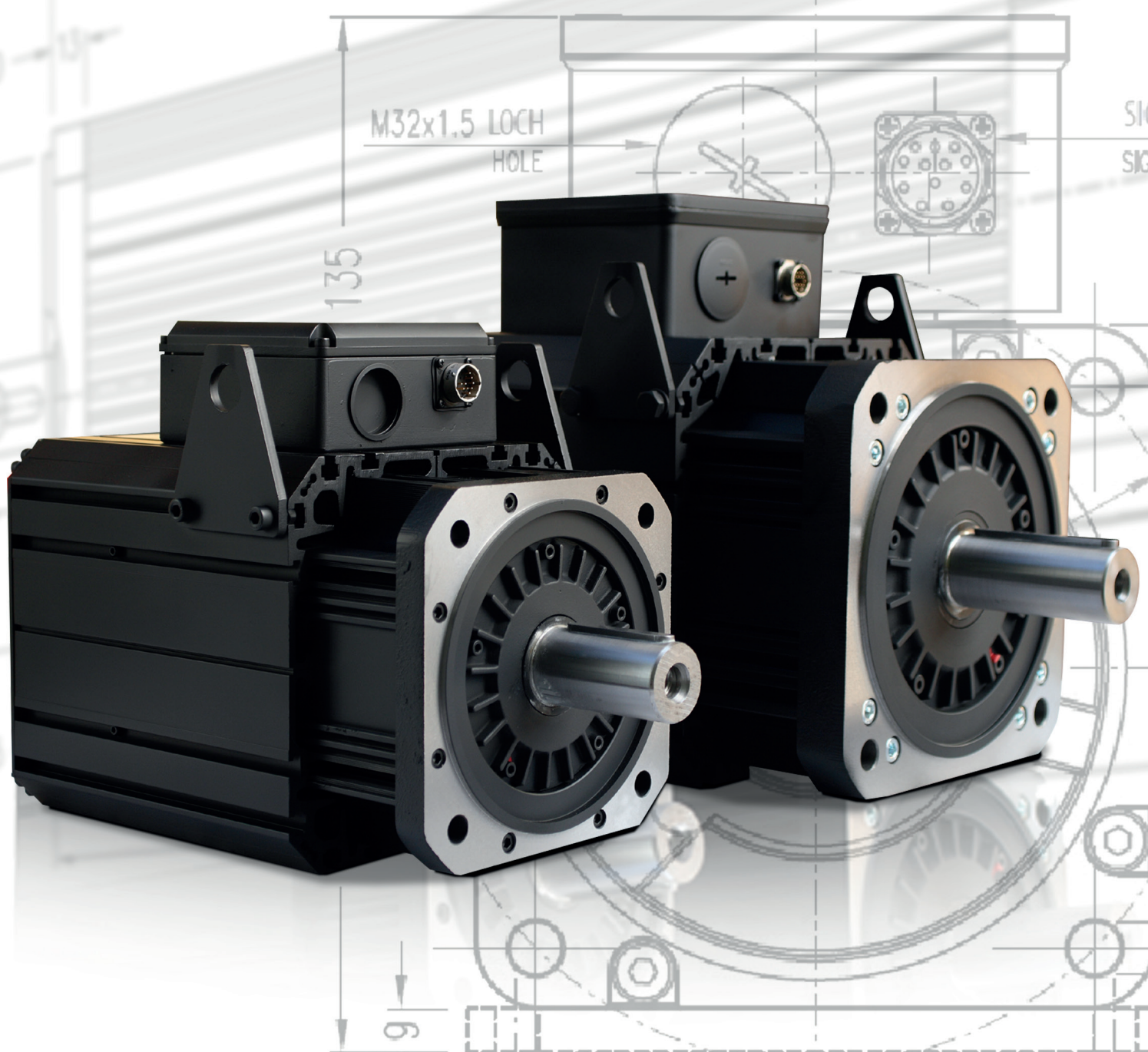


**HYDAC**

**INTERNATIONAL**

**HYDAC KineSys**  
HSM servomotors



**NOTE**

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

## Generality

The HSM series servomotors have been designed to offer the highest dynamic performance and the maximum flexibility. The Boron Iron Neodymium magnets with high energy production allow getting a motor with high specific power, bearing high overload without any risk of demagnetization.

The magnetic circuit has been studied to allow motors to produce sinusoidal power with reduced torque ripples.

Low rotor inertia allows strong accelerations and decelerations. The servomotors are compatible with grid voltages of 380/460Vac. Other voltages are available on request.

## Main features

- Winding: three-phase with Y connection without accessible neutral wire.
- Winding insulation of coils: Class H according to CEI EN 60034-1 (2000)
- Thermal dimensioning: class F ( $\Delta T_{max}=105K$ ) according to CEI EN 60034-1 (2000)
- Protection degree: IP54 according to CEI EN 60043-5 (2001)
- Feedback device: two poles resolver, Hiperface
- Cooling: IC 410 (motor without self-ventilation), IC 416 (motor with self-ventilation) according to CEI EN 60034-6 (1997)
- Key shafts according to CEI 2 23 (1993)
- Bearings: lubricated for life
- Thermal protection: thermal cutout with normal closed contact. Operating temperature 130  $\pm$  5 ° C. (ceiling voltage 250 Vac, maximum current 5Aac)
- Flange: IM B5 according to CEI EN 60034 – 7 (1993)
- Any installation position
- Terminal box for power and bayonet connector for the signal
- Color: Black RAL 9005
- Reference conditions: +40°C, max. height 1000 m above sea level
- Storage temperature: –10°C to +70°C

## Options

- Protection degree: IP65 (motor without forced-ventilation) according to CEI EN 60034-5 (2001)
- Flange: IM B3, IM B35 according to CEI En 60034-7 (1993)
- Terminal box rotating 90°
- Oil seal
- More options on request

## Maximum radial rating

The calculation of the maximum radial rating refers to 20.000 working hours with load on shaft projection center. The axial load must not exceed 20% of the maximum radial rating.

1/min	3000	4000	6000
Type	N	N	N
HSM 032	394	358	311
HSM 034	409	371	323
HSM 036	419	380	331
HSM 038	427	387	337

1/min	2000	3000	4000
Type	N	N	N
HSM 051	675	588	533
HSM 052	712	620	562
HSM 053	740	644	584
HSM 054	760	662	600
HSM 055	777	677	613
HSM 056	790	688	624
HSM 057	802	698	633
HSM 058	811	706	640

1/min	1500	2000	3000
Type	N	N	N
HSM 071	1170	1059	921
HSM 072	1217	1102	957
HSM 073	1252	1133	984
HSM 074	1277	1155	1002
HSM 075	1297	1172	1016
HSM 076	1311	1185	1026
HSM 077	1322	1194	1033
HSM 078	1130	1201	1038

1/min	1000	2000	3000
Type	N	N	N
HSM 082	3429	2712	2363
HSM 084	3778	2983	2596
HSM 086	3976	3133	2724
HSM 088	4097	3224	2759

1/min	1000	2000	3000
Type	N	N	N
HSM 092	6129	4844	4219
HSM 094	6449	5089	4427
HSM 096	6974	5478	4750
HSM 098	7142	5594	4842

WARNING: avoid axial shocks on the shaft during the assembly

## Ventilation

The motors can be provided with electric fan positioned on the opposite side of the coupling that supplies an axial fan. The air is sucked at the back side of the motor and is let off toward the flange side.

Motor Type	HSMV 7	HSMV 8	HSMV 9	Unit
Single phase supply voltage +6% -10%	230	230	230	V AC
Frequency	50 – 60	50 – 60	50 – 60	Hz
Current	0,31 – 0,26	0,37 – 0,33	0,66 – 0,94	A
Power	44 – 42	60	150 – 215	W
Air flow minimum clearance	104	83	127	mm
Start Temperature	70	70	70	°C
Type of protection	IP44	IP44	IP44	-
Additional weight	3,2	10	22	Kg
Air flow	180	440	1200	m <sup>3</sup> /h
Pressure	280	220	550	Pa

**Technical Data: HSM 03**

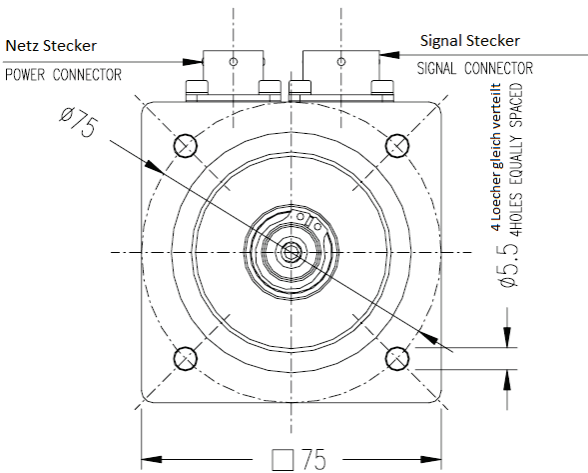
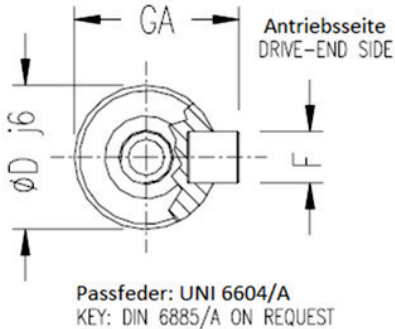
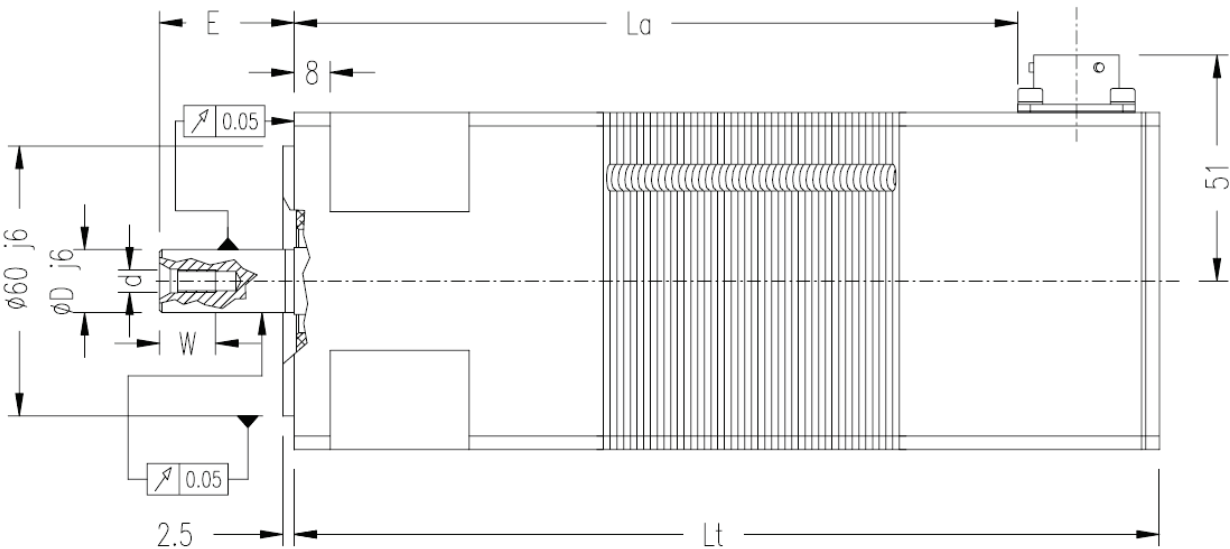
Supply voltage 400 V

Motor HSM - 3000 1/min		032304	034304	036304	038304
Nominal power	Pn [W]	201	408	597	722
Stall torque (dT=105 °C)	Ton [Nm]	0,8	1,6	2,4	3
Nominal torque	Tn [Nm]	0,64	1,3	1,9	2,3
Nominal speed	n [1/min]	3000	3000	3000	3000
Peak torque	Tpk [Nm]	2,1	4,2	6,3	8,3
Nominal current	In [A]	0,51	0,91	1,37	1,57
Stall current (dT=105 °C)	Ion [A]	0,63	1,12	1,73	2,05
Peak current	Ipk [A]	1,7	2,9	4,5	5,7
Rotor inertia	Jm [gm <sup>2</sup> ]	0,04	0,075	0,11	0,145
Back EMF (20°C)	ke [Vmin/1000]	0,81	0,918	0,891	0,940
Torque constant	kt [Nm/A]	1,263	1,431	1,389	1,465
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	52	25,2	12,9	9,4
Winding inductance Phase-Phase (20°C)	Lc [mH]	148	67	40	18
Nominal voltage	Vn [V]	284	312	298	309
Weight	m [kg]	2,1	3,1	4,1	5,1
Pole pairs	p	6	6	6	6

Motor HSM - 4000 1/min		032404	034404	036404	038404
Nominal power	Pn [W]	268	545	796	964
Stall torque (dT=105 °C)	Ton [Nm]	0,8	1,6	2,4	3
Nominal torque	Tn [Nm]	0,64	1,3	1,9	2,3
Nominal speed	n [1/min]	4000	4000	4000	4000
Peak torque	Tpk [Nm]	2,1	4,2	6,3	8,3
Nominal current	In [A]	0,69	1,24	1,77	2,1
Stall current (dT=105 °C)	Ion [A]	0,86	1,52	2,24	2,74
Peak current	Ipk [A]	2,3	4	5,8	7,6
Rotor inertia	Jm [gm <sup>2</sup> ]	0,04	0,075	0,11	0,145
Back EMF (20°C)	ke [Vmin/1000]	0,594	0,675	0,689	0,702
Torque constant	kt [Nm/A]	0,926	1,052	1,073	1,094
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	32,4	13,7	7,5	5,4
Winding inductance Phase-Phase (20°C)	Lc [mH]	80	36	24	11
Nominal voltage	Vn [V]	275	301	304	305
Weight	m [kg]	2,1	3,1	4,1	5,1
Pole pairs	p	6	6	6	6

