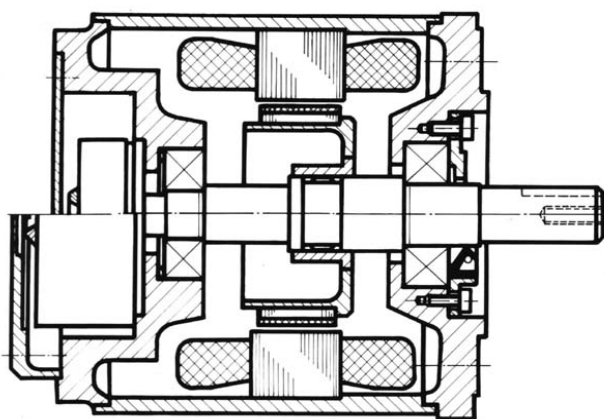


SynchroDyn-Servo motors

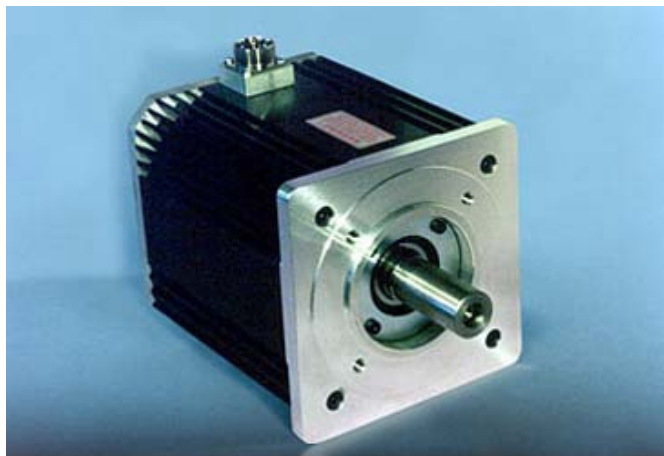
On function concept these motors are 3-phase AC Synchronous motors with an 8-pole permanent magnet rotor. The patented rotor is realised as a hollow cylinder. This unique design, together with the high coercive strength of the rare earth (SmCo_5) magnets gives the SynchroDyn servo motors the following outstanding features:

- High performance density at a compact axial length
- High overload operating mode
- High continuous acceleration
- Zero cogging, even at an extremely low speed
- Small start up- and stopping times
- Position feedback of the rotor through the resolver
- Temperature-sensor included in winding
- With permanent magnet rotor, brushless, sinusoidal commutated
- Small electrical and mechanical time constant
- Precise linearity between current and torque



Fail Safe Brake

For backlash free position hold of the motor shaft, the SynchroDyn servo motor are also available with built-in electromagnetic brake option on the mounting flange side. The brake will act as safety brake in the event of line failure. For opening, the brake must be connected at DC-voltage.



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.

Standard version

IP 54 protection (IEC 34-5), type A cooling (non ventilated), shaft runout tolerance class N, vibration class N (ISO 2373), insulation class F (IEC 34-7), PTC temperature sensor, shielded ball bearings lubricated for life, separate connectors for motor and resolver, mating plugs included.

Options

The following options and accessories are available on request:

Reduced vibration severity, increased protection class, special flange, special output shaft, shorter axial length, class S cooling, rotatable connector box.

