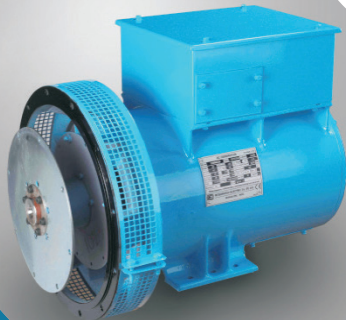
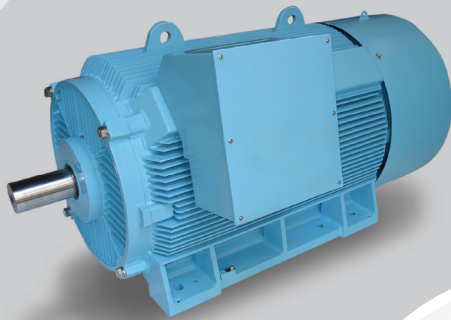




INTEGRATED ELECTRIC CO. PVT. LTD.,

Bengaluru, India



**Rotating Electrical Machines & Motion
Control Solutions**

www.int-elec.com

About Us

Established in 1982, Integrated Electric (IEC) manufactures high quality electrical rotating machines and drives in a wide range and variety. Its product basket includes DC Motors between 0.37 and 2500kW, Variable speed AC Motors between 0.37 and 1500 kW, Re-rolling mill duty slip ring motors between 600 and 2000 kW, Special purpose PM Motors, Synchronous Reluctance Motors. Special Generators between 7.5 and 320kVA and Variable Frequency Drives, Active Front End Converters, Custom Power Converter, Educational & Research Solutions. IEC's AC Motors are divided into four types depending on the configuration.

The IEL Series of Inverter Duty AC Motors range from 0.37kW to 1500kW in frame sizes 90 to 560. These motors are made suitable for lower speed (minimum 10% rated) operation by using a separately driven constant speed cooling fan. They are suitable for both constant torque operation (by maintaining constant V/f ratio) and for constant kW operation (by weakening the flux) and can be used in applications like rolling mills, extruders, lifts, fans, winders etc. Custom design solutions are provided for different base frequencies to reduce the current rating.

The IE Synchronous Reluctance Motor Series has been developed, which operate at very high efficiencies for various applications like compressors, fan, pumps, etc., Details can be provided on enquiry.

The IESL Series of Re-Rolling Mill Duty Slip Ring AC Motors range from 600 kW to 2000kW in frame sizes 500 and 560. These are High Starting Torque motors with capability to operate at variable speed under controlled starting and speed adjustment via external resistors in the rotor circuit.

The IEL Series of Compact AC Motors range from 3.7kW to 1500kW in frame sizes 100 to 355. These are usually open type motors and have a high power to weight ratio. They are cooled with a separate fan and are suitable for low speed operation using an inverter. These rotors have a low inertia and are ideal for application requiring superior dynamic response.

There are two dedicated manufacturing facilities available for the manufacture of these machines. The production is organized to provide flexibility and short lead times. IEC's major strength is in the manufacture of special products that meet specific application requirements. The company has been ISO 9001 certified since 1998 and spares no effort to ensure that a high level of quality is maintained. The process of continuous improvement permeates throughout the organization and results in our delivering better value to the customer year after year.

