customer specifications
- Computerised decision support and control system for inspection of all incoming material
- Automated data-logging from instruments through Multiplexers in the computers, thereby eliminating human errors
- Computerised 3-dimensional co-ordinate measuring machine
- Computerised profile projector with magnifying capability up to 100 times for fine measurements of mechanical components
- State-of-the-art instruments and gauges for testing of electronic, electrical and mechanical components
- Test facilities for inspection of coating thickness and surface treatment
- Surface roughness tester
- Spring constant checking machine
- Hardness tester, electrical conductivity tester
- Well defined Quality audits for in-process & final stages of production
- Product prototypes testing facility, including load test, high voltage / de-electric test, environmental test, heat test, dust test, water-ingress level test and more



PRODUCT	PRODUCT No.	MARKET	TECHNOLOGY
Traction Power Electronics			
■ Hotel Load Converter 2x500 kVA	1	Electric Locomotives	IGBT based
■ Static Converter 180 kVA	1	Electric Locomotives	GTO based
■ Auxiliary Converter 3x130 kVA	1	Electric Locomotives	IGBT based
■ Auxiliary Converter 3x100 kVA	1	Electric Locomotives	IGBT based
■ Underslung Converter 25 kVA SGC	2	Railway Passenger Coaches	IGBT based
■ Underslung Converter 25 kVA HOG	2	Railway Passenger Coaches	IGBT based
■ Underslung Converter 100 kVA	2	Metro Railway Coaches	IGBT based
■ Underslung Converter 50 kVA	2	Metro Railway Coaches	IGBT based
■ Underslung Converter 5 kW	2	Metro Railway Coaches	IGBT based
■ Battery Charger 30 kW Pre-Cooling	3	SGAC Coaches	IGBT based
■ SMPS Battery Charger 6.5 kW	3	LHB Coaches	IGBT based
Traction Switchgear and Panels			
■ Vacuum Circuit Breaker	4	Electric Locomotives, EMUs and Metro Cars	Electro-Mechanical
■ Earthing Switch	5	Electric Locomotives, EMUs and Metro Cars	Electro-Mechanical
■ Master Controller	6	Electric Locomotives, EMUs and Metro Cars	Electro-Mechanical
■ Key Multiplier	7	Traction Vehicles	Mechanical
■ Electro-pneumatic Contactor	8	Traction Vehicles	Electro-Mechanical
■ Electro-magnetic Contactor	9	Traction Vehicles	Electro-Mechanical
■ Protection Relays	10	Electric Locomotives	Electro-Mechanical (current / voltage operated),



PRODUCT	PRODUCT No.	MARKET	TECHNOLOGY
Traction Switchgear and Panels			
■ General Purpose, Wheel Slip and Ground Relays	10	Diesel Locomotives / EMUs	Electro-Mechanical
■ Electrical Panels	11	Main line and Metro Railways	Electro-Mechanical
■ Circular Power and Data Connectors	12	Onboard and Stationary Traction	Electro-Mechanical
Data Acquisition and Control Device			
■ Tachograph System	13	Electric and Diesel Locomotives and EMUs	Microprocessor based Electronic
■ Driver Display Unit	14	Electric and Diesel Locomotives	Microprocessor based LCD displays
■ Active Speed Sensor	15	Electric Locomotives	Hall effect



PRODUCT	PRODUCT No.	MARKET	TECHNOLOGY
Data Acquisition and Control Device			
■ Pulse Generator	16	Electric and Diesel Locomotives, EMUs and Metro Trains	Opto-electronic
■ Diagnostic Display/Terminal	17	Electric and Diesel Locomotives and EMUs	Microprocessor based LCD displays
■ Event Recorder	18	Electric and Diesel Locomotives and EMUs	Microprocessor based Electronic
■ Vigilance Control Device	19	Electric and Diesel Locomotives and EMUs	Microprocessor based Electronic
Audio and Display Systems			
■ Onboard Public Address and Passenger Information System	20	Mainline and Mass-transit Vehicles	DSP based control unit with redundant CPU and Power Supply Boards
■ Integrated Public Address Systems & Passenger Information Display System and Master Clock System for Stations	21	Networked Stations	DSP and high end Processor based
Escalators			
■ Escalators		Railway, Metro Stations and Airports	Microprocessor based Electro-mechanical
Uninterruptible Power Supplies			
■ UPS		Industrial and IT applications	IGBT based Double conversion. High frequency PWM

Hotel Load Converter 2x500 kVA

IGBT for Electric Locomotives



Compliant Standards:

IEC 60571 (Edition 2.1), IEC 61287-1 (Edition 2.0),
IEC 60310 (Edition 3.0), IEC 61373 (Edition 2.0)
and other relevant IEC and Indian (BIS) Standards.

Applications

Converts single phase input voltage with typical railway characteristics to stabilised 3-phase voltages for the safe and reliable operation of Air conditioners and other hotel load of full train (coaches).

TECHNICAL FEATURES

State of the art DSP based system

Stabilised and balanced output of 750 V and 50 Hz with minimum distortion

Power factor close to unity achieved using Four Quadrant (4Q) front end converter

Event and data logging/ debugging using USB / CAN / RS232 / RS485

Online monitoring for fault diagnostics

Data modem for remote feed back of status

Optical link between DSP and power devices

Maintenance free, being fully static and modular construction

Less noise

Easy to maintain and lower life cycle cost

Static Converter 180 kVA

IGBT for Electric Locomotives



Compliant Standards:

IEC 60571 (Edition 2.1), IEC 61287-1 (Edition 2.0), IEC 60310 (Edition 3.0), IEC 61373 (Edition 2.0) and other relevant IEC and Indian (BIS) Standards.

