



LE MOTEUR ROTOVERTEUR A PRODUCTION D'ENERGIE SURUNITAIRE

Design Concept by

Fabrice ANDRE



Le moteur surunitaire produit une énergie par l'efficacité du moteur Brushless entraînant un alternateur accouplé à basse vitesse. Le rendement énergétique de la génératrice, entraînée par le moteur, permet de récupérer un excédent de production d'énergie électrique utile et stable. Cette source d'énergie se limite dans la faisabilité acquise à ce jour de 2 à 30 kva, selon la gamme de moteur ci-dessous.

Ce moteur permet d'assurer l'autonomie énergétique d'un bâtiment à partir de la performance du génie électromécanique et non plus d'une source intermittente telle que le soleil ou le vent. La pérennité de la machine s'estime par la simulation de l'usure des pièces en mouvement par friction. A ce jour nous sommes en mesure de garantir la machine 100 000 heures dans un usage conventionnel (environ 11 ans).

L'énergie produite provient du rendement surunitaire de l'alternateur en charge entraîné par le mouvement du moteur à haute performance. La courbe de puissance des génératrices calquées sur la courbe de consommation des moteurs d'entrainements détermine la plage de production ainsi que la puissance calculée par le différentiel des charges. On gère la puissance développée par l'alternateur par la vitesse de rotation régulée par un variateur de fréquence de type AXM.

L'amélioration de la performance des génératrices basses vitesses, d'une part, (couple / vitesse) et la sobriété énergétique d'autre part des moteurs d'entrainement, permettront de faire évoluer la gamme vers des puissances compatibles avec la production d'énergie à caractère industriel (500 kw à 1 000 Mw).

La production d'énergie électrique peut s'envisager sous deux formes : à partir d'une source existante alimentant le moteur d'entrainement, nous pouvons produire une énergie surunitaire destinée à la consommation classique. Cette énergie apportera un complément à faible coût garantissant l'amortissement linéaire de l'investissement.

Dans le cadre de l'autonomie énergétique, nous pouvons aussi produire de l'énergie en ayant initié le mouvement d'entrainement du moteur à partir d'un parc de batteries (12,24 ou 48V). Le courant produit est rebouclable mais il nécessite une gestion instantanée des charges et des productions par une régulation thermodynamique permanente. L'usage de thermo-batterie à l'acétate de magnésium permettra de lisser la courbe des charges et d'optimiser la pérennité du système.

Le rebouclage du courant produit par la génératrice pour alimenter le moteur d'entrainement ne peut s'opérer qu'après avoir analysé la fréquence des phases pour optimiser la résonance. En l'état actuel du savoir faire nous pilotons le système via une carte électronique d'asservissement, de contrôle et de gestion de régulation des charges entrantes et sortantes du rotovertour. Le moteur est construit en quatre parties : un moteur d'entrainement à très haute performance (99%) qui consomme du courant, une génératrice qui produit plus de courant que le moteur n'en consomme, un châssis de support et un boîtier électronique pour piloter l'ensemble.



Electrical Specification

Rated Output Power(W):	1800
Rated Rotatoin Speed (RPM):	480
Recified DC Current at Rated Output (A):	6
Requied Torque at Rated Power:	44.5
Phase Resistance (Ohms):	5.0
Output Wire Square Section (mm ²):	4
Output Wire Length (mm):	600
Insulation:	H Class
Generator configuration:	3 Phase star connected AC output
Design Lifetime:	>20 years

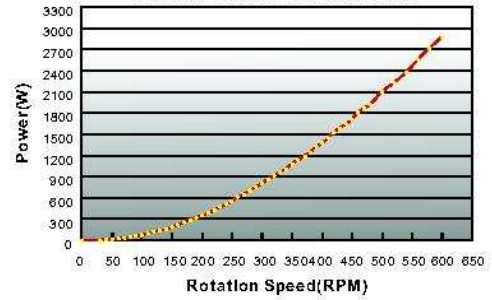
Mechanical Specification

Weight (Kgs):	19.5
Starting Torque (NM):	<0.9
Rotor Inertia (Kg. m ²):	0.013
Bearing Type:	High standard NSK 6207DDUC3 (Front) NSK 6207VVC3 (Rear)

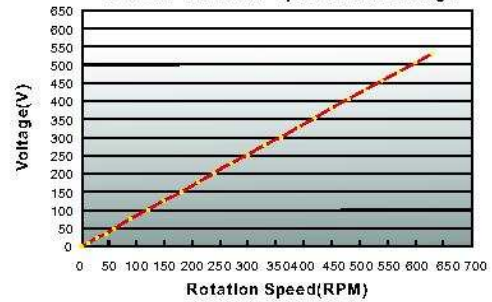
Material Specification

Shaft Material:	High standard Stainless Steel
Shaft Bearing:	High standard SKF or NSK bearing
Outer Frame Material:	High standard Aluminium alloy with TF/T6 heat treatment
(TF/T6 full heat treatment for increasing the performance of aluminium alloy as follows. Heat 4-12 hours at 525-545 degrees Celsius, quench with hot water, and precipitation heat treatment for 8-12 hours at 155-175 degrees Celsius.)	
Fasteners (nuts and bolts):	High standard Stainless Steel
Windings Temperature Rating:	180 degrees Celsius
Magnet Material:	NdFeB (Neodymium Iron Boron)
Magnets Temperature Rating:	150 degrees Celsius
Lamination Stack:	High specification cold-rolled Steel

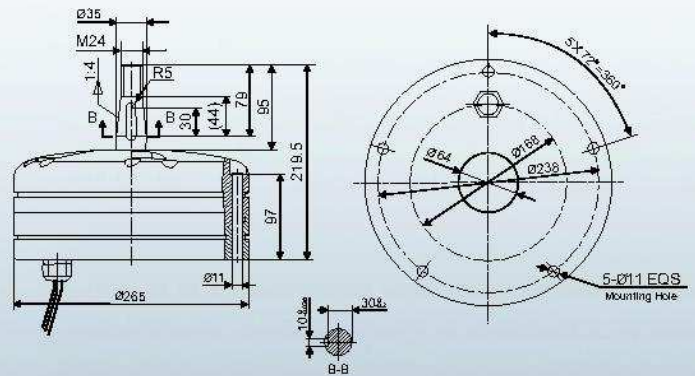
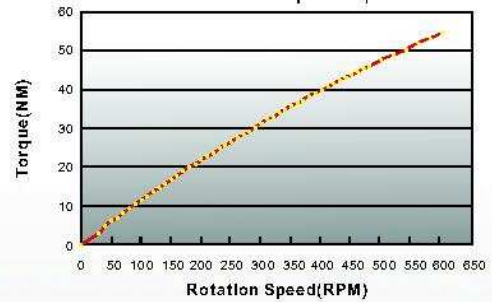
GL-PMG-1800 PMG Power Curve

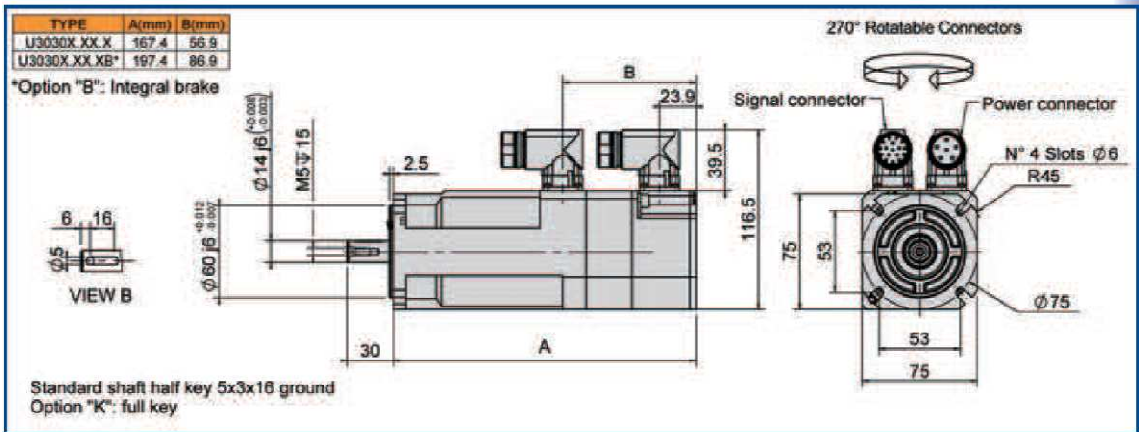


GL-PMG-1800 PMG Open Circuit Voltage



GL-PMG-1800 PMG Input Torque Curve

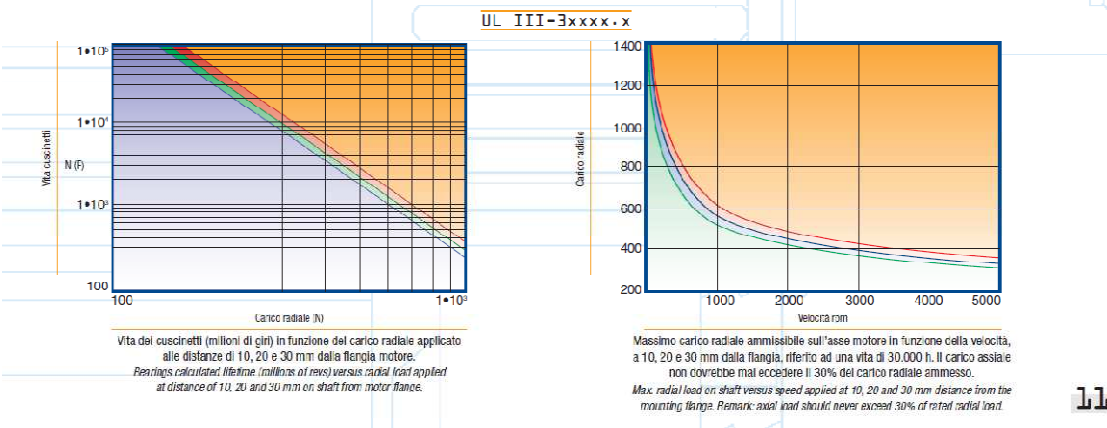
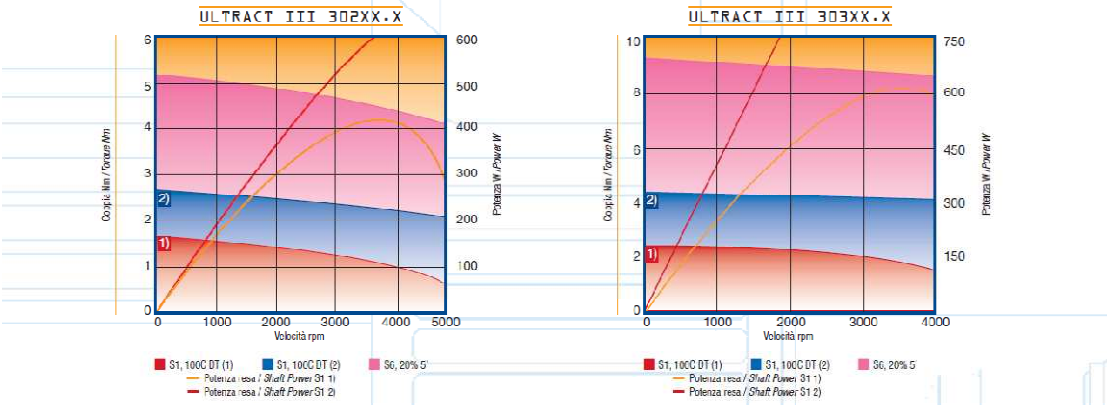




