



PRODUCT PROFILE



Indian
Engineering
Company
with Global
Presence



ABOUT US

With a legacy of more than 60 illustrious years on its side, BHEL is one of the largest engineering and manufacturing companies of its kind in India, engaged in the design, engineering, manufacture, construction, testing, commissioning and servicing of a wide range of products, services and systems for core sectors of the economy, viz. Power Generation, Transmission, Industry, Transportation, Renewable Energy, Oil & Gas, Water, Defence & Aerospace, and E-Mobility & Energy Storage Solutions with over 180 product offerings to meet the needs of these sectors. The establishment of BHEL production facility in the late 50's and early 60's was with a mandate to achieve self-sufficiency in indigenous manufacture of heavy electrical equipment which has been duly accomplished.

BHEL, as a part of India's founding leaders' vision, was bestowed with the onus to make the country self-reliant in manufacture of heavy electrical equipment. This dream has been more than realised and the company's contribution to nation building endeavour is going to continue likewise. BHEL's mammoth size of operations is evident from its widespread network of 16 manufacturing plants, 2 repair units, 4 regional offices, 8 service centres, 15 regional marketing centres, 3 overseas offices and more than 150 project sites across India and abroad.

The total installed capacity base of BHEL-supplied equipment of 185 GW globally, speaks volumes about the contribution made by BHEL in the power sector.

Having been adept at responding to the market requirements throughout its illustrious journey, the company is transforming itself by strengthening its leadership in core businesses, while sustaining growth

through diversification by enhancing its portfolio in solar, transportation, transmission, defence, aerospace, water businesses & other areas. Continuing on its transformation journey, BHEL is embracing change and developing new avenues of growth, which will enable BHEL to contribute further in creating a New India.

The strategy of diversifying and capitalizing on new business opportunities stems from the commitment to innovation-led growth which is an indispensable part of BHEL's business model. The diverse R&D focus of the organization ranges from Advanced Ultra Supercritical thermal power plants to superconducting applications for electrical equipment.

With footprints in 83 countries in all the six inhabited continents, BHEL is verily India's "Industrial Ambassador". BHEL has installed more than 11 GW of power generating capacities overseas. Currently, the company is executing two large projects, namely 2x660 MW Maitree thermal power project in Bangladesh and 900 MW Arun-3 hydro project in Nepal, among orders totalling up to 7 GW.

The high level of quality & reliability of BHEL products and systems is an outcome of strict adherence to international standards through acquiring and adapting some of the best technologies from the world's leading OEM companies together with technologies developed in its own R&D centres. All the entities of the company are accredited to ISO 9001:2015, Quality Management Systems, with major manufacturing units also accredited to Environmental Management Systems, ISO 14001:2015, and Occupational Health & Safety Management Systems, OHSAS 18001:2007.

THERMAL POWER PLANTS

- Capability for manufacture and supply of Steam Generators, Steam Turbines, Turbo Generators along with regenerative feed cycle upto 1000 MW capacities for fossil-fuel and upto 350 MW for combined-cycle applications
- Air and water cooled Condensers, Condensate Extraction Pumps, Boiler Feed Pumps, Duplex Heaters, Valves and Heat Exchangers meeting above requirement of TG Sets upto 1000 MW
- Energy Efficient Renovation and Modernisation (EE R&M) and Life Extension (LE) of old thermal power plants and Residual Life Assessment (RLA) studies

NUCLEAR POWER PLANTS

- Reactor side components like Steam generators, Reactor headers, End shields, special purpose Heat Exchangers, Pressure Vessels, Motors etc. for Nuclear Power plants.
- TG island equipment of PHWRs (Pressurised Heavy Water Reactors), FBRs (Fast Breeder Reactors) and AHWRs (Advanced Heavy Water Reactors) covering Steam Turbine, Turbo Generators, MSRs (Moisture Separator Reheaters), other heat exchangers and pumps including 'EPC' solutions.

GAS-BASED POWER PLANTS

- Gas turbines and matching generators ranging from 25 MW to 299 MW (ISO) rating with following features:
 - Gas turbine based co-generation and combined-cycle systems for industry and utility applications
 - Capability to burn a variety of fuels (both gaseous and liquids) along with mixed firing in different combinations of fuels
 - Low exhaust emission levels upto 15ppm of NOx with Dry Low NOx (DLN) combustors & noise requirement.

