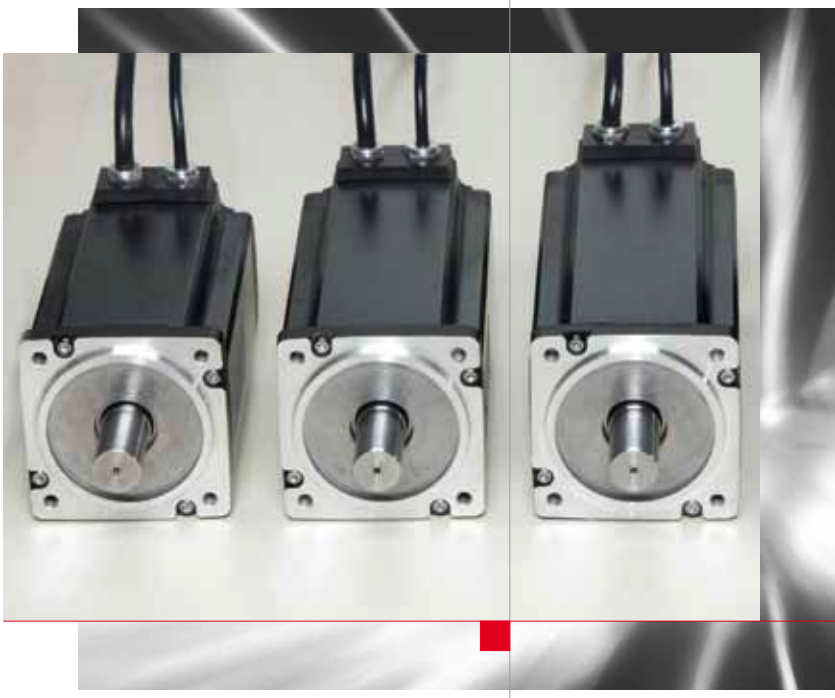
Servo Motors

Ordering Catalogue



Product range:

- LSMx - Servo Motors
  Rated torque: 0.64 to 14.4 Nm

Ordering Catalogue Servo Motors

Id. No.: 0814.27B.0-00

Status: 04/2011

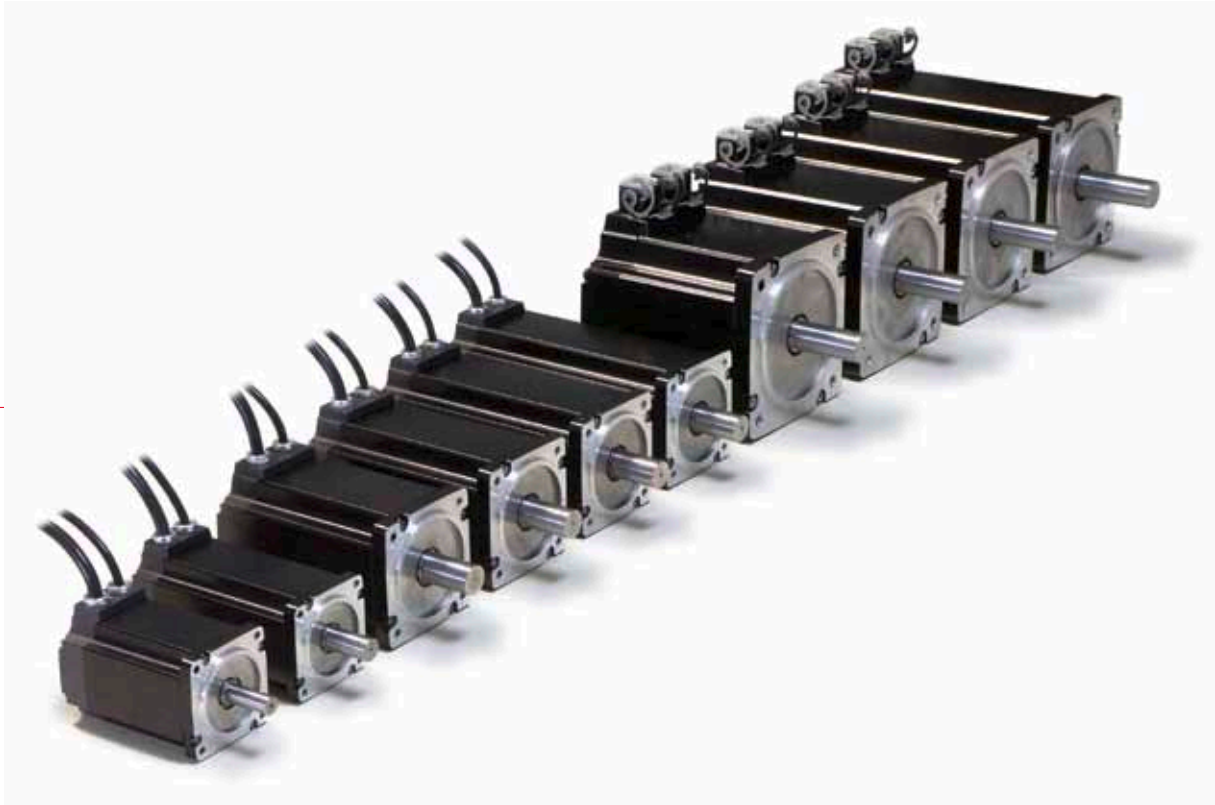
Subject to change without prior notice.

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

Servo Motors

The following double page gives you an overview of the contents of the ordering catalogue.

Please take your time to read also the first chapter. It provides information about the capacities of LSMx Servo Motors in compact form.



Contents

Sequence of selection procedure

General information	Choosing the right drive and motor requires knowledge about the specific speed and load cycle of the drive task.
1.	Determination of the supply voltage: 230 V to 400 V
2.	Determination of the installation space
3.	Determination of the max. torque from the load cycle profile, see project engineering manual c-line Drives in appendix - on our product DVD.
4.	Determination of the mean (effective) torque, see project engineering manual c-line Drives in appendix - on our product DVD.
5.	Determination of the required motor type: LSML/LSMM, see page 1-2
6.	Selection from the motor that fulfils the folowwing criteria from the corresponding data page: Synchronous servo motor: $n_{max} \leq 1{,}1 \cdot n_{rated}$ $M_{eff} \leq M_{rated}$
7.	Determinationof the required encoder system: Resolver, absolut encoder, see page 1-2
8.	Complete motor designationwith all required options (type key), see page 1-2
9.	Determination of the length of the required prefabricated power cable, see project engineering manual c-line Drives, chapter 4 - on our product DVD.
10.	Determination of the required prefabricated encoder cable or determintation of the plug size for installation by customer, Resolver, absolut encoder, see page 3-2
11.	Selection of inverter/servo controller for the selected motor in the selection an ordering data based on the standard overload conditions. The selection of inverters/servo controllers with respect to the corresponding standstill AC current or rated AC current of the motor.

Ordering code LTi synchronous motors LSM

Example LSMM13-300-4N-11000

Article designation ▶	LSM	M	13	-	300	-	4	N	-	1	1	0	0	0
LTi servo motor series M	LSM													
Inertia of the motor	Low	L												
	Middle	M												
Flange size	60 mm		06											
	80 mm		08											
	130 mm		13											
Rated output power	200 W				020									
	400 W				040									
	750 W				075									
	1000 W				100									
	1500 W				150									
	2000 W				200									
	3000 W				300									
Supply voltage	230 V						2							
	400 V						4							
Maximum speed	2500 min^{-1}							N						
	4000 min^{-1}							F [1]						
Option brake	without brake									0				
	with brake									1				
Option feather key	without feather key										0			
	with feather key										1			
Option encoder	Resolver											0		
	Absolute encoder SEK37 (single-turn)											1		
	Absolute encoder SEL37 (multi-turn)											2		
Option matching plug	Cable without matching plug												0	
	Cable with matching plug (straigth, EMV) at LSML0x on power and signal connection												1	
Option radial seal	Motor without radial seal													0
	Motor with radial seal IP65													1

1) only capabale for LSML

Option Encoder

Ordering options	Description	Interface	Oscillations analog	Single-turn info	Multi-turn info
0	Resolver 1 pole pair	analog	1	14 bit	-
1	Single-turn absolute encoder SEK37	analog and Hiperface	16	16 x 14 bit	-
2	Mutli-turn absolute enoder SEL37	analog and Hiperface	16	16 x 14 bit	12 bit

Ordering Catalogue Servo Motors
Id.No.: 0814.27B.0-00 Status: 04/2011

Option Brake

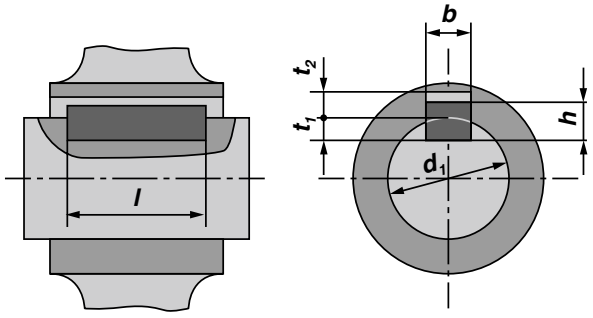
All brakes are permanent magnet DC fail-safe brakes.

