

Order code LTi synchronous motors LSx

Example LSH-074-1-30-560

Article designation →	LSX	-	074	-	1	-	30	-	560	/	Options (if available)
LTi synchronous motor series T or H	T H										
Edge measurement of motor in mm (not the flange measurement)			050 074 097 127 158 190 220								
Overall length					2 3 4 5						
Rated speed (x100)							30 45				
Controller d.c. link voltage (VDC)									24 48 320 560		
Ordering options (will be joined)											T0 B 1R G3 G6.1M G12.1S G12.2S T1 P 3R G5 G6.1S G12.1M G12.2M T4 X 5R G6.2M G6.2S K S4

Definition Standard Motor shaft smooth (no feather key)
 Resolver 1 pole pair
 IP64 acc. to DIN 40050 except the flange
 IP54 acc. to DIN VDE0530-5 or EN60034-5 (rotating machines)
 Resolver plug straight outgoing
 Power plug straight outgoing
 Double basic insulation (winding and PTC)

- Options:**
- T0 (Thermal protection: thermostatic switch (e.g. Klixon)
 - T1 (DIN-PTC double basic insulated) is specified as standard!
 - T4 (Thermal protection: KTY84-130)
 - B Holding brake 24 VDC
 - P Feather key acc. to DIN 6885 sheet 1
 - X Customized design (e.g. special flange / shaft / housing, encoder, etc.)
 - K Cable 1 m open ends (standard LST-037)
 - S4 angled / rotatable plugs
 - 1R Resolver 1 pole pair
 - V Degree of protection IP65 without radial seal
 - W Degree of protection IP65 with radial seal (approx. 10mm longer)

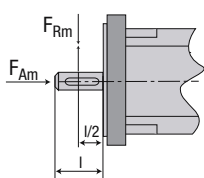


Note:

Texts in pink represent motors or options, which are marked as preferred type (reduced delivery time).

Permissible axial and transverse force

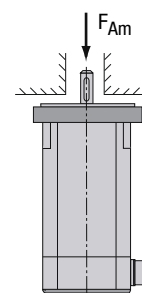
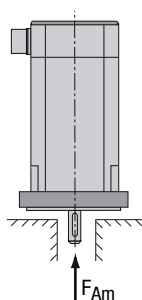
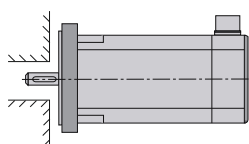
Sizes	Radial force F_{Rm} [N] at speed n [rpm]					Axial force F_{Am} [N] at speed n [rpm]					F_G [N]
	1000	2000	3000	4500	6000	1000	2000	3000	4500	6000	
LST-037	230	185	160	140	130	44	35	31	27	24	2
LST-037/B	130	100	90	77	70	24	19	17	15	13	2
LSH-050	310	250	220	190	170	60	50	42	36	32	2
LST-050	325	260	225	195	175	62	50	43	37	34	2
LSH-074	480	380	330	290	260	90	70	63	55	50	6
LST-074	535	425	370	325	295	100	80	70	60	55	6
LSH-097	850	680	600	520	470	160	130	115	100	90	15
LST-097	920	730	640	560	510	175	140	120	105	95	18
LSH-127	970	770	670	590	530	185	145	125	110	100	34
LST-127	1000	790	690	600	550	190	150	130	115	105	34
LST-158	1020	810	710	620	560	195	155	135	120	110	60
LST-190	1950	1550	1350	1170	1070	370	290	260	225	200	100
LST-220	2500	1950	1700	1490	1350	470	370	320	280	260	200



The table specifies the max. permissible transverse force (radial force F_{Rm}) at the point of application $l/2$ and the max. permissible axial force F_{Am} for a life of 20,000 h. A transverse force not acting on the centre of the shaft end can be simply converted to the changed lever ratios.

Either the permissible radial force or the axial force may be applied to the motor shaft!

Technical data design

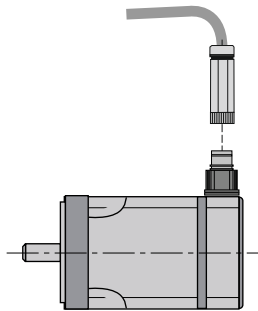


Design	B5	V1	V3
Shaft	free shaft end	free shaft end bottom	free shaft end top
Mounting	Flange mounting Access from housing side	Flange mounting bottom Access from housing side	Flange mounting top Access from housing side



Note: With vertical installation (V1) the permissible axial forces (F_{Am}) do apply. With vertical installation pointing up (V3) the permissible axial forces are reduced by the force caused by the weight of the rotor (F_G).

Overview LST servo motors



Type	U _{DC}	Page
LST-037	320 V	3 - 4
LST-050	320 V	3 - 8
LST-074	320 V	3 - 12
	560 V	3 - 16
LST-097	320 V	3 - 20
	560 V	3 - 24
LST-127	560 V	3 - 28
LST-158	560 V	3 - 32
LST-190	560 V	3 - 36
LST220	560 V	3 - 40

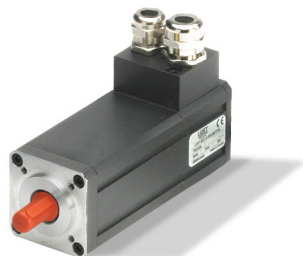
LST-motor - the versatile solution

Equipped with conventional winding technology, the LST-motor unites all advantages of a 6-pole synchronous servo motor.

- Excellent suitability for speeds up to 9000 rpm, special windings available on request.
- High overload capability even at standstill, due to the excellent heat distribution in the stator pack.
- Increased moment of inertia of rotor for torque adaptation.

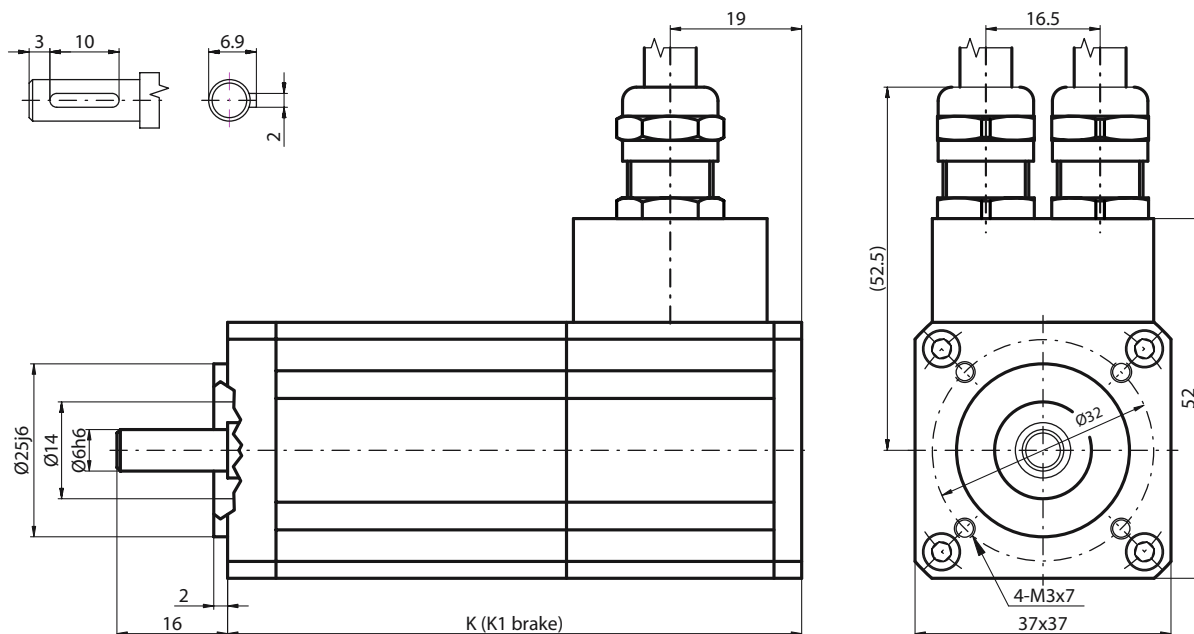
Technical data	Stall torque	Rated torque	Rated AC current	Rated AC current	Rated speed
Motor	M_0 [Nm]	M_N [Nm]	at 560 V I_N [A]	at 320 V I_N [A]	n_N [rpm]
LST-037-1	0.10	0.09	-	0.56	6000
LST-037-2	0.20	0.18	-	0.92	6000
LST-037-3	0.30	0.27	-	0.89	6000
LST-050-1	0.20	0.19	-	0.60	4500
LST-050-2	0.40	0.36	-	0.88	4500
LST-050-3	0.60	0.55	-	1.18	4500
LST-050-4	0.80	0.72	-	1.47	4500
LST-050-5	0.95	0.85	-	1.71	4500
LST-074-1	0.65	0.60	0.64	1.04	3000
LST-074-2	1.30	1.15	0.95	1.58	3000
LST-074-3	1.90	1.60	1.26	2.20	3000
LST-074-4	2.50	2.20	1.62	2.70	3000
LST-074-5	3.00	2.50	1.82	3.00	3000
LST-097-1	2.60	2.30	1.85	3.00	3000
LST-097-2	3.90	3.30	2.60	4.30	3000
LST-097-3	5.30	4.60	3.80	5.90	3000
LST-097-4	7.50	6.40	4.40	8.10	3000
LST-097-5	9.50	8.50	6.20	10.5	3000
LST-127-1	6.60	5.70	4.00	-	3000
LST-127-2	10.5	8.80	6.30	-	3000
LST-127-3	13.5	11.0	9.50	-	3000
LST-127-4	17.0	14.5	10.0	-	3000
LST-127-5	22.0	17.0	13.0	-	3000
LST-158-1	13.5	13.0	8.20	-	3000
LST-158-2	19.0	17.0	10.6	-	3000
LST-158-3	22.0	19.0	12.3	-	3000
LST-158-4	29.0	24.0	14.7	-	3000
LST-158-5	35.0	26.0	18.2	-	3000
LST-190-1	27.0	21.0	13.5	-	3000
LST-190-2	32.0	23.0	15.0	-	3000
LST-190-3	40.0	26.0	17.9	-	3000
LST-220-1	40.0	30.0	17.8	-	3000
LST-220-2	68.0	50.0	31.1	-	3000
LST-220-3	93.0	60.0	43.6	-	3000
LST-220-4	115.0	50.0	29.3	-	3000

Motor type LST-037 ($U_{ZK} = 320\text{ V}$)



Motor length [mm]	K (with resolver)	K (with optical encoder G12.x)	K (with optical encoder G6.x)	Additional length with design LSX-xxx-...,B (brake)
LST-037-1-60-320	81			30
LST-037-2-60-320	86		Not available	30
LST-037-3-60-320	111			30