Motors are available with gearhead, rear shaft

Characteristics

Rated values ¹⁾	Symbol	Unit	HV 10 S-300	HV 10 L-300	HV 13 S-300	HV 13 L-300	HV 16 S-300	HV 16 L-300
Nominal torque ²⁾	M_N	Nm	1	2	4	8	12	18
Nominal speed ²⁾	n_N	min ⁻¹	3000	3000	3000	3000	3000	3000
Power output ²⁾	P_N	W	310	630	1250	2500	3750	5600
Nominal frequency	f_N	Hz	200	200	200	200	200	200
Terminal voltage ³⁾	U_N	V	120	140	150	150	165	165
Nominal current ^{2) 3)}	I_N	A	2	3,1	5,7	11,4	15,4	24
Motor Performances								
Peak torque ⁵⁾	M_{max}	Nm	6	12	24	48	60	90
Max. peak torque ⁵⁾	I_{max}	A	9	18	36	72	90	135
Acceleration at peak torque	a_{max}	10 ³ rad/s ²	65	73	36	40	18	20
Stall torque	M_0	Nm	1,3	2,5	5	10	15	20,5
Current at stall torque	I_0	A	1,9	3,7	7,4	13,4	26,8	29
Max. load speed	n_{max}	min ⁻¹	5000	4500	4500	4000	4000	4000
Max. no load speed	n_0	min ⁻¹	6000	5500	5000	5000	4500	4500
Intrinsic Motor Constants								
Torque constant ³⁾	k_T	Nm/A	0,5	0,64	0,7	0,7	0,78	0,78
Back EMF constant ³⁾	k_E	V/10 ³ min ⁻¹	30	38	42	42	47	47
Terminal resistance ⁴⁾	R_A	Ω	9,5	4,7	1,55	0,55	0,40	0,22
Armature inductance ⁴⁾	L_A	mH	17,4	10,7	5,0	2,3	1,8	1,1
Mechanical time constant	T_m	ms	5,1	2,9	3,2	2,2	3,3	2,8
Electrical time constant	T_e	ms	1,8	2,3	3,2	4,2	4,6	5,2
Inertia (rotor)	J	kgcm ²	0,86	1,64	6,56	11,75	32,4	45,2
Inertia (rotor and brake)	J	kgcm ²	1,01	1,79	8,26	13,45	39,2	52,0
Thermal Characteristics								
Thermal time constant ⁶⁾	T_{th}	min	25	25	30	30	35	35
Thermal resistance ⁶⁾	R_{th}	K/W	0,55	0,55	0,33	0,33	0,24	0,24
Temperature coeff. of back EMF	c_{th}	%/K	-0,04	-0,04	-0,04	-0,04	-0,04	-0,04
Max. cont. winding temperature	$t_{wi max}$	°C	155	155	155	155	155	155
Physical Data								
Number of magnet poles	$2p$	pcs	8	8	8	8	8	8
Radial shaft load	F_R	N	400	400	500	500	600	600
Axial shaft load	F_A	N	200	200	250	250	400	400
Weight (mass)	m	kg	2,4	3,2	6,6	9,6	13,1	16,8
Weight with brake	m	kg	2,8	3,6	7,1	10,1	13,6	17,3

¹⁾ Motor TENV, protection IP 54 or IP 65, ambient temperature +40 °C, operation <1000 m above sea level.

²⁾ Continuous operation S1 (IEC 34-7), housing temperature +80 °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 10³ Hz

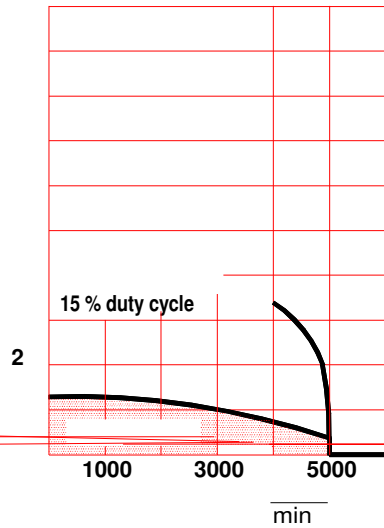
⁵⁾ Intermittent operation S3, IEC 34.7, 15% duty cycle, one time 10 s.

