Technical Data

Brushless high speed Actuator

HyspeeDyn

HG...-600-series

SynchroDyn-Servo motors

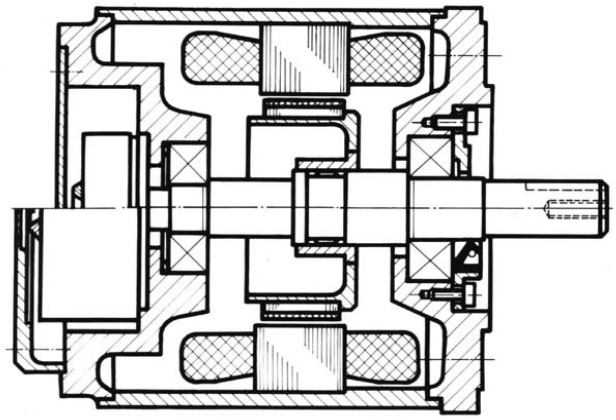
The high speed servo motors of the HG-series are a variant on the approved SynchroDyn-servo motors. They were especially designed for rated speeds up to 12000 rpm.
*The **HG...-600** series operates with a higher rated voltage for direct connection to servo amplifiers with 3x400 V AC supply voltage.*

Due to the high power density a forced ventilation is required to derive the dissipation heat. Therefore, the compressed air is lead into the inside of the coil and exits extensively on the backside of the motor.

The HG…-series correspond to a standard synchronous motor with a 4-pole permanent magnet rotor.

Characteristics:

- *Nominal speed from 10.000 to 12.000 rpm*
- *High power density by short and compact axial length*
- *High overload operating mode*
- *Cooling with compressed air (no water or oil cooling required)*
- *Low inertia, small electrical and mechanical time constants*
- *Short acceleration and deceleration times*
- *0,8 ... 6 Nm (1000 ... 7500 W)*
- *with integrated resolver*



Like a conventional AC motor, the stator coil is supplied with sinusoidal, three-phase AC-current. At PWM control of the circulation frequently and the terminal voltage, the speed of the SynchroDyn servo motor can smoothly operate between zero speed and max. no load speed, in addition high rated and maximum torques are available over the whole speed range.

The rotor position is seized by a brushless resolver. Through its sine und cosine-signals, the current angle of the rotor and the rotation speed are reported to the servo-amplifier, so no additional position sensor is needed. The hollow shaft resolver is integrated in the rear side of the servo motor.

Standard version

IP 54-R (IEC 34-5) protection; forced air cooling; shaft run out tolerance class N; vibration class R (ISO 2373); insulation class F (IEC 34-7);), temperature sensor with NTC-resistance; double shielded bearings with life-long lubrication; connectors for the motor and resolver, mating plugs included; screw terminal ½“ for forced air cooling.

Printed Motors

PMI®

Characteristics

Rated values [1]	Symbol	Unit	HG 10 SS-600	HG 10 LS-600	HG 13 SS-600	HG 13 LS-600
Nominal torque [2]	M_N	Nm	0,8	1,6	3,2	6,0
Nominal speed [2]	n_N	rpm	12000	12000	12000	12000
Power output [2]	P_N	W	1000	2000	4000	7500
Nominal frequency	f_N	Hz	400	400	400	400
Terminal voltage [3] [4]	U_N	V	318	318	300	300
Nominal current [2] [3]	I_N	A	2,4	4,6	9,4	18,2
Motor Performances						
Peak torque [5]	M_{max}	Nm	4	8	16	28
Max. peak torque [5]	I_{max}	A	10	18	35	60
Acceleration at peak torque	a_{max}	$10^3 rad/s^2$	45000	45000	24000	23000
Stall torque	M_0	Nm	1,0	1,9	3,6	6,6
Current at stall torque	I_0	A	2,7	5	10	18,5
Max. load speed	n_{max}	min^{-1}	12500	12500	12500	12500
Max. no load speed	n_0	min^{-1}	13000	13000	13000	13000
Intrinsic Motor Constants						
Torque constant [3]	k_T	Nm/A	0,36	0,38	0,36	0,36
Back EMF constant [3]	k_E	$V/10^3 min^{-1}$	21,6	23,24	22,04	21,87
Terminal resistance [4]	R_A	Ω	10,3	3,7	1,0	0,29
Armature inductance [4]	L_A	mH	ca. 11	8	6	ca. 3,5
Mechanical time constant	T_m	ms	5,4	3,1	3,1	2,0
Electrical time constant	T_e	ms	< 3	< 3	< 3	< 3
Inertia (rotor)	J	$kgcm^2$	0,88	1,68	6,6	11,84
Thermal Characteristics						
Thermal Time constant [6]	T_{th}	min	30	30	35	35
Thermal resistance [6]	R_{th}	K/W	0,3	0,3	0,2	0,2
Temperature coeff. of back EMF	c_{th}	%/K	-0,04	-0,04	-0,04	-0,04
Max. cont. winding temperature	$t_{Wi\ max}$	°C	155	155	155	155
Physical Data						
Number of magnet poles	2p	pcs	4	4	4	4
Radial shaft load	F_R	N	400	400	500	600
Axial shaft load	F_A	N	200	200	250	250
Weight	m	kg	2,4	3,2	6,8	9,8