Dimensional sketch



Technical data	Symbol	LST-037-1-60-320	LST-037-2-60-320	LST-037-3-60-320
Rated speed	n_n	6000 rpm	6000 rpm	6000 rpm
Rated frequency	f_N	300 Hz	300 Hz	300 Hz
DC link voltage (controller)	U_{dc}	320 V	320 V	320 V
Nominal AC voltage	U_n	200 V	200 V	200 V
Rated torque	M_n	0.09 Nm	0.18 Nm	0.27 Nm
Rated AC current	I_n	0.56 A	0.92 A	0.89 A
Power	P	0.056 kW	0.11 kW	0.17 kW
Stall torque	M_0	0.10 Nm	0.20 Nm	0.30 Nm
Stall AC current	I_0	0.58 A	0.97 A	0.95 A
Peak torque	M_{max}	0.40 Nm	0.80 Nm	1.20 Nm
Peak current	I_{max}	2.5 A	4.2 A	4.1 A
Maximum speed	n_{max}	12000 rpm	12000 rpm	12000 rpm
EMF constant	K_E	10.5 V/1000	12.5 V/1000	19.0 V/1000
Torque constant	K_T	0.17 Nm/A	0.21 Nm/A	0.31 Nm/A
Winding resistance (two phases)	R_{2ph}	38.9 Ω	18.9 Ω	22.9 Ω
Winding inductance (two phases)	L_{2ph}	6.5 mH	4.5 mH	6.5 mH
No load speed	n_0	19050 rpm	16000 rpm	10460 rpm
Electric time constant	T_{el}	0.17 ms	0.24 ms	0.28 ms
Thermal time constant	T_{th}	18 min.	20 min.	20 min.
Moment of inertia of rotor	J	0.000006 kgm ²	0.000008 kgm ²	0.000008 kgm ²
Mass	m	0.37 kg	0.45 kg	0.45 kg
Brake (optional)				
Nominal AC voltage	U_N	24 V \pm 10 %		
Rated AC current at 20 °C to release	I_N	0.33 A		
permissible maximum speed	n_{max}	10,000 rpm		
permissible friction energy	W_R	0.20 x 10 ⁶ Ws		
Moment of inertia	J_B	0.0000013 kgm ²		
Mass	m	0.075 kg		
Braking torque	M_H	0.4 Nm		

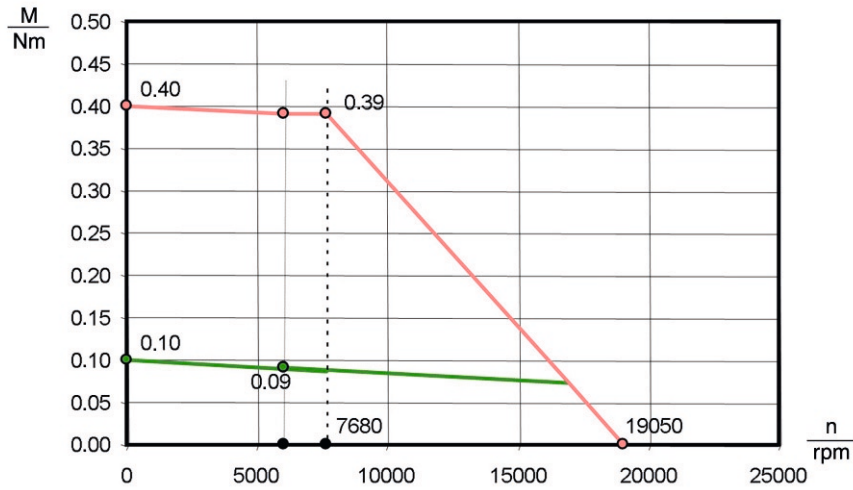
Motor type LST-037 ($U_{ZK} = 320 \text{ V}$)

Explanation on characteristics:

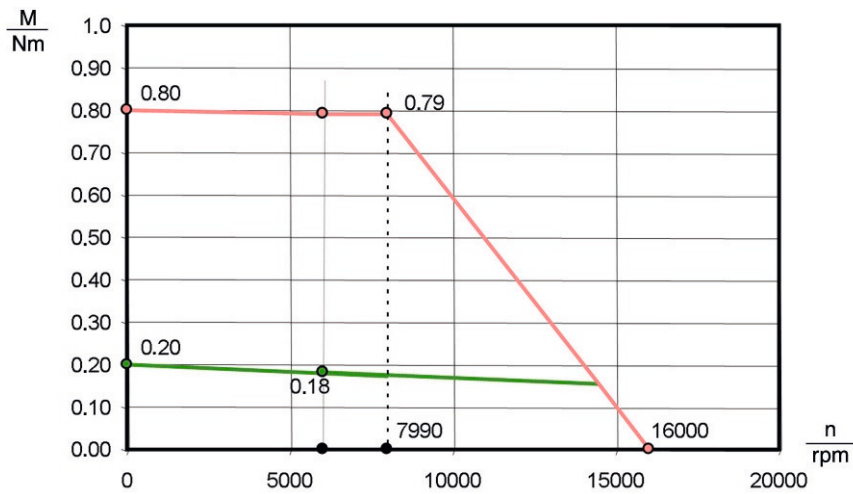
The upper characteristic (M_{max}) describes the short-term max. possible torque at the corresponding speed (important with dynamic processes).

The lower characteristic (M_{nenn}) shows the thermally permissible continuous torque.

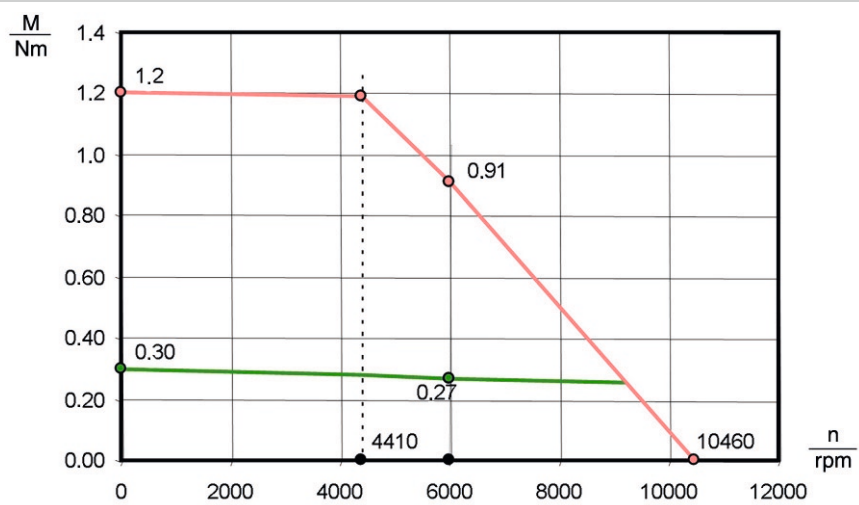
LST-037-1-60-320



LST-037-2-60-320



LST-037-3-60-320

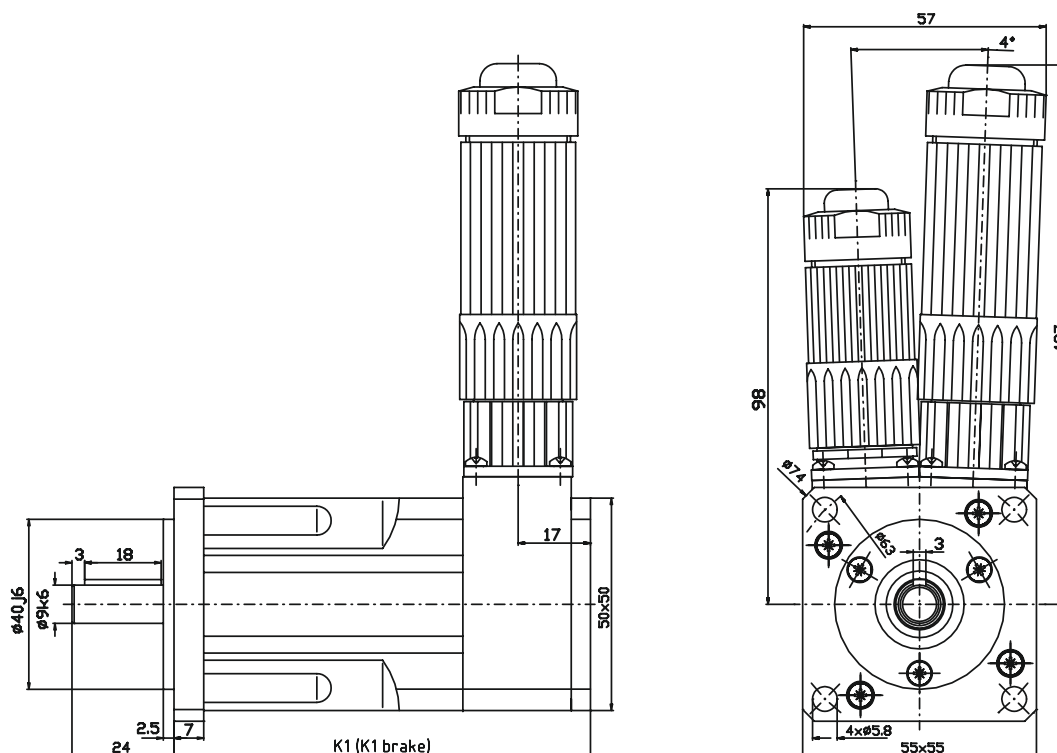


Motor type LST-050 ($U_{ZK} = 320 \text{ V}$)



Motor length [mm]	K (with resolver)	K (with optical encoder G12.2S/ G12.2M5)	K (with optical encoder G6.2S/ G6.2M)	Additional length with design LSX-xxx-...,B (brake)
LST-050-1-45-320	98	141.5	109	33
LST-050-2-45-320	113	156.5	124	33
LST-050-3-45-320	128	171.5	139	33
LST-050-4-45-320	143	186.5	154	33
LST-050-5-45-320	158	201.5	169	33

Dimensional sketch



Technical data	Symbol	LST-050-1-45-320	LST-050-2-45-320	LST-050-3-45-320	LST-050-4-45-320	LST-050-5-45-320
Rated speed	n_n	4500 rpm	4500 rpm	4500 rpm	4500 rpm	4500 rpm
Rated frequency	f_n	225 Hz	225 Hz	225 Hz	225 Hz	225 Hz
DC link voltage (controller)	U_{dc}	320 V	320 V	320 V	320 V	320 V
Nominal AC voltage	U_n	200 V	200 V	200 V	200 V	200 V
Rated torque	M_n	0.19 Nm	0.36 Nm	0.55 Nm	0.72 Nm	0.85 Nm
Rated AC current	I_n	0.60 A	0.88 A	1.18 A	1.47 A	1.71 A
Power	P	0.089 kW	0.17 kW	0.26 kW	0.34 kW	0.44 kW
Stall torque	M_0	0.20 Nm	0.40 Nm	0.60 Nm	0.80 Nm	0.95 Nm
Stall AC current	I_0	0.59 A	0.93 A	1.23 A	1.56 A	1.82 A
Peak torque	M_{max}	0.80 Nm	1.6 Nm	2.4 Nm	3.2 Nm	3.8 Nm
Peak current	I_{max}	2.5 A	4.0 A	5.3 A	6.7 A	7.8 A
Maximum speed	n_{max}	12000 rpm	12000 rpm	12000 rpm	12000 rpm	12000 rpm
EMF constant	K_E	20.5 V/1000	26.0 V/1000	29.5 V/1000	31.0 V/1000	31.5 V/1000
Torque constant	K_T	0.34 Nm/A	0.43 Nm/A	0.49 Nm/A	0.51 Nm/A	0.52 Nm/A
Winding resistance (two phases)	R_{2ph}	54 Ω	26.3 Ω	19.9 Ω	14.6 Ω	10.7 Ω
Winding inductance (two phases)	L_{2ph}	32 mH	21.4 mH	17.2 mH	14.4 mH	11.3 mH
No load speed	n_0	9760 rpm	7690 rpm	6780 rpm	6450 rpm	6350 rpm
Electric time constant	T_{el}	0.59 ms	0.82 ms	0.87 ms	0.98 ms	1.1 ms
Thermal time constant	T_{th}	10 min.	15 min.	20 min.	22 min.	27 min.
Moment of inertia of rotor	J	0.000006 kgm ²	0.000008 kgm ²	0.000011 kgm ²	0.000013 kgm ²	0.000018 kgm ²
Mass	m	0.90 kg	1.06 kg	1.21 kg	1.36 kg	1.52 kg
Brake (optional)						
Nominal AC voltage	U_N	24 V \pm 10 %				
Rated AC current at 20 °C to release	I_N	0.46 A				
permissible maximum speed	n_{max}	10,000 rpm				
permissible friction energy	WR	0.41 x 10 ⁶ Ws				
Moment of inertia	J_B	0.000007 kgm ²				
Mass	m	0.15 kg				
Braking torque	M_H	2.0 Nm				