⁶⁾ Based upon mounted motors, heat transfer from motor to equipment

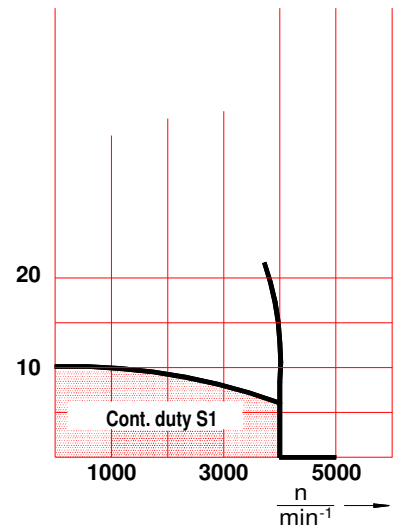
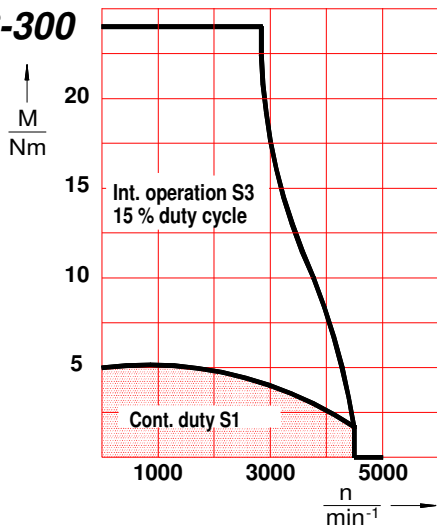
All specification subject to change without notice

