



# AC MOTORS



**INTEGRATED ELECTRIC COMPANY PVT LTD**

**Bangalore, India**

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, AC Motors between 0.12 and 1000kW, AC Drives between 0.5 and 300kW, AC Generators between 7.5 and 320kVA and DC and AC Variable Speed Diesel Generator Sets.

IEC's AC Motors are divided into four types depending on the configuration.

**The IES Series** of Standard AC Motors range from 0.12kW to 200kW in frame sizes 63 to 315 and are available in 2, 4, 6 and 8 pole designs. These motors are suitable for a variety of industrial, domestic, agricultural and other general purpose applications. They are characterized by streamlined design, efficient cooling and noiseless running and they conform to all national and international standards. All motors are of IE2 efficiency (where applicable).

**The IED Series** of AC Motors range from 160kW to 1000kW in frame sizes 315 to 450 and are available in 2, 4, 6 and 8 pole designs. These motors have a dual air circuit which help in developing higher power ratings and are suitable for a variety of industrial applications. All motors are of IE2 efficiency (where applicable).

**The IEL Series** of Inverter Duty AC Motors range from 0.37kW to 1000kW in frame sizes 90 to 450. 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 extruders, lifts, fans, winders etc.

**The IEL Series** of Square Frame AC Motors range from 3.7kW to 150kW in frame sizes 100 to 180. 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 (Corona Resistant Copper is optionally used for motors driven by AC Drives)
- Terminal box is mounted on top upto Frame 315 (RHS/LHS optional) and RHS/LHS for Frames 355 to 450
- Terminal Boards are with 6 terminals
- Duty Cycle: Standard designs are S1 duty. Motors for duty cycles S2 to S8 can be offered on request. Motors are designed to withstand 3 consecutive starts from a cold condition and 2 consecutive starts in a hot condition in an hour
- Cooling: IC411 for IES/IED motors, IC416 for IEI motors and 100 frame IEL motors, IC06 for IEL motors of Frame 112 and above
- Protection: IP55 for IES/IED and IEI motors and IP23 for IEL motors. Optionally IP56, IP65 and IP66 can be offered for IES/IED motors
- Optional accessories like Thermistors, RTDs, BTDS, Space heaters etc. can be provided
- Bearings:
  - Sealed for life bearings for IES/IEI frames 63-160, IEL frames 100 & 112
  - Regreasable bearings for IES/IED/IEI frames 180 – 450, IEL frames 132 – 180
  - Roller bearings on DE side for IES/IED/IEI by default for frames 280 – 450 (non 2 pole motors) and IEL frames 132-180. Optionally can be provided for IES/IEI frames 180-250
- Mountings available are B3/B5/B6/B7/B14/B34/B35/V1/V3/V5/V6
- Standards adhered to are:
  - Efficiency: IS12615:2011 and IEC60034-30 for IES/IED/IEI machines with 2/4/6 poles
  - Efficiency: IS325 for machines not covered by IEC60034-30
  - 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
  - Standard Outputs: IEC60072
  - Methods of determining losses and efficiency: IEC60034-2
  - Tolerances on Main Parameters: IEC60034-1

### BEARING DETAILS

FRAME	DE	NDE	FRAME	DE	NDE
63	6202 C3 ZZ	6202 C3 ZZ	180	6310 C3	6310 C3
71	6203 C3 ZZ	6203 C3 ZZ	200	6312 C3	6312 C3
80	6204 C3 ZZ	6204 C3 ZZ	225	6313 C3	6313 C3
90	6205 C3 ZZ	6205 C3 ZZ	250	6315 C3	6315 C3
100	6206 C3 ZZ	6206 C3 ZZ	280(2P)	6316 C3	6316 C3
112	6306 C3 ZZ	6306 C3 ZZ	280(4,6,8P)	NU 317 C3	6317 C3
132	6208 C3 ZZ	6208 C3 ZZ	315(2P)	6318 C3	6318 C3
160	6309 C3 ZZ	6209 C3 ZZ	315(4,6,8P)	NU 318 C3	6318 C3