Ordering options	Description	Feature	Unit	LSML06-020/040	LSML08-075/100	LSMM13-100/150	LSMM13-200/300
0	without brake	-	-	-	-	-	-
1	with brake	Insulating class	-	F (155 °C)			
		max. speed	min^{-1}	10.000			
		Power supply	V DC	24 -10 %/+6 %			
		Input supply	W	11	12	18	24
		Static braking torque	Nm	2.0	4.5	9.0	20
		Dynamic braking torque	Nm	1.7	3.8	7.5	15
		Input current	A	0.46	0.5	0.75	1.0
		Inductance	mH	0.7	1.0	0.9	0.9
		Friction work	kJ	580	580	890	1290
		Release time	ms	25	35	40	50
		Response delay (DC)	ms	2	2	2	3
		Coil resistance (+20 °C)	Ω	48.7 – 56.0	44.7 – 51.3	29.8 – 34.2	22.4 – 25.6
		Insulation resistance (500 V DC)	MΩ	500	500	500	500

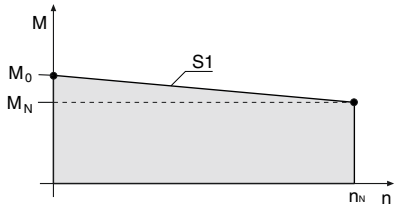
Option Feather key

A „high“ feather key is used (cf. DIN 6885-1 (1968-08), form A). The width of the shaft groove provides a tight fit (tolerance P9).

Ordering options	Description	Dimension	Unit	LSML06-020/040	LSML08-075/100	LSMM13-100/150	LSMM13-200/300	LSMM13-300
0	without feather key	-	-	-	-	-	-	-
1	with feather key	b	mm	4	5	6	8	8
		d_1	mm	11	14	19	22	24
		h	mm	4	5	6	7	7
		t_1	mm	2.5	3	3.5	4	4
		t_2	mm	1.8	2.3	2.8	3.3	3.3
		l	mm	18	22	22	40	50
		Distance to the front end of the shaft	mm	2	3	3	5	5



Basic equipment

Property	LSML06	LSML08	LSMM13
Type of machine	Permanent-field synchronous servo motor		
Magnetic material	Neodymium-Iron-Boron		
Housing material	Aluminium, smooth surface (not ribbed)		
Paint finish	RAL 9005 (matt black)		
Design (DIN 42948)	B5, V1, V3		
Degree of protection (DIN 40050)	IP65 as standard (except A-side; here for installation position V1, B5, V3: IP54)		
Insulating class	Insulating class F acc. to VDE 0530 , winding temperature Δt = +100 °C, Ambient temperature t_U = -20 °C bis +40 °C, moisture condensation excluded		
Shaft end on side A	smooth shaft		
Rotational accuracy, concentricity and axial running deviation acc. to DIN 42955	Tolerance N (normal)		
Torque load	In order to rule out thermal overloading of the motor, the effective moment of load at medium speed must not be above the S1-characteristic.  $M_{eff} = \sqrt{\frac{S\,(M^2_n \times t_n)}{t_{ges}}}$ $\bar{n} = \frac{S\,(n_n \times t_n)}{t_{ges}}$		
Maximum pulse torque	Typically 2 to 4 times the rated torque for max. 0.2 s, depending on regulator assignment		
Rate of rise of voltage dU/dt	8 kV/µs		
Vibrational severity acc. to ISO 2373	Level N		
Bearing life	the average life under nominal conditions (Mmax ≤ M_n) is 20,000 h		
Connecting type of motor and holding brake	Flying leads		Plug
Connecting type of encoder system	Flying leads		Plug
Cooling	convektive		
Thermal monitoring of motor	none		
Encoder	Standard resolver brushless 2-pole ccw (Size 15)		

Environmental conditions

Property	LSMx-xx
Ambient temperatures in operation	-10 °C to +40 °C for resolver; -10 °C to +125 °C to SEK/SEL37 Above these temperatures a power derating of 1 %/K must be taken into account. The maximum ambient temperature is 50 °C.
Storage temperature	-20 °C to +70 °C
Atmospheric humidity	<90 % relative atmospheric humidity (without condensation)
Max. installation altitude	4,000 m above sea level; >1,000 m a power derating of 1 %/100 m is to be taken into account

Ordering Catalogue Servo Motors
Id. No.: 0814.27B.0-00 Status: 04/2011

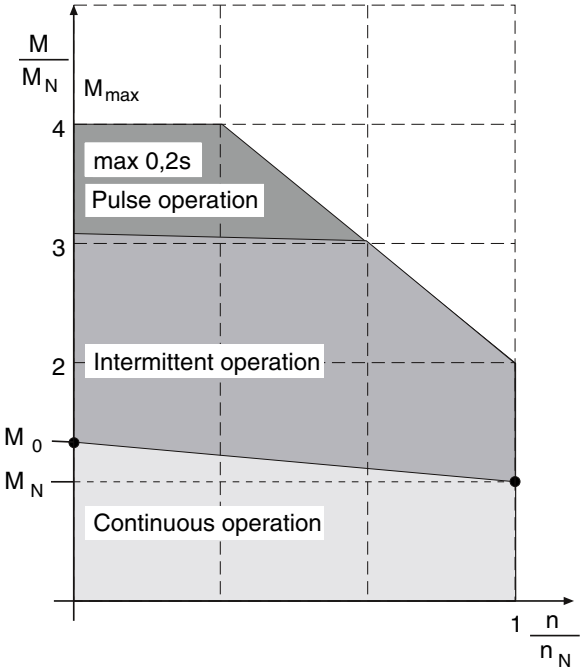
Cooling

The following conditions are prerequisites for all rated data:

- Ambient temperature ≤ +40 °C
- Attachment of the motor to an aluminium plate with a temperature ≤ +40 °C
- Installation altitude ≤ 1000 m above sea level.
- Seating ≥ 4 x the area of the motor flange
- Thickness of seating ≥ 10 mm

If the motor is mounted so it is insulated (no heat dissipation via the flange), the rated torque must be reduced.

Typical M-n-characteristic of Servo Motors

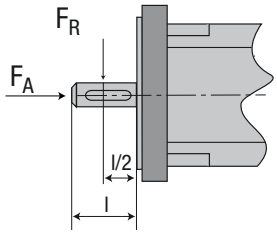


M-n-characteristic for synchronous motors

Term	Explanation
M_0 stall torque	Thermal limiting torque of the motor at standstill. The motor is able to provide this torque over an unlimited period of time.
I_0 stall AC current	Effective value of the motor phase current, which is needed to generate the stall torque.
M_N rated torque	Thermal limiting torque of the motor at rated speed n_N.
I_N rated current	Effective value of the motor phase current, which is needed to generate the rated torque.
P_N rated power	Continuous output of the motor at the rated operating point (M_N, n_N) at rated AC current I_N and rated voltage U_N.
M_{MAX}, I_{MAX} cut-off characteristic	The motors may be loaded with max. four times the rated AC current.

Permissible axial and transverse force

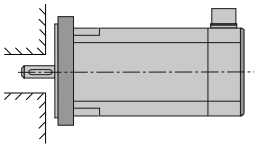
Feature	Symbol	Unit	LSML 06-020	LSML 06-040	LSML 08-075	LSML 08-100	LSMM 13-100	LSMM 13-150	LSMM 13-200	LSMM 13-300
permissible transverse forces	F_R	N	250	250	350	350	650	650	900	900
permissible axial forces	F_A	N	50	50	70	70	130	130	180	180

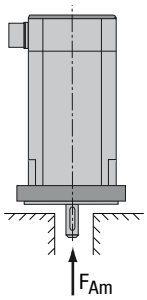


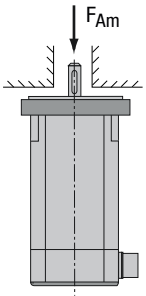
The table specifies the max. permissible transverse force (radial force F_R) at the point of application l/2 and the max. permissible axial force F_A ($F_A = 0{,}2 \cdot F_R$) for a life of 20,000 h. A transverse force not acting on the centre of the shaft end can be simply converted to the changed lever ratios.

