L-force catalogue

Automation systems
Drive solutions

Controls
Inverters
Motors
Gearboxes
Engineering Tools

Motors: MCA asynchronous servo motors

Gearboxes: g700-P planetary gearbox

Lenze
As easy as that.

Contents of the L-force catalogue

Selected portfolio

Additional portfolio

Lenze makes many things easy for you.

With our motivated and committed approach, we work together with you to create the best possible solution and set your ideas in motion - whether you are looking to optimise an existing machine or develop a new one. We always strive to make things easy and seek perfection therein. This is anchored in our thinking, in our services and in every detail of our products. It's as easy as that!

1

Developing ideas

Are you looking to build the best machine possible and already have some initial ideas? Then get these down on paper together with us, starting with small innovative details and stretching all the way to completely new machines. Working together, we will develop an intelligent and sustainable concept that is perfectly aligned with your specific requirements.

2

Drafting concepts

We see welcome challenges in your machine tasks, supporting you with our comprehensive expertise and providing valuable impetus for your innovations. We take a holistic view of the individual motion and control functions here and draw up consistent, end-to-end drive and automation solutions for you - keeping everything as easy as possible and as extensive as necessary.

3

Implementing solutions

Our easy formula for satisfied customers is to establish an active partnership with fast decision-making processes and an individually tailored offer. We have been using this simple principle to meet the ever more specialised customer requirements in the field of mechanical engineering for many years.

4

Manufacturing machines

Functional diversity in perfect harmony: as one of the few full-range providers in the market, we can provide you with precisely those products that you actually need for any machine task – no more and no less. Our L-force product portfolio, a consistent platform for implementing drive and automation tasks, is invaluable in this regard.

5

Ensuring productivity

Productivity, reliability and new performance peaks on a daily basis – these are our key success factors for your machine. After delivery, we offer you cleverly devised service concepts to ensure continued safe operation. The primary focus here is on technical support, based on the excellent application expertise of our highly-skilled and knowledgeable after-sales team.

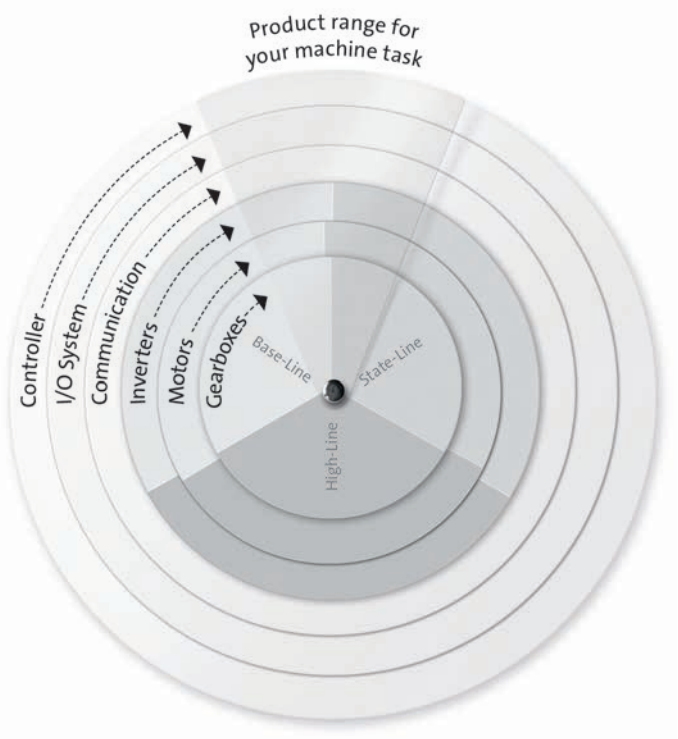
A matter of principle: the right products for every application.

Lenze's extensive L-force product portfolio follows a very simple principle. The functions of our finely scaled products are assigned to the three lines Base-Line, State-Line or High-Line.

But what does this mean for you? It allows you to quickly recognise which products represent the best solution for your own specific requirements.

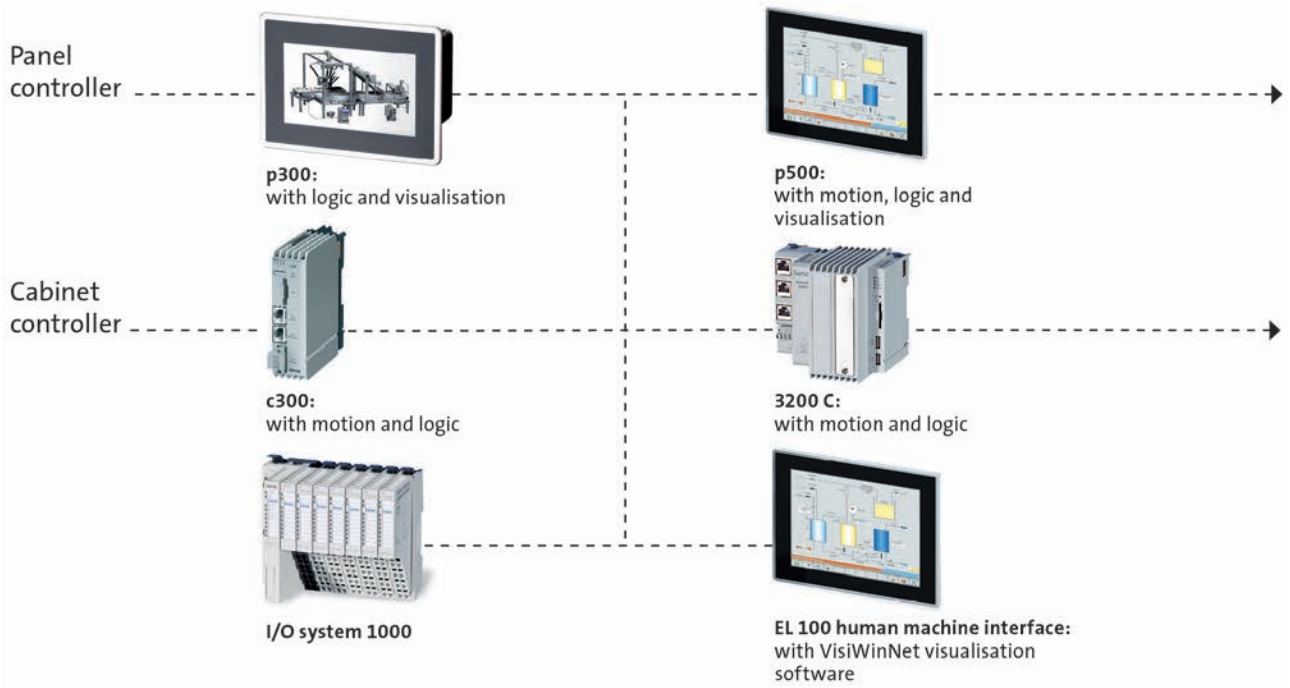
Powerful products with a major impact:
- Easy handling
- High quality and durability
- Reliable technologies in tune with the latest developments

Lenze products undergo the most stringent testing in our own laboratory. This allows us to ensure that you will receive consistently high quality and a long service life. In addition to this, five logistics centres ensure that the Lenze products you select are available for quick delivery anywhere across the globe. It's as easy as that!

