

HANZEL

Electric motor

HANZEL Worldwide Operations

Electric motor

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Standard Induction Motor

2016-2017 Version

About **HANZEL**

Electric motor

Founded in 1991, Hanzel is specialized in the electric motor industry for over 25 years. Hanzel has 9 subsidiaries and 4 manufacturing plants all over the world with over 1000 employees. The motors are promoted in over 50 countries.

Hanzel offers a wide range of electric motors from 0.09kW to 630kW. The main products are standard induction motors with efficiency of IE1, IE2 and IE3. Hanzel is also specialized in designing special motors for specific industries such as explosion-proof motor, inverter duty motor, two speed motor, smoke extraction motor and screw air compressor motor. The motors are widely used in industries including fans, pumps, compressors, conveyors, and etc.

Customer is our first concern, quality is our top honor. Hanzel continues to build distribution network world widely, which enables us to provide local stock and delivery, customized products and excellent customer services.



HANZEL
Electric motor



OVERVIEW

The IE1/IE2/IE3 series of 3 phase asynchronous motors are Totally Enclosed Fan Cooled (TEFC) with IP55 environmental protection. These motors are designed and manufactured in accordance with IEC standards.

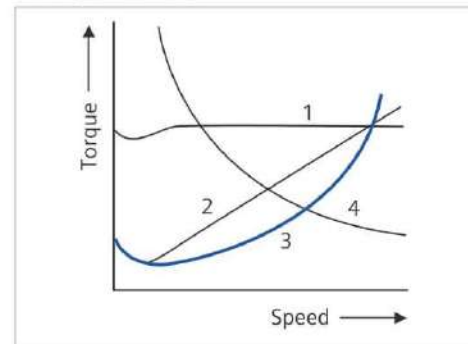
Standard Features

- **Frame material** : Cast Iron & Aluminum
- **Terminal box material** : Cast Iron & Aluminum
Plastic cable entry is standard (Metallic cable entry is optional)
- **Standard colour** : RAL 5010
- Specific wound stators supporting multiple 3PH mains supply voltages at 50Hz or 60Hz
- **Aluminum Frame sizes** : 63mm ~ 160mm
- **Cast Iron Frame sizes** : 80mm ~ 355mm
- **Rated power range** : 0.09kW ~ 355kW at 50Hz
- Standard mounting types and variations (IEC 60034-7)
TEFC with IP55 degree of protection (IEC 60034-5)
IP 55 Dust protected Jetting Water
IP 56 Dust protected Powerful Jetting
IP 65 Dust Tight Jetting Water
IP 66 Dust Tight Powerful Jetting
All Electric motor are protected to IP55 as a minimum Higher levels of protection are available on request ..

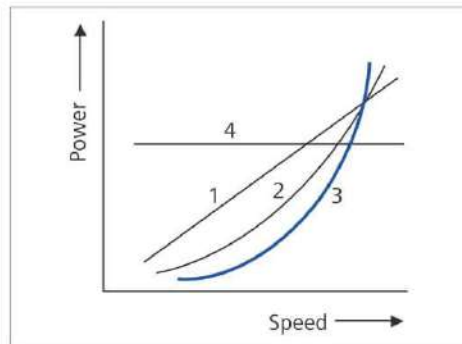
- Overload capacity of 1.5 times rated current for 2 minutes(IEC 60034-1)
- Oil seal as standard on DE and NDE rotor shaft for motor with FS 63-355
- Anti-condensation heater (space heater) as option
- Winding protection with PTC, PT130 or PT150 as option
- Insulation class: F, used according to temperature rise B
- Flexible cable entry (Rotatable terminal box)
- Rotor shaft with open or closed keyway (A type key) and NDE shaft extension
- Regreasing Nipples from size 160 and up

The IE1/IE2/IE3 is a general purpose motor with cast iron frame designed for constant or adjustable speed with continuous duty operation (S1) torque over a speed range.

Load torque characteristics



Torque / speed characteristic



Power / speed characteristic

1. Torque almost constant; power proportional to speed.
2. Torque increases proportionally with the speed; power proportional to the square of the speed.
3. Torque increases proportionally with the square of the speed; power proportional to the cube of the speed.
4. Torque decreases in inverse proportion to the speed; power constant.

Nameplate

Motor type
Duty cycle
Series No
Drive -end Bearing & Non-Drive-end bearing
Protection degree
Weight
Insulation class
Rated voltage
Rated frequency
RPM
Rated output
Electric current
Power factor

HANZEL MOTOR						CE IEC 60034-1	
TYPE	IE1-71M1-2	S1-100%		No.	0616200037001		
6202/C3	6202/C3	IP 55	6 kg	Ins. cl	F		
V	Hz	r/min	kW	COSφ	A		
220~240 △	50	2740	0.37	0.81	1.71~1.57		
380~420 Y	50	2740	0.37	0.81	0.99~0.90		
440~480 Y	60	3285	0.37	0.81	0.86~0.79		
HENGSHU HOLDINGS CO.,LTD							

Mechanical Design

Terminal box

Terminal boxes are top mounted as default on the motor. This box can be rotated by 4 X 90° to allow for cable entry from each direction. In addition the terminal box can be installed either on the Left Hand Side or Right Hand Side when viewed from the drive end (DE) side of the motor.

Motor Type	Frame Size	Protection degree	Rotation of Terminal box	Number of Cable gland	Terminal Box material	Terminal bus	Max.cable Size(mm²)	Cable entry size
IE1/IE2/IE3	63	IP 55	4x90°	1	Aluminum	M4	2	M18X1.5
	71	IP 55	4x90°	1	Aluminum	M4	2	M18X1.5
	80	IP 55	4x90°	1	Aluminum	M4	2.5	M20X1.5
	90	IP 55	4x90°	1	Aluminum	M5	2.5	M20X1.5
	100	IP 55	4x90°	1	Aluminum	M5	4	M25X1.5
	112	IP 55	4x90°	1 or 2	Aluminum	M5	4	M27X1.5
	132	IP 55	4x90°	1 or 2	Aluminum	M5	6	M27X1.5
	160	IP 55	4x90°	2	Cast-iron	M6	10	2-M32X1.5
	180	IP 55	4x90°	2	Cast-iron	M6	16	2-M32X1.5
	200	IP 55	4x90°	2	Cast-iron	M8	25	2-M40X1.5
	225	IP 55	4x90°	2	Cast-iron	M8	35	2-M40X1.5
	250	IP 55	4x90°	2	Cast-iron	M10	120	2-M50X1.5
	280	IP 55	4x90°	2	Cast-iron	M10	120	2-M50X1.5
	315	IP 55	4x90°	2	Cast-iron	M16	240	2-M63X1.5
	355	IP 55	4x90°	2	Cast-iron	M20	400	2-M72X2

Cooling and Ventilation

The standard motors from FS 80 ~ 355 are fitted with an radial flow fan for cooling in accordance with IEC 60034-6 cooling method. For applications where self ventilation is not adequate, an optional external blower can be ordered.

Bearing

All motors are supplied with the ball bearing as standard. FS 160 and above, roller bearings and angular contact ball bearings on options. These bearings are either of the sealed or regreaseable type.

Bearing type

Motor Type	Frame Size	Poles	Drive –end Bearing	Non-Drive-end bearing
IE1/IE2/IE3-63	63	2,4,6,8	6201 2RZC3	6201 2RZC3
IE1/IE2/IE3-71	71	2,4,6,8	6202 2RZC3	6202 2RZC3
IE1/IE2/IE3-80	80	2,4,6,8	6204 2RZC3	6204 2RZC3
IE1/IE2/IE3-90	90	2,4,6,8	6205 2RZC3	6205 2RZC3
IE1/IE2/IE3-100	100	2,4,6,8	6206 2RZC3	6206 2RZC3
IE1/IE2/IE3-112	112	2,4,6,8	6306 2RZC3	6306 2RZC3
IE1/IE2/IE3-132	132	2,4,6,8	6308 2RZC3	6308 2RZC3
IE1/IE2/IE3-160	160	2,4,6,8	6309 C3	6309 C3
IE1/IE2/IE3-180	180	2,4,6,8	6311 C3	6311 C3
IE1/IE2/IE3-200	200	2,4,6,8	6312 C3	6312 C3
IE1/IE2/IE3-225	225	2,4,6,8	6313 C3	6313 C3
IE1/IE2/IE3-250	250	2,4,6,8	6314 C3	6314 C3
IE1/IE2/IE3-280	280	2	6314 C3	6314 C3
IE1/IE2/IE3-280	280	4,6,8	6317 C3	6317 C3
IE1/IE2/IE3-315	315	2	6317 C3	6317 C3
IE1/IE2/IE3-315	315	4,6,8	6319 C3	6319 C3
IE1/IE2/IE3-355	355	2	6319 C3	6319 C3
IE1/IE2/IE3-355	355	4,6,8	6322 C3	6322 C3

General Specifications

Voltages / Frequencies

Standard Voltages are 380V-420 50Hz and 440-480 60Hz

Insulation

The components of the insulation system are selected so as to ensure good protection against chemically aggressive gases, vapours, dust, oil and air humidity.

All materials used for insulating the winding and winding ends correspond to insulating classes F or H according to IEC 60085:

- -Enamel-insulated copper wires with temperature index 200(Class H);
- -Insulating sheet on polyester base (Class F);
- -Impregnation with fenolic resins modified with polyester resins (Class H);

Limit temperature for insulating material according IEC60085

Insulation Class	Limit Temperature (°C)
B	130
F	155
H	180

Temperature Rise

Standard single-speed continuous duty (S1) motors have temperature rise within class B limit.Motors with higher output and pole-changing motors normally have tempure rise within Class F limit .

Insulation Class	Max Temperature Rise (°C)
B	80
F	105
H	125

Temperature rises specified at a reference ambient air temperature of 40°C

PTC temperature sensor (thermistors):

It consist of 3 sensors connected in series embedded in the stator winding .

Once reaching the operating temperature,the device quickly changes its resistance;

it must be connected to a suitable releasing device (supplied on motors 11kW and above)

Duty Cycles

S1 Continuous Duty	Operation under constant load,lasting long enough to allow the machine to reach thermal equilibrium.
S2 Short-Time Duty	Operation under constant load,for a time too short to allow the machine to reach thermal equilibrium.Idle time of the machine is long enough to allow the machine to cooldown to ambient temperature. Standard duration of short-term operation:10,30,60 and 90 minutes.
S3 Intermittent Periodic Duty	Operation under repeated,constant load in specified cycles.Neither operating nor resting period are long enough to allow the motor to reach thermal equilibrium.The starting losses are small and do not essentially influence the temperature rise.The nominal values of relative starting time are 15,25,40,60% at a daily 10-minute cycle.
S4 Intermittent Periodic Duty	Operation under repeated,constant load in specified cycles.The start of the motor influences the temperature rise.
S5 Intermittent Periodic Duty	Same as S4 operation,except that the electric braking of the machine has an essential influence on the temperature rise.
S6 Continuously Operation With Cyclic Load	Operation consisting of a continuous series of equal cycles.Each cycle is made up of no load and a constant load period.The cycle duration is not long enough to allow the machine to reach thermal equilibrium in one cycl.In order to define S6 operation , the relative starting time must be specified.
S7 Intermittent Periodic Duty with Starting and Braking	Uninterrupted operation with a series of constant loading and braking periods.The most demanding type of operation for the motor.In order to define this type of operation,The number of cycles per hour and the inertia constant must be specified.
S8 Intermittent Periodic Duty with pole Changing	This type of operation only exists with pole amplitude modulated motors.In this case the definition of operation must contain the following data for each pole: -Number of starts per hour -Inertia constant -Relative operation period

Electrical Design

Reliable quality and performance

To ensure reliable and long life, the windings are made of materials with class F temperature rise limited to class B (80K) .

