

Motori sincroni modulari  
a magneti permanenti

*Modular permanent magnets  
synchronous motors*

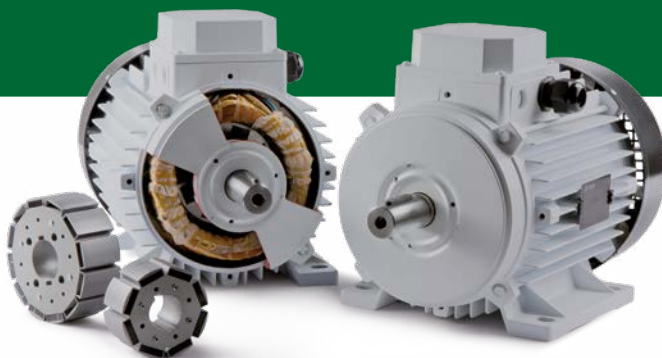


MADE IN ITALY



# Motori sincroni brushless a magneti permanenti

## Synchronous brushless permanent magnets motors



I prodotti SOGA della serie **PMM** sono **motori sincroni a magneti permanenti** trifase di nuova concezione che offrono ottime performance di potenza e coppia al variare della velocità e possono essere alimentati dalla maggior parte degli inverter standard disponibili nel mercato normalmente utilizzati con i motori asincroni, purché predisposti al controllo dei motori sincroni a magneti permanenti.

I PMM, dotati di rotorì multipolari modulari con magneti al neodimio-ferro-boro (NdFeb), sono raccomandati in diverse applicazioni a seconda delle 4 versioni di design adottate:

### 1 LOW SPEED RANGE

Motori per utilizzo in "direct drive" per evitare sistemi di riduzione di velocità o, al limite, semplificarli a meno stadi di riduzione (e quindi con ulteriore aumento del rendimento).

### 2 HIGH EFFICIENCY RANGE

Motori con ottime caratteristiche di coppia e di rendimento. Soluzione ideale per assicurare, in un ingombro ridotto e leggero, alte prestazioni in servizio continuo a velocità variabile e ridurre i costi operativi del sistema.

### 3 HIGH PERFORMANCE RANGE

Motori con buon rendimento (IE3) che in dimensioni della taglia IEC160 offrono prestazioni di potenza e di coppia di molto superiori a quelle dei motori asincroni tradizionali. Ottima soluzione per macchine con poco spazio disponibile per alloggiare un motore.

### 4 CONSTANT TORQUE RANGE

Motori servoventilati e dotati di resolver o encoder per utilizzo in applicazioni a coppia costante.

I motori PMM vengono realizzati in costruzioni meccaniche standardizzate IEC nelle altezze d'asse 90, 112 e 160, in tutte le forme costruttive, per una facile intercambiabilità con i tradizionali motori asincroni ma offrendo caratteristiche ben superiori in dimensioni ridotte. A richiesta possono essere realizzate esecuzioni custom con alberi, flange e componenti speciali per meglio aderire alle applicazioni del cliente.

Per ottimizzare le prestazioni e ridurre ulteriormente le dimensioni di ingombro, anche i motori ribassati per macchine da taglio MR71 e MR93 sono disponibili nelle versioni sincrone PMM.

Le applicazioni tipiche per questo tipo di motori sono: compressori a vite, ventilatori industriali, pompe, motoriduttori, automazione industriale, argani, rulli avvolgimento, macchine utensili, macchine tessili, ecc.

SOGA products of **PMM** series are new-designed three-phase **synchronous permanent magnet motors** offering highest output and torque performances at variable speed. They can be supplied by the most of standard inverters available in the market commonly used with asynchronous motors, if suitable to drive also synchronous permanent magnet motors.

PMMs, equipped with neodymium (NdFeb) modular multipole rotors, are recommended in different applications, depending on the 4 design versions adopted:

### LOW SPEED RANGE

Motors for "direct drive" use to avoid speed reduction systems or also to simplify them with fewer reduction stages (therefore, by further improving efficiency).

### HIGH EFFICIENCY RANGE

Motors with highest torque and efficiency values. They are the ideal solution to ensure, with compact and light size, high performances in continuous duty at variable speed by reducing the system operating costs.

### HIGH PERFORMANCE RANGE

Motors with a good efficiency level (IE3) that, on IEC160 frame size, offer output and torque performances much superior than the ones of traditional asynchronous motors. This is the best solution for machines with small space to place a motor.

### CONSTANT TORQUE RANGE

Servo-ventilated motors with resolver or encoder for constant torque applications.

PMM motors are made in IEC standard mechanical design on the frame sizes 90, 112 and 160, in all possible construction forms, to allow an easy interchangeability with traditional asynchronous motors but offering much superior features in reduced dimensions.

On request customized executions can be realized with special shafts, flanges and components to better fit the client's requirements.

For optimizing the performances and further reducing the overall dimensions, also our flat motors MR71 and MR93 for cutting machines are available in PMM synchronous versions.

