"World class technology®
through power of Alliance"
1959
- Company Incorporated
- Set up Plant in Ballabgarh (Haryana) for manufacturing of Automotive Instruments

1981
- Signed joint venture agreement with Lucas Industries Plc, UK for manufacturing of Automotive Instruments

1988
- Major diversification of business activity for manufacturing of traction equipment for Indian Railways
- Established new production facility at Noida, Delhi, NCR
- Started production of Railway Tachographs in technical collaboration with Hasler AG, Switzerland

1989
- Set up R&D centre at Noida

1992
- Started production of Protection Relays for Indian Railways in technical collaboration with Secheron SA, Switzerland

1993
- Recognition of R&D Centre by Government of India
- Started production of Wheel Flange Lubricating Systems for Indian Railways in technical collaboration with Secheron SA, Switzerland

1994
- Obtained ISO 9001 certification

1996
- Started production of Online Uninterruptible Power Supply Systems up to 40 kVA in technical collaboration with Powertronics SpA, Italy

1998
- Started production of Vacuum Circuit Breakers for Electric Locomotives and EMUs in technical collaboration with Secheron SA, Switzerland
- Relocated to a larger and modern manufacturing facility in Noida

1999
- Started production of 300 kVA GTO based Auxiliary Converter for Electric Locomotives (AC propulsion) in technical collaboration with Chittaranjan Locomotive Works, Indian Railways
- Started production of IGBT based Underslung Converter (DC to AC) for Passenger Coaches in technical collaboration with Hyundai Heavy Industries Co Ltd, South Korea

2000
- Started production of IGBT based Static Converter for Electric Locomotives (DC propulsion) in technical collaboration with Hyundai Heavy Industries Co Ltd, South Korea
- Started production of IGBT based Onboard Converter (UC to AC) for Passenger Coaches in technical collaboration with Hyundai Heavy Industries Co Ltd, South Korea

2001
- Started production of Electrical Circular Connectors for traction application in technical collaboration with Gimola AG, Switzerland
2002
- Started production of Passenger Information Systems for Indian Railways & Metro Railways in technical collaboration with Whiteley Electronics Ltd, UK

2004
- Started manufacturing Onboard Electrical Panels for Delhi Metro under technical alliance with Daeyang Electric Co Ltd, South Korea

2006
- Signed technical collaboration agreement with Ganz Transelco Traction Electronics Ltd, Hungary for manufacturing of Onload Tap Changers for Electric Locomotives
- Signed technical collaboration agreement with Powertronix SpA, Italy for manufacturing of UPS Systems upto 2400 kVA
- Signed agreement for joint development of specialised Switchgear items for traction application with Alfa Union AS, Czech Republic

2007
- Improvised Vacuum Circuit Breaker design & technology for enhanced reliability and applied for its patenting
- Designed & developed GPS based Passenger Information Display Systems for Railway Coaches

2008
- Technological improvement in design of various Onboard Data Acquisition Systems by incorporating Field Programmable Gate Array (FPGA) Chip

2009
- Signed technical licence agreement with Pipy AG, Switzerland for local production of Onboard Diagnostic Terminal for Railways
- Designed & developed a range of DC to 3 Phase AC and DC to DC IGBT based Underslung Converters for Metro Railways
- Designed & developed LED based Destination Display Boards cum Passenger Announcement & Vehicle Tracking Systems for modern Buses
- Designed & developed GPS/GSM compatible Public Information Systems for Bus-Q-Shelters
- Obtained TS 16949 certification for the Co’s Display Systems range, meant for Automobile industry

2010
- Started production of Earthing Switches for Electric locomotives and EMUs
- Started production of Master Controllers for 3 Phase AC Locomotives
- Started production of Key Multipliers Safety Interlocking systems for Locomotives & EMUs
- Obtained CE & E Marking for the range of Display Systems, meant for Automobile industry
- Obtained Technical Approval from RDSO, Ministry of Railways for supply & installation of Heavy-duty Passenger Escalators at Indian Railway Stations