HYDRO POWER PLANTS

- EPC & Turnkey Contract (including Civil works) with custom-built conventional hydro turbines of Kaplan, Francis and Pelton types with matching generators upto 300 MW
- Pump turbines with matching motor-generators upto 250 MW
- Bulb turbine with matching generators upto 10 MW
- High capacity pumps along with matching motors for Lift Irrigation Schemes (upto 150 MW)
- Mini/Micro and small hydro power plants upto 25 MW unit rating
- Microprocessor based Digital Governing system for all types of Hydro Power plants
- Renovation, Modernization and uprating of Hydro power plants

- Spherical (rotary) valves, butterfly valves and auxiliaries for hydro stations
- Balance of Plant & System Integration

SOLAR POWER SYSTEM

- EPC solutions of Solar PV Power Plants:
 - Grid Interactive systems with & without BESS (Battery Energy Storage System)
 - Standalone systems
 - Roof Top systems
 - Hybrid systems
 - Canal Top Systems
 - Floating Solar power plants
 - Solar based water pumping systems

DG POWER PLANTS

- HSD, LDO, FO, LSHS, natural gas based diesel generator power plants, unit rating of upto 20 MW and voltage upto 11 kV, for emergency, peaking as well as base load operations on turnkey basis

DESALINATION AND WATER TREATMENT PLANTS

- Complete Water Management Solutions for Power Plants, Industrial applications and Municipal applications with different treatment technologies:
 - Pre Treatment Plants (PT)
 - Desalination Plants
 - Demineralization Plants (DM)
 - Membrane Based Treatment Systems
 - Electro Deionization plants
 - Effluent Treatment Plants (ETP)
 - Sewage Treatment Plants (STP)
 - Zero Liquid Discharge (ZLD) System
 - Cooling water treatment plants
 - Tertiary Treatment Plants

SYSTEMS AND SERVICES

- Power Generation Systems
 - Turnkey power stations/ EPC contracts
 - Combined-cycle power plants
 - Cogeneration systems
 - Captive power plants
 - Modernization and renovation of power stations and RLA studies.
 - Software packages including simulators for utilities
 - Erection, commissioning, support services, spares management and consultancy services for all the above systems
- Railway Track Electrification



INDUSTRIAL SYSTEMS

- Coal Handling Plant and Ash Handling Plant including Civil & Structural, Mechanical, Electrical works and Automation systems
- Mine Winder systems
- Electrics, Drives, Controls & Automation Systems for Processing & Compacting of Raw Materials, Iron Making, Primary & Secondary Steel Making, Casters & steel Finishing like Mills & process Lines for both long products & flat products
- Raw Material Handling System including Civil & Structural, Mechanical, Electrical and Automation systems for Steel and other industries
- Electrics & Automation Systems for High Current Rectifiers of Smelters and Processing Mills for Aluminium Plants
- Automated Storage & Retrieval Systems (ASRS)

BOILERS

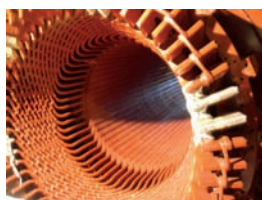
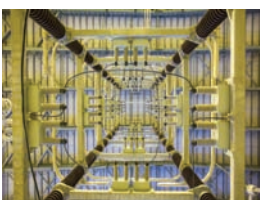
- Steam generators for utilities, ranging from 30 to 800 MW capacity, using coal, lignite, oil, natural gas or a combination of these fuels; capability to manufacture boilers with supercritical parameters upto 1000 MW unit size
- Fuel Flexible boilers capable of all combination of blending / co-firing diverse qualities of imported/ indigenised coals, blending of lignite, petcoke, etc
- Steam Generators for Nuclear Power Plant
- Steam generators for industrial applications of the following types ranging from 40 to 450 T/Hour capacity, using coal, natural gas, industrial gases, biomass, lignite, oil, Bagasse or a combination thereof
 - Pulverized coal / lignite fired boilers
 - Stoker fired boilers
 - Bubbling fluidized bed combustion (BFBC) boilers
 - Circulating fluidized bed combustion (CFBC) boilers
 - Heat-recovery steam generators (HRSG)
 - Chemical recovery boilers for paper industry, ranging from capacity of 100 to 1000 T/Day of dry solids
- Gravimetric feeder/ Volumetric feeder
- Acoustic Tube leak Detection systems