Curve delle prestazioni

Safe operating areas

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Electrical Specification

Rated Output Power(W):	3500
Rated Rotatoin Speed (RPM):	250
Recified DC Current at Rated Output (A):	11
Requied Torque at Rated Power (NM):	150
Phase Resistance (Ohms):	2.7
Output Wire Square Section (mm ²):	6
Output Wire Length (mm):	100
Insulation:	H Class
Generator configuration:	3 Phase star connected AC output
Design Lifetime:	>20 years

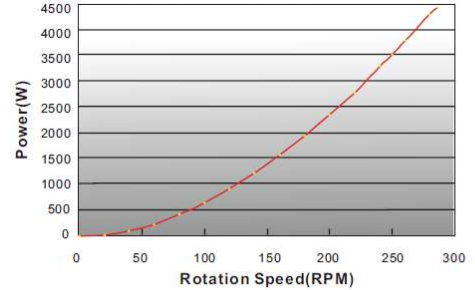
Mechanical Specification

Mounting Type:	Horizontal
Weight (Kgs):	78
Starting Torque (NM):	<2.0
Rotor Inertia (Kg.m ²):	0.066
Bearing Type:	High standard NSK 6209DDU (Front) NSK 6309DDU (Rear)

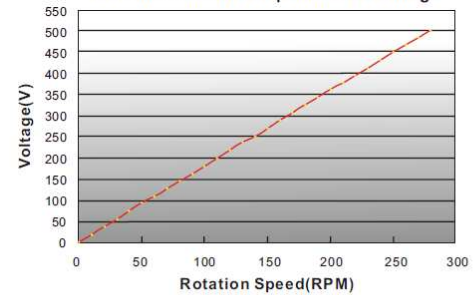
Material Specification

Shaft Material:	Nickle plated 40 Cr Steel with quenching and tempering treatment
Shaft Bearing:	High standard SKF or NSK bearing
Outer Frame Material:	Steel with anti-corrosion treatment
Fasteners (nuts and bolts):	High standard Stainless Steel
Windings Temperature Rating:	180 degrees Celsius
Magnet Material:	NdFeB (Neodymium Iron Boron)
Magnets Temperature Rating:	150 degrees Celsius
Lamination Stack:	High specification cold-rolled Steel

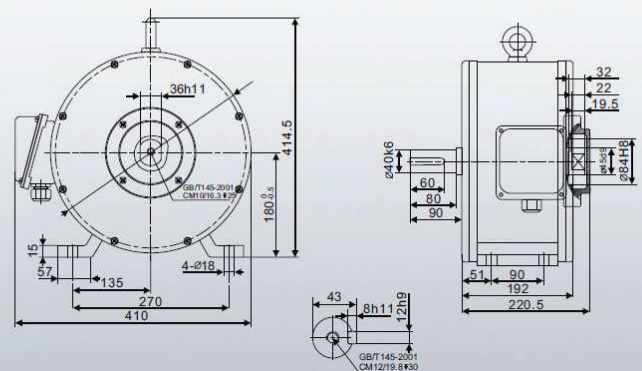
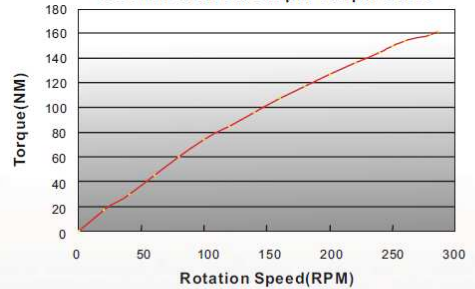
GL-PMG-3500 PMG Power Curve

