Jyoti Ltd.

Water • Power • Progress


# A PRODUCT PROFILE

## About Jyoti Ltd.

Jyoti Ltd. is a leading engineering company offering high quality products and services to clients in India and in the international market. Established in 1943, today Jyoti Ltd. is serving the vital fields of national and international economy such as:

- Power (Thermal, Hydel & Nuclear) Generation, Transmission and Distribution,
- Agriculture, providing irrigation through pumping systems,
- Water Supply & Sewerage Schemes,
- Defence, particularly Naval & Marine Establishments,
- Railways,
- Core Industries like Steel, Cement, Paper, Sugar, Fertilizers,Chemicals & Petrochemicals.

Jyoti offers a wide range of quality products and services conforming to Indian and international standards.

Jyoti has received ISO-9001Certification for establishing and applying Quality System for design, development, manufacture and servicing of its switchgear, pumps, generators, motors and hydro turbines.

The Products and Services include :

- Medium & Large Pumps,
- Hydro-Electric Generating Systems,
- L.T. & H.T. Alternators and Motors,
- Special Rotating Electrical Machines like Arno Converters, Sugar Centrifuge Motors, Frequency Converters etc,
- Medium Voltage Switchgear & Switchboards and
- Electronics and Control Systems.
- Jyoti assumes single-source responsibility for implementing Turn-Key Projects.
- Jyoti Pro/ENGINEER Design Service Centre offers CAD / CAM / CAE solutions to improve engineering processes.

The wide range of products and services offered are engineered by different product and service groups manned by competent professionals specialising in their respective fields. Jyoti has a country-wide marketing network of Zonal & Branch offices and System Houses. System Houses serve as an extended arm of the network. Well equipped customer services are availaole at authorised service centres as well as at Zonal & Branch Offices. With opening up of economy, the Export Division has intensified its operations in the international market. In order to meet the growing demand of 'Jyoti' switchboards in gulf countries, a unit to manufacture medium voltage switchboards has been set up at Sohar, in Oman. This unit, Jyoti Sohar Switchgear LLC is a joint-venture between Jyoti Ltd. and OMZEST Group of Muscat.

'Jyoti' Products, which meet stringent requirements of Core Sectors of Indian and Global enonomy, have been developed at Jyoti R & D Centre through market oriented research. First of its kind to be set up in Private Sector in 1964, the R & D Centre has produced a capability to cater to changing market needs through a planned, focused and cost-effective Research and Development. The basic philiosophy is to preserve and enhance 'Core Competence' in technology development to maintain competitiveness in Global Market.The Company has received several National Awards for Import Substitution from Government of India. The Company has also received prestigious Awards from institutions like Associated Chambers of Commerce and Industry of India (ASSOCHAM), Federation of Indian Chambers of Commerce and Industry (FICCI) and Confederation of Indian Industry (CII), for its pioneering efforts in developing indigenous technology. Jyoti has won the Award from International Association for Small Hydro for its outstanding contribution as equipment manufacturer for development of Small Hydro Power (SHP) in India and recognition from IREDA for outstanding contributions to renewable energy sector.

Jyoti has set up a Pro/ENGINEER Design Service Centre, the first of its kind in the Western region of the country. The Centre aims at Virtual Engineering by providing CAD/CAM/CAE solutions i.e. to improve designs, manufacturing processes and enhance the product quality on the one hand and reduce cost and time on the other.

Though Jyoti's corporate philosophy is to develop indigenous technology, Jyoti imports technical know-how on a selective basis with a view to update its own technological base and remain competitive. Jyoti has entered into technical collaborations with leading foreign firms for manufacture of various products. At present, it has technical collaboration with Toshiba Corporation, Japan for manufacture of Vacuum Circuit Breakers. Jyoti has entered into technical collaboration with Jeumont Industrie, France, to manufacture High Voltage Alternators for Steam/Gas Turbine duty In co-operation with Turboinstitut, Slovenia, Jyoti aims to offer a wide range of runners and improved designs of Small Hydel Sets.

Jyoti has Technical Tie Up with leading engineering companies from Czech Republic viz. M/s. SIGMA Group, a.s. for Large Pumps and M/s. CKD Blansko Engineering, a.s. for Pump Turbines.

Being an integral part of the society, Jyoti is deeply conscious of its obligations and responsibilities towards society. Jyoti has played a major role in rehabilitating the handicapped by providing training and assisting various voluntary organisations and encouraging its own employees to participate in areas like promotion of renewable sources of energy, preservation of environment, voluntary blood donation programmes, vocational training for rural and urban youth and integrated rural development programmes. Jyoti has received prestigious awards for these efforts from Government of India and FICCI.