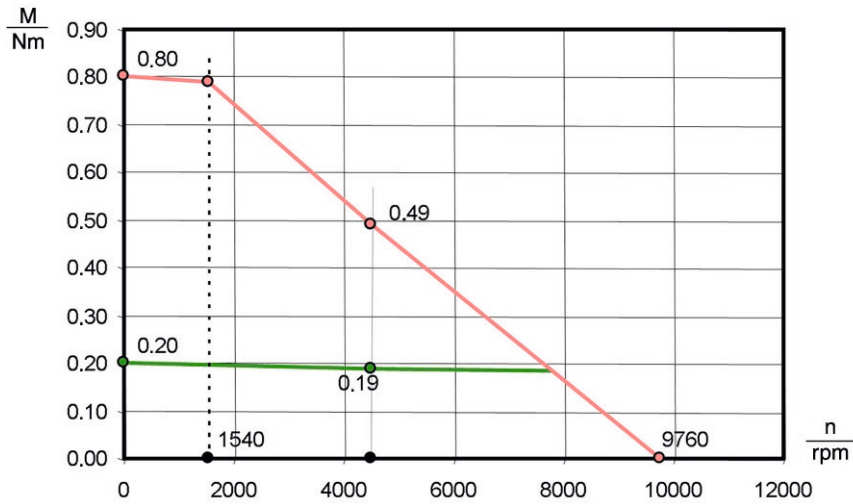
Motor type LST-050 ($U_{ZK} = 320 \text{ V}$)

Explanation on characteristics:

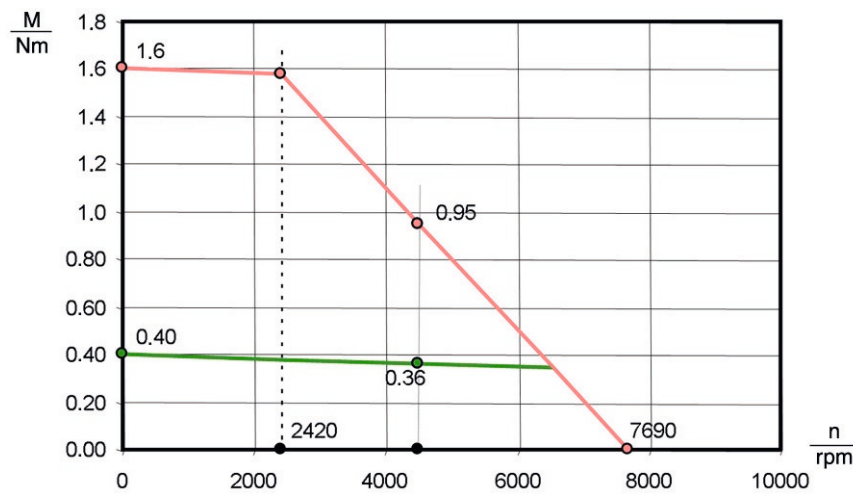
The upper characteristic (M_{max}) describes the short-term max. possible torque at the corresponding speed (important with dynamic processes).

The lower characteristic (M_{nenn}) shows the thermally permissible continuous torque.

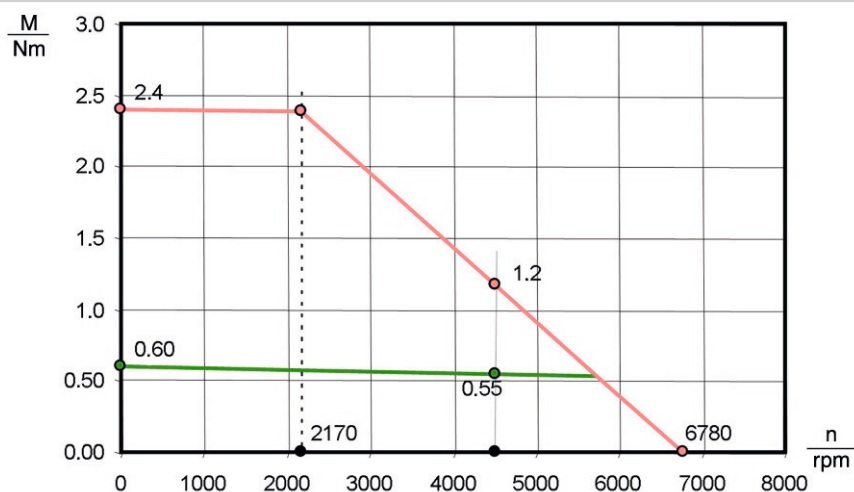
LST-050-1-45-320



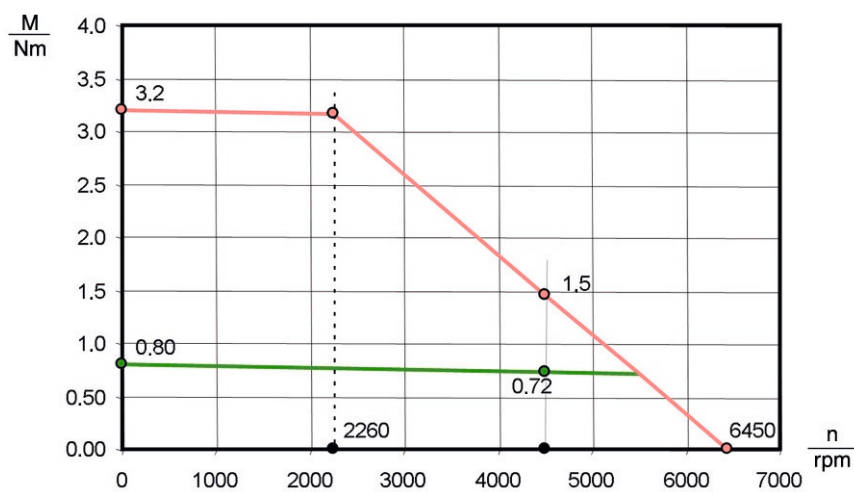
LST-050-2-45-320



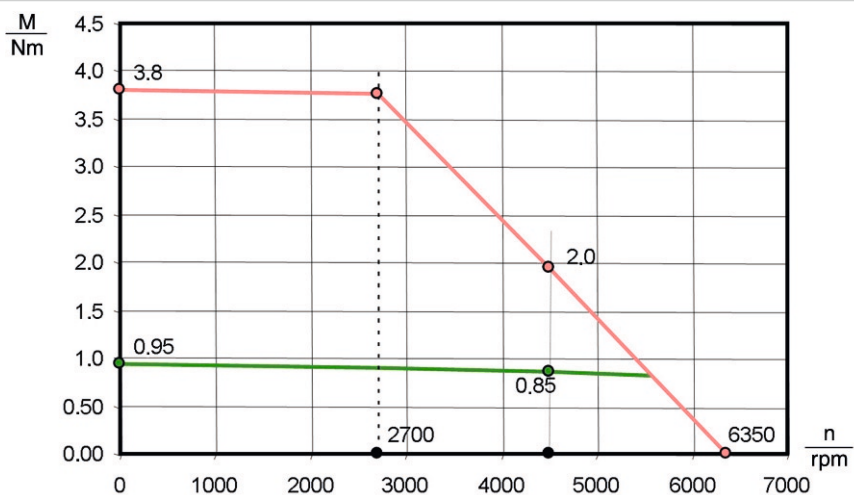
LST-050-3-45-320



LST-050-4-45-320



LST-050-5-45-320

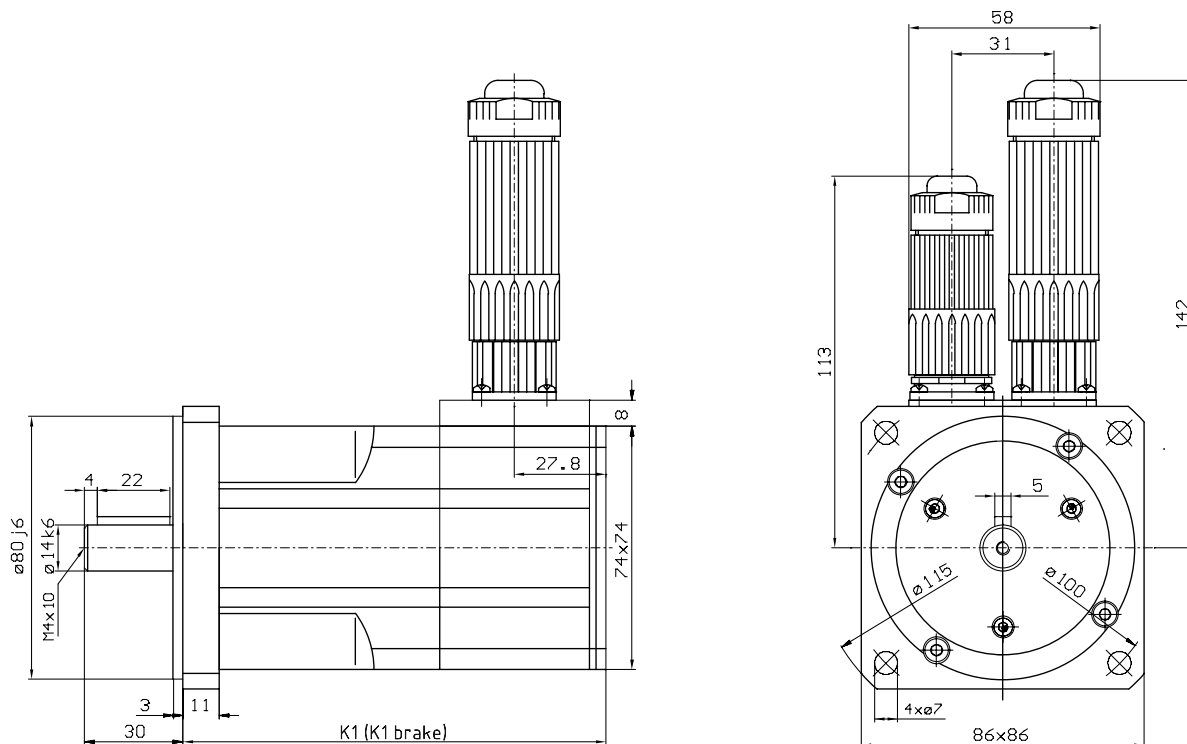


Motor type LST-074 ($U_{ZK} = 320\text{ V}$)



Motor length [mm]	K (with resolver)	K (with optical encoder G3, G5, G12.x)	K (with optical encoder G6.x)	Additional length with design LSX-xxx-...,B (brake)
LST-074-1-30-320	109	150	128.5	33
LST-074-2-30-320	127	168	146.5	33
LST-074-3-30-320	145	186	164.5	33
LST-074-4-30-320	163	204	182.5	33
LST-074-5-30-320	181	222	200.5	33