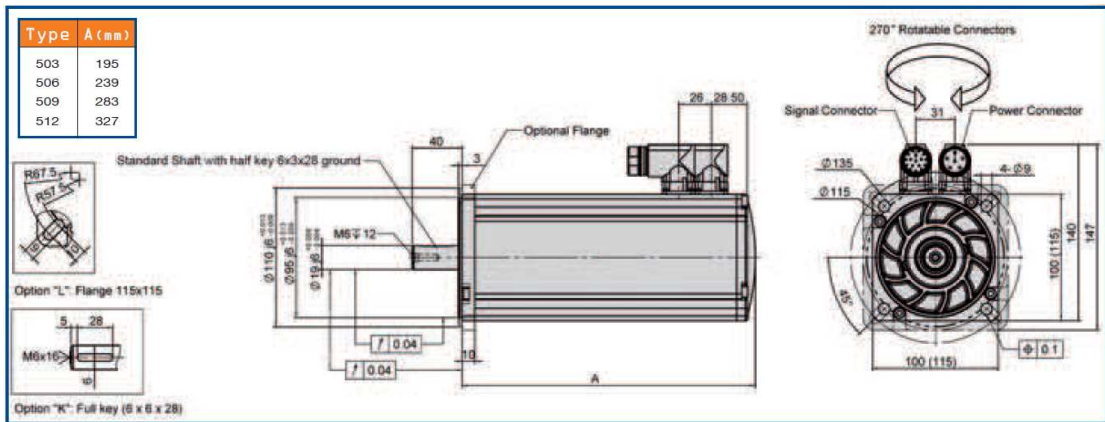


GL-PMG-3500 PMG Open Circuit Voltage



GL-PMG-3500 PMG Input Torque Curve

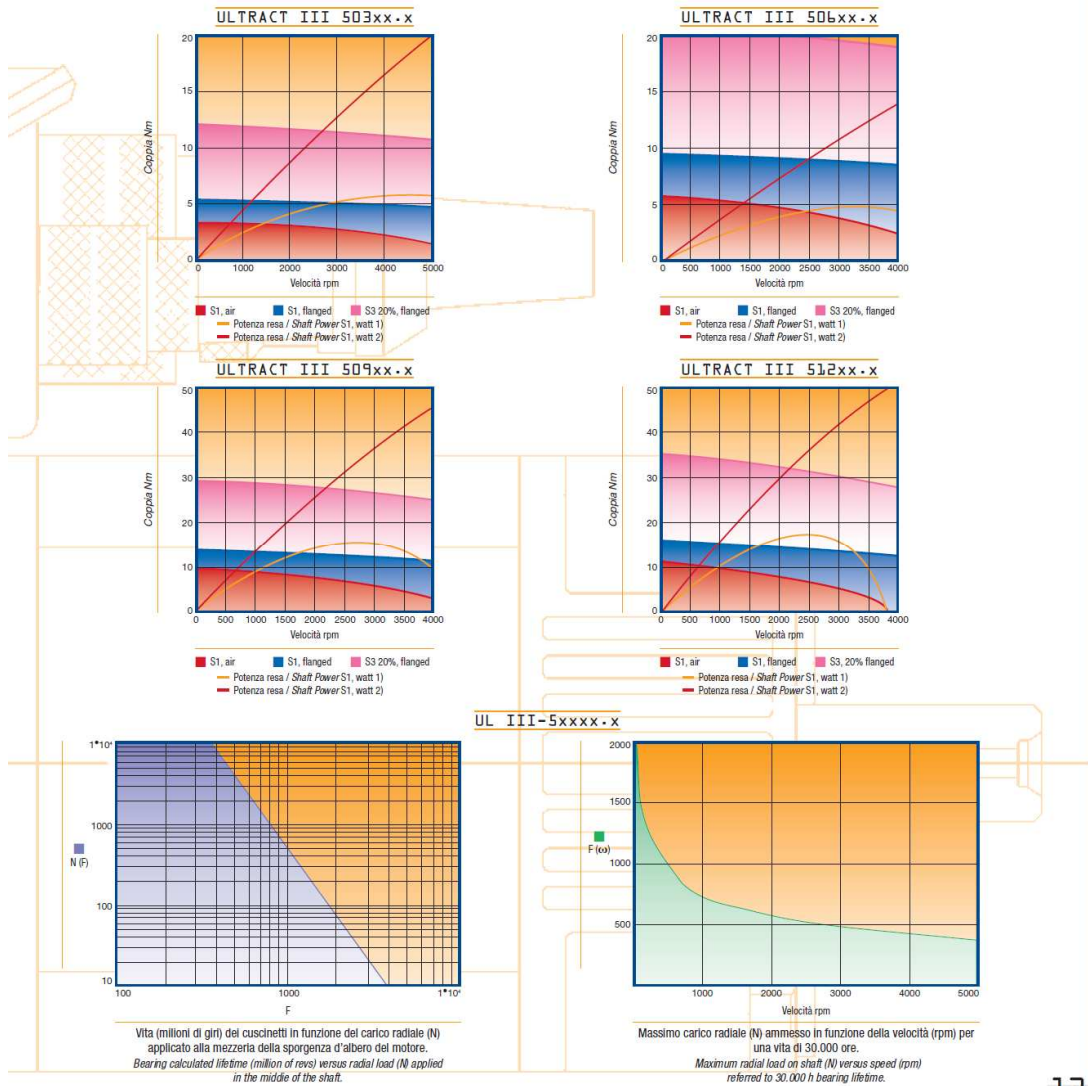




Curve delle prestazioni

Safe operating areas

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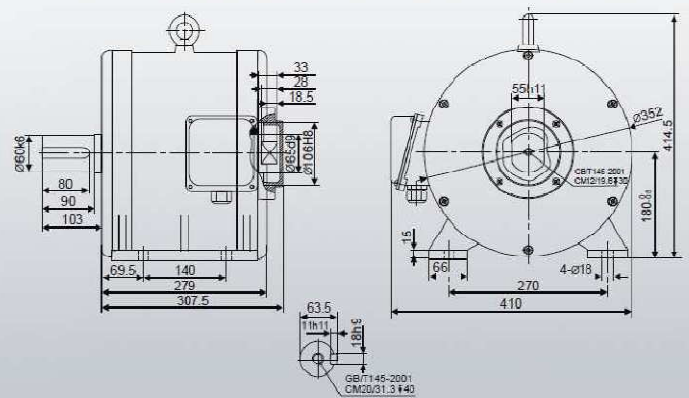
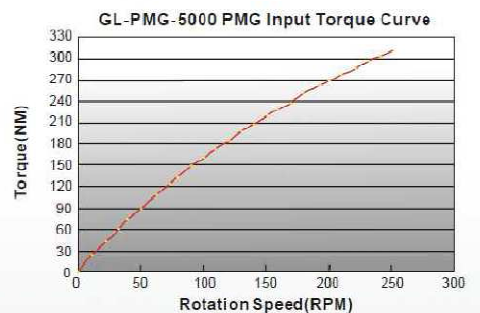
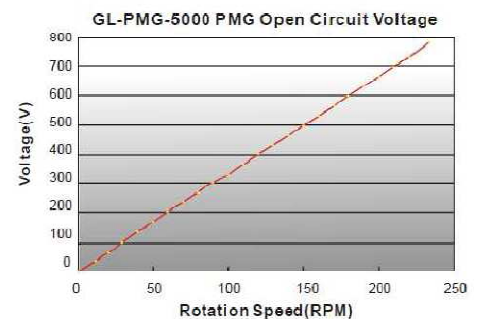
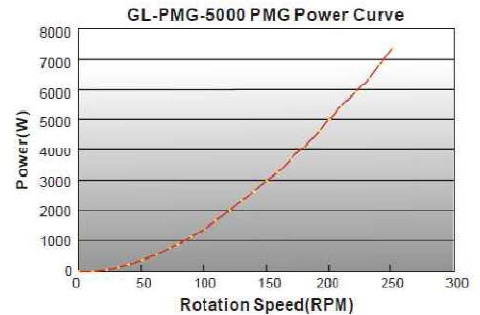
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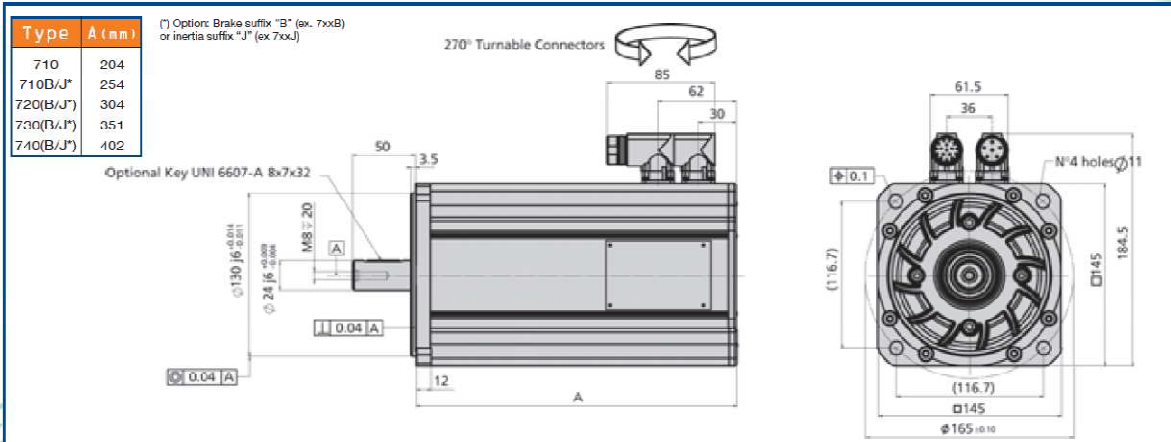


Electrical Specification	
Rated Output Power(W):	5000
Rated Rotation Speed (RPM):	200
Rectified DC Current at Rated Output (A):	10
Required Torque at Rated Power (NM):	269
Phase Resistance (Ohms):	3.3
Output Wire Square Section (mm ²):	6
Output Wire Length (mm):	100
Insulation:	H Class
Generator configuration:	3 Phase star connected AC output
Design Lifetime:	>20 years

Mechanical Specification	
Mounting Type:	Horizontal
Weight (Kgs):	140
Starting Torque (NM):	<3.5
Rotor Inertia (Kg.m ²):	0.138
Bearing Type:	High standard NSK 6213VVC3 (Front) NSK 6213VVC3 (Rear)

Material Specification	
Shaft Material:	Nickle plated 40 Cr Steel with quenching and tempering treatment
Shaft Bearing:	High standard SKF or NSK bearing
Outer Frame Material:	Steel with anti-corrosion treatment
Fasteners (nuts and bolts):	High standard Stainless Steel
Windings Temperature Rating:	180 degrees Celsius
Magnet Material:	NdFeB (Neodymium Iron Boron)
Magnets Temperature Rating:	150 degrees Celsius
Lamination Stack:	High specification cold-rolled Steel



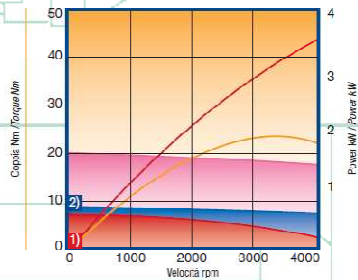


Curve delle prestazioni

Safe operating areas

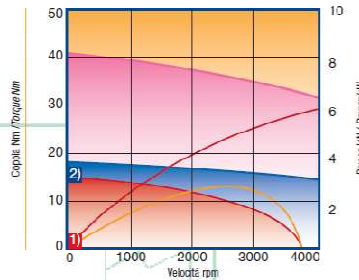


ULTRACT III 710xx.x



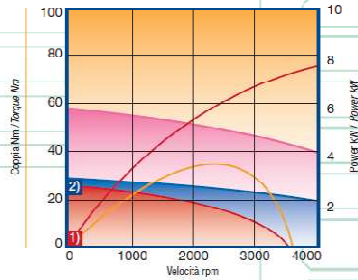
■ S1, air ■ S1, flanged ■ S3 20%, flanged
 — Potenza resa / Shaft Power S1, watt 1
 — Potenza resa / Shaft Power S1, watt 2

ULTRACT III 720xx.x



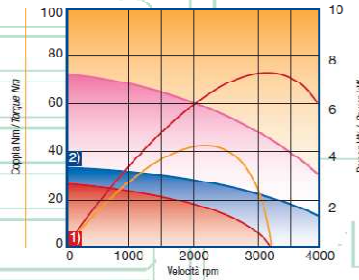
■ S1, air ■ S1, flanged ■ S3 20%, flanged
 — Potenza resa / Shaft Power S1, watt 1
 — Potenza resa / Shaft Power S1, watt 2

ULTRACT III 730xx.x



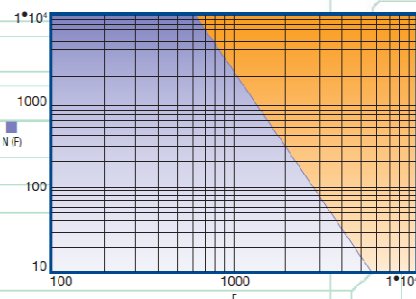
■ S1, air ■ S1, flanged ■ S3 20%, flanged
 — Potenza resa / Shaft Power S1, watt 1
 — Potenza resa / Shaft Power S1, watt 2

ULTRACT III 740xx.x

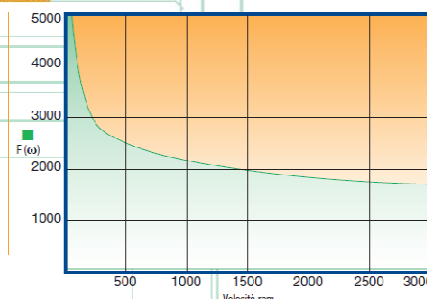


■ S1, air ■ S1, flanged ■ S3 20%, flanged
 — Potenza resa / Shaft Power S1, watt 1
 — Potenza resa / Shaft Power S1, watt 2

UL III-7xxxx.x



Vita in milioni di giri dei cuscinetti in funzione del carico radiale (N) applicato alla mesocolla della sporgenza d'albero del motore.
 Bearing calculated lifetime (million of revs) versus radial load (N) applied in the middle of the shaft



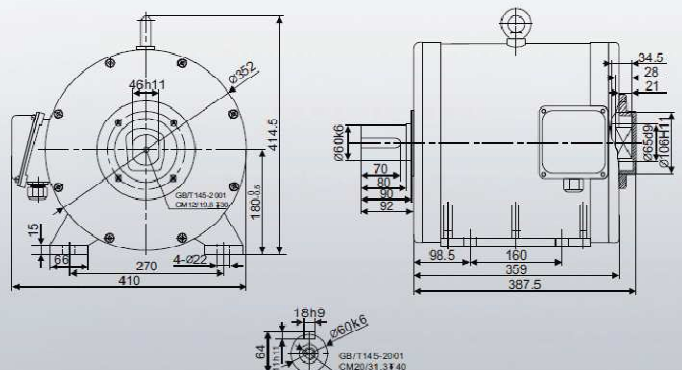
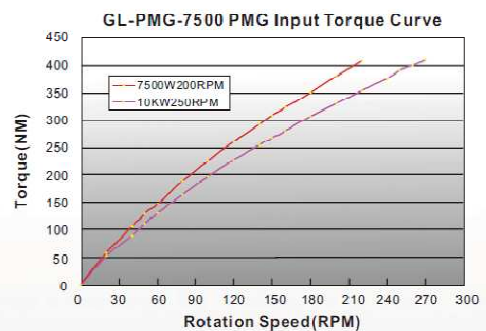
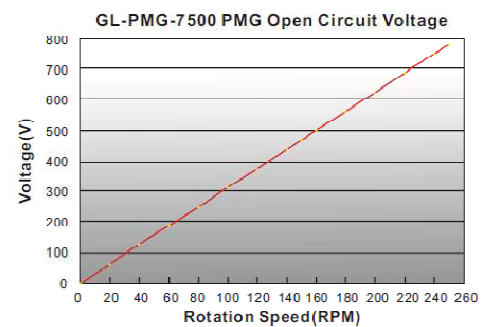
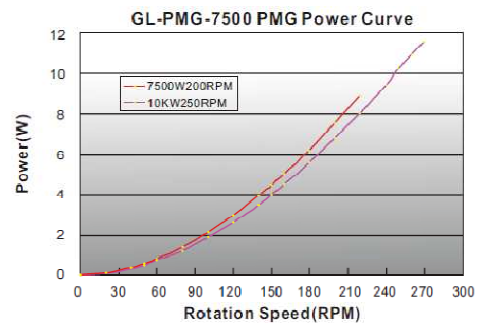
Massimo carico radiale (N) ammesso in funzione della velocità (rpm) per una vita di 30.000 ore.
 Maximum radial load on shaft (N) versus speed (rpm) related to 30,000 h bearing lifetime.