Motor HSM - 6000 1/min		032604	034604	036604	038604
Nominal power	Pn [W]	402	816	1193	1444
Stall torque (dT=105 °C)	Ton [Nm]	0,8	1,6	2,4	3
Nominal torque	Tn [Nm]	0,64	1,3	1,9	2,3
Nominal speed	n [1/min]	6000	6000	6000	6000
Peak torque	Tpk [Nm]	2,1	4,2	6,3	8,3
Nominal current	In [A]	0,95	1,82	2,51	3,1
Stall current (dT=105 °C)	Ion [A]	1,19	2,24	3,17	4,05
Peak current	Ipk [A]	3,1	5,8	8,3	11,3
Rotor inertia	Jm [gm <sup>2</sup> ]	0,04	0,075	0,11	0,145
Back EMF (20°C)	ke [Vmin/1000]	0,432	0,459	0,486	0,475
Torque constant	kt [Nm/A]	0,673	0,715	0,758	0,741
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	16,7	6,3	3,9	2,44
Winding inductance Phase-Phase (20°C)	Lc [mH]	42	19	12	5,4
Nominal voltage	Vn [V]	292	303	317	306
Weight	m [kg]	2,1	3,1	4,1	5,1
Pole pairs	p	6	6	6	6

**Overall dimensions HSM03**



Kühlung: Konvektion IC410  
 Cooling: Free Convection IC410

	Lt	La	øD J6	E	d x W	F	GA
HSM32	151	118	11 (14)	23 (30)	M4x10 (M5x12.5)	4 (5)	12.5 (16)
HSM34	172	143					
HSM36	193	160					
HSM38	214	181					
STANDARD/(OVERSIZE)							

**Technische Daten: HSM 05**

Supply voltage 400 V

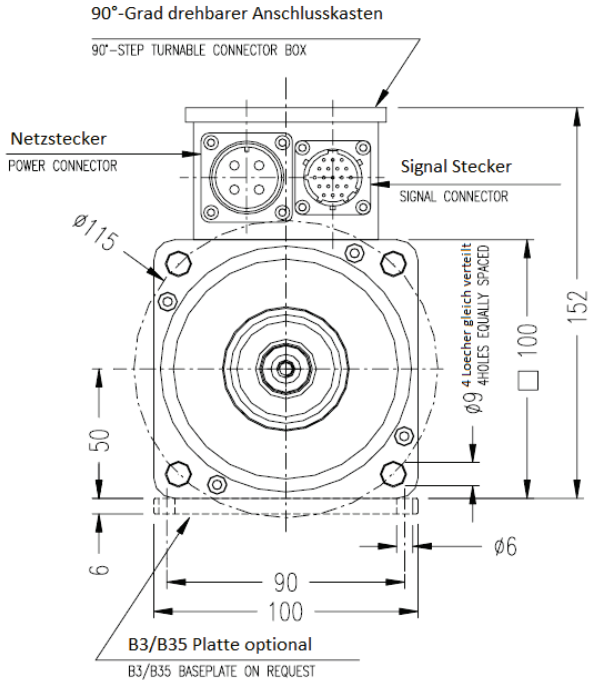
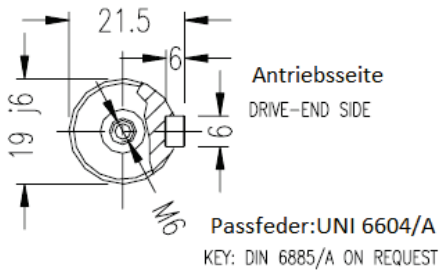
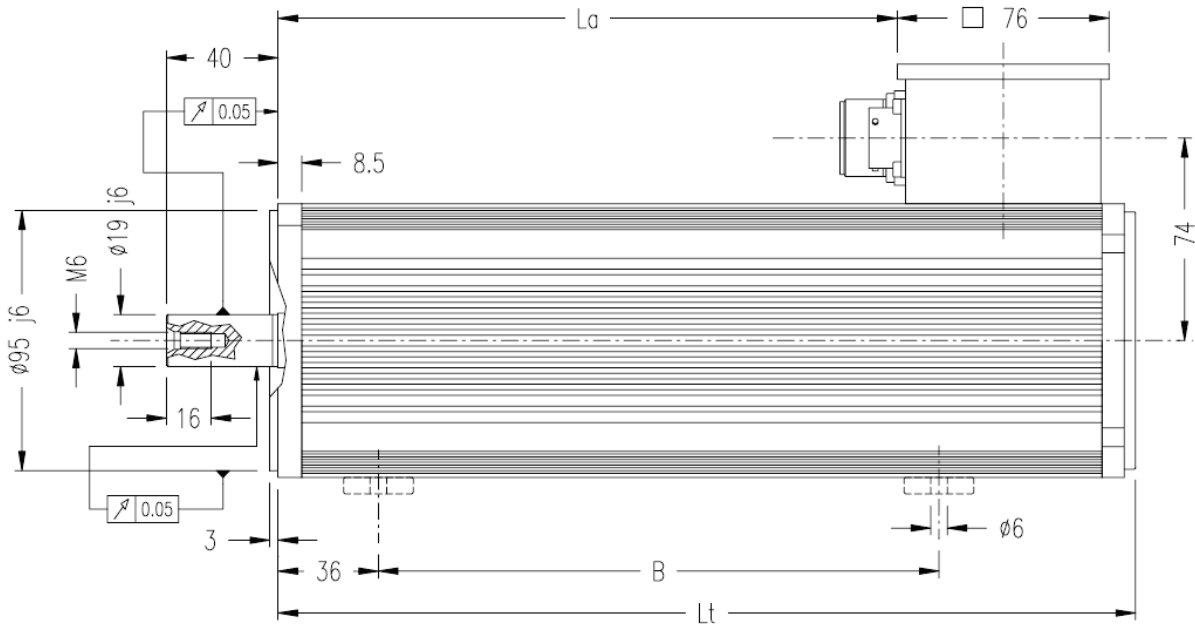
Motor HSM - 2000 1/min		051204	052204	053204	054204	055204	056204	057204	058204
Nominal power	Pn[W]	376	773	1045	1317	1526	1714	1860	2006
Stall torque (dT=105 °C)	Ton [Nm]	2	4	5,4	6,9	8,2	9,3	10,4	11,5
Nominal torque	Tn [Nm]	1,8	3,7	5	6,3	7,3	8,2	8,9	9,6
Nominal speed	n [1/min]	2000	2000	2000	2000	2000	2000	2000	2000
Peak torque	Tpk [Nm]	5	10	15	20	25	30	35	40
Nominal current	In [A]	0,8	1,56	2,2	2,73	3,12	3,65	3,84	4,27
Stall current(dT=105 °C)	Ion [A]	0,89	1,68	2,38	2,99	3,5	4,14	4,48	5,12
Peak current	lpk [A]	2,2	4,2	6,6	8,6	10,6	13,3	15	17,7
Rotor inertia	Jm [gm <sup>2</sup> ]	0,125	0,2	0,28	0,35	0,425	0,5	0,58	0,65
Back EMF (20°C)	ke [Vmin/1000]	1,441	1,525	1,455	1,478	1,502	1,441	1,488	1,441
Torque constant	kt [Nm/A]	2,247	2,377	2,269	2,305	2,341	2,247	2,319	2,247
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	84	28,7	15,5	9,77	7,73	5,51	4,89	3,9
Winding inductance Phase-Phase (20°C)	Lc [mH]	192	73	48,3	34,6	28	23,1	20	16
Nominal voltage	Vn [V]	303	320	306	310	315	303	312	303
Weigt	m [kg]	4,2	5,1	6	6,9	7,8	8,7	9,6	10,5
Pole pairs	p	8	8	8	8	8	8	8	8

Motor HSM - 3000 1/min		051304	052304	053304	054304	055304	056304	057304	058304
Nominal power	Pn[W]	550	1130	1507	1884	2135	2355	2512	2670
Stall torque (dT=105 °C)	Ton [Nm]	2	4	5,4	6,9	8,2	9,3	10,4	11,5
Nominal torque	Tn [Nm]	1,75	3,6	4,8	6	6,8	7,5	8	8,5
Nominal speed	n [1/min]	3000	3000	3000	3000	3000	3000	3000	3000
Peak torque	Tpk [Nm]	5	10	15	20	25	30	35	40
Nominal current	In [A]	1,25	2,36	3,13	3,86	4,39	4,96	5,29	5,46
Stall current(dT=105 °C)	Ion [A]	1,42	2,62	3,52	4,44	5,3	6,2	6,9	7,4
Peak current	lpk [A]	3,5	6,5	9,7	12,8	16	19,7	23	25,5
Rotor inertia	Jm [gm <sup>2</sup> ]	0,125	0,2	0,28	0,35	0,425	0,5	0,58	0,65
Back EMF (20°C)	ke [Vmin/1000]	0,901	0,979	0,984	0,998	0,993	0,97	0,97	0,998
Torque constant	kt [Nm/A]	1,404	1,527	1,534	1,556	1,548	1,512	1,512	1,556
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	32,7	12,3	6,71	4,67	3,37	2,52	2,06	1,87
Winding inductance Phase-Phase (20°C)	Lc [mH]	70,7	36,9	21,2	17,6	12	9,9	9,2	8,27
Nominal voltage	Vn [V]	284	309	310	314	313	306	306	314
Weigt	m [kg]	4,2	5,1	6	6,9	7,8	8,7	9,6	10,5
Pole pairs	p	8	8	8	8	8	8	8	8

Motor HSM - 4000 1/min		051404	052404	053404	054404	055404	056404	057404	058404
Nominal power	Pn[W]	712	1467	1927	2346	2598	2807	2933	3143
Stall torque (dT=105 °C)	Ton [Nm]	2	4	5,4	6,9	8,2	9,3	10,4	11,5
Nominal torque	Tn [Nm]	1,7	3,5	4,6	5,6	6,2	6,7	7	7,5
Nominal speed	n [1/min]	4000	4000	4000	4000	4000	4000	4000	4000
Peak torque	Tpk [Nm]	5	10	15	20	25	30	35	40
Nominal current	In [A]	1,5	3	4,02	4,86	5,38	5,7	6	6,5
Stall current(dT=105 °C)	Ion [A]	1,77	3,43	4,72	6	7,1	8	9	10
Peak current	lpk [A]	4,4	8,5	13	17,2	21,6	25,5	30	35
Rotor inertia	Jm [gm <sup>2</sup> ]	0,125	0,2	0,28	0,35	0,425	0,5	0,58	0,65
Back EMF (20°C)	ke [Vmin/1000]	0,725	0,748	0,734	0,739	0,739	0,748	0,744	0,739
Torque constant	kt [Nm/A]	1,131	1,167	1,144	1,152	1,152	1,167	1,159	1,152
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	20,8	7,03	3,7	2,58	1,84	1,53	1,24	1,02
Winding inductance Phase-Phase (20°C)	Lc [mH]	48,5	21,4	13,3	10	7,7	5,9	5,2	4,55
Nominal voltage	Vn [V]	305	314	308	310	310	314	312	310
Weigt	m [kg]	4,2	5,1	6	6,9	7,8	8,7	9,6	10,5
Pole pairs	p	8	8	8	8	8	8	8	8



**Overall dimensions HSM05**



Kühlung: Konvektion IC410  
Cooling: Free Convection IC410

Länge/Typ	HSM051	HSM052	HSM053	HSM054	HSM055	HSM056	HSM057	HSM058
B	71	93	115	136	158	179	201	223
La	92	114	136	157	179	200	222	244
Lt	178	200	222	243	265	286	308	330

**Technical Data: HSM 07**

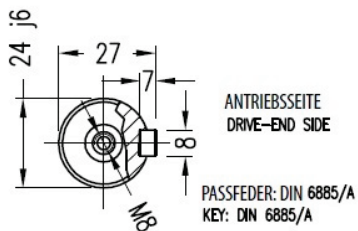
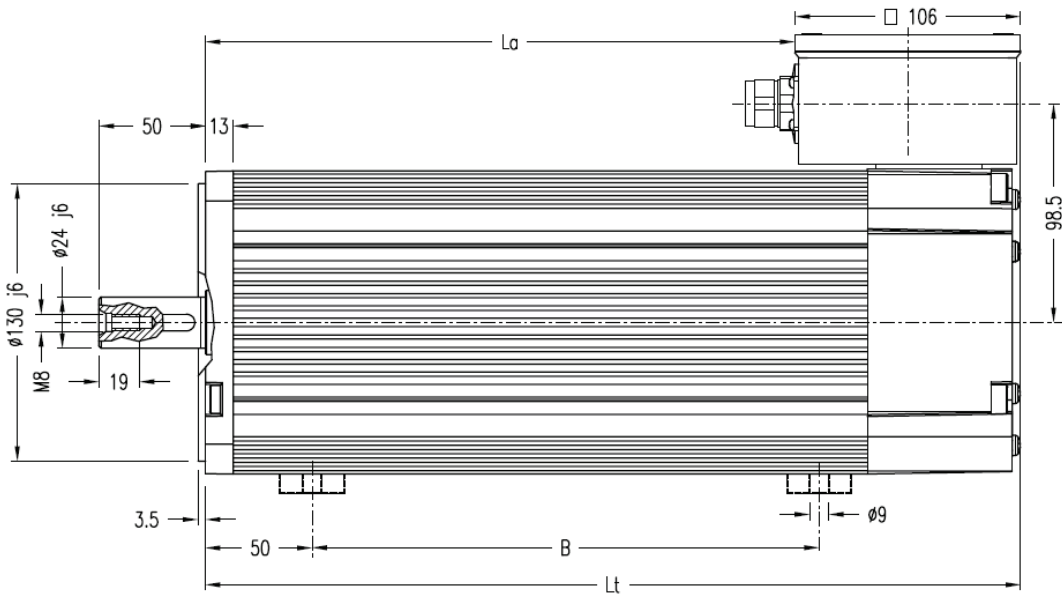
Supply voltage 400 V