Typical applications for this kind of motors are: screw compressors, industrial fans, pumps, gearboxes, industrial automation, cranes, rewinding rollers, tool machines, textile machines, etc.





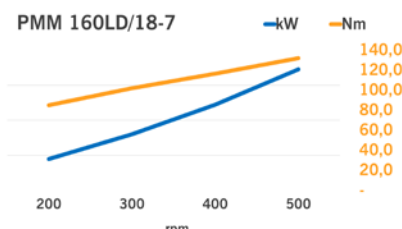
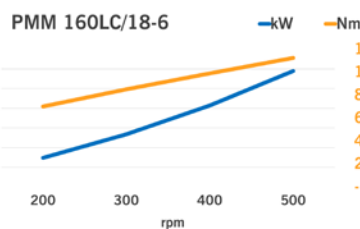
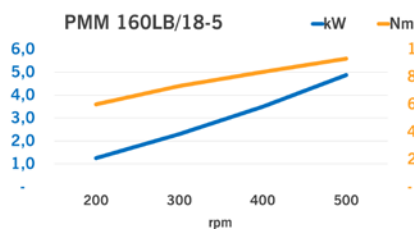
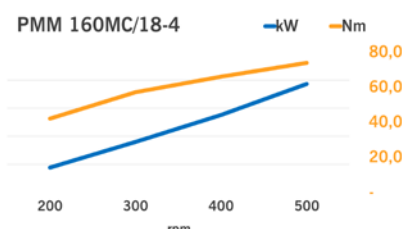
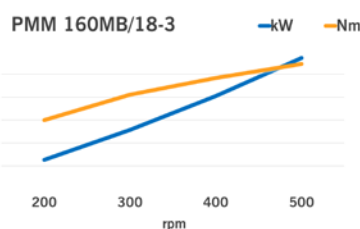
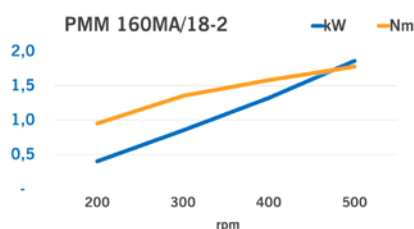
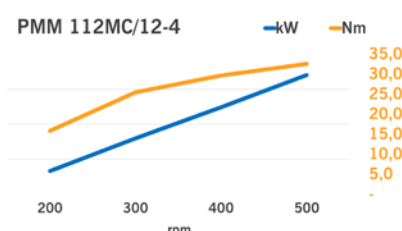
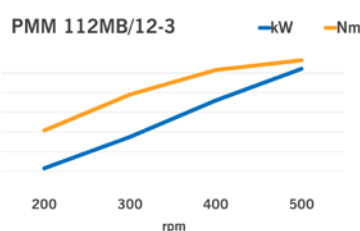
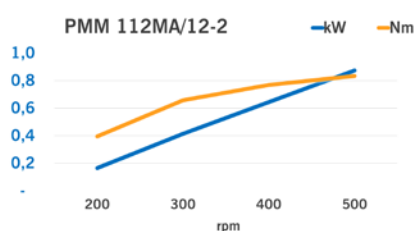
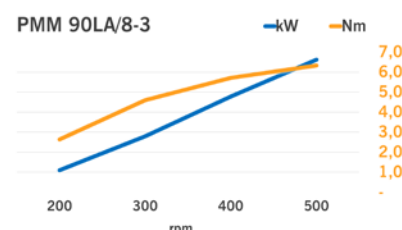
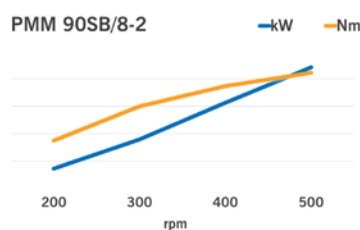
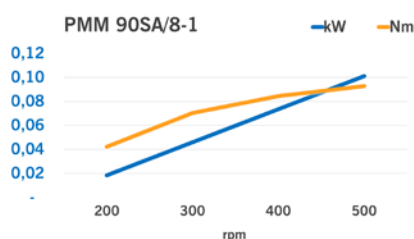


# 1 LOW SPEED RANGE

Riduttori, argani, rulliere motorizzate, ventilatori, compressori, miscelatori, automazione...

Gearboxes, winches, motorized roller conveyors, fans, compressors, mixers, automation...