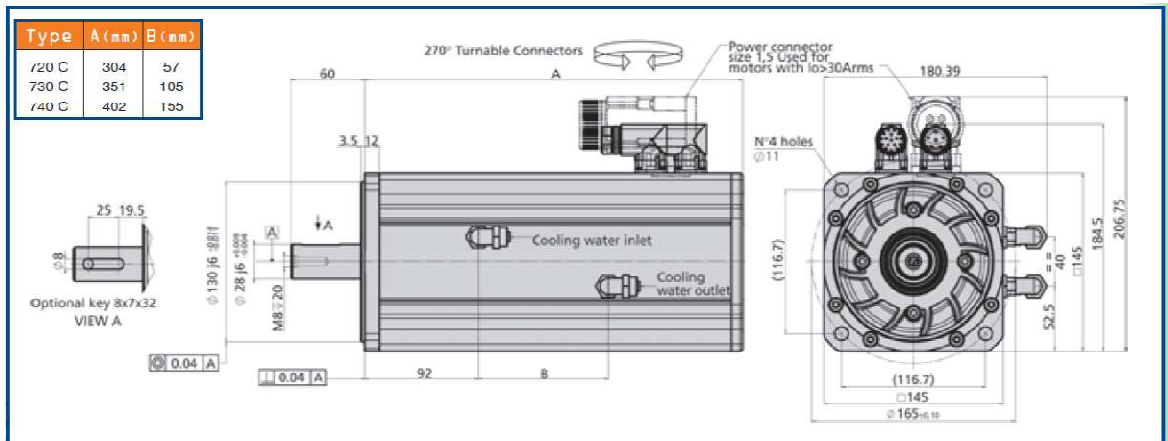


Electrical Specification	
Rated Output Power(W):	7500 10K
Rated Rotatoin Speed (RPM):	200 250
Recified DC Current at Rated Output (A):	15.6 16.5
Requied Torque at Rated Power (NM):	382 392
Phase Resistance (Ohms):	2.1
Output Wire Square Section (mm):	6
Output Wire Length (mm):	100
Insultation:	H Class
Generator configuration:	3 Phase star connected AC output
Design Lifetime:	>20 years

Mechanical Specification	
Mounting Type:	Horizontal
Weight (Kgs):	175
Starting Torque (NM):	<5.9
Rotor Inertia (Kg.m ²):	0.210
Bearing Type:	High standard NSK 6213DDU (Front) NSK 6313DDU (Rear)

Material Specification	
Shaft Material:	Nickle plated 40 Cr Steel with quenching and tempering treatment
Shaft Bearing:	High standard SKF or NSK bearing
Outer Frame Material:	Steel with anti-corrosion treatment
Fasteners (nuts and bolts):	High standard Stainless Steel
Windings Temperature Rating:	180 degrees Celsius
Magnet Material:	NdFeB (Neodymium Iron Boron)
Magnets Temperature Rating:	150 degrees Celsius
Lamination Stack:	High specification cold-rolled Steel



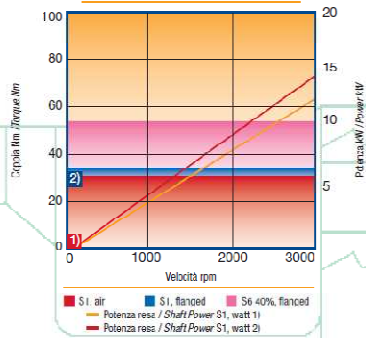


Curve delle prestazioni

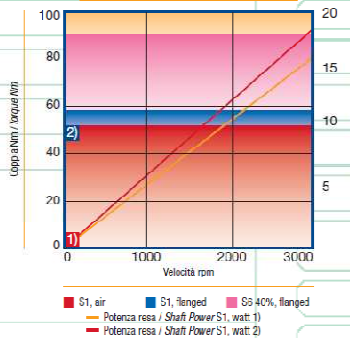
Safe operating areas



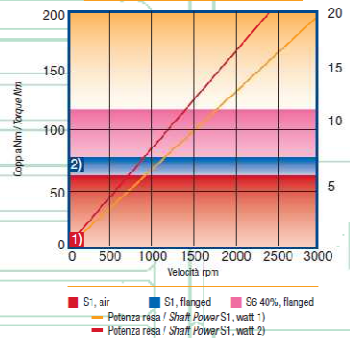
ULTRACT III 720Cxx.x



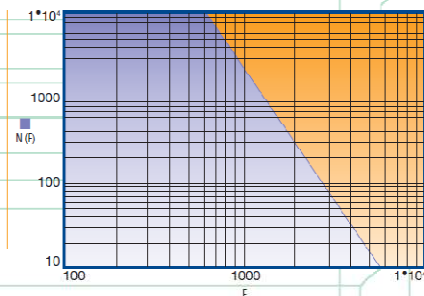
ULTRACT III 730Cxx.x



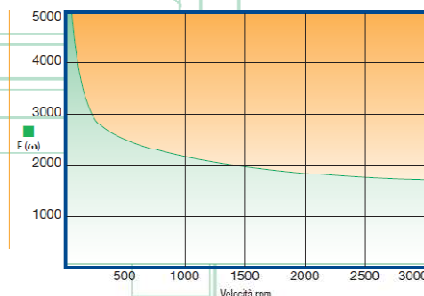
ULTRACT III 740Cxx.x



UL III-7xxxx.x



Vita (milioni di giri) dei cuscinetti in funzione del carico radiale (N) applicato alla mezziera della sporgenza d'albero del motore.
Bearing calculated lifetime (million of revs) versus radial load (N) applied in the middle of the shaft.



Massimo carico radiale (N) ammesso in funzione della velocità (rpm) per una vita di 30.000 ore
Maximum radial load on shaft (N) versus speed (rpm) referred to 30,000 h bearing lifetime.



Electrical Specification

Rated Output Power(W):	12K
Rated Rotatoin Speed (RPM):	135
Recified DC Current at Rated Output (A):	25
Requied Torque at Rated Power (NM):	947
Phase Resistance (Ohms):	0.9
Output Wire Square Section (mm):	10
Output Wire Length (mm):	200
Insulation:	H Class
Generator configuration:	3 Phase star connected AC output
Design Lifetime:	>20 years

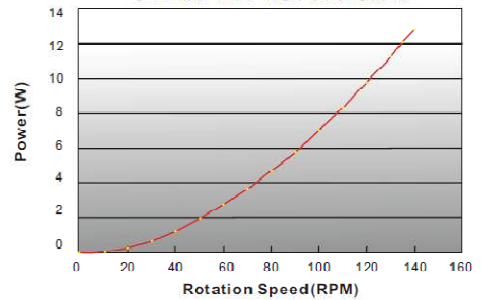
Mechanical Specification

Mounting Type:	Horizontal
Weight (Kgs):	350
Starting Torque (NM):	<14
Rotor Inertia (Kg.m):	1.59
Bearing Type:	High standard NSK 6220DDU (Front) NSK 6220DDU (Rear)

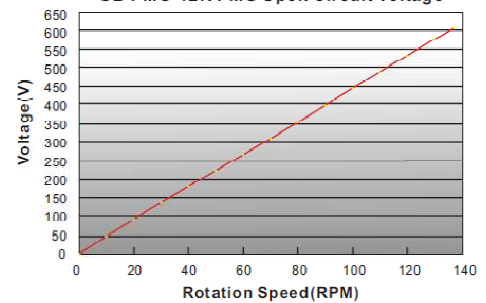
Material Specification

Shaft Material:	Nickle plated 40 Cr Steel with quenching and tempering treatment
Shaft Bearing:	High standard SKF or NSK bearing
Outer Frame Material:	Steel with anti-corrosion treatment
Fasteners (nuts and bolts):	High standard Stainless Steel
Windings Temperature Rating:	180 degrees Celsius
Magnet Material:	NdFeB (Neodymium Iron Boron)
Magnets Temperature Rating:	150 degrees Celsius
Lamination Stack:	High specification cold-rolled Steel

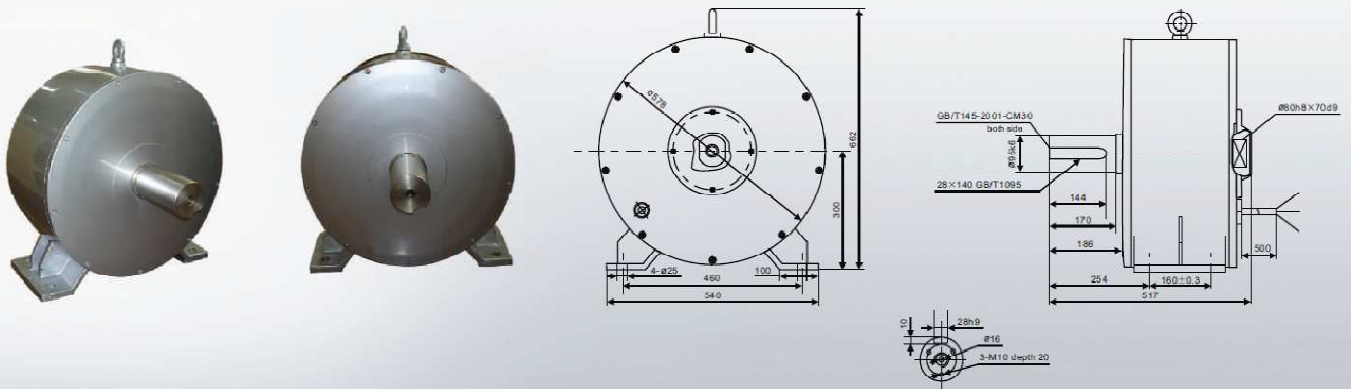
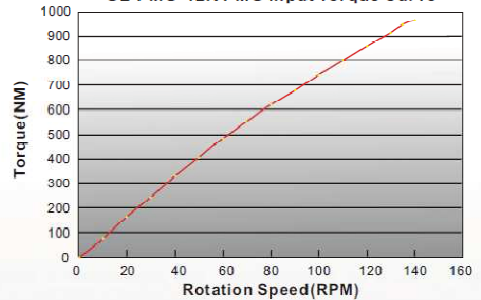
GL-PMG-12K PMG Power Curve