Applications

Converts single phase input voltage with typical railway characteristics to stabilised 3-phase voltages for the safe and reliable operation of electrical equipment onboard railway vehicles.

TECHNICAL FEATURES

State of the art DSP based system
Stabilised and balanced output at 415 V and 50 Hz with minimum distortion
Eliminates the need of special auxiliary motors thereby reducing the cost of auxiliary motors
Near unity power factor achieved using 4 quadrant front end converter
Maintenance free, being fully static
Less noise
Event and data logging facility helps in fault diagnostics
Electrically and functionally one to one replacement of Arno Converter
Online monitoring
Controlled battery charger with galvanic isolation between converter and battery
Eliminates the disadvantages of rotary converter
Optical link between DSP and power devices

Auxiliary Converter 3x130 kVA

IGBT for Electric Locomotives



The product is developed for feeding auxiliary power to WAP5 / WAP7 / WAG9, WAG9H three phase locomotives for Indian Railways.

Compliant Standards:

IEC 61287-1, IEC 60571, IEC 60310,
IEC 61373 and IEC61375.

Applications

The unit is put on board on three phase locomotive WAP5 / WAP7 / WAG9 / WAP9H. This is used to provide stabilized 3 phase sine wave voltage for safe and reliable operation of auxiliary motors and load. This also feeds DC load and battery charging.

TECHNICAL FEATURES

Designed to give 3x130kVA with VVVF control
A modular concept, in which, each module serves a specific power and control function
Designed to sustain wide voltage and frequency variations of catenary
Voltage (DC Link) indication (LED blinking) for safety of maintenance staff
Interface with safety interlocking system
Digital Signal Processor (DSP) based electronics for controlling and monitoring.
Utilization of existing cooling systems no additional blower fan
Communication between converter and the vehicle control unit through MICAS-S2 and TCN
Easy to maintain and lower life cycle cost

Auxiliary Converter 3x100 kVA

GTO for Electric Locomotives



Compliant Standards:

IEC 61287-1, IEC 60571 and IEC 60310.

Applications

Converts single phase input voltage with typical railway characteristics to stabilised 3-phase voltages for the safe and reliable operation of electrical equipment onboard railway vehicles.

TECHNICAL FEATURES

A modular concept, in which, each module serves a specific power and control function

Designed to give 200 kVA with VVVF and 100 kVA with VVCF

Designed to sustain wide input voltage and frequency variations

Independent phase modules of inverter combined to build a 3-phase inverter

Thyristor controlled rectifiers

Protection against over voltages in the DC link and at the input

Microprocessor based electronic rack for controlling and monitoring the functioning of the power modules

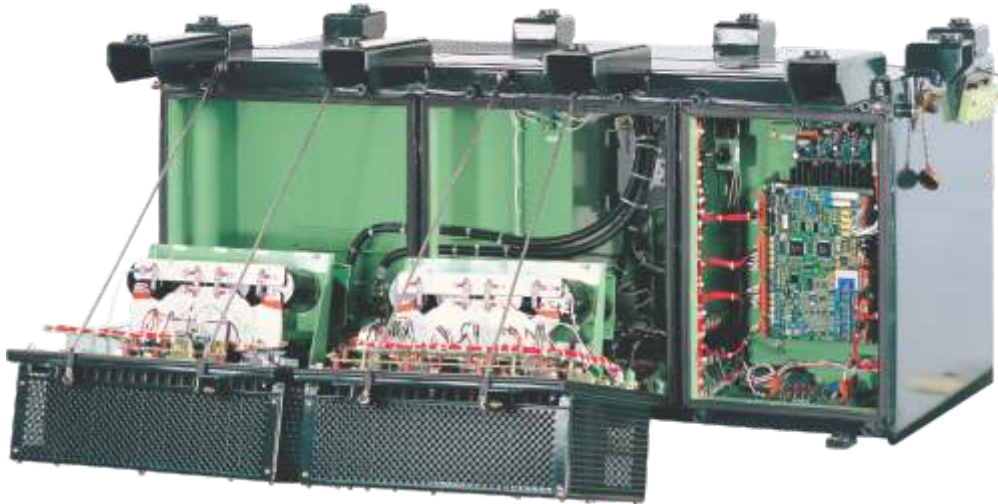
Cooling within the cubicle through internal fans

Communication between converter and the vehicle control unit through MICAS-52

Easy to maintain and lower life cycle cost

Underslung Converter 25 kVA SGC

IGBT for Railway Passenger Coaches



Developed Underslung Static Converter IGBT-based 25kVA. The product, exclusively developed for railway passenger coaches.

Compliant Standards:

IEC 60571, IEC 61287-1 and IEC 60310.

Applications

Converts 110V DC supply of the coach batteries into 3-phase 415V, 50 Hz AC.

Feeds 3-phase power to the loads, viz., air conditioning, lights, ventilation, pantry, and the like of the passenger coaches.

TECHNICAL FEATURES

Under carriage mounting of converter saves space for 2 extra berths inside the coach, enhancing revenue earnings

Under carriage mounting also prevents noise pollution, adding to passenger comfort

Sturdy MS / SS sheet fabricated enclosure, with special protective surface treatment, makes it ideal for under carriage mounting

IP 65 protection makes the enclosure impervious to water, even in flood situations

High efficiency leads to low power consumption.