2011
- Designed and developed a comprehensive range of Power Quality Solutions based upon “Four Quadrant Converter Technology” and applied for their patenting
- Selected by Railway Board, Ministry of Railways for its ‘Pilot Project’ of design, supply & installation of Heavy-duty Escalators at its various Railway Stations, under consortium with Canny Elevator Co Ltd, China
- Entered into Technical Alliance with Elno Societe Nouvelle, France for Public Address Systems for networked Mainline and Metro Railway Stations & control centres
CORPORATE OVERVIEW

QUALITY POLICY

Key Theme: Learning-Change-Reliable

We are committed to create an environment which encourages continual improvement in technology, processes and other functional areas through learning and change mechanism encompassing our customers, collaborators, suppliers and employees to deliver to our customer a product with reliable operational performance.”

MISSION

“Design, Manufacture, Market and Service:

• Power Conditioning Equipment
• HT / LT Switchgears and Electrical Panels
• Measuring, Recording and Control Devices
• Passenger Information System”

VISION

“To design and manufacture world class Electronic and Electrical equipments to highest quality and reliability standards for traction and other applications”

HUMAN RESOURCE

Qualified Engineers
(Doctorate / Post Graduate / Graduate)

Miscellaneous

Technicians (I.T.I.)

Graduate / Diploma Holders
(Non-Engineering)

Diploma Engineers

“Continuous product and process related internal and external training programmes, for improvement in quality and skill of human resource at all levels, is an integral part of our corporate philosophy”

TECHNICAL PERSONNEL ≈ 80%

ADMIN. / COMM. PERSONNEL ≈ 20%
TECHNOLOGICAL ALLIANCES

Chittaranjan Locomotive Works, Indian Railways, India

Piny AG, Switzerland

Ganz Transelektro Kézlekedési Berendezéseket Gyártó KFT, Hungary

Daeyang Electric Co Ltd, South Korea

Canny Elevator Co Ltd, China

Elmo Societe Nouvelle, France

PRODUCTS

300 kVA GTO based Auxiliary Converter for Electric Locomotives (AC propulsion)

Onboard Diagnostic Terminal for Railways

Onload Tap Changer for Electric Locomotives (DC propulsion)

Onboard Electrical Panels for Metro Railways

Heavy Duty Passenger Escalators for Railway Stations

Public Address Systems (PAS) for Mainline & Metro Railways
INFRASTRUCTURE OVERVIEW

- Production area of 30,000 sq. mts. with modern layout, matching international standards
- Production floors separated on the basis of various product categories, for ease of production & testing functions as well as movement of men & material
- Production floors fully equipped with modern machines, tools and trained operators, as required
- Fully IT enabled and secured work environment deploying state-of-art I&C technologies including Wi-fi
- Implemented Baan ERP System for organizational efficiency and optimisation of resources
- Connected power of 750 kVA, backed-up by captive generating capacity of 1450 kVA
- Compressed clean & dry air available in production sections
- Dust free, ESD protected & controlled environment for electronic board production
- Plant equipped with modern material handling facilities, including, goods elevator, overhead cranes, pallet trucks etc
- Well laid out storage area with specialised vertical storage systems for specialized parts & assemblies
• 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 & 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
• Qualified Engineers (Doctorates, Post Graduates & Graduates), experienced in development of new technologies, technology absorption, adaptation and system engineering
• Thermal management & system design capability
• Mould & Die designing competency
• Host of development & simulation tools
• Well equipped versatile electronic lab for developing & testing of prototypes
• Conversant with International Standards such as IEC, DIN, IEEE, EN, MIL etc. and competent to develop products in compliance
# Traction Power Electronics