Either the permissible radial force or the axial force may be applied to the motor shaft! At standstill a one-off axial force of 40 % of the radial force is allowed for motor mounting.

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

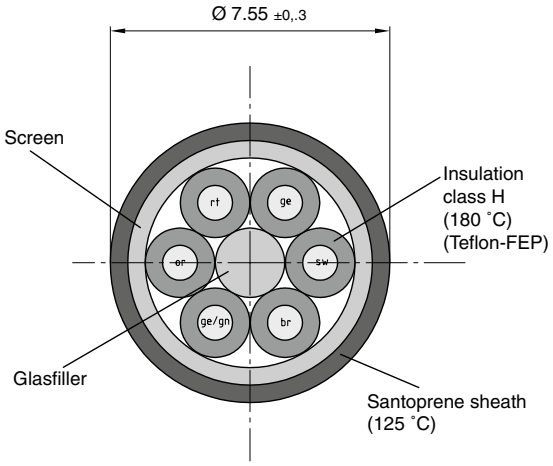
NOTE: With vertical installation (V1) the permissible forces (F_A) do apply. With vertical installation pointing up (V3) the permissible axial forces are reduced by the force caused by the weight of the rotor (F_G).

Connection system

LSML06 and LSML08: Power terminals

Technical data power cable		
Property	**Explanation**	**Value**
Cable length		0.5 m
Conductor	acc. to IEC 60228 class 5	Copper, tin-plated, finely stranded 6 x 0.75 mm²
Insulation material	Conductor	Teflon-FEP
Sheath material		Santoprene
Sheath colour		Black with lettering (max. temperature 155 °C/125 °C)
Shield		Copper braid, tin-plated
Optical screen coverage factor		≥80 %
Mating plug		As standard without, available as an option
Rated voltage U_0/U		300 / 500 V
Proof voltage	Strand / Strand	2000 V
Temperature range	stationary routed	-40 °C / +125 °C
Temperature range	flexible	-25 °C / +125 °C

Power cable

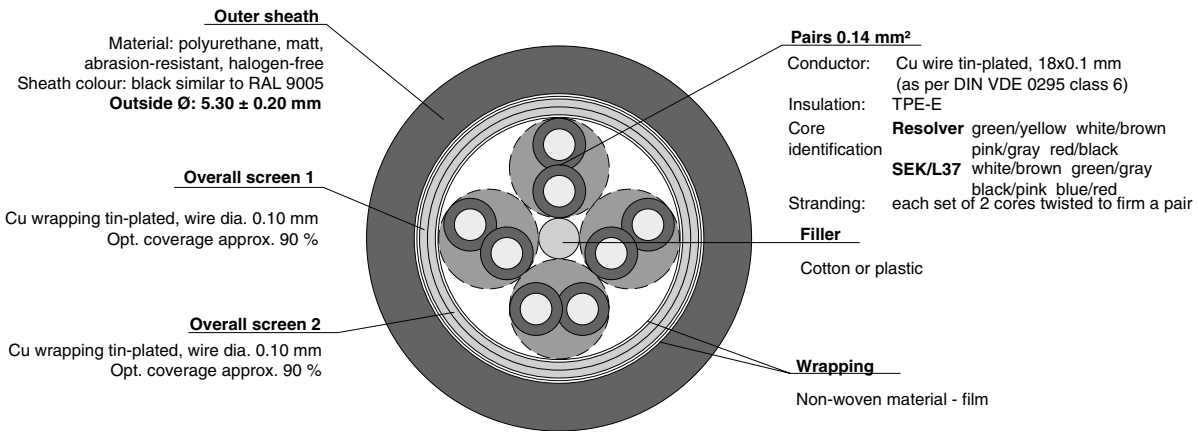


Assignment	
Colour	**Designation**
Brown	Brake+
Black	Brake-
Yellow	U
Orange	V
Red	W
Yellow/Green	PE

LSML06 and LSML08: Encoder connections

Technical data signal cable		
Property	**Explanation**	**Value**
Cable length		0.5 m
Individual cores		Twisted in pairs
Shield		Copper braid, tin-plated
Optical screen coverage factor		≥80 %
Mating plug		As standard without, available as an option
Operating voltage		max. 250 V AC
Test voltage	Strand/Strand	1500 V
	Strand/Shield	1200 V
Conductor resistance	at +20 °C	max. 141,3 Ω/km
Capacitance	at 1 kHz	100 ±15 pF/m
Insulation resistance		500 MΩ x km
Operating temperature	stationary routed	-30 °C to +90 °C
	flexible	-30 °C to +125 °C
Bending radius	stationary routed	2 x external Ø
	flexible	15 x externalØ
Resistance to oil		acc. to VDE 0472.803, CEI20-11
Other properties		Halogen-free, abrasion-resistant, RoHS-compliant, silicone-free, capable for energy chains

Signal cable Resolver



Assignment		
Colour	**Designation**	**Signal**
Green	S1	Cos+
White	S2	Sin+
Yellow	S3	Cos-
Brown	S4	Sin-
Pink	R1	Ref+
Gray	R2	Ref-
Red	-	*not assigned*
Black	-	*not assigned*

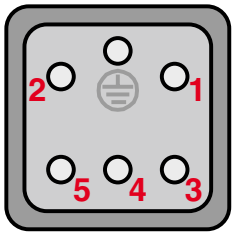
Signal cable SEK37/SEL37

Assignment	
Colour	**Signal**
Red	Us
White	Sin+
Brown	RefSin
Pink	Cos+
Black	RefCos
Blue	GND
Gray	Data+
Green	Data-

LSMM13: Power terminal and encoder connections

Technical data Plug connections		
Property	**Explanation**	**Value**
Size		1
Material		Die-cast aluminium
Housing form		CKAX 03 I (manufacturer's identifier)
Mating plug		none
Degree of protection	With mating connector fitted	IP 65

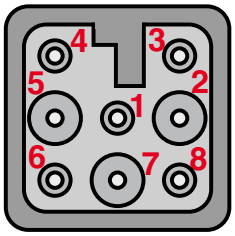
Assignment Power plug



View of motor on mating plug

Number	Designation
1	U
2	V
3	W
4	Br+
5	Br-
⏚	PE

Assignment Signal plug



View of motor on mating plug

Number	Resolver		SEK37/SEL37
	Designation	Signal	Signal
1	S1	Cos+	Cos+
2	S2	Sin+	Sin+
3	S3	Cos-	RefCos
4	S4	Sin-	RefSin
5	R1	Ref+	Us
6	R2	Ref-	GND
7	*not assigned*		Data+
8	*not assigned*		Data-

Overview LSMx Servo Motors

Type	U_n	Page
LSML06	230 V	Page 2-2
LSML08	230 V / 400 V	Page 2-5
LSMM13	230 V / 400 V	Page 2-8