Being naturally cooled the converter does not require any moving parts for cooling. This enhances life and reliability

Vacuum pressure impregnation using 'H-class' resins for filler inductors makes it ideal for traction duty

Maintenance free, being fully static

Converter's modular design makes it easily accessible through side panels and affords easy maintenance

Fault logging facility for ease of maintenance

State of the art DSP based system

Data transfer through serial communication between onboard display and underslung converter

Control and monitoring through onboard interactive VFD panel

PC interface facility for downloading of logged data and online monitoring

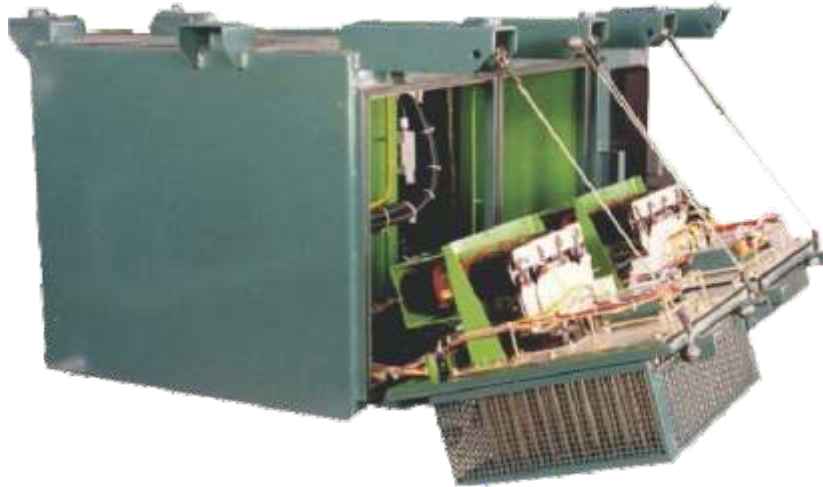
Converts 110V DC supply of the coach batteries into 3-phase 415V, 50 Hz AC

Feeds 3-phase stabilised power to the loads of the passenger coaches, viz., air conditioning, lights, ventilation, pantry, and the like

Coach wheel/axle driven alternator rectifier system charges the batteries

Underslung Converter 25 kVA HOG

IGBT for Railway Passenger Coaches



The converter employs state of the art DSP control and feeds the stabilized power to air conditioning and other loads of the railway passenger coaches.

Compliant Standards:

IEC 60571, IEC 61287-1 and IEC 60310.

Applications

Converts single phase AC supply available from the locomotive transformer into 3-phase 415V, 50 Hz supply.

Feeds 3-phase power to the loads, viz., air conditioning, lights, ventilation, pantry, and the like of the passenger coaches.

TECHNICAL FEATURES

Under carriage mounting of converter saves space for 2 extra berths inside the coach, enhancing revenue earnings

Sturdy MS sheet fabricated enclosure, with special protective surface treatment, makes it ideal for under carriage mounting

Under carriage mounting also prevents noise pollution, adding to passenger comfort

IP 65 protection makes the enclosure impervious to water, even in flood situations. High efficiency leads to low power consumption

Being naturally cooled the converter does not require any moving parts for cooling. This enhances life and reliability

Vacuum pressure impregnation using 'H-class' resins for filter inductors makes it ideal for traction duty

Maintenance free, being fully static

Converter's modular design makes it easily accessible through side panels and affords easy maintenance

State of the art DSP based system

Fault logging facility for ease of maintenance

Data transfer through serial communication between onboard display and underslung converter

Control and monitoring through onboard interactive VFD panel

PC interface facility for downloading of logged data and online monitoring

Underslung Converter 100 kVA

IGBT for Metro Railways



Compliant Standards:

IEC 61287-1 (Edition 2.0), IEC 60571 (Edition 2.1), IEC 60310 (Edition 3.0), IEC 61373 (Edition 2.0) and other relevant IEC and Indian (BIS) standards.

Applications

Converts third rail DC input voltage with wide variation to stabilized three-phase, 415V, 50 Hz voltages for safe and reliable operation of electrical equipment roof mounted package unit (RMPU's) in metro vehicles.

TECHNICAL FEATURES

State of the art DSP based system
Stabilized and balanced three-phase, 415V, 50Hz output, with low current distortion
Balanced output eliminates the need of special auxiliary motors thereby reducing the cost of auxiliary motors
Wide DC input variation (500 - 990 VDC) including 4.5% ripple and safety margin
Maintenance free, being fully static
Low noise level
Underslung structure with IP65 protection class
On line monitoring
Event and Data logging facility
Natural cooled

Underslung Converter 50 kVA

IGBT for Metro Railways



Compliant Standards:

IEC 61287-1 (Edition 2.0), IEC 60571 (Edition 2.1), IEC 60310 (Edition 3.0), IEC 61373 (Edition 2.0), and other relevant IEC and Indian (BIS) standards.

Applications

Converts third rail DC input voltage with wide variation to stabilized three-phase, 415V, 50 Hz voltages for air compressors and 110V DC for battery charging and auxiliary loads.

TECHNICAL FEATURES

State of the art DSP based system
Stabilized and balanced outputs <ul style="list-style-type: none">(i) Three-phase, 415V, 50Hz for air compressor(ii) 110V DC (Boost voltage 150V DC and Float voltage 126 V DC) for battery charging and auxiliary loads
Balanced three-phase output eliminates the need of special auxiliary motors there by reducing the cost of auxiliary motors
Wide DC Input variation (500 - 990 VDC) including 4.5% ripple and safety margin
Maintenance free, being fully static
Low noise level
Underslung structure with IP65 protection class
On line monitoring
Event and Data logging facility
Natural cooled
Boost and Float changer for smooth charging of battery

Underslung Converter 5 kW

IGBT for Metro Railways



Compliant Standards:

IEC 61287-1 (Edition 2.0), IEC-60571 (Edition 2.1), IEC- 60310 (Edition 3.0), IEC 61373 (Edition 2.0), and other relevant IEC and Indian (BIS) standards.

Applications

Converts third rail DC input voltage with wide variation to stabilized 6 - 12 V DC (capacity 417 Amp) for the safe and reliable operation of DC motor braking, for metro vehicles.