Motor HSM - 1500 1/min		071154	072154	073154	074154	075154	076154	077154	078154
Nominal power	Pn [W]	832	1586	2167	2700	2983	3297	3847	4412
Stall torque (dT=105 °C)	Ton [Nm]	5,8	11	15,3	19,5	22,5	26	30	34
Nominal torque	Tn [Nm]	5,3	10,1	13,8	17,2	19	21	24,5	28,1
Nominal speed	n [1/min]	1500	1500	1500	1500	1500	1500	1500	1500
Peak torque	Tpk [Nm]	12,8	26	38	51	64	77	90	102
Nominal current	In [A]	1,84	3,43	4,55	5,46	6,29	6,84	8,08	9,23
Stall current (dT=105°C)	Ion [A]	2,02	3,74	5,04	6,19	7,45	8,46	9,89	11,16
Peak current	Ipk [A]	4,4	8,6	12,5	16,1	20,9	24,7	29,2	33,2
Rotor inertia	Jm [gm <sup>2</sup> ]	0,53	0,84	1,16	1,46	1,77	2,07	2,38	2,68
Back EMF (20°C)	ke [Vmin/1000]	193	198	204	212	203	206	204	205
Torque constant	kt [Nm/A]	2,87	2,94	3,03	3,15	3,02	3,07	3,03	3,04
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	23,6	8,02	4,64	3,4	2,34	1,93	1,59	1,37
Winding inductance Phase-Phase (20°C)	Lc [mH]	88,3	50,2	32,3	26,4	19,1	15,5	13,3	10,7
Nominal voltage	Vn [V]	339	334	333	343	323	326	322	322
Weight	m [kg]	9	11,4	13,6	15,5	18,3	20,5	23,6	26
Pole pairs	p	4	4	4	4	4	4	4	4

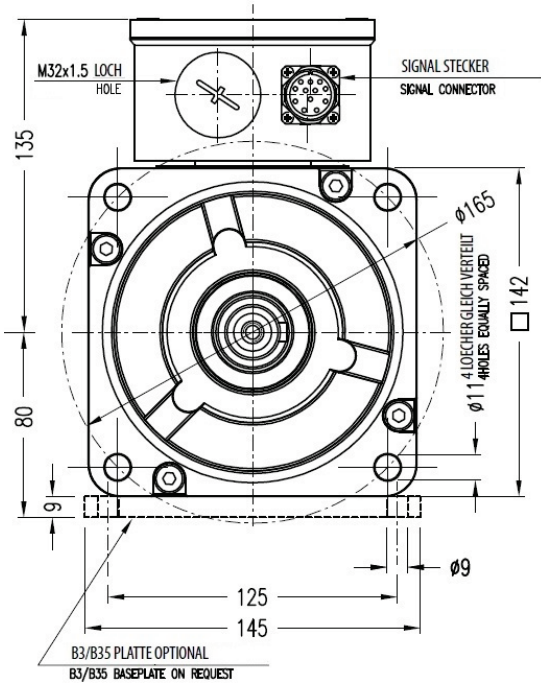
Motor HSM - 2000 1/min		071204	072204	073204	074204	075204	076204	077204	078204
Nominal power	Pn [W]	1045	2090	2780	3450	3760	4080	4770	5430
Stall torque (dT=105 °C)	Ton [Nm]	5,8	11	15,3	19,5	22,5	26	30	34
Nominal torque	Tn [Nm]	5	10	13,3	16,5	18	19,5	22,8	26
Nominal speed	n [1/min]	2000	2000	2000	2000	2000	2000	2000	2000
Peak torque	Tpk [Nm]	12,8	26	38	51	64	77	90	102
Nominal current	In [A]	2,2	4,43	5,92	7,14	7,62	8,54	9,92	11,25
Stall current (dT=105°C)	Ion [A]	2,55	4,87	6,81	8,44	9,5	11,4	13,1	14,7
Peak current	Ipk [A]	5,6	11,2	16,9	21,9	26,8	33,2	38,5	43,8
Rotor inertia	Jm [gm <sup>2</sup> ]	0,53	0,84	1,16	1,46	1,77	2,07	2,38	2,68
Back EMF (20°C)	ke [Vmin/1000]	153	152	151	155	159	154	154	155
Torque constant	kt [Nm/A]	2,27	2,25	2,24	2,31	2,36	2,28	2,29	2,31
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	14,7	4,72	2,55	1,83	1,43	1,07	0,905	0,782
Winding inductance Phase-Phase (20°C)	Lc [mH]	58	29,3	18,2	14,2	11	9,3	7,81	5,86
Nominal voltage	Vn [V]	345	334	324	329	332	319	321	321
Weight	m [kg]	9	11,4	13,6	15	18,3	20,5	23,6	26
Pole pairs	p	4	4	4	4	4	4	4	4

Motor HSM - 3000 1/min		071304	072304	073304	074304	075304	076304	077304	078304
Nominal power	Pn [W]	1410	2830	3770	4550	4870	5180	5900	6590
Stall torque (dT=105 °C)	Ton [Nm]	5,8	11	15,3	19,5	22,5	26	30	34
Nominal torque	Tn [Nm]	4,5	9	12	14,5	15,5	16,5	18,8	21
Nominal speed	n [1/min]	3000	3000	3000	3000	3000	3000	3000	3000
Peak torque	Tpk [Nm]	12,8	26	38	51	64	77	90	102
Nominal current	In [A]	2,83	5,81	7,62	9,2	9,84	10,5	12	13,3
Stall current (dT=105°C)	Ion [A]	3,65	7,1	9,71	12,4	14,3	16,5	19,2	21,6
Peak current	Ipk [A]	8	16,3	24,1	32,1	40,2	48,2	56,7	64
Rotor inertia	Jm [gm <sup>2</sup> ]	0,53	0,84	1,16	1,46	1,77	2,07	2,38	2,68
Back EMF (20°C)	ke [Vmin/1000]	107	104	106	106	106	106	105	106
Torque constant	kt [Nm/A]	1,59	1,55	1,58	1,58	1,58	1,58	1,56	1,58
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	7,25	2,19	1,26	0,849	0,65	0,515	0,419	0,361
Winding inductance Phase-Phase (20°C)	Lc [mH]	30,2	13,5	9,23	5,8	4,78	4,09	3,1	2,94
Nominal voltage	Vn [V]	350	332	335	330	327	325	322	324
Weight	m [kg]	9	11,4	13,6	15,5	18,3	20,5	23,6	26
Pole pairs	p	4	4	4	4	4	4	4	4

**Overall dimensions HSM 07**



Kühlung: Konvektion IC410  
Cooling: Free Convection IC410



Length/Type	HSM071	HSM072	HSM073	HSM074	HSM075	HSM076	HSM077	HSM078
B	73	100	128	155	183	210	238	265
La	111	139	167	194	222	249	277	304
Lt	217	245	273	300	328	355	383	410

**Technical Data: HSM V7**

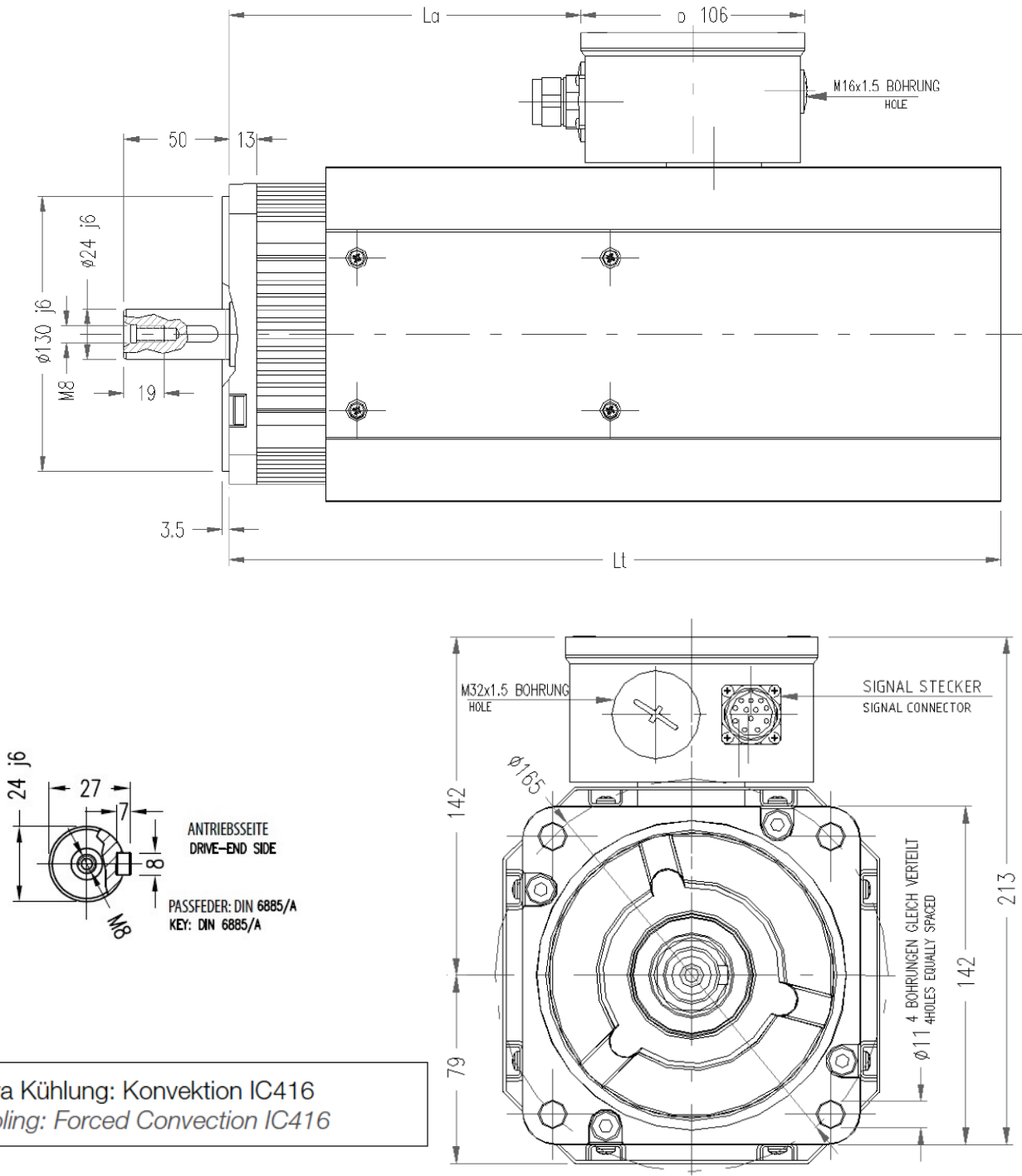
Supply voltage 400 V

Motor HSM - 1500 1/min forced ventilation		V71154	V72154	V73154	V74154	V75154	V76154	V77154	V78154
Nominal power	Pn [W]	1165	2220	3034	3780	4176	4616	5386	6177
Stall torque (dT=105 °C)	Ton [Nm]	8,12	15,4	21,42	27,3	31,5	36,4	42	47,6
Nominal torque	Tn [Nm]	7,42	14,14	19,32	24,08	26,6	29,4	34,3	39,34
Nominal speed	n [1/min]	1500	1500	1500	1500	1500	1500	1500	1500
Peak torque	Tpk [Nm]	16,3	32	49	65	81	98	114	130
Nominal current	In [A]	2,58	4,8	6,37	7,64	8,81	9,58	11,31	12,92
Stall current (dT=105°C)	Ion [A]	2,83	5,24	7,06	8,67	10,43	11,84	13,85	15,62
Peak current	l <sub>pk</sub> [A]	5,7	11	16,1	20,7	26,9	31,8	37,6	42,7
Rotor inertia	Jm [gm <sup>2</sup> ]	0,53	0,84	1,16	1,46	1,77	2,07	2,38	2,68
Back EMF (20°C)	ke [Vmin/1000]	193	198	204	212	203	206	204	205
Torque constant	kt [Nm/A]	2,87	2,94	3,03	3,15	3,02	3,07	3,03	3,04
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	23,6	8,02	4,64	3,4	2,34	1,93	1,59	1,37
Winding inductance Phase-Phase (20°C)	Lc [mH]	88,3	50,2	32,3	26,4	19,1	15,5	13,3	10,7
Nominal voltage	Vn [V]	364	355	349	382	334	335	331	331
Weight	m [kg]	13	14,5	17,5	18,5	21	24	27	30
Pole pairs	p	4	4	4	4	4	4	4	4

Motor HSM - 2000 1/min forced ventilation		V71204	V72204	V73204	V74204	V75204	V76204	V77204	V78204
Nominal power	Pn [W]	1463	2926	3892	4830	5264	5712	6678	7602
Stall torque (dT=105 °C)	Ton [Nm]	8,12	15,4	21,42	27,3	31,5	36,4	42	47,6
Nominal torque	Tn [Nm]	7	14	18,62	23,1	25,2	27,3	31,92	36,4
Nominal speed	n [1/min]	2000	2000	2000	2000	2000	2000	2000	2000
Peak torque	Tpk [Nm]	16,2	33	49	65	81	98	114	130
Nominal current	In [A]	3,08	6,2	8,29	10	10,67	11,96	13,89	15,75
Stall current (dT=105°C)	Ion [A]	3,57	6,82	9,53	11,82	13,3	15,9	18,3	20,6
Peak current	l <sub>pk</sub> [A]	7,1	14,4	21,7	28,2	34,4	42,7	49,6	56,3
Rotor inertia	Jm [gm <sup>2</sup> ]	0,53	0,84	1,16	1,46	1,77	2,07	2,38	2,68
Back EMF (20°C)	ke [Vmin/1000]	153	152	151	155	159	154	154	155
Torque constant	kt [Nm/A]	2,27	2,25	2,24	2,31	2,36	2,28	2,29	2,31
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	14,7	4,72	2,55	1,83	1,43	1,07	0,905	0,782
Winding inductance Phase-Phase (20°C)	Lc [mH]	58	29,3	18,2	14,2	11	9,3	7,81	5,86
Nominal voltage	Vn [V]	367	353	337	341	341	327	328	327
Weight	m [kg]	13	14,5	17,5	18,5	21	24	27	30
Pole pairs	p	4	4	4	4	4	4	4	4