BOILER AUXILIARIES

- Fans
 - Axial reaction fans of single stage and double stage for clean air application and dust laden hot gases applications upto 200°C, with capacity ranging from 40 to 1300m³/s and pressure ranging from 400 to 1,500 mmwc
 - Axial impulse fans for both clean air and flue gas

applications upto 200°C, with capacity ranging from 25 to 600m³/s and pressure from 300 to 700 mmwc

- Single and double-suction radial fans (plate aerofoil bladed) for clean air and dust-laden hot gases applications upto 400°C, with capacity ranging from 4 to 660m³/s and pressure ranging from 200 to 3000 mmwc
- Air Preheaters
 - Tubular Air Preheaters for industrial, utility boilers and CFBC boilers
 - Rotary regenerative Air-Preheaters (different types like Bisector, Tri Sector and Quad Sector) for utilities of capacity upto 1000 MW
 - Air PreHeater for boilers with Selective Catalytic Reduction (SCR) for De-NO_x application
- Pulverizers
 - Bowl mills of slow and medium speed (for both pressurized & suction environment) for coal fired thermal stations with capacity from 10 T/ Hr to 120 T/ Hr suitable upto 1000 MW thermal power stations.
 - Ball Tube mills for pulverizing low-grade coal with high ash content from 30 T/ Hr to 110 T/ Hr catering to 110 MW to 500 MW thermal power stations
- Electrostatic Precipitators (ESP)
 - Electrostatic precipitators with outlet emission as low as 17 mg/Nm³ (efficiency upto 99.97%) for coal fired utility and industrial applications including Bio mass fired boilers, cement plants, steel plants, soda recovery boilers etc
 - Bag Filters for utility and industrial applications
 - Mechanical Dust Collector for SCR application
 - Ammonia Flue Gas Conditioning System
- Guillotine Gates & Dampers
 - Guillotine gates with electric/ pneumatic actuator. 100% leak proof with seal air width: 7 m & duct height: 14.5 meters
 - Bi-plane dampers with electric/ pneumatic actuator. 100% leak proof with seal air Type -1: width: 7 m & duct height: 14.5, Type -2 : width 12 m & duct height 10.5 m
 - Louver dampers (open close/ regulating) with electric/ pneumatic actuator: Type -1: width: 7 m & duct height: 14.5, Type -2 : width 12 m & duct height 10.5 m
 - Control dampers (regulating) with electric/ pneumatic actuator Type -1: width: 7 m & duct height: 14.5, Type -2: width 12 m & duct height 10.5 m
- Flue Gas Desulphurization (FGD) systems
 - Flue Gas Desulphurization (FGD) systems with sea water/ limestone slurry scrubber



- Steel Chimneys for Heat Recovery Steam Generators (HRSG), Industrial Boilers, auxiliary boilers and other flue gas exhaust applications
- Selective Catalytic Reduction (SCR) systems
 - SCR System (Honeycomb & Plate type) with anhydrous Ammonia/ Aqueous Ammonia/ Urea reagent for NOx emission control
- Selective Non- Catalytic Reduction (SNCR) systems
 - Selective Non- Catalytic Reduction (SNCR) systems with Urea & Ammonia handling systems

SOOT BLOWERS

- Long retractable soot blowers (LRSB) for travel upto 12.2m
- Furnace temperature probe (FTP) for travel length 10 m
- Long retractable Non-rotating (LRNR) soot blowers with forward blowing for Air heaters
- Ash discharge valve for CFBC boiler application
- Soot blowers with sequential PLC, control panel and integral starter
 - Rack type Long retractable soot blowers
 - Rotary soot blowers
- Wall blowers

VALVES

- High and Low-pressure Turbines Bypass Valves & hydraulic system for utilities and industrial application
- High and medium-pressure Valves, Cast and Forged Steel Valves of Gate, Globe, Non-Return (Swing-Check and Piston Lift-Check) types for steam, oil and gas duties upto 950 mm diameter, maximum pressure class 4500 (791 kg/cm²) and 650 °C temperature
- Hot reheat and cold reheat Isolating Devices upto 900 mm pipe size class 1500 and steam temp upto 650°C
- High capacity Spring Loaded Safety Valves for set pressure upto 372 kg/cm² and temperature upto 630°C,
- Automatic electrically operated pressure relief valves for set pressure upto 210 kg/cm² and temperature upto 593°C
- Safety relief valves for applications in power, process and other industries for set pressure upto 421 kg/cm² and temperature upto 537° C
- Reactive cum absorptive type vent Silencers maximum diameter of 2700 mm.
- Direct Water Level Gauges
- Angle Drain Valves - Single & Multi Stage for Turbine Drain Application
- Severe Service Control Valves for RH & SH Spray Lines
- Quick Closing Non return Valves for Extraction lines and Cold Reheat Non Return valves, upto 800mm diameter, 158 kg/cm² pressure and 540°C temperature

