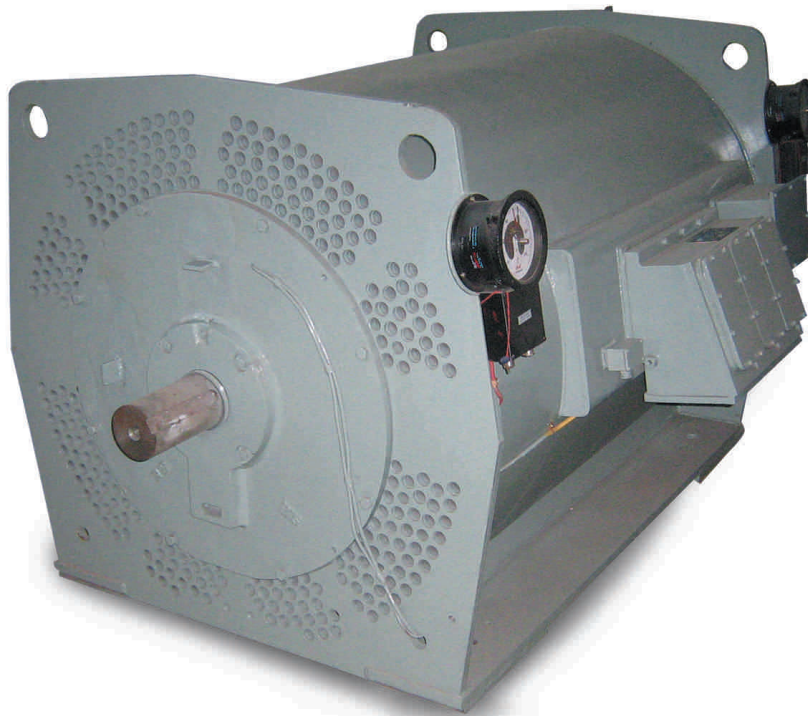




Teepak

Totally Enclosed Tube Ventilated  
High Voltage Induction Motors



*Motors for the Long Run!*

## Specifications

Range	: Upto 1500 KW
Poles	: Upto 14 Pole
Voltage	: Upto 6600 Volt
Frame	: 450 – 710
Insulation	: C1-F with rise limit C1-B
Rotor	: Squirrel Cage**
Mounting	: Horizontal & Vertical
Rotation	: Uni-direction/Bi-direction
Cooling	: IC 0151
Bearing	: Grease lubricated anti-friction Rolling Element
Degree of Protection	: IP 54, IP 55

*\*\* For Slip-Ring, please refer to us*

## Major Features

- Fabricated Robust Steel construction for frames.
- Uniform internal cooling circuit.
- Axial Cooling for smaller ratings, both radial and axial ventilation for larger ratings.
- Basic mounting dimensions as per IS.
- Class 'F' insulation system, both Resin rich & Resin poor (VPI) varieties available.
- Rotors are dynamically balanced .
- Rotor bars are brazed with end rings by One Shot Brazing process.
- Environmentally friendly motors to meet all Drives
- Fault tested Phase Segregated Terminal box.
- RTD, BTD, Dial type Temperature indicator available.
- Separate Terminal Box available for Neutral point, RTD, BTD termination purpose.
- Provision for Magnetic Slot Wedge to improve Efficiency, Power Factor and improve Electromagnetic noise
- Provision for special Epoxy paint system

## Design and Construction

### Standards and regulations

The machines comply with IS-325, relevant BS and IEC. The motors can be offered to specific requirements of the customers.

The motors are designed for voltage and frequency as per IS 325. The standard values and the permissible variations are :

Voltage – 2.2 to 6.6 kV  $\pm$  10%

Frequency – 50 Hz  $\pm$  5%

Motors are also available to suit systems where voltage and frequency variations exceed the standard limits.

The rated outputs correspond to the continuous running duty with cooling air temperature of 40°C and site altitudes not exceeding 1000 m. above m.s.l.

### Types of construction

The machines are available in types of construction B3, V1 or B35.

