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021-87700210



Servo motors



Dynamic, powerful and compact

NEW

MCA 9 kW – 53.8 kW

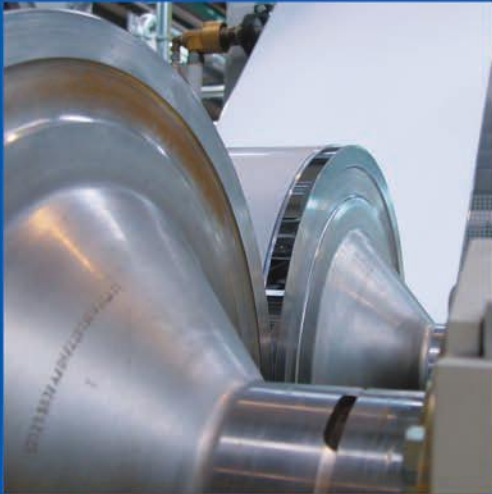
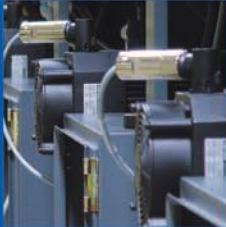
MQA 10.6 kW – 60.2 kW

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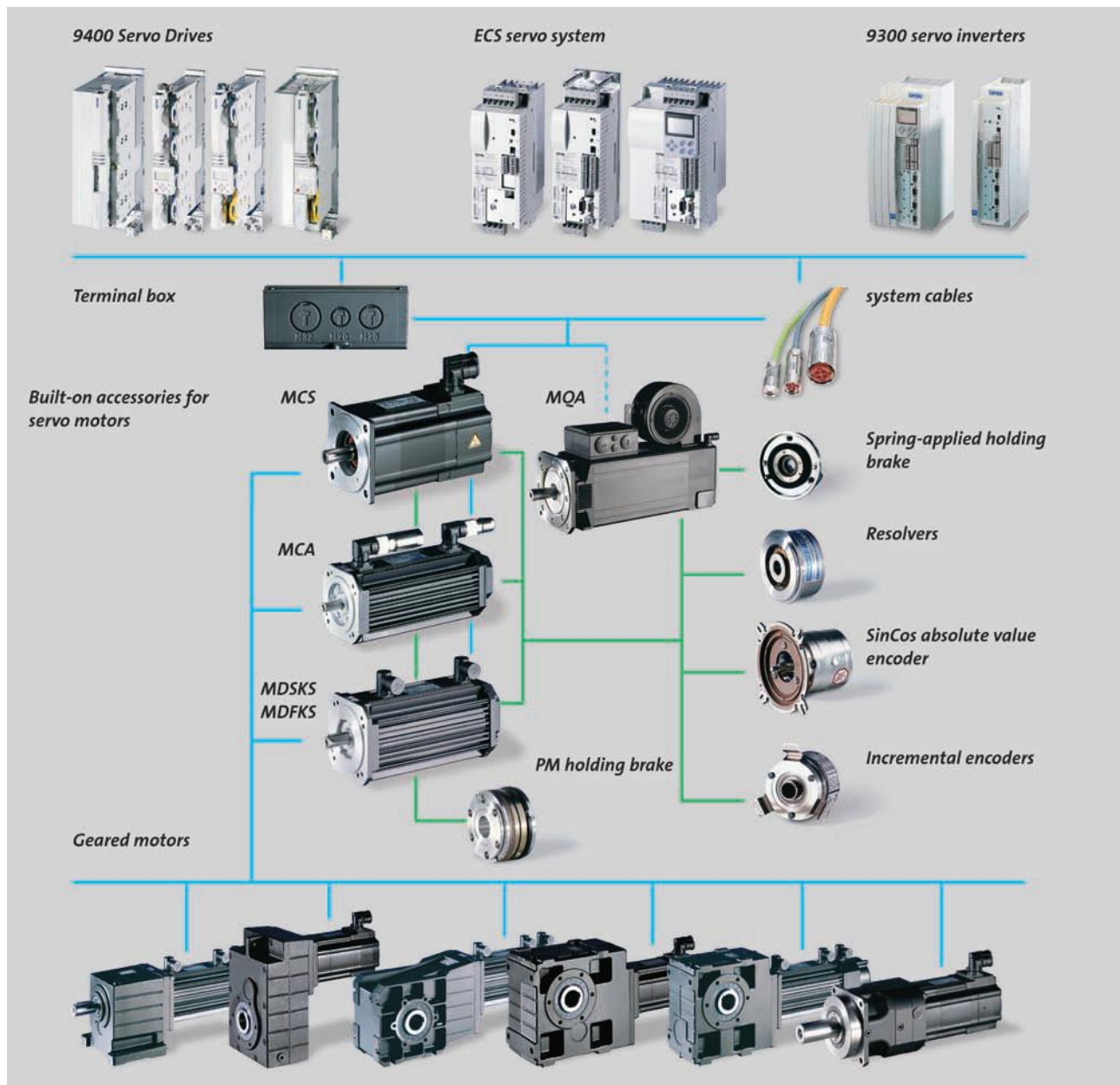


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System overview | Servo motors



Further catalogues

This catalogue describes servo motors. Further components in the above system overview may be found in the following catalogues:

components	
Servo Drives 9400	Catalogue: Servo Drives 9400
ECS servo system	Catalogue: ECS servo system
9300 servo inverter	Catalogue: 9300 servo inverters
Geared servo motors	Catalogue: G-motion servo MC

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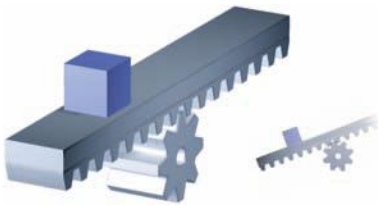
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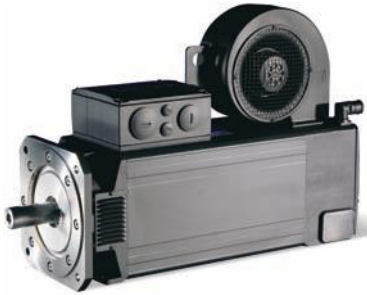
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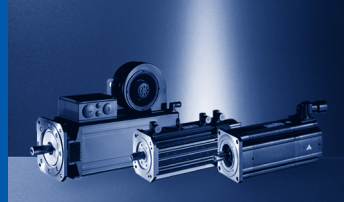
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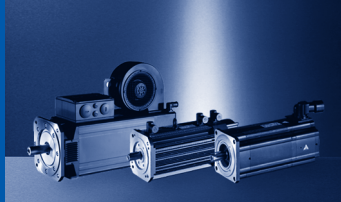
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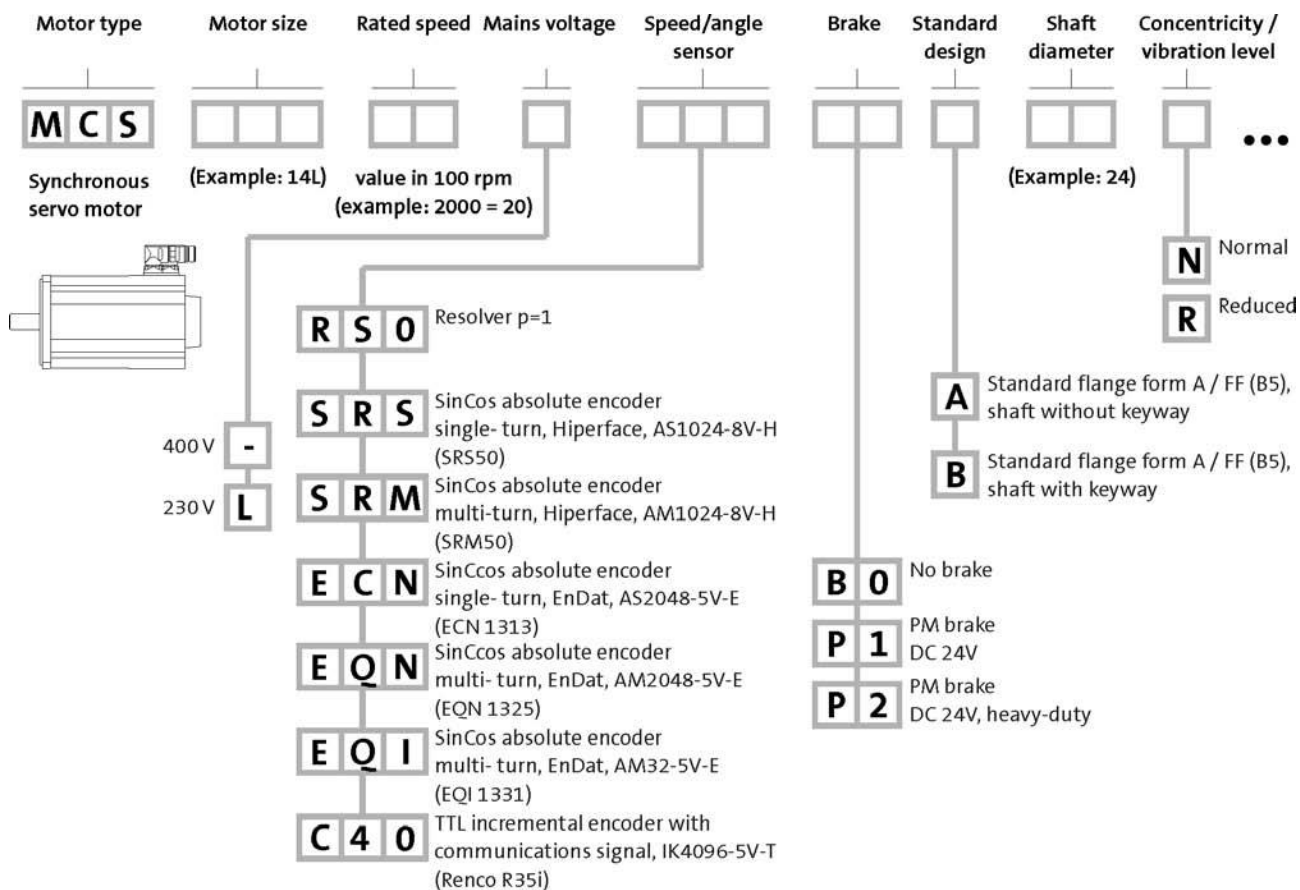


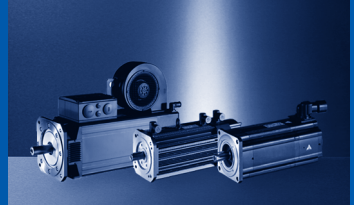


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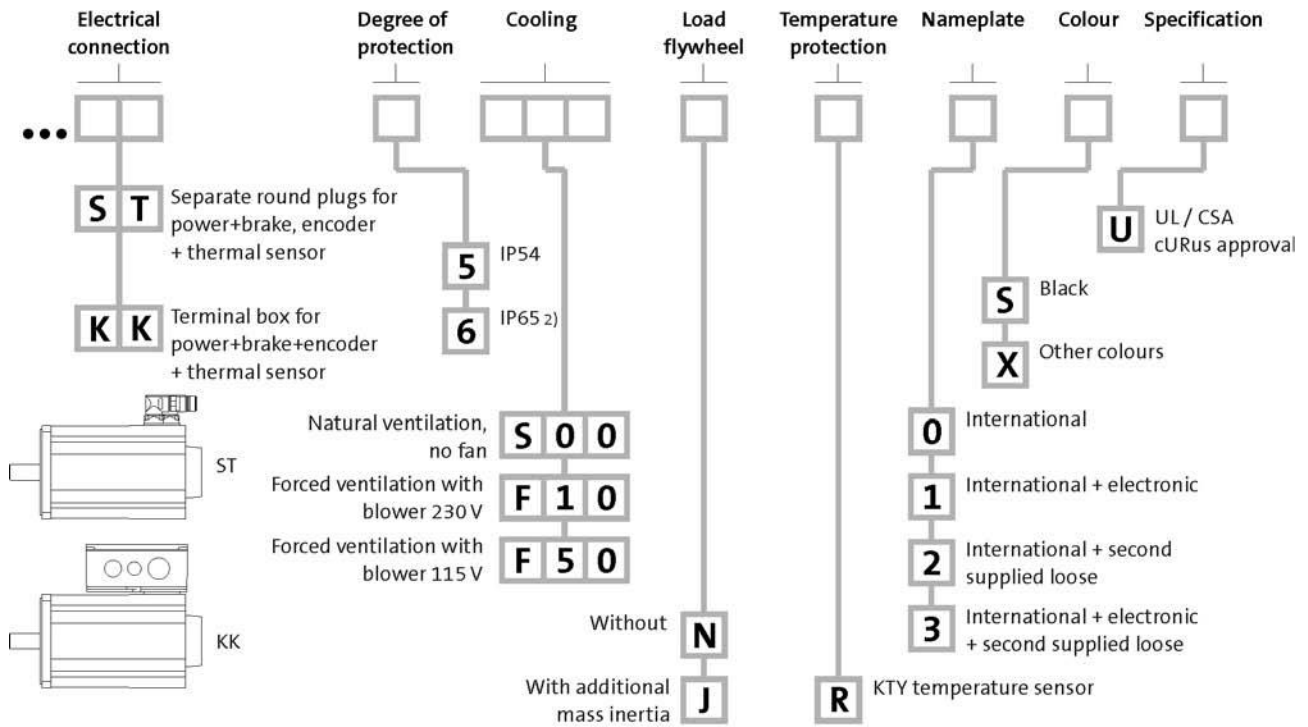
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MCS synchronous servo motors

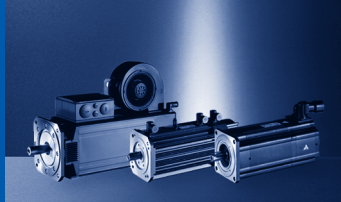




MCS synchronous servo motors



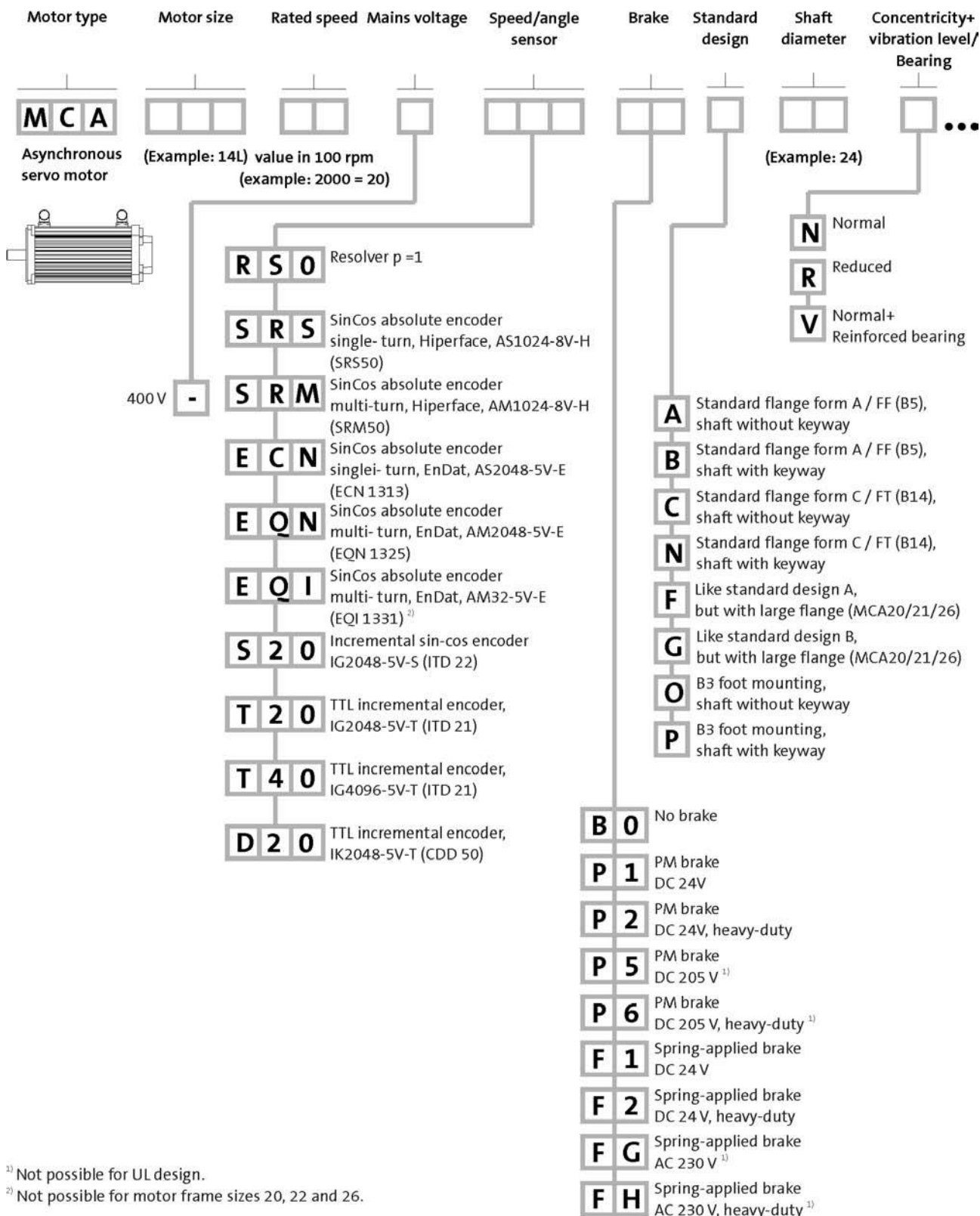
²⁾ Not possible with blower.

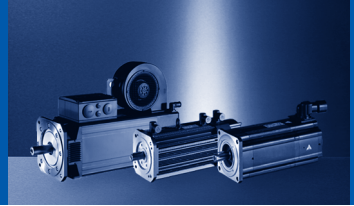


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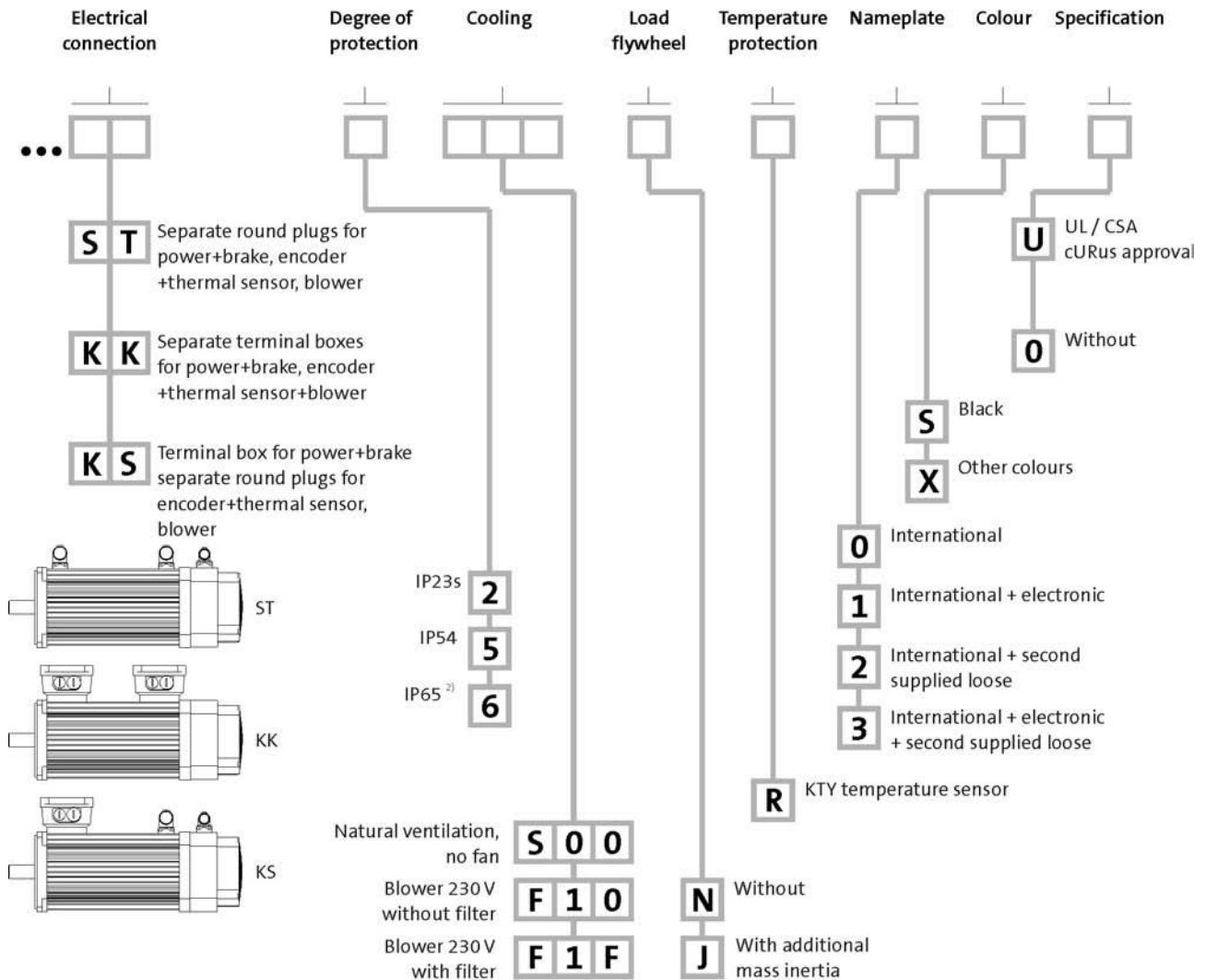
Product key

MCA asynchronous servo motors

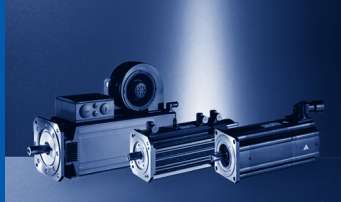




MCA asynchronous servo motors



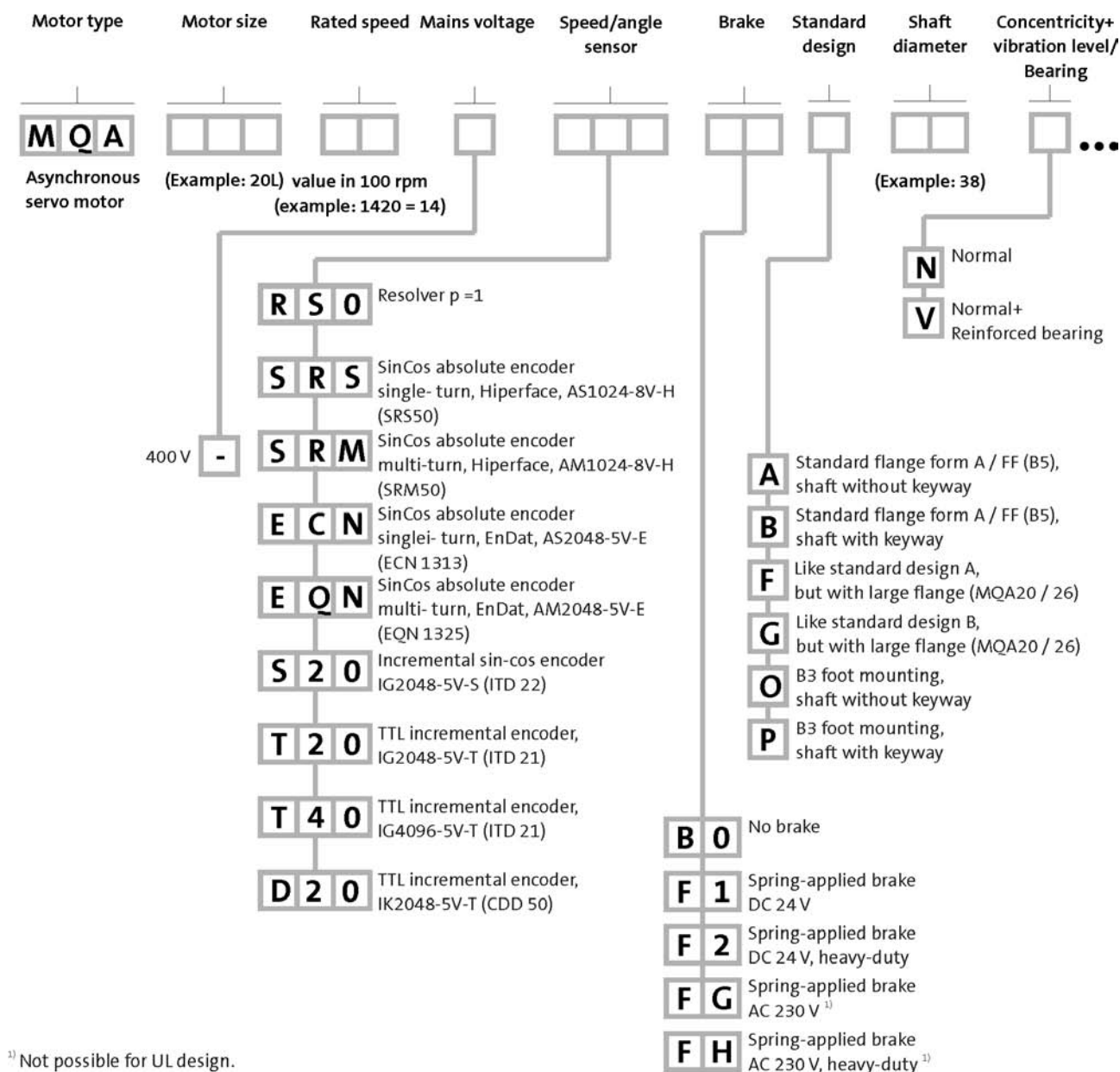
²⁾ Not possible with blower.

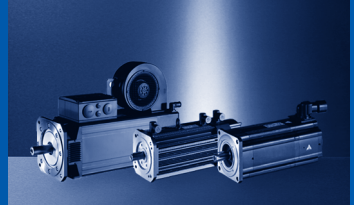


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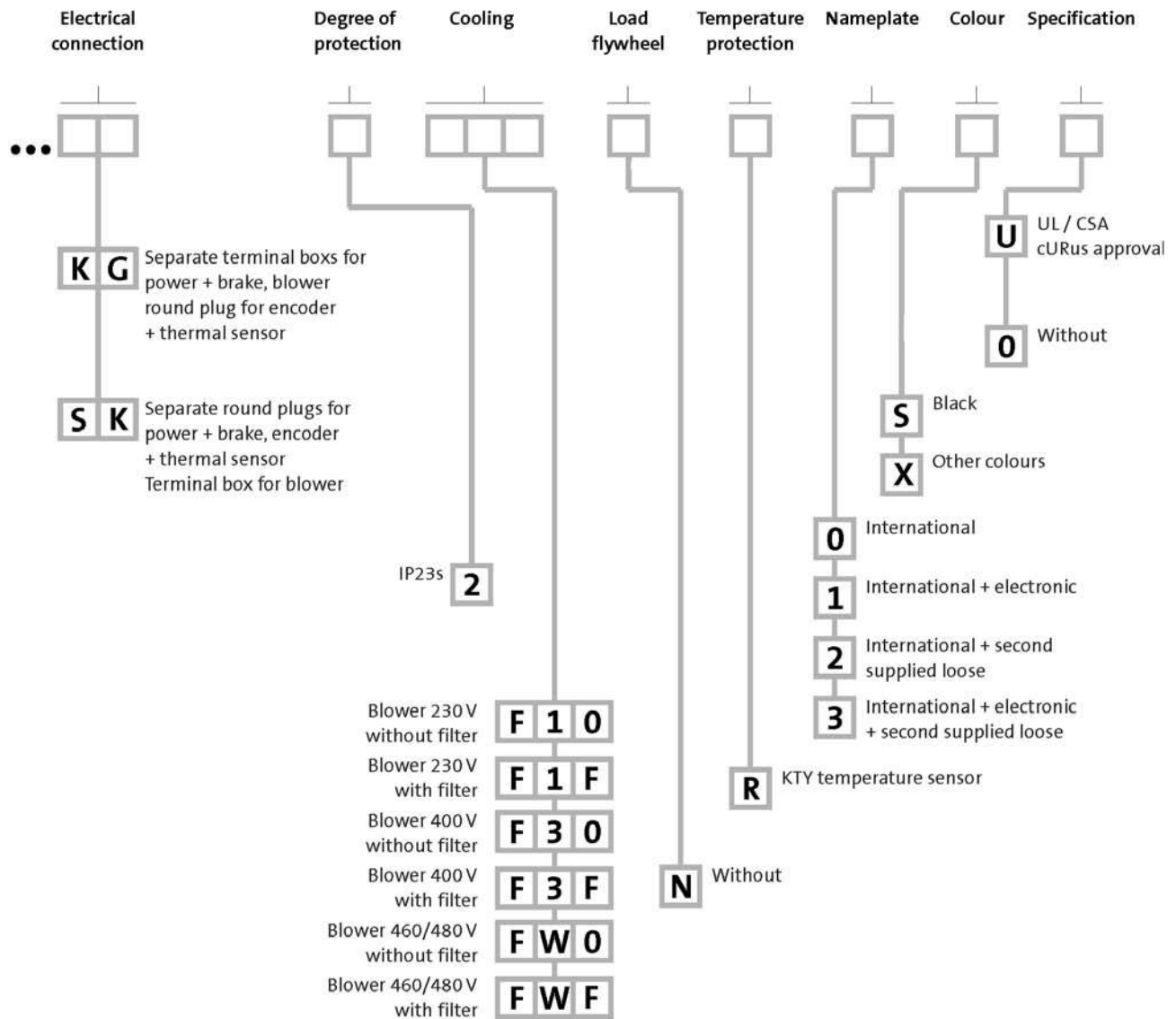
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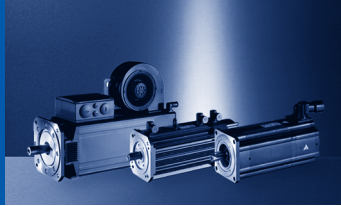
MQA asynchronous servo motors





MQA asynchronous servo motors

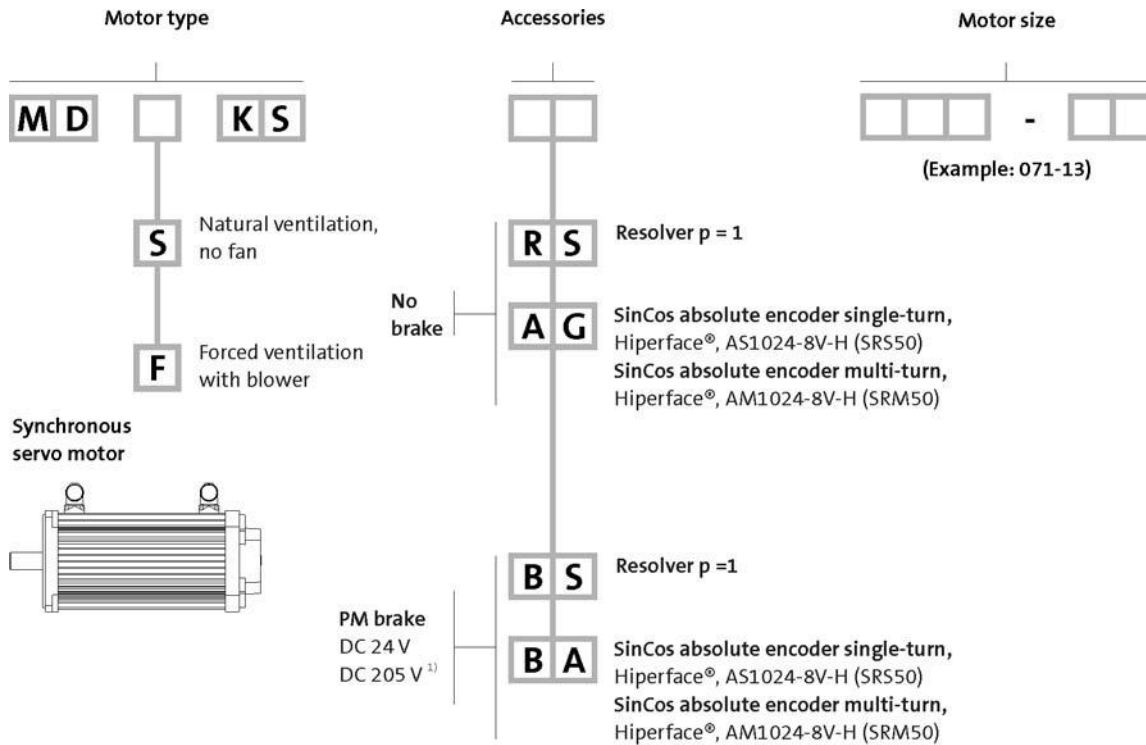




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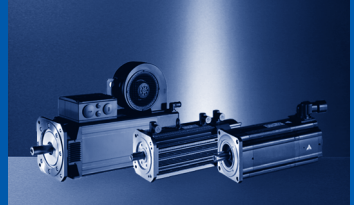
MDKS synchronous servo motors



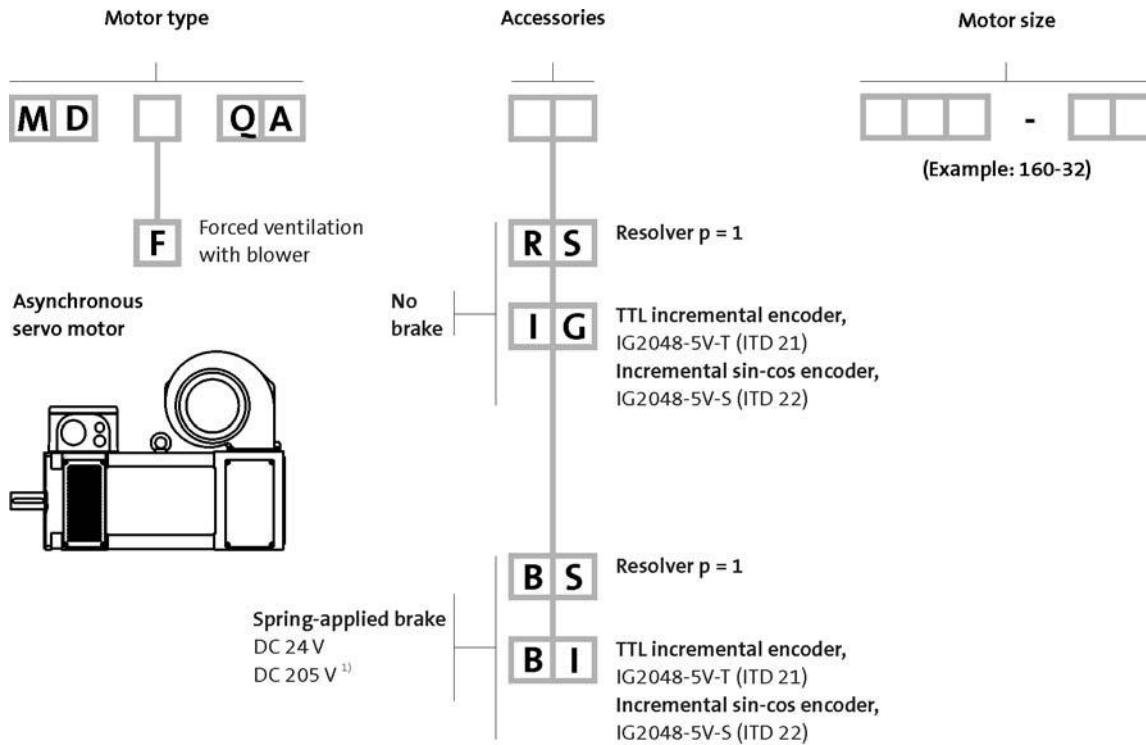
¹⁾ Not possible for UL design.

Ordering details checklist	
Product key	MDSKS / MDFKS
Built-on accessories: brake	Without/24 V DC/205 V DC
Motor design	B14 / B5 design
Shaft design	with/without keyway
Enclosure	IP54 / IP65
Motor connection	Circular connector/terminal box
Colour	RAL 9005 (jet black) / RAL

→ 30 - Servo motor designs



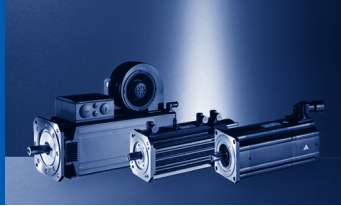
MDFQA asynchronous servo motors



¹⁾ Not possible for UL design.

Ordering details checklist	
Product key	MDFQA
Built-on accessories: brake	Without/24 V DC/205 V DC
Built-on accessories: blower	G2D120 without filters
Motor design	B35 / B5 design
Shaft design	with/without keyway
Colour	RAL 9005 (jet black) / RAL

→ 33 - Servo motor designs



General information

Product information

Servo motors

Servo drive systems are nowadays subjected to the most stringent demands. The differing drive unit components all complement each other perfectly. The Lenze servo motors have an important role to play in this system. Tailored to the various applications, synchronous and asynchronous motors that have been optimised to satisfy the various requirements in terms of dynamic response, accuracy and drive behaviour, are available across a wide torque and power range.

Dynamic

All servo motors are characterised by a low moment of inertia and a high overload capacity. Continuous temperature measurement using an integrated thermal sensor means that a largely temperature-independent optimum control behaviour is achieved. In combination with the servo inverters, high speed accuracies, the best smooth running characteristics and high angular accelerations can be achieved.

Precise

In combination with the specially designed neodymium iron boron (NdFeB) high-energy magnets, the new SEpT design (Single Element Pole Technology) enables a distortion-free, entirely sinusoidal working field to be generated on MCS synchronous servo motors. This ensures both excellent smooth running characteristics (due to the absence of field distortion) and maximum power density (as the working field is generated almost entirely from the induced energy). This optimised field form also eliminates practically all distorting cogging and latching torques.

Long-lived

The high quality level demanded of the components used meets the requirements made on modern drive technology in respect of operational reliability and service life. A reinforced insulation system with thermal reserve (enamel-insulated wire complying with temperature class H, utilization according to F) ensures a long service life of the winding. In addition, the winding of MCS servo motors is best protected by the full stator encapsulation, even when exposed to severe vibrations, and the heat can be even better dissipated. This increases the load capacity and ensures a long, trouble-free service life. Pre-stressed and generously dimensioned roller bearings with high-temperature resistant grease further guarantee a high bearing service life.

Reliable in operation

The IP54 degree of protection design ensures good protection of the motors in the MCS, MD□KS and MCA series against dust and water. Where enhanced requirements are made on the protection of the drive, the naturally ventilated design MCS, MD□KS and MCA motors can also be supplied in degree of protection IP65.

CE conformity

Naturally, all servo motors comply with EU directives:

- ▶ CE conformity with the Low Voltage Directive
- ▶ CE conformity with the EMC Directive for a typical drive configuration with inverter

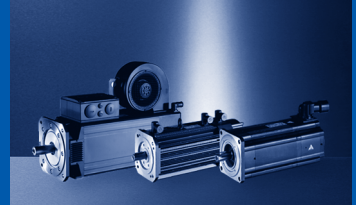
Compliance with electromagnetic compatibility can be guaranteed quite simply by using pre-assembled system cables.

UL certification

All servo motors are prepared for use on the continent of America. MCS, MCA and MQA series servo motors are cURus certified, MDSKS, MDFKS and MDFQA series motors are UR certified. (Exception: version with the 205 V brake.)

No compromises in the take-off speed

The wide ratio range of Lenze gearboxes, combined with the small ratio step of 1.12, allows the required output speed range to be chosen very precisely. The ability to connect the gearboxes directly in the case of the MCS, MD□KS and MCA servo motors produces an extremely compact drive unit with a minimal unit volume. It goes without saying that all servo motors can also be combined with gearboxes in the conventional manner.



Adaptable

The modular design of the motors and the conceptually planned variants make it easier to make the correct choice for the application case concerned.

The drives are a match for practically any drive task thanks to the variety of output-side designs of the motors and geared motors:

- ▶ Servo motor with cylindrical shaft end with or without keyway
- ▶ Geared servo motors with solid shaft, hollow shaft or hollow shaft with shrink disc
- ▶ Geared servo motors with or without flange, foot or centring
- ▶ Different integrated angle sensors allow adaptation to the desired accuracy: resolver as a standard solution with optimised behaviour thanks to internal improvement of the resolver accuracy, sincos absolute value encoder for the greatest accuracy or even incremental encoder for general applications.
- ▶ Matched to the motor type concerned, permanent magnet or spring-applied holding brakes with different torque ranges ensure exact positioning in all application cases, even when the drive is deenergised.

Quiet

The high chopper frequencies of the servo inverters (up to 16 kHz) and a cleverly designed magnetic circuit result in extremely low noise levels. Optimised gear teeth geometry in the Lenze gearboxes prevents noise developing, while the internally ribbed cast iron gearbox housing also helps reduce noise levels.

Compact

The high power density of all servo motors permits small, highly dynamic drive units. The use of geared servo motors with direct mounting of the motors leads to particularly compact drives.

Reduced play

The use of backlash-free permanent magnet holding brakes allows a position to be held precisely, even if the drive is deenergised.

Backlash-free connecting elements in the Lenze transmission and the high quality of the gearing thanks to precision manufacturing permit extremely low output backlash on the servo geared motors by comparison with comparable transmissions. All servo motors in the MCS and MCA 10...19 / 21 series can be combined with directly flanged GPA series planetary gearboxes to meet the highest requirements on reduced backlash.

Naturally, here too, just as with all our motor-gearbox combinations, we consistently use friction-type connection which will also reliably cope with highly dynamic servo applications.

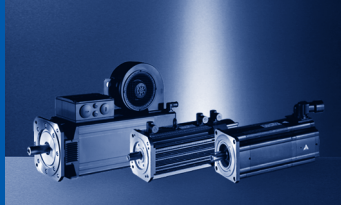
Special types

We can also provide special models tailored to meet the requirements of specific applications.

Easy to install

All Lenze servo motors are guaranteed to be extremely easy to install, with short down times whenever one needs to be replaced. All connectors on the MCS, MD□KS and MCA motors are keyed to prevent incorrect connection and can be turned through about 320° to allow them to be fitted and removed easily in all situations.





General information

Product information

About this catalogue

This catalogue brings together all the synchronous servo motors in the MCS, MDSKS, MDFKS and series and the asynchronous servo motors in the MCA, MQA, MDFQA series. The motor-inverter combinations are listed for the default settings for the servo inverters. All further possible assignments can be downloaded from the Internet.

The same product range is also covered in the electronic DSC catalogue. The electronic catalogue is available on DVD and on the Internet at www.lenze.de/dsc.

On the Internet you can also find and download as a PDF additional information such as torque characteristics for the individual motor inverter combinations. Various operating modes, e.g. different maximum currents at different switching frequencies, are listed.

Selection and ordering

Please note the Drive dimensioning chapter.

Here you will find general data, designs and definitions (references to the assignment tables).

Further selection tables with different switching frequencies are available under the following identifiers:

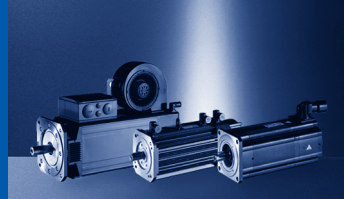
- ▶ DS_ZT_MCS_0001
- ▶ DS_ZT_MCA_0001
- ▶ DS_ZT_MQA_0001
- ▶ DS_ZT_MDSKS_0001
- ▶ DS_ZT_MDFKS_0001
- ▶ DS_ZT_MDFQA_0001

Simply enter this identifier (e.g. DS_ZT_MCS_0001) as a search term on www.lenze.de/dsc and you will be offered the information in a PDF file.

To ensure rapid and correct delivery we require:

- ▶ your delivery data such as delivery date and delivery address
- ▶ the complete product key of our products. Please also take note of the ordering details checklist for the MD□KS and MDFQA series of servo motor.

A list of Lenze sales offices can be found at the end of this catalogue.

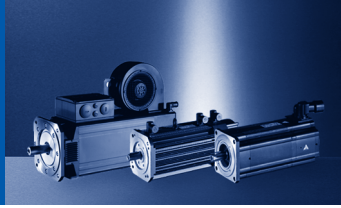


List of abbreviations

η	[%]	Mechanical efficiency,
$\cos \varphi$		Power factor,
du / dt	[kV / μ s]	Insulation resistance, Maximum rate of voltage rise
f_{max}	[kHz]	Limit frequency,
$f_{max, 1}$	[Hz]	Max. input frequency,
f_N	[Hz]	Rated frequency,
F_{ax}	[N]	Axial force,
$F_{ax,max}$	[N]	Max. axial force,
$F_{ax,min}$	[N]	Min. axial force,
F_{rad}	[N]	Radial force,
$F_{rad,min}$	[N]	Min. radial force,
H	[m]	Installation height, Amsl
I_0	[A]	Standstill current,
$I_{0, max}$	[A]	Max. standstill current,
I_{max}	[A]	Max. current,
I_N	[A]	Rated current,
J	[kgcm ²]	Moment of inertia, Standard
J_L / J_{MB}		Moment of inertia, Permissible load / brake motor ratio
J_{MB}	[kgcm ²]	Moment of inertia, Brake motor
$KE_{LL 150^\circ C}$	[V / 1000 rp]	Voltage constant, At 150 ° C
$Kt_{0 150^\circ C}$	[Nm/A]	Torque constant, Standstill, at 150 ° C
k_{m1}		Torque correction factor,
$L_{1\sigma}$	[mH]	Stator leakage inductance,
L_N	[mH]	Rated inductance,

m	[kg]	Mass, Standard
M_0	[Nm]	Stall torque,
$M_{0, max}$	[Nm]	Max. stall torque,
M_{av}	[Nm]	Mean dynamic torque, At 120 ° C
M_{max}	[Nm]	Max. torque,
M_N	[Nm]	Rated torque,
n_{eto}	[min ⁻¹]	Transition speed,
n_k	[min ⁻¹]	Speed,
n_{max}	[min ⁻¹]	Max. speed,
n_N	[min ⁻¹]	Rated speed,
P_N	[kW]	Rated power,
Q_E	[J]	Maximum switching energy,
R_1	[Ω]	Stator impedance,
R_2	[Ω]	Rotor impedance,
t_1	[ms]	Engagement time,
t_2	[ms]	Disengagement time,
$T_{opr,max}$	[°C]	Max. ambient operating temperature,
$T_{opr,min}$	[°C]	Min. ambient operating temperature,
U_{max}	[V]	Max. mains voltage,
U_{min}	[V]	Min. mains voltage,
$U_{N,AC}$	[V]	Rated voltage, AC
$U_{N,DC}$	[V]	Rated voltage, DC
Z_{ro}	[Ω]	Rotor impedance,

CE	Communauté Européenne
CSA	Canadian Standards Association
DIN	Deutsches Institut für Normung e.V.
EMC	Electromagnetic compatibility
EN	European standard
IEC	International Electrotechnical Commission
IM	International Mounting Code
IP	International Protection Code
NEMA	National Electrical Manufacturers Association
UL	Underwriters Laboratory Listed Product
UR	Underwriters Laboratory Recognized Product
VDE	Verband deutscher Elektrotechniker

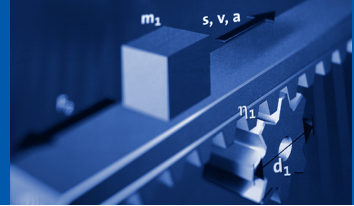


General information

Product information

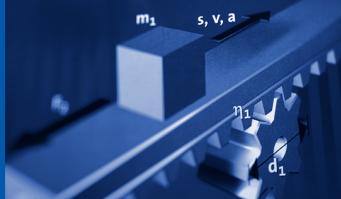
General information

Standards and operating conditions



			MCS		MDSKS	MDFKS
Version			Self-ventilated	Forced-ventilated	Self-ventilated	Forced-ventilated
Cooling type						
Enclosure			IP54	IP54	IP54	IP54
EN 60529			IP65		IP65	
Temperature class			F			
VDE 0530; utilisation			F			
VDE 0530; insulation system (enamel-insulated wire)						
Approval			cURus ¹⁾		GOST	
Type			GOST		UR ¹⁾	
Insulation resistance						
Maximum voltage amplitude	U	[kV]	1.50			
Maximum rate of voltage rise	du / dt	[kV / μs]	5.00			
Smooth running						
DIN 42955			N			
Linear movement						
DIN 42955			N			
Concentricity						
DIN 42955			N			
Min. ambient operating temperature						
Without brake	T _{opr,min}	[°C]	-20	-15	-20	-15
With brake	T _{opr,min}	[°C]	-10			
Max. ambient operating temperature						
Without brake	T _{opr,max}	[°C]	40			
With brake	T _{opr,max}	[°C]	40			
Max. surface temperature						
	T	[°C]	140	110	140	110
Mechanical tolerance						
Flange centring diameter			b ₂ ≤ 230 mm = j6 b ₂ > 230 mm = h6			
Shaft diameter			d ≤ 50 mm = k6 d > 50 mm = m6			
Max. installation height above sea level						
Without power reduction	H _{max}	[m]	1000			
With power reduction	H _{max}	[m]	4000			
Max. air humidity						
Without condensation		[%]	85.0			

¹⁾ Recognized component File No. E 210321.



General information

Standards and operating conditions

			MCA	MQA	MDFQA
Version					
Cooling type			Self-ventilated	Forced-ventilated	
Enclosure					
EN 60529			IP54 IP65	IP54 ³⁾ IP23s ²⁾	IP23s
Temperature class					
VDE 0530; utilisation				F	
VDE 0530; insulation system (enamel-insulated wire)				F	
Approval					
Type				cURus ⁴⁾ GOST	GOST UR ⁵⁾
Insulation resistance					
Maximum voltage amplitude	U	[kV]		1.50	
Maximum rate of voltage rise	du / dt	[kV / μs]		5.00	
Smooth running					
DIN 42955			R ¹⁾ N		N
Linear movement					
DIN 42955			R ¹⁾ N		N
Concentricity					
DIN 42955			R ¹⁾ N		N
Min. ambient operating temperature					
Without brake	T _{opr,min}	[°C]	-20		-15
With brake	T _{opr,min}	[°C]		-10	
Max. ambient operating temperature					
Without brake	T _{opr,max}	[°C]		40	
With brake	T _{opr,max}	[°C]		40	
Max. surface temperature					
	T	[°C]	140		110
Mechanical tolerance					
Flange centring diameter				b ₂ ≤ 230 mm = j6 b ₂ > 230 mm = h6	
Shaft diameter				d ≤ 50 mm = k6 d > 50 mm = m6	
Max. installation height above sea level					
Without power reduction	H _{max}	[m]		1000	
With power reduction	H _{max}	[m]		4000	
Max. air humidity					
Without condensation		[%]		85.0	

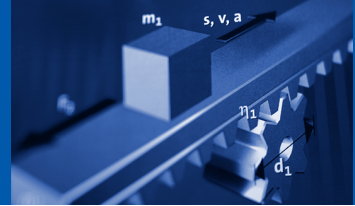
¹⁾ MCA14, 17, 19 and 21.

²⁾ MCA20, 22 and 26.

³⁾ Not possible on MCA20.

⁴⁾ Recognized component File No. E 210321.

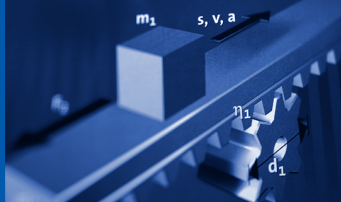
⁵⁾ MDFQA160: on request, Recognized component File No. E 217551.



MCS synchronous servo motors

	MCS06	MCS09	MCS12	MCS14	MCS19
Version Design	B5-FF75	B5-FF100	B5-FF130	B5-FF165	B5-FF215
Version Shaft end (with and without keyway)	11 x 23	14 x 30	19 x 40	24 x 50	28 x 60
Version A end shield	Not oil-tight				
Brake Permanent magnet brake	DC 24 V	DC 24 V 24 V DC, reinforced			
Version Speed and angle encoder	Resolver SinCos single-turn/multi-turn				
Cooling without fan Axial blower, single phase	Naturally ventilated			230 V; 50 Hz 115 V; 60 Hz	
Temperature sensor Temperature detector PTC thermistor	KTY 2x PTC additional (3 phase monitoring)				
Version Circular connector for motor connection	Power + Brake Encoder + thermal sensor		Power + Brake Encoder + thermal sensor Blower		
Version Terminal box for motor connection	Power + brake + encoder + thermal sensor				
Shaft bearings Bearing type Position of the locating bearing	Deep-groove ball bearing with high-temperature resistant grease, sealing disc or cover plate Non-drive end				
Colour	RAL9005M				

► Terminal boxes not possible if blower is fitted.



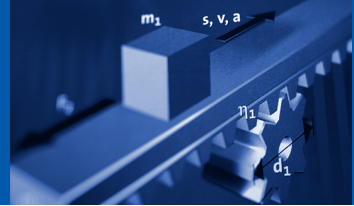
Drive dimensioning

Servo motor designs

MD□KS synchronous servo motors

	MDSKS□□036	MDSKS□□056	MDSKS□□071	MDFKS□□071
Version Design	B5-FF75	B14-FT85 B5-FF100	B14-FT130 B5-FF130	
Version Shaft end (with and without keyway)	11 x 23	14 x 30	19 x 40	
Version A end shield	Not oil-tight			
Brake Permanent magnet brake	DC 24 V AC 230 V ¹⁾ DC 205 V ¹⁾			
Version Speed and angle encoder	Resolver	Resolver SinCos single-turn/multi-turn		
Cooling without fan Axial blower, single phase	Naturally ventilated			230 V; 50 Hz
Temperature sensor Temperature detector	KTY			
Version Circular connector for motor connection	Power + Brake Encoder + thermal sensor			Power + Brake Encoder + thermal sensor Blower
Version Terminal box for motor connection	Power + Brake Encoder + thermal sensor			Power + Brake Encoder + thermal sensor + blower
Terminal box + circular connector for motor connection Terminal box	Power + Brake Encoder + thermal sensor			
Circular connectors				Blower
Shaft bearings Bearing type Position of the locating bearing	Deep-groove ball bearing with high-temperature resistant grease, sealing disc or cover plate Drive end			
Colour	RAL9005M			

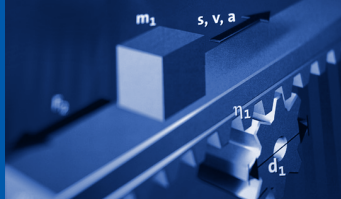
¹⁾ Not possible for UR version.



MCA asynchronous servo motors

	MCA10	MCA13	MCA14	MCA17	MCA19
Version Design	B14-FT85 B5-FF100	B14-FT130 B5-FF130	B14-FT130 B5-FF165		B14-FT130 B5-FF215
Version Shaft end (with and without keyway)	14 x 30	19 x 40	24 x 50		28 x 60
Version A end shield	Not oil-tight Oilproof				
Brake Spring-applied brake Permanent magnet brake	DC 24 V AC 230 V ¹⁾ DC 205 V ¹⁾				
Version Speed and angle encoder	Resolver SinCos single-turn/multi-turn Incremental encoder				
Cooling without fan Axial blower, single phase	Naturally ventilated 230 V; 50 Hz				
Temperature sensor Temperature detector	KTY				
Version Circular connector for motor connection	Power + Brake Encoder + thermal sensor Blower				
Version Terminal box for motor connection	Power + Brake Encoder + thermal sensor	Power + Brake Encoder + thermal sensor + blower			
Terminal box + circular connector for motor connection Terminal box	Power + Brake Encoder + thermal sensor				
Circular connectors		Blower			
Shaft bearings Bearing type Position of the locating bearing	Deep-groove ball bearing with high-temperature resistant grease, sealing disc or cover plate Drive end				
Colour	RAL9005M				

¹⁾ Not possible for UR version.



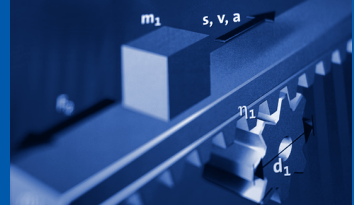
Drive dimensioning

Servo motor designs

MCA asynchronous servo motors

	MCA20	MCA21	MCA22	MCA26
Version Design	B3 B5-FF215 B5-FF265	B14-FT130 B5-FF215 B5-FF265	B3 B5-FF265	B3 B5-FF265 B5-FF350
Version Shaft end (with and without keyway)	38 x 80			55 x 110
Version A end shield	Not oil-tight Oilproof			
Brake Spring-applied brake	DC 24 V AC 230 V ¹⁾		DC 24 V AC 230 V ¹⁾	
Permanent magnet brake		DC 24 V AC 230 V ¹⁾ DC 205 V ¹⁾		
Version Speed and angle encoder	Resolver SinCos single-turn/multi-turn Incremental encoder			
Cooling without fan Axial blower, single phase	230 V; 50 Hz 230 V; 60 Hz	Naturally ventilated 230 V; 50 Hz	230 V; 50 Hz 230 V; 60 Hz	
Temperature sensor Temperature detector	KTY			
Version Circular connector for motor connection	Power + Brake Encoder + thermal sensor Blower			
Version Terminal box for motor connection		Power + Brake Encoder + thermal sensor + blower		
Terminal box + circular connector for motor connection Terminal box	Power + Brake	Power + Brake Encoder + thermal sensor	Power + Brake	
Circular connectors	Encoder + thermal sensor Blower	Blower	Encoder + thermal sensor Blower	
Shaft bearings Bearing type	Deep-groove ball bearing with high-temperature resistant grease, sealing disc or cover plate			
Position of the locating bearing	Non-drive end	Drive end	Non-drive end	
Colour	RAL9005M			

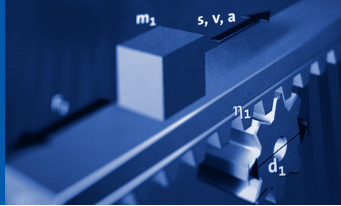
¹⁾ Not possible for UR version.



MQA/MDFQA asynchronous servo motors

	MQA20	MQA22	MQA26	MDFQA□□160
Version Design	B3 B5-FF215 B5-FF265	B3 B5-FF265	B3 B5-FF265 B5-FF350	B35-FF350
Version Shaft end (with and without keyway)	38 x 80		55 x 110	
Version A end shield	Not oil-tight Oilproof			Not oil-tight
Brake Spring-applied brake	DC 24 V AC 230 V ¹⁾			DC 24 V AC 230 V ¹⁾ DC 205 V ¹⁾
Version Speed and angle encoder	Resolver SinCos single-turn/multi-turn Incremental encoder			Without Resolver SinCos single- turn/multi-turn Incremental encoder
Cooling Radial blower, single phase	230 V; 50 Hz 230 V; 60 Hz			
Radial blower, three phase	400 V; 50 Hz 400 V; 60 Hz 460 V; 50 Hz 460 V; 60 Hz 480 V; 60 Hz			
Temperature sensor Temperature detector	KTY			
Thermal contact				Thermal contact
Terminal box + circular connector for motor connection Terminal box	Power + Brake Blower			Power + thermal sensor Blower
Circular connectors	Power + Brake Encoder + thermal sensor	Encoder + thermal sensor		Brake + encoder
Shaft bearings Bearing type	Deep-groove ball bearing with high-temperature resistant grease, sealing disc or cover plate			
Position of the locating bearing	Non-drive end			
Colour	Primed (grey) RAL9005M			

¹⁾ Not possible for UR version.



Drive dimensioning

Servo motor designs

Cooling effect of mounting flange

Installation on a thermally conducting/insulating plate or chassis has an influence on how the motors heat up, in particular in the naturally ventilated motors. The influence is slight or negligible in the case of the MQA and MDFQA series servo motors.

The motor rating data stated in the catalogue is valid for installation on a steel plate set up in free convection with the dimensions listed below:

- ▶ MCS06: 270 x 270 mm
- ▶ MCS09: 330 x 330 mm
- ▶ MCS12 / 14 / 19: 450 x 450 mm
- ▶ MDSKS□□036 / 056 / 071: 270 x 270 mm
- ▶ MCA10 / 13: 270 x 270 mm
- ▶ MCA14 / 17: 330 x 330 mm
- ▶ MCA19 ... 26: 450 x 450 mm

Vibration severity

		MCS06	MCS09	MCS12	MCS14	MCS19
Vibrational severity EN 60034-14				A		
Maximum r.m.s. value of the vibration velocity ¹⁾	[mm/s]			1.60		

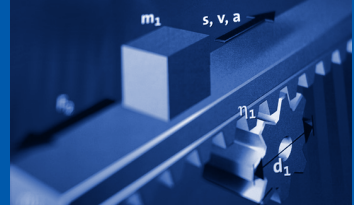
		MDSKS□□036	MDSKS□□056	MDSKS□□071	MDFKS□□071
Vibrational severity EN 60034-14				A	
Maximum r.m.s. value of the vibration velocity ¹⁾	[mm/s]			1.60	

		MCA10	MCA13	MCA14	MCA17	MCA19	MCA20	MCA21	MCA22	MCA26
Vibrational severity EN 60034-14		A			B		A	B		A
Maximum r.m.s. value of the vibration velocity ¹⁾	[mm/s]	1.60			0.70		1.60	0.70		1.60

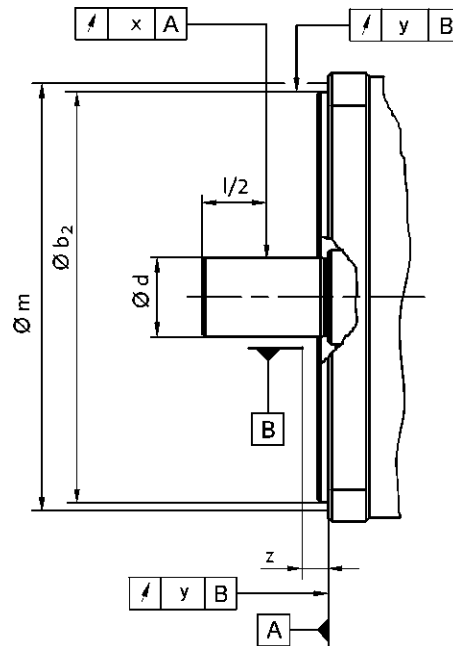
		MQA20	MQA22	MQA26	MDFQA□□160
Vibrational severity EN 60034-14				A	
Maximum r.m.s. value of the vibration velocity ¹⁾	[mm/s]			1.60	

- ▶ at n = 600...3600 rpm

¹⁾ Free suspension



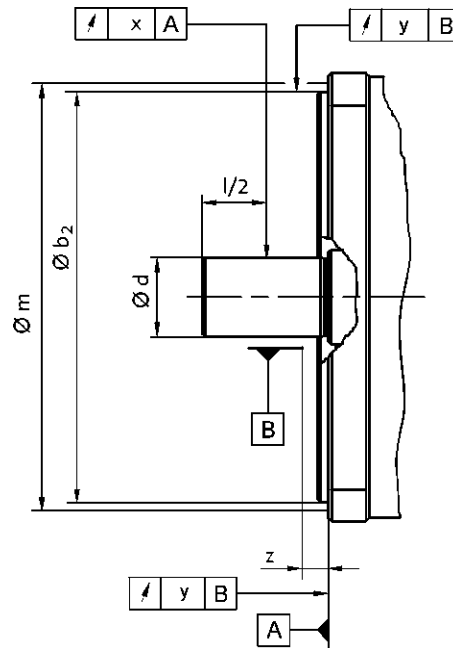
Concentricity and axial run-out of the mounting flanges and smooth running of the shaft ends



				MCS06	MCS09	MCS12	MCS14	MCS19
Flange size				FF75	FF100	FF130	FF165	FF215
Dimensions								
	b_2	j6	[mm]	60	80	110	130	180
	d	k6	[mm]	11	14	19	24	28
Distance								
Measuring diameter	m		[mm]	65.0	85.0	115	135	185
Dial gauge holder for flange check	z	± 1	[mm]			10.0		
Concentricity								
DIN 42955						N		
Value	y		[mm]	0.080			0.10	
Linear movement								
DIN 42955						N		
Value	y		[mm]	0.080			0.10	
Smooth running								
DIN 42955						N		
Value	x		[mm]	0.035			0.040	

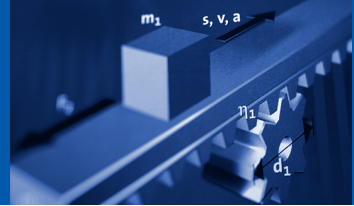
- Limit values for monitoring the smooth running of the shaft ends and concentricity and axial run-out of the mounting flanges in accordance with DIN 42 955

Concentricity and axial run-out of the mounting flanges and smooth running of the shaft ends

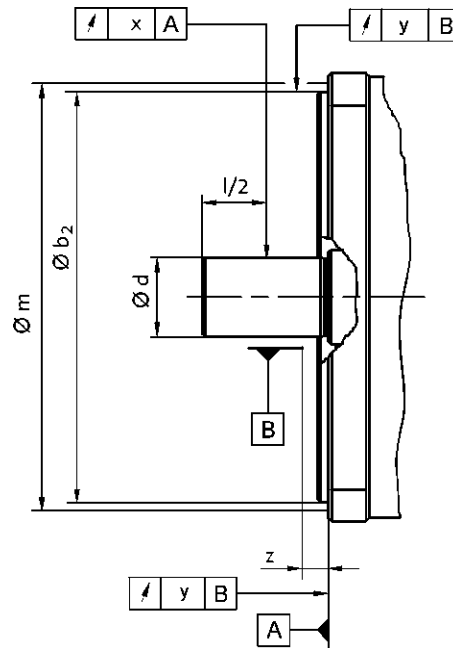


				MDSKS□□036		MDSKS□□056		MDSKS□□071		MDFKS□□071		
Flange size				FF75		FF100	FT85	FF130	FT130	FF130	FT130	
Dimensions												
	b ₂	j6	[mm]	60	80	70	110					
	d	k6	[mm]	11	14		19					
Distance												
Measuring diameter	m		[mm]	86.0	113	98.0	149					
Dial gauge holder for flange check	z	+/- 1	[mm]	10.0								
Concentricity												
DIN 42955												
Value	y		[mm]	0.080				N		0.10		
Linear movement												
DIN 42955												
Value	y		[mm]	0.080				N		0.10		
Smooth running												
DIN 42955												
Value	x		[mm]	0.035				N		0.040		

- Limit values for monitoring the smooth running of the shaft ends and concentricity and axial run-out of the mounting flanges in accordance with DIN 42 955

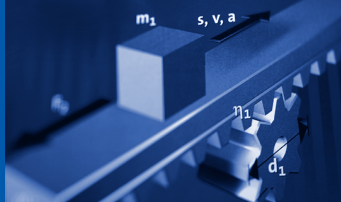


Concentricity and axial run-out of the mounting flanges and smooth running of the shaft ends



				MCA10		MCA13		MCA14		MCA17		MCA19	
Flange size				FF100	FT85	FF130	FT130	FF165	FT130	FF165	FT130	FF215	FT130
Dimensions	b_2	j6	[mm]	80	70	110		130	110	130	110	180	110
	b_2	h6	[mm]										
	d	k6	[mm]	14		19			24			28	
	d	m6	[mm]										
Distance													
Measuring diameter	m		[mm]	113	98.0	149		188	149	188	149	239	149
Dial gauge holder for flange check	z	± 1	[mm]	10.0									
Concentricity													
DIN 42955													
Value	y		[mm]	0.080		0.10				R		0.050	
Linear movement													
DIN 42955													
Value	y		[mm]	0.080		0.10				R		0.050	
Smooth running													
DIN 42955													
Value	x		[mm]	0.035		0.040				R		0.021	

- Limit values for monitoring the smooth running of the shaft ends and concentricity and axial run-out of the mounting flanges in accordance with DIN 42 955

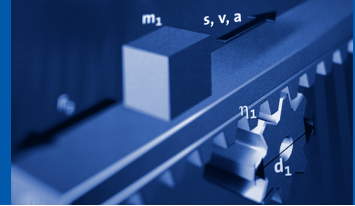


Drive dimensioning

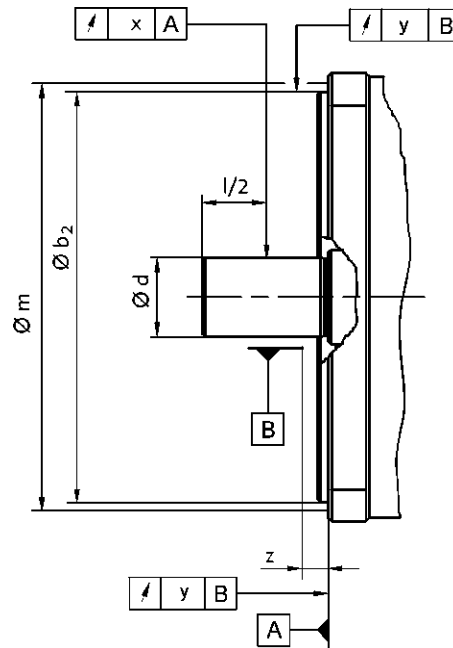
Servo motor designs

				MCA20		MCA21			MCA22	MCA26	
Flange size				FF215	FF265	FF215	FF265	FT130		FF265	FF350
Dimensions	b ₂	j6	[mm]	180	230	180	230	110		230	
	b ₂	h6	[mm]								300
	d	k6	[mm]			38					
	d	m6	[mm]							55	
Distance											
Measuring diameter	m		[mm]	239	289	239	289	149		289	384
Dial gauge holder for flange check	z	+/- 1	[mm]				10.0				
Concentricity											
DIN 42955				N		R				N	
Value	y		[mm]	0.10		0.050				0.10	
Linear movement											
DIN 42955				N		R				N	
Value	y		[mm]	0.10		0.050				0.10	
Smooth running											
DIN 42955				N		R				N	
Value	x		[mm]	0.050		0.060			0.050	0.060	

- Limit values for monitoring the smooth running of the shaft ends and concentricity and axial run-out of the mounting flanges in accordance with DIN 42 955

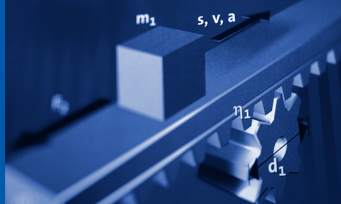


Concentricity and axial run-out of the mounting flanges and smooth running of the shaft ends



				MQA20	MQA22	MQA26	MD- FQA□□160
Flange size				FF215	FF265		FF350
Dimensions	b_2	j6	[mm]	180	230		300
	b_2	h6	[mm]				
	d	k6	[mm]		38		
	d	m6	[mm]			55	
Distance	m		[mm]	239	289		384
Measuring diameter	z	+/- 1	[mm]		10.0		
Concentricity DIN 42955					N		
Value	y		[mm]		0.10		0.13
Linear movement DIN 42955					N		
Value	y		[mm]		0.10		0.13
Smooth running DIN 42955					N		
Value	x		[mm]	0.050		0.060	

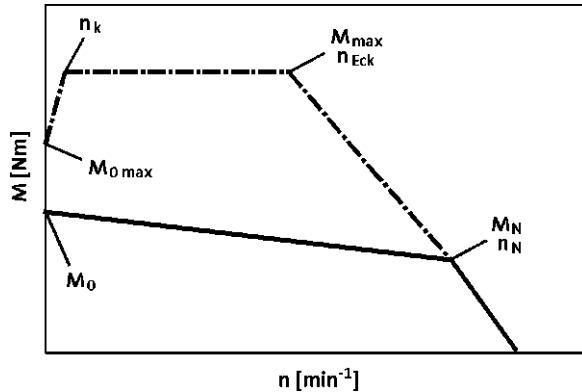
- Limit values for monitoring the smooth running of the shaft ends and concentricity and axial run-out of the mounting flanges in accordance with DIN 42 955



Drive dimensioning

Definitions

Notes on the selection tables



Please note:

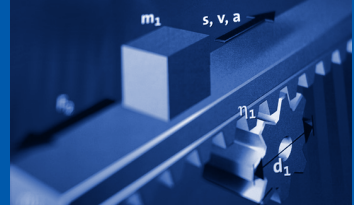
- ▶ Under gravitational load (e.g. vertical drive axes, hoists, test benches, unwinders) $M_{0\max}$ must be taken into consideration
- ▶ Under passive load (e.g. horizontal drive axes) $M_{\max}$ can, as a rule, be used
- ▶ With speeds $< n_k$ the torque $M_{0\max}$ achievable is less than $M_{\max}$ depending on the inverter
- ▶ In the case of servo inverters, the switching frequency-dependent overload capacity is taken into consideration at the default setting. For further information, see the Servo inverter catalogue.

	n_k
	[min ⁻¹]
MCS	75.0
MDSKS	100
MDFKS	
MCA	
MQA	150
MDFQA	

Further selection tables with different switching frequencies are available under the following identifiers:

- ▶ DS_ZT_MCS_0001
- ▶ DS_ZT_MCA_0001
- ▶ DS_ZT_MQA_0001
- ▶ DS_ZT_MDSKS_0001
- ▶ DS_ZT_MDFKS_0001
- ▶ DS_ZT_MDFQA_0001

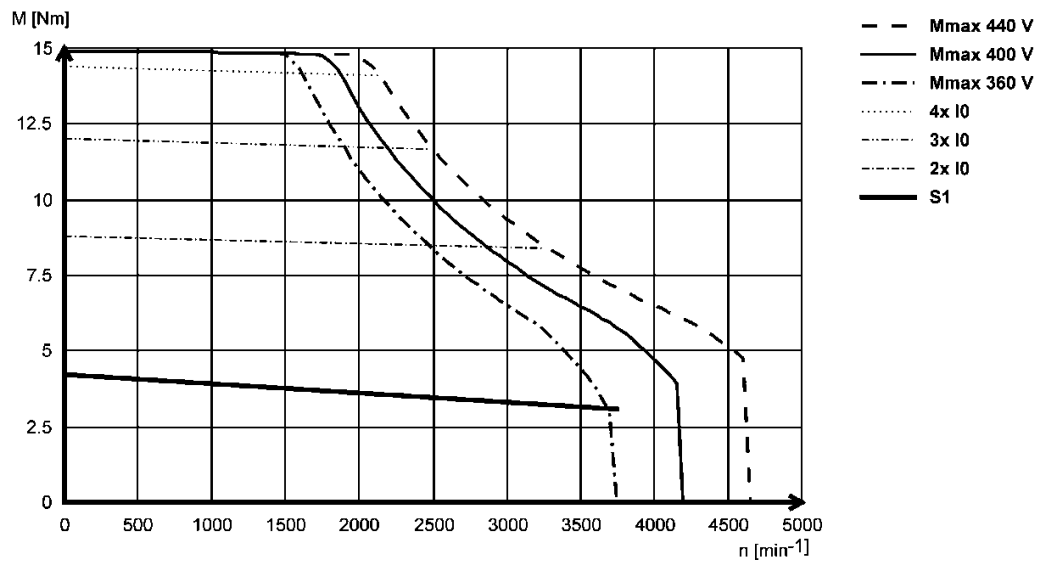
Simply enter this identifier (e.g. DS_ZT_MCS_0001) as a search term on www.lenze.de/dsc and you will be offered the information in a PDF file.



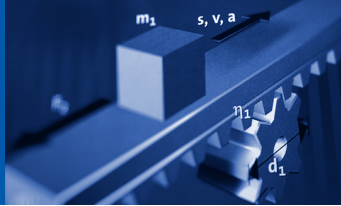
Notes on the torque characteristics

This catalogue gives continuous and limit torque characteristics for synchronous and asynchronous servo motors.

Characteristics for synchronous motors



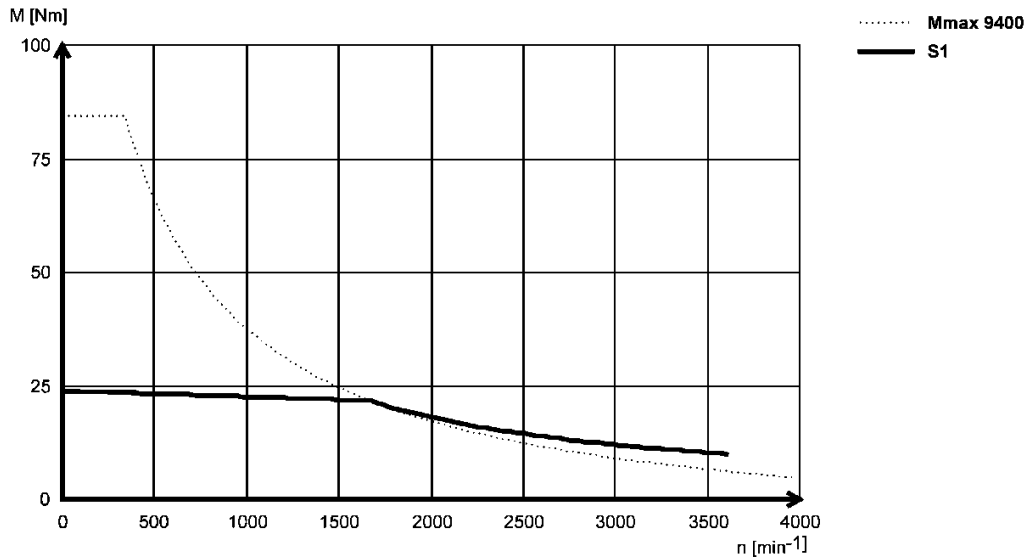
For the synchronous servo motors, both the continuous operation characteristic (S1) and the limit torque characteristic are shown; these result from the selection of servo inverters with maximum currents that correspond to a multiple of the motor standstill current (2x I₀ ... 4x I₀).



Drive dimensioning

Definitions

Characteristics for asynchronous motors



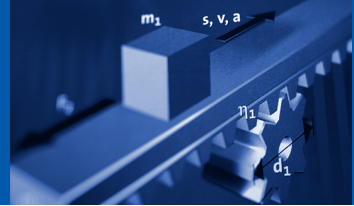
Two characteristic curves are shown for each of the asynchronous servo motors. The continuous duty characteristic (S1) shows the speed-dependent continuous torque of the motor when operating on a servo inverter run at a constant switching frequency of 8 kHz. The limit torque characteristic corresponds to that resulting from operation of the motor on the largest possible Servo Drive 9400 in each case (see selection tables). The servo inverter is set to a variable switching frequency here.

Characteristics in the Internet

You will find the torque characteristics for inverter motor combinations on the Internet at www.lenze.de/dsc. Here you will find all realistic combinations with the servo inverter 9400, 9300 and ECS series. These characteristics are determined with the default settings for the inverters in each case:

- ▶ 9400 with variable switching frequency.
This means that, in the limit case, up to 6 times overcurrent can be used.
- ▶ 9300 and ECS with fixed switching frequency.

Further information on the terms switching frequency and default setting may be found in the relevant Operating Instructions for the servo inverter.

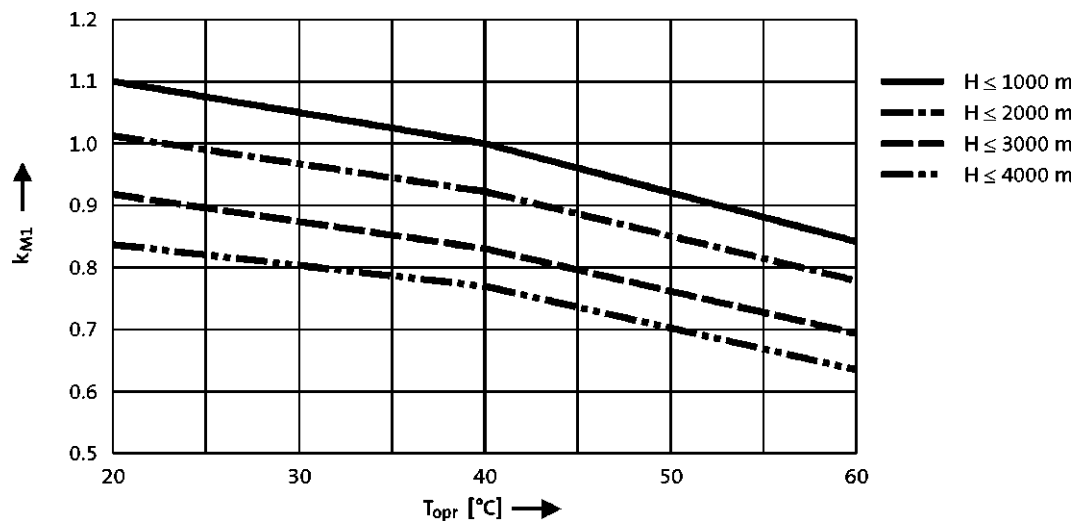


Influence of ambient temperature and site altitude

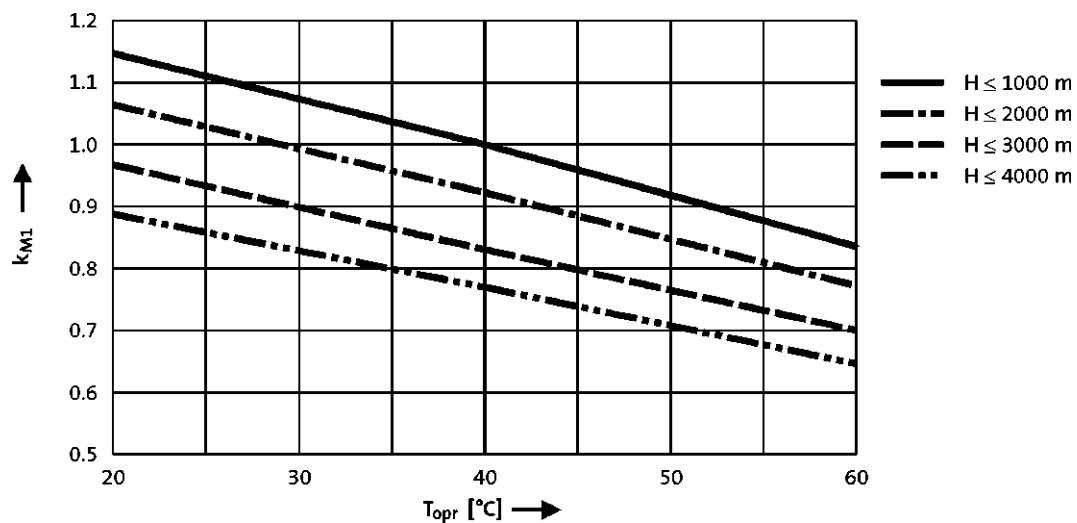
The information relating to the servo motors in the tables and graphs is valid for a maximum ambient temperature (T_{opr}) of 40 °C and a site altitude (H) up to 1000 m above sea level. The torque correction factor (k_{M1}) shall be applied to the S1 torque characteristic (M_0) in the event of differing installation conditions.

- ▶ The maximum permissible ambient temperature (T_{opr}) for servo motors with blowers is 40 °C

MCS, MD□KS synchronous servo motors



MCA, MQA, MDFQA asynchronous servo motors





MCS synchronous servo motors

Rated data

Mains connection 3x 400 V

Motors without blower

	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	I_{max}	$U_{N,AC}$	f_N
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[A]	[V]	[Hz]
MCS06C41-	4050	0.80	2.40	0.60	0.25	1.30	1.30	5.40	225	270
MCS06C60-	6000	0.80	2.40	0.50	0.31	2.50	2.40	10.8	135	400
MCS06F41-	4050	1.50	4.40	1.20	0.51	1.50	1.50	5.30	320	270
MCS06F60-	6000	1.50	4.40	0.90	0.57	2.90	2.50	10.5	180	400
MCS06I41-	4050	2.00	6.20	1.50	0.64	1.70	1.60	5.90	325	270
MCS06I60-	6000	2.00	6.20	1.20	0.75	3.40	2.90	11.8	190	400
MCS09D41-	4050	3.30	9.50	2.30	1.00	2.60	2.30	10.0	320	270
MCS09D60-	6000	3.30	9.50	1.80	1.10	5.30	3.80	20.0	210	400
MCS09F38-	3750	4.20	15.0	3.10	1.20	3.00	2.50	15.0	330	250
MCS09F60-	6000	4.20	15.0	2.40	1.50	6.00	4.50	30.0	230	400
MCS09H41-	4050	5.50	20.0	3.80	1.60	4.30	3.40	20.0	300	270
MCS09H60-	6000	5.50	20.0	3.00	1.90	8.50	6.00	40.0	190	400
MCS09L41-	4050	7.50	32.0	4.50	1.90	6.20	4.20	32.0	295	270
MCS09L51-	5100	7.50	32.0	3.60	1.90	12.4	6.90	64.0	180	340

	η	$J^{1)}$	$KE_{LL\ 150\ ^\circ C}$	$R_{UV\ 20\ ^\circ C}$	$R_{UV\ 150\ ^\circ C}$	L_N	$Kt_{0\ 150\ ^\circ C}$	$n_{max}^{2)}$	$m^{1)}$
	[%]	[kgcm ²]	[V /1000 rp]	[Ω]	[Ω]	[mH]	[Nm/A]	[min ⁻¹]	[kg]
MCS06C41-	65	0.14	36.6	27.1	36.5	51.0	0.66	8000	1.80
MCS06C60-	70	0.14	18.3	6.80	9.10	12.8	0.33	8000	1.80
MCS06F41-	77	0.22	60.1	21.9	29.5	63.5	1.05	8000	2.20
MCS06F60-	81	0.22	30.0	5.50	7.40	15.9	0.53	8000	2.20
MCS06I41-	81	0.30	73.4	18.8	25.4	60.2	1.21	8000	2.90
MCS06I60-	84	0.30	36.7	4.70	6.30	15.1	0.60	8000	2.90
MCS09D41-	87	1.10	71.2	7.00	9.40	25.1	1.25	7000	4.30
MCS09D60-	87	1.10	35.6	1.80	2.40	6.30	0.62	7000	4.30
MCS09F38-	91	1.50	79.8	5.20	7.00	24.6	1.40	7000	5.20
MCS09F60-	91	1.50	39.9	1.30	1.80	6.20	0.70	7000	5.20
MCS09H41-	91	1.90	75.7	3.20	4.30	16.1	1.29	7000	6.10
MCS09H60-	91	1.90	37.8	0.80	1.10	4.00	0.65	7000	6.10
MCS09L41-	91	2.80	71.7	1.80	2.40	9.90	1.21	7000	7.90
MCS09L51-	91	2.80	35.9	0.44	0.59	2.50	0.60	7000	7.90

¹⁾ No brake.

²⁾ Mechanically permissible maximum speed.

MCS synchronous servo motors

Rated data



Mains connection 3x 400 V

Motors without blower

	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	I_{max}	$U_{N,AC}$	f_N
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[A]	[V]	[Hz]
MCS12D20-	1950	6.40	18.0	5.50	1.10	2.70	2.60	10.0	345	130
MCS12D41-	4050	6.40	18.0	4.30	1.80	5.50	4.50	20.0	310	270
MCS12H15-	1500	11.4	29.0	10.0	1.60	4.10	3.80	12.0	300	100
MCS12H35-	3525	11.4	29.0	7.50	2.80	8.20	5.70	24.0	325	235
MCS12L20-	1950	15.0	56.0	13.5	2.80	6.20	5.90	28.0	330	130
MCS12L41-	4050	15.0	56.0	11.0	4.70	12.4	10.2	57.0	300	270
MCS14D15-	1500	11.0	29.0	9.20	1.45	5.00	4.50	17.0	305	100
MCS14D36-	3600	11.0	29.0	7.50	2.80	10.0	7.50	33.0	295	240
MCS14H15-	1500	21.0	55.0	16.0	2.50	8.50	6.60	26.0	325	100
MCS14H32-	3225	21.0	55.0	14.0	4.70	16.9	11.9	52.0	295	215
MCS14L15-	1500	28.0	77.0	23.0	3.60	12.0	9.70	37.0	315	100
MCS14L32-	3225	28.0	77.0	17.2	5.80	24.0	15.0	75.0	275	215
MCS14P14-	1350	37.0	105	30.0	4.20	12.2	10.8	46.0	340	90
MCS14P32-	3225	37.0	105	21.0	7.10	24.3	15.6	92.0	315	215

	η	$J^{1)}$	$KE_{LL\ 150\ ^\circ C}$	$R_{UV\ 20\ ^\circ C}$	$R_{UV\ 150\ ^\circ C}$	L_N	$Kt_{0\ 150\ ^\circ C}$	$n_{max}^{2)}$	$m^{1)}$
	[%]	[kgcm ²]	[V /1000 rp]	[Ω]	[Ω]	[mH]	[Nm/A]	[min ⁻¹]	[kg]
MCS12D20-	79	4.00	137	8.70	11.8	52.2	2.34	6000	6.40
MCS12D41-	84	4.00	68.6	2.20	2.90	13.0	1.17	6000	6.40
MCS12H15-	88	7.30	173	5.70	7.70	42.1	2.79	6000	9.50
MCS12H35-	91	7.30	86.5	1.40	1.90	10.5	1.40	6000	9.50
MCS12L20-	90	10.6	149	2.20	3.00	21.8	2.42	6000	12.6
MCS12L41-	91	10.6	74.6	0.55	0.75	5.50	1.21	6000	12.6
MCS14D15-	88	8.10	129	4.00	5.40	49.8	2.19	6000	10.7
MCS14D36-	92	8.10	64.2	1.00	1.35	12.5	1.09	6000	10.7
MCS14H15-	92	14.2	153	1.94	2.61	34.1	2.48	6000	15.5
MCS14H32-	93	14.2	76.3	0.48	0.65	8.50	1.24	6000	15.5
MCS14L15-	90	23.4	152	1.21	1.64	22.0	2.33	6000	20.1
MCS14L32-	93	23.4	76.2	0.30	0.41	5.50	1.16	6000	20.1
MCS14P14-	90	34.7	179	1.10	1.49	23.9	3.04	6000	24.9
MCS14P32-	93	34.7	89.4	0.28	0.37	6.00	1.52	6000	24.9

¹⁾ No brake.

²⁾ Mechanically permissible maximum speed.



MCS synchronous servo motors

Rated data

Mains connection 3x 400 V

Motors without blower

	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	I_{max}	$U_{N,AC}$	f_N
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[A]	[V]	[Hz]
MCS19F14-	1425	32.0	86.0	27.0	4.00	9.90	8.60	31.0	335	95
MCS19F30-	3000	32.0	86.0	21.0	6.60	19.8	14.0	63.0	300	200
MCS19J14-	1425	51.0	129	40.0	6.00	15.2	12.3	45.0	330	95
MCS19J30-	3000	51.0	129	29.0	9.10	30.5	18.5	90.0	300	200
MCS19P14-	1350	64.0	190	51.0	7.20	17.5	14.3	60.0	330	90
MCS19P30-	3000	64.0	190	32.0	10.0	34.9	19.0	120	320	200

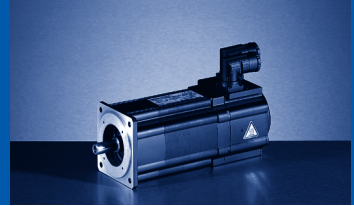
	η	$J^{1)}$	$KE_{LL\ 150\ ^\circ C}$	$R_{UV\ 20\ ^\circ C}$	$R_{UV\ 150\ ^\circ C}$	L_N	$Kt_{0\ 150\ ^\circ C}$	$n_{max}^{2)}$	$m^{1)}$
	[%]	[kgcm ²]	[V /1000 rp]	[Ω]	[Ω]	[mH]	[Nm/A]	[min ⁻¹]	[kg]
MCS19F14-	92	65.0	195	1.30	1.75	20.8	3.23	4000	23.0
MCS19F30-	93	65.0	97.2	0.32	0.44	5.20	1.62	4000	23.0
MCS19J14-	92	105	199	0.65	0.88	12.8	3.31	4000	30.0
MCS19J30-	93	105	99.5	0.16	0.22	3.20	1.65	4000	30.0
MCS19P14-	92	160	216	0.54	0.73	9.60	3.66	4000	40.0
MCS19P30-	93	160	108	0.14	0.18	2.40	1.83	4000	40.0

¹⁾ No brake.

²⁾ Mechanically permissible maximum speed.