# DUAL AIR CIRCUIT IE2 EFFICIENCY MOTORS

3000 RPM		IED MOTORS- 2POLE - 415V - 50Hz							
Output (kW)	Frame	Speed (RPM)	Efficiency (%)	Cos Ø	I <sub>FL</sub> (Amps)	I <sub>SC</sub> /I <sub>FL</sub> (pu)	T <sub>ST</sub> /T <sub>FL</sub> (pu)	T <sub>MAX</sub> /T <sub>FL</sub> (pu)	GD <sup>2</sup> (kgm <sup>2</sup> )
250	315	2979	95.0	0.90	407	7.0	1.6	2.6	22.89
315	315	2979	95.0	0.90	513	7.0	1.6	2.6	26.96
280	355	2980	95.0	0.90	456	7.0	1.6	2.6	15.70
355	355	2980	95.0	0.90	578	7.0	1.6	2.6	19.77
400	355	2980	95.0	0.90	651	7.0	1.6	2.6	22.28
500	355	2982	95.0	0.90	814	7.0	1.6	2.6	27.85
560	400	2985	95.0	0.91	901	7.0	1.6	2.6	37.07
630	400	2985	95.0	0.91	1014	7.0	1.6	2.6	41.70
710	400	2985	95.0	0.91	1143	7.0	1.6	2.6	47.00
800	450	2986	95.0	0.91	1287	7.0	0.9	2.6	64.50
900	450	2986	95.0	0.91	1448	7.0	0.9	2.6	72.50
1000	450	2986	95.0	0.91	1609	7.0	0.9	2.6	82.00

1500 RPM		IED MOTORS- 4POLE - 415V - 50Hz							
Output (kW)	Frame	Speed (RPM)	Efficiency (%)	Cos Ø	I <sub>FL</sub> (Amps)	I <sub>SC</sub> /I <sub>FL</sub> (pu)	T <sub>ST</sub> /T <sub>FL</sub> (pu)	T <sub>MAX</sub> /T <sub>FL</sub> (pu)	GD <sup>2</sup> (kgm <sup>2</sup> )
200	315	1486	95.1	0.86	340	7.0	1.7	2.6	18.10
225	315	1486	95.1	0.86	383	7.0	1.7	2.6	20.30
250	315	1488	95.1	0.87	420	7.0	1.8	2.7	22.50
280	315	1488	95.1	0.87	471	7.0	1.8	2.7	25.00
315	315	1488	95.1	0.87	530	7.0	1.8	2.7	28.00
225	355	1488	95.1	0.87	378	7.0	1.7	2.6	22.50
250	355	1488	95.1	0.87	420	7.0	1.7	2.6	24.00
280	355	1488	95.1	0.87	471	7.0	1.8	2.7	25.30
315	355	1488	95.1	0.87	530	7.0	1.8	2.7	28.40
355	355	1488	95.1	0.87	597	7.0	1.8	2.7	32.00
400	355	1488	95.1	0.87	673	7.0	1.8	2.8	36.00
500	355	1488	95.1	0.88	831	7.0	1.8	2.8	45.00
560	400	1490	95.1	0.88	931	7.0	1.7	2.8	62.60
630	400	1490	95.1	0.88	1047	7.0	1.7	2.7	70.50
710	400	1490	95.1	0.88	1180	7.0	1.7	2.7	79.40
800	450	1490	95.1	0.88	1330	7.0	1.7	2.7	100.70
900	450	1490	95.1	0.88	1496	7.0	1.7	2.7	113.30
1000	450	1490	95.1	0.89	1644	7.0	1.7	2.7	127.70
Not covered under IEC60034-30									

“ Higher outputs in smaller frame sizes..... ”