Voltage and Frequency

Standard motor will operate on mains power supplies in accordance with IEC 60034-1 Category A (combination of voltage deviation $\pm 5\%$ and frequency deviation $\pm 2\%$) voltage and frequency fluctuations

Rated Output

Rated output power refers to continuous duty (S1) operation in accordance with IEC 60034-1 when operated at 40 °C ambient temperature and at site altitudes of 1000m or less. current overload is in accordance with IEC 60034-1(1.5 times for 2 minutes)

Environmental

- Suitable for IP55 installations
- Below or equal to 1000m above sea level
- Operating temperature between -20°C and 40°C
- Relative humidity

Temperature	Relative Humidity
-20°C ≤ T ≤ 20°C	100%
20°C < T ≤ 30°C	95%
30°C < T ≤ 40°C	55%

Note: For other requirements, Hanzel should be consulted

If environmental conditions vary from those listed above, please consult the chart below for output power derating factor.

	< 30°C	30~40°C	45°C	50°C	55°C	60°C
1000m	1.07	1.00	0.96	0.92	0.87	0.82
1500m	1.04	0.97	0.93	0.89	0.84	0.79
2000m	1.00	0.94	0.90	0.86	0.82	0.77
2500m	0.96	0.90	0.86	0.83	0.78	0.74
3000m	0.92	0.86	0.82	0.79	0.75	0.70
3500m	0.88	0.82	0.79	0.75	0.71	0.67
4000m	0.82	0.77	0.74	0.71	0.67	0.63

Space heater electrical data

Frame Size	80~90	100~112	132~160	180~200	225~280	315	355
Power(W)	20	30	40	50	60	80	110
Voltage(V)	220						

Converter fed application

IE1 / IE2 / IE3 motors are suitable for pumps, fans, compressors, textile machine and mechanical machine applications where variable or constant speed is required. When motor operating with a constant load by a speed lower than 50% of rated speed, External separately driven fan.

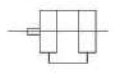
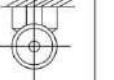
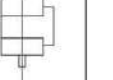
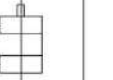
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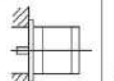
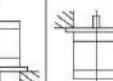
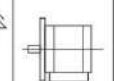
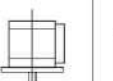
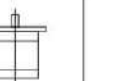
(1) In application where the motor is driven by a converter, the degree of electrical interference depends on the type of converter used (type, number of IGBTs, interference suppression measures, and manufacturer), cabling, distance and application requirements. (2) The installation guidelines of the converter manufacturer with regards to electromagnetic compatibility must be considered at all times during the design and implementation phases.

Technical data for separated fan

Motor frame size	Voltage (V)	Frequency (HZ)	Rated Output (kW)	Current Noise (A)	Speed (r/min)	Fan Power (m³/h)	Fan Pressure (Pa)
80	380V	50	30	0.08	2400	330	60
90	380V	50	52	0.2	2800	390	60
100	380V	50	52	0.2	2800	600	70
112	380V	50	52	0.2	2800	800	80
132	380V	50	40	0.1	2400	1000	70
160	380V	50	80	0.23	1400	1000	50
180	380V	50	80	0.23	1400	1200	55
200	380V	50	230	0.71	1400	1800	65
225	380V	50	230	0.71	1400	1800	65
250	380V	50	230	0.71	1400	3300	85
280	380V	50	230	0.71	1400	4000	110
315	380V	50	370	1.1	1250	6200	180
355	380V	50	550	1.8	1350	7000	180

Construction or mounting type

Construction type	With feet and without flange on the end-shield (DE)					
Mounting type	IM B3 FS 80 ~ 355	IM B6 FS 80 ~ 160	IM B7 FS 80 ~ 160	IM B8 FS 80 ~ 160	IM V5 FS 80 ~ 225	IM V6 FS 80 ~ 225
Diagram						

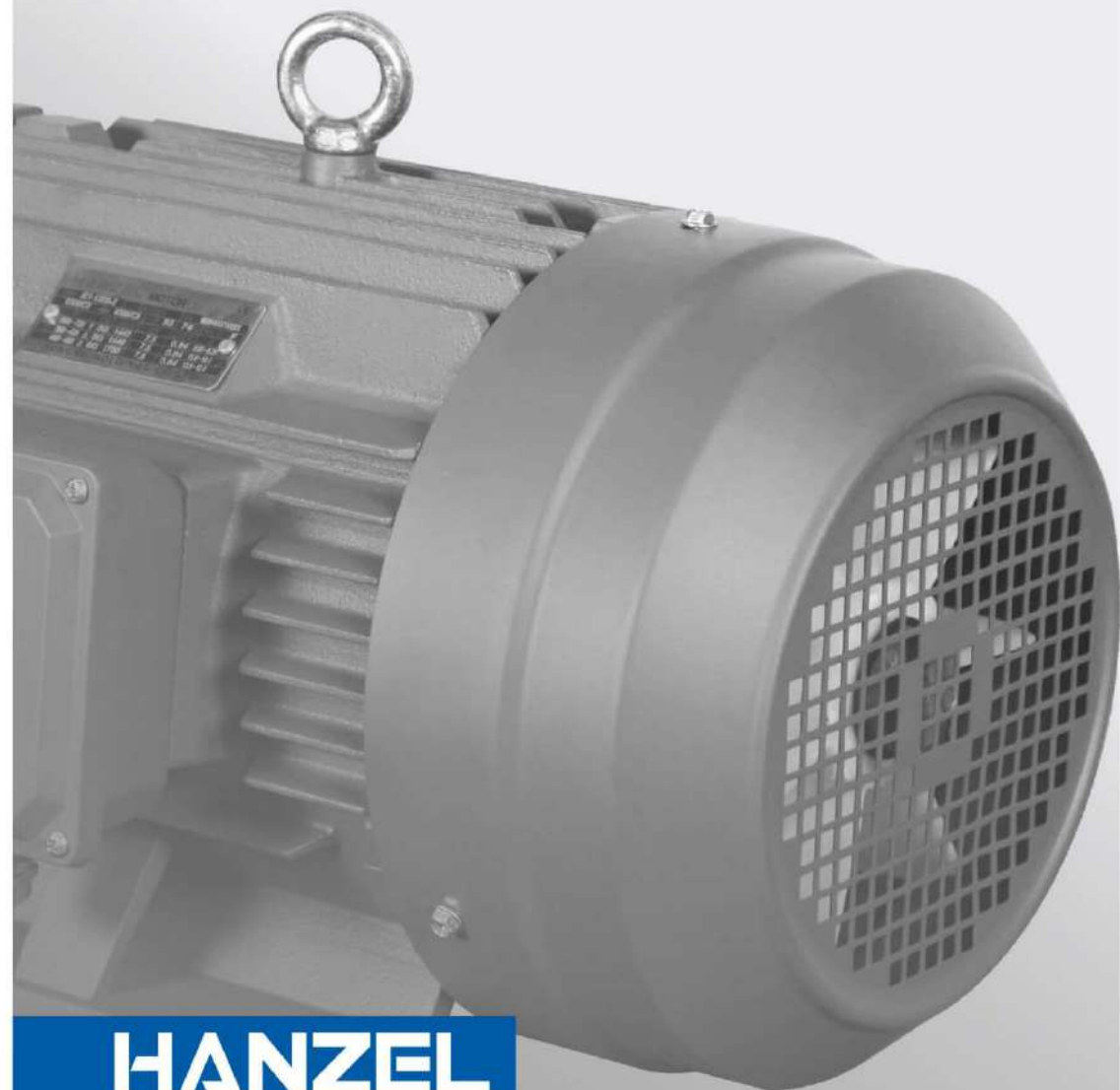
Construction type	Without feet and with flange on the end-shield (DE)			With feet and with flange on the end-shield (DE)		
Mounting type	IM B5 FS 80 ~ 280	IM V1 ¹⁾ FS 80 ~ 355	IM V3 FS 80 ~ 160	IM B35 FS 80 ~ 355	IM V15 FS 80 ~ 160	IM V36 FS 80 ~ 160
Diagram						

1) For IMV1 with canopy and without canopy, motor has different order number. Please find detailed information in "Technical data table".

Frequent malfunctions and solutions

Stoppage	Possible reasons	Check or calibration methods
1. No-load motor can't start	1. Circuit broken wires (one of the three is the root) 2. When the child three-phase winding of the a phase breakers ("Y" type of connection) 3. The power supply voltage and frequency is wrong	Check the power supply voltage or individual connection. Check the fuse, feeders of current and each phase of the winding resistance. Check voltage and frequency
2. Motor load in cannot begin at low load or no-load to start when, but in load increase speed that are even stop to plunge	1. The low voltage power supply 2. The group turns around the son between short circuit 3. The stator three-phase winding out-of-phase break line ("Δ" then method) 4. Overload	Check the line voltage; Check each phase windings and each phase no-load current; Check each phase winding resistance; Check the load
3. Motor stay in low rotation speed	1. A connect the stator winding, motor hair crosstalk 2. The rotor ring and guide bar among fracture	Check feeders current and lead wire mark; Check short-circuit current
4. Stator overheating	1. Feeders three roots there was a break or stator winding a phase open circuit 2. The power supply voltage too big or too low 3. overload 4. Same stator circle or short circuit 5. And ventilated bad	Check the fuse, line voltage and current between wire; Check the current in a feeders, Check the stator alternate with and ground insulation resistance; Check the winding resistance and stable way
5. Bearing overheating	1. The assembly wrong 2. The motor shaft and the dragging is not parallel axis 3. No lubricating oil, oil impurities or oily bad there 4. Belts tight 5. Don't balance of magnetic big suction	Check whether the rotor to turn; Correction two axis balance; Use the car wash oil changing; The belt or loose move feet; Check the air gap eccentric degrees
6. When feeder insurance facilities trip	1. A connect the stator winding 2. Put a "Y" shall meet type stator windings to become "Δ" 3. Winding base to short circuit or alternate with short circuit	Check mark and lead wire by law; Check mark and lead wire by law; Check the phase windings of the insulation and the same base of insulation
7. Mechanical vibration	1. Relet not only in balance quite a low speed don't vibration 2. the axial moving there 3. transmission belt joint answered the bad 4. pulley is not even	Check the balance situation; Check the clearance of bearing, and to make adjustments. To meet the belt; Check the pulley

Note: There are many reasons for the malfunctions, sometimes there might be several reasons for one problem, sometimes one reason might cause several problems. These listed in the table are just those frequent appeared, please don't hesitate to contact us while in need.