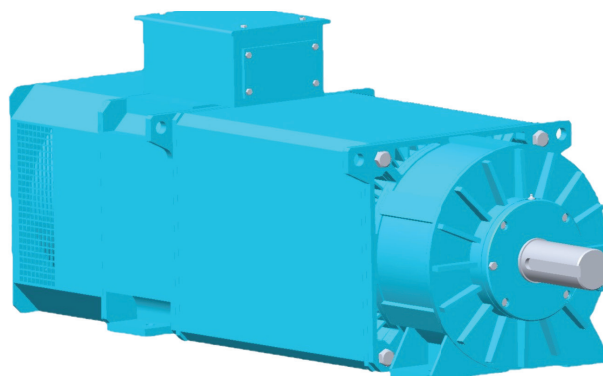
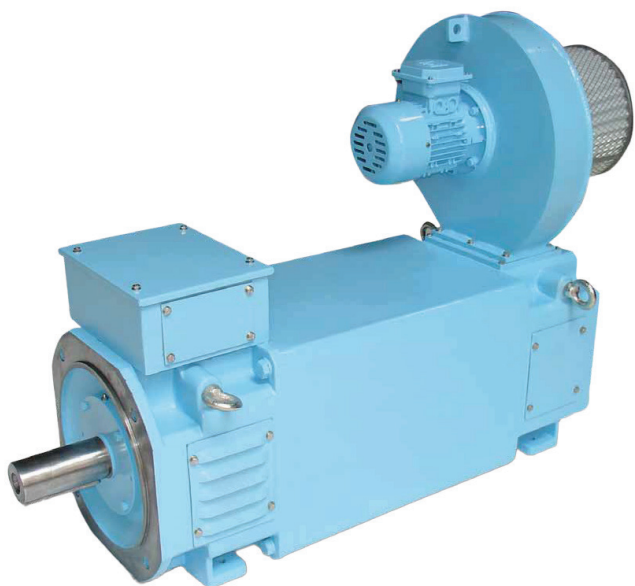
General Specifications

- Design Ambient is 50°C and Altitude is 1000m above MSL
- Class F insulation (Class H optional) is used with temperature rise restricted to Class B limits
- Motors have CE certification
- Dual coated enameled wire of Class 200°C is used on all motors. All IEC products are subject to VPT for superior insulation & longevity of the motors.
- Terminal box is mounted on top upto Frame 315 (RHS/LHS optional) and RHS/LHS for Frames 355 to 450
- Terminal Boards are with 3/6 terminals
- Duty Cycle: Standard designs are of S1 duty. Motors for duty cycles S2 to S8 can be offered on request. However since these are variable speed motors they can be designed for custom application.
- Cooling: IC416 for IEL motors, 100 to 180 frame IEL motors & Synchronous Reluctance Motors, IC06 for IEL motors of Frame 100 and above, IC01 for IESL motors
- Protection: IP55 for IEL, 100 to 180 frame IEL motors & Synchronous Reluctance Motors and IP23 for IEL motors and IESL motors.
- Optional accessories like Thermistors, RTDs, BTDs, Space heaters etc. can be provided
- Bearings:
 - Sealed for life bearings for IEL frames 90-160, IEL frames 100 & 112
 - Regreasable bearings for IEL frames 180 – 560, IEL frames 132 – 355
 - Roller bearings on DE side for IEL by default for frames 280 – 560 (non 2 pole motors) and IEL frames 132-355. Optionally can be provided for IEL frames 180-250
- Mountings available are B3/B5/B6/B7/B14/B34/B35/V1/V3/V5/V6
- Standards adhered to are:
 - Efficiency: IS12615:2018 and IEC60034-30 for IEL machines with 2/4/6/8 poles
 - Performance: IEC60034-1
 - Dimensions: IS1231, IS2223 and IS2254 as applicable
 - Protection: IEC60034-5
 - Cooling: IEC60034-6
 - Mechanical Vibration: IS12075 and IEC60034-14
 - Noise: IS12065 and IEC60034-09
 - Methods of determining losses and efficiency: IEC60034-2
 - Tolerances on Main Parameters: IEC60034-1

COMPACT AC MOTORS

Frame: 100 to 355

Power: 3.7 kW to 1500kW



- Integrated Electric, manufactures Square frame A.C. Motors for variable speed drives applications
- Designed to achieve high output to weight ratio in compact frame Sizes offering considerable space saving
- Rotors have low inertia which helps in achieving good dynamic response
- Ideal replacement for DC motors in most industrial applications
- Operates both in constant Torque as well as constant HP regions
- 600, 750, 1000 and 1500 rpm are the standard base rpm's offered and correspond to base frequency settings of 21, 26, 34.6 and 52Hz
- IP-23 IC-06 Force cooling provided, which offers continuous cooling even at lower operating speed below the base speed
- Vacuum pressure impregnation for stator winding
- Class "F" insulation scheme
- Maximum torque in excess of 200% to handle overloads
- Encoder mounting facility at the non drive end
- B35 mounting by default