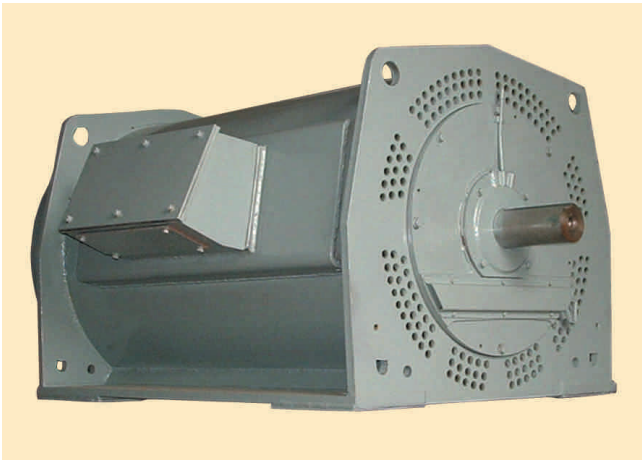


Fig 1 : MARATHON Electric TETV – Horizontal Mounting



Fig 2 : MARATHON Electric TETV – Vertical Mounting

## Ventilation system

The machines have closed circuit with a concentric tube nest Cooler, which is Integral with the frame. Rotor is fitted with shaft-mounted external and internal fans.

For 2-Pole machines the internal and external fans are uni-directional.

The external fan is located in the fan casing on the non drive-end and forces the open-circuit air through the cooling tubes of the stator frame.

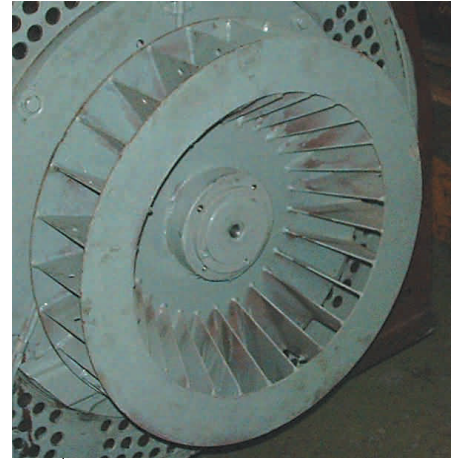


Fig 3 : Typical External Fan

The internal fan in the main compartment forces the

primary air to circulate in symmetrical ducts in the laminated rotor core. The primary air circulates through the end Windings and the ducts in the core packs and extracts the heat to the cooling tubes.

## Degrees of protection

The machines are manufactured with a degree of protection IP 54 or IP 55, corresponding to IS 4691 or IEC 34-5. Method of cooling complies with IC 0151. The motors are suitable to service both indoor and outdoor, and is strongly recommended for dusty environments.

## Stator frame and winding

The stator frame is of welded construction. The axial cooling tubes are expanded into the two end walls.

The stator core pack is fitted centrally in the stator frame and secured against rotation and displacement.

The stator winding (two layer lap type) constitute of diamond shaped coils and are provided with Mica based insulation system complying with class F insulation requirements. The insulation system comprises of two varieties – Resin Rich Varnish Impregnated type or, Resin Poor Epoxy Impregnated (VPI) type. The insulation possesses high die-electric strength, high resistance to moisture and aggressive gases and vapours, thus providing excellent mechanical stability and longer life.



Fig 4 : Typical Wound Stator

### Rotor construction

The rotor consists of a rigid shaft made out of ultrasonically tested steel forging. It is manufactured from carbon manganese steel of grade C45, 150M19, or equivalent. Standard motors have a single plain parallel shaft extension with a single key way and the motors are balanced with a half key fitted. The extension is drilled and tapped as per standard.



Fig 5 : Typical Cage Rotor

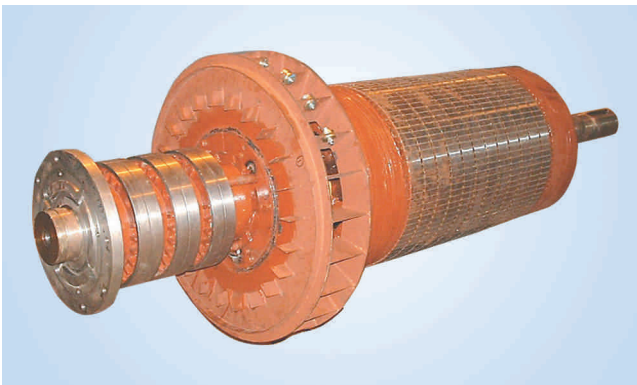


Fig 6 : Typical Wound Rotor

All squirrel cage motors have copper or copper alloy rotor cages. Tight fitting rotor bars are butt brazed to copper endrings by one shot brazing process. Rotors of slipring motors are designed and manufactured with high

quality Class F/H insulated bars to suit arduous site conditions. All rotors are dynamically balanced to more stringent levels to make the overall motor vibration severity well below the limits specified in IS I2075.