Printed Motors

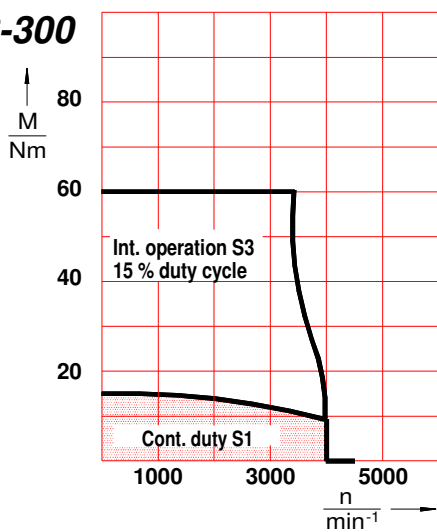




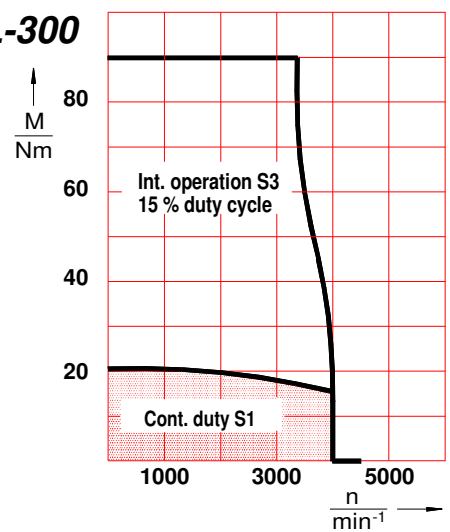
HV 13 S-300



HV 16 S-300

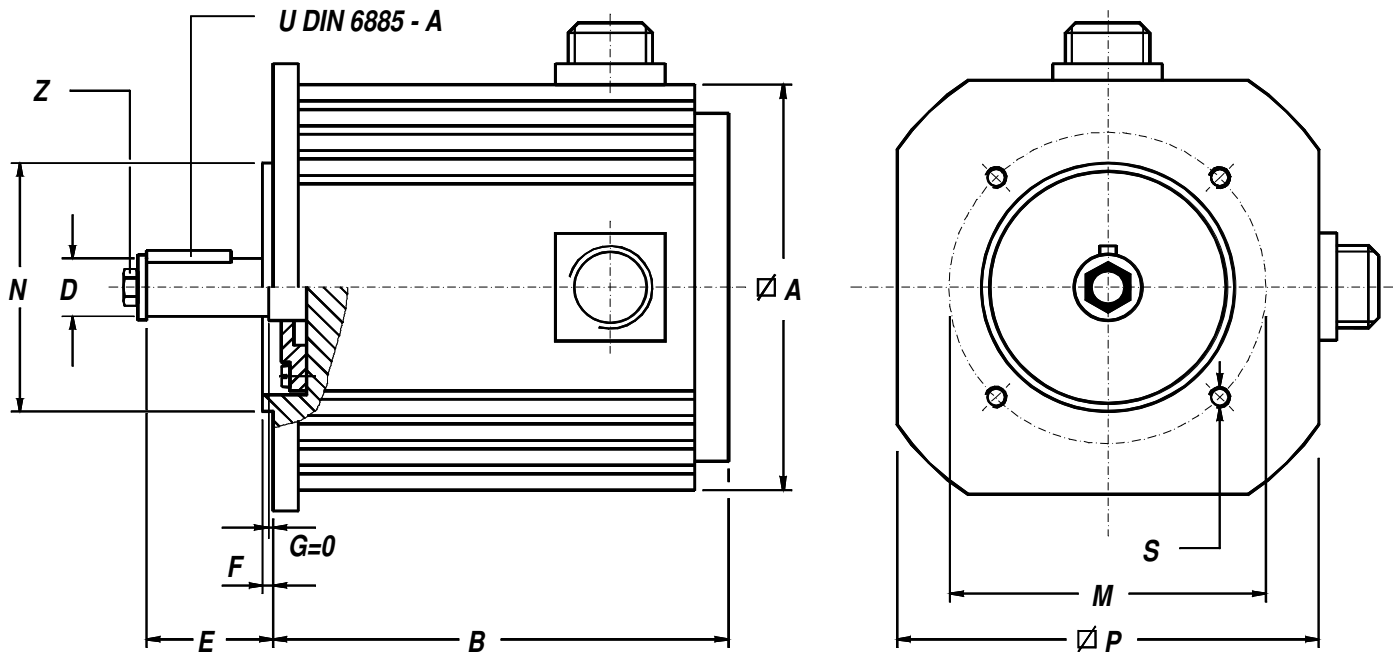


HV 16 L-300



Outline Drawings

HV... 300 series



Motor	A	B	D	E	F	M	N	P	S	U	Z
HV 10 S-300	98	108	14 ^{j6}	30	2,5	75	60 ^{j6}	100	M5x8	5x5x20	M5x12
HV 10 L-300	98	128	14 ^{j6}	30	2,5	75	60 ^{j6}	100	M5x8	5x5x20	M5x12
HV 13 S-300	128	162	24 ^{j6}	50	3	100	80 ^{j6}	130	M6x10	8x7x32	M8x20
HV 13 L-300	128	198	24 ^{j6}	50	3	100	80 ^{j6}	130	M6x10	8x7x32	M8x20
HV 16 S-300	158	198	28 ^{j6}	57	3	115	95 ^{j6}	160	M8x10	8x7x32	M8x20
HV 16 L-300	158	277	28 ^{j6}	60	3	115	95 ^{j6}	160	M8x10	8x7x32	M8x20

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

Other options (B5, shaft without parallel key, flying leads...) on request

Order Code Key

H x - H 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 = HV 10 ...
 13 = HV 13 ...
 16 = HV 16 ...

Electrical options

0 = standard ratings

Feedback

1 = without feedback system
 2 = resolver

Fail safe brake

0 = without brake
 1 = permanent magnet brake

Stack options

1 = length: "short"
 2 = length: "long"
 ...
 9 = special length

How to order:

SynchroDyn servo motor, B14 flange, IP 54 protection, outline dimensions and ratings in standard, with fail safe brake, 2-pole resolver:

HO - H1302 - M12

All specifications subject to change without notice

Accessories:

	Article-No		Article-No
Mating plug actuator HV 10 S-300 to HV 13 S-300 HV 13 L-300 to HV 16 L-300	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

Druckschrift HV 0094.0 E

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



Printed Motors