The LSMx motor

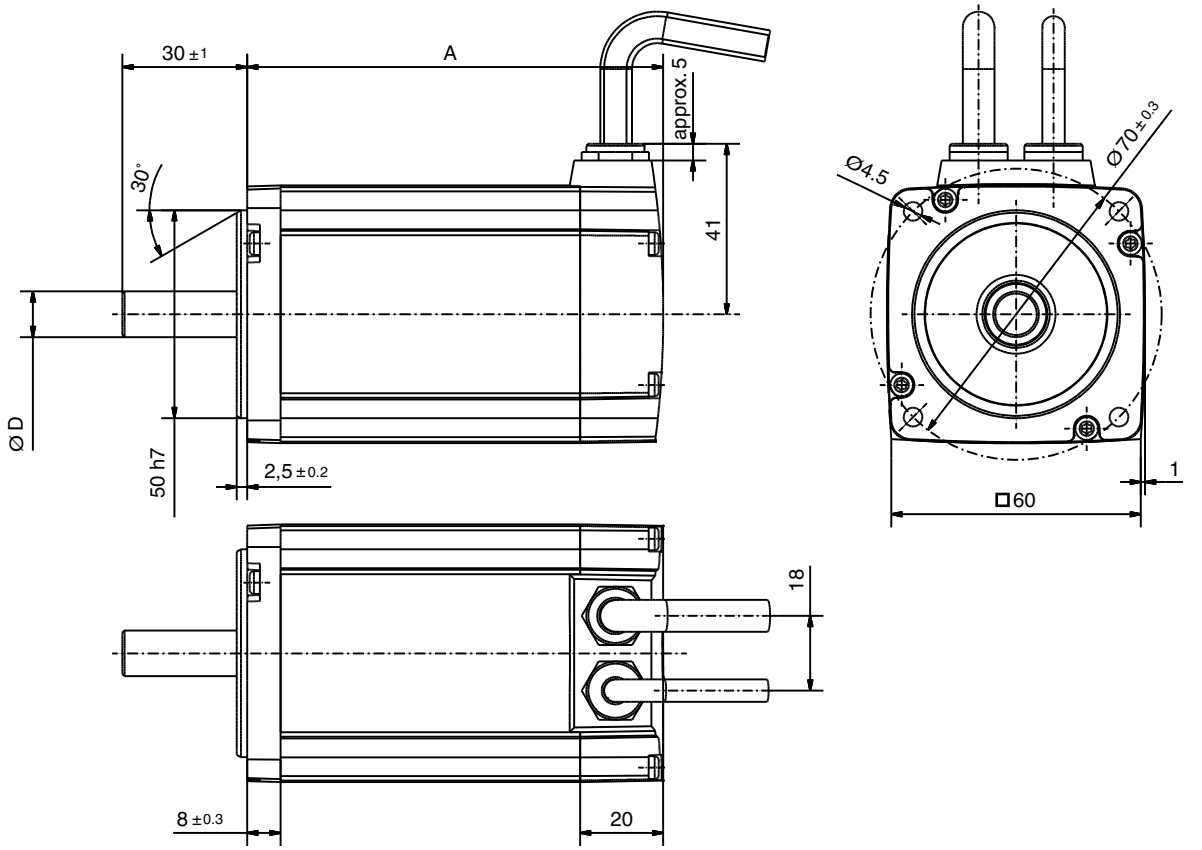
- The series is divided into ***low inertia*** (LSML) and ***middle inertia*** (LSMM).
- In the ***low inertia*** series there are motors with ratings of 200 W, 400 W, 750 W and 1000 W. The rated speed is 3000 min^{-1}. They are designed for a 3-phase supply at 230 V. In addition, the LSML08 motors with ratings of 750 W and 1000 W are also available for 400 V.
- The ***middle inertia*** series includes motors with ratings of 1 kW, 1.5 kW, 2 kW and 3 kW. Here the rated speed is 2000 min^{-1}, the motors are designed for a 3-phase supply at 230 V or 400 V. The LSMM13-300 motor is only available as a 400 V variant.
- The surface of the motors has been kept smooth (not ribbed) to ensure good cleaning in applications in a very wide range of areas.
- By means of distributed winding technology, low electrical time constants were achieved for good controllability.
- Designed in accordance with IEC standards and CE-compliant.

Technical data of motor	Stall torque M_0 [Nm]	Rated torque M_N [Nm]	Rated current at 475 V DC I_N [A]	Rated current at 268 V DC I_N [A]	Rated speed n_N [min^{-1}]
LSML06-020	0.7	0.64	-	0.85	3000
LSML06-040	1.5	1.28	-	1.6	3000
LSML08-075	2.8	2.4	1.7	2.95	3000
LSML08-100	3.5	3.2	2.2	3.8	3000
LSMM13-100	5.5	4.8	2.1	3.65	2000
LSMM13-150	9.1	7.2	3.1	5.4	2000
LSMM13-200	12.3	9.6	3.9	6.8	2000
LSMM13-300	19.9	14.4	5.8	-	2000

Motor type LSML06

2

Dimensional sketch



Dimensions	LSML06-020-2	LSML06-040-2
A (motor length) without brake	102 ±2 mm	132 ±2 mm
A (motor length) with brake	136 ±2 mm	166 ±2 mm
D (shaft diameter)	11 mm h6	14 mm h6

Technical data [1]	Symbol	Unit	LSML06-020-2	LSML06-040-2
Rated speed	n_n	min^{-1}	3000	3000
Rated frequency	f_N	Hz	150	150
DC link voltage (controller)	U_{dc}	V	268	268
Nominal AC voltage	U_n	V	230	230
Rated torque	M_n	Nm	0.64	1.28
Rated current per phase	I_n	A	0.85	1.6
Nominal power	P	W	200	400
Stall torque	M_0	Nm	0.7	1.5
Stall AC current per phase	I_0	A	0.89	1.9
Peak torque	M_{max}	Nm	2.6	5.2
Peak current per phase	I_{max}	A	3.3	6.4
Maximum speed	n_{max}	min^{-1}	4000	3950
EMF constant	K_E	V/1000 min^{-1}	55	55
Torque constant [2]	K_T	Nm/A	0.75	0.80
Winding resistance (per phase) at +20 °C	R_{ph}	Ω	13.0	5.0
Winding inductance (per phase)	L_{ph}	mH	19.1	9.4
Electrical time constant	T_{el}	ms	1.5	1.9
Thermal time constant	T_{th}	min.	25	25
Moment of inertia of rotor	J	kg m²	$0.22 \cdot 10^{-4}$	$0.413 \cdot 10^{-4}$
Mass of the motor	m	kg	1.3	1.8
Brake (optional)				
Rated voltage -10 %/+6 %	U_N	V	24	24
Moment of inertia with brake	J_B	kg m²	$0.319 \cdot 10^{-4}$	$0.512 \cdot 10^{-4}$
Static braking torque	M_{stat}	Nm	2.0	2.0
Dynamic braking torque	M_{dyn}	Nm	1.7	1.7
Mass of the motor with brake	m	kg	1.6	2.2

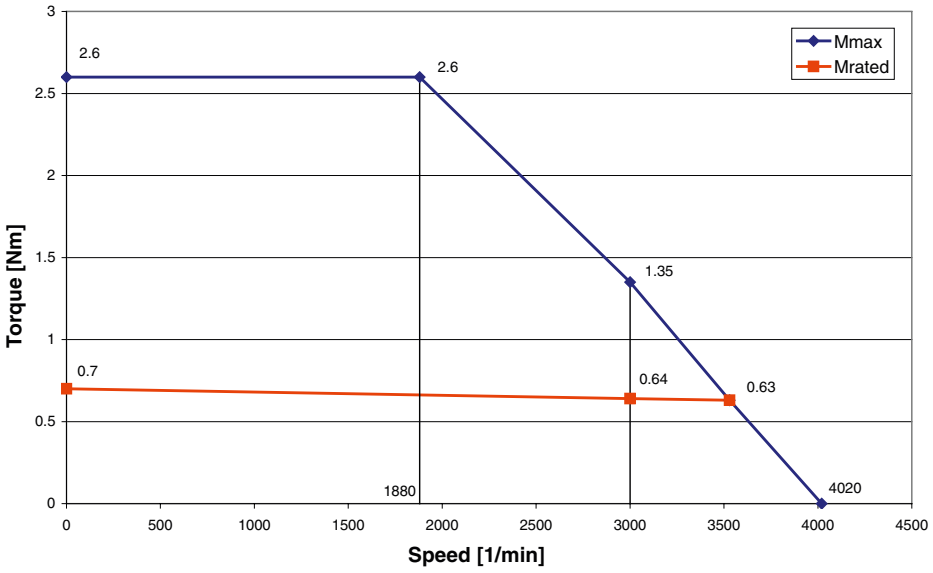
1) All values with tolerance ±5 %.
2) For rated operation

Explanation on characteristics:

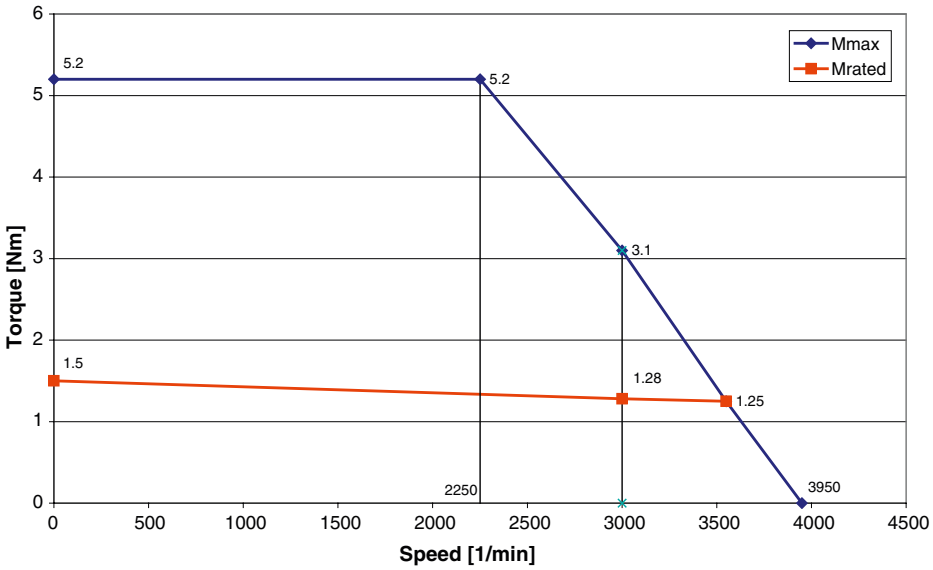
The upper characteristic (M_{max}) describes the short-term max. possible torque at the corresponding speed (important with dynamic processes).