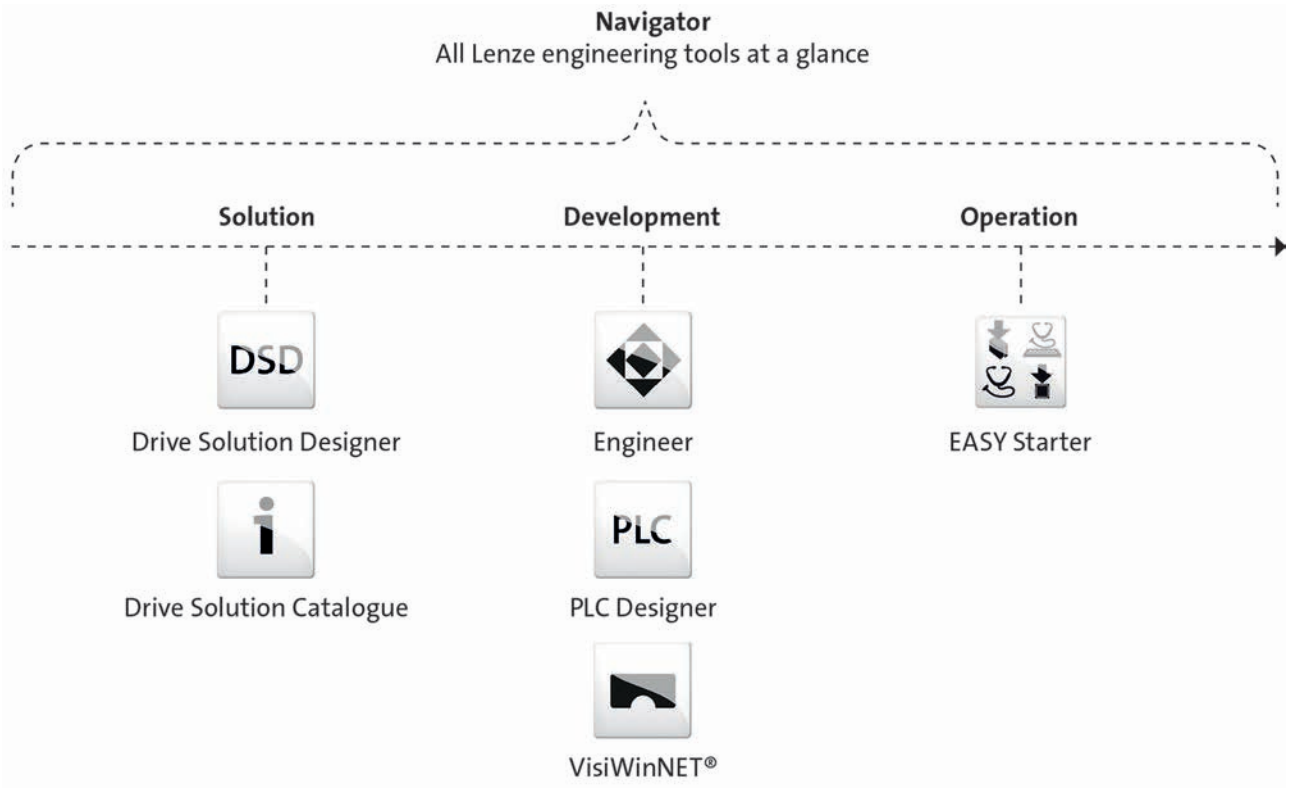


L-force product portfolio

Controls

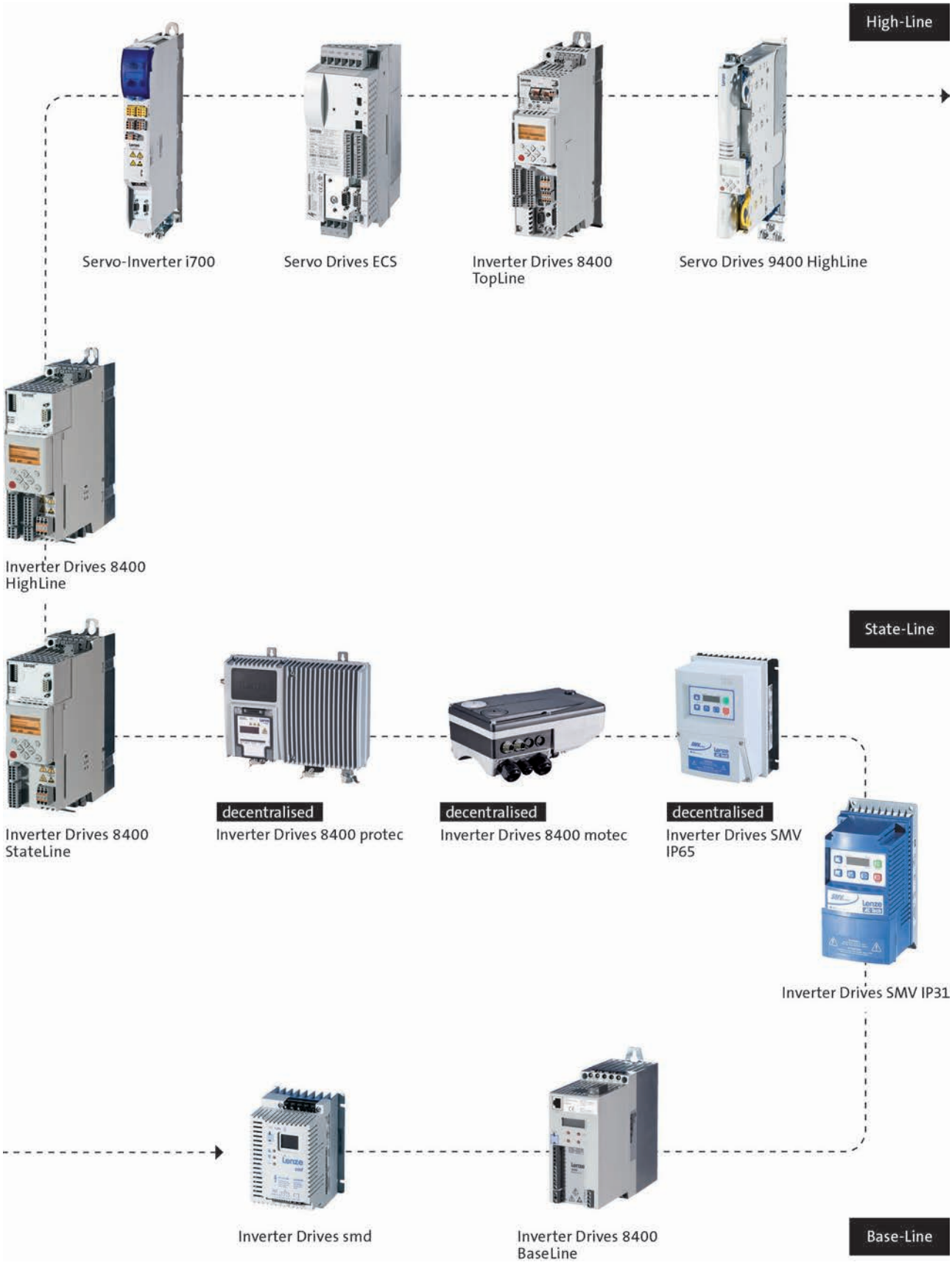


Engineering Tools



L-force product portfolio

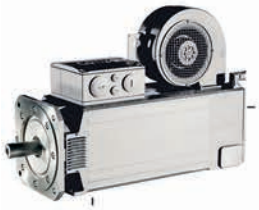
Inverters



L-force product portfolio

Motors

High-Line



MQA asynchronous servo motors

SDSGS synchronous servo motors

MDXKS synchronous servo motors

Synchronous servo motors MCS

Asynchronous servo motors MCA

Asynchronous servo motors SDSGA

State-Line

MF three-phase AC motors

MH three-phase AC motors

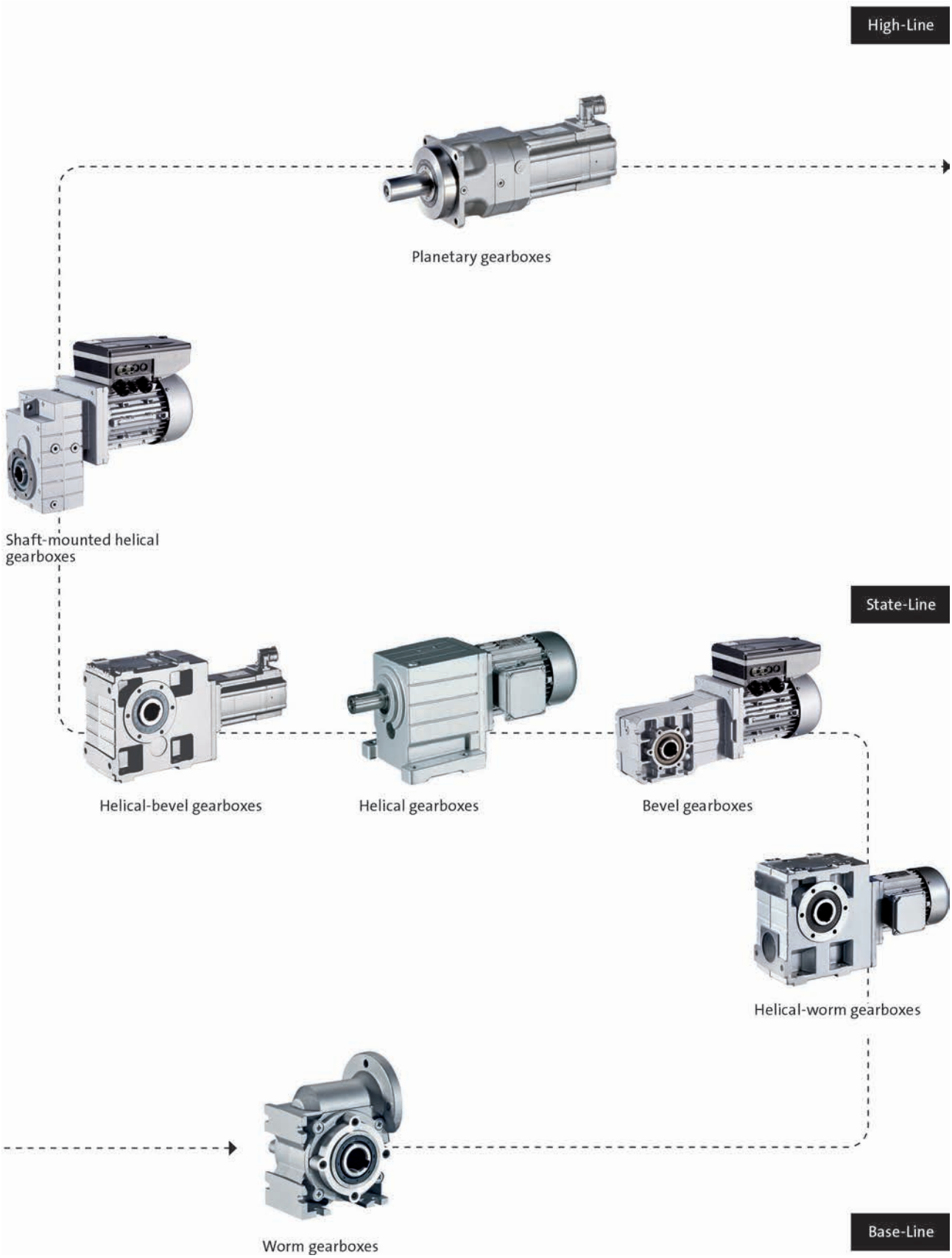
MD three-phase AC motors

Basic MD/MH three-phase AC motors

Base-Line

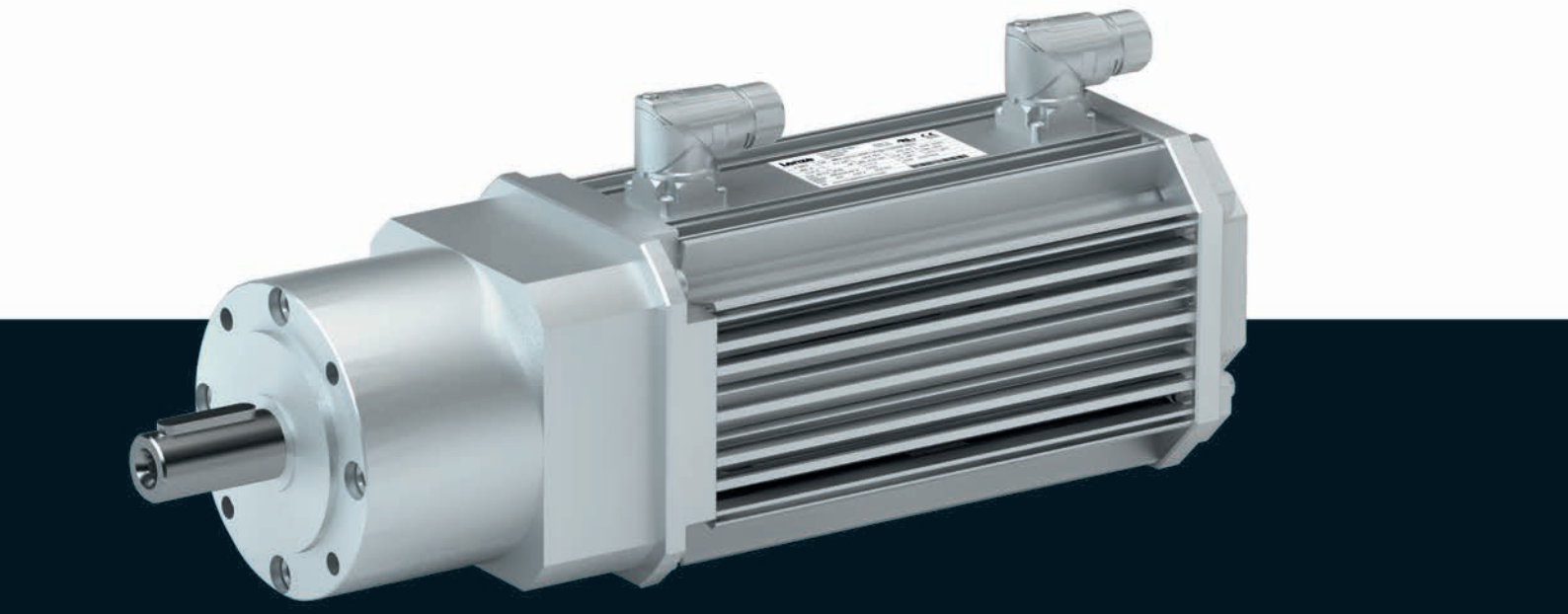
L-force product portfolio

Gearboxes



g700-P planetary-geared motors

12 ... 647 Nm (asynchronous servo motors)



g700-P planetary geared motors

Contents

g700-P planetary geared motors

Contents

List of abbreviations

c		Load capacity
i		Ratio
J	[kgcm²]	Moment of inertia
m	[kg]	Mass
M_2	[Nm]	Output torque
$M_{2, max}$	[Nm]	Max. output torque
$n_{2, eto}$	[r/min]	Transition speed
$n_{2, th}$	[r/min]	Thermal limit speed

CCC	China Compulsory Certificate
CE	Communauté Européenne
CSA	Canadian Standards Association
cURus	Combined certification marks of UL for the USA and Canada
DIN	Deutsches Institut für Normung e.V.
EMC	Electromagnetic compatibility
EN	European standard
GOST	Certificate for Russian Federation
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 (Association of German Electrical Engineers)

g700-P planetary geared motors

General information

Product information

In combination with asynchronous servo motors, our planetary gearbox form a compact and powerful drive unit. Numerous options at the input end provide for the drive to be easily and precisely adapted to your application.

The planetary gearbox g700 is the ideal solution for demanding and dynamic tasks. With its high reliability, long service life and outstanding scalability, it provides everything you need to manage demanding machine tasks.

Versions

- High input speed possible Max. input speed 18000 rpm
- Wide variety of ratios i= 3...512 in 24 ratios
- High rated torque bandwidth 20 ... 800 Nm in five sizes
- Lifetime lubrication
- Suitable for any mounting position, hence only one variant
- With MCA asynchronous servo motors, rated torque: 2 Nm ... 61.4 Nm

The product name

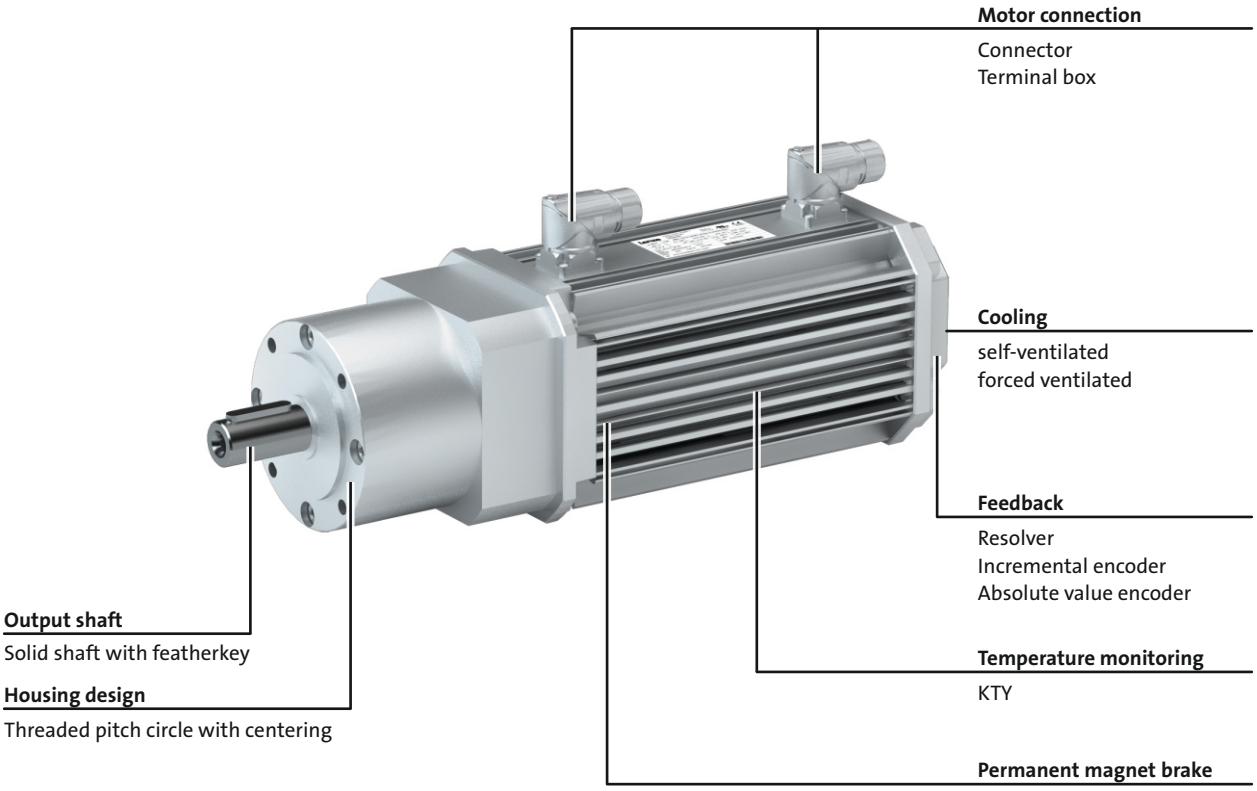
Gearbox type	Product range		Design	Rated torque [Nm]	Product
Planetary gearbox	g700	-	P	20	g700-P20
				44	g700-P44
				130	g700-P130
				260	g700-P260
				800	g700-P800

6.1

Equipment

Overview

The equipment includes all the options available as standard and all the built-on accessories of the product.



The gearbox kit

Geared motor

Product	g700-P130	g700-P260	g700-P800
Motor type	Asynchronous servo motor		
Servo motor			
2.0 Nm	MCA10		
4.0 - 6.3 Nm		MCA13	
5.4 - 12 Nm		MCA14	
9.5 - 21 Nm			MCA17
12 - 36 Nm			MCA19
17 - 61 Nm			
Technical data			
Output torque	See selection table		
Output speed	See selection table		
Ratio	See selection table		
Load capacity	See selection table		
Moment of inertia	See selection table		
Mounting position			
Standard	Any		
Colour	Primed Paint in various corrosion-protection designs in accordance with RAL colours		
Surface and corrosion protection	Without OKS(uncoated) OKS-G (primed) OKS-S (small) OKS-M (medium) OKS-L (large)		

The gearbox kit

Motor details

Product	MCA					
	10I40	13I34 13I41	14L16 14L20 14L35 14L41	17N17 17N23 17N35 17N41	19S17 19S23 19S35 19S42	21X17 21X25 21X35 21X42
Connection type	Plug connectors Terminal box					
Permanent magnet holding brake						
Rated torque [Nm]	3.3	12	15	24	46	88
Brake voltage [V]	DC 24 AC 230					
Feedback	With absolute value encoder With incremental encoder With resolver					
Cooling	Self-ventilated	Self-ventilated Forced-ventilated				
Temperature monitoring	KTY83-110 thermal detector					
Approval	cURus GOST_R UkrSepro					
Degree of protection	IP54 IP65					

► Further information and installation feasibilities can be found in the Motors chapter.