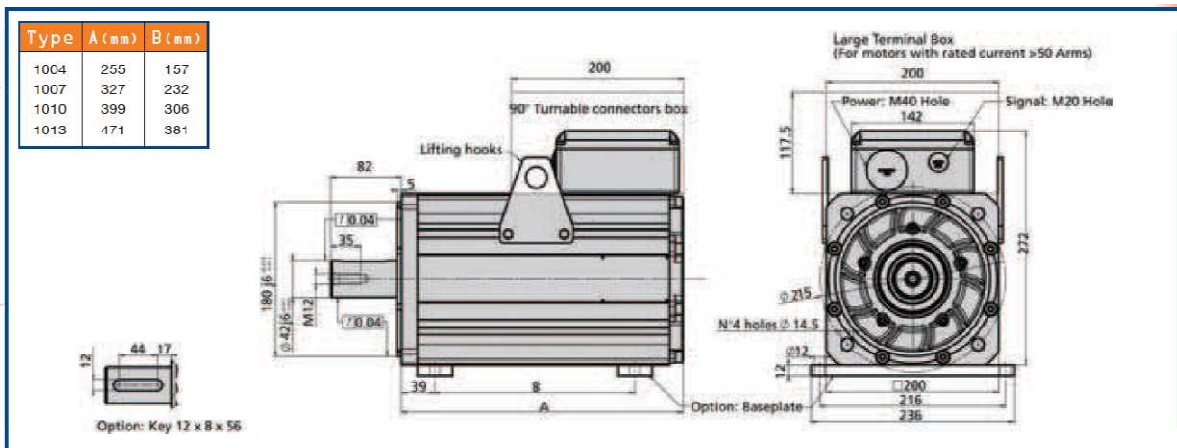


GL-PMG-12K PMG Open Circuit Voltage



GL-PMG-12K PMG Input Torque Curve

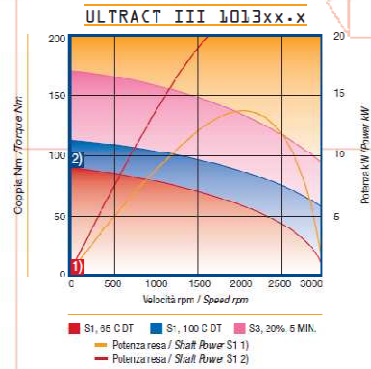
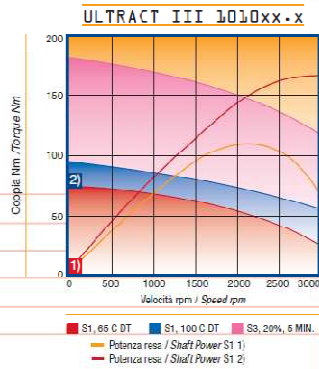
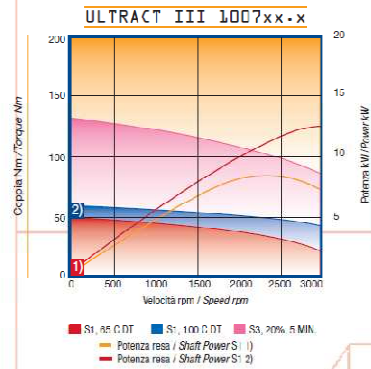
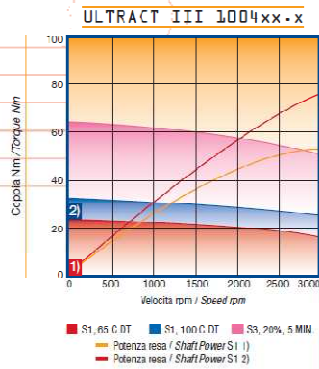




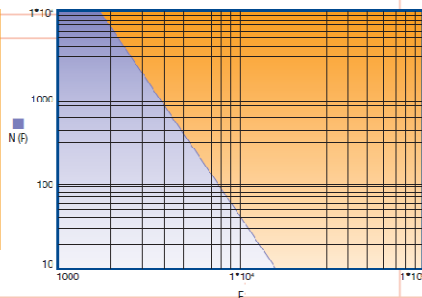
Curve delle prestazioni

Safe operating areas

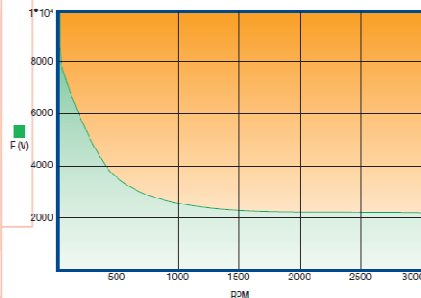
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UL III-10xxxx-x



Vita (milioni di giri) dei cuscinetti in funzione del carico radiale (N) applicato alla mezziera della sporgenza d'albero del motore.
 Bearing calculated lifetime (million of revs) versus radial load (N) applied in the middle of the shaft.



Massimo carico radiale (N) ammesso in funzione della velocità (rpm) per una vita di 30.000 ore.
 Maximum radial load on shaft (N) versus speed (rpm) referred to 30.000 h bearing lifetime.

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Electrical Specification

Rated Output Power(W):	15K
Rated Rotatoin Speed (RPM):	125
Recified DC Current at Rated Output (A):	28
Requied Torque at Rated Power (NM):	12.84
Phase Resistance (Ohms):	1.1
Output Wire Square Section (mm ²):	10
Output Wire Length (mm):	200
Insulation:	H Class
Generator configuration:	3 Phase star connected AC output
Design Lifetime:	>20 years

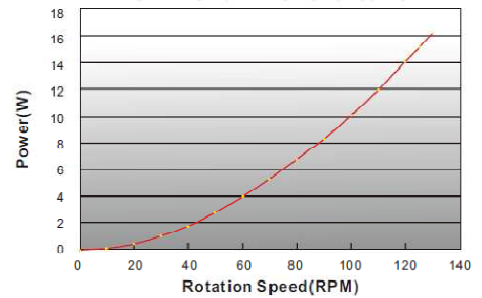
Mechanical Specification

Mounting Type:	Horizontal
Weight (Kgs):	375
Starting Torque (NM):	<15
Rotor Inertia (Kg.m):	1.79
Bearing Type:	High standard NSK 6220DDU (Front) NSK 6220DDU (Rear)

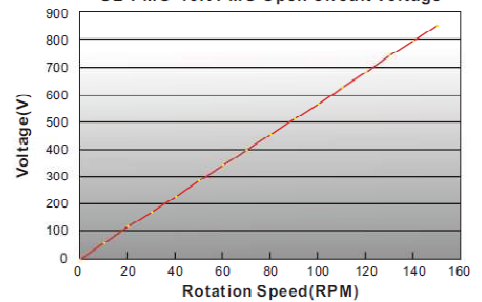
Material Specification

Shaft Material:	Nickle plated 40 Cr Steel with quenching and tempering treatment
Shaft Bearing:	High standard SKF or NSK bearing
Outer Frame Material:	Steel with anti-corrosion treatment
Fasteners (nuts and bolts):	High standard Stainless Steel
Windings Temperature Rating:	180 degrees Celsius
Magnet Material:	NdFeB (Neodymium Iron Boron)
Magnets Temperature Rating:	150 degrees Celsius
Lamination Stack:	High specification cold-rolled Steel

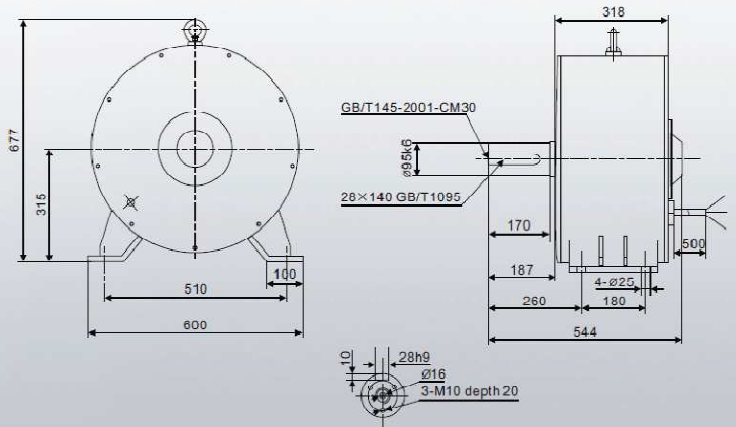
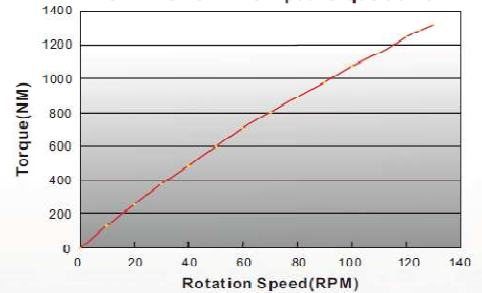
GL-PMG-15K PMG Power Curve