The lower characteristic (M_{rated}) shows the thermally permissible continous torque.

Motor characteristics LSML06-020-2

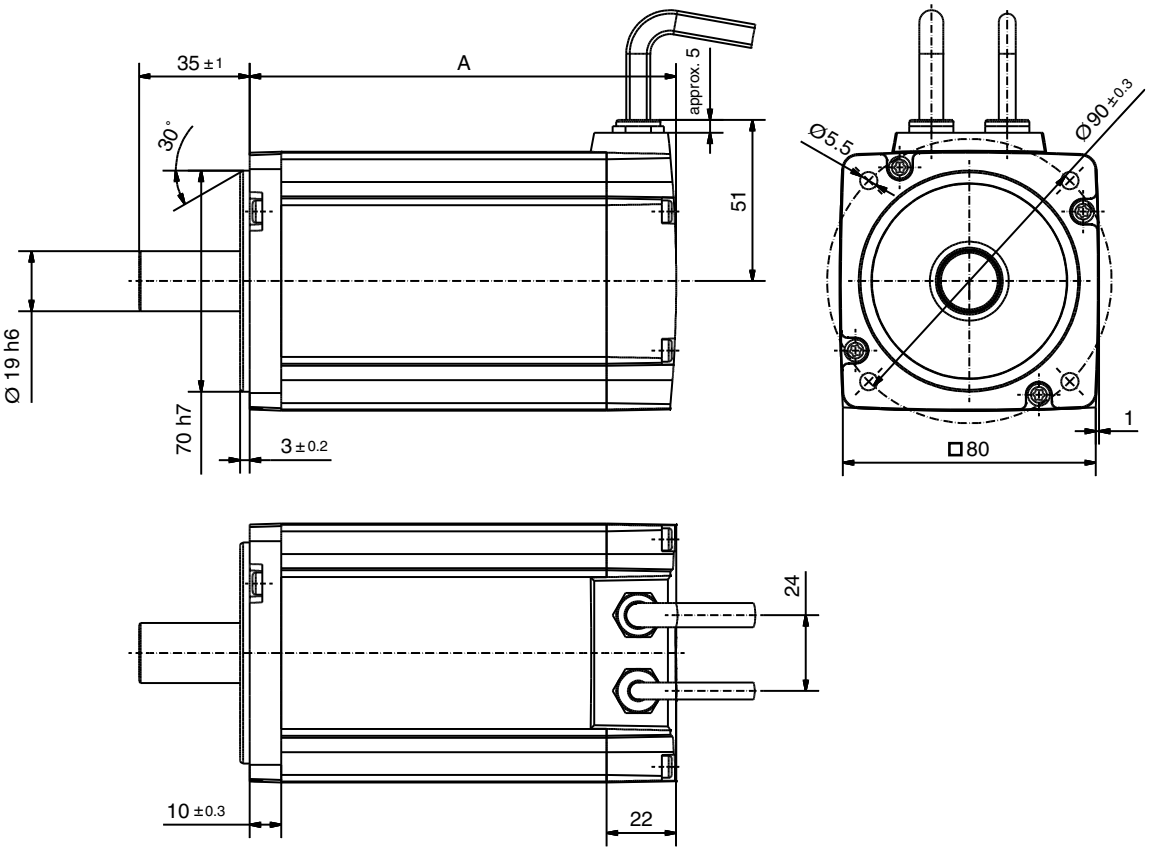


Motor characteristics LSML06-040-2



Motor type LSML08

Dimensional sketch



Dimensions	LSML08-075-x	LSML08-100-x
A (motor length) without brake	136 ±2 mm	156 ±2 mm
A (motor length) with brake	178 ±2 mm	198 ±2 mm

Technical data [1]	Symbol	Unit	LSML08-075-2	LSML08-075-4	LSML08-100-2	LSML08-100-4
Rated speed	n_n	min^{-1}	3000	3000	3000	3000
Rated frequency	f_N	Hz	150	150	150	150
DC link voltage (controller)	U_{dc}	V	268	475	268	475
Nominal AC voltage	U_n	V	230	400	230	400
Rated torque	M_n	Nm	2.4	2.4	3.2	3.2
Rated current per phase	I_n	A	2.95	1.7	3.8	2.2
Nominal power	P	W	750	750	1000	1000
Stall torque	M_0	Nm	2.8	2.8	3.5	3.5
Stall AC current per phase	I_0	A	3.1	1.8	4.0	2.3
Peak torque	M_{max}	Nm	9.6	9.6	12.8	12.8
Peak current per phase	I_{max}	A	11.30	6.5	14.8	8.5
Maximum speed	n_{max}	min^{-1}	3750	3750	3650	3650
EMF constant	K_E	V/1000 min^{-1}	55	100	55	100
Torque constant [2]	K_T	Nm/A	0.81	1.41	0.84	1.45
Winding resistance (per phase) at +20 °C	R_{ph}	Ω	2.3	7.0	1.5	4.5
Winding inductance (per phase)	L_{ph}	mH	6.0	18.5	4.3	13.3
Electrical time constant	T_{el}	ms	2.6	2.6	2.9	3.0
Thermal time constant	T_{th}	min.	30	30	30	30
Moment of inertia of rotor	J	kg m²	$1.4 \cdot 10^{-4}$	$1.4 \cdot 10^{-4}$	$1.93 \cdot 10^{-4}$	$1.93 \cdot 10^{-4}$
Mass of the motor	m	kg	2.9	2.9	3.6	3.6
Brake (optional)						
Rated voltage -10 %/+6 %	U_N	V	24	24	24	24
Moment of inertia with brake	J_B	kg m²	$1.68 \cdot 10^{-4}$	$1.68 \cdot 10^{-4}$	$2.2 \cdot 10^{-4}$	$2.2 \cdot 10^{-4}$
Static braking torque	M_{stat}	Nm	4.5	4.5	4.5	4.5
Dynamic braking torque	M_{dyn}	Nm	3.8	3.8	3.8	3.8
Mass of the motor with brake	m	kg	3.6	3.6	4.3	4.3

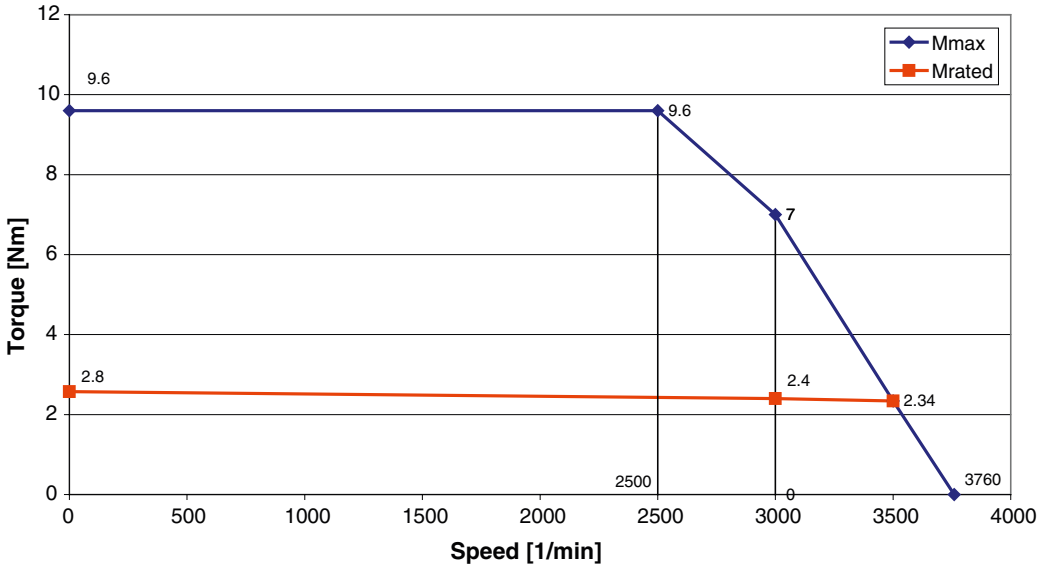
1) All values with tolerance ±5 %.
2) For rated operation