| model          | poles | modules | output (S1) | rpm   |        |        |        |
|----------------|-------|---------|-------------|-------|--------|--------|--------|
|                |       |         | torque      | 200   | 300    | 400    | 500    |
| PMM 90SA/8-1   | 8     | 1       | kW          | 0,02  | 0,05   | 0,07   | 0,10   |
|                |       |         | Nm          | 0,88  | 1,46   | 1,76   | 1,93   |
| PMM 90SB/8-2   | 8     | 2       | kW          | 0,04  | 0,09   | 0,16   | 0,22   |
|                |       |         | Nm          | 1,76  | 3,00   | 3,74   | 4,22   |
| PMM 90LA/8-3   | 8     | 3       | kW          | 0,06  | 0,14   | 0,24   | 0,33   |
|                |       |         | Nm          | 2,64  | 4,60   | 5,71   | 6,33   |
| PMM 112MA/12-2 | 12    | 2       | kW          | 0,17  | 0,41   | 0,64   | 0,87   |
|                |       |         | Nm          | 7,91  | 13,18  | 15,38  | 16,70  |
| PMM 112MB/12-3 | 12    | 3       | kW          | 0,23  | 0,55   | 0,92   | 1,24   |
|                |       |         | Nm          | 10,99 | 17,50  | 21,97  | 23,73  |
| PMM 112MC/12-4 | 12    | 4       | kW          | 0,33  | 0,80   | 1,24   | 1,70   |
|                |       |         | Nm          | 15,82 | 25,46  | 29,67  | 32,52  |
| PMM 160MA/18-2 | 18    | 2       | kW          | 0,40  | 0,85   | 1,32   | 1,86   |
|                |       |         | Nm          | 19,00 | 27,00  | 31,57  | 35,57  |
| PMM 160MB/18-3 | 18    | 3       | kW          | 0,63  | 1,29   | 2,02   | 2,85   |
|                |       |         | Nm          | 30,00 | 41,02  | 48,34  | 54,50  |
| PMM 160MC/18-4 | 18    | 4       | kW          | 0,88  | 1,79   | 2,76   | 3,86   |
|                |       |         | Nm          | 42,00 | 57,13  | 65,92  | 73,83  |
| PMM 160LB/18-5 | 18    | 5       | kW          | 1,25  | 2,30   | 3,50   | 4,88   |
|                |       |         | Nm          | 60,00 | 73,25  | 83,50  | 93,17  |
| PMM 160LC/18-6 | 18    | 6       | kW          | 1,47  | 2,67   | 4,14   | 5,89   |
|                |       |         | Nm          | 70,00 | 85,00  | 98,89  | 112,51 |
| PMM 160LD/18-7 | 18    | 7       | kW          | 1,78  | 3,20   | 4,88   | 6,90   |
|                |       |         | Nm          | 85,00 | 102,00 | 116,46 | 131,85 |



# 2

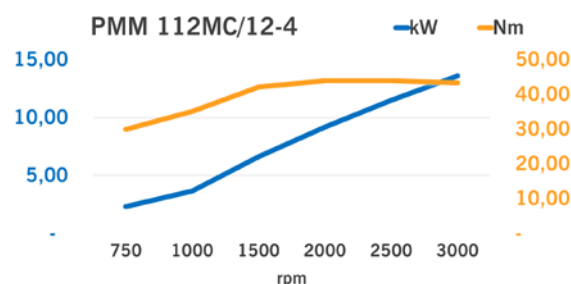
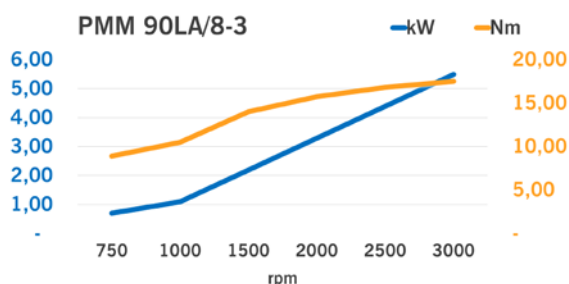
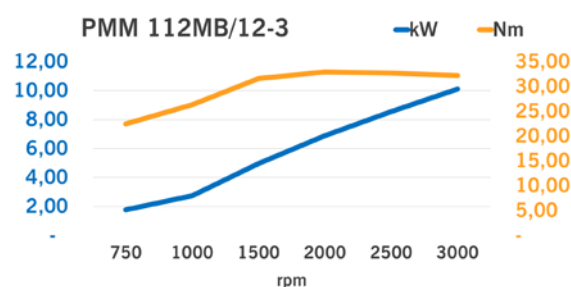
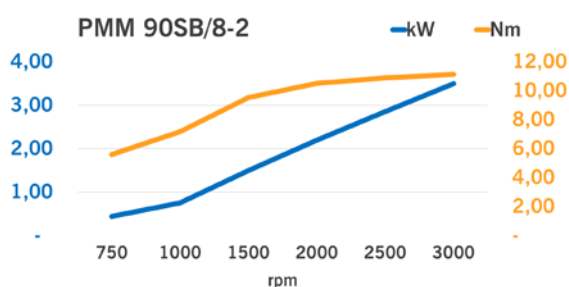
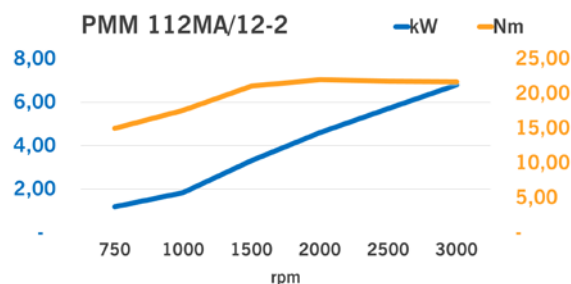
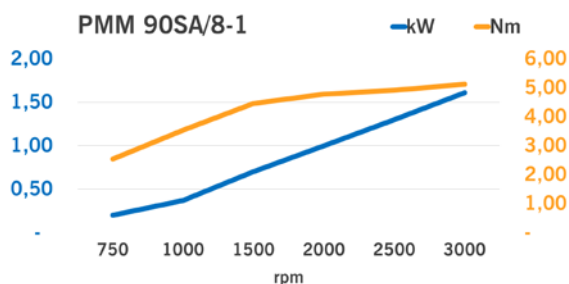
## HIGH EFFICIENCY RANGE

Applicazioni HVAC, movimentazione, pompe da vuoto, compressori a vite...