MCS synchronous servo motors

Rated data



Mains connection 3x 400 V

Motors with blower

	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	I_{max}	$U_{N,AC}$	f_N
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[A]	[V]	[Hz]
MCS12D17-	1650	7.50	17.7	7.00	1.20	3.20	3.00	10.0	330	110
MCS12D35-	3525	7.50	17.7	6.00	2.20	6.40	5.60	20.0	300	235
MCS12H14-	1350	12.8	29.0	12.0	1.70	4.30	4.10	12.0	310	90
MCS12H34-	3375	12.8	29.0	10.5	3.70	8.50	7.50	24.0	320	225
MCS12L17-	1650	19.0	56.4	17.0	2.90	7.20	6.70	28.0	300	110
MCS12L39-	3900	19.0	56.4	14.0	5.70	14.4	11.7	57.0	295	260
MCS14D14-	1350	12.5	29.0	12.0	1.70	5.70	5.40	17.0	345	90
MCS14D30-	3000	12.5	29.0	10.5	3.30	11.4	9.70	33.0	325	200
MCS14H12-	1200	25.5	54.8	23.5	3.00	9.30	8.30	26.0	335	80
MCS14H28-	2775	25.5	54.8	20.5	6.00	18.4	15.0	52.0	325	185
MCS14L14-	1350	34.5	77.1	30.5	4.30	13.4	11.8	37.0	335	90
MCS14L30-	3000	34.5	77.1	25.5	8.00	26.7	20.8	75.0	310	200
MCS14P11-	1050	43.5	105	42.0	4.60	14.1	13.4	46.0	330	70
MCS14P26-	2625	43.5	105	33.0	9.10	28.3	21.9	92.0	325	175

	η	$J^{2)}$	$KE_{LL\ 150\ ^\circ C}$	$R_{UV\ 20\ ^\circ C}$	$R_{UV\ 150\ ^\circ C}$	L_N	$Kt_{0\ 150\ ^\circ C}$	$n_{max}^{1)}$	$m^{1)}$
	[%]	[kgcm ²]	[V /1000 rp]	[Ω]	[Ω]	[mH]	[Nm/A]	[min ⁻¹]	[kg]
MCS12D17-	75	4.00	137	8.72	11.8	52.2	2.34	6000	8.50
MCS12D35-	82	4.00	68.6	2.18	2.94	13.0	1.17	6000	8.50
MCS12H14-	80	7.30	173	5.72	7.72	42.1	2.98	6000	11.6
MCS12H34-	86	7.30	86.5	1.39	1.88	10.5	1.51	6000	11.6
MCS12L17-	90	10.6	149	2.22	2.99	21.8	2.64	6000	14.7
MCS12L39-	94	10.6	74.6	0.55	0.75	5.50	1.32	6000	14.7
MCS14D14-	84	8.10	129	4.00	5.40	49.8	2.19	6000	14.5
MCS14D30-	92	8.10	64.2	1.00	1.35	12.5	1.09	6000	14.5
MCS14H12-	87	14.2	153	1.94	2.61	34.1	2.75	6000	19.5
MCS14H28-	93	14.2	76.3	0.48	0.65	8.50	1.39	6000	19.5
MCS14L14-	88	23.4	152	1.21	1.64	22.0	2.57	6000	24.0
MCS14L30-	92	23.4	76.2	0.30	0.41	5.50	1.29	6000	24.0
MCS14P11-	86	34.7	179	1.10	1.49	23.9	3.08	6000	29.0
MCS14P26-	92	34.7	89.4	0.28	0.37	6.00	1.54	6000	29.0

¹⁾ No brake.

²⁾ Mechanically permissible maximum speed.



MCS synchronous servo motors

Rated data

Mains connection 3x 400 V

Motors with blower

	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	I_{max}	$U_{N,AC}$	f_N
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[A]	[V]	[Hz]
MCS19F12-	1200	41.5	86.0	38.0	4.80	12.2	11.3	31.0	320	80
MCS19F29-	2850	41.5	86.0	32.5	9.70	24.5	20.1	63.0	320	190
MCS19J12-	1200	70.5	129	62.5	7.90	20.3	18.3	45.0	320	80
MCS19J29-	2850	70.5	129	50.5	15.1	40.6	31.0	90.0	315	190
MCS19P12-	1200	86.0	190	72.0	9.00	22.4	21.3	60.0	310	80
MCS19P29-	2850	86.0	190	53.0	15.8	44.7	29.5	120	315	190

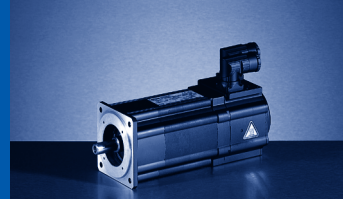
	η	$J^{2)}$	$KE_{LL\ 150\ ^\circ C}$	$R_{UV\ 20\ ^\circ C}$	$R_{UV\ 150\ ^\circ C}$	L_N	$Kt_{0\ 150\ ^\circ C}$	$n_{max}^{1)}$	$m^{1)}$
	[%]	[kgcm ²]	[V /1000 rp]	[Ω]	[Ω]	[mH]	[Nm/A]	[min ⁻¹]	[kg]
MCS19F12-	90	65.0	195	1.30	1.75	20.8	3.40	4000	29.0
MCS19F29-	95	65.0	97.2	0.32	0.44	5.20	1.69	4000	29.0
MCS19J12-	89	105	199	0.65	0.88	12.8	3.47	4000	36.0
MCS19J29-	93	105	99.5	0.16	0.22	3.20	1.74	4000	36.0
MCS19P12-	90	160	216	0.54	0.73	9.60	3.84	4000	46.0
MCS19P29-	93	160	108	0.14	0.18	2.40	1.92	4000	46.0

¹⁾ No brake.

²⁾ Mechanically permissible maximum speed.

MCS synchronous servo motors

Rated data



Mains connection 3x 230 V

Motors without blower

	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	I_{max}	$U_{N,AC}$	f_N
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[A]	[V]	[Hz]
MCS06C41L	4050	0.80	2.40	0.60	0.25	2.50	2.50	10.8	125	270
MCS06C60L	6000	0.80	2.40	0.50	0.31	4.30	4.00	18.5	85	400
MCS06F41L	4050	1.50	4.40	1.20	0.51	2.90	2.90	10.5	165	270
MCS06F60L	6000	1.50	4.40	0.90	0.57	3.80	3.40	16.5	125	400
MCS06I41L	4050	2.00	6.20	1.50	0.64	3.10	2.90	11.8	175	270
MCS06I60L	6000	2.00	6.20	1.20	0.75	4.20	3.60	16.0	150	400
MCS09D41L	4050	3.30	9.50	2.30	1.00	5.30	4.60	20.0	165	270
MCS09D60L	6000	3.30	9.50	1.80	1.10	10.3	7.00	39.0	110	400
MCS09F38L	3750	4.20	15.0	3.10	1.20	6.00	5.00	30.0	160	250
MCS09F60L	6000	4.20	15.0	2.40	1.50	10.5	7.90	53.0	125	400
MCS09H41L	4050	5.50	20.0	3.80	1.60	8.50	6.80	40.0	160	270
MCS09H60L	6000	5.50	20.0	3.00	1.90	12.0	8.00	57.0	145	400
MCS09L41L	4050	7.50	32.0	4.50	1.90	12.4	8.40	64.0	145	270

	η	J^1	$KE_{LL 150^\circ C}$	$R_{UV 20^\circ C}$	$R_{UV 150^\circ C}$	L_N	$Kt_{0 150^\circ C}$	$n_{max}^{2)}$	m^1
	[%]	[kgcm ²]	[V /1000 rp]	[Ω]	[Ω]	[mH]	[Nm/A]	[min ⁻¹]	[kg]
MCS06C41L	65	0.14	21.5	6.00	8.00	12.8	0.33	8000	1.80
MCS06C60L	70	0.14	12.5	2.20	2.90	4.30	0.19	8000	1.80
MCS06F41L	81	0.22	34.5	5.50	7.40	15.9	0.62	8000	2.20
MCS06F60L	82	0.22	22.2	2.30	3.00	6.90	0.40	8000	2.20
MCS06I41L	81	0.30	38.0	4.70	6.20	15.1	0.64	8000	2.90
MCS06I60L	84	0.30	28.5	2.50	3.40	9.30	0.48	8000	2.90
MCS09D41L	87	1.10	35.6	1.80	2.40	6.30	0.62	7000	4.30
MCS09D60L	87	1.10	18.3	0.45	1.20	1.70	0.32	7000	4.30
MCS09F38L	90	1.50	39.9	1.30	1.80	6.20	0.70	7000	5.20
MCS09F60L	91	1.50	22.8	0.42	0.56	2.00	0.40	7000	5.20
MCS09H41L	91	1.90	37.8	0.80	1.10	4.00	0.65	7000	6.10
MCS09H60L	91	1.90	26.6	0.36	0.48	2.00	0.46	7000	6.10
MCS09L41L	91	2.80	35.9	0.44	0.59	2.50	0.60	7000	7.90

¹⁾ No brake.

²⁾ Mechanically permissible maximum speed.



MCS synchronous servo motors

Rated data

Mains connection 3x 230 V

Motors without blower

	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	I_{max}	$U_{N,AC}$	f_N
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[A]	[V]	[Hz]
MCS12D20L	1950	6.40	18.0	5.50	1.10	5.50	5.20	20.0	175	130
MCS12D41L	4050	6.40	18.0	4.30	1.80	10.7	8.80	40.0	155	270
MCS12H15L	1500	11.4	29.0	10.0	1.60	8.20	7.80	24.0	158	100
MCS12H30L	3000	11.4	29.0	8.00	2.50	13.5	10.5	39.0	165	200
MCS12L20L	1950	15.0	56.0	13.5	2.80	12.4	11.8	57.0	165	130

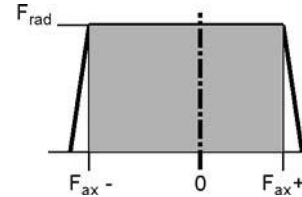
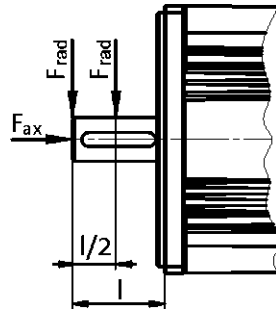
	η	$J^{1)}$	$KE_{LL\ 150\ ^\circ C}$	$R_{UV\ 20\ ^\circ C}$	$R_{UV\ 150\ ^\circ C}$	L_N	$Kt_{0\ 150\ ^\circ C}$	$n_{max}^{2)}$	$m^{1)}$
	[%]	[kgcm ²]	[V /1000 rp]	[Ω]	[Ω]	[mH]	[Nm/A]	[min ⁻¹]	[kg]
MCS12D20L	79	4.00	68.6	2.20	2.90	13.0	1.17	6000	6.40
MCS12D41L	84	4.00	35.0	0.55	0.75	3.40	0.60	6000	6.40
MCS12H15L	82	7.30	86.5	1.43	1.93	10.5	1.40	6000	9.50
MCS12H30L	87	7.30	53.0	0.50	0.67	4.00	0.86	6000	9.50
MCS12L20L	90	10.6	76.9	0.55	0.75	5.50	1.21	6000	12.6

¹⁾ No brake.

²⁾ Mechanically permissible maximum speed.



Permissible radial and axial forces



Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
Max. radial force, Lever arm $l/2$					Min. axial force, Lever arm $l/2$					Max. axial force, Lever arm $l/2$					
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MCS06	740	590	470	410	340	-260	-210	-170	-150	-140	140	80	40	30	10
MCS09	1040	830	660	580	490	-700	-550	-440	-380	-330	470	310	200	150	90
MCS12	1030	820	650	570	480	-880	-690	-550	-490	-420	560	370	230	160	100
MCS14	1830	1450	1150	1010	850	-1150	-900	-720	-640	-550	720	470	290	200	120
MCS19	3840	3050	2430	2120	1790	-1550	-1210	-960	-840	-730	950	620	360	250	130

Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
Max. radial force, Lever arm l					Min. axial force, Lever arm l					Max. axial force, Lever arm l					
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MCS06	630	500	400	350	290	-210	-170	-140	-130	-120	90	50	20	0	-10
MCS09	900	710	570	500	420	-630	-500	-400	-350	-300	400	260	160	120	70
MCS12	890		560	490		-820	-640	-520	-460	-400	490	320	190	130	
MCS14	1590	1260	1000	880	740	-1040	-820	-660	-580	-510	610	390	230	150	
MCS19	3330	2650	2100	1840	1550	-1320	-1040	-830	-740	-640	730	450	240	140	40

- The values for the bearing service life L_{10} relate to a mean speed of 4000 rpm and are additionally restricted by the grease lifetime depending on the ambient temperatures.



MCS synchronous servo motors

9400 Servo Drives selection tables

Mains connection 3x 400 V

Motors without blower

					E94A□□	E0024	E0034	E0044	E0074	E0094	E0134	E0174	E0244	E0324	E0474	E0594
					I _N	1.9	3.1	5.0	8.8	11.7	16.3	20.6	29.4	38.4	47.0	59.0
					I _{0,max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0
MCS	M _N	n _N	I _N	P _N	I _{max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0
06C41-	0.6	4050	1.3	0.25	M ₀	0.8										
					M _N	0.6										
					M _{0,max}	2.4										
					M _{max}	2.4										
					n _{eto}	-										
06C60-	0.5	6000	2.4	0.31	M ₀	0.6	0.8									
					M _N	0.4	0.5									
					M _{0,max}	1.5	2.3									
					M _{max}	1.5	2.3									
					n _{eto}	-	-									
06F41-	1.2	4050	1.5	0.51	M ₀	1.5										
					M _N	1.2										
					M _{0,max}	4.4										
					M _{max}	4.4										
					n _{eto}	-										
06F60-	0.9	6000	2.5	0.57	M ₀	1.0	1.5									
					M _N	0.7	0.9									
					M _{0,max}	3.0	4.3									
					M _{max}	3.0	4.3									
					n _{eto}	-	-									
06I41-	1.5	4050	1.6	0.64	M ₀	2.0										
					M _N	1.5										
					M _{0,max}	6.2										
					M _{max}	6.2										
					n _{eto}	-										
06I60-	1.2	6000	2.9	0.75	M ₀	1.1	1.8	2.0								
					M _N	0.8	1.2	1.2								
					M _{0,max}	3.3	5.5	6.2								
					M _{max}	3.3	5.5	6.2								
					n _{eto}	-	-	-								
09D41-	2.3	4050	2.3	1.00	M ₀	2.4	3.3									
					M _N	1.9	2.3									
					M _{0,max}	6.3	9.5									
					M _{max}	6.3	9.5									
					n _{eto}	-	-									
09D60-	1.8	6000	3.8	1.10	M ₀			3.1	3.3							
					M _N			1.8	1.8							
					M _{0,max}			8.0	9.5							
					M _{max}			8.0	9.5							
					n _{eto}			-	-							
09F38-	3.1	3750	2.5	1.20	M ₀		4.2	4.2								
					M _N		3.1	3.1								
					M _{0,max}		11.6	14.9								
					M _{max}		11.6	14.9								
					n _{eto}		-	-								
09F60-	2.4	6000	4.5	1.50	M ₀			3.5	4.2	4.2	4.2					
					M _N			2.4	2.4	2.4	2.4					
					M _{0,max}			9.8	12.0	14.4	14.9					
					M _{max}			9.8	12.0	14.4	14.9					
					n _{eto}			-	-	-	-					

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCS synchronous servo motors

9400 Servo Drives selection tables



Mains connection 3x 400 V

Motors without blower

					E94A□□	E0024	E0034	E0044	E0074	E0094	E0134	E0174	E0244	E0324	E0474	E0594
					I _N	1.9	3.1	5.0	8.8	11.7	16.3	20.6	29.4	38.4	47.0	59.0
					I _{0,max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0
MCS	M _N	n _N	I _N	P _N	I _{max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0
09H41-	3.8	4050	3.4	1.60	M ₀		4.0	5.5	5.5							
					M _N		3.5	3.8	3.8							
					M _{0,max}		12.0	17.5	20.4							
					M _{max}		12.0	17.5	20.4							
					n _{eto}		-	-	-							
09H60-	3.0	6000	6.0	1.90	M ₀				5.5	5.5	5.5	5.5				
					M _N				3.0	3.0	3.0	3.0				
					M _{0,max}				12.5	15.8	20.1	20.4				
					M _{max}				12.5	15.8	20.1	20.4				
					n _{eto}				-	-	-	-				
09L41-	4.5	4050	4.2	1.90	M ₀			6.0	7.5	7.5						
					M _N			4.5	4.5	4.5						
					M _{0,max}			17.4	22.2	28.5						
					M _{max}			17.4	22.2	28.5						
					n _{eto}			-	-	-						
09L51-	3.6	5100	6.9	1.90	M ₀				5.3	7.0	7.5	7.5	7.5			
					M _N				3.6	3.6	3.6	3.6	3.6			
					M _{0,max}				11.9	15.5	20.9	25.8	29.7			
					M _{max}				11.9	15.5	20.9	25.8	29.7			
					n _{eto}				-	-	-	-	-			
12D20-	5.5	1950	2.6	1.10	M ₀	4.4	6.4									
					M _N	4.0	5.5									
					M _{0,max}	11.8	17.7									
					M _{max}	11.8	17.7									
					n _{eto}	-	-									
12D41-	4.3	4050	4.5	1.80	M ₀			5.9	6.4							
					M _N			4.3	4.3							
					M _{0,max}			14.7	17.7							
					M _{max}			14.7	17.7							
					n _{eto}			-	-							
12H15-	10.0	1500	3.8	1.60	M ₀		8.7	11.4								
					M _N		8.2	10.0								
					M _{0,max}		24.6	29.0								
					M _{max}		24.6	29.0								
					n _{eto}		-	-								
12H35-	7.5	3525	5.7	2.80	M ₀			7.0	11.4	11.4	11.4					
					M _N			6.6	7.5	7.5	7.5					
					M _{0,max}			20.1	25.8	29.0	29.0					
					M _{max}			20.1	25.8	29.0	29.0					
					n _{eto}			-	-	-	-					
12L20-	13.5	1950	5.9	2.80	M ₀			12.1	15.0	15.0	15.0					
					M _N			11.4	13.5	13.5	13.5					
					M _{0,max}			35.5	44.6	55.7	56.4					
					M _{max}			35.5	44.6	55.7	56.4					
					n _{eto}			-	-	-	-					
12L41-	11.0	4050	10.2	4.70	M ₀				10.6	14.0	15.0	15.0	15.0			
					M _N				9.5	11.0	11.0	11.0	11.0			
					M _{0,max}				24.4	31.6	41.9	50.8	56.4			
					M _{max}				24.4	31.6	41.9	50.8	56.4			
					n _{eto}				-	-	-	-	-			

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCS synchronous servo motors

9400 Servo Drives selection tables

Mains connection 3x 400 V

Motors without blower

					E94A□□	E0024	E0034	E0044	E0074	E0094	E0134	E0174	E0244	E0324	E0474	E0594
					I _N	1.9	3.1	5.0	8.8	11.7	16.3	20.6	29.4	38.4	47.0	59.0
					I _{0,max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0
MCS	M _N	n _N	I _N	P _N	I _{max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0
14D15-	9.2	1500	4.5	1.45	M ₀			11.0	11.0							
					M _N			9.2	9.2							
					M _{0,max}			28.3	29.0							
					M _{max}			28.3	29.0							
					n _{eto}			-	-							
14D36-	7.5	3600	7.5	2.80	M ₀				9.6	11.0	11.0					
					M _N				7.5	7.5	7.5					
					M _{0,max}				20.2	25.6	29.0					
					M _{max}				20.2	25.6	29.0					
					n _{eto}				-	-	-					
14H15-	16.0	1500	6.6	2.50	M ₀			12.4	21.0	21.0	21.0					
					M _N			12.1	16.0	16.0	16.0					
					M _{0,max}			37.1	46.6	54.8	54.8					
					M _{max}			37.1	46.6	54.8	54.8					
					n _{eto}			-	-	-	-					
14H32-	14.0	3225	11.9	4.70	M ₀					14.4	20.3	21.0	21.0			
					M _N					13.6	14.0	14.0	14.0			
					M _{0,max}					33.0	43.9	53.2	54.8			
					M _{max}					33.0	43.9	53.2	54.8			
					n _{eto}					-	-	-	-			
14L15-	23.0	1500	9.7	3.60	M ₀				20.5	27.1	28.0					
					M _N				20.9	23.0	23.0					
					M _{0,max}				48.0	61.4	77.1					
					M _{max}				48.0	61.4	77.1					
					n _{eto}				-	-	-					
14L32-	17.2	3225	15.0	5.80	M ₀						19.0	24.0	28.0	28.0	28.0	
					M _N						17.2	17.2	17.2	17.2	17.2	
					M _{0,max}						45.0	55.3	63.9	77.1	77.1	
					M _{max}						45.0	55.3	63.9	77.1	77.1	
					n _{eto}						-	-	-	-	-	
14P14-	30.0	1350	10.8	4.20	M ₀				26.7	35.2	37.0	37.0				
					M _N				24.4	30.0	30.0	30.0				
					M _{0,max}				56.1	71.7	93.3	105.1				
					M _{max}				56.1	71.7	93.3	105.1				
					n _{eto}				-	-	-	-				
14P32-	21.0	3225	15.6	7.10	M ₀						24.8	31.4	37.0	37.0	37.0	
					M _N						21.0	21.0	21.0	21.0	21.0	
					M _{0,max}						52.5	64.6	74.7	92.2	105.1	
					M _{max}						52.5	64.6	74.7	92.2	105.1	
					n _{eto}						-	-	-	-	-	
19F14-	27.0	1425	8.6	4.00	M ₀				28.4	32.0	32.0					
					M _N				27.0	27.0	27.0					
					M _{0,max}				62.1	78.9	86.0					
					M _{max}				62.1	78.9	86.0					
					n _{eto}				-	-	-					
19F30-	21.0	3000	14.0	6.60	M ₀						26.3	32.0	32.0	32.0		
					M _N						21.0	21.0	21.0	21.0		
					M _{0,max}						56.6	70.2	81.6	86.0		
					M _{max}						56.6	70.2	81.6	86.0		
					n _{eto}						-	-	-	-	-	

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCS synchronous servo motors

9400 Servo Drives selection tables



Mains connection 3x 400 V

Motors without blower

					E94A□□	E0024	E0034	E0044	E0074	E0094	E0134	E0174	E0244	E0324	E0474	E0594
					I _N	1.9	3.1	5.0	8.8	11.7	16.3	20.6	29.4	38.4	47.0	59.0
					I _{0,max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0
MCS	M _N	n _N	I _N	P _N	I _{max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0
19J14-	40.0	1425	12.3	6.00	M ₀					38.9	51.0	51.0				
					M _N					37.7	40.0	40.0				
					M _{0,max}					85.0	114.4	129.0				
					M _{max}					85.0	114.4	129.0				
					n _{eto}					-	-	-				
19J30-	29.0	3000	18.5	9.10	M ₀						27.3	34.4	49.2	51.0	51.0	
					M _N						25.6	29.0	29.0	29.0	29.0	
					M _{0,max}						60.8	75.9	88.9	112.9	129.0	
					M _{max}						60.8	75.9	88.9	112.9	129.0	
					n _{eto}						-	-	-	-	-	
19P14-	51.0	1350	14.3	7.20	M ₀						59.6	64.0	64.0	64.0		
					M _N						51.0	51.0	51.0	51.0		
					M _{0,max}						128.4	159.9	186.6	190.0		
					M _{max}						128.4	159.9	186.6	190.0		
					n _{eto}						-	-	-	-	-	
19P30-	32.0	3000	19.0	10.00	M ₀						29.9	37.8	53.9	64.0	64.0	64.0
					M _N						27.5	32.0	32.0	32.0	32.0	32.0
					M _{0,max}						65.7	83.6	98.5	126.6	152.5	187.2
					M _{max}						65.7	83.6	98.5	126.6	152.5	187.2
					n _{eto}						-	-	-	-	-	-

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCS synchronous servo motors

9400 Servo Drives selection tables

Mains connection 3x 400 V

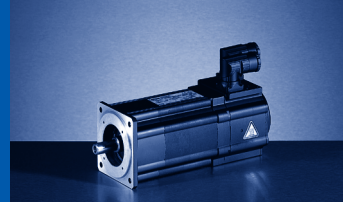
Motors with blower

					E94A□□	E0024	E0034	E0044	E0074	E0094	E0134	E0174	E0244	E0324	E0474	E0594
					I _N	1.9	3.1	5.0	8.8	11.7	16.3	20.6	29.4	38.4	47.0	59.0
					I _{0,max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0
MCS	M _N	n _N	I _N	P _N	I _{max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0
12D17-	7.0	1650	3.0	1.20	M ₀	4.4	7.3									
					M _N	4.0	7.0									
					M _{0,max}	11.8	17.7									
					M _{max}	11.8	17.7									
					n _{eto}	-	-									
12D35-	6.0	3525	5.6	2.20	M ₀			5.9	7.5							
					M _N			5.4	6.0							
					M _{0,max}			14.7	17.7							
					M _{max}			14.7	17.7							
					n _{eto}			-	-							
12H14-	12.0	1350	4.1	1.70	M ₀		8.7	12.8								
					M _N		8.2	12.0								
					M _{0,max}		24.6	29.0								
					M _{max}		24.6	29.0								
					n _{eto}		-	-								
12H34-	10.5	3375	7.5	3.70	M ₀			7.0	12.8	12.8	12.8					
					M _N			6.6	10.5	10.5	10.5					
					M _{0,max}			20.1	25.8	29.0	29.0					
					M _{max}			20.1	25.8	29.0	29.0					
					n _{eto}			-	-	-	-					
12L17-	17.0	1650	6.7	2.90	M ₀			12.1	19.0	19.0	19.0					
					M _N			11.4	17.0	17.0	17.0					
					M _{0,max}			35.5	44.6	55.7	56.4					
					M _{max}			35.5	44.6	55.7	56.4					
					n _{eto}			-	-	-	-					
12L39-	14.0	3900	11.7	5.70	M ₀				10.6	15.3	19.0	19.0	19.0			
					M _N				9.5	13.9	14.0	14.0	14.0			
					M _{0,max}				24.4	31.6	41.9	50.8	56.4			
					M _{max}				24.4	31.6	41.9	50.8	56.4			
					n _{eto}				-	-	-	-	-			
14D14-	12.0	1350	5.4	1.70	M ₀			11.0	12.5							
					M _N			11.0	12.0							
					M _{0,max}			28.3	29.0							
					M _{max}			28.3	29.0							
					n _{eto}			-	-							
14D30-	10.5	3000	9.7	3.30	M ₀				9.6	12.5	12.5					
					M _N				9.5	10.5	10.5					
					M _{0,max}				20.2	25.6	29.0					
					M _{max}				20.2	25.6	29.0					
					n _{eto}				-	-	-					
14H12-	23.5	1200	8.3	3.00	M ₀			12.4	24.1	25.5	25.5					
					M _N			12.1	23.5	23.5	23.5					
					M _{0,max}			37.1	46.6	54.8	54.8					
					M _{max}			37.1	46.6	54.8	54.8					
					n _{eto}			-	-	-	-					
14H28-	20.5	2775	15.0	6.00	M ₀					16.1	20.5	25.5	25.5			
					M _N					15.9	20.5	20.5	20.5			
					M _{0,max}					33.0	43.9	53.2	54.8			
					M _{max}					33.0	43.9	53.2	54.8			
					n _{eto}					-	-	-	-			

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCS synchronous servo motors

9400 Servo Drives selection tables



Mains connection 3x 400 V

Motors with blower

					E94A□□	E0024	E0034	E0044	E0074	E0094	E0134	E0174	E0244	E0324	E0474	E0594
					I _N	1.9	3.1	5.0	8.8	11.7	16.3	20.6	29.4	38.4	47.0	59.0
					I _{0,max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0
MCS	M _N	n _N	I _N	P _N	I _{max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0
14L14-	30.5	1350	11.8	4.30	M ₀				20.5	30.0	34.5					
					M _N				20.5	30.0	30.5					
					M _{0,max}				48.0	61.4	77.1					
					M _{max}				48.0	61.4	77.1					
					n _{eto}				-	-	-					
14L30-	25.5	3000	20.8	8.00	M ₀						21.0	26.6	34.5	34.5	34.5	
					M _N						20.0	25.3	25.5	25.5	25.5	
					M _{0,max}						45.0	55.3	63.9	77.1	77.1	
					M _{max}						45.0	55.3	63.9	77.1	77.1	
					n _{eto}						-	-	-	-	-	
14P11-	42.0	1050	13.4	4.60	M ₀				26.7	36.4	43.5	43.5				
					M _N				24.4	36.4	42.0	42.0				
					M _{0,max}				56.1	71.7	93.3	105.1				
					M _{max}				56.1	71.7	93.3	105.1				
					n _{eto}				-	-	-	-				
14P26-	33.0	2625	21.9	9.10	M ₀						24.8	31.4	43.5	43.5	43.5	
					M _N						24.6	31.0	33.0	33.0	33.0	
					M _{0,max}						52.5	64.6	74.7	92.2	105.1	
					M _{max}						52.5	64.6	74.7	92.2	105.1	
					n _{eto}						-	-	-	-	-	
19F12-	38.0	1200	11.3	4.80	M ₀				29.9	39.5	41.5					
					M _N				29.3	38.0	38.0					
					M _{0,max}				62.1	78.9	86.0					
					M _{max}				62.1	78.9	86.0					
					n _{eto}				-	-	-					
19F29-	32.5	2850	20.1	9.70	M ₀						26.3	34.9	41.5	41.5		
					M _N						26.0	32.5	32.5	32.5		
					M _{0,max}						56.6	70.2	81.6	86.0		
					M _{max}						56.6	70.2	81.6	86.0		
					n _{eto}						-	-	-	-	-	
19J12-	62.5	1200	18.3	7.90	M ₀						56.6	70.5				
					M _N						55.7	62.5				
					M _{0,max}						114.4	129.0				
					M _{max}						114.4	129.0				
					n _{eto}						-	-				
19J29-	50.5	2850	31.0	15.10	M ₀								49.2	66.7	70.5	
					M _N								47.9	50.5	50.5	
					M _{0,max}								88.9	112.9	129.0	
					M _{max}								88.9	112.9	129.0	
					n _{eto}								-	-	-	
19P12-	72.0	1200	21.3	9.00	M ₀							79.1	86.0	86.0		
					M _N							69.6	72.0	72.0		
					M _{0,max}							159.9	186.6	190.0		
					M _{max}							159.9	186.6	190.0		
					n _{eto}							-	-	-		
19P29-	53.0	2850	29.5	15.80	M ₀								56.5	73.9	86.0	86.0
					M _N								52.8	53.0	53.0	53.0
					M _{0,max}								98.5	126.6	152.5	187.2
					M _{max}								98.5	126.6	152.5	187.2
					n _{eto}								-	-	-	-

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCS synchronous servo motors

9400 Servo Drives selection tables

Mains connection 3x 230 V

Motors without blower

					E94A□□	E0024	E0034	E0044	E0074	E0094	E0134	E0174	E0244	E0324
					I _N	1.9	3.1	5.0	8.8	11.7	16.3	20.6	29.4	38.4
					I _{0,max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8
MCS	M _N	n _N	I _N	P _N	I _{max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8
06C41L	0.6	4050	2.6	0.25	M ₀	0.6	0.8							
					M _N	0.5	0.6							
					M _{0,max}	1.5	2.3							
					M _{max}	1.5	2.3							
					n _{eto}	-	-							
06C60L	0.5	6000	4.0	0.31	M ₀		0.6	0.8	0.8					
					M _N		0.4	0.5	0.5					
					M _{0,max}		1.5	2.2	2.4					
					M _{max}		1.5	2.2	2.4					
					n _{eto}		-	-	-					
06F41L	1.2	4050	2.9	0.51	M ₀	1.0	1.5	1.5						
					M _N	0.8	1.2	1.2						
					M _{0,max}	2.7	4.2	4.4						
					M _{max}	2.7	4.2	4.4						
					n _{eto}	-	-	-						
06F60L	0.9	6000	3.8	0.57	M ₀		1.2	1.5	1.5					
					M _N		0.8	0.9	0.9					
					M _{0,max}		3.1	4.3	4.4					
					M _{max}		3.1	4.3	4.4					
					n _{eto}		-	-	-					
06I41L	1.5	4050	3.2	0.64	M ₀		2.0	2.0						
					M _N		1.5	1.5						
					M _{0,max}		5.4	6.2						
					M _{max}		5.4	6.2						
					n _{eto}		-	-						
06I60L	1.2	6000	3.8	0.75	M ₀		1.5	2.0						
					M _N		1.0	1.2						
					M _{0,max}		4.4	6.2						
					M _{max}		4.4	6.2						
					n _{eto}		-	-						
09D41L	2.3	4050	4.6	1.00	M ₀			3.1	3.3					
					M _N			2.3	2.3					
					M _{0,max}			8.0	9.5					
					M _{max}			8.0	9.5					
					n _{eto}			-	-					
09D60L	1.8	6000	7.0	1.10	M ₀				2.8	3.3	3.3			
					M _N				1.8	1.8	1.8			
					M _{0,max}				5.7	7.3	9.5			
					M _{max}				5.7	7.3	9.5			
					n _{eto}				-	-	-			
09F38L	3.1	3750	5.0	1.20	M ₀			3.5	4.2	4.2	4.2			
					M _N			3.1	3.1	3.1	3.1			
					M _{0,max}			9.8	12.0	13.8	15.0			
					M _{max}			9.8	12.0	13.8	15.0			
					n _{eto}			-	-	-	-			
09F60L	2.4	6000	7.9	1.50	M ₀				3.5	4.2	4.2	4.2	4.2	
					M _N				2.4	2.4	2.4	2.4	2.4	
					M _{0,max}				7.8	9.8	12.6	14.5	15.0	
					M _{max}				7.8	9.8	12.6	14.5	15.0	
					n _{eto}				-	-	-	-	-	

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCS synchronous servo motors

9400 Servo Drives selection tables



Mains connection 3x 230 V

Motors without blower

					E94A□□	E0024	E0034	E0044	E0074	E0094	E0134	E0174	E0244	E0324
					I _N	1.9	3.1	5.0	8.8	11.7	16.3	20.6	29.4	38.4
					I _{0,max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8
MCS	M _N	n _N	I _N	P _N	I _{max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8
09H41L	3.8	4050	6.8	1.60	M ₀				5.5	5.3	5.5	5.5		
					M _N				3.8	3.0	3.8	3.8		
					M _{0,max}				12.4	11.8	19.7	20.0		
					M _{max}				12.4	11.8	19.7	20.0		
					n _{eto}				-	-	-	-		
09H60L	3.0	6000	8.0	1.90	M ₀				4.0	5.5	5.5	5.5	5.5	
					M _N				3.0	3.8	3.0	3.0	3.0	
					M _{0,max}				9.2	15.6	15.4	18.3	20.0	
					M _{max}				9.2	15.6	15.4	18.3	20.0	
					n _{eto}				-	-	-	-	-	
09L41L	4.5	4050	8.4	1.90	M ₀				5.3	7.0	7.5	7.5	7.5	7.5
					M _N				4.5	4.5	4.5	4.5	4.5	4.5
					M _{0,max}				11.9	15.5	20.9	25.8	29.7	31.9
					M _{max}				11.9	15.5	20.9	25.8	29.7	31.9
					n _{eto}				-	-	-	-	-	-
12D20L	5.5	1950	5.2	1.10	M ₀			5.9	6.4					
					M _N			5.3	5.5					
					M _{0,max}			14.9	17.7					
					M _{max}			14.9	17.7					
					n _{eto}			-	-					
12D41L	4.3	4050	8.8	1.80	M ₀				5.3	6.4	6.4	6.4		
					M _N				4.3	4.3	4.3	4.3		
					M _{0,max}				10.6	13.6	17.7	17.9		
					M _{max}				10.6	13.6	17.7	17.9		
					n _{eto}				-	-	-	-		
12H15L	10.0	1500	7.6	1.60	M ₀				11.4	11.4	10.0			
					M _N				10.0	10.0	11.4			
					M _{0,max}				25.8	29.0	29.0			
					M _{max}				25.8	29.0	29.0			
					n _{eto}				-	-	-			
12H30L	8.0	3000	10.5	2.50	M ₀				7.4	9.8	11.4			
					M _N				6.7	8.0	8.0			
					M _{0,max}				16.4	21.5	29.0			
					M _{max}				16.4	21.5	29.0			
					n _{eto}				-	-	-			
12L20L	13.5	1950	11.8	2.80	M ₀				10.6	14.0	15.0	15.0	15.0	
					M _N				10.1	13.3	13.5	13.5	13.5	
					M _{0,max}				24.4	31.5	41.8	50.5	56.0	
					M _{max}				24.4	31.5	41.8	50.5	56.0	
					n _{eto}				-	-	-	-	-	

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCS synchronous servo motors

ECS servo system selection tables

Mains connection 3x 400 V

Motors without blower

					ECS□□	004C□B	008C□B	016C□B	032C□B	048C□B	064C□B
					I _N	2.0	4.0	8.0	12.7	17.0	20.0
					I _{0,max}	2.3	4.6	9.1	18.1	27.2	36.3
MCS	M _N	n _N	I _N	P _N	I _{max}	4.0	8.0	16.0	32.0	48.0	64.0
06C41-	0.6	4050	1.3	0.25	M ₀	0.8					
					M _N	0.6					
					M _{0,max}	1.2					
					M _{max}	1.9					
					n _{eto}	2747					
06C60-	0.5	6000	2.4	0.31	M ₀	0.6	0.8				
					M _N	0.4	0.5				
					M _{0,max}	0.6	1.2				
					M _{max}	1.0	1.9				
					n _{eto}	7000	6814				
06F41-	1.2	4050	1.5	0.51	M ₀	1.5					
					M _N	1.2					
					M _{0,max}	2.0					
					M _{max}	3.6					
					n _{eto}	1902					
06F60-	0.9	6000	2.5	0.57	M ₀	1.0	1.5				
					M _N	0.7	0.9				
					M _{0,max}	1.0	2.0				
					M _{max}	1.8	3.7				
					n _{eto}	7000	4602				
06I41-	1.5	4050	1.6	0.64	M ₀	2.0	2.0				
					M _N	1.5	1.5				
					M _{0,max}	2.6	5.0				
					M _{max}	4.4	6.2				
					n _{eto}	1898	1384				
06I60-	1.2	6000	2.9	0.75	M ₀	1.2	2.0	2.0			
					M _N	0.8	1.2	1.2			
					M _{0,max}	1.3	2.6	5.2			
					M _{max}	2.2	4.7	6.2			
					n _{eto}	6407	4200	3157			
09D41-	2.3	4050	2.3	1.00	M ₀		3.3	3.3			
					M _N		2.3	2.3			
					M _{0,max}		5.0	8.8			
					M _{max}		8.0	9.4			
					n _{eto}		2361	2008			
09D60-	1.8	6000	3.8	1.10	M ₀		2.5	3.3			
					M _N		1.8	1.8			
					M _{0,max}		2.5	4.9			
					M _{max}		4.4	8.0			
					n _{eto}		7000	5217			
09F38-	3.1	3750	2.5	1.20	M ₀		4.2	4.2			
					M _N		3.1	3.1			
					M _{0,max}		6.2	10.8			
					M _{max}		9.8	14.9			
					n _{eto}		2589	1737			
09F60-	2.4	6000	4.5	1.50	M ₀		2.8	4.2	4.2		
					M _N		2.1	2.4	2.4		
					M _{0,max}		3.2	6.1	10.8		
					M _{max}		5.4	9.8	14.9		
					n _{eto}		7000	5906	3715		

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCS synchronous servo motors

ECS servo system selection tables



Mains connection 3x 400 V

Motors without blower

					ECS□□	004C□B	008C□B	016C□B	032C□B	048C□B	064C□B
					I _N	2.0	4.0	8.0	12.7	17.0	20.0
					I _{0,max}	2.3	4.6	9.1	18.1	27.2	36.3
MCS	M _N	n _N	I _N	P _N	I _{max}	4.0	8.0	16.0	32.0	48.0	64.0
09H41-	3.8	4050	3.4	1.60	M ₀		5.2	5.5			
					M _N		3.8	3.8			
					M _{0,max}		5.9	11.1			
					M _{max}		9.9	17.5			
					n _{eto}		3675	2231			
09H60-	3.0	6000	6.0	1.90	M ₀			5.2	5.5	5.5	
					M _N			3.0	3.0	3.0	
					M _{0,max}			5.9	11.0	15.5	
					M _{max}			9.9	17.5	20.4	
					n _{eto}			7000	5061	4375	
09L41-	4.5	4050	4.2	1.90	M ₀		4.8	7.5	7.5		
					M _N		4.3	4.5	4.5		
					M _{0,max}		5.2	10.3	19.5		
					M _{max}		9.1	17.4	31.9		
					n _{eto}		4450	3188	1878		
09L51-	3.6	5100	6.9	1.90	M ₀			4.8	7.5	7.5	7.5
					M _N			3.6	3.6	3.6	3.6
					M _{0,max}			5.2	10.3	15.1	19.6
					M _{max}			9.1	17.5	25.1	31.9
					n _{eto}			7000	7000	5647	4076
12D20-	5.5	1950	2.6	1.10	M ₀	4.7	6.4	6.4			
					M _N	4.2	5.5	5.5			
					M _{0,max}	4.6	9.1	17.0			
					M _{max}	8.0	15.3	17.7			
					n _{eto}	1730	1089	919			
12D41-	4.3	4050	4.5	1.80	M ₀		4.7	6.4			
					M _N		3.8	4.3			
					M _{0,max}		4.6	8.8			
					M _{max}		7.8	14.7			
					n _{eto}		3902	2433			
12H15-	10.0	1500	3.8	1.60	M ₀		11.2	11.4			
					M _N		10.0	10.0			
					M _{0,max}		11.9	22.6			
					M _{max}		20.1	29.0			
					n _{eto}		1220	918			
12H35-	7.5	3525	5.7	2.80	M ₀		5.6	11.2	11.4		
					M _N		5.3	7.5	7.5		
					M _{0,max}		6.0	11.8	22.5		
					M _{max}		10.4	20.1	29.0		
					n _{eto}		3850	2838	2092		
12L20-	13.5	1950	5.9	2.80	M ₀			15.0	15.0		
					M _N			13.5	13.5		
					M _{0,max}			21.4	39.4		
					M _{max}			35.5	56.4		
					n _{eto}			1324	863		
12L41-	11.0	4050	10.2	4.70	M ₀			9.7	15.0	15.0	15.0
					M _N			8.6	11.0	11.0	11.0
					M _{0,max}			10.8	21.3	30.8	39.5
					M _{max}			19.0	35.5	49.6	56.4
					n _{eto}			4450	3013	2236	1907

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCS synchronous servo motors

ECS servo system selection tables

Mains connection 3x 400 V

Motors without blower

					ECS□□	004C□B	008C□B	016C□B	032C□B	048C□B	064C□B
					I _N	2.0	4.0	8.0	12.7	17.0	20.0
					I _{0,max}	2.3	4.6	9.1	18.1	27.2	36.3
MCS	M _N	n _N	I _N	P _N	I _{max}	4.0	8.0	16.0	32.0	48.0	64.0
14D15-	9.2	1500	4.5	1.45	M ₀		8.8	11.0			
					M _N		8.2	9.2			
					M _{0,max}		9.6	17.9			
					M _{max}		15.9	28.3			
					n _{eto}		1141	689			
14D36-	7.5	3600	7.5	2.80	M ₀			8.8	11.0		
					M _N			7.5	7.5		
					M _{0,max}			9.5	17.8		
					M _{max}			15.9	28.3		
					n _{eto}			2496	1614		
14H15-	16.0	1500	6.6	2.50	M ₀			19.8	21.0		
					M _N			16.0	16.0		
					M _{0,max}			22.3	41.2		
					M _{max}			37.1	54.8		
					n _{eto}			920	667		
14H32-	14.0	3225	11.9	4.70	M ₀				15.8	21.0	21.0
					M _N				14.0	14.0	14.0
					M _{0,max}				22.2	32.1	41.3
					M _{max}				37.1	51.9	54.8
					n _{eto}				1953	1471	1409
14L15-	23.0	1500	9.7	3.60	M ₀			18.7	28.0	28.0	
					M _N			19.0	23.0	23.0	
					M _{0,max}			21.9	42.1	59.9	
					M _{max}			37.6	68.5	77.1	
					n _{eto}			1284	828	767	
14L32-	17.2	3225	15.0	5.80	M ₀				14.8	19.8	23.3
					M _N				14.6	17.2	17.2
					M _{0,max}				21.8	32.4	42.2
					M _{max}				37.6	53.9	68.5
					n _{eto}				2801	2096	1757
14P14-	30.0	1350	10.8	4.20	M ₀				37.0	37.0	37.0
					M _N				30.0	30.0	30.0
					M _{0,max}				49.1	70.0	88.4
					M _{max}				80.0	105.1	105.1
					n _{eto}				710	573	573
14P32-	21.0	3225	15.6	7.10	M ₀				19.3	25.9	30.5
					M _N				17.1	21.0	21.0
					M _{0,max}				25.4	37.9	49.3
					M _{max}				43.9	63.0	80.0
					n _{eto}				2469	1829	1495
19F14-	27.0	1425	8.6	4.00	M ₀			25.9	32.0		
					M _N			25.1	27.0		
					M _{0,max}			28.6	54.6		
					M _{max}			48.9	86.0		
					n _{eto}			1204	746		
19F30-	21.0	3000	14.0	6.60	M ₀				20.5	27.5	32.0
					M _N				19.0	21.0	21.0
					M _{0,max}				27.2	40.5	53.0
					M _{max}				47.2	68.3	86.0
					n _{eto}				2774	2033	1653

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



Mains connection 3x 400 V

Motors without blower

					ECS□□	004C□B	008C□B	016C□B	032C□B	048C□B	064C□B
					I _N	2.0	4.0	8.0	12.7	17.0	20.0
					I _{0,max}	2.3	4.6	9.1	18.1	27.2	36.3
MCS	M _N	n _N	I _N	P _N	I _{max}	4.0	8.0	16.0	32.0	48.0	64.0
19J14-	40.0	1425	12.3	6.00	M ₀				42.6	51.0	
					M _N				40.0	40.0	
					M _{0,max}				58.9	82.8	
					M _{max}				96.0	129.0	
					n _{eto}				1063	839	
19J30-	29.0	3000	18.5	9.10	M ₀					28.4	33.4
					M _N					26.6	29.0
					M _{0,max}					42.6	56.9
					M _{max}					73.8	96.0
					n _{eto}					2850	2323
19P14-	51.0	1350	14.3	7.20	M ₀				46.4	62.2	64.0
					M _N				45.3	51.0	51.0
					M _{0,max}				64.6	91.5	120.1
					M _{max}				106.7	155.5	190.0
					n _{eto}				1227	996	870
19P30-	32.0	3000	19.0	10.00	M ₀					31.2	36.7
					M _N					28.6	32.0
					M _{0,max}					45.8	61.1
					M _{max}					81.2	106.7
					n _{eto}					2938	2715

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCS synchronous servo motors

ECS servo system selection tables

Mains connection 3x 400 V

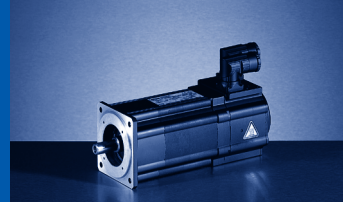
Motors with blower

					ECS□□	004C□B	008C□B	016C□B	032C□B	048C□B	064C□B
					I _N	2.0	4.0	8.0	12.7	17.0	20.0
					I _{0,max}	2.3	4.6	9.1	18.1	27.2	36.3
MCS	M _N	n _N	I _N	P _N	I _{max}	4.0	8.0	16.0	32.0	48.0	64.0
12D17-	7.0	1650	3.0	1.20	M ₀	4.7	7.5	7.5			
					M _N	4.2	7.0	7.0			
					M _{0,max}	4.6	9.1	17.0			
					M _{max}	8.0	15.3	17.7			
					n _{eto}	1730	1089	919			
12D35-	6.0	3525	5.6	2.20	M ₀		4.7	7.5			
					M _N		3.8	6.0			
					M _{0,max}		4.6	8.8			
					M _{max}		7.8	14.7			
					n _{eto}		3902	2433			
12H14-	12.0	1350	4.1	1.70	M ₀		11.2	12.8			
					M _N		10.6	12.0			
					M _{0,max}		11.9	22.6			
					M _{max}		20.1	29.0			
					n _{eto}		1220	918			
12H34-	10.5	3375	7.5	3.70	M ₀		5.6	11.2	12.8		
					M _N		5.3	10.0	7.5		
					M _{0,max}		6.0	11.8	22.5		
					M _{max}		10.4	20.1	29.0		
					n _{eto}		3850	2838	2092		
12L17-	17.0	1650	6.7	2.90	M ₀			19.0	19.0		
					M _N			17.0	17.0		
					M _{0,max}			21.4	39.4		
					M _{max}			35.5	56.4		
					n _{eto}			1324	863		
12L39-	14.0	3900	11.7	5.70	M ₀			9.7	16.7	19.0	19.0
					M _N			8.6	14.0	14.0	14.0
					M _{0,max}			10.8	21.3	30.8	39.5
					M _{max}			19.0	35.5	49.6	56.4
					n _{eto}			4450	3013	2236	1907
14D14-	12.0	1350	5.4	1.70	M ₀		8.8	12.5			
					M _N		8.2	12.0			
					M _{0,max}		9.6	17.9			
					M _{max}		15.9	28.3			
					n _{eto}		1141	689			
14D30-	10.5	3000	9.7	3.30	M ₀			8.8	11.4		
					M _N			8.6	9.7		
					M _{0,max}			9.5	17.8		
					M _{max}			15.9	28.3		
					n _{eto}			2496	1614		
14H12-	23.5	1200	8.3	3.00	M ₀			19.8	25.5		
					M _N			19.6	23.5		
					M _{0,max}			22.3	41.2		
					M _{max}			37.1	54.8		
					n _{eto}			920	667		
14H28-	20.5	2775	15.0	6.00	M ₀				15.8	23.5	25.5
					M _N				15.6	20.5	20.5
					M _{0,max}				22.2	32.1	41.3
					M _{max}				37.1	51.9	54.8
					n _{eto}				1953	1471	1409

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCS synchronous servo motors

ECS servo system selection tables



Mains connection 3x 400 V

Motors with blower

					ECS□□	004C□B	008C□B	016C□B	032C□B	048C□B	064C□B
					I _N	2.0	4.0	8.0	12.7	17.0	20.0
					I _{0,max}	2.3	4.6	9.1	18.1	27.2	36.3
MCS	M _N	n _N	I _N	P _N	I _{max}	4.0	8.0	16.0	32.0	48.0	64.0
14L14-	30.5	1350	11.8	4.30	M ₀			18.7	32.7	34.5	
					M _N			19.0	30.5	30.5	
					M _{0,max}			21.9	42.1	59.9	
					M _{max}			37.6	68.5	77.1	
					n _{eto}			1284	828	767	
14L30-	25.5	3000	20.8	8.00	M ₀					19.8	23.3
					M _N					19.7	23.3
					M _{0,max}					32.4	42.2
					M _{max}					53.9	68.5
					n _{eto}					2096	1757
14P11-	42.0	1050	13.4	4.60	M ₀				39.1	43.5	43.5
					M _N				38.9	42.0	42.0
					M _{0,max}				49.1	70.0	88.4
					M _{max}				80.0	105.1	105.1
					n _{eto}				710	573	573
14P26-	33.0	2625	21.9	9.10	M ₀					25.9	30.5
					M _N					25.6	30.1
					M _{0,max}					37.9	49.3
					M _{max}					63.0	80.0
					n _{eto}					1829	1495
19F12-	38.0	1200	11.3	4.80	M ₀			25.9	41.5		
					M _N			25.1	38.0		
					M _{0,max}			28.6	54.6		
					M _{max}			48.9	86.0		
					n _{eto}			1204	746		
19F29-	32.5	2850	20.1	9.70	M ₀					27.5	33.9
					M _N					27.4	32.5
					M _{0,max}					40.5	53.0
					M _{max}					68.3	86.0
					n _{eto}					2033	1653
19J12-	62.5	1200	18.3	7.90	M ₀					59.0	69.4
					M _N					58.1	62.5
					M _{0,max}					82.8	82.8
					M _{max}					129.0	129.0
					n _{eto}					839	839
19J29-	50.5	2850	31.0	15.10	M ₀						34.3
					M _N						32.6
					M _{0,max}						56.9
					M _{max}						96.0
					n _{eto}						2323
19P12-	72.0	1200	21.3	9.00	M ₀					62.2	76.8
					M _N					57.5	67.6
					M _{0,max}					91.5	120.1
					M _{max}					155.5	190.0
					n _{eto}					996	870
19P29-	53.0	2850	29.5	15.80	M ₀						36.7
					M _N						35.9
					M _{0,max}						61.1
					M _{max}						106.7
					n _{eto}						2715

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCS synchronous servo motors

ECS servo system selection tables

Mains connection 3x 230 V

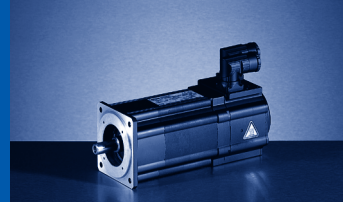
Motors without blower

					ECS□□	004C□B	008C□B	016C□B	032C□B	048C□B	064C□B
					I _N	2.0	4.0	8.0	12.7	17.0	20.0
					I _{0,max}	2.3	4.6	9.1	18.1	27.2	36.3
MCS	M _N	n _N	I _N	P _N	I _{max}	4.0	8.0	16.0	32.0	48.0	64.0
06C41L	0.6	4050	2.6	0.25	M ₀	0.6	0.8				
					M _N	0.5	0.6				
					M _{0,max}	0.6	1.1				
					M _{max}	1.0	1.9				
					n _{eto}	6298	2835				
06C60L	0.5	6000	4.0	0.31	M ₀		0.7	0.8			
					M _N		0.5	0.5			
					M _{0,max}		0.7	1.3			
					M _{max}		1.2	2.2			
					n _{eto}		7000	1149			
06F41L	1.2	4050	2.9	0.51	M ₀	1.0	1.5	1.5			
					M _N	0.8	1.2	1.2			
					M _{0,max}	1.2	2.1	3.9			
					M _{max}	1.9	3.5	4.4			
					n _{eto}	3838	2118	2831			
06F60L	0.9	6000	3.8	0.57	M ₀		1.5	1.5			
					M _N		0.9	0.9			
					M _{0,max}		1.5	2.9			
					M _{max}		2.6	4.3			
					n _{eto}		6138	3182			
06I41L	1.5	4050	3.2	0.64	M ₀	1.3	2.0	2.0			
					M _N	1.0	1.5	1.5			
					M _{0,max}	1.4	2.8	5.0			
					M _{max}	2.4	4.4	6.2			
					n _{eto}	3549	1947	2831			
06I60L	1.2	6000	3.8	0.75	M ₀		1.9	2.0			
					M _N		1.2	1.2			
					M _{0,max}		2.1	4.1			
					M _{max}		3.6	6.2			
					n _{eto}		3417	1149			
09D41L	2.3	4050	4.6	1.00	M ₀		2.5	3.3	3.3		
					M _N		2.0	2.3	2.3		
					M _{0,max}		2.5	4.9	8.8		
					M _{max}		4.4	8.0	9.5		
					n _{eto}		4091	2547	2170		
09D60L	1.8	6000	7.0	1.10	M ₀			2.6	3.3	3.3	
					M _N			1.8	1.8	1.8	
					M _{0,max}			2.6	5.0	7.1	
					M _{max}			4.5	8.1	9.5	
					n _{eto}			7000	5373	4626	
09F38L	3.1	3750	5.0	1.20	M ₀			4.2	4.2		
					M _N			3.1	3.1		
					M _{0,max}			6.1	10.8		
					M _{max}			9.8	15.0		
					n _{eto}			1149	1951		
09F60L	2.4	6000	7.9	1.50	M ₀			3.2	4.2	4.2	4.2
					M _N			2.4	2.4	2.4	2.4
					M _{0,max}			3.6	6.8	9.6	11.9
					M _{max}			6.1	10.9	14.3	15.0
					n _{eto}			6985	3448	2612	2397

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCS synchronous servo motors

ECS servo system selection tables



Mains connection 3x 230 V

Motors without blower

					ECS□□	004C□B	008C□B	016C□B	032C□B	048C□B	064C□B
					I _N	2.0	4.0	8.0	12.7	17.0	20.0
					I _{0,max}	2.3	4.6	9.1	18.1	27.2	36.3
MCS	M _N	n _N	I _N	P _N	I _{max}	4.0	8.0	16.0	32.0	48.0	64.0
09H41L	3.8	4050	6.8	1.60	M ₀			5.2	5.5	5.5	
					M _N			3.8	3.8	3.8	
					M _{0,max}			5.9	11.0	15.3	
					M _{max}			9.9	17.2	20.0	
					n _{eto}			1149	2138	1852	
09H60L	3.0	6000	8.0	1.90	M ₀			3.7	5.5	5.5	5.5
					M _N			3.0	3.0	3.0	3.0
					M _{0,max}			4.1	8.0	11.5	14.5
					M _{max}			7.2	13.2	17.9	20.0
					n _{eto}			1149	4081	2984	2695
09L41L	4.5	4050	8.4	1.90	M ₀			4.8	7.5	7.5	7.5
					M _N			4.3	4.5	4.5	4.5
					M _{0,max}			5.2	10.3	15.1	19.6
					M _{max}			9.1	17.5	25.1	31.9
					n _{eto}			4562	3243	2497	1909
12D20L	5.5	1950	5.2	1.10	M ₀		4.7	6.4			
					M _N		4.2	5.5			
					M _{0,max}		4.6	9.0			
					M _{max}		8.0	14.9			
					n _{eto}		1878	1181			
12D41L	4.3	4050	8.8	1.80	M ₀			4.8	6.4	6.4	
					M _N			3.9	4.3	4.3	
					M _{0,max}			4.6	9.2	13.3	
					M _{max}			8.1	15.2	17.9	
					n _{eto}			4102	2535	2187	
12H15L	10.0	1500	7.6	1.60	M ₀			11.2	11.4		
					M _N			10.0	10.0		
					M _{0,max}			11.8	22.5		
					M _{max}			20.1	29.0		
					n _{eto}			1098	827		
12H30L	8.0	3000	10.5	2.50	M ₀			6.8	10.7	11.4	
					M _N			6.1	8.0	8.0	
					M _{0,max}			7.2	14.3	20.9	
					M _{max}			12.7	24.3	29.0	
					n _{eto}			2831	1849	1591	
12L20L	13.5	1950	11.8	2.80	M ₀				15.0	15.0	15.0
					M _N				13.5	13.5	13.5
					M _{0,max}				21.3	30.7	39.4
					M _{max}				35.4	49.3	56.0
					n _{eto}				1307	1004	866

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCS synchronous servo motors

EVS9300 servo inverter selection tables

Mains connection 3x 400 V

Motors without blower

					EVS	9321-E□	9322-E□	9323-E□	9324-E□	9325-E□	9326-E□	9327-E□	9328-E□	9329-E□
					I _N	1.5	2.5	3.9	7.0	13.0	23.5	32.0	47.0	59.0
					I _{0,max}	2.3	3.8	5.9	10.5	19.5	23.5	32.0	47.0	52.0
MCS	M _N	n _N	I _N	P _N	I _{max}	2.3	3.8	5.9	10.5	19.5	35.3	48.0	70.5	88.5
06C41-	0.6	4050	1.3	0.25	M ₀	0.8	0.8	0.8						
					M _N	0.6	0.6	0.6						
					M _{0,max}	1.2	1.8	2.4						
					M _{max}	1.2	1.8	2.4						
					n _{eto}	4635	2871	2019						
06C60-	0.5	6000	2.4	0.31	M ₀		0.8	0.8	0.8					
					M _N		0.5	0.5	0.5					
					M _{0,max}		1.0	1.5	2.4					
					M _{max}		1.0	1.5	2.4					
					n _{eto}		7000	7000	5368					
06F41-	1.2	4050	1.5	0.51	M ₀	1.5	1.5	1.5						
					M _N	1.2	1.2	1.2						
					M _{0,max}	2.0	3.4	4.4						
					M _{max}	2.0	3.4	4.4						
					n _{eto}	2819	1973	1562						
06F60-	0.9	6000	2.5	0.57	M ₀		1.3	1.5	1.5					
					M _N		0.9	0.9	0.9					
					M _{0,max}		1.7	3.0	4.4					
					M _{max}		1.7	3.0	4.4					
					n _{eto}		7000	5714	3773					
06I41-	1.5	4050	1.6	0.64	M ₀	1.8	2.0	2.0						
					M _N	1.4	1.5	1.5						
					M _{0,max}	2.6	4.2	6.2						
					M _{max}	2.6	4.2	6.2						
					n _{eto}	2994	1980	1384						
06I60-	1.2	6000	2.9	0.75	M ₀		1.5	2.0	2.0					
					M _N		1.0	1.2	1.2					
					M _{0,max}		2.1	3.3	5.7					
					M _{max}		2.1	3.3	5.7					
					n _{eto}		7000	5486	3414					
09D41-	2.3	4050	2.3	1.00	M ₀		3.1	3.3	3.3					
					M _N		2.3	2.3	2.3					
					M _{0,max}		4.2	6.2	9.4					
					M _{max}		4.2	6.2	9.4					
					n _{eto}		4895	2937	2008					
09D60-	1.8	6000	3.8	1.10	M ₀			2.4	3.3	3.3				
					M _N			1.8	1.8	1.8				
					M _{0,max}			3.2	5.6	9.3				
					M _{max}			3.2	5.6	9.3				
					n _{eto}			7000	7000	4492				
09F38-	3.1	3750	2.5	1.20	M ₀		3.5	4.2	4.2					
					M _N		3.1	3.1	3.1					
					M _{0,max}		5.2	7.7	12.0					
					M _{max}		5.2	7.7	12.0					
					n _{eto}		4000	3250	2173					
09F60-	2.4	6000	4.5	1.50	M ₀				4.2	4.2				
					M _N				2.4	2.4				
					M _{0,max}				6.9	11.4				
					M _{max}				6.9	11.4				
					n _{eto}				7000	5035				

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCS synchronous servo motors

EVS9300 servo inverter selection tables



Mains connection 3x 400 V

Motors without blower

					EVS	9321-E□	9322-E□	9323-E□	9324-E□	9325-E□	9326-E□	9327-E□	9328-E□	9329-E□
					I _N	1.5	2.5	3.9	7.0	13.0	23.5	32.0	47.0	59.0
					I _{0,max}	2.3	3.8	5.9	10.5	19.5	23.5	32.0	47.0	52.0
MCS	M _N	n _N	I _N	P _N	I _{max}	2.3	3.8	5.9	10.5	19.5	35.3	48.0	70.5	88.5
09H41-	3.8	4050	3.4	1.60	M ₀			5.0	5.5	5.5				
					M _N			3.8	3.8	3.8				
					M _{0,max}			7.5	12.5	20.1				
					M _{max}			7.5	12.5	20.1				
					n _{eto}			4250	2977	1988				
09H60-	3.0	6000	6.0	1.90	M ₀				4.5	5.5				
					M _N				3.0	3.0				
					M _{0,max}				6.7	11.7				
					M _{max}				6.7	11.7				
					n _{eto}				7000	7000				
09L41-	4.5	4050	4.2	1.90	M ₀			4.7	7.5	7.5				
					M _N			4.2	4.5	4.5				
					M _{0,max}			6.7	11.7	20.8				
					M _{max}			6.7	11.7	20.8				
					n _{eto}			4450	4154	2796				
09L51-	3.6	5100	6.9	1.90	M ₀				4.2	7.5	7.5			
					M _N				3.6	3.6	3.6			
					M _{0,max}				6.0	11.1	13.2			
					M _{max}				6.0	11.1	19.1			
					n _{eto}				7000	7000	7000			
12D20-	5.5	1950	2.6	1.10	M ₀		5.9	6.4	6.4					
					M _N		5.3	5.5	5.5					
					M _{0,max}		7.6	11.6	17.7					
					M _{max}		7.6	11.6	17.7					
					n _{eto}		1790	1358	919					
12D41-	4.3	4050	4.5	1.80	M ₀			4.6	6.4	6.4				
					M _N			3.7	4.3	4.3				
					M _{0,max}			5.9	10.1	17.3				
					M _{max}			5.9	10.1	17.3				
					n _{eto}			4344	3275	2116				
12H15-	10.0	1500	3.8	1.60	M ₀			10.9	11.4	11.4				
					M _N			10.0	10.0	10.0				
					M _{0,max}			15.1	25.8	29.0				
					M _{max}			15.1	25.8	29.0				
					n _{eto}			1676	1013	918				
12H35-	7.5	3525	5.7	2.80	M ₀				9.8	11.4				
					M _N				7.5	7.5				
					M _{0,max}				13.5	24.1				
					M _{max}				13.5	24.1				
					n _{eto}				3618	2447				
12L20-	13.5	1950	5.9	2.80	M ₀				15.0	15.0				
					M _N				13.5	13.5				
					M _{0,max}				24.4	41.9				
					M _{max}				24.4	41.9				
					n _{eto}				1718	1158				
12L41-	11.0	4050	10.2	4.70	M ₀					15.0	15.0	15.0		
					M _N					11.0	11.0	11.0		
					M _{0,max}					22.8	27.0	35.5		
					M _{max}					22.8	38.5	49.6		
					n _{eto}					4287	2799	2236		

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCS synchronous servo motors

EVS9300 servo inverter selection tables

Mains connection 3x 400 V

Motors without blower

					EVS	9321-E□	9322-E□	9323-E□	9324-E□	9325-E□	9326-E□	9327-E□	9328-E□	9329-E□
					I _N	1.5	2.5	3.9	7.0	13.0	23.5	32.0	47.0	59.0
					I _{0,max}	2.3	3.8	5.9	10.5	19.5	23.5	32.0	47.0	52.0
MCS	M _N	n _N	I _N	P _N	I _{max}	2.3	3.8	5.9	10.5	19.5	35.3	48.0	70.5	88.5
14D15-	9.2	1500	4.5	1.45	M ₀			8.5	11.0	11.0				
					M _N			8.0	9.2	9.2				
					M _{0,max}			12.1	20.2	29.0				
					M _{max}			12.1	20.2	29.0				
					n _{eto}			1437	928	676				
14D36-	7.5	3600	7.5	2.80	M ₀				7.7	11.0	11.0			
					M _N				7.0	7.5	7.5			
					M _{0,max}				10.9	19.0	22.2			
					M _{max}				10.9	19.0	29.0			
					n _{eto}				3479	2159	1593			
14H15-	16.0	1500	6.6	2.50	M ₀				17.3	21.0				
					M _N				16.0	16.0				
					M _{0,max}				25.4	43.9				
					M _{max}				25.4	43.9				
					n _{eto}				1247	800				
14H32-	14.0	3225	11.9	4.70	M ₀					16.2	21.0	21.0		
					M _N					14.0	14.0	14.0		
					M _{0,max}					23.8	28.2	37.1		
					M _{max}					23.8	40.2	51.9		
					n _{eto}					2875	1817	1471		
14L15-	23.0	1500	9.7	3.60	M ₀					28.0	28.0			
					M _N					23.0	23.0			
					M _{0,max}					45.0	52.9			
					M _{max}					45.0	73.8			
					n _{eto}					1126	788			
14L32-	17.2	3225	15.0	5.80	M ₀					15.2	27.4	28.0	28.0	
					M _N					14.9	17.2	17.2	17.2	
					M _{0,max}					23.5	28.3	37.6	52.9	
					M _{max}					23.5	41.0	53.9	73.9	
					n _{eto}					3953	2608	2096	1672	
14P14-	30.0	1350	10.8	4.20	M ₀					37.0	37.0	37.0		
					M _N					30.0	30.0	30.0		
					M _{0,max}					52.5	61.8	80.0		
					M _{max}					52.5	86.3	105.1		
					n _{eto}					998	668	573		
14P32-	21.0	3225	15.6	7.10	M ₀					19.8	35.8	37.0	37.0	
					M _N					17.5	21.0	21.0	21.0	
					M _{0,max}					27.4	33.0	43.9	61.8	
					M _{max}					27.4	47.9	63.0	86.4	
					n _{eto}					3300	2299	1829	1404	
19F14-	27.0	1425	8.6	4.00	M ₀				22.6	32.0	32.0			
					M _N				22.0	27.0	27.0			
					M _{0,max}				33.0	58.2	68.3			
					M _{max}				33.0	58.2	86.0			
					n _{eto}				1459	1056	746			
19F30-	21.0	3000	14.0	6.60	M ₀					21.0	32.0	32.0		
					M _N					19.5	21.0	21.0		
					M _{0,max}					29.2	35.2	47.2		
					M _{max}					29.2	51.5	68.3		
					n _{eto}					3352	2573	2033		

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCS synchronous servo motors

EVS9300 servo inverter selection tables



Mains connection 3x 400 V

Motors without blower

					EVS	9321-E□	9322-E□	9323-E□	9324-E□	9325-E□	9326-E□	9327-E□	9328-E□	9329-E□
					I _N	1.5	2.5	3.9	7.0	13.0	23.5	32.0	47.0	59.0
					I _{0,max}	2.3	3.8	5.9	10.5	19.5	23.5	32.0	47.0	52.0
MCS	M _N	n _N	I _N	P _N	I _{max}	2.3	3.8	5.9	10.5	19.5	35.3	48.0	70.5	88.5
19J14-	40.0	1425	12.3	6.00	M ₀					43.6	51.0	51.0		
					M _N					40.0	40.0	40.0		
					M _{0,max}					60.8	72.4	96.0		
					M _{max}					60.8	104.5	129.0		
					n _{eto}					1376	996	839		
19J30-	29.0	3000	18.5	9.10	M ₀						39.3	51.0	51.0	51.0
					M _N						29.0	29.0	29.0	29.0
					M _{0,max}						36.8	50.2	72.4	79.5
					M _{max}						55.2	73.8	104.7	127.6
					n _{eto}						3150	2850	2162	1817
19P14-	51.0	1350	14.3	7.20	M ₀					47.5	64.0	64.0		
					M _N					46.4	51.0	51.0		
					M _{0,max}					69.5	79.6	106.7		
					M _{max}					69.5	116.7	155.5		
					n _{eto}					1400	1187	996		
19P30-	32.0	3000	19.0	10.00	M ₀						43.1	58.7	64.0	64.0
					M _N						32.0	32.0	32.0	32.0
					M _{0,max}						39.6	53.9	79.6	87.6
					M _{max}						59.3	81.2	116.9	144.3
					n _{eto}						3000	2938	2638	2298

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCS synchronous servo motors

EVS9300 servo inverter selection tables

Mains connection 3x 400 V

Motors with blower

					EVS	9322-E□	9323-E□	9324-E□	9325-E□	9326-E□	9327-E□	9328-E□	9329-E□
					I _N	2.5	3.9	7.0	13.0	23.5	32.0	47.0	59.0
					I _{0,max}	3.8	5.9	10.5	19.5	23.5	32.0	47.0	52.0
MCS	M _N	n _N	I _N	P _N	I _{max}	3.8	5.9	10.5	19.5	35.3	48.0	70.5	88.5
12D17-	7.0	1650	3.0	1.20	M ₀	5.9	7.5	7.5					
					M _N	5.3	7.0	7.0					
					M _{0,max}	7.6	11.6	17.7					
					M _{max}	7.6	11.6	17.7					
					n _{eto}	1790	1358	919					
12D35-	6.0	3525	5.6	2.20	M ₀		4.6	7.5	7.5				
					M _N		3.7	6.0	6.0				
					M _{0,max}		5.9	10.1	17.3				
					M _{max}		5.9	10.1	17.3				
					n _{eto}		4344	3275	2116				
12H14-	12.0	1350	4.1	1.70	M ₀		10.9	12.8	12.8				
					M _N		10.3	12.0	12.0				
					M _{0,max}		15.1	25.8	29.0				
					M _{max}		15.1	25.8	29.0				
					n _{eto}		1676	1013	918				
12H34-	10.5	3375	7.5	3.70	M ₀			9.8	12.8				
					M _N			9.6	10.5				
					M _{0,max}			13.5	24.1				
					M _{max}			13.5	24.1				
					n _{eto}			3618	2447				
12L17-	17.0	1650	6.7	2.90	M ₀			18.5	19.0				
					M _N			17.0	17.0				
					M _{0,max}			24.4	41.9				
					M _{max}			24.4	41.9				
					n _{eto}			1718	1158				
12L39-	14.0	3900	11.7	5.70	M ₀				17.2	19.0	19.0		
					M _N				14.0	14.0	14.0		
					M _{0,max}				22.8	27.0	35.5		
					M _{max}				22.8	38.5	49.6		
					n _{eto}				4287	2799	2236		
14D14-	12.0	1350	5.4	1.70	M ₀		8.5	12.5	12.5				
					M _N		8.0	12.0	12.0				
					M _{0,max}		12.1	20.2	29.0				
					M _{max}		12.1	20.2	29.0				
					n _{eto}		1437	928	676				
14D30-	10.5	3000	9.7	3.30	M ₀			7.7	12.5	12.5			
					M _N			7.0	10.0	10.0			
					M _{0,max}			10.9	19.0	22.2			
					M _{max}			10.9	19.0	29.0			
					n _{eto}			3479	2159	1593			
14H12-	23.5	1200	8.3	3.00	M ₀			17.3	25.5				
					M _N			17.2	23.5				
					M _{0,max}			25.4	43.9				
					M _{max}			25.4	43.9				
					n _{eto}			1247	800				
14H28-	20.5	2775	15.0	6.00	M ₀				16.2	25.5	25.5		
					M _N				16.1	20.5	20.5		
					M _{0,max}				23.8	28.2	37.1		
					M _{max}				23.8	40.2	51.9		
					n _{eto}				2875	1817	1471		

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCS synchronous servo motors

EVS9300 servo inverter selection tables



Mains connection 3x 400 V

Motors with blower

					EVS	9322-E□	9323-E□	9324-E□	9325-E□	9326-E□	9327-E□	9328-E□	9329-E□
					I _N	2.5	3.9	7.0	13.0	23.5	32.0	47.0	59.0
					I _{0,max}	3.8	5.9	10.5	19.5	23.5	32.0	47.0	52.0
MCS	M _N	n _N	I _N	P _N	I _{max}	3.8	5.9	10.5	19.5	35.3	48.0	70.5	88.5
14L14-	30.5	1350	11.8	4.30	M ₀				33.4	34.5			
					M _N				30.5	30.5			
					M _{0,max}				45.0	52.9			
					M _{max}				45.0	73.8			
					n _{eto}				1126	788			
14L30-	25.5	3000	20.8	8.00	M ₀					27.4	34.5	34.5	
					M _N					25.5	25.5	25.5	
					M _{0,max}					28.3	37.6	52.9	
					M _{max}					41.0	53.9	73.9	
					n _{eto}					2608	2096	1672	
14P11-	42.0	1050	13.4	4.60	M ₀				40.1	43.5	43.5		
					M _N				40.0	42.0	42.0		
					M _{0,max}				52.5	61.8	80.0		
					M _{max}				52.5	86.3	105.1		
					n _{eto}				998	668	573		
14P26-	33.0	2625	21.9	9.10	M ₀					35.8	43.5	43.5	
					M _N					33.0	33.0	33.0	
					M _{0,max}					33.0	43.9	61.8	
					M _{max}					47.9	63.0	86.4	
					n _{eto}					2299	1829	1404	
19F12-	38.0	1200	11.3	4.80	M ₀			22.6	41.5	41.5			
					M _N			22.0	38.0	38.0			
					M _{0,max}			33.0	58.2	68.3			
					M _{max}			33.0	58.2	86.0			
					n _{eto}			1459	1056	746			
19F29-	32.5	2850	20.1	9.70	M ₀					39.9	41.5		
					M _N					32.5	32.5		
					M _{0,max}					35.2	47.2		
					M _{max}					51.5	68.3		
					n _{eto}					2573	2033		
19J12-	62.5	1200	18.3	7.90	M ₀				43.6	70.5	70.5		
					M _N				43.4	62.5	62.5		
					M _{0,max}				60.8	72.4	96.0		
					M _{max}				60.8	104.5	129.0		
					n _{eto}				1376	996	839		
19J29-	50.5	2850	31.0	15.10	M ₀						55.5	70.5	70.5
					M _N						50.5	50.5	50.5
					M _{0,max}						50.2	72.4	79.5
					M _{max}						73.8	104.7	127.6
					n _{eto}						2850	2162	1817
19P12-	72.0	1200	21.3	9.00	M ₀				47.5	86.0	86.0		
					M _N				46.4	72.0	72.0		
					M _{0,max}				69.5	79.6	106.7		
					M _{max}				69.5	116.7	155.5		
					n _{eto}				1400	1187	996		
19P29-	53.0	2850	29.5	15.80	M ₀						58.7	86.0	86.0
					M _N						53.0	53.0	53.0
					M _{0,max}						53.9	79.6	87.6
					M _{max}						81.2	116.9	144.3
					n _{eto}						2938	2638	2298

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

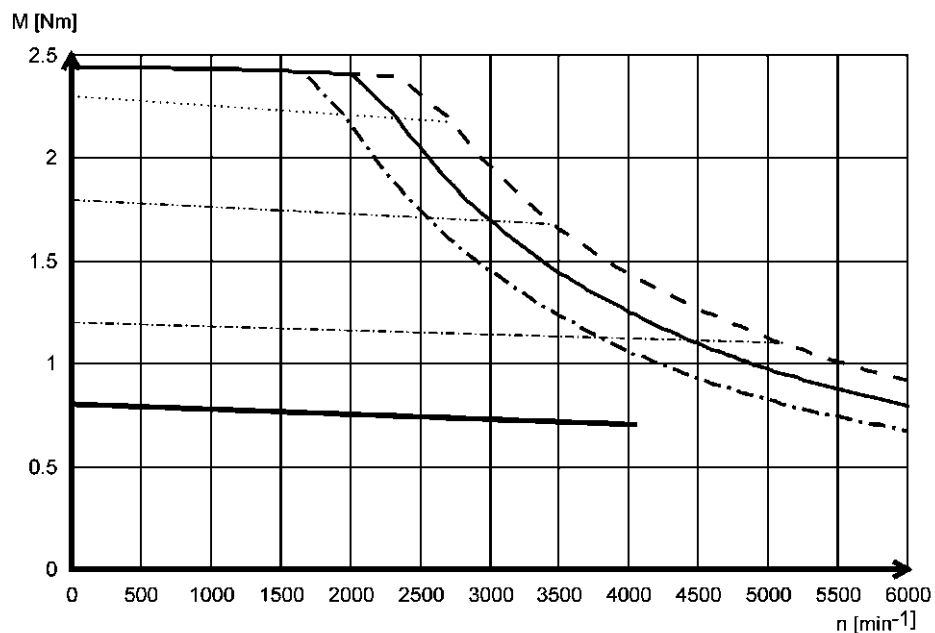


MCS synchronous servo motors

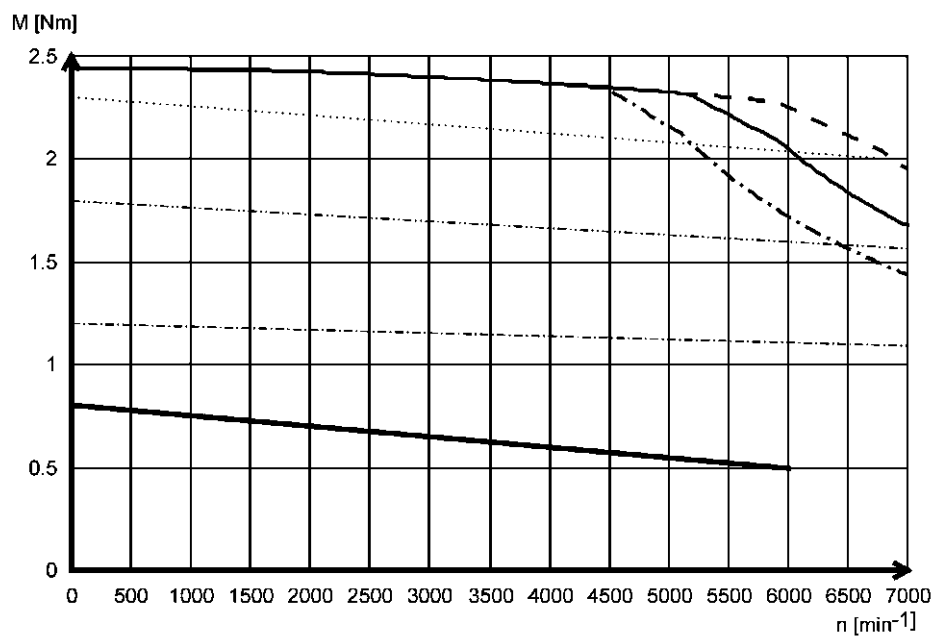
Torque characteristics

Mains connection 3x 400 V

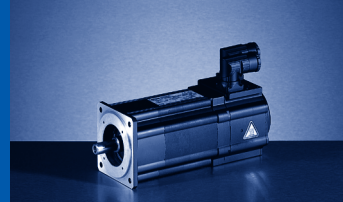
MCS06C41



MCS06C60

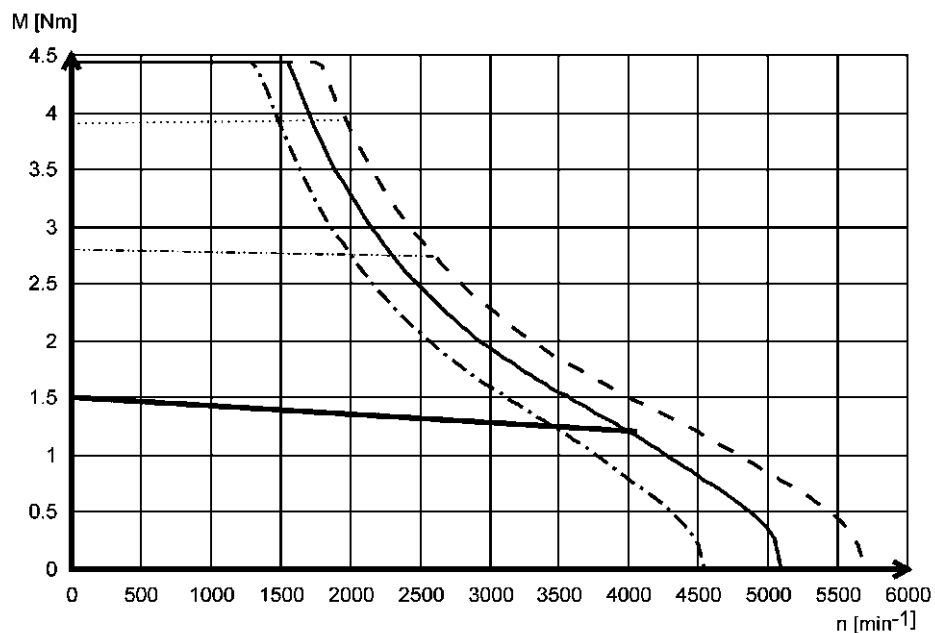


► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

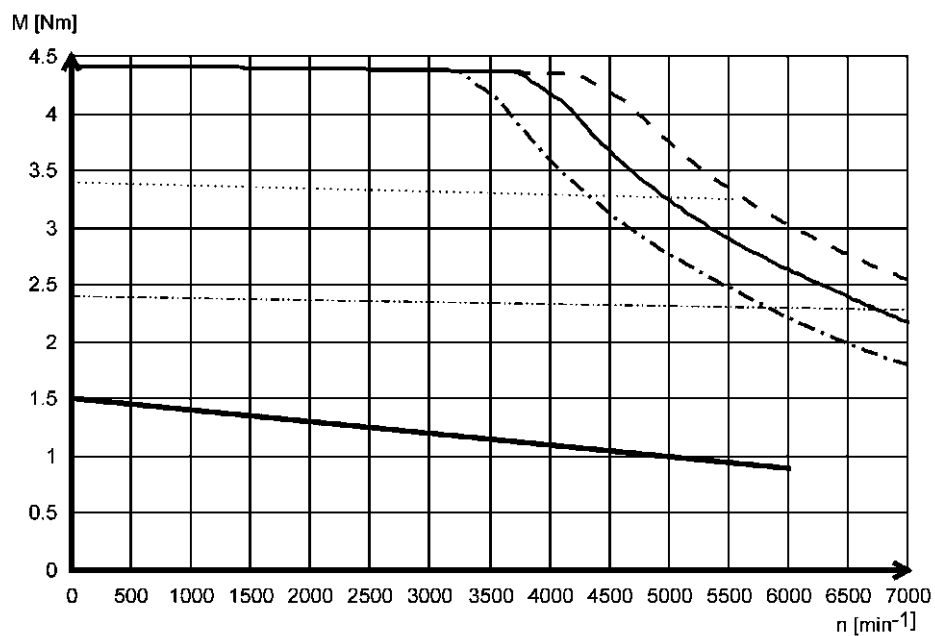


Mains connection 3x 400 V

MCS06F41



MCS06F60



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

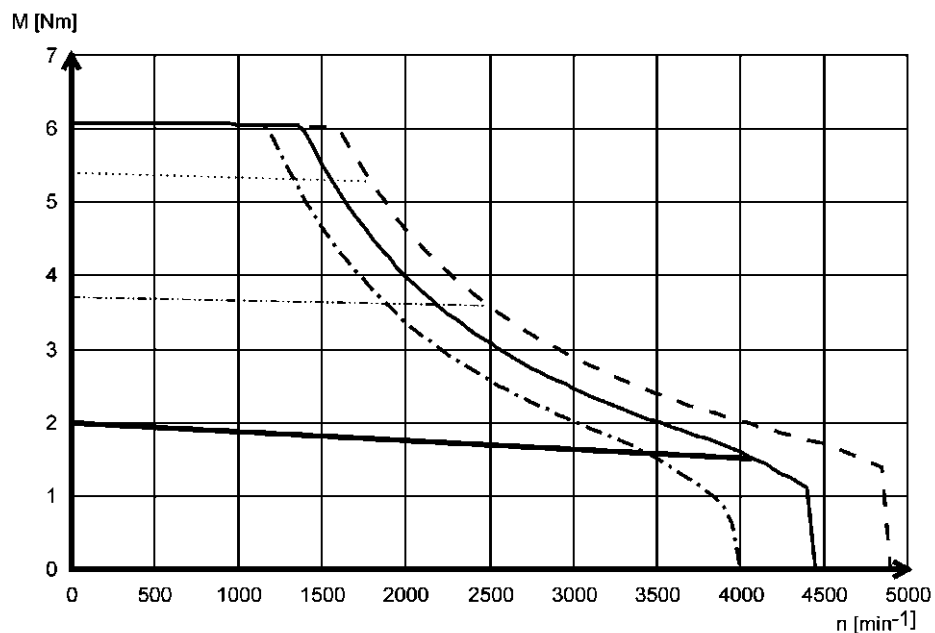


MCS synchronous servo motors

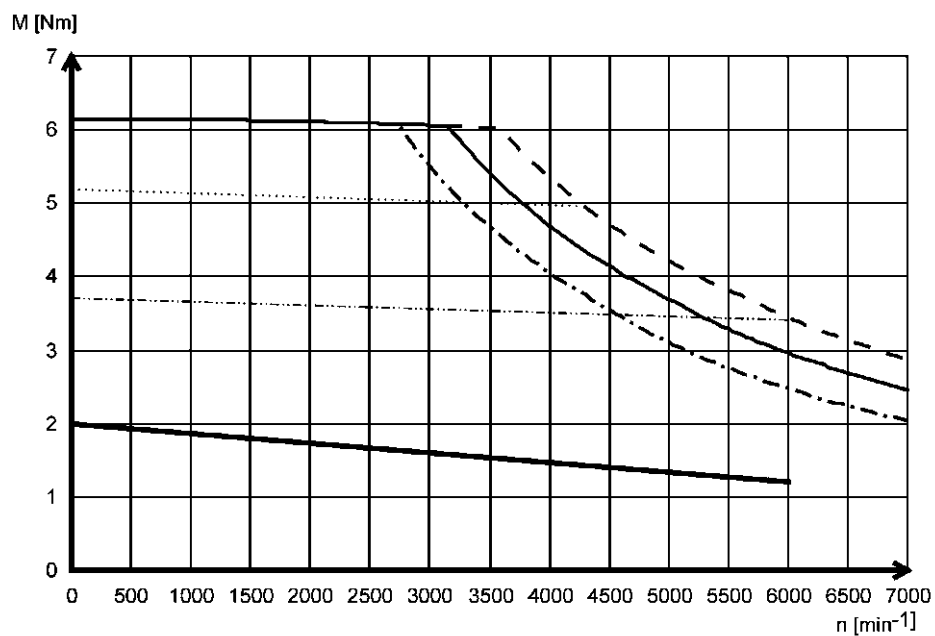
Torque characteristics

Mains connection 3x 400 V

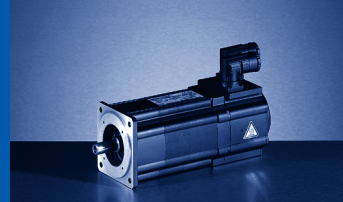
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MCS06I60