### End shields

The end shields at the drive and non drive-ends are made of fabricated steel or cast iron. The end shields are designed for fitting the bearing assembly and take care for transmitting the static and dynamic load.

### Bearings

Depending on the design and the operating conditions specified in the order, the machines are fitted with grease-lubricated rolling element bearings. The bearings are selected for minimum maintenance and avoid the need of external lubrication systems.

### Terminal boxes

The electrical connections of the stator winding are terminated in the main terminal box. The terminal box is generally of phase segregated and of double walled construction. The design minimizes the possibility of phase to phase to earth fault, limits its extent and reduces the possible hazard to the personnel in operation. These Phase Segregated Terminal Boxes (PSTB) have been successfully fault tested at CPRI laboratory, Bhopal, PVC/XLPE cables can be directly terminated to PSTB.

Machines containing auxiliary circuits for functions such as anti-condensation heating, temperature monitoring etc. are fitted with separate auxiliary terminal boxes. All types of Terminal boxes comply with degree of protection IP 54/55 or, IEC 34.5.



Fig 7 : Typical Termination Arrangement Showing RTD-BTD (L) PSTB (C), Space Heater (R)

### PHASE SEGREGATED TERMINAL BOX

Fault level : 3.3 kV - 250 MVA

6.6. kV- 500 MVA



The number, location and type of terminal boxes can be seen from the dimension drawing of the machine; circuit arrangement and connections of the main and auxiliary circuits are either documented in the O & M manuals or supplied separately.

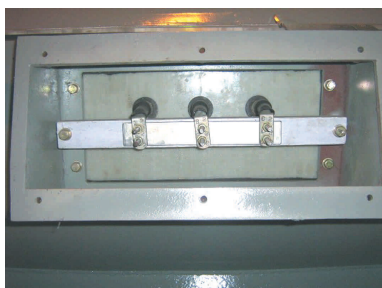


Fig 8 : Typical Arrangement for Neutral Point Termination (Shorting Link Supplied separately)



Fig 9 : Typical Alternative Arrangement for Neutral Point Termination

## Paint System

Surface is primed after degreasing and cleaning using Epilux 610 primer to a dry film. A single finish coat of two pack Epoxy paint is then applied.

## Accessories

Provided on request are PT 100 winding temperature detectors, PT100 bearing temperature detectors, Dial type temperature indicator for bearings etc.

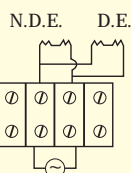
Space heaters are provided as standard feature.



Fig 10 : MARATHON Electric TETV Slipring Version

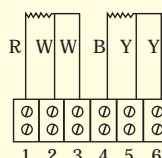
### HEATER

1 Ph, 240 V Supply



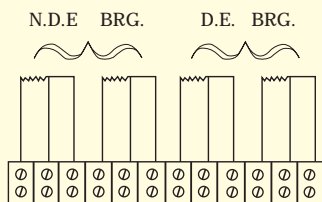
### AIR RTD

Colour Code  
R - Red  
W - White  
B - Blue  
Y - Yellow

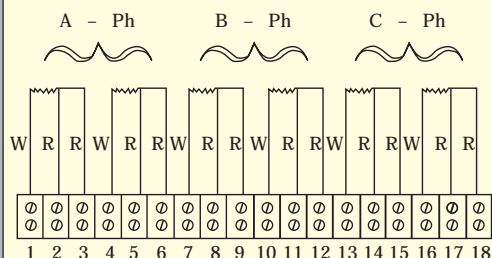


### BEARING RTD

Colour Code  
R - Red  
W - White  
B - Blue  
Y - Yellow



### WINDING RTD



Colour Code  
W - White  
R - Red

Fig 11 : Typical Wiring Diagrams for winding RTD, Bearing RTD and Space Heater

## Total Quality

The complete range of HT Motors is manufactured to a Quality Assurance Plan, which lays down stringent acceptance norms for each stage of production. All materials are critically tested in-house to ensure

conformity with National and International standards.