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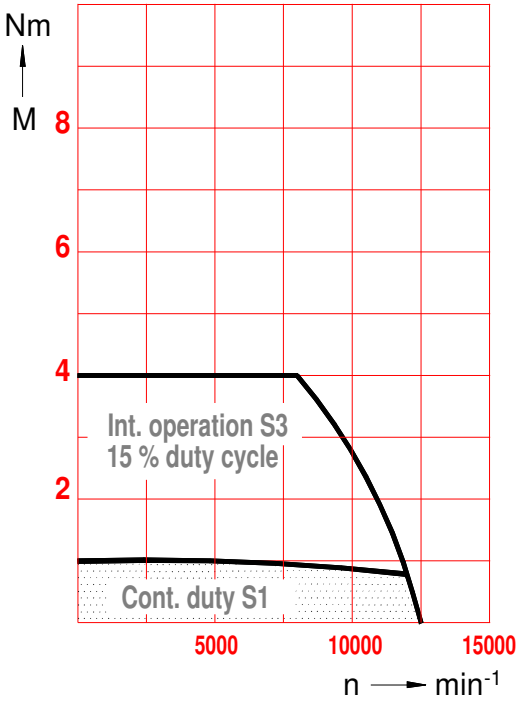
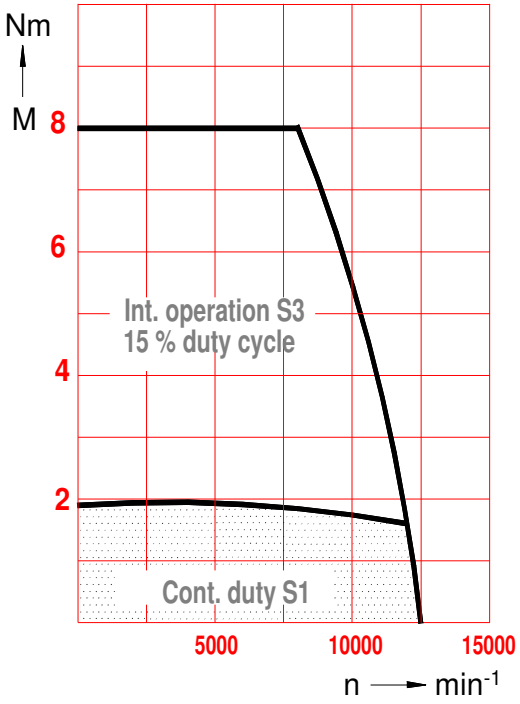
1) Motor with forced air cooling 600 l/min; IP 54-R (IP 65-R) protection
2) Continuous operation S1 (IEC 34-7), housing temperature + 65 °C
   Motor can operate at all points of the torque-speed curve up to max. load speed.
3) RMS values, for sinusoidal current/voltage peak factor $\sqrt{2}$
4) Measured between two terminals; R_A at 25 °C; L_A at 10^3 Hz
5) Intermittent operation S3 (VDE 0530), IEC 34.7, 15% duty cycle, one time 5 s.
6) Based upon mounted motors, with forced air cooling 600 l/min , nominal ambient temperature +40 °C