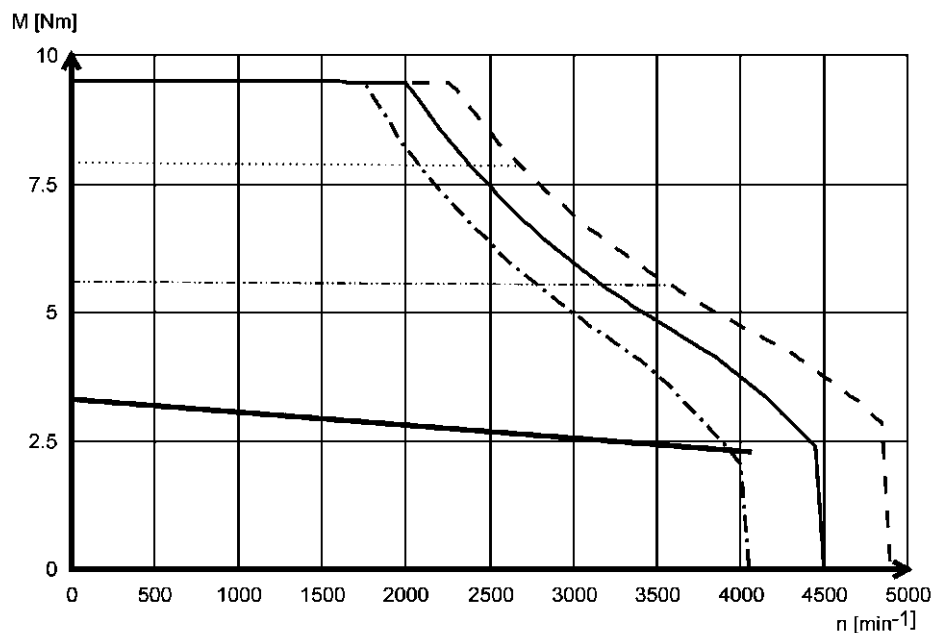


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

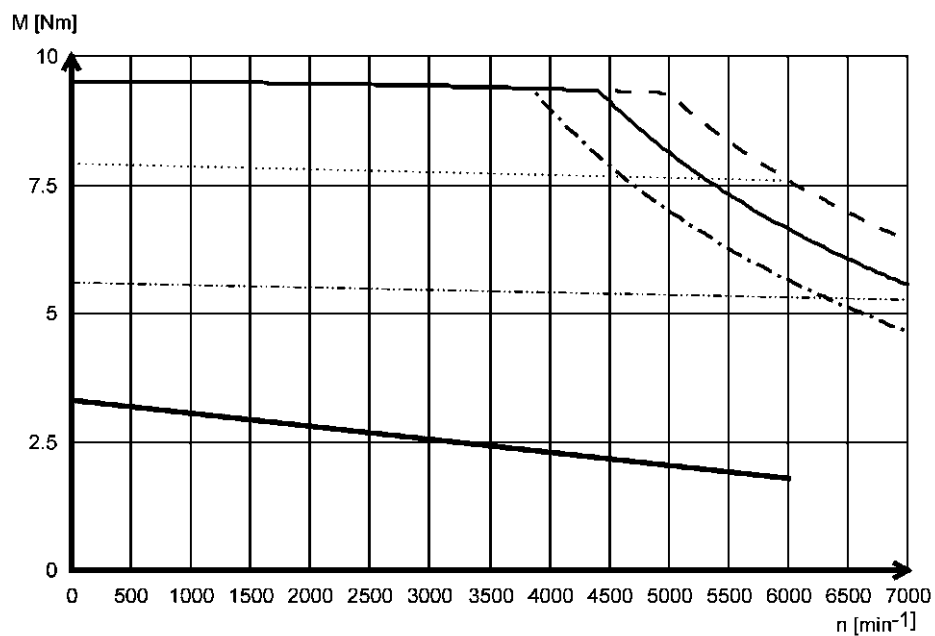


Mains connection 3x 400 V

MCS09D41



MCS09D60



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

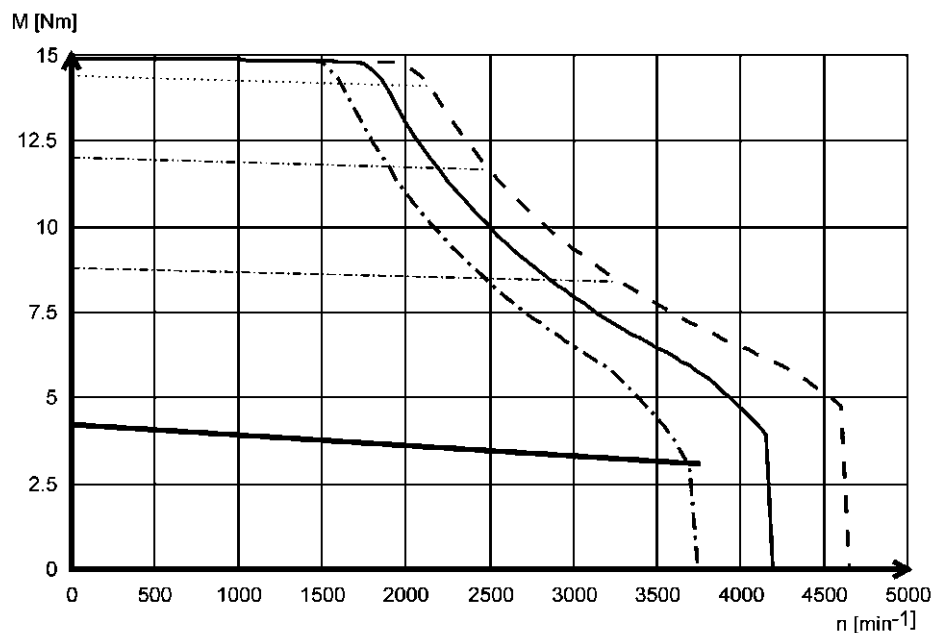


MCS synchronous servo motors

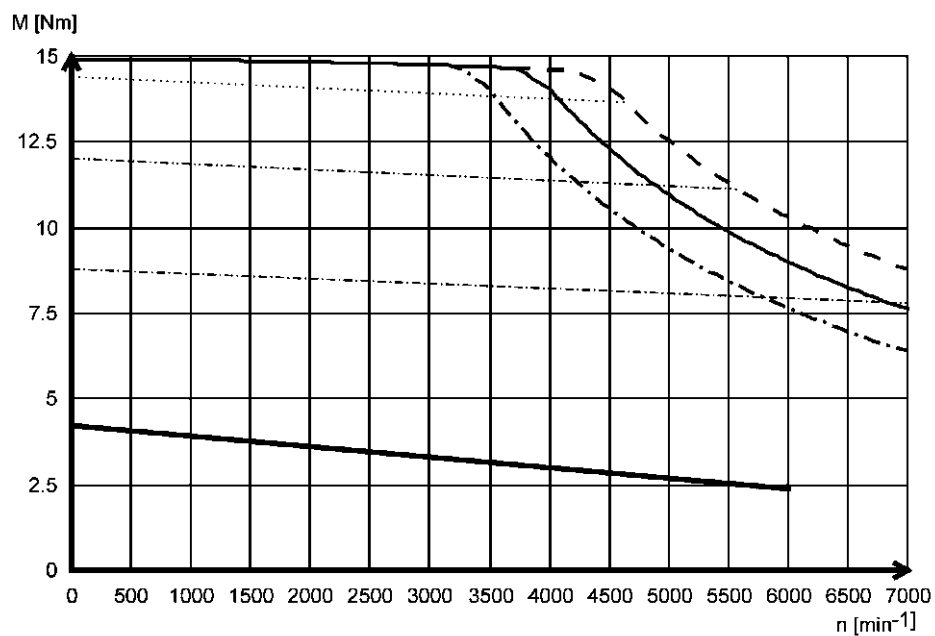
Torque characteristics

Mains connection 3x 400 V

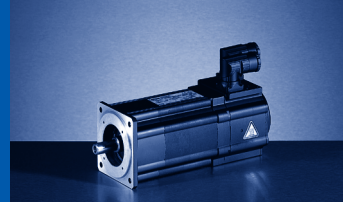
MCS09F38



MCS09F60

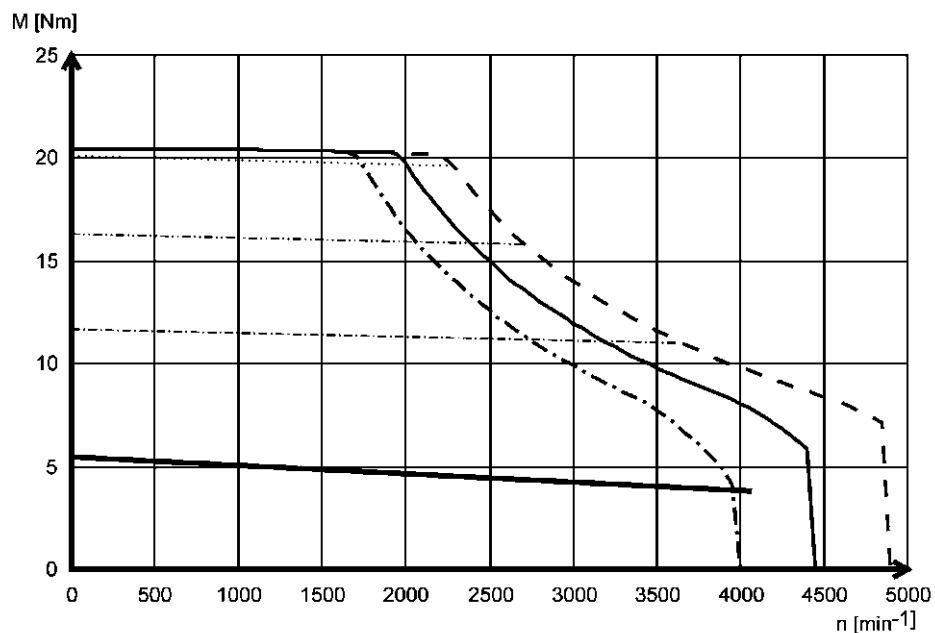


► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

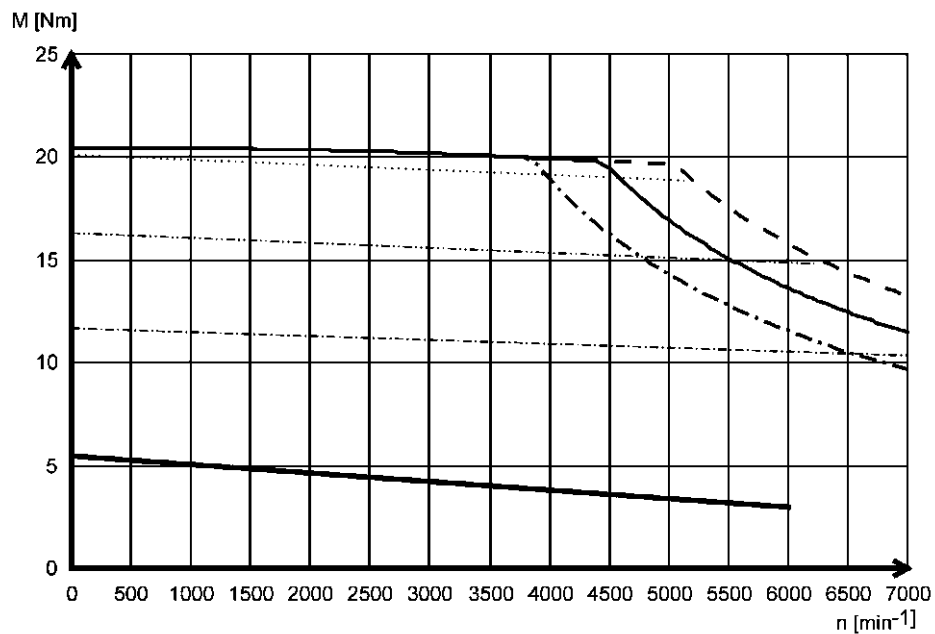


Mains connection 3x 400 V

MCS09H41



MCS09H60



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

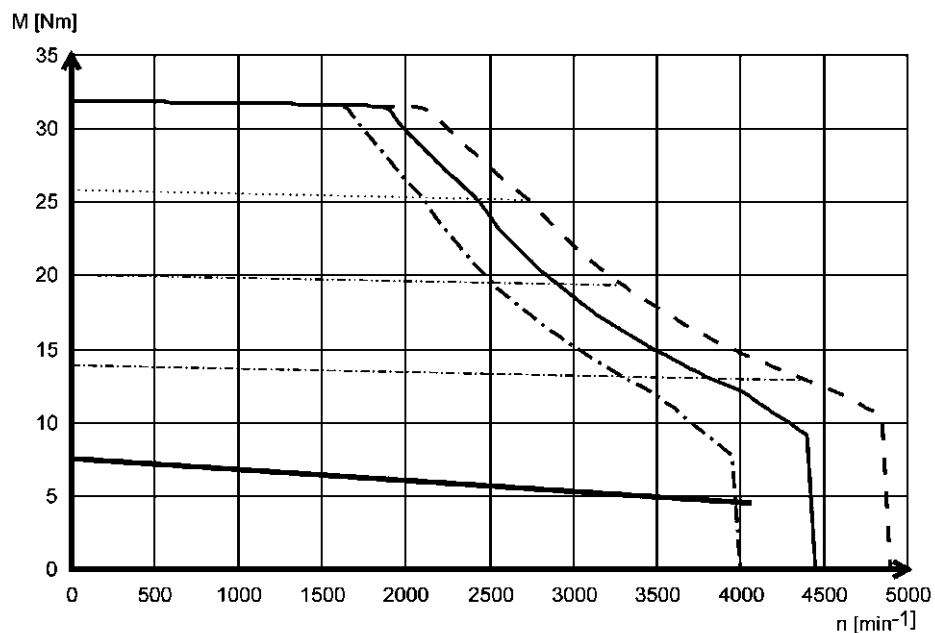


MCS synchronous servo motors

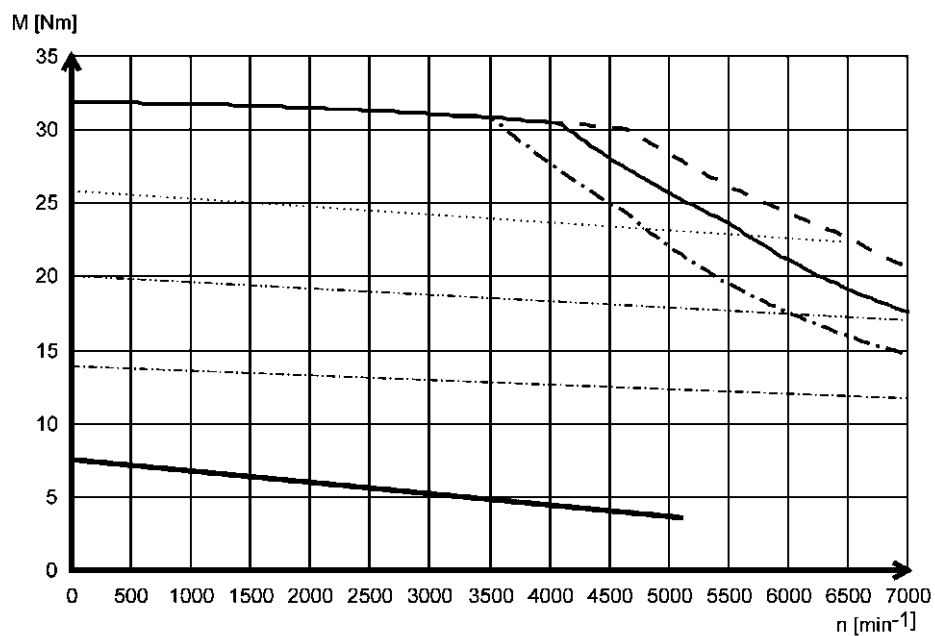
Torque characteristics

Mains connection 3x 400 V

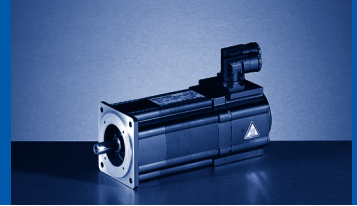
MCS09L41



MCS09L51

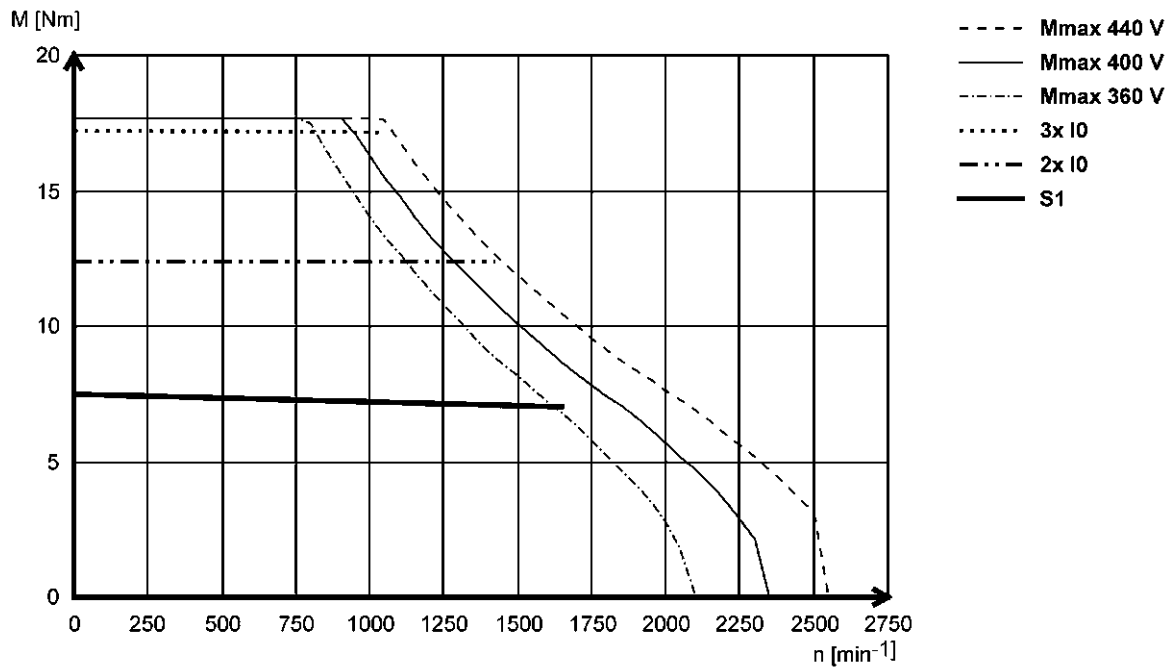


► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

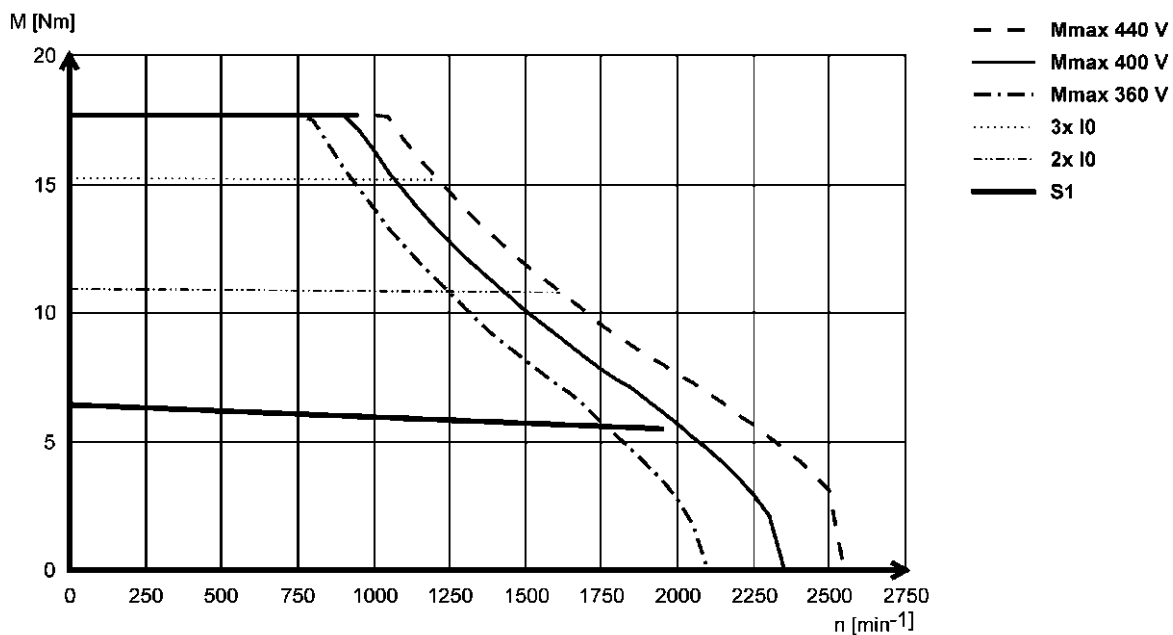


Mains connection 3x 400 V

MCS12D17



MCS12D20



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

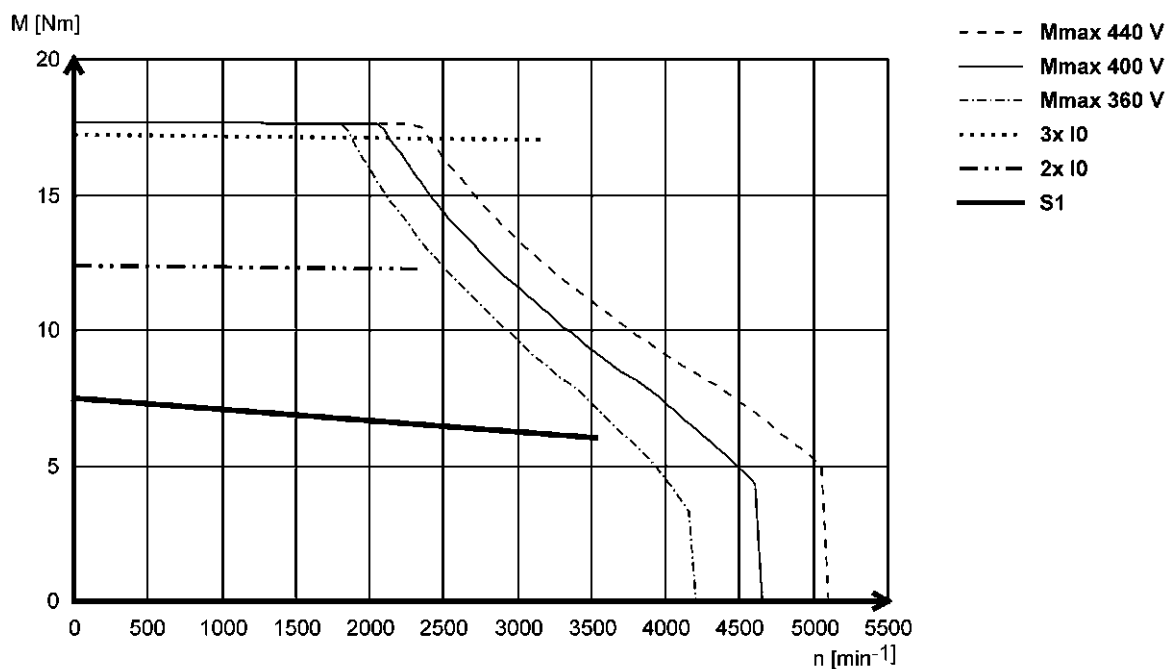


MCS synchronous servo motors

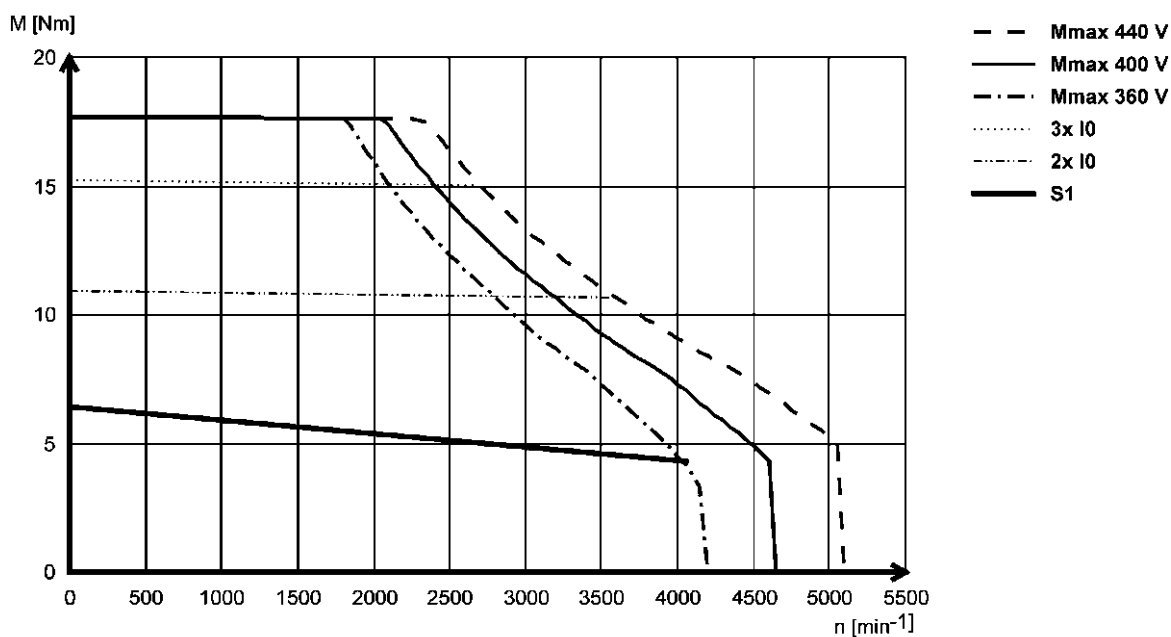
Torque characteristics

Mains connection 3x 400 V

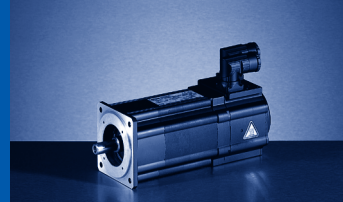
MCS12D35



MCS12D41

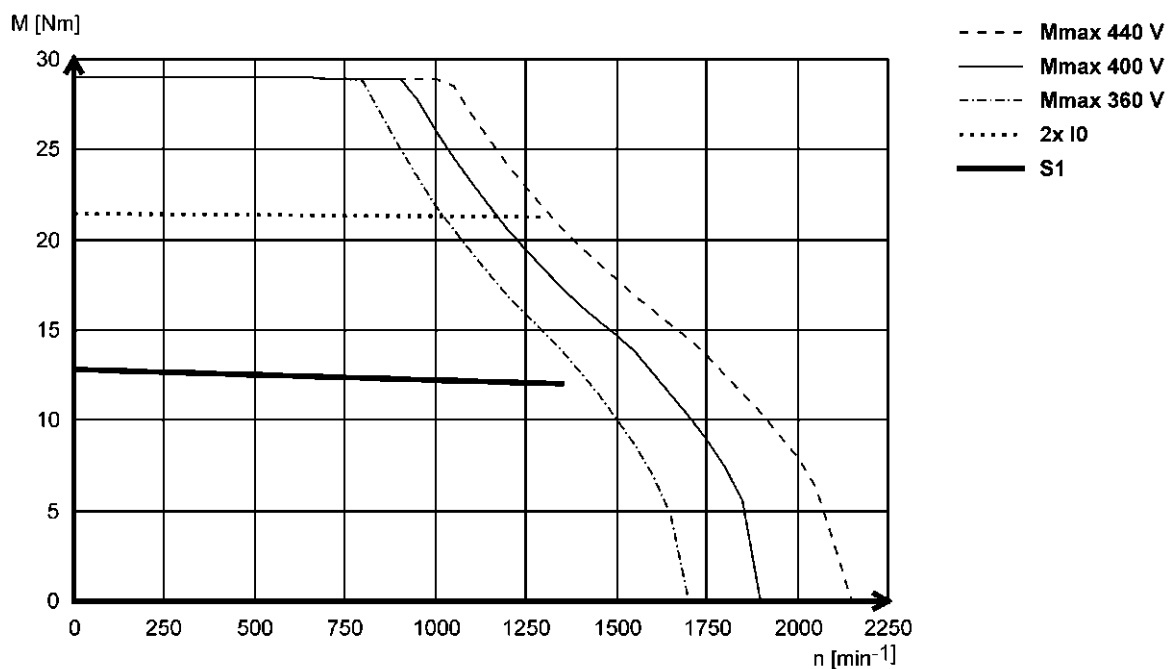


► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

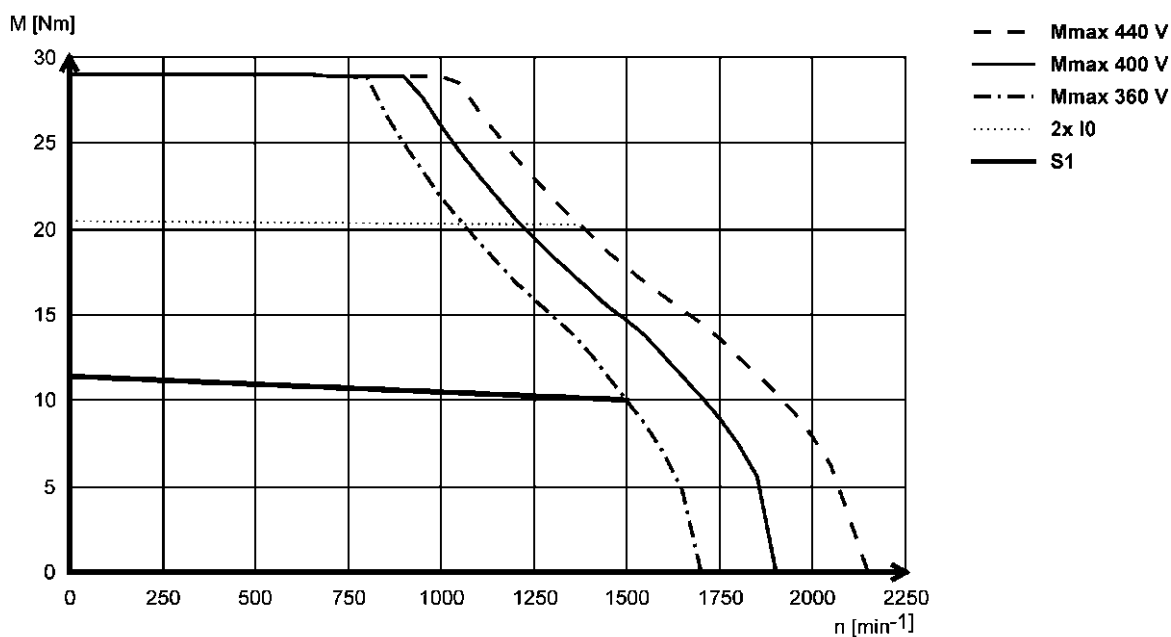


Mains connection 3x 400 V

MCS12H14



MCS12H15



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

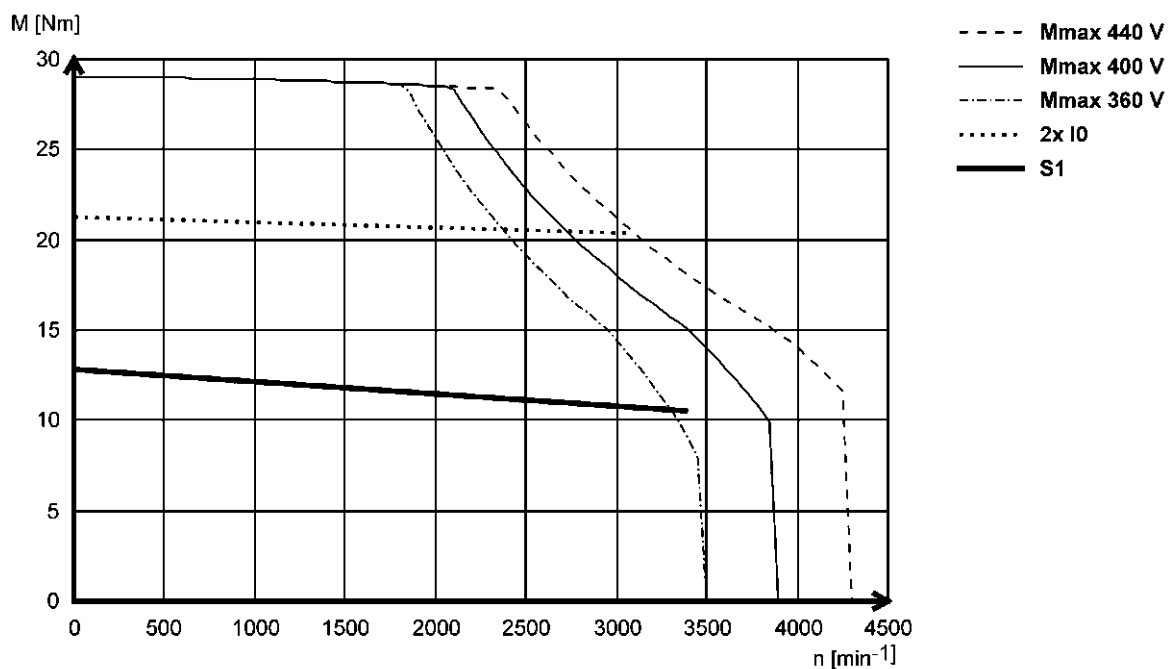


MCS synchronous servo motors

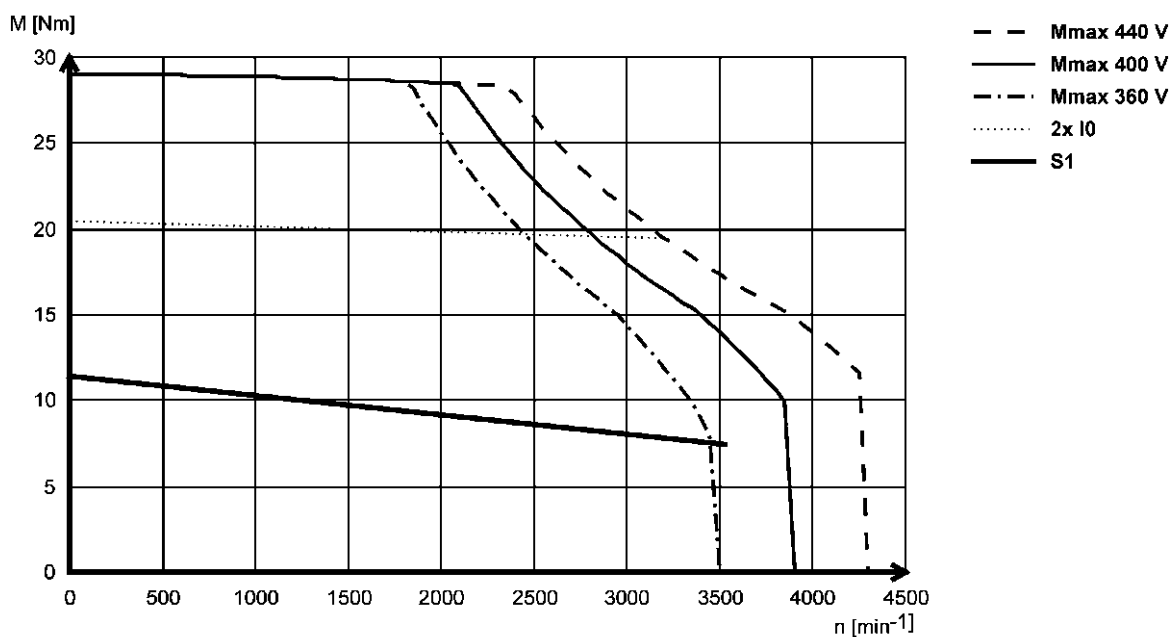
Torque characteristics

Mains connection 3x 400 V

MCS12H34



MCS12H35

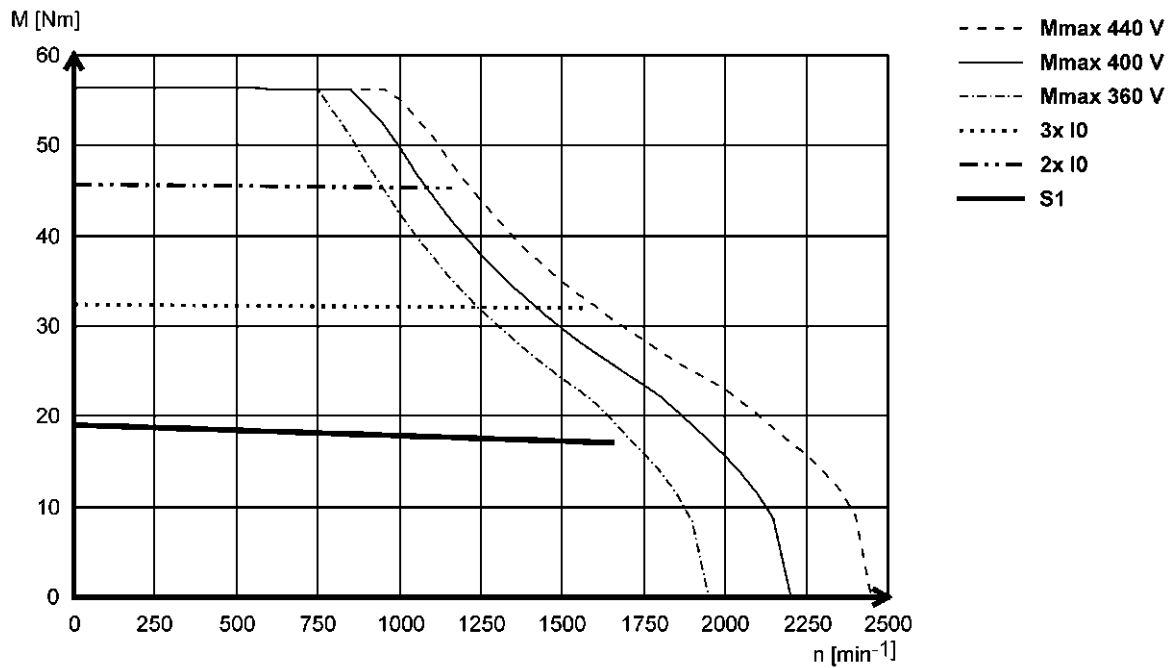


► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

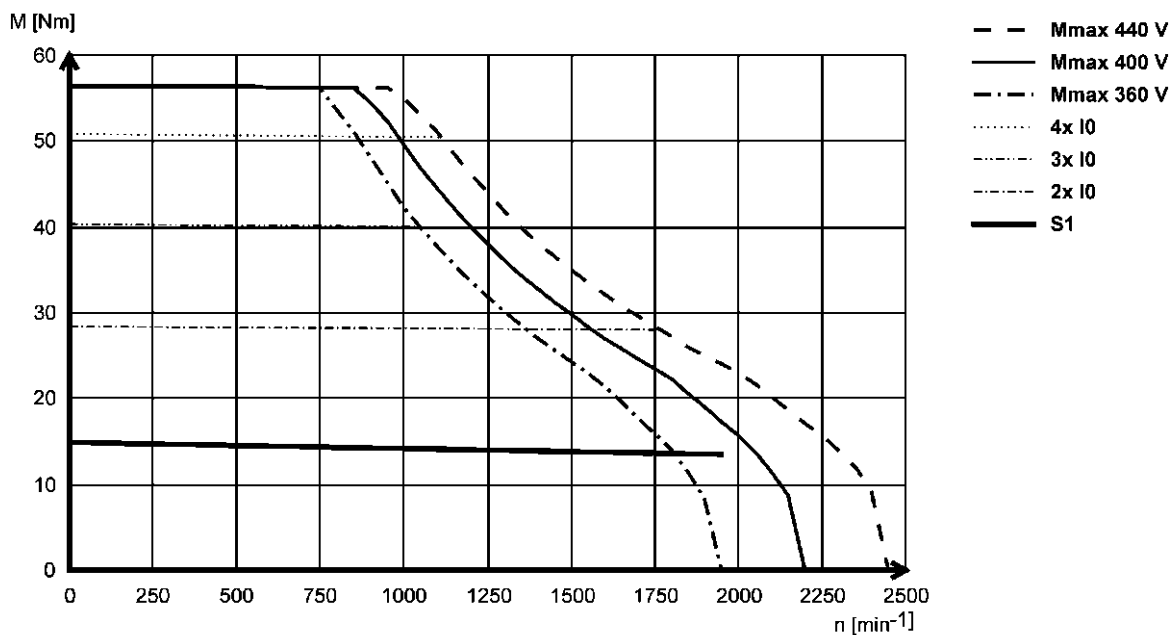


Mains connection 3x 400 V

MCS12L17



MCS12L20



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

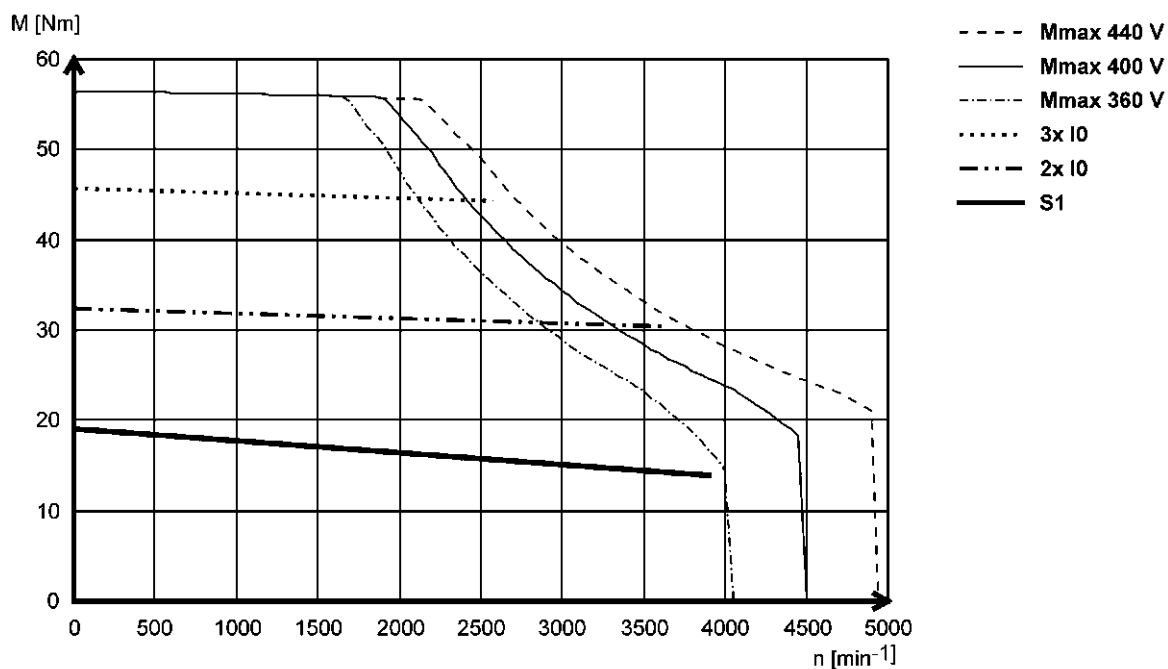


MCS synchronous servo motors

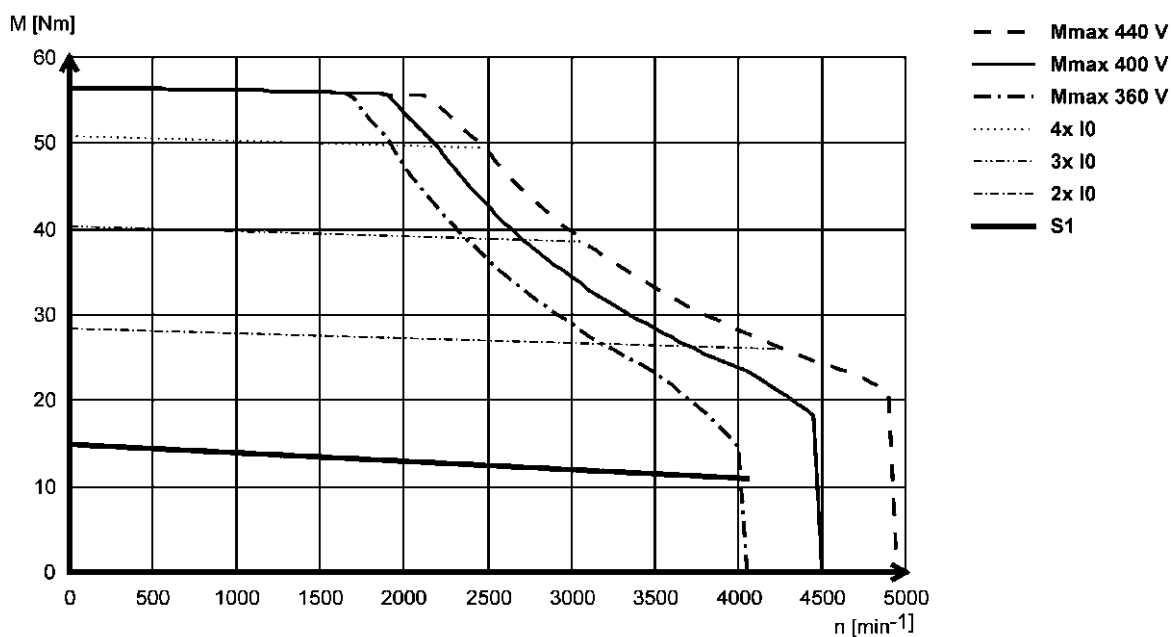
Torque characteristics

Mains connection 3x 400 V

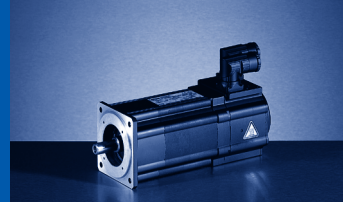
MCS12L39



MCS12L41

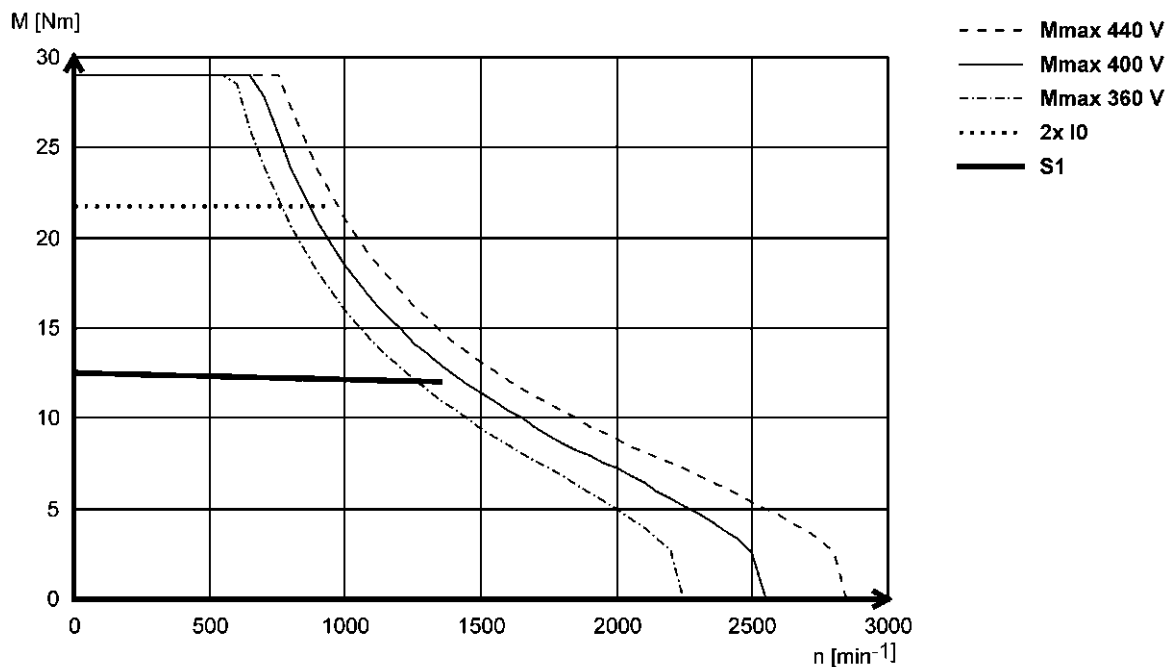


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

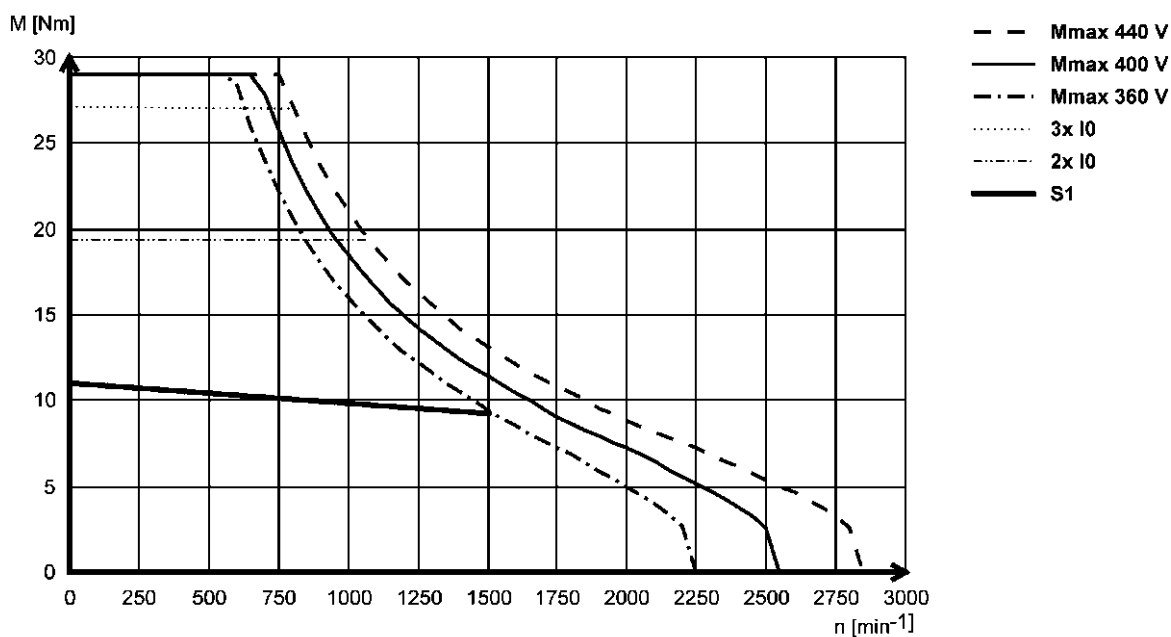


Mains connection 3x 400 V

MCS14D14



MCS14D15



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

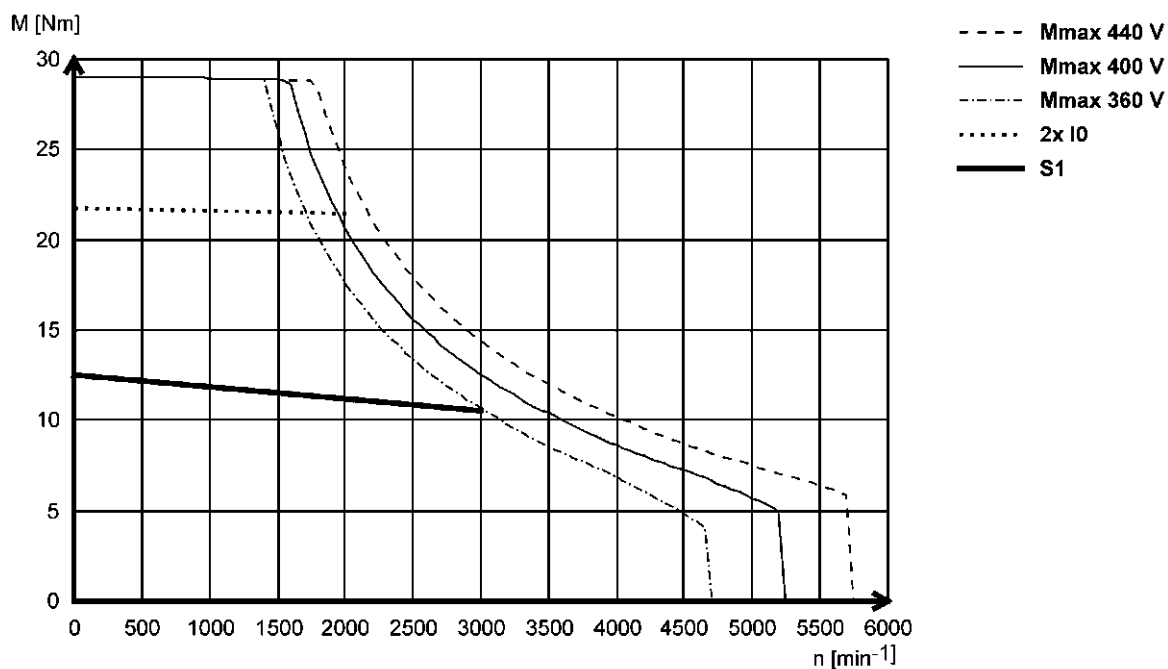


MCS synchronous servo motors

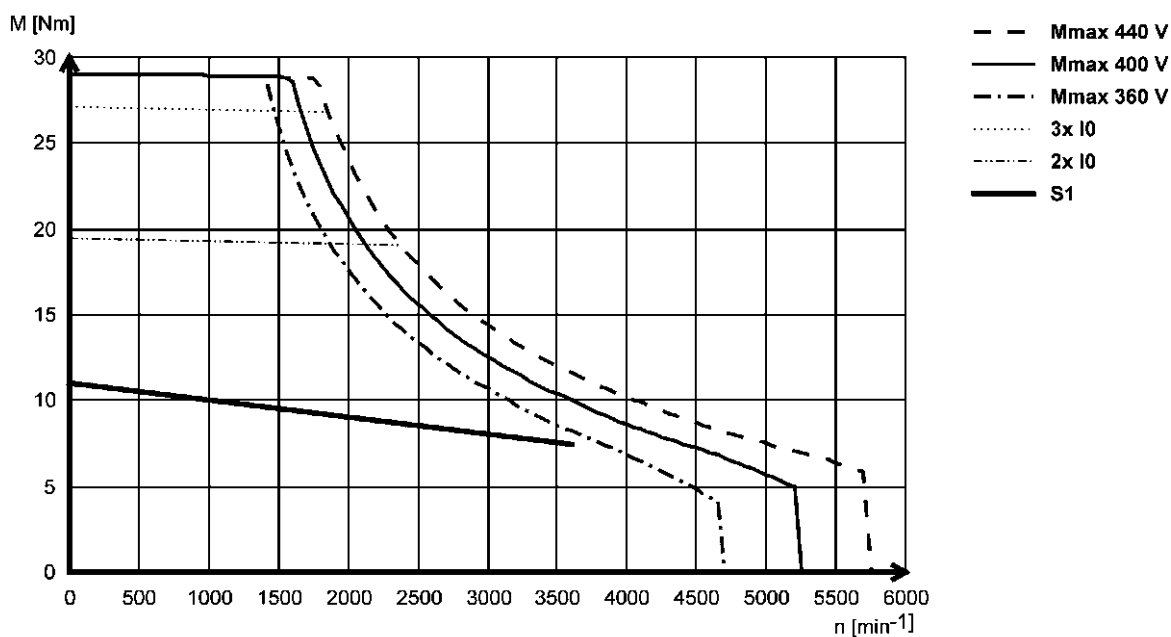
Torque characteristics

Mains connection 3x 400 V

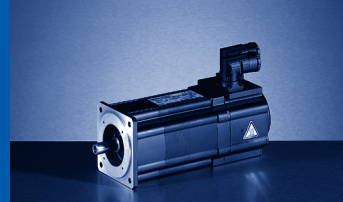
MCS14D30



MCS14D36

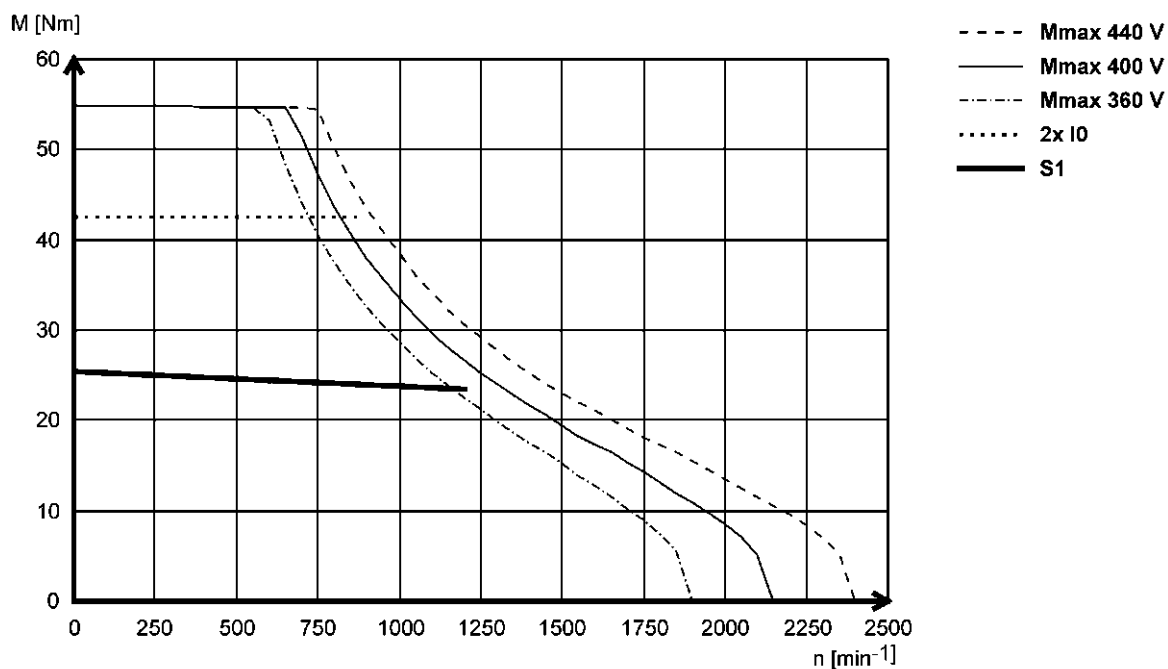


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

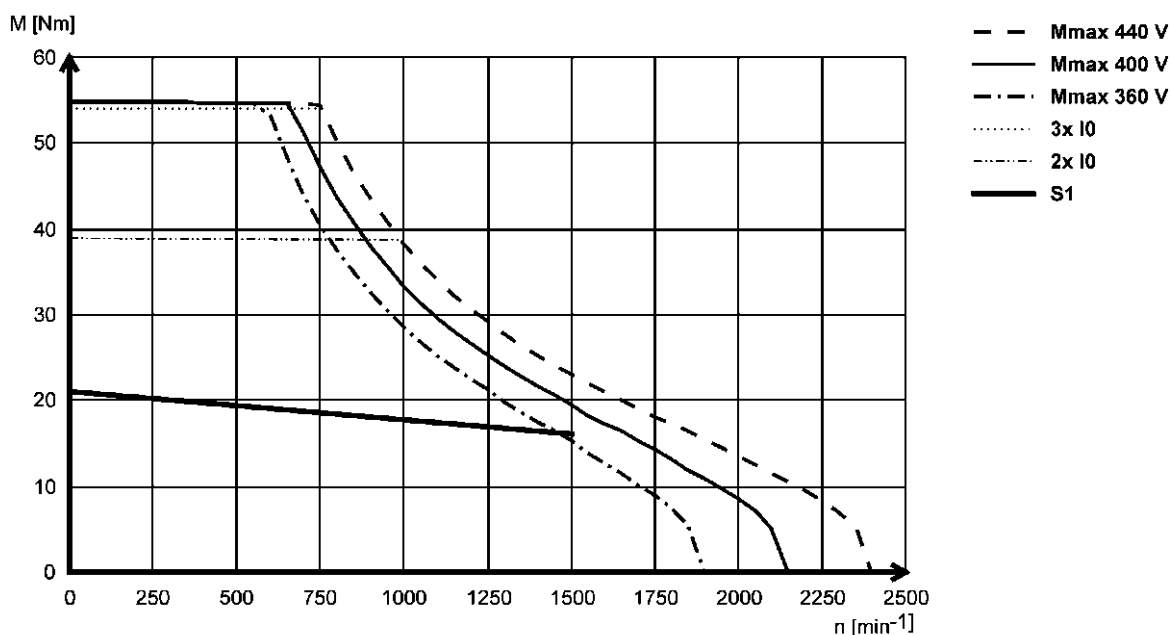


Mains connection 3x 400 V

MCS14H12



MCS14H15



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

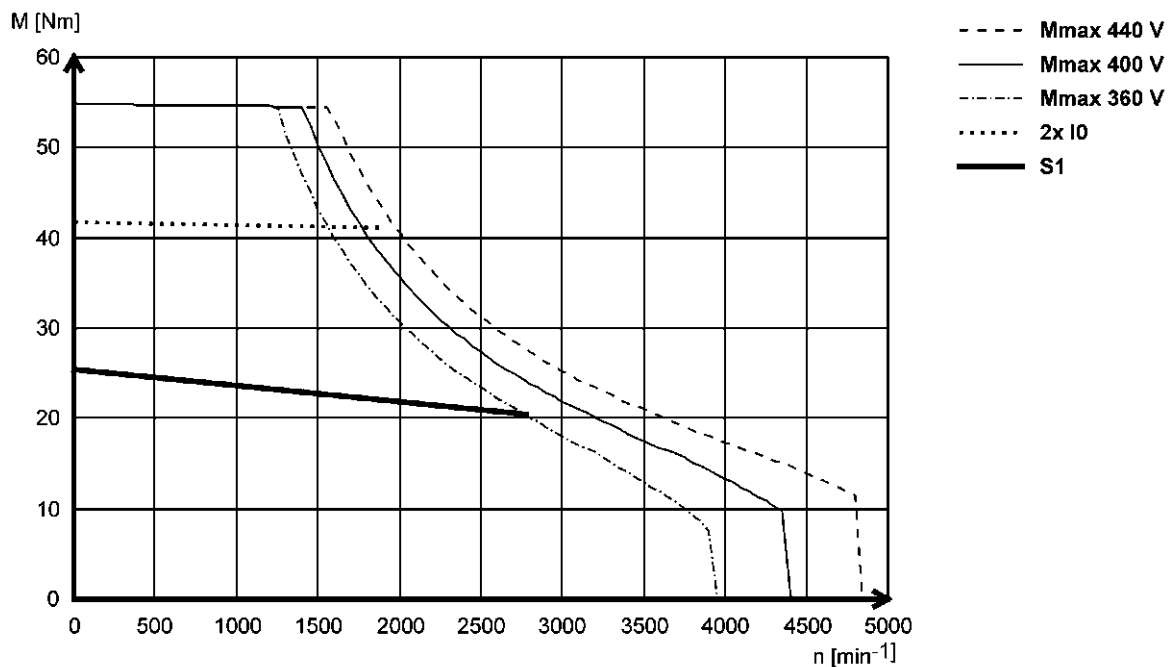


MCS synchronous servo motors

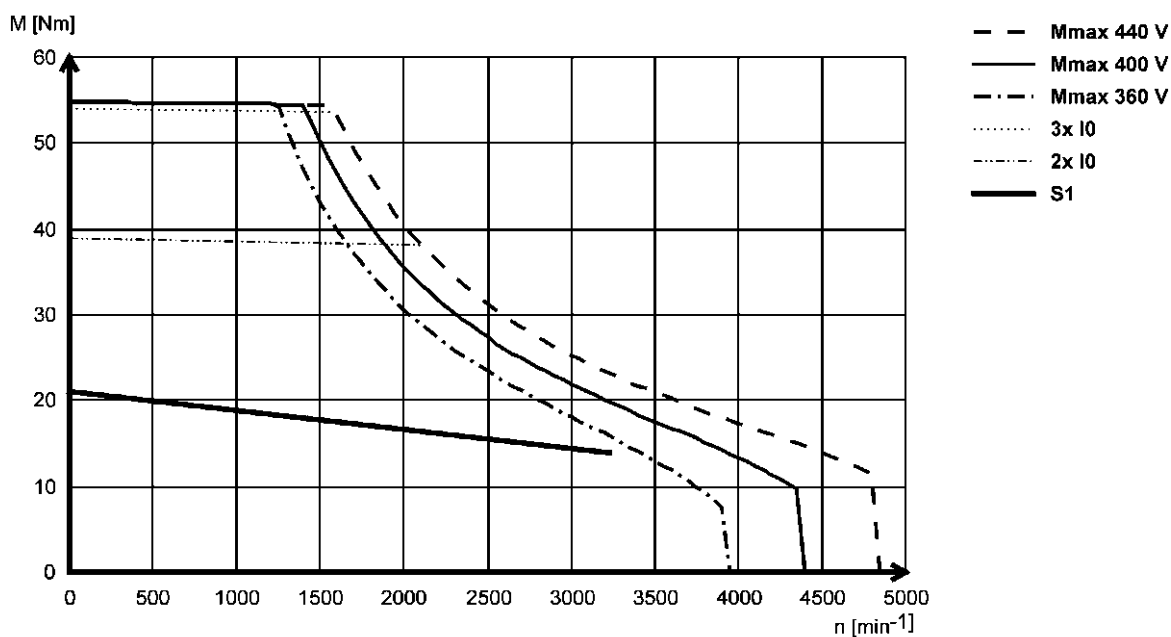
Torque characteristics

Mains connection 3x 400 V

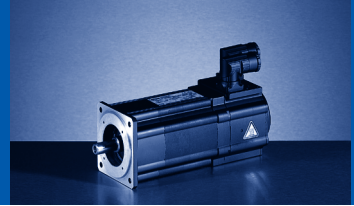
MCS14H28



MCS14H32

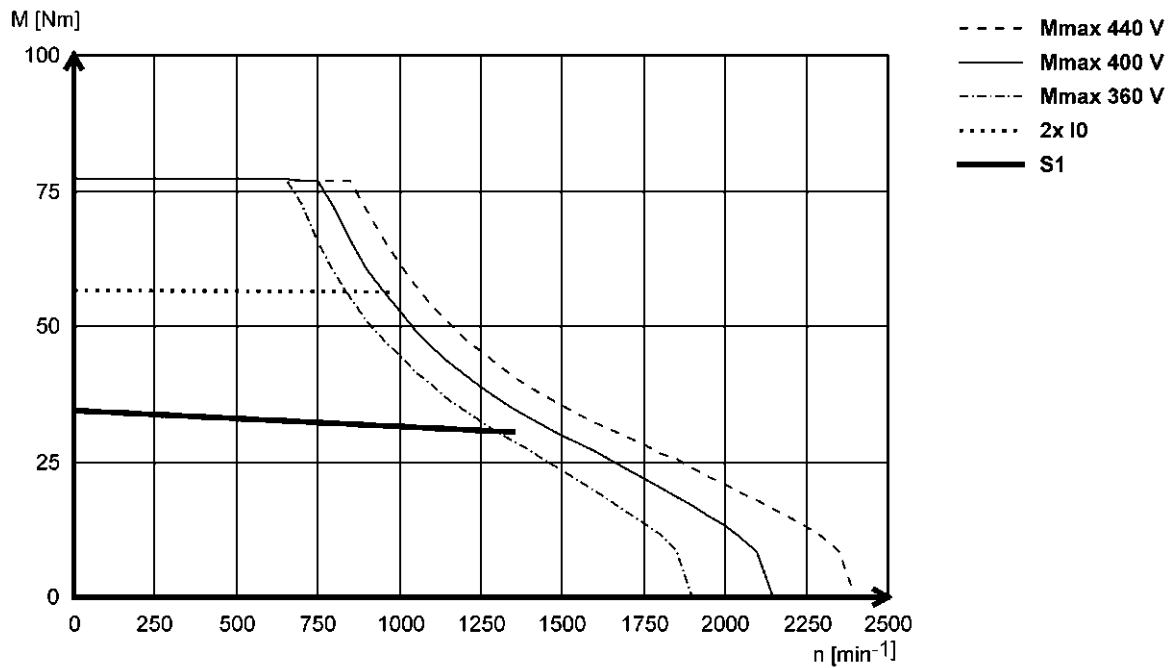


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

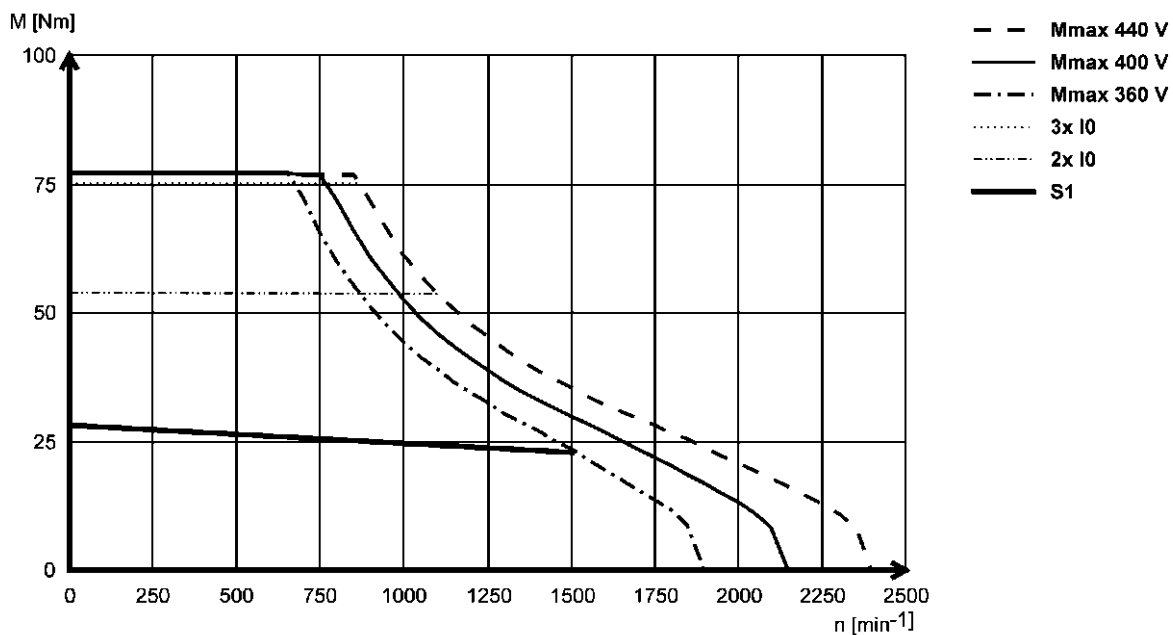


Mains connection 3x 400 V

MCS14L14



MCS14L15



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

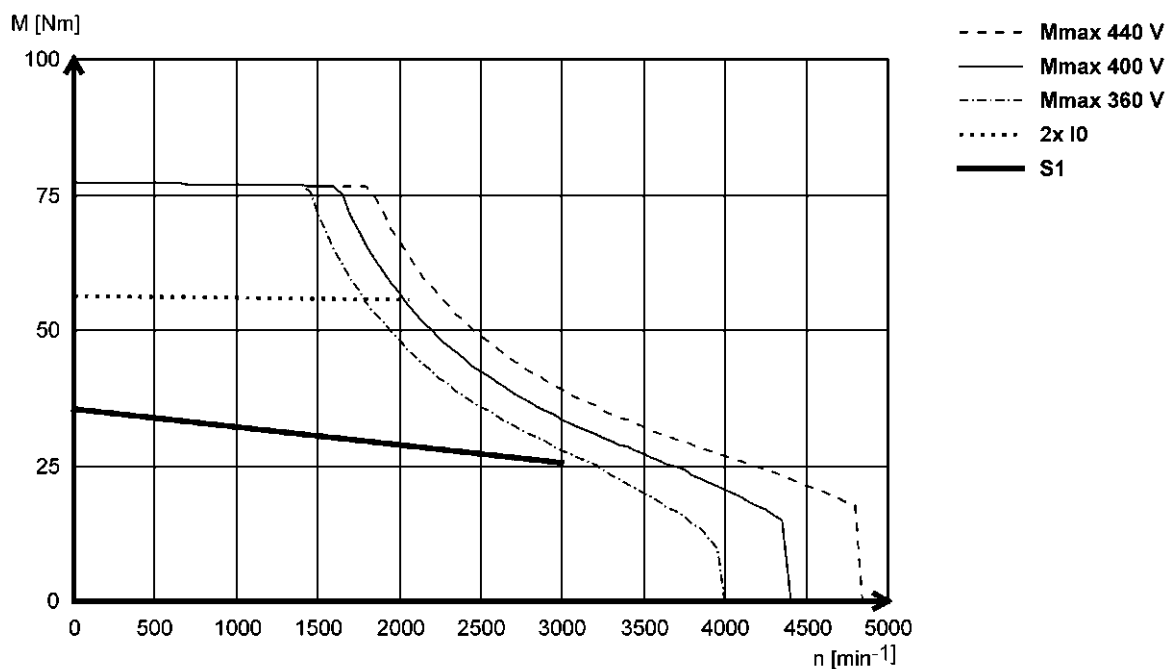


MCS synchronous servo motors

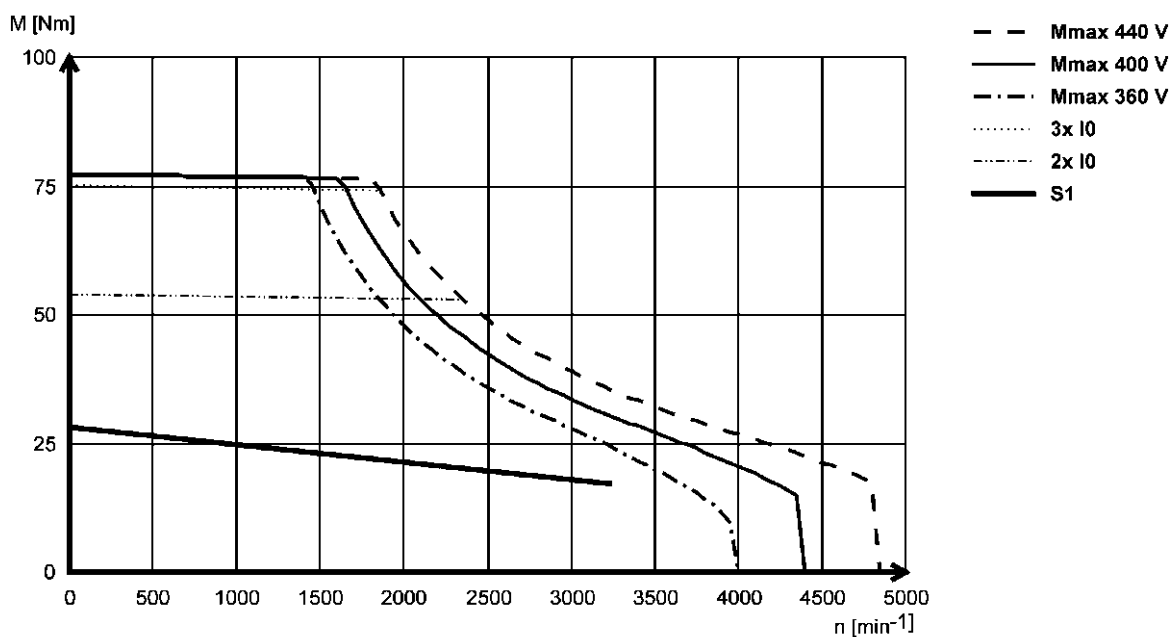
Torque characteristics

Mains connection 3x 400 V

MCS14L30



MCS14L32

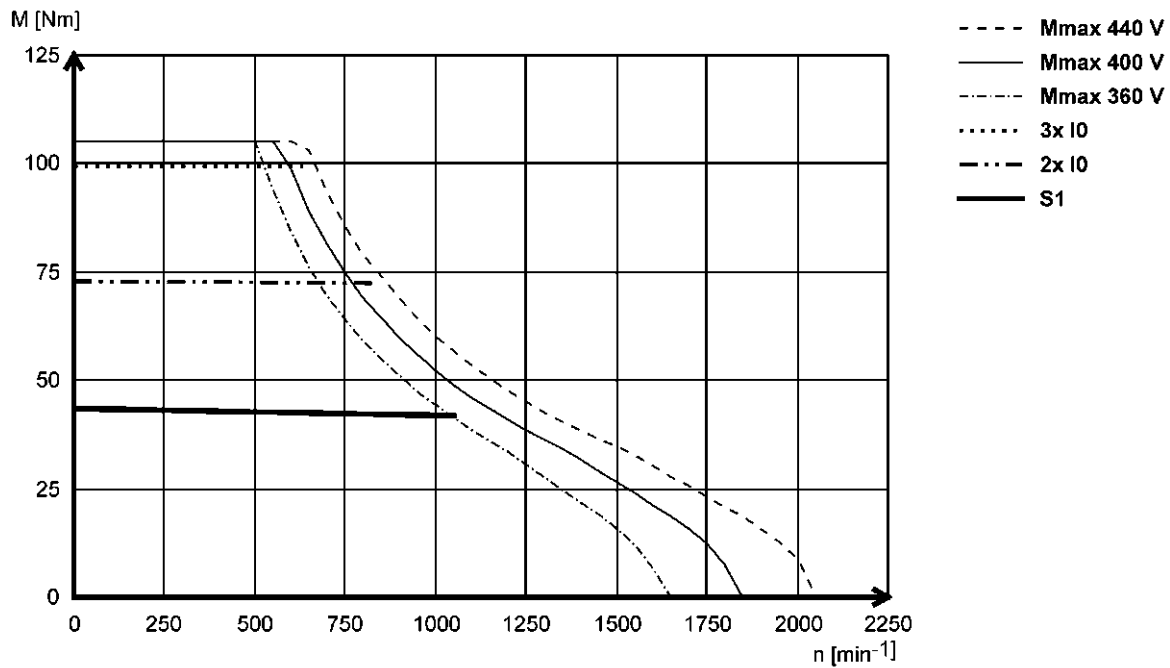


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

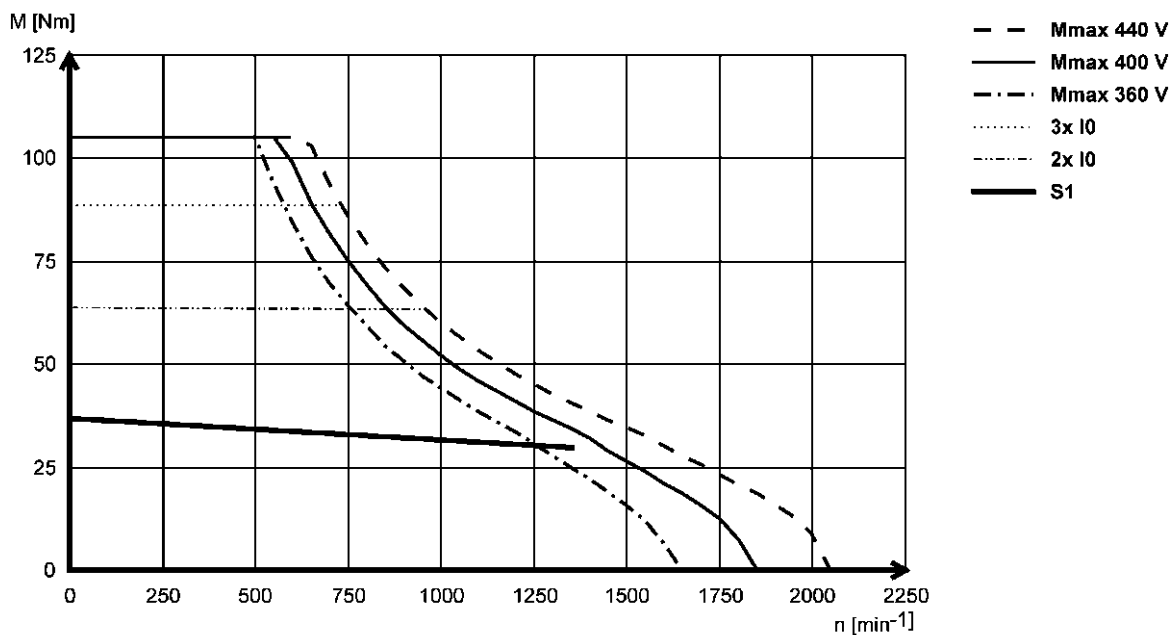


Mains connection 3x 400 V

MCS14P11



MCS14P14



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

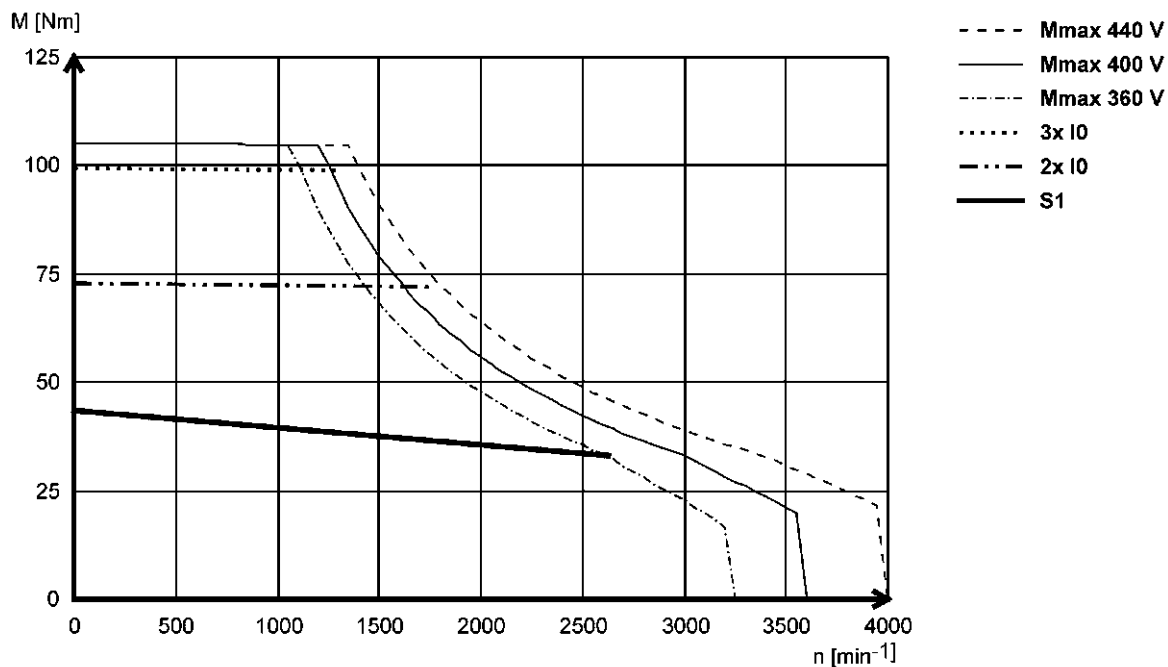


MCS synchronous servo motors

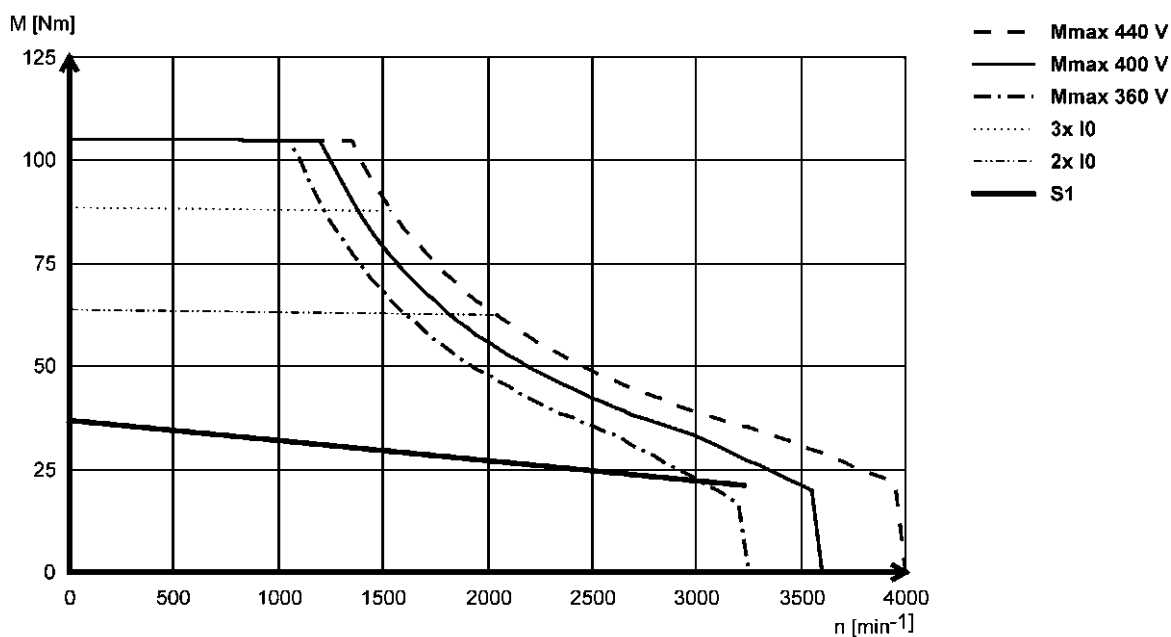
Torque characteristics

Mains connection 3x 400 V

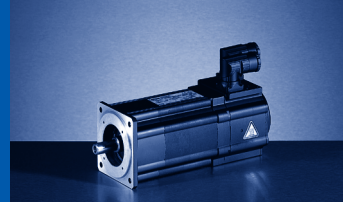
MCS14P26



MCS14P32

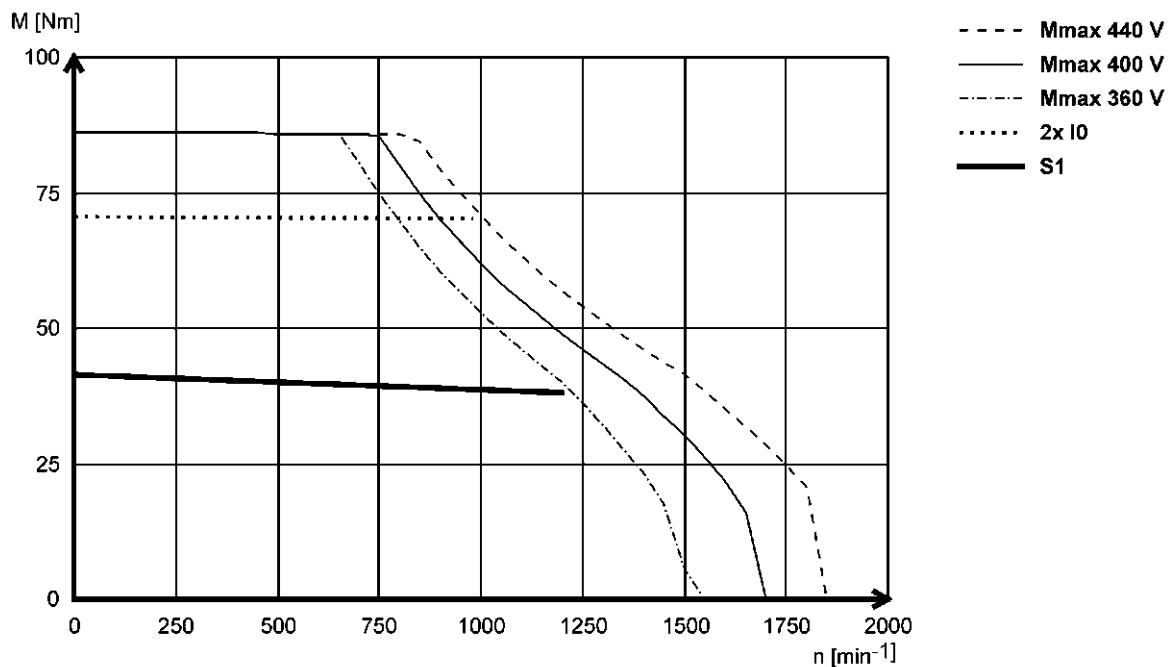


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

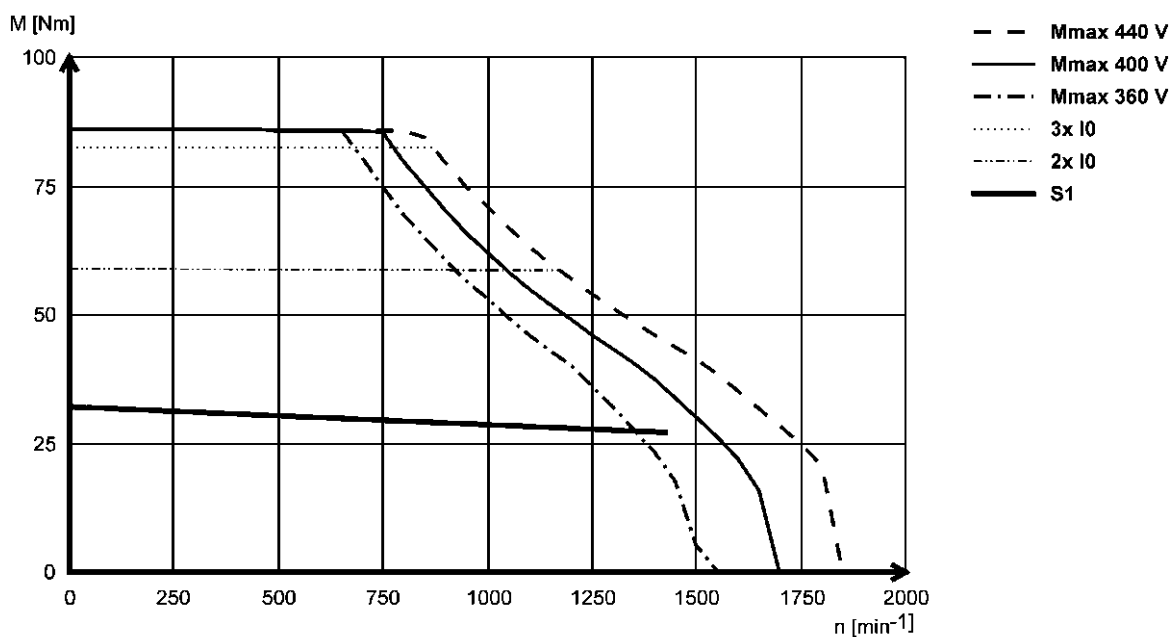


Mains connection 3x 400 V

MCS19F12



MCS19F14



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

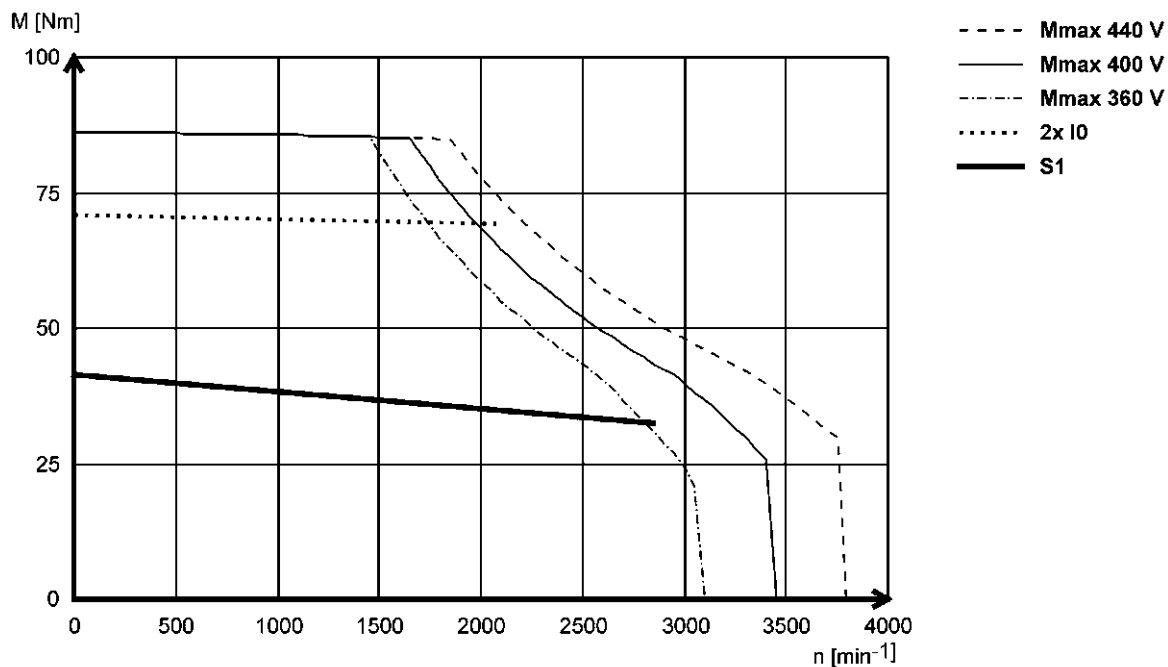


MCS synchronous servo motors

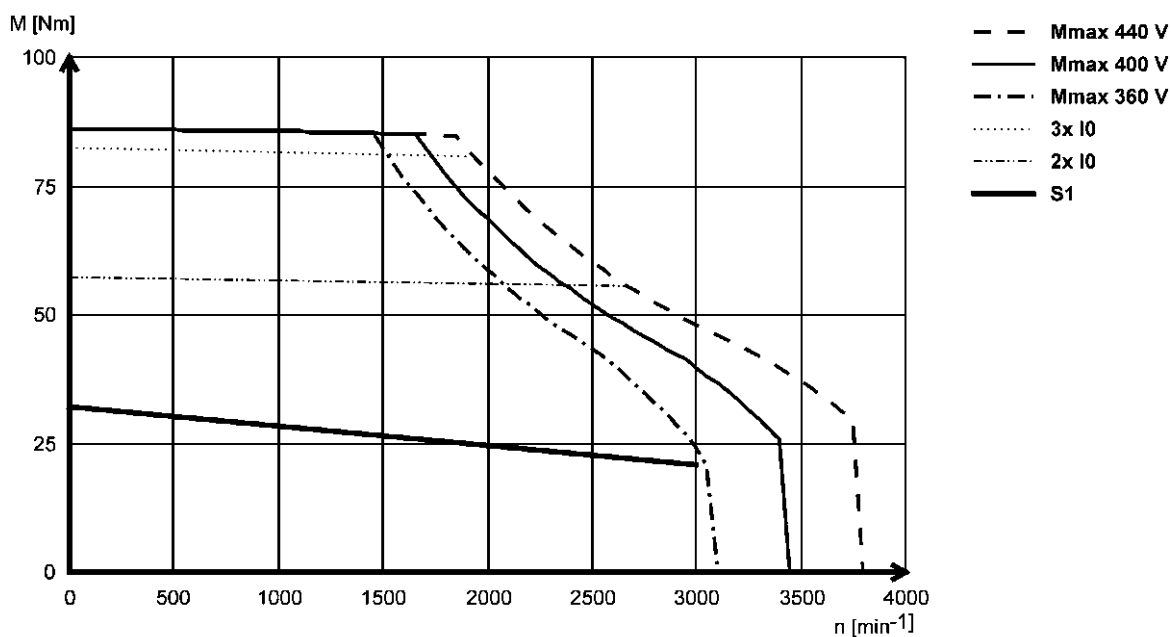
Torque characteristics

Mains connection 3x 400 V

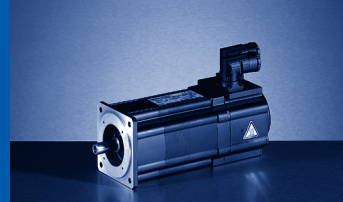
MCS19F29



MCS19F30

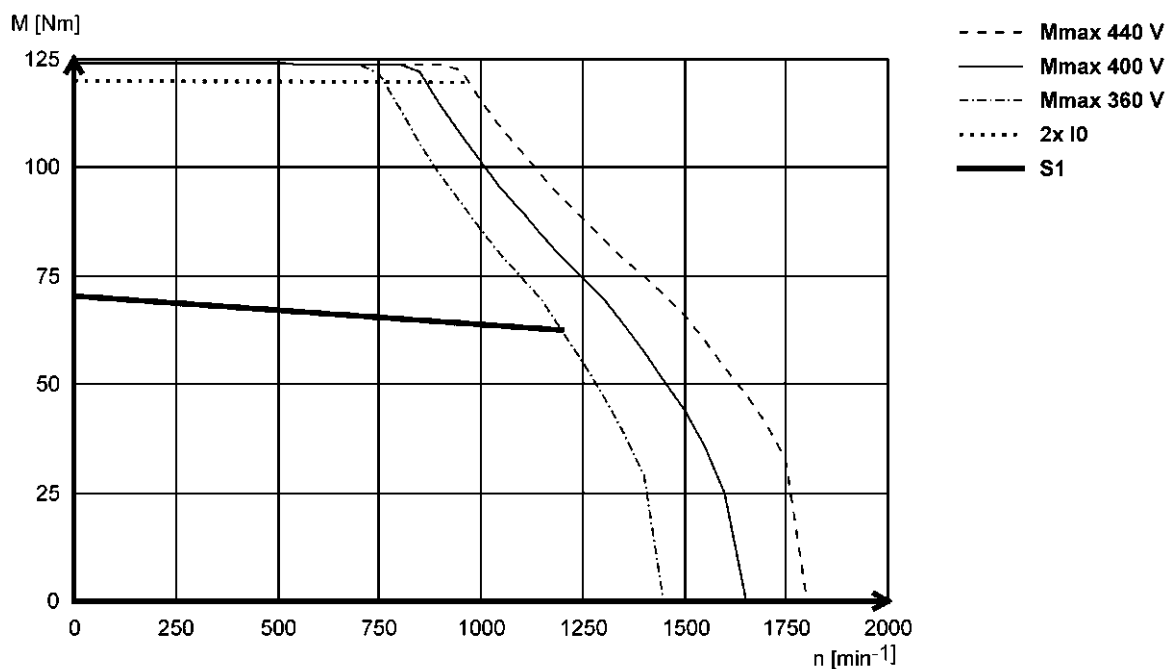


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

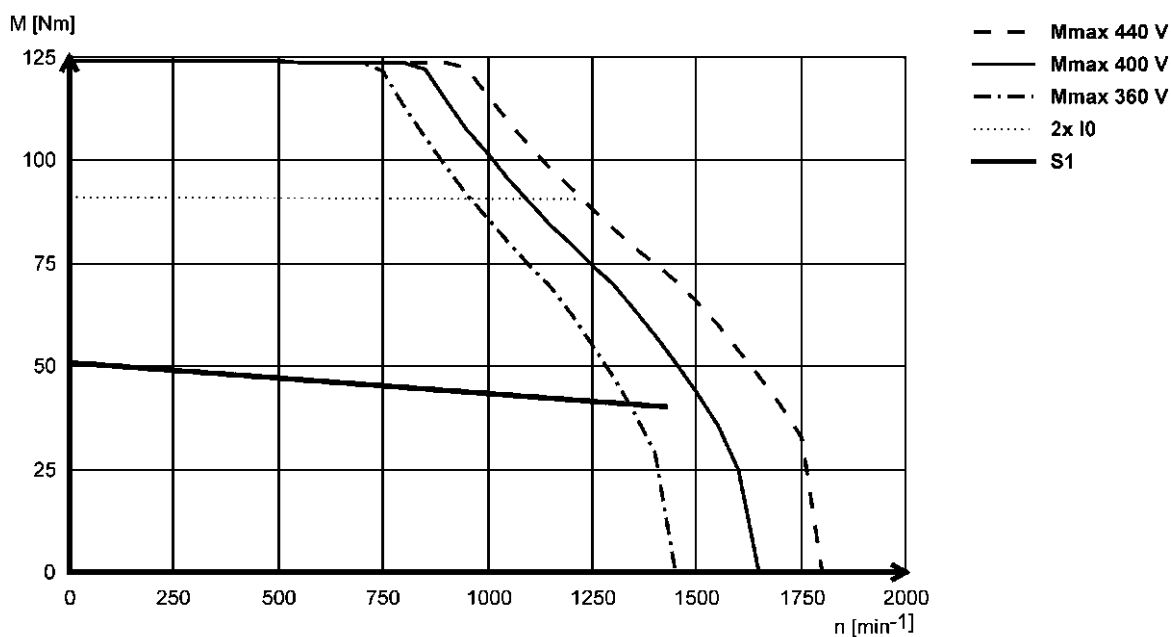


Mains connection 3x 400 V

MCS19J12



MCS19J14



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

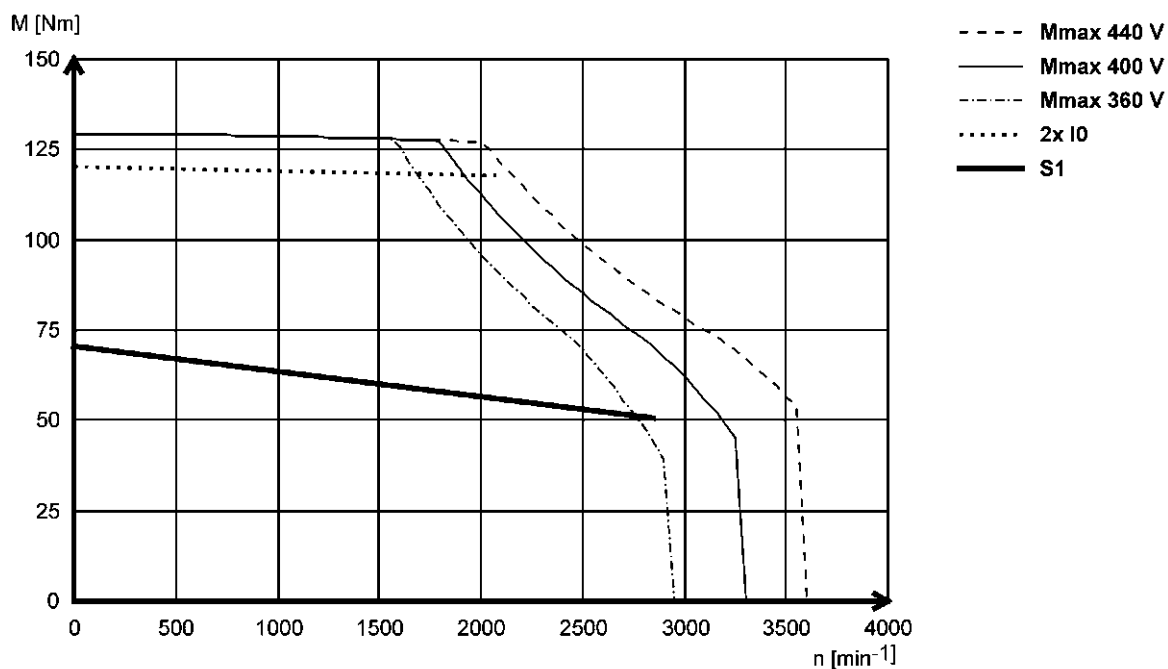


MCS synchronous servo motors

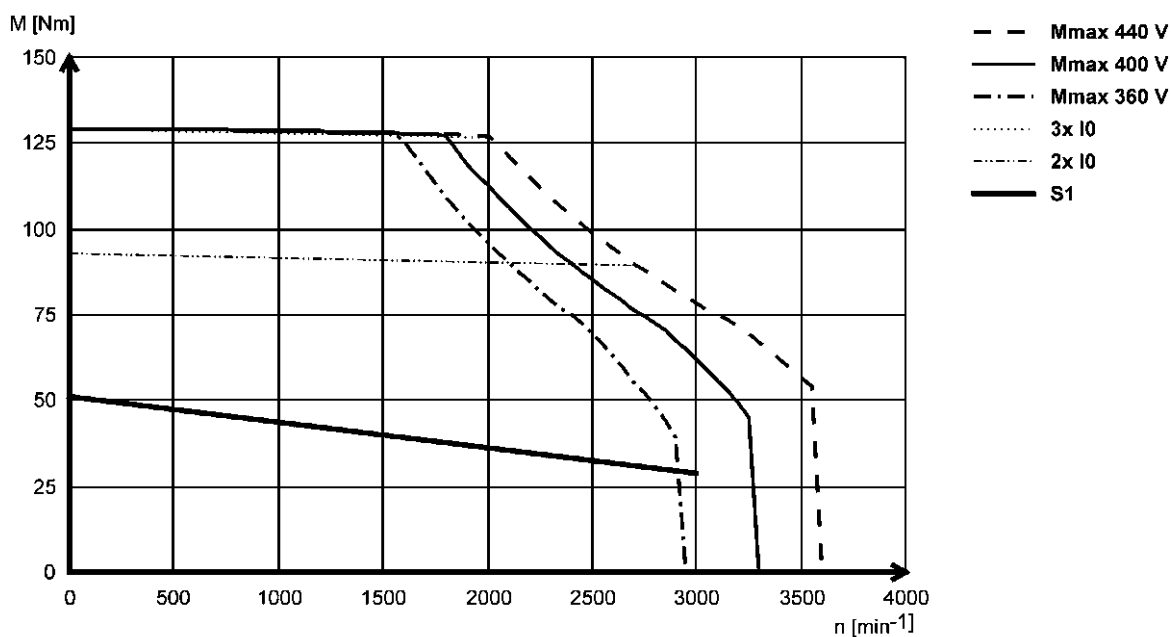
Torque characteristics

Mains connection 3x 400 V

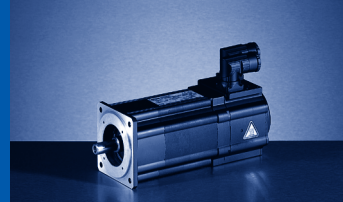
MCS19J29



MCS19J30

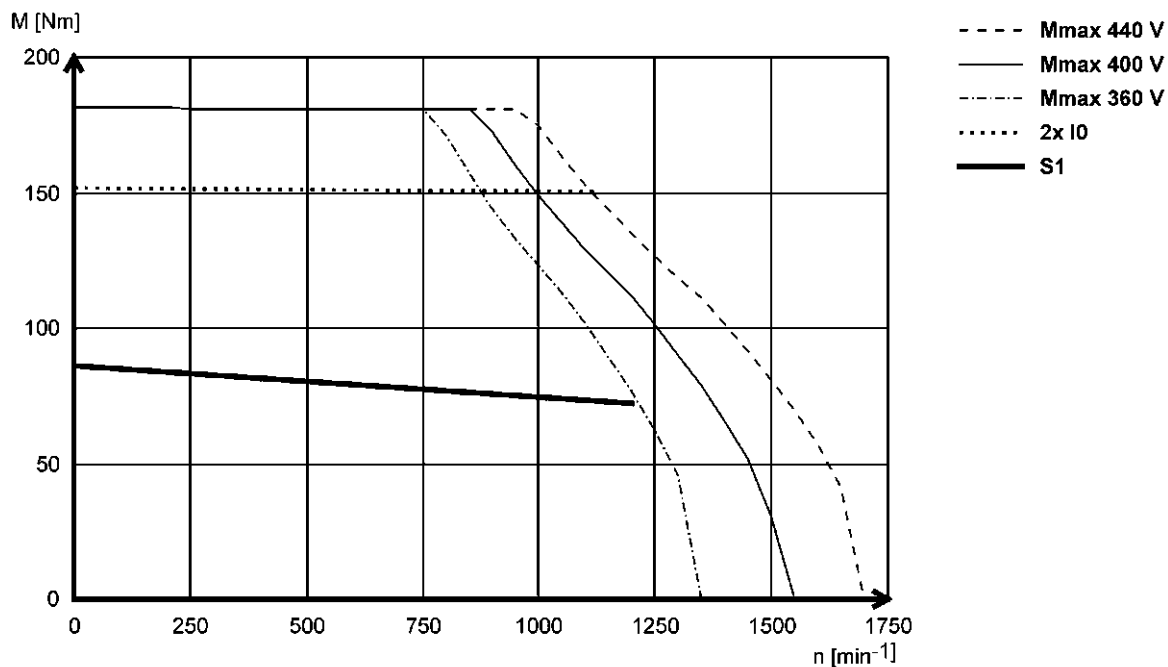


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

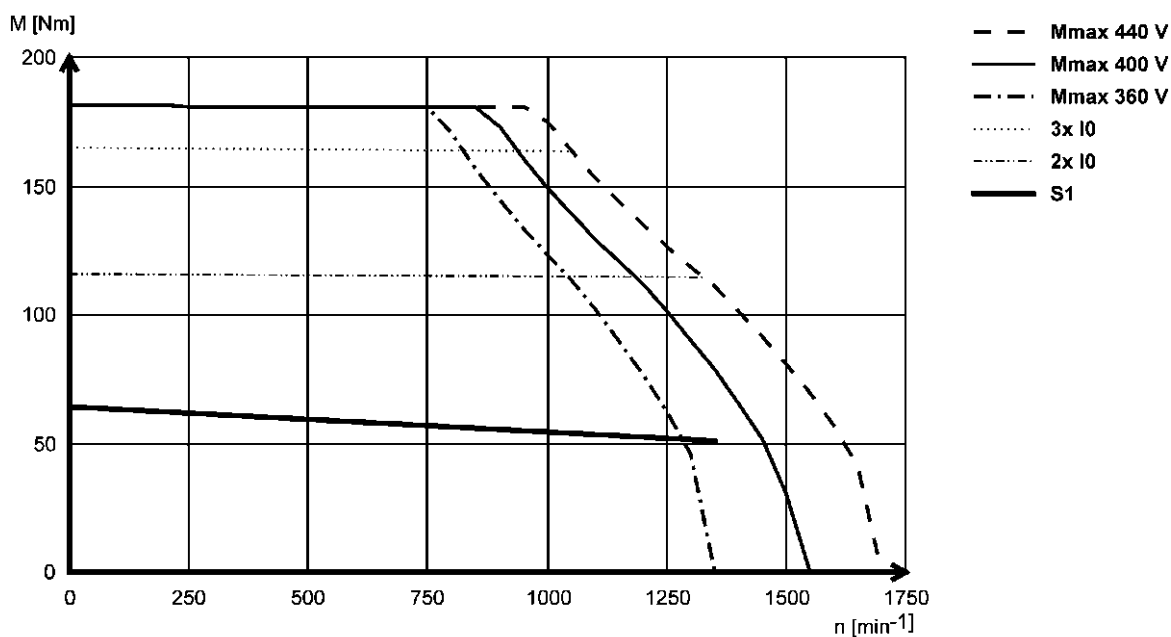


Mains connection 3x 400 V

MCS19P12



MCS19P14



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

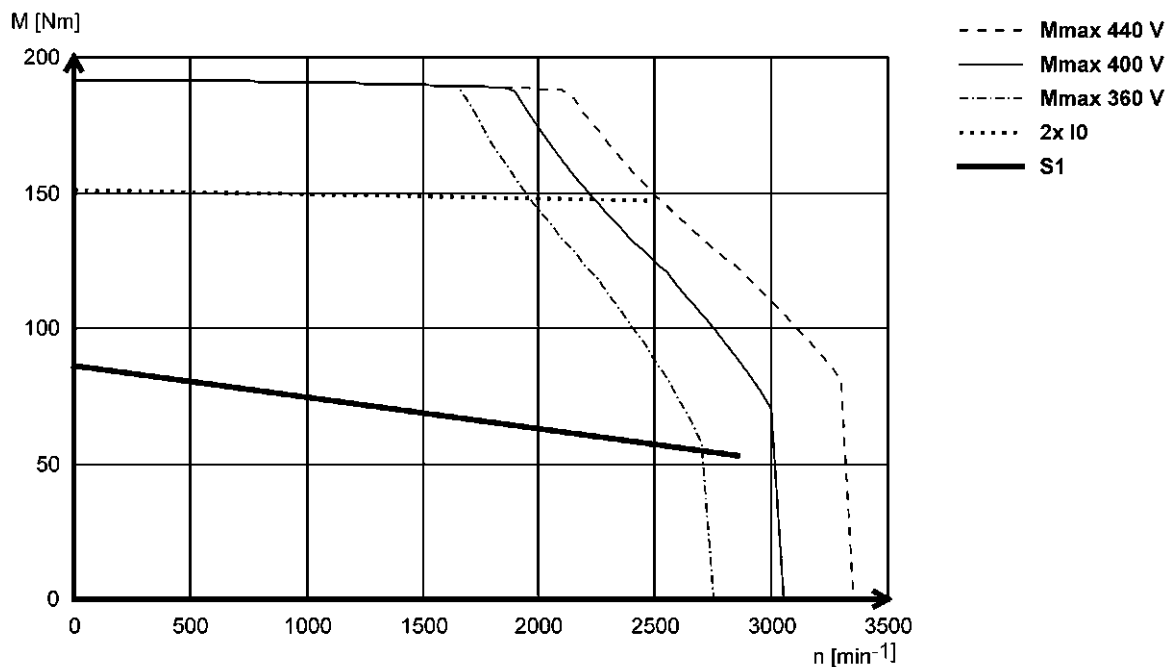


MCS synchronous servo motors

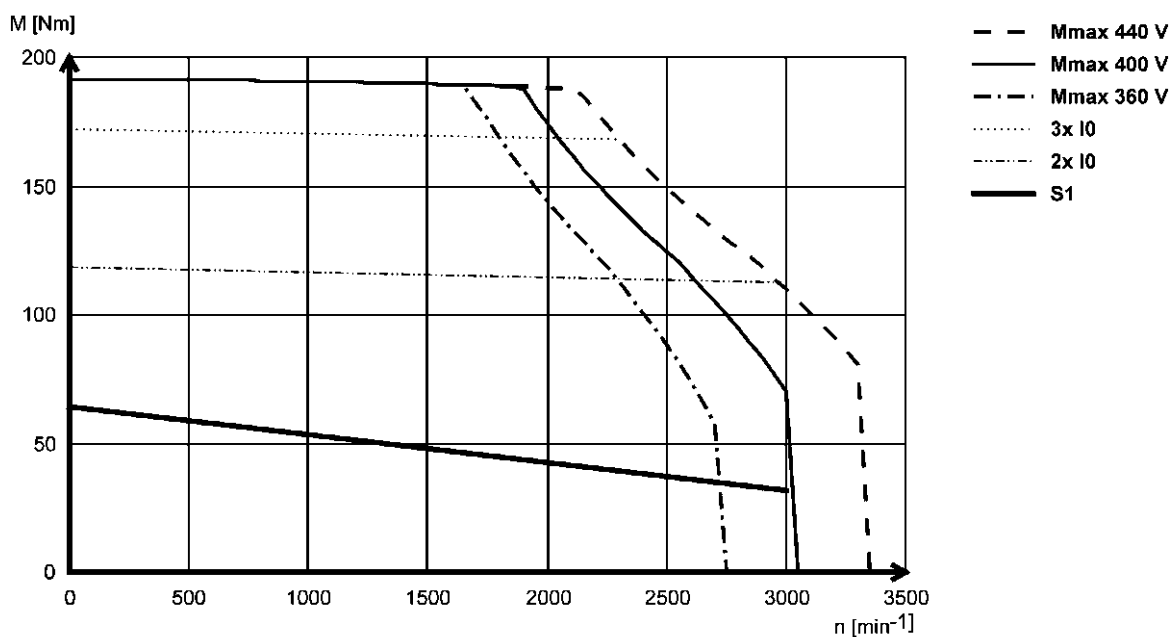
Torque characteristics

Mains connection 3x 400 V

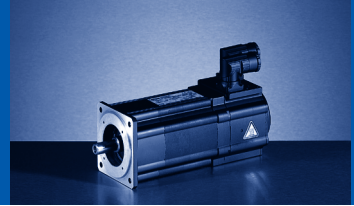
MCS19P29



MCS19P30

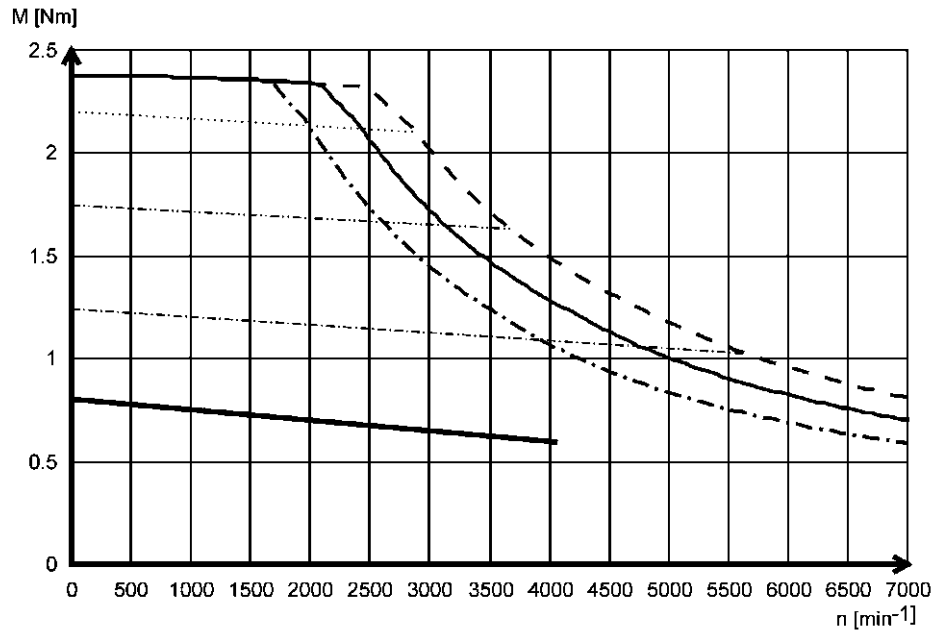


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

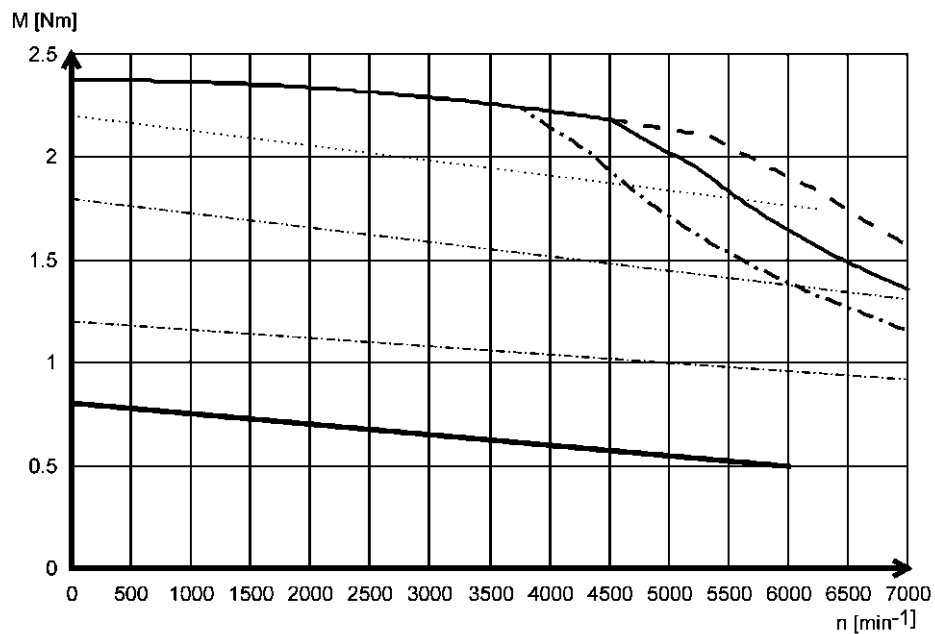


Mains connection 3x 230 V

MCS06C41L



MCS06C60L



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

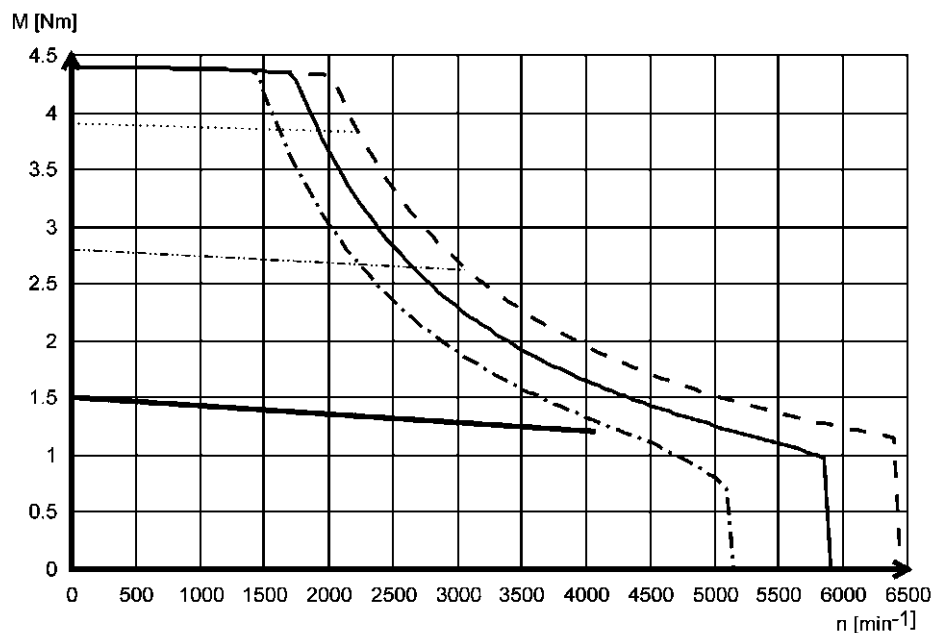


MCS synchronous servo motors

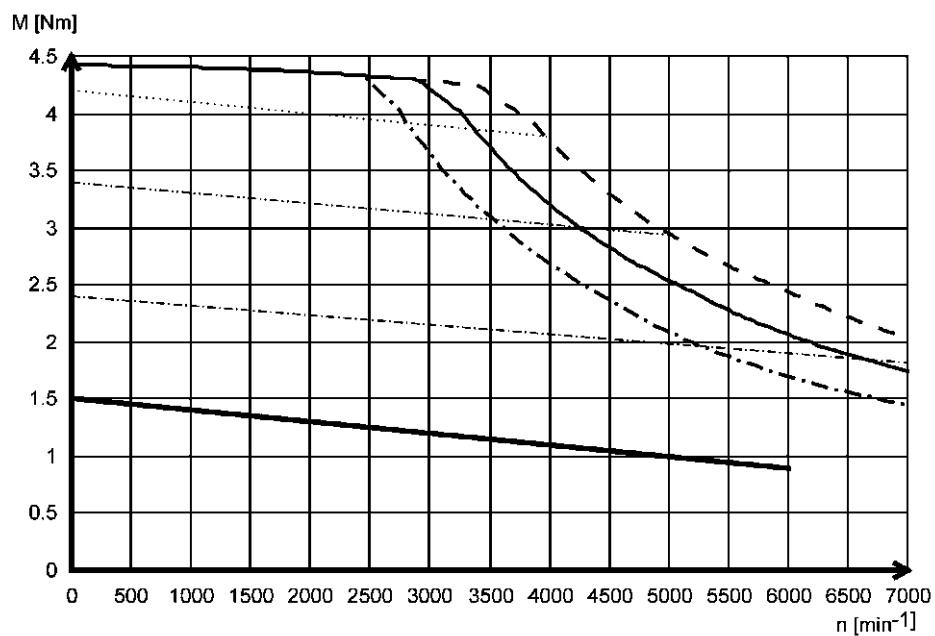
Torque characteristics

Mains connection 3x 230 V

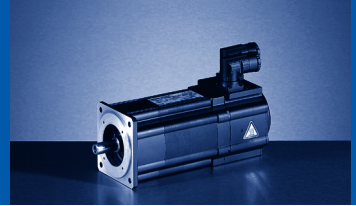
MCS06F41L



MCS06F60L

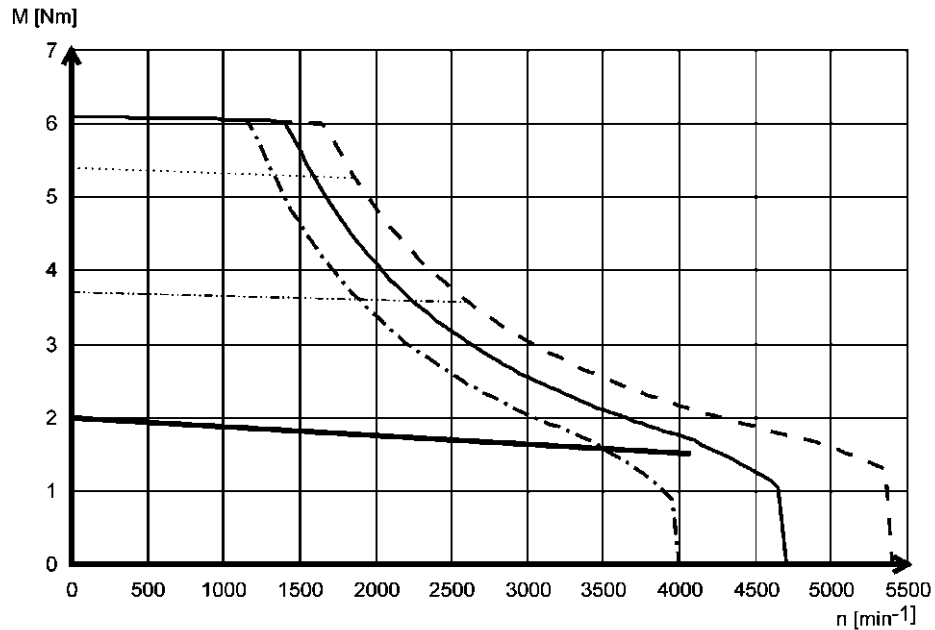


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

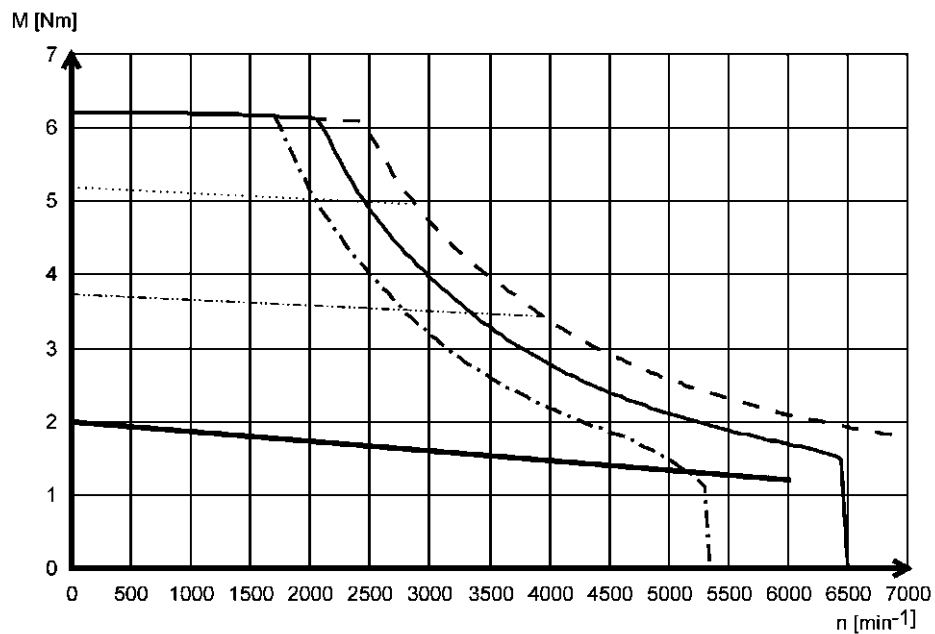


Mains connection 3x 230 V

MCS06I41L



MCS06I60L



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

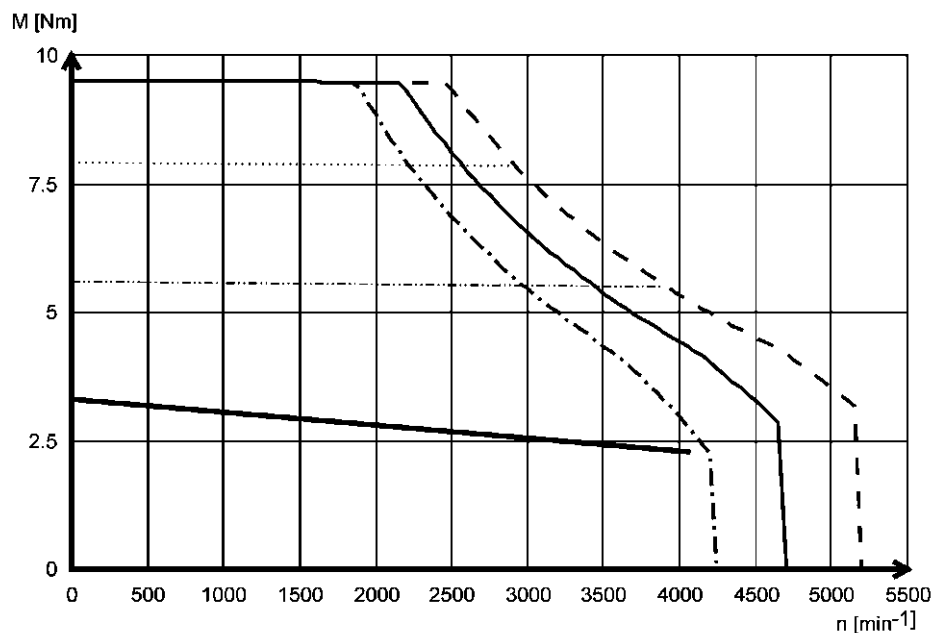


MCS synchronous servo motors

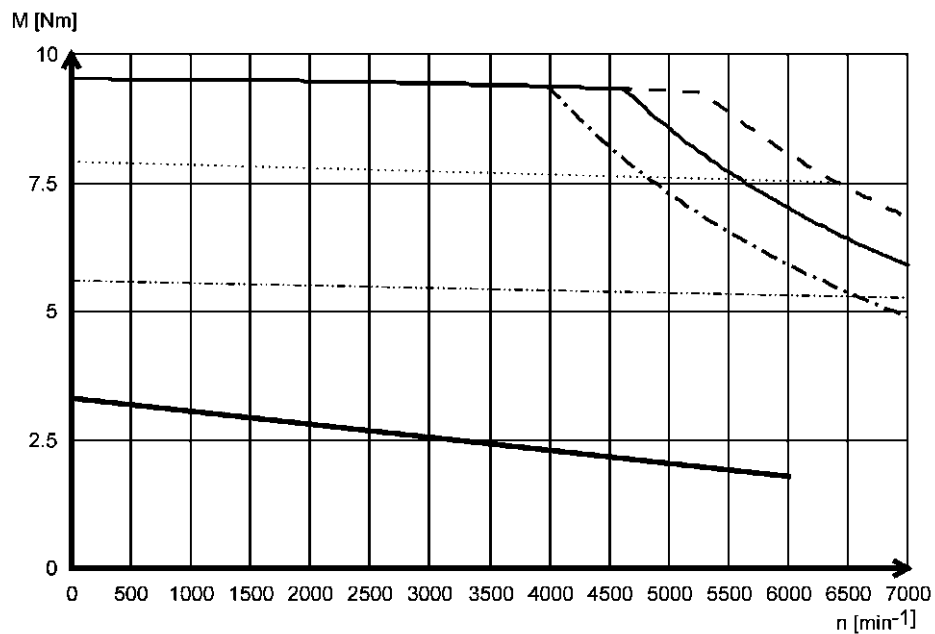
Torque characteristics

Mains connection 3x 230 V

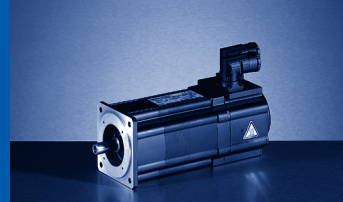
MCS09D41L



MCS09D60L

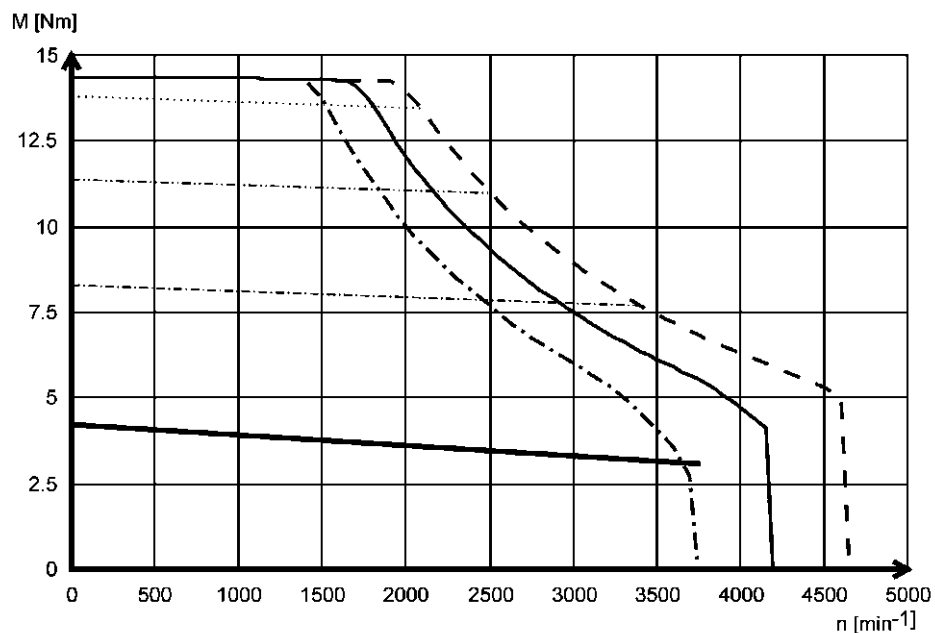


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

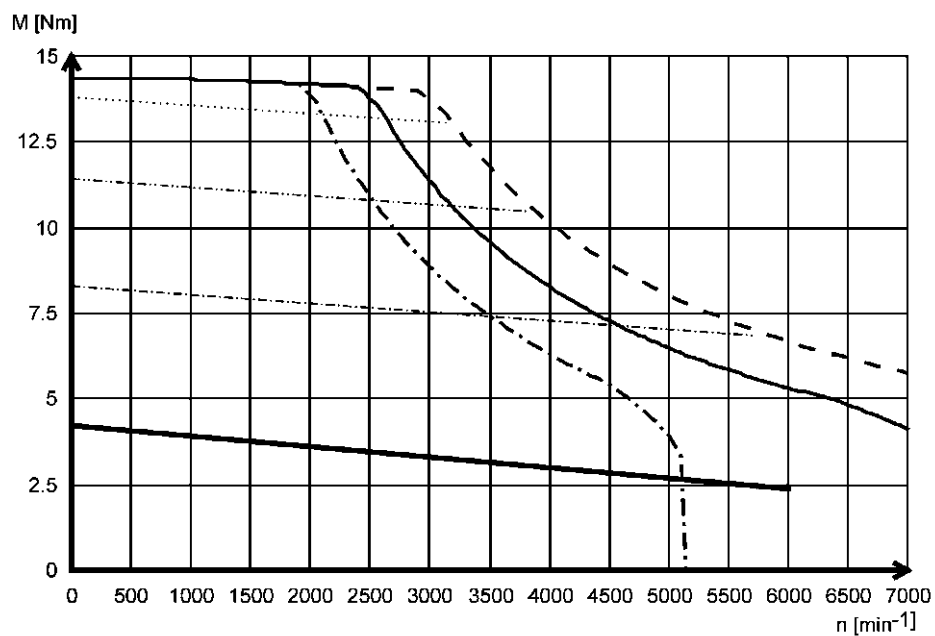


Mains connection 3x 230 V

MCS09F38L



MCS09F60L



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

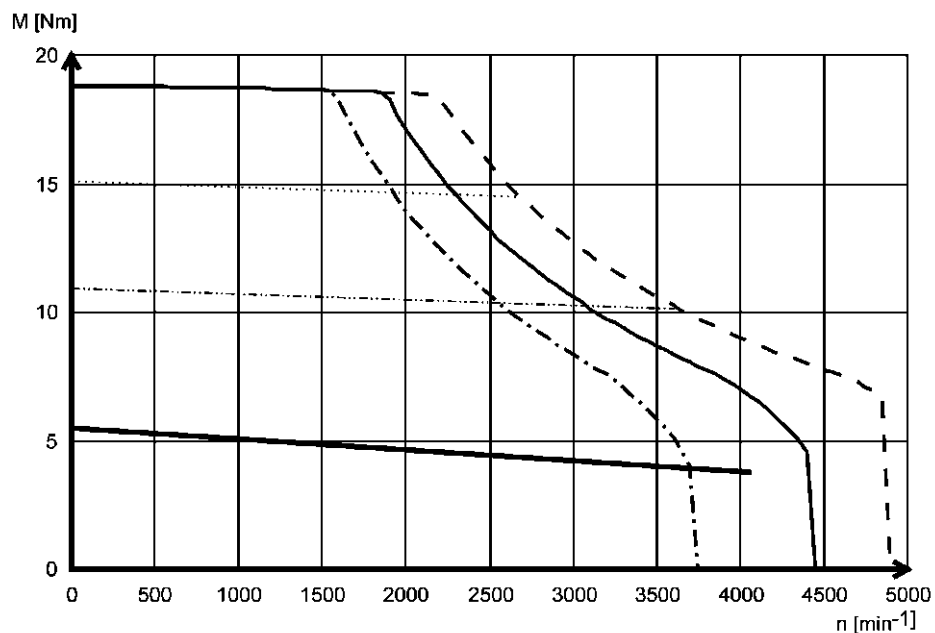


MCS synchronous servo motors

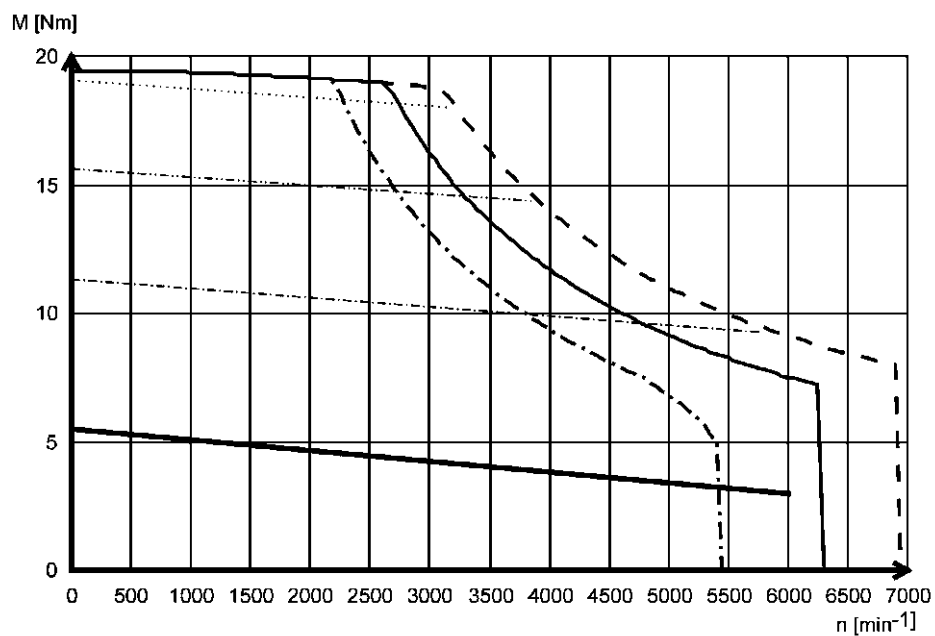
Torque characteristics

Mains connection 3x 230 V

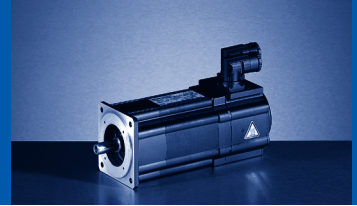
MCS09H41L



MCS09H60L

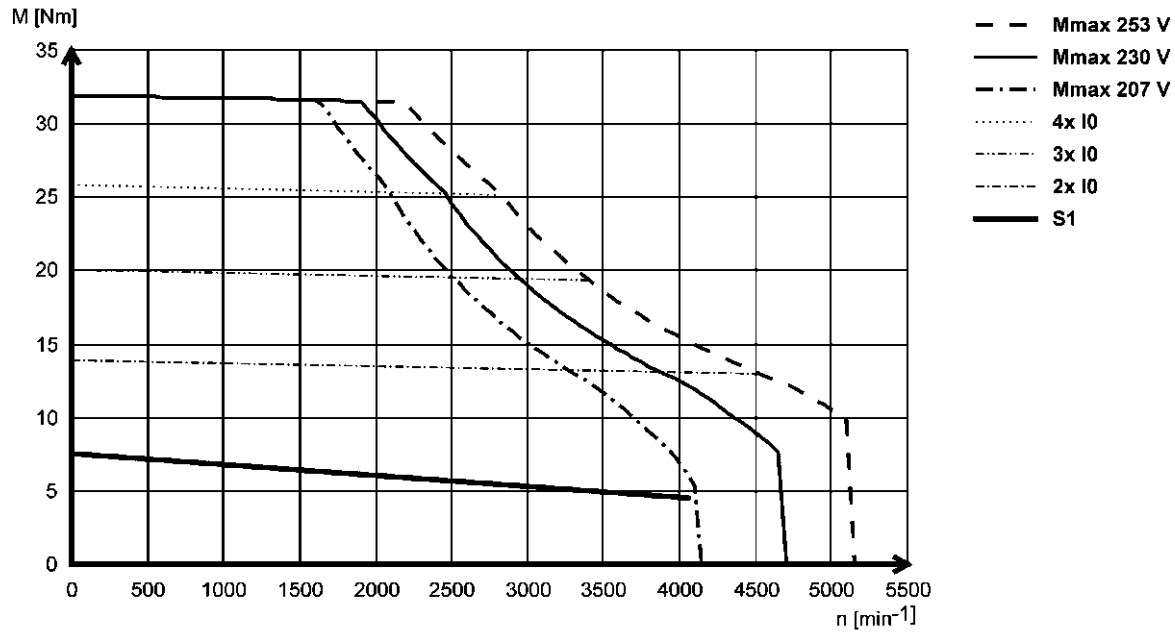


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.



Mains connection 3x 230 V

MCS09L41L



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

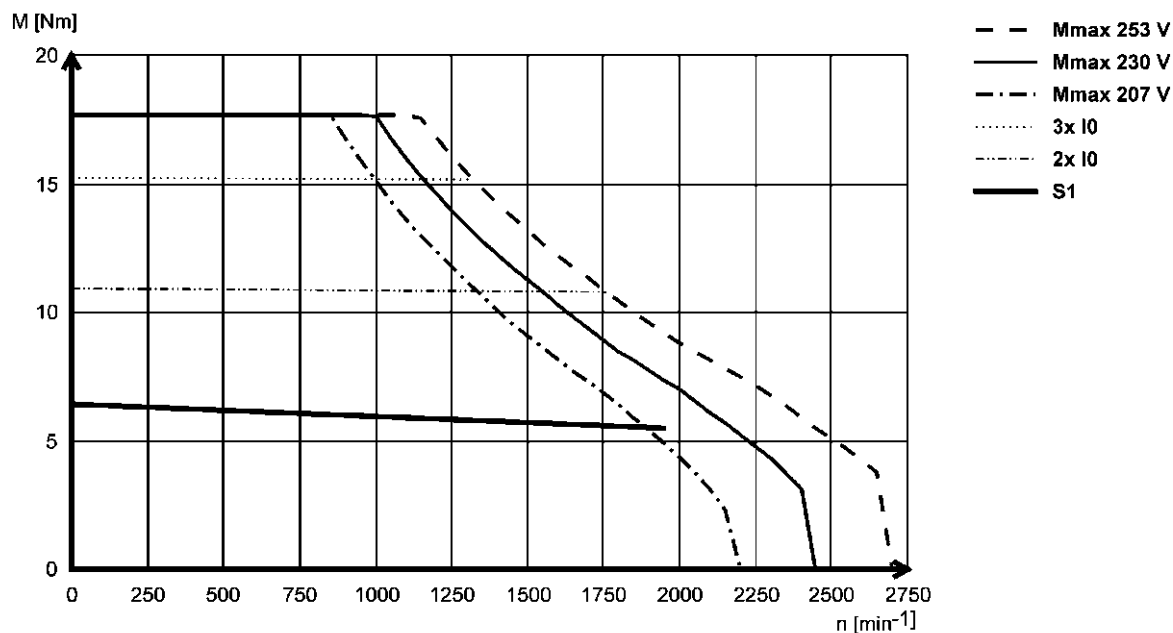


MCS synchronous servo motors

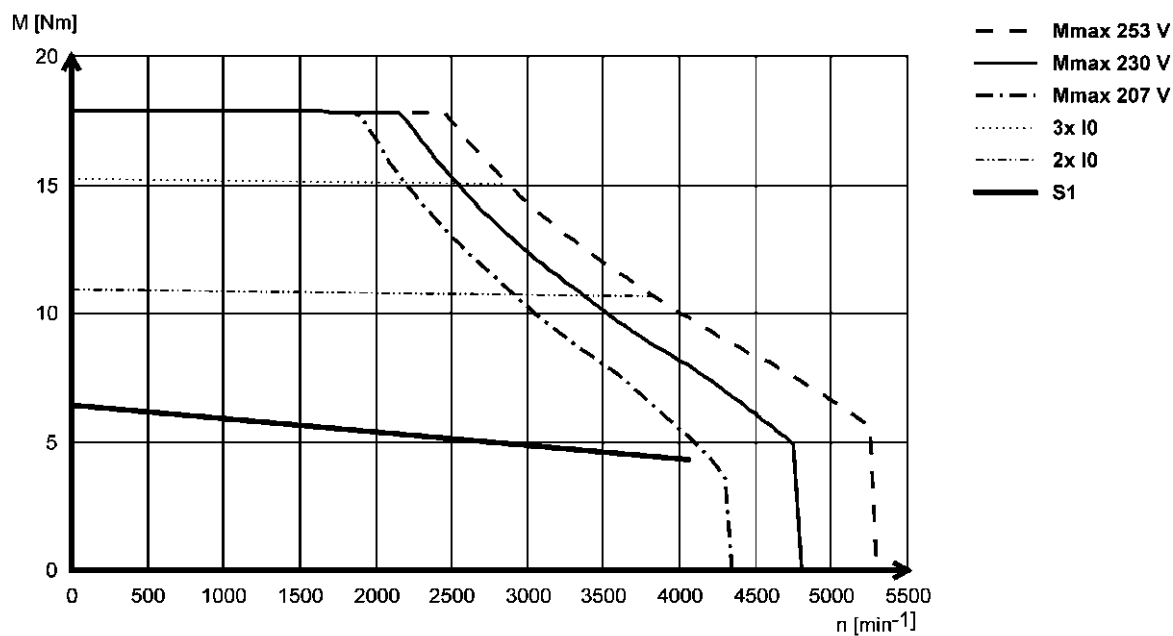
Torque characteristics

Mains connection 3x 230 V

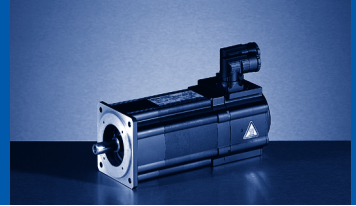
MCS12D20L



MCS12D41L

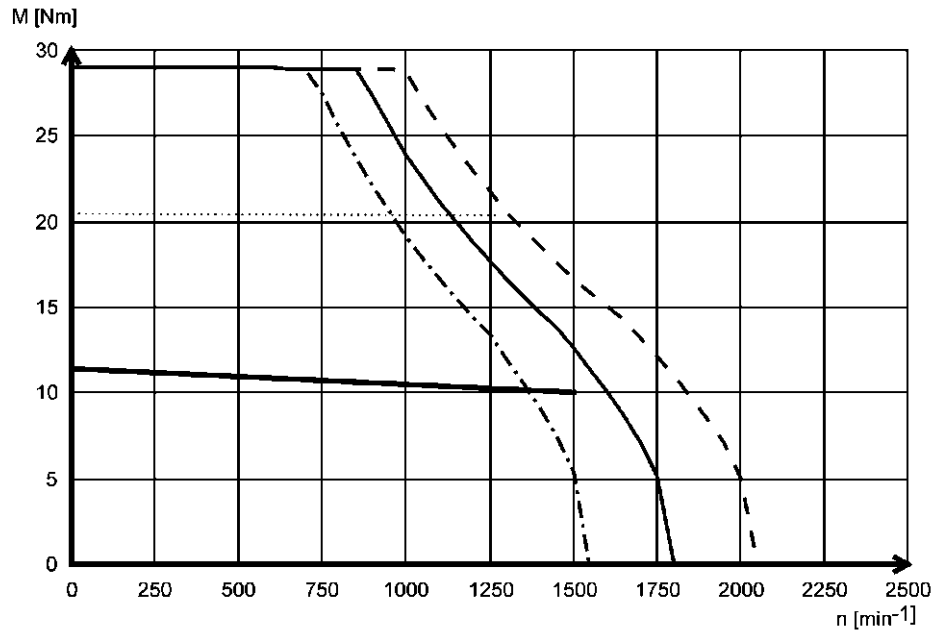


► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

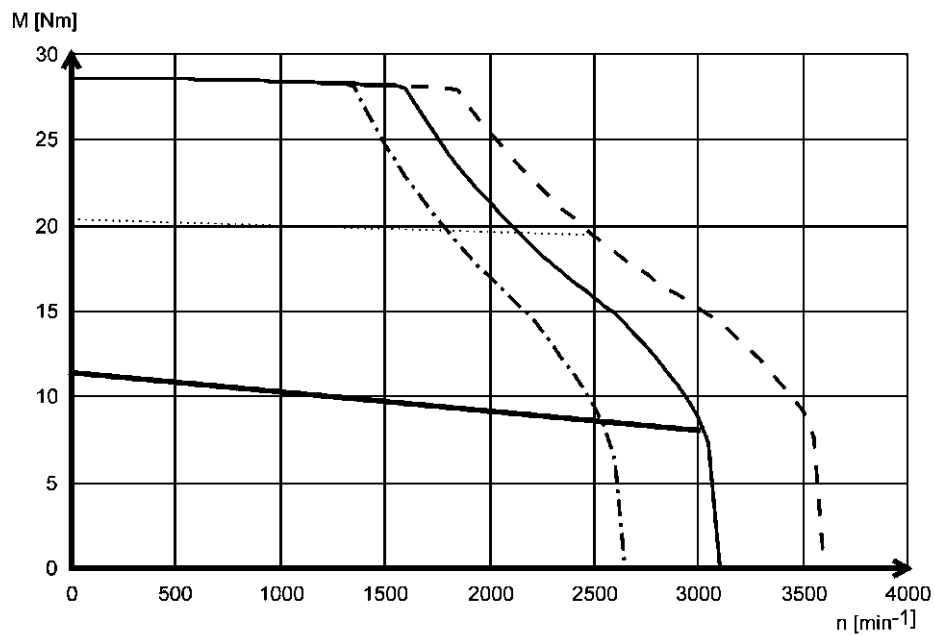


Mains connection 3x 230 V

MCS12H15L



MCS12H30L



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

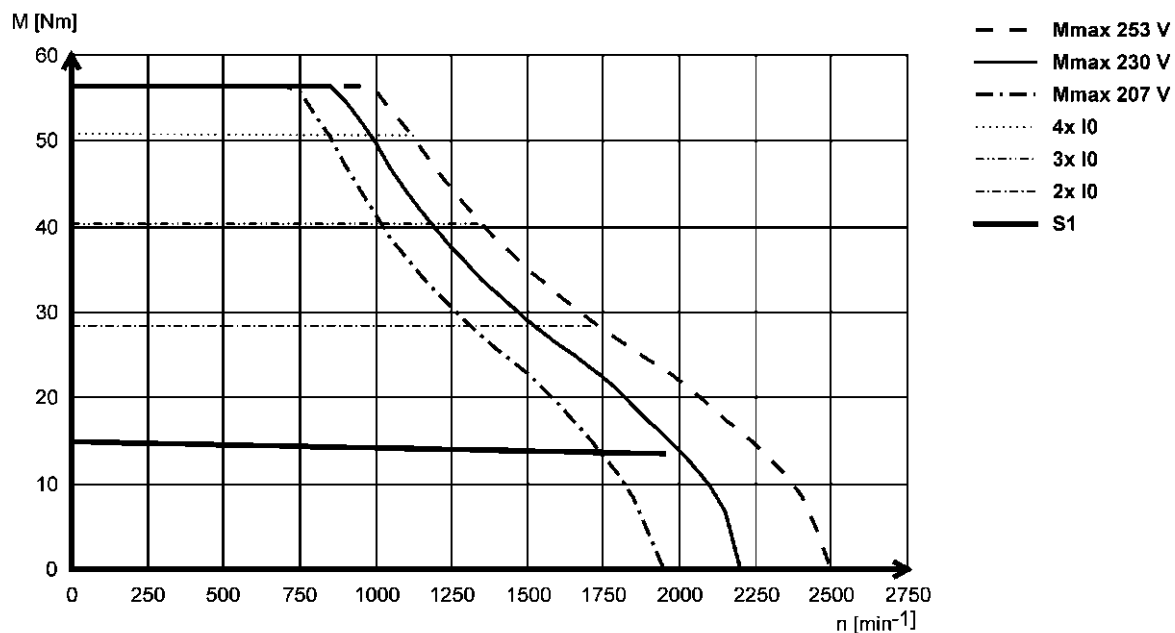


MCS synchronous servo motors

Torque characteristics

Mains connection 3x 230 V

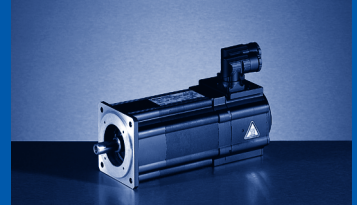
MCS12L20L



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

MCS synchronous servo motors

Torque characteristics





MCS synchronous servo motors

Accessories

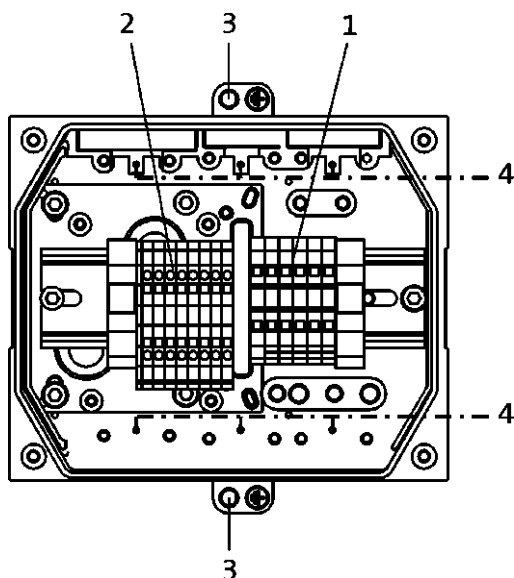
Terminal box for motor connection

If a servo motor is to be connected to an existing cable or plug connectors are not to be used for other reasons, the connection can also be made via a terminal box.

The terminals are designed as tension spring terminals to ensure here the long-term vibration resistance of the cable contacts with adequate contact pressure required.

The terminal boxes have generously dimensioned space for the customer's own wiring and large surface shield connection areas to ensure a secure EMC-compliant connection. The cable outlet may be to the left or to the right, depending on requirements.

It is not possible to build on a terminal box on the MCS06 and the design with the blower.



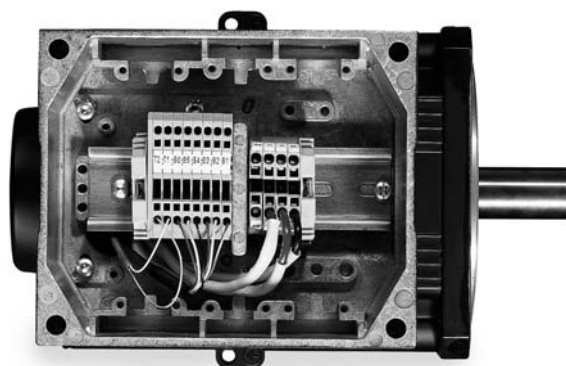
1: Power connection (terminals loadable up to 65 A) + brake connection.

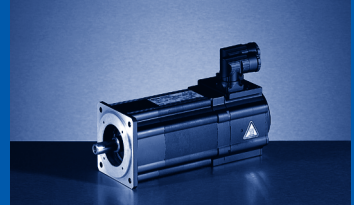
2: Angle/speed sensor connection + temperature connection.

3: PE connection.

4: Large area shield contact.

5: Openings of 2x M32, 2x M25, 2x M20 fittings. The openings are filled and can be opened up as required by the customer.





Holding brakes

The MCS synchronous servo motors can be equipped with integral permanent magnet holding brakes for 24 V DC. The brakes are active once the supply voltage is switched off (closed-circuit principle). Where the brakes are used purely as holding brakes, there is practically no wear on the friction surfaces.

On travel axes compliance with the permissible mass inertia ratio J_L / J_{MB} ensures that the permissible maximum switching energy of the brake is not exceeded and up to 2000 emergency stop functions can be executed from a speed of 3000 rpm.

In lifting axes the load torque resulting from the force due to weight additionally acts. The information relating to J_L / J_{MB} does not apply in this event.

Caution:

The brakes used are not safety brakes in the sense that a reduction in torque may arise as a result of disruptive factors that cannot be influenced, e.g. oil ingress.

The ohmic voltage drop along the cable must be taken into consideration in long motor supply cables and must be compensated for by a higher voltage at the line input.

The following applies for Lenze system cables:

$$U[V] = U_B[V] + 0.08 \frac{[V]}{[A] \cdot [m]} \cdot I_{Lg}[m] \cdot I_B[A]$$

If no suitable voltage (incorrect value, incorrect polarity) is applied to the brake, the brake will be applied and can be overheated and destroyed by the motor continuing to rotate. The shortest switching times of the brakes are achieved by DC switching of the voltage. A spark suppressor is required to suppress interference and to increase the service life of the relay contacts here.



Permanent magnet holding brake



MCS synchronous servo motors

Accessories

Holding brake data

		U _{N,DC} ³⁾	M _N	M _N	M _{av}	I _N ²⁾	J	t ₁ ¹⁾	t ₂ ¹⁾	Q _E ⁴⁾	m	J _{MB}	J _L / J _{MB}
			20 °C	120 °C	120 °C								
		[V]	[Nm]	[Nm]	[Nm]	[A]	[kgcm²]	[ms]	[ms]	[J]	[kg]	[kgcm²]	
MCS06C	P1	24	2.20	2.00	0.60	0.34	0.12	15.0	30.0	30.0	0.30	0.26	22.1
MCS06F												0.34	16.6
MCS06I												0.42	13.3
MCS09D			8.00	6.00	4.50	0.65	1.07	20.0	40.0	400	0.80	2.17	36.4
MCS09F												2.57	30.5
MCS09H												2.97	26.3
MCS09L			12.0	10.0	7.00			13.0	43.0		0.90	3.87	19.9
MCS12D												5.07	15.0
MCS12H												8.40	8.70
MCS12L			22.0	18.0	8.00	0.88	3.20	15.0	150	640	1.90	11.7	5.90
MCS14D												11.3	10.5
MCS14H												17.4	6.50