Technical Specifications

| | |
|---------------------|---|
| Mounting | B35 (Foot cum Flange) |
| Frequency | As per table |
| Voltage | 400 Volts +/- 10% |
| Insulation | Class "F" |
| Ambient Temperature | 50 Deg C |
| Cooling Options | IC-06 for 100 to 355 Frames IC-416 for 100 to 180 frames |
| Duty | S1 |
| Protection Options | IP23 for 100 to 355 Frames IP54 for 100 to 180 frames |

Typical Applications

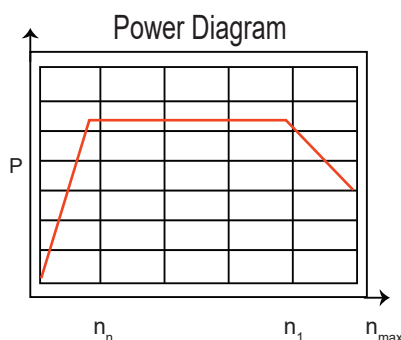
| |
|--------------------------------|
| Printing and Packaging |
| Wire Drawing |
| Extruders and Blow film making |
| Conveyors |
| Steel and Rolling mills |
| Textile |

COMPACT AC MOTORS RATING CHART

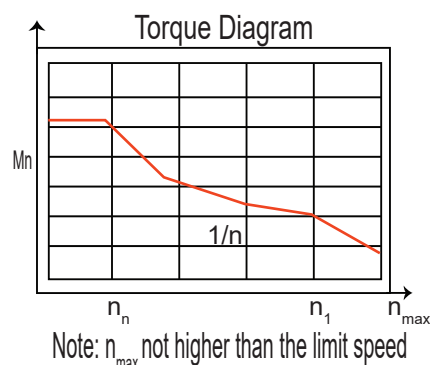
| Frame | 600 RPM - (21 Hz) | | | | 750 RPM - (26 Hz) | | | | 1000 RPM - (34.6 Hz) | | | | 1500 RPM - (52 Hz) | | | |
|-------|-------------------|-------|------|------|-------------------|-------|------|------|----------------------|-------|------|------|--------------------|-------|------|------|
| | kW | Amps | Pf | %n | kW | Amps | Pf | %n | kW | Amps | Pf | %n | kW | Amps | Pf | %n |
| 100S | 1.5 | 3.70 | 0.78 | 76.1 | 1.8 | 4.4 | 0.78 | 76.8 | 2.5 | 5.7 | 0.80 | 80.3 | 3.7 | 8.1 | 0.79 | 85.4 |
| 100M | 2.2 | 5.40 | 0.78 | 76.0 | 2.7 | 6.5 | 0.78 | 78.0 | 3.7 | 8.3 | 0.80 | 81.4 | 5.5 | 11.8 | 0.79 | 86.6 |
| 100L | 3.0 | 7.35 | 0.78 | 76.0 | 3.7 | 8.6 | 0.78 | 79.7 | 5.0 | 11.1 | 0.80 | 82.1 | 7.5 | 15.7 | 0.79 | 87.5 |
| 112S | 3.0 | 7.40 | 0.78 | 75.9 | 3.7 | 8.7 | 0.79 | 79.5 | 5.0 | 10.8 | 0.81 | 83.3 | 7.5 | 15.6 | 0.80 | 87.5 |
| 112M | 4.4 | 10.7 | 0.76 | 78.6 | 5.5 | 12.5 | 0.77 | 82.4 | 7.3 | 15.3 | 0.81 | 85.4 | 11.0 | 22.4 | 0.80 | 89.3 |
| 112L | 6.0 | 13.4 | 0.81 | 80.0 | 7.5 | 16.7 | 0.78 | 83.7 | 10.0 | 21.4 | 0.78 | 86.9 | 15.0 | 30.3 | 0.80 | 90.2 |
| 112P | 7.4 | 16.8 | 0.80 | 79.8 | 9.3 | 20.1 | 0.79 | 83.8 | 12.3 | 25.3 | 0.79 | 87.1 | 18.5 | 36.8 | 0.81 | 90.1 |
| 112X | 9.0 | 20.8 | 0.77 | 80.1 | 11.0 | 24.5 | 0.77 | 84.1 | 14.5 | 30.9 | 0.78 | 87.6 | 22.0 | 44.0 | 0.80 | 90.5 |