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>PRODUCT NO.</th>
<th>MARKET</th>
<th>TECHNOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auxiliary Converter</td>
<td>1</td>
<td>Electric Locomotives</td>
<td>GTO / IGBT based</td>
</tr>
<tr>
<td>Static Converter</td>
<td>1</td>
<td>Electric Locomotives</td>
<td>IGBT based</td>
</tr>
<tr>
<td>Underslung Converter (DC to AC)</td>
<td>2</td>
<td>Railway Passenger Coaches</td>
<td>IGBT based</td>
</tr>
<tr>
<td>Underslung Converter (AC to AC)</td>
<td>2</td>
<td>Railway Passenger Coaches</td>
<td>IGBT based</td>
</tr>
<tr>
<td>Third Rail Fed Underslung Converter (DC to DC)</td>
<td>2</td>
<td>Metro Railway Coaches</td>
<td>IGBT based</td>
</tr>
<tr>
<td>Third Rail Fed Underslung Converter (DC to AC)</td>
<td>2</td>
<td>Metro Railway Coaches</td>
<td>IGBT based</td>
</tr>
<tr>
<td>SMPS Battery Charger</td>
<td>3</td>
<td>Locomotives, Coaches &amp; Depots</td>
<td>IGBT based</td>
</tr>
</tbody>
</table>

# Traction HT/LT Switchgear & Panels

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>PRODUCT NO.</th>
<th>MARKET</th>
<th>TECHNOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum Circuit Breaker</td>
<td>4</td>
<td>Electric Locomotives, EMUs &amp; Metro Cars</td>
<td>Electro-mechanical</td>
</tr>
<tr>
<td>Earthing Switch</td>
<td>5</td>
<td>Electric Locomotives, EMUs &amp; Metro Cars</td>
<td>Electro-mechanical</td>
</tr>
<tr>
<td>Master Controller</td>
<td>6</td>
<td>Electric Locomotives, EMUs &amp; Metro Cars</td>
<td>Electro-mechanical</td>
</tr>
<tr>
<td>Key Multiplier</td>
<td>7</td>
<td>Traction Vehicles</td>
<td>Mechanical</td>
</tr>
<tr>
<td>Protection Relays</td>
<td>8</td>
<td>Electric Locomotives</td>
<td>Electro-mechanical, (current/voltage operated)</td>
</tr>
<tr>
<td>General Purpose, Wheel Slip &amp; Ground Relays</td>
<td>8</td>
<td>Diesel Locomotives/EMUs</td>
<td>Electro-mechanical</td>
</tr>
<tr>
<td>Tap Changer</td>
<td>9</td>
<td>Electric Locomotives</td>
<td>Electro-mechanical</td>
</tr>
<tr>
<td>Electrical Panels</td>
<td>10</td>
<td>Main line &amp; Metro Railways</td>
<td>Electro-mechanical</td>
</tr>
<tr>
<td>Circular Power and Data Connectors</td>
<td>11</td>
<td>Onboard &amp; Stationary Traction</td>
<td>Electro-mechanical</td>
</tr>
<tr>
<td>PRODUCT</td>
<td>PRODUCT NO.</td>
<td>APPLICATION</td>
<td>TECHNOLOGY</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------</td>
<td>--------------------------------------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td><strong>ONBOARD MEASUREMENT DEVICES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tachograph Systems</td>
<td>12</td>
<td>Electric &amp; Diesel Locomotives and EMUs</td>
<td>Microprocessor based Electronic</td>
</tr>
<tr>
<td>Pulse Generator</td>
<td>13</td>
<td>Electric &amp; Diesel Locomotives and EMUs, Metro Trains</td>
<td>Opto-electronic</td>
</tr>
<tr>
<td><strong>ONBOARD CONTROL DEVICES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vigilance Control Device</td>
<td>14</td>
<td>Electric &amp; Diesel Locomotives and EMUs</td>
<td>Microprocessor based Electronic</td>
</tr>
<tr>
<td>Event Recorder</td>
<td>15</td>
<td>Electric &amp; Diesel Locomotive and EMUs</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Display Terminal</td>
<td>16</td>
<td>Electric &amp; Diesel Locomotive and EMUs</td>
<td></td>
</tr>
<tr>
<td><strong>ONBOARD &amp; STATIONARY; DISPLAY &amp; INTEGRATED ANNOUNCEMENT SYSTEMS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPS/GSMR based Passenger Information and Display System</td>
<td>17</td>
<td>Mainline &amp; Mass-transit Vehicles and Stations</td>
<td>Microprocessor based LED displays</td>
</tr>
<tr>
<td>Passenger Information Systems</td>
<td>18</td>
<td>Mainline &amp; Mass-transit Vehicles and Stations</td>
<td>Microprocessor based LED displays</td>
</tr>
</tbody>
</table>
300 kVA 1ø to 3ø GTO based Auxiliary Converter
- Electric Locomotives (AC propulsion)