The gearbox kit

Motor details

Connection type

Plug connectors

Terminal box

Cooling: self-ventilated

With resolver

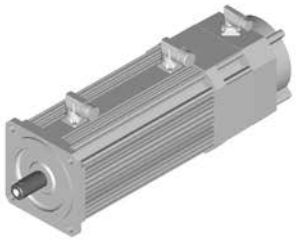
With permanent magnet brake

With feedback
With feedback and permanent magnet brake

Cooling: forced ventilated

With resolver

With permanent magnet brake



With feedback
With feedback and permanent magnet brake

The gearbox kit

Gearbox details

Product					
	g700-P20	g700-P44	g700-P130	g700-P260	g700-P800
Driven shaft					
Solid shaft with featherkey [mm]	10x23	14x30	20x36	25x50	40x80
Design	Standard				
Gasket	NBR				
Bearing	Standard				
Housing					
Housing version	Without foot with centering				
Output flange					
flange diameter [mm]	40	60	80	115	160
Lubricant					
Type	Klüberplex BEM34-132				
Breather element	Without				
Backlash					
Backlash	Standard				

► Further information and installation feasibilities can be found in the Gearboxes chapter.

The gearbox kit

Gearbox details

Solid shaft
 With centering

Dimensioning

General information about the data provided in this catalogue

The powers, torques and speeds specified in this catalogue are rounded values and are valid under the following conditions:

- Operating time/day = 8 h (100% OT)
- Duty class I for up to 10 switching operations/h
- Mounting positions and designs in this catalogue
- Standard lubricant
- T_{amb} = 30 °C for gearboxes,
  T_{amb} = 40 °C for motors (in accordance with EN 60034)
- Site altitude < = 1000 m amsl
- The selection tables provide the permissible mechanical powers and torques. For notes on the thermal power limit, see chapter drive dimensioning.
- The rated power specified for motors and geared motors applies to operating mode S1 (in accordance with EN 60034).

Under different operating conditions, the values obtained may vary from those listed here.
In the case of extreme operating conditions, please consult your Lenze sales office.

Dimensioning

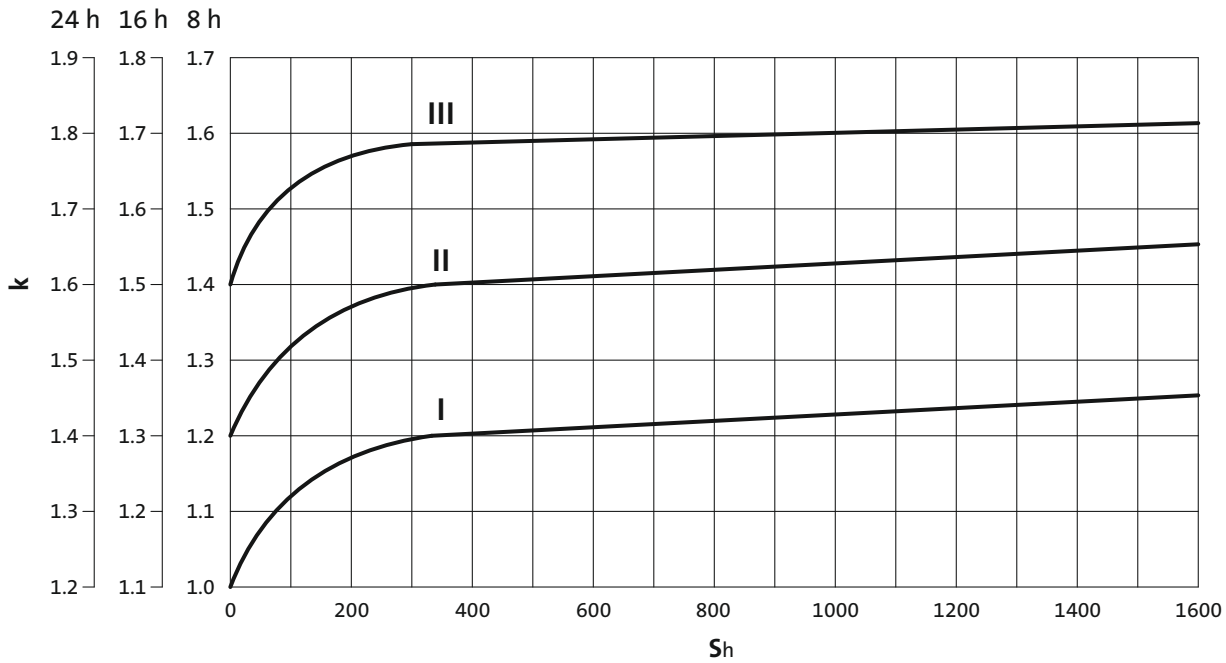
Load capacity and application factor

Load capacity c of gearbox
Rated value for the load capacity of Lenze geared motors.
- c is the ratio of the permissible rated torque of the gearbox to the rated torque supplied by the drive component (e.g. the built-in Lenze motor).
- The value of c must always be greater than the value of the application factor k calculated for the application.

Application factor k (according to DIN 3990)
Takes into account the influence of temporally variable loads which are actually present during the anticipated operating time of gearboxes and geared motors.
k is determined by:
- the type of load
- the load intensity
- temporal influences

Duty class	Load type
I	Smooth operation, small or light jolts
II	Uneven operation, average jolts
III	Uneven operation, severe jolts and/or alternating load

Application factor k



► S_h= switchings/h

Dimensioning

Weights

The values given in the tables consider the following gearbox/motor combination:
- Gearbox with solid shaft including lubricant amount
- Motor with feedback

For versions deviating from this, additional weights have to be considered.

The respective values can be found for:
- Geared motors with feedback
  > Chapter: Geared motors/Technical data
- Motor options: Brake
  > Chapter: Motors/Accessories

Moments of inertia

The given moments of inertia of the gearbox refer to the drive shaft. The influence of the ratio (i^2) has been considered in the data.

When the total moment of inertia of the geared motor is calculated, the values of the geared motors and the brake have to be added.

The respective values can be found for:
- Geared motors with feedback
  > Chapter: Geared motors/Technical data/Selection tables
- Motor options: Brake
  > Chapter: Motors/Accessories

Selection tables, notes

Notes on the selection tables

The selection tables show the available combinations of gearbox type, number of stages, ratio and motor. They are used only to provide basic orientation.
The following legend indicates the structure of the selection tables.

Number of the gear stage of the gearbox

2-stage gearboxes

Inverter operation						i	Product		Cooling	
$M_{2,max}$ [Nm]	$n_{2,th}$ [r/min]	M_2 [Nm]	$n_{2,eto}$ [r/min]	c	J [kgcm²]		g700	MCS		
6.7	506	5	506	1.3	0.200	8.000	-P20	06C41	Selbst	27
9.4	579	4	579	2.1	0.200	7.000	-P20	06C41	Selbst	27
15	810	3	810	4.8	0.200	5.000	-P20	06C41	Selbst	27
17	405	6	405	2.6	0.300	10.000	-P44	06C41	Selbst	29

For operating mode S1
Torque **M_2** and
thermal output speed **$n_{2,th}$**

Product Gearbox

Product Motor

Ratio i

Moment of inertia of geared motor

Type of motor cooling

Page number for dimensions

For operating mode S2,S3 und S6
Max. permissible acceleration torque of geared motor **$M_{2,max}$** and
output speed **$n_{2,eto}$**

Load capacity of the gearbox
c is the ratio between the permissible rated torque of the gearbox and the rated torque of the three-phase AC motor (converted to the driven shaft).
c must be always higher than the service factor **k** determined for the application **k**.

$$c = \frac{M_{2,zul}}{M_{1N} \cdot i \cdot \eta_{Getr}} > k$$

Selection tables

1-stage gearboxes

Inverter operation						i	Product		Cooling	
$M_{2, max}$ [Nm]	$n_{2, th}$ [r/min]	M_2 [Nm]	$n_{2, eto}$ [r/min]	c	J [kgcm²]		g700	MCA		
38	305	19	305	2.0	3.100	10.000	-P130	10I40	natural	24
50	494	15	494	3.2	2.800	8.000	-P130	10I40	natural	24
60	564	12	564	4.6	2.800	7.000	-P130	10I40	natural	24
84	265	17	265	4.9	5.000	10.000	-P260	10I40	natural	26
95	265	38	265	2.5	11.000	10.000	-P260	13I41	natural	26
95	265	52	265	1.8	22.000	10.000	-P260	14L41	natural	26
95	265	60	265	1.6	11.000	10.000	-P260	13I34	forced	31
95	200	64	200	1.5	22.000	10.000	-P260	14L20	natural	26
115	667	16	667	5.8	22.000	3.000	-P260	14L20	natural	26
120	438	28	438	3.9	9.600	8.000	-P260	13I41	natural	26
120	438	40	438	2.9	20.000	8.000	-P260	14L41	natural	26
120	426	47	426	2.5	9.600	8.000	-P260	13I34	forced	31
120	250	51	250	2.3	20.000	8.000	-P260	14L20	natural	26
135	500	24	500	5.0	9.700	7.000	-P260	13I41	natural	26
135	500	34	500	3.7	21.000	7.000	-P260	14L41	natural	26
135	487	40	487	3.2	9.700	7.000	-P260	13I34	forced	31
135	286	43	286	3.0	21.000	7.000	-P260	14L20	natural	26
155	500	22	500	5.9	21.000	4.000	-P260	14L20	natural	26
195	400	27	400	5.9	21.000	5.000	-P260	14L20	natural	26
331	250	71	250	5.3	44.000	4.000	-P800	17N17	forced	35
396	194	71	194	5.4	24.000	8.000	-P800	14L35	forced	35
406	194	81	194	4.8	24.000	8.000	-P800	14L16	forced	35
423	230	80	230	4.8	42.000	5.000	-P800	17N35	forced	35
435	230	93	230	4.3	42.000	5.000	-P800	17N17	forced	35
450	230	66	230	5.6	78.000	5.000	-P800	19S23	natural	29
450	194	71	194	5.4	41.000	8.000	-P800	17N23	natural	29
450	194	81	194	4.8	77.000	8.000	-P800	19S42	natural	29
450	194	117	194	3.6	77.000	8.000	-P800	19S23	natural	29
450	194	140	194	3.0	41.000	8.000	-P800	17N35	forced	35
450	194	160	194	2.7	41.000	8.000	-P800	17N17	forced	35

Selection tables

2-stage gearboxes

Inverter operation						i	Product		Cooling	
$M_{2, max}$ [Nm]	$n_{2, th}$ [r/min]	M_2 [Nm]	$n_{2, eto}$ [r/min]	c	J [kgcm²]		g700	MCA		
86	313	17	313	5.2	3.100	12.000	-P130	10I40	natural	25
110	263	24	263	3.8	3.100	15.000	-P130	10I40	natural	25
110	158	46	158	2.3	2.800	25.000	-P130	10I40	natural	25
110	99	75	99	1.5	2.800	40.000	-P130	10I40	natural	25
120	247	26	247	3.9	2.900	16.000	-P130	10I40	natural	25
120	198	34	198	3.1	2.800	20.000	-P130	10I40	natural	25
120	123	60	123	2.0	2.800	32.000	-P130	10I40	natural	25
120	55	114	55	1.1	5.000	64.000	-P260	10I40	natural	27
185	140	37	140	4.8	3.900	25.000	-P260	10I40	natural	27
210	389	37	389	4.5	20.000	9.000	-P260	14L41	natural	27
210	379	46	379	3.8	9.600	9.000	-P260	13I34	forced	32
210	222	50	222	3.6	20.000	9.000	-P260	14L20	natural	27
230	213	48	213	4.0	11.000	15.000	-P260	13I41	natural	27
230	213	71	213	3.0	22.000	15.000	-P260	14L41	natural	27
230	213	85	213	2.5	11.000	15.000	-P260	13I34	forced	32
230	140	91	140	2.4	9.800	25.000	-P260	13I41	natural	27
230	140	127	140	1.8	21.000	25.000	-P260	14L41	natural	27
230	136	148	136	1.5	9.800	25.000	-P260	13I34	forced	32
230	133	92	133	2.4	22.000	15.000	-P260	14L20	natural	27
230	88	69	88	3.1	3.700	40.000	-P260	10I40	natural	27
230	88	150	88	1.5	9.600	40.000	-P260	13I41	natural	27
230	88	203	88	1.1	20.000	40.000	-P260	14L41	natural	27
230	80	157	80	1.4	21.000	25.000	-P260	14L20	natural	27
250	109	50	109	4.3	3.700	32.000	-P260	10I40	natural	27
260	221	33	221	5.6	11.000	12.000	-P260	13I41	natural	27
260	221	51	221	4.2	22.000	12.000	-P260	14L41	natural	27
260	221	63	221	3.6	11.000	12.000	-P260	13I34	forced	32
260	194	50	194	4.2	10.000	16.000	-P260	13I41	natural	27
260	194	74	194	3.1	21.000	16.000	-P260	14L41	natural	27
260	194	90	194	2.7	10.000	16.000	-P260	13I34	forced	32
260	175	67	175	3.4	9.800	20.000	-P260	13I41	natural	27
260	175	98	175	2.5	21.000	20.000	-P260	14L41	natural	27
260	171	117	171	2.1	9.800	20.000	-P260	13I34	forced	32
260	167	68	167	3.4	22.000	12.000	-P260	14L20	natural	27
260	125	97	125	2.5	21.000	16.000	-P260	14L20	natural	27
260	109	119	109	2.1	9.600	32.000	-P260	13I41	natural	27
260	109	162	109	1.6	20.000	32.000	-P260	14L41	natural	27
260	107	190	107	1.4	9.600	32.000	-P260	13I34	forced	32
260	100	126	100	2.0	21.000	20.000	-P260	14L20	natural	27
260	63	202	63	1.3	20.000	32.000	-P260	14L20	natural	27