Motor HSM - 3000 1/min forced ventilation		V71304	V72304	V73304	V74304	V75304	V76304	V77304	V78304
Nominal power	Pn [W]	1974	3962	5278	6370	6818	7252	8260	9226
Stall torque (dT=105 °C)	Ton [Nm]	8,12	15,4	21,42	27,3	31,5	36,4	42	47,6
Nominal torque	Tn [Nm]	6,3	12,6	16,8	20,3	21,7	23,1	26,32	29,4
Nominal speed	n [1/min]	3000	3000	3000	3000	3000	3000	3000	3000
Peak torque	Tpk [Nm]	16,3	33	49	65	81	98	114	130
Nominal current	In [A]	3,96	8,13	10,67	12,88	13,78	14,7	16,8	18,7
Stall current (dT=105°C)	Ion [A]	5,11	9,94	13,59	17,3	20	23,1	26,9	30,2
Peak current	l <sub>pk</sub> [A]	10,3	21	31	41,3	51,6	62	72,9	83
Rotor inertia	Jm [gm <sup>2</sup> ]	0,53	0,84	1,16	1,46	1,77	2,07	2,38	2,68
Back EMF (20°C)	ke [Vmin/1000]	107	104	106	106	106	106	105	106
Torque constant	kt [Nm/A]	1,58	1,54	1,57	1,57	1,57	1,57	1,56	1,57
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	7,25	2,19	1,26	0,849	0,65	0,515	0,419	0,361
Winding inductance Phase-Phase (20°C)	Lc [mH]	30,2	13,5	9,23	5,8	4,78	4,09	3,1	2,94
Nominal voltage	Vn [V]	369	345	346	339	333	330	326	329
Weight	m [kg]	13	14,5	17,5	18,5	21	24	27	30
Pole pairs	p	4	4	4	4	4	4	4	4

**Overall dimensions HSM V7**



Extra Kühlung: Konvektion IC416  
 Cooling: Forced Convection IC416

Length/Type	HSM V71	HSM V72	HSM V73	HSM V74	HSM V75	HSM V76	HSM V77	HSM V78
$L_a$	111	139	167	194	222	249	277	304
$L_t$	312	340	368	395	423	450	478	505

**Technical Data: HSM 08**

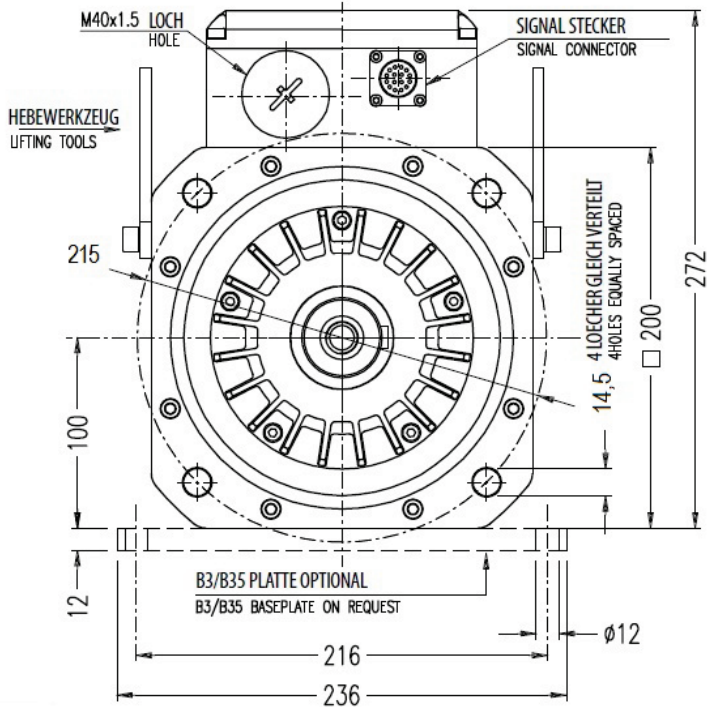
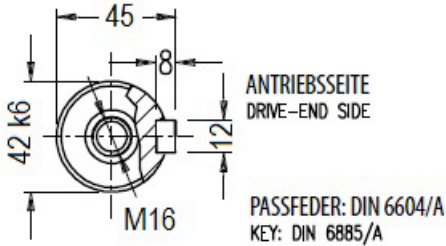
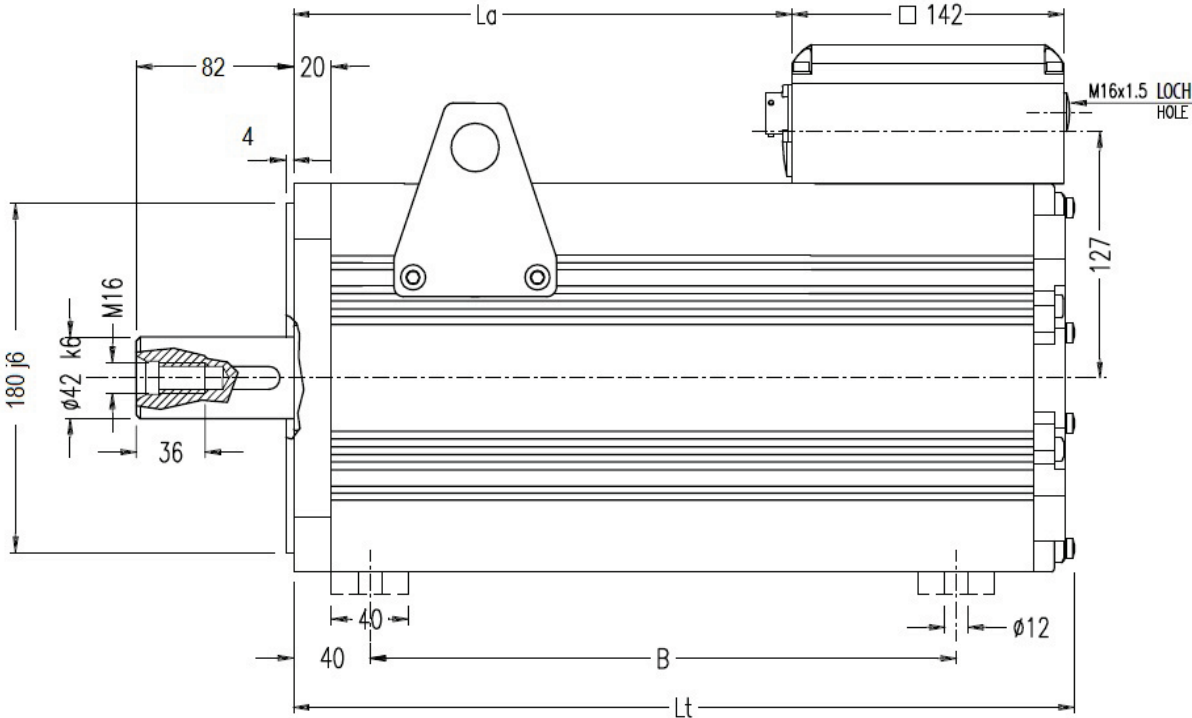
Supply Voltage 400 V

Motor HSM - 1000 1/min		082104	084104	086104	088104
Nominal power	P <sub>n</sub> [W]	3150	5985	8610	11130
Stall torque (dT=105 °C)	T <sub>on</sub> [Nm]	30	57	82	106
Nominal torque	T <sub>n</sub> [Nm]	30	57	82	106
Nominal speed	n [1/min]	1000	1000	1000	1000
Peak torque	T <sub>pk</sub> [Nm]	88	165	239	290
Nominal current	I <sub>n</sub> [A]	6,04	12,63	16,52	23,57
Stall current (dT=105°C)	I <sub>on</sub> [A]	6,04	12,63	16,52	23,57
Peak current	I <sub>pk</sub> [A]	18	37	48	64
Rotor inertia	J <sub>m</sub> [gm <sup>2</sup> ]	6	9	12	15
Back EMF (20°C)	k <sub>e</sub> [Vmin/1000]	316	287	316	286
Torque constant	k <sub>t</sub> [Nm/A]	4,97	4,51	4,963	4,497
Winding resistance Phase-Phase (20°C)	R <sub>c</sub> [Ohm]	4,86	1,34	0,9	0,62
Winding inductance Phase-Phase (20°C)	L <sub>c</sub> [mH]	47,8	19,8	15,9	11,2
Nominal voltage	V <sub>n</sub> [V]	358	316	343	315
Weight	m [kg]	30	43	54	68
Pole pairs	p	4	4	4	4

Motor HSM - 2000 1/min		082204	084204	086204	088204
Nominal power	P <sub>n</sub> [W]	6270	7031	15675	19855
Stall torque (dT=105 °C)	T <sub>on</sub> [Nm]	30	57	80	105
Nominal torque	T <sub>n</sub> [Nm]	30	55,8	75	95
Nominal speed	n [1/min]	2000	2000	2000	2000
Peak torque	T <sub>pk</sub> [Nm]	88	165	239	290
Nominal current	I <sub>n</sub> [A]	13,29	23,18	33,25	42,25
Stall current (dT=105°C)	I <sub>on</sub> [A]	13,29	23,67	35,46	46,7
Peak current	I <sub>pk</sub> [A]	39	69	106	129
Rotor inertia	J <sub>m</sub> [gm <sup>2</sup> ]	6	9	12	15
Back EMF (20°C)	k <sub>e</sub> [Vmin/1000]	143	153	143	143
Torque constant	k <sub>t</sub> [Nm/A]	2,26	2,41	2,26	2,25
Winding resistance Phase-Phase (20°C)	R <sub>c</sub> [Ohm]	0,947	0,385	0,194	0,155
Winding inductance Phase-Phase (20°C)	L <sub>c</sub> [mH]	9,9	5,6	3,3	2,81
Nominal voltage	V <sub>n</sub> [V]	312	200	303	304
Weight	m [kg]	30	43	54	68
Pole pairs	p	4	4	4	4

Motor HSM - 3000 1/min		082304	084304	086304	088304
Nominal power	P <sub>n</sub> [W]	9420	15637	20410	24398
Stall torque (dT=105 °C)	T <sub>on</sub> [Nm]	30	57	82	105
Nominal torque	T <sub>n</sub> [Nm]	30	49,8	65	77,7
Nominal speed	n [1/min]	3000	3000	3000	3000
Peak torque	T <sub>pk</sub> [Nm]	88	165	239	290
Nominal current	I <sub>n</sub> [A]	18,12	33,09	36,02	46,08
Stall current (dT=105°C)	I <sub>on</sub> [A]	18,12	37,88	45,44	62,27
Peak current	I <sub>pk</sub> [A]	53	110	133	172
Rotor inertia	J <sub>m</sub> [gm <sup>2</sup> ]	6	9	12	15
Back EMF (20°C)	k <sub>e</sub> [Vmin/1000]	106	95	115	107
Torque constant	k <sub>t</sub> [Nm/A]	1,66	1,5	1,8	1,69
Winding resistance Phase-Phase (20°C)	R <sub>c</sub> [Ohm]	0,486	0,149	0,126	0,086
Winding inductance Phase-Phase (20°C)	L <sub>c</sub> [mH]	5,3	2,19	2,11	1,58
Nominal voltage	V <sub>n</sub> [V]	340	302	358	335
Weight	m [kg]	30	43	54	68
Pole pairs	p	4	4	4	4

**Overall dimensions HSM 08**



Kühlung: Konvektion IC410  
 Cooling: Free Convection IC410

Length/Type	HSM 082	HSM 084	HSM 086	HSM 088
B	156	231	306	380
La	110	185	260	334
Lt	259	333	408	483

**Technical Data: HSM V8**

Supply voltage 400 V

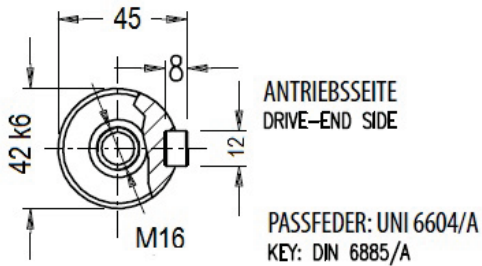
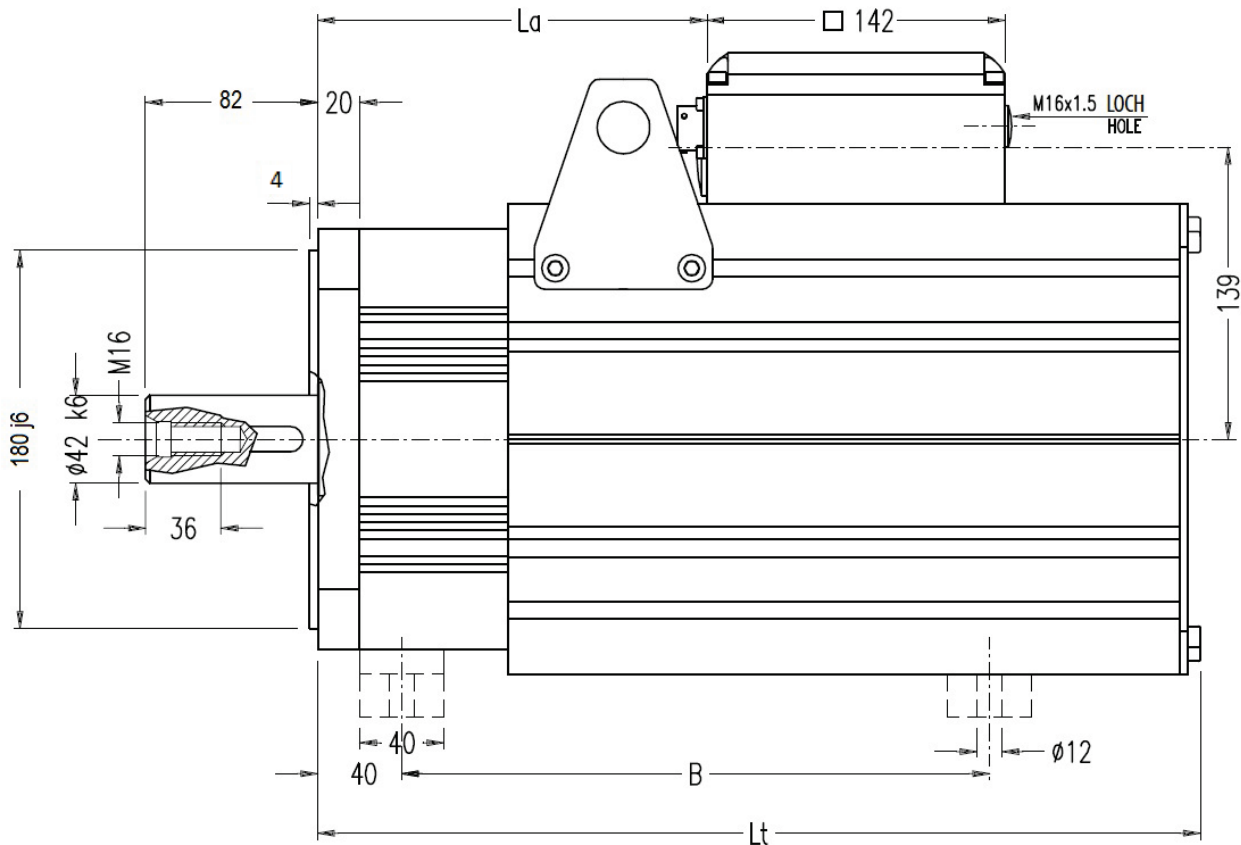
Motor HSM - 1000 1/min forced ventilation		V82104	V84104	V86104	V88104
Nominal power	Pn [W]	4830	8715	12023	15015
Stall torque (dT=105 °C)	Ton [Nm]	47	85	118	149
Nominal torque	Tn [Nm]	46	83	114,5	143
Nominal speed	n [1/min]	1000	1000	1000	1000
Peak torque	Tpk [Nm]	138	250	347	408
Nominal current	In [A]	9,3	18,4	23,1	31,8
Stall current (dT=105°C)	Ion [A]	9,5	18,8	23,8	33,1
Peak current	Ipk [A]	27,8	55,4	69,9	90,8
Rotor inertia	Jm [gm <sup>2</sup> ]	6	9	12	15
Back EMF (20°C)	ke [Vmin/1000]	316	285	316	286
Torque constant	kt [Nm/A]	4,97	4,51	4,96	4,5
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	4,86	1,34	0,9	0,62
Winding inductance Phase-Phase (20°C)	Lc [mH]	47,8	19,8	15,9	11,2
Nominal voltage	Vn [V]	390	336	360	330
Weight	m [kg]	37	49	64	78
Pole pairs	p	4	4	4	4