Explanation on characteristics:

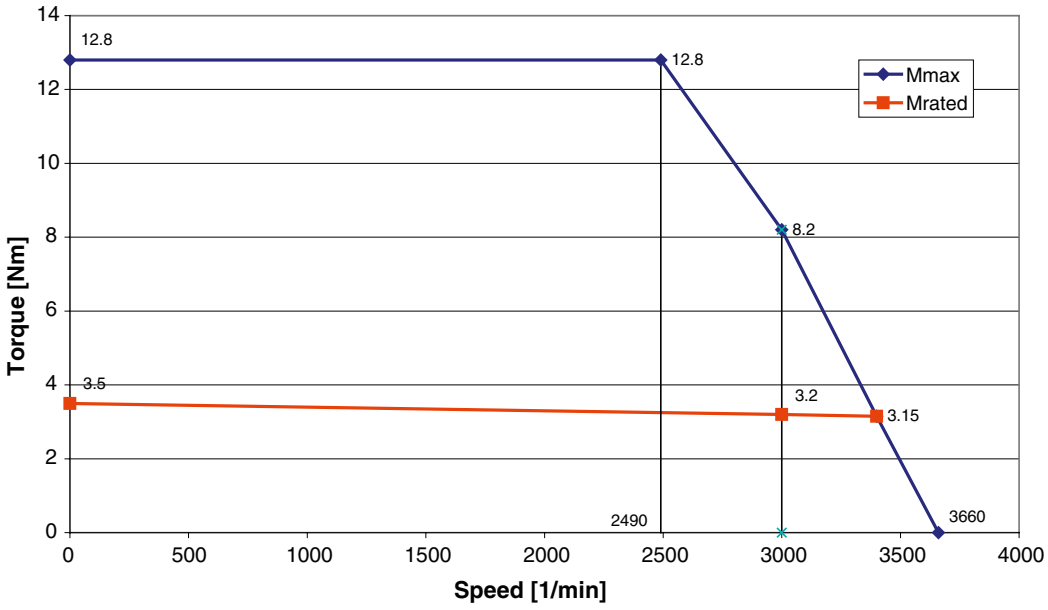
The upper characteristic (M_{max}) describes the short-term max. possible torque at the corresponding speed (important with dynamic processes).

The lower characteristic (M_{rated}) shows the thermally permissible continous torque.

Motor characteristics LSML08-075-x



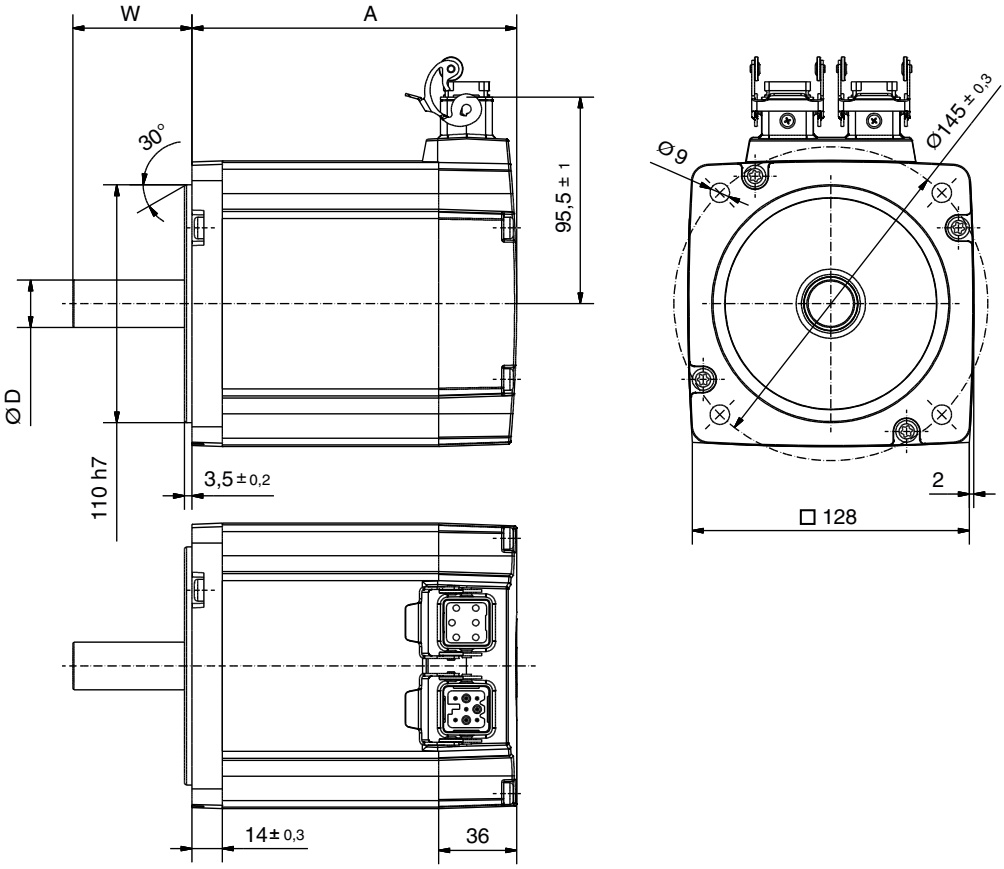
Motor characteristics LSML08-100-x



Motor type LSMM13

2

Dimensional sketch



Dimensions	LSMM13-100-x	LSMM13-150-x	LSMM13-200-x	LSMM13-300-4
A (motor length) without brake	150 ±2 mm	165 ±2 mm	190 ±2 mm	235 ±2 mm
A (motor length) with brake	180 ±2 mm	195 ±2 mm	225 ±2 mm	270 ±2 mm
D (shaft diameter)	22 mm h6	22 mm h6	22 mm h6	24 mm h6
W (length of the open end of the shaft)	55 ±1 mm	55 ±1 mm	55 ±1 mm	65 ±1 mm

Technical data [1]	Symbol	Unit	LSMM13-100-2	LSMM13-100-4	LSMM13-150-2	LSMM13-150-4	LSMM13-200-2	LSMM13-200-4	LSMM13-300-4
Rated speed	n_n	min^{-1}	2000	2000	2000	2000	2000	2000	2000
Rated frequency	f_N	Hz	100	100	100	100	100	100	100
DC link voltage (controller)	U_{dc}	V	268	475	268	475	268	475	475
Nominal AC voltage	U_n	V	230	400	230	400	230	400	400
Rated torque	M_n	Nm	4.8	4.8	7.2	7.2	9.6	9.6	14.4
Rated current per phase	I_n	A	3.65	2.1	5.4	3.1	6.8	3.9	5.8
Nominal power	P	W	1000	1000	1500	1500	2000	2000	3000
stall AC current	M_0	Nm	5.5	5.5	9.1	9.1	12.3	12.3	19.9
Stall AC current per phase	I_0	A	4.0	2.3	6.4	3.7	8.5	4.9	7.6
Peak torque	M_{max}	Nm	19.2	19.2	28.8	28.8	38.4	38.4	57.4
Peak current per phase	I_{max}	A	14.4	8.3	21.3	12.3	26.8	15.4	23
Maximum speed	n_{max}	min^{-1}	2500	2500	2450	2450	2400	2400	2300
EMF constant	K_E	V/1000 min^{-1}	85	155	85	155	85	165	165
Torque constant [2]	K_T	Nm/A	1.3	2.3	1.3	2.3	1.4	2.5	2.5
Winding resistance (per phase) at +20 °C	R_{ph}	Ω	1.6	4.6	0.9	2.6	0.5	1.6	0.9
Winding inductance (per phase)	L_{ph}	mH	6.3	19.2	4.1	12.8	2.9	8.7	5.4
Electrical time constant	T_{el}	ms	3.9	4.2	4.6	4.9	5.8	5.4	6.0
Thermal time constant	T_{th}	min.	35	35	42	42	49	49	49
Moment of inertia of rotor	J	kg m²	$9.82 \cdot 10^{-4}$	$9.82 \cdot 10^{-4}$	$14.0 \cdot 10^{-4}$	$14.0 \cdot 10^{-4}$	$21.1 \cdot 10^{-4}$	$21.1 \cdot 10^{-4}$	$33.8 \cdot 10^{-4}$
Mass of the motor	m	kg	6.9	6,9	8,5	8,5	10,6	10.6	14.7
Brake (optional)									
Rated voltage -10 %/+6 %	U_N	V	24	24	24	24	24	24	24
Moment of inertia with brake	J_B	kg m²	$10.5 \cdot 10^{-4}$	$10.5 \cdot 10^{-4}$	$14.8 \cdot 10^{-4}$	$14.8 \cdot 10^{-4}$	$23.1 \cdot 10^{-4}$	$23.1 \cdot 10^{-4}$	$35.8 \cdot 10^{-4}$
Static braking torque	M_{stat}	Nm	9.0	9.0	9.0	9.0	20.0	20.0	20.0
Dynamic braking torque	M_{dyn}	Nm	7.5	7.5	7.5	7.5	15.0	15.0	15.0
Mass of the motor with brake	m	kg	7.9	7.9	9.3	9.3	12.1	12.1	16.3