180 kVA 1ø to 3ø IGBT Based Static Converter
- Electric Locomotives (DC Propulsion)

25 kVA IGBT based Underslung Converter (DC to AC)
- Self Generating Passenger Coaches

50 kVA IGBT based Underslung Converter (DC to 3ø AC & DC to DC)
- Metro Railways

30 kVA 1ø to 3ø IGBT based Underslung Converter (AC to AC)
- Head On Generation Passenger Coaches

100 kVA IGBT based Underslung Converter (DC to 3ø AC)
- Metro Railways

SMPS Battery Charger
TRACTION HT/LT SWITCHGEAR AND PANELS

4. 25 kV, 1000 A, AC Vacuum Circuit Breaker
   - Electric Locomotives EMUs & Metro Railways

5. Earthing Switch
   - Electric Locomotives EMUs & Metro Railways

6. Master Controller
   - Locomotives & EMUs

7. Key Multiplier
   - Traction Vehicles

8. Protection Relays
   - Electric Locomotives

9. Onload Tap Changer
   - Electric Locomotives

10. Electrical Switchgear Panels
    - Indian Railway & Vehicle Builders

8. General Purpose Relay
   - Diesel Locomotives
ELECTRICAL CONNECTORS & ACCESSORIES

Bayonet Type Circular & Data Connector - Traction Application

ONBOARD MEASUREMENT DEVICES

Microprocessor based Tachograph System type Telpro

Opto Electronic Pulse Generator

ONBOARD CONTROL DEVICES

Vigilance Control Device

Event Recorder

Diagnostic Display/Terminal
ONBOARD & STATIONARY; DISPLAY & INTEGRATED ANNOUNCEMENT SYSTEMS

GPS / GSMR based Passenger Information Display System

PUBLIC ADDRESS & PASSENGER INFORMATION SYSTEM

Head Code (Destination Indicator)

Concourse Display

Driver Interface Unit with Mic

Saloon Display

Passenger Interface Unit & Emergency Alarm Button

Power Amplifier

Line Route Map

Central Electronic Control Unit
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 & Place" machine, Programable Reflow Oven, Ultra sonic PCB Cleaner, In-circuit Tester, Customized automated test jigs & rework stations
- Through-hole PCB manufacturing line equipped with light guided "Pick & Place" machines, wave soldering machine
- ESD-protected Kardex shuttle storage systems for storing specialised Electronic components & boards
- Environmental chambers for temperature & humidity cycling
- State-of-art measuring & test equipment like CRO, harmonic analyzer, temperature scanners, power supplies, multi-meters etc.
ELECTRICAL

- Well-equipped manufacturing and testing facilities for assembly and testing of Power Electronics equipment up to 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 & control
- Single phase variable voltage source up to 300 kVA
- Variable voltage DC source up to 50 kW
- Resistive & inductive loading facilities
- High voltage test setup up to 100 kV
- Facilities for manufacturing of coils and bushings using customized CNC winding machines
- AC high current source up to 1000 Amp
- Shielded tan δ & 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
- Specific products certified for CE and E Marking
- Products certified for ISO/TS 16949:2002
- 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 upto 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 / di-electric test, environmental test, heat test, dust test, water-ingress level test and more
PRODUCTS DEVELOPED