Motor HSM - 2000 1/min forced ventilation		V82204	V84204	V86204	V88204
Nominal power	Pn [W]	9614	16866	22363	28006
Stall torque (dT=105 °C)	Ton [Nm]	48	85	115	147
Nominal torque	Tn [Nm]	46	80,7	107	134
Nominal speed	n [1/min]	2000	2000	2000	2000
Peak torque	Tpk [Nm]	138	250	347	408
Nominal current	In [A]	20,4	33,5	47,4	59,6
Stall current (dT=105°C)	Ion [A]	21,3	35,3	50,9	65,3
Peak current	Ipk [A]	61	104	154	182
Rotor inertia	Jm [gm <sup>2</sup> ]	6	9	12	15
Back EMF (20°C)	ke [Vmin/1000]	143	153	143	143
Torque constant	kt [Nm/A]	2,26	2,41	2,26	2,25
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	0,947	0,385	0,194	0,155
Winding inductance Phase-Phase (20°C)	Lc [mH]	9,9	5,6	3,3	2,81
Nominal voltage	Vn [V]	337	345	316	318
Weight	m [kg]	37	49	64	78
Pole pairs	p	4	4	4	4

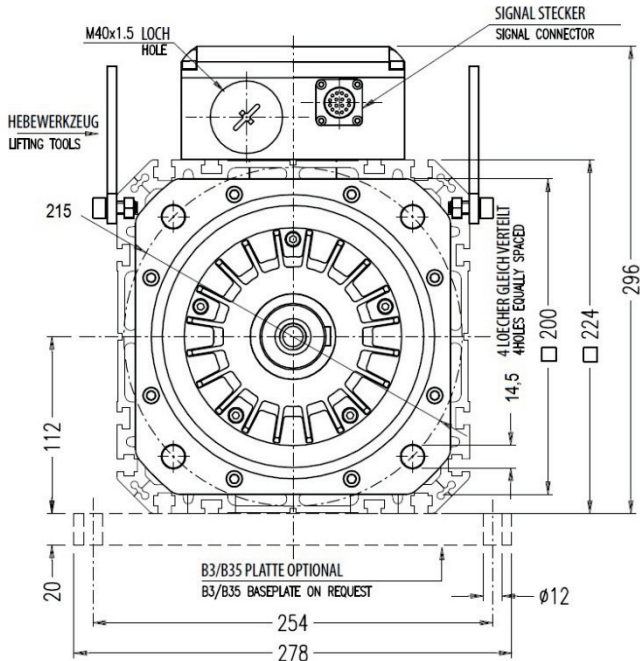
Motor HSM - 3000 1/min forced ventilation		V82304	V84304	V86304	V88304
Nominal power	Pn [W]	14130	24052	32028	41762
Stall torque (dT=105 °C)	Ton [Nm]	48	85	118	160
Nominal torque	Tn [Nm]	45	76,6	102	133
Nominal speed	n [1/min]	3000	3000	3000	3000
Peak torque	Tpk [Nm]	138	250	347	408
Nominal current	In [A]	27,2	50,9	56,5	78,8
Stall current (dT=105°C)	Ion [A]	29	56,5	65,3	94,8
Peak current	Ipk [A]	83	166	192	242
Rotor inertia	Jm [gm <sup>2</sup> ]	6	9	12	15
Back EMF (20°C)	ke [Vmin/1000]	106	95	115	107
Torque constant	kt [Nm/A]	1,66	1,5	1,8	1,69
Winding resistance Phase-Phase (20°C)	Rc [Ohm]	0,486	0,149	0,126	0,086
Winding inductance Phase-Phase (20°C)	Lc [mH]	5,3	2,19	2,11	1,49
Nominal voltage	Vn [V]	363	318	374	352
Weight	m [kg]	37	49	64	78
Pole pairs	p	4	4	4	4



**Overall dimensions HSM V8**



Extra Kühlung: Konvektion IC416  
Cooling: Forced Convection IC416



Length/Type	HSM V82	HSM V84	HSM V86	HSM V88
B	205	280	354	429
La	110	185	260	334
Lt	353	428	502	577

**Technical Data: HSM 09**

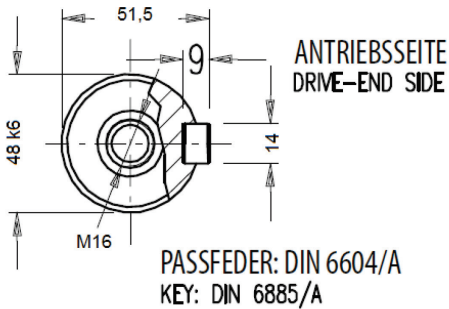
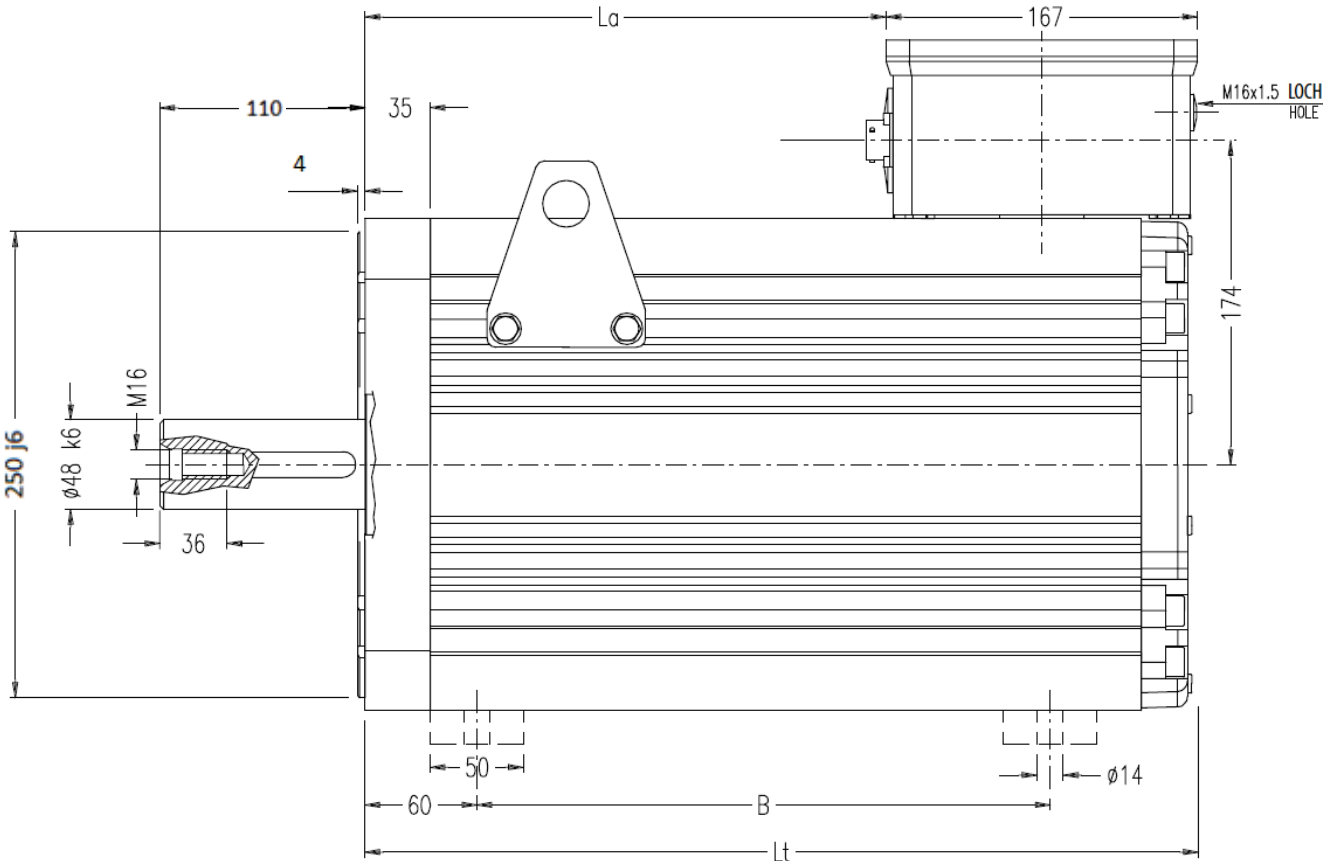
Supply voltage 400 V

Motor HSM - 1000 1/min forced ventilation		092104	094104	096104	098104
Nominal power	Pn[W]	9870	18480	26670	34125
Stall torque (dT=105 °C)	Ton [Nm]	94	176	255	332
Nominal torque	Tn [Nm]	94	176	254	325
Nominal speed	n [1/min]	1000	1000	1000	1000
Peak torque	Tpk [Nm]	253	485	708	923
Nominal current	In [A]	19	35	50	72
Stall current (dT=105 °C)	Ion [A]	19	35	50	74
Peak current	Ipk [A]	50	96	140	205
Rotor inertia	Jm [gm <sup>2</sup> ]	22	36	49	63
Back EMF (20 °C)	ke [Vmin/1000]	322	322	322	287
Torque constant	kt [Nm/A]	5,07	5,07	5,07	4,50
Winding resistance Phase-Phase (20 °C)	Rc [Ohm]	1,06	0,355	0,195	0,115
Winding inductance Phase-Phase (20 °C)	Lc [mH]	21,56	10,78	7,19	4,26
Nominal voltage	Vn [V]	370	361	357	315
Weight	m [kg]	75	109	143	177
Pole pairs	p	8	8	8	8

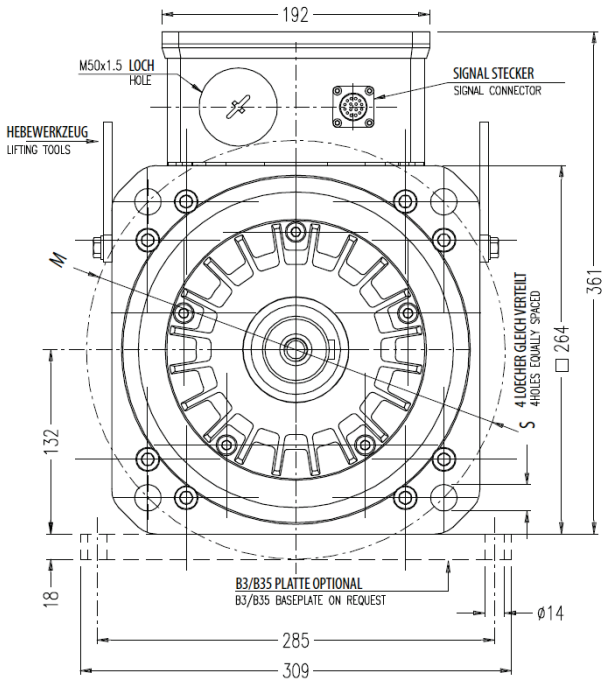
Motor HSM - 2000 1/min forced ventilation		092204	094204	096204	098204
Nominal power	Pn[W]	19228	35530	48279	60192
Stall torque (dT=105 °C)	Ton [Nm]	92	179	255	332
Nominal torque	Tn [Nm]	92	170	231	288
Nominal speed	n [1/min]	2000	2000	2000	2000
Peak torque	Tpk [Nm]	253	485	708	923
Nominal current	In [A]	36	75	91	128
Stall current (dT=105 °C)	Ion [A]	36	79	101	47
Peak current	Ipk [A]	100	215	279	410
Rotor inertia	Jm [gm <sup>2</sup> ]	22	36	49	63
Back EMF (20 °C)	ke [Vmin/1000]	161	143	161	143
Torque constant	kt [Nm/A]	2,53	2,25	2,53	2,25
Winding resistance Phase-Phase (20 °C)	Rc [Ohm]	0,289	0,068	0,048	0,025
Winding inductance Phase-Phase (20 °C)	Lc [mH]	5,39	2,13	1,8	1,06
Nominal voltage	Vn [V]	360	313	346	305
Weight	m [kg]	75	109	143	177
Pole pairs	p	8	8	8	8