Selection tables

2-stage gearboxes

Inverter operation						i	Product		Cooling	
$M_{2, max}$ [Nm]	$n_{2, th}$ [r/min]	M_2 [Nm]	$n_{2, eto}$ [r/min]	c	J [kgcm²]		g700	MCA		
450	47	230	47	1.9	13.000	64.000	-P800	13I41	natural	30
450	47	311	47	1.4	24.000	64.000	-P800	14L41	natural	30
450	47	363	47	1.2	13.000	64.000	-P800	13I34	forced	33
450	31	386	31	1.2	24.000	64.000	-P800	14L20	natural	30
486	83	97	83	5.8	32.000	12.000	-P800	14L16	forced	33
602	68	119	68	4.7	14.000	25.000	-P800	13I34	forced	33
688	87	124	87	4.5	32.000	15.000	-P800	14L35	forced	33
700	87	103	87	5.1	48.000	15.000	-P800	17N41	natural	30
700	87	124	87	4.5	48.000	15.000	-P800	17N23	natural	30
700	87	143	87	4.0	32.000	15.000	-P800	14L16	forced	33
700	87	143	87	4.0	84.000	15.000	-P800	19S42	natural	30
700	87	213	87	3.0	84.000	15.000	-P800	19S23	natural	30
700	87	257	87	2.6	48.000	15.000	-P800	17N35	forced	33
700	87	297	87	2.3	48.000	15.000	-P800	17N17	forced	33
700	68	94	68	5.5	25.000	25.000	-P800	14L41	natural	30
700	68	129	68	4.4	25.000	25.000	-P800	14L20	natural	30
700	68	205	68	3.1	42.000	25.000	-P800	17N41	natural	30
700	68	240	68	2.7	25.000	25.000	-P800	14L35	forced	33
700	68	240	68	2.7	42.000	25.000	-P800	17N23	natural	30
700	68	272	68	2.5	78.000	25.000	-P800	19S42	natural	30
700	68	383	68	1.8	78.000	25.000	-P800	19S23	natural	30
700	68	447	68	1.6	42.000	25.000	-P800	17N35	forced	33
700	67	505	67	1.4	42.000	25.000	-P800	17N17	forced	33
700	65	272	65	2.5	25.000	25.000	-P800	14L16	forced	33
700	58	121	58	4.7	14.000	40.000	-P800	13I41	natural	30
700	58	181	58	3.5	24.000	40.000	-P800	14L41	natural	30
700	58	220	58	3.0	14.000	40.000	-P800	13I34	forced	33
700	58	357	58	2.0	41.000	40.000	-P800	17N41	natural	30
700	58	406	58	1.7	24.000	40.000	-P800	14L35	forced	33
700	58	406	58	1.7	41.000	40.000	-P800	17N23	natural	30
700	58	451	58	1.6	77.000	40.000	-P800	19S42	natural	30
700	58	613	58	1.1	77.000	40.000	-P800	19S23	natural	30
700	50	237	50	2.8	24.000	40.000	-P800	14L20	natural	30
700	41	451	41	1.6	24.000	40.000	-P800	14L16	forced	33
713	75	128	75	4.8	27.000	16.000	-P800	14L35	forced	33
745	75	149	75	4.3	27.000	16.000	-P800	14L16	forced	33
800	83	97	83	5.8	84.000	12.000	-P800	19S42	natural	30
800	83	153	83	4.3	84.000	12.000	-P800	19S23	natural	30
800	83	188	83	3.6	48.000	12.000	-P800	17N35	forced	33
800	83	220	83	3.2	48.000	12.000	-P800	17N17	forced	33

Selection tables

2-stage gearboxes

Inverter operation						i	Product		Cooling	
$M_{2, max}$ [Nm]	$n_{2, th}$ [r/min]	M_2 [Nm]	$n_{2, eto}$ [r/min]	c	J [kgcm²]		g700	MCA		
800	75	106	75	5.5	43.000	16.000	-P800	17N41	natural	30
800	75	128	75	4.8	43.000	16.000	-P800	17N23	natural	30
800	75	149	75	4.3	79.000	16.000	-P800	19S42	natural	30
800	75	223	75	3.2	79.000	16.000	-P800	19S23	natural	30
800	75	270	75	2.7	43.000	16.000	-P800	17N35	forced	33
800	75	313	75	2.4	43.000	16.000	-P800	17N17	forced	33
800	70	147	70	4.4	43.000	20.000	-P800	17N41	natural	30
800	70	175	70	3.9	26.000	20.000	-P800	14L35	forced	33
800	70	175	70	3.9	43.000	20.000	-P800	17N23	natural	30
800	70	201	70	3.5	26.000	20.000	-P800	14L16	forced	33
800	70	201	70	3.5	79.000	20.000	-P800	19S42	natural	30
800	70	294	70	2.6	79.000	20.000	-P800	19S23	natural	30
800	70	352	70	2.2	43.000	20.000	-P800	17N35	forced	33
800	70	404	70	1.9	43.000	20.000	-P800	17N17	forced	33
800	59	128	59	4.9	26.000	32.000	-P800	14L41	natural	30
800	59	159	59	4.2	15.000	32.000	-P800	13I34	forced	33
800	59	173	59	3.9	26.000	32.000	-P800	14L20	natural	30
800	59	269	59	2.8	42.000	32.000	-P800	17N41	natural	30
800	59	314	59	2.4	26.000	32.000	-P800	14L35	forced	33
800	59	314	59	2.4	42.000	32.000	-P800	17N23	natural	30
800	59	356	59	2.2	78.000	32.000	-P800	19S42	natural	30
800	59	490	59	1.6	78.000	32.000	-P800	19S23	natural	30
800	59	572	59	1.4	42.000	32.000	-P800	17N35	forced	33
800	53	647	53	1.2	42.000	32.000	-P800	17N17	forced	33
800	51	356	51	2.2	26.000	32.000	-P800	14L16	forced	33

Selection tables

3-stage gearboxes

Inverter operation						i	Product		Cooling	
$M_{2, max}$ [Nm]	$n_{2, th}$ [r/min]	M_2 [Nm]	$n_{2, eto}$ [r/min]	c	J [kgcm²]		g700	MCA		
230	29	209	29	1.1	4.900	120.000	-P260	10I40	natural	28
260	58	104	58	2.4	3.700	60.000	-P260	10I40	natural	28
260	58	216	58	1.2	9.600	60.000	-P260	13I41	natural	28
260	44	144	44	1.8	3.900	80.000	-P260	10I40	natural	28
260	35	180	35	1.4	3.900	100.000	-P260	10I40	natural	28

Dimensions, notes

Notes on the dimensions

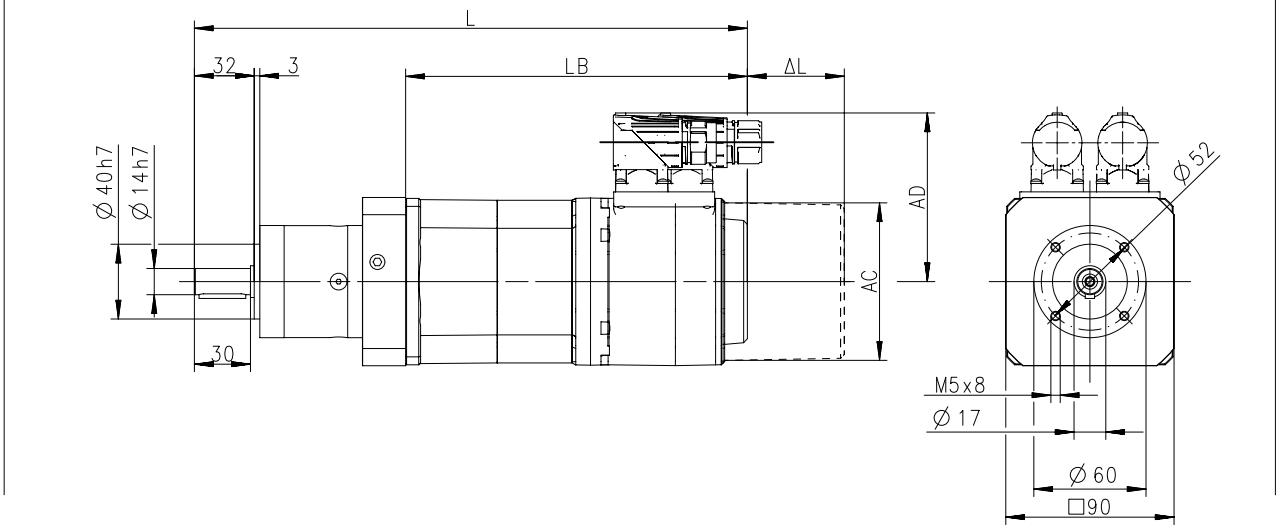
The following legend shows the layout of the dimension sheets.

Product gearbox

g700-P44

Driven shaft design

Abmessungen mit Vollwelle



Product Motor

Produkt			MCS				
			06C41	06F41	06I41	09D41	09F38
Abmessungen							
Gesamtlänge	**L**	**[mm]**	~~238~~	268	298	296	316
Länge Motor	**LB**	**[mm]**	~~132~~	162	192	183	203
Länge Motoranbauten	**Δ L**	**[mm]**	100			71	
Motordurchmesser	**AC**	**[mm]**	86			89	
Abstand Motor/Anschluss	**AD**	**[mm]**	77			89.7	

Distance of motor centre to the end of connector

Total length of the drive without built-on accessories

Motor diameter

Motor length without built-on accessories

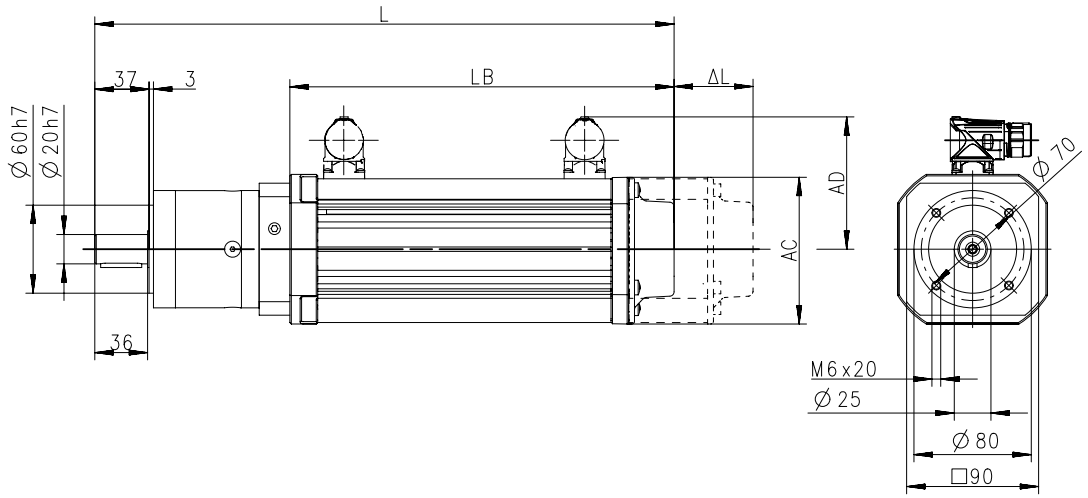
Additional length of the built-on accessories (longest version)

Dimensions, self-ventilated motors

g700-P130, 1-stage gearboxes

3 | 4 | 5 | 6

Dimensions with solid shaft and Flange



8800252-00

Product			MCA
			10I40
Length			
Total length	**L**	**[mm]**	395
Motor length	**LB**	**[mm]**	262
Length of motor options	**Δ L**	**[mm]**	78.5
Motor diameter	**AC**	**[mm]**	102
Distance motor/connection	**AD**	**[mm]**	90

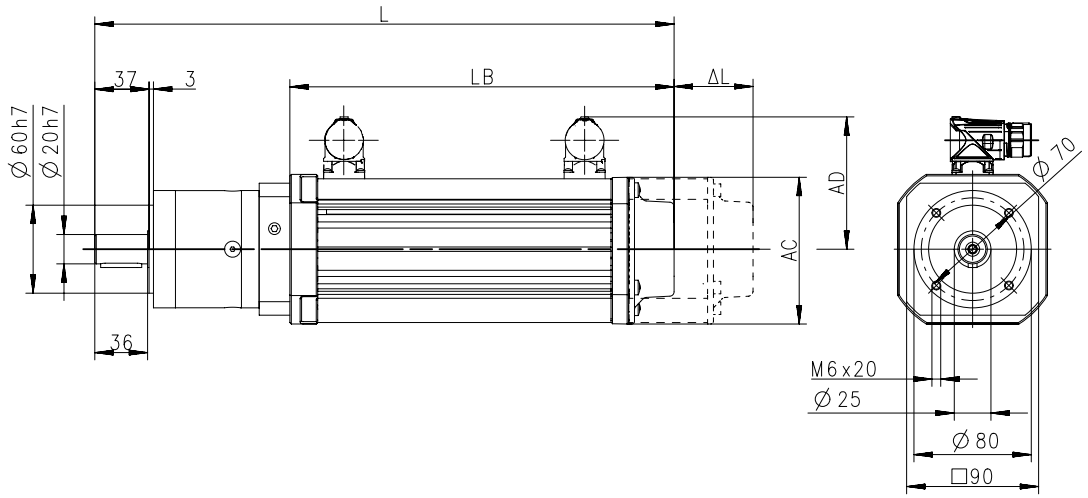
				Allgemeintoleranzen general tolerance nach: Lenze | V01-en_GB-04/2014	Oberflaechen/ surface	
						Werksto Rohtei
				Datum/date	Name	Benennu