MCS14L			37.0	32.0	15.0	0.93	12.4	96.0	113	2350	3.10	26.6	3.90
MCS14P												37.9	2.40
MCS19F			37.0	32.0	15.0	0.93	12.4	96.0	113	2350	3.10	77.4	5.20

Holding brake data, reinforced design

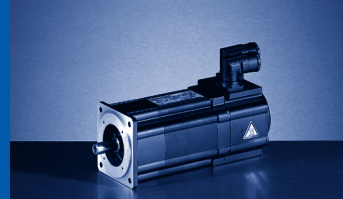
		$U_{N,DC}^{3)}$	M_N	M_N	M_{av}	$I_N^{2)}$	J	$t_1^{1)}$	$t_2^{1)}$	$Q_E^{4)}$	m	J_{MB}	J_L / J_{MB}
			20 °C	120 °C	120 °C								
		[V]	[Nm]	[Nm]	[Nm]	[A]	[kgcm ²]	[ms]	[ms]	[J]	[kg]	[kgcm ²]	
MCS09D	P2	24	12.0	10.0	7.00	0.65	1.07	20.0	40.0	400	0.80	2.17	36.4
MCS09F												2.57	30.5
MCS09H												2.97	26.3
MCS09L												3.87	19.9
MCS12D			24.0	19.0	12.0	0.71	3.13	16.0	90.0	890	1.20	7.10	24.3
MCS12H												10.4	16.3
MCS12L												13.7	12.1
MCS14D			37.0	32.0	15.0	0.93	12.4	96.0	113	2350	3.10	20.5	22.2
MCS14H												26.6	16.9
MCS14L												35.8	12.3
MCS14P			100	80.0	43.0	1.29	30.0	30.0	90.0	2100	4.30	47.1	9.10
MCS19J												135	2.20
MCS19P			100	80.0	43.0	1.29	30.0	30.0	90.0	2100	4.30	190	1.20

¹⁾ Engagement and disengagement times valid for rated voltage (40%) and protective circuit for brakes with varistor for DC-controlled switching. The times may increase without a protective circuit.

²⁾ The currents are maximum values for a cold brake (data for sizing the power supply). The values for a motor at operating temperature are considerably lower.

³⁾ With 24V DC brake: smoothed DC voltage, ripple $\leq 1\%$.

⁴⁾ Maximum switching energy per emergency stop with $n = 3000 \text{ min}^{-1}$.



Blower data 50 Hz

		Enclosure	Number of phases					
				U_{min}	U_{max}	$U_{N,AC}$	P_N	I_N
				[V]	[V]	[V]	[kW]	[A]
MCS12	F10	IP54	1	210	240	230	0.019	0.12
MCS14	F50			104	122	115	0.046	0.32
MCS19	F10			210	240	230	0.060	0.26
	F50			104	122	115	0.055	0.50

Blower data 60 Hz

		Enclosure	Number of phases					
				U_{min}	U_{max}	$U_{N,AC}$	P_N	I_N
				[V]	[V]	[V]	[kW]	[A]
MCS12	F10	IP54	1	210	240	230	0.019	0.12
	F50			104	122	115	0.018	0.22
MCS14	F10			210	240	230	0.046	0.32
	F50			104	122	115	0.044	0.56
MCS19	F10			210	240	230	0.060	0.26
	F50			104	122	115	0.070	0.61



MCS synchronous servo motors

Accessories

Tailored to meet the requirements of the various applications and necessary accuracies, the following feedback systems are available.

Resolver

Stator-fed resolver with two 90° stator windings and one rotor winding with transformer winding.

Speed / angle sensor	1)			RS0
Resolution			[°]	0.80
Angle			[°]	-10 ... 10
Accuracy			[°]	-10 ... 10
Absolute positioning				1 revolution
Max. speed	$n_{\max}$		[min ⁻¹]	8000
Max. input voltage	$U_{\max}$		[V]	10.0
DC	$U_{\max}$		[V]	10.0
Max. input frequency	$f_{\max, 1}$		[kHz]	4.00
Ratio		$\pm 5 \%$		0.30
Stator / rotor		$\pm 5 \%$		0.30
Rotor impedance	Z_{ro}		[Ω]	51 + j90
Stator impedance	Z_{so}		[Ω]	102 + j150
Impedance	Z_{rs}		[Ω]	44 + j76
Min. insulation resistance	R		[MΩ]	10.0
At DC 500 V	R		[MΩ]	10.0
Number of pole pairs				1
Max. angle error			[°]	-10 ... 10
Version				E94A
Inverter assignment				ECS
				EVS93

1) → 14 - Product key > speed/angle sensor



Incremental and SinCos absolute value encoder

Encoder type			TTL incre- mental	SinCos absolute value				
Speed / angle sensor	1)		C40	EQI	SRS	SRM	ECN	EQN
			IK4096-5V-T	AM32-5V-E	AS1024-8V-H	AM1024-8V-H	AS2048-5V-E	AM2048-5V-E
Encoder type			Single turn	Multi-turn	Single turn	Multi-turn	Single turn	Multi-turn
Pulses			4096	32	1024		2048	
Output signals			TTL 5 V		1 Vss			
Interfaces				EnDat	Hiperface		EnDat	
Absolute revolution			0	4096	1	4096	1	4096
Resolution Angle 2)		[°]	1.30		0.40			
Accuracy		[°]	-1 ... 1	-5 ... 5	-0.8 ... 0.8		-0.6 ... 0.6	
Min. input voltage DC	$U_{min,1}$	[V]	4.50	4.75	7.00		4.75	
Max. input voltage DC	U_{max}	[V]	5.50	5.25	12.0		5.25	
Max. speed	n_{max}	[min ⁻¹]	7324	12000	6000		12000	
Max. current consump- tion	I_{max}	[mA]	75.0	170	80.0		150	250
Limit frequency	f_{max}	[kHz]	500	6.00	200			
Version Inverter assignment			E94P E94S	E94A	E94A ECS EVS93		E94A	

1) → 14 - Product key > speed/angle sensor

2) Dependent on inverter.



MCS synchronous servo motors

Accessories

Temperature sensor

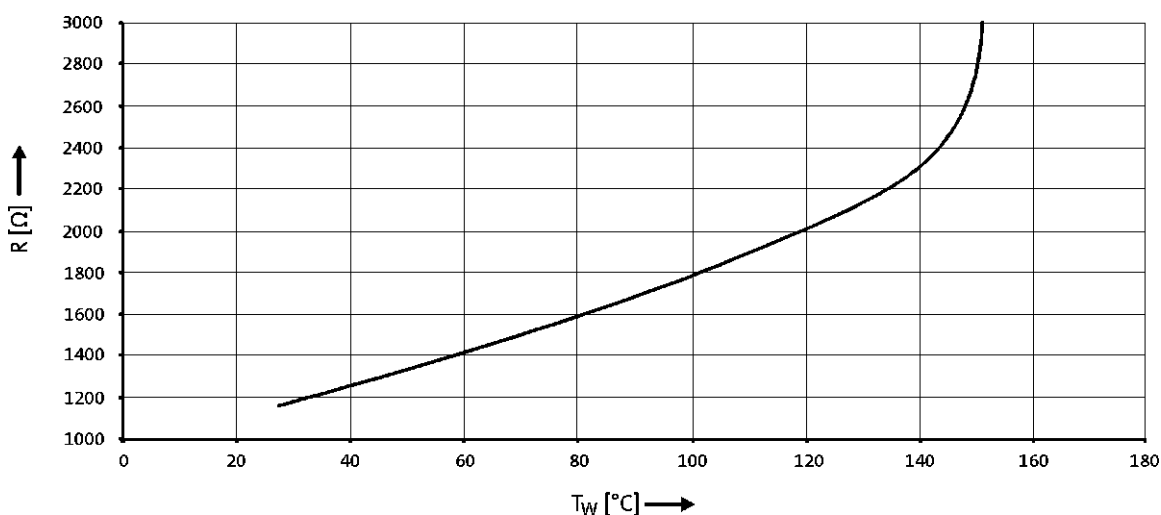
The thermal sensors used in the MCS motors monitor the motor temperature continuously. The temperature signal is transmitted over the system cable of the feedback system to the servo controller. Because of the different physical conditions, there are two temperature monitoring mechanisms on the MCS motors (there is no complete motor protection in either case)

MCS06

On this motor, the winding temperature of one winding phase is monitored with a KTY 83-110 type thermal sensor.

MCS09 ... 19

These motors are monitored by three thermal sensors (1x KTY 83-110 + 2x PTC 150 Ω) connected in series. This means that the temperature of the motor is determined with great accuracy in the permitted operating range and at the same time the overtemperature response configured in the controller is executed in the event of overtemperature in one of the winding phases.



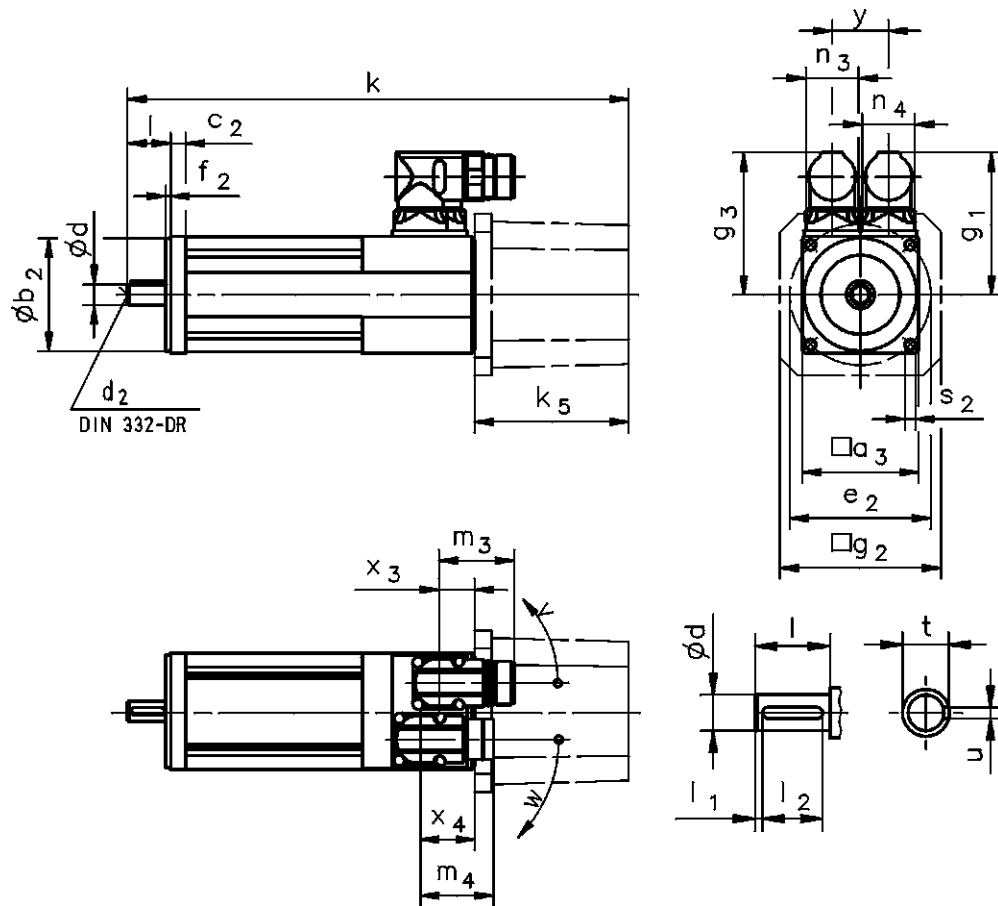
- If the detector is supplied with a measured current of 1 mA, the above relationship between the temperature and the resistance applies.

MCS synchronous servo motors

Dimensions [mm]



Motors without blower



			MCS06C	MCS06F	MCS06I
RS0 / C40 B0	k	[mm]	155	185	215
RS0 / C40 P?	k	[mm]	174	204	233
RS0 / C40	k ₅	[mm]			
	g ₂	[mm]			
SR? / E?? B0	k	[mm]	237	266	297
SR? / E?? P?	k	[mm]	255	285	315
SR? / E??	k ₅	[mm]		82	
	g ₂	[mm]		86	

	g ₁	g ₃	x ₃	x ₄	m ₃	m ₄	n ₃	n ₄	y	v	w
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[°]
MCS06	77	77	19	29	40	40	28	28	30	190	230

	d	d ₂	l	l ₁	l ₂	u	t
	k ₆						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCS06	11	M4	23	2.0	18	4.0	13

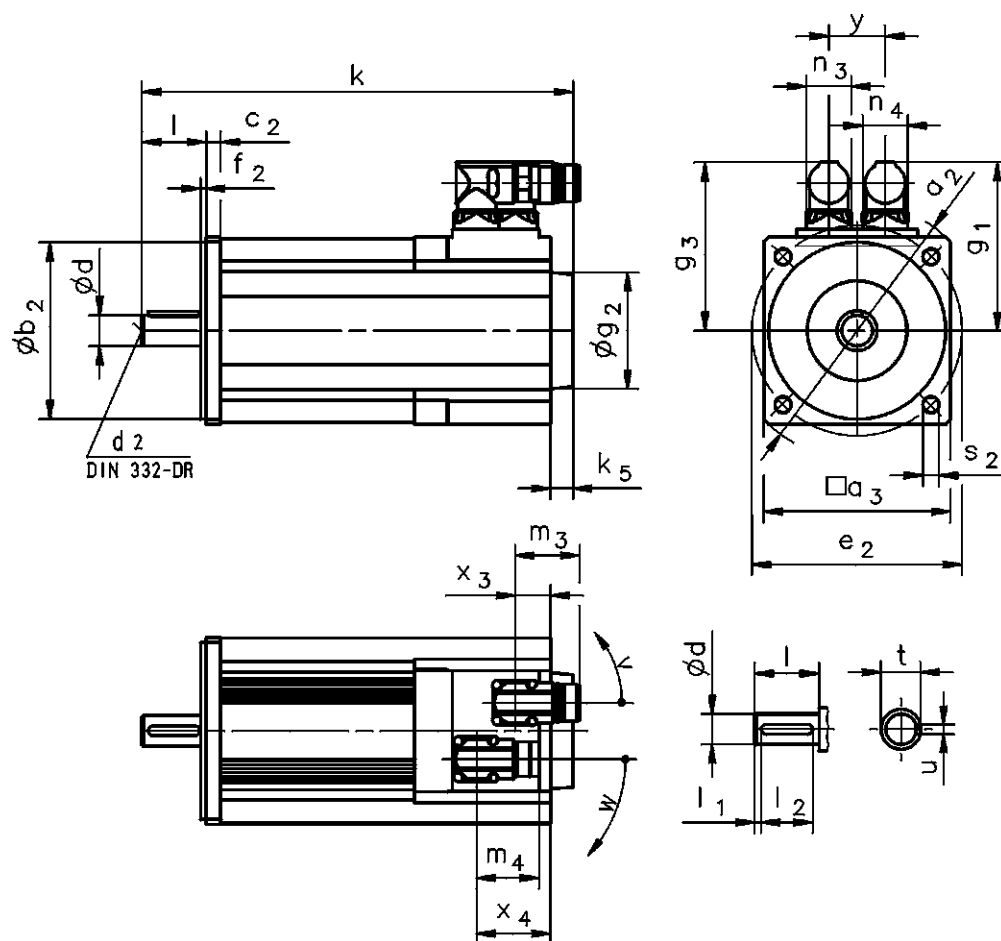
	a ₃	b ₂	c ₂	e ₂	f ₂	s ₂
	j ₆					
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCS06	62	60	8	75	2.5	5.5



MCS synchronous servo motors

Dimensions [mm]

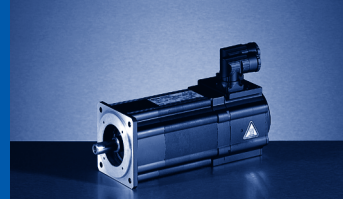
Motors without blower



			MCS09D	MCS09F	MCS09H	MCS09L	MCS12D	MCS12H	MCS12L
RS0 / C40 B0	k	[mm]	213	233	253	293	228	268	308
RS0 / C40 P?	k	[mm]	233	253	273	313	248	288	328
RS0 / C40	k ₅	[mm]	13				14		
	g ₂	[mm]	67				72		
SR? / E?? B0	k	[mm]	264	284	304	344	277	317	357
SR? / E?? P?	k	[mm]	284	304	324	364	297	337	377
SR? / E??	k ₅	[mm]	64				63		
	g ₂	[mm]	81				89		
			MCS14D	MCS14H	MCS14L	MCS14P	MCS19F	MCS19J	MCS19P
RS0 / C40 B0	k	[mm]	251	291	331	371	280	320	380
RS0 / C40 P?	k	[mm]	279	319	359	399	314	364	424
RS0 / C40	k ₅	[mm]	24				15		
	g ₂	[mm]	78						
SR? / E?? B0	k	[mm]	301	341	381	421	329	369	429
SR? / E?? P?	k	[mm]	329	369	409	449	363	413	473
SR? / E??	k ₅	[mm]	74				64		
	g ₂	[mm]	101						

MCS synchronous servo motors

Dimensions [mm]



	g ₁	g ₃	x ₃	x ₄	m ₃	m ₄	n ₃	n ₄	y	v	w
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[°]
MCS09	90	90	20	44	40	40	28	28	35	195	260
MCS12	105	105	22	46							

	g ₁	g ₃	x ₃	x ₄	m ₃	m ₄	n ₃	n ₄	y	v	w
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[°]
MCS14D15-	117	117	24	48	40	40	28	28	35	195	260
MCS14D36-											
MCS14H15-											
MCS14H32-											
MCS14L15-											
MCS14L32-	146	126	29	36		75		45		180	205
MCS14P14-	117	117	24	48		40		28		195	260
MCS14P32-	146	126	29	36		75		45		180	205
MCS19F14-	142	142	24 51 ¹⁾	48 75 ¹⁾		40		28		195	260
MCS19F30-	171	151	29 56 ¹⁾	36 63 ¹⁾		75		45		180	205
MCS19J14-	142	142	24 51 ¹⁾	48 75 ¹⁾		40		28		195	260
MCS19J30-	171	151	29 56 ¹⁾	36 63 ¹⁾		75		45		180	205
MCS19P14-	142	142	24 51 ¹⁾	48 75 ¹⁾		40		28		195	260
MCS19P30-	171	151	29 56 ¹⁾	36 63 ¹⁾		75		45		180	205

	d	d ₂	l	l ₁	l ₂	u	t
	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCS09	14	M5	30	2.5	25	5.0	16
MCS12	19	M6	40	4.0	32	6.0	22
MCS14	24	M8	50	5.0	40	8.0	27
MCS19	28	M10	60		50		31

	a ₂	a ₃	b ₂	c ₂	e ₂	f ₂	s ₂
			j6				
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCS09	120	89	80	8	100	3.0	7.0
MCS12	160	116	110	9	130	3.5	10.0
MCS14	188	143	130	13	165		12.0
MCS19	250	192	180	11	215	4.0	14.0

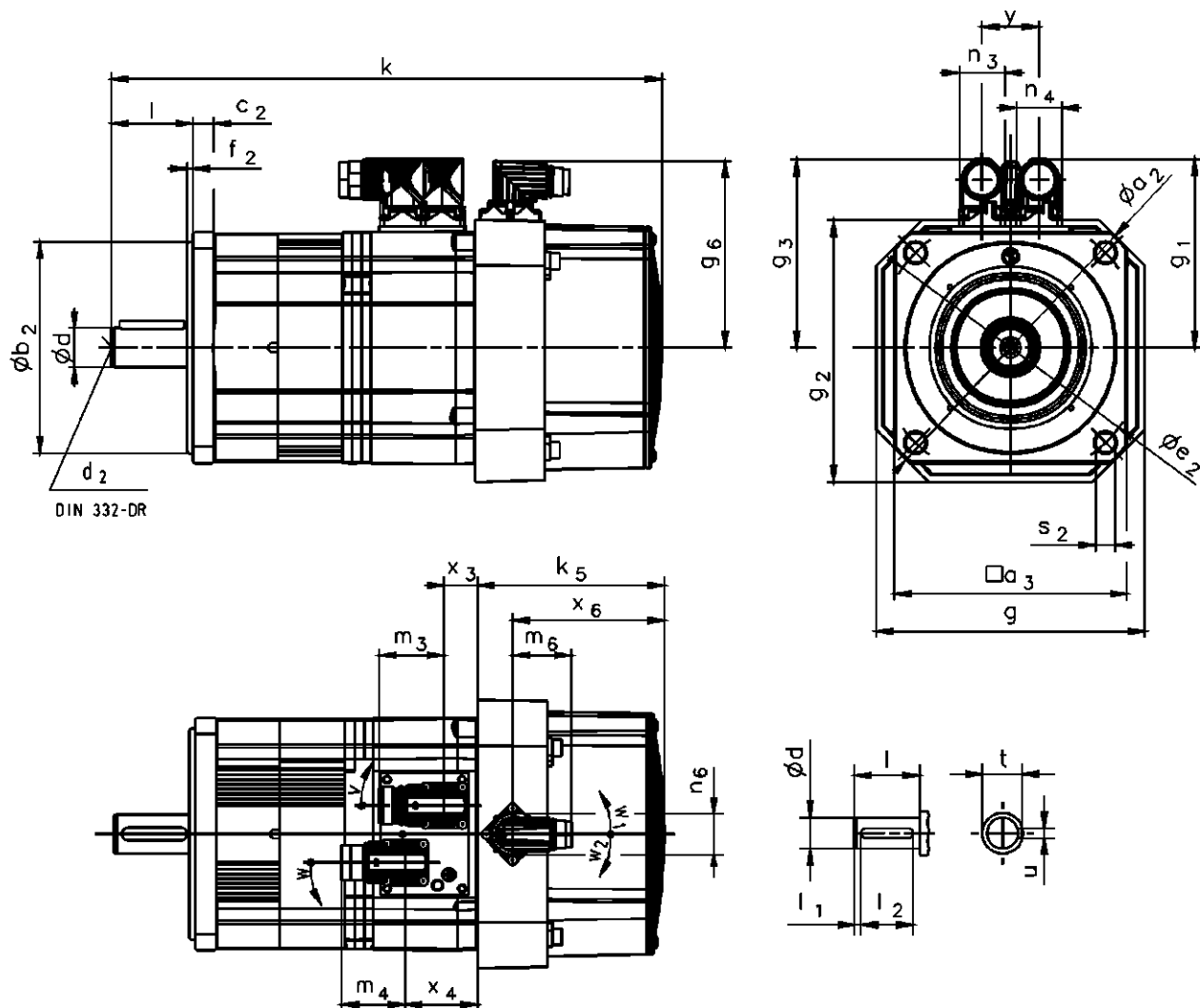
¹⁾ On version with brake (P?)



MCS synchronous servo motors

Dimensions [mm]

Motors with blower



			MCS12D	MCS12H	MCS12L	MCS14D	MCS14H	MCS14L	MCS14P	MCS19F	MCS19J	MCS19P
RS0 / C40 B0	k	[mm]	301	341	381	339	379	419	459	387	427	487
RS0 / C40 P?	k	[mm]	321	361	401	368	408	448	488	421	471	531
RS0 / C40	k ₅	[mm]	92			115				126		
SR? / E?? B0	k	[mm]	344	384	424	392	432	472	512	425	465	525
SR? / E?? P?	k	[mm]	364	404	444	421	461	501	541	459	509	569
SR? / E??	k ₅	[mm]	135			169				165		
	g	[mm]	140			167				212		
	g ₂	[mm]	140			163				210		

MCS synchronous servo motors

Dimensions [mm]



	g ₁	g ₃	g ₆	x ₃	x ₄	x ₆	m ₃	m ₄	m ₆	n ₃	n ₄	n ₆	y	v	w	w ₁	w ₂	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[°]	[°]	[°]	
MCS12D17	105	105	107	16	40	67		40			28							
MCS12D35																		
MCS12H14																		
MCS12H34																		
MCS12L17																		
MCS12L39																		
MCS14D14	117	117	115	20	44	93	40	37	28	28	35	160	160	120	130			
MCS14D30																		
MCS14H12																		
MCS14H28																		
MCS14L14																		
MCS14L30																		
MCS14P11																		
MCS14P26																		
MCS19F12	142	142		19 46 ¹⁾	43 70 ¹⁾											96	40	28
MCS19F29																		
MCS19J12																		
MCS19J29																		
MCS19P12																		
MCS19P29																		

	d	d ₂	l	l ₁	l ₂	u	t
	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCS12	19	M6	40	4.0	32	6.0	22
MCS14	24	M8	50	5.0	40	8.0	27
MCS19	28	M10	60		50		31

	a ₂	a ₃	b ₂	c ₂	e ₂	f ₂	s ₂
			j6				
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCS12	160	116	110	9	130	3.5	10.0
MCS14	188	143	130	13	165		12.0
MCS19	250	192	180	11	215	4.0	14.0

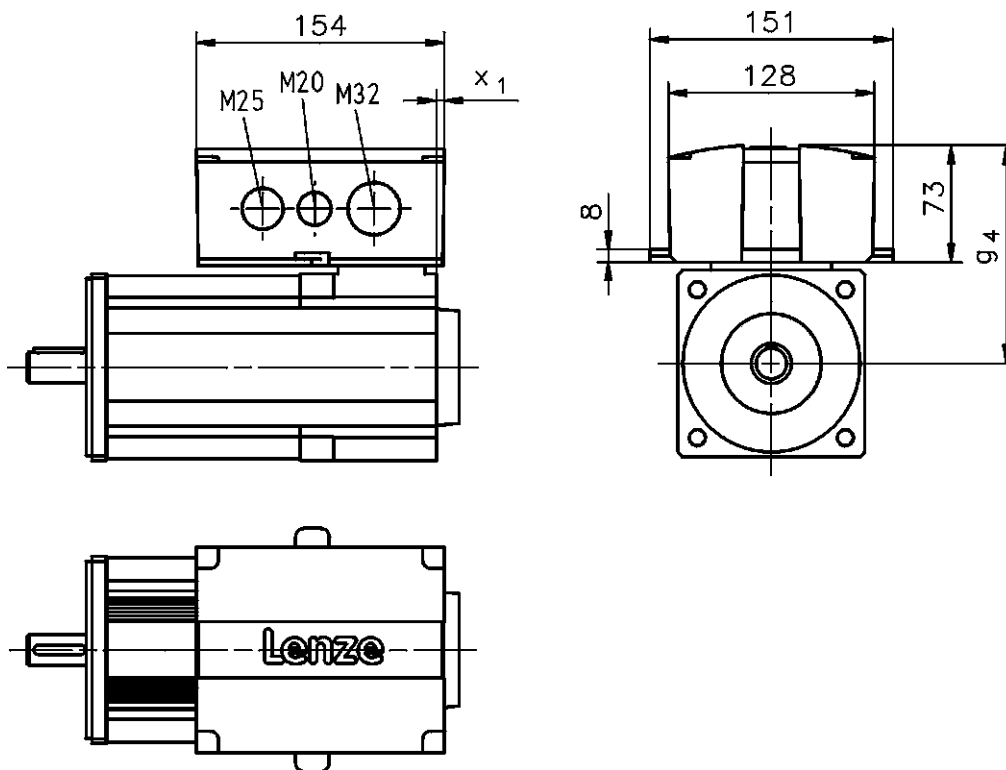
¹⁾ On version with brake (P?)



MCS synchronous servo motors

Dimensions [mm]

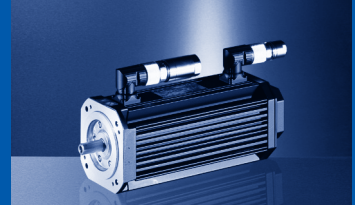
Motors with terminal box



	g_4	x_1
	[mm]	[mm]
MCS09	121	8
MCS12	136	5
MCS14	147	3
MCS19	172	

MD□KS synchronous servo motors

Rated data



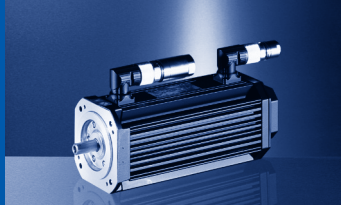
Mains connection 3x 400 V

	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	I_{max}	$U_{N,AC}$	f_N
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[A]	[V]	[Hz]
MDSKS□□036-13	4000	0.70	3.10	0.60	0.25	0.90	0.90	5.00	245	200
MDSKS□□036-23	4000	1.50	7.20	1.30	0.54	1.25	1.10	7.50	345	200
MDSKS□□056-23	3800	3.20	11.6	2.80	1.10	2.60	2.30	10.0	330	190
MDSKS□□056-33	4000	4.70	17.2	4.20	1.80	4.00	3.60	16.0	325	200
MDSKS□□071-03	3400	6.70	23.6	5.70	2.00	4.90	4.20	19.0	330	170
MDSKS□□071-13	3700	10.0	35.2	8.30	3.20	8.40	7.00	32.0	325	185
MDSKS□□071-33	3600	14.7	52.0	12.3	4.60	11.9	10.0	45.0	325	180
MDFKS□□071-03	3300	8.80	23.6	7.50	2.60	6.60	5.60	19.0	330	165
MDFKS□□071-13	3600	13.3	35.2	11.0	4.10	11.1	9.20	32.0	325	180
MDFKS□□071-33	3500	19.3	52.0	16.2	5.90	15.6	13.1	45.0	325	175

	η	$J^{1)}$	$KE_{LL\ 150\ ^\circ C}$	$R_{UV\ 20\ ^\circ C}$	$R_{UV\ 150\ ^\circ C}$	L_N	$Kt_{0\ 150\ ^\circ C}$	$n_{max}^{2)}$	$m^{1)}$
	[%]	[kgcm ²]	[V /1000 rp]	[Ω]	[Ω]	[mH]	[Nm/A]	[min ⁻¹]	[kg]
MDSKS□□036-13	66	0.22	47.2	29.3	36.6	47.4	0.72	8000	1.50
MDSKS□□036-23	83	0.36	74.5	28.7	38.7	39.9	1.20	8000	2.10
MDSKS□□056-23	85	1.20	78.1	10.1	13.6	17.1	1.23	5500	5.30
MDSKS□□056-33	87	1.80	74.6	5.10	6.90	10.8	1.18	5500	6.30
MDSKS□□071-03	85	6.00	93.0	3.40	4.60	10.6	1.37	5000	8.90
MDSKS□□071-13	82	8.00	84.5	1.50	2.10	5.30	1.19	5000	10.9
MDSKS□□071-33	82	10.0	88.2	1.10	1.60	5.80	1.24	5000	13.0
MDFKS□□071-03	81	6.00	93.0	3.40	4.60	10.6	1.33	5000	10.2
MDFKS□□071-13	79	8.00	84.5	1.50	2.10	5.30	1.20	5000	12.2
MDFKS□□071-33	80	10.0	88.2	1.10	1.60	5.80	1.24	5000	12.2

¹⁾ No brake.