TECHNICAL FEATURES

State of the art DSP based system
Stabilized and balanced output (6 – 12 V DC adjustable)
Wide DC input variation (500 – 950 V DC)
Maintenance free, being fully static
Low noise level
Underslung structure with IP65 protection class
On line monitoring
Event and Data logging facility
Output galvanically isolated from input
Natural cooled

Battery Charger 30 kW Pre-Cooling

IGBT for SGAC Coaches



Pre-cooling Unit Cum Charger IGBT based front end 30kW. The DSP based system works in four different modes to meet the requirement of SGAC coaches for Indian Railways.

Compliant Standards:

IEC 60571, IEC 61000, IEC 61373.

Applications

The product is for under-slung fitment in self generating air conditioned coaches primarily for precooling the air conditioned coaches at the yard / station and charging the batteries (VRLA or LMLA fitted in Coaches).

TECHNICAL FEATURES

State of the art DSP based system

IGBT based rectifier to obtain input power factor close to Unity (0.99)

Low noise level smaller than 65 dB

Very low voltage and current ripples smaller than 2%

Facility to receive data via RS 232 communication on laptops for on-line data monitoring

With on-board display unit to change the working mode and check the status of unit

Capability to charge battery in constant voltage as well as constant current mode for different type of batteries (VRLA and LMLA with different current hour ratings)

SMPS Battery Charger 6.5 kW

IGBT for LHB Coaches



Battery Charger 6.5 kW with integrated SMPS technology. The product has a proven track record of reliability in performance under varying conditions.

Applications

The battery charger is used in LHB type coaches as a DC voltage source for loads, as well as, to charge batteries.

TECHNICAL FEATURES

Integrated SMPS technology
Compact, light weight and rugged construction
Facility to receive data via RS 232 communication on laptops for line data monitoring
Very low voltage and current ripples
LCD display
Data logging facility
Requires minimum maintenance
Low noise level
Indications for battery reverse polarity

Vacuum Circuit Breaker

Electro-Mechanical for Electric Locomotives, EMUs and Metro Cars



Compliant Standards: IEC 60077.

Applications

The VCBA type circuit breaker is used as a line circuit breaker:

To close and open the power circuit of the vehicle from the overhead catenary.

To interrupt the power circuit current under overload, short circuit or any other defined conditions.

TECHNICAL FEATURES

Single pole AC circuit breaker

Equipped with vacuum interrupter

Earthing switch can be engaged directly on the breaker

Pneumatic closing and holding, opening through spring induced force

Constructed for roof mounting

Requires minimum maintenance

Requires less space for installation

Provides protection against fault currents

Isolates the traction vehicle from the overhead catenary wire

Traction Switchgear

Earthing Switch

Electro-Mechanical for Electric Locomotives, EMUs and Metro Cars



Earthing Switch suitable for Electric Locomotives & designed to withstand extremes of Electrical and thermal stresses.

Applications

The Earthing Switch is a manually operated device with safety interlocking keys, designed to ground electrical circuit on both side of AC Vacuum Circuit Breaker when the AC Vacuum Circuit Breaker is open. This ensures the safety of the maintenance personnel during maintenance and routine checking.

TECHNICAL FEATURES

Compact design

Minimum maintenance requirement

Manually operated from inside the vehicle

Rugged construction with proven performance under severe operating condition of the Electric Traction Vehicle.

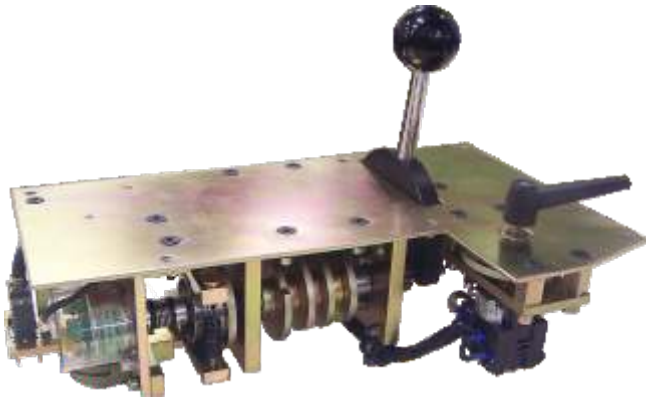
Interlocking with KEY arrangement for safe operation

Ensure high Electrical and Mechanical Endurance

Traction Switchgear

Master Controller

Electro-Mechanical for Electric Locomotives, EMUs and Metro Cars



Master Controller is manually operated equipment that comprises the control elements required for driving and braking, as well as for controlling the auxiliary function of traction rail vehicles from Driver's desk. Master controller is suitable for use on 3-phase, 25KV, AC Locomotives as well as in the Driving Cars of EMUs.

TECHNICAL FEATURES

Reliable and have High-Precision response
Requires no maintenance
Modular and compact design
Ease of connection with Circuit through bayonet connector and SUB-D connector
Robust design to withstand vibration encountered during service
Enhance service life due to low friction of moving parts

Key Multiplier

Mechanical for Traction Vehicles



Key Multiplier is suitable for traction vehicles. This is a Safety Device based on key interlocking mechanism, ment for the safety of maintenance personnel.

Applications

Key Multiplier Safety Device will allow to isolate and guarantee the electrical grounding before access of maintenance staff to roof mounted equipment and the high voltage power equipment such as the filter cubical, auxiliary converters, traction onverters, auxiliary cubicles and control cubicles & any other high voltage equipment.

TECHNICAL FEATURES

Mechanical Service life	20,000 operations
Codes for Lock and Key	computerised profile and colour coding
Working temperature	-25°C to 70°C
Humidity	max. 100% saturation during rainy season

Contactors Electro-Pneumatic

Electro-Mechanical for Traction Vehicles



Electro pneumatic Contactor is a double pole heavy duty contactor designed to be used on traction vehicles. In order to work efficiently both with high and low circuit in AC and DC circuits, the contactors are equipped with arc blow-out circuit. Additionally the exhaust air blast is utilized for extinguishing the arc.