Dimensions, self-ventilated motors

g700-P130, 2-stage gearboxes

3	4		5	6	

Dimensions with solid shaft and Flange



8800252-00

Product			MCA
			10I40
Length			
Total length	**L**	**[mm]**	413
Motor length	**LB**	**[mm]**	262
Length of motor options	**Δ L**	**[mm]**	78.5
Motor diameter	**AC**	**[mm]**	102
Distance motor/connection	**AD**	**[mm]**	90

Allgemeintoleranzen / general tolerance nach: | Oberflaechen/ surface | Werksto / Rohtei

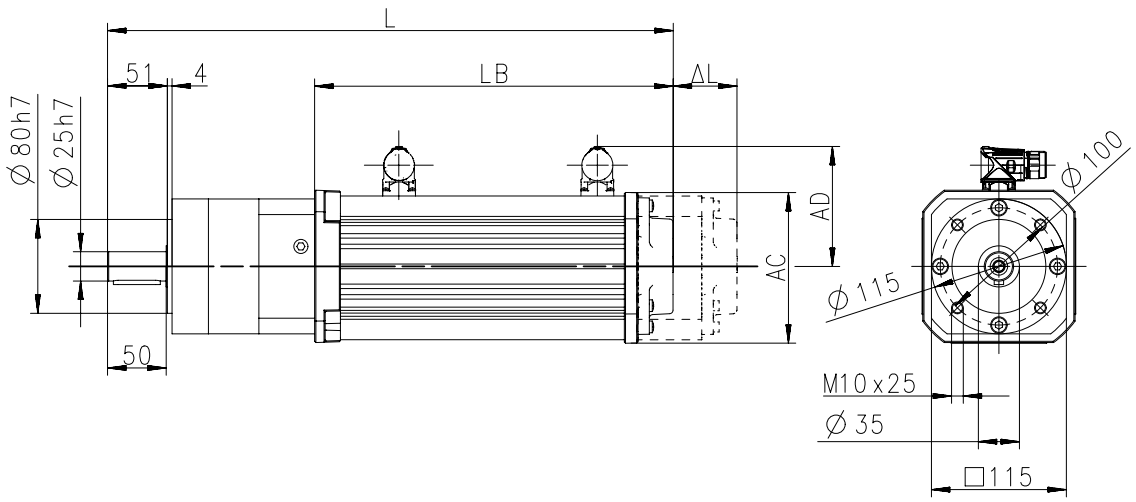
Datum/date | Name | Benennu

Dimensions, self-ventilated motors

g700-P260, 1-stage gearboxes

3 | 4 | 5 | 6

Dimensions with solid shaft and Flange



Product			MCA			
			10I40	13I41	14L20	14L41
Length						
Total length	**L**	**[mm]**	438	447	478	
Motor length	**LB**	**[mm]**	262	270.5	301.5	
Length of motor options	**Δ L**	**[mm]**	78.5	89	88.5	
Motor diameter	**AC**	**[mm]**	102	130	142	
Distance motor/connection	**AD**	**[mm]**	90	102	109	

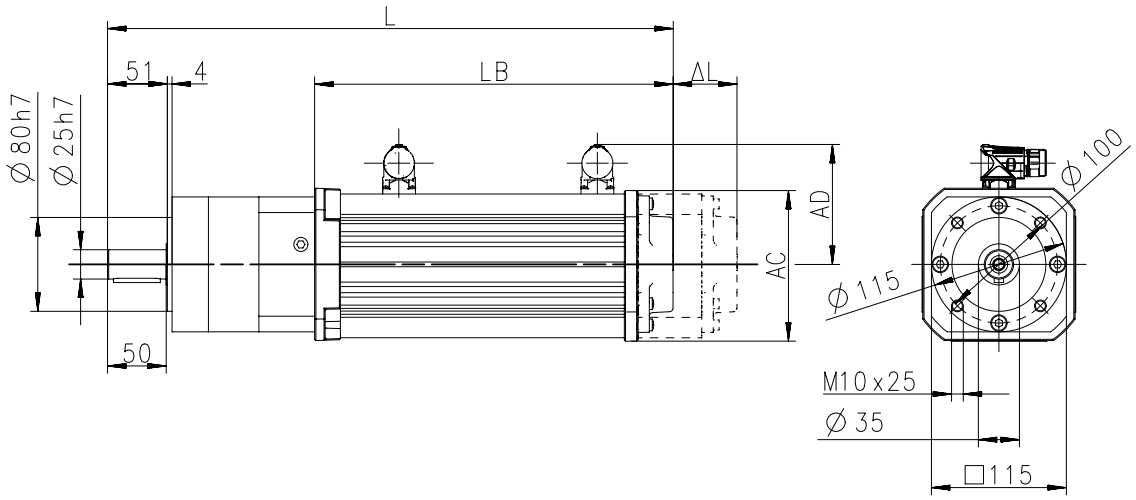
				Allgemeintoleranzen general tolerance nach: Lenze | V01-en_GB-04/2014	Oberflaechen/ surface	Werksto Rohtei
					Datum/date	Name Benennu

Dimensions, self-ventilated motors

g700-P260, 2-stage gearboxes

3	4		5	6	

Dimensions with solid shaft and Flange



8800253-00

Product			MCA			
			10I40	13I41	14L20	14L41
Length						
Total length	**L**	**[mm]**	466	474	505	
Motor length	**LB**	**[mm]**	262	270.5	301.5	
Length of motor options	**Δ L**	**[mm]**	78.5	89	88.5	
Motor diameter	**AC**	**[mm]**	102	130	142	
Distance motor/connection	**AD**	**[mm]**	90	102	109	

Allgemeintoleranzen general tolerance nach:

Oberflaechen/ surface

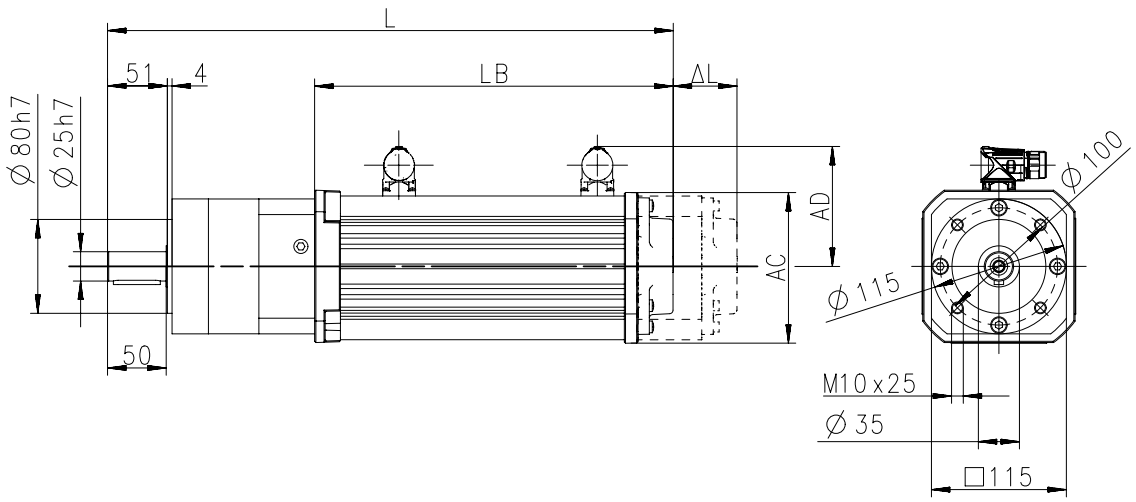
Datum/date | Name | Benennu

Dimensions, self-ventilated motors

g700-P260, 3-stage gearboxes

3	4		5	6	

Dimensions with solid shaft and Flange



8800253-00

Product			MCA	
			10I40	13I41
Length				
Total length	**L**	**[mm]**	493	502
Motor length	**LB**	**[mm]**	262	270.5
Length of motor options	**Δ L**	**[mm]**	78.5	89
Motor diameter	**AC**	**[mm]**	102	130
Distance motor/connection	**AD**	**[mm]**	90	102

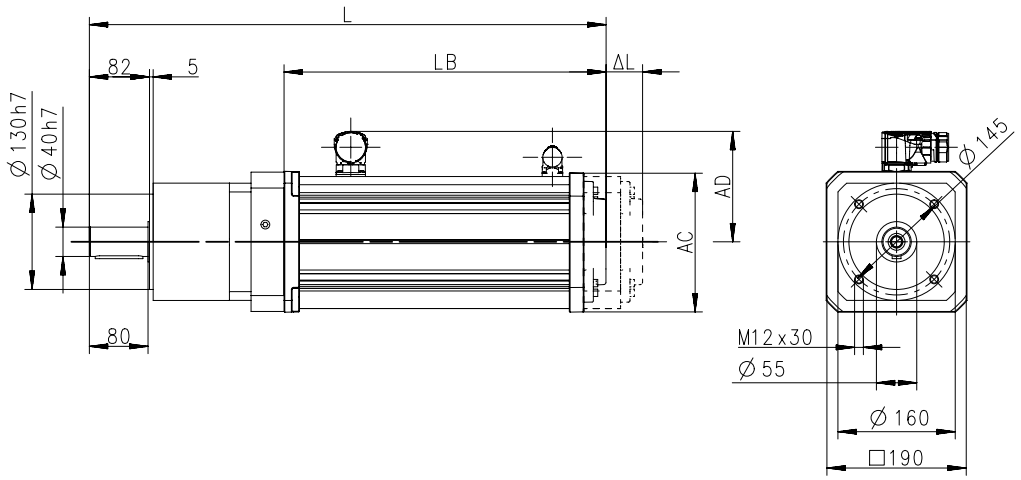
				Allgemeintoleranzen general tolerance nach: Lenze | V01-en_GB-04/2014		Oberflaechen/ surface	Werksto Rohtei
					Datum/date	Name	Benennu

Dimensions, self-ventilated motors

g700-P800, 1-stage gearboxes

3 | 4 | 5 | 6

Dimensions with solid shaft and Flange



8800254-00

Product			MCA		
			17N23	19S23	19S42
Length					
Total length	**L**	**[mm]**	595	667	
Motor length	**LB**	**[mm]**	339.5	401	
Length of motor options	**Δ L**	**[mm]**	89.2	88.2	
Motor diameter	**AC**	**[mm]**	165	192	
Distance motor/connection	**AD**	**[mm]**	117.5	151	

6.1

Allgemeintoleranzen general tolerance nach:

Oberflaechen/ surface

Werksto Rohtei

6.1 - 29

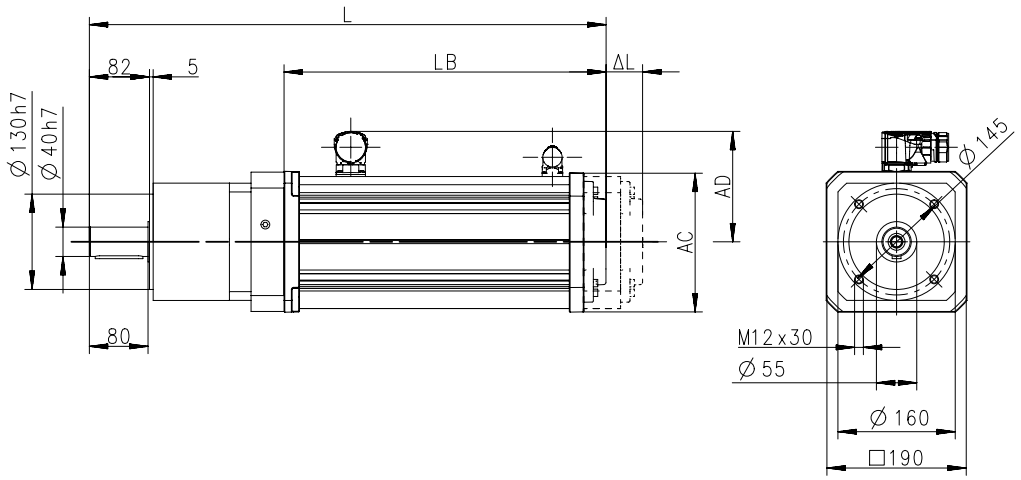
Datum/date | Name | Benennu

Dimensions, self-ventilated motors

g700-P800, 2-stage gearboxes

3 | 4 | 5 | 6

Dimensions with solid shaft and Flange



8800254-00

Product			MCA						
			13I41	14L20	14L41	17N23	17N41	19S23	19S42
Length									
Total length	**L**	**[mm]**	576	607		645		716	
Motor length	**LB**	**[mm]**	270.5	301.5		339.5		401	
Length of motor options	**Δ L**	**[mm]**	89	88.5		89.2		88.2	
Motor diameter	**AC**	**[mm]**	130	142		165		192	
Distance motor/connection	**AD**	**[mm]**	102	109		117.5		151	

6.1

Allgemeintoleranzen / general tolerance nach: Lenze | V01-en_GB-04/2014

Oberflaechen/ surface

Datum/date | Name | Benennu

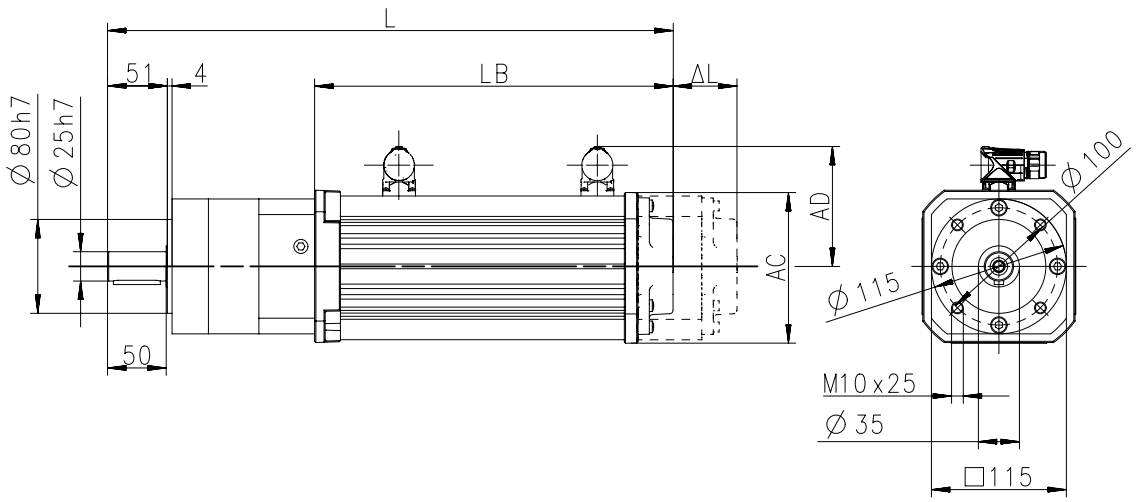
Werksto
Rohtei

Dimensions, forced ventilated motors

g700-P260, 1-stage gearboxes

3	4		5	6	

Dimensions with solid shaft and Flange



8800253-00

Product			MCA
			13I34
Length			
Total length	**L**	**[mm]**	515
Motor length	**LB**	**[mm]**	338.5
Length of motor options	**Δ L**	**[mm]**	89.5
Motor diameter	**AC**	**[mm]**	130
Distance motor/connection	**AD**	**[mm]**	102