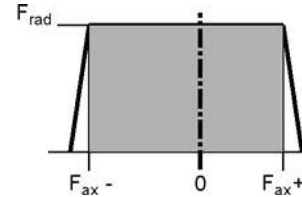
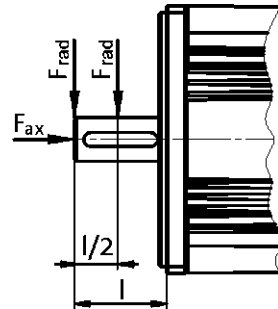
²⁾ Mechanically permissible maximum speed.



MD□KS synchronous servo motors

Rated data

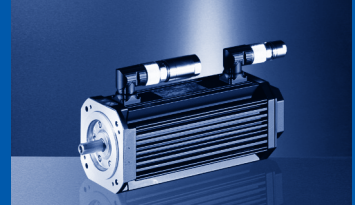
Permissible radial and axial forces



Bearing service life L ₁₀															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
	Max. radial force, Lever arm l/2					Min. axial force, Lever arm l/2					Max. axial force, Lever arm l/2				
	F _{rad,max}	F _{rad,max}	F _{rad,max}	F _{rad,max}	F _{rad,max}	F _{ax,min}	F _{ax,min}	F _{ax,min}	F _{ax,min}	F _{ax,min}	F _{ax,max}	F _{ax,max}	F _{ax,max}	F _{ax,max}	F _{ax,max}
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MDSKS□□036	620	495	390	340	290	-135	-80	-35	-10	10	245	190	145	120	100
MDSKS□□056	590	470	370	310	220	-90	-40	0	10		280	230	190	180	180
MDSKS□□071	910	700	430		50	-50	20	20	20		-50	520	450	450	450
MDFKS□□071															

Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
	Max. radial force, Lever arm l					Min. axial force, Lever arm l					Max. axial force, Lever arm l				
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MDSKS□□036	580	460	365	320	270	-135	-80	-35	-10	10	245	190	145	120	100
MDSKS□□056	550	430	340	290	200	-90	-40	0	10		280	230	190	180	180
MDSKS□□071	820	630	390	280	40	-50	20	20	20	-50	520	450	450	450	520
MDFKS□□071															

- The values for the bearing service life L_{10} relate to a mean speed of 4000 rpm and are additionally restricted by the grease lifetime depending on the ambient temperatures.

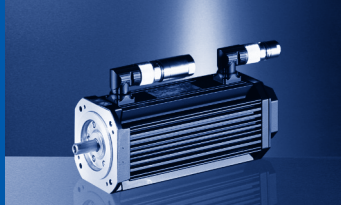


Mains connection 3x 400 V

Motors without blower

					E94A□□	E0024	E0034	E0044	E0074	E0094	E0134	E0174
					I _N	1.9	3.1	5.0	8.8	11.7	16.3	20.6
					I _{0,max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5
MDSKS	M _N	n _N	I _N	P _N	I _{max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5
036-13	0.6	4000	0.9	0.25	M ₀	0.6						
					M _N	0.6						
					M _{0,max}	3.1						
					M _{max}	3.1						
					n _{eto}	-						
036-23	1.3	4000	1.1	0.54	M ₀	1.5	1.5					
					M _N	1.3	1.3					
					M _{0,max}	6.2	7.2					
					M _{max}	6.2	7.2					
					n _{eto}	-	-					
056-23	2.8	3800	2.3	1.10	M ₀	2.3	3.2					
					M _N	2.3	2.8					
					M _{0,max}	7.5	11.6					
					M _{max}	7.5	11.6					
					n _{eto}	-	-					
056-33	4.2	4000	3.6	1.80	M ₀		3.6	4.7				
					M _N		3.6	4.2				
					M _{0,max}		12.0	17.2				
					M _{max}		12.0	17.2				
					n _{eto}		-	-				
071-03	5.7	3400	4.2	2.00	M ₀		4.2	6.7	6.7			
					M _N		4.2	5.7	5.7			
					M _{0,max}		15.2	21.4	23.6			
					M _{max}		15.2	21.4	23.6			
					n _{eto}		-	-	-			
071-13	8.3	3700	7.0	3.20	M ₀			6.0	10.0	10.0	10.0	
					M _N			5.9	8.3	8.3	8.3	
					M _{0,max}			22.0	27.1	32.7	35.2	
					M _{max}			22.0	27.1	32.7	35.2	
					n _{eto}			-	-	-	-	
071-33	12.3	3600	10.0	4.60	M ₀				10.9	14.3	14.7	14.7
					M _N				10.8	12.3	12.3	12.3
					M _{0,max}				31.2	38.9	48.3	52.0
					M _{max}				31.2	38.9	48.3	52.0
					n _{eto}				-	-	-	-

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MD□KS synchronous servo motors

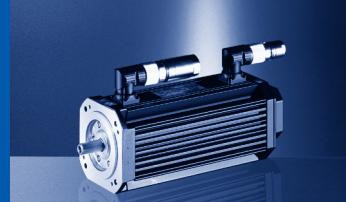
9400 Servo Drives selection tables

Mains connection 3x 400 V

Motors with blower

					E94A□□	E0044	E0074	E0094	E0134	E0174
					I _N	5.0	8.8	11.7	16.3	20.6
					I _{0,max}	16.0	21.0	28.0	39.0	49.5
MDFKS	M _N	n _N	I _N	P _N	I _{max}	16.0	21.0	28.0	39.0	49.5
071-03	7.5	3300	5.6	2.60	M ₀	6.7	8.8			
					M _N	6.7	7.5			
					M _{0,max}	21.6	23.6			
					M _{max}	21.6	23.6			
					n _{eto}	-	-			
071-13	11.0	3600	9.2	4.10	M ₀		10.5	13.3	13.3	
					M _N		10.5	11.0	11.0	
					M _{0,max}		27.8	33.1	35.2	
					M _{max}		27.8	33.1	35.2	
					n _{eto}		-	-	-	
071-33	16.2	3500	13.1	5.90	M ₀			14.4	19.3	19.3
					M _N			14.3	16.2	16.2
					M _{0,max}			40.0	48.8	52.0
					M _{max}			40.0	48.8	52.0
					n _{eto}			-	-	-

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

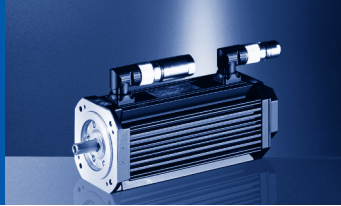


Mains connection 3x 400 V

Motors without blower

					ECS□□	004C□B	008C□B	016C□B	032C□B	048C□B
					I _N	2.0	4.0	8.0	12.7	17.0
					I _{0,max}	2.3	4.6	9.1	18.1	27.2
MDSKS	M _N	n _N	I _N	P _N	I _{max}	4.0	8.0	16.0	32.0	48.0
036-13	0.6	4000	0.9	0.25	M ₀	0.6	0.7			
					M _N	0.6	0.6			
					M _{0,max}	1.6	2.8			
					M _{max}	2.5	3.1			
					n _{eto}	3359	2414			
036-23	1.3	4000	1.1	0.54	M ₀	1.5	1.5			
					M _N	1.3	1.3			
					M _{0,max}	2.8	5.1			
					M _{max}	4.5	7.2			
					n _{eto}	2501	1086			
056-23	2.8	3800	2.3	1.10	M ₀		3.2	3.2		
					M _N		2.8	2.8		
					M _{0,max}		5.9	10.7		
					M _{max}		9.6	11.6		
					n _{eto}		2816	2452		
056-33	4.2	4000	3.6	1.80	M ₀		4.7	4.7		
					M _N		4.2	4.2		
					M _{0,max}		5.4	11.1		
					M _{max}		9.9	17.2		
					n _{eto}		3620	2705		
071-03	5.7	3400	4.2	2.00	M ₀		5.5	6.7		
					M _N		5.4	5.7		
					M _{0,max}		6.2	14.1		
					M _{max}		12.7	21.4		
					n _{eto}		3177	2750		
071-13	8.3	3700	7.0	3.20	M ₀			9.5	10.0	
					M _N			8.3	8.3	
					M _{0,max}			10.8	24.3	
					M _{max}			22.0	35.2	
					n _{eto}			3517	3000	
071-33	12.3	3600	10.0	4.60	M ₀			9.9	14.7	14.7
					M _N			9.8	12.3	12.3
					M _{0,max}			11.2	27.6	38.1
					M _{max}			24.8	42.7	52.0
					n _{eto}			3368	2840	2350

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MDKS synchronous servo motors

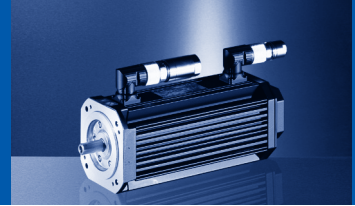
ECS servo system selection tables

Mains connection 3x 400 V

Motors with blower

					ECS□□	008C□B	016C□B	032C□B	048C□B
					I _N	4.0	8.0	12.7	17.0
					I _{0,max}	4.6	9.1	18.1	27.2
MDFKS	M _N	n _N	I _N	P _N	I _{max}	8.0	16.0	32.0	48.0
071-03	7.5	3300	5.6	2.60	M ₀	5.3	8.8		
					M _N	5.4	7.5		
					M _{0,max}	6.2	14.6		
					M _{max}	13.2	21.6		
					n _{eto}	3177	2750		
071-13	11.0	3600	9.2	4.10	M ₀		9.6	13.3	
					M _N		9.6	11.0	
					M _{0,max}		10.9	25.0	
					M _{max}		22.8	35.2	
					n _{eto}		3517	3000	
071-33	16.2	3500	13.1	5.90	M ₀			15.7	19.3
					M _N			15.7	16.2
					M _{0,max}			22.4	39.2
					M _{max}			43.6	52.0
					n _{eto}			2840	2350

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

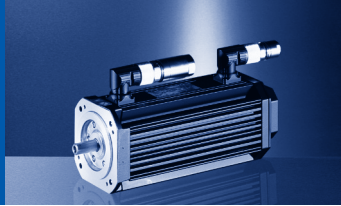


Mains connection 3x 400 V

Motors without blower

					EVS	9321-E□	9322-E□	9323-E□	9324-E□	9325-E□	9326-E□	9327-E□
					I _N	1.5	2.5	3.9	7.0	13.0	23.5	32.0
					I _{0,max}	2.3	3.8	5.9	10.5	19.5	23.5	32.0
MDSKS	M _N	n _N	I _N	P _N	I _{max}	2.3	3.8	5.9	10.5	19.5	35.3	48.0
036-13	0.6	4000	0.9	0.25	M ₀	0.6	0.6					
					M _N	0.6	0.6					
					M _{0,max}	1.6	2.4					
					M _{max}	1.6	2.4					
					n _{eto}	4845	3505					
036-23	1.3	4000	1.1	0.54	M ₀	1.5	1.5	1.5				
					M _N	1.3	1.3	1.3				
					M _{0,max}	2.8	4.3	6.1				
					M _{max}	2.8	4.3	6.1				
					n _{eto}	3443	2598	1645				
056-23	2.8	3800	2.3	1.10	M ₀		3.1	3.2	3.2			
					M _N		2.8	2.8	2.8			
					M _{0,max}		4.9	7.4	11.6			
					M _{max}		4.9	7.4	11.6			
					n _{eto}		3601	3248	2452			
056-33	4.2	4000	3.6	1.80	M ₀			4.6	4.7	4.7		
					M _N			4.2	4.2	4.2		
					M _{0,max}			7.6	12.5	17.2		
					M _{max}			7.6	12.5	17.2		
					n _{eto}			3834	3360	2455		
071-03	5.7	3400	4.2	2.00	M ₀			5.3	6.7	6.7		
					M _N			5.3	5.7	5.7		
					M _{0,max}			9.7	15.8	23.6		
					M _{max}			9.7	15.8	23.6		
					n _{eto}			3291	3047	2500		
071-13	8.3	3700	7.0	3.20	M ₀				8.3	10.0	10.0	
					M _N				8.3	8.3	8.3	
					M _{0,max}				15.5	25.7	29.3	
					M _{max}				15.5	25.7	35.2	
					n _{eto}				3690	3418	3000	
071-33	12.3	3600	10.0	4.60	M ₀					14.7	14.7	14.7
					M _N					12.3	12.3	12.3
					M _{0,max}					29.3	34.1	42.7
					M _{max}					29.3	45.4	52.0
					n _{eto}					3252	2716	2350

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MDKS synchronous servo motors

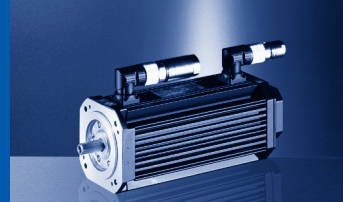
EVS9300 servo inverter selection tables

Mains connection 3x 400 V

Motors with blower

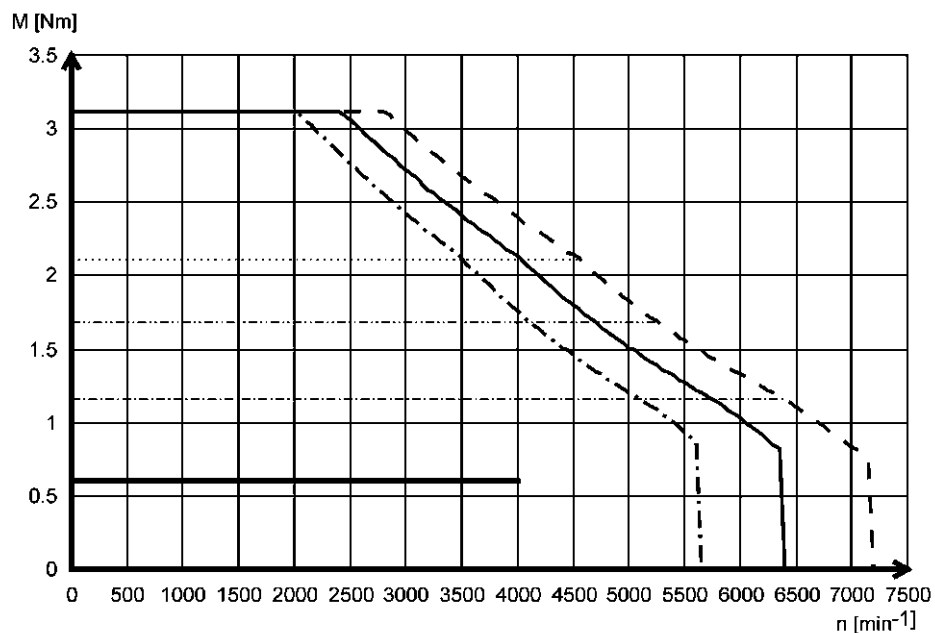
					EVS	9323-E□	9324-E□	9325-E□	9326-E□	9327-E□
					I _N	3.9	7.0	13.0	23.5	32.0
					I _{0,max}	5.9	10.5	19.5	23.5	32.0
MDFKS	M _N	n _N	I _N	P _N	I _{max}	5.9	10.5	19.5	35.3	48.0
071-03	7.5	3300	5.6	2.60	M ₀	5.2	8.8	8.8		
					M _N	5.2	7.5	7.5		
					M _{0,max}	7.9	16.3	23.6		
					M _{max}	7.9	16.3	23.6		
					n _{eto}	3291	3047	2500		
071-13	11.0	3600	9.2	4.10	M ₀		8.4	13.3	13.3	
					M _N		8.4	11.0	11.0	
					M _{0,max}		12.6	26.4	29.9	
					M _{max}		12.6	26.4	35.2	
					n _{eto}		3690	3418	3000	
071-33	16.2	3500	13.1	5.90	M ₀			16.1	19.3	19.3
					M _N			16.1	16.2	16.2
					M _{0,max}			30.5	35.2	43.6
					M _{max}			30.5	46.2	52.0
					n _{eto}			3252	2716	2350

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

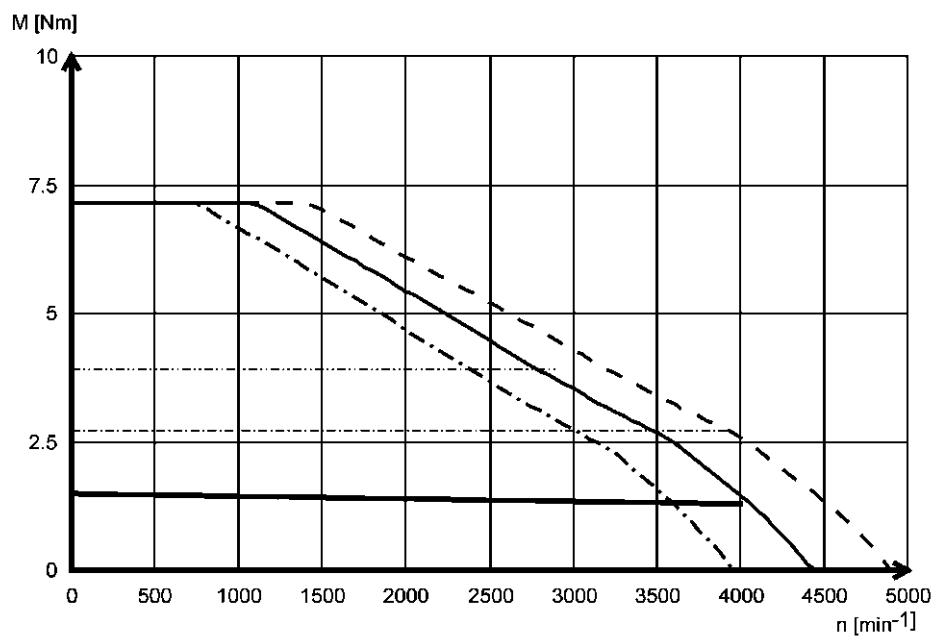


Mains connection 3x 400 V

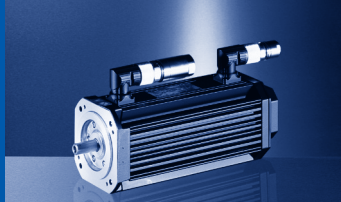
MDSKS□□036-13



MDSKS□□036-23



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

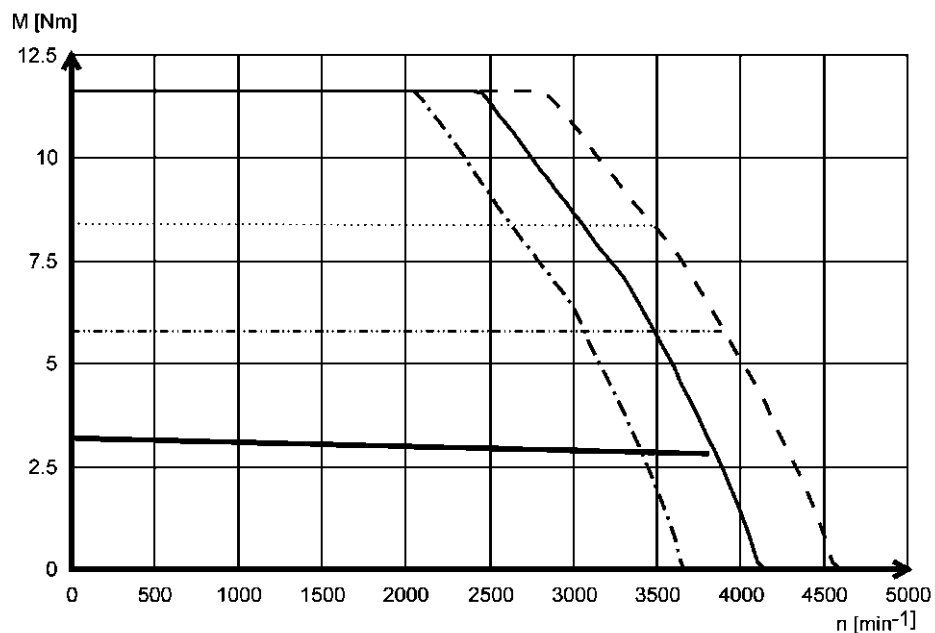


MD□KS synchronous servo motors

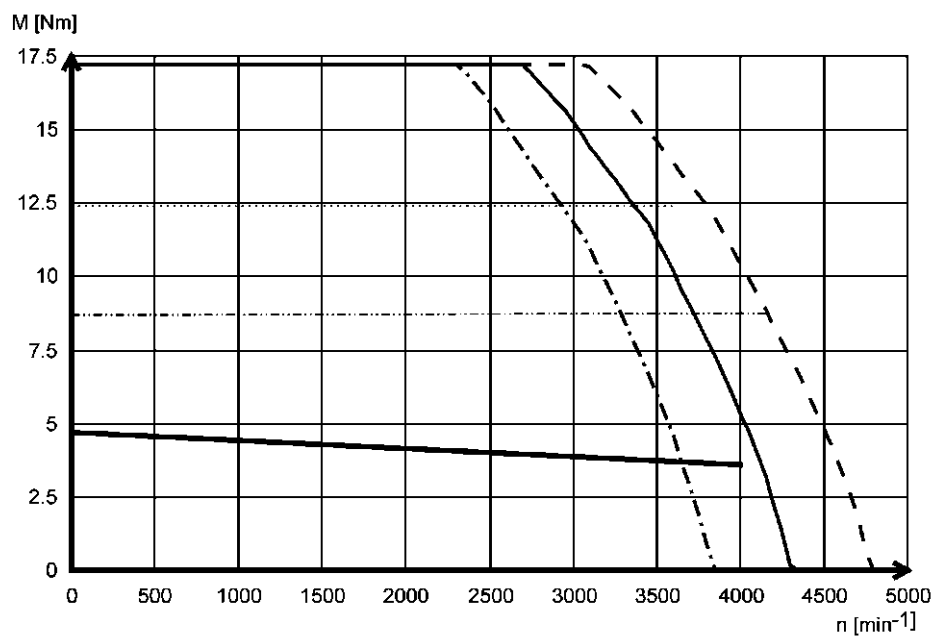
Torque characteristics

Mains connection 3x 400 V

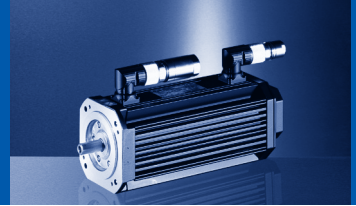
MDSKS□□056-23



MDSKS□□056-33

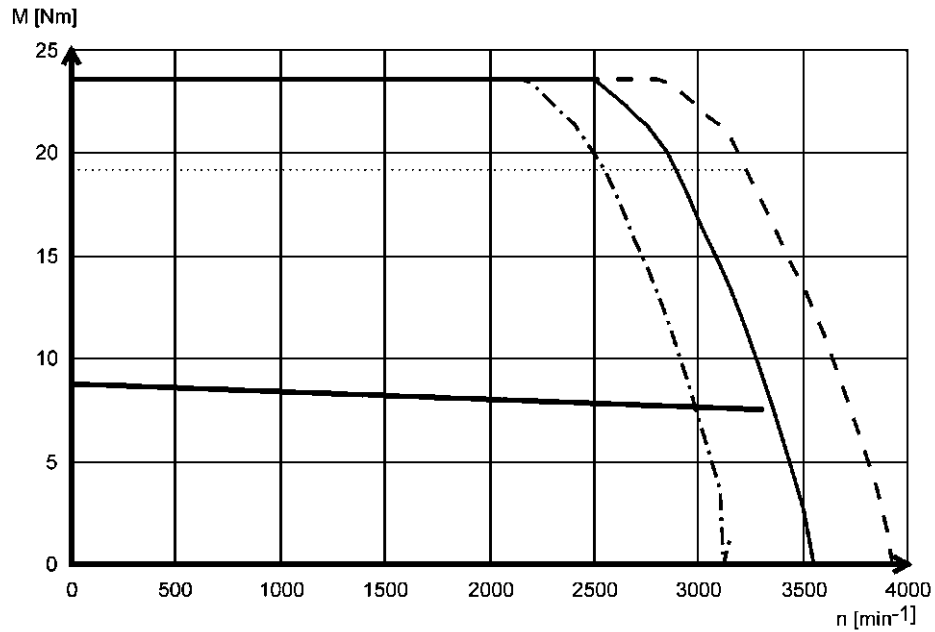


► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

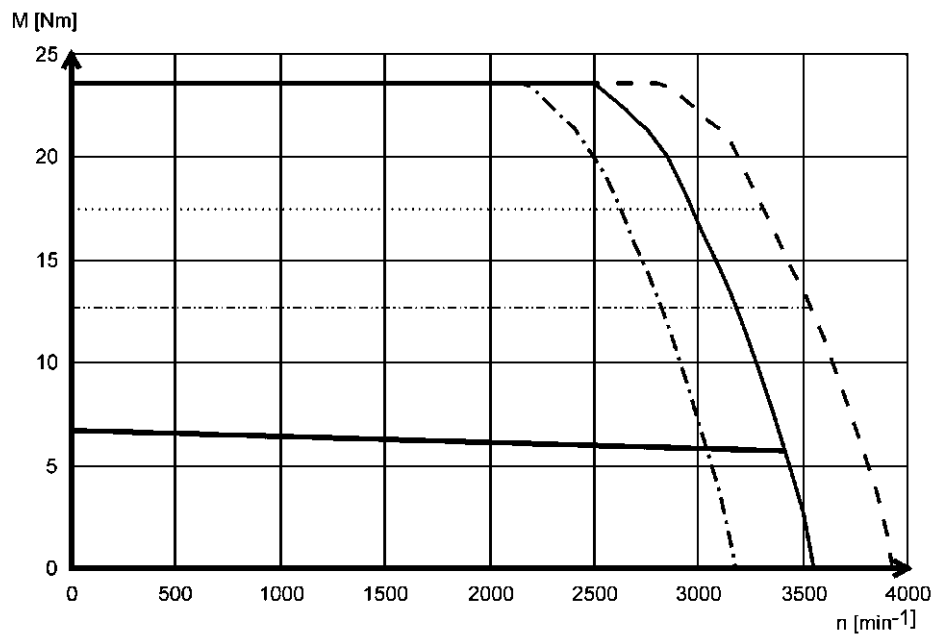


Mains connection 3x 400 V

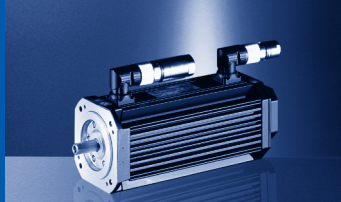
MDSKS□□071-03



MDFKS□□071-03



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

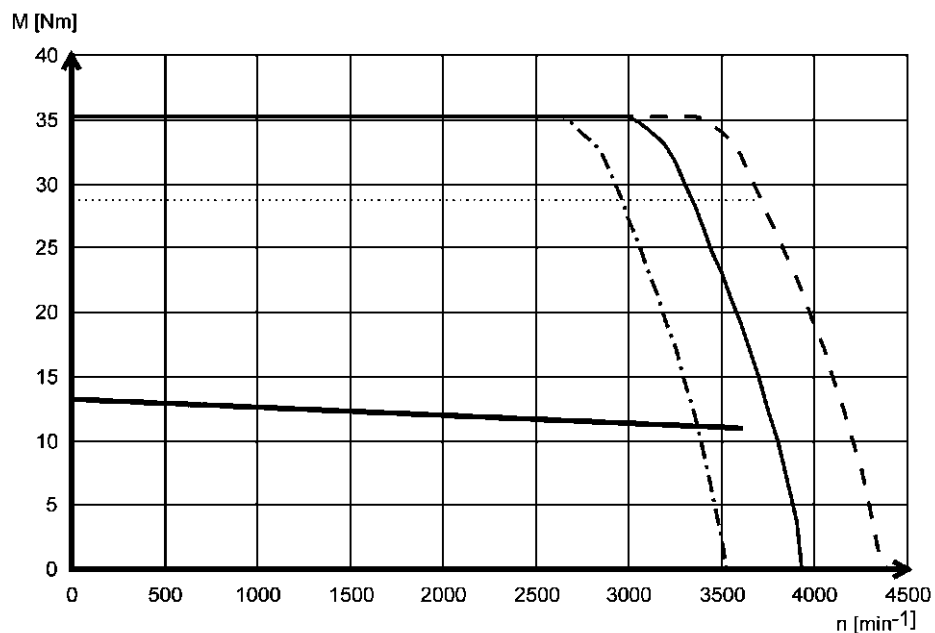


MD□KS synchronous servo motors

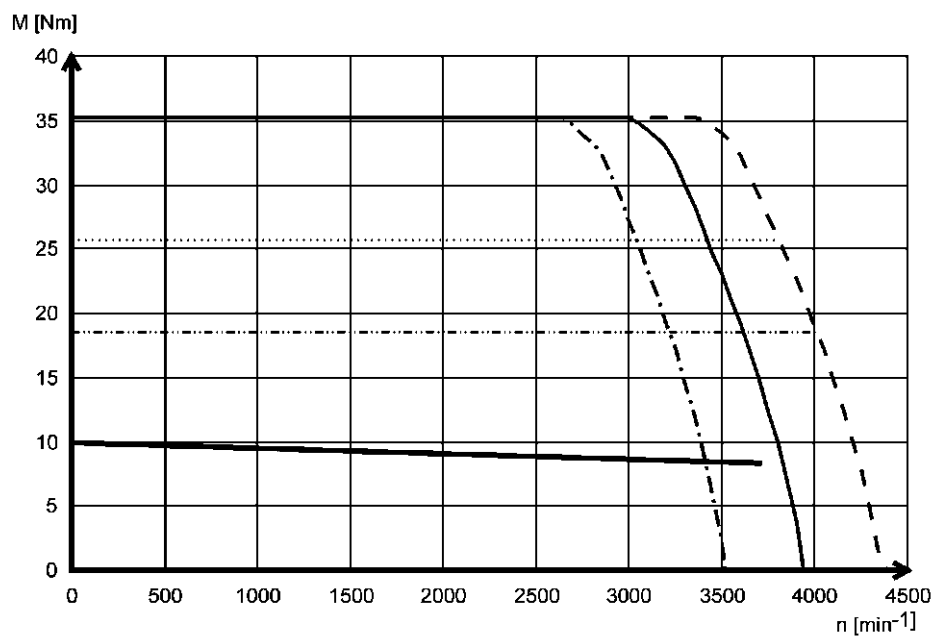
Torque characteristics

Mains connection 3x 400 V

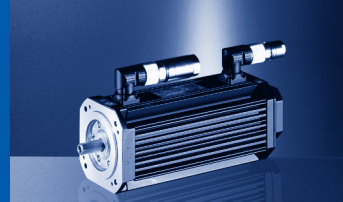
MDSKS□□071-13



MDFKS□□071-13

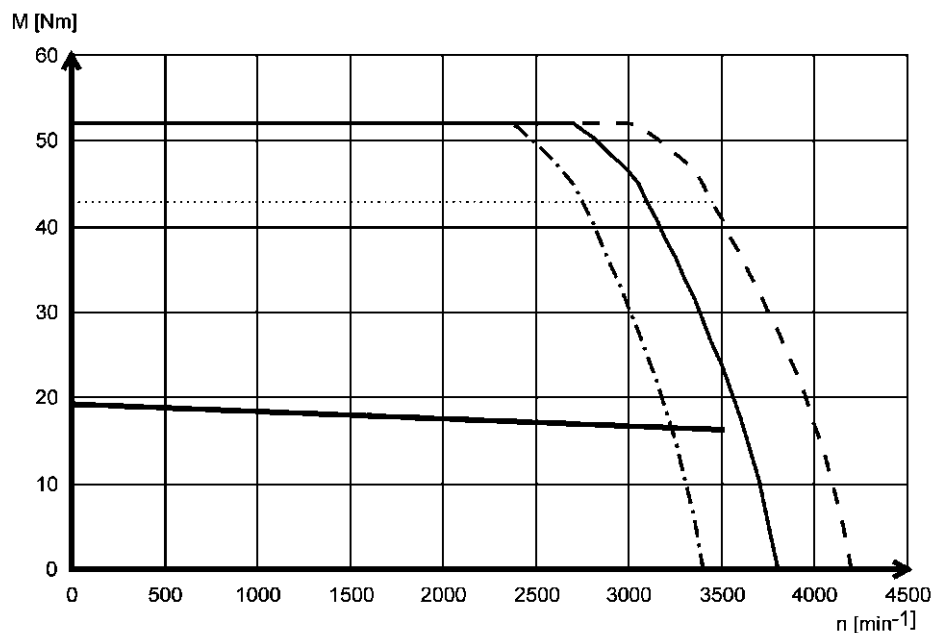


► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

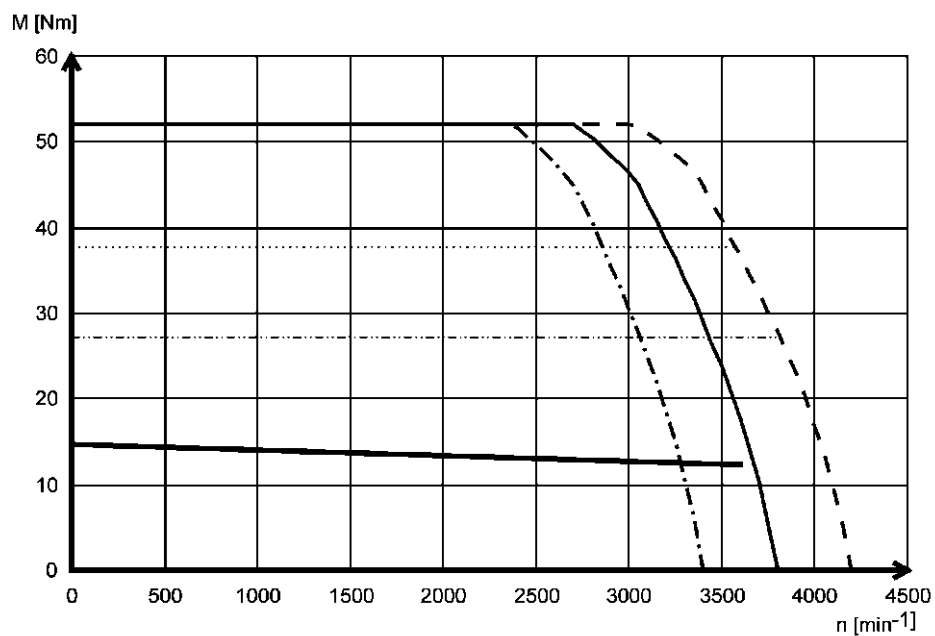


Mains connection 3x 400 V

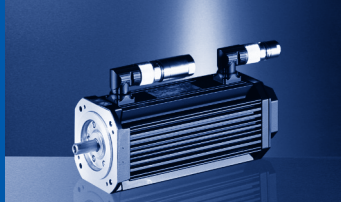
MDSKS□□071-33



MDFKS□□071-33



► Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.



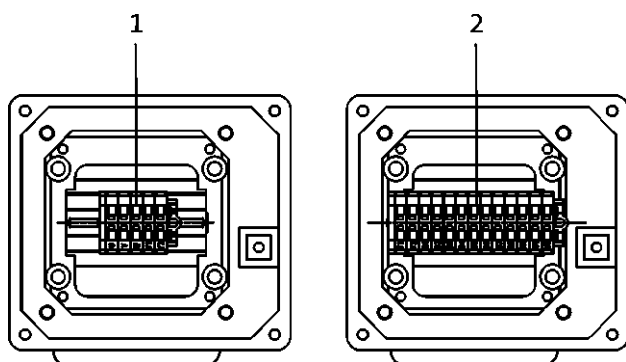
MD□KS synchronous servo motors

Accessories

Terminal box for motor connection

If a servo motor is to be connected to an existing cable or plug connectors are not to be used for other reasons, the connection can also be made via a terminal box.

The motor can either be fitted with a terminal box for the power connection and motor holding brake or a second terminal box provided to connect the motor feedback and fan (if applicable).

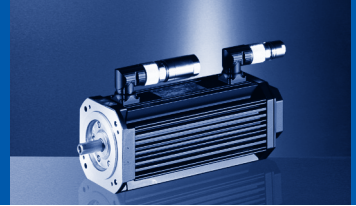


1: Power connection + brake connection + PE connection.

2: Angle/speed sensor connection + thermal sensor connection



MD□KS synchronous servo motors with blower and terminal box



Holding brakes

The MD□KS synchronous servo motors can be equipped with integral permanent magnet holding brakes. The voltages available for this model are 24 V DC and 205 V DC. The brakes are active once the supply voltage is switched off (closed-circuit principle).

On travel axes compliance with the permissible mass inertia ratio J_L / J_{MB} ensures that the permissible maximum switching energy of the brake is not exceeded and up to 2000 emergency stop functions can be executed from a speed of 3000 rpm.

In lifting axes the load torque resulting from the force due to weight additionally acts. The information relating to J_L / J_{MB} does not apply in this event.

Caution:

The brakes used are not safety brakes in the sense that a reduction in torque may arise as a result of disruptive factors that cannot be influenced, e.g. oil ingress.

The ohmic voltage drop along the cable must be taken into consideration in long motor supply cables and must be compensated for by a higher voltage at the line input.

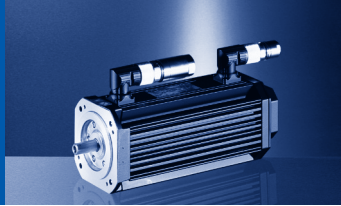
The following applies for Lenze system cables:

$$U[V] = U_B[V] + 0.08 \frac{[V]}{[A] \cdot [m]} \cdot I_{Lg}[m] \cdot I_B[A]$$

If no suitable voltage (incorrect value, incorrect polarity) is applied to the brake, the brake will be applied and can be overheated and destroyed by the motor continuing to rotate. The shortest switching times of the brakes are achieved by DC switching of the voltage. A spark suppressor is required to suppress interference and to increase the service life of the relay contacts here.



Permanent magnet holding brake



MD□KS synchronous servo motors

Accessories

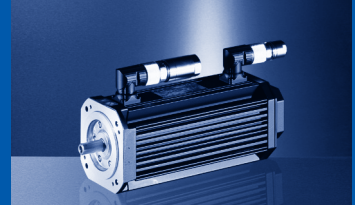
Holding brake data

- The ratings apply only for servo motors and for geared servo motors if the servo motor is mounted by way of a mounting flange.

B5 / B14 design servo motors GPA servo geared motors

	U _{N,DC} ^{3, 4)}	M _N	M _N	M _{av}	I _N ²⁾	J	t ₁ ¹⁾	t ₂ ¹⁾	Q _E ⁵⁾	m	J _{MB}	J _L / J _{MB}										
		20 °C	120 °C	120 °C																		
	[V]	[Nm]	[Nm]	[Nm]	[A]	[kgcm²]	[ms]	[ms]	[J]	[kg]	[kgcm²]											
MDSKS□□036-13	24	4.50	4.00	3.00	0.34	0.19	220	35.0	220	0.30	0.41	108										
MDSKS□□036-23											0.55	80.1										
MDSKS□□056-23		3.30	2.50	1.20	0.50	0.38	10.0	20.0	350	0.90	1.58	43.9										
MDSKS□□056-33											2.18	31.5										
MDSKS□□056-23	205				0.060						1.58	43.9										
MDSKS□□056-33											2.18	31.5										
MDSKS□□071-03	24	12.0	11.0	5.50	0.67	1.06	20.0	29.0	400	0.80	7.06	10.5										
MDSKS□□071-13																						
MDSKS□□071-33																						
MDSKS□□071-03																						
MDSKS□□071-13	205													0.080								
MDSKS□□071-33																						
MDFKS□□071-03	24														0.67							
MDFKS□□071-13																						
MDFKS□□071-33	205				0.080																	
MDFKS□□071-03																						
MDFKS□□071-13																						
MDFKS□□071-33																						

- ¹⁾ Engagement and disengagement times valid for rated voltage (±0%) and protective circuit for brakes with varistor for DC-controlled switching. The times may increase without a protective circuit.
- ²⁾ The currents are maximum values for a cold brake (data for sizing the power supply). The values for a motor at operating temperature are considerably lower.
- ³⁾ With 24 V DC brake: smoothed DC voltage, ripple ≤ 1 %.
With 205 V DC brake: connection to 230 V AC through rectifier.
- ⁴⁾ UR not possible in the case of a brake with 205 V supply voltage.
- ⁵⁾ Maximum switching energy per emergency stop with $n = 3000 \text{ min}^{-1}$.



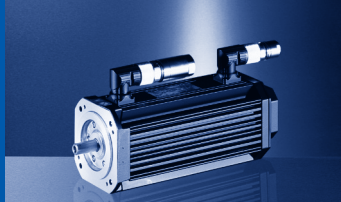
Holding brake data

- These ratings apply only for geared servo motors with integrated servo motor (without mounting flange).

GST, GFL, GKR, GKS, GSS geared servo motors

	U _{N,DC} ^{3, 4)}	M _N	M _N	M _{av}	I _N ²⁾	J	t ₁ ¹⁾	t ₂ ¹⁾	Q _E ⁵⁾	m	J _{MB}	J _L / J _{MB}
		20 °C	120 °C	120 °C								
	[V]	[Nm]	[Nm]	[Nm]	[A]	[kgcm²]	[ms]	[ms]	[J]	[kg]	[kgcm²]	
MDSKS□□056-23	24	6.00	5.00	2.50	0.67	1.06	20.0	29.0	400	0.80	2.26	34.9
MDSKS□□056-33											2.86	27.3
MDSKS□□056-23	205					2.26					34.9	
MDSKS□□056-33						2.86					27.3	
MDSKS□□071-03	24	15.0	12.0	6.00	0.75	3.60	13.0	30.0	700	1.50	9.60	10.6
MDSKS□□071-13												
MDSKS□□071-33												
MDSKS□□071-03	205				0.090							
MDSKS□□071-13												
MDSKS□□071-33												
MDFKS□□071-03	24				0.75							
MDFKS□□071-13												
MDFKS□□071-33												
MDFKS□□071-03	205				0.090							
MDFKS□□071-13												
MDFKS□□071-33												

- ¹⁾ Engagement and disengagement times valid for rated voltage (40%) and protective circuit for brakes with varistor for DC-controlled switching. The times may increase without a protective circuit.
- ²⁾ The currents are maximum values for a cold brake (data for sizing the power supply). The values for a motor at operating temperature are considerably lower.
- ³⁾ With 24 V DC brake: smoothed DC voltage, ripple $\leq 1\%$.
With 205 V DC brake: connection to 230 V AC through rectifier.
- ⁴⁾ UR not possible in the case of a brake with 205 V supply voltage.
- ⁵⁾ Maximum switching energy per emergency stop with $n = 3000 \text{ min}^{-1}$.



MD□KS synchronous servo motors

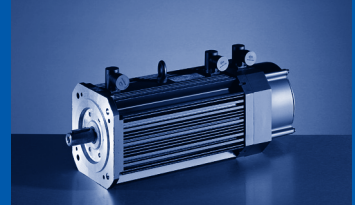
Accessories

Blower data 50 Hz

	Enclosure	Number of phases					
			U_{min}	U_{max}	$U_{N,AC}$	P_N	I_N
			[V]	[V]	[V]	[kW]	[A]
MDFKS□□071	IP54	1	210	240	230	0.019	0.12

Blower data 60 Hz

	Enclosure	Number of phases					
			U_{min}	U_{max}	$U_{N,AC}$	P_N	I_N
			[V]	[V]	[V]	[kW]	[A]
MDFKS□□071	IP54	1	210	240	230	0.019	0.12



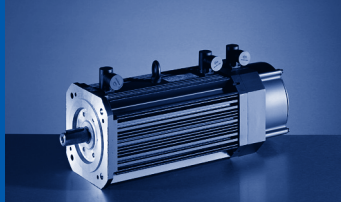
Tailored to meet the requirements of the various applications and necessary accuracies, the following feedback systems are available.

Resolver

Stator-fed resolver with two 90° stator windings and one rotor winding with transformer winding.

Built-on accessories	1)			BS RS
Resolution Angle			[°]	0.80
Accuracy			[°]	-10 ... 10
Absolute positioning				1 revolution
Max. speed	$n_{\max}$		[min ⁻¹]	8000
Max. input voltage DC	$U_{\max}$		[V]	10.0
Max. input frequency	$f_{\max, 1}$		[kHz]	4.00
Ratio Stator / rotor		± 5 %		0.30
Rotor impedance	Z_{ro}		[Ω]	51 + j90
Stator impedance	Z_{so}		[Ω]	102 + j150
Impedance	Z_{rs}		[Ω]	44 + j76
Min. insulation resistance At DC 500 V	R		[MΩ]	10.0
Number of pole pairs				1
Max. angle error			[°]	-10 ... 10
Version Inverter assignment				E94A ECS EVS93

1) → 20 - Product key > built-on accessories



MD□KS synchronous servo motors

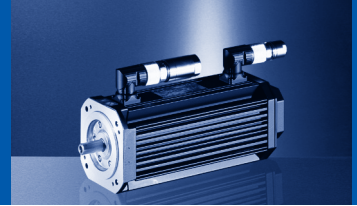
Accessories

Incremental and SinCos absolute value encoder

Encoder type			SinCos absolute value	
Built-on accessories	1)		AG BA	
			AS1024-8V-H	AM1024-8V-H
Encoder type			Single turn	Multi-turn
Pulses			1024	
Output signals			1 Vss	
Interfaces			Hiperface	
Absolute revolution			1	4096
Resolution				
Angle 2)		[°]	0.40	
Accuracy				
		[°]	-0.8 ... 0.8	
Min. input voltage				
DC	$U_{min,1}$	[V]	7.00	
Max. input voltage				
DC	U_{max}	[V]	12.0	
Max. speed				
	n_{max}	[min ⁻¹]	6000	
Max. current consumption				
	I_{max}	[mA]	80.0	
Limit frequency				
	f_{max}	[kHz]	200	
Version				
Inverter assignment			E94A ECS EVS93	

1) → 20 - Product key > built-on accessories

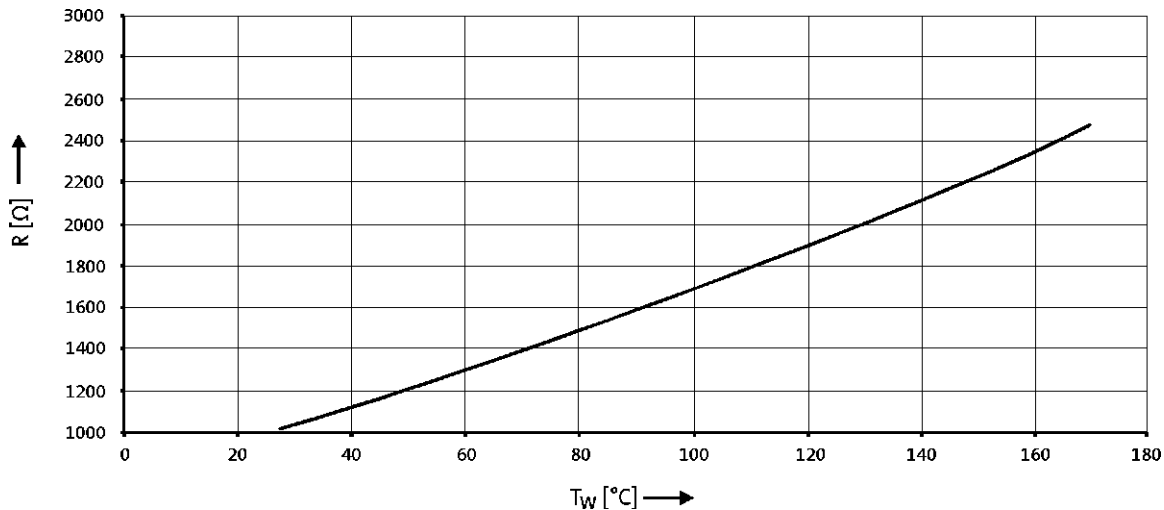
2) Dependent on inverter.



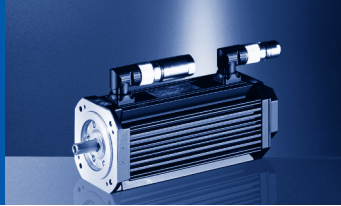
Temperature sensor

The thermal sensors (1x KTY 83-110) continuously monitor the motor temperature. The temperature signal is transmitted over the system cable of the feedback system to the servo controller.

This means that the temperature of the motor is determined with great accuracy in the permitted operating range and at the same time the overtemperature response configured in the controller is executed in the event of overtemperature in one of the winding phases.



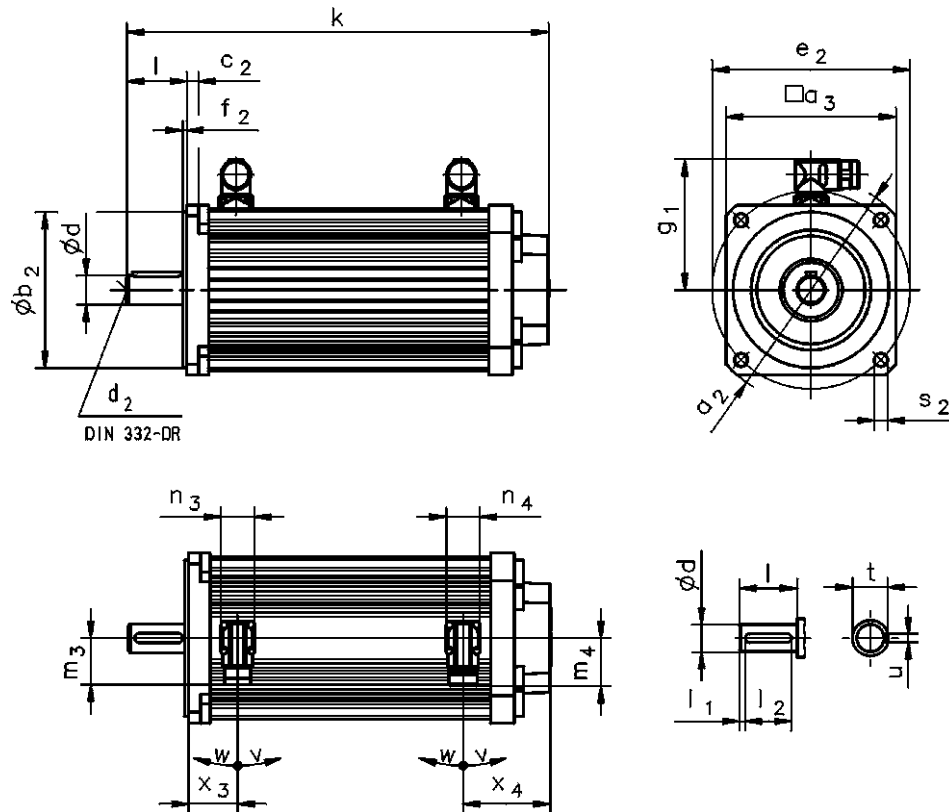
- If the detector is supplied with a measured current of 1 mA, the above relationship between the temperature and the resistance applies.



MD□KS synchronous servo motors

Dimensions [mm]

Motors without blower

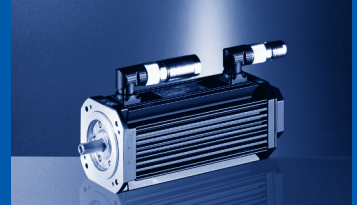


			MDSKS□□036-13	MDSKS□□036-23	MDSKS□□056-23	MDSKS□□056-33
RS	k	[mm]	166	190	241	276
	x ₃	[mm]	81	105		36
	x ₄	[mm]		22		60
BS	k	[mm]	194	218	267	302
	x ₃	[mm]	81	105		59
	x ₄	[mm]		50		60
ERG / IG	k	[mm]			295	330
	x ₃	[mm]				36
	x ₄	[mm]				114
BA / BI	k	[mm]			321	356
	x ₃	[mm]				59
	x ₄	[mm]				114

			MDSKS□□071-03	MDSKS□□071-13	MDSKS□□071-33
RS	k	[mm]	259	294	329
	x ₃	[mm]		39	
	x ₄	[mm]		58	
BS	k	[mm]	294	329	364
	x ₃	[mm]		72	
	x ₄	[mm]		58	
ERG / IG	k	[mm]	314	349	384
	x ₃	[mm]		39	
	x ₄	[mm]		113	
BA / BI	k	[mm]	349	384	419
	x ₃	[mm]		72	
	x ₄	[mm]		113	

MD□KS synchronous servo motors

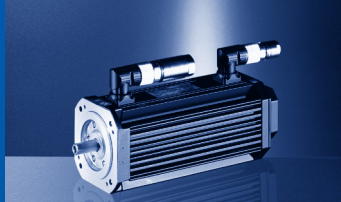
Dimensions [mm]



	g_1	n_3	n_4	m_3	m_4	v	w
	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[°]
MDSKS□□036-13	77	28	28	40	40	195	80
MDSKS□□036-23							
MDSKS□□056-23	90						
MDSKS□□056-33							
MDSKS□□071-03	102						
MDSKS□□071-13							
MDSKS□□071-33							

	d	d_2	l	l_1	l_2	u	t
	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MDSKS□□036	11	M4	23	3.0	18	4.0	13
MDSKS□□056	14	M5	30	2.5	25	5.0	16
MDSKS□□071	19	M6	40	2.0	36	6.0	22

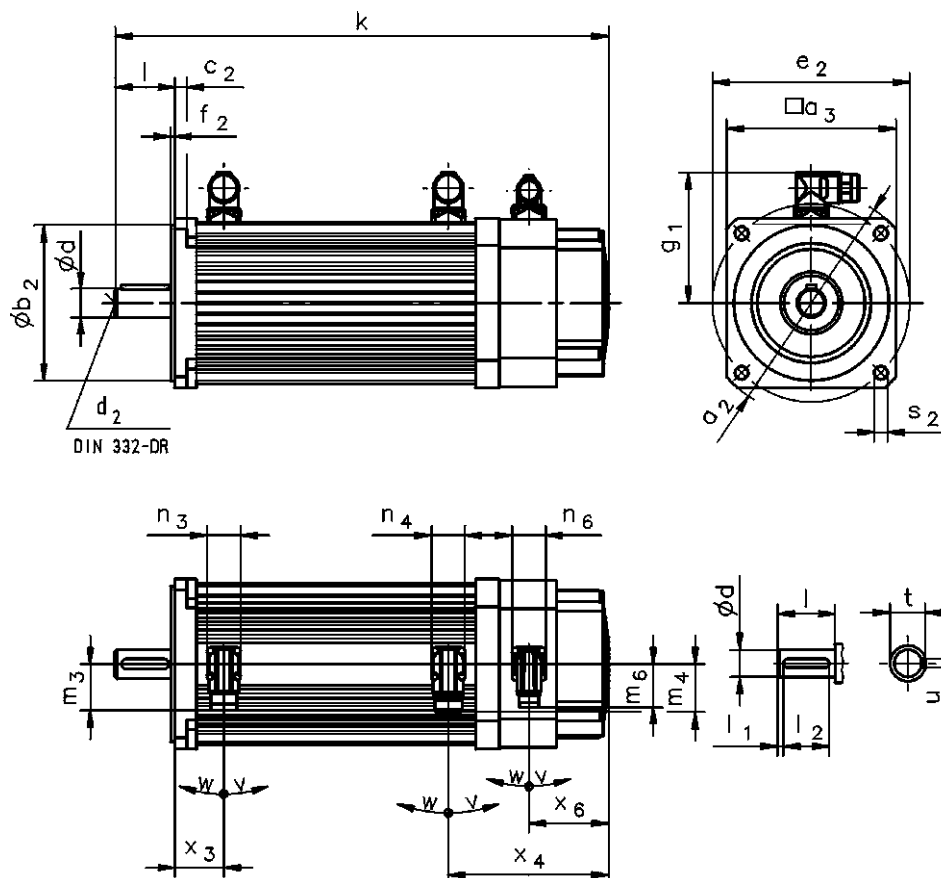
		a_2	a_3	b_2	c_2	e_2	f_2	s_2
				j6				
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MDSKS□□036	FF75	87	70	60	14	75	2.5	6.0
MDSKS□□056	FF100	120	102	80	8	100	3.0	7
	FT85			70		85	2.5	M6
MDSKS□□071	FF130	160	130	110	9	130	3.5	9.0
	FT130							M8



MDKS synchronous servo motors

Dimensions [mm]

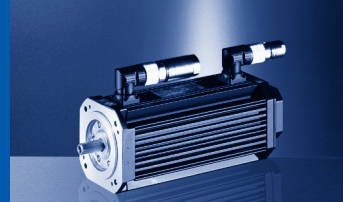
Motors with blower



		MDFKS□□071-03	MDFKS□□071-13	MDFKS□□071-33
RS	k [mm]	327	362	397
	x ₃ [mm]		39	
	x ₄ [mm]		126	
BS	k [mm]	362	397	432
	x ₃ [mm]		72	
	x ₄ [mm]		126	
ERG / IG	k [mm]	382	417	452
	x ₃ [mm]		39	
	x ₄ [mm]		181	
BA / BI	k [mm]	417	452	487
	x ₃ [mm]		72	
	x ₄ [mm]		181	
	x ₆ [mm]		73	

MD□KS synchronous servo motors

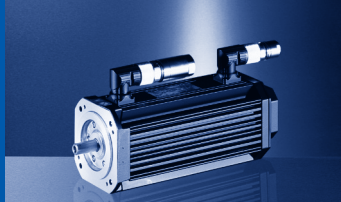
Dimensions [mm]



	g_1	n_3	n_4	n_6	m_3	m_4	m_6	v	w
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[°]
MDFKS□□071-03	102	28	28	28	40	40	40	195	80
MDFKS□□071-13									
MDFKS□□071-33									

	d	d_2	l	l_1	l_2	u	t
	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MDFKS□□071	19	M6	40	2.0	36	6.0	22

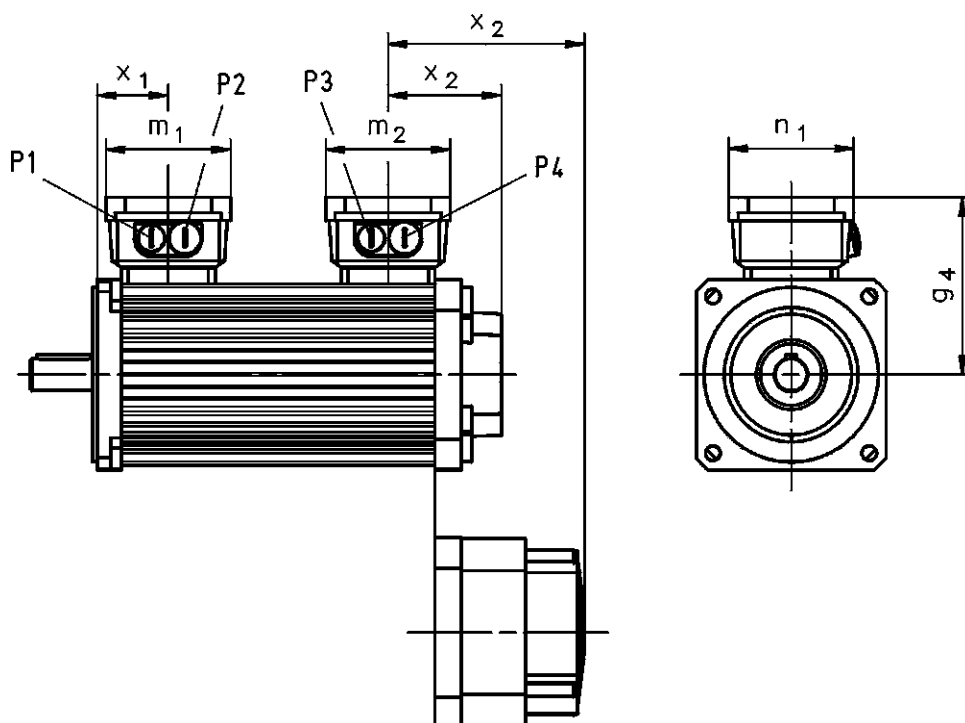
		a_2	a_3	b_2	c_2	e_2	f_2	s_2
				j6				
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MDFKS□□071	FF130	160	130	110	9	130	3.5	9.0
	FT130							M8



MD□KS synchronous servo motors

Dimensions [mm]

Motors with terminal box

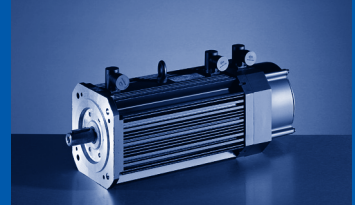


			MDSKS□□056-23	MDSKS□□056-33	MDSKS□□071-03	MDSKS□□071-13	MDSKS□□071-33
RS	x ₂	[mm]	63	78	62	77	
BS	x ₂	[mm]		78		77	
ERG / IG	x ₂	[mm]	117	132	116	131	
BA / IG	x ₂	[mm]		132		131	
			MDFKS□□071-03	MDFKS□□071-13	MDFKS□□071-33		
RS	x ₂	[mm]	130	145			
BS	x ₂	[mm]		145			
ERG / IG	x ₂	[mm]	184	199			
BA / IG	x ₂	[mm]		199			

	g ₄	m ₁	m ₂	n ₁	x ₁	P ₁	P ₂	P ₃	P ₄
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MDSKS□□056	113				54				
MDSKS□□071		93	93	93		M16x1.5	M20x1.5	M16x1.5	M20x1.5
MDFKS□□071	125				57				

MCA asynchronous servo motors

Rated data



Mains connection 3x 400 V

Motors without blower

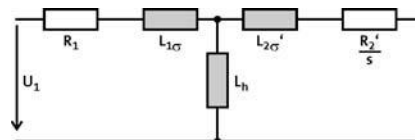
	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	$U_{N,AC}$	f_N	$\cos \varphi$	$J^{1)}$	η
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[V]	[Hz]		[kgcm ²]	[%]
MCA10I40	3950	2.30	10.0	2.00	0.80	2.60	2.40	390	140	0.70	2.40	70
MCA13I41	4050	4.60	32.0	4.00	1.70	4.60	4.40	390	140	0.76	8.30	75
MCA14L20	2000	8.00	60.0	6.70	1.40	3.90	3.30	390	70	0.75	19.2	84
MCA14L41	4100	8.00	60.0	5.40	2.30	7.70	5.80	390	140	0.75	19.2	78
MCA17N23	2300	12.8	100	10.8	2.60	6.00	5.50	390	80	0.81	36.0	86
MCA17N41	4110	12.8	100	9.50	4.10	12.0	10.2	350	140	0.80	36.0	83
MCA19S23	2340	22.5	180	16.3	4.00	9.90	8.20	390	80	0.80	72.0	90
MCA19S42	4150	22.5	180	12.0	5.20	19.7	14.0	330	140	0.78	72.0	83
MCA21X25	2490	39.0	300	24.6	6.40	15.9	13.5	390	85	0.83	180	85
MCA21X42	4160	39.0	300	17.0	7.40	31.8	19.8	320	140	0.80	180	84

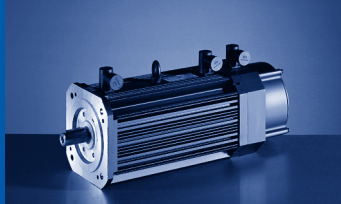
	R_1	$R_{UV\ 20\ ^\circ C}$	$R_{UV\ 150\ ^\circ C}$	R_2	$L_{1\sigma}$	L	$L_{2\sigma}$	$n_{max}^{2)}$	$m^{1)}$
	[Ω]	[Ω]	[Ω]	[Ω]	[mH]	[mH]	[mH]	[min ⁻¹]	[kg]
MCA10I40	4.70	9.40	12.7	8.20	9.80	168	10.0	8000	6.40
MCA13I41	1.70	3.40	4.60	2.20	5.40	98.1	4.90		10.4
MCA14L20	3.00	6.00	8.10	4.90	10.0	269	10.0		15.1
MCA14L41	0.75	1.50	2.00	1.20	2.50	66.6	2.50		22.9
MCA17N23	1.52	3.04	4.10	2.20	6.20	176	6.80		44.7
MCA17N41	0.38	0.76	1.00	0.50	1.50	43.5	1.70		60.0
MCA19S23	0.69	1.38	1.90	1.00	3.20	102	3.90		
MCA19S42	0.18	0.35	0.50	0.20	0.80	25.8	1.00		
MCA21X25	0.36	0.72	1.00	0.60	2.30	78.8	2.80		
MCA21X42	0.090	0.18	0.20	0.10	0.60	19.5	0.70		

¹⁾ No brake.

²⁾ Mechanically permissible maximum speed.

The figures in columns R_1 , $L_{1\sigma}$, L_h , R_2' and $L_{2\sigma}'$ refer to a single-phase equivalent circuit diagram at 20 °C (V-circuit).





MCA asynchronous servo motors

Rated data

Mains connection 3x 400 V

Motors with blower, IP54

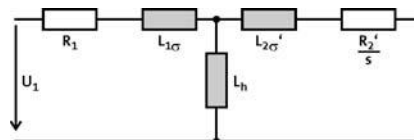
	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	$U_{N,AC}$	f_N	$\cos \varphi$	$J^{1)}$	η
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[V]	[Hz]		[kgcm ²]	[%]
MCA13I34	3410	7.00	32.0	6.30	2.20	6.30	6.00	390	120	0.75	8.30	72
MCA14L16	1635	13.5	60.0	12.0	2.10	5.30	4.80	390	60	0.81	19.2	80
MCA14L35	3455	13.5	60.0	10.8	3.90	10.5	9.10	390	120	0.80	19.2	79
MCA17N17	1680	23.9	100	21.5	3.80	9.10	8.50	390	60	0.80	36.0	83
MCA17N35	3480	23.9	100	19.0	6.90	18.1	15.8	390	120	0.80	36.0	81
MCA19S17	1700	40.0	180	36.3	6.40	15.4	13.9	390	60	0.83	72.0	82
MCA19S35	3510	40.0	180	36.0	13.2	30.8	28.7	390	120	0.80	72.0	85
MCA21X17	1710	75.0	300	61.4	11.0	25.8	22.5	390	60	0.85	180	85
MCA21X35	3520	75.0	300	55.0	20.3	49.5	42.5	390	120	0.80	180	88
MCA22P08...5F□□	760	120	500	110	8.75	23.4	22.1	345	28	0.83	487	80
MCA22P14...5F□□	1425	120	500	107	16.0	40.5	37.7	350	50	0.80	487	87
MCA22P17...5F□□	1670	120	500	106	18.5	46.7	42.7	360	58	0.78	487	88
MCA22P29...5F□□	2935	120	500	100	30.7	80.9	72.1	360	100	0.79	487	87
MCA26T05...5F□□	550	220	1100	216	12.4	35.4	34.9	350	19	0.69	1335	83
MCA26T10...5F□□	1030	220	1100	210	22.7	62.9	61.5	350	36	0.69	1335	88
MCA26T12...5F□□	1200	220	1100	207	26.0	78.4	75.1	350	41	0.66	1335	87
MCA26T22...5F□□	2235	220	1100	195	45.5	125	113	340	76	0.74	1335	92

	R_1	$R_{UV\ 20\ ^\circ C}$	$R_{UV\ 150\ ^\circ C}$	R_2	$L_{1\sigma}$	L	$L_{2\sigma}$	$n_{max}^{2)}$	$m^{1)}$
	[Ω]	[Ω]	[Ω]	[Ω]	[mH]	[mH]	[mH]	[min ⁻¹]	[kg]
MCA13I34	1.70	3.40	4.60	2.20	4.90	81.9	4.40	8000	12.0
MCA14L16	3.00	6.00	8.10	4.90	9.50	252	9.30		16.9
MCA14L35	0.75	1.50	2.00	1.20	2.40	56.8	2.30		25.5
MCA17N17	1.52	3.04	4.10	2.20	5.60	143	6.00		48.2
MCA17N35	0.38	0.76	1.00	0.50	1.40	33.1	1.50		63.5
MCA19S17	0.69	1.38	1.90	1.00	2.60	56.1	3.10		
MCA19S35	0.18	0.35	0.50	0.20	0.70	13.0	0.80		
MCA21X17	0.36	0.72	1.00	0.60	2.10	68.7	2.60		
MCA21X35	0.090	0.18	0.20	0.10	0.50	16.6	0.60	5000	105
MCA22P08...5F□□	0.54	1.07	1.62	0.75	3.56	85.7	4.80		
MCA22P14...5F□□		0.36	0.54		3.60	88.4	4.85		
MCA22P17...5F□□	0.13	0.27	0.40	0.19	0.90	22.2	1.21		
MCA22P29...5F□□		0.080	0.12			22.1			
MCA26T05...5F□□	0.44	0.59	0.89	0.39	2.58	54.9	4.79	4500	194
MCA26T10...5F□□		0.20	0.30		2.62	59.4	4.87		
MCA26T12...5F□□	0.11	0.15	0.23	0.098	0.64	13.2	1.19		
MCA26T22...5F□□		0.050	0.075		0.68	17.6	1.26		

¹⁾ No brake.

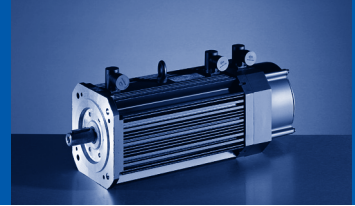
²⁾ Mechanically permissible maximum speed.

The figures in columns R_1 , $L_{1\sigma}$, L_h , R_2' and $L_{2\sigma}'$ refer to a single-phase equivalent circuit diagram at 20 °C (R-circuit).



MCA asynchronous servo motors

Rated data



Mains connection 3x 400 V

Motors with blower, IP23

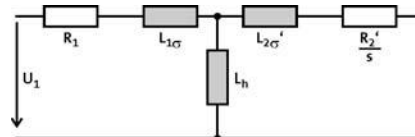
	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	$U_{N,AC}$	f_N	$\cos \varphi$	J	η
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[V]	[Hz]		[kgcm ²]	[%]
MCA20X14...2F□□	1420	68.0	250	61.0	9.07	26.0	23.0	350	50	0.81	171	82
MCA20X29...2F□□	2930	68.0	250	53.5	16.4	52.0	42.4	350	100	0.75	171	87
MCA22P08...2F□□	760	135	500	120	9.55	26.0	23.5	355	28	0.83	487	80
MCA22P14...2F□□	1425	135	500	115	17.2	45.1	40.0	360	50	0.80	487	86
MCA22P17...2F□□	1670	135	500	112	19.6	52.1	44.5	360	58	0.80	487	88
MCA22P29...2F□□	2935	135	500	110	33.8	90.2	77.8	360	100	0.78	487	89
MCA26T05...2F□□	550	290	1100	280	16.1	44.0	42.4	350	20	0.77	1335	81
MCA26T10...2F□□	1030	290	1100	260	28.0	78.0	69.6	350	36	0.76	1335	87
MCA26T12...2F□□	1200	290	1100	255	32.0	101	83.3	350	41	0.73	1335	87
MCA26T22...2F□□	2235	290	1100	230	53.8	160	127	340	76	0.78	1335	92

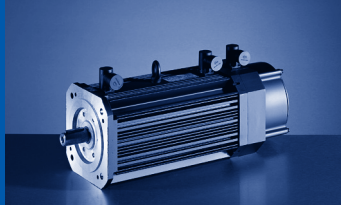
	R_1	$R_{UV\ 20\ ^\circ C}$	$R_{UV\ 150\ ^\circ C}$	R_2	$L_{1\sigma}$	L	$L_{2\sigma}$	n_{max}	m
	[Ω]	[Ω]	[Ω]	[Ω]	[mH]	[mH]	[mH]	[min ⁻¹]	[kg]
MCA20X14...2F□□	0.37	0.73	1.10	0.57	2.01	54.8	2.14	5000	64.0
MCA20X29...2F□□	0.091	0.18	0.28	0.14	0.50	13.6	0.54		
MCA22P08...2F□□	0.54	1.07	1.62	0.75	4.74	81.6	3.50		
MCA22P14...2F□□		0.36	0.54		3.55	85.1	4.79		
MCA22P17...2F□□	0.13	0.27	0.40	0.19	0.90	22.2	1.22		105
MCA22P29...2F□□		0.080	0.12				1.21		
MCA26T05...2F□□	0.44	0.59	0.89	0.39	2.60	57.4	4.83	4500	194
MCA26T10...2F□□		0.20	0.30		2.63	60.2	4.88		
MCA26T12...2F□□	0.11	0.15	0.23	0.098	0.64	13.3	1.19		
MCA26T22...2F□□		0.050	0.077		0.68	17.7	1.27		

¹⁾ No brake.

²⁾ Mechanically permissible maximum speed.

The figures in columns R_1 , $L_{1\sigma}$, L_h , R_2' and $L_{2\sigma}'$ refer to a single-phase equivalent circuit diagram at 20 °C (V-circuit).

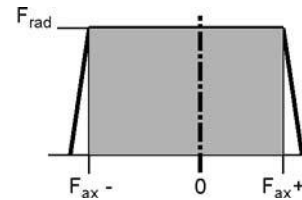
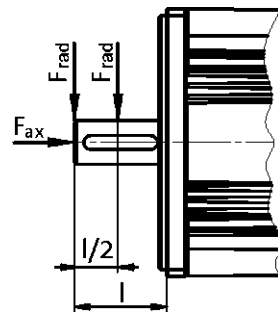




MCA asynchronous servo motors

Rated data

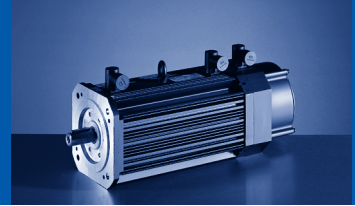
Permissible radial and axial forces



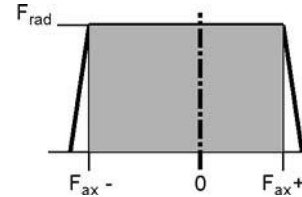
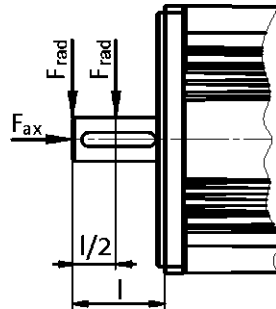
Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
Max. radial force, Lever arm $l/2$						Min. axial force, Lever arm $l/2$					Max. axial force, Lever arm $l/2$				
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MCA10	630	500	400	330	230	-80	-30	0	10	10	270	220	190	180	180
MCA13	980	750	470		60	-50	20	20	20	-40	520	450	450	450	510
MCA14	1130	900	710		380	-90	0	60	60	60	450	370	310	310	310
MCA17	1560	1240	830	610			20	40	40	40	710	590	570	570	570
MCA19	2120	1280	610	280			70	70	70	70	1420	1420	1420	1420	
MCA20	3740	2980	2370	2080	1760	-1250	-970	-760	-670	-570	610	330	120	30	-70
MCA21	3410	2650	1660	1180		-160	70	70	70		1640	1420	1420	1420	
MCA22	3930	3140	2510	2210	1880	-2250	-1680	-1260	-1060	-860	1610	1040	610	420	220
MCA26	7500	5990	4780	4200	3570	-2580	-2300	-1420	-1200	-960	1650	990	490	270	30

Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
Max. radial force, Lever arm l						Min. axial force, Lever arm l					Max. axial force, Lever arm l				
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MCA10	590	470	370	310	220	-10	-30	0	10	10	270	220	190	180	180
MCA13	900	690	430	300	60	-50	20	20	20	-40	520	450	450	450	510
MCA14	1040	830	650	500	350	-90	0	60	60	60	450	370	310	310	310
MCA17	1440	1150	770	570			20	40	40	40	710	590	570	570	570
MCA19	1960	1180	560	260			70	70	70	70	1420	1420	1420	1420	
MCA20	3420	2720	2170	1900	1610	-1090	-860	-680	-600	-520	450	210	40	-40	-130
MCA21	3130	2440	1530	1080		-160	70	70	70		1640	1420	1420	1420	
MCA22	3660	2920	2340	2050	1750	-2110	-1580	-1180	-1000	-810	1470	930	540	350	170
MCA26	6920	5520	4410	3880	3290	2300	-1700	-1270	-1060	-860	1370	780	340	140	-70

- The values for the bearing service life L_{10} relate to a mean speed of 4000 rpm. On MCA20/22/26 to a speed of 3000 rpm. They are additionally restricted by the grease lifetime depending on the ambient temperatures.



Permissible radial and axial forces

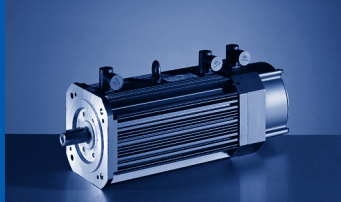


Reinforced bearings

Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
	Max. radial force, Lever arm $l/2$ (reinforced bearings)					Min. axial force, Lever arm $l/2$ (reinforced bearings)					Max. axial force, Lever arm $l/2$ (reinforced bearings)				
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MCA20	7120	5660	4500	3940	3330	940	-740	-600	-530	-460	300	100	-50	-110	-180
MCA22	7440	5930	4730	4140	3510	-1990	-1480	-1110	-940	-760	1340	840	470	300	120
MCA26	10510	8370	6670	5840	4950	2130	-1580	-1180	-990	-800	1200	650	250	60	-130

Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
	Max. radial force, Lever arm l (reinforced bearings)					Min. axial force, Lever arm l (reinforced bearings)					Max. axial force, Lever arm l (reinforced bearings)				
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MCA20	6510	5180	4120	3600	3050	680	-550	-450	-410	-360	40	-90	-190	-230	-280
MCA22	6930	5520	4400	3850	3260	-1730	-1300	-970	-820	-670	1090	650	330	180	30
MCA26	9690	7720	6150	5390	4560	1640	-1220	-910	-770	-620	720	290	-20	-160	-310

- The values for the bearing service life L_{10} relate to a mean speed of 3000 rpm and are additionally restricted by the grease lifetime depending on the ambient temperatures.



MCA asynchronous servo motors

9400 Servo Drives selection tables

Mains connection 3x 400 V

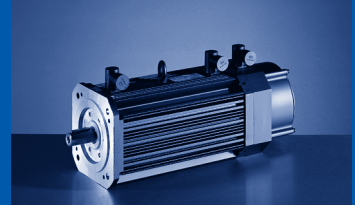
Motors without blower

					E94A□□	E0024	E0034	E0044	E0074	E0094	E0134	E0174	E0244	E0324
					I _N	1.9	3.1	5.0	8.8	11.7	16.3	20.6	29.4	38.4
					I _{0,max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8
MCA	M _N	n _N	I _N	P _N	I _{max}	6.0	10.0	16.0	21.0	28.0	39.0	49.5	58.8	76.8
10I40	2.0	3950	2.4	0.80	M ₀	1.1	2.3							
					M _N	1.0	2.0							
					M _{0,max}	6.9	10.0							
					M _{max}	6.9	10.0							
					n _{eto}	-	-							
13I41	4.0	4050	4.4	1.70	M ₀			4.6	4.6					
					M _N			4.0	4.0					
					M _{0,max}			18.9	20.8					
					M _{max}			18.9	20.8					
					n _{eto}			-	-					
14L20	6.7	2000	3.3	1.40	M ₀		5.1	8.0						
					M _N		4.4	6.7						
					M _{0,max}		25.0	42.8						
					M _{max}		25.0	42.8						
					n _{eto}		-	-						
14L41	5.4	4100	5.8	2.30	M ₀			3.5	8.0	8.0				
					M _N			3.5	5.4	5.4				
					M _{0,max}			21.5	27.0	31.3				
					M _{max}			21.5	27.0	31.3				
					n _{eto}			-	-	-				
17N23	10.8	2300	5.5	2.60	M ₀			9.5	12.8					
					M _N			9.0	10.8					
					M _{0,max}			38.0	50.0					
					M _{max}			38.0	50.0					
					n _{eto}			-	-					
17N41	9.5	4110	10.2	4.10	M ₀				7.1	11.5	12.8	12.8		
					M _N				6.7	9.5	9.5	9.5		
					M _{0,max}				24.0	33.3	45.8	49.9		
					M _{max}				24.0	33.3	45.8	49.9		
					n _{eto}				-	-	-	-		
19S23	16.3	2340	8.2	4.00	M ₀				18.4	22.5	22.5			
					M _N				15.6	16.3	16.3			
					M _{0,max}				55.0	73.7	86.0			
					M _{max}				55.0	73.7	86.0			
					n _{eto}				-	-	-			
19S42	12.0	4150	14.0	5.20	M ₀						15.0	22.5	22.5	
					M _N						12.0	12.0	12.0	
					M _{0,max}						48.8	62.0	70.0	
					M _{max}						48.8	62.0	70.0	
					n _{eto}						-	-	-	
21X25	24.6	2490	13.5	6.40	M ₀					21.4	39.0	39.0	39.0	
					M _N					19.6	24.6	24.6	24.6	
					M _{0,max}					71.7	96.0	126.0	136.0	
					M _{max}					71.7	96.0	126.0	136.0	
					n _{eto}					-	-	-	-	
21X42	17.0	4160	19.8	7.40	M ₀								31.3	39.0
					M _N								17.0	17.0
					M _{0,max}								71.7	91.0
					M _{max}								71.7	91.0
					n _{eto}								-	-

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCA asynchronous servo motors

9400 Servo Drives selection tables

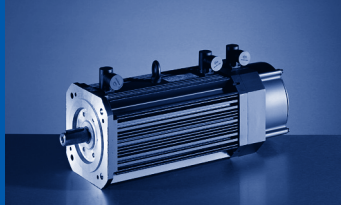


Mains connection 3x 400 V

Motors with blower, IP54

					E94A□□	E0044	E0074	E0094	E0134	E0174	E0244	E0324	E0474	E0594	E0864
					I _N	5.0	8.8	11.7	16.3	20.6	29.4	38.4	47.0	59.0	86.0
					I _{0,max}	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0	172.0
MCA	M _N	n _N	I _N	P _N	I _{max}	16.0	21.0	28.0	39.0	49.5	58.8	76.8	94.0	118.0	172.0
13L34	6.3	3410	6.0	2.20	M ₀	4.6	7.0	7.0							
					M _N	4.4	6.3	6.3							
					M _{0,max}	20.8	26.0	29.2							
					M _{max}	20.8	26.0	29.2							
					n _{eto}	-	-	-							
14L16	12.0	1635	4.8	2.10	M ₀	12.0	13.5								
					M _N	12.0	12.0								
					M _{0,max}	45.4	52.6								
					M _{max}	45.4	52.6								
					n _{eto}	-	-								
14L35	10.8	3455	9.1	3.90	M ₀		10.1	13.5	13.5						
					M _N		9.7	10.8	10.8						
					M _{0,max}		32.4	46.0	60.0						
					M _{max}		32.4	46.0	60.0						
					n _{eto}		-	-	-						
17N17	21.5	1680	8.5	3.80	M ₀		21.6	23.9	23.9						
					M _N		21.5	21.5	21.5						
					M _{0,max}		59.4	81.4	84.5						
					M _{max}		59.4	81.4	84.5						
					n _{eto}		-	-	-						
17N35	19.0	3480	15.8	6.90	M ₀				19.4	23.9	23.9				
					M _N				19.0	19.0	19.0				
					M _{0,max}				59.2	75.0	90.0				
					M _{max}				59.2	75.0	90.0				
					n _{eto}				-	-	-				
19S17	36.3	1700	13.9	6.40	M ₀				40.0	40.0	40.0				
					M _N				36.3	36.3	36.3				
					M _{0,max}				105.0	133.0	148.0				
					M _{max}				105.0	133.0	148.0				
					n _{eto}				-	-	-				
19S35	36.0	3510	28.7	13.20	M ₀						36.9	40.0	40.0	40.0	
					M _N						36.0	36.0	36.0	36.0	
					M _{0,max}						82.0	112.0	132.0	160.0	
					M _{max}						82.0	112.0	132.0	160.0	
					n _{eto}						-	-	-	-	
21X17	61.4	1710	22.5	11.00	M ₀					54.4	75.0	75.0	75.0		
					M _N					50.4	61.4	61.4	61.4		
					M _{0,max}					134.0	158.0	215.0	246.0		
					M _{max}					134.0	158.0	215.0	246.0		
					n _{eto}					-	-	-	-		
21X35	55.0	3520	42.5	20.30	M ₀								63.9	75.0	75.0
					M _N								55.0	55.0	55.0
					M _{0,max}								134.0	167.0	232.0
					M _{max}								134.0	167.0	232.0
					n _{eto}								-	-	-

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCA asynchronous servo motors

9400 Servo Drives selection tables

Mains connection 3 x 400 V and switching frequency
8 kHz

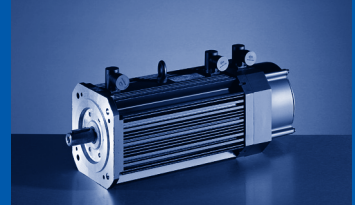
Motors with blower, IP54

					E94A□□	E0174	E0244	E0324	E0474	E0594	E0864	E1044	E1454	E1724	E2024	E2454
					I _N	16.5	23.5	32.0	41.0	41.0	73.0	78.0	102.0	120.0	131.0	160.0
					I _{0,max}	49.5	58.8	76.8	94.0	118.0	172.0	208.0	261.0	310.0	364.0	441.0
MCA	M _N	n _N	I _N	P _N	I _{max}	49.5	58.8	76.8	94.0	118.0	172.0	208.0	261.0	310.0	364.0	441.0
22P08- ...5F□□	110.0	760	22.1	8.80	M ₀	64.0	110.0	120.0								
					M _N	64.0	110.0	110.0								
					M _{0,max}	261.0	313.0	402.0								
					M _{max}	261.0	313.0	402.0								
					n _{eto}	-	-	-								
22P14- ...5F□□	107.0	1425	37.7	16.00	M ₀			82.0	120.0	120.0						
					M _N			82.0	107.0	107.0						
					M _{0,max}			242.0	300.0	372.0						
					M _{max}			242.0	300.0	372.0						
					n _{eto}			-	-	-						
22P17- ...5F□□	105.0	1670	42.7	18.50	M ₀					99.0	120.0					
					M _N					99.0	106.0					
					M _{0,max}					325.0	463.0					
					M _{max}					325.0	463.0					
					n _{eto}					-	-					
22P29- ...5F□□	100.0	2935	72.1	30.70	M ₀							110.0	120.0	120.0		
					M _N							100.0	100.0	100.0		
					M _{0,max}							335.0	416.0	465.0		
					M _{max}							335.0	416.0	465.0		
					n _{eto}							-	-	-		
26T05- ...5F□□	216.0	550	34.9	12.40	M ₀			191.0	220.0	220.0	220.0					
					M _N			191.0	216.0	216.0	216.0					
					M _{0,max}			531.0	665.0	826.0	1010.0					
					M _{max}			531.0	665.0	826.0	1010.0					
					n _{eto}			-	-	-	-					
26T10- ...5F□□	210.0	1030	61.5	22.70	M ₀					77.0	220.0	220.0	220.0			
					M _N					77.0	210.0	210.0	210.0			
					M _{0,max}					472.0	713.0	855.0	1044.0			
					M _{max}					472.0	713.0	855.0	1044.0			
					n _{eto}					-	-	-	-			
26T12- ...5F□□	207.0	1200	75.1	26.00	M ₀						204.0	219.0	220.0	220.0		
					M _N						204.0	207.0	207.0	207.0		
					M _{0,max}						502.0	609.0	739.0	819.0		
					M _{max}						502.0	609.0	739.0	819.0		
					n _{eto}						-	-	-	-		
26T22- ...5F□□	195.0	2235	112.9	45.50	M ₀								154.0	211.0	220.0	220.0
					M _N								154.0	195.0	195.0	195.0
					M _{0,max}								523.0	611.0	711.0	843.0
					M _{max}								523.0	611.0	711.0	843.0
					n _{eto}								-	-	-	-

- ▶ I... [A], M... [Nm], n... [min⁻¹], P... [kW]
- ▶ Please get in touch with your local Lenze subsidiary if you wish to operate the motors at a lower switching frequency.

MCA asynchronous servo motors

9400 Servo Drives selection tables

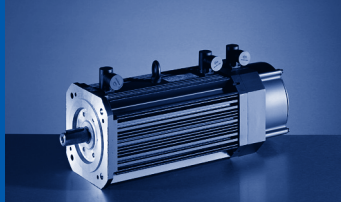


Mains connection 3 x 400 V and switching frequency
8 kHz

Motors with blower, IP23

					E94A□□	E0174	E0244	E0324	E0474	E0594	E0864	E1044	E1454	E1724	E2024	E2454	E2924
					I _N	16.5	23.5	32.0	41.0	41.0	73.0	78.0	102.0	120.0	131.0	160.0	191.0
					I _{0,max}	49.5	58.8	76.8	94.0	118.0	172.0	208.0	261.0	310.0	364.0	441.0	526.0
MCA	M _N	n _N	I _N	P _N	I _{max}	49.5	58.8	76.8	94.0	118.0	172.0	208.0	261.0	310.0	364.0	441.0	526.0
20X14- ...2F□□	61.0	1420	23.0	9.10	M ₀	32.5	67.0										
					M _N	32.5	67.0										
					M _{0,max}	154.2	208.0										
					M _{max}	154.2	208.0										
					n _{eto}	-	-										
20X29- ...2F□□	53.5	2930	42.4	16.40	M ₀			28.0	53.5	57.0							
					M _N			28.0	53.5	57.0							
					M _{0,max}			116.0	148.2	192.8							
					M _{max}			116.0	148.2	192.8							
					n _{eto}			-	-	-							
22P08- ...2F□□	120.0	760	23.5	9.60	M ₀		120.0	135.0									
					M _N		120.0	120.0									
					M _{0,max}		313.0	402.0									
					M _{max}		313.0	402.0									
					n _{eto}		-	-									
22P14- ...2F□□	115.0	1425	40.0	17.20	M ₀				118.0	118.0							
					M _N				115.0	115.0							
					M _{0,max}				300.0	372.0							
					M _{max}				300.0	372.0							
					n _{eto}				-	-							
22P17- ...2F□□	112.0	1670	44.5	19.60	M ₀					99.0	135.0						
					M _N					99.0	112.0						
					M _{0,max}					325.0	463.0						
					M _{max}					325.0	463.0						
					n _{eto}					-	-						
22P29- ...2F□□	110.0	2935	77.8	33.80	M ₀							110.0	135.0	135.0			
					M _N							110.0	110.0	110.0			
					M _{0,max}							335.0	416.0	486.0			
					M _{max}							335.0	416.0	486.0			
					n _{eto}							-	-	-			
26T05- ...2F□□	280.0	550	42.4	16.10	M ₀				268.0	268.0	290.0						
					M _N				268.0	268.0	280.0						
					M _{0,max}				665.0	826.0	1100.0						
					M _{max}				665.0	826.0	1100.0						
					n _{eto}				-	-	-						
26T10- ...2F□□	260.0	1030	69.6	28.00	M ₀						270.0	290.0	290.0				
					M _N						260.0	260.0	260.0				
					M _{0,max}						713.0	855.0	1044.0				
					M _{max}						713.0	855.0	1044.0				
					n _{eto}						-	-	-				
26T12- ...2F□□	255.0	1200	83.3	32.00	M ₀						204.0	219.0	290.0	290.0	290.0		
					M _N						204.0	219.0	255.0	255.0	255.0		
					M _{0,max}						502.0	609.0	739.0	840.0	896.0		
					M _{max}						502.0	609.0	739.0	840.0	896.0		
					n _{eto}						-	-	-	-	-		
26T22- ...2F□□	230.0	2235	126.7	53.80	M ₀									211.0	242.0	290.0	290.0
					M _N									211.0	230.0	230.0	230.0
					M _{0,max}									611.0	711.0	843.0	1001.0
					M _{max}									611.0	711.0	843.0	1001.0
					n _{eto}									-	-	-	-

- ▶ I... [A], M... [Nm], n... [min⁻¹], P... [kW]
- ▶ Please get in touch with your local Lenze subsidiary if you wish to operate the motors at a lower switching frequency.