| 132M | 11.0 | 24.3 | 0.80 | 82.4 | 14.0 | 29.0 | 0.81 | 85.8 | 18.5 | 37.8 | 0.79 | 88.0 | 28.0 | 55.4 | 0.81 | 90.7 |
| 132L | 12.5 | 27.7 | 0.78 | 84.2 | 16.0 | 32.9 | 0.82 | 85.9 | 21.0 | 41.6 | 0.82 | 88.0 | 32.0 | 63.9 | 0.79 | 91.3 |
| 132P | 14.5 | 32.9 | 0.76 | 83.5 | 18.5 | 39.6 | 0.79 | 85.9 | 24.0 | 48.2 | 0.81 | 88.5 | 37.0 | 71.7 | 0.82 | 91.5 |
| 132X | 17.2 | 36.9 | 0.81 | 83.5 | 21.5 | 44.8 | 0.80 | 86.3 | 28.8 | 58.1 | 0.81 | 88.9 | 43.0 | 82.4 | 0.82 | 91.5 |
| 160S | 22.0 | 43.0 | 0.85 | 86.8 | 28.0 | 54.0 | 0.84 | 88.9 | 37.3 | 70.0 | 0.83 | 91.7 | 56.0 | 102.6 | 0.85 | 93.0 |
| 160M | 25.0 | 49.5 | 0.84 | 87.6 | 31.0 | 59.3 | 0.85 | 88.7 | 42.0 | 78.9 | 0.84 | 91.9 | 63.0 | 116.0 | 0.84 | 93.3 |
| 160L | 30.0 | 58.4 | 0.85 | 87.6 | 36.0 | 68.8 | 0.84 | 90.1 | 50.0 | 93.6 | 0.84 | 91.7 | 75.0 | 137.2 | 0.84 | 93.5 |
| 160P | 33.0 | 64.2 | 0.85 | 87.6 | 41.0 | 78.7 | 0.84 | 90.0 | 54.0 | 102.6 | 0.85 | 91.5 | 81.0 | 148.6 | 0.84 | 93.7 |
| 180S | 35.0 | 68.0 | 0.85 | 87.6 | 45.0 | 86.5 | 0.84 | 90.0 | 60.0 | 112.5 | 0.84 | 92.0 | 90.0 | 165.0 | 0.84 | 94.0 |
| 180M | 46.0 | 89.0 | 0.85 | 88.0 | 60.0 | 114.3 | 0.84 | 91.0 | 80.0 | 151.0 | 0.84 | 92.0 | 120.0 | 220.0 | 0.84 | 94.0 |
| 180L | 57.0 | 110.0 | 0.85 | 88.2 | 75.0 | 142.5 | 0.84 | 91.0 | 100.0 | 187.0 | 0.84 | 92.2 | 150.0 | 271.5 | 0.85 | 94.0 |
| 225S | 70.0 | 132.1 | 0.85 | 90.0 | 90.0 | 167.9 | 0.85 | 91.0 | 125.0 | 229.0 | 0.85 | 93.0 | 180.0 | 322.0 | 0.85 | 95.0 |
| 225M | 90.0 | 169.8 | 0.85 | 90.0 | 125.0 | 233.3 | 0.85 | 91.0 | 170.0 | 311.0 | 0.85 | 93.0 | 250.0 | 447.0 | 0.85 | 95.0 |
| 225L | 110.0 | 207.5 | 0.85 | 90.0 | 156.5 | 292.0 | 0.85 | 91.0 | 213.4 | 390.0 | 0.85 | 93.0 | 300.0 | 537.0 | 0.85 | 95.0 |

NOTE:- Detail for 250 Frame and above will be provided on request.

POWER TORQUE CHARACTERISTICS



Where,
 n_n is the rated speed
 n_1 is the extended speed from base speed (field weakening mode)
 n_{max} is the maximum speed (upto 6000 rpm)



Note: n_{max} not higher than the limit speed



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