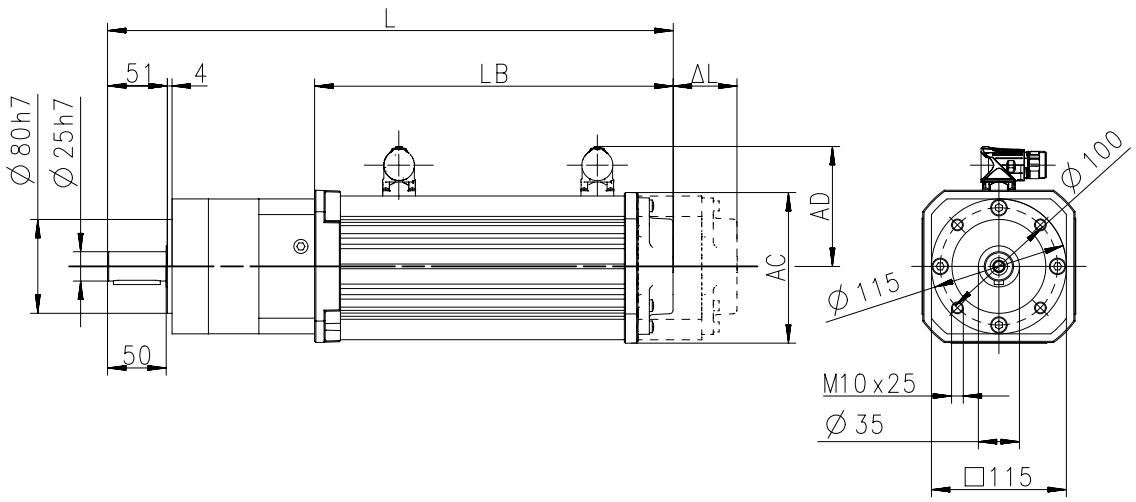
				Allgemeintoleranzen general tolerance nach:	Oberflaechen/ surface	
						Werksto Rohtei
				6.1 - 31		
				Datum/date	Name	Benennu

Dimensions, forced ventilated motors

g700-P260, 2-stage gearboxes

3 | 4 | 5 | 6

Dimensions with solid shaft and Flange



8800253-00

Product			MCA
			13I34
Length			
Total length	**L**	**[mm]**	542
Motor length	**LB**	**[mm]**	338.5
Length of motor options	**Δ L**	**[mm]**	89.5
Motor diameter	**AC**	**[mm]**	130
Distance motor/connection	**AD**	**[mm]**	102

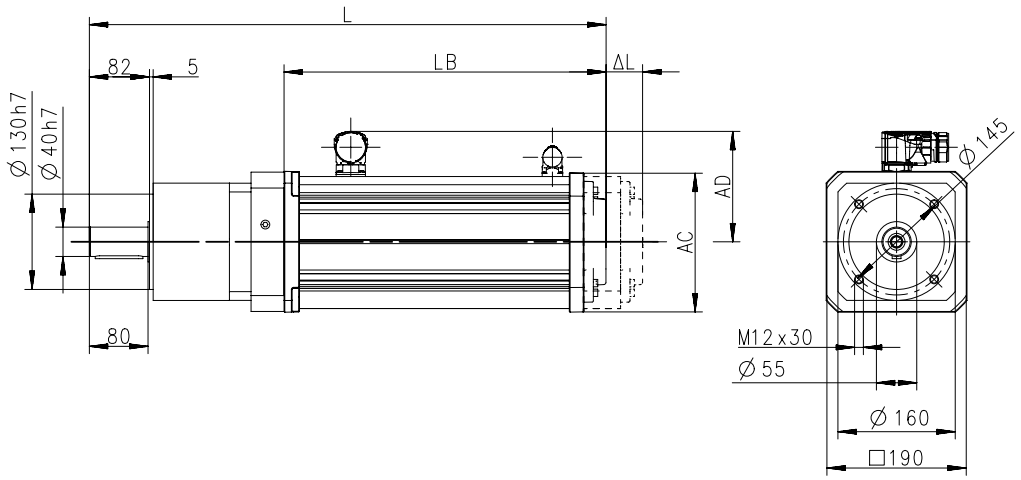
				Allgemeintoleranzen general tolerance nach: Lenze | V01-en_GB-04/2014	Oberflaechen/ surface	Werksto Rohtei
				Datum/date	Name	Benennu

Dimensions, forced ventilated motors

g700-P800, 1-stage gearboxes

3 | 4 | 5 | 6

Dimensions with solid shaft and Flange



8800254-00

Product			MCA			
			14L16	14L35	17N17	17N35
Length						
Total length	**L**	**[mm]**	619		681	
Motor length	**LB**	**[mm]**	363.5		425.5	
Length of motor options	**Δ L**	**[mm]**	88.5		89	
Motor diameter	**AC**	**[mm]**	142		165	
Distance motor/connection	**AD**	**[mm]**	109		117.5	

Allgemeintoleranzen / general tolerance nach:

Oberflaechen/ surface

6.1 - 33

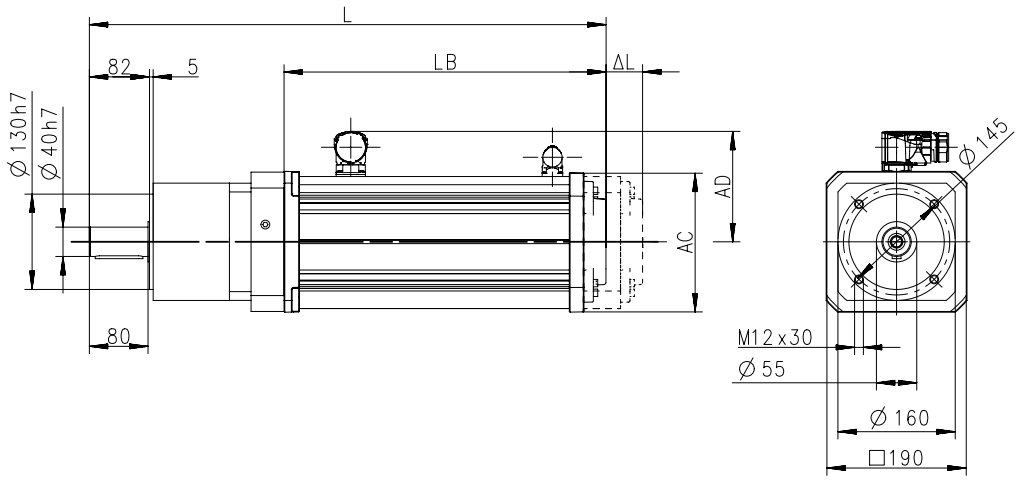
Datum/date | Name | Werksto / Rohtei | Benennu

Dimensions, forced ventilated motors

g700-P800, 2-stage gearboxes

3 | 4 | 5 | 6

Dimensions with solid shaft and Flange



8800254-00

Product			MCA				
			13I34	14L16	14L35	17N17	17N35
Length							
Total length	**L**	**[mm]**	644	669		731	
Motor length	**LB**	**[mm]**	338.5	363.5		425.5	
Length of motor options	**Δ L**	**[mm]**	89.5	88.5		89	
Motor diameter	**AC**	**[mm]**	130	142		165	
Distance motor/connection	**AD**	**[mm]**	102	109		117.5	

Allgemeintoleranzen general tolerance nach:

Oberflaechen/ surface

6.1 - 33

Datum/date | Name | Benennu

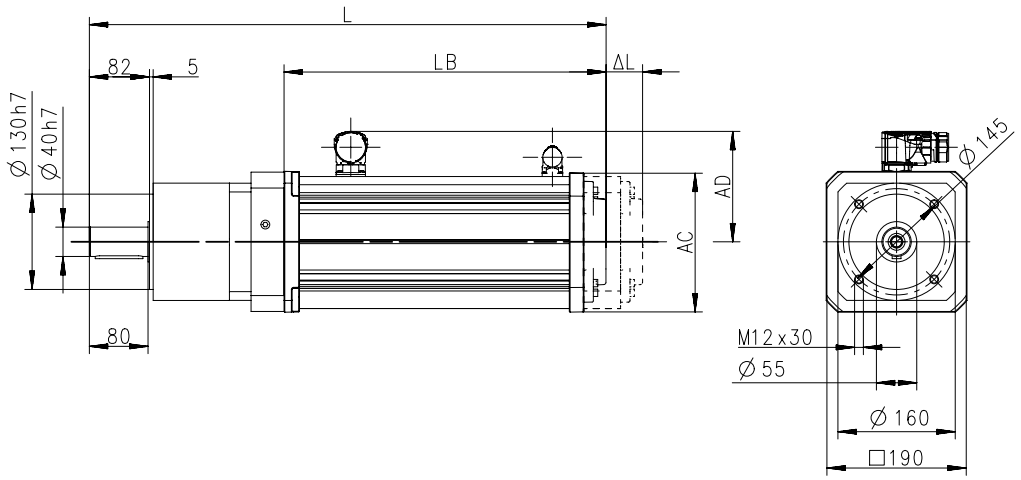
Werksto Rohtei

Dimensions, forced ventilated motors

g700-P800, 2-stage gearboxes

3 | 4 | 5 | 6

Dimensions with solid shaft and Flange



8800254-00

Product			MCA				
			13I34	14L16	14L35	17N17	17N35
Length							
Total length	**L**	**[mm]**	644	669		731	
Motor length	**LB**	**[mm]**	338.5	363.5		425.5	
Length of motor options	**Δ L**	**[mm]**	89.5	88.5		89	
Motor diameter	**AC**	**[mm]**	130	142		165	
Distance motor/connection	**AD**	**[mm]**	102	109		117.5	

Allgemeintoleranzen general tolerance nach:

Oberflaechen/ surface

6.1 - 35

Datum/date | Name | Benennu

Werksto

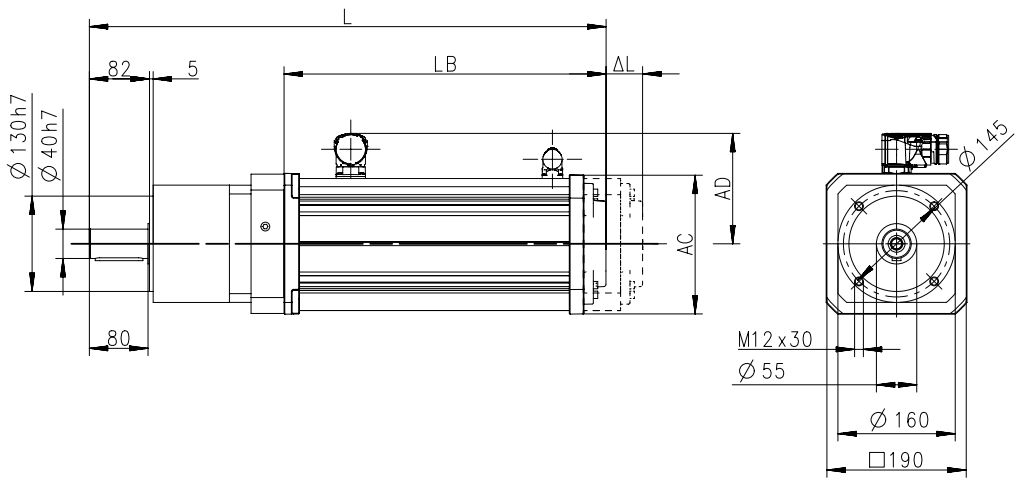
Rohtei

Dimensions, forced ventilated motors

g700-P800, 1-stage gearboxes

3 | 4 | 5 | 6

Dimensions with solid shaft and Flange



8800254-00

Product			MCA			
			14L16	14L35	17N17	17N35
Length						
Total length	**L**	**[mm]**	619		681	
Motor length	**LB**	**[mm]**	363.5		425.5	
Length of motor options	**Δ L**	**[mm]**	88.5		89	
Motor diameter	**AC**	**[mm]**	142		165	
Distance motor/connection	**AD**	**[mm]**	109		117.5	

Allgemeintoleranzen general tolerance nach:

Oberflaechen/ surface

6.1 - 35

Datum/date | Name | Benennu

Werksto

Rohtei

Weights, self-ventilated motors

1-stage gearboxes

				MCA				
				10I40	13I41	14L20 14L41	17N23	19S23 19S42
g700	-P130	m	[kg]	8.5				
	-P260	m	[kg]	12	16	21		
	-P800	m	[kg]				41	63

2-stage gearboxes

				MCA				
				10I40	13I41	14L20 14L41	17N23 17N41	19S23 19S42
g700	-P130	m	[kg]	9.0				
	-P260	m	[kg]	14	18	23		
	-P800	m	[kg]		32	37	45	67

3-stage gearboxes

				MCA	
				10I40	13I41
g700	-P260	m	[kg]	16	20

Weights, forced ventilated motors

1-stage gearboxes

				MCA		
				13I34	14L16 14L35	17N17 17N35
g700	-P260	m	[kg]	18		
	-P800	m	[kg]		35	44

2-stage gearboxes

				MCA		
				13I34	14L16 14L35	17N17 17N35
g700	-P260	m	[kg]	20		
	-P800	m	[kg]	34	39	48

Surface and corrosion protection

For optimum protection of geared motors against ambient conditions, the surface and corrosion protection system (OKS) offers tailor-made solutions.