Dimensional sketch



Technical data	Symbol	LST-074-1-30-320	LST-074-2-30-320	LST-074-3-30-320	LST-074-4-30-320	LST-074-5-30-320
Rated speed	n_n	3000 rpm	3000 rpm	3000 rpm	3000 rpm	3000 rpm
Rated frequency	f_n	150 Hz	150 Hz	150 Hz	150 Hz	150 Hz
DC link voltage (controller)	U_{dc}	320 V	320 V	320 V	320 V	320 V
Nominal AC voltage	U_n	200 V	200 V	200 V	200 V	200 V
Rated torque	M_n	0.60 Nm	1.15 Nm	1.6 Nm	2.2 Nm	2.5 Nm
Rated AC current	I_n	1.04 A	1.58 A	2.2 A	2.7 A	3.0 A
Power	P	0.18 kW	0.36 kW	0.5 kW	0.69 kW	0.78 kW
Stall torque	M_0	0.65 Nm	1.3 Nm	1.9 Nm	2.5 Nm	3.0 Nm
Stall AC current	I_0	1.06 A	1.67 A	2.5 A	3.0 A	3.5 A
Peak torque	M_{max}	2.6 Nm	5.2 Nm	7.6 Nm	10.0 Nm	12.0 Nm
Peak current	I_{max}	4.6 A	7.2 A	10.7 A	13.0 A	15.0 A
Maximum speed	n_{max}	12000 rpm	12000 rpm	12000 rpm	12000 rpm	12000 rpm
EMF constant	K_E	37.0 V/1000	47.0 V/1000	46.0 V/1000	50.0 V/1000	52.0 V/1000
Torque constant	K_T	0.61 Nm/A	0.78 Nm/A	0.76 Nm/A	0.83 Nm/A	0.86 Nm/A
Winding resistance (two phases)	R_{2ph}	28.2 Ω	12.7 Ω	6.7 Ω	5.4 Ω	4.1 Ω
Winding inductance (two phases)	L_{2ph}	33.3 mH	21.5 mH	13.1 mH	11.7 mH	9.4 mH
No load speed	n_0	5410 rpm	4260 rpm	4350 rpm	4000 rpm	3850 rpm
Electric time constant	T_{el}	1.2 ms	1.7 ms	2.0 ms	2.2 ms	2.3 ms
Thermal time constant	T_{th}	25 min.	30 min.	31 min.	32 min.	33 min.
Moment of inertia of rotor	J	0.00005 kgm ²	0.000065 kgm ²	0.000092 kgm ²	0.00014 kgm ²	0.00015 kgm ²
Mass	m	1.75 kg	2.25 kg	2.7 kg	3.2 kg	3.65 kg
Brake (optional)						
Nominal AC voltage	U_N	24 V \pm 10 %				
Rated AC current at 20 °C to release	I_N	0.5 A				
permissible maximum speed	n_{max}	10,000 rpm				
permissible friction energy	WR	0.58 x 10 ⁶ Ws				
Moment of inertia	J_B	0.000018 kgm ²				
Mass	m	0.3 kg				
Braking torque	M_H	4.5 Nm				

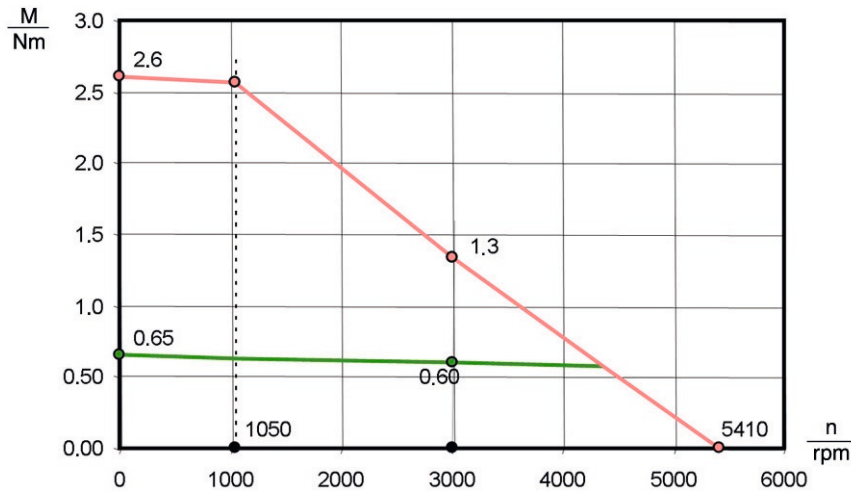
Motor type LST-074 ($U_{ZK} = 320\text{ V}$)

Explanation on characteristics:

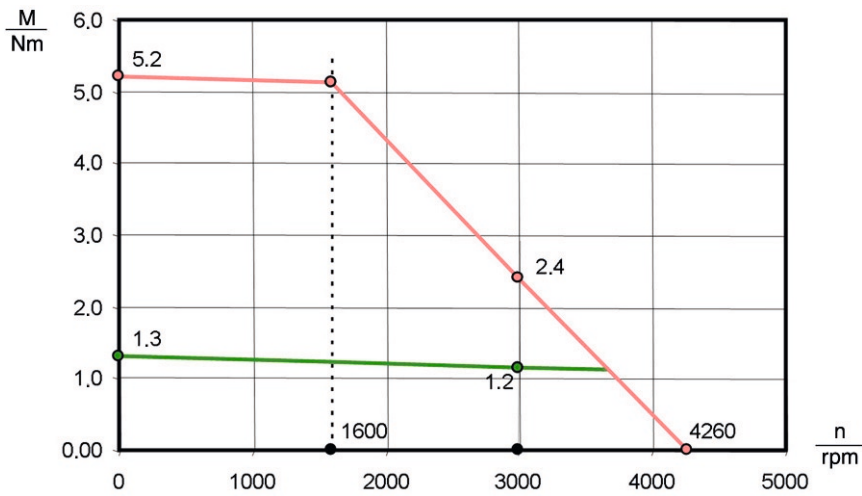
The upper characteristic (M_{max}) describes the short-term max. possible torque at the corresponding speed (important with dynamic processes).

The lower characteristic (M_{nenn}) shows the thermally permissible continuous torque.

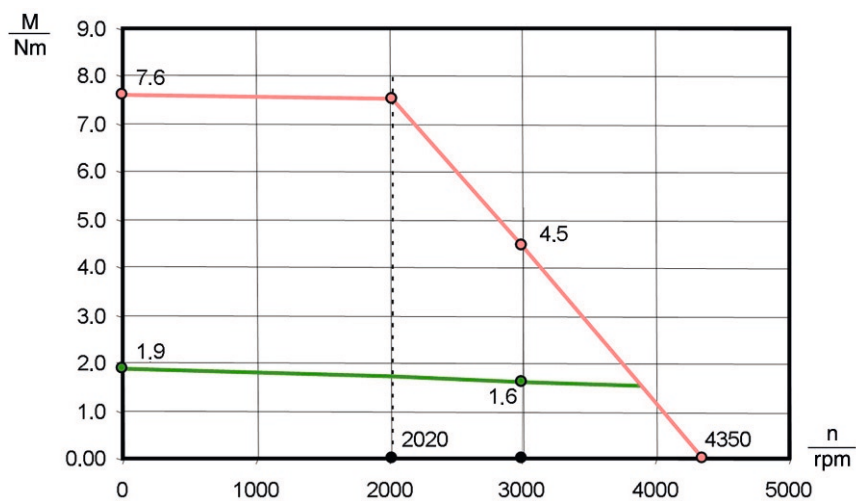
LST-074-1-30-320



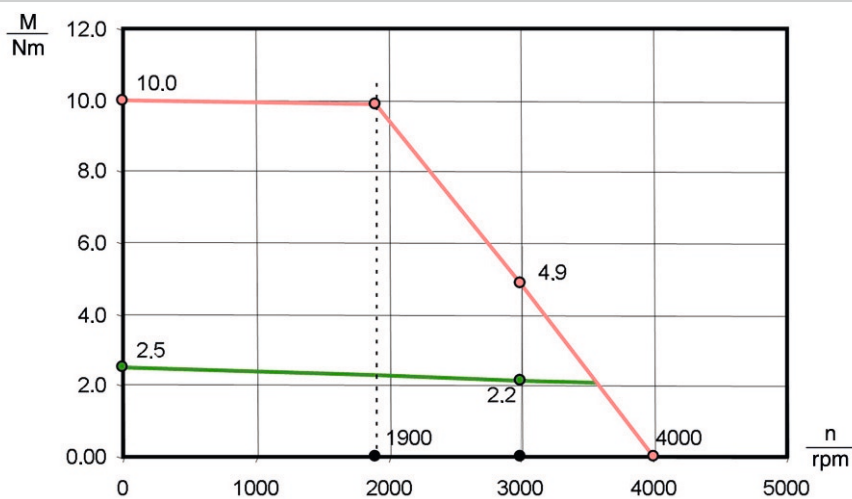
LST-074-2-30-320



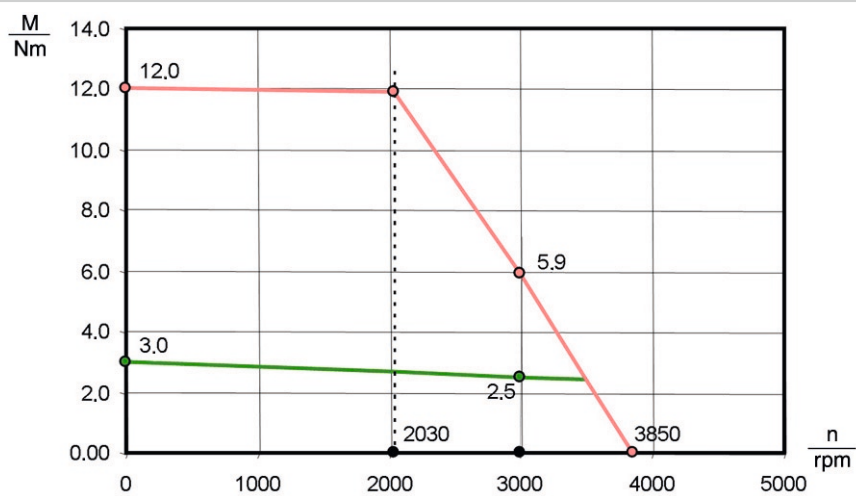
LST-074-3-30-320



LST-074-4-30-320



LST-074-5-30-320

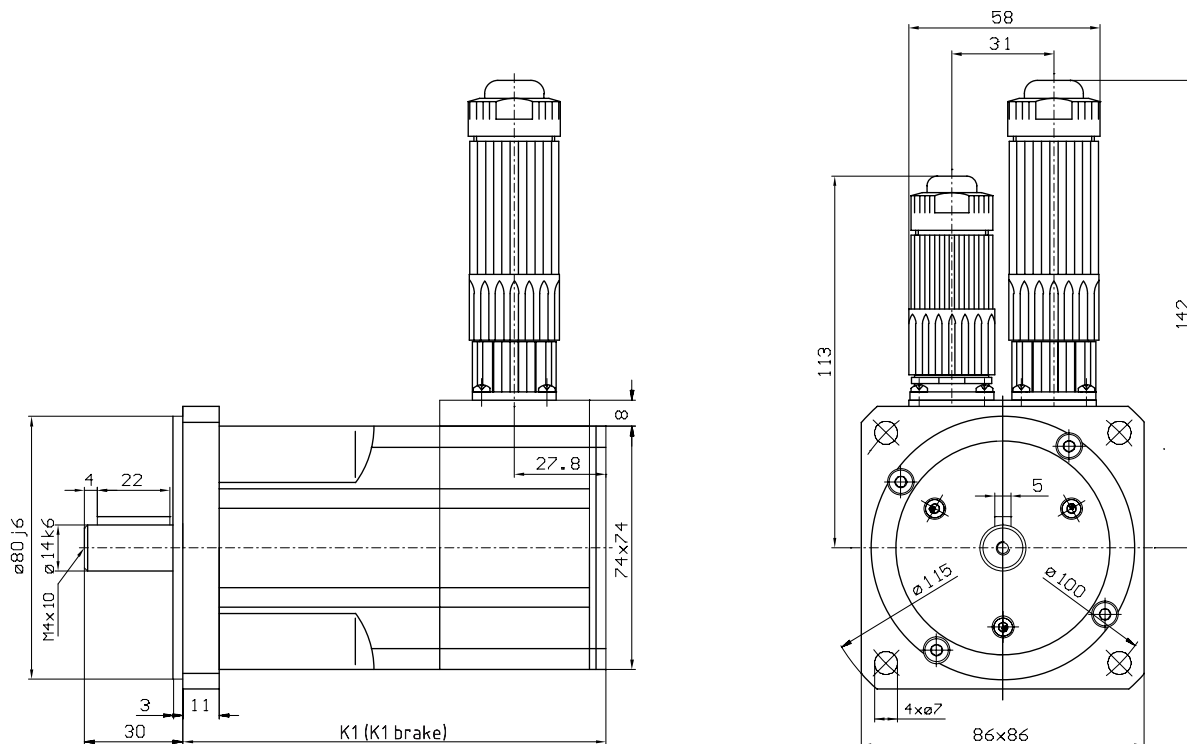


Motor type LST-074 ($U_{ZK} = 560 \text{ V}$)