## PUMPS

### Vertical Turbine Pumps

| | | |
|---|---|---|
| Size | : | 150 mm to 750 mm |
| Capacity | : | 300 lpm to 70,000 lpm |
| Head | : | Upto 200 M |

### Vertical Mixed-Flow Pumps

| | | |
|---|---|---|
| Size | : | 300 mm to 1300 mm |
| Capacity | : | 7,000 lpm to 6,00,000 lpm |
| Head | : | Upto 100 M |

### Vertical Propeller Pumps

| | | |
|---|---|---|
| Size | : | 250 mm to 1500 mm |
| Capacity | : | 5000 lpm to 4,00,000 lpm |
| Head | : | Upto 10 M |

### Horizontal Split-Casing Pumps

| | | |
|---|---|---|
| Size | : | 125 mm x 150 mm to 1200 mm x 1200 mm |
| Capacity | : | 2000 lpm to 2,70,000 lpm |
| Head | : | Upto 150 M |

### Volute Pumps

| | | |
|---|---|---|
| Size | : | 2200 mm |
| Capacity | : | Upto 5,00,000 lpm |
| Head | : | Upto 150 M |

### Vertical Non-Clog Pumps

| | | |
|---|---|---|
| Size | : | 200 mm x 250 mm to 500 mm x 600 mm |
| Capacity | : | 4,000 lpm to 60,000 lpm |
| Head | : | Upto 35 M |

### Horizontal Non-Clog Pumps

| | | |
|---|---|---|
| Size | : | 200 mm x 200 mm to 600 mm x 600 mm |
| Capacity | : | 4000 lpm to 60,000 lpm |
| Head | : | Upto 70 M |

### Submersible Pumps

| | | |
|---|---|---|
| Size | : | Upto 200 mm |
| Capacity | : | 80 lpm to 2000 lpm |
| Head | : | Upto 273 M |

### Vertical Condensate Pumps

| | | |
|---|---|---|
| Size | : | 225 upto 550 T |
| Capacity | : | 1000 lpm to 8,000 lpm |
| Head | : | Upto 200 M |

### Special Pumps

- **Lubricating Oil Pumps**
  (for steam turbines)

Size : For 120 MW & 236 MW for turbines
Capacity : Upto 10,000 lpm
Head : Upto 300 M

- **Moderator Pumps**
  for heavy water pumping in Nuclear Power Stations
- **End Suction Pumps**

Size : 32 mm to 150 mm delivery
Capacity : 15000 lpm
Head : Upto 150 M
MOC : CI, CS, S.S. 316 & 304 Construction

- **Sewage Pumps**

Size : 80 mm to 300 mm
Capacity : 10000 lpm
Head : 50 M
Solid Sizes Handle : Max. 130 mm
HP : Max. 150 HP

- **Polder Pumps**

Size : Upto 300 mm Delivery Size
Capacity : Upto 16,500 lpm
Head : Upto 50 M
HP : Upto 180 HP

- **Domestic Pumps**

Self priming, single phase, domestic, Unibuilt Pumps
Capacity : Upto 140 lpm
Head : Upto 55 M
HP : 2 HP

- **Vertical Inline Pumps**

Size : Upto 350 mm delivery
Capacity : 10,000 lpm
Head : Upto 150 M

## HYDRO-ELECTRIC GENERATING SYSTEMS

(Full equipment comprising Turbine, Governor, Butterfly Valve, Generator and Control Panel)

| Runner Type | Head (M) | Output (KW) |
|---|---|---|
| Pelton | 60-700 | 50-10,000 |
| Turgo-Impulse | 30-210 | 10-5,000 |
| Francis | 9-190 | 50-10,000 |
| Propeller | 15-50 | 10-10,000 |
| Kaplan | 15-50 | 500-10,000 |
| Tubular | 2-25 | 5-8,000 |

Butterfly Valves 300 mm - 3200 mm
Spherical Valves 400 - 600 mm
Electronic/PLC Based Governor