PIPING SYSTEMS

- Power cycle piping, Constant load Hangers, Variable spring Hangers, Hanger components, Low Pressure piping including circulating water piping for power stations upto 1000 MW capacity including Super Critical sets
- Piping systems for Nuclear Power Stations, Combined Cycle Power Plants & Industrial boilers and process industries
- Prefabricated piping/ duck spools to cater to refinery segment complying with National Association of Corrosion Engineers (NACE) requirements

SEAMLESS STEEL TUBES

- Hot-finished and cold-drawn seamless steel tubes with a range varying from outer diameter of 21 to 133 mm and wall thickness of 2 to 12.5 mm, in carbon steel and low-alloy steels to suit ASTM/ASME and other international specifications.
- Rifled tubes (ribbed) with a range varying from tube outer diameter of 38.1 to 63.5 mm and wall thickness of 5.6mm to 7.1mm, in carbon steel and low-alloy steels to suit ASME and other international specifications.
- Spiral finned Tubes with a range varying from tube outer diameter of 31.8 to 114.3 mm and wall thickness of 2.4mm to 9.5mm and with fin height of 12.5mm to 21mm and fin density ranges from 40 to 240 fins per metre, in carbon steel and alloy steels to suit ASME standards.

STEAM TURBINES

- Steam Turbines upto 1000 MW rating for thermal sets and upto 700MW ratings for Nuclear Power Plants.
- 15000 HP Marine Turbines for marine propulsion.

TURBOGENERATORS

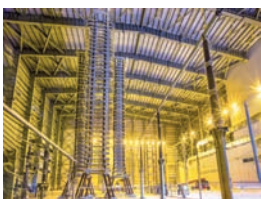
- Turbogenerators of higher rating upto 1000 MW for Thermal and Nuclear Power Plants and upto 195 MW for Combined Cycle plant.

INDUSTRIAL SETS

- Steam Turbine based Captive Power Plants
 - STG/Boilers/BTG/EPC: Unit rating upto 200 MW
 - Non Reheat upto 120 MW unit rating
 - Reheat upto 200 MW unit rating
- Gas Turbine based Captive Power Plants GTG/HRSG/ EPC: Fr-5 (26 MW) to Fr-9E (126 MW)

CASTINGS AND FORGINGS

- Heavy castings and forgings of creep resistant alloy steels, stainless steel and other grades of alloy steels meeting stringent international specifications for components of sub critical, supercritical and Ultra-super critical technology.



CONDENSER AND HEAT EXCHANGERS

- Surface Condenser:
 - For thermal power plants upto 800 MW
 - For Nuclear power plants
 - 12.5 MW Marine applications
 - Industrial Condensers
- Feed Water Heaters (HP Heaters, LP Heaters, Drain Coolers, Duplex Heater, De-Super Heaters, etc.)
 - Thermal : 7 to 500 MW (sub-critical) & 300-800 MW (super critical with single stream)
 - Moisture Separator & Reheater (MSR) and other Feed Water Heaters for Nuclear Power Plants (236 MW, 500 MW & 700 MW Nuclear sets).
- Live Steam Reheater (LSR):
 - 500 MW Fast Breeder Reactor (FBR) Nuclear sets
- Auxiliary Heat Exchangers for Turbo and Hydro Generators :
 - Air Coolers (Frame & Tube Type)
 - Oil Coolers (Shell & Tube Type and Plug in Type)
 - Hydrogen Coolers (Frame & Tube Type)
- Auxiliary Heat Exchangers for Transformers :
 - Oil Coolers (Shell & Tube Type Single Tube or Concentric Double Tube Type) (Frame & Tube Type)
- Auxiliary Heat Exchangers for general application
 - Water - Water Coolers (Shell & Tube Type)
- Gland steam condensers
 - Industrial applications upto 7 MW to 150 MW
 - Thermal Plants upto 500 MW
 - Nuclear Plants upto 700 MW
- Air-cooled heat exchangers for GTG uptoFr-9E, and Compressor applications of all ratings
 - Steam jet air ejectors for condensers upto 150 MW
 - Deaerators from 7 MW to 800 MW
 - Gas coolers for compressor applications
 - Oil coolers- STG upto 150 MW, GTG uptoFr-9E
 - Generator Air coolers upto 150 MW STG and GTG upto 9 FA
 - D2O and Moderator Heat Exchangers for Nuclear primary cycle