HANZEL
Electric motor
IE1

IE1 PERFORMANCE DATA

Type No.	Rated output (kW)	HP	Rated current IFL 380V A	Rated current IFL 400V A	Rated current IFL 420V A	Rated speed (r/min)	Rated current IFL 440V A	Rated current IFL 460V A	Rated current IFL 480V A	Rated speed (r/min)	EFF %	Power factor cos φ	Rated Torque N.m	Start Torque Ratio TST/IFL	Start Torque Ratio IST/IFL	Max. Torque Ratio TTM/IFL	Noise level LW dB(A)	Weight (Kg)
IE1	380~420V/50Hz					440~480V/50Hz												
	Synchronous speed 3000r/min																	
IE1-63M1-2	0.18	0.25	0.53	0.50	0.48	2720	0.46	0.44	0.42	3260	65.0	0.80	0.6	2.2	5.5	2.2	61	7
IE1-63M2-2	0.25	0.37	0.69	0.66	0.62	2720	0.60	0.57	0.55	3260	68.0	0.81	0.9	2.2	5.5	2.2	61	8
IE1-71M1-2	0.37	0.55	0.99	0.94	0.90	2740	0.86	0.82	0.78	3285	70.0	0.81	1.3	2.2	6.1	2.2	64	10
IE1-71M2-2	0.55	0.75	1.4	1.33	1.27	2740	1.21	1.16	1.11	3285	73.0	0.82	1.9	2.2	6.1	2.3	64	11
IE1-80M1-2	0.75	1.0	1.83	1.74	1.66	2825	1.58	1.51	1.45	3390	75.0	0.83	2.5	2.2	6.1	2.3	67	15
IE1-80M2-2	1.1	1.5	2.61	2.48	2.36	2825	2.25	2.16	2.07	3390	77.0	0.84	3.7	2.2	7.0	2.3	67	16
IE1-90S-2	1.5	2.0	3.46	3.29	3.13	2840	2.99	2.86	2.74	3405	79.0	0.84	5.0	2.2	7.0	2.3	72	19
IE1-90L-2	2.2	3.0	4.85	4.61	4.39	2840	4.19	4.01	3.84	3405	81.0	0.85	7.4	2.2	7.0	2.3	72	22
IE1-100L-2	3	4.0	6.34	6.02	5.74	2870	5.48	5.24	5.02	3440	83.0	0.87	10.0	2.2	7.5	2.3	76	32
IE1-112M-2	4	5.5	8.20	7.79	7.42	2880	7.08	6.77	6.49	3455	85.0	0.88	13.3	2.2	7.5	2.3	77	39
IE1-132S1-2	5.5	7.5	11.1	10.5	10.0	2900	9.59	9.17	8.79	3480	86.0	0.88	18.1	2.2	7.5	2.3	80	58
IE1-132S2-2	7.5	10	14.9	14.2	13.5	2900	12.9	12.3	11.8	3480	87.0	0.88	24.7	2.2	7.5	2.3	80	66
IE1-160M1-2	11	15	21.2	20.1	19.2	2930	18.3	17.5	16.8	3515	88.4	0.89	35.9	2.2	7.5	2.3	86	104
IE1-160M2-2	15	20	28.6	27.2	25.9	2930	24.7	23.6	22.6	3515	89.4	0.89	48.9	2.2	7.5	2.3	86	112
IE1-160L-2	18.5	25	34.7	33.0	31.4	2930	30.0	28.7	27.5	3515	90.0	0.90	60.3	2.2	7.5	2.3	86	132
IE1-180M-2	22	30	41.0	39.0	37.1	2940	35.4	33.9	32.5	3525	90.5	0.90	71.5	2.0	7.5	2.3	89	162
IE1-200L1-2	30	40	55.4	52.6	50.1	2950	47.9	45.8	43.9	3540	91.4	0.90	97.1	2.0	7.5	2.3	92	225
IE1-200L2-2	37	50	67.9	64.5	61.4	2950	58.6	56.1	53.8	3540	92.0	0.90	119.8	2.0	7.5	2.3	92	245
IE1-225M-2	45	60	82.1	78.0	74.3	2960	70.9	67.8	65.0	3550	92.5	0.90	145.2	2.0	7.5	2.3	92	290
IE1-250M-2	55	75	99.8	94.8	90.3	2965	86.2	82.4	79.0	3555	93.0	0.90	177.2	2.0	7.5	2.3	93	367
IE1-280S-2	75	100	135.3	128.5	122.4	2970	116.9	111.8	107.1	3560	93.6	0.90	241.2	2.0	7.5	2.3	94	495
IE1-280M-2	90	120	160.0	152.0	144.8	2970	138.2	132.2	126.7	3560	93.9	0.91	289.4	2.0	7.5	2.3	94	540
IE1-315S-2	110	150	195.4	185.6	176.8	2975	168.8	161.4	154.7	3570	94.0	0.91	353.1	1.8	7.1	2.2	96	880
IE1-315M-2	132	180	233.2	221.5	211.0	2975	201.4	192.6	184.6	3570	94.5	0.91	423.7	1.8	7.1	2.2	96	1000
IE1-315L1-2	160	220	279.3	265.3	252.7	2975	241.2	230.7	221.1	3570	94.6	0.92	513.6	1.8	7.1	2.2	99	1080
IE1-315L2-2	200	270	348.4	331.0	315.2	2975	300.9	287.8	275.8	3570	94.8	0.92	642.0	1.8	7.1	2.2	99	1130
IE1-355M-2	250	340	433.7	412.0	392.4	2980	374.6	358.3	343.4	3575	95.3	0.92	801.2	1.6	7.1	2.2	103	1560
IE1-355L-2	315	430	545.3	518.0	493.4	2980	470.9	450.5	431.7	3575	95.6	0.92	1009.5	1.6	7.1	2.2	103	1740

IE1 PERFORMANCE DATA

Type No.	Rated output (kW)	HP	Rated current IFL 380V A	Rated current IFL 400V A	Rated current IFL 420V A	Rated speed (r/min)	Rated current IFL 440V A	Rated current IFL 460V A	Rated current IFL 480V A	Rated speed (r/min)	EFF %	Power factor cos φ	Rated Torque N.m	Start Torque Ratio TST/IFL	Start Torque Ratio IST/IFL	Max Torque Ratio TTM/IFL	Noise level LW dB(A)	Weight (Kg)
IE1	380~420V/50Hz					440~480V/60Hz												
	Synchronous speed 1500r/min																	
IE1-63M1-4	0.12	0.18	0.44	0.42	0.40	1310	0.38	0.36	0.35	1570	57.0	0.72	0.9	2.1	4.4	2.2	52	7.5
IE1-63M2-4	0.18	0.25	0.62	0.59	0.56	1310	0.54	0.51	0.49	1570	60.0	0.73	1.3	2.1	4.4	2.2	52	8.5
IE1-71M1-4	0.25	0.37	0.79	0.75	0.71	1330	0.68	0.65	0.63	1595	65.0	0.74	1.8	2.1	5.2	2.2	55	10.5
IE1-71M2-4	0.37	0.55	1.12	1.06	1.01	1330	0.97	0.93	0.89	1595	67.0	0.75	2.7	2.1	5.2	2.2	55	11.5
IE1-80M1-4	0.55	0.75	1.57	1.49	1.42	1390	1.36	1.30	1.24	1665	71.0	0.75	3.8	2.4	5.2	2.3	58	15
IE1-80M2-4	0.75	1.00	2.05	1.95	1.85	1390	1.77	1.69	1.62	1665	73.0	0.76	5.2	2.3	6.0	2.3	58	16
IE1-90S-4	1.1	1.5	2.85	2.71	2.58	1400	2.46	2.35	2.26	1680	76.2	0.77	7.6	2.3	6.0	2.3	61	20
IE1-90L-4	1.5	2.0	3.68	3.50	3.33	1400	3.18	3.04	2.91	1680	78.5	0.79	10.3	2.3	6.0	2.3	61	23
IE1-100L1-4	2.2	3.0	5.09	4.84	4.61	1420	4.40	4.20	4.03	1700	81.0	0.81	14.9	2.3	7.0	2.3	64	31
IE1-100L2-4	3	4.0	6.73	6.39	6.09	1420	5.81	5.56	5.33	1700	82.6	0.82	20.3	2.3	7.0	2.3	64	35
IE1-112M-4	4	5.5	8.80	8.36	7.96	1440	7.60	7.27	6.97	1725	84.2	0.82	26.5	2.3	7.0	2.3	65	41
IE1-132S-4	5.5	7.5	11.7	11.1	10.6	1440	10.1	9.67	9.26	1725	85.7	0.83	36.5	2.3	7.0	2.3	71	60
IE1-132M-4	7.5	10.0	15.6	14.8	14.1	1440	13.5	12.9	12.4	1725	87.0	0.84	49.7	2.3	7.0	2.3	71	74
IE1-160M-4	11	15	22.5	21.4	20.4	1460	19.4	18.6	17.8	1750	88.4	0.84	72.0	2.2	7.0	2.3	75	108
IE1-160L-4	15	20	30.0	28.5	27.1	1460	25.9	24.8	23.8	1750	89.4	0.85	98.1	2.2	7.5	2.3	75	128
IE1-180M-4	18.5	25	36.3	34.5	32.8	1465	31.4	30.0	28.7	1755	90.5	0.86	120.2	2.2	7.5	2.3	76	158
IE1-180L-4	22	30	42.9	40.8	38.8	1465	37.1	35.4	34.0	1755	91.0	0.86	142.9	2.2	7.5	2.3	76	172
IE1-200L-4	30	40	58.0	55.1	52.5	1470	50.1	47.9	45.9	1760	92.0	0.86	194.9	2.2	7.2	2.3	79	241
IE1-225S-4	37	50	70.2	66.7	63.5	1475	60.6	58.0	55.6	1770	92.5	0.87	239.6	2.2	7.2	2.3	81	280
IE1-225M-4	45	60	85.0	80.8	76.9	1475	73.4	70.2	67.3	1770	92.8	0.87	291.4	2.2	7.2	2.3	81	305
IE1-250M-4	55	75	103.3	98.1	93.5	1475	89.2	85.3	81.8	1770	93.0	0.87	354.9	2.2	7.2	2.3	83	375
IE1-280S-4	75	100	139.3	132.3	126.0	1480	120.3	115.1	110.3	1775	93.8	0.87	484.0	2.2	7.2	2.3	86	507
IE1-280M-4	90	120	167.4	159.0	151.5	1480	144.6	138.3	132.5	1775	94.2	0.87	580.7	2.2	7.2	2.3	86	572
IE1-315S-4	110	150	201.0	191.0	181.9	1480	173.6	166.0	159.1	1775	94.5	0.88	709.8	2.1	6.9	2.2	93	930
IE1-315M-4	132	180	240.4	228.4	217.5	1480	207.6	198.6	190.3	1775	94.8	0.88	851.8	2.1	6.9	2.2	93	1050
IE1-315L1-4	160	220	287.8	273.4	260.4	1480	248.6	237.8	227.8	1775	94.9	0.89	1032.4	2.1	6.9	2.2	97	1110
IE1-315L2-4	200	270	359.8	341.8	325.5	1480	310.7	297.2	284.8	1775	95.0	0.89	1290.5	2.1	6.9	2.2	97	1180
IE1-355M-4	250	340	443.3	421.1	401.1	1490	382.9	366.2	351.0	1785	95.3	0.90	1602.3	2.1	6.9	2.2	101	1580
IE1-355L-4	315	430	558.6	530.7	505.4	1490	482.4	461.5	442.2	1785	95.6	0.90	2019.0	2.1	6.9	2.2	101	1750