MCA asynchronous servo motors

ECS servo system selection tables

Mains connection 3x 400 V

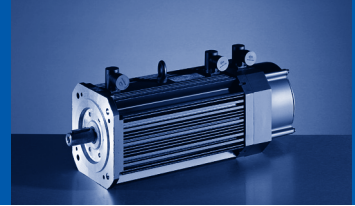
Motors without blower

					ECS□□	008C□B	016C□B	032C□B	048C□B	064C□B
					I _N	4.0	8.0	12.7	17.0	20.0
					I _{0,max}	4.6	9.1	18.1	27.2	36.3
MCA	M _N	n _N	I _N	P _N	I _{max}	8.0	16.0	32.0	48.0	64.0
10I40	2.0	3950	2.4	0.80	M ₀	2.3				
					M _N	2.0				
					M _{0,max}	5.6				
					M _{max}	8.1				
					n _{eto}	-				
13I41	4.0	4050	4.4	1.70	M ₀	3.0	4.6			
					M _N	3.0	4.0			
					M _{0,max}	4.3	11.0			
					M _{max}	9.4	18.2			
					n _{eto}	-	-			
14L20	6.7	2000	3.3	1.40	M ₀	8.0	8.0			
					M _N	6.7	6.7			
					M _{0,max}	10.7	25.3			
					M _{max}	21.6	42.8			
					n _{eto}	-	-			
14L41	5.4	4100	5.8	2.30	M ₀		8.0	8.0		
					M _N		5.4	5.4		
					M _{0,max}		11.0	24.0		
					M _{max}		20.7	29.1		
					n _{eto}		-	-		
17N23	10.8	2300	5.5	2.60	M ₀		12.8	12.8		
					M _N		10.8	10.8		
					M _{0,max}		20.5	43.5		
					M _{max}		40.2	63.7		
					n _{eto}		-	-		
17N41	9.5	4110	10.2	4.10	M ₀		6.1	12.8	12.8	
					M _N		6.1	9.5	9.5	
					M _{0,max}		7.8	21.5	33.5	
					M _{max}		17.4	29.6	57.7	
					n _{eto}		-	-	-	
19S23	16.3	2340	8.2	4.00	M ₀		15.1	22.5		
					M _N		15.1	16.3		
					M _{0,max}		18.7	43.5		
					M _{max}		38.5	67.9		
					n _{eto}		-	-		
19S42	12.0	4150	14.0	5.20	M ₀			9.8	16.7	
					M _N			9.8	12.0	
					M _{0,max}			18.4	31.9	
					M _{max}			29.9	58.2	
					n _{eto}			-	-	
21X25	24.6	2490	13.5	6.40	M ₀			21.0	39.0	
					M _N			21.0	24.6	
					M _{0,max}			41.0	64.5	
					M _{max}			64.4	120.5	
					n _{eto}			-	-	
21X42	17.0	4160	19.8	7.40	M ₀				13.0	17.0
					M _N				13.0	17.0
					M _{0,max}				30.0	45.0
					M _{max}				59.4	83.0
					n _{eto}				-	-

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCA asynchronous servo motors

ECS servo system selection tables

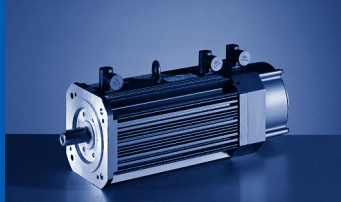


Mains connection 3x 400 V

Motors with blower, IP54

					ECS□□	008C□B	016C□B	032C□B	048C□B	064C□B
					I _N	4.0	8.0	12.7	17.0	20.0
					I _{0,max}	4.6	9.1	18.1	27.2	36.3
MCA	M _N	n _N	I _N	P _N	I _{max}	8.0	16.0	32.0	48.0	64.0
13L34	6.3	3410	6.0	2.20	M ₀		7.0			
					M _N		6.3			
					M _{0,max}		10.7			
					M _{max}		20.8			
					n _{eto}		-			
14L16	12.0	1635	4.8	2.10	M ₀	8.9	13.5			
					M _N	8.9	12.0			
					M _{0,max}	11.5	25.4			
					M _{max}	21.6	46.7			
					n _{eto}	-	-			
14L35	10.8	3455	9.1	3.90	M ₀		8.3	13.5	13.5	
					M _N		8.3	10.8	10.8	
					M _{0,max}		11.0	27.0	41.0	
					M _{max}		22.2	42.0	67.8	
					n _{eto}		-	-	-	
17N17	21.5	1680	8.5	3.80	M ₀		19.5	23.9		
					M _N		19.5	21.5		
					M _{0,max}		23.0	53.0		
					M _{max}		44.8	80.0		
					n _{eto}		-	-		
17N35	19.0	3480	15.8	6.90	M ₀			12.7	23.0	
					M _N			12.7	19.0	
					M _{0,max}			23.0	37.5	
					M _{max}			37.7	64.4	
					n _{eto}			-	-	
19S17	36.3	1700	13.9	6.40	M ₀			28.3	40.0	40.0
					M _N			28.3	36.3	36.3
					M _{0,max}			46.5	72.0	98.0
					M _{max}			75.4	130.8	158.9
					n _{eto}			-	-	-
21X17	61.4	1710	22.5	11.00	M ₀					52.5
					M _N					52.5
					M _{0,max}					107.0
					M _{max}					190.0
					n _{eto}					-

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCA asynchronous servo motors

EVS9300 servo inverter selection tables

Mains connection 3x 400 V

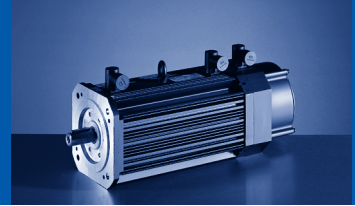
Motors without blower

					EVS	9322-E□	9323-E□	9324-E□	9325-E□	9326-E□	9327-E□	9328-E□	9329-E□
					I _N	2.5	3.9	7.0	13.0	23.5	32.0	47.0	59.0
					I _{0,max}	3.8	5.9	10.5	19.5	23.5	32.0	47.0	52.0
MCA	M _N	n _N	I _N	P _N	I _{max}	3.8	5.9	10.5	19.5	35.3	48.0	70.5	88.5
10I40	2.0	3950	2.4	0.80	M ₀	2.2	2.3						
					M _N	2.0	2.0						
					M _{0,max}	4.4	7.3						
					M _{max}	4.4	7.3						
					n _{eto}	-	-						
13I41	4.0	4050	4.4	1.70	M ₀			4.6	4.6				
					M _N			4.0	4.0				
					M _{0,max}			12.6	19.5				
					M _{max}			12.6	19.5				
					n _{eto}			-	-				
14L20	6.7	2000	3.3	1.40	M ₀		8.0	8.0					
					M _N		6.7	6.7					
					M _{0,max}		15.1	29.3					
					M _{max}		15.1	29.3					
					n _{eto}		-	-					
14L41	5.4	4100	5.8	2.30	M ₀			7.0	8.0				
					M _N			5.4	5.4				
					M _{0,max}			13.2	26.0				
					M _{max}			13.2	26.0				
					n _{eto}			-	-				
17N23	10.8	2300	5.5	2.60	M ₀			12.8	12.8				
					M _N			10.8	10.8				
					M _{0,max}			24.4	46.2				
					M _{max}			24.4	46.2				
					n _{eto}			-	-				
17N41	9.5	4110	10.2	4.10	M ₀				12.8	12.8	12.8		
					M _N				9.5	9.5	9.5		
					M _{0,max}				23.4	37.0	54.0		
					M _{max}				23.4	43.7	59.4		
					n _{eto}				-	-	-		
19S23	16.3	2340	8.2	4.00	M ₀				22.5	22.5			
					M _N				16.3	16.3			
					M _{0,max}				47.2	78.0			
					M _{max}				47.2	88.2			
					n _{eto}				-	-			
19S42	12.0	4150	14.0	5.20	M ₀				10.0	22.5	22.5		
					M _N				10.0	12.0	12.0		
					M _{0,max}				20.7	33.5	51.0		
					M _{max}				20.7	43.3	60.7		
					n _{eto}				-	-	-		
21X25	24.6	2490	13.5	6.40	M ₀				23.7	39.0	39.0		
					M _N				23.7	24.6	24.6		
					M _{0,max}				46.2	66.0	84.0		
					M _{max}				46.2	78.0	92.4		
					n _{eto}				-	-	-		
21X42	17.0	4160	19.8	7.40	M ₀					24.0	39.0	39.0	39.0
					M _N					17.0	17.0	17.0	17.0
					M _{0,max}					24.0	47.0	84.0	94.0
					M _{max}					43.9	63.3	96.8	123.0
					n _{eto}					-	-	-	-

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

MCA asynchronous servo motors

EVS9300 servo inverter selection tables

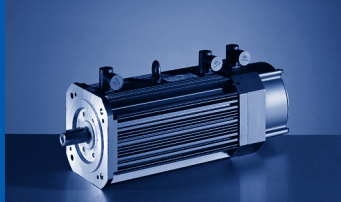


Mains connection 3x 400 V

Motors with blower, IP54

					EVS	9324-E□	9325-E□	9326-E□	9327-E□	9328-E□	9329-E□	9330-E□	9331-E□
					I _N	7.0	13.0	23.5	32.0	47.0	59.0	89.0	110.0
					I _{0,max}	10.5	19.5	23.5	32.0	47.0	52.0	80.0	110.0
MCA	M _N	n _N	I _N	P _N	I _{max}	10.5	19.5	35.3	48.0	70.5	88.5	133.5	165.0
13I34	6.3	3410	6.0	2.20	M ₀	7.0	7.0						
					M _N	6.3	6.3						
					M _{0,max}	13.0	25.0						
					M _{max}	13.0	25.0						
					n _{eto}	-	-						
14L16	12.0	1635	4.8	2.10	M ₀	13.5							
					M _N	12.0							
					M _{0,max}	29.6							
					M _{max}	29.6							
					n _{eto}	-							
14L35	10.8	3455	9.1	3.90	M ₀		13.5	13.5					
					M _N		10.8	10.8					
					M _{0,max}		29.3	47.0					
					M _{max}		29.3	53.8					
					n _{eto}		-	-					
17N17	21.5	1680	8.5	3.80	M ₀		23.9						
					M _N		21.5						
					M _{0,max}		57.2						
					M _{max}		57.2						
					n _{eto}		-						
17N35	19.0	3480	15.8	6.90	M ₀			23.9	23.9	23.9			
					M _N			19.0	19.0	19.0			
					M _{0,max}			27.5	57.0	89.0			
					M _{max}			50.7	69.2	100.2			
					n _{eto}			-	-	-			
19S17	36.3	1700	13.9	6.40	M ₀		34.0	40.0	40.0				
					M _N		34.0	36.3	36.3				
					M _{0,max}		50.1	76.0	112.0				
					M _{max}		50.1	95.9	130.8				
					n _{eto}		-	-	-				
19S35	36.0	3510	28.7	13.20	M ₀			21.0	39.0	40.0	40.0	40.0	
					M _N			21.0	36.0	36.0	36.0	36.0	
					M _{0,max}			21.0	39.0	73.0	80.0	161.5	
					M _{max}			45.7	67.6	104.3	132.9	180.0	
					n _{eto}			-	-	-	-	-	
21X17	61.4	1710	22.5	11.00	M ₀			65.5	75.0	75.0	75.0		
					M _N			61.4	61.4	61.4	61.4		
					M _{0,max}			65.5	102.0	178.0	200.0		
					M _{max}			104.1	143.3	210.7	257.3		
					n _{eto}			-	-	-	-		
21X35	55.0	3520	42.5	20.30	M ₀					68.0	75.0	75.0	75.0
					M _N					55.0	55.0	55.0	55.0
					M _{0,max}					68.0	88.0	156.0	219.0
					M _{max}					107.7	135.9	205.0	250.1
					n _{eto}					-	-	-	-

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]



MCA asynchronous servo motors

EVS9300 servo inverter selection tables

**Mains connection 3 x 400 V and switching frequency
8 kHz**

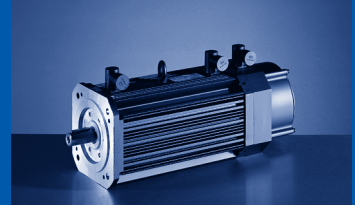
Motors with blower, IP54

					EVS	9326-E□	9327-E□	9328-E□	9329-E□	9330-E□	9331-E□	9332-E□
					I _N	23.5	32.0	47.0	59.0	89.0	110.0	145.0
					I _{0,max}	23.5	32.0	47.0	52.0	80.0	110.0	126.0
MCA	M _N	n _N	I _N	P _N	I _{max}	35.3	48.0	70.5	88.5	133.5	165.0	217.5
22P08- ...5F□□	110.0	760	22.1	8.80	M ₀	115.0	120.0	120.0	120.0			
					M _N	108.0	110.0	110.0	110.0			
					M _{0,max}	115.0	166.0	242.0	267.0			
					M _{max}	185.0	247.0	338.8	345.8			
					n _{eto}	-	-	-	-			
22P14- ...5F□□	107.0	1425	37.7	16.00	M ₀			120.0	120.0	120.0		
					M _N			107.0	107.0	107.0		
					M _{0,max}			146.0	60.0	264.0		
					M _{max}			230.1	292.9	341.8		
					n _{eto}			-	-	-		
22P17- ...5F□□	105.0	1670	42.7	18.50	M ₀			120.0	120.0	120.0	120.0	
					M _N			106.0	106.0	106.0	106.0	
					M _{0,max}			124.0	140.0	240.0	335.0	
					M _{max}			180.5	227.7	342.1	378.3	
					n _{eto}			-	-	-	-	
22P29- ...5F□□	100.0	2935	72.1	30.70	M ₀					118.0	120.0	120.0
					M _N					100.0	100.0	100.0
					M _{0,max}					122.0	171.0	200.0
					M _{max}					215.6	273.1	355.1
					n _{eto}					-	-	-
26T05- ...5F□□	216.0	550	34.9	12.40	M ₀		191.0	220.0	220.0	220.0		
					M _N		191.0	216.0	216.0	216.0		
					M _{0,max}		191.0	303.0	333.0	615.0		
					M _{max}		313.0	482.0	612.0	751.0		
					n _{eto}		-	-	-	-		
26T10- ...5F□□	210.0	1030	61.5	22.70	M ₀				159.0	220.0	220.0	
					M _N				197.0	210.0	210.0	
					M _{0,max}				159.0	300.0	440.0	
					M _{max}				343.0	552.0	671.0	
					n _{eto}				-	-	-	
26T12- ...5F□□	207.0	1200	75.1	26.00	M ₀					207.0	220.0	220.0
					M _N					255.0	207.0	207.0
					M _{0,max}					258.0	327.0	397.0
					M _{max}					424.0	512.0	663.0
					n _{eto}					-	-	-
26T22- ...5F□□	195.0	2235	112.9	45.50	M ₀						177.0	220.0
					M _N						177.0	195.0
					M _{0,max}						203.0	220.0
					M _{max}						315.0	432.0
					n _{eto}						-	-

- ▶ I... [A], M... [Nm], n... [min⁻¹], P... [kW]
- ▶ Please get in touch with your local Lenze subsidiary if you wish to operate the motors at a lower switching frequency.

MCA asynchronous servo motors

EVS9300 servo inverter selection tables

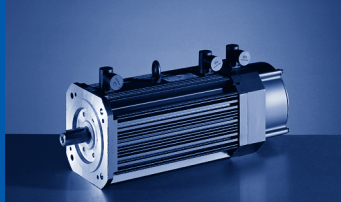


**Mains connection 3 x 400 V and switching frequency
8 kHz**

Motors with blower, IP23

					EVS	9326-E□	9327-E□	9328-E□	9329-E□	9330-E□	9331-E□	9332-E□
					I _N	23.5	32.0	47.0	59.0	89.0	110.0	145.0
					I _{0,max}	23.5	32.0	47.0	52.0	80.0	110.0	126.0
MCA	M _N	n _N	I _N	P _N	I _{max}	35.3	48.0	70.5	88.5	133.5	165.0	217.5
20X14- ...2F□□	61.0	1420	23.0	9.10	M ₀	61.0	68.0	68.0				
					M _N	61.0	61.0	61.0				
					M _{0,max}	61.0	93.0	153.0				
					M _{max}	109.3	156.7	232.1				
					n _{eto}	-	-	-				
20X29- ...2F□□	53.5	2930	42.4	16.40	M ₀		28.0	66.3	68.0	68.0		
					M _N		28.0	53.5	53.5	53.5		
					M _{0,max}		28.0	66.3	72.0	129.0		
					M _{max}		68.5	112.5	146.4	226.7		
					n _{eto}		-	-	-	-		
22P08- ...2F□□	120.0	760	23.5	9.60	M ₀	115.0	135.0	135.0	135.0			
					M _N	115.0	120.0	120.0	120.0			
					M _{0,max}	115.0	166.0	242.0	267.0			
					M _{max}	185.0	247.0	338.8	345.8			
					n _{eto}	-	-	-	-			
22P14- ...2F□□	115.0	1425	40.0	17.20	M ₀			135.0	135.0	135.0		
					M _N			115.0	115.0	115.0		
					M _{0,max}			146.0	160.0	264.0		
					M _{max}			230.1	292.9	341.8		
					n _{eto}			-	-	-		
22P17- ...2F□□	112.0	1670	44.5	19.60	M ₀			124.0	134.0	135.0	135.0	
					M _N			112.0	112.0	112.0	112.0	
					M _{0,max}			124.0	140.0	240.0	335.0	
					M _{max}			180.5	227.7	342.1	378.3	
					n _{eto}			-	-	-	-	
22P29- ...2F□□	110.0	2935	77.8	33.80	M ₀					118.0	135.0	135.0
					M _N					110.0	110.0	110.0
					M _{0,max}					122.0	171.0	200.0
					M _{max}					215.6	273.1	355.1
					n _{eto}					-	-	-
26T05- ...2F□□	280.0	550	42.4	16.10	M ₀		191.0	290.0	290.0	290.0		
					M _N		191.0	280.0	280.0	280.0		
					M _{0,max}		191.0	303.0	333.0	615.0		
					M _{max}		313.0	482.0	612.0	751.0		
					n _{eto}		-	-	-	-		
26T10- ...2F□□	260.0	1030	69.6	28.00	M ₀				159.0	290.0	290.0	
					M _N				197.0	260.0	260.0	
					M _{0,max}				159.0	300.0	440.0	
					M _{max}				343.0	552.0	671.0	
					n _{eto}				-	-	-	
26T12- ...2F□□	255.0	1200	83.3	32.00	M ₀					232.0	290.0	290.0
					M _N					255.0	255.0	255.0
					M _{0,max}					258.0	327.0	397.0
					M _{max}					424.0	512.0	663.0
					n _{eto}					-	-	-
26T22- ...2F□□	230.0	2235	126.7	53.80	M ₀						177.0	222.0
					M _N						177.0	230.0
					M _{0,max}						203.0	220.0
					M _{max}						315.0	432.0
					n _{eto}						-	-

- ▶ I... [A], M... [Nm], n... [min⁻¹], P... [kW]
- ▶ Please get in touch with your local Lenze subsidiary if you wish to operate the motors at a lower switching frequency.