Speed-torque characteristics

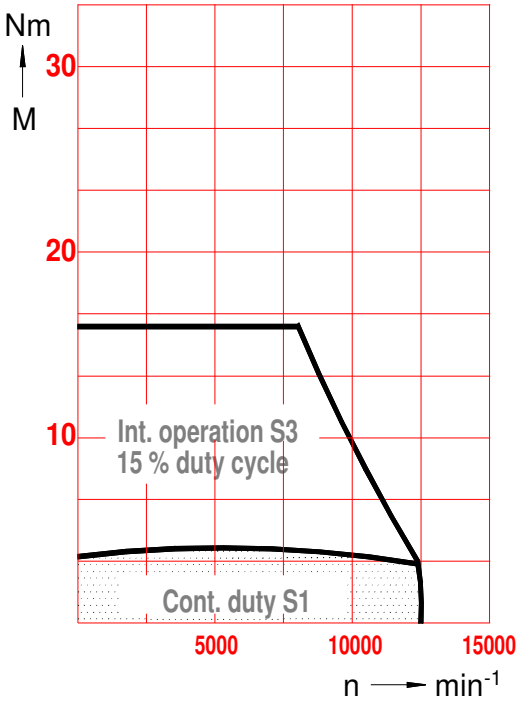
HG 10 SS-600



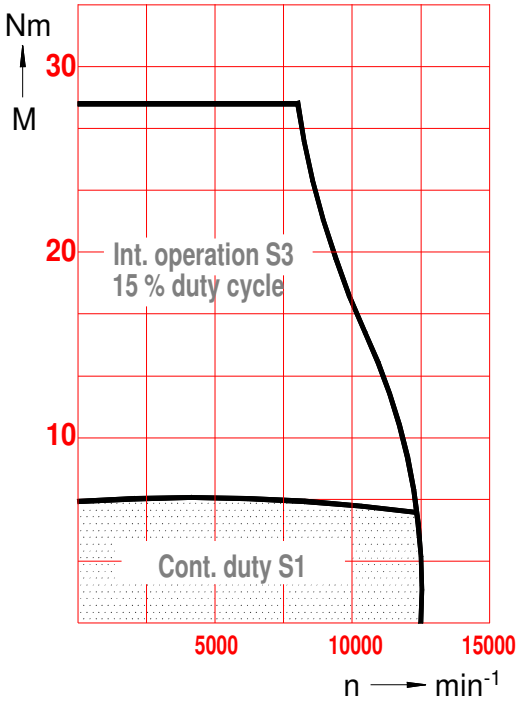
HG 10 LS-600



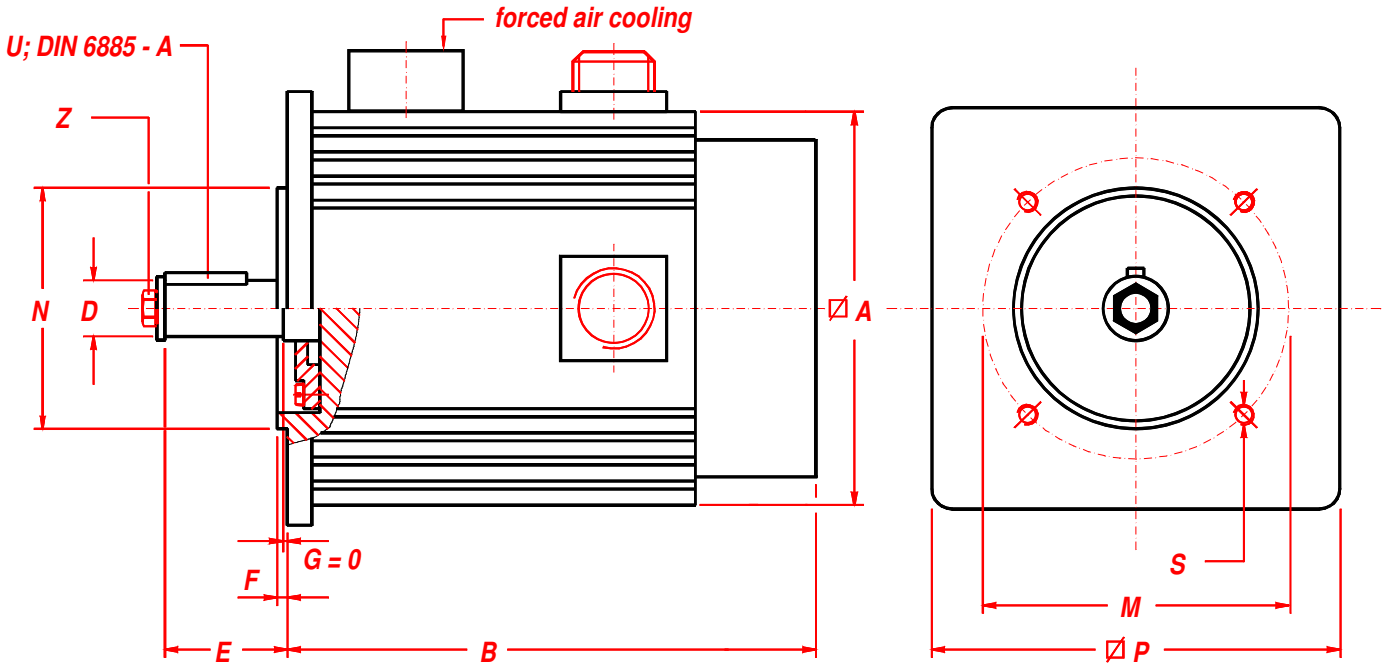
HG 13 SS-600



HG 13 LS-600



Outline Drawings
HG... 600 series



Motor	A	B	D	E	F	M	N	P	S	U	Z
HG 10 SS-600	98	135	14^{j6}	30	2,5	75	60^{j6}	100	M5x8	5x5x20	M5x12
HG 10 LS-600	98	155	14^{j6}	30	2,5	75	60^{j6}	100	M5x8	5x5x20	M5x12
HG 13 SS-600	128	190	24^{j6}	50	3	100	80^{j6}	130	M6x10	8x7x32	M8x20
HG 13 LS-600	128	226	24^{j6}	50	3	100	80^{j6}	130	M6x10	8x7x32	M8x20

Outline dimensions in mm, shaftend and mounting flange according to IEC 72

Other options (B5) on request

Order Code Key

H x - G xx xx - M xx

Mounting, protection
O = B14 (IEC 34 T7) IP 54, standard outline
N = B5 (IEC 34 T7), IP 54, standard outline

I = motor with gearhead, on request
K = customer specifications

Size (dimension P in cm)
10 = HG 10 ...
13 = HG 13 ...

Electrical options
5 = standard nominal value (600-V, 12000 rpm)

Feedback
1 = without feedback system
2 = resolver

Fail safe brake
0 = without brake

Stack options
1 = length: "short"
2 = length: "long"

How to order:

SynchroDyn servo motor, HG 13 SS-600, B 14 flange, IP 54 protection, standard characteristics and standard rated values, 2-pole resolver:

HO - G1351 - M02

All specifications subject to change without notice

Accessories

	Article-No.		Article-No.
Mating plug motor, 4 pin *HG 10 ...* *HG 13 ...*	 *HO-44308-500* *HO-53076-300*	*mating plug resolver/temperature sensor, 8 pin (suitable for all motors) with MIL-plug on request*	*HO-44295- 500*

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Printed Motors GmbH
Industrie-Servoantriebssysteme
Industriestrasse 20
D-74909 Meckesheim
Germany

Tel. *+49 (0) 62 26 84 21*
Fax. *+49 (0) 62 26 60 862*
e-mail: *info@printedmotors.com*
Internet: *www.printedmotors.com*

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