IE1 PERFORMANCE DATA

Type No.	Rated output (kW)	HP	Rated current IFL 380V A	Rated current IFL 400V A	Rated current IFL 420V A	Rated speed (r/min)	Rated current IFL 440V A	Rated current IFL 460V A	Rated current IFL 480V A	Rated speed (r/min)	EFF %	Power factor cos φ	Rated Torque N.m	Start Torque Rated Torque TST/TFI	Start Torque Rated Torque IST/IFL	Max Torque Rated Torque TM/TFI	Noise level LW dB(A)	Weight (kg)
IE1	380~420V/50Hz					440~480V/60Hz												
	Synchronous speed 1000r/min																	
IE1-71M1-6	0.18	0.25	0.74	0.70	0.67	850	0.64	0.61	0.59	1020	56.0	0.66	2.0	1.9	4.0	2.0	52	10
IE1-71M2-6	0.25	0.37	0.95	0.90	0.86	850	0.82	0.78	0.75	1020	59.0	0.68	2.8	1.9	4.0	2.0	52	11
IE1-80M1-6	0.37	0.50	1.30	1.24	1.18	900	1.12	1.07	1.03	1080	62.0	0.70	4.0	1.9	4.7	2.0	54	15
IE1-80M2-6	0.55	0.75	1.79	1.70	1.62	900	1.55	1.48	1.42	1080	65.0	0.72	5.9	1.9	4.7	2.1	54	16
IE1-90S-6	0.75	1.00	2.29	2.18	2.07	910	1.98	1.89	1.81	1090	69.0	0.72	7.9	2.0	5.5	2.1	57	20
IE1-90L-6	1.1	1.5	3.18	3.02	2.88	910	2.75	2.63	2.52	1090	72.0	0.73	11.5	2.0	5.5	2.1	57	23
IE1-100L-6	1.5	2.0	4.00	3.80	3.62	930	3.45	3.30	3.17	1115	76.0	0.75	15.6	2.0	5.5	2.1	61	30
IE1-112M-6	2.2	3.0	5.57	5.29	5.04	940	4.81	4.60	4.41	1125	79.0	0.76	22.5	2.0	6.5	2.1	65	39
IE1-132S-6	3	4.0	7.40	7.03	6.70	960	6.39	6.11	5.86	1150	81.0	0.76	29.8	2.1	6.5	2.1	69	55
IE1-132M1-6	4	5.5	9.75	9.26	8.82	960	8.42	8.05	7.72	1150	82.0	0.76	39.8	2.1	6.5	2.1	69	68
IE1-132M2-6	5.5	7.5	12.9	12.3	11.7	960	11.1	10.7	10.2	1150	84.0	0.77	54.4	2.1	6.5	2.1	69	73
IE1-160M-6	7.5	10.0	17.2	16.3	15.6	970	14.9	14.2	13.6	1160	86.0	0.77	73.8	2.0	6.5	2.1	73	104
IE1-160L-6	11	15	24.5	23.3	22.2	970	21.2	20.2	19.4	1160	87.5	0.78	108.3	2.0	6.5	2.1	73	126
IE1-180L-6	15	20	31.6	30.0	28.6	970	27.3	26.1	25.0	1160	89.0	0.81	147.7	2.0	7.0	2.1	73	168
IE1-200L1-6	18.5	25	38.6	36.7	34.9	975	33.3	31.9	30.6	1170	90.0	0.81	180.3	2.1	7.0	2.1	76	215
IE1-200L2-6	22	30	44.7	42.5	40.4	975	38.6	36.9	35.4	1170	90.0	0.83	214.4	2.1	7.0	2.1	76	238
IE1-225M-6	30	40	59.3	56.3	53.7	980	51.2	49.0	47.0	1175	91.5	0.84	292.3	2.0	7.0	2.1	76	280
IE1-250M-6	37	50	71.1	67.6	64.3	980	61.4	58.7	56.3	1175	92.0	0.86	360.6	2.1	7.0	2.1	78	350
IE1-280S-6	45	60	85.9	81.6	77.7	980	74.2	71.0	68.0	1175	92.5	0.86	438.5	2.1	7.0	2.0	80	463
IE1-280M-6	55	75	104.7	99.5	94.7	980	90.4	86.5	82.9	1175	92.8	0.86	536.0	2.1	7.0	2.0	80	506
IE1-315S-6	75	100	141.7	134.6	128.2	985	122.4	117.1	112.2	1180	93.5	0.86	727.2	2.0	7.0	2.0	85	860
IE1-315M-6	90	120	169.5	161.0	153.4	985	146.4	140.0	134.2	1180	93.8	0.86	872.6	2.0	7.0	2.0	85	980
IE1-315L1-6	110	150	206.7	196.4	187.0	985	178.5	170.8	163.6	1180	94.0	0.86	1066.5	2.0	6.7	2.0	85	1060
IE1-315L2-6	132	180	244.7	232.5	221.4	985	211.3	202.1	193.7	1180	94.2	0.87	1279.8	2.0	6.7	2.0	85	1135
IE1-355M1-6	160	220	292.3	277.7	264.5	990	252.4	241.5	231.4	1185	94.5	0.88	1543.4	1.9	6.7	2.0	92	1480
IE1-355M2-6	200	270	365.4	347.1	330.6	990	315.6	301.9	289.3	1185	94.7	0.88	1929.3	1.9	6.7	2.0	92	1640
IE1-355L-6	250	340	456.8	434.0	413.3	990	394.5	377.4	361.6	1185	94.9	0.88	2411.6	1.9	6.7	2.0	92	1810

IE1 PERFORMANCE DATA

Type No.	Rated output (kW)	HP	Rated current IFL 380V A	Rated current IFL 400V A	Rated current IFL 420V A	Rated speed (r/min)	Rated current IFL 440V A	Rated current IFL 460V A	Rated current IFL 480V A	Rated speed (r/min)	EFF %	Power factor cos φ	Rated Torque N.m	Start Torque Rated Torque TST/TFL	Start Torque Rated Torque IST/IFL	Max. Torque Rated Torque TM/TFL	Noise level LW dB(A)	Weight (Kg)
IE1	380~420V/50Hz					440~480V/60Hz												
	Synchronous speed 750r/min																	
IE1-80M1-8	0.18	0.25	0.88	0.84	0.80	650	0.76	0.73	0.70	780	51.0	0.61	2.7	1.8	3.3	1.9	52	15
IE1-80M2-8	0.25	0.37	1.15	1.09	1.04	650	0.99	0.95	0.91	780	54.0	0.61	3.7	1.8	3.3	1.9	52	16
IE1-90S-8	0.37	0.50	1.49	1.42	1.35	660	1.29	1.23	1.18	790	62.0	0.61	5.3	1.8	4.0	1.9	56	20
IE1-90L-8	0.55	0.75	2.17	2.06	1.96	660	1.87	1.79	1.72	790	63.0	0.61	7.8	1.8	4.0	2.0	56	24
IE1-100L1-8	0.75	1.00	2.40	2.28	2.17	690	2.07	1.98	1.90	825	71.0	0.67	10.5	1.8	4.0	2.0	59	28
IE1-100L2-8	1.1	1.5	3.32	3.15	3.00	690	2.87	2.74	2.63	825	73.0	0.69	15.4	1.8	5.0	2.0	59	30
IE1-112M-8	1.5	2.0	4.40	4.18	3.98	700	3.80	3.63	3.48	840	75.0	0.69	20.8	1.8	5.0	2.0	61	38
IE1-132S-8	2.2	3.0	6.04	5.74	5.46	710	5.22	4.99	4.78	850	78.0	0.71	29.8	1.8	6.0	2.0	64	54
IE1-132M-8	3	4.0	7.90	7.51	7.15	710	6.82	6.53	6.25	850	79.0	0.73	40.6	1.8	6.0	2.0	64	63
IE1-160M1-8	4	5.5	10.3	9.79	9.32	720	8.90	8.51	8.15	860	81.0	0.73	53.1	1.9	6.0	2.0	68	91
IE1-160M2-8	5.5	7.5	13.6	12.9	12.3	720	11.8	11.2	10.8	860	83.0	0.74	73.0	2.0	6.0	2.0	68	103
IE1-160L-8	7.5	10.0	17.8	16.9	16.1	720	15.4	14.7	14.1	860	85.5	0.75	99.5	2.0	6.0	2.0	68	128
IE1-180L-8	11	15	25.1	23.9	22.7	730	21.7	20.7	19.9	875	87.5	0.76	143.9	2.0	6.6	2.0	70	165
IE1-200L-8	15	20	34.1	32.4	30.9	730	29.5	28.2	27.0	875	88.0	0.76	196.2	2.0	6.6	2.0	73	224
IE1-225S-8	18.5	25	41.1	39.1	37.2	730	35.5	34.0	32.5	875	90.0	0.76	242.0	1.9	6.6	2.0	73	255
IE1-225M-8	22	30	47.4	45.0	42.9	730	40.9	39.2	37.5	875	90.5	0.78	287.8	1.9	6.6	2.0	73	292
IE1-250M-8	30	40	63.4	60.2	57.4	735	54.8	52.4	50.2	880	91.0	0.79	389.8	1.9	6.6	2.0	75	368
IE1-280S-8	37	50	77.8	73.9	70.4	735	67.2	64.3	61.6	880	91.5	0.79	480.7	1.9	6.6	2.0	76	475
IE1-280M-8	45	60	94.1	89.4	85.1	735	81.3	77.7	74.5	880	92.0	0.79	584.7	1.9	6.6	2.0	76	527
IE1-315S-8	55	75	111.2	106.6	100.6	735	96.0	91.9	88.0	880	92.8	0.81	714.6	1.8	6.6	2.0	82	840
IE1-315M-8	75	100	151.3	143.7	136.9	735	130.7	125.0	119.6	880	93.0	0.81	974.5	1.8	6.6	2.0	82	1020
IE1-315L1-8	90	120	177.8	168.9	160.9	740	153.6	146.9	140.8	885	93.8	0.82	1189.4	1.8	6.6	2.0	82	1100
IE1-315L2-8	110	150	216.8	206.0	196.2	740	187.2	179.1	171.6	885	94.0	0.82	1429.3	1.8	6.4	2.0	82	1180
IE1-355M1-8	132	180	261.0	248.0	236.1	740	225.4	215.6	206.6	885	93.7	0.82	1703.5	1.8	6.4	2.0	90	1610
IE1-355M2-8	160	220	314.7	299.0	284.7	740	271.8	260.0	249.1	885	94.2	0.82	2064.9	1.8	6.4	2.0	90	1700
IE1-355L-8	200	270	387.4	368.0	350.5	740	334.6	320.0	306.7	885	94.5	0.83	2581.1	1.8	6.4	2.0	90	1850
Synchronous speed 600r/min																		
IE1-315S-10	45	60	99.6	94.6	90.1	590	86.0	82.3	78.9	705	91.5	0.75	728.4	1.5	6.2	2.0	82	830
IE1-315M-10	55	75	121.1	115.1	109.6	590	104.6	100.0	95.9	705	92.0	0.75	890.3	1.5	6.2	2.0	82	960
IE1-315L1-10	75	100	162.1	154.0	146.7	590	140.0	133.9	128.3	705	92.5	0.76	1214.0	1.5	6.2	2.0	82	1080
IE1-315L2-10	90	120	191.0	181.5	172.8	590	165.0	157.8	151.2	705	93.0	0.77	1456.8	1.5	6.2	2.0	82	1150
IE1-355M1-10	110	150	229.9	218.4	208.0	590	196.6	189.9	182.0	705	93.2	0.78	1780.5	1.3	6.0	2.0	90	1565
IE1-355M2-10	132	180	275.0	261.3	248.8	590	237.5	227.2	217.7	705	93.5	0.78	2136.6	1.3	6.0	2.0	90	1685
IE1-355L-10	160	220	333.3	316.6	301.6	590	287.9	275.3	263.9	705	93.5	0.78	2589.8	1.3	6.0	2.0	90	1830