Motor length [mm]	K (with resolver)	K (with optical encoder G3, G5, G12.x)	K (with optical encoder G6.x)	Additional length with design LSX-xxx-...,B (brake)
LST-074-1-30-560	109	150	128.5	33
LST-074-2-30-560	127	168	146.5	33
LST-074-3-30-560	145	186	164.5	33
LST-074-4-30-560	163	204	182.5	33
LST-074-5-30-560	181	222	200.5	33

Dimensional sketch



Technical data	Symbol	LST-074-1-30-560	LST-074-2-30-560	LST-074-3-30-560	LST-074-4-30-560	LST-074-5-30-560
Rated speed	n_n	3000 rpm	3000 rpm	3000 rpm	3000 rpm	3000 rpm
Rated frequency	f_n	150 Hz	150 Hz	150 Hz	150 Hz	150 Hz
DC link voltage (controller)	U_{dc}	560 V	560 V	560 V	560 V	560 V
Nominal AC voltage	U_n	200 V	200 V	200 V	200 V	200 V
Rated torque	M_n	0.60 Nm	1.15 Nm	1.6 Nm	2.2 Nm	2.5 Nm
Rated AC current	I_n	0.64 A	0.95 A	1.26 A	1.62 A	1.82 A
Power	P	0.18 kW	0.36 kW	0.5 kW	0.69 kW	0.78 kW
Stall torque	M_0	0.65 Nm	1.3 Nm	1.9 Nm	2.5 Nm	3.0 Nm
Stall AC current	I_0	0.65 A	1.01 A	1.42 A	1.8 A	2.1 A
Peak torque	M_{max}	2.6 Nm	5.2 Nm	7.6 Nm	10.0 Nm	12.0 Nm
Peak current	I_{max}	2.8 A	4.3 A	6.1 A	7.7 A	9.0 A
Maximum speed	n_{max}	12000 rpm	12000 rpm	12000 rpm	12000 rpm	12000 rpm
EMF constant	K_E	60.0 V/1000	46.0 V/1000	81.0 V/1000	84.0 V/1000	87.0 V/1000
Torque constant	K_T	0.99 Nm/A	0.78 Nm/A	1.34 Nm/A	1.39 Nm/A	1.44 Nm/A
Winding resistance (two phases)	R_{2ph}	75 Ω	34.5 Ω	20.9 Ω	15.0 Ω	11.6 Ω
Winding inductance (two phases)	L_{2ph}	88 mH	62 mH	40.4 mH	33.2 mH	26.7 mH
No load speed	n_0	5500 rpm	4230 rpm	4070 rpm	3930 rpm	3790 rpm
Electric time constant	T_{el}	1.2 ms	1.8 ms	1.9 ms	2.2 ms	2.3 ms
Thermal time constant	T_{th}	25 min.	30 min.	31 min.	32 min.	33 min.
Moment of inertia of rotor	J	0.00005 kgm ²	0.000065 kgm ²	0.000092 kgm ²	0.00014 kgm ²	0.00015 kgm ²
Mass	m	1.75 kg	2.25 kg	2.7 kg	3.2 kg	3.65 kg
Brake (optional)						
Nominal AC voltage	U_N	24 V \pm 10 %				
Rated AC current at 20 °C to release	I_N	0.5 A				
permissible maximum speed	n_{max}	10,000 rpm				
permissible friction energy	WR	0.58 x 10 ⁶ Ws				
Moment of inertia	J_B	0.000018 kgm ²				
Mass	m	0.3 kg				
Braking torque	M_H	4.5 Nm				

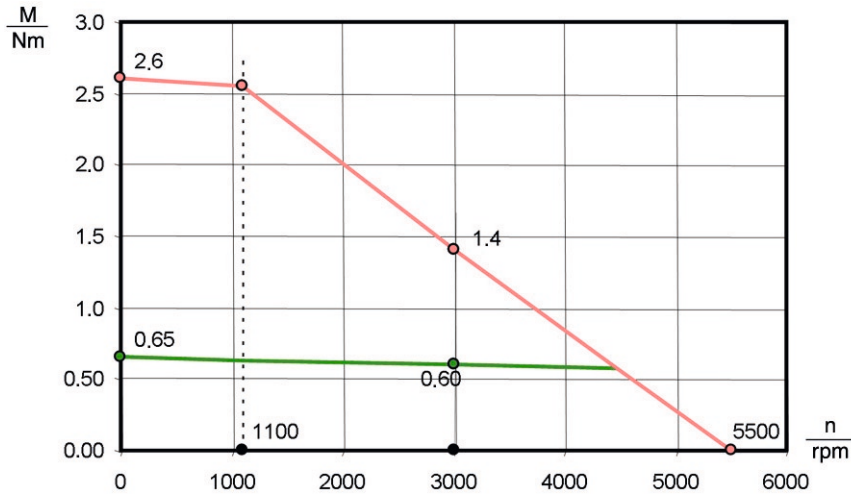
Motor type LST-074 ($U_{ZK} = 560 \text{ V}$)

Explanation on characteristics:

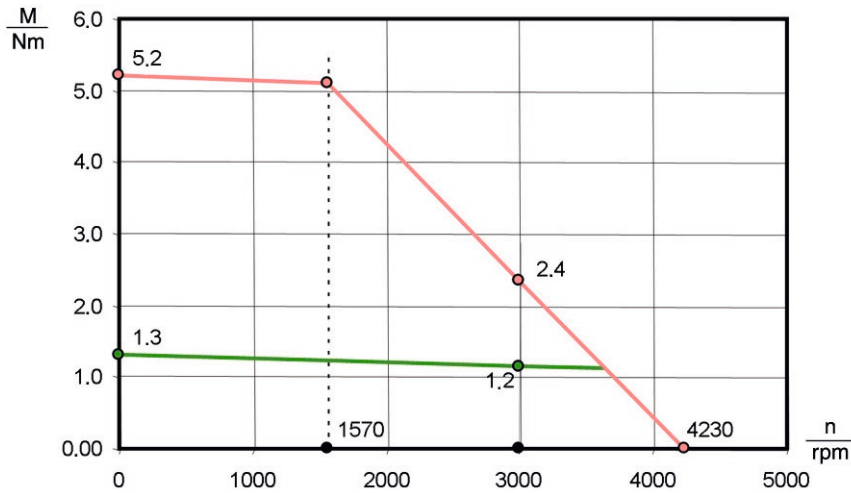
The upper characteristic (M_{\max}) describes the short-term max. possible torque at the corresponding speed (important with dynamic processes).

The lower characteristic (M_{nenn}) shows the thermally permissible continuous torque.