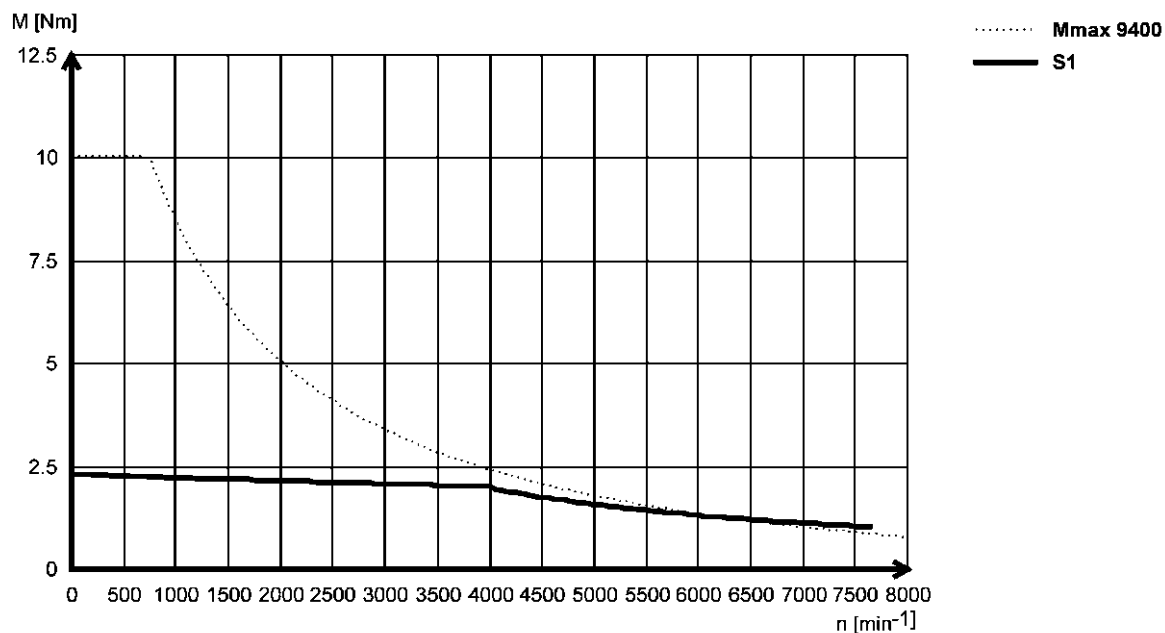


MCA asynchronous servo motors

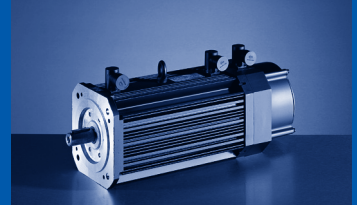
Torque characteristics

Mains connection 3x 400 V

MCA10I40

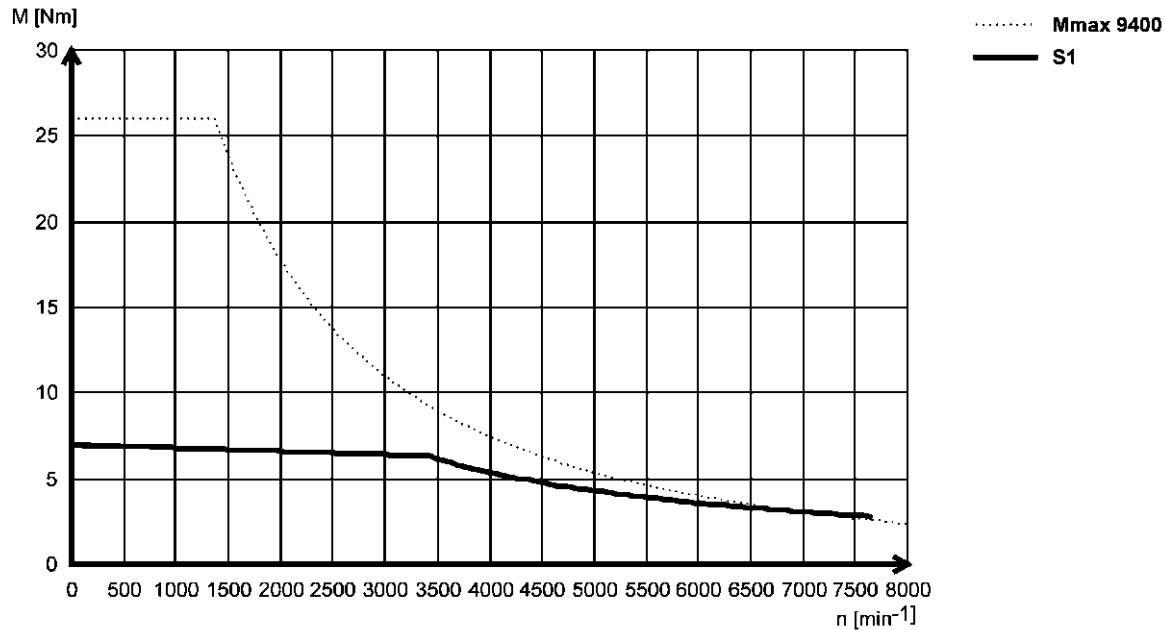


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

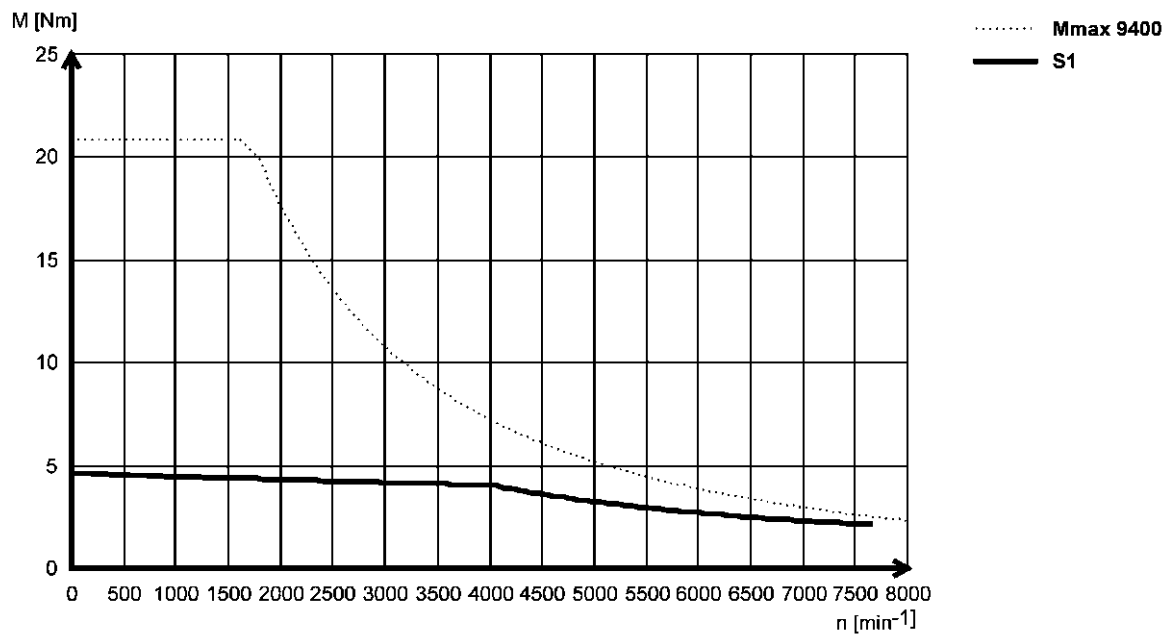


Mains connection 3x 400 V

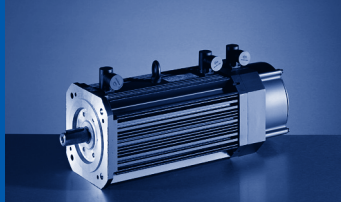
MCA13I34



MCA13I41



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

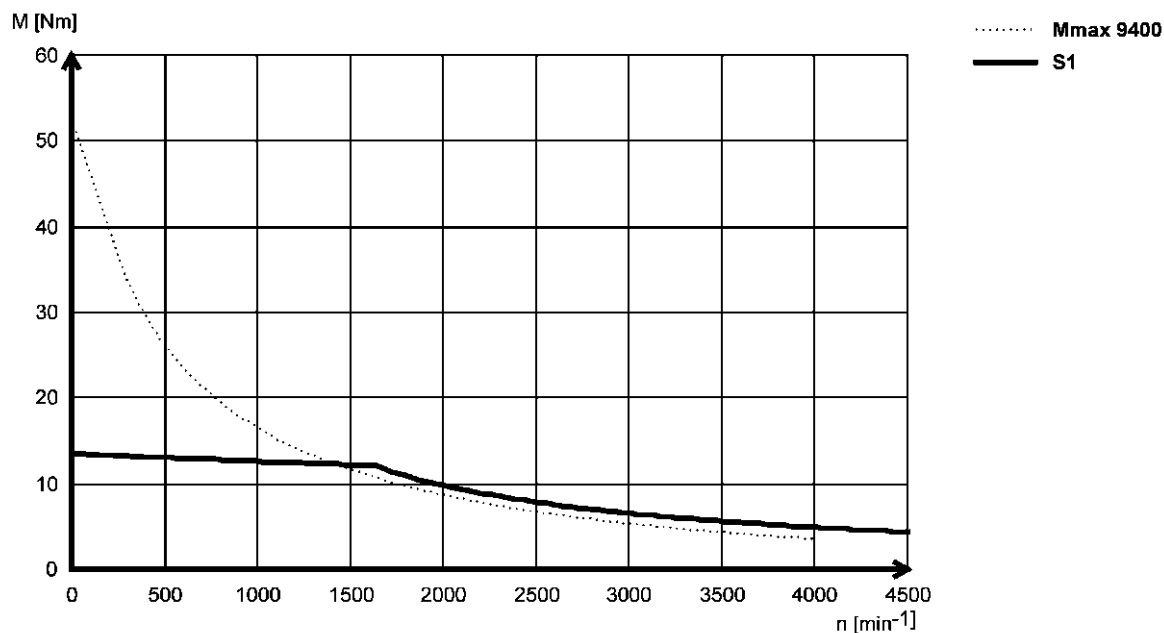


MCA asynchronous servo motors

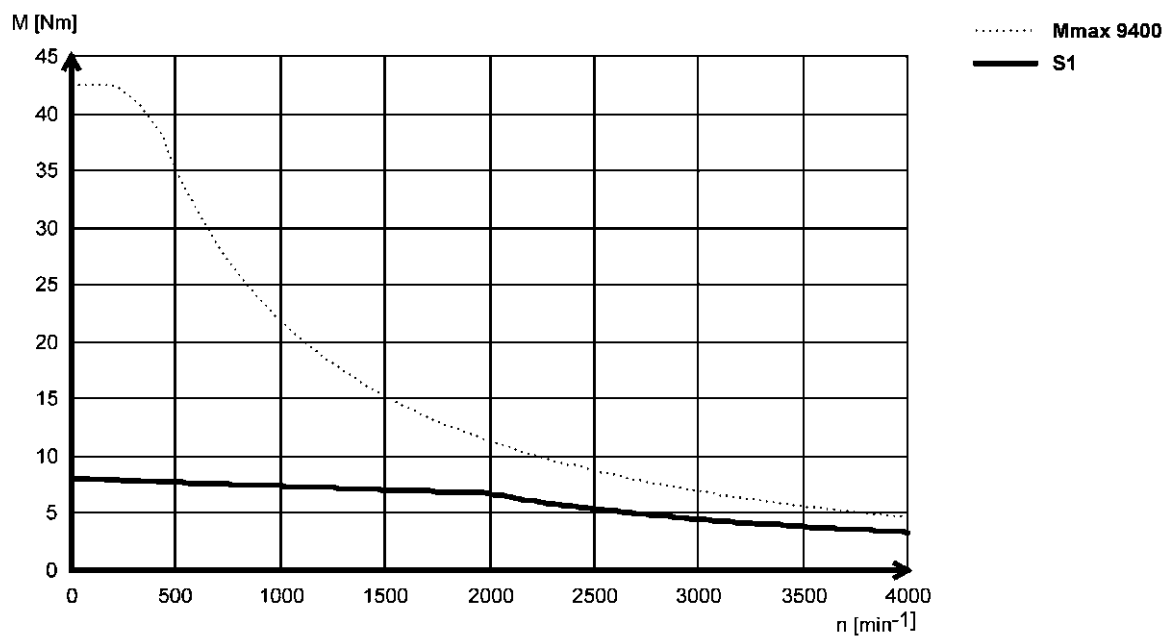
Torque characteristics

Mains connection 3x 400 V

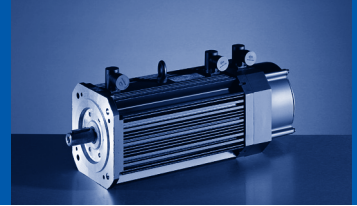
MCA14L16



MCA14L20

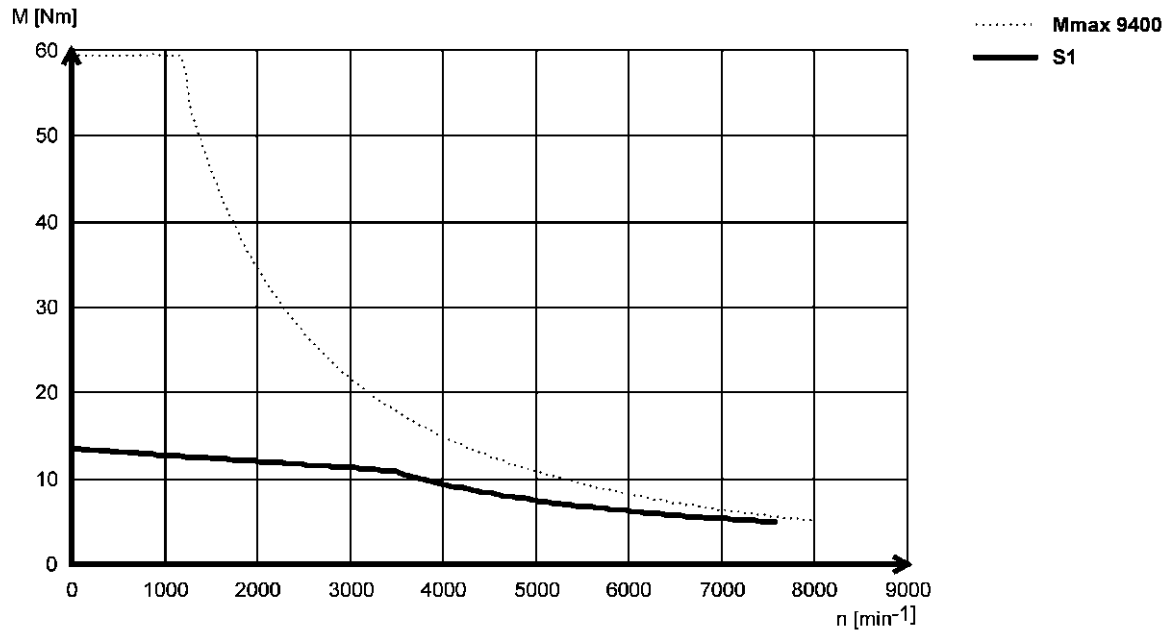


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

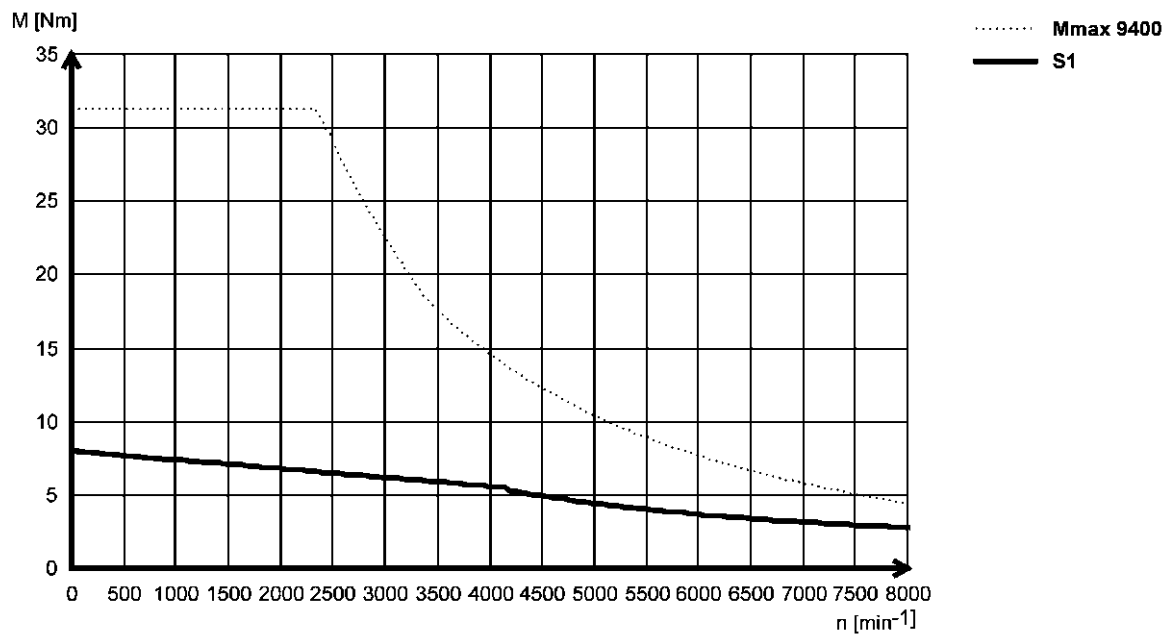


Mains connection 3x 400 V

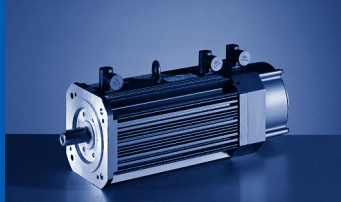
MCA14L35



MCA14L41



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

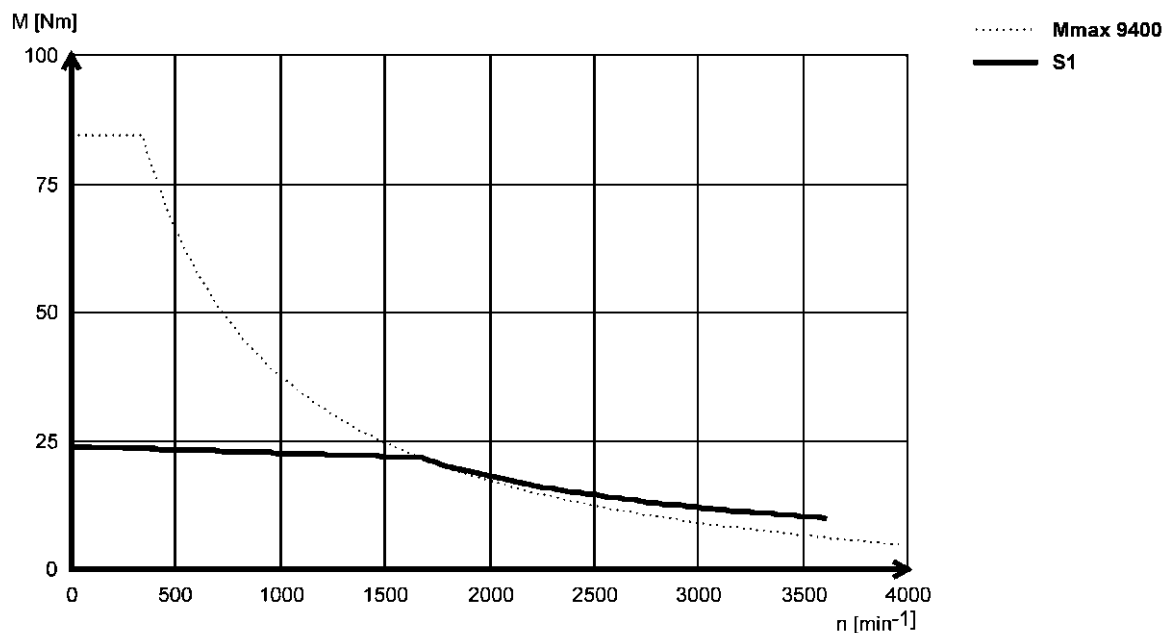


MCA asynchronous servo motors

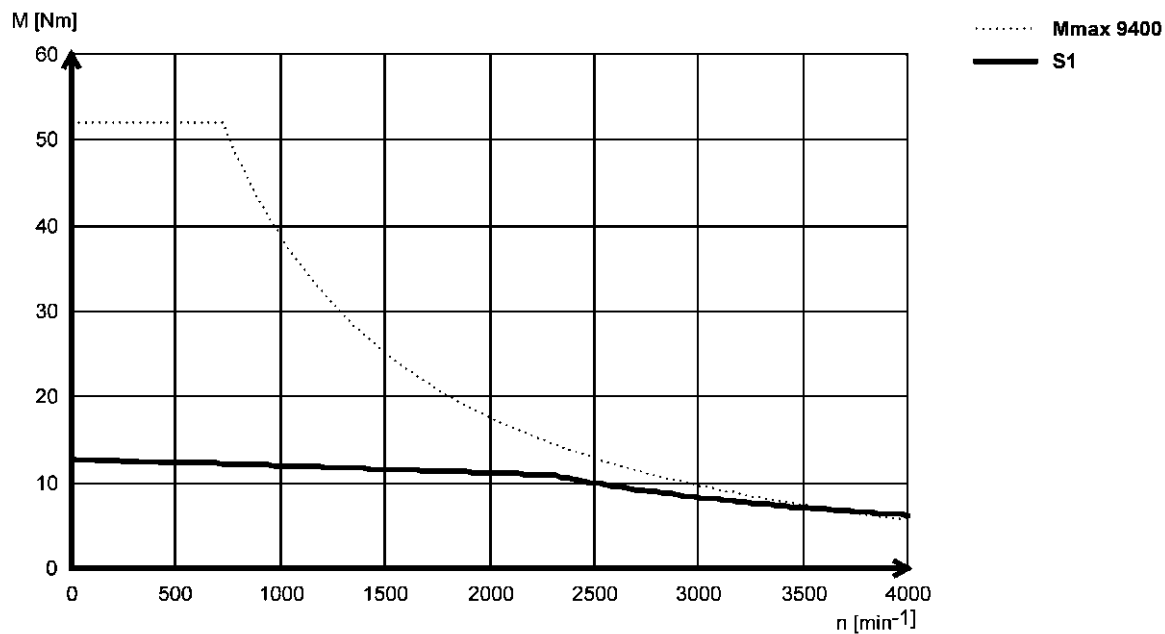
Torque characteristics

Mains connection 3x 400 V

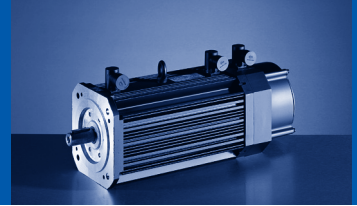
MCA17N17



MCA17N23

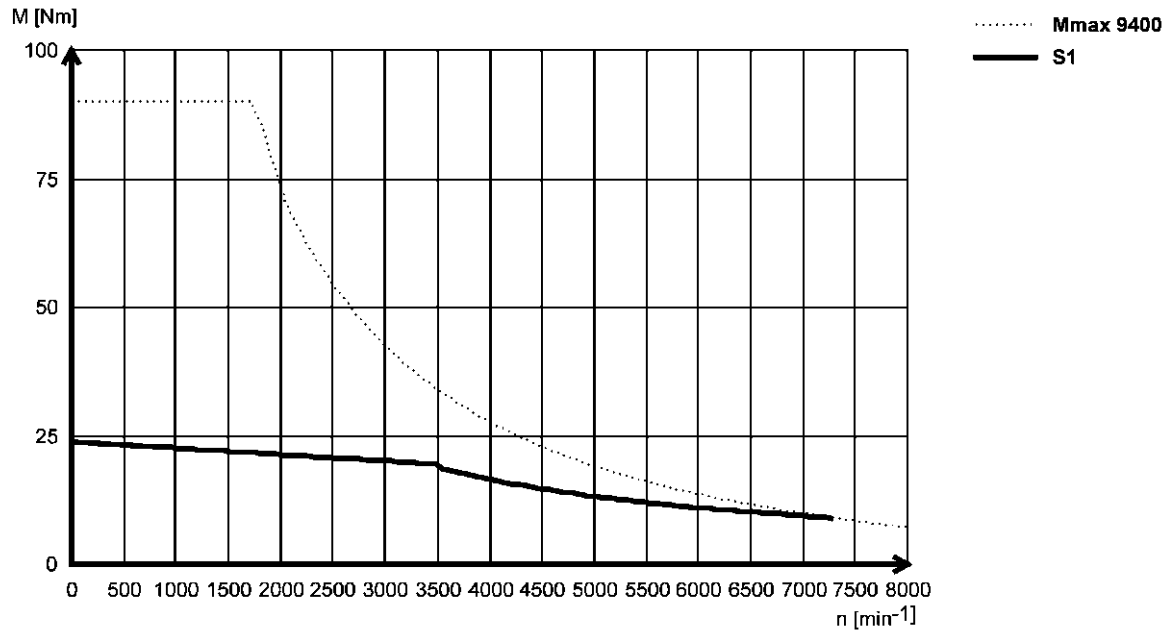


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

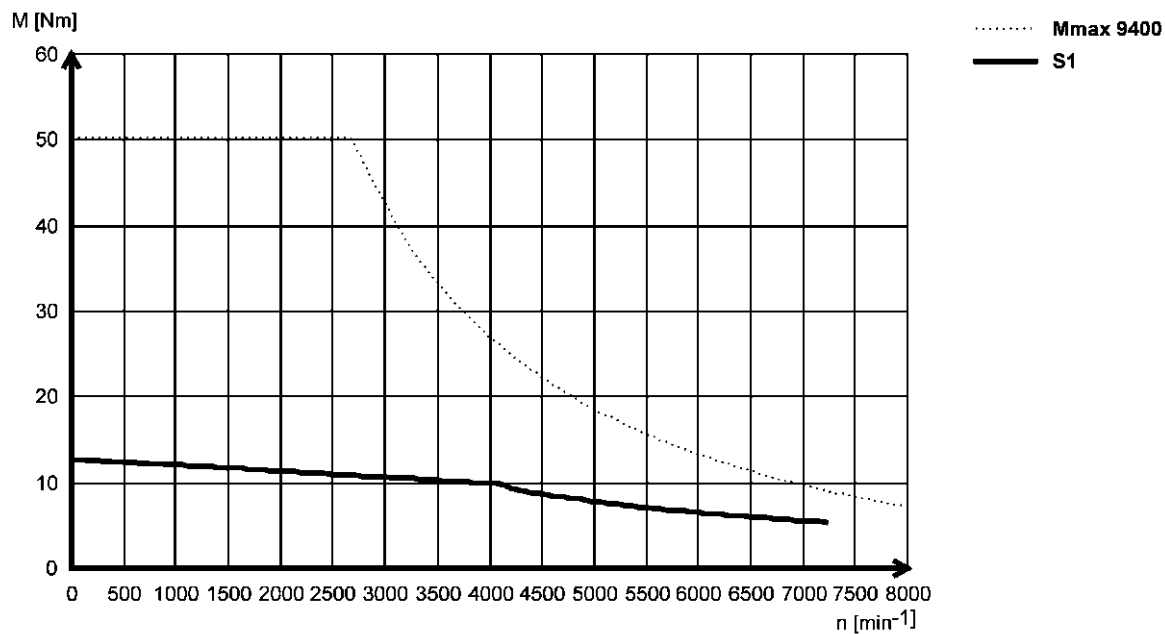


Mains connection 3x 400 V

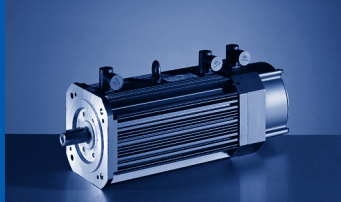
MCA17N35



MCA17N41



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

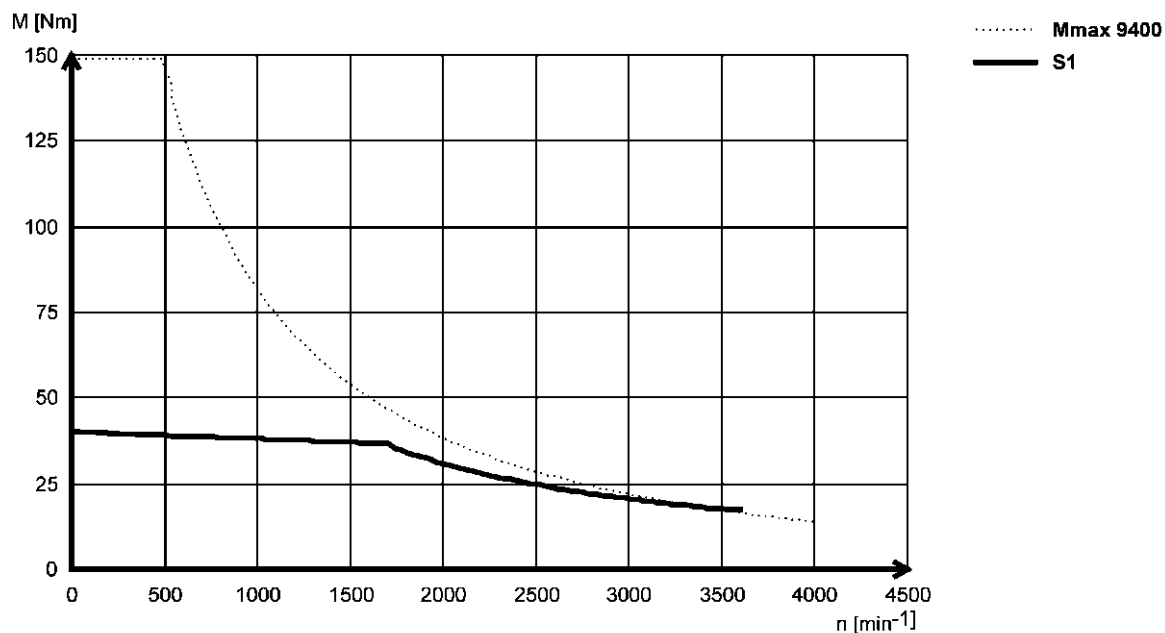


MCA asynchronous servo motors

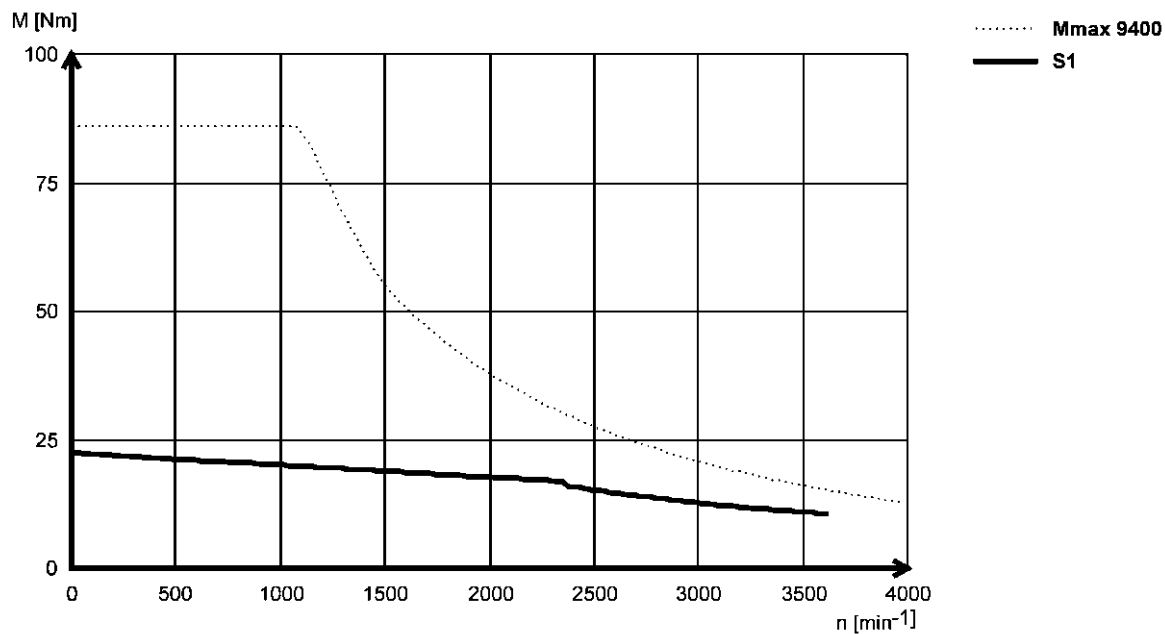
Torque characteristics

Mains connection 3x 400 V

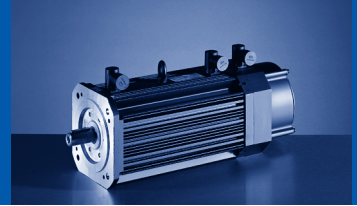
MCA19S17



MCA19S23

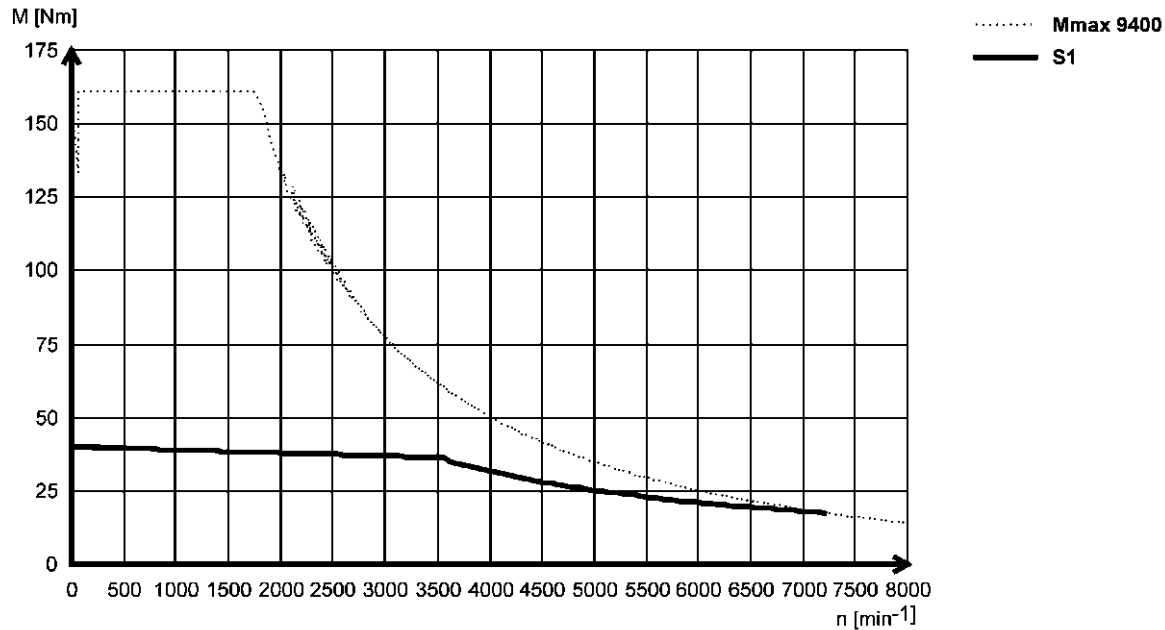


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

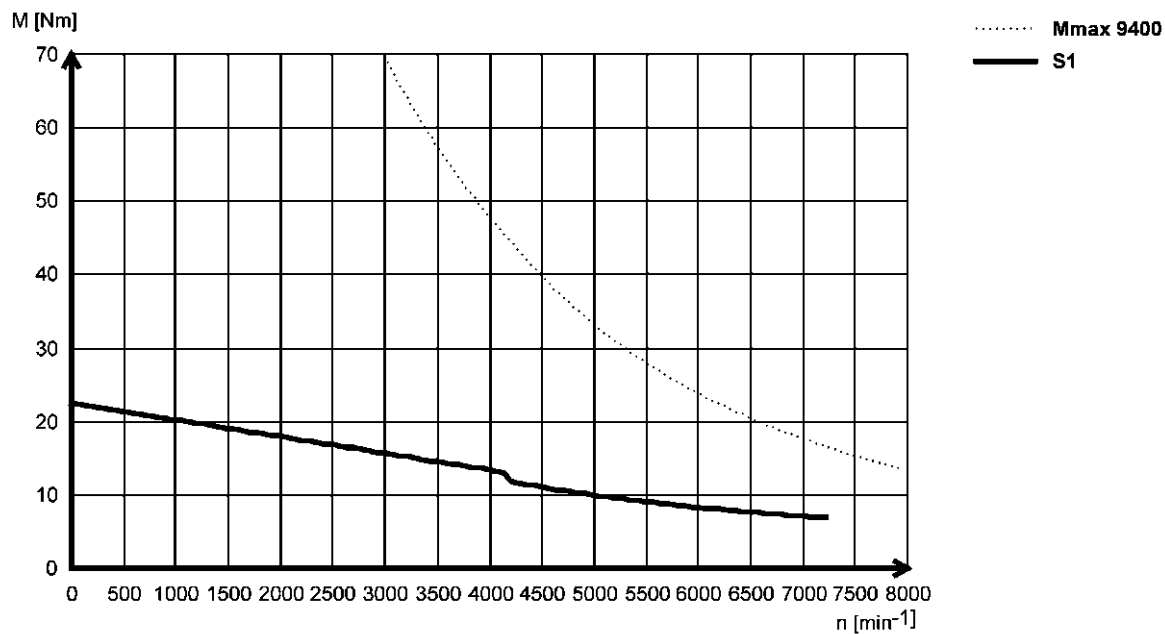


Mains connection 3x 400 V

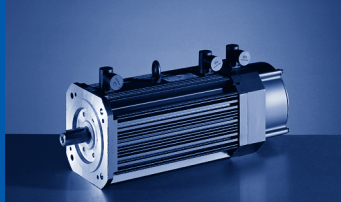
MCA19S35



MCA19S42



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

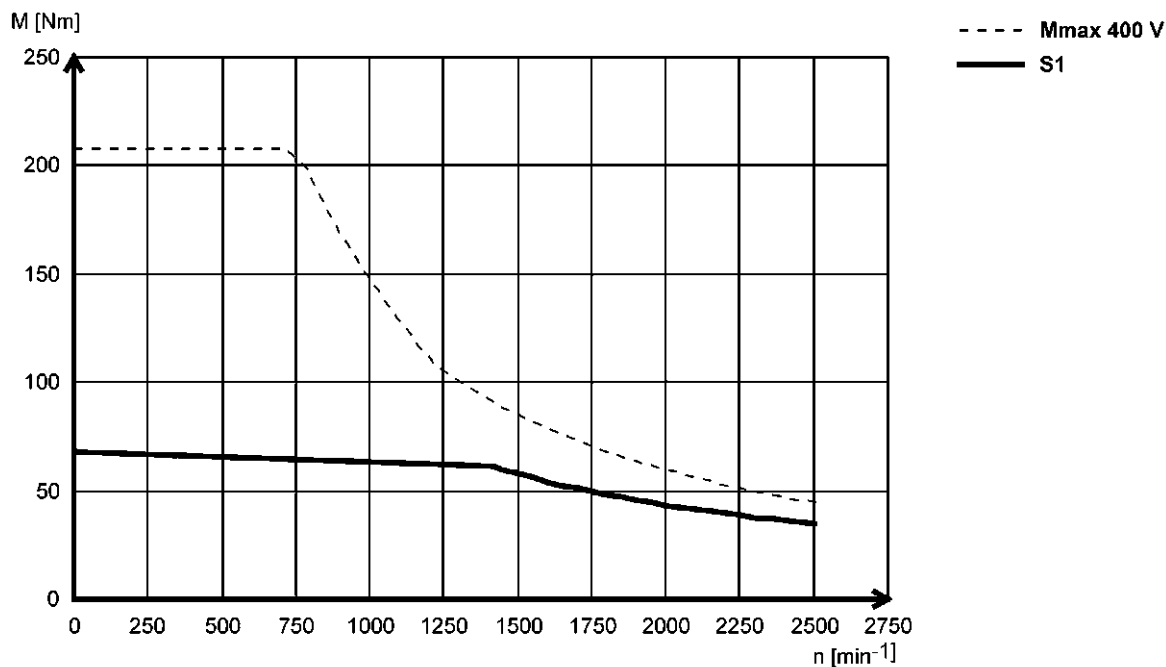


MCA asynchronous servo motors

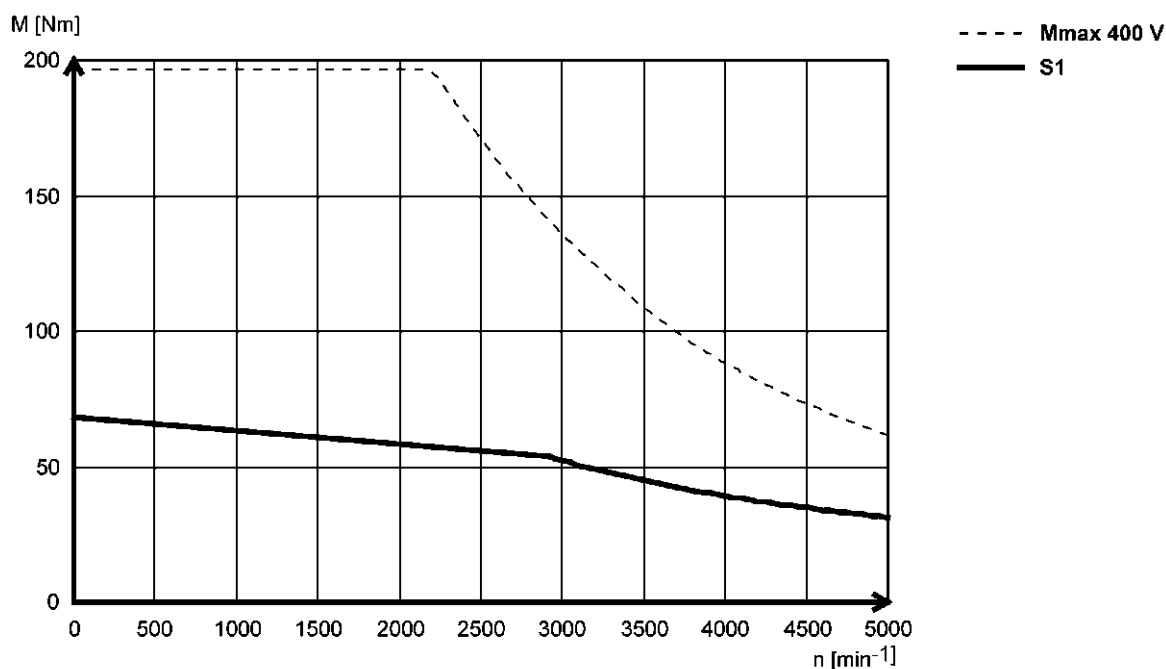
Torque characteristics

Mains connection 3x 400 V

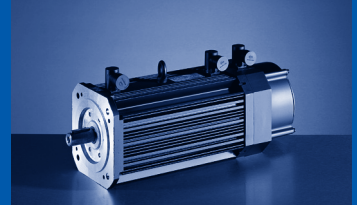
MCA20X14...2F□□



MCA20X29...2F□□

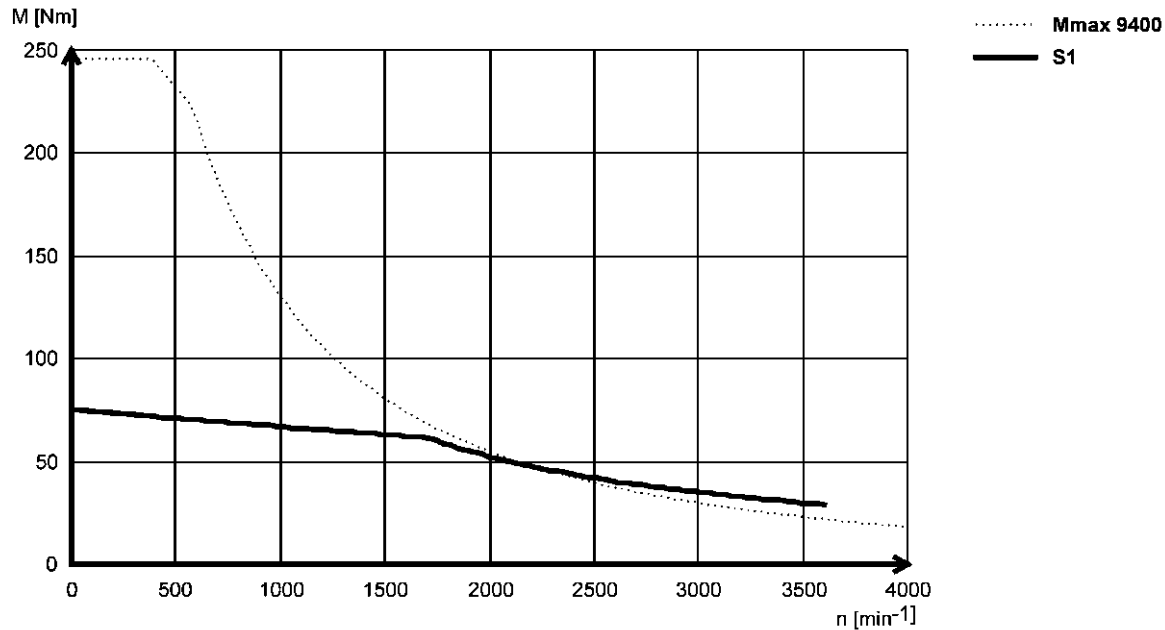


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

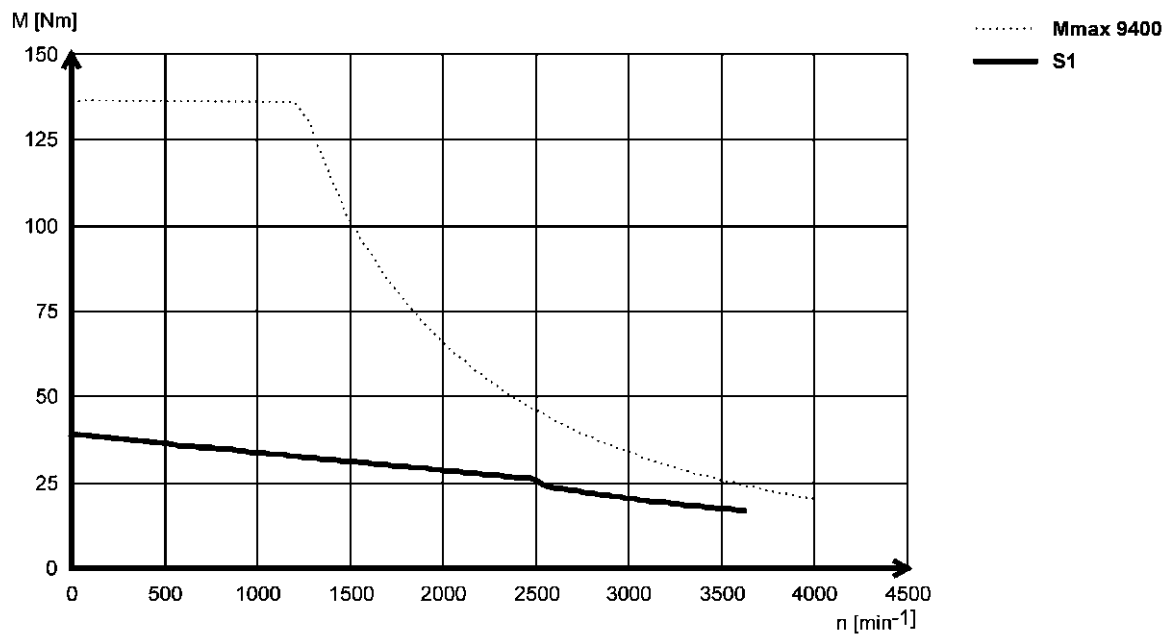


Mains connection 3x 400 V

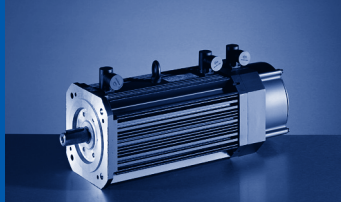
MCA21X17



MCA21X25



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

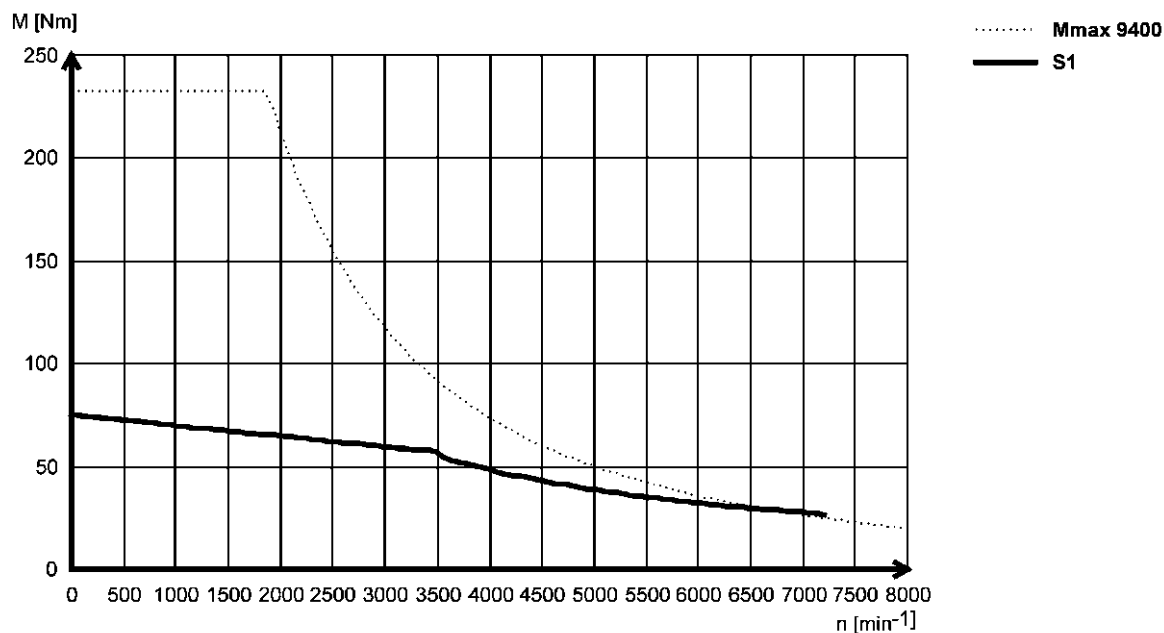


MCA asynchronous servo motors

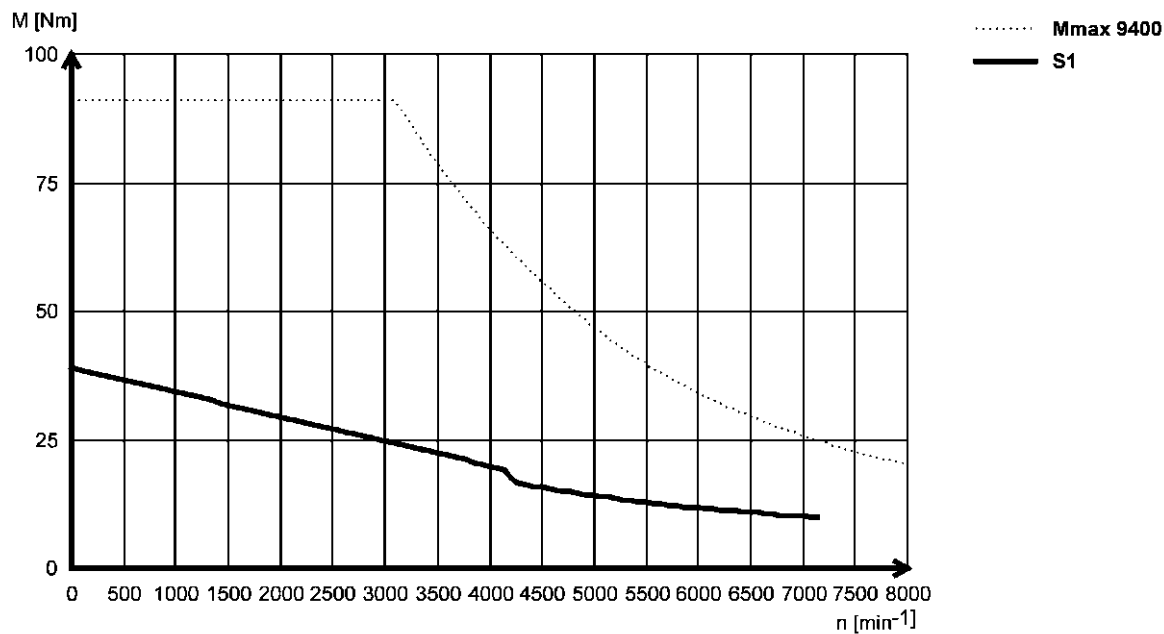
Torque characteristics

Mains connection 3x 400 V

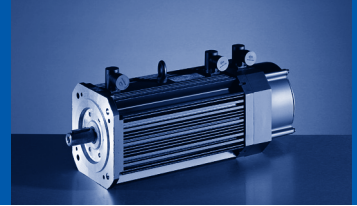
MCA21X35



MCA21X42

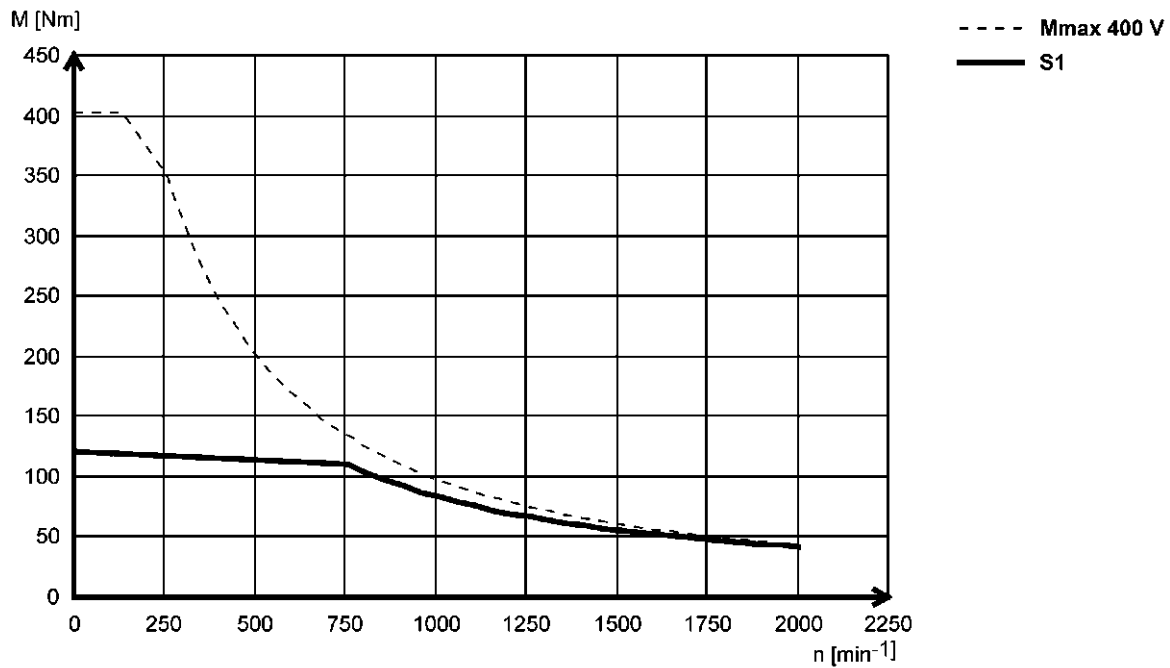


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

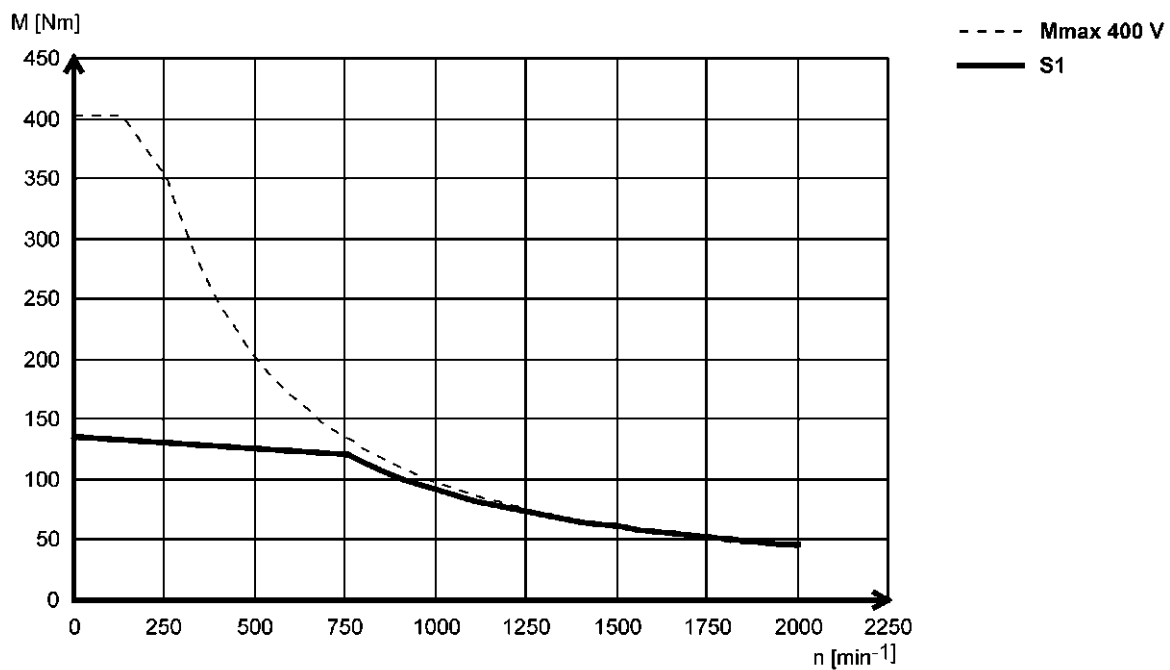


Mains connection 3x 400 V

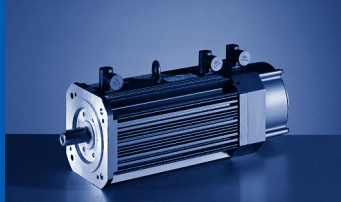
MCA22P08...5F□□



MCA22P08...2F□□



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

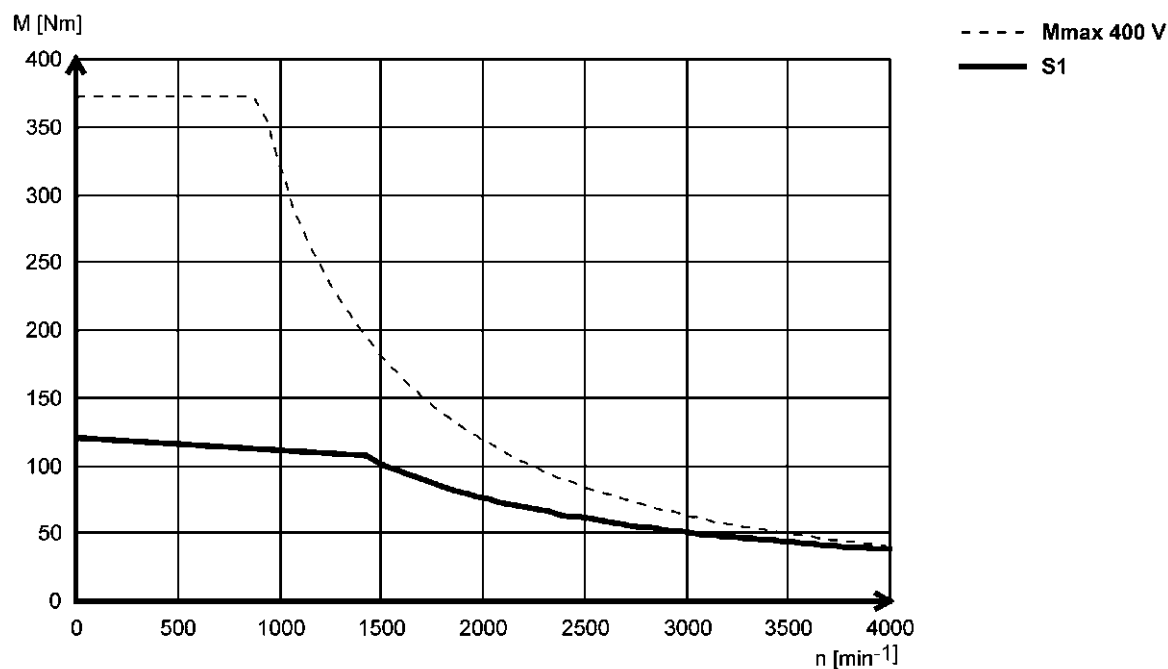


MCA asynchronous servo motors

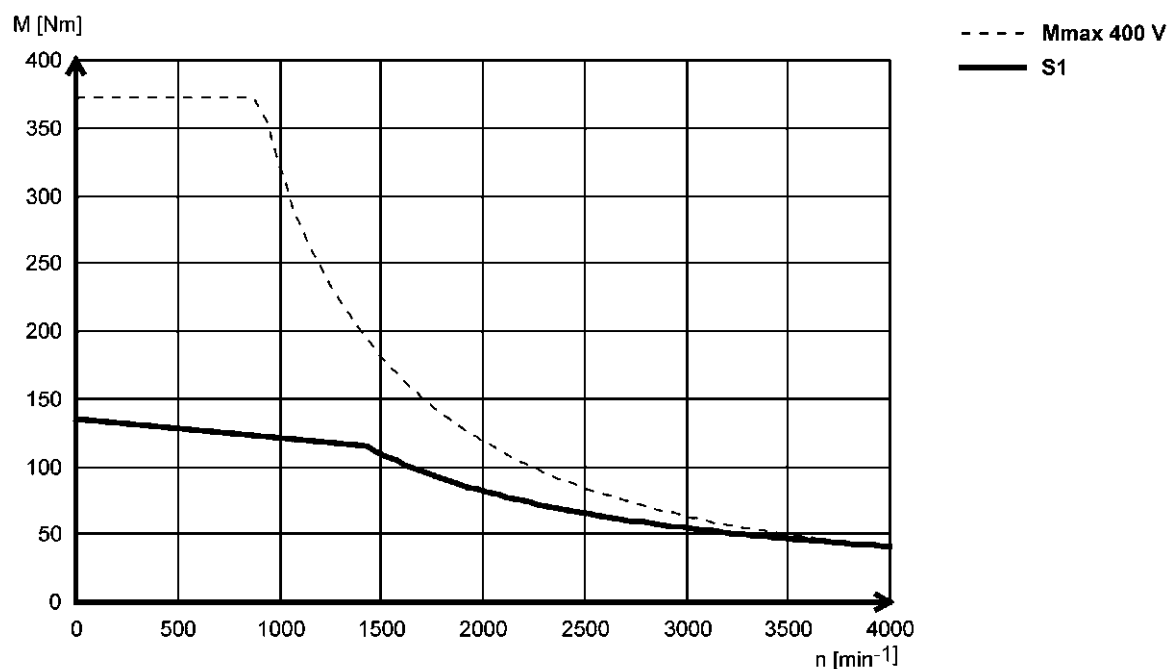
Torque characteristics

Mains connection 3x 400 V

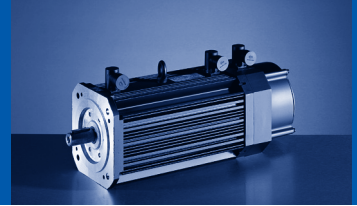
MCA22P14...5F□□



MCA22P14...2F□□

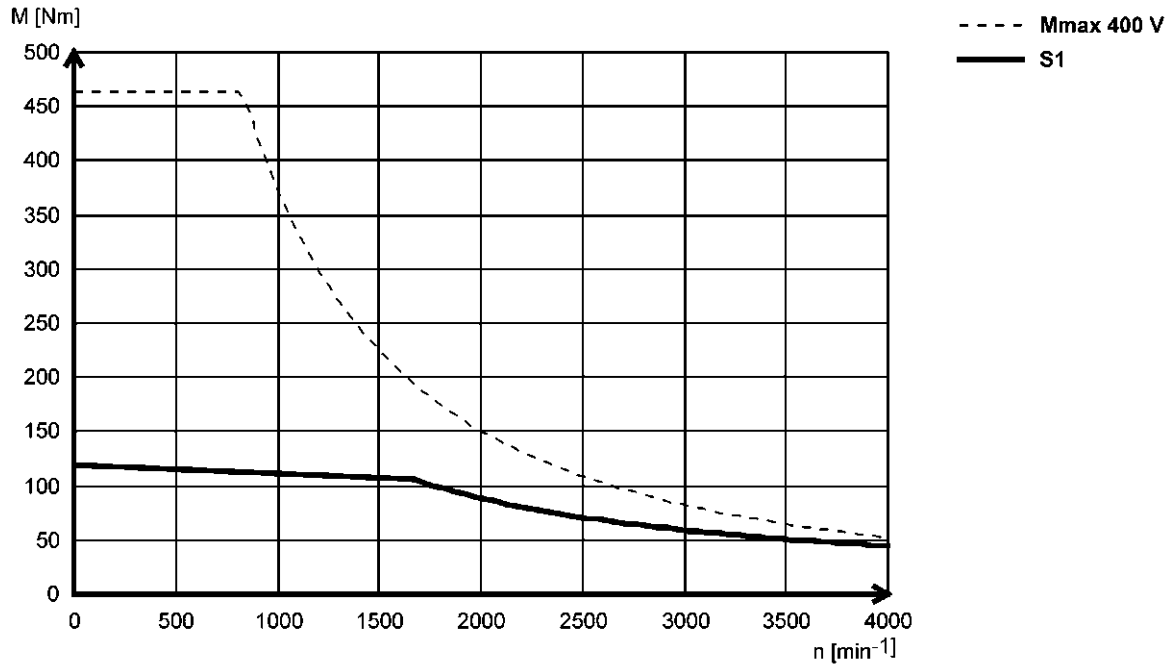


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

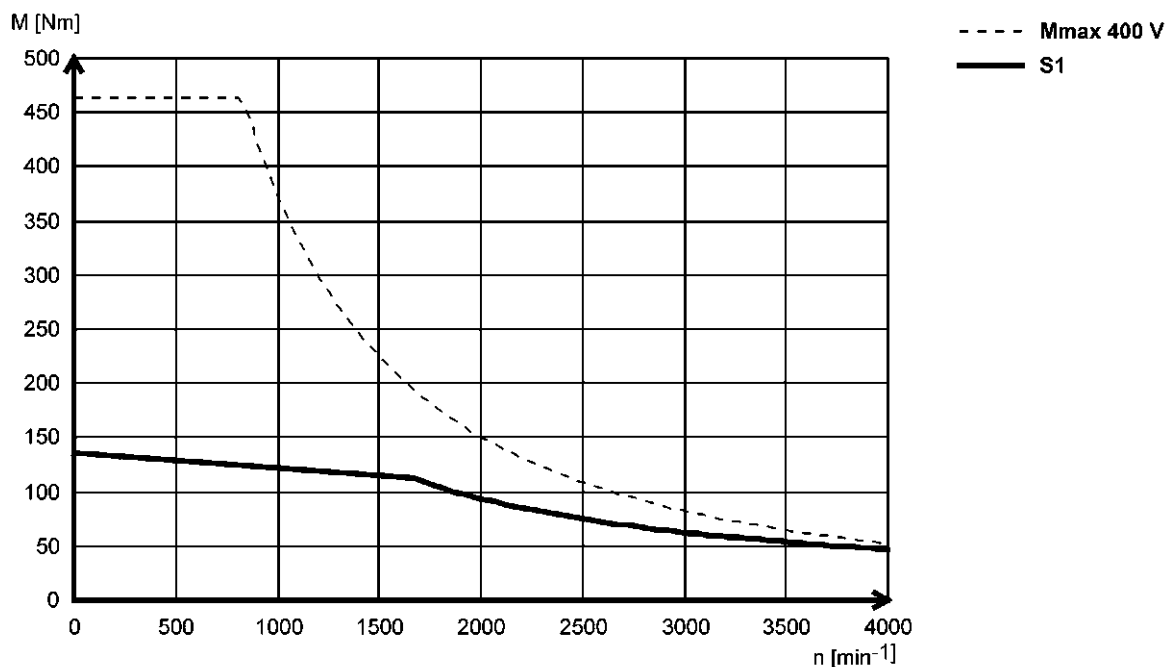


Mains connection 3x 400 V

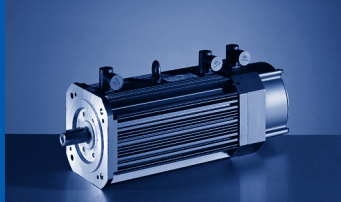
MCA22P17...5F□□



MCA22P17...2F□□



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

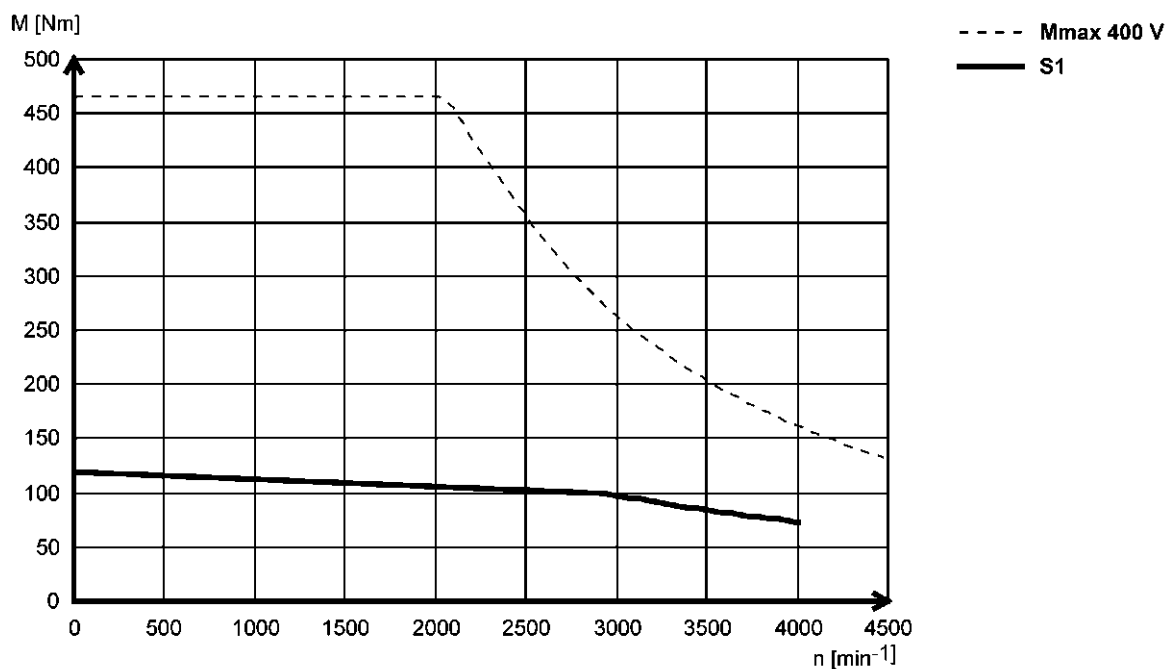


MCA asynchronous servo motors

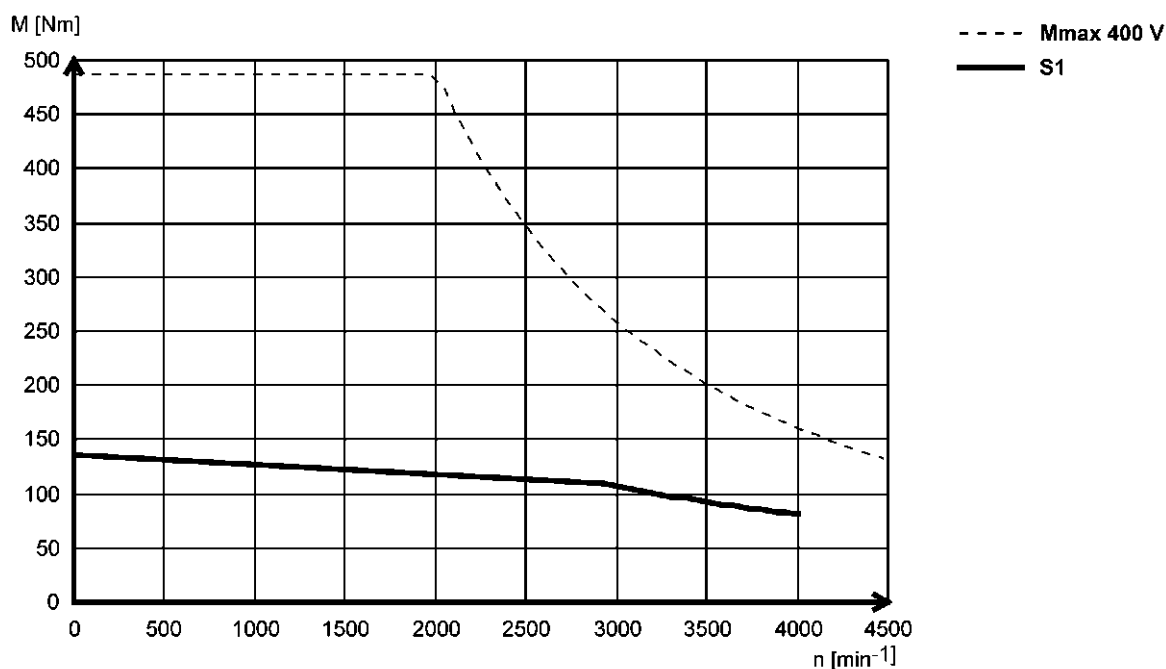
Torque characteristics

Mains connection 3x 400 V

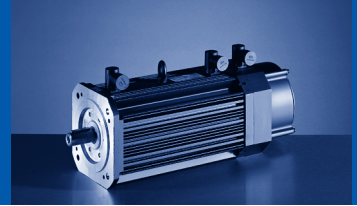
MCA22P29...5F□□



MCA22P29...2F□□

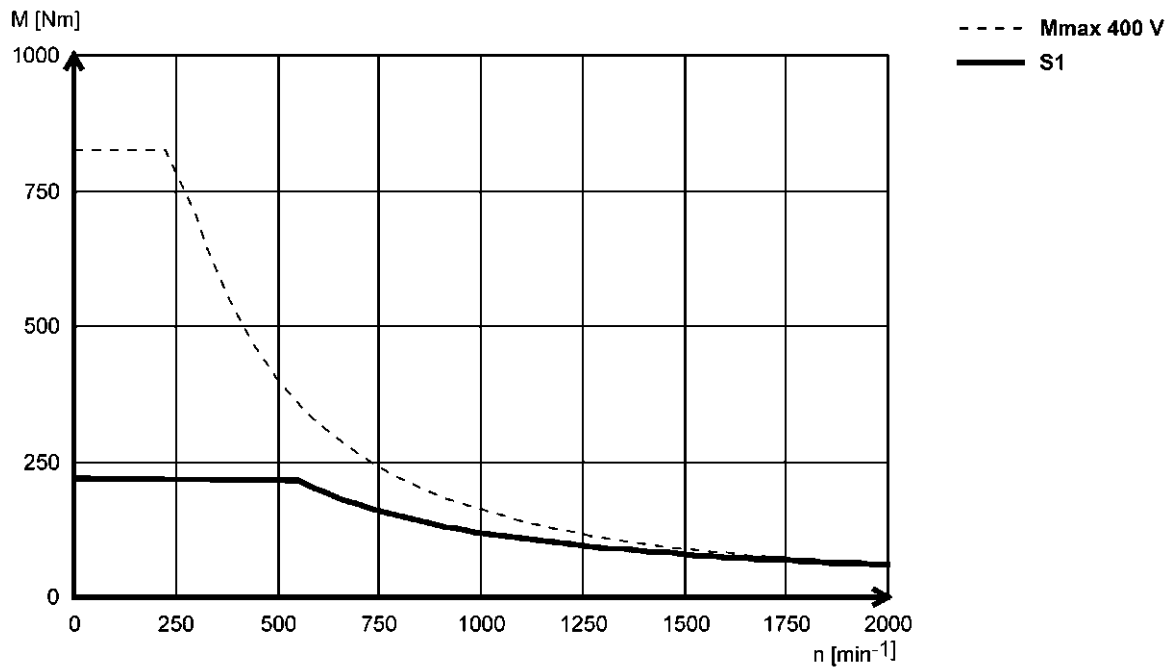


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

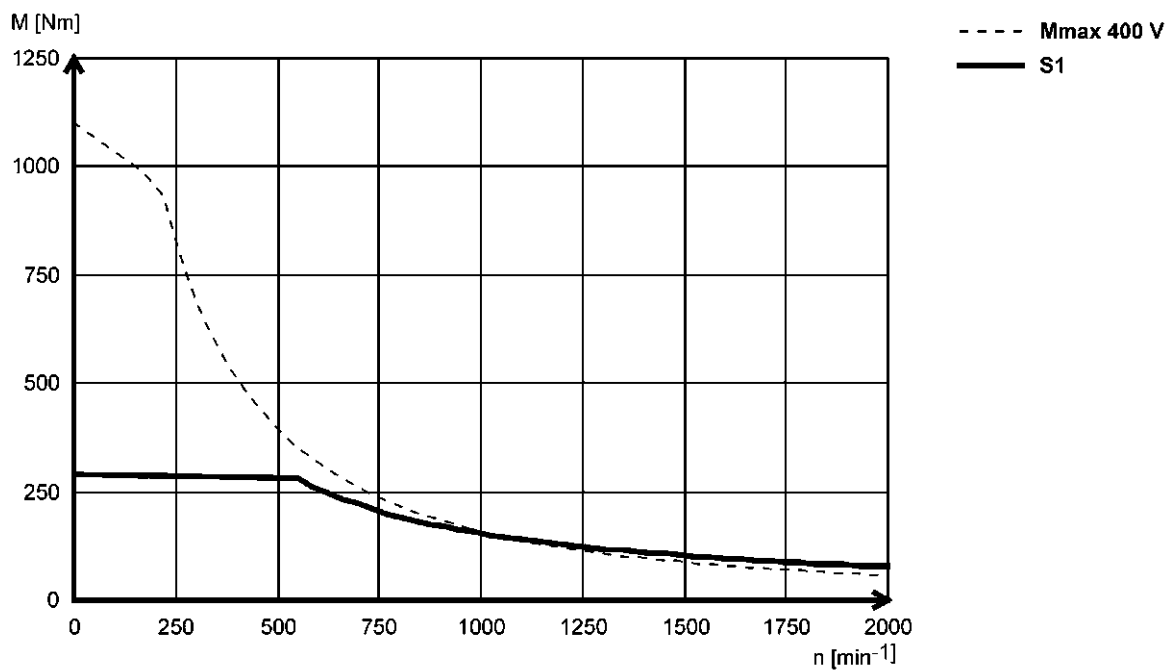


Mains connection 3x 400 V

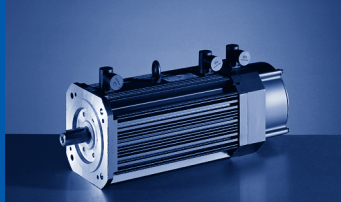
MCA26T05...5F□□



MCA26T05...2F□□



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

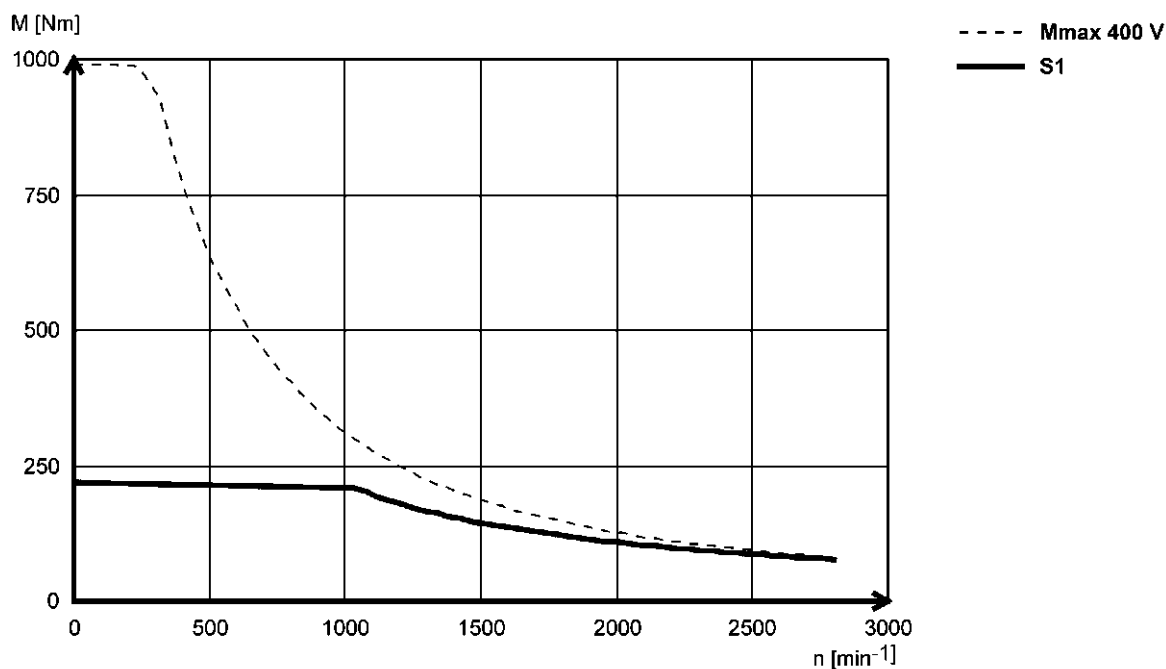


MCA asynchronous servo motors

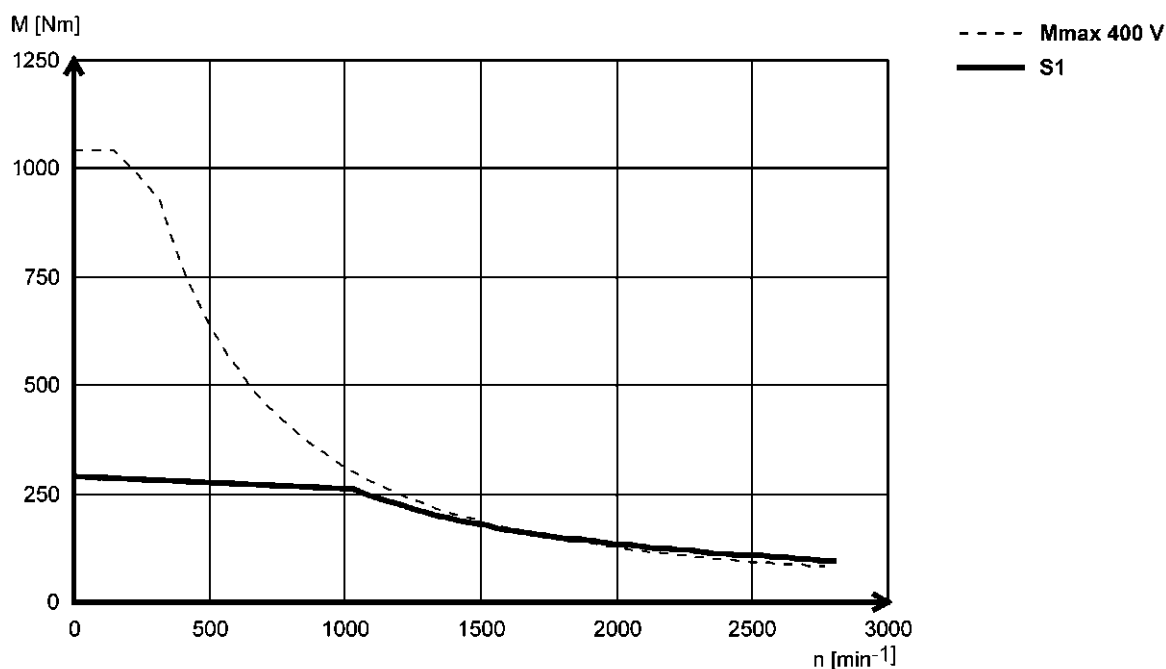
Torque characteristics

Mains connection 3x 400 V

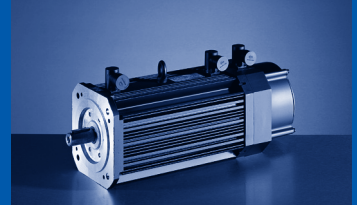
MCA26T10...5F□□



MCA26T10...2F□□

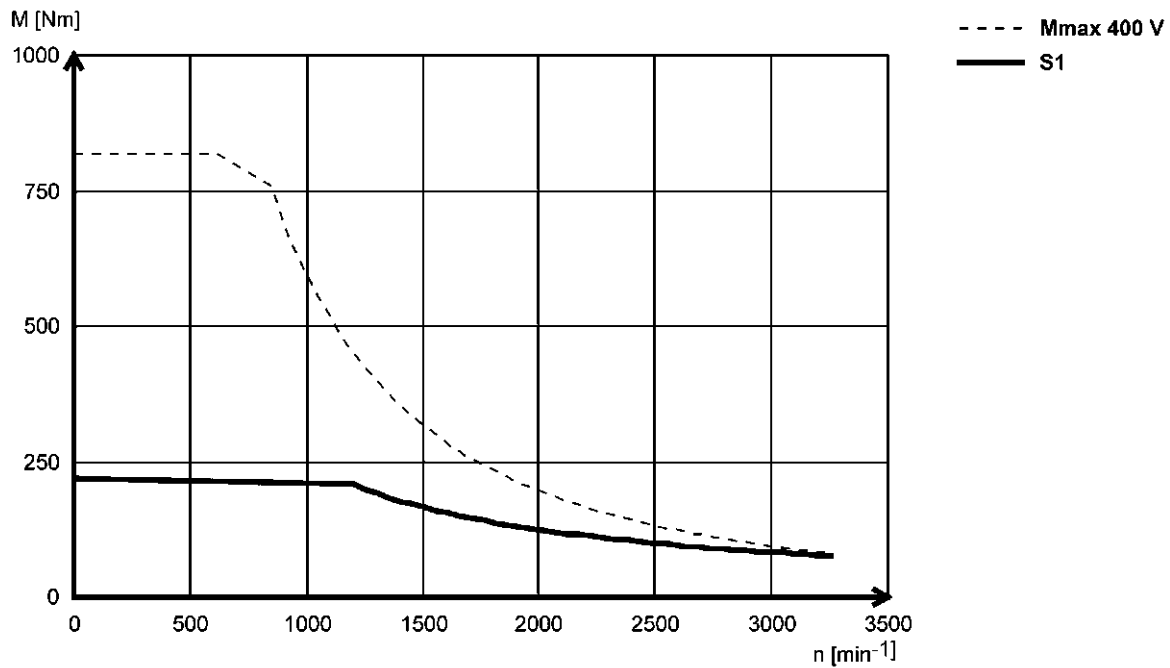


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

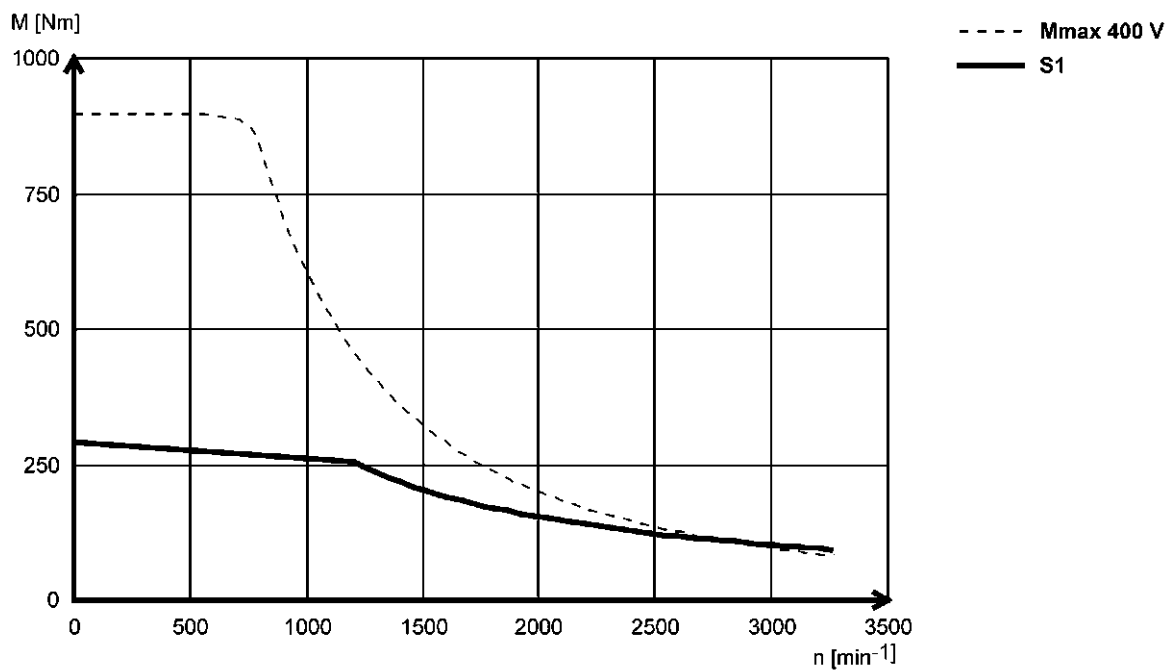


Mains connection 3x 400 V

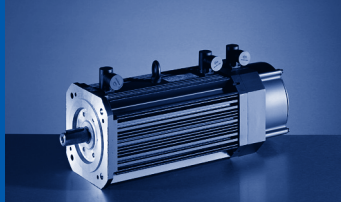
MCA26T12...5F□□



MCA26T12...2F□□



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

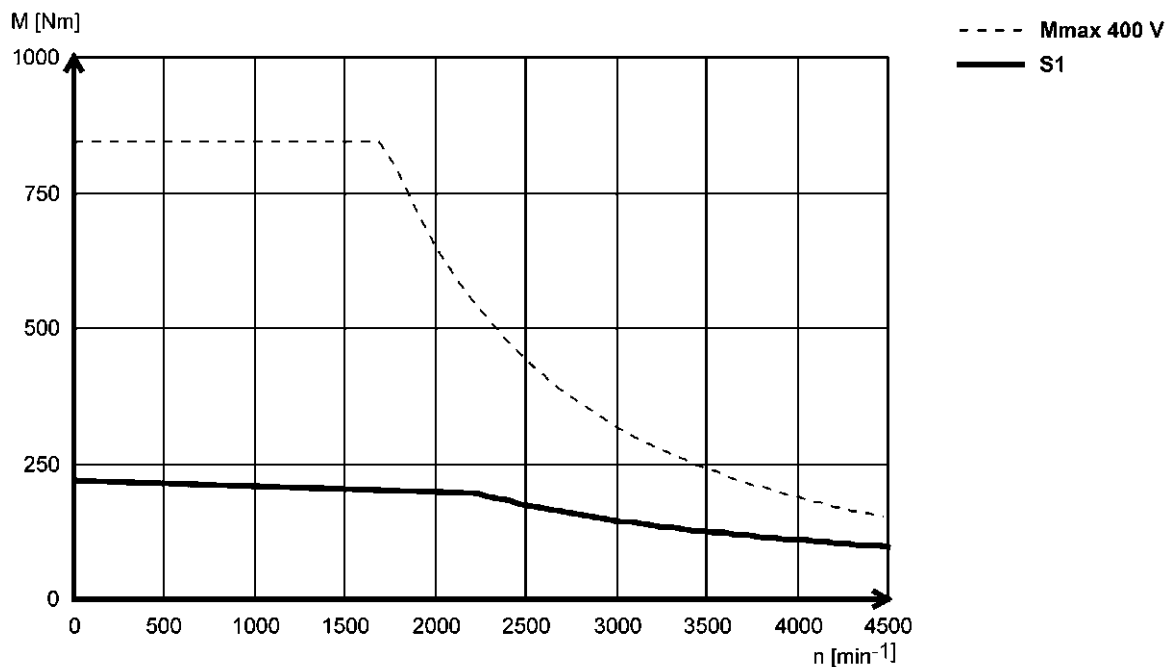


MCA asynchronous servo motors

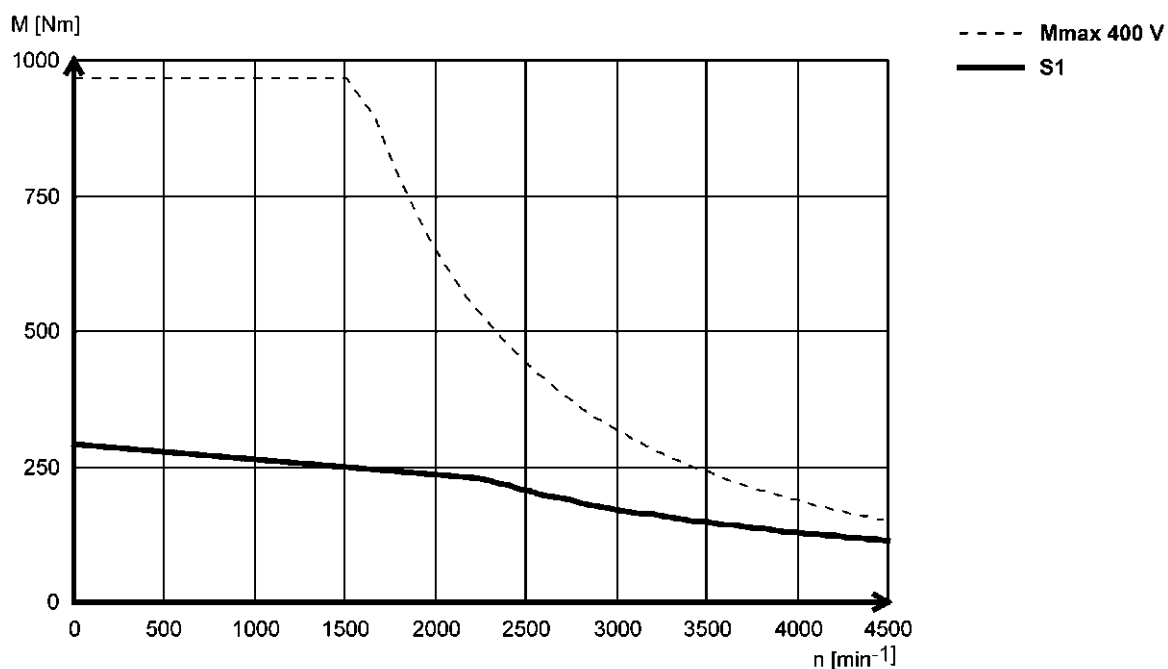
Torque characteristics

Mains connection 3x 400 V

MCA26T22...5F□□



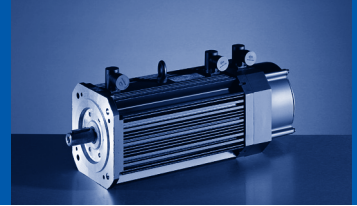
MCA26T22...2F□□

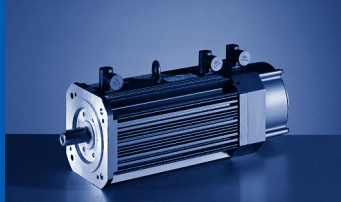


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

MCA asynchronous servo motors

Torque characteristics





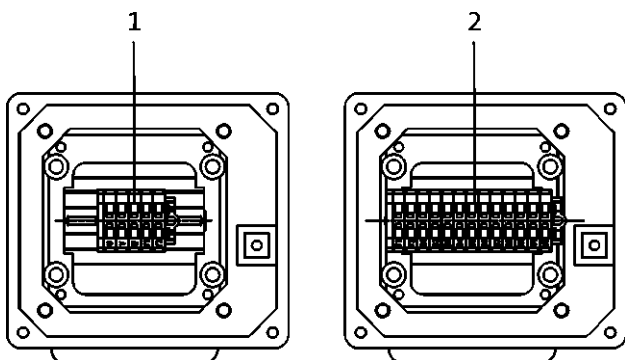
MCA asynchronous servo motors

Accessories

Terminal box for motor connection

If a servo motor is to be connected to an existing cable or plug connectors are not to be used for other reasons, the connection can also be made via a terminal box.

The motor can either be fitted with a terminal box for the power connection and motor holding brake or a second terminal box provided to connect the motor feedback and fan (if applicable).

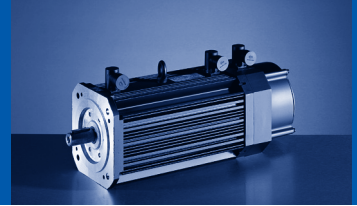


1: Power connection + brake connection + PE connection.

2: Angle/speed sensor connection + thermal sensor connection



MCA asynchronous servo motors with blower and terminal box



Holding brakes

The MCA10...19 and 21 asynchronous servo motors can be equipped with integral permanent magnet holding brakes. The brake voltage available for this model is 24 V DC or 205 V DC.

Spring-applied holding brakes with voltages of 24 V DC or 230 V AC are available for MCA20, 22 and 26.

The brakes are active once the supply voltage is switched off (closed-circuit principle).

On travel axes compliance with the permissible mass inertia ratio J_L / J_{MB} ensures that the permissible maximum switching energy of the brake is not exceeded and up to 2000 emergency stop functions can be executed from a speed of 3000 rpm.

In lifting axes the load torque resulting from the force due to weight additionally acts. The information relating to J_L / J_{MB} does not apply in this event.

Caution:

The brakes used are not safety brakes in the sense that a reduction in torque may arise as a result of disruptive factors that cannot be influenced, e.g. oil ingress.

The ohmic voltage drop along the cable must be taken into consideration in long motor supply cables and must be compensated for by a higher voltage at the line input.

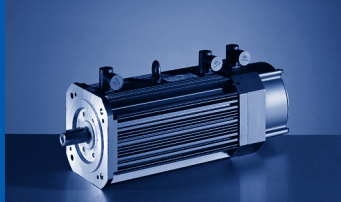
The following applies for Lenze system cables:

$$U[V] = U_B[V] + 0.08 \frac{[V]}{[A] \cdot [m]} \cdot l_g[m] \cdot I_B[A]$$

If no suitable voltage (incorrect value, incorrect polarity) is applied to the brake, the brake will be applied and can be overheated and destroyed by the motor continuing to rotate. The shortest switching times of the brakes are achieved by DC switching of the voltage. A spark suppressor is required to suppress interference and to increase the service life of the relay contacts here.



Permanent magnet holding brake



MCA asynchronous servo motors

Accessories

Holding brake data

- The ratings apply only for servo motors and for geared servo motors if the servo motor is mounted by way of a mounting flange.

B5 / B14 design servo motors GPA servo geared motors

		$U_{N,DC}^{3,4)}$	$U_{N,AC}^{5)}$	M_N	M_N	M_{av}	$I_N^{2)}$	J	$t_1^{1)}$	$t_2^{1)}$	$Q_E^{6)}$	m	J_{MB}	J_L / J_{MB}
				20 °C	120 °C	120 °C								
		[V]	[V]	[Nm]	[Nm]	[Nm]	[A]	[kgcm ²]	[ms]	[ms]	[J]	[kg]	[kgcm ²]	
MCA10	P1 P5	24	230	3.30	2.50	1.20	0.50	0.38	10.0	20.0	350	0.90	2.78	24.5
		205					0.060							
MCA13		24		12.0	11.0	5.50	0.67	1.06	20.0	29.0	400	0.80	9.36	7.70
		205					0.080							
MCA14		24		15.0	12.0	6.00	0.75	3.60	13.0	30.0	700	1.50	22.8	5.20
		205					0.090							
MCA17		24		24.0	22.0	11.0	0.75	9.50	25.0	50.0	1200	2.70	39.6	5.10
		205					0.090							
MCA19		24		46.0	40.0	18.0	1.00	9.50	25.0	73.0	1900	2.70	81.5	3.70
		205					0.12							
MCA20	F1 FG	24	230	90.0	80.0	50.0	3.13	6.88	260	220	18000	13.0	177	19.6
							0.37							
MCA21	P1 P5	24	230	88.0	35.0		1.46	31.8	53.0	97.0	2800	5.00	212	1.70
		205					0.18							
MCA22	F1 FG	24	230	150	130	80.0	3.75	18.1	50.0	260	23000	20.5	505	8.20
							0.44		400					
MCA26		24		300	260	160	3.75	70.4	50.0	310	39000	26.0	1405	12.7
			230			200	0.37		600	360	51000	30.7		

Holding brake data, reinforced design

		$U_{N,DC}^{3,4)}$	$U_{N,AC}^{5)}$	M_N	M_N	M_{av}	$I_N^{2)}$	J	$t_1^{1)}$	$t_2^{1)}$	$Q_E^{6)}$	m	J_{MB}	J_L / J_{MB}
				20 °C	120 °C	120 °C								
		[V]	[V]	[Nm]	[Nm]	[Nm]	[A]	[kgcm ²]	[ms]	[ms]	[J]	[kg]	[kgcm ²]	
MCA20	F2 FH	24	230	150	130	100	2.58	14.1	25.0	240	31000	15.4	189	33.0
							0.30		260					
MCA22		24	230	300	260	160	3.75	36.3	50.0	310	39000	26.0	523	14.1
							0.44		400					
MCA26		24	230	500	430	260	3.75	70.4	60.0	390	51000	30.8	1405	12.7
							0.44		600					

¹⁾ Engagement and disengagement times valid for rated voltage (±0%) and protective circuit for brakes with varistor for DC-controlled switching. The times may increase without a protective circuit.

²⁾ The currents are maximum values for a cold brake (data for sizing the power supply). The values for a motor at operating temperature are considerably lower.

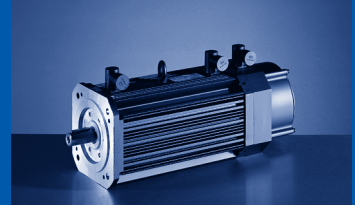
³⁾ With 24 V DC brake: smoothed DC voltage, ripple ≤ 1 %.

With 205 V DC brake: connection to 230 V AC through rectifier.

⁴⁾ UR not possible in the case of a brake with 205 V supply voltage.

⁵⁾ UR not possible in the case of a brake with 230 V supply voltage.

⁶⁾ Maximum switching energy per emergency stop with $n = 3000 \text{ min}^{-1}$.



Holding brake data

- These ratings apply only for geared servo motors with integrated servo motor (without mounting flange).

GST, GFL, GKR, GKS, GSS geared servo motors

		U _{N,DC} ^{3,4)}	M _N	M _N	M _{av}	I _N ²⁾	J	t ₁ ¹⁾	t ₂ ¹⁾	Q _E ⁵⁾	m	J _{MB}	J _L / J _{MB}
			20 °C	120 °C	120 °C								
		[V]	[Nm]	[Nm]	[Nm]	[A]	[kgcm ²]	[ms]	[ms]	[J]	[kg]	[kgcm ²]	
MCA10	P1 P5	24	6.00	5.00	2.50	0.67	1.06	20.0	29.0	400	0.80	3.46	22.4
		205				0.80							
MCA13		24	15.0	12.0	6.00	0.75	3.60	13.0	30.0	700	1.50	11.9	8.40
		205				0.090							
MCA14		24	23.0	20.0	20.0	0.92	9.50	18.0	55.0	1350	2.40	22.8	6.60
		205				0.12							
MCA17		24				0.92						45.5	5.00
		205				0.12							
MCA19		24	48.0	40.0		1.46	31.8	30.0	100	2800	4.80	104	4.50
		205				0.18							
MCA21		24	88.0	80.0	35.0	1.46		53.0	97.0		5.00	212	1.70
		205				0.18							

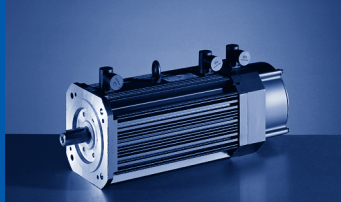
¹⁾ Engagement and disengagement times valid for rated voltage (±0%) and protective circuit for brakes with varistor for DC-controlled switching. The times may increase without a protective circuit.

²⁾ The currents are maximum values for a cold brake (data for sizing the power supply). The values for a motor at operating temperature are considerably lower.

³⁾ With 24 V DC brake: smoothed DC voltage, ripple ≤ 1 %.
With 205 V DC brake: connection to 230 V AC through rectifier.

⁴⁾ UR not possible in the case of a brake with 205 V supply voltage.

⁵⁾ Maximum switching energy per emergency stop with $n = 3000 \text{ min}^{-1}$.



MCA asynchronous servo motors

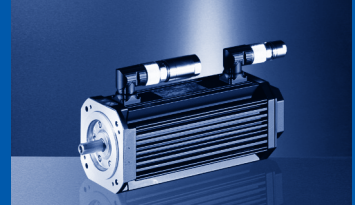
Accessories

Blower data 50 Hz

		Enclosure	Number of phases						
				$U_{\min}$	$U_{\max}$	$U_{N,AC}$	P_N	I_N	
				[V]	[V]	[V]	[kW]	[A]	
MCA13	F10	IP54	1	210	240	230	0.019	0.12	
MCA14							0.046	0.32	
MCA17									
MCA19									
MCA20	F10 F1F	IP23s			250		0.17	0.73	
MCA21	F10	IP54			240		0.060	0.26	
MCA22	F10	IP23s			250		0.24	1.05	
MCA26	F1F	IP54					0.40	1.75	

Blower data 60 Hz

		Enclosure	Number of phases						
				$U_{\min}$	$U_{\max}$	$U_{N,AC}$	P_N	I_N	
				[V]	[V]	[V]	[kW]	[A]	
MCA13	F10	IP54	1	210	240	230	0.019	0.12	
MCA14							0.046	0.32	
MCA17									
MCA19									
MCA20	F10 F1F	IP23s			250		0.20	0.90	
MCA21	F10	IP54			240		0.060	0.26	
MCA22	F10	IP23s			250		0.28	1.23	
MCA26	F1F	IP54					0.41	1.82	



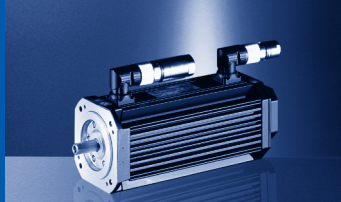
Tailored to meet the requirements of the various applications and necessary accuracies, the following feedback systems are available.

Resolver

Stator-fed resolver with two 90° stator windings and one rotor winding with transformer winding.

Speed / angle sensor	1)			RS0
Resolution				
Angle			[°]	0.80
Accuracy			[°]	-10 ... 10
Absolute positioning				1 revolution
Max. speed	$n_{\max}$		[min ⁻¹]	8000
Max. input voltage DC	$U_{\max}$		[V]	10.0
Max. input frequency	$f_{\max, 1}$		[kHz]	4.00
Ratio Stator / rotor		± 5 %		0.30
Rotor impedance	Z_{ro}		[Ω]	51 + j90
Stator impedance	Z_{so}		[Ω]	102 + j150
Impedance	Z_{rs}		[Ω]	44 + j76
Min. insulation resistance At DC 500 V	R		[MΩ]	10.0
Number of pole pairs				1
Max. angle error			[°]	-10 ... 10
Version Inverter assignment				E94A ECS EVS93

1) → 16 - Product key > speed/angle sensor



MCA asynchronous servo motors

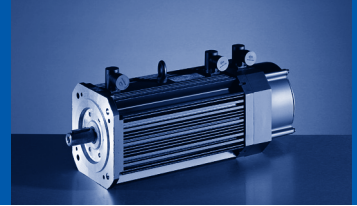
Accessories

Incremental and SinCos absolute value encoder

Encoder type			TTL incremental			SinCos incremental	SinCos absolute value				
Speed / angle sensor	1)		T20	T40	D20	S20	EQI	SRS	SRM	ECN	EQN
			IG2048-5V-T	IG4096-5V-T	IK2048-5V-T	IG2048-5V-S	AM32-5V-E	AS1024-8V-H	AM1024-8V-H	AS2048-5V-E	AM2048-5V-E
Encoder type			Single turn				Multi-turn	Single turn	Multi-turn	Single turn	Multi-turn
Pulses			2048	4096	2048		32	1024		2048	
Output signals			TTL 5 V			1 Vss					
Interfaces							EnDat	Hiperface		EnDat	
Absolute revolution			0				4096	1	4096	1	4096
Resolution											
Angle 2)		[°]	2.60			0.40					
Accuracy		[°]	-2 ... 2			-0.8 ... 0.8	-5 ... 5	-0.8 ... 0.8		-0.6 ... 0.6	
Min. input voltage DC	U _{min,1}	[V]	4.75		4.50		4.75	7.00		4.75	
Max. input voltage DC	U _{max}	[V]	5.25		5.50		5.25	12.0		5.25	
Max. speed	n _{max}	[min ⁻¹]	8789			5273	12000	6000		12000	
Max. current consumption	I _{max}	[mA]	150		50.0	100	170	80.0		150	250
Limit frequency	f _{max}	[kHz]	300			180	6.00	200			
Version											
Inverter assignment			E94A ECS EVS93				E94A	E94A ECS EVS93		E94A	

1) → 16 - Product key > speed/angle sensor

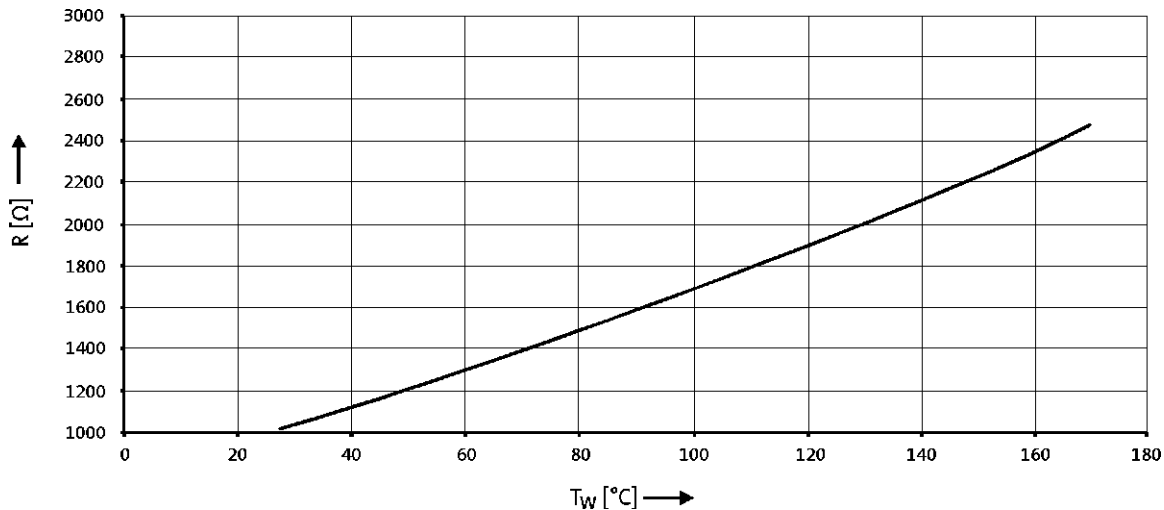
2) Dependent on inverter.



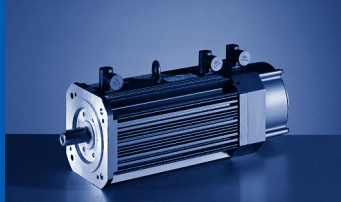
Temperature sensor

The thermal sensors (1x KTY 83-110) continuously monitor the motor temperature. The temperature signal is transmitted over the system cable of the feedback system to the servo controller.

This means that the temperature of the motor is determined with great accuracy in the permitted operating range and at the same time the overtemperature response configured in the controller is executed in the event of overtemperature in one of the winding phases.



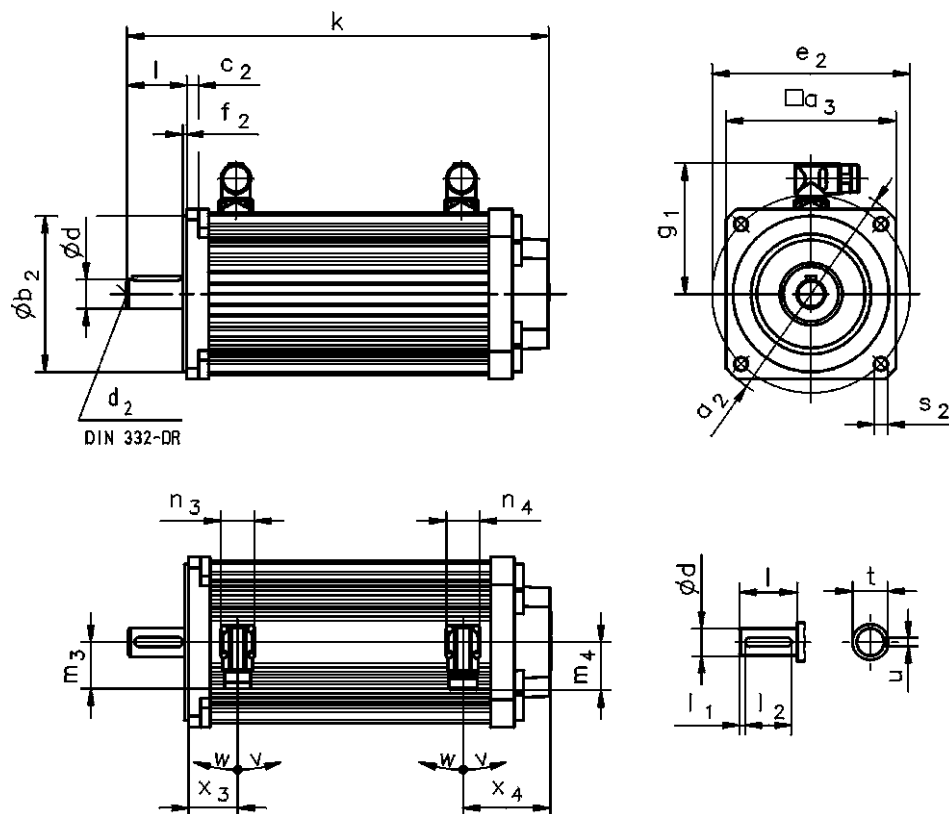
- If the detector is supplied with a measured current of 1 mA, the above relationship between the temperature and the resistance applies.



MCA asynchronous servo motors

Dimensions [mm]

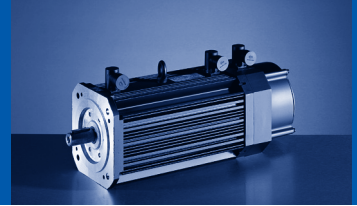
Motors without blower



			MCA10I40	MCA13I41	MCA14L20	MCA17N23	MCA19S23	MCA21X25
					MCA14L41	MCA17N41	MCA19S42	MCA21X42
RSO B0	k	[mm]	292	311	352	390	461	550
	x ₃	[mm]	37	45	41	43	56	62
	x ₄	[mm]	61	65	73			78
RSO P?	k	[mm]	317	346	385	425	499	592
	x ₃	[mm]	59	72	68	75	91	102
	x ₄	[mm]	61	65	73			78
S?? / E?? / T20 / CDD B0	k	[mm]	346	365	407	444	511	599
	x ₃	[mm]	37	45	41	43	56	62
	x ₄	[mm]	115	119	128	127	123	127
S?? / E?? / T20 / CDD P?	k	[mm]	371	400	440	479	549	641
	x ₃	[mm]	59	72	68	75	91	102
	x ₄	[mm]	115	119	128	127	123	127

MCA asynchronous servo motors

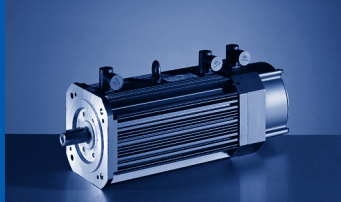
Dimensions [mm]



	g₁	n₃	n₄	m₃	m₄	v	w
	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[°]
MCA10I40	90	28	28	40	40	195	80
MCA13I41	102						
MCA14L20	109						
MCA14L41							
MCA17N23	118						
MCA17N41							
MCA19S23	151	40	71	71	71		
MCA19S42							
MCA21X25	162						
MCA21X42							

	d	d₂	l	l₁	l₂	u	t
	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA10	14	M5	30	2.5	25	5.0	16
MCA13	19	M6	40	2.0	36	6.0	22
MCA14	24	M8	50	5.0	40	8.0	27
MCA17					50		
MCA19	28	M10	60		70	10.0	41
MCA21	38	M12	80		70		

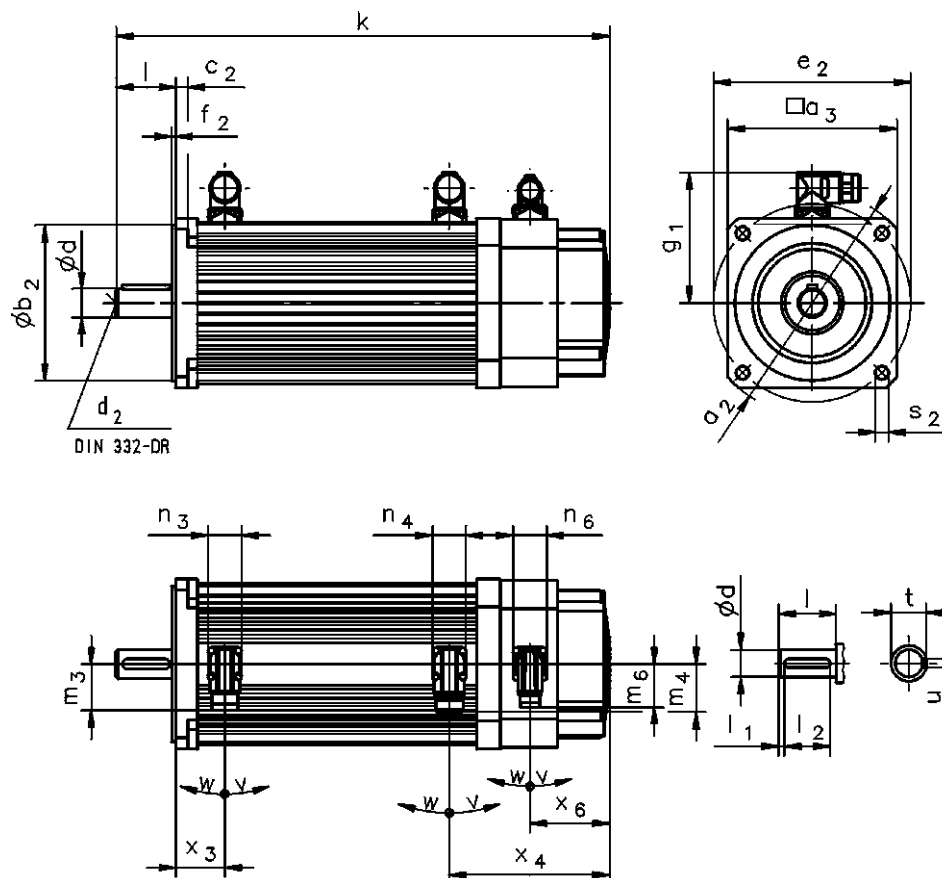
		a₂	a₃	b₂	c₂	e₂	f₂	s₂
				j6				
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA10	FF100	120	102	80	8	100	3.0	7
	FT85			70		85	2.5	M6
MCA13	FF130	160	130	110	9	130	3.5	9.0
	FT130							M8
MCA14	FF165	188	142	130	10	165		11.0
	FT130			110		130		M8
MCA17	FF165	200	165	130	12	165		11.0
	FT130			110		130		M8
MCA19	FF215	250	192	180	11	215	4.0	13.0
	FT130			110		130	3.5	M8
MCA21	FF215	300	214	180	12	215	4.0	13.0
	FF265		250	230		265		
	FT130		214	110	11	130	3.5	M8



MCA asynchronous servo motors

Dimensions [mm]

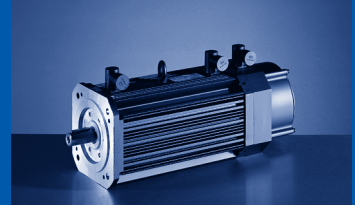
Motors with blower, MCA13...19/21



			MCA13I34	MCA14L16	MCA17N17	MCA19S17	MCA21X17
				MCA14L35	MCA17N35	MCA19S35	MCA21X35
RSO B0	k	[mm]	379	414	476	558	646
	x ₃	[mm]	45	41	43	56	62
	x ₄	[mm]	133	135	159	170	174
RSO P?	k	[mm]	414	447	511	596	688
	x ₃	[mm]	72	68	75	91	102
	x ₄	[mm]	133	135	159	170	174
S?? / E?? / T20 / CDD B0	k	[mm]	433	469	530	608	695
	x ₃	[mm]	45	41	43	56	62
	x ₄	[mm]	187	190	213	220	223
S?? / E?? / T20 / CDD P?	k	[mm]	468	502	565	646	737
	x ₃	[mm]	72	68	75	91	102
	x ₄	[mm]	187	190	213	220	223
	x ₆	[mm]	73	67	94	103	96

MCA asynchronous servo motors

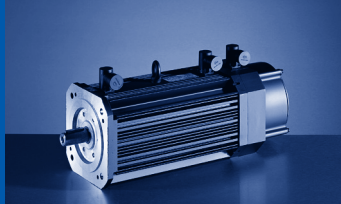
Dimensions [mm]



	g₁	n₃	n₄	n₆	m₃	m₄	m₆	v	w
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[°]
MCA13I34	102	28	28	28	40	40	37	195	80
MCA14L16	109								
MCA14L35									
MCA17N17									
MCA17N35	118								
MCA19S17	151	40			71				
MCA19S35									
MCA21X17	162								
MCA21X35									

	d	d ₂	l	l ₁	l ₂	u	t
	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA13	19	M6	40	2.0	36	6.0	22
MCA14	24	M8	50	5.0	40	8.0	27
MCA17							
MCA19					28	M10	60
MCA21	38	M12	80			70	10.0

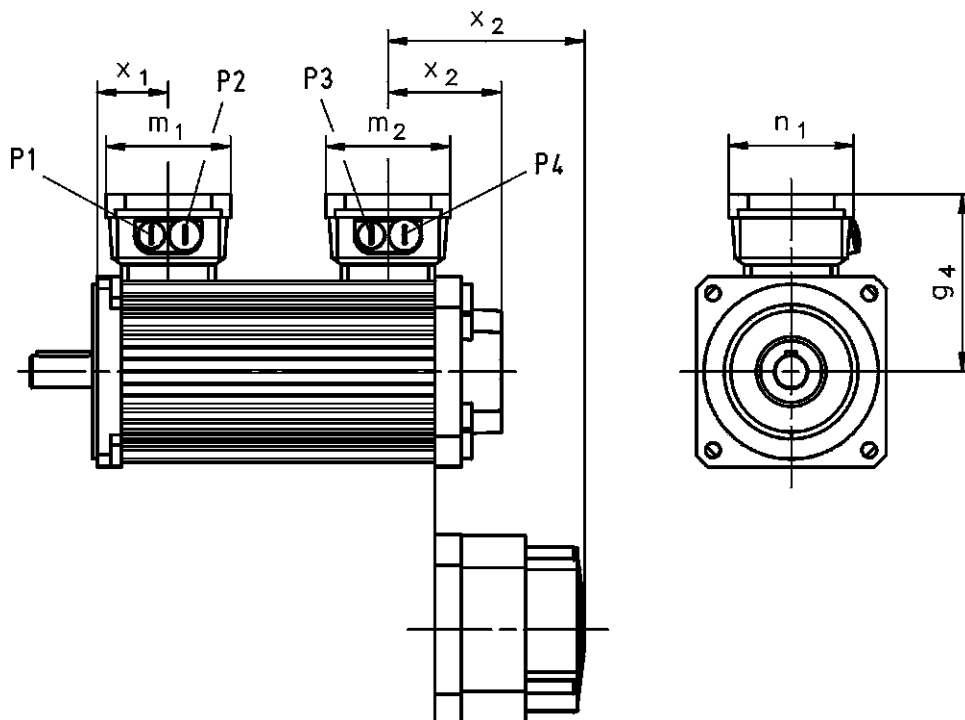
		a_2	a_3	b_2	c_2	e_2	f_2	s_2
				j6				
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA13	FF130	160	130	110	9	130	3.5	9.0
	FT130							M8
MCA14	FF165	188	142	130	10	165		11.0
	FT130			110		130		M8
MCA17	FF165	200	165	130	12	165		11.0
	FT130			110		130		M8
MCA19	FF215	250	192	180	11	215	4.0	13.0
	FT130			110		130	3.5	M8
MCA21	FF215	300	214	180	12	215	4.0	13.0
	FF265		250	230		265		
	FT130		214	110		130	3.5	M8



MCA asynchronous servo motors

Dimensions [mm]

Motors with terminal box, MCA10...19/21



			MCA10I40	MCA13I41	MCA14L20	MCA17N23	MCA19S23	MCA21X25
					MCA14L41	MCA17N41	MCA19S42	MCA21X42
RSO B0	x ₂	[mm]	78	77	85		87 ²⁾ 93 ¹⁾	91 ²⁾ 97 ¹⁾
RSO P?	x ₂	[mm]	78	77	85		87 ²⁾ 93 ¹⁾	91 ²⁾ 97 ¹⁾
S?? / E?? / T20 / CDD B0	x ₂	[mm]	132	131	140	139	137 ²⁾ 143 ¹⁾	141 ²⁾ 147 ¹⁾
S?? / E?? / T20 / CDD P?	x ₂	[mm]	132	131	140	139	137 ²⁾ 143 ¹⁾	141 ²⁾ 147 ¹⁾

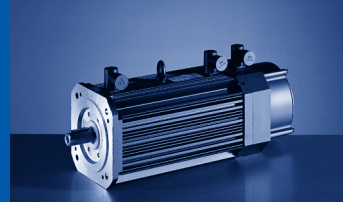
			MCA13I34	MCA14L16	MCA17N17	MCA19S17	MCA21X17
				MCA14L35	MCA17N35	MCA19S35	MCA21X35
RSO B0	x ₂	[mm]	145	147	171	190	193
RSO P?	x ₂	[mm]	145	147	171	190	193
S?? / E?? / T20 / CDD B0	x ₂	[mm]	199	202	225	240	243
S?? / E?? / T20 / CDD P?	x ₂	[mm]	199	202	225	240	243

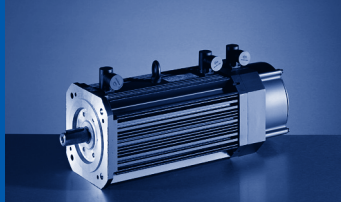
	g ₄	m ₁	m ₂	n ₁	x ₁	P ₁	P ₂	P ₃	P ₄
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA10	113	93	93	93	54	M16x1.5	M20x1.5	M16x1.5	M20x1.5
MCA13	125				57				
MCA14	132				53				
MCA17	140				55				
MCA19	158	120	93 ¹⁾ 120 ²⁾	93 ¹⁾ 109 ²⁾	73	M25x1.5	M32x1.5		
MCA21	169				84				

¹⁾ IP54
²⁾ IP65

MCA asynchronous servo motors

Dimensions [mm]

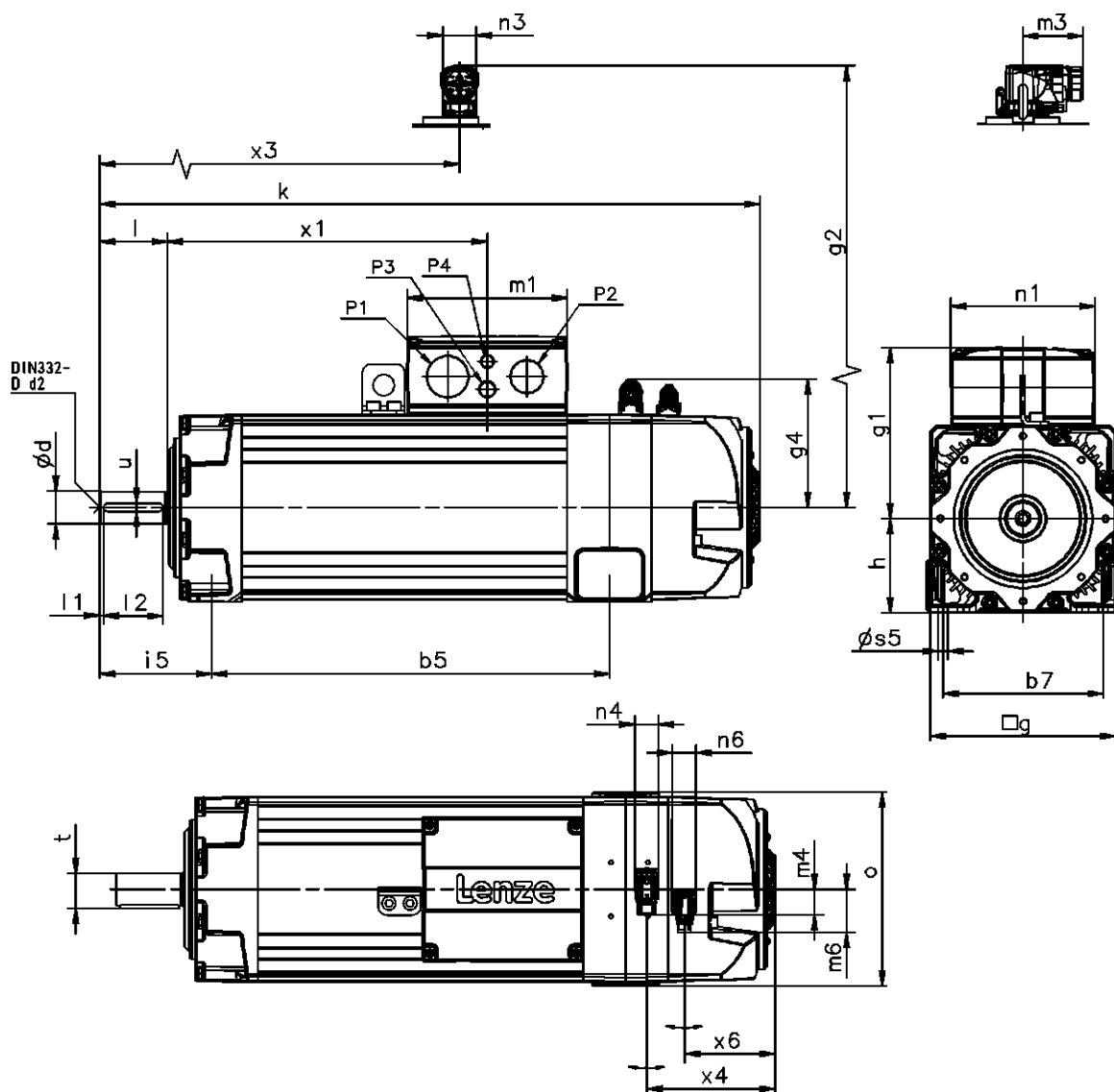




MCA asynchronous servo motors

Dimensions [mm]

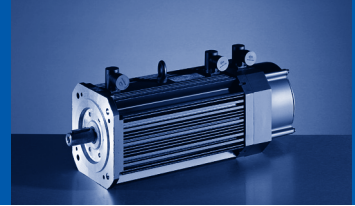
Motors with blower, MCA20/22/26, B3



			MCA20	MCA22	MCA26
RS0 / E?? / T?? / S?? / D20 B0...F10	k	[mm]	666	783	970
RS0 / E?? / T?? / S?? / D20 B0...F1F	k	[mm]	753	873	1021
RS0 / E?? / T?? / S?? / D20 B0	x_4	[mm]	145	155	197
	m_4	[mm]	24.0	30.0	24.0
RS0 F1...F10	k	[mm]	753	878	1125
RS0 F1...F1F	k	[mm]	878	968	1176
RS0 F1	x_4	[mm]	151	159	201
	m_4	[mm]	30.0		24.0
E?? / T?? / S?? / D20 F1...F10	k	[mm]	792	911	1163
E?? / T?? / S?? / D20 F1...F1F	k	[mm]	911	1001	1214
E?? / T?? / S?? / D20 F1	x_4	[mm]	141	159	200
	m_4	[mm]	30.0		24.0
RS0 / E?? / T?? / S?? / D20 F2...F10	k	[mm]	818	943	1163
RS0 / E?? / T?? / S?? / D20 F2...F1F	k	[mm]	943	1033	1214
RS0 / E?? / T?? / S?? / D20 F2	x_4	[mm]	141	159	200
	m_4	[mm]	30.0		24.0

MCA asynchronous servo motors

Dimensions [mm]

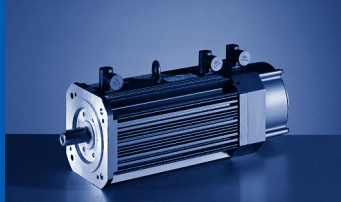


	g	g ₁	g ₂	g ₄	m ₁	m ₃	m ₆	n ₁	n ₃	n ₄	n ₆
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA20	200	170	167	141	154	71	51	128	40	28	28
MCA22	220	203		153	190		52	171			
MCA26	260	256		173	238		51	212			

	o	P ₁	P ₂	P ₃	P ₄	x ₁	x ₃	x ₆
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA20	206	M32x1.5	M25x1.5	M20x1.5	M16x1.5	155	347	101
MCA22	230	M50x1.5	M40x1.5			380		108
MCA26	269	M63x1.5	M50x1.5			465		152

	d	d	d ₂	l	l ₁	l ₂	u	t
	k6	m6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA20	38		M12	80	5.0	70	10.0	41
MCA22								
MCA26		55	M14	110		100	16.0	59

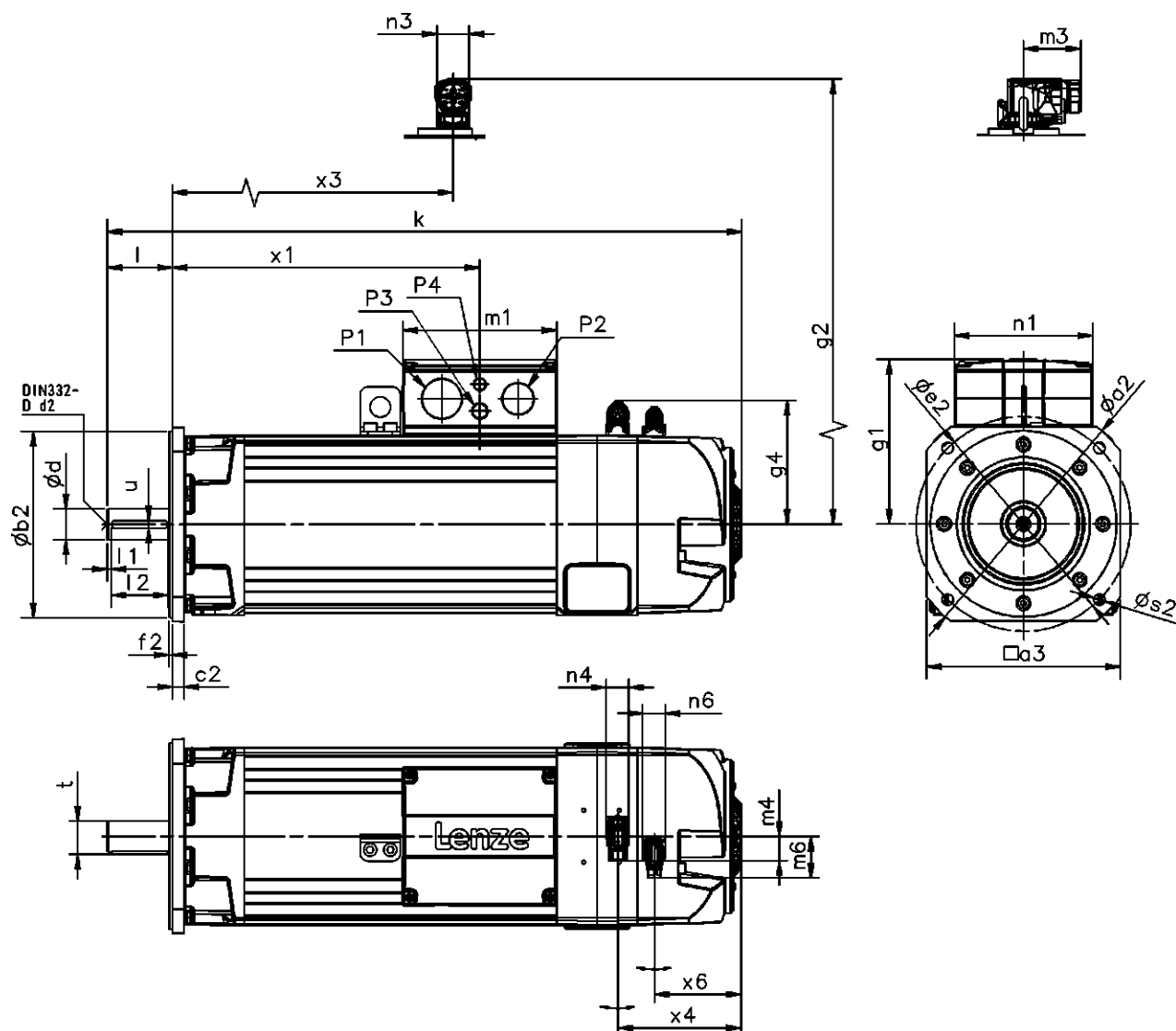
	h	b ₅	b ₇	s ₅	i ₅
	[mm]	[mm]	[mm]	[mm]	[mm]
MCA20	100	366	160	11.5	134
MCA22	112	472	190		133
MCA26	132	581	215	14.0	165



MCA asynchronous servo motors

Dimensions [mm]

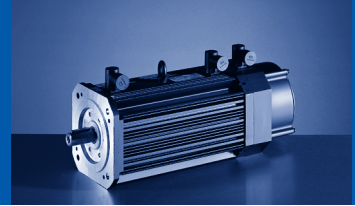
Motors with blower, MCA20/22/26, B5



			MCA20	MCA22	MCA26
RS0 / E?? / T?? / S?? / D20 B0...F10	k	[mm]	666	783	970
RS0 / E?? / T?? / S?? / D20 B0...F1F	k	[mm]	753	873	1021
RS0 / E?? / T?? / S?? / D20 B0	x4	[mm]	145	155	197
	m4	[mm]	24.0	30.0	24.0
RS0 F1...F10	k	[mm]	753	878	1125
RS0 F1...F1F	k	[mm]	878	968	1176
RS0 F1	x4	[mm]	151	159	201
	m4	[mm]	30.0		24.0
E?? / T?? / S?? / D20 F1...F10	k	[mm]	792	911	1163
E?? / T?? / S?? / D20 F1...F1F	k	[mm]	911	1001	1214
E?? / T?? / S?? / D20 F1	x4	[mm]	141	159	200
	m4	[mm]	30.0		24.0
RS0 / E?? / T?? / S?? / D20 F2...F10	k	[mm]	818	943	1163
RS0 / E?? / T?? / S?? / D20 F2...F1F	k	[mm]	943	1033	1214
RS0 / E?? / T?? / S?? / D20 F2	x4	[mm]	141	159	200
	m4	[mm]	30.0		24.0

MCA asynchronous servo motors

Dimensions [mm]

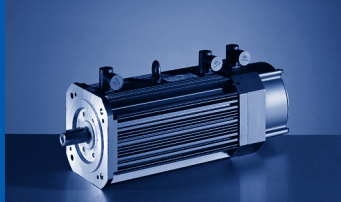


	g	g ₁	g ₂	g ₄	m ₁	m ₃	m ₆	n ₁	n ₃	n ₄	n ₆
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA20	200	170	167	141	154	71	51	128	40	28	28
MCA22	220	203		153	190		52	171			
MCA26	260	256		173	238		51	212			

	o	P ₁	P ₂	P ₃	P ₄	x ₁	x ₃	x ₆
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA20	206	M32x1.5	M25x1.5	M20x1.5	M16x1.5	155	347	101
MCA22	230	M50x1.5	M40x1.5			380		108
MCA26	269	M63x1.5	M50x1.5			465		152

	d	d	d ₂	l	l ₁	l ₂	u	t
	k6	m6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA20	38		M12	80	5.0	70	10.0	41
MCA22			M14	110		100	16.0	59
MCA26		55						

			MCA20		MCA22	MCA26	
			FF215		FF265		FF350
a ₂		[mm]	250		300		400
a ₃		[mm]	196		240		320
b ₂	j6	[mm]	180		230		
b ₂	h6	[mm]					300
c ₂		[mm]			15		
e ₂		[mm]	215		265		350
f ₂		[mm]			4.0		
s ₂		[mm]			14		

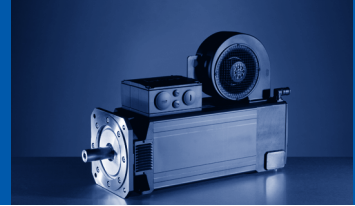


MCA asynchronous servo motors

Dimensions [mm]

MQA asynchronous servo motors

Rated data



Mains connection 3x 400 V

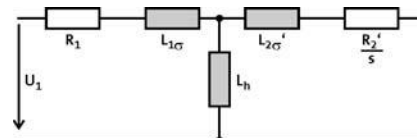
	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	$U_{N,AC}$	f_N	$\cos \varphi$	$J^{1)}$	η
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[V]	[Hz]		[kgcm ²]	[%]
MQA20L14...2F□□	1420	76.0	250	71.3	10.6	27.0	26.5	360	50	0.84	171	80
MQA20L29...2F□□	2930	76.0	250	66.2	20.3	54.0	46.9	360	100	0.80	171	90
MQA22P08...2F□□	760	156	500	145	11.5	29.5	27.6	360	28	0.86	487	77
MQA22P14...2F□□	1425	156	500	135	20.1	51.0	45.6	360	50	0.82	487	86
MQA22P17...2F□□	1670	156	500	130	22.7	59.0	50.3	360	58	0.83	487	88
MQA22P29...2F□□	2935	156	500	125	38.4	102	86.0	360	100	0.79	487	90
MQA26T05...2F□□	550	325	1100	296	17.0	48.5	44.5	360	20	0.78	1335	81
MQA26T10...2F□□	1030	325	1100	288	31.1	85.5	76.2	360	36	0.77	1335	87
MQA26T12...2F□□	1200	325	1100	282	35.4	109	88.8	360	42	0.78	1335	82
MQA26T22...2F□□	2235	325	1100	257	60.2	171	138	340	76	0.80	1335	92

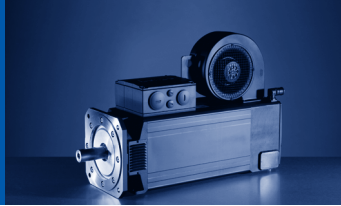
	R_1	$R_{UV\ 20\ ^\circ C}$	$R_{UV\ 150\ ^\circ C}$	R_2	$L_{1\sigma}$	L	$L_{2\sigma}$	$n_{max}^{2)}$	$m^{1)}$
	[Ω]	[Ω]	[Ω]	[Ω]	[mH]	[mH]	[mH]	[min ⁻¹]	[kg]
MQA20L14...2F□□	0.37	0.73	1.10	0.57	1.98	52.5	2.10	5000	63.0
MQA20L29...2F□□	0.091	0.18	0.28	0.14	0.49	13.0	0.52		
MQA22P08...2F□□	0.54	1.07	1.62	0.75	3.52	83.0	4.76		
MQA22P14...2F□□		0.36	0.54		3.57	86.9	4.81		
MQA22P17...2F□□	0.13	0.27	0.40	0.19	0.90	21.7	1.21		
MQA22P29...2F□□		0.080	0.12		0.89	21.5	1.20		
MQA26T05...2F□□	0.44	0.59	0.89	0.39	2.57	54.0	4.78	4500	193
MQA26T10...2F□□		0.20	0.30		2.33	57.4	4.91		
MQA26T12...2F□□	0.11	0.15	0.23	0.098	0.63	12.6	1.18		
MQA26T22...2F□□		0.050	0.075		0.73	17.8	1.34		

¹⁾ No brake.

²⁾ Mechanically permissible maximum speed.

The figures in columns R_1 , $L_{1\sigma}$, L_h , R_2' and $L_{2\sigma}'$ refer to a single-phase equivalent circuit diagram at 20 °C (V-circuit).

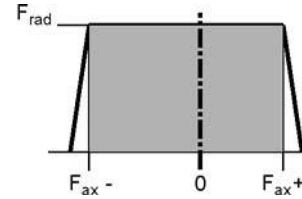
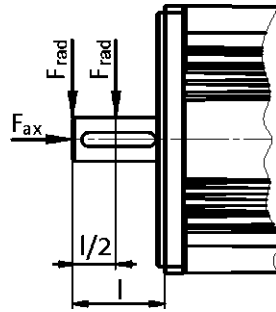




MQA asynchronous servo motors

Rated data

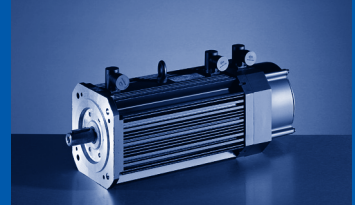
Permissible radial and axial forces



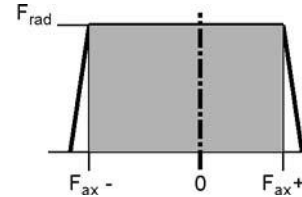
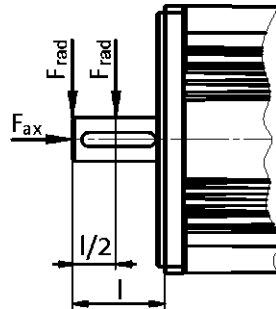
Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
Max. radial force, Lever arm $l/2$					Min. axial force, Lever arm $l/2$					Max. axial force, Lever arm $l/2$					
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MQA20	3740	2980	2370	2080	1760	-1250	-970	-760	-670	-570	610	330	120	30	-70
MQA22	3930	3140	2510	2210	1880	-2250	-1680	-1260	-1060	-860	1610	1040	610	420	220
MQA26	7500	5990	4780	4200	3570	-2580	-2300	-1420	-1200	-960	1650	990	490	270	30

Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
Max. radial force, Lever arm l					Min. axial force, Lever arm l					Max. axial force, Lever arm l					
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MQA20	3420	2720	2170	1900	1610	-1090	-860	-680	-600	-520	450	210	40	-40	-130
MQA22	3660	2920	2340	2050	1750	-2110	-1580	-1180	-1000	-810	1470	930	540	350	170
MQA26	6920	5520	4410	3880	3290	2300	-1700	-1270	-1060	-860	1370	780	340	140	-70

- The values for the bearing service life L_{10} relate to a mean speed of 3000 rpm and are additionally restricted by the grease lifetime depending on the ambient temperatures.



Permissible radial and axial forces

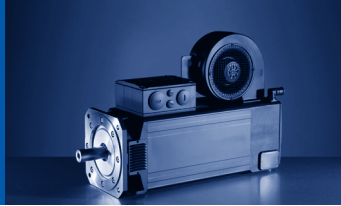


Reinforced bearings

Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
	Max. radial force, Lever arm $l/2$ (reinforced bearings)					Min. axial force, Lever arm $l/2$ (reinforced bearings)					Max. axial force, Lever arm $l/2$ (reinforced bearings)				
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MQA20	7120	5660	4500	3940	3330	940	-740	-600	-530	-460	300	100	-50	-110	-180
MQA22	7440	5930	4730	4140	3510	-1990	-1480	-1110	-940	-760	1340	840	470	300	120
MQA26	10510	8370	6670	5840	4950	2130	-1580	-1180	-990	-800	1200	650	250	60	-130

Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
	Max. radial force, Lever arm l (reinforced bearings)					Min. axial force, Lever arm l (reinforced bearings)					Max. axial force, Lever arm l (reinforced bearings)				
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MQA20	6510	5180	4120	3600	3050	680	-550	-450	-410	-360	40	-90	-190	-230	-280
MQA22	6930	5520	4400	3850	3260	-1730	-1300	-970	-820	-670	1090	650	330	180	30
MQA26	9690	7720	6150	5390	4560	1640	-1220	-910	-770	-620	720	290	-20	-160	-310

- The values for the bearing service life L_{10} relate to a mean speed of 3000 rpm and are additionally restricted by the grease lifetime depending on the ambient temperatures.



MQA asynchronous servo motors

9400 Servo Drives selection tables

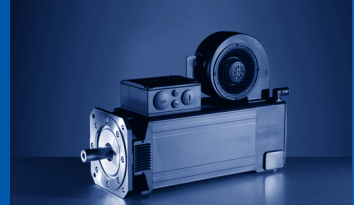
Mains connection 3 x 400 V and switching frequency 8 kHz

					E94A□□	E0174	E0244	E0324	E0474	E0594	E0864	E1044	E1454	E1724
					I _N	16.5	23.5	32.0	41.0	41.0	73.0	78.0	102.0	120.0
					I _{0,max}	49.5	58.8	76.8	94.0	118.0	172.0	208.0	261.0	310.0
MQA	M _N	n _N	I _N	P _N	I _{max}	49.5	58.8	76.8	94.0	118.0	172.0	208.0	261.0	310.0
20L14- ...2F□□	71.3	1420	26.5	10.60	M ₀	32.5	68.0							
					M _N	32.5	68.0							
					M _{0,max}	154.2	208.0							
					M _{max}	154.2	208.0							
					n _{eto}	-	-							
20L29- ...2F□□	66.2	2930	46.9	20.30	M ₀			28.0	53.5	53.5				
					M _N			28.0	53.5	53.5				
					M _{0,max}			116.0	148.2	192.8				
					M _{max}			116.0	148.2	192.8				
					n _{eto}			-	-	-				
22P08- ...2F□□	145.0	760	27.6	11.50	M ₀		116.0	156.0						
					M _N		116.0	145.0						
					M _{0,max}		313.0	402.0						
					M _{max}		313.0	402.0						
					n _{eto}		-	-						
22P14- ...2F□□	135.0	1425	45.6	20.10	M ₀					118.0				
					M _N					118.0				
					M _{0,max}					372.0				
					M _{max}					372.0				
					n _{eto}					-				
22P17- ...2F□□	130.0	1670	50.3	22.70	M ₀					99.0	156.0			
					M _N					99.0	130.0			
					M _{0,max}					325.0	463.0			
					M _{max}					325.0	463.0			
					n _{eto}					-	-			
22P29- ...2F□□	125.0	2935	86.0	38.40	M ₀							109.0	156.0	156.0
					M _N							109.0	125.0	125.0
					M _{0,max}							335.0	416.0	486.0
					M _{max}							335.0	416.0	486.0
					n _{eto}							-	-	-

- I... [A], M... [Nm], n... [min⁻¹], P... [kW]
- Please get in touch with your local Lenze subsidiary if you wish to operate the motors at a lower switching frequency.

MQA asynchronous servo motors

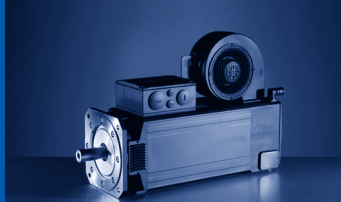
9400 Servo Drives selection tables



Mains connection 3 x 400 V and switching frequency 8 kHz

					E94A□□	E0474	E0594	E0864	E1044	E1454	E1724	E2024	E2454	E2924	E3664
					I _N	41.0	41.0	73.0	78.0	102.0	120.0	131.0	160.0	191.0	240.0
					I _{0,max}	94.0	118.0	172.0	208.0	261.0	310.0	364.0	441.0	526.0	659.0
MQA	M _N	n _N	I _N	P _N	I _{max}	94.0	118.0	172.0	208.0	261.0	310.0	364.0	441.0	526.0	659.0
26T05- ...2F□□	296.0	550	44.5	17.00	M ₀	268.0	268.0	325.0							
					M _N	268.0	268.0	296.0							
					M _{0,max}	665.0	826.0	1100.0							
					M _{max}	665.0	826.0	1100.0							
					n _{eto}	-	-	-							
26T10- ...2F□□	288.0	1030	76.2	31.10	M ₀			270.0	298.0	325.0					
					M _N			270.0	288.0	288.0					
					M _{0,max}			713.0	855.0	1044.0					
					M _{max}			713.0	855.0	1044.0					
					n _{eto}			-	-	-					
26T12- ...2F□□	282.0	1200	88.8	35.40	M ₀				219.0	291.0	325.0	325.0			
					M _N				219.0	282.0	282.0	282.0			
					M _{0,max}				609.0	739.0	840.0	950.0			
					M _{max}				609.0	739.0	840.0	950.0			
					n _{eto}				-	-	-	-			
26T22- ...2F□□	257.0	2235	138.1	60.10	M ₀							242.0	290.0	325.0	325.0
					M _N							242.0	257.0	257.0	257.0
					M _{0,max}							711.0	843.0	1001.0	1100.0
					M _{max}							711.0	843.0	1001.0	1100.0
					n _{eto}							-	-	-	-

- I... [A], M... [Nm], n... [min⁻¹], P... [kW]
- Please get in touch with your local Lenze subsidiary if you wish to operate the motors at a lower switching frequency.



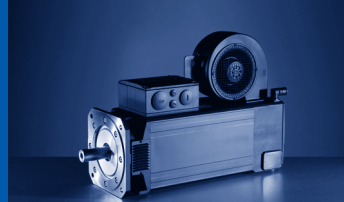
MQA asynchronous servo motors

EVS9300 servo inverter selection tables

Mains connection 3 x 400 V and switching frequency 8 kHz

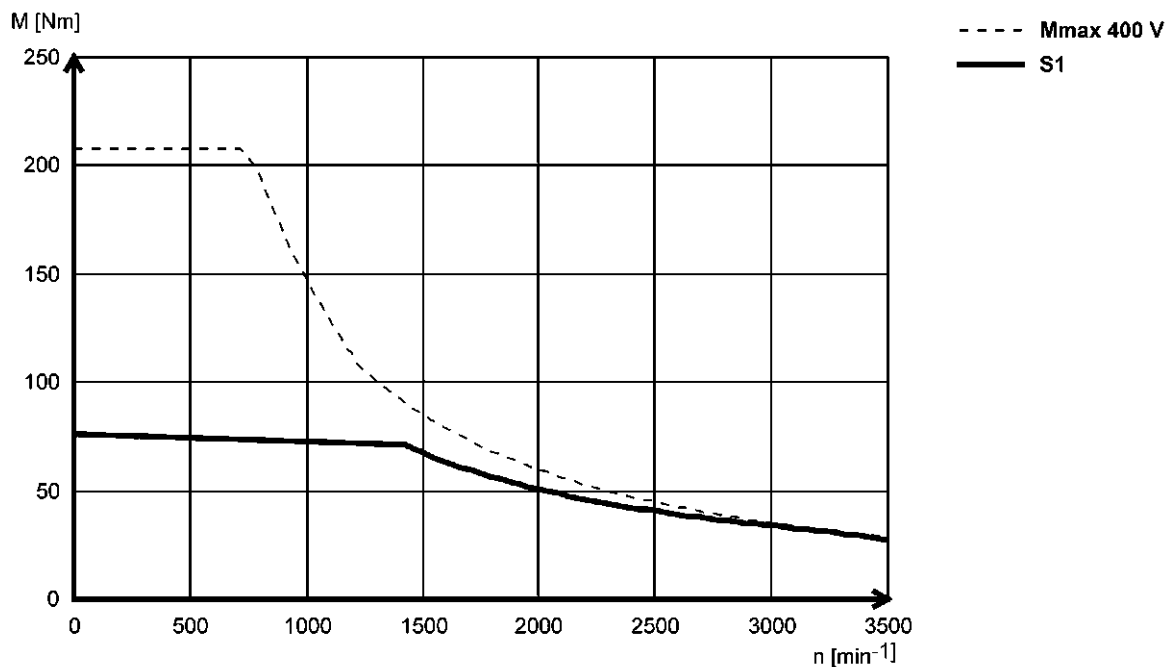
					EVS	9326-E□	9327-E□	9328-E□	9329-E□	9330-E□	9331-E□	9332-E□
					I _N	23.5	32.0	47.0	59.0	89.0	110.0	145.0
					I _{0,max}	23.5	32.0	47.0	52.0	80.0	110.0	126.0
MQA	M _N	n _N	I _N	P _N	I _{max}	35.3	48.0	70.5	88.5	133.5	165.0	217.5
20L14- ...2F□□	71.3	1420	26.5	10.60	M ₀	61.0	76.0	76.0				
					M _N	61.0	71.3	71.3				
					M _{0,max}	61.0	112.0	187.0				
					M _{max}	109.3	156.7	232.1				
					n _{eto}	-	-	-				
20L29- ...2F□□	66.2	2930	46.9	20.30	M ₀		28.0	66.3	76.0	76.0		
					M _N		28.0	66.2	66.2	66.2		
					M _{0,max}		28.0	66.3	95.0	169.0		
					M _{max}		68.5	112.5	146.4	226.7		
					n _{eto}		-	-	-	-		
22P08- ...2F□□	145.0	760	27.6	11.50	M ₀		156.0	156.0	156.0			
					M _N		145.0	145.0	145.0			
					M _{0,max}		177.0	280.0	293.0			
					M _{max}		247.0	338.8	345.8			
					n _{eto}		-	-	-			
22P14- ...2F□□	135.0	1425	45.6	20.10	M ₀			146.0	156.0	156.0		
					M _N			135.0	135.0	135.0		
					M _{0,max}			146.0	186.0	188.0		
					M _{max}			230.1	292.9	341.8		
					n _{eto}			-	-	-		
22P17- ...2F□□	130.0	1670	50.3	22.70	M ₀			124.0	156.0	156.0	156.0	
					M _N			124.0	130.0	130.0	130.0	
					M _{0,max}			124.0	140.0	240.0	335.0	
					M _{max}			180.5	227.7	342.1	378.3	
					n _{eto}			-	-	-	-	
22P29- ...2F□□	125.0	2935	86.0	38.40	M ₀					135.5	156.0	156.0
					M _N					125.0	125.0	125.0
					M _{0,max}					137.0	195.0	250.0
					M _{max}					215.6	273.1	355.1
					n _{eto}					-	-	-
26T05- ...2F□□	296.0	550	44.5	17.00	M ₀			303.0	325.0	325.0		
					M _N			296.0	296.0	296.0		
					M _{0,max}			303.0	333.0	615.0		
					M _{max}			482.0	612.0	751.0		
					n _{eto}			-	-	-		
26T10- ...2F□□	288.0	1030	76.2	31.10	M ₀					319.0	325.0	
					M _N					288.0	288.0	
					M _{0,max}					300.0	440.0	
					M _{max}					552.0	671.0	
					n _{eto}					-	-	
26T12- ...2F□□	282.0	1200	88.8	35.40	M ₀					284.0	325.0	325.0
					M _N					282.0	282.0	282.0
					M _{0,max}					258.0	327.0	397.0
					M _{max}					424.0	512.0	663.0
					n _{eto}					-	-	-
26T22- ...2F□□	257.0	2235	138.1	60.10	M ₀						177.0	222.0
					M _N						177.0	257.0
					M _{0,max}						203.0	220.0
					M _{max}						315.0	432.0
					n _{eto}						-	-

- ▶ I... [A], M... [Nm], n... [min⁻¹], P... [kW]
- ▶ Please get in touch with your local Lenze subsidiary if you wish to operate the motors at a lower switching frequency.