IE2 PERFORMANCE DATA

Type No.	Rated output (kW)	HP	Rated current IFL 380V A	Rated current IFL 400V A	Rated current IFL 420V A	Rated speed (r/min)	Rated current IFL 440V A	Rated current IFL 460V A	Rated current IFL 480V A	Rated speed (r/min)	EFF %	Power factor cos φ	Rated Torque N·m	Start Torque Rated Torque TST/TPL	Start Torque Rated Torque IST/ISL	Max Torque Rated Torque Tm/TPL	Noise level LW dB(A)	Weight (Kg)
IE2																		
	380~420V/50Hz					440~480V/60Hz												
	Synchronous speed 3000 r/min																	
IE2-80M1-2	0.75	1.0	1.8	1.71	1.63	2855	1.55	1.49	1.43	3425	77.4	0.82	2.51	2.2	7.0	2.3	62	16
IE2-80M2-2	1.1	1.5	2.5	2.38	2.26	2870	2.16	2.07	1.98	3440	79.6	0.83	3.66	2.2	7.3	2.3	62	17
IE2-90S-2	1.5	2.0	3.3	3.14	2.99	2865	2.85	2.73	2.61	3435	81.3	0.84	5	2.2	7.6	2.3	67	20
IE2-90L-2	2.2	3.0	4.7	4.47	4.25	2870	4.06	3.88	3.72	3440	83.2	0.85	7.32	2.2	7.6	2.3	67	23
IE2-100L-2	3	4.0	6.2	5.89	5.61	2875	5.35	5.12	4.91	3450	84.6	0.87	10	2.2	7.8	2.3	74	34
IE2-112M-2	4	5.5	8.0	7.60	7.24	2910	6.91	6.61	6.33	3490	85.8	0.88	13.1	2.2	8.3	2.3	77	42
IE2-132S1-2	5.5	7.5	10.9	10.4	9.86	2935	9.41	9.00	8.63	3520	87.0	0.88	17.9	2.0	8.3	2.3	79	62
IE2-132S2-2	7.5	10	14.5	13.8	13.1	2930	12.5	12.0	11.5	3515	88.1	0.89	24.4	2.0	7.9	2.3	79	70
IE2-160M1-2	11	15	21	20.0	19.0	2950	18.1	17.4	16.6	3540	89.4	0.89	35.6	2.0	8.1	2.3	81	112
IE2-160M2-2	15	20	28.4	27.0	25.7	2945	24.5	23.5	22.5	3530	90.3	0.89	48.6	2.0	8.1	2.3	81	120
IE2-160L-2	18.5	25	34.7	33.0	31.4	2945	30.0	28.7	27.5	3530	90.9	0.89	60	2.0	8.2	2.3	81	138
IE2-180M-2	22	30	41.1	39.1	37.2	2950	35.5	34.0	32.5	3540	91.3	0.89	71.2	2.0	8.2	2.3	83	180
IE2-200L1-2	30	40	55.7	52.9	50.4	2960	48.1	46.0	44.1	3550	92.0	0.89	96.8	2.0	7.6	2.3	84	240
IE2-200L2-2	37	50	68.3	64.9	61.8	2960	59.0	56.4	54.1	3550	92.5	0.89	119	2.0	7.6	2.3	84	260
IE2-225M-2	45	60	82.7	78.6	74.8	2965	71.4	68.3	65.5	3555	92.9	0.89	145	2.0	7.7	2.3	86	305
IE2-250M-2	55	75	101	96.0	91.4	2970	87.2	83.4	80.0	3560	93.2	0.89	177	2.0	7.1	2.3	89	386
IE2-280S-2	75	100	137	130.2	124.0	2975	118.3	113.2	108.5	3570	93.8	0.89	241	1.8	7.1	2.3	91	515
IE2-280M-2	90	120	163	154.9	147.5	2970	140.8	134.7	129.0	3560	94.1	0.89	289	1.8	7.1	2.3	91	560
IE2-315S-2	110	150	197	187.2	178.2	2975	170.1	162.7	156.0	3570	94.3	0.90	353	1.8	7.1	2.3	92	920
IE2-315M-2	132	180	236	224.2	213.5	2975	203.8	195.0	186.8	3570	94.6	0.90	424	1.8	7.1	2.3	92	1035
IE2-315L1-2	160	220	282	267.9	255.1	2975	243.8	233.0	223.3	3570	94.8	0.91	514	1.8	7.2	2.3	92	1115
IE2-315L2-2	200	270	352	334.4	318.5	2975	304.0	290.8	278.7	3570	95.0	0.91	642	1.8	7.2	2.2	92	1165
IE2-355M-2	250	340	439	417.1	397.2	2960	379.1	362.7	347.5	3575	95.0	0.91	801	1.6	7.2	2.2	100	1616
IE2-355L-2	315	430	554	526.3	501.2	2980	478.5	457.7	438.6	3575	95.0	0.91	1009	1.6	7.2	2.2	100	1806