# DUAL AIR CIRCUIT IE2 EFFICIENCY MOTORS

## 1000 RPM

## IED MOTORS- 6POLE - 415V - 50Hz

Output (kW)	Frame	Speed (RPM)	Efficiency (%)	Cos Ø	I <sub>FL</sub> (Amps)	I <sub>SC</sub> /I <sub>FL</sub> (pu)	T <sub>ST</sub> /T <sub>FL</sub> (pu)	T <sub>MAX</sub> /T <sub>FL</sub> (pu)	GD <sup>2</sup> (kgm <sup>2</sup> )
200	315	988	95.0	0.85	345	7.0	1.6	2.6	35.00
225	315	988	95.0	0.85	388	7.0	1.6	2.6	39.50
250	315	988	95.0	0.85	431	7.0	1.7	2.6	43.50
200	355	989	95.0	0.85	345	7.0	1.7	2.6	36.00
225	355	989	95.0	0.85	388	7.0	1.7	2.6	39.00
250	355	989	95.0	0.85	431	7.0	1.7	2.6	43.00
280	355	989	95.0	0.85	482	7.0	1.7	2.6	48.00
315	355	990	95.0	0.85	543	7.0	1.7	2.6	54.00
355	355	990	95.0	0.85	612	7.0	1.6	2.6	60.50
400	355	990	95.0	0.86	681	7.0	1.6	2.5	68.00
450	400	991	95.0	0.86	766	7.0	1.6	2.6	90.00
500	400	991	95.0	0.86	851	7.0	1.6	2.6	100.60
560	400	991	95.0	0.86	954	7.0	1.6	2.6	113.30
630	450	991	95.0	0.86	1073	7.0	1.7	2.6	155.00
710	450	991	95.0	0.86	1209	7.0	1.6	2.6	174.00
800	450	991	95.0	0.86	1362	7.0	1.6	2.6	196.00