## ROTATING ELECTRICAL MACHINES

### Horizontal H.T. & L.T. Motors

- High Tension

  3.3, 6.6, and 11 kV Squirrel Cage and Slipring Induction Motors upto 3000 kW

Synchronous Motors upto 5000 kW

- Low Tension

  (i) Squirrel Cage
  3 phase, upto 550 kW

  (ii) Slipring
  3 phase, upto 550 kW

### Vertical H.T. & L.T. Motors

- High Tension

  3.3, 6.6 and 11 kV Squirrel Cage and Slipring Induction Motors upto 3000 kW

  Synchronous Motors upto 3000 kW

- Low Tension

  (i) Hollow Shaft 3 phase, Squirrel Cage upto 550 kW

  (ii) Solid Shaft

  3 phase Squirrel Cage and Slipring upto 550 kW

### Two-Speed, Pole Amplitude Modulated Motors (PAM Motors)

LT & HT upto 3000 kW

### Induction Generators, L.T. & H.T.

For Hydel, Wind and other applications, upto 3000 kW.

### Induction Regulators

60 kVA to 600 kVA
Voltage Variation : 10 Volts to 600 Volts

Increased Safety Type 'e' motors - L.T. & H.T.

### Arno Converters

Single phase to three phase Vertical & Horizontal upto 150 kVA, 415 V mainly for AC Electric Locomotives in Indian Railways

Auxiliary Motors for AC Locomotives

### Alternators (A.C. Generators)

Self-Excited and Self- Regulated (SESR) slipring type Alternators, Horizontal and Vertical, upto 200 kVA, 415 V, 50 Hz.

### Brushless Alternators with Electronic AVRs

- L. T. Alternators
  40 kVA to 3750 kVA, 415-440 V for Diesel Engines, Steam and Hydel Turbines
- H. T. Alternators
  1000 kVA to 7500 kVA
  3.3 kV, 6.6kV and 11kV
  for Diesel Engines, Steam, Gas and Hydel Turbines
- Marine Alternators for Navy and Ocean-going ships.
- Alternators for P&T applications

### Frequency Converters

50/60 Hz, 50/150 Hz. and 50/200 Hz L.T. and H.T.upto 5000 kVA

## MEDIUM VOLTAGE SWITCHGEAR & SWITCHBOARDS

### Vacuum Circuit Breakers

- 12kV-12.5KA upto 40 KA,Indoor, rated current upto 3150 Amps.
- 36 kV-12.5 upto 25 KA, Indoor, rated current upto 2000 Amps.
- 12 kV-12.5 upto 25 KA, Outdoor, rated currrent upto 2000 Amps.
- 36 kV-12.5 upto 25 KA, Outdoor, rated current upto 2000 Amps.

### Vacuum Contactors

3.6 kV & 6.6 kV Indoor, Draw-out, rated current upto 400 Amps. suitable for AC4 switching duty

### Ring Main Unit

12 kV, 20 KA upto 630 A Indoor & Outdoor type Fully Extensible

### Switchboards

### Draw-out type Indoor Panels.

- 12 kV-12.5 KA upto 40 KA, rated current upto 4000 Amps.
- 12 kV-12.5 KA upto 25 KA rated current upto 2000 Amps. Double Busbar
- 36 kV-12.5KA upto 25 KA, rated current upto 2000 Amps.

### Draw-out type Outdoor, Single or Multi - Panel Kiosks.

- 12 kV-12.5/25 KA, rated current upto 2000 Amps.

### Retrofit

- Providing complete solution for retrofit of old MOCBs by New VCBs.

## ELECTRONICS & CONTROL SYSTEMS

### Protective Relays

- Static, Non-Directional IDMTL,Over Current and Earth Fault Relays-with standard inverse, very inverse characteristics-Single Pole Relays, type JSRSA and Triple Pole Relays, type JTRSA (Draw-out Case)
- Static, Instantaneous, Under Voltage/ Over Voltage Relays, type PV (Draw- out Case)
- Static, Definite Time - Lag, Over Voltage / Under Voltage Relays, type SPVK.(Draw-out Case)
- Static, Directional IDMTL, Over Current/ Earth Fault Relays, type JDRSA, Single Pole (Draw-out Case)

### Auxiliary Relays

- Voltage operated, plug-in type, Auxiliary Relays with plug-in bases, suitable for front/rear connection, type RE-300.
- Voltage operated, plug-in type, Mini-Auxiliary Relays with plug-in bases, suitable for front connection, type RE-400 (built in LED)

### Others

- Storage Power Packs for Tripping, for 10 / 20 W Sec.
- Test Plug Boxes, type C and V.
- Static Trip Circuit-Supervision Relays, type JTS.