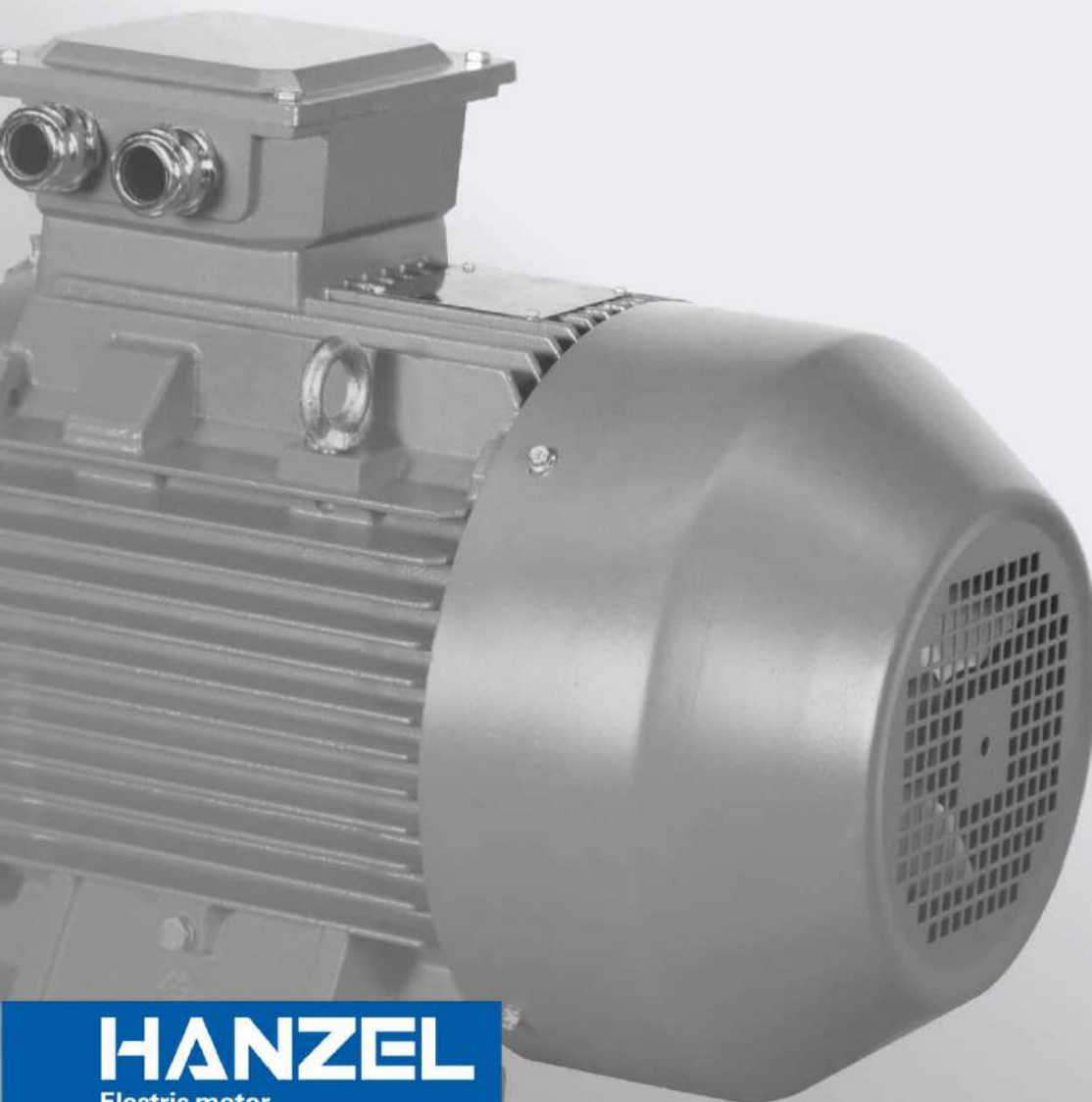
HANZEL
Electric motor
IE2

IE2 PERFORMANCE DATA

Type No.	Rated output (kW)	HP	Rated current IFL 380V A	Rated current IFL 400V A	Rated current IFL 420V A	Rated speed (r/min)	Rated current IFL 440V A	Rated current IFL 460V A	Rated current IFL 480V A	Rated speed (r/min)	EFF %	Power factor cos φ	Rated Torque N.m	Start Torque TST/IFL	Start Torque TFL/IFL	Max Torque TTM/IFL	Noise level LW dB(A)	Weight (Kg)
IE2																		
	380~420V/50Hz					440~480V/60Hz												
	Synchronous speed 1500r/min																	
IE2-80M2-4	0.75	1.0	1.9	1.81	1.72	1425	1.84	1.57	1.50	1710	79.6	0.76	5.03	2.3	6.6	2.3	56	18
IE2-90S-4	1.1	1.5	2.7	2.57	2.44	1420	2.33	2.23	2.14	1700	81.4	0.77	7.4	2.3	6.8	2.3	59	21
IE2-90L-4	1.5	2.0	3.5	3.33	3.17	1420	3.02	2.89	2.77	1700	82.8	0.78	10.1	2.3	7.0	2.3	59	24
IE2-100L1-4	2.2	3.0	5	4.75	4.52	1430	4.32	4.13	3.96	1715	84.3	0.80	14.7	2.3	7.6	2.3	64	34
IE2-100L2-4	3	4.0	6.6	6.27	5.97	1430	5.70	5.45	5.23	1715	85.5	0.81	20	2.3	7.6	2.3	64	38
IE2-112M-4	4	5.5	8.7	8.27	7.87	1450	7.51	7.19	6.89	1740	86.6	0.81	26.3	2.2	7.8	2.3	65	45
IE2-132S-4	5.5	7.5	11.6	11.0	10.5	1465	10.0	9.58	9.18	1755	87.7	0.82	35.9	2.0	7.9	2.3	71	64
IE2-132M-4	7.5	10.0	15.5	14.7	14.0	1465	13.4	12.8	12.3	1755	88.7	0.83	48.9	2.0	7.5	2.3	71	78
IE2-160M-4	11	15	22.4	21.3	20.3	1470	19.4	18.5	17.7	1760	89.8	0.83	71.5	2.0	7.7	2.3	73	120
IE2-160L-4	15	20	29.9	28.4	27.1	1470	25.8	24.7	23.7	1760	90.6	0.84	97.4	2.0	7.8	2.3	73	138
IE2-180M-4	18.5	25	36.3	34.5	32.8	1470	31.4	30.0	28.7	1760	91.2	0.85	120	2.0	7.8	2.3	76	174
IE2-180L-4	22	30	42.9	40.8	38.8	1465	37.1	35.4	34.0	1755	91.6	0.85	143	2.0	7.8	2.3	76	188
IE2-200L-4	30	40	58.1	55.2	52.6	1475	50.2	48.0	46.0	1770	92.3	0.85	194	2.0	7.3	2.3	76	256
IE2-225S-4	37	50	70.5	67.0	63.8	1480	60.9	58.2	55.8	1775	92.7	0.86	239	2.0	7.4	2.3	78	300
IE2-225M-4	45	60	85.4	81.1	77.3	1480	73.8	70.6	67.6	1775	93.1	0.86	290	2.0	7.4	2.3	78	325
IE2-250M-4	55	75	104	98.8	94.1	1485	89.8	85.9	82.3	1780	93.5	0.86	354	2.0	7.4	2.3	79	400
IE2-280S-4	75	100	139	132.1	125.8	1490	120.1	114.8	110.0	1785	94.0	0.87	481	2.0	6.9	2.3	80	543
IE2-280M-4	90	120	165	156.8	149.3	1485	142.5	136.3	130.6	1780	94.2	0.88	579	2.0	6.9	2.3	80	608
IE2-315S-4	110	150	199	189.1	180.1	1485	171.9	164.4	157.5	1780	94.5	0.89	707	2.0	7.0	2.2	88	970
IE2-315M-4	132	180	238	226.1	215.3	1485	205.6	196.6	188.4	1780	94.7	0.89	849	2.0	7.0	2.2	88	1090
IE2-315L1-4	160	220	285	270.8	257.9	1485	246.1	235.4	225.6	1780	94.9	0.90	1029	2.0	7.1	2.2	88	1160
IE2-315L2-4	200	270	355	337.3	321.2	1485	306.6	293.3	281.0	1780	95.1	0.90	1286	2.0	7.1	2.2	88	1230
IE2-355M-4	250	340	444	421.8	401.7	1490	383.5	366.8	351.5	1785	95.1	0.90	1602	2.0	7.1	2.2	95	1640
IE2-355L-4	315	430	559	531.1	505.8	1490	482.8	461.8	442.5	1785	95.1	0.90	2019	2.0	7.1	2.2	95	1810

IE2 PERFORMANCE DATA

Type No.	Rated output (kW)	HP	Rated current IFL 380V A	Rated current IFL 400V A	Rated current IFL 420V A	Rated speed (r/min)	Rated current IFL 440V A	Rated current IFL 460V A	Rated current IFL 480V A	Rated speed (r/min)	EFF %	Power factor cos φ	Rated Torque N.m	Start Torque TST/IFL	Start Torque TST/IFL	Max Torque TTM/IFL	Noise level LW dB(A)	Weight (Kg)
IE2		380~420V/50Hz					440~480V/60Hz											
		Synchronous speed 1000r/min																
IE2-90S-6	0.75	1.0	2.1	2.00	1.90	935	1.81	1.73	1.66	1120	75.9	0.71	7.66	2.0	6.0	2.1	57	21
IE2-90L-6	1.1	1.5	3	2.85	2.71	935	2.59	2.48	2.38	1120	78.1	0.72	11.2	2.0	6.0	2.1	57	24
IE2-100L-6	1.5	2.0	4	3.80	3.62	945	3.45	3.30	3.17	1130	79.8	0.72	15.2	2.0	6.5	2.1	61	33
IE2-112M-6	2.2	3.0	5.7	5.42	5.16	965	4.92	4.71	4.51	1155	81.8	0.72	21.8	2.0	6.6	2.1	65	42
IE2-132S-6	3	4.0	7.6	7.22	6.88	975	6.56	6.28	6.02	1170	83.3	0.72	29.4	1.9	6.8	2.1	69	59
IE2-132M1-6	4	5.5	9.7	9.22	8.78	975	8.38	8.01	7.68	1170	84.6	0.74	39.2	1.9	6.8	2.1	69	72
IE2-132M2-6	5.5	7.5	13	12.4	11.8	975	11.2	10.7	10.3	1170	86.0	0.75	53.9	1.9	7.0	2.1	69	78
IE2-160M-6	7.5	10.0	16.8	16.0	15.2	975	14.5	13.9	13.3	1170	87.2	0.78	73.5	2.0	7.0	2.1	70	112
IE2-160L-6	11	15	23.9	22.7	21.6	975	20.6	19.7	18.9	1170	88.7	0.79	108	2.0	7.2	2.1	70	134
IE2-180L-6	15	20	31.8	30.2	28.8	980	27.5	26.3	25.2	1175	89.7	0.80	146	1.9	7.3	2.1	73	178
IE2-200L1-6	18.5	25	38.9	37.0	35.2	980	33.6	32.1	30.8	1175	90.4	0.80	180	1.9	7.3	2.1	73	226
IE2-200L2-6	22	30	45.4	43.1	41.1	980	39.2	37.5	35.9	1175	90.9	0.81	214	1.9	7.4	2.1	73	243
IE2-225M-6	30	40	60.6	57.6	54.8	985	52.3	50.1	48.0	1180	91.7	0.82	291	1.9	6.9	2.1	74	295
IE2-250M-6	37	50	73.5	69.8	66.5	985	63.5	60.7	58.2	1180	92.2	0.83	359	1.9	7.1	2.1	76	368
IE2-280S-6	45	60	86.8	82.5	78.5	990	75.0	71.7	68.7	1185	92.7	0.85	434	1.9	7.3	2.0	78	496
IE2-280M-6	55	75	104	98.8	94.1	990	89.8	85.9	82.3	1185	93.1	0.86	531	1.9	7.3	2.0	78	545
IE2-315S-6	75	100	145	137.8	131.2	990	125.2	119.8	114.8	1185	93.7	0.84	723	1.9	6.6	2.0	83	910
IE2-315M-6	90	120	171	162.5	154.7	990	147.7	141.3	135.4	1185	94.0	0.85	868	1.9	6.7	2.0	83	1030
IE2-315L1-6	110	150	209	198.6	189.1	990	180.5	172.7	165.5	1185	94.3	0.85	1081	1.9	6.7	2.0	83	1120
IE2-315L2-6	132	180	247	234.7	223.5	990	213.3	204.0	195.5	1185	94.6	0.86	1273	1.9	6.8	2.0	83	1185
IE2-355M1-6	160	220	298	283.1	269.6	990	257.4	246.2	235.9	1185	94.8	0.86	1543	1.9	6.8	2.0	85	1530
IE2-355M2-6	200	270	372	353.4	336.6	990	321.3	307.3	294.5	1185	95.0	0.86	1929	1.9	6.8	2.0	85	1690
IE2-355L-6	250	340	465	441.8	420.7	990	401.6	384.1	368.1	1185	95.0	0.86	2412	1.9	6.8	2.0	85	1855