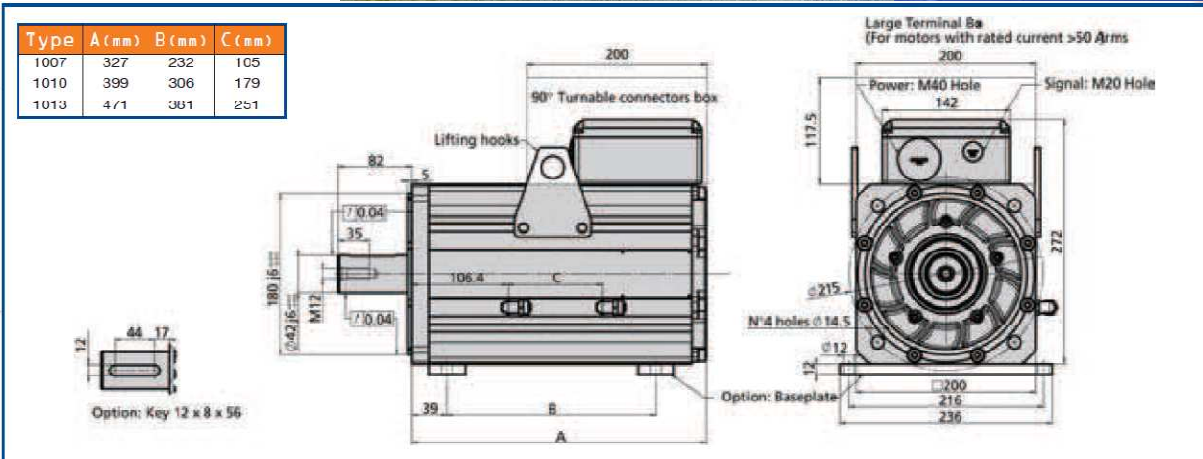


GL-PMG-15K PMG Open Circuit Voltage



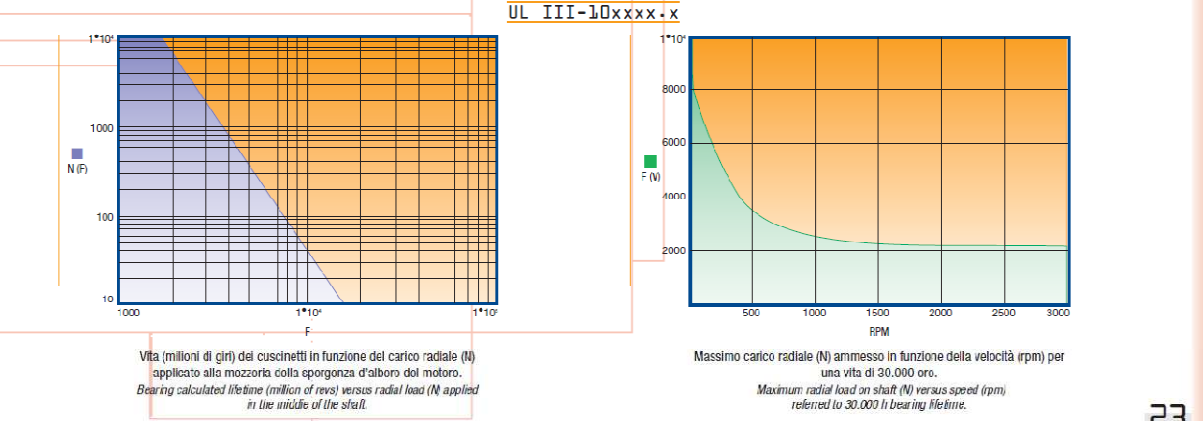
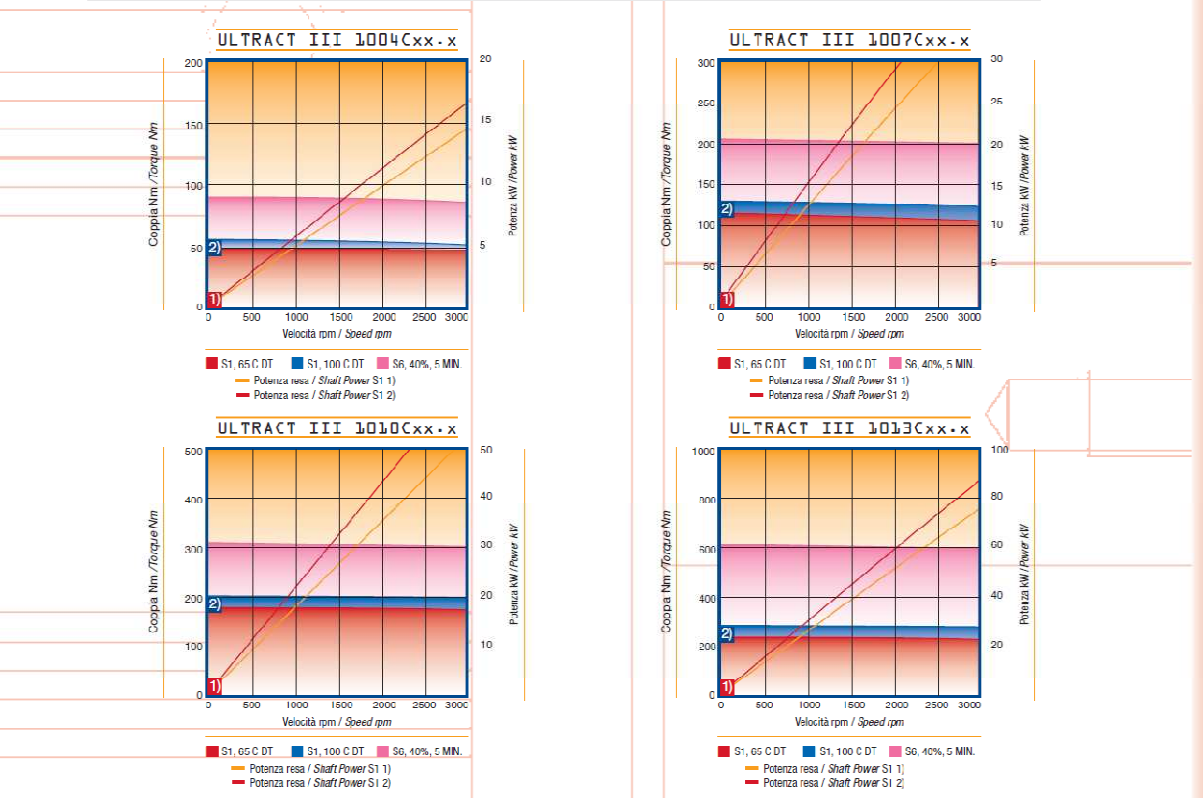
GL-PMG-15K PMG Input Torque Curve





Curve delle prestazioni

Safe operating areas

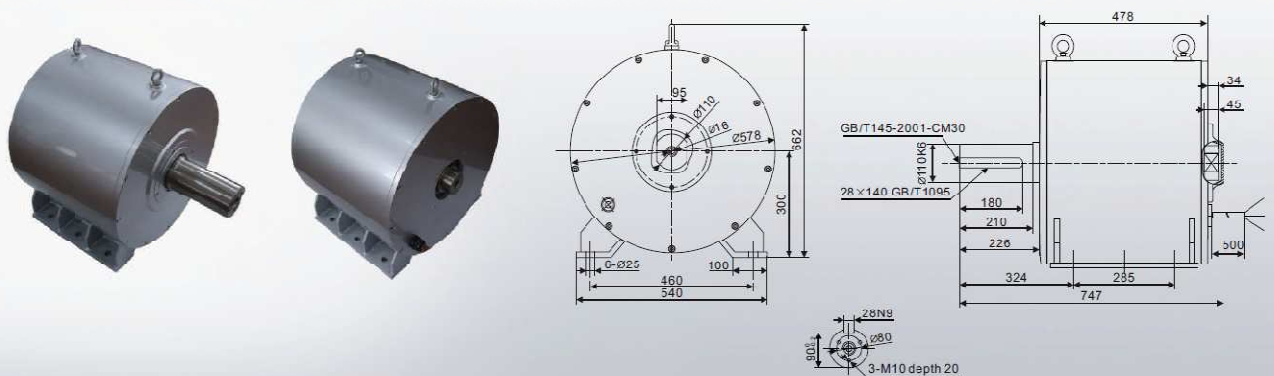
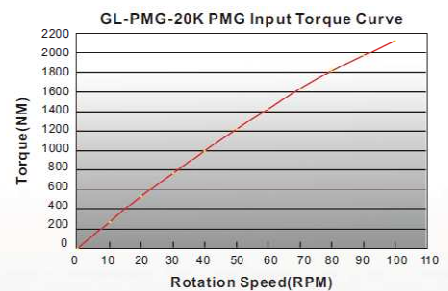
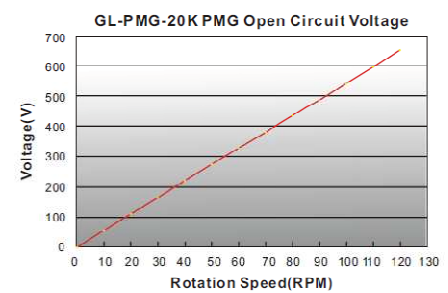
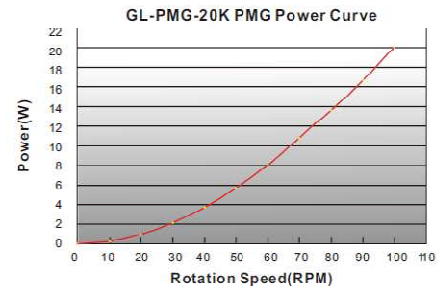


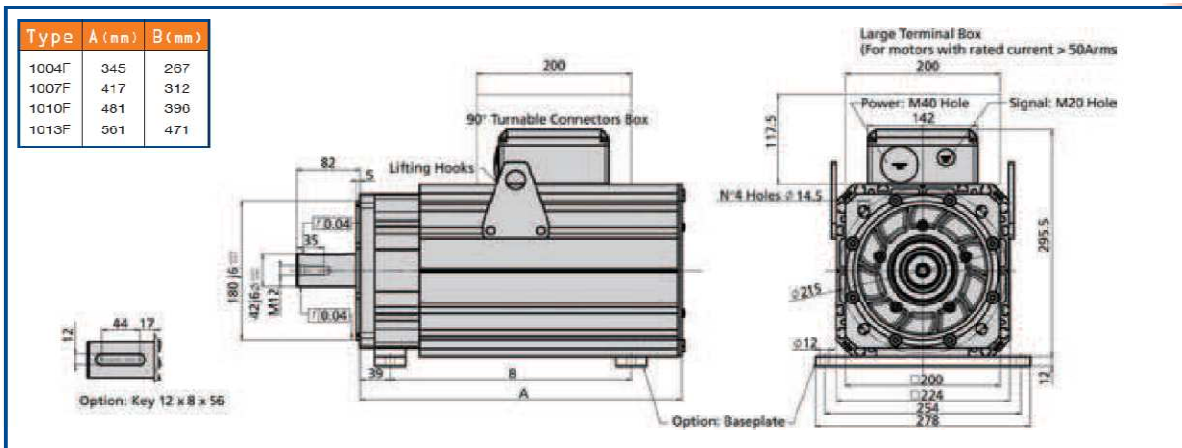


Electrical Specification	
Rated Output Power(W):	20K
Rated Rotatoin Speed (RPM):	100
Recified DC Current at Rated Output (A):	48
Requied Torque at Rated Power (NM):	2129
Phase Resistance (Ohms):	0.6
Output Wire Square Section (mm):	16
Output Wire Length (mm):	200
Insulation:	H Class
Generator configuration:	3 Phase star connected AC output
Design Lifetime:	>20 years