Motor HSM - 3000 1/min forced ventilation		092304	094304	096304	098304
Nominal power	Pn[W]	27318	45216	58090	67510
Stall torque (dT=105 °C)	Ton [Nm]	92	175	254	334
Nominal torque	Tn [Nm]	87	144	185	215
Nominal speed	n [1/min]	3000	3000	3000	3000
Peak torque	Tpk [Nm]	253	485	708	923
Nominal current	In [A]	52	85	110	127
Stall current (dT=105 °C)	Ion [A]	54	104	150	198
Peak current	Ipk [A]	403	805	1208	1610
Rotor inertia	Jm [gm <sup>2</sup> ]	22	36	49	63
Back EMF (20 °C)	ke [Vmin/1000]	108	108	108	108
Torque constant	kt [Nm/A]	1,69	1,69	1,69	1,69
Winding resistance Phase-Phase (20 °C)	Rc [Ohm]	0,125	0,04	0,021	0,014
Winding inductance Phase-Phase (20 °C)	Lc [mH]	2,4	1,2	0,8	0,6
Nominal voltage	Vn [V]	354	344	338	334
Weight	m [kg]	75	109	143	177
Pole pairs	p	8	8	8	8

**Overall dimensions HSM 09**



Kühlung: Konvektion IC410  
Cooling: Free Convection IC410



Length/Type	HSM 092	HSM 094	HSM 096	HSM 098
B	200	307	414	521
La	172	279	386	493
Lt	340	447	554	661

**Technical Data: HSM V9**

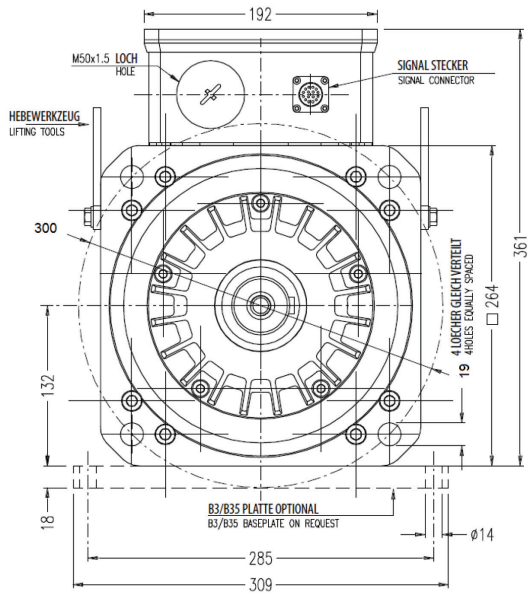
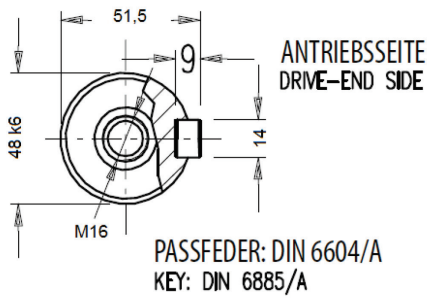
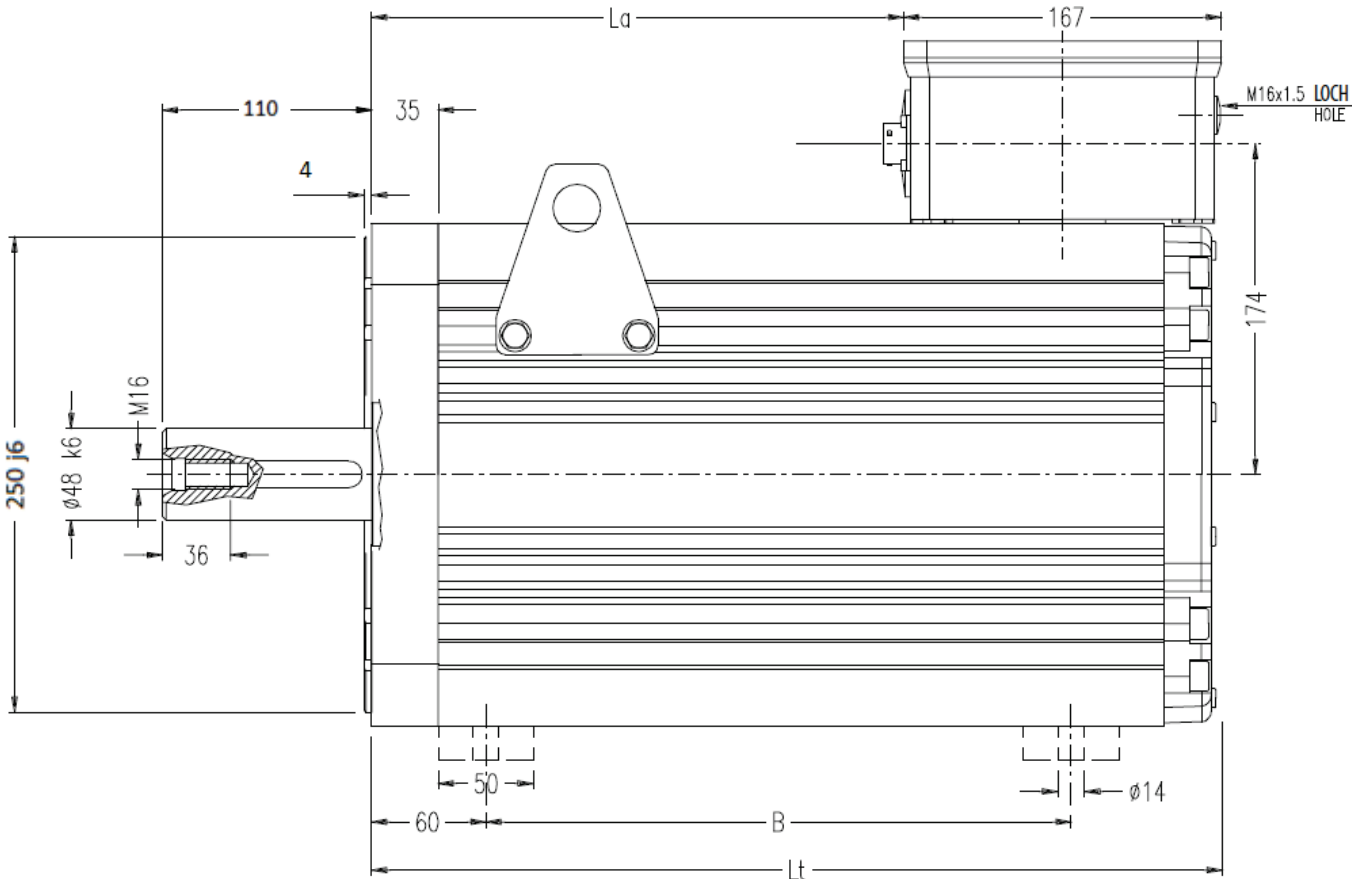
Supply voltage 400 V

Motor HSM - 1000 1/min forced ventilation		V92104	V94104	V96104	V98104
Nominal power	Pn [W]	12810	23835	34230	44205
Stall torque (dT=105 °C)	Ton [Nm]	122	232	338	442
Nominal torque	Tn [Nm]	122	227	326	421
Nominal speed	n [1/min]	1000	1000	1000	1000
Peak torque	Tpk [Nm]	333	638	931	1214
Nominal current	In [A]	24	45	64	93
Stall current (dT=105 °C)	Ion [A]	24	46	67	98
Peak current	Ipk [A]	66	126	184	270
Rotor inertia	Jm [gm <sup>2</sup> ]	22	36	49	63
Back EMF (20 °C)	ke [Vmin/1000]	322	322	322	287
Torque constant	kt [Nm/A]	5,07	5,07	5,07	4,50
Winding resistance Phase-Phase (20 °C)	Rc [Ohm]	1,06	0,36	0,2	0,115
Winding inductance Phase-Phase (20 °C)	Lc [mH]	21,6	10,8	7,19	4,26
Nominal voltage	Vn [V]	394	380	374	330
Weight	m [kg]	89	126	164	203
Pole pairs	p	8	8	8	8

Motor HSM - 2000 1/min forced ventilation		V92204	V94204	V96204	V98204
Nominal power	Pn [W]	24453	46189	64372	82137
Stall torque (dT=105 °C)	Ton [Nm]	120	236	338	442
Nominal torque	Tn [Nm]	117	221	308	393
Nominal speed	n [1/min]	2000	2000	2000	2000
Peak torque	Tpk [Nm]	333	638	931	1214
Nominal current	In [A]	46	98	122	174
Stall current (dT=105 °C)	Ion [A]	47	105	133	196
Peak current	Ipk [A]	132	283	368	539
Rotor inertia	Jm [gm <sup>2</sup> ]	22	36	49	63
Back EMF (20 °C)	ke [Vmin/1000]	161	143	161	143
Torque constant	kt [Nm/A]	2,53	2,25	2,53	2,25
Winding resistance Phase-Phase (20 °C)	Rc [Ohm]	0,28	0,07	0,05	0,03
Winding inductance Phase-Phase (20 °C)	Lc [mH]	5,39	2,13	1,8	1,06
Nominal voltage	Vn [V]	378	329	363	320
Weight	m [kg]	89	126	164	203
Pole pairs	p	8	8	8	8

Motor HSM - 3000 1/min forced ventilation		V92304	V94304	V96304	V98304
Nominal power	Pn [W]	35168	62800	86350	108330
Stall torque (dT=105 °C)	Ton [Nm]	121	231	337	445
Nominal torque	Tn [Nm]	112	200	275	345
Nominal speed	n [1/min]	3000	3000	3000	3000
Peak torque	Tpk [Nm]	333	638	931	1214
Nominal current	In [A]	66	118	163	204
Stall current (dT=105 °C)	Ion [A]	72	137	200	263
Peak current	Ipk [A]	197	378	551	719
Rotor inertia	Jm [gm <sup>2</sup> ]	22	36	49	63
Back EMF (20 °C)	ke [Vmin/1000]	108	108	108	108
Torque constant	kt [Nm/A]	1,69	1,69	1,69	1,69
Winding resistance Phase-Phase (20 °C)	Rc [Ohm]	0,12	0,04	0,02	0,014
Winding inductance Phase-Phase (20 °C)	Lc [mH]	2,4	1,2	0,8	0,6
Nominal voltage	Vn [V]	372	361	355	351
Weight	m [kg]	89	126	164	203
Pole pairs	p	8	8	8	8

**Overall dimensions HSM V9**

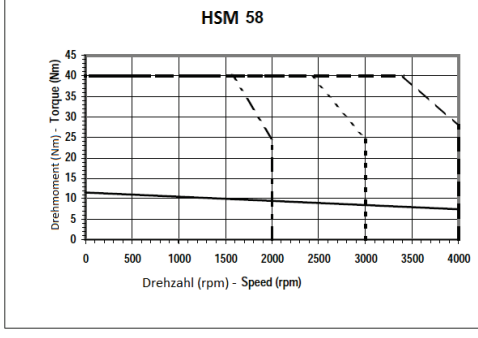
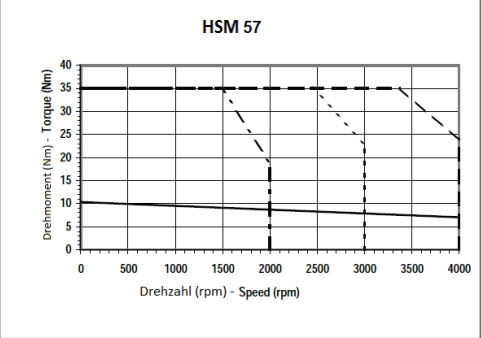
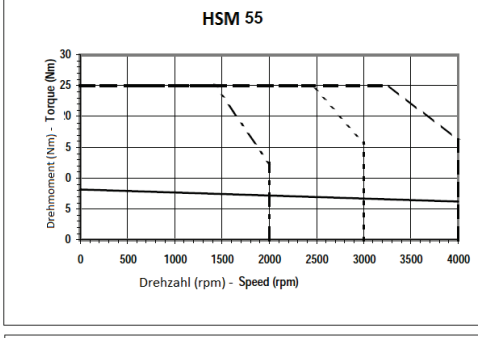
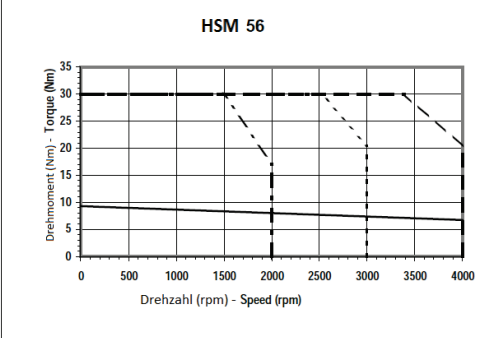
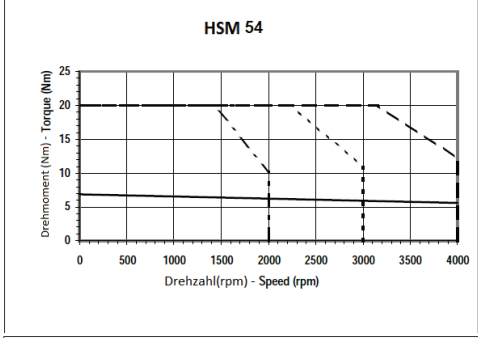
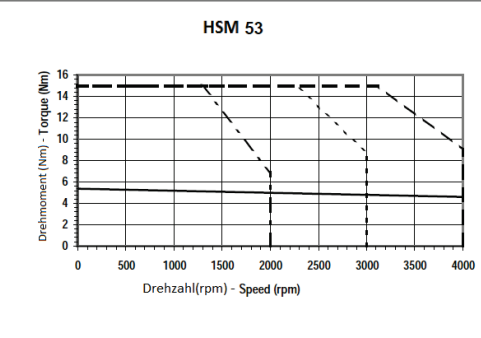
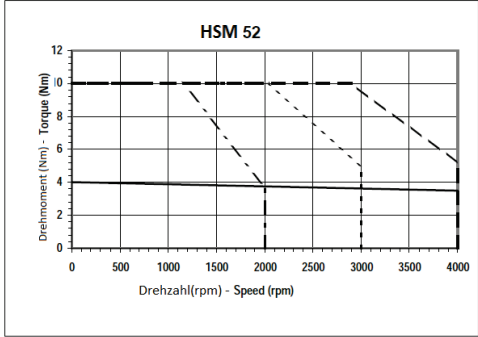
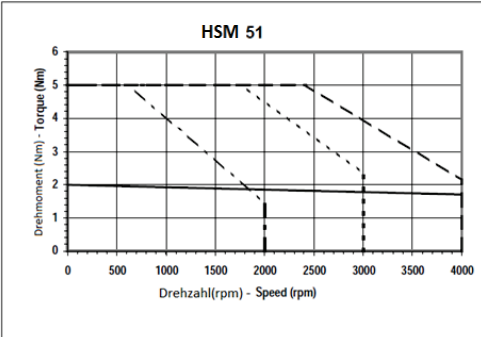