HANZEL
Electric motor
IE3

IE3 PERFORMANCE DATA

Type No.	Rated output (kW)	HP	Rated current IFL 380V A	Rated current IFL 400V A	Rated current IFL 420V A	Rated speed (r/min)	Rated current IFL 440V A	Rated current IFL 460V A	Rated current IFL 480V A	Rated speed (r/min)	EFF %	Power factor cos φ	Rated Torque N.m	Start Torque Rated Torque TST/ITL	Start Torque Rated Torque IST/ITL	Max Torque Rated Torque TMT/ITL	Noise level LW dB(A)	Weight (Kg)
IE3																		
	380~420V/50Hz					440~480V/60Hz												
	Synchronous speed 3000 r/min																	
IE3-80M1-2	0.75	1.0	1.7	1.62	1.54	2870	1.47	1.40	1.35	3440	80.7	0.82	2.5	2.2	7.0	2.3	62	18
IE3-80M2-2	1.1	1.5	2.4	2.28	2.17	2875	2.07	1.98	1.90	3450	82.7	0.83	3.65	2.2	7.3	2.3	62	19
IE3-90S-2	1.5	2.0	3.2	3.04	2.90	2880	2.76	2.64	2.53	3455	84.2	0.84	4.97	2.2	7.6	2.3	67	22
IE3-90L-2	2.2	3.0	4.6	4.37	4.16	2880	3.97	3.80	3.64	3455	85.9	0.85	7.3	2.2	7.6	2.3	67	25
IE3-100L-2	3	4.0	6	5.70	5.43	2880	5.18	4.96	4.75	3455	87.1	0.87	9.95	2.2	7.8	2.3	74	37
IE3-112M-2	4	5.5	7.8	7.41	7.06	2915	6.74	6.44	6.18	3495	88.1	0.88	13.1	2.2	8.3	2.3	77	47
IE3-132S1-2	5.5	7.5	10.6	10.1	9.59	2935	9.15	8.76	8.39	3520	89.2	0.88	17.9	2.0	8.3	2.3	79	68
IE3-132S2-2	7.5	10	14.4	13.7	13.0	2930	12.4	11.9	11.4	3515	90.1	0.88	24.4	2.0	7.9	2.3	79	75
IE3-160M1-2	11	15	20.6	19.6	18.6	2950	17.8	17.0	16.3	3540	91.2	0.89	35.6	2.0	8.1	2.3	81	122
IE3-160M2-2	15	20	27.9	26.5	25.2	2945	24.1	23.1	22.1	3530	91.9	0.89	48.6	2.0	8.1	2.3	81	131
IE3-160L-2	18.5	25	34.2	32.5	30.9	2945	29.5	28.3	27.1	3530	92.4	0.89	60	2.0	8.2	2.3	81	150
IE3-180M-2	22	30	40.5	38.5	36.6	2950	35.0	33.5	32.1	3540	92.7	0.89	71.2	2.0	8.2	2.3	83	193
IE3-200L1-2	30	40	54.9	52.2	49.7	2965	47.4	45.4	43.5	3555	93.3	0.89	96.6	2.0	7.6	2.3	84	255
IE3-200L2-2	37	50	67.4	64.0	61.0	2965	58.2	55.7	53.4	3555	93.7	0.89	119	2.0	7.6	2.3	84	275
IE3-225M-2	45	60	80.8	76.8	73.1	2965	69.8	66.8	64.0	3555	94.0	0.90	145	2.0	7.7	2.3	86	326
IE3-250M-2	55	75	98.5	93.6	89.1	2975	85.1	81.4	78.0	3570	94.3	0.90	177	2.0	7.7	2.3	89	417
IE3-280S-2	75	100	134	127.3	121.2	2975	115.7	110.7	106.1	3570	94.7	0.90	241	1.8	7.1	2.3	91	540
IE3-280M-2	90	120	160	152.0	144.8	2975	138.2	132.2	126.7	3570	95.0	0.90	289	1.8	7.1	2.3	91	596
IE3-315S-2	110	150	195	185.3	176.4	2985	168.4	161.1	154.4	3580	95.2	0.90	352	1.8	7.1	2.3	92	965
IE3-315M-2	132	180	234	222.3	211.7	2985	202.1	193.3	185.3	3580	95.4	0.90	422	1.8	7.1	2.3	92	1070
IE3-315L1-2	160	220	279	265.1	252.4	2985	241.0	230.5	220.9	3580	95.6	0.91	512	1.8	7.2	2.3	92	1150
IE3-315L2-2	200	270	349	331.6	315.8	2985	301.4	288.3	276.3	3580	95.8	0.91	640	1.8	7.2	2.2	92	1210
IE3-355M-2	250	340	436	414.2	394.5	2985	376.6	360.2	345.2	3580	95.8	0.91	800	1.6	7.2	2.2	100	1670
IE3-355L-2	315	430	549	521.6	496.7	2985	474.1	453.5	434.6	3580	95.8	0.91	1008	1.6	7.2	2.2	100	1865

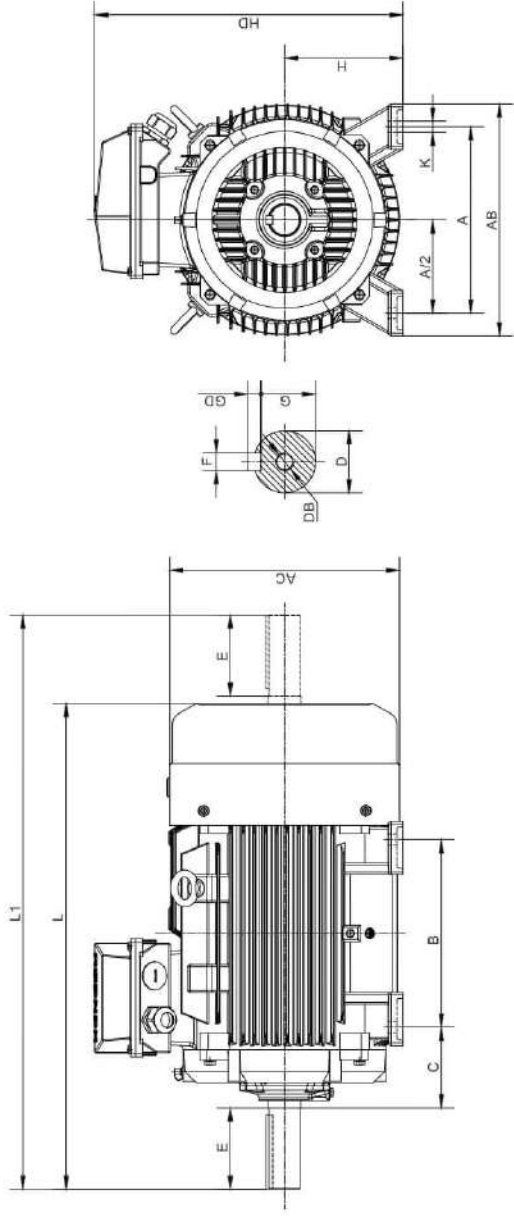
IE3 PERFORMANCE DATA

Type No.	Rated output (kW)	HP	Rated current IFL 380V A	Rated current IFL 400V A	Rated current IFL 420V A	Rated speed (r/min)	Rated current IFL 440V A	Rated current IFL 460V A	Rated current IFL 480V A	Rated speed (r/min)	EFF %	Power factor cos φ	Rated Torque N·m	Start Torque Rated Torque TST/TFL	Start Torque Rated Torque IST/IFL	Max Torque Rated Torque TM/TFL	Noise level LW dB(A)	Weight (Kg)
IE3																		
	380~420V/50Hz					440~480V/60Hz												
	Synchronous speed 1500 r/min																	
IE3-80M2-4	0.75	1.0	1.80	1.71	1.63	1430	1.55	1.49	1.43	1715	82.5	0.75	5.01	2.30	6.60	2.30	56	20
IE3-90S-4	1.1	1.5	2.80	2.47	2.35	1430	2.25	2.15	2.06	1715	84.1	0.76	7.35	2.30	6.80	2.30	59	23
IE3-90L-4	1.5	2.0	3.50	3.33	3.17	1430	3.02	2.89	2.77	1715	85.3	0.77	10	2.30	7.00	2.30	59	26
IE3-100L1-4	2.2	3.0	4.80	4.56	4.34	1440	4.15	3.97	3.80	1725	86.7	0.81	14.6	2.30	7.60	2.30	64	37
IE3-100L2-4	3	4.0	6.30	5.99	5.70	1440	5.44	5.20	4.99	1725	87.7	0.82	19.9	2.30	7.60	2.30	64	42
IE3-112M-4	4	5.5	8.40	7.98	7.60	1455	7.25	6.94	6.65	1745	88.6	0.82	26.3	2.20	7.80	2.30	65	49
IE3-132S-4	5.5	7.5	11.2	10.6	10.1	1465	9.67	9.25	8.87	1755	89.6	0.83	35.9	2.00	7.90	2.30	71	70
IE3-132M-4	7.5	10.0	15.0	14.3	13.6	1465	13.0	12.4	11.9	1755	90.4	0.84	48.9	2.00	7.50	2.30	71	84
IE3-160M-4	11	15	21.5	20.4	19.5	1470	18.6	17.8	17.0	1760	91.4	0.85	71.5	2.00	7.70	2.30	73	130
IE3-160L-4	15	20	28.8	27.4	26.1	1470	24.9	23.8	22.8	1760	92.1	0.86	97.4	2.00	7.60	2.30	73	148
IE3-180M-4	18.5	25	35.3	33.5	31.9	1470	30.5	29.2	28.0	1760	92.6	0.86	120	2.00	7.80	2.30	76	192
IE3-180L-4	22	30	41.8	39.7	37.8	1470	36.1	34.5	33.1	1760	93.0	0.86	143	2.00	7.80	2.30	76	206
IE3-200L-4	30	40	56.6	53.8	51.2	1475	48.9	46.8	44.8	1770	93.6	0.86	194	2.00	7.30	2.30	76	275
IE3-225S-4	37	50	69.6	66.1	63.0	1480	60.1	57.5	55.1	1775	93.9	0.86	239	2.00	7.40	2.30	78	325
IE3-225M-4	45	60	84.4	80.2	76.4	1480	72.9	69.7	66.8	1775	94.2	0.86	290	2.00	7.40	2.30	78	350
IE3-250M-4	55	75	103.0	97.9	93.2	1485	89.0	85.1	81.5	1780	94.6	0.86	354	2.00	7.40	2.30	79	435
IE3-280S-4	75	100	136.0	129.2	123.1	1490	117.5	112.4	107.7	1785	95.0	0.88	481	2.00	6.70	2.30	80	585
IE3-280M-4	90	120	163.0	154.9	147.5	1490	140.8	134.7	129.0	1785	95.2	0.88	577	2.00	6.90	2.30	80	653
IE3-315S-4	110	150	197.0	187.2	178.2	1490	170.1	162.7	156.0	1785	95.4	0.89	705	2.00	7.00	2.20	88	1010
IE3-315M-4	132	180	236.0	224.2	213.5	1490	203.8	195.0	186.8	1785	95.6	0.89	846	2.00	7.00	2.20	88	1140
IE3-315L1-4	160	220	285.0	270.8	257.9	1490	246.1	235.4	225.6	1785	95.8	0.89	1026	2.00	7.10	2.20	88	1210
IE3-315L2-4	200	270	352.0	334.4	318.5	1490	304.0	290.8	278.7	1785	96.0	0.90	1282	2.00	7.10	2.20	88	1285
IE3-355M-4	250	340	440.0	418.0	398.1	1495	380.0	363.5	348.3	1790	96.0	0.90	1597	2.00	7.10	2.20	95	1680
IE3-355L-4	315	430	554.0	526.3	501.2	1495	478.5	457.7	438.6	1790	96.0	0.90	2012	2.00	7.10	2.20	95	1870