HVAC applications, material handling, vacuum pumps, screw compressors...



| model          | poles | modules | output (S1)<br>torque | rpm   |       |       |       |       |       |
|----------------|-------|---------|-----------------------|-------|-------|-------|-------|-------|-------|
|                |       |         |                       | 750   | 1000  | 1500  | 2000  | 2500  | 3000  |
| PMM 90SA/8-1   | 8     | 1       | kW                    | 0,20  | 0,37  | 0,70  | 1,00  | 1,30  | 1,61  |
|                |       |         | Nm                    | 2,54  | 3,54  | 4,46  | 4,78  | 4,92  | 5,13  |
| PMM 90SB/8-2   | 8     | 2       | kW                    | 0,44  | 0,75  | 1,50  | 2,20  | 2,85  | 3,50  |
|                |       |         | Nm                    | 5,60  | 7,17  | 9,55  | 10,51 | 10,89 | 11,13 |
| PMM 90LA/8-3   | 8     | 3       | kW                    | 0,70  | 1,10  | 2,20  | 3,30  | 4,40  | 5,50  |
|                |       |         | Nm                    | 8,92  | 10,51 | 14,04 | 15,76 | 16,82 | 17,52 |
| PMM 112MA/12-2 | 12    | 2       | kW                    | 1,18  | 1,84  | 3,31  | 4,60  | 5,70  | 6,81  |
|                |       |         | Nm                    | 15,00 | 17,58 | 21,10 | 21,97 | 21,80 | 21,68 |
| PMM 112MB/12-3 | 12    | 3       | kW                    | 1,77  | 2,76  | 4,97  | 6,90  | 8,56  | 10,12 |
|                |       |         | Nm                    | 22,50 | 26,37 | 31,64 | 32,96 | 32,70 | 32,23 |
| PMM 112MC/12-4 | 12    | 4       | kW                    | 2,33  | 3,68  | 6,62  | 9,20  | 11,50 | 13,62 |
|                |       |         | Nm                    | 30,00 | 35,16 | 42,19 | 43,95 | 43,95 | 43,36 |



# 3

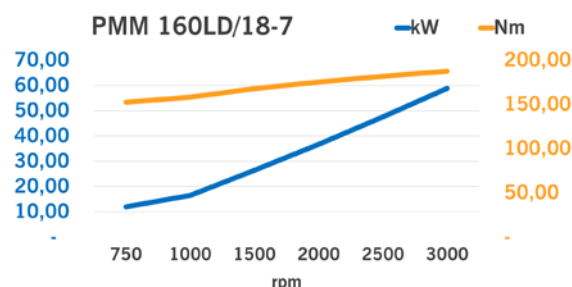
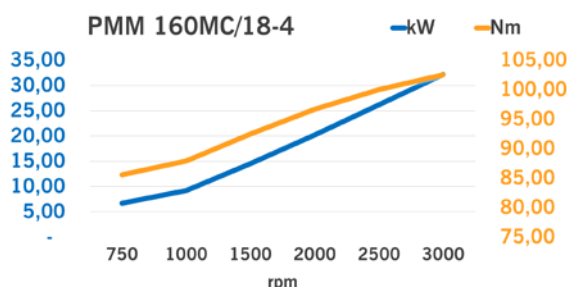
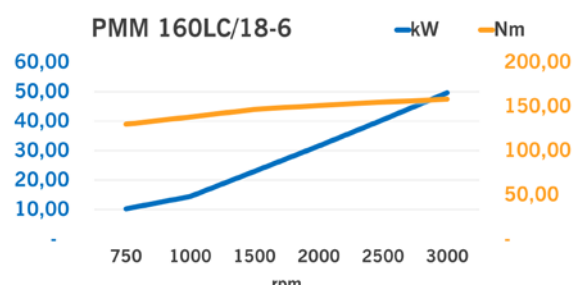
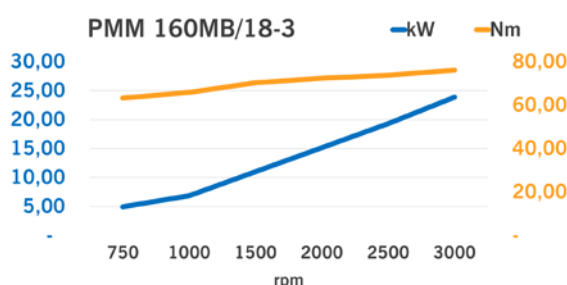
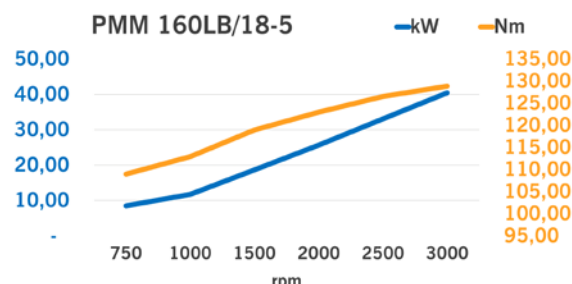
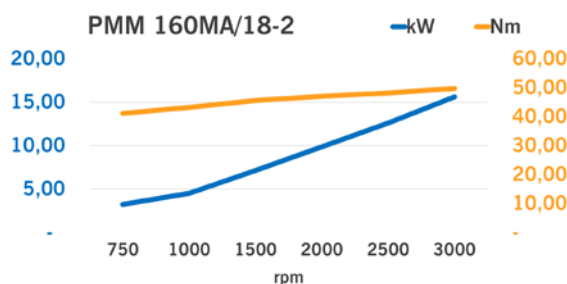
## HIGH PERFORMANCE RANGE