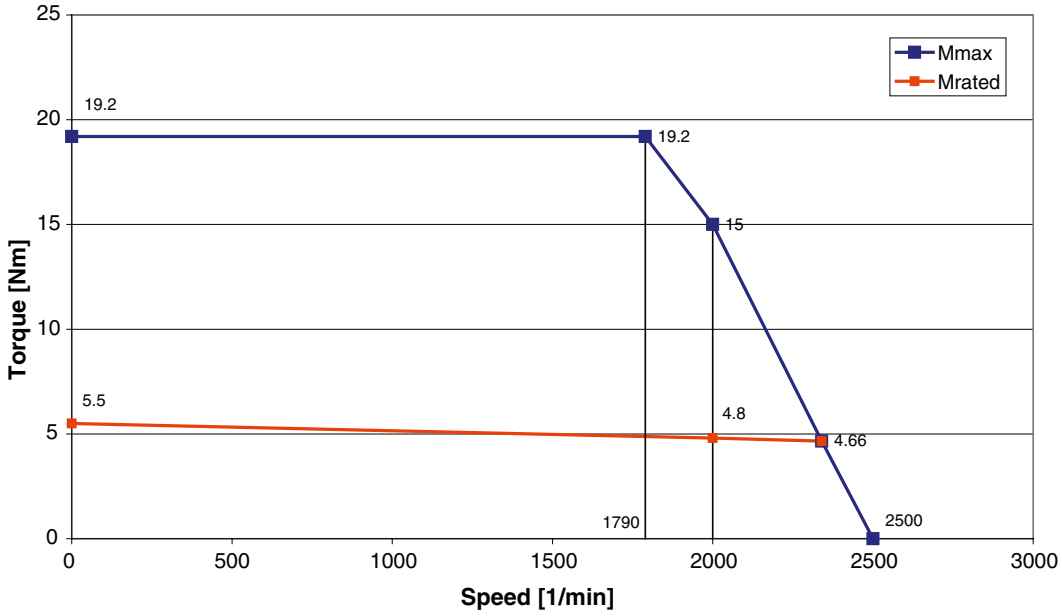
1) All values with tolerance ±5 %.
2) For rated operation

Explanation on characteristics:

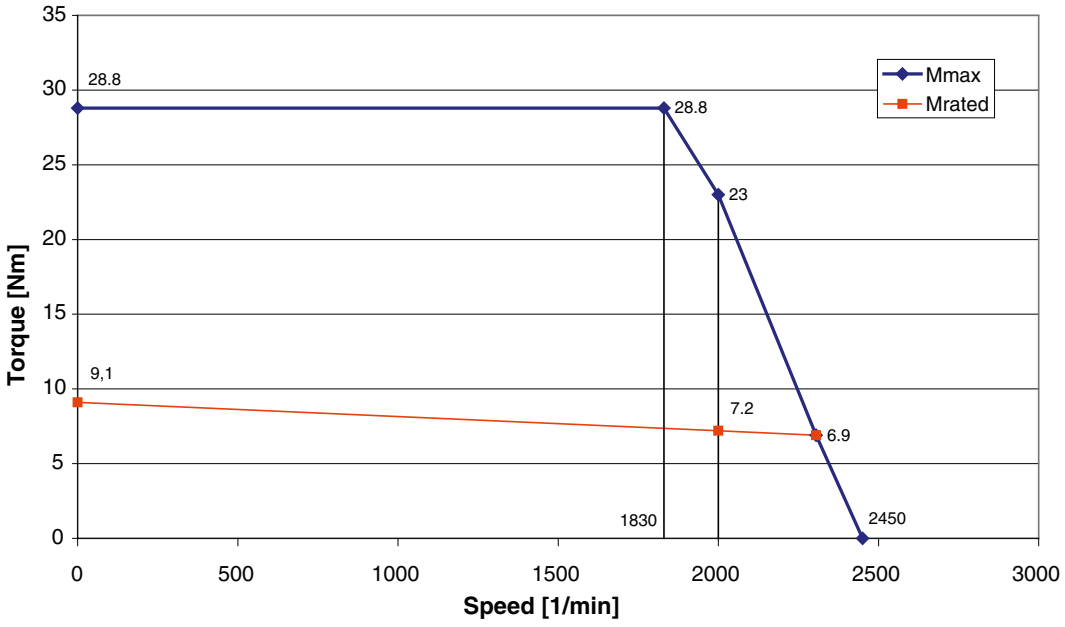
The upper characteristic (M_{max}) describes the short-term max. possible torque at the corresponding speed (important with dynamic processes).

The lower characteristic (M_{rated}) shows the thermally permissible continous torque.