## Pro/ENGINEER Design Service Centre :

To improve mechanical design, following services are offered :

### Solid and Surface Modelling

- Conceptual Design
- 3-D Modelling of Components
- Creation of Manufacturing Drawings with Bill of Materials
- Creation of Assembly Process Charts
- Photorealistic Image Generation
- Defining Design Intent
- Building of Large Assemblies
- Conversion of 2-D Manufacturing Drawings into 3-D Models
- Exploded View of Assemblies
- STL Data Generation for Rapid Prototyping

### Tool Design

- Mould Design for Plastic Components
- Press Tools Design for Sheetmetal Parts
- Pressure Die-casting Design
- Jigs and Fixtures Design

### Function Analysis

- Interference / Clearance Analysis
- Design Optimisation
- Curves and Surfaces Analysis
- Structural Analysis
- Model Analysis

## ANSYS CFX Computational Fluid Dynamics

The analysis of Pumps and Turbine flow performance including separation and flow reversal study are carried out using this software. This helps to identify and correct early in the design process and improve the hydraulic profile and efficiency.

## TURN-KEY PROJECTS

***Some of the Projects executed for:***

### Electricity Boards

- Circulating Water (CW) Systems for Koradi, Bhusaval, Nasik & Chandrapur Thermal Power Stations of Maharashtra State Electricity Board. (MSEB)
- CW System for Chandrapur Thermal Power Station for Assam State Electricity Board.
- 3 X 1000 KW Hydel Power Station at Mungpoo Khalikhola in West Bangal.
- 2 X 1500 KW Hydel Power Station at Robomchu in Sikkim.
- 3 X 6000 KW Hydel Power Station at Shimsha in Karnataka.
- 3 X 6000 KW Hydel Power Station at Kemphole in Karnataka.
- Ash Water Recyling System for Waregaon Bund to Koradi. Khaparkheda Thermal Power Stations of Maharashtra State Electricity Board. Ash-Water recycling system for Chandrapur Thermal Power Station of MSEB.
- CW System for Unchar and Dadri Thermal Power Stations of National Thermal Power Corporation (NTPC.)
- CW System for Kota Thermal Power Station of Rajasthan State Electricity Board.
- CW System for Bhatinda Thermal Power Station of Punjab State Electricity Board.
- CW System for Dhuvaran Thermal Power Station of Gujarat Electricity Board.

### Steel Plants

- CW System for Bokaro Steel Plant
- Make-up Water System for Visakhapatnam Steel Plant.
- Electrical Sub-Stations at Rourkela, Bokaro, Bhilai, Dankuni Steel Plants.

### Defence Department

- Electrical sub-station at Ordnance Factory, Itarsi
- Electrical sub-station at Tank Factory, Chennai.
- Electrical sub-station at Vehicle Factory, Chennai.
- Electrical sub-station at Naval Air Station, Arkonam
- Dewatering System at Hindustan Shipyard, North Dry Dock, Visakhapatnam and for Naval Dry Dock for DGNP, Mumbai.

### Water Supply and Sewage Schemes

- Bhopal, Panam (Vadodara), Kilpauk (Madras), Surat, Salauli-Goa, Barvi (Maharashtra), Bodella (Delhi Municipal Corporation, Delhi) and PHED (Jodhpur).

### Irrigation Projects

- Chitwan Irrigation Project, Nepal
- Ravi-Tawi Irrigation Project, J & K
- Vishnupuri Lift Irrigation Scheme, Nanded, Maharashtra
- 33 KV Switchyard Equipment at Narwad for Krishna-Koyana Irrigation Project.
- Janai-Sirsai Lift Irrigation Scheme of Irrigation Dept., Govt. of Maharashtra
- EPC Contract of Khorsam to Saraswati Barrage Life Irrigation Project in Gujarat inclusive construction of 2 Pumping Stations and supply, installation, testing and commissioning of 6 Nos. 800 VM and 3 Nos. 5507 Pumps, 66 kV Switchyard, 11 kV Sub-station and related electro-mechanical work. The Project commissioned within one year.
- Various Lift Irrigation Schemes under Vidarbha Irrigation Development Corporation, Government of Maharashtra.

### Semi-Government Undertakings

- Electrification Work at Madras Refinery, Chennai; GNFC, Bharuch; at Neemuch and Tandur Cement Plants of Cement Corporation of India; at International Airport Authority of India; New Delhi; at Hydrocracker Project, Indian Oil Corporation Ltd., Vadodara; at Hindustan Zinc Ltd., Udaipur; at Mumbai Airport for National Authority, Mumbai; at Indoor Stadium, Surat Municipal Corporation, Surat.


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