Applicazioni in cui, per esiguità di spazio disponibile, è necessaria una costruzione compatta con elevate caratteristiche di potenza e coppia.

Applications wherever, due to limited space available, a compact construction with high output and torque characteristics is required.



| model          | poles | modules | output (S1)<br>torque | rpm    |        |        |        |        |        |
|----------------|-------|---------|-----------------------|--------|--------|--------|--------|--------|--------|
|                |       |         |                       | 750    | 1000   | 1500   | 2000   | 2500   | 3000   |
| PMM 160MA/18-2 | 18    | 2       | kW                    | 3,23   | 4,52   | 7,16   | 9,87   | 12,63  | 15,64  |
|                |       |         | Nm                    | 41,20  | 43,23  | 45,60  | 47,13  | 48,26  | 49,81  |
| PMM 160MB/18-3 | 18    | 3       | kW                    | 4,97   | 6,90   | 11,04  | 15,18  | 19,32  | 23,92  |
|                |       |         | Nm                    | 63,29  | 65,92  | 70,32  | 72,52  | 73,83  | 76,18  |
| PMM 160MC/18-4 | 18    | 4       | kW                    | 6,72   | 9,20   | 14,53  | 20,24  | 26,18  | 32,20  |
|                |       |         | Nm                    | 85,55  | 87,90  | 92,50  | 96,69  | 100,00 | 102,55 |
| PMM 160LB/18-5 | 18    | 5       | kW                    | 8,56   | 11,83  | 18,70  | 25,76  | 33,12  | 40,48  |
|                |       |         | Nm                    | 108,99 | 113,00 | 119,00 | 123,06 | 126,57 | 128,92 |
| PMM 160LC/18-6 | 18    | 6       | kW                    | 10,21  | 14,45  | 23,00  | 31,63  | 40,48  | 49,68  |
|                |       |         | Nm                    | 130,00 | 138,00 | 146,50 | 151,00 | 154,70 | 158,22 |
| PMM 160LD/18-7 | 18    | 7       | kW                    | 11,96  | 16,56  | 26,39  | 36,77  | 47,65  | 58,88  |
|                |       |         | Nm                    | 152,36 | 158,22 | 168,00 | 175,50 | 182,00 | 187,52 |





