

3 - RENDIMENTI

I motori trifase 2 e 4 P Smem con potenza compresa tra 1,1 e 90 Kw sono a rendimento aumentato EFF2 e riportano in targa il logo registrato **EFF 2**.

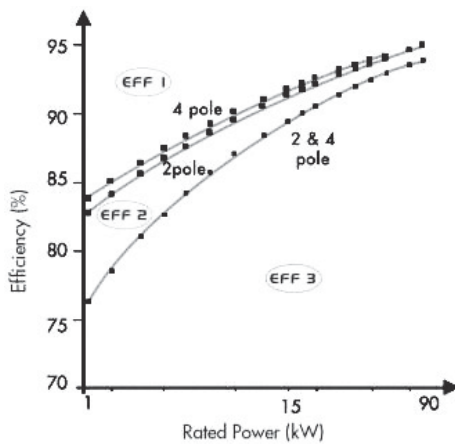
Le tabelle seguenti riportano l'accordo stabilito tra la Commissione Europea ed il CEMEP (Comitato Europeo Costruttori Macchine Rotanti e Elettronica di Potenza) sul sistema di classificazione dei motori basato sul rendimento.

3 - EFFICIENCY

Smem three-phase motors 2 and 4 P with power ranging from 1,1 up 90 Kw are high efficiency motors **EFF2** and there is stated the registered mark **EFF 2** on name plate.

The following diagram shows agreement between European Commission and CEMEP (European Committee of Manufacturer of Electrical Machines and Power Electronics) on classification system of electric motors based on efficiency.

ELECTRIC MOTOR EFFICIENCY MOTORI 4 POLI/4 POLE MOTORS MOTORI 2 POLI/2 POLE MOTORS



| Kw | EFF3 motors η % | EFF2 motors η % | EFF1 motors η % |
|------|-----------------|-----------------|-----------------|
| 1.1 | < 76,2 | ≥ 76,2 | ≥ 83,8 |
| 1.5 | < 78,5 | ≥ 78,5 | ≥ 85,0 |
| 2.2 | < 81,0 | ≥ 81,0 | ≥ 86,4 |
| 3 | < 82,6 | ≥ 82,6 | ≥ 87,4 |
| 4 | < 84,6 | ≥ 84,6 | ≥ 88,3 |
| 5.5 | < 85,7 | ≥ 85,7 | ≥ 89,2 |
| 7.5 | < 87,0 | ≥ 87,0 | ≥ 90,1 |
| 11 | < 88,4 | ≥ 88,4 | ≥ 91,0 |
| 15 | < 89,4 | ≥ 89,4 | ≥ 91,8 |
| 18.5 | < 90,0 | ≥ 90,0 | ≥ 92,2 |
| 22 | < 90,5 | ≥ 90,5 | ≥ 92,6 |
| 30 | < 91,4 | ≥ 91,4 | ≥ 93,2 |
| 37 | < 92,0 | ≥ 92,0 | ≥ 93,6 |
| 45 | < 92,5 | ≥ 92,5 | ≥ 93,9 |
| 55 | < 93,0 | ≥ 93,0 | ≥ 94,2 |
| 75 | < 93,6 | ≥ 93,6 | ≥ 94,7 |
| 90 | < 93,9 | ≥ 93,9 | ≥ 95,0 |

| Kw | EFF3 motors η % | EFF2 motors η % | EFF1 motors η % |
|------|-----------------|-----------------|-----------------|
| 1.1 | < 76,2 | ≥ 76,2 | ≥ 82,8 |
| 1.5 | < 78,5 | ≥ 78,5 | ≥ 84,1 |
| 2.2 | < 81,0 | ≥ 81,0 | ≥ 85,6 |
| 3 | < 82,6 | ≥ 82,6 | ≥ 86,7 |
| 4 | < 84,6 | ≥ 84,6 | ≥ 87,6 |
| 5.5 | < 85,7 | ≥ 85,7 | ≥ 88,6 |
| 7.5 | < 87,0 | ≥ 87,0 | ≥ 89,5 |
| 11 | < 88,4 | ≥ 88,4 | ≥ 90,5 |
| 15 | < 89,4 | ≥ 89,4 | ≥ 91,3 |
| 18.5 | < 90,0 | ≥ 90,0 | ≥ 91,8 |
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| 30 | < 91,4 | ≥ 91,4 | ≥ 92,9 |
| 37 | < 92,0 | ≥ 92,0 | ≥ 93,3 |
| 45 | < 92,5 | ≥ 92,5 | ≥ 93,7 |
| 55 | < 93,0 | ≥ 93,0 | ≥ 94,0 |
| 75 | < 93,6 | ≥ 93,6 | ≥ 94,6 |
| 90 | < 93,9 | ≥ 93,9 | ≥ 95,0 |