Extra Kühlung: Konvektion IC416  
 Cooling: Forced Convection IC416

Length/Type	HSM V92	HSM V94	HSM V96	HSM V98
B	300	407	514	621
La	172	279	386	493
Lt	470	577	684	791

**Safe operating area HSM 05**

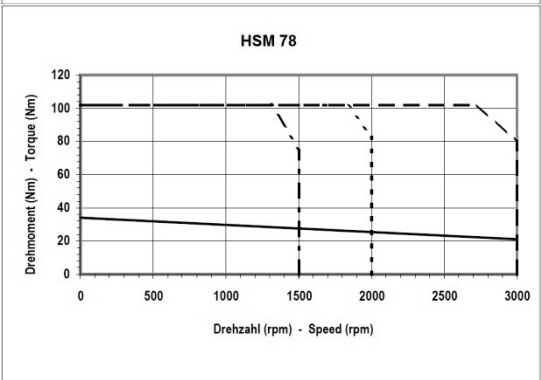
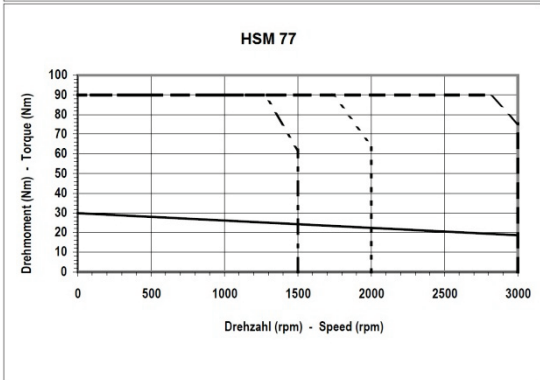
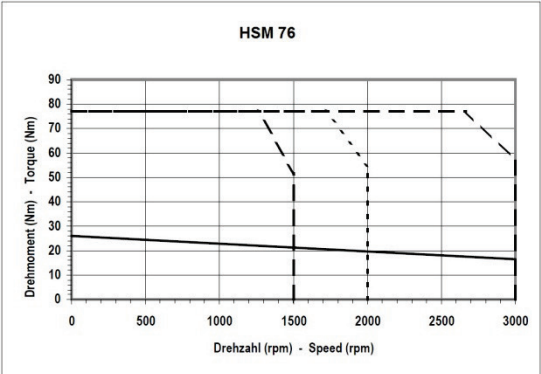
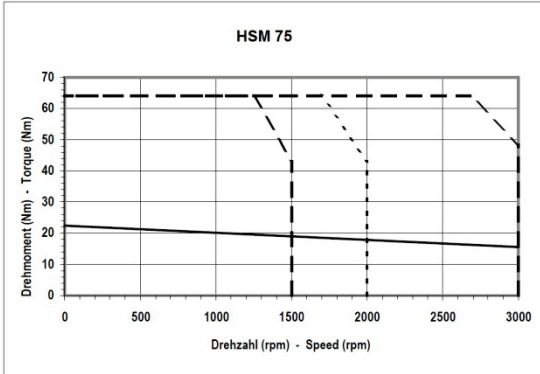
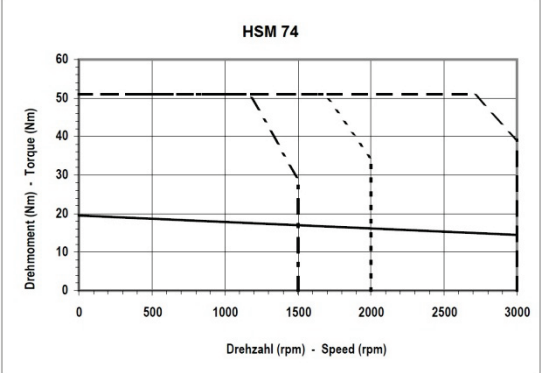
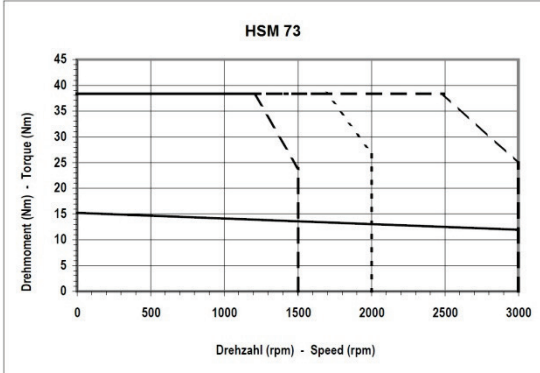
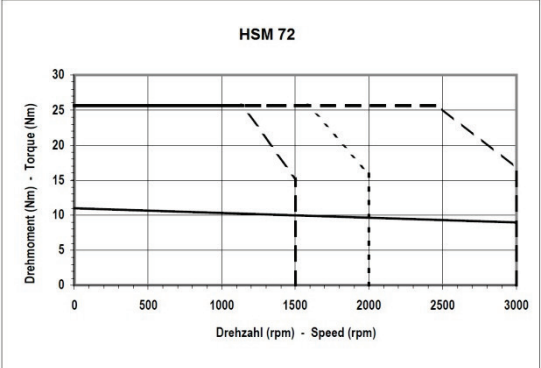
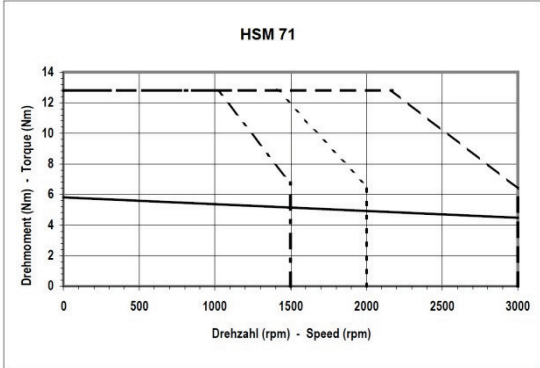
Continuous torque (dT = 105°C) versus speed.  
 Max torque versus speed with supply voltage 357 Vrms.



\_\_\_\_\_ = Dauerdrehmoment S1    \_\_\_\_\_ = Max. Drehmoment bei 1000 rpm    \_\_\_\_\_ = Max. Drehmoment bei 2000 rpm    \_\_\_\_\_ = Max. Drehmoment bei 3000 rpm  
 \_\_\_\_\_ = Continuous torque S1    \_\_\_\_\_ = Max torque 1000 rpm    \_\_\_\_\_ = Max torque 2000 rpm    \_\_\_\_\_ = Max torque 3000 rpm

**Safe operating area HSM 07**

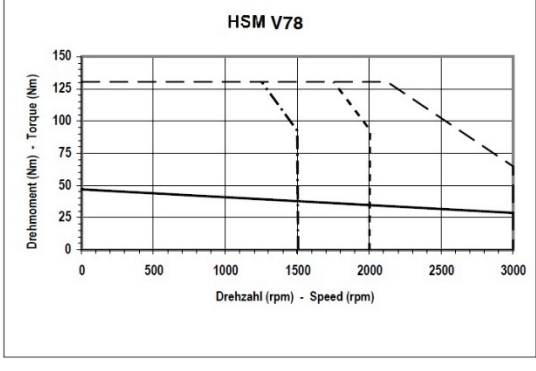
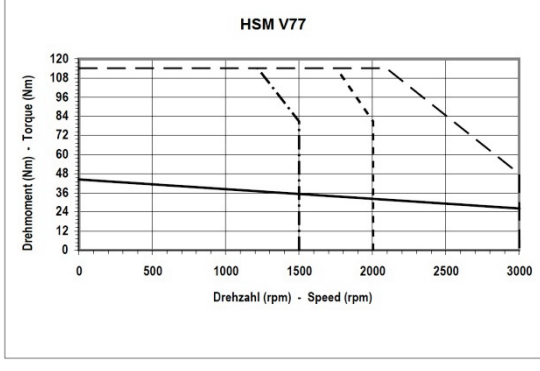
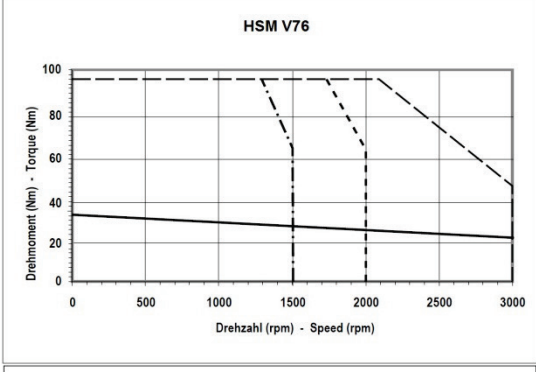
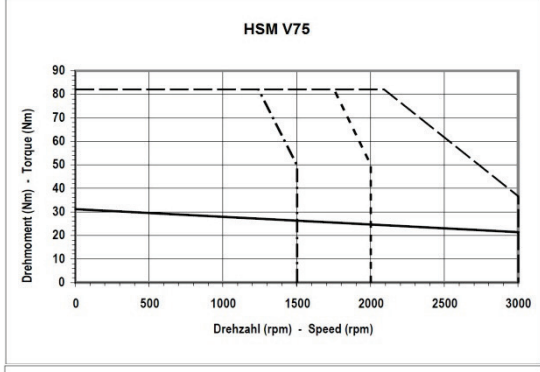
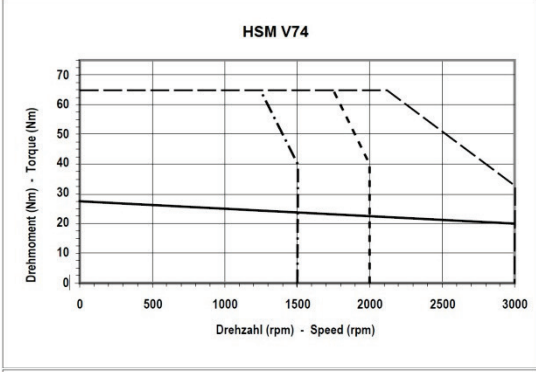
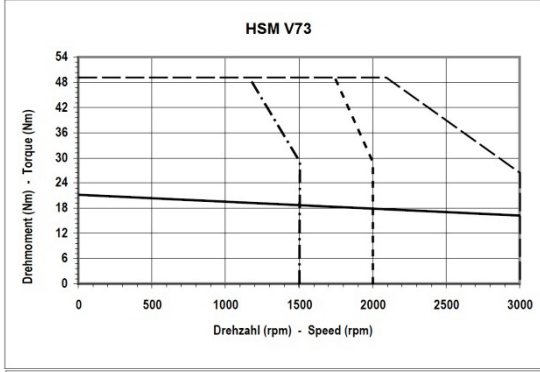
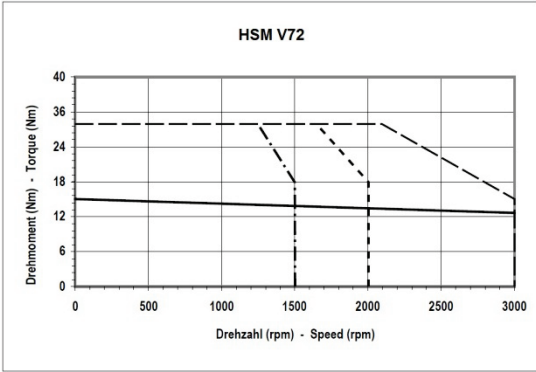
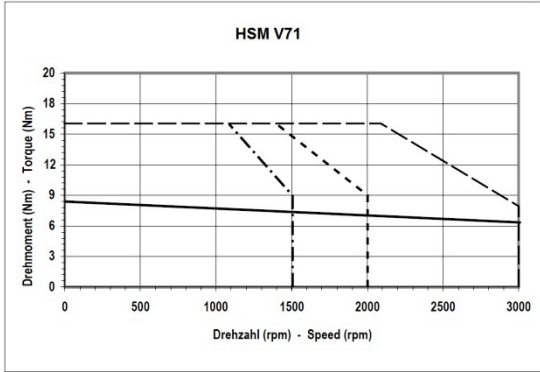
Continuous torque (dT = 105°C) versus speed.  
 Max torque versus speed with supply voltage 357 Vrms.



\_\_\_\_\_ = Dauerdrehmoment S1    \_\_\_\_\_ = Max. Drehmoment bei 1000 rpm    \_\_\_\_\_ = Max. Drehmoment bei 2000 rpm    \_\_\_\_\_ = Max. Drehmoment bei 3000 rpm  
 \_\_\_\_\_ = Continuous torque S1    \_\_\_\_\_ = Max torque 1000 rpm    \_\_\_\_\_ = Max torque 2000 rpm    \_\_\_\_\_ = Max torque 3000 rpm

**Safe operating area HSM V7**

Continuous torque (dT = 105°C) versus speed.  
 Max torque versus speed with supply voltage 357 Vrms.