PUMPS

- Pumps for various utility power plant applications upto a capacity of 1000 MW:
 - Boiler feed pumps (motor or steam turbine driven) and Boiler feed booster pumps.
 - Condensate extraction pumps including Drip Pumps
 - Circulating water pumps (also known as Cooling water Pumps)

- Concrete Volute Cooling Water Pumps
- Pumps for Secondary Side of Nuclear Power Plants

COMPRESSORS

- Multi stage Centrifugal compressors along with Drives (Steam Turbine, Electric Motor and Gas Turbine) and auxiliary system with capacity upto 300000 m3/hr for various gases (Air, CO₂, N₂, H₂, NH₃, Natural Gas, Wet Gas, Propylene etc.) for applications in Refineries, Fertilizers, Petrochemicals, Oil & Gas, Steel, Power and Natural Gas Transportation sectors.
 - Horizontally split type upto 40 bar design pressure
 - Vertically split type upto 350 bar design pressure

SOLAR PHOTOVOLTAICS

- Mono/ Multi Crystalline Solar cells (156mm)
- Mono/ Multi Crystalline PV Modules (upto 330 Wp)
- Power Conditioning Unit (upto 1.25 MW)
- Power Transformers (15 MVA and above)
- Passive Solar Tracking System
- Space grade solar panels

AUTOMATION AND CONTROL SYSTEMS

- Automation and Control Systems for
 - Steam Generator/ Boiler Controls including Boiler Protection
 - Steam Turbine Controls
 - Boiler Feed Pump (BFP) Drive Turbine Control
 - Station Control and Instrumentation/ DCS
 - Offsite/Off base controls/ Balance of Plant Controls
 - o Ash Handling Plant (AHP)
 - o Coal Handling Plant(CHP)
 - o Water System for power plant
 - o Mill Reject System (MRS)
 - o Condensate On-Load Tube Cleaning system (COLTCS)
 - o Gas Booster Compressor (GBC)
 - o Condensate Polishing Unit (CPU)
 - o Heating, Ventilation & Air conditioning (HVAC)
 - o Fuel Oil Unloading System (FOUS)
 - Hydro Power Plant Control System
 - Gas Turbine Control System
 - Nuclear Power Plant Primary Cycle Control Centre Instrumentation Package (CCIP)
 - Nuclear Power Plant Turbine & Secondary Cycle control system
 - Power block of solar thermal power plant
 - Industrial Automation
 - Sub-Station Automation (SAS)



- Non-FST HVDC control panels
- Electrical Control System (ECS) for Refineries
- Energy Management System (EMS) for Power Plant
- Electrical Interface System for MV/LV Switchgear

TRANSMISSION SYSTEMS CONTROL

- EHV & UHV Sub-stations/switchyards both AIS & GIS type ranging from 33kV to 765kV.
- HVDC transmission systems.
- Flexible AC Transmission system (FACTS) solutions
 - Fixed Series Compensation(FSC)
 - Static VAR Compensation (SVC)
 - STATCOM
 - Controlled Shunt Reactor (CSR)
 - Phase Shifting Transformer (PST)
 - Converter Valves and controls for HVDC & FACTS.

SOFTWARE SYSTEM SOLUTION

- Merit Order Rating
- Performance Analysis, Diagnostics & Optimization (PADO) for Thermal Utilities
- Performance Calculation & Optimization system and Real Time Performance Data Monitoring system
- OPC connectivity from DCS to third party systems
- Enterprise Asset Management System (EAMS)
- Operator Training Simulator

SWITCHGEAR

Medium Voltage Vacuum Switchgear for indoor and outdoor applications for voltage ratings upto 36 kV and Gas insulated switchgears upto 420kV.