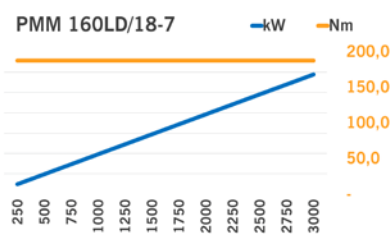
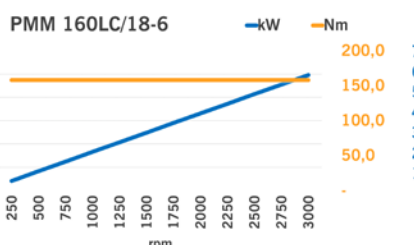
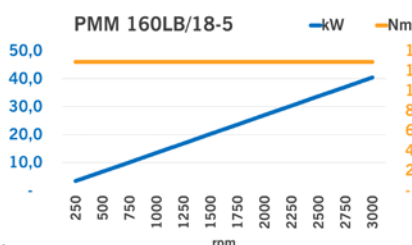
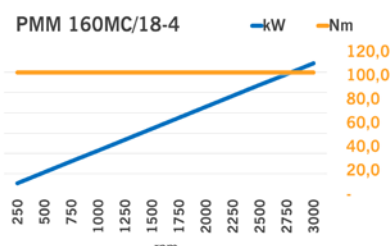
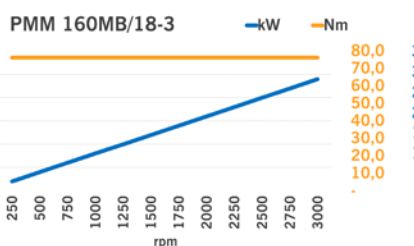
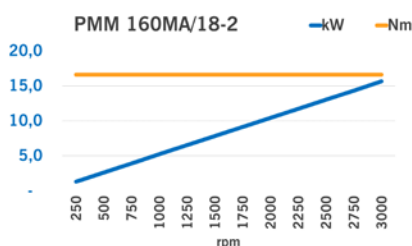
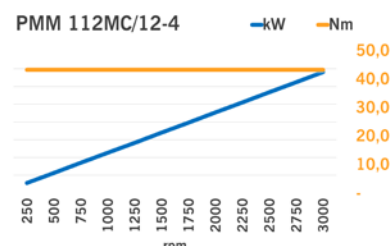
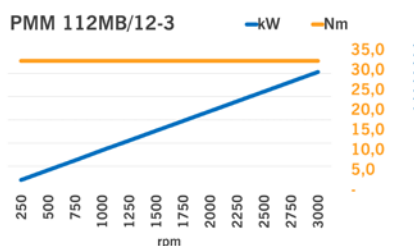
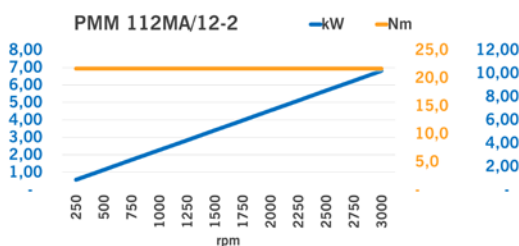
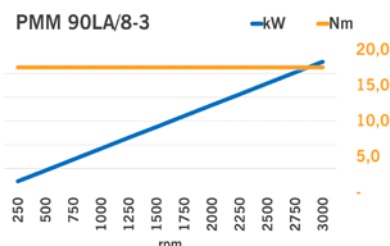
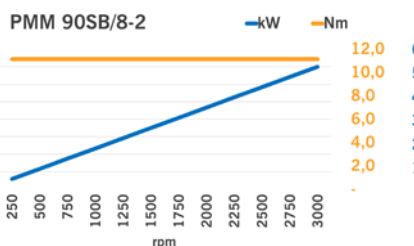
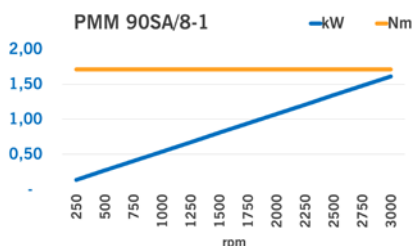
# 4

## CONSTANT TORQUE RANGE

Automazione: rulliere, nastri trasportatori, svolgitori, convogliatori, presse, riduttori...

Automation: roller conveyors, conveyor belts, unwinders machines, feeders, presses, gearboxes...