## 750 RPM

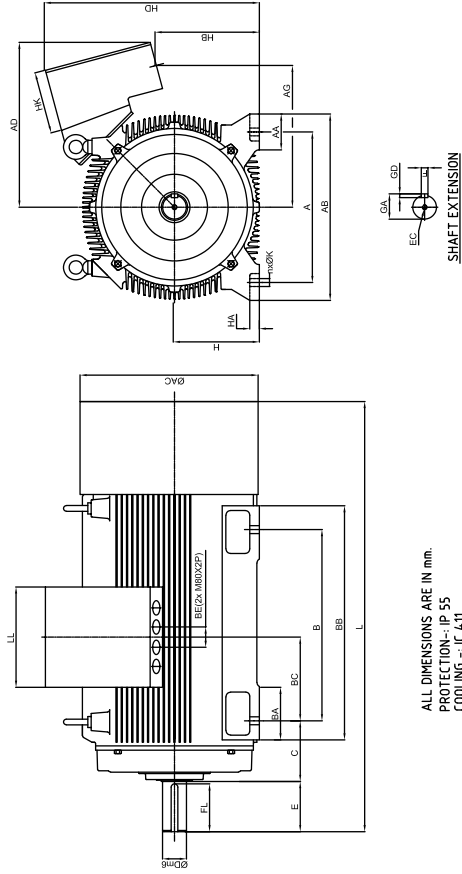
## IED MOTORS- 8POLE - 415V - 50Hz

Output (kW)	Frame	Speed (RPM)	Efficiency (%)	Cos Ø	I <sub>FL</sub> (Amps)	I <sub>SC</sub> /I <sub>FL</sub> (pu)	T <sub>ST</sub> /T <sub>FL</sub> (pu)	T <sub>MAX</sub> /T <sub>FL</sub> (pu)	GD <sup>2</sup> (kgm <sup>2</sup> )
160	315	739	94.5	0.81	291	6.5	1.6	2.6	35.00
180	315	739	94.5	0.81	327	6.5	1.6	2.6	35.00
200	315	739	94.7	0.81	363	6.5	1.7	2.5	45.00
160	355	740	94.7	0.81	290	6.5	1.7	2.5	40.00
180	355	740	94.7	0.81	326	6.5	1.7	2.5	45.00
200	355	740	94.7	0.81	363	6.5	1.7	2.5	50.00
225	355	740	94.7	0.81	408	6.5	1.7	2.5	56.00
250	355	741	95.2	0.81	451	6.5	1.6	2.5	62.00
315	355	741	95.3	0.81	568	6.5	1.6	2.5	78.00
355	400	742	95.6	0.81	638	6.5	1.7	2.6	110.20
400	400	742	95.7	0.81	718	6.5	1.6	2.5	124.00
450	400	742	95.8	0.81	807	6.5	1.6	2.5	140.00
500	450	744	96.0	0.81	895	6.5	1.6	2.5	180.00
560	450	744	96.1	0.81	1001	6.5	1.6	2.5	202.00
630	450	744	96.1	0.81	1126	6.5	1.6	2.5	227.50
Not covered under IEC60034-30									

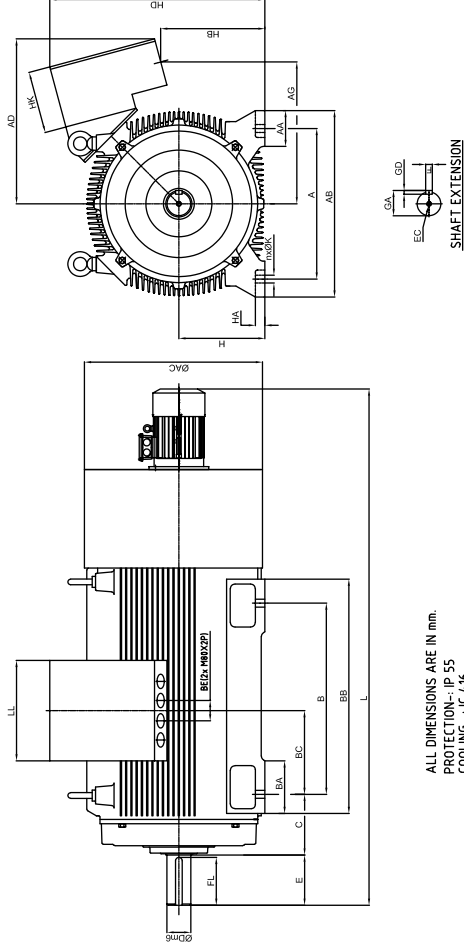
Dimensions on page: 17 (a)

“ Cost effective..... ”

### 17 (a) FRAME 315 TO 450 (IED), B3 MOUNTING



### 17 (b) FRAME 315 TO 450 (IEI), B3 MOUNTING



### FRAME 315 TO 400(IEI) : B3 MOUNTING

Frame	A	AA	AB	AB	AG	AD	AD	AG	B	BA	BB	BC	BE	C	ØD	E	H	HA	HB	HD	HK	nXØK	L	LL	GA	GD	F	EC
315	560	120	680	700	482	409	482	409	630	220	780	100	180	180	85	170	315	30	525	765	150	4XØ26	1476	305	91	14	22	M24
355	630	150	780	790	710	600	710	600	800	220	980	200	135	224	100	210	355	40	450	900	280	4XØ35	1800	420	106	16	28	M24
400	710	150	860	830	720	620	720	620	900	220	1080	250	135	224	110	210	400	45	450	970	280	4XØ35	1915	420	116	16	28	M24

### FRAME 355 AND 400(IEI) : B3 MOUNTING

Frame	A	AA	AB	AB	AG	AD	AD	AG	B	BA	BB	BC	BE	C	ØD	E	H	HA	HB	HD	HK	nXØK	L	LL	GA	GD	F	EC
355	630	150	780	790	710	600	710	600	800	220	980	200	135	224	100	210	355	40	450	900	280	4XØ35	2160	420	106	16	28	M24
400	710	150	860	830	720	620	720	620	900	220	1080	250	135	224	110	210	400	45	450	970	280	4XØ35	2200	420	116	16	28	M24



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