- Indoor switchgears
 - Upto 12 kV, 50 kA, 4000 Amp for thermal, nuclear, hydro and combined cycle Power Plant Projects
 - Upto 36 kV, 31.5 kA, 2500 Amp for Industries, solar power plants and refineries
 - Compact switchgear 12 kV, 25 kA, 1250 Amp for distribution system
- Outdoor Vacuum circuit breakers
 - 12 kV, 25 kA, 1250 Amp for distribution segment
 - 36 kV, 25 kA, 2000 Amp for transmission and distribution segment
 - 25 kV, 25 kA, 1600 Amp for track side railway application
- Outdoor pole mounted capacitor switch (Autorecloser / sectionaliser) for 12 kV rural segment
- Gas insulated switchgears
 - 36 kV, 40kA, 1600 Amp for Refineries, Urban Sector

- 145 kV, 31.5 kA, 2500 Amp for transmission & distribution network
- 420kV, 40kA, 3150 Amp for transmission sector (hydro station / metro).
- SF6 circuit breakers ((145kV, 40 kA, 3150A), (420 kV, 50kA, 4000A))

ON LOAD TAP CHANGERS (OLTC)

- On Load Tap Changer upto 765 kV class Transformer & Off Circuit Tap Switch upto 765 kV class Transformer for various application like Power Transformer, Furnace Transformer, Station Transformer, Rectifier Transformer etc.

L T SWITCHGEAR & BUS DUCTS

- Bus-ducts with associated equipment to suit generator power output of utilities of upto 800 MW capacity.
- 415 V LT Switchgear for Thermal Power Plant, Hydro, Nuclear, CPP & Steel industry.

TRANSFORMERS & REACTORS

- Power transformers for voltage upto 1200 kV
 - Generator transformers (upto 600 MVA, 420 kV, 3 Ph / 400 MVA, 765 kV, 1 Ph/500 MVA, 420 kV, 1 Ph)
 - Auto transformers (upto 1000 MVA, 400 kV, 3 Ph / 600 MVA, 400 kV, 1 Ph / 500 MVA, 765 kV, 1 Ph / 1000 MVA, 1200 kV, 1 Ph)
- Converter Transformers / Smoothing Reactors (upto 600 MVA, ± 800 kV) / (upto 254 MVA, ± 500 kV) for HVDC transmission.
- Shunt Reactors (upto 150 MVA, 420 kV, 3 Ph / 110 MVA, 765 kV, 1 Ph)
- Controlled Shunt Reactors (upto 200 MVA, 420 kV, 3 Ph/ 200 MVA, 420 kV, 1 Ph / 200 MVA, 765 kV, 1 Ph) for Flexible AC Transmission system applications.
- Phase Shifting Transformers (upto 500 MVA, 400 kV, 3 Ph/ Upto 500 MVA 400 kV 1 Ph) for transmission lines
- Instrument transformers
 - Current transformers upto 400 kV
 - Electro-magnetic voltage transformers upto 220 kV
 - Capacitor voltage transformers (33KV to 1200 kV)
 - 24kV PR class Current Transformer for HVDC Projects
- Special Transformers
 - Rectifier transformer (upto 120 kA, 132 kV)
 - Furnace transformer (upto 33 kV, 60 MVA)
- ESP transformers upto 95 kV, 1600 mA
- Smoothing reactors upto 3.3 mH , 2700 Amp.
- Dry Type reactor upto 300 mH , 120 Amp.
- DC Choke upto 0.5 mH , 4600 Amp.



- Dry type transformers upto 15 MVA 33 kV.
- Composite Monitoring System for Power Transformers

CAPACITORS

- H.T. Capacitors
 - Motors Capacitors for Power factor correction (3.3 to 11 kV delta connected Capacitor banks)
 - Shunt, Series & SVC (Static VAR compensation), Harmonic filter & HVDC applications (3.3 kV to 500 kV, 1 Ph/ 3 Ph capacitor banks)
- Capacitor Divider for CVT
- Coupling Capacitor (33kV to 800 kV, 4400pF to 13200 pF) for transmission lines
- Surge Capacitor for protection of Generators & Transformers (11kV to 40 kV)
- Roof Capacitor for traction locomotive
 - Capacitor Divider for CVT upto 1200 kV
 - Coupling Capacitor for PLCC upto 400kV
 - Fuse-less capacitor

BUSHINGS

- Oil Impregnated Paper (OIP) condenser bushings 52 to 525 kV for transformer applications
- 25 kV Locomotive bushings

CONTROL GEAR

- Electronic controllers for ESPs in industries/ power plants
- Digital Static Excitation control system (2000 A, 400 V DC with redundant thyristor stacks & DC field breaker)
- Large current rectifiers with PLC Based digital controls
- Control & Protection Panels (upto 400 kV) For EHV Transmission projects
- SCAP, Thyristor, RAPCON and STATCON Panels.