Applications

Used for traction vehicle equipments like Contactor Filter On/Off, Contactor filter Adaption, auxiliary equipments, traction converters, etc.

TECHNICAL FEATURES

Compact and Space saving wall mounting
Used for Higher voltage upto 3000V and 600A AC/DC application. Having double pole normally open contacts
Low Maintenance and Reliable operations under extreme condition
Contact movement designed for self cleaning action
Contacts are easily inspected and replaced
Independent of polarity.
Arc Extinguisher helps to break down the arc voltage and to cool the arc effectively
Operating Coil designed for voltage tolerance of -30% to +25%.
All non metallic components are of fire retardant self – extinguishing materials
Option of upto 8 (NO or NC) auxiliary contacts, customization possible
Sturdy structure and a long mechanical life (over 10 million operations)
Supplementary air blast ensures short switching times throughout the entire range

Contactors Electro-Magnetic

Electro-Mechanical for Traction Vehicles



Electromagnetic Contactor is a single pole heavy duty contactor designed to be used on traction vehicles. In order to work efficiently both AC and DC circuits, the contactors are equipped with arc blow-out circuit.

Applications

Used for traction vehicle equipments like Discharging Resister, Heating System, auxiliary equipments, traction converters, etc.

TECHNICAL FEATURES

Compact and Space saving wall mounting
Used for Higher voltage, upto 3000V and 50A AC/DC application. Having single pole normally open contacts
Low Maintenance and Reliable operations under extreme condition
Contact movement designed for self cleaning action
Contacts are easily inspected and replaced
Independent of polarity
Arc Extinguisher helps to break down the arc voltage and to cool the arc effectively
Operating Coil designed for voltage tolerance of -30% to +25%
All non metallic components are of fire retardant self – extinguishing materials
Option of upto 4 (NO or NC) auxiliary contacts, customization possible
Sturdy structure and a long mechanical life (over 5 million operations)

Traction Switchgear

Protection Relay

Electro-Mechanical for Electric Locomotives

Protection Relays suitable for electric traction vehicles. Designed to withstand extremes of mechanical and thermal stresses, the product has a proven track record for reliability.



Applications

The relays are designed for protecting electric locomotive equipments & circuits:

- Main transformer against overloading.
- Excitation windings of traction motors and rheostatic braking resistance against over current.
- Auxiliary equipments against overloading.
- Silicon Rectifier against overloading.
- Main power circuit and auxiliary circuit against earth fault.
- Locomotive's electrical equipment against drop of OHE voltage below minimum value.

TECHNICAL FEATURES

Plug-in design for simple mounting and easy checking
Minimum maintenance
Compact and lightweight design
Rugged construction with proven performance under varying condition
Adjustable tripping current/voltage value as per requirement
High insulation level
High repeatability at the set value
High mechanical and electrical endurance

General Purpose Relay

Electro-Mechanical for Diesel Locomotives / EMUs



Applications

Used for initiation of alarms, sequencing, control and auxiliary circuits.

TECHNICAL FEATURES

Rugged construction with proven performance under varying conditions
High insulation level
Dust guard on contacts
High mechanical and electrical endurance
High repeatability

Auxiliary Supply Control Panel

Electro-Mechanical for Mainline and Metro Railways



Auxiliary Supply Control Panel for Driving Trailer car and Motor car of the Delhi Metro.

Compliant Standards:

IEC61373 Cat 1 Class A, IEC60529 (Edition 2.1), IEC60068-2-2 and other relevant IEC & Indian (BIS) standards.

Applications

As a control panel for controlling light, fan, air-conditioning, public address / public information system and other related accessories inside the coach. The panels are designed for protecting Metro car & circuits.

TECHNICAL FEATURES

Equipped with protection devices for unit protection
Equipped with controller units for fan, air-conditioning and public address/public information system
Marking for each wire for identification
Easy front access to all the devices fitted in the panel
Requires no maintenance
Low noise level
Enclosed panel structure with IP53 protection class
Forced air cooling

Auxiliary Supply Control Panel Electro-Mechanical for Mainline Railways



Auxiliary Supply Control Panel suitable for 3-phase 750V, 50 Hz input train line systems for feeding coach lighting, air conditioning, pantry, pump control, sanitary system, public address system and the like.

Applications

As a control panel for controlling light, fan, air-conditioner, pump and other related accessories inside the coach.

TECHNICAL FEATURES

Equipped with protection devices for unit protection

Consists of measuring/indicating instruments for monitoring of different parameters

Equipped with switchgear for battery charger, DC-DC converter, earthing device, etc.

Easy front access to all the devices fitted in the panel

A compact fluorescent tube light, operated on 110 V DC, fitted inside the panel for easy maintenance of the same

Traction Switchgear

Circular Connectors

Electro-Mechanical for Onboard & Stationary Traction



Traction Grade Circular Connectors for both indoor and outdoor use in railway applications. The product developed under the most stringent conditions.

TECHNICAL FEATURES

A positive, quick mating, 3-point bayonet coupling

Insert arrangement for upto 61 contacts and upto 150A per contact rating

Terminal cross section of 0.5 to 50 mm²

Elastic insulators of Chloroprene, Silicon and Ethylene Acrylate for standard, high temperature and fire protection requirements, respectively

Completely sealed to protect moisture condensation and flashover

Resistant to liquid fuels, lubricants and insulating oils etc

Robust mechanical construction

Compliant Standards:

MIL-C-5015 and VG95234 standards.