Mechanical Specification	
Mounting Type:	Horizontal
Weight (Kgs):	585
Starting Torque (NM):	<30
Rotor Inertia (Kg.m ²):	3.24
Bearing Type:	High standard NSK 23024C (Front) NSK 6220DDU (Rear)

Material Specification	
Shaft Material:	Nickle plated 40 Cr Steel with quenching and tempering treatment
Shaft Bearing:	High standard SKF or NSK bearing
Outer Frame Material:	Steel with anti-corrosion treatment
Fasteners (nuts and bolts):	High standard Stainless Steel
Windings Temperature Rating:	180 degrees Celsius
Magnet Material:	NdFeB (Neodymium Iron Boron)
Magnets Temperature Rating:	150 degrees Celsius
Lamination Stack:	High specification cold-rolled Steel

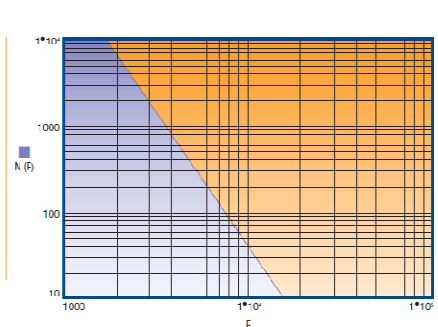
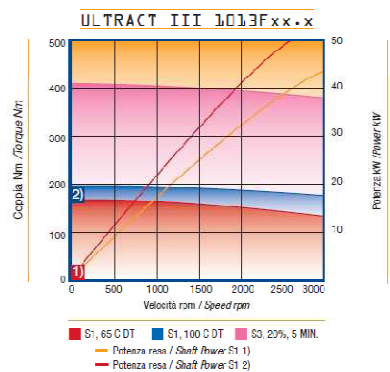
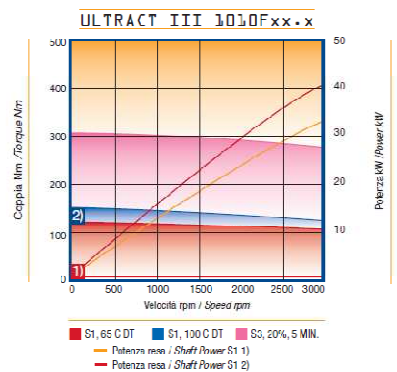
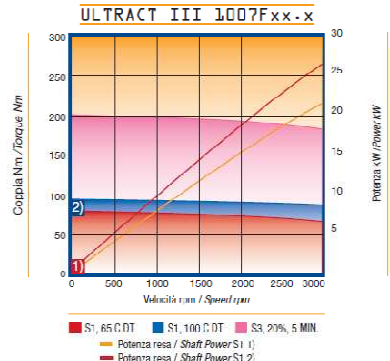
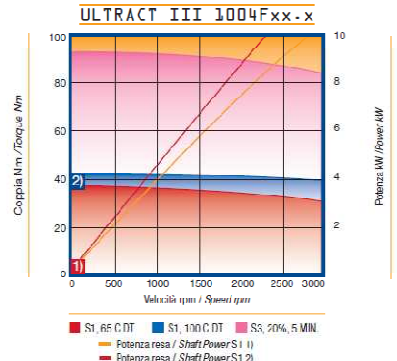




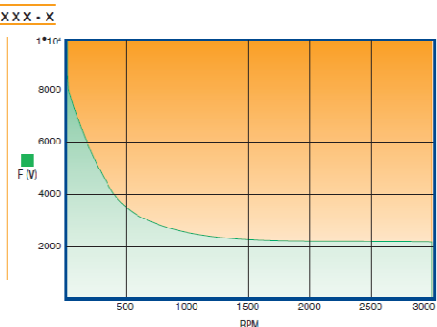
Curve delle prestazioni

Safe operating areas

10F



Vita (milioni di giri) dei cuscinetti in funzione del carico radiale (N) applicato alla mezzoria: curva sporgenza d'albero del motore.
Bearing calculated lifetime (million of rev) versus radial load (N) applied in the middle of the shaft.



Massimo carico radiale (N) ammesso in funzione della velocità (rpm) per una vita di 30.000 ore.
Maximum radial load on shaft (N) versus speed (rpm) referred to 30.000 h bearing lifetime.



Electrical Specification

Rated Output Power(W):	30K
Rated Rotatoin Speed (RPM):	100
Recified DC Current at Rated Output (A):	73
Requied Torque at Rated Power:	3300
Phase Resistance (Ohms):	0.36
Output Wire Square Section (mm):	20
Output Wire Length (mm):	500
Insulation:	H Class
Generator configuration:	3 Phase star connected AC output
Design Lifetime:	>20 years

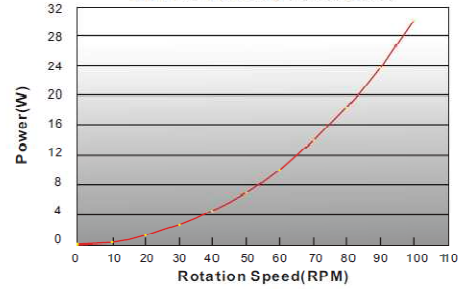
Mechanical Specification

Mounting Type:	Horizontal
Weight (Kgs):	760
Starting Torque (NM):	<37
Rotor Inertia (Kg.m):	4.47
Bearing Type:	High standard NSK 23026C3 (Front) NSK 6220DDU (Rear)

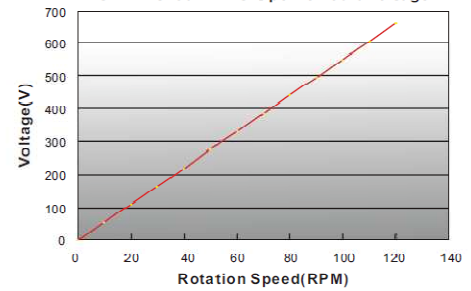
Material Specification

Shaft Material:	Nickle plated 40 Cr Steel with quenching and tempering treatment
Shaft Bearing:	High standard SKF or NSK bearing
Outer Frame Material:	Steel with anti-corrosion treatment
Fasteners (nuts and bolts):	High standard Stainless Steel
Windings Temperature Rating:	180 degrees Celsius
Magnet Material:	NdFeB (Neodymium Iron Boron)
Magnets Temperature Rating:	150 degrees Celsius
Lamination Stack:	High specification cold-rolled Steel

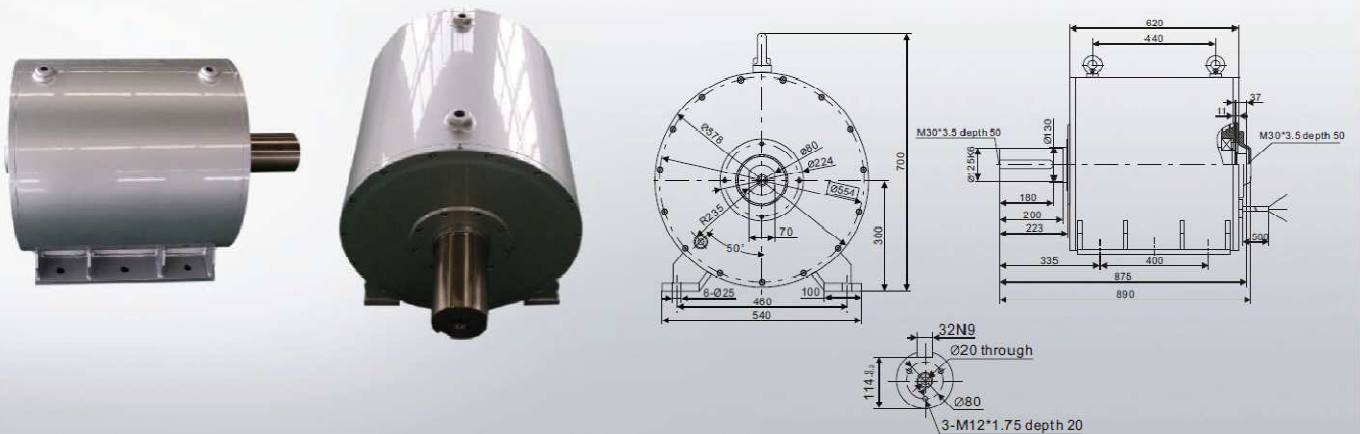
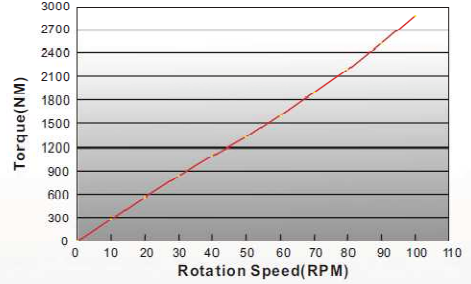
GL-PMG-30K PMG Power Curve