OWN DEVELOPMENT
- Microprocessor based Tachograph system type UGT
- Microprocessor based Tachograph system type SP-90
- Microprocessor based Energy cum Speed Monitoring system (Telem) for Electric Locomotives
- Microprocessor based Energy cum Speed Monitoring system for AC and DC EMUs
- Vigilance Control Device
- Electronic Signal Converter
- General Purpose, Wheel Slip & Ground Relays
- TrueOnline IGBT based Uninterruptible Power Supply systems (from 1 kVA to 20 kVA)
- Electrical Control Panels
- Various types of Onboard SMPS type Power Supplies and Chargers
- Electro pneumatic & Electro magnetic power contactor
- Power brake and Motor reverser switches for locomotives
- GPS based passenger information display system
- GPS/GSMR compatible PA/PIS System for Automotive Application
- CCTV Surveillance System
- IGBT based Third Rail Fed Underslung DC to AC converter (upto 100 kVA) for metro application
- IGBT based Third Rail Fed DC-DC converters (upto 25 kVA)
- Networked Passenger Information Display System for station of Metro Rail System
- IGBT based AC to DC Pre-cooling battery charger (30 kW)
- IGBT based Dynamic Reactive Power compensating solutions (350 kVAR and extendable for higher kVAR)

IN COLLABORATION
- Electro-mechanical Tachograph system type ‘RT’
- Wheel Flange Lubricating system
- GTO based 300 kVA Auxiliary Converter for Electric Locomotives
- IGBT based 180 kVA Static Converter for Electric Locomotives
- IGBT based 25 kVA Underslung Converter (DC to AC) for Coaches
- IGBT based 25 kVA Underslung Converter (AC to AC) for Passenger Coaches
- IGBT based 25 kVA Onboard Converter (DC to AC) for Passenger Coaches
- 25kV, 1000 A Vacuum Circuit Breaker
- Protection Relays (current/voltage operated)
- True Online IGBT based, Green Power uninterruptible power supply systems (from 1 kVA to 40 kVA)
- Passenger Information System
- Opto-Electronic Pulse Generator
- Onload Tap Changer
- Atlas Series UPS (10kVA to 120kVA)
Autometers Alliance Ltd (AAL) is a technology driven company dedicated to serving Railways, Mass Transit & Road Transportation as well as the Industrial sectors. AAL offers its engineering solutions, products and services, complying with the relevant Specs, Standards and operating environment of the market segment being served.

AAL continues the above pursuit without losing focus on its core-competence; always striving to broad-band its solutions range through own pioneering R&D as well as by inviting identification/sourcing/supply &/or technological alliance proposals from global technology providers, for newer realms including but not limited to;

- Power Quality improvement/management products & turnkey solutions.
- Techno-mobility products and turnkey solutions – Elevator, Escalator, Moving Walk.
- Non-conventional & green energy solutions or a part of them.
- Modernization solutions for complete/partial portion of the Main line, Urban and Mass Rapid Transit systems for their improved safety, reliability and energy efficiency.
- Export-led joint-cooperation for mass-transit application products etc.
AAL
Autometers Alliance Ltd

Corporate Office:
C-63, Sector - 57,
Noida - 201 307 (U.P.) India
Tel.: +91 (0) 120-6770100, 6770200, 2583545-46
+91 (0) 120-2479200
Fax: +91 (0) 120-2583542
E-mail: info@autometers.com

Branches

Delhi:
Tel.: +91 (0) 11-22158052, 42828409
Fax: +91 (0) 11-22158083
E-mail: aaldelhi@vsnl.net

Mumbai:
Tel.: +91 (0) 22-66710412
Fax: +91 (0) 22-21662299
E-mail: ashwest@vsnl.com

Chandigarh:
Tel.: +91 (0) 172-2737369
Fax: +91 (0) 172-2731672
E-mail: autometers_chd@datazone.in

Kolkata:
Tel.: +91 (0) 33-22310192
Fax: +91 (0) 33-22310192
E-mail: info@autometers.com

Chennai:
Tel.: +91 (0) 44-28522457
Fax: +91 (0) 44-28525910
E-mail: info.chennai@autometers.com

Disclaimer
Autometers Alliance Ltd reserves the right to introduce changes and improvements made possible by advances in technology and functionality without prior intimation or justification up to the time of both parties endorsing this document with their signatures, or up to the time when the product is actually completed. This document is a 'Quick Reference' and does not mention all features of the equipment.