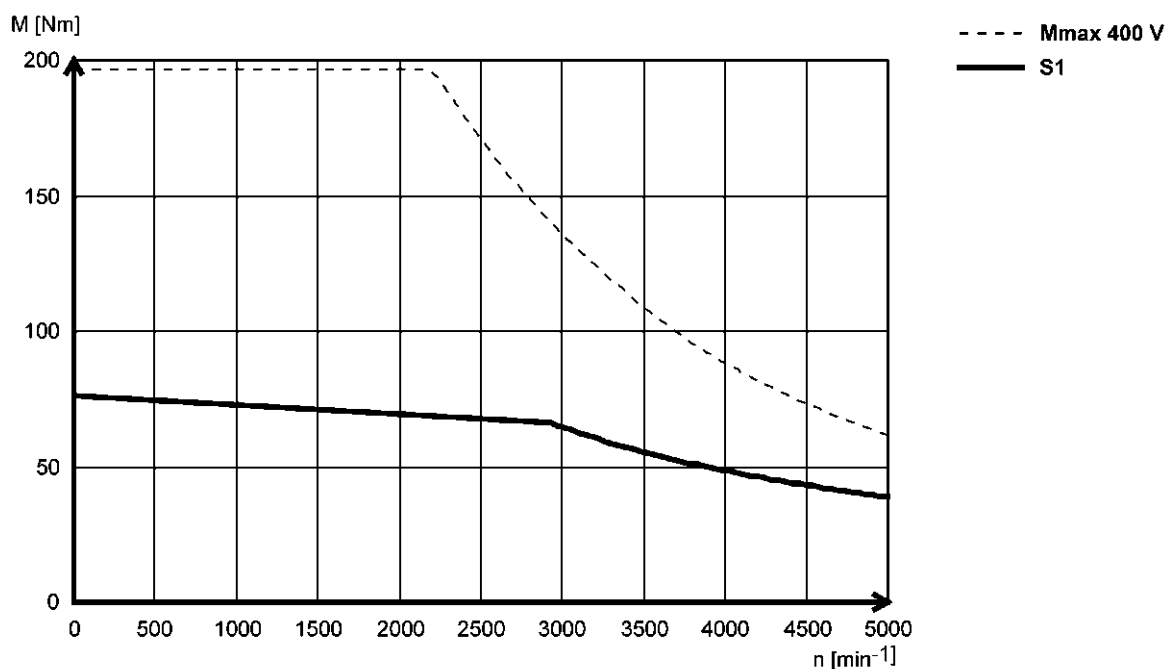


Mains connection 3x 400 V

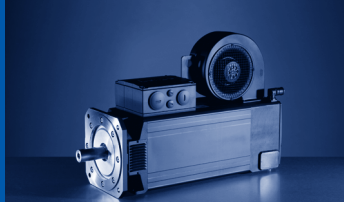
MQA20L14...2F□□



MQA20L29...2F□□



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

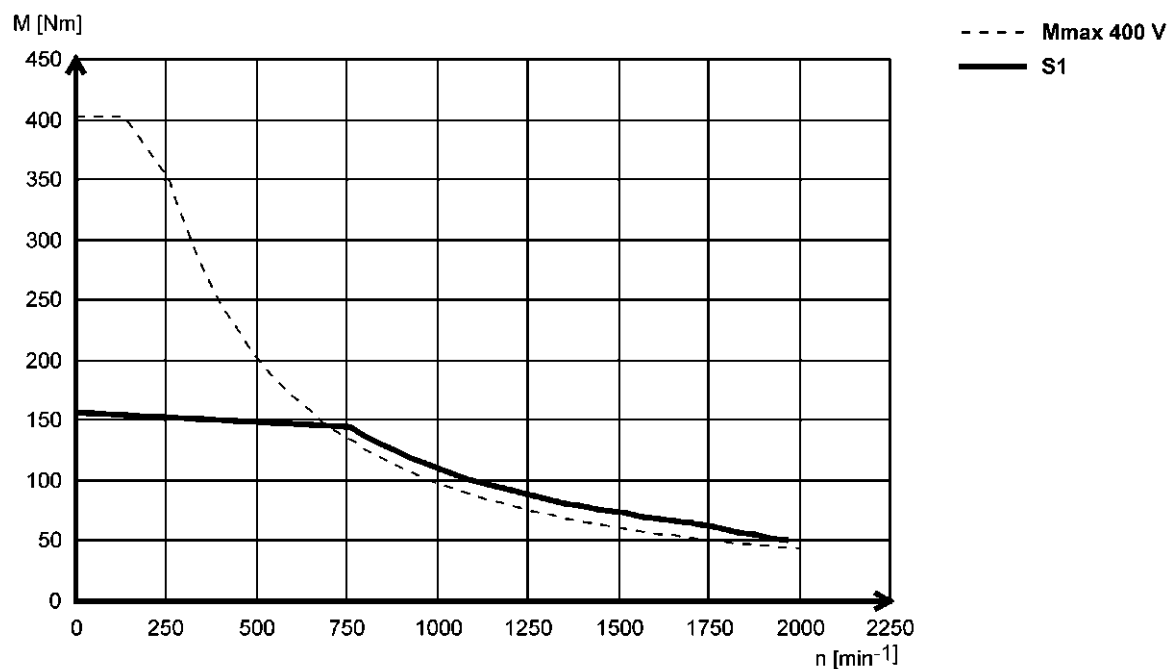


MQA asynchronous servo motors

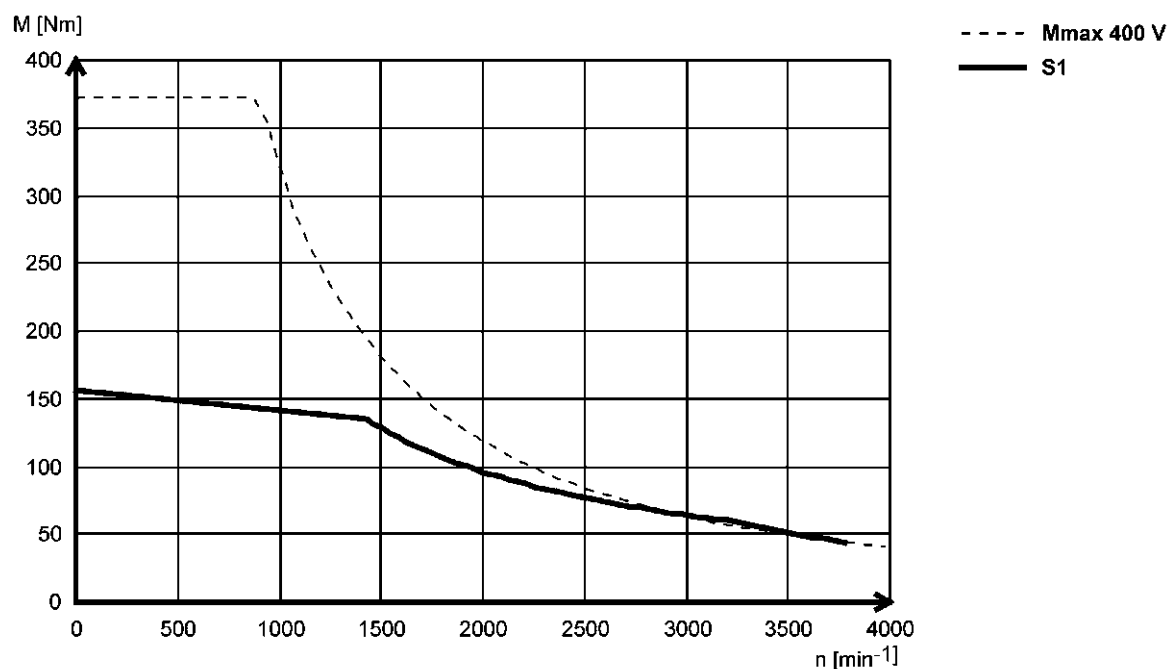
Torque characteristics

Mains connection 3x 400 V

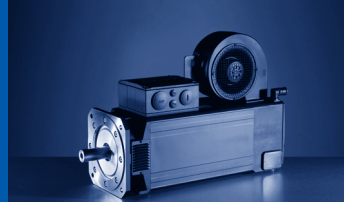
MQA22P08...2F□□



MQA22P14...2F□□

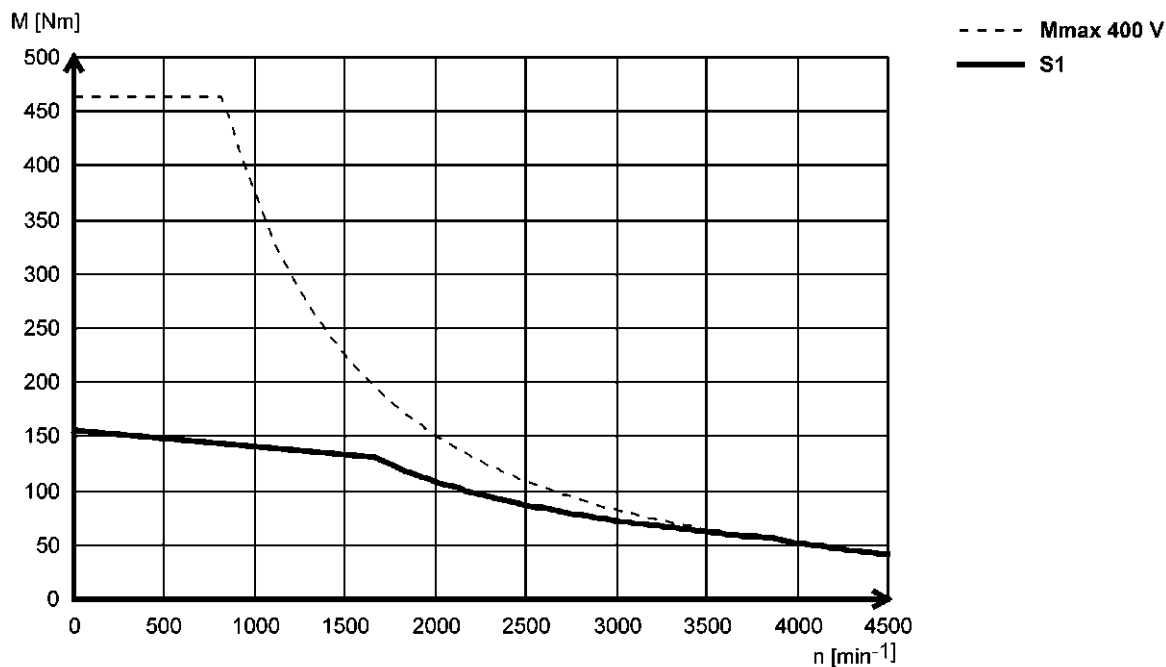


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

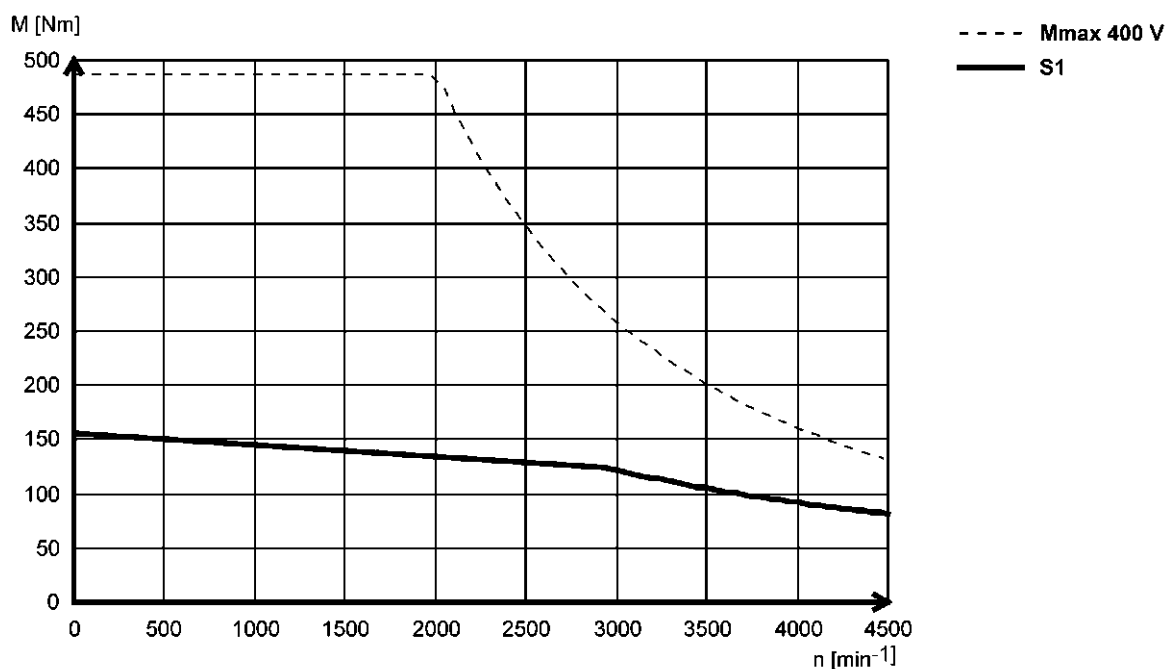


Mains connection 3x 400 V

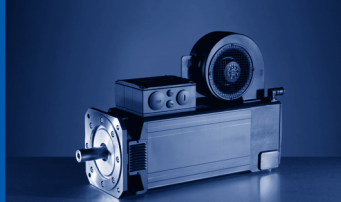
MQA22P17...2F□□



MQA22P29...2F□□



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

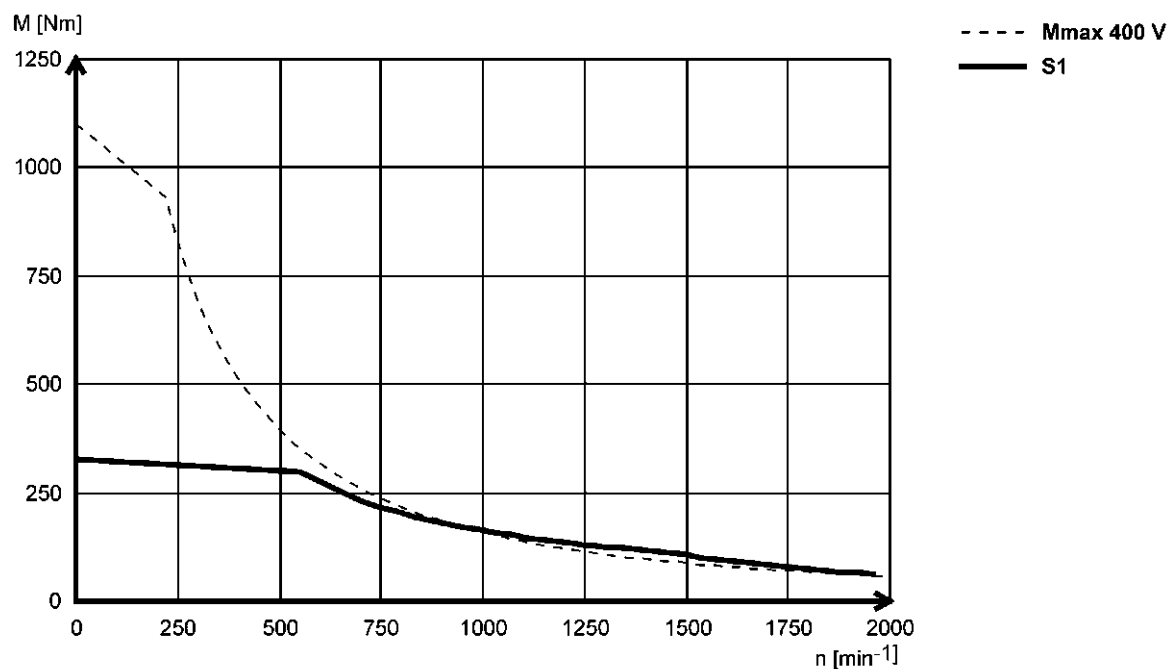


MQA asynchronous servo motors

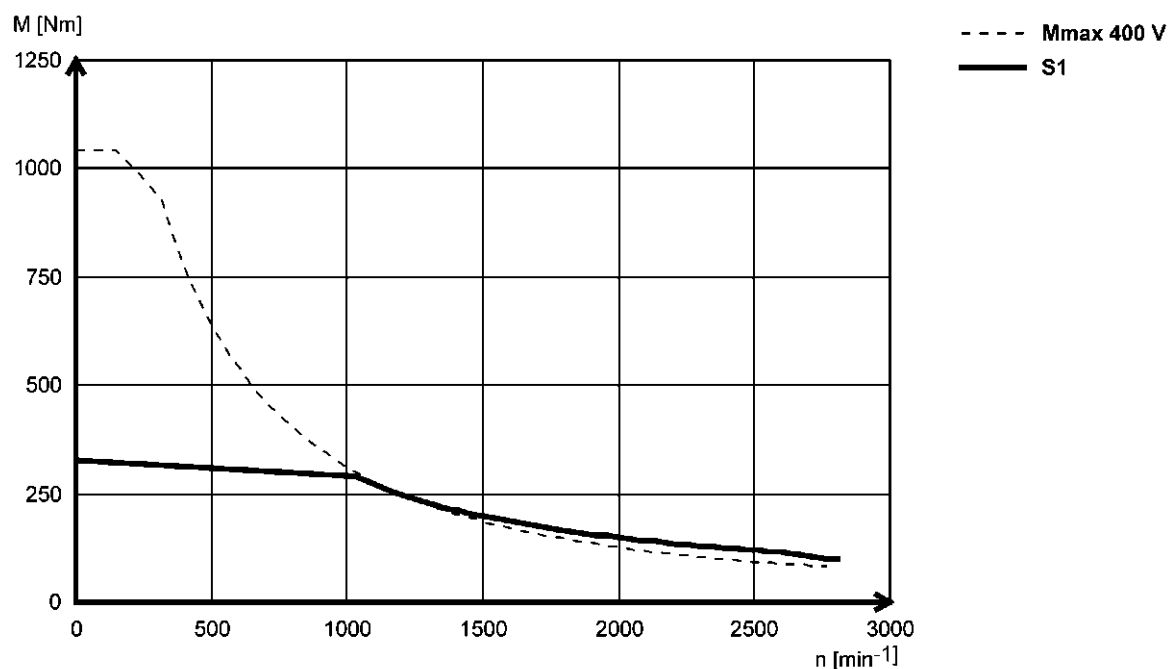
Torque characteristics

Mains connection 3x 400 V

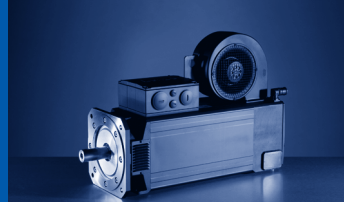
MQA26T05...2F□□



MQA26T10...2F□□

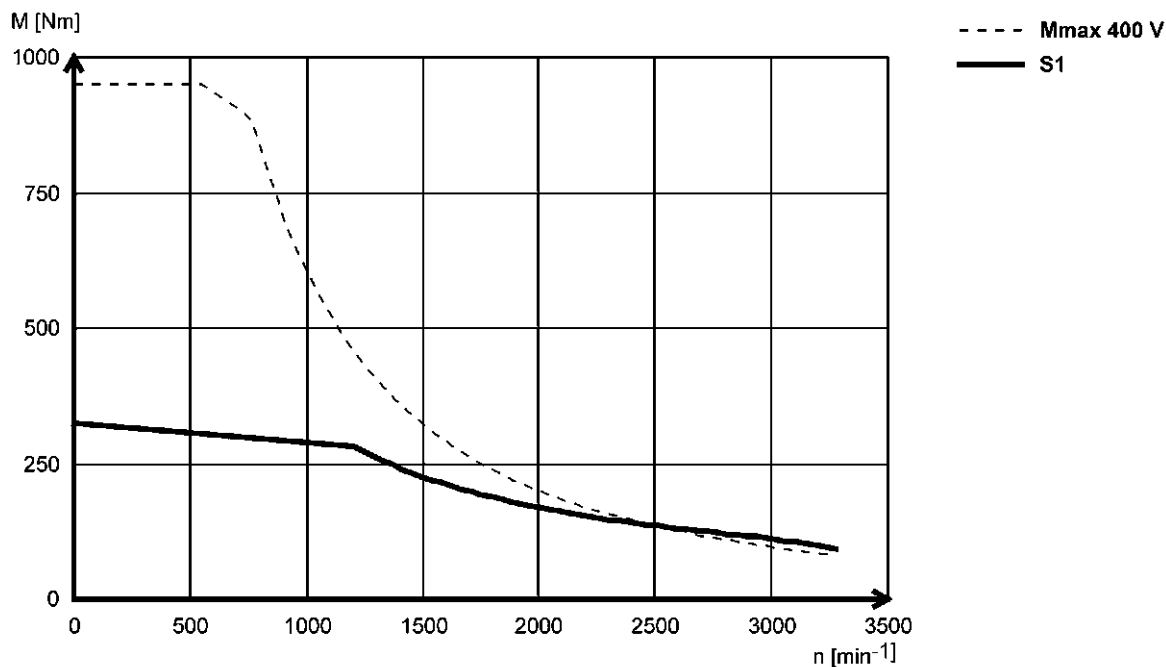


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

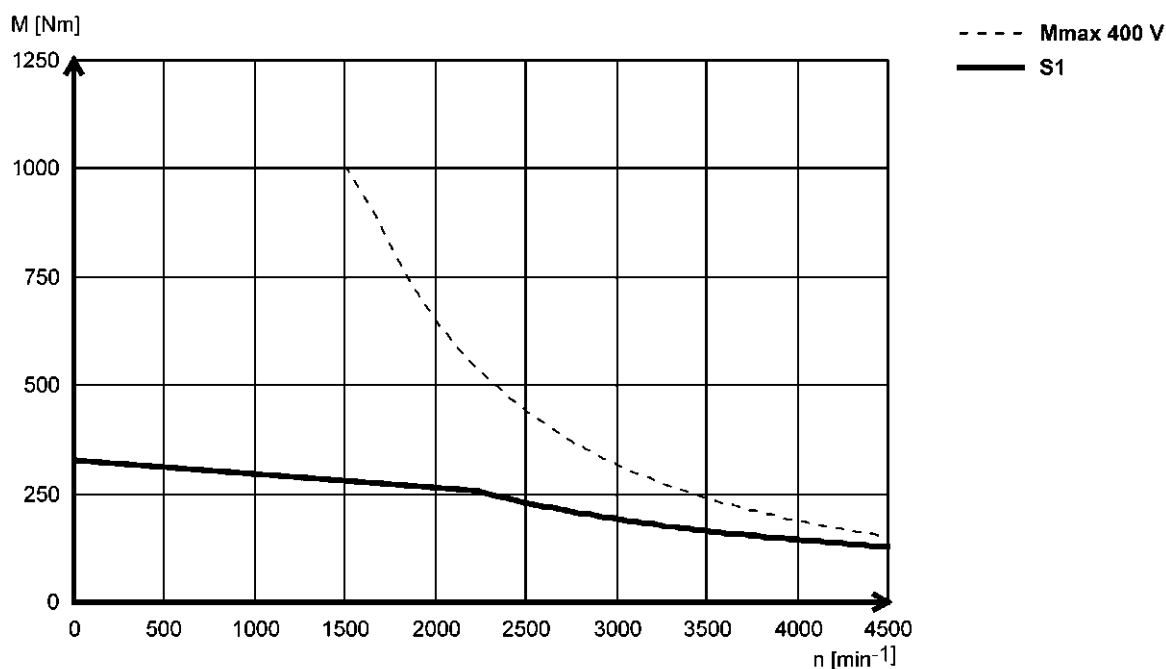


Mains connection 3x 400 V

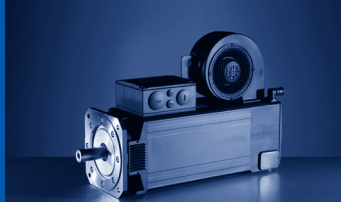
MQA26T12...2F□□



MQA26T22...2F□□



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.



MQA asynchronous servo motors

Accessories

Holding brakes

The servo motors can be equipped with integral spring-applied holding brakes. The voltages available for this model are 24 V DC and 230 V AC.

The brakes are active once the supply voltage is switched off (closed-circuit principle). Where the brakes are used purely as holding brakes, there is practically no wear on the friction surfaces.

Caution:

The brakes used are not safety brakes in the sense that a reduction in torque may arise as a result of disruptive factors that cannot be influenced, e.g. oil ingress.

The ohmic voltage drop along the cable must be taken into consideration in long motor supply cables and must be compensated for by a higher voltage at the line input.

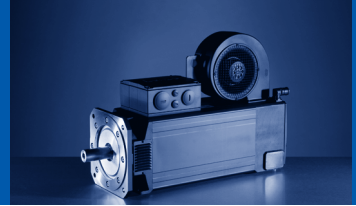
The following applies for Lenze system cables:

$$U[V] = U_B[V] + 0.08 \frac{[V]}{[A] \cdot [m]} \cdot l_g[m] \cdot I_B[A]$$

If no suitable voltage (incorrect value, incorrect polarity) is applied to the brake, the brake will be applied and can be overheated and destroyed by the motor continuing to rotate. The shortest switching times of the brakes are achieved by DC switching of the voltage. A spark suppressor is required to suppress interference and to increase the service life of the relay contacts here.



Spring-applied brake



Holding brake data

		U _{N,DC} ⁽³⁾	U _{N,AC} ⁽⁴⁾	M _N	M _N	M _{av}	I _N ⁽²⁾	J	t ₁ ⁽¹⁾	t ₂ ⁽¹⁾	Q _E ⁽⁵⁾	m	J _{MB}	J _L /J _{MB}
				20 °C	120 °C	120 °C								
		[V]	[V]	[Nm]	[Nm]	[Nm]	[A]	[kgcm ²]	[ms]	[ms]	[J]	[kg]	[kgcm ²]	
MQA20	F1 FG	24		90.0	80.0	50.0	3.13	6.88	25.0	220	18000	13.0	177	19.6
			230				0.37		260					
MQA22		24		150	130	80.0	3.75	18.1	50.0	260	23000	20.5	505	8.20
			230				0.44		400					
MQA26		24		300	260	200	3.13	70.4	60.0	320	51000	30.7	1405	12.7
			230				0.37		600					

Holding brake data, reinforced design

		U _{N,DC} ³⁾	U _{N,AC} ⁴⁾	M _N	M _N	M _{av}	I _N ²⁾	J	t ₁ ¹⁾	t ₂ ¹⁾	Q _E ⁵⁾	m	J _{MB}	J _L /J _{MB}
				20 °C	120 °C	120 °C								
		[V]	[V]	[Nm]	[Nm]	[Nm]	[A]	[kgcm²]	[ms]	[ms]	[J]	[kg]	[kgcm²]	
MQA20	F2 FH	24		150	130	100	2.58	14.1	25.0	240	31000	15.4	185	33.0
		230	0.30				260							
MQA22		24		300	260	160	3.75	36.3	50.0	310	39000	26.0	523	14.1
		230	0.44				400							
MQA26		24		500	430	260	3.75	70.4	60.0	390	51000	30.8	1405	12.7
		230	0.44				600							

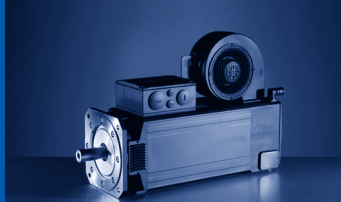
¹⁾ Engagement and disengagement times valid for rated voltage (±0%) and protective circuit for brakes with varistor for DC-controlled switching. The times may increase without a protective circuit.

²⁾ The currents are maximum values for a cold brake (data for sizing the power supply). The values for a motor at operating temperature are considerably lower.

³⁾ With 24V DC brake: smoothed DC voltage, ripple ≤1 %.

⁴⁾ UR not possible in the case of a brake with 230 V supply voltage.

⁵⁾ Maximum switching energy per emergency stop with $n = 3000 \text{ min}^{-1}$.



MQA asynchronous servo motors

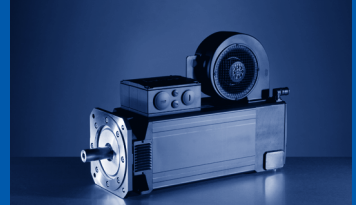
Accessories

Blower data 50 Hz

		Enclosure	Number of phases	Connection method					
					U _{min}	U _{max}	U _{N,AC}	P _N	I _N
					[V]	[V]	[V]	[kW]	[A]
MQA20	F10 F1F	IP23s	1		210	250	230	0.090	0.39
	3				380	460	400	0.060	0.10
			Δ	200	310	230	0.090	0.42	
			Y	350	530	480		0.24	
MQA22	F10 F1F		1		210	250	230	0.26	1.10
	3				360	440	400	0.30	0.48
			Δ	200	290	230	0.25	1.03	
			Y	350	530	480		0.58	
MQA26	F10 F1F		1		210	250	230	0.40	1.75
	3				360	440	400	0.42	0.65
			Δ	200	280	230	0.48	2.40	
			Y	350	480	400		1.40	

Blower data 60 Hz

		Enclosure	Number of phases	Connection method					
					U _{min}	U _{max}	U _{N,AC}	P _N	I _N
					[V]	[V]	[V]	[kW]	[A]
MQA20	F10 F1F	IP23s	1		210	250	230	0.12	0.49
	3				380	460	400	0.071	0.11
			Δ	200	310	230	0.11	0.45	
			Y	350	530	480		0.26	
MQA22	F10 F1F		1		210	250	230	0.30	1.28
	3				360	440	400	0.34	0.52
			Δ	200	290	230	0.35	1.13	
			Y	350	530	480		0.65	
MQA26	F10 F1F		1		210	250	230	0.41	1.82
	3				360	440	400	0.39	0.60
			Δ	200	310	230	0.75	2.60	
			Y	350	530	440		1.50	



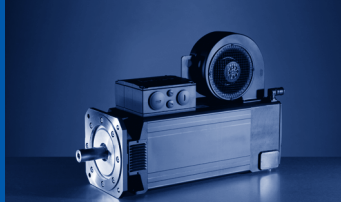
Tailored to meet the requirements of the various applications and necessary accuracies, the following feedback systems are available.

Resolver

Stator-fed resolver with two 90° stator windings and one rotor winding with transformer winding.

Speed / angle sensor	1)			RS0
Resolution			[°]	0.80
Angle			[°]	
Accuracy			[°]	-10 ... 10
Absolute positioning				1 revolution
Max. speed	$n_{\max}$		[min ⁻¹]	8000
Max. input voltage	$U_{\max}$		[V]	10.0
DC				
Max. input frequency	$f_{\max, 1}$		[kHz]	4.00
Ratio		$\pm 5 \%$		0.30
Stator / rotor				
Rotor impedance	Z_{ro}		[Ω]	51 + j90
Stator impedance	Z_{so}		[Ω]	102 + j150
Impedance	Z_{rs}		[Ω]	44 + j76
Min. insulation resistance	R		[MΩ]	10.0
At DC 500 V				
Number of pole pairs				1
Max. angle error			[°]	-10 ... 10
Version				E94A ECS EVS93
Inverter assignment				

1) → 18 - Product key > speed/angle sensor



MQA asynchronous servo motors

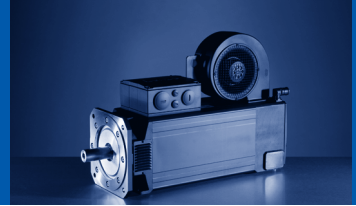
Accessories

Incremental and SinCos absolute value encoder

Encoder type			TTL incremental			SinCos incremental	SinCos absolute value			
Speed / angle sensor	¹⁾		T20	T40	D20	S20	SRS	SRM	ECN	EQN
			IG2048-5V-T	IG4096-5V-T	IK2048-5V-T	IG2048-5V-S	AS1024-8V-H	AM1024-8V-H	AS2048-5V-E	AM2048-5V-E
Encoder type			Single turn					Multi-turn	Single turn	Multi-turn
Pulses			2048	4096	2048		1024		2048	
Output signals			TTL 5 V				1 Vss			
Interfaces							Hiperface		EnDat	
Absolute revolution			0				1	4096	1	4096
Resolution			2.60				0.40			
Angle ²⁾		[°]								
Accuracy		[°]	-2 ... 2				-0.8 ... 0.8		-0.6 ... 0.6	
Min. input voltage										
DC	$U_{min,1}$	[V]	4.75		4.50		7.00		4.75	
Max. input voltage										
DC	U_{max}	[V]	5.25		5.50		12.0		5.25	
Max. speed										
	n_{max}	[min ⁻¹]	8789		5273		6000		12000	
Max. current consumption										
	I_{max}	[mA]	150	50.0	100		80.0		150	250
Limit frequency										
	f_{max}	[kHz]	300		180		200			
Version										
Inverter assignment			E94A ECS EVS93						E94A	

¹⁾ → 18 - Product key > speed/angle sensor

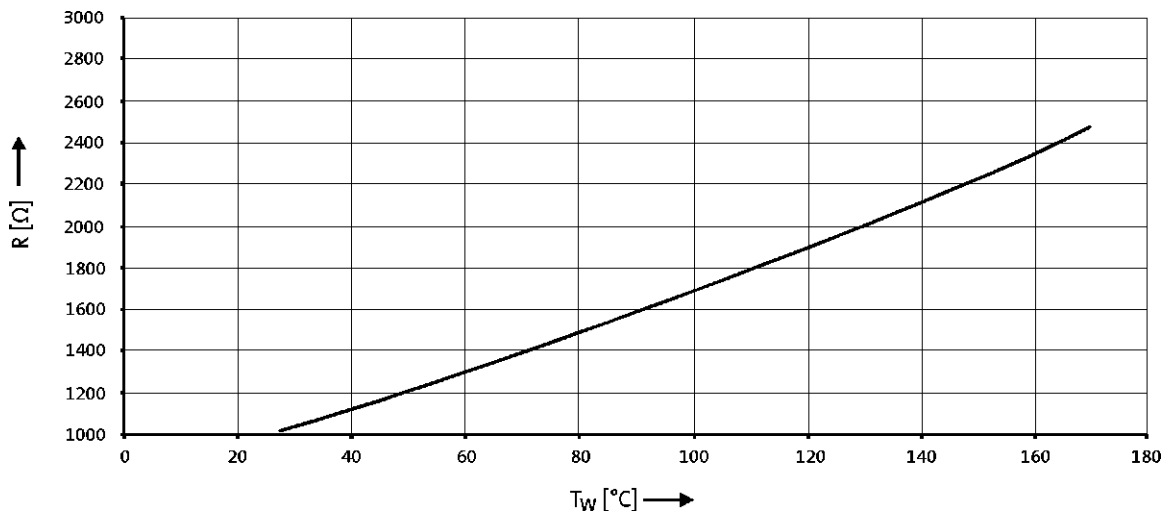
²⁾ Dependent on inverter.



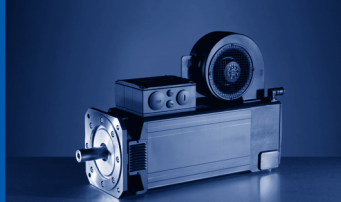
Temperature sensor

The thermal sensors (1x KTY 83-110) continuously monitor the motor temperature. The temperature signal is transmitted over the system cable of the feedback system to the servo controller.

This means that the temperature of the motor is determined with great accuracy in the permitted operating range and at the same time the overtemperature response configured in the controller is executed in the event of overtemperature in one of the winding phases.



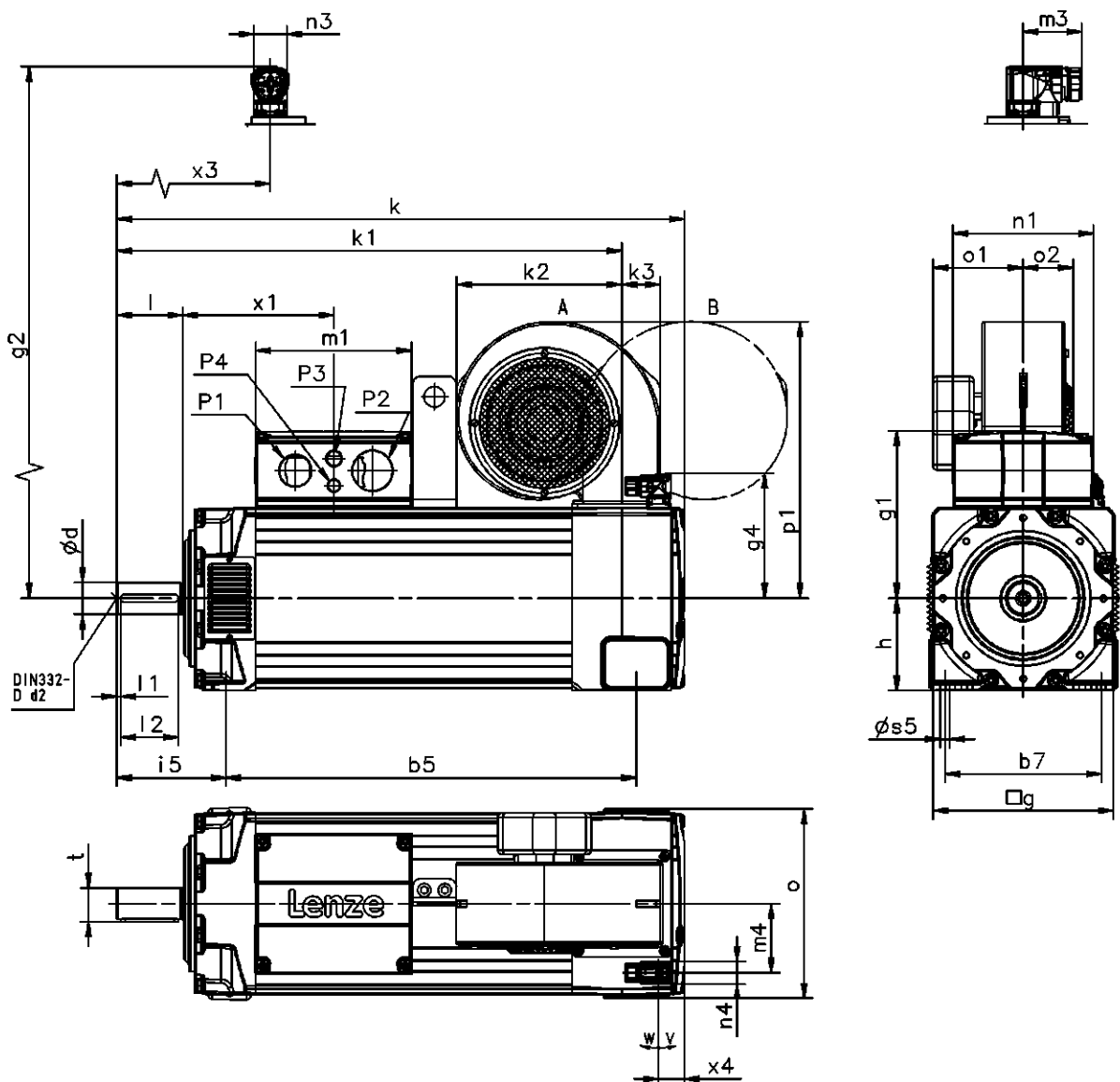
- If the detector is supplied with a measured current of 1 mA, the above relationship between the temperature and the resistance applies.



MQA asynchronous servo motors

Dimensions [mm]

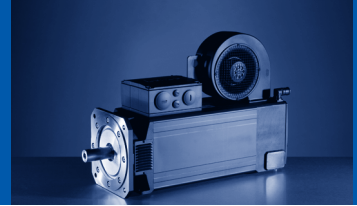
Motors with blower, B3



			MQA20	MQA22	MQA26
RS0 / E?? / T?? / S?? / D20 B0	k	[mm]	576	691	841
	x ₄	[mm]	33.0	31.0	24.0
	m ₄	[mm]	74.0	84.0	100
RS0 F1	k	[mm]	661	773	979
	x ₄	[mm]	41.0	40.0	
	m ₄	[mm]	70.0	76.0	96.0
E?? / T?? / S?? / D20 F1	k	[mm]	699	811	1017
	x ₄	[mm]	41.0	40.0	
	m ₄	[mm]	70.0	76.0	96.0
RS0 / E?? / T?? / S?? / D20 F2	k	[mm]	724	843	1017
	x ₄	[mm]	41.0	40.0	
	m ₄	[mm]	70.0	76.0	96.0

MQA asynchronous servo motors

Dimensions [mm]



	g	g ₁	g ₂	g ₄	m ₁	m ₃	n ₁	n ₃	n ₄
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MQA20	200	170	167	140	154	71	128	40	28
MQA22	220	203		153	190		171		
MQA26	260	256		173	238		212		

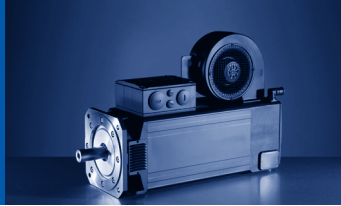
	o	P ₁	P ₂	P ₃	P ₄	v	w	x ₁	x ₃
	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[°]	[mm]	[mm]
MQA20	206	M32x1.5	M25x1.5	M20x1.5	M16x1.5	195	80	155	107
MQA22	230	M50x1.5	M40x1.5					380	
MQA26	266	M63x1.5	M50x1.5					465	

	d	d	d ₂	l	l ₁	l ₂	u	t
	k6	m6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MQA20	38		M12	80	5.0	70	10.0	41
MQA22						100	16.0	59
MQA26		55	M14	110				

	h	b ₅	b ₇	s ₅	i ₅
	[mm]	[mm]	[mm]	[mm]	[mm]
MQA20	100	386	160	11.5	134
MQA22	112	500	190		133
MQA26	132	605	215	14.0	165

			MQA20	MQA22	MQA26
F10/F30	k ₁	[mm]	498	615	764
	k ₂	[mm]	152	201	221
	k ₃	[mm]	32.0	38.0	70.0
	o ₁	[mm]	117	110	106
	o ₂	[mm]	47.0	61.0	87.0
	p ₁	[mm]	276	336	391
F1F/F3F	k ₁	[mm]	498	615	764
	k ₂	[mm]	152	201	221
	k ₃	[mm]	32.0	38.0	70.0
	o ₁	[mm]	118	110	106
	o ₂	[mm]	124	141	
	p ₁	[mm]	276	336	391

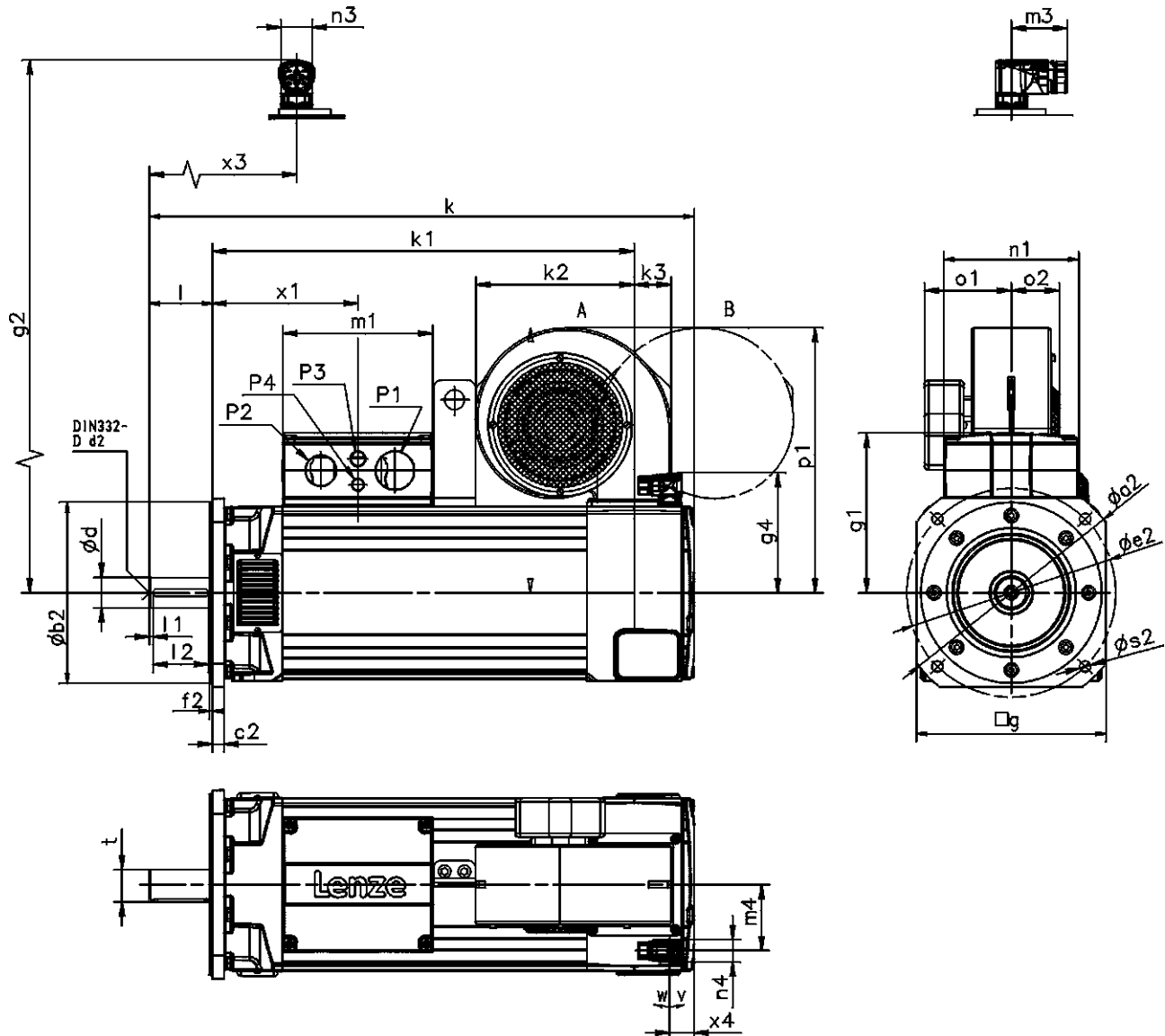
			MQA20	MQA22	MQA26
FW0	k ₁	[mm]	498	615	764
	k ₂	[mm]	177	232	255
	k ₃	[mm]	34.0	28.0	50.0
	o ₁	[mm]	158	187	208
	o ₂	[mm]	32.0	38.0	28.0
	p ₁	[mm]	305	371	408
FWF	k ₁	[mm]	498	615	764
	k ₂	[mm]	224	242	255
	k ₃	[mm]	34.0	28.0	100
	o ₁	[mm]	158	187	213
	o ₂	[mm]	64.0	77.0	28.0
	p ₁	[mm]	305	371	423



MQA asynchronous servo motors

Dimensions [mm]

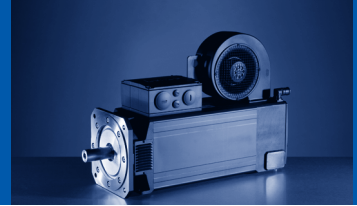
Motors with blower, B5



			MQA20	MQA22	MQA26
RS0 / E?? / T?? / S?? / D20 B0	k	[mm]	576	691	841
	x ₄	[mm]	33.0	31.0	24.0
	m ₄	[mm]	74.0	84.0	100
RS0 F1	k	[mm]	661	773	979
	x ₄	[mm]	41.0	40.0	
	m ₄	[mm]	70.0	76.0	96.0
E?? / T?? / S?? / D20 F1	k	[mm]	699	811	1017
	x ₄	[mm]	41.0	40.0	
	m ₄	[mm]	70.0	76.0	96.0
RS0 / E?? / T?? / S?? / D20 F2	k	[mm]	724	843	1017
	x ₄	[mm]	41.0	40.0	
	m ₄	[mm]	70.0	76.0	96.0

MQA asynchronous servo motors

Dimensions [mm]



	g	g ₁	g ₂	g ₄	m ₁	m ₃	n ₁	n ₃	n ₄
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MQA20	200	170	167	140	154	71	128	40	28
MQA22	220	203		153	190		171		
MQA26	260	256		173	238		212		

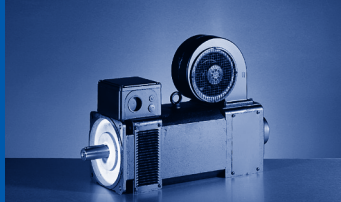
	o	P ₁	P ₂	P ₃	P ₄	v	w	x ₁	x ₃
	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[°]	[mm]	[mm]
MQA20	206	M32x1.5	M25x1.5	M20x1.5		195	80	155	107
MQA22	230	M50x1.5	M40x1.5		M16x1.5			380	
MQA26	266	M63x1.5	M50x1.5					465	

	d	d	d ₂	l	l ₁	l ₂	u	t
	k6	m6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MQA20	38		M12	80	5.0	70	10.0	41
MQA22								
MQA26		55	M14	110		100	16.0	59

			MQA20	MQA22	MQA26
			FF215	FF265	FF350
a ₂		[mm]	250	300	400
a ₃		[mm]	196	240	320
b ₂	j6	[mm]	180	230	
b ₂	h6	[mm]			300
c ₂		[mm]		15	
e ₂		[mm]	215	265	350
f ₂		[mm]		4.0	
s ₂		[mm]		14	

			MQA20	MQA22	MQA26
F10/F30	k ₁	[mm]	498	615	764
	k ₂	[mm]	152	201	221
	k ₃	[mm]	32.0	38.0	70.0
	o ₁	[mm]	117	110	106
	o ₂	[mm]	47.0	61.0	87.0
	p ₁	[mm]	276	336	391
F1F/F3F	k ₁	[mm]	498	615	764
	k ₂	[mm]	152	201	221
	k ₃	[mm]	32.0	38.0	70.0
	o ₁	[mm]	118	110	106
	o ₂	[mm]	124	141	
	p ₁	[mm]	276	336	391

			MQA20	MQA22	MQA26
FW0	k ₁	[mm]	498	615	764
	k ₂	[mm]	177	232	255
	k ₃	[mm]	34.0	28.0	50.0
	o ₁	[mm]	158	187	208
	o ₂	[mm]	32.0	38.0	28.0
	p ₁	[mm]	305	371	408
FWF	k ₁	[mm]	498	615	764
	k ₂	[mm]	224	242	255
	k ₃	[mm]	34.0	28.0	100
	o ₁	[mm]	158	187	213
	o ₂	[mm]	64.0	77.0	28.0
	p ₁	[mm]	305	371	423



MDFQA asynchronous servo motors

Rated data

Mains connection 3x 400 V

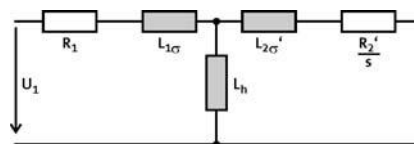
	n_N	M_0	M_{max}	M_N	P_N	I_0	I_N	$U_{N,AC}$	f_N	$\cos \varphi$	$J^{1)}$	η
	[min ⁻¹]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[V]	[Hz]		[kgcm ²]	[%]
MDFQA□□160-32, 18, Y	498	480	1400	433	22.6	56.0	51.5	360	18	0.87	2900	81
MDFQA□□160-32, 31, Δ	890	480	1400	434	40.5	95.0	87.0	355	31	0.86	2900	89
MDFQA□□160-32, 44, Y	1280	470	1400	410	55.0	130	116	340	44	0.89	2900	91
MDFQA□□160-32, 78, Δ	2295	470	1400	395	95.0	230	196	340	78	0.88	2900	93

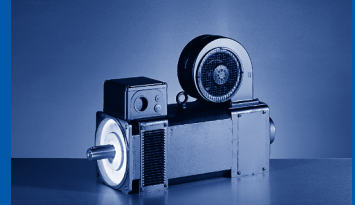
	R_1	$R_{UV\ 20\ ^\circ C}$	$R_{UV\ 150\ ^\circ C}$	R_2	$L_{1\sigma}$	L	$L_{2\sigma}$	$n_{max}^{2)}$	$m^{1)}$
	[Ω]	[Ω]	[Ω]	[Ω]	[mH]	[mH]	[mH]	[min ⁻¹]	[kg]
MDFQA□□160-32, 18, Y	0.22	0.45	0.60	0.20	2.65	73.8	2.23	6500	300
MDFQA□□160-32, 31, Δ		0.15	0.20			76.1			
MDFQA□□160-32, 44, Y	0.040	0.078	0.10	0.040	0.47	15.6	0.39		
MDFQA□□160-32, 78, Δ		0.026	0.035			16.2	0.38		

¹⁾ No brake.

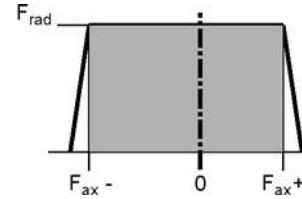
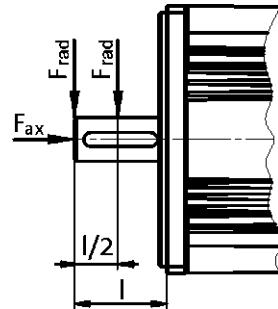
²⁾ Mechanically permissible maximum speed.

The figures in columns R_1 , $L_{1\sigma}$, L_h , R_2' and $L_{2\sigma}'$ refer to a single-phase equivalent circuit diagram at 20 °C (□-circuit).





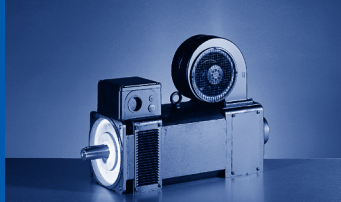
Permissible radial and axial forces



Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
	Max. radial force, Lever arm $l/2$					Min. axial force, Lever arm $l/2$					Max. axial force, Lever arm $l/2$				
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MDFQA□□160	5400	4330	3480	3070	2620	-3610	-2650	-1940	-1610	-1280	2530	1570	860	530	200

Bearing service life L_{10}															
	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h	5000 h	10000 h	20000 h	30000 h	50000 h
	Max. radial force, Lever arm l					Min. axial force, Lever arm l					Max. axial force, Lever arm l				
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,min}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
MDFQA□□160	4950	3970	3200	2820	2410	-3400	-2490	-1820	-1510	-1200	2320	1410	740	430	120

- The values for the bearing service life L_{10} relate to a mean speed of 3000 rpm and are additionally restricted by the grease lifetime depending on the ambient temperatures.



MDFQA asynchronous servo motors

9400 Servo Drives selection tables

Mains connection 3 x 400 V and switching frequency
8 kHz

Y-connection motors

					E94A□□	E0594			
					I _N	41.0			
					I _{0,max}	118.0			
MDFQA	M _N	n _N	I _N	P _N	I _{max}	118.0			
160-32	433.0	498	51.5	22.60	M ₀	342.0			
					M _N	342.0			
					M _{0,max}	1064.0			
					M _{max}	1064.0			
					n _{eto}	-			
					E94A□□	E1454	E1724	E2024	
					I _N	102.0	120.0	131.0	
					I _{0,max}	261.0	310.0	364.0	
MDFQA	M _N	n _N	I _N	P _N	I _{max}	261.0	310.0	364.0	
160-32	410.0	1280	115.5	55.00	M ₀	363.0	433.0	470.0	
					M _N	363.0	410.0	410.0	
					M _{0,max}	991.0	1177.0	1375.0	
					M _{max}	991.0	1177.0	1375.0	
					n _{eto}	-	-	-	

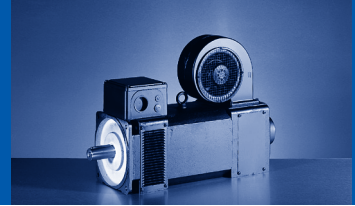
Δ- connected motors

					E94A□□	E0864	E1044	E1454
					I _N	73.0	78.0	102.0
					I _{0,max}	172.0	208.0	261.0
MDFQA	M _N	n _N	I _N	P _N	I _{max}	172.0	208.0	261.0
160-32	434.0	890	87.0	40.50	M ₀	350.0	378.0	480.0
					M _N	350.0	378.0	434.0
					M _{0,max}	915.0	1110.0	1390.0
					M _{max}	915.0	1110.0	1390.0
					n _{eto}	-	-	-
					E94A□□	E2454	E2924	E3664
					I _N	160.0	191.0	240.0
					I _{0,max}	441.0	526.0	659.0
MDFQA	M _N	n _N	I _N	P _N	I _{max}	441.0	526.0	659.0
160-32	395.0	2295	195.5	95.00	M ₀	308.0	380.0	470.0
					M _N	308.0	380.0	395.0
					M _{0,max}	881.0	1048.0	1301.0
					M _{max}	881.0	1048.0	1301.0
					n _{eto}	-	-	-

- ▶ I... [A], M... [Nm], n... [min⁻¹], P... [kW]
- ▶ Please get in touch with your local Lenze subsidiary if you wish to operate the motors at a lower switching frequency.

MDFQA asynchronous servo motors

EVS9300 servo inverter selection tables



Mains connection 3x 400 V

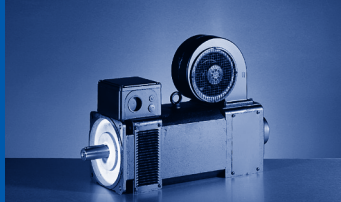
Y-connection motors

					EVS	9328-E□	9329-E□	9330-E□
					I _N	47.0	59.0	89.0
					I _{0,max}	47.0	52.0	80.0
MDFQA	M _N	n _N	I _N	P _N	I _{max}	70.5	88.5	133.5
160-32	433.0	498	51.5	22.60	M ₀	395.0	435.0	480.0
					M _N	395.0	433.0	433.0
					M _{0,max}	395.0	435.0	680.0
					M _{max}	615.0	795.0	1260.0
					n _{eto}	-	-	-
					EVS	9331-E□	9332-E□	
					I _N	110.0	145.0	
					I _{0,max}	110.0	126.0	
MDFQA	M _N	n _N	I _N	P _N	I _{max}	165.0	217.5	
160-32	410.0	1280	115.5	55.00	M ₀	365.0	470.0	
					M _N	365.0	410.0	
					M _{0,max}	365.0	455.0	
					M _{max}	630.0	850.0	
					n _{eto}	-	-	

Δ- connected motors

					EVS	9330-E□	9331-E□	9332-E□
					I _N	89.0	110.0	145.0
					I _{0,max}	80.0	110.0	126.0
MDFQA	M _N	n _N	I _N	P _N	I _{max}	133.5	165.0	217.5
160-32	434.0	890	87.0	40.50	M ₀	435.0	480.0	480.0
					M _N	434.0	434.0	434.0
					M _{0,max}	385.0	585.0	731.0
					M _{max}	668.0	850.0	1140.0
					n _{eto}	-	-	-

► I... [A], M... [Nm], n... [min⁻¹], P... [kW]

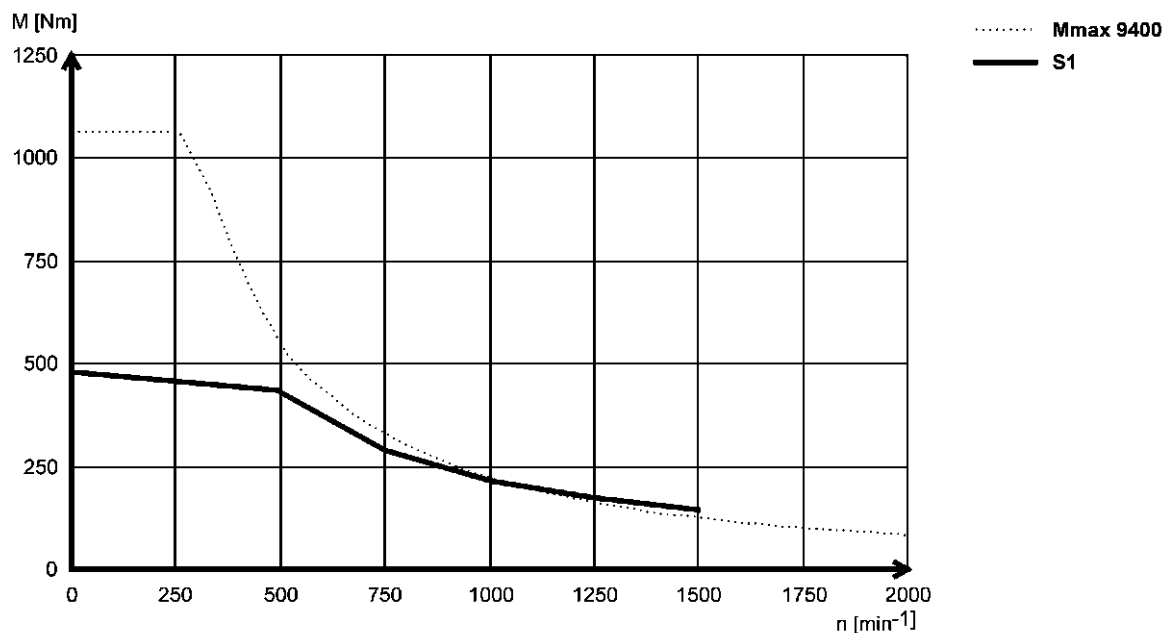


MDFQA asynchronous servo motors

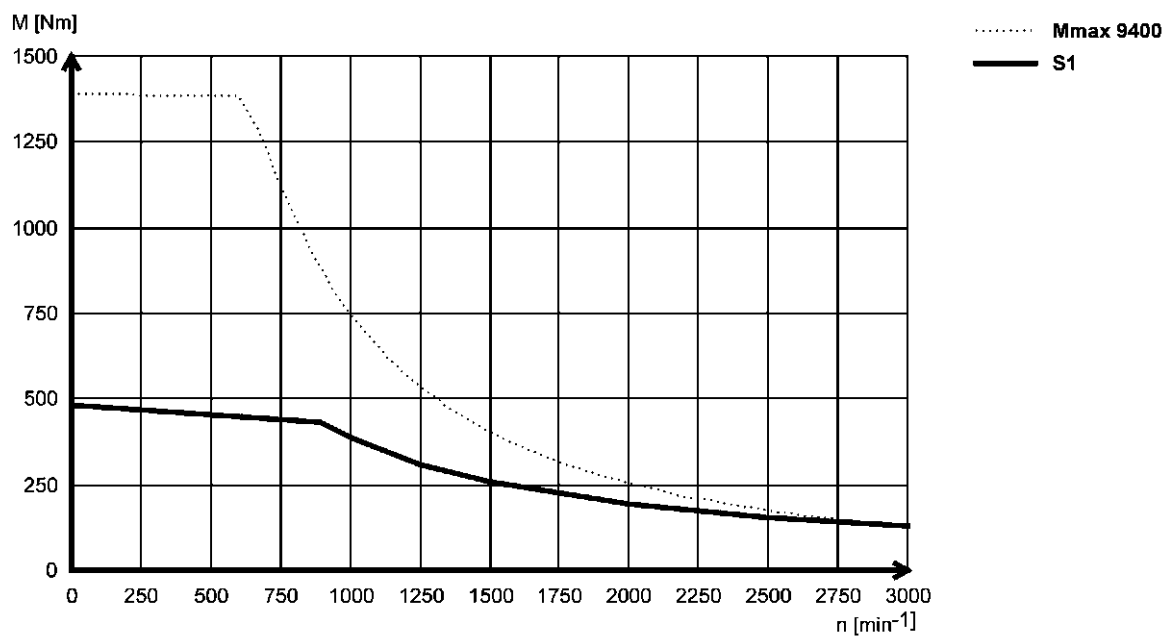
Torque characteristics

Mains connection 3x 400 V

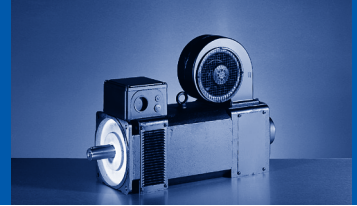
MDFQA160-32, 31, Y



MDFQA160-32, 31, Δ

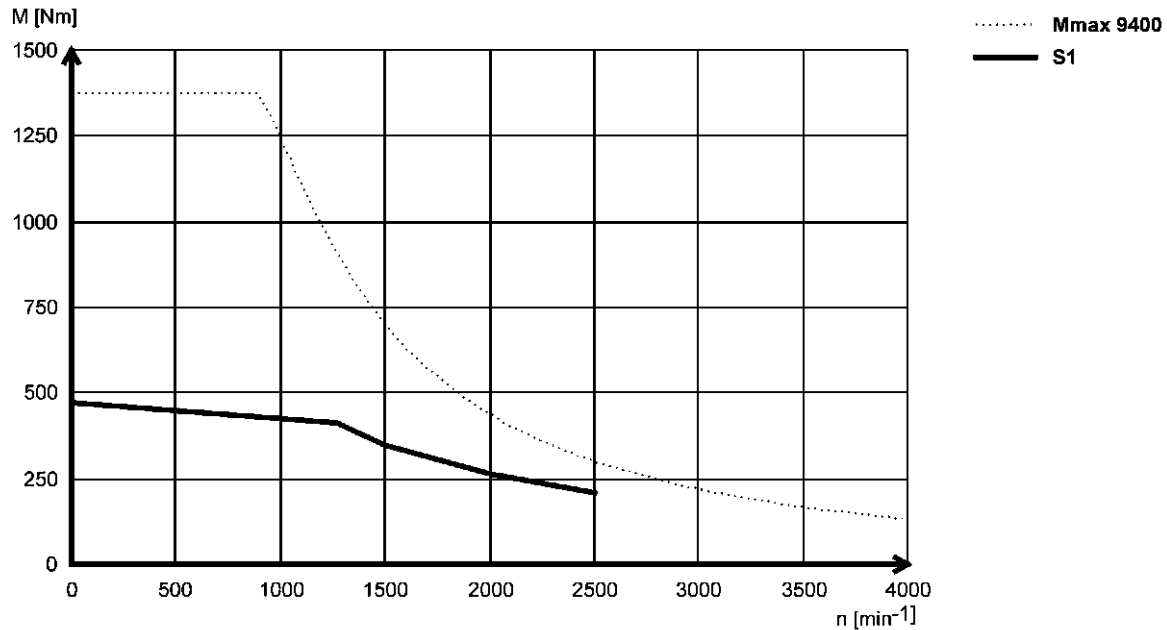


- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.

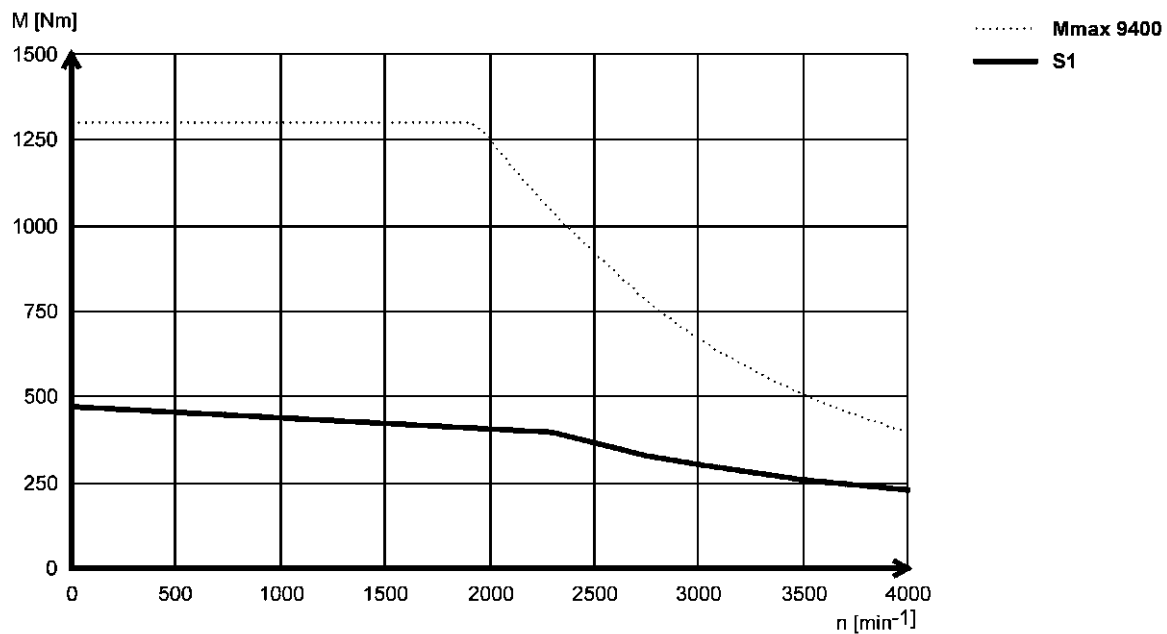


Mains connection 3x 400 V

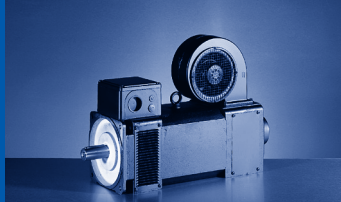
MDFQA160-32, 78, Y



MDFQA160-32, 78, Δ



- Further torque characteristics with Lenze inverters may be found at www.lenze.de/dsc.



MDFQA asynchronous servo motors

Accessories

Holding brakes

The MDFQA asynchronous servo motors can be equipped with integral spring-applied holding brakes. The voltages available for this model are 24 V DC and 205 V DC.

The brakes are active once the supply voltage is switched off (closed-circuit principle). Where the brakes are used purely as holding brakes, there is practically no wear on the friction surfaces.

Caution:

The brakes used are not safety brakes in the sense that a reduction in torque may arise as a result of disruptive factors that cannot be influenced, e.g. oil ingress.

The ohmic voltage drop along the cable must be taken into consideration in long motor supply cables and must be compensated for by a higher voltage at the line input.

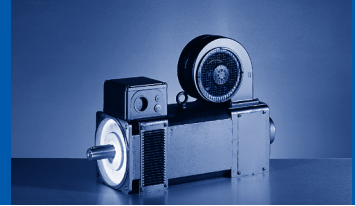
The following applies for Lenze system cables:

$$U[V] = U_B[V] + 0.08 \frac{[V]}{[A] \cdot [m]} \cdot l_g[m] \cdot I_B[A]$$

If no suitable voltage (incorrect value, incorrect polarity) is applied to the brake, the brake will be applied and can be overheated and destroyed by the motor continuing to rotate. The shortest switching times of the brakes are achieved by DC switching of the voltage. A spark suppressor is required to suppress interference and to increase the service life of the relay contacts here.



Spring-applied brake



Holding brake data

	$U_{N,DC}^{(4)}$	$M_N^{(1)}$	$I_N^{(5)}$	J	$t_1^{(2,3)}$	$t_2^{(2)}$	$Q_E^{(6)}$	$S_{hü}$	m
	[V]	[Nm]	[A]	[kgcm ²]	[ms]	[ms]	[J]	[1/h]	[kg]
MDFQA□□160	24	400	4.17	73.0	165	340	80000	19.0	25.4
	205		0.49						

Holding brake data, reinforced design

	$U_{N,DC}^{(4)}$	$M_N^{(1)}$	$I_N^{(5)}$	J	$t_1^{(2,3)}$	$t_2^{(2)}$	$Q_E^{(6)}$	$S_{hü}$	m
	[V]	[Nm]	[A]	[kgcm ²]	[ms]	[ms]	[J]	[1/h]	[kg]
MDFQA□□160	24	600	4.58	200	175	585	120000	15.0	37.2
	205		0.54						

¹⁾ Characteristic torques are related to the relative speed $\Delta n = 100$ rpm.

²⁾ Engagement and disengagement times valid for rated voltage (≈ 90) and protective circuit for brakes with spark suppressors. The times may increase without a protective circuit. The operating times are mean values. Leakage depends on the type of rectifier, the air path and the coil current.

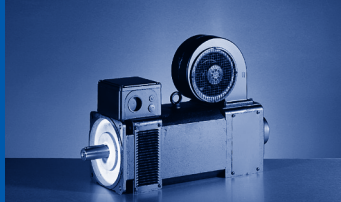
³⁾ Engagement times with DC side switching, in the case of AC side switching t_1 increases by a factor of about 10.

⁴⁾ With 24 V DC brake: smoothed DC voltage, ripple $\leq 1\%$.

With 205 V DC brake: connection to 230 V AC through rectifier.

⁵⁾ The currents are maximum values for a cold brake (data for sizing the power supply). The values for a motor at operating temperature are considerably lower.

⁶⁾ Maximum switching energy per emergency stop with $n = 3000 \text{ min}^{-1}$.



MDFQA asynchronous servo motors

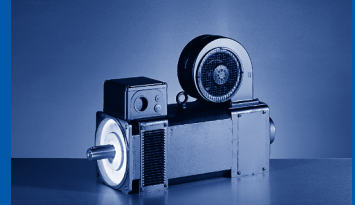
Accessories

Blower data 50 Hz

	Enclosure	Number of phases					
			U_{min}	U_{max}	$U_{N,AC}$	P_N	I_N
			[V]	[V]	[V]	[kW]	[A]
MDFQA□□160	IP23s	3	350	540	400	0.65	1.40

Blower data 60 Hz

	Enclosure	Number of phases					
			U_{min}	U_{max}	$U_{N,AC}$	P_N	I_N
			[V]	[V]	[V]	[kW]	[A]
MDFQA□□160	IP23s	3	350	540	400	0.65	1.40



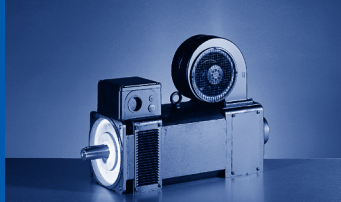
Tailored to meet the requirements of the various applications and necessary accuracies, the following feedback systems are available.

Resolver

Stator-fed resolver with two 90° stator windings and one rotor winding with transformer winding.

Built-on accessories	1)			BS RS
Resolution Angle			[°]	0.80
Accuracy			[°]	-10 ... 10
Absolute positioning				1 revolution
Max. speed	$n_{\max}$		[min ⁻¹]	8000
Max. input voltage DC	$U_{\max}$		[V]	10.0
Max. input frequency	$f_{\max, 1}$		[kHz]	4.00
Ratio Stator / rotor		± 5 %		0.30
Rotor impedance	Z_{ro}		[Ω]	51 + j90
Stator impedance	Z_{so}		[Ω]	102 + j150
Impedance	Z_{rs}		[Ω]	44 + j76
Min. insulation resistance At DC 500 V	R		[MΩ]	10.0
Number of pole pairs				1
Max. angle error			[°]	-10 ... 10
Version Inverter assignment				E94A ECS EVS93

1) → 21 - Product key > built-on accessories



MDFQA asynchronous servo motors

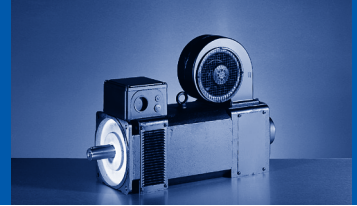
Accessories

Incremental and SinCos absolute value encoder

Encoder type			TTL incremental	SinCos incremental
Built-on accessories	¹⁾		BI IG	
			IG2048-5V-T	IG2048-5V-S
Encoder type			Single turn	
Pulses			2048	
Output signals			TTL 5 V	1 Vss
Interfaces				
Absolute revolution			0	
Resolution Angle ²⁾		[°]	2.60	0.40
Accuracy		[°]	-2 ... 2	-0.8 ... 0.8
Min. input voltage DC	$U_{min,1}$	[V]	4.75	4.50
Max. input voltage DC	U_{max}	[V]	5.25	5.50
Max. speed	n_{max}	[min ⁻¹]	8789	5273
Max. current consumption	I_{max}	[mA]	150	100
Limit frequency	f_{max}	[kHz]	300	180
Version Inverter assignment			E94A ECS EVS93	

¹⁾ → 21 - Product key > built-on accessories

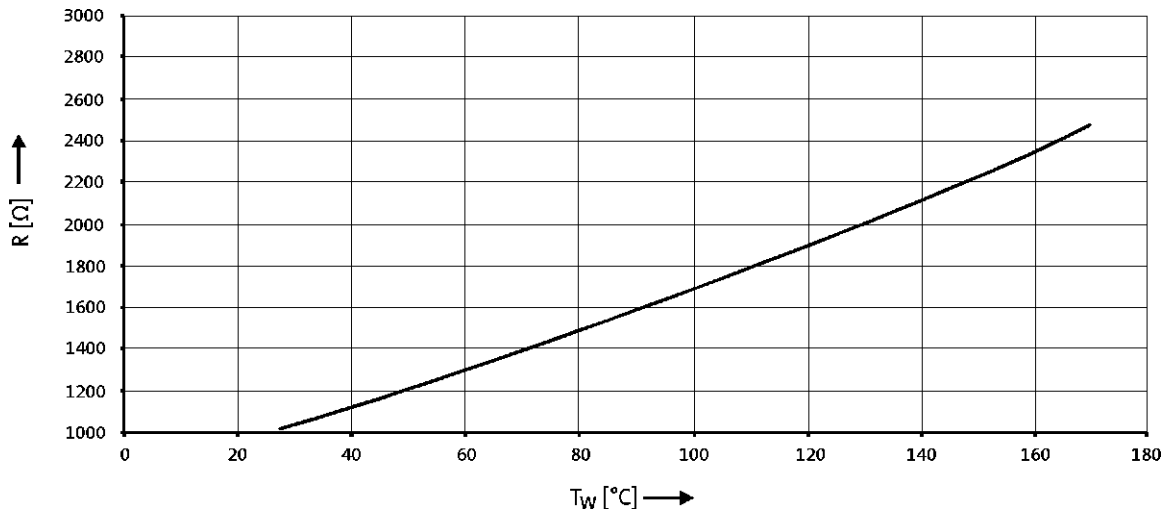
²⁾ Dependent on inverter.



Temperature sensor

The thermal sensors (1x KTY 83-110) continuously monitor the motor temperature. The temperature signal is transmitted over the system cable of the feedback system to the servo controller.

This means that the temperature of the motor is determined with great accuracy in the permitted operating range and at the same time the overtemperature response configured in the controller is executed in the event of overtemperature in one of the winding phases.



- If the detector is supplied with a measured current of 1 mA, the above relationship between the temperature and the resistance applies.



Blower DNG6-35 with filter

Blower DNG6-35 without filter

DIN332-DS M20

1x M16x1,5
2x M63x1,5

Ø300_{H6}

Z

X

Ø350

Ø400

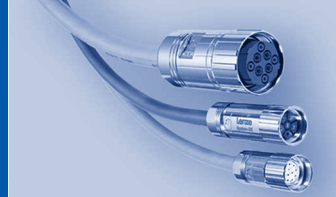
Ø18

brake connector

encoder connector

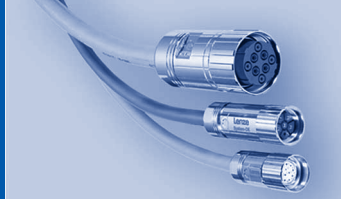
NN	k	[mm]	1000
RS	k	[mm]	1000
IG (ITD21 / ITD22)	k	[mm]	1000
IG (CDD50)	k	[mm]	1000
ERG	k	[mm]	1000

BR	k	[mm]	1000
BS	k	[mm]	1000
BI (ITD21 / ITD22)	k	[mm]	1000
BI (CDD50)	k	[mm]	1000
BA	k	[mm]	1000



The motor cable is selected from the cable cross-sections available using the socket identifier M01/ M02... (product key system cables – cable end).

- ▶ The sockets and motors are assigned on the following pages.
- ▶ The cable cross-sections available may be found in the system cables product key.
- ▶ Connection via terminal boxes is not possible on the MCS06 and MDSKS036 synchronous servo motors.
- ▶ The cross-section of a cable and its permissible current load must always be checked when a cable is connected to a motor through a terminal box.
- ▶ All possible combinations are described in detail in the System cables manual.
- ▶ The manual may be found at www.lenze.de -Services & Downloads - Technical documentation - Library - X1_Accessories - X15_External accessories.



System cables

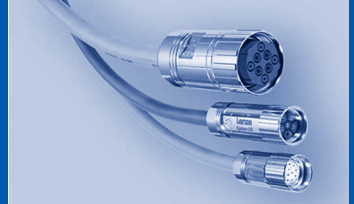
Assignment of socket to servo motor

MCS synchronous servo motors

	Power / brake		Blower	
	Screw cap socket	SpeedTec socket	Screw cap socket	SpeedTec socket
MCS06	M01	M04		
MCS09				
MCS12D17	M01	M04	L02	L04
MCS12D20				
MCS12D35			L02	L04
MCS12D41				
MCS12H14			L02	L04
MCS12H15				
MCS12H30				
MCS12H34			L02	L04
MCS12H35				
MCS12L17			L02	L04
MCS12L20				
MCS12L39			L02	L04
MCS12L41				
MCS14D14			L02	L04
MCS14D15				
MCS14D30			L02	L04
MCS14D36				
MCS14H12			L02	L04
MCS14H15				
MCS14H28	M02 M03	M05 M06	L02	L04
MCS14H32	M01	M04		
MCS14L14			L02	L04
MCS14L15				
MCS14L30	M02 M03	M05 M06	L02	L04
MCS14L32				
MCS14P11	M01	M04	L02	L04
MCS14P14				
MCS14P26	M02 M03	M05 M06	L02	L04
MCS14P32				

System cables

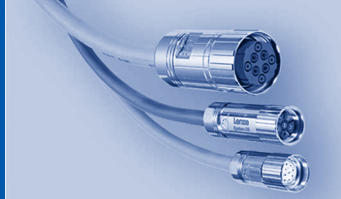
Assignment of socket to servo motor



	Power / brake		Blower	
	Screw cap socket	SpeedTec socket	Screw cap socket	SpeedTec socket
MCS19F12	M01	M04	L02	L04
MCS19F14				
MCS19F29	M02 M03	M05 M06	L02	L04
MCS19F30				
MCS19J12	M01	M04	L02	L04
MCS19J14				
MCS19J29	M03	M06	L02	L04
MCS19J30	M02 M03	M05 M06		
MCS19P12			L02	L04
MCS19P14	M01	M04		
MCS19P29	M03	M06	L02	L04
MCS19P30				

MD□KS synchronous servo motors

	Power / brake		Blower	
	Screw cap socket	SpeedTec socket	Screw cap socket	SpeedTec socket
MDSKS□□036	M01	M04		
MDSKS□□056				
MDSKS□□071				
MDFKS□□071			L01	L03



System cables

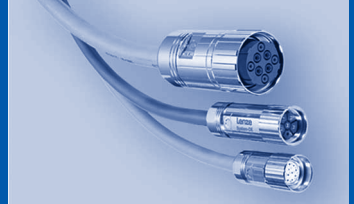
Assignment of socket to servo motor

MCA asynchronous servo motors

	Power / brake		Blower	
	Screw cap socket	SpeedTec socket	Screw cap socket	SpeedTec socket
MCA10I40	M01	M04		
MCA13I34			L02	L04
MCA13I41				
MCA14L16			L02	L04
MCA14L20				
MCA14L35			L02	L04
MCA14L41				
MCA17N17			L02	L04
MCA17N23				
MCA17N35			L02	L04
MCA17N41				
MCA19S17	M02	M05	L02	L04
MCA19S23				
MCA19S35	M02 M03	M05 M06	L02	L04
MCA19S42				
MCA20X14...2F□□	M03	M06	L02	L04
MCA20X29...2F□□				
MCA21X17	M02 M03	M05 M06		
MCA21X25	M02	M05		
MCA21X35	M03	M06	L02	L04
MCA21X42	M02	M05		
	M03	M06		

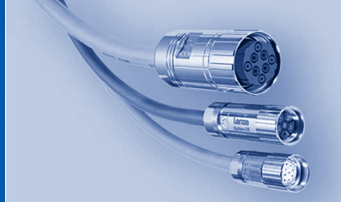
MQA asynchronous servo motors

	Power / brake		Blower	
	Screw cap socket	SpeedTec socket	Screw cap socket	SpeedTec socket
MQA20L14...2F□□	M02	M05		
MQA20L29...2F□□	M03	M06		



Feedback

	Feedback	
	Screw cap socket	SpeedTec socket
AM1024-8V-H	F02	F06
AM2048-5V-E	F03	F07
AM32-5V-E		
AS1024-8V-H	F02	F06
AS2048-5V-E	F03	F07
IG2048-5V-S	F02	F06
IG2048-5V-T		
IG4096-5V-T	F04	F08
IK2048-5V-T	F02	F06
IK4096-5V-T	F04	F08
RS0	F01	F05



System cables

Product key

Motor connecting cables

Product series	Cable type	Connection cable	Cable length in decimetres	Cable end on the motor side (socket)	Cable end on the controller side
E Y P Motor		A	0 0 0 3 Minimum length 5 0 0 0 Maximum length		
Fixed installation	0 0 0 3 1.0 mm ²			M 0 1 Screw plug M 0 4 SpeedTec	A 0 0 Without plug-in connector
	0 0 0 4 1.5 mm ²				
	0 0 0 5 2.5 mm ²				
	0 0 0 5 2.5 mm ²			M 0 2 Screw plug M 0 5 SpeedTec	A 0 0 Without plug-in connector
	0 0 0 6 4.0 mm ²				
	0 0 0 7 6.0 mm ²			M 0 3 Screw plug M 0 6 SpeedTec	A 0 0 Without plug-in connector
	0 0 0 8 10.0 mm ²				
	0 0 0 9 16.0 mm ²				
Trailing cable	0 0 1 0 1.0 mm ²			M 0 1 Screw plug M 0 4 SpeedTec	A 0 0 Without plug-in connector
	0 0 1 1 1.5 mm ²				
	0 0 1 2 2.5 mm ²				
	0 0 1 2 2.5 mm ²			M 0 2 Screw plug M 0 5 SpeedTec	A 0 0 Without plug-in connector
	0 0 1 3 4.0 mm ²				
	0 0 1 4 6.0 mm ²			M 0 3 Screw plug M 0 6 SpeedTec	A 0 0 Without plug-in connector
	0 0 1 5 10.0 mm ²				
	0 0 1 6 16.0 mm ²				



Motor connecting cables

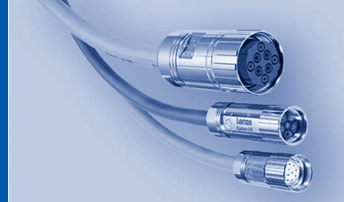
Product series	Cable type	Cable without plug-in connector	Cable length in decimetres	Cable end on the motor side	Cable end on the controller side
E Y P Motor		Y	0 0 0 3 5 0 0 0 Minimum length Maximum length		
Fixed installation	0 0 0 3 0 0 0 4 0 0 0 5 0 0 0 6 0 0 0 7 0 0 0 8 0 0 0 9	1.0 mm ² 1.5 mm ² 2.5 mm ² 4.0 mm ² 6.0 mm ² 10.0 mm ² 16.0 mm ²		A 0 0 Without plug-in connector	A 0 0 Without plug-in connector
Trailing cable	0 0 1 0 0 0 1 1 0 0 1 2 0 0 1 3 0 0 1 4 0 0 1 5 0 0 1 6	1.0 mm ² 1.5 mm ² 2.5 mm ² 4.0 mm ² 6.0 mm ² 10.0 mm ² 16.0 mm ²		A 0 0 Without plug-in connector	A 0 0 Without plug-in connector

System cables

Product key

Feedback connecting cables

Product series	Cable type	Connection cable	Cable length in decimetres	Cable end on the motor side (socket)	Cable end on the controller side	For use with
E Y		A				
F			0 0 0 3 5 0 0 0			
Feedback			Minimum length Maximum length			
Fixed installation	0 0 1 7	Resolver		F 0 1 Screw plug F 0 5 SpeedTec	S 0 1 Sub-D plug S 0 2 Sub-D plug A 0 0 Without plug-in connector	EV593..., ECS... E94xx...
				A 0 0 Without plug-in connector	S 0 1 Sub-D plug S 0 2 Sub-D plug	EV593..., ECS... E94xx...
	0 0 2 1	Sin/cos encoder (EnDat)		F 0 3 Screw plug F 0 7 SpeedTec	S 0 3 Sub-D plug A 0 0 Without plug-in connector	E94xx...
				A 0 0 Without plug-in connector	S 0 3 Sub-D plug	E94xx...
Trailing cable	0 0 2 0	Resolver		F 0 1 Screw plug F 0 5 SpeedTec	S 0 4 Sub-D plug S 0 5 Sub-D plug A 0 0 Without plug-in connector	EV593..., ECS... E94xx...
				A 0 0 Without plug-in connector	S 0 4 Sub-D plug S 0 5 Sub-D plug	EV593..., ECS... E94xx...
	0 0 2 2	Sin/cos encoder (EnDat)		F 0 3 Screw plug F 0 7 SpeedTec	A 0 0 Without plug-in connector	



Feedback connecting cables

Product series	Cable type	Connection cable	Cable length in decimetres	Cable end on the motor side (socket)	Cable end on the controller side	For use with
E Y		A				
	F		0 0 0 3 5 0 0 0			
	Feedback		Minimum length Maximum length			
Fixed installation	0 0 1 8	Sin/cos encoder (Hiperface) and incremental encoder		F 0 2 Screw plug F 0 6 SpeedTec	W 0 2 Sub-D plug S 0 3 Sub-D plug A 0 0 Without plug-in connector	EV593..., ECS... EVF93... E94xx... E82xV..., E84xV...
	0 0 2 3	Renco R35i incremental encoder		F 0 4 Screw plug F 0 8 SpeedTec	S 0 6 Sub-D plug A 0 0 Without plug-in connector	E94P...
	0 0 1 9	Sin/cos encoder (Hiperface) and incremental encoder		F 0 2 Screw plug F 0 6 SpeedTec	A 0 0 Without plug-in connector	E82xV..., E84xV...
	0 0 2 4	Renco R35i incremental encoder		F 0 4 Screw plug F 0 8 SpeedTec	A 0 0 Without plug-in connector	

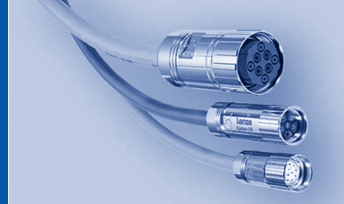


System cables

Product key

Feedback connecting cables

Product series	Cable type	Cable without plug-in connector	Cable length in decimetres	Cable end on the motor side	Cable end on the controller side
E Y		Y			
F			0 0 0 3 5 0 0 0		
Feedback			Minimum length Maximum length		
Fixed installation	0 0 1 7	Resolver		A 0 0 Without plug-in connector	A 0 0 Without plug-in connector
	0 0 1 8	Sin/cos encoder (Hiperface) and incremental encoder			
	0 0 2 1	Sin/cos encoder (EnDat)			
	0 0 2 3	Renco R35i incremental encoder			
Trailing cable	0 0 2 0	Resolver		A 0 0 Without plug-in connector	A 0 0 Without plug-in connector
	0 0 1 9	Sin/cos encoder (Hiperface) and incremental encoder			
	0 0 2 2	Sin/cos encoder (EnDat)			
	0 0 2 4	Renco R35i incremental encoder			



Blower connecting cables

Product series	Cable type	Connection cable	Cable length in decimetres	Cable end on the motor side (socket)	Cable end (control cabinet)	For use with
E Y L Blower		A	0 0 0 3 Minimum length 5 0 0 0 Maximum length			
Fixed installation	0 0 0 1			L 0 1 Screw plug L 0 3 SpeedTec	A 0 0 Without plug-in connector	MDFKS
				L 0 2 Screw plug L 0 4 SpeedTec	A 0 0 Without plug-in connector	MCA, MCS, MDFQA, MDFMA
Trailing cable	0 0 0 2			L 0 1 Screw plug L 0 3 SpeedTec	A 0 0 Without plug-in connector	MDFKS
				L 0 2 Screw plug L 0 4 SpeedTec	A 0 0 Without plug-in connector	MCA, MCS, MDFQA, MDFMA



System cables

Product key

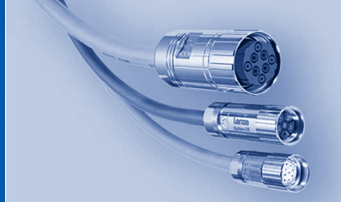
Blower connecting cables

Product series	Cable type	Cable without plug-in connector	Cable length in decimetres	Cable end on the motor side	Cable end (control cabinet)
E Y L Blower		Y	0 0 0 3 5 0 0 0 Minimum length Maximum length		
Fixed installation	0 0 0 1			A 0 0 Without plug-in connector	A 0 0 Without plug-in connector
Trailing cable	0 0 0 2			A 0 0 Without plug-in connector	A 0 0 Without plug-in connector



Motor extensions

Product series	Cable type	Extension cable	Cable length in decimetres	Cable end on the motor side (socket)	Cable end on the controller side (pin)
E Y P Motor		V	0 0 0 3 Minimum length 5 0 0 0 Maximum length		
Fixed installation	0 0 0 3	1.0 mm ²		M 0 1 Screw plug	P 0 4 SpeedTec
	0 0 0 4	1.5 mm ²		M 0 4 SpeedTec	
	0 0 0 5	2.5 mm ²		A 0 0 Without plug-in connector	
	0 0 0 5	2.5 mm ²		M 0 2 Screw plug	P 0 5 SpeedTec
	0 0 0 6	4.0 mm ²		M 0 5 SpeedTec	
				A 0 0 Without plug-in connector	
	0 0 0 7	6.0 mm ²		M 0 3 Screw plug	P 0 6 SpeedTec
	0 0 0 8	10.0 mm ²		M 0 6 SpeedTec	
	0 0 0 9	16.0 mm ²		A 0 0 Without plug-in connector	
Trailing cable	0 0 1 0	1.0 mm ²		M 0 1 Screw plug	P 0 4 SpeedTec
	0 0 1 1	1.5 mm ²		M 0 4 SpeedTec	
	0 0 1 2	2.5 mm ²		A 0 0 Without plug-in connector	
	0 0 1 2	2.5 mm ²		M 0 2 Screw plug	P 0 5 SpeedTec
	0 0 1 3	4.0 mm ²		M 0 5 SpeedTec	
				A 0 0 Without plug-in connector	
	0 0 1 4	6.0 mm ²		M 0 3 Screw plug	P 0 6 SpeedTec
	0 0 1 5	10.0 mm ²		M 0 6 SpeedTec	
	0 0 1 6	16.0 mm ²		A 0 0 Without plug-in connector	

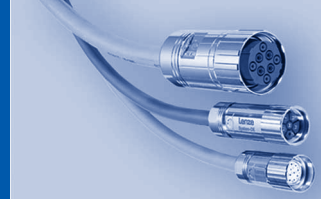


System cables

Product key

Feedback extensions

Product series	Cable type	Extension cable	Cable length in decimetres	Cable end on the motor side (socket)	Cable end on the controller side (pin)
E Y		V			
F Feedback			0 0 0 3 Minimum length 5 0 0 0 Maximum length		
Fixed installation	0 0 1 7	Resolver		F 0 1 Screw plug F 0 5 SpeedTec A 0 0 Without plug-in connector	G 0 6 SpeedTec
	0 0 2 1	Sin/cos encoder (EnDat)		F 0 3 Screw plug F 0 7 SpeedTec A 0 0 Without plug-in connector	G 0 8 SpeedTec
Trailing cable	0 0 2 0	Resolver		F 0 1 Screw plug F 0 5 SpeedTec A 0 0 Without plug-in connector	G 0 6 SpeedTec
	0 0 2 2	Sin/cos encoder (EnDat)		F 0 3 Screw plug F 0 7 SpeedTec A 0 0 Without plug-in connector	G 0 8 SpeedTec



Feedback extensions

Product series	Cable type	Extension cable	Cable length in decimetres	Cable end on the motor side (socket)	Cable end on the controller side (pin)
E Y		V			
F Feedback			0 0 0 3 Minimum length 5 0 0 0 Maximum length		
Fixed installation	0 0 1 8	Sin/cos encoder (Hiperface) and incremental encoder		F 0 2 Screw plug F 0 6 SpeedTec A 0 0 Without plug-in connector	G 0 7 SpeedTec
	0 0 2 3	Renco R35i incremental encoder		F 0 4 Screw plug F 0 8 SpeedTec A 0 0 Without plug-in connector	G 0 9 SpeedTec
Trailing cable	0 0 1 9	Sin/cos encoder (Hiperface) and incremental encoder		F 0 2 Screw plug F 0 6 SpeedTec A 0 0 Without plug-in connector	G 0 7 SpeedTec
	0 0 2 4	Renco R35i incremental encoder		F 0 4 Screw plug F 0 8 SpeedTec A 0 0 Without plug-in connector	G 0 9 SpeedTec

System cables

Product key

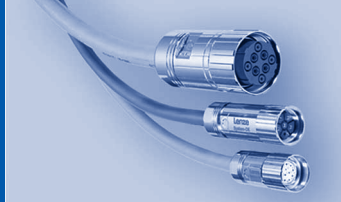
Separate fan extensions

Product series	Cable type	Extension cable	Cable length in decimetres	Cable end on the motor side (socket)	Cable end (pin)	For use with
E Y		V				
L Blower			0 0 0 3 5 0 0 0			
			Minimum length Maximum length			
Fixed installation	0 0 0 1			L 0 1 Screw plug L 0 3 SpeedTec A 0 0 Without plug-in connector	J 0 3 SpeedTec	MDFKS
Trailing cable	0 0 0 2			L 0 2 Screw plug L 0 4 SpeedTec A 0 0 Without plug-in connector L 0 1 Screw plug L 0 3 SpeedTec A 0 0 Without plug-in connector L 0 2 Screw plug L 0 4 SpeedTec A 0 0 Without plug-in connector	J 0 4 SpeedTec J 0 3 SpeedTec J 0 4 SpeedTec	MCA, MCS, MDFQA, MDFMA MDFKS MCA, MCS, MDFQA, MDFMA

System cables

Product key





System cables

Product key

System cables

Product key



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"Our customers come first. Customer satisfaction is what motivates us. By thinking in terms of how we can add value for our customers we can increase productivity through reliability."



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