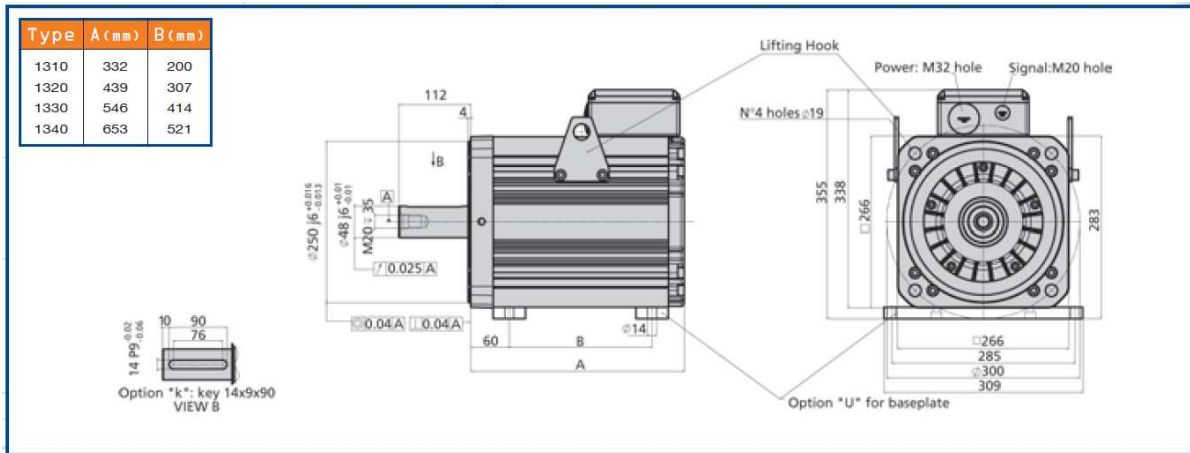


GL-PMG-30K PMG Open Circuit Voltage



GL-PMG-30K PMG Input Torque Curve

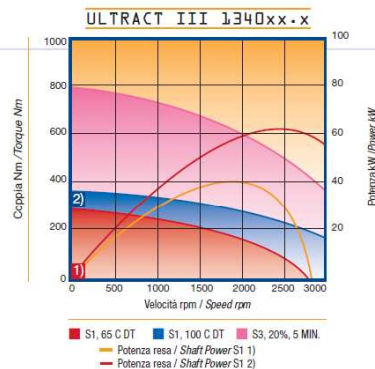
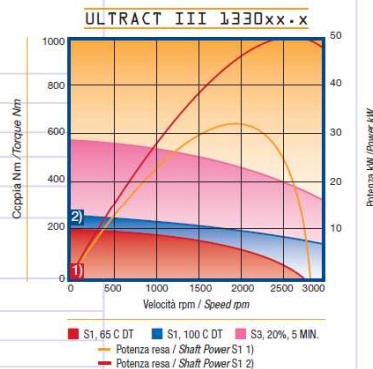
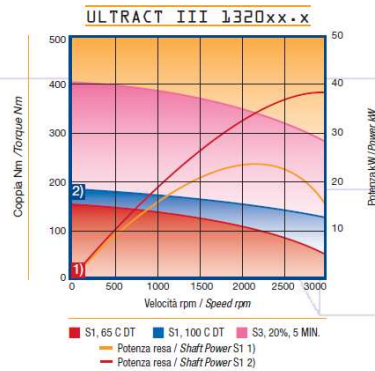
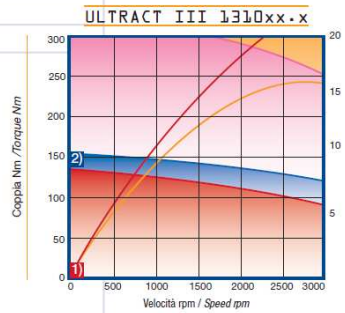




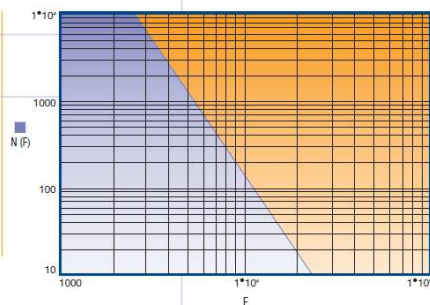
Curve delle prestazioni

Safe operating areas

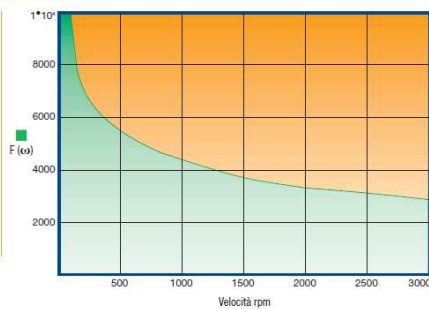
13



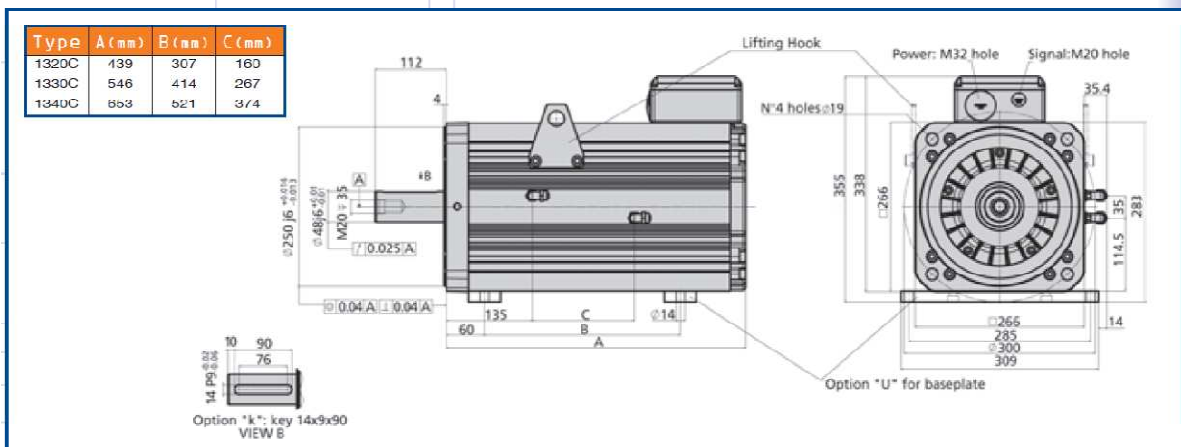
UL III-13xxxx.x



Vita (milioni di giri) dei cuscinetti in funzione del carico radiale (N) applicato alla mezziera della sporgenza d'albero del motore.
Bearing calculated lifetime (million of revs) versus radial load (N) applied in the middle of the shaft.



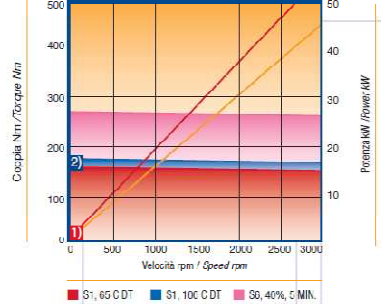
Massimo carico radiale (N) ammesso in funzione della velocità (rpm) per una vita di 30.000 ore.
Maximum radial load on shaft (N) versus speed (rpm) referred to 30,000 h bearing lifetime.



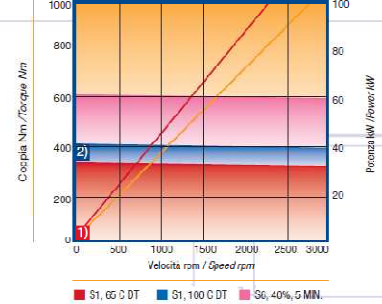
Curve delle prestazioni

Safe operating areas

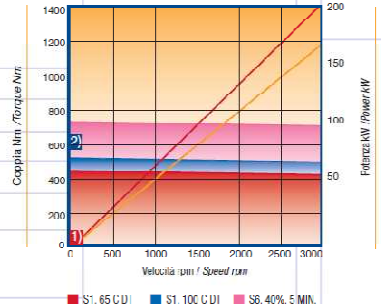
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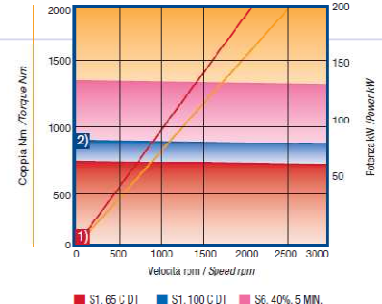
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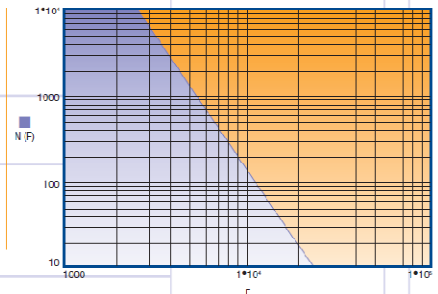
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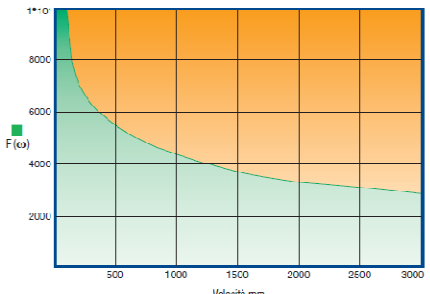
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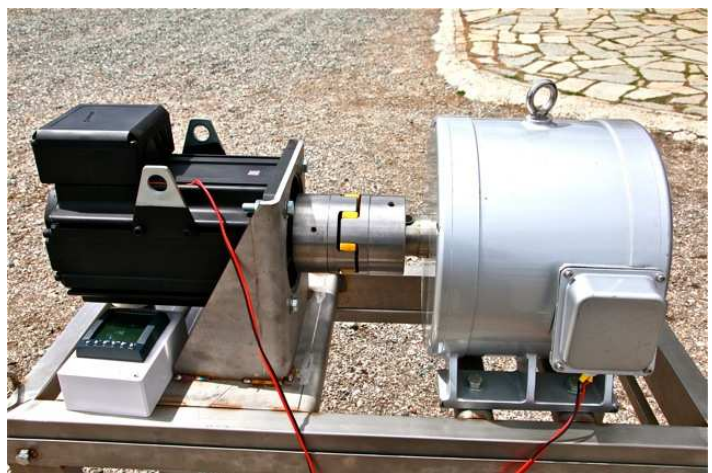
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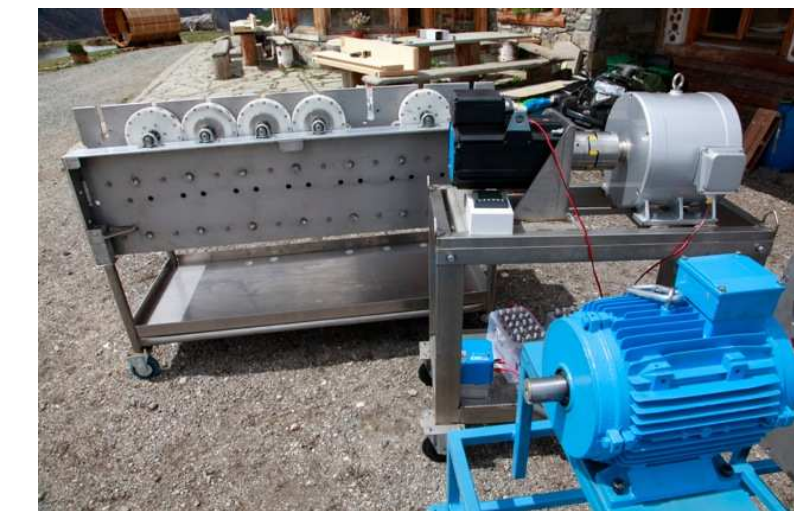


Vita (milioni di giri) dei cuscinetti in funzione del carico radiale (N) applicato alla maggioranza della sporgenza d'albero del motore.
 Bearing calculated lifetime (million of rev) versus radial load (N) applied in the majority of the shaft.



Massimo carico radiale (N) ammesso in funzione della velocità (rpm) per una vita di 30.000 ore.
 Maximum radial load on shaft (N) versus speed (rpm) referred to 30.000 h bearing lifetime.





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