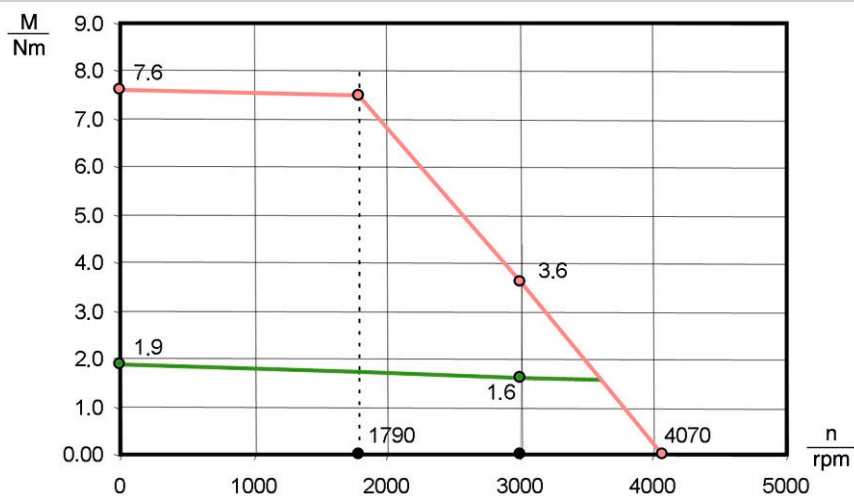
LST-074-1-30-560



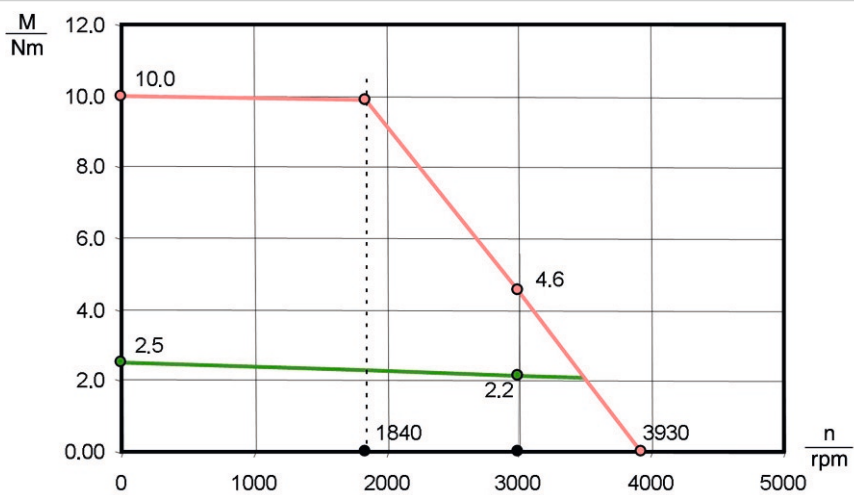
LST-074-2-30-560



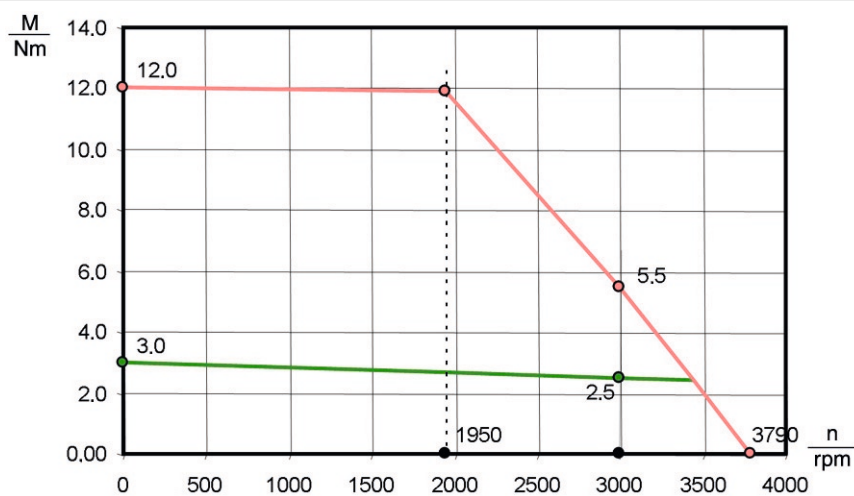
LST-074-3-30-560



LST-074-4-30-560



LST-074-5-30-560

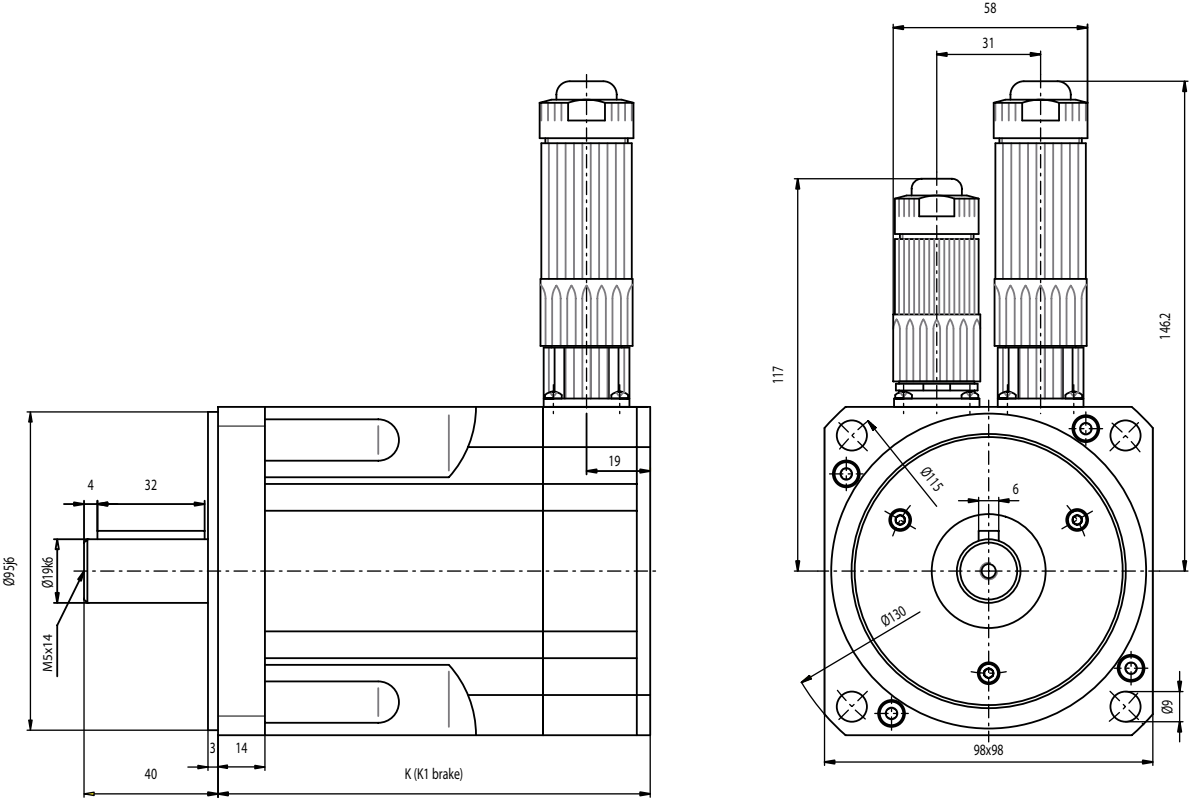


Motor type LST-097 ($U_{ZK} = 320\text{ V}$)



Motor length [mm]	K (with resolver)	K (with optical encoder G3, G5, G12.x)	K (with optical encoder G6.x)	Additional length with design LSX-xxx-...,B (brake)
LST-097-1-30-320	146	183	167	32
LST-097-2-30-320	161	198	182	32
LST-097-3-30-320	176	213	197	32
LST-097-4-30-320	221	258	242	32
LST-097-5-30-320	276	313	297	32

Dimensional sketch



Technical data	Symbol	LST-097-1-30-320	LST-097-2-30-320	LST-097-3-30-320	LST-097-4-30-320	LST-097-5-30-320
Rated speed	n_n	3000 rpm	3000 rpm	3000 rpm	3000 rpm	3000 rpm
Rated frequency	f_n	150 Hz	150 Hz	150 Hz	150 Hz	150 Hz
DC link voltage (controller)	U_{dc}	320 V	320 V	320 V	320 V	320 V
Nominal AC voltage	U_n	200 V	200 V	200 V	200 V	200 V
Rated torque	M_n	2.3 Nm	3.3 Nm	4.6 Nm	6.4 Nm	8.5 Nm
Rated AC current	I_n	3.0 A	4.3 A	5.9 A	8.1 A	10.5 A
Power	P	0.72 kW	1.0 kW	1.44 kW	2.0 kW	2.67 kW
Stall torque	M_0	2.6 Nm	3.9 Nm	5.3 Nm	7.5 Nm	9.5 Nm
Stall AC current	I_0	3.1 A	4.8 A	6.5 A	9.1 A	11.3 A
Peak torque	M_{max}	10.4 Nm	15.6 Nm	21 Nm	30 Nm	38 Nm
Peak current	I_{max}	18.9 A	29 A	39.0 A	54 A	68 A
Maximum speed	n_{max}	12000 rpm	12000 rpm	12000 rpm	12000 rpm	12000 rpm
EMF constant	K_E	50.0 V/1000	49.0 V/1000	49.5 V/1000	50.0 V/1000	51.0 V/1000
Torque constant	K_T	0.83 Nm/A	0.81 Nm/A	0.82 Nm/A	0.83 Nm/A	0.84 Nm/A
Winding resistance (two phases)	R_{2ph}	3.6 Ω	2.3 Ω	1.66 Ω	0.87 Ω	0.59 Ω
Winding inductance (two phases)	L_{2ph}	15.9 mH	11.8 mH	9.8 mH	5.6 mH	4.1 mH
No load speed	n_0	4000 rpm	4080 rpm	4040 rpm	4000 rpm	3920 rpm
Electric time constant	T_{el}	4.4 ms	5.2 ms	5.9 ms	6.4 ms	6.9 ms
Thermal time constant	T_{th}	60 min.	65 min.	64 min.	66 min.	68 min.
Moment of inertia of rotor	J	0.00019 kgm ²	0.00023 kgm ²	0.00027 kgm ²	0.00042 kgm ²	0.00061 kgm ²
Mass	m	4.5 kg	5.05 kg	5.6 kg	7.7 kg	10.5 kg
Brake (optional)						
Nominal AC voltage	U_N	24 V \pm 10 %				
Rated AC current at 20 °C to release	I_N	0.75 A				
permissible maximum speed	n_{max}	10,000 rpm				
permissible friction energy	WR	0.89 x 10 ⁶ Ws				
Moment of inertia	J_B	0.000054 kgm ²				
Mass	m	0.46 kg				
Braking torque	M_H	9.0 Nm				

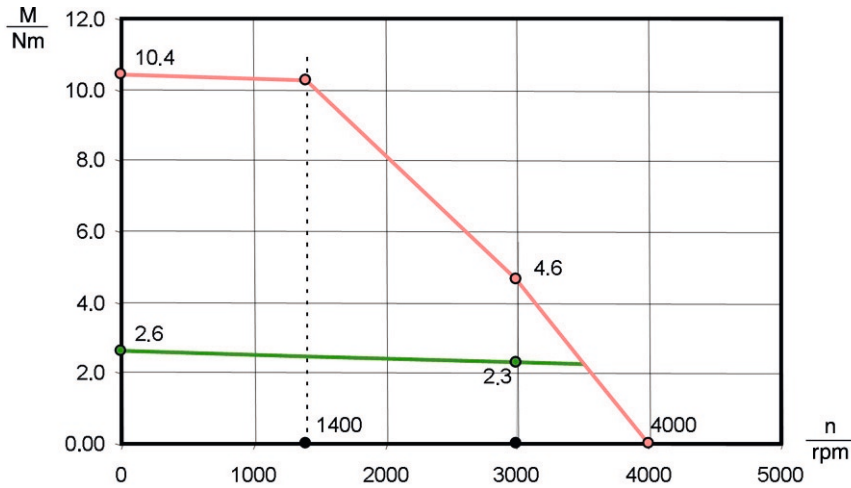
Motor type LST-097 ($U_{ZK} = 320 \text{ V}$)

Explanation on characteristics:

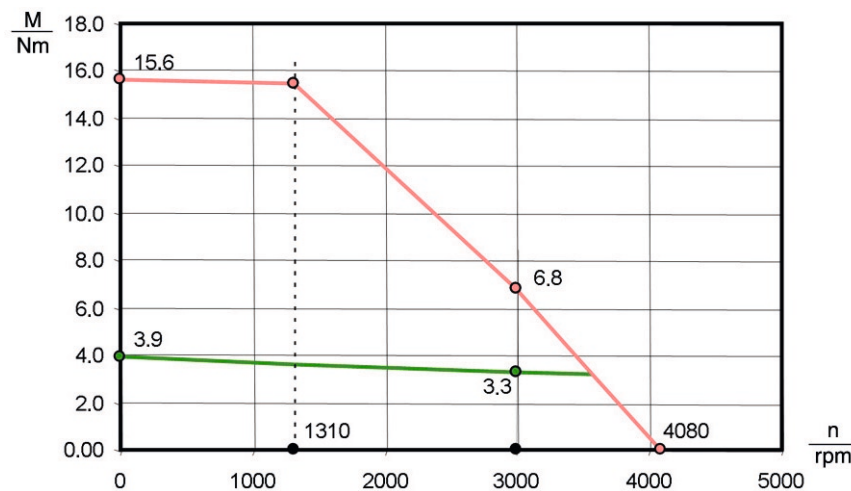
The upper characteristic (M_{\max}) describes the short-term max. possible torque at the corresponding speed (important with dynamic processes).

The lower characteristic (M_{nen}) shows the thermally permissible continuous torque.