IE3 PERFORMANCE DATA

Type No.	Rated output (kW)	HP	Rated current IFL 380V A	Rated current IFL 400V A	Rated current IFL 420V A	Rated speed (r/min)	Rated current IFL 440V A	Rated current IFL 460V A	Rated current IFL 480V A	Rated speed (r/min)	EFF %	Power factor cos φ	Rated Torque N·m	Start Torque Rated Torque TST/TFL	Start Torque Rated Torque IST/IFL	Max Torque Rated Torque Tm/TFL	Noise level LW dB(A)	Weight (Kg)
IE3			380~420V/50Hz				440~480V/60Hz											
Synchronous speed 1000 r/min																		
IE3-90S-6	0.75	1.0	2	1.90	1.81	945	1.73	1.65	1.58	1130	78.9	0.71	7.58	2.00	6.00	2.10	57	23
IE3-90L-6	1.1	1.5	2.8	2.66	2.53	950	2.42	2.31	2.22	1140	81.0	0.73	11.1	2.00	6.00	2.10	57	26
IE3-100L-6	1.5	2.0	3.8	3.61	3.44	950	3.28	3.14	3.01	1140	82.5	0.73	15.1	2.00	6.50	2.10	61	36
IE3-112M-6	2.2	3.0	5.4	5.13	4.89	965	4.66	4.46	4.28	1155	84.3	0.74	21.8	2.00	6.60	2.10	65	46
IE3-132S-6	3	4.0	7.2	6.84	6.51	975	6.22	5.95	5.70	1170	85.6	0.74	29.4	1.90	6.80	2.10	69	63
IE3-132M1-6	4	5.5	9.5	9.03	8.60	975	8.20	7.85	7.52	1170	86.8	0.74	39.2	1.90	6.80	2.10	69	76
IE3-132M2-6	5.5	7.5	12.7	12.1	11.5	975	11.0	10.5	10.1	1170	88.0	0.75	53.9	1.90	7.00	2.10	69	83
IE3-160M-6	7.5	10.0	16.2	15.4	14.7	980	14.0	13.4	12.8	1175	89.1	0.79	73.1	1.90	7.00	2.10	70	120
IE3-160L-6	11	15	23.1	22.0	20.9	980	20.0	19.1	18.3	1175	90.3	0.80	107	1.90	7.20	2.10	70	145
IE3-180L-6	15	20	30.9	29.4	28.0	980	26.7	25.5	24.5	1175	91.2	0.81	146	1.90	7.30	2.10	73	188
IE3-200L1-6	18.5	25	37.8	35.9	34.2	985	32.7	31.2	29.9	1180	91.7	0.81	197	1.90	7.30	2.10	73	242
IE3-200L2-6	22	30	44.8	42.6	40.5	985	38.7	37.0	35.5	1180	92.2	0.81	213	1.90	7.40	2.10	73	262
IE3-225M-6	30	40	59.1	56.2	53.5	985	51.0	48.8	46.8	1180	92.9	0.83	291	1.90	6.90	2.10	74	320
IE3-250M-6	37	50	71.7	68.1	64.9	985	61.9	59.2	56.8	1180	93.3	0.84	359	1.90	7.10	2.10	76	398
IE3-280S-6	45	60	85.8	81.5	77.6	990	74.1	70.9	67.9	1185	93.7	0.85	434	1.90	7.30	2.00	78	532
IE3-280M-6	55	75	103	97.9	93.2	990	89.0	85.1	81.5	1185	94.1	0.86	531	1.90	7.30	2.00	78	583
IE3-315S-6	75	100	143	135.9	129.4	990	123.5	118.1	113.2	1185	94.6	0.84	723	1.90	6.60	2.00	83	965
IE3-315M-6	90	120	170	161.5	153.8	990	146.8	140.4	134.6	1185	94.9	0.85	888	1.90	6.70	2.00	83	1085
IE3-315L1-6	110	150	207	196.7	187.3	990	178.8	171.0	163.9	1185	95.1	0.85	1061	1.90	6.70	2.00	83	1175
IE3-315L2-6	132	180	244	231.8	220.8	990	210.7	201.6	193.2	1185	95.4	0.86	1273	1.90	6.80	2.00	83	1230
IE3-355M1-6	160	220	296	281.2	267.8	995	255.6	244.5	234.3	1190	95.6	0.86	1536	1.90	6.80	2.00	85	1575
IE3-355M2-6	200	270	365	346.8	330.2	995	315.2	301.5	289.0	1190	95.8	0.87	1920	1.90	6.80	2.00	85	1760
IE3-355L-6	250	340	456	433.2	412.6	995	393.8	376.7	361.0	1190	95.8	0.87	2399	1.90	6.80	2.00	85	1920

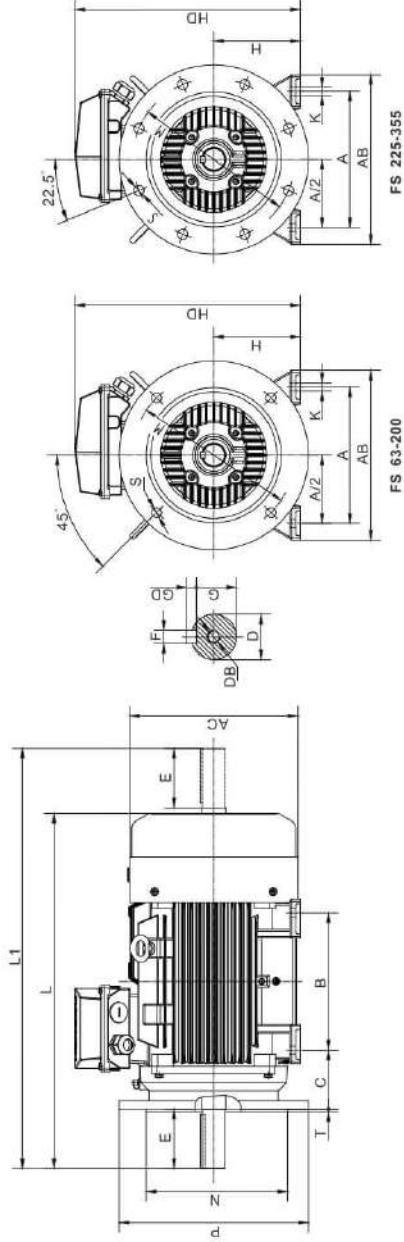
DIMENSIONS MOUNT **B3**



FS 63-355
 NOTES FS 63-90 motor without eyebolts

机座号 Frame size	极数 Poles	安装尺寸 Mounting Dimensions										外形尺寸 Overall Dimensions					
		A	A/2	B	C	D	E	F	G	H	K	DB	GD	AB	AC	AD	L1
63M	2, 4	100	50	80	40	11	23	6	8.5	63	7	M4	4	135	130	180	230
71M	2, 4, 6	112	56	90	45	14	30		11	71		M5	5	150	145	195	250
80M		125	62.5	100	50	19	40		15.5	80	+0.360 0	M6	6	165	175	220	295
90S		140	70	100	56	24	50	8	20	99	10	M8		180	195	250	320
90L		160	80	140	63		60		24	100		M10	7	205	215	270	345
100L		180	95	140	70	28	60		24	112	12			230	240	300	400
112M		190	95	140	70	±2.0			33	132		M12		270	275	345	470
132S	2, 4, 6, 8	216	108	140	89	38	80	10	37	150	15	M16	8	320	330	420	510
132M		254	127	254	108	42	110	14	42.5	190				355	380	455	615
160M		279	139.5	279	121	48	110	14	49	200				395	420	505	670
160L		318	159	305	133	55	140	18	53	225				435	470	580	740
180M	2	356	178	311	149	55	110	15	53	250	19			490	510	615	815
180L	4, 6, 8	406	203	349	188	60	140	18	58	280				550	590	660	885
200L	2	457	228.5	388	190	75	170	22	67.5	315	24	M20	11	635	645	800	1055
225S	4, 8	508	254	457	216	85	170	22	71	355				710	730	880	1180
225M	2	550	275	500	225	90	180	22	75	385				780	800	960	1270
250M	2	600	300	550	250	100	200	22	80	425				850	870	1040	1375
250L	4, 6, 8	650	325	600	275	110	220	22	85	465				920	940	1110	1465
280S	2	700	350	650	300	120	240	22	90	505				1000	1020	1200	1565
280M	4, 6, 8	750	375	700	325	130	260	22	95	545				1080	1100	1300	1685
315S	2	800	400	750	350	140	280	22	100	585				1160	1180	1380	1765
315M	4, 6, 8, 10	850	425	800	375	150	300	22	105	625				1240	1260	1460	1845
315L	2	900	450	850	400	160	320	22	110	665				1320	1340	1540	1925
355M	2	1000	500	950	450	180	360	22	120	745				1460	1480	1680	2065
355L	4, 6, 8, 10	1100	550	1050	500	200	400	22	130	825				1600	1620	1820	2245

DIMENSIONS MOUNT **B35**



FS 63-355
 NOTES FS 63-90 motor without eyebolts

机座号 尺寸		安装尺寸 Mounting Dimensions												外型尺寸 Overall Dimensions											
Frame Size	A	A/2	B	C	D	E	F	G	H	K	M	N	P	R	S	T	Flange Holes	DB	GD	AB	AC	AD	L	L1	
63M	2.4	100	50	80	40	11	-0.008	23	4	6.5	7	115	95	-0.013	140	10	0	M4	4	135	130	180	230	255	
71M	2.4/6	112	56	90	45	14	-0.030	30	5	0	145	130	110	-0.03	160		-0.300	M5	5	150	145	195	256	290	
80M		125	62.5	100	50	19		40	6	15.5	10	165	130		200	±1.5	3.5	M6	6	165	175	220	286	340	
90S		140	70	125	56	24	-0.008	50		20	90	215	180	-0.014	250			M8		180	195	250	346	400	
90L		160	80	140	63	28	-0.004	60	8	0	100	215	180	-0.01	300	-0.030		M10	7	205	215	270	386	450	
112M	2.4/6/8	190	95	140	70	±2.0		80		100	112	265	230		350	±2.0	4	M12		230	240	300	400	465	
132S		216	108	178	89	39		80	10	33	132	300	250		400	15				270	275	345	470	555	
132M																			8						
160M		254	127	254	210	42	-0.018	12		37	160	300	250	-0.018	450	19	0	M16		320	330	420	670	785	
160L		276	138	241	210	48		110	14	42.5	180	350	350	-0.013	500	±3.0	0			355	380	455	740	855	
180M		318	159	305	241	55			16	49	200	350	300	-0.016	400		-0.300			395	420	505	770	885	
180L																			11						
200L		356	178	311	279	60		140	18	53	225	400	350	-0.019	450	19	0		10	435	470	560	820	935	
225M	48																								
225M	48																								
250M	48	406	203	349	168	60		18		63	0					0			11	450	510	615	910	1055	
280S	2																								
280S	48	457	228.5	398	75	-0.030	140	20		58	24	500	450	-0.020	550			M20	12	550	580	680			
280M	2																		11						
280M	48																		12						
315S	2																								
315S	48	508	254	457	80	-0.032	140	20		71	28	600	550	-0.022	600	±4.0	8		11						
315M	2	560	280	508	508	85	-0.035	140	18	71	315	600	550	-0.022	660				11						
315M	48																		14						
315L	2																		11						
315L	48	560	280	508	508	85	-0.035	140	18	71	315	600	550	-0.022	660				14						
355M	2																		14						
355M	48	630	315	560	560	90	-0.038	140	20	86	355	740	680	-0.025	800	24	6		12						
355L	2	810	395	630	530	95	-0.038	140	20	86	355	740	680	-0.025	800			M24	14	7300	710	880	1530	1710	
355L	48																	M20	12						
355L	48																	M24	14						