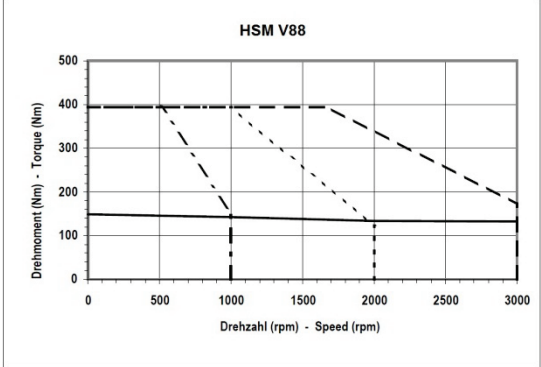
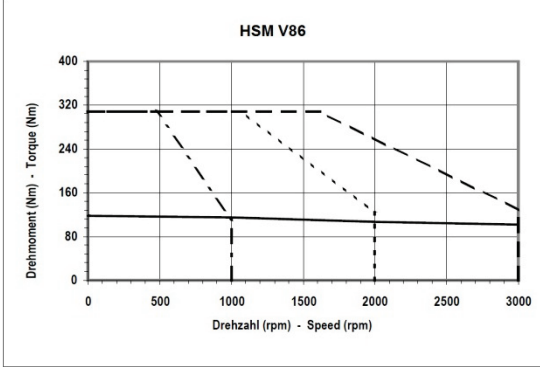
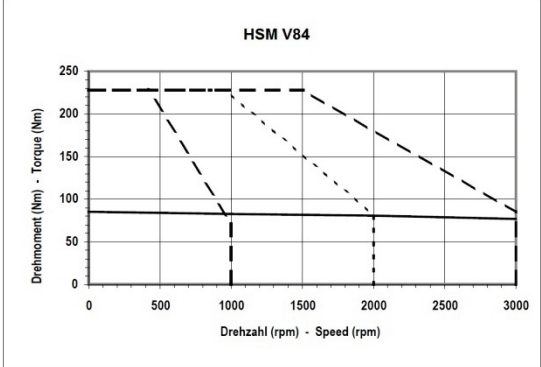
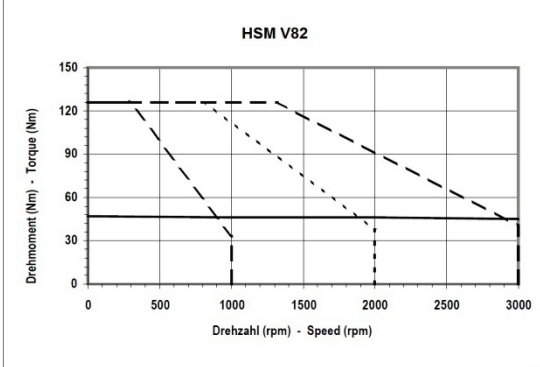
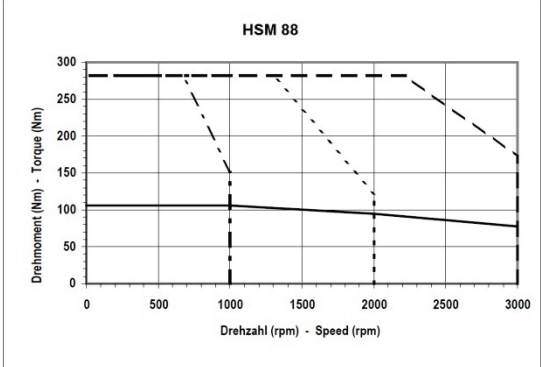
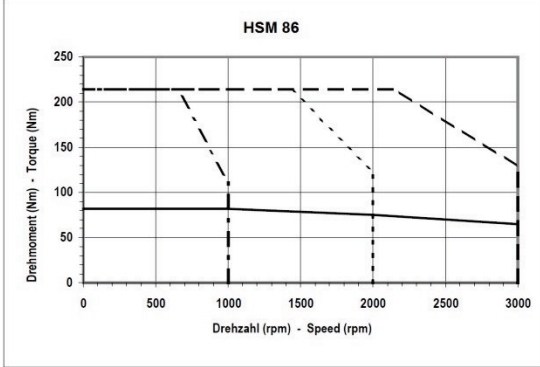
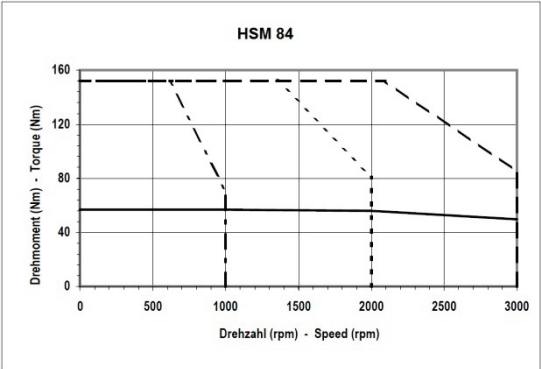
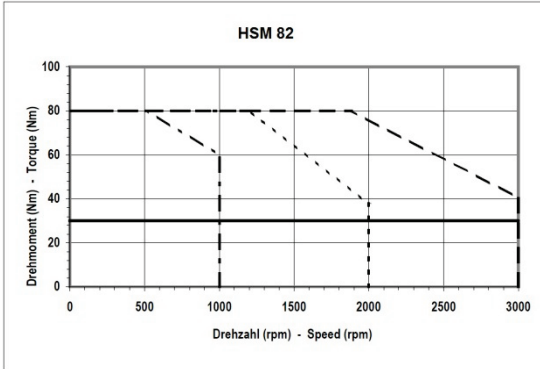


\_\_\_\_\_ = Dauerdrehmoment S1    \_\_\_\_\_ = Max. Drehmoment bei 1000 rpm    \_\_\_\_\_ = Max. Drehmoment bei 2000 rpm    \_\_\_\_\_ = Max. Drehmoment bei 3000 rpm  
 \_\_\_\_\_ = Continuous torque S1    \_\_\_\_\_ = Max torque 1000 rpm    \_\_\_\_\_ = Max torque 2000 rpm    \_\_\_\_\_ = Max torque 3000 rpm



**Safe operating area HSM 08 / HSM V8**

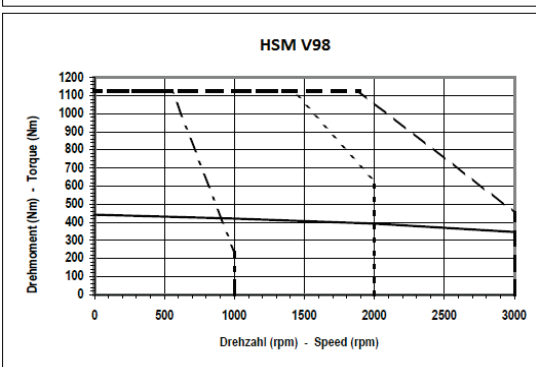
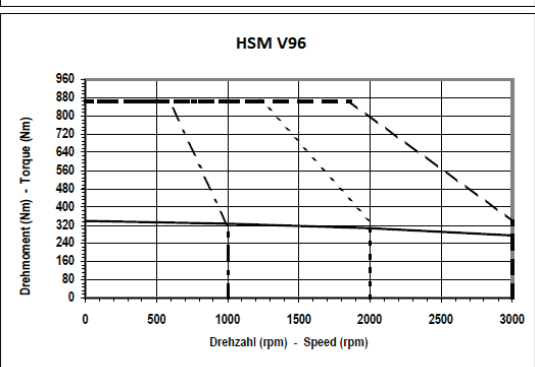
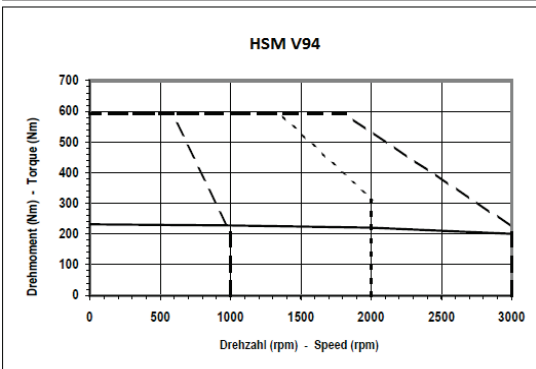
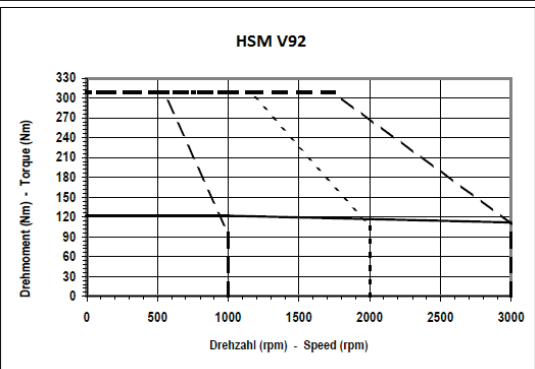
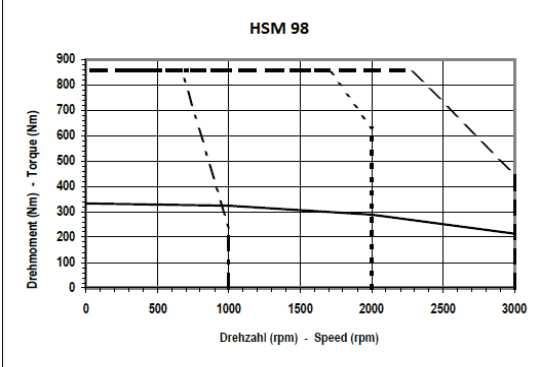
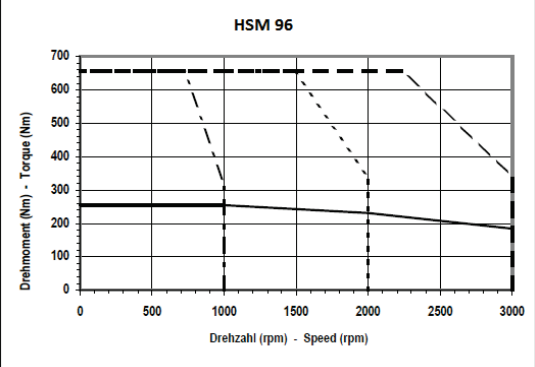
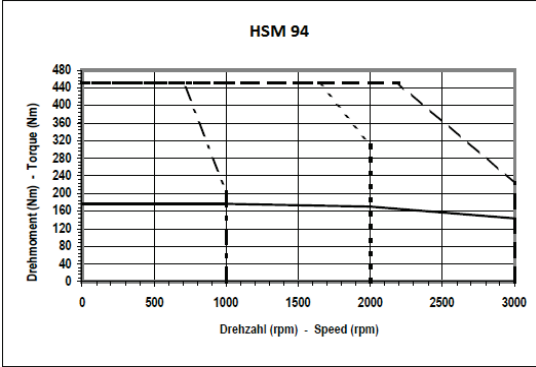
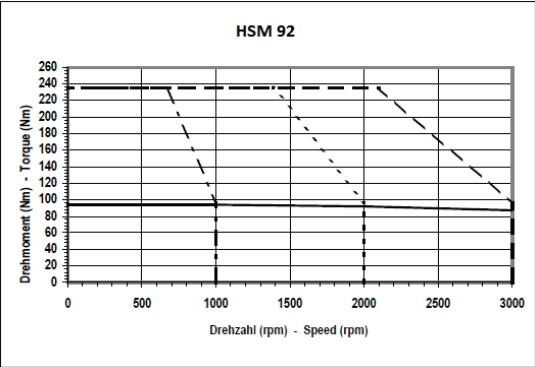
Continuous torque (dT = 105°C) versus speed.  
 Max torque versus speed with supply voltage 357 Vrms.



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 \_\_\_\_\_ = Continuous torque S1    \_\_\_\_\_ = Max torque 1000 rpm    - - - = Max torque 2000 rpm    \_\_\_\_\_ = Max torque 3000 rpm

**Safe operating area HSM 09 / HSM V9**

Continuous torque (dT = 100°C) versus speed.  
 Max torque versus speed with supply voltage 357 Vrms.



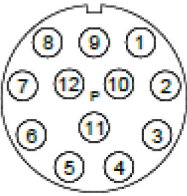
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 \_\_\_\_\_ = Continuous torque S1    \_\_\_\_\_ = Max torque 1000 rpm    \_\_\_\_\_ = Max torque 2000 rpm    \_\_\_\_\_ = Max torque 3000 rpm

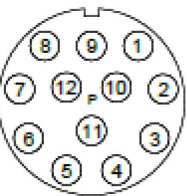
**Connection – HSM7 – HSM9**

**Performance**

Terminal board	Description	Explanation
U1	A	Motor phase L1
V1	B	Motor phase L2
W1	C	Motor phase L3
	PT	Temperature control
	PT	Temperature control
<i>(option)</i>	<i>FAN</i>	<i>Supply Ventilation</i>
<i>(option)</i>	<i>FAN</i>	<i>Supply Ventilation</i>

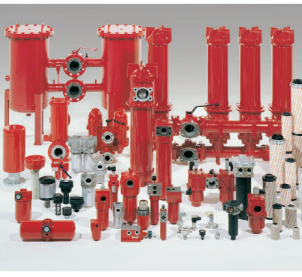
**SIGNAL**

<p>Hypertac SFFA12TMRSN000</p>  <p>View Motor plug</p>	Plug 12 PIN		Resolver LTN type RE 21-1-V32	
	1	S2	Yellow	
	2	S3	Black	
	3			
	4			
	5	R2	Black / White	
	6			
	7	R1	Red / White	
	8	Temperature control		
	9	Temperature control		
	10	S4	Blue	
	11	S1	Red	
	12			

<p>Hypertac SFFA12TMRSN000</p>  <p>View Motor plug</p>	Plug 12 PIN		Hiperface Sick type SEL 52	
	1	Temperature control		
	2	Temperature control		
	3			
	4	REFSIN	Brown	
	5	REFCOS	Black	
	6	Data +	Grey / Yellow	
	7	Data -	Green / Purple	
	8	+ SIN	White	
	9	+ COS	Pink	
	10	Us (7..12V)	Red	
	11	GND	Blue	
	12			



Accumulators 30.000



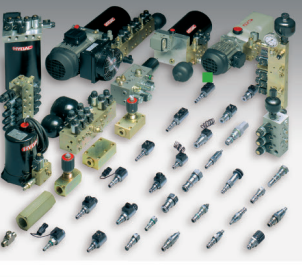
Filter Technology 70.000



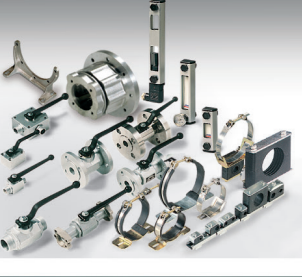
Process Technology 77.000



Filter Systems 79.000



Compact Hydraulics 53.000



Accessories 61.000






Electronics 180.000



Cooling Systems 57.000

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