Applications

Ideal for industrial environment that requires utmost environmental reliability and ease of mating and unmating. These connectors are used in power generators, battery systems, ships, telecommunications, railway equipment, industrial machinery, engines and the like.

D Type Connectors

Electro-Mechanical for Onboard & Stationary Traction



Traction Grade D-Type Data Connectors for indoor applications.

TECHNICAL FEATURES

Crimping: Termination through crimped joints using special crimping tools

EMI Protection: To provide 360° EMI immunity, the data connector provides optimum linking of the cable shield to the cable clamp by means of a separate crimp and shield bushing. The small side spikes on the cable clamp guarantee a gastight connection to the connector shell and crimping ensures easy positioning of the shield bushing

Complaint Standards:

Protection Class IP44, as per DIN 40050.

Coding: On site coding of data connectors is possible by means of a coding tool. This is carried out by inserting coding slide corresponding to its position in the coding plate

Tachograph System

Microprocessor for Diesel Locomotives and DMUs



Microprocessor-based Speed Recording System TELPRO, exclusively for Diesel Electric Locomotives/ Diesel Multiple Units (DMUs). The product integrates the latest technology and can be customised for all types of traction vehicles, like metro train, LRVs, rail cars, inspection cars, and the like.

Compliant Standards:

IEC- 60571, IEC61000-4-3, 4, 6, 8.

Applications

Speed, Time, Distance indication for driver.
Administrative control of traction vehicle for traffic scheduling.

Vehicle trend analysis in case of breakdown / accident.

Analysis of driver's operational performance to provide training, if required.

TECHNICAL FEATURES

Light weight and compact in size
Adequate journey data recording capacity
Data transfer through Pen-drive
Both analog and digital displays for speed
Both internal and external memories for data storage
Memory freeze facility
Stepless wheel wear compensation
Dual sensor opto electronic pulse generator for speed sensing
Over speed audio visual alarm
7-digit odometer
User friendly Windows-based data extraction and analysis software
Graphical and tabular reports generation for easy analysis of recorded data
Cumulative, Trip-wise, Train-wise, Driver-wise and Date-wise report generation
Master-Slave configurations

Tachograph System

Microprocessor for Electric Locomotives and EMUs



Microprocessor-based Energy cum Speed Recording System TELPRO, exclusively for Electric Locomotives/ Electrical Multiple Units (EMUs).

The product integrates the latest technology and can be customised for all types of traction vehicles, like metro train, LRVs, rail cars, inspection cars, and the like.

Compliant Standards:

IEC- 60571, IEC61000-4-3, 4, 6, 8.

Applications

Speed, Time, Distance indication for driver.
Administrative control of traction vehicle for traffic scheduling.

Vehicle trend analysis in case of breakdown/accident.

Analysis of driver's operational performance to provide training, if required.

TECHNICAL FEATURES

Light weight and compact in size
Adequate journey data recording capacity
Data transfer through Pen-drive
Both analog and digital displays for speed
Both internal and external memories for data storage
Memory freeze facility
Stepless wheel wear compensation
Dual sensor opto electronic pulse generator for speed sensing
Measurement of OHE current and OHE voltage
Measurement of power factor and Energy consumption
Specific energy consumption analysis
Over speed audio visual alarm
7-digit odometer
User friendly Windows-based data extraction and analysis software
Graphical and tabular reports generation for easy analysis of recorded data
Cumulative, Trip-wise, Train-wise, Driver-wise and Date-wise report generation
Master-Slave configuration

Driver Display Unit

Microprocessor LCD Displays for Electric and Diesel Locomotives



Driver Display unit is a robust terminal device constructed for harsh environments, Designed to work in a wide temperature(-25°C to +70°C) and wide operating voltage 24 to 110VDC, it has TFT Screen (800×600 pixels) 10.4 inch with LED backlight, EMI protection is used to meet the EN50155 and the IEC 801-x specifications.

The device is resistant to shock/vibration and well protected against dust and water. It is encased in a robust metallic box with natural cooling (without cooling fan).

Driver display Unit is designed for Railways applications in such a fashion that it may be customized for various functions like display of Radio Remote control system, Train Protection and Warning System, Train Control and monitoring system, Microprocessor based control and fault diagnostics system etc.

Applications

As an intelligent graphical display in locomotives / EMU / Metro.

TECHNICAL FEATURES

Enables to work with multiple field bus systems like RS 485/422, CAN, Ethernet and MVB

Internal Temperature sensor

Automatic Brightness control

Real Time Clock and Watch Dog

UIC 612 key board

3 Optical Indicators on the front Panel

Internal Buzzer

3 Digital inputs/outputs

10.4" screen size

SVGA resolution

Active Speed Sensor

Hall Effect for Electric Locomotives



Active Speed Sensor based on Hall Effect sensing principle to work in harsh environment for speed monitoring of Traction Motor. Active Speed Sensor senses the toothed iron wheel having 120 teeth to be mounted on Traction Motor shaft.

Applications

Measured speed signal is used for calculation of Locomotive speed in order to activate the speed limit for constant speed control & for the adhesion control during starting and braking and to manage the effectiveness of wheel slip control.

TECHNICAL FEATURES

Sensors and its processing circuits are encased in metallic (Aluminium) housing and sealed properly confirming to IP68 protection class

Sensor is protected against short-circuit, overvoltage and reverse polarity

Based on Hall effect sensing principle it provides very accurate measurement of Traction Motor speed almost from 0 speed to 3000 RPM

Two galvanically isolated Speed pulse signal

Replacement of WIEGAND Type speed sensor

Pulse Generator

Opto Electronics Electric, Diesel Locomotive, EMUs and Metro Trains



Opto Electronic Pulse Generator with state of the art design, provides excellent performance for use in rail vehicles and urban transportation systems under extreme operating conditions.