INSULATORS

- Porcelain Insulators
 - High-tension Porcelain Disc insulators for AC/ DC applications, ranging from 70kN to 420 kN electro-mechanical strength, for clean and polluted atmospheres, Suitable for application upto 1200kV AC & ± 800 kV HVDC transmission line & Sub-stations.
 - Hollow insulators upto 765 kV for Transformers & SF6 circuit breakers.
 - Solid core insulators upto 400 kV for Bus Post & Isolators for substation applications.
- Composite Long Rod Insulators
 - Upto ± 800 kV, 420kN for HVDC application
 - Upto 765kV, 210kN for HVAC application.
 - Traction Insulators Stayarm, Bracket & 9 Tonne Insulators for Indian railways.

- Ceramic Lining (CERALIN) wear resistant material for Thermal Power Plant & Ash Slurry Application.
- Industrial and Special Ceramics
 - EWLI –Electronic Water Level Indicators used in Boiler Drum Water Level Monitoring (BHELVISION system)
 - Ceramic and Tungsten Carbide Flow Beans for Christmas tree valves.
 - Grinding Media for Pulverizing in Thermal Power Plant.

ELECTRICAL MACHINES

- AC Machines for Safe Area Application
 - Squirrel cage induction motors -150 kW to 22000 kW
 - Slip ring induction motors - 150 kW to 10000 kW
 - Synchronous motors- 1000 kW to 25000 kW
 - Variable speed Motors- 150 kW to 22000 kW (Squirrel cage motors)
 - Variable speed Motors- 1000 kW to 25000 kW (Synchronous motors)
- AC Machines for Hazardous Area Application (Fixed speed or with VFD)
 - Flame-proof squirrel cage Induction motors (Ex 'd') (150 kW to 1500 kW)
 - Non-sparking squirrel cage Induction motors (Ex 'n') (150 kW to 4000 kW (higher ratings on request))
 - Increased safety squirrel cage Induction motors (Ex 'e') (150 kW to 4000 kW (higher ratings on request))
 - Pressurized Squirrel cage induction motors (Ex 'p') (150 kW to 22000 kW)
 - Pressurized Synchronous motors (Ex 'p') (1000 kW to 25000 kW)
- Industrial Alternators (Steam turbine, Gas turbine and Diesel engine driven) (3000 kVA to 25000 kVA)
- Vertical Motors for Primary Coolant Pumps for nuclear power plants
- Induction Generators (300 kVA to 6000 kVA) for mini/ micro hydro plant.
- 2 Pole Air cooled Steam/ Gas Turbine driven Generators (3 MW to 160 MW)
- 4 Pole Air cooled Steam/ Gas Turbine driven Generators (3 MW to 40 MW)
- 2 Pole Hydrogen cooled Steam/ Gas Turbine driven Generators from 36 MW to 270 MW
- Permanent Magnet Based Generators upto 5 MW.
- Gas Turbine generators upto 270MW.
- Alternators for industrial applications with single bearing upto 2 MW.



RAIL TRANSPORTATION

Transportation Systems

- AC electric locomotives (upto 6000 HP, 25 kV AC)
- AC-DC dual voltage electric locomotives
- ACEMU Coaches
- Metro Coaches
- Traction Propulsion Systems for:
 - 9000 HP IGBT based AC Locomotives
 - 6000 HP IGBT based AC Locomotives
 - 3-phase IGBT based AC Electrical Multiple Units (EMUs)
 - Air-conditioned ACEMU
 - ACEMU electrics for DC drives
 - 1600HP IGBT based DEMU
 - 3-phase IGBT based MEMU
 - 1600HP Multi-Genset Locomotive
- Regeneration system for DC Propulsion system of WAG7 Locomotive
- Diesel Electric Tower Car
- Diesel-Electric Shunting Locomotives (upto 1400 HP)
- Battery powered Locomotive
- OHE recording-cum-test car
- Battery Powered Road Vehicles
- Dynamic track stabilizers
- Rail cum Road vehicle