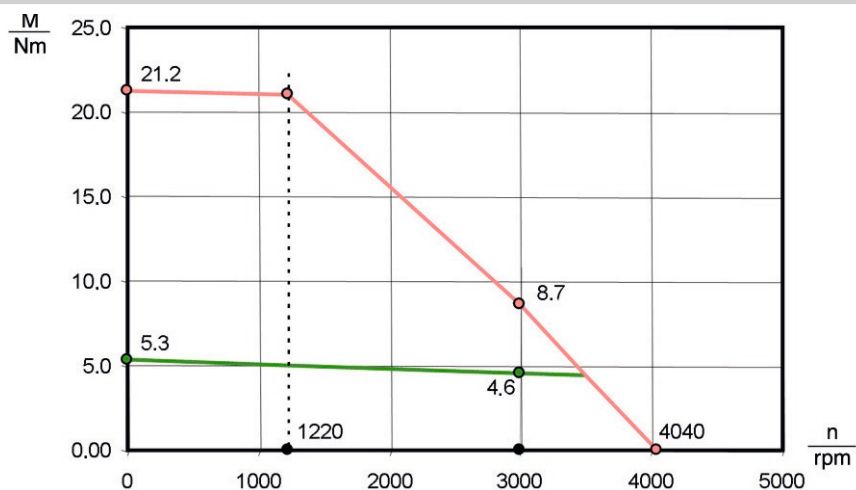
LST-097-1-30-320



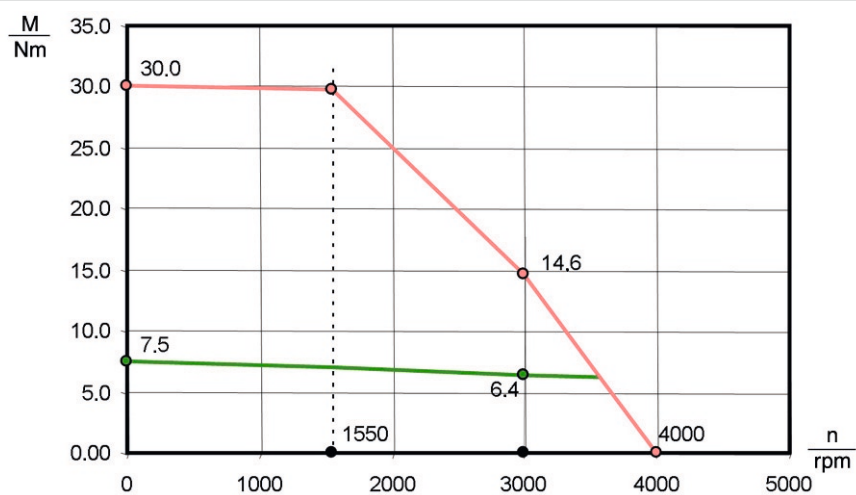
LST-097-2-30-320



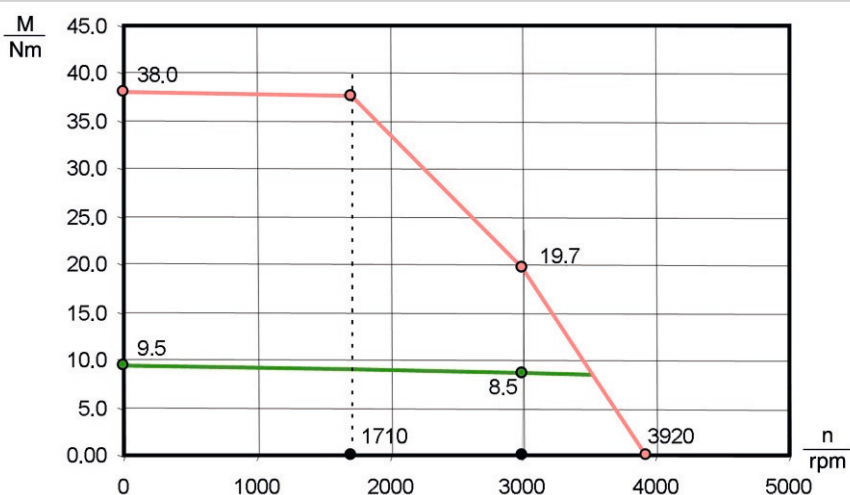
LST-097-3-30-320



LST-097-4-30-320



LST-097-5-30-320

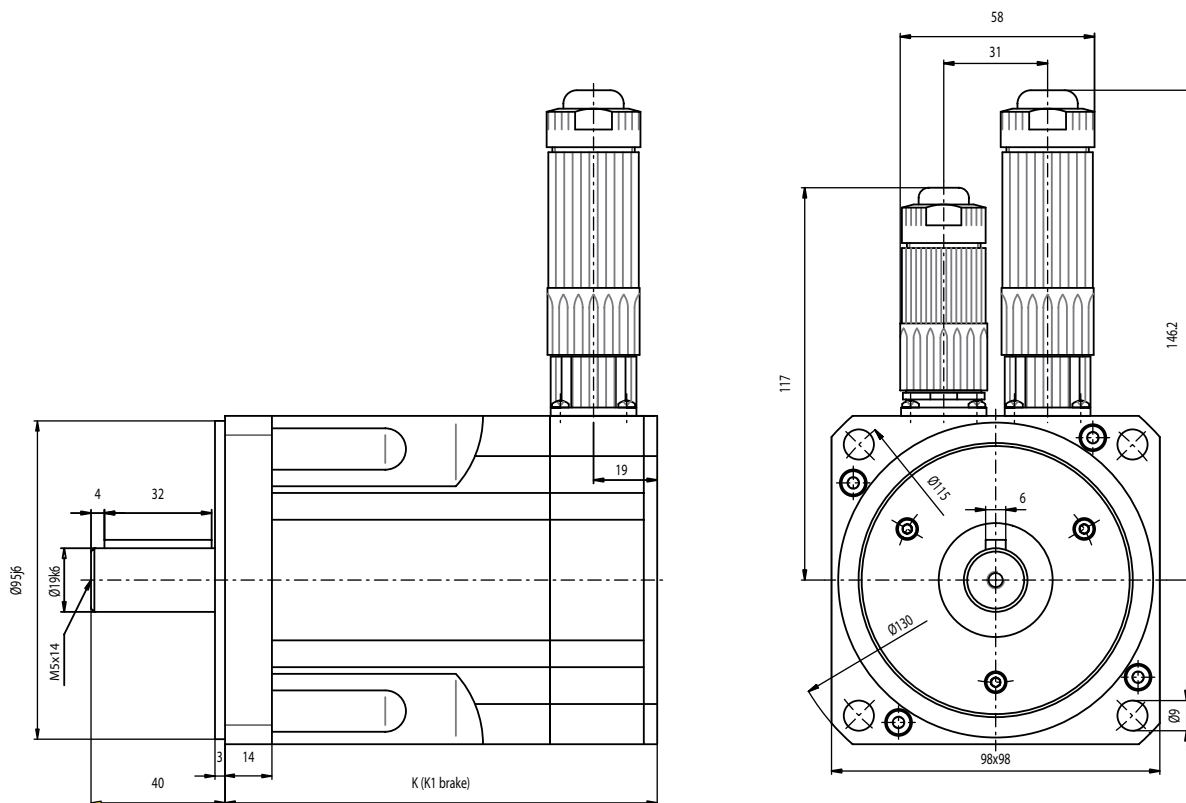


Motor type LST-097 ($U_{ZK} = 560 \text{ V}$)



Motor length [mm]	K (with resolver)	K (with optical encoder G3, G5, G12.x)	K (with optical encoder G6.x)	Additional length with design LSX-xxx-...,B (brake)
LST-097-1-30-560	146	183	167	32
LST-097-2-30-560	161	198	18	32
LST-097-3-30-560	176	213	193	32
LST-097-4-30-560	221	228	219	32
LST-097-5-30-560	236	243	234	32

Dimensional sketch



Technical data	Symbol	LST-097-1-30-560	LST-097-2-30-560	LST-097-3-30-560	LST-097-4-30-560	LST-097-5-30-560
Rated speed	n_n	3000 rpm	3000 rpm	3000 rpm	3000 rpm	3000 rpm
Rated frequency	f_n	150 Hz	150 Hz	150 Hz	150 Hz	150 Hz
DC link voltage (controller)	U_{dc}	560 V	560 V	560 V	560 V	560 V
Nominal AC voltage	U_n	330 V	330 V	330 V	330 V	330 V
Rated torque	M_n	2.3 Nm	3.3 Nm	4.6 Nm	6.4 Nm	8.5 Nm
Rated AC current	I_n	1.85 A	2.6 A	3.8 A	4.4 A	6.2 A
Power	P	0.72 kW	1.0 kW	1.44 kW	2.0 kW	2.67 kW
Stall torque	M_0	2.6 Nm	3.9 Nm	5.3 Nm	7.5 Nm	9.5 Nm
Stall AC current	I_0	1.92 A	2.9 A	4.1 A	4.8 A	6.6 A
Peak torque	M_{max}	10.4 Nm	15.6 Nm	21.0 Nm	30.0 Nm	38 Nm
Peak current	I_{max}	11.5 A	17.3 A	25.0 A	29 A	40 A
Maximum speed	n_{max}	12000 rpm	12000 rpm	12000 rpm	12000 rpm	12000 rpm
EMF constant	K_E	82.0 V/1000	82.0 V/1000	78.0 V/1000	94.0 V/1000	87.0 V/1000
Torque constant	K_T	1.36 Nm/A	1.36 Nm/A	1.29 Nm/A	1.55 Nm/A	1.44 Nm/A
Winding resistance (two phases)	R_{2ph}	9.6 Ω	6.3 Ω	4.2 Ω	3.0 Ω	1.65 Ω
Winding inductance (two phases)	L_{2ph}	41.5 mH	33.1 mH	24.0 mH	19.2 mH	11.7 mH
No load speed	n_0	4020 rpm	4020 rpm	4230 rpm	3510 rpm	3790 rpm
Electric time constant	T_{el}	4.3 ms	5.3 ms	5.7 ms	6.4 ms	7.1 ms
Thermal time constant	T_{th}	60 min.	65 min.	64 min.	66 min.	68 min.
Moment of inertia of rotor	J	0.00019 kgm ²	0.00023 kgm ²	0.00027 kgm ²	0.00042 kgm ²	0.00061 kgm ²
Mass	m	4.5 kg	5.05 kg	5.6 kg	7.7 kg	10.5 kg
Brake (optional)						
Nominal AC voltage	U_N	24 V \pm 10 %				
Rated AC current at 20 °C to release	I_N	0.75 A				
permissible maximum speed	n_{max}	10,000 rpm				
permissible friction energy	WR	0.89 x 10 ⁶ Ws				
Moment of inertia	J_B	0.000054 kgm ²				
Mass	m	0.46 kg				
Braking torque	M_H	9.0 Nm				

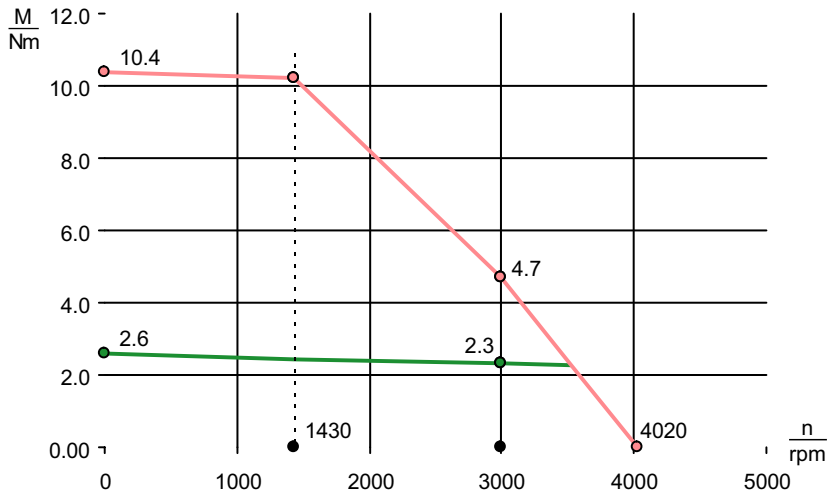
Motor type LST-097 ($U_{ZK} = 560 \text{ V}$)

Explanation on characteristics:

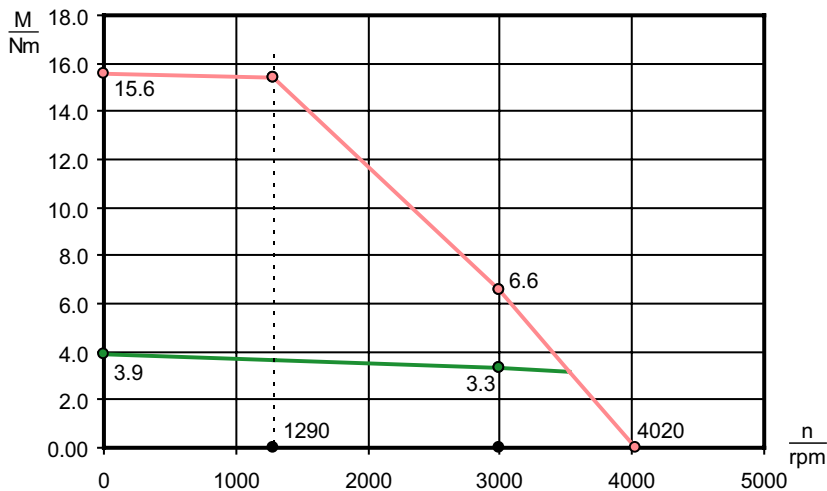
The upper characteristic (M_{max}) describes the short-term max. possible torque at the corresponding speed (important with dynamic processes).