Compliant Standards:

IP68 & IEC 60571.

Applications

The product is used for various control and safety functions. It provides the electrical output corresponding to wheel rotation for systems, like wheel slip/slide control system, speed indicator cum recording system, locomotive control system etc.

TECHNICAL FEATURES

Aluminium alloy housing conforming to IP 68 with mounting flange and removable cover

Suitable to withstand extreme mechanical and thermal stresses encountered in traction vehicles

Axle driven by means of a driving fork

Carrier plate designed to hold up to 5 optical sensors

Convenient electrical phase shifting of output signals by adjusting the position of the sensors

Code disc with 1 or 2 tracks for generating pulse frequency between 1 and 200 pulses per revolution. Discs with special codes are also available

Diagnostics Terminal

Microprocessor LCD Displays for Electric, Diesel Locomotives and EMUs



The Diagnostic Display Terminal is a robust terminal device constructed for harsh environments. A special wide temperature electronic, a wide temperature LCD (4×40 characters, LED back light) and a switch panel with EMI protection are used to meet the EN50155 and the IEC 801-x specifications. The device is resistant to shock and vibration and well-protected against dust and water (front panel: IP65). Encased in a robust aluminium box and without the need of a cooling fan, the Diagnostic Display Terminal can operate from -20°C to +70°C at relative humidity of 95%.

The communication between Host and Diagnostic Display Terminal is realized by a serial link: either RS422 (standard), or RS485. The I/O-signals for RS422 and RS485 are electrically isolated.

The Diagnostic Display Terminal itself generates scan codes which are sent to the Host every time a key is pressed or released (MAKE and BRAKE-codes).

Applications

Diagnostic Display Terminal in 3 Phase Electric Locomotives.

It is the ideal solution for displaying information or entering data in extreme environments.

Its robustness makes it possible to use the device in industrial fabrication, in vehicles and outdoors.

TECHNICAL FEATURES

Robust design
Light weight and compact in size
IP65 class front panel
Wide operating voltage range
4 x 40 Characteroriented display
Adjustable backlight
Natural cooling
Resistant to shocks and vibration
Conforms to EN 50155, IEC 801-2,3,4, 5, 6

Event Recorder

Microprocessor for Electric, Diesel Locomotives and EMUs



Event Recorder for GM Locomotives (ERGM) is tailored specially for WDG-4 / WDP-4 type locomotives received by Indian Railways from General Motors. This system records the data related to speed, date, time and various other events / parameters.

Applications

Recording of journey data in WDP-4 & WDG-4 type of locomotives.

Data storage of locomotive's speed, brake cylinder pressure, brake pipe pressure, main generator power, tractive effort etc. with date and time stamp.

Administrative control of vehicle for traffic scheduling.

Vehicle trend analysis in case of train breakdown / accident.

TECHNICAL FEATURES

Compact size

Sufficient recording capacity for vehicle journey data

Portable memory module for data extraction on shed computer

Visual indication for recorder functioning

Compatible with data of EM2000 control system

User friendly application software for analysis of stored data

Tabular and graphical report generation

Vigilance Control Device

Microprocessor for Electric, Diesel Locomotives and EMUs



Vigilance Control Device supervises the alertness of the driving crew during train movement. This device can be installed in diesel electric and electric locomotives/EMUs as a standalone unit.

Applications

Safety of train in case of absence / inactive driving crew.

To create alertness in driving crew for safe train movement.

Data analysis for management review in case of breakdown/accident.

TECHNICAL FEATURES

Normal driving activities like throttle, master controller, sander, loco brake, train brake, dynamic brake, etc. are taken as input signals for VCD operation

Improves vigilance and provides warning and brake application signals in a predefined manner

Records data with date and time, power on / off, penalty brake application, VCD By pass, VCD fault condition, VCD activation, VCD suppression etc. in a non-volatile memory for management review

Windows-based data extraction and analysis software for report generation. Data extraction through Pen Drive

User friendly data analysis software, allows to configure the unit with predefined timing cycle parameters

Onboard Public Address and Passenger Information System

DSP Control Unit with redundant CPU and Power Supply boards for Mainline & Mass-transit Vehicles.



Public Address and Passenger Information System (PA/PIS) for the use in modern rail /road transportation systems. This microprocessor-based electronic system comprises audio and visual equipment and a Main control unit to control overall operation of the system.

The PA/PIS closely integrates the audio and visual functions for conveying the desired information to passengers.

SALIENT FEATURES

Public address throughout the train.
Cab to cab communication
Passenger emergency alarm communication.
Automatic route information and stopping pattern
Standard operational messages
Automatic announcement using pre-recorded messages
Automatic volume control of loudspeakers according to ambient noise
Automatic brightness control of external displays according to ambient light conditions
Audio recording in the driver cab for all types of audio conversation
Audio link between the driver and control.
Train radio interface
GPS interface
Redundant support for Power Supply and Controller Card
Fault data recording and downloading
Power amplifier to drive loudspeakers with graphic equaliser function
Playback of Background Music with priority scheduling

A. Visual functions

- **Saloon displays:** Installed inside the train to display journey related messages.
- **Dynamic route displays:** Installed inside the train for progressively indication of the train movement.
- **External displays:** Installed in the front and rear cab and coach side of the train to display the train number and/or destination information.

B. Audio functions

- **Passenger address:** Automatic pre-recorded announcements; manual announcements by the driver; and emergency announcements both by the driver and the control room.
- **Communication:** Cab to cab communication and driver to passenger communication.
- **Warning/alarm:** Passenger alarm warning tone and door opening/closing chime.