| model          | poles | modules | output<br>(S1) | rpm   |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-------|---------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                |       |         | torque         | 250   | 500   | 750   | 1000  | 1250  | 1500  | 1750  | 2000  | 2250  | 2500  | 2750  | 3000  |
| PMM 90SA/8-1   | 8     | 1       | kW             | 0,13  | 0,27  | 0,40  | 0,54  | 0,67  | 0,81  | 0,94  | 1,07  | 1,21  | 1,34  | 1,48  | 1,61  |
|                |       |         | Nm             | 5,1   | 5,1   | 5,1   | 5,1   | 5,1   | 5,1   | 5,1   | 5,1   | 5,1   | 5,1   | 5,1   | 5,1   |
| PMM 90SB/8-2   | 8     | 2       | kW             | 0,29  | 0,58  | 0,87  | 1,17  | 1,46  | 1,75  | 2,04  | 2,33  | 2,62  | 2,91  | 3,20  | 3,50  |
|                |       |         | Nm             | 11,1  | 11,1  | 11,1  | 11,1  | 11,1  | 11,1  | 11,1  | 11,1  | 11,1  | 11,1  | 11,1  | 11,1  |
| PMM 90LA/8-3   | 8     | 3       | kW             | 0,46  | 0,92  | 1,38  | 1,83  | 2,29  | 2,75  | 3,21  | 3,67  | 4,13  | 4,58  | 5,04  | 5,50  |
|                |       |         | Nm             | 17,5  | 17,5  | 17,5  | 17,5  | 17,5  | 17,5  | 17,5  | 17,5  | 17,5  | 17,5  | 17,5  | 17,5  |
| PMM 112MA/12-2 | 12    | 2       | kW             | 0,57  | 1,13  | 1,70  | 2,27  | 2,84  | 3,40  | 3,97  | 4,54  | 5,11  | 5,67  | 6,24  | 6,81  |
|                |       |         | Nm             | 21,7  | 21,7  | 21,7  | 21,7  | 21,7  | 21,7  | 21,7  | 21,7  | 21,7  | 21,7  | 21,7  | 21,7  |
| PMM 112MB/12-3 | 12    | 3       | kW             | 0,84  | 1,69  | 2,53  | 3,37  | 4,22  | 5,06  | 5,90  | 6,75  | 7,59  | 8,43  | 9,28  | 10,12 |
|                |       |         | Nm             | 32,2  | 32,2  | 32,2  | 32,2  | 32,2  | 32,2  | 32,2  | 32,2  | 32,2  | 32,2  | 32,2  | 32,2  |
| PMM 112MC/12-4 | 12    | 4       | kW             | 1,13  | 2,27  | 3,40  | 4,54  | 5,67  | 6,81  | 7,94  | 9,08  | 10,21 | 11,35 | 12,48 | 13,62 |
|                |       |         | Nm             | 43,4  | 43,4  | 43,4  | 43,4  | 43,4  | 43,4  | 43,4  | 43,4  | 43,4  | 43,4  | 43,4  | 43,4  |
| PMM 160MA/18-2 | 18    | 2       | kW             | 1,30  | 2,61  | 3,91  | 5,21  | 6,52  | 7,82  | 9,12  | 10,43 | 11,73 | 13,03 | 14,34 | 15,64 |
|                |       |         | Nm             | 49,8  | 49,8  | 49,8  | 49,8  | 49,8  | 49,8  | 49,8  | 49,8  | 49,8  | 49,8  | 49,8  | 49,8  |
| PMM 160MB/18-3 | 18    | 3       | kW             | 1,99  | 3,99  | 5,98  | 7,97  | 9,97  | 11,96 | 13,95 | 15,95 | 17,94 | 19,93 | 21,93 | 23,92 |
|                |       |         | Nm             | 76,2  | 76,2  | 76,2  | 76,2  | 76,2  | 76,2  | 76,2  | 76,2  | 76,2  | 76,2  | 76,2  | 76,2  |
| PMM 160MC/18-4 | 18    | 4       | kW             | 2,68  | 5,37  | 8,05  | 10,73 | 13,42 | 16,10 | 18,78 | 21,47 | 24,15 | 26,83 | 29,52 | 32,20 |
|                |       |         | Nm             | 102,5 | 102,5 | 102,5 | 102,5 | 102,5 | 102,5 | 102,5 | 102,5 | 102,5 | 102,5 | 102,5 | 102,5 |
| PMM 160LB/18-5 | 18    | 5       | kW             | 3,37  | 6,75  | 10,12 | 13,49 | 16,87 | 20,24 | 23,61 | 26,99 | 30,36 | 33,73 | 37,11 | 40,48 |
|                |       |         | Nm             | 128,9 | 128,9 | 128,9 | 128,9 | 128,9 | 128,9 | 128,9 | 128,9 | 128,9 | 128,9 | 128,9 | 128,9 |
| PMM 160LC/18-6 | 18    | 6       | kW             | 4,14  | 8,28  | 12,42 | 16,56 | 20,70 | 24,84 | 28,98 | 33,12 | 37,26 | 41,40 | 45,54 | 49,68 |
|                |       |         | Nm             | 158,2 | 158,2 | 158,2 | 158,2 | 158,2 | 158,2 | 158,2 | 158,2 | 158,2 | 158,2 | 158,2 | 158,2 |
| PMM 160LD/18-7 | 18    | 7       | kW             | 4,91  | 9,81  | 14,72 | 19,63 | 24,53 | 29,44 | 34,35 | 39,25 | 44,16 | 49,07 | 53,97 | 58,88 |
|                |       |         | Nm             | 187,5 | 187,5 | 187,5 | 187,5 | 187,5 | 187,5 | 187,5 | 187,5 | 187,5 | 187,5 | 187,5 | 187,5 |





## DIMENSIONI DI INGOMBRO IN STANDARD IEC IEC STANDARD OVERALL DIMENSIONS

Dimensioni di ingombro dei modelli standard PMG90, PMG112 e PMG160.