TRANSPORTATION EQUIPMENT

- Traction Converter & Auxiliary Converter
- Vehicle Control Electronics
- Hotel Load Converter
- Composite Converter comprising Traction Converter and Hotel Load Converter
- Traction Transformer
 - Upto 5400 kVA for conventional locomotives
 - Upto 7775 KVA for 3 phase drive locomotives.
 - Upto 1050 KVA conventional AC EMU/ MEMUs
 - Upto 1578 kVA for 3 phase EMU
- 3- phase AC Traction Motors (upto 1200 kW) for Locomotives & EMUs
- DC Traction Motors (upto 630 kW) for Locomotives & EMUs
- AC Traction Alternators (upto 3860 kW) for Locomotives & EMUs
- DC Traction Generators upto 2000 kW
- DC Blower motors (upto 50kW) for dynamic braking system
- Motor Generator sets (upto 25 kW) for auxiliary requirements
- Traction gears and pinions for Locomotives & EMUs
- Wagon (upto 28 axle, 296 Tonne)

DEFENCE AND AEROSPACE

- Super Rapid Gun Mount (SRGM) 76/62 gun for naval ships
- Integrated Platform Management system (IPMS) for naval ships
- Integrated Bridge System (IBS)
- Static Main Motor Generator (SMMG)
- Rotary Main Motor Generator with Controls (RMMG)
- Training Simulator for Vehicles, platforms, radars, weapons, missiles and Computer Based Training (CBT) for all defence and para-military forces
- Turret Casting for T-72 Tanks
- Casting and Forgings for ships
- Compact Heat Exchangers for various aircraft platforms
- Fuel Tanks and other components for Launch Vehicles and Satellites.
- Permanent Magnet Frequency converters with drive unit
- Reserve Propulsion motor with drive unit
- Compact Brushless Alternators
- Space grade Batteries

ENERGY STORAGE SYSTEM & E- MOBILITY

- Electric Bus
- Powertrains for Electric Vehicles including motors
- Charging Infrastructure for Electric Vehicles
- Battery Energy Storage System including Power conditioning unit (PCU) and SCADA

OIL FIELD EQUIPMENT

- Oil Rigs – On-shore drilling rigs with AC-VFD and AC-SCR technology for drilling upto depths of 9,000 metres, work-over rigs for servicing upto depths of 6,100 metres, mobile rigs for drilling upto depths of 3,000 metres, complete with matching draw-works and hoisting equipment including:
 - Mast and substructure
 - Rotating equipment : Draw works ; Rotary ; Swivels; Travelling Blocks
 - Independent Rotary drive unit
 - Mud System including pumps
 - Refurbishment and up gradation of BHEL and Non BHEL make Oil Rigs
 - 3-phase Oil rig motor upto 1150 HP
 - DC Oil rig motors upto 1000 HP (Draw works, mud pump, drilling)
 - Oil rig alternators upto 1750 KVa
 - AC/ DC Power Control Room for E760, E1400, E2000 & E3000 Rig
 - AC Power Pack upto 1430 kVA for DG sets
 - o AC Control Module



PRODUCT PROFILE



- o DC Control Module
- Driller's Console upto 3 mud pumps, IRD & draw work control & monitoring, load rating (0-1800 A, 0-1000V)
- Mobile lightening Tower, Rig Lightening Tower
- AC- VFD Controls for AC Rigs
- STATCOM for power Factor improvement in AC SCR Rigs
- Well heads and X-mas Trees upto 10,000 psi, Mud Line Suspension, Choke and Kill manifold, CBM Wellheads, DSPM H- Manifold Assembly, Mud valves.

FABRICATED EQUIPMENT AND MECHANICAL PACKAGES

- Cryogenic Air Separation Units
- Cryogenic storage tanks, Mounded storage systems and storage spheres
- Pressure Vessels, Columns, Reactors/Separators, Heat Exchangers
- Fired Heaters
- Purge Gas Recovery Unit





For enquiries and further information

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BHEL's Global Footprints



This graphical representation does not purport to be the political map of the world



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Powering Progress... Brightening Lives Touching Every Indian Home