Audio and Display Systems

Integrated Public Address Systems & Passenger Information Display System and Master Clock System For Stations

DSP and High end processor based system for Networked Stations



Comprehensive solution for integrated public address system (PAS), Passenger Information Display System (PIDS) & Master Clock System (MCS) which is used on networked metro stations. The purpose of the system is to provide useful information to commuters in the station premises regarding train arrival, train departure, journey message, emergency/ special message, real time data by means of audio announcements & visual information.

SALIENT FEATURES

Audio announcement & coordinated visual information to passengers regarding train arrival, departure from Operation Control Center (OCC), station control room (SCR) or digital call station/ microphone/ platform supervisory booths

Distribution of timing signals to all the clocks & other equipment at Stations, Depot & OCC

Facility to broadcast up to 2 different messages simultaneously over different zones or group of zones of the network

Facility to broadcast live message over a particular platform through digital call station/ microphone

Configuration of message priorities originated from different sources

Recording of audio messages announced in any zone at local station/ remote OCC

Intelligibility in PAS equipment at all times for noise level changing environment

Intelligibility in PIDS display boards at all times for ambient light changing environment

Instant voice recording/message construction facility for audio broadcast/ visual display

Scheduling of automatic messages based on internal time countdown of PAS/PIDS system internal clock and triggered by signaling system for any correction

Alarm management

Audio and Display Systems

Platform and Concourse Display

Microprocessor LED Displays for Stations



The LED based Platforms and Concourse Displays (Metro and Railways) are latest state-of-the-art Intelligent Display Boards to display messages for Public Information. These Display Boards are useful for Installation at public places like Railways Workshop, Station Concourse, Station Platform area or similar Applications. The Display Board receives messages to be displayed on it from a remotely located computer over wired/wireless serial communication link and displays the Information in Hindi, English & any Indian regional language accordingly.

The system is designed around powerful CPU having sufficient memory. Automatic brightness control according to ambient light conditions is incorporated in the system to provide good legibility under direct sunlight.

The LEDs used for Information Display are ultra bright Amber/Red/Green colored with wide viewing angle. These LEDs are arranged in 48x16 or 32x16, 16x16 (Customised) matrix boards to provide character size of sufficient height for good visibility.

The System is a rugged and Compact Unit that requires cable connections for power supply and data only. Power supply required for operation of the unit is 230V±10%,50HzAC or 110 VAC/DC.

Applications

Information display in:

Station Concourse

Station Platforms

Depots

Entry / Exit Gates

SALIENT FEATURES

Ultra Bright, wide viewing angle LEDs for better visibility

Automatic Brightness control as per Ambient light conditions for good viewability under Direct sunlight

Easy mounting

Multi-lingual (Hindi, English or Indian regional language) message generation through PC loaded with customized user friendly software

Standalone, compact design

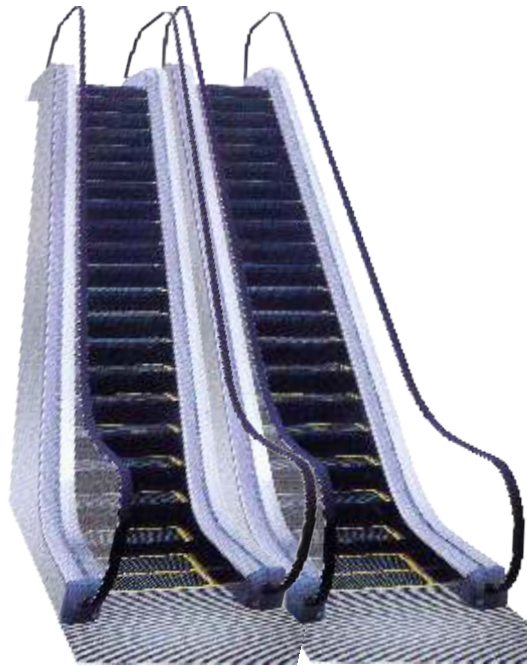
Elegant mechanical enclosure and fixings to meet application requirements

Low power consumption

Escalators

Escalators

For Railway, Metro, Airports and Foot-over Bridges



Environment Friendly Advanced & Tailor made Heavy Duty Public Place Escalators with all passenger safety features.

Compliant Standards:

EN115 – 2010.

Applications

Heavy duty (20 Hr. per day, 7 days a week).

For Mass Transit System.

For Railway, Metro, Airports and Foot Over Bridge.

Outdoor, Semi out door application.

SALIENT FEATURES

Type of Escalator: Heavy duty reversible

Yellow line & Step gap light to facilitate Passenger to adjust feet within step tread

Oil collection tray to improve safety and reduce fire risk

Provision of Oil Separator to eliminate mixing with water and hazard free disposal

Energy saving mode: On no-load / light load, speed of Escalator will automatically reduce without jerk to save electrical energy to the extent of 30%

Remote monitoring and control from centralized location

Voice announcement system to guide passenger for safe ride

Escalator will be equipped with safety devices to ensure safety of the passengers

Uninterruptible Power Supplies (UPS Systems)

Uninterruptible Power Supply up to 2400 kVA

For IT, Medical and Industrial Applications



Applications

These state-of-the-art UPS systems are being used to provide clean and Uninterrupted power to IT Enabled Services, Data centres, CNC Machines, Medical Electronics equipment, Printing & Packaging Machines & other Continuous process Industries where power failure for a fraction of second can result in major Production and Financial loss.

SALIENT FEATURES

FPGA (DSP) Based Double Conversion Topology – True Online Architecture

Active Power Factor Correction at UPS Input

Wide Input voltage range

High Frequency PWM Based Inverter / Converter Using IGBTs

Parallelability for capacity enhancement and redundancy

Auto Re-transfer Static Switch

Modular Construction - Low MTTR

ECO Mode for energy saving

UPS Management Software for Local/ Remote monitoring

Compatibility with Regenerative loads



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