Customers are welcome to carry out stage inspection or final inspection during manufacture.



Specialized custom built motors • Specialists in short cycle deliveries

**Marathon Electric Motors (India) Ltd.** Registered & Head Office: 58, Taratala Road, Kolkata - 700024. IT Motor & Fan Factory, Paharpur Works, 58, Taratala Road, Kolkata - 700024, Tel: 2469 5369 / 8530, 09331059516. Large IT Motor & HT Motor Factory, AEI Works 1, Taratala Road, Kolkata-700024. **Marathon Regional Offices:** **New Delhi:** 708, Eros Building, 56, Nehru Place; Tel: 011 4160 7123, 09313290402. **Chandigarh:** Chamber No. 8a, 2 Floor, Sco No. 2441-42, Sector 22-C; Tel: 09316102451. **Mumbai:** 114 Navneelam, R.G. Thadani Marg, Worli; Tel: 022 3265 9844, 09322645753, Fax: 022 3040 1555. **Pune:** 41/14, Office Club Swaroop Complex Karve Road; Tel: 020 2546 3978, 09371025388. **Ahmedabad:** 415 / Platinum Plaza, Nr. Pushkar Tower, Judge-bungalow-bodakdev Road; Tel: 079 2560 2297, 09327048567. **Nagpur:** 1 Floor, Block A, Thapar Enclave, Plot No. 148, Ramdaspath; Tel: 0712 2526 220, 09373283527. **Raipur:** 1 Floor, 141, Sundernagar, Near Adarsh Chowk; Tel: 0771 2210 240. 09329128913. **Chennai:** Door No. 9, Flat No. 7, 1 Floor, Thiru. Vi. Ka. Road, Royapettah, (opp, Sathyam Theatre), Tel: 044 4351 0152, 09382102392, Fax: 044 4351 0153. **Secunderabad:** Cabin No. 47, 303, Swapnalok Complex, 92, S. D. Road; Tel: 040 2781 2724, 09391340619. **Bangalore:** C1-101, White House, 15 Cross, 6 Main R. T. Nagar; Tel: 080 2655 8729, 09341279429. **Bhubaneswar:** C/o. Plot No. 16-b, Engineers Colony, Old Station Bazar; Tel: 0674 231 3744, 09338212907. **Jamsbedpur:** C/o. Mr. D. P. Ghosh, House No. 7, Bidyasagar Path, Uliyan, Kadma; Tel: 0 93346 12014. **GEMI Motors India Pvt. Ltd.,** Sec.-11 Model Town, Faridabad - 121006 (INDIA), Tel: 0129 2286421/2265340; Fax : 0129-2284855, email : gemi.sales@regalbeloit.com **GEMI Regional Offices :** **Ahmedabad :** 406, Vedant Complex, 7, Kalpana Colony, Off. C.G. Road, Navrangpura, Ahmedabad-380009, Tel: 079-26561819, 9825611502. Fax: 079-26560452. **Chennai :** 6 Arcot Road, Vadapalani, Chennai - 600092, Tel: 044-42136697, 42333353, 9840429331, Fax: 044-42082322. **Jaipur :** C/o Flat No. 104, Block A, Rama Heritage Apartments, Central Spine, Vidhyadhar Nagar, Jaipur-302 023. Ph: 9982655661. **Kolkata :** 58, Taratala Road, Kolkata - 700024; Tel: 91 033 24695560/61, Fax: 033 24695369/8530. **Mumbai :** B-908/909, Sagar Tech Plaza, Andheri - Kurla Road, Saki Naka, Andheri (East), Mumbai - 400072, Tel: 022-28523106, 9833756269, Fax: 022-28528938. **Pune :** C/o: 8, Sethu Apartments, Right Bhusari Colony, Paud Road, Kothrud, Pune-411038, Tel: 020-65224846, 9960604846. **Bangalore :** Tel:9342299995. **Hyderabad :** Tel:9393002665. **Delhi :** Flat No. 516-518, 5th Floor, Antriksh Bhawan, 22 K.G. Marg New Delhi -01 Tel: 9873184209.