

IE2 & IE3
Energy Efficient
3 Phase
LV Induction Motors



Prima Series

CE IE2 & IE3

HAVELLS-LAFERT MOTORS



Prima Series

IE2 & IE3 Motors

Havells is the first in India to introduce complete range of IE2, IE3 Efficiency Motors



Overview

The New Standard IEC60034-30/IS12615:2011 defines and harmonizes worldwide the IE efficiencies classes for low-voltage three-phase cage Induction motors.

The IE Efficiency classes defined as:

IE1-Standard Efficiency (Comparable to EFF2)

IE2-High Efficiency (Comparable to EFF1)

IE3 – Premium Efficiency

The efficiencies required by the new standards can only be achieved by the increased use of active and higher quality of materials and more complexity production technique etc. Hence purchase price of motor will increase accordingly.

What is IE?

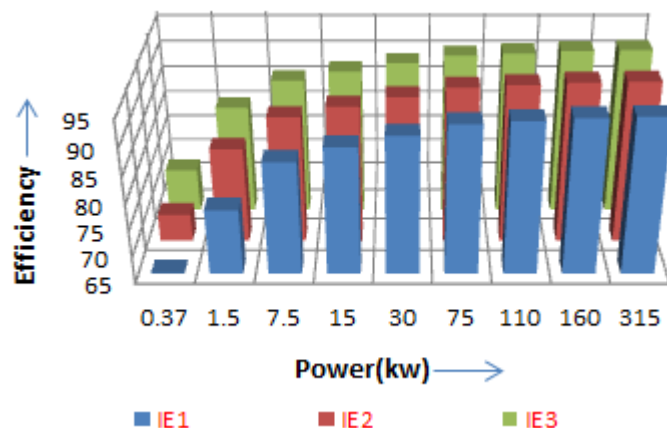
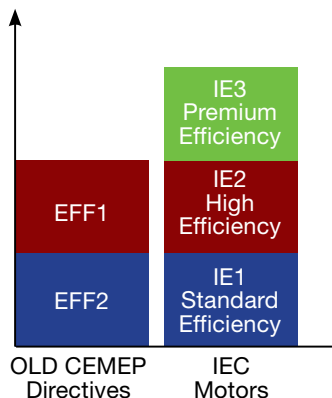
IE is "International Efficiency" with class 1, 2 & 3 i.e. IE1 & IE2 & IE3. The new standard IEC 60034-30: 2008 & IS12615:2011 defines these classes. At the same time, with the IEC 60034-2-1: 2007 standard, a new procedure for the determination of efficiency has been introduced which also contributes to international harmonization. This standard is made to unify motor testing procedure, determination of efficiency and product labeling requirements. This is to enable motor user worldwide to easily identify premium efficiency products.

Need of Improved Efficiency

Over 70% of all electrical energy consumed in industries is used by the motors, hence improving the efficiency of electric motors can save energy as well as operating cost, which is more than its purchase cost.



The New Efficiency classes and its equivalence with other nomenclature is given as below:





Method of testing Efficiency

In addition to the new nomenclature, the measuring technique has also changed. The efficiency levels according to EN 60034-30 are measured with the new method stipulated in EN 60034-2-1. The Stray load losses are no longer assumed to be sum of 0.5%; instead, they are determined by making measurements.

This new method for IE motors helps to generate more exact data regarding stray load loss and will show a reduction in the measured efficiency level for the motor. Thus for a

The New IS 21615: 2011 is applicable for three-phase, 50Hz, single speed & Squirrel cage induction motors.

Havells range of motors have the following specification:

• Voltage	:	Rated voltage ≤1000V
• Output	:	Rated output 0.37kW to 315kW
• No of Poles	:	2, 4 or 6 poles
• Frame Dimensions	:	Meet frame size to output relation as covered in IS: 1231
• Ambient Temperature	:	Designed for an ambient temperature not exceeding 50°C and altitude not exceeding 1000
• Balance Voltage	:	Designed for operation on virtually sinusoidal and balanced Voltage conditions as defined in 7.2.1 of IS/IEC 60034-1
• Degree of protection	:	Degree of protection IP55
• Cooling Method	:	Method of cooling IC411 in accordance with IS 6362/IEC 60034-6

given efficiency, an IE2 motor will need to have more active material as compared to EFF1 motor to compensate for the increase in measured losses.

Havells IE2 & IE3 motors conform to IS 12615:2011 and IEC 60034-30:2008

- Suitable for continuous process industries, where high energy saving is essential.
- Short Payback Period.
- Enhanced motor life.
- Less maintenance.

Cost effectiveness:

Saving concluded as follows:

kW = Output of motor

IE1 = Efficiency of IE1 motors

IE2 = Efficiency of IE2 motors

PD = Price Difference between two efficiencies;

$$X = \frac{\text{kW}}{\text{IE1}} - \frac{\text{kW}}{\text{IE2}}$$

Saving = (X x Working hrs x Working days x Tariff x 100)

Payback Period = (PD/Saving) x 12 months

Special Application

The major benefit to use these motors are in continuous duty application like Cement, textiles, blowers, compressors, fans & pumps etc.



kW	2-Pole			4 Pole			6 Pole		
	Frame Size	Efficiency %		Frame Size	Efficiency %		Frame Size	Efficiency %	
		IE2	IE3		IE2	IE3		IE2	IE3
0.37	71	72.2	75.5	71	70.1	73	80	69	71.9
0.55	71	74.8	78.1	80	75.1	78	80	72.9	75.9
0.75	80	77.4	80.7	80	79.6	82.5	90S	75.9	78.9
1.1	80	79.6	82.7	90S	81.4	84.1	90L	78.1	81
1.5	90S	81.3	84.2	90L	82.8	85.3	100L	79.8	82.5
2.2	90L	83.2	85.9	100L	84.3	86.7	112M	81.8	84.3
3.7	100L	85.5	87.8	112M	86.3	88.4	132S	84.3	86.5
5.5	132S	87	89.2	132S	87.7	89.6	132M	86	88
7.5	132S	88.1	90.1	132M	88.7	90.4	160M	87.2	89.1
11	160M	89.4	91.2	160M	89.8	91.4	160L	88.7	90.3
15	160M	90.3	91.9	160L	90.6	92.1	180L	89.7	91.2
18.5	160L	90.9	92.4	180M	91.2	92.6	200L	90.4	91.7
22	180M	91.3	92.7	180L	91.6	93	200L	90.9	92.2
30	200L	92	93.3	200L	92.3	93.6	225M	91.7	92.9
37	200L	92.5	93.7	225S	92.7	93.9	250M	92.2	93.3
45	225M	92.9	94	225M	93.1	94.2	280S	92.7	93.7
55	250M	93.2	94.3	250M	93.5	94.6	280M	93.1	94.1
75	280S	93.8	94.7	280S	94	95	315S	93.7	94.6
90	280M	94.1	95	280M	94.2	95.2	315M	94	94.9
110	315S	94.3	95.2	315S	94.5	95.4	315M	94.3	95.1
125	315M	94.5	95.3	315M	94.6	95.5	315M	94.4	95.2
132	315M	94.6	95.4	315M	94.7	95.6	315L	94.6	95.4
160	315L	94.8	95.6	315L	94.9	95.8	355M	94.8	95.6
200	315L	95	95.8	315L	95.1	96	355M	95	95.8
250	355M	95	95.8	355M	95.1	96	355L	95	95.8
315	355L	95	95.8	355L	95.1	96	355L	95	95.8

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