The lower characteristic (M_{nenn}) shows the thermally permissible continuous torque.

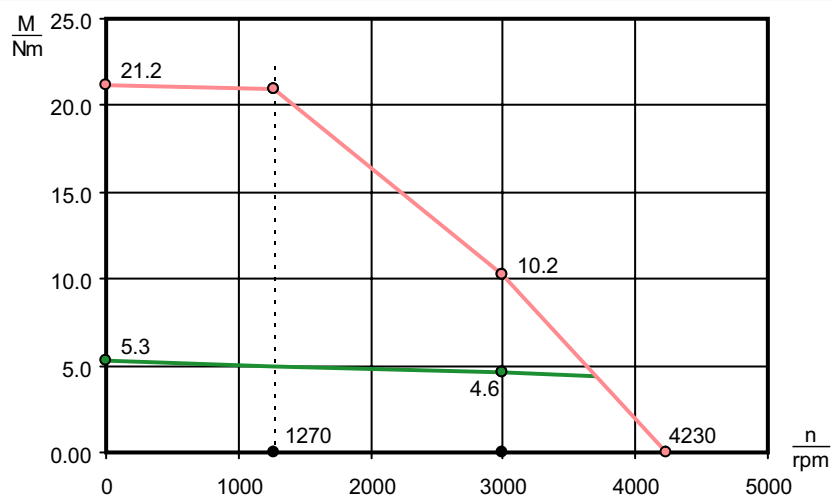
LST-097-1-30-560



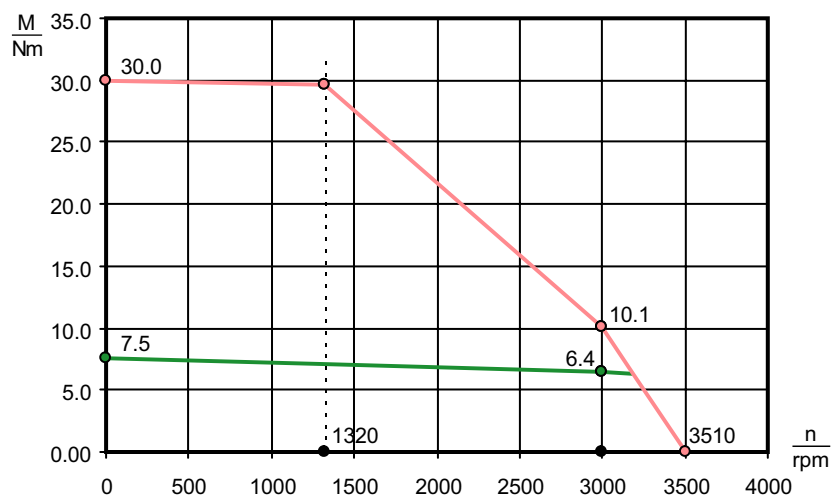
LST-097-2-30-560



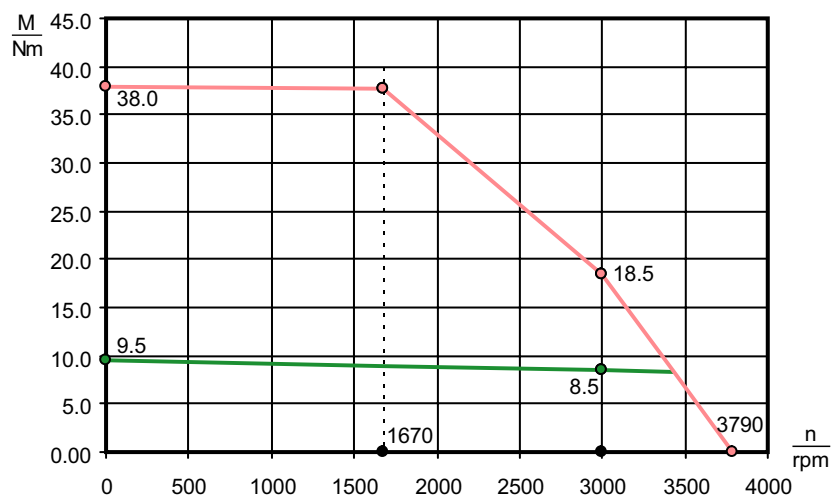
LST-097-3-30-560



LST-097-4-30-560



LST-097-5-30-560



Encoders for servo motors

Overview of encoder types

Ordering option	Encoder designations		compatible with				Encoder properties		System properties		
	Description	sin/cos periods/revolution	LST 037	LSx-050	LSH-074 to LSH-127	LST 074 to LST-220	typical absolute accuracy Encoder (data sheet of encoder manufacturer)	typical repeat accuracy of encoder (data sheet of encoder manufacturer)	ServoOne position resolution for positioning of speed control	c-line position resolution for positioning control	c-line position resolution for speed control
1R	Resolver 1 pole pair	1	X	X	X	X	+/- 10'	+/- 1'	14 bit +/- 1'	14 bit +/- 1'	14 bit +/- 1'
3R	Resolver 3 pole pair	3	X	X		X	+/- 5'	+/- 1'	3x14 bit +/- 0.3'	3x14 bit +/- 0.3'	3x14 bit +/- 0.3'
5R	Resolver 5 pole pair	5			X		+/- 5'	+/- 1'	5x14bit +/- 0.2'	5x14bit +/- 0.2'	5x14bit +/- 0.2'
G3	Multi-turn absolute encoder EQN 1325 SSI	2048			X	X	+/- 20"	+/- 6"	25bit +/- 0.04"	16 bit (CDD)	25bit +/- 0.04"
G5	Single-turn absolute encoder ECN 1313 SSI	2048			X	X	+/- 20"	+/- 6"	25bit +/- 0.04"	16 bit (CDD)	25bit +/- 0.04"
G6.1S ¹⁾	Single-turn absolute encoder SRS 50	1024			X	X	+/- 45"	+/- 7"	24bit +/- 0.08"	16 bit (CDD)	24bit +/- 0.08"
G6.1M ¹⁾	Multi-turn absolute encoder SRM 50	1024			X	X	+/- 45"	+/- 7"	24bit +/- 0.08"	16 bit (CDD)	24bit +/- 0.08"
G6.2S ¹⁾	Single-turn absolute encoder SKS 36	128		X	X	X	+/- 80"	+/- 40"	21bit +/- 0.6"	16 bit (CDD)	21bit +/- 0.6"
G6.2M ¹⁾	Multi-turn absolute encoder SKM 36	128		X	X	X	+/- 80"	+/- 40"	21bit +/- 0.6"	16 bit (CDD)	21bit +/- 0.6"
G12.1S ¹⁾	Single-turn absolute encoder ECN 1313 Endat 2.1	2048			X	X	+/- 20"	+/- 6"	25bit +/- 0.04"	16 bit (CDD)	25bit +/- 0.04"
G12.1M ¹⁾	Multi-turn absolute encoder EQN 1325 Endat 2.1	2048			X	X	+/- 20"	+/- 6"	25bit +/- 0.04"	16 bit (CDD)	25bit +/- 0.04"
G12.2S ¹⁾	Single-turn absolute encoder ECN 1113 Endat 2.1	512			X	X	+/- 60"	+/- 25"	23bit +/- 0.16"	16 bit (CDD)	23bit +/- 0.16"
G12.2M ¹⁾	Multi-turn absolute encoder EQN 1125 Endat 2.1	512			X	X	+/- 60"	+/- 25"	23bit +/- 0.16"	16 bit (CDD)	23bit +/- 0.16"

¹⁾ not usable with CDE3000 and CDF3000

Appendix

Holding brake



The backlash-free permanent-field single-area holding brake works in accordance with the stall AC current principle, i.e. the brake needs to be energized for releasing.

On all LSx-motors the holding brake is mounted directly behind the flange (side A) to provide an optimal holding torque.

The holding brake is generally switched on and off during standstill. When using the holding brake as an emergency stop brake you must pay attention to the maximum permissible friction energy (WR).

LSH servo motors with holding brake are identified by their type plate.

Example: LSH-074-1-30-560/T1,B,1R

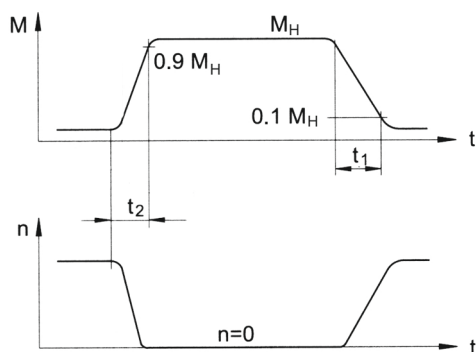


Note: When operating the brake as emergency stop brake the braking torque may be considerably lower than the holding torque.

Response times of holding brakes

Switching by DC-side:

Takes place between rectifier and coil, very short overtravel is thereby achieved. For all drives requiring exact braking, also for hoisting gear in particular, DC-side switching of the brake is strictly required (break time $t_2 =$).



M	Braking torque	t	Time
M_H	Holding torque of spring operated brake	t_1	Make time
N	Rotary speed	t_2	Break time

Technical data holding brake

Size	t_1 [ms]	t_2 [ms]	M_H [Nm]	I_N [A] at 24 V	U_N [V]	n_{max} [min ⁻¹]	m [kg]	W_R [10 ⁶ Ws]	J_B [kgcm ²]
LST-037	6	10	0.4	0.33	24 V ± 10 %	10,000	0.075	0.20	0.013
LSx-050	6	25	2.0	0.46		10,000	0.15	0.41	0.07
LSx-074	7	35	4.5	0.5		10,000	0.3	0.58	0.18
LSx-097	7	40	9.0	0.75		10,000	0.82	0.89	0.54
LSx-127	10	50	18.0	1.0		10,000	1.8	1.29	1.66
LST-158	22	90	36	1.1		10,000	2.85	2.90	5.56
LST-190	22	90	36	1.1		8,000	3.25	2.9	6.2
LST-220	65	105	145	2.1		8,000	9.5	13	56

M_H Holding torque (break-away torque)	m Mass (weight)
I_N Excitation current at 20 °C for releasing	W_R Permissible friction energy up to 0.1 mm abrasion (for emergency stop)
U_N DC voltage for releasing	J_B Moment of inertia of holding brake
n_{max} Maximum speed (unbraked)	



Note: The above specified data m and J_B are pure brake data, without accounting for the required addition mass of the motor shaft.

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The German version is the original version of the ordering catalogue.

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