Motor characteristics LSMM13-100-x

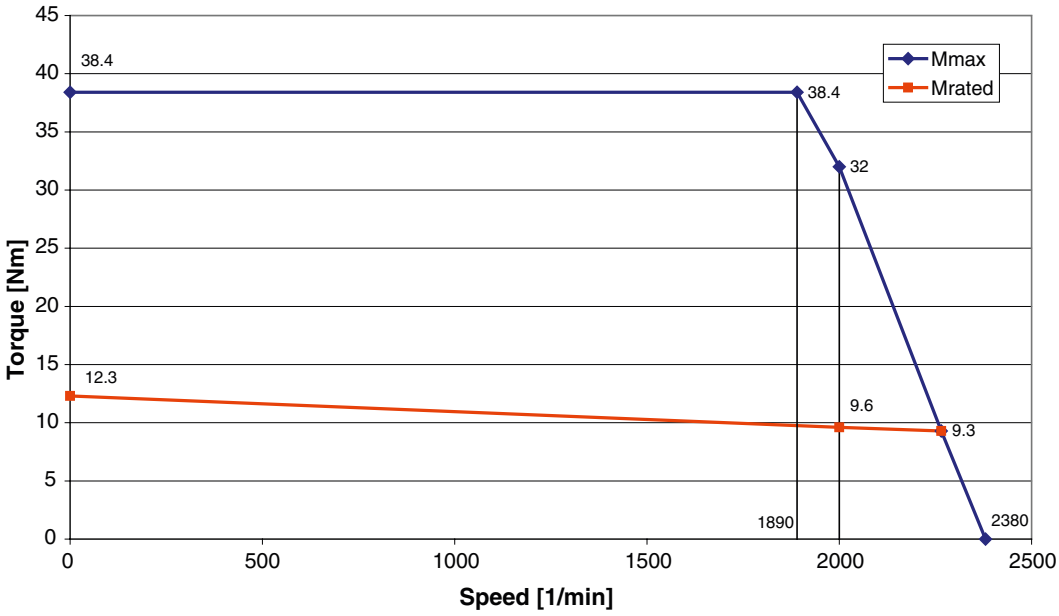


Motor characteristics LSMM13-150-x

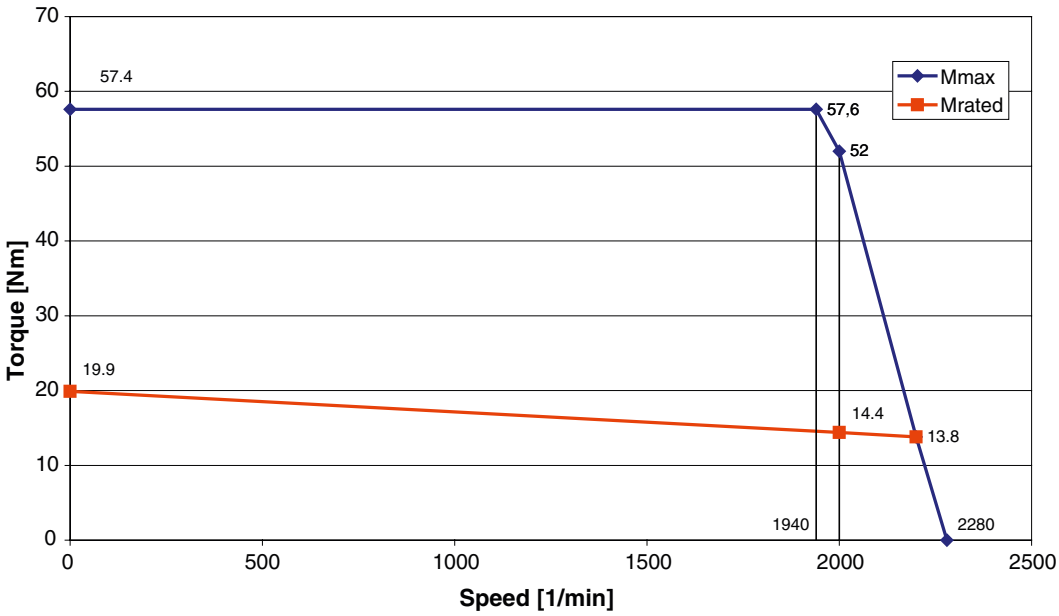


Ordering Catalogue Servo Motors
Id.No.: 0814.27B.0-00 Status: 04/2011

Motor characteristics LSMM13-200-x



Motor characteristics LSMM13-300-4



Accessories for Servo Motors

Contents	Type	Page
Prefabricated encoder cables	KRY4-KSxxx KGH8C-KSxxx KGH8S-KSxxx	Page 3-2
Prefabricated motor cables	KM9-KSxxx KM9B-KSxxx	Page 3-3

Prefabricated encoder cables

Ordering key

		K	yyyy	-	KS	xxx
Preffabricated cable						
Encoder system	Resolver cable		RY4			
	Encoder cable Hiperface c-line		GH8C			
	Encoder cable Hiperface SOx		GH8S			
Capable for energy chains					KS	
Cable length	2 m					002
	3 m					003
	5 m					005
	8 m					008
	10 m					010
	15 m					015
	20 m					020

Technical data

		KRY4-KSxxx	KGH8C-KSxxx	KGH8S-KSxxx
Controller type		CDD, CDE, ServoOne, ServoOne junior	CDD, CDE	ServoOne, ServoOne junior
Motors with encoder system		Resolver	G6.xyz	G6.xyz
Assignment on controller side (Sub-D-plug)		1 = S2 2 = S4 3 = S1 4 = n.c. 5 = PTC+ 6 = R1 7 = R2 8 = S3 9 = PTC-	1 = REFCOS 2 = +COS 3 = Us 7 -12VDC 4 = Data+ 5 = data - 6 = REFSIN 7 = NC (not connected) 8 = GND 9 = NC (not connected) 10 = NC (not connected) 11 = +SIN 12 = NC (not connected) 13 = NC (not connected) 14 = NC (not connected) 15 = NC (not connected)	1 = REFCOS 2 = +COS 3 = Us 7 -12VDC 4 = Data+ 5 = data - 6 = REFSIN 7 = bridged with 12 8 = GND 9 = NC (not connected) 10 = NC (not connected) 11 = +SIN 12 = brigded with 7 13 = NC (not connected) 14 = NC (not connected) 15 = NC (not connected
Minimum bending radius		90 mm	100 mm	
Temperature range:	for stationary routing	-40 ... +85 °C	-35 ... +80 °C	
	for flexible applications		-35 ... +80 °C	
Cable diameter approx.		8.8 mm		
Capable for energy chains		yes		
Material of oversheath		PUR		
Resistance		against oil, hydrolysis and microbial activity (VDE0472)		
Certifications		UL-Style 20233, 80 °C - 300 V, CSA-C22.2N.210-M90, 75 °C - 300 V FT1		

Prefabricated motor cables

Ordering key

		KM	yy	-	KS	xxx
Prefabricated cable		KM				
Cables for brake	without		9			
	with		9B			
Capable for energy chains					KS	
Cable length	2 m					002
	3 m					003
	5 m					005
	8 m					008
	10 m					010
	15 m					015
	20 m					020

Technical data

		KM9-KSxxx	KM9B-KSxxx
Controller type		c-line, ServoOne	
Motor type		LSMx motors with pluggable power terminal	
Mindestbiegeradius	for stationary routing	90 mm	
	for flexible applications	120 mm	
Temperature range		-30 ... +80 °C	
Cable diameter approx.		Ø 12 mm	
Cable cross-section		4G1,5 + 2 x 2 x 0,75 mm²	
Material of oversheath		PUR	
Resistance		against oil, hydrolysis and microbial activity (VDE 0472)	
Assignment of strands		1 = U 2 = V 3 = W PE = ge/gn	1 = U 2 = V 3 = W PE = ge/gn 4 = brake + 5 = brake -
Certification		UL AWM 80 °C - 600 V/1000 V; CSA AWM 80 °C - 600 V/1000 V FT1	

Appendix

Holding brake

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

Example: LSML08-100-2F-**1**0000

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

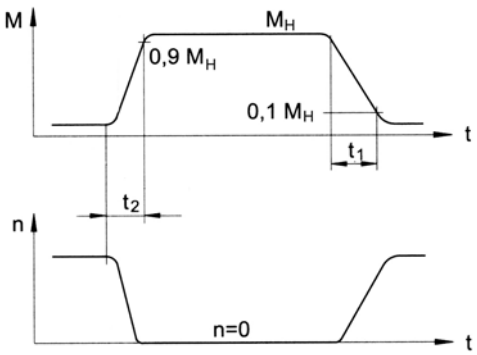
On all LSMx-motors the holding brake is mounted directly behind the flange (side A) to provide an optimal holding torque.

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 (W_R).

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.



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

Mating plug

Components for appropriate mating plugs for the signal and power connections on the LSMM13 motors can be purchased direct from the manufacturer. On this page you will find information on the manufacturer as well as an overview of the components required.

ILME GmbH
Max-Planck-Straße 12
D-51674 Wiehl
Germany
Fon +49 2261 7955-0
Fax +49 2261 7955-5
technik@ilme.de
www.ilme.de

Designation	Detail 1	Detail 2	Detail 3	Ilme arcticle designation
Socket insert	Crimp	5P	16A	CQF 05
Socket insert	Crimp	8P	10A	CDF 08
Female crimp contact	0.3 mm²	silver-plated	10A	CDFA 0.3
Female crimp contact	0.5 mm²	silver-plated	16A	CCFA 0.5
Female crimp contact	1.5 mm²	silver-plated	16A	CCFA 1.5
Stainless steel screw and seal for housing	-	-	-	CKR 65
Semi-cable gland	Brass	M20	-	AG M20T
Full cable gland	EMC	M20	-	AS M20E
EMC hood	straight	M20	Die-cast aluminium	MKAS V20
EMC hood	side	M20	Die-cast aluminium	MKAS VA20

Declaration of Conformity for LSMx Motors

EG-Konformitätserklärung

EC Declaration of Conformity

LTi DRiVES

Der Hersteller *The manufacturer*	LTi DRiVES GmbH Gewerbestraße 5-9 35633 Lahnau

erklärt hiermit, dass die folgenden Produkte
declares that the following products

Produktbezeichnung: *Product designation:*	Servomotor *Servomotor*
Produkttypen: *Product types:*	LSMx, LSP *LSMx, LSP*

den Sicherheitsbestimmungen der nachstehenden EG-Richtlinie entsprechen:
comply with the essential requirements of the following EC Directive:

2006/95/EG *2006/95/EC*	[Niederspannungsrichtlinie] *[Low Voltage Directive]*

und dass folgende angeführten harmonisierten Normen angewandt wurden:
and that the following harmonised standards have been applied:

EN 60034-1:2010
Drehende elektrische Maschinen - Teil 1: Bemessung und Betriebsverhalten (IEC 60034-1:2010)
Rotating electrical machines - Part 1: Rating and performance (IEC 60034-1:2010)

EN 60529:1991/A1:2000
Schutzarten durch Gehäuse (IP-Code) (IEC 60529:1989+A1:1999)
Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989+A1:1999)

Jahr der CE-Kennzeichnung / *Year of CE-marking:* 2011

Unterschrift / *signature*	
Name / *name:*	Dr. Josef Wiesing
Stellung / *position:*	Geschäftsführer / *Managing Director*
Datum / *date:*	13.04.2011

Dokument: 1175.0DK.0-00

FB P087 EG-Konformitätserklärung 2010/03 A

Seite / Page 1 / 1

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Nevertheless we would like to point out that this document cannot always be updated parallel to the technical further development of our products.

Information and specifications may be changed at any time. For information on the latest version please refer to http://drives.lt-i.com.

The german version is the original of the ordering catalogue.

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