Vantaggi nell'utilizzo dei motori in EFF1

- riduzione dei consumi di energia elettrica. Es: nel caso di un motore di 15 Kw per 6000 ore/annue di utilizzo, si possono risparmiare circa 4 Mwh per anno (più di 200€ con 0,05 €/Kwh)
- riduzione della sovratemperatura del motore e quindi incremento della durata dell'isolante, dei cuscinetti e degli altri componenti
- vantaggi nelle applicazioni che richiedono l'impiego di inverter
- minore rumorosità
- maggiore resistenza ai sovraccarichi

Advantages of using EFF1 motors

- less consumption of electric energy. E.g.: using a 15 Kw motor for 6000 hours/year duty, it can be saved about 4 Mwh per year (more than 200 € with 0,05 €/Kwh)
- reduction of motor temperature rises: that means longer life for insulation material, bearings and other components
- higher capacities in application where inverter is required
- reduces noise level
- suitable for overloads

3.1 - Calcolo risparmio energetico

Qui di seguito riportiamo il metodo per calcolare agevolmente il risparmio energetico:

$$R = h \times Kw \times \%FL \times \text{€/Kwh} \times (1/\eta_2\% - 1/\eta_1\%)$$

dove:

R = risparmio energetico annuale

h = ore utilizzo annue motore

Kw = potenza motore (Kw)

%FL = coefficiente di utilizzo della potenza nominale del motore

€/Kwh = costo energia

$\eta_2\%$ = % rendimento del motore EFF2

$\eta_1\%$ = % rendimento del motore EFF1

3.1 - Energetic saving calculation

Here below how to calculate quickly the energetic savings:

where:

R = annual saving

h = annual running (hours)

Kw = motor rated power (Kw)

%FL = fraction of full load power at which motors runs

€/Kwh = electricity cost

$\eta_2\%$ = % efficiency of standard motor EFF2


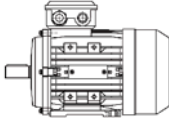
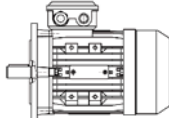
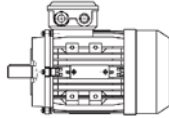
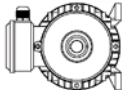
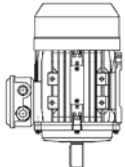
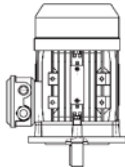
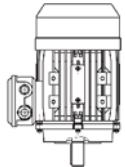

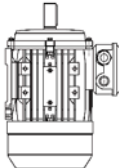
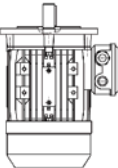
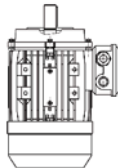
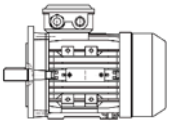
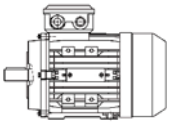
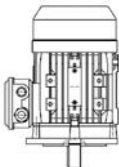
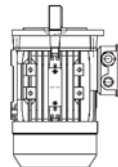
$\eta_1\%$ = % efficiency of standard motor EFF1

4 - FORME COSTRUTTIVE

Le normative IEC 34-7 prevede due modi alternativi di definire la forma costruttiva (posizione di montaggio) di un motore elettrico: il primo definito dalle lettere IM (International Mounting) seguite da un'altra lettera (B = albero orizzontale; V = albero verticale) e da un numero, il secondo è un codice più generale composto dalle lettere IM e da quattro numeri.

4 - AVAILABLE CONFIGURATIONS

According to IEC 34-7, there are two ways to define the configuration and installation position for an electric motor: the first way is defined by the letters IM (International Mounting) followed by another letter (B = horizontal shaft; V = vertical shaft) and from a number, the second way is a more general code composed by the letters IM and from four numbers.

| Motori B3 con piedi B3 motors with foot mounting | | Motore B5 con flangia Flange mounted B5 motors | Motore B14 con flangia Flange mounted B14 motors |
|---|---|--|---|
| IM 1051 (IM B6) | IM 1001 (IM B3) | IM 3001 (IM B5) | IM 3601 (IM B14) |
|  |  |  |  |
| IM 1061 (IM B7) | IM 1011 (IM V5) | IM 3011 (IM V1) | IM 3611 (IM V18) |
|  |  |  |  |
| IM 1071 (IM B8) | IM 1031 (IM V6) | IM 3031 (IM V3) | IM 3631 (IM V19) |
|  |  |  |  |
| IM 2001 (IM B35) (B3/B5) | IM 2101 (IM B34) (B3/B14) | IM 2011 (IM V15) (V1/V5) | IM 2031 (IM V36) (V3/V6) |
|  |  |  |  |