Various surface coatings combined with other protective measures ensure that the geared motors operate reliably even at high air humidity, in outdoor installations or in the presence of atmospheric impurities. Any colour from the RAL Classic collection can be chosen for the top coat. The geared motors are also available unpainted (no surface and corrosion protection).

Surface and corrosion protection	Applications	Measures
OKS-G (primed)	• Dependent on subsequent top coat applied	• 2K PUR priming coat (grey) • Zinc-coated screws • Rust-free breather elements Optional measures • Stainless steel nameplate
OKS-S (small)	• Standard applications • Internal installation in heated buildings • Air humidity up to 90%	• Surface coating as per corrosivity category C1 (in line with EN 12944-2) • Zinc-coated screws • Rust-free breather elements Optional measures • Stainless steel nameplate
OKS-M (medium)	• Internal installation in non-heated buildings • Covered, protected external installation • Air humidity up to 95%	• Surface coating as per corrosivity category C2 (in line with EN 12944-2) • Zinc-coated screws • Rust-free breather elements Optional measures • Stainless steel shaft • Stainless steel nameplate • Rust-free shrink disc (on request)
OKS-L (large)	• External installation • Air humidity above 95% • Chemical industry plants • Food industry	• Surface coating as per corrosivity category C3 (in line with EN 12944-2) • Blower cover and B end shield additionally primed • Cable glands with gaskets • Corrosion-resistant brake with cover ring, stainless friction plate, and chrome-plated armature plate (on request) • All screws/screw plugs zinc-coated • Stainless breather elements • Threaded holes that are not used are closed by means of plastic plugs Optional measures • Sealed recesses on motor (on request) • Stainless steel shaft • Stainless steel nameplate • Rust-free shrink disc (on request) • Additional priming coat on cast iron fan • Oil expansion tank and torque plates painted separately and supplied loose

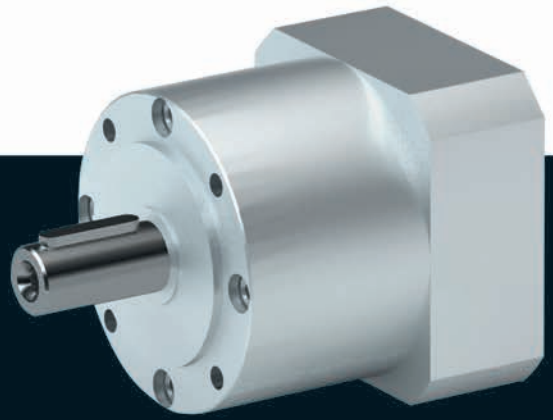
Surface and corrosion protection

Structure of surface coating

Surface and corrosion protection	Corrosivity category	Surface coating	Colour
	DIN EN ISO 12944-2	Structure	
Without OKS(uncoated)		Dipping primed gearbox	
OKS-G (primed)		Dipping primed gearbox 2K PUR priming coat	
OKS-S (small)	C1	Dipping primed gearbox 2K-PUR top coat	Standard: RAL 7012 Optional: RAL Classic
OKS-M (medium)	C2	Dipping primed gearbox 2K PUR priming coat 2K-PUR top coat	
OKS-L (large)	C3		

g700-P planetary gearbox

20 to 800 Nm



g700-P planetary gearbox

Contents

g700-P planetary gearbox

Contents

List of abbreviations

$F_{ax,max}$	[N]	Max. axial force
$F_{rad,max}$	[N]	Max. radial force
i		Ratio
J	[kgcm²]	Moment of inertia
m	[kg]	Mass

g700-P planetary gearbox

General information

Product information

The planetary gearbox g700 is the ideal solution for demanding and dynamic tasks. With its high reliability, long service life and outstanding scalability, it provides everything you need to manage demanding machine tasks.

Versions

- High input speed possible Max. input speed 18000 rpm
- Wide variety of ratios i= 3...512 in 24 ratios
- High rated torque bandwidth 20 ... 800 Nm in five sizes
- Lifetime lubrication
- Suitable for any mounting position, hence only one variant

The product name

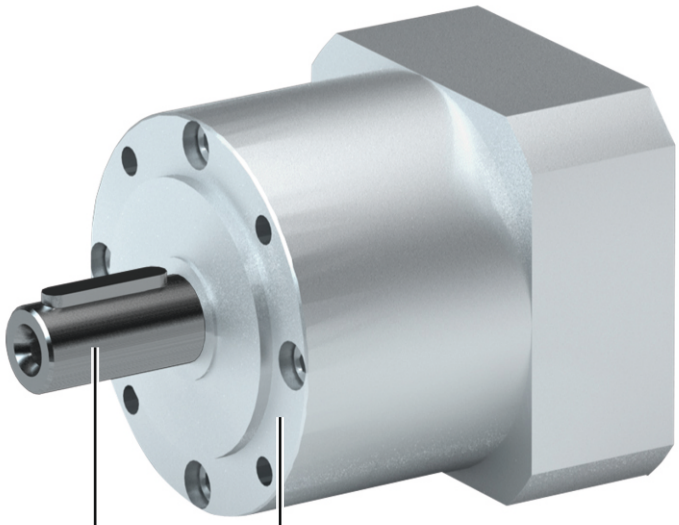
Gearbox type	Product range		Design	Rated torque [Nm]	Product
Planetary gearbox	g700	-	P	20	g700-P20
				44	g700-P44
				130	g700-P130
				260	g700-P260
				800	g700-P800

6.1.1

Equipment

Overview

The equipment includes all the options available as standard and all the built-on accessories of the product.



The gearbox kit

Gearbox details

Product					
	g700-P20	g700-P44	g700-P130	g700-P260	g700-P800
Driven shaft					
Solid shaft with featherkey [mm]	10x23	14x30	20x36	25x50	40x80
Design	Standard				
Gasket	NBR				
Bearing	Standard				
Housing					
Housing version	Without foot with centering				
Output flange					
flange diameter [mm]	40	60	80	115	160
Lubricant					
Type	Klüberplex BEM34-132				
Breather element	Without				
Backlash					
Backlash	Standard				

► Further information and installation feasibilities can be found in the Gearboxes chapter.

The gearbox kit

Gearbox details

Solid shaft
 With centering

Functions and features

Product	g700-P20	g700-P44	g700-P130	g700-P260	g700-P800
Housing					
Design	Cylindrical shape				
Solid shaft					
Design	with keyway to DIN 6885				
Tolerance	h7				
Toothed parts					
Design	Spur-toothed				
Ratios	Mathematically precise				
Shaft-hub joint					
	Force-fit, motor gearbox connected via clamping hub				
Lubricants					
Changing interval	Lubricated for life				
Quantities	Can be installed in any orientation				
Mechanical efficiency					
1-stage gearboxes [$\eta_{c=1}$]	0.96				
2-stage gearboxes [$\eta_{c=1}$]	0.94				
3-stage gearboxes [$\eta_{c=1}$]	0.90				

Direction of rotation

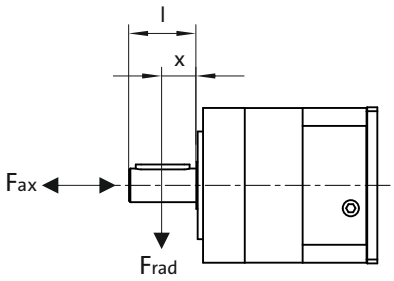
6.1.1

Permissible radial and axial forces at output

Permissible radial force
$F_{rad,per} = F_{radmax}$ if $F_{ax} = 0$

Permissible axial force
$F_{ax,per} = F_{ax,max}$ if $F_{rad} = 0$

► If F_{rad} **and** $F_{ax} \neq 0$, please contact Lenze.

Application of forces


Product	n_2 [r/min]
	100

	Max. radial force, Solid shaft with flange	Max. axial force, Solid shaft with flange
	$F_{rad,max}$	$F_{ax,max}$
	[N]	[N]
g700-P20	200	200
g700-P44	500	400
g700-P130	1000	750
g700-P260	2500	1750
g700-P800	7000	5000

► Application of force F_{rad}: centre of shaft journal (x = l/2)
► $F_{ax,max}$ only valid with $F_{rad} = 0$

Backlash and torsional rigidity

1-stage gearboxes

Product	Backlash	Torsional stiffness
	[arcmin]	[Nm/arcmin]
g700-P20	15.0	1.00
g700-P44	10.0	2.30
g700-P130	7.00	6.00
g700-P260		12.0
g700-P800	6.00	38.0

2-stage gearboxes

Product	Backlash	Torsional stiffness
	[arcmin]	[Nm/arcmin]
g700-P20	19.0	1.10
g700-P44	12.0	2.50
g700-P130	9.00	6.50
g700-P260		13.0
g700-P800	10.0	41.0

3-stage gearboxes

Product	Backlash	Torsional stiffness
	[arcmin]	[Nm/arcmin]
g700-P20	22.0	1.00
g700-P44	15.0	2.50
g700-P130	11.0	6.30
g700-P260		12.0

► The backlash is measured with 1 % of the rated torque, at least 1 Nm.

Speeds and torques

- **Rated torque $M_{2, GN}$**
  At rated speed, ambient temperature 30 °C and duty type S1.
- **Max. output torque $M_{2, max}$**
  At output speed 100 r/min , duty type S1, uniform and shock-free motion.
- **Emergency off torque $M_{2, not}$**
  Max.1000 emergency switching off actions during gearbox service life
- **Max. gearbox input speed**
  $n_{1, max\ 50\%}$
  Max. medium speed at 50 % rated torque
  $n_{1, max\ 100\%}$
  Max. medium speed at 100 % rated torque
  $n_{1, max}$
  Max. permissible speed

1-stage gearboxes

Product	Ratio	Rated torque	Max. output torque	Max. gearbox input speed			Emergency off-torque
	i	$M_{2, GN}$	$M_{2, max}$	$n_{1, max\ 50\%}$	$n_{1, max\ 100\%}$	$n_{1, max}$	$M_{2, not}$
		[Nm]	[Nm]	[r/min]	[r/min]	[r/min]	[Nm]
g700-P20	3.000	11	18	5000	5000	18000	23
	4.000	15	24	5000	5000		30
	5.000	14	22	5000	5000		36
	7.000	9	14	5000	5000		26
	8.000	6	10	5000	5000		27
	10.000	5	8	5000	5000		27
g700-P44	3.000	28	45	4500	4500	13000	66
	4.000	38	61	4500	4500		88
	5.000	40	64	4500	4500		80
	7.000	25	40	4500	4500		80
	8.000	18	29	4500	4500		80
	10.000	15	24	4500	4500		80
g700-P130	3.000	85	136	4000	2700	7000	180
	4.000	115	184	3850	2500		240
	5.000	110	176	4000	3000		220
	7.000	65	104	4000	4000		178
	8.000	50	80	4000	4000		190
	10.000	38	61	4000	4000		200
g700-P260	3.000	115	184	3350	2550	6500	390
	4.000	155	248	3400	2500		520
	5.000	195	312	3500	2500		500
	7.000	135	216	3500	3500		340
	8.000	120	192	3500	3500		380
	10.000	95	152	3500	3500		480
g700-P800	3.000	400	640	1350	900	6500	800
	4.000	450	720	1450	1000		900
	5.000	450	720	1650	1150		900
	8.000	450	720	2150	1550		900

Speeds and torques

2-stage gearboxes

Product	Ratio	Rated torque	Max. output torque	Max. gearbox input speed			Emergency off-torque
	i	$M_{2, GN}$	$M_{2, max}$	$n_{1, max\ 50\%}$	$n_{1, max\ 100\%}$	$n_{1, max}$	$M_{2, not}$
		[Nm]	[Nm]	[r/min]	[r/min]	[r/min]	[Nm]
g700-P20	9.000	17	26	5000	5000	18000	33
	12.000	20	32	5000	5000		40
	15.000	18	29	5000	5000		36
	16.000	20	32	5000	5000		40
	20.000	20	32	5000	5000		40
	25.000	18	29	5000	5000		36
	32.000	20	32	5000	5000		40
	40.000	18	29	5000	5000		36
	64.000	8	12	5000	5000		27
g700-P44	9.000	44	70	4500	4500	13000	88
	12.000	44	70	4500	4500		88
	15.000	44	70	4500	4500		88
	16.000	44	70	4500	4500		88
	20.000	44	70	4500	4500		88
	25.000	40	64	4500	4500		80
	32.000	44	70	4500	4500		88
	40.000	40	64	4500	4500		80
	64.000	18	29	4500	4500		80
g700-P130	9.000	130	208	4000	3050	7000	260
	12.000	120	192	4000	3750		240
	15.000	110	176	4000	4000		220
	16.000	120	192	4000	4000		240
	20.000	120	192	4000	4000		240
	25.000	110	176	4000	4000		220
	32.000	120	192	4000	4000		240
	40.000	110	176	4000	4000		220
	64.000	50	80	4000	4000		190
g700-P260	9.000	210	336	3500	2650	6500	500
	12.000	260	416	3500	2650		520
	15.000	230	368	3500	3200		500
	16.000	260	416	3500	3100		520
	20.000	260	416	3500	3500		520
	25.000	230	368	3500	3500		500
	32.000	260	416	3500	3500		520
	40.000	230	368	3500	3500		500
	64.000	120	192	3500	3500		380
g700-P800	12.000	800	1280	1550	1000	6500	1600
	15.000	700	1120	1850	1300		1400
	16.000	800	1280	1750	1200		1600
	20.000	800	1280	2050	1400		1600
	25.000	700	1120	2350	1700		1400
	32.000	800	1280	2650	1900		1600
	40.000	700	1120	2950	2300		1400
	64.000	450	720	3000	3000		900

Speeds and torques

3-stage gearboxes

Product	Ratio	Rated torque	Max. output torque	Max. gearbox input speed			Emergency off-torque
	i	$M_{2, GN}$	$M_{2, max}$	$n_{1, max\ 50\%}$	$n_{1, max\ 100\%}$	$n_{1, max}$	$M_{2, not}$
		[Nm]	[Nm]	[r/min]	[r/min]	[r/min]	[Nm]
g700-P20	60.000	20	32	5000	5000		40
	80.000	20	32	5000	5000		40
	100.000	20	32	5000	5000		40
	120.000	18	29	5000	5000		36
	160.000	20	32	5000	5000	18000	40
	200.000	18	29	5000	5000		36
	256.000	20	32	5000	5000		40
	320.000	18	29	5000	5000		36
	512.000	8	12	5000	5000		27
g700-P44	60.000	44	70	4500	4500		88
	80.000	44	70	4500	4500		88
	100.000	44	70	4500	4500		88
	120.000	44	70	4500	4500		88
	160.000	44	70	4500	4500	13000	88
	200.000	40	64	4500	4500		80
	256.000	44	70	4500	4500		88
	320.000	40	64	4500	4500		80
	512.000	18	29	4500	4500		80
g700-P130	60.000	110	176	4000	4000		220
	80.000	120	192	4000	4000		240
	100.000	120	192	4000	4000		240
	120.000	110	176	4000	4000		220
	160.000	120	192	4000	4000	7000	240
	200.000	110	176	4000	4000		220
	256.000	120	192	4000	4000		240
	320.000	110	176	4000	4000		220
	512.000	50	80	4000	4000		190
g700-P260	60.000	260	416	3500	3500		520
	80.000	260	416	3500	3500		520
	100.000	260	416	3500	3500		520
	120.000	230	368	3500	3500		500
	160.000	260	416	3500	3500	6500	520
	200.000	230	368	3500	3500		500
	256.000	260	416	3500	3500		520
	320.000	230	368	3500	3500		500
	512.000	120	192	3500	3500		380

Moments of inertia

- The moments of inertia relate to the drive shaft of the gearbox.
- The total moment of inertia is calculated by adding the values of the gearbox, motor and accessories.

1-stage gearboxes

Product	Dimensions	Ratio	Moment of inertia
	Motor shaft diameter		
	d	i	J
	[mm]		[kgcm²]
g700-P20	11	3.000	0.065
	11	4.000	0.056
	11	5.000	0.053
	11	7.000	0.052
	11	8.000	0.051
	11	10.000	0.043
g700-P44	11	3.000	0.134
	11	4.000	0.092
	11	5.000	0.077
	11	7.000	0.071
	11	8.000	0.064
	11	10.000	0.130
	14	3.000	0.108
	14	4.000	0.066
	14	5.000	0.051
	14	7.000	0.014
	14	8.000	0.038
	14	10.000	0.014
g700-P130	11	3.000	0.770
	11	4.000	0.520
	11	5.000	0.450
	11	7.000	0.420
	11	8.000	0.390
	11	10.000	0.740
	14	3.000	0.770
	14	4.000	0.520
	14	5.000	0.450
	14	7.000	0.420
	14	8.000	0.390
	14	10.000	0.740
	19	3.000	0.770
	19	4.000	0.520
	19	5.000	0.450
	19	7.000	0.420
	19	8.000	0.390
	19	10.000	0.740
g700-P260	11	3.000	2.662
	11	4.000	1.822
	11	5.000	1.562
	11	7.000	1.442
	11	8.000	1.352
	11	10.000	2.652

Product	Dimensions	Ratio	Moment of inertia
	Motor shaft diameter		
	d	i	J
	[mm]		[kgcm²]
g700-P260	14	3.000	2.655
	14	4.000	1.815
	14	5.000	1.555
	14	7.000	1.435
	14	8.000	1.345
	14	10.000	2.645
	19	3.000	2.630
	19	4.000	1.790
	19	5.000	1.530
	19	7.000	1.410
	19	8.000	1.320
	19	10.000	2.620
	24	3.000	2.574
	24	4.000	1.734
	24	5.000	1.474
	24	7.000	1.354
	24	8.000	1.264
	24	10.000	2.564
	28	3.000	4.897
	28	4.000	4.057
	28	5.000	3.797
	28	7.000	3.687
	28	8.000	3.587
	28	10.000	4.887
g700-P800	19	3.000	12.211
	19	4.000	7.851
	19	5.000	6.141
	19	8.000	4.701
	24	3.000	12.140
	24	4.000	7.780
	24	5.000	6.070
	24	8.000	4.630
	28	3.000	12.040
	28	4.000	7.680
	28	5.000	5.970
	28	8.000	4.530

Moments of inertia

2-stage gearboxes

Product	Dimensions	Ratio	Moment of inertia
	Motor shaft diameter		
	d	i	J
	[mm]		[kgcm²]
g700-P20	11	9.000	0.064
	11	12.000	0.063
	11	15.000	0.057
	11	16.000	0.056
	11	20.000	0.053
	11	25.000	0.053
	11	32.000	0.051
	11	40.000	0.050
	11	64.000	0.063
g700-P44	11	9.000	0.063
	11	12.000	0.126
	11	15.000	0.076
	11	16.000	0.087
	11	20.000	0.074
	11	25.000	0.074
	11	32.000	0.063
	11	40.000	0.063
	11	64.000	0.075
	14	9.000	0.064
	14	12.000	0.100
	14	15.000	0.050
	14	16.000	0.061
	14	20.000	0.048
	14	25.000	0.048
	14	32.000	0.014
	14	40.000	0.037
	14	64.000	0.049
g700-P130	11	9.000	0.390
	11	12.000	0.720
	11	15.000	0.710
	11	16.000	0.500
	11	20.000	0.440
	11	25.000	0.440
	11	32.000	0.390
	11	40.000	0.390
	11	64.000	0.510
	14	9.000	0.390
	14	12.000	0.720
	14	15.000	0.710
	14	16.000	0.500
	14	20.000	0.440
	14	25.000	0.440
	14	32.000	0.390
	14	40.000	0.390
	14	64.000	0.510
	19	9.000	0.390
	19	12.000	0.720
	19	15.000	0.710
	19	16.000	0.500
	19	20.000	0.440
	19	25.000	0.440
	19	32.000	0.390
	19	40.000	0.390
	19	64.000	0.510

Product	Dimensions	Ratio	Moment of inertia
	Motor shaft diameter		
	d	i	J
	[mm]		[kgcm²]
g700-P260	11	9.000	1.332
	11	12.000	2.592
	11	15.000	2.562
	11	16.000	1.782
	11	20.000	1.532
	11	25.000	1.522
	11	32.000	1.332
	11	40.000	1.332
	11	64.000	2.602
	14	9.000	1.325
	14	12.000	2.585
	14	15.000	2.555
	14	16.000	1.775
	14	20.000	1.525
	14	25.000	1.515
	14	32.000	1.325
	14	40.000	1.325
	14	64.000	2.595
	19	9.000	1.300
	19	12.000	2.560
	19	15.000	2.530
	19	16.000	1.750
	19	20.000	1.500
	19	25.000	1.490
	19	32.000	1.300
	19	40.000	1.300
	19	64.000	2.570
	24	9.000	1.244
	24	12.000	2.504
	24	15.000	2.474
	24	16.000	1.694
	24	20.000	1.444
	24	25.000	1.434
	24	32.000	1.244
	24	40.000	1.244
	24	64.000	2.514
	28	9.000	3.567
	28	12.000	4.827
	28	15.000	4.797
	28	16.000	4.017
	28	20.000	3.767
	28	25.000	3.757
	28	32.000	3.567
	28	40.000	3.567
	28	64.000	4.837

Moments of inertia

2-stage gearboxes

Product	Dimensions	Ratio	Moment of inertia
	Motor shaft diameter		
	d	i	J
	[mm]		[kgcm²]
g700-P800	19	12.000	12.441
	19	15.000	12.421
	19	16.000	7.541
	19	20.000	6.721
	19	25.000	5.881
	19	32.000	6.431
	19	40.000	5.351
	19	64.000	4.571
	24	12.000	12.370
	24	15.000	12.350
	24	16.000	7.470
	24	20.000	6.650
	24	25.000	5.810
	24	32.000	6.360
	24	40.000	5.280
	24	64.000	4.500
	28	12.000	12.270
	28	15.000	12.250
	28	16.000	7.370
	28	20.000	6.550
	28	25.000	5.710
	28	32.000	6.260
	28	40.000	5.180
	28	64.000	4.400

Moments of inertia

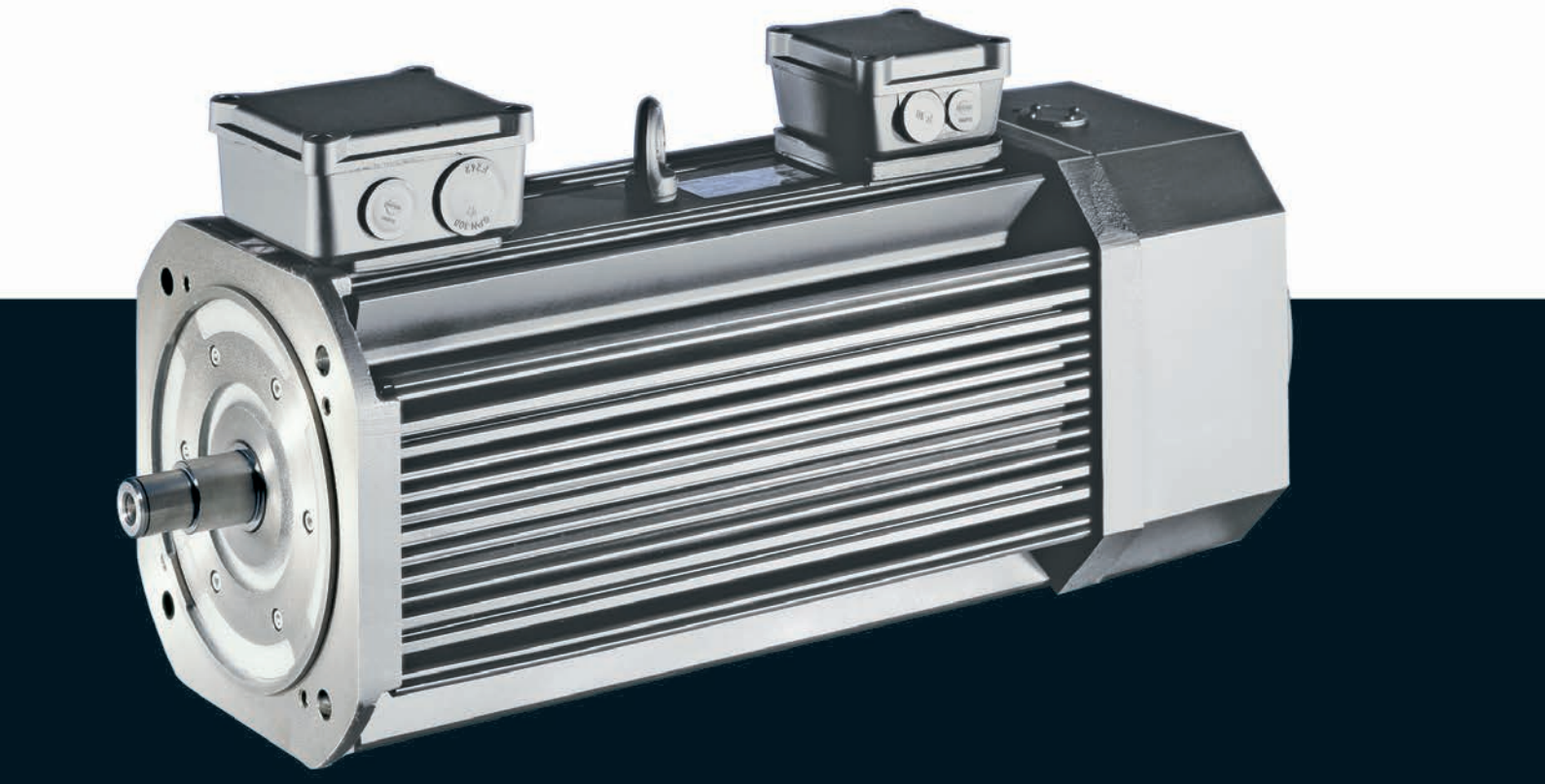
3-stage gearboxes

Product	Dimensions	Ratio	Moment of inertia
	Motor shaft diameter		
	d	i	J
	[mm]		[kgcm²]
g700-P20	11	60.000	0.050
	11	80.000	0.053
	11	100.000	0.053
	11	120.000	0.063
	11	160.000	0.050
	11	200.000	0.050
	11	256.000	0.050
	11	320.000	0.050
	11	512.000	0.050
g700-P44	11	60.000	0.063
	11	80.000	0.074
	11	100.000	0.074
	11	120.000	0.063
	11	160.000	0.063
	11	200.000	0.063
	11	256.000	0.063
	11	320.000	0.063
	11	512.000	0.063
	14	60.000	0.037
	14	80.000	0.048
	14	100.000	0.048
	14	120.000	0.037
	14	160.000	0.037
	14	200.000	0.037
	14	256.000	0.037
	14	320.000	0.037
	14	512.000	0.037
g700-P130	11	60.000	0.390
	11	80.000	0.500
	11	100.000	0.440
	11	120.000	0.700
	11	160.000	0.390
	11	200.000	0.390
	11	256.000	0.390
	11	320.000	0.390
	11	512.000	0.390
	14	60.000	0.390
	14	80.000	0.500
	14	100.000	0.440
	14	120.000	0.700
	14	160.000	0.390
	14	200.000	0.390
	14	256.000	0.390
	14	320.000	0.390
	14	512.000	0.390
	19	60.000	0.390
	19	80.000	0.500
	19	100.000	0.440
	19	120.000	0.700
	19	160.000	0.390
	19	200.000	0.390
	19	256.000	0.390
	19	320.000	0.390
	19	512.000	0.390

Product	Dimensions	Ratio	Moment of inertia
	Motor shaft