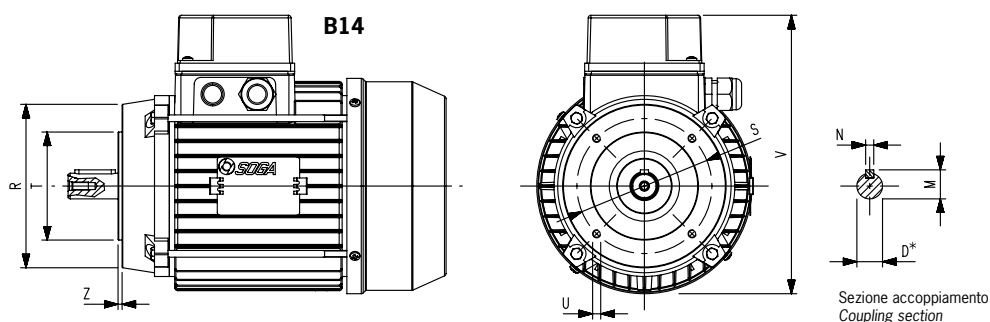
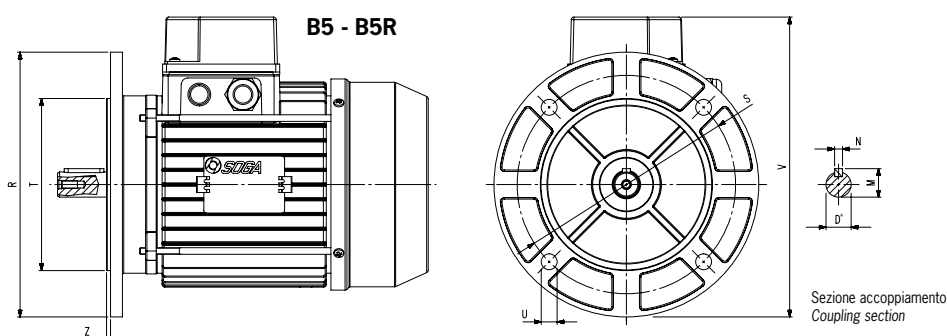
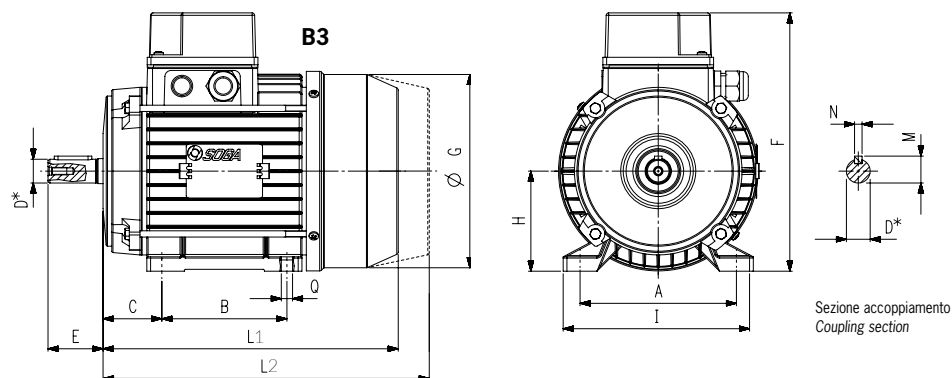
Versioni custom disponibili a richiesta.

I motori asincroni ribassati della serie MR possono essere realizzati in versione PMM sulle seguenti taglie:

- MR 71 con parti attive del PMM90
- MR 93 con parti attive del PMM112.

Overall dimensions of the standard models PMG90, PMG112 and PMG160. Custom versions available on request. The low profile asynchronous motors of the MR series can be made in the PMM version in the following sizes:

- MR 71: with active parts of PMM90
- MR 93: with active parts of PMM112.



| frame size<br>IEC | B3  |     |     |    |     |       |     |     |     |                                        |                                  |    |    |    |
|-------------------|-----|-----|-----|----|-----|-------|-----|-----|-----|----------------------------------------|----------------------------------|----|----|----|
|                   | A   | B   | C   | D  | E   | F     | G   | H   | I   | L1<br>PMM motors<br>version<br>1, 2, 3 | L2<br>PMM motors<br>version<br>4 | M  | N  | Q  |
| 90S               | 140 | 100 | 56  | 24 | 50  | 220   | 176 | 90  | 170 | 254,5                                  | 321,5                            | 27 | 8  | 9  |
| 90L               | 140 | 125 | 56  | 24 | 50  | 220   | 176 | 90  | 170 | 279,5                                  | 346,5                            | 27 | 8  | 9  |
| 112               | 190 | 140 | 70  | 28 | 60  | 262   | 215 | 112 | 220 | 328,5                                  | 393,5                            | 31 | 8  | 11 |
| 160M              | 254 | 210 | 108 | 42 | 110 | 382,5 | 311 | 160 | 318 | 494                                    | 668                              | 45 | 12 | 13 |
| 160L              | 254 | 254 | 108 | 42 | 110 | 382,5 | 311 | 160 | 318 | 538                                    | 712                              | 45 | 12 | 13 |

| frame size<br>IEC | flange B5 |     |     |      |     |   | flange B5 reduced |     |     |      |     |     | flange B14 |     |     |     |     |     |
|-------------------|-----------|-----|-----|------|-----|---|-------------------|-----|-----|------|-----|-----|------------|-----|-----|-----|-----|-----|
|                   | R         | S   | T   | U    | V   | Z | R                 | S   | T   | U    | V   | Z   | R          | S   | T   | U   | V   | Z   |
| 90                | 200       | 165 | 130 | 11,5 | 230 | 3 | 160               | 130 | 110 | 11,5 | 218 | 3,5 | 140        | 115 | 95  | M8  | 219 | 3   |
| 112               | 250       | 215 | 180 | 14   | 277 | 4 | 200               | 165 | 130 | 14   | 262 | 4   | 160        | 130 | 110 | M8  | 263 | 3,5 |
| 160               | 350       | 300 | 250 | 18   | 398 | 5 | 300               | 265 | 230 | 18   | 387 | 5   | 255        | 215 | 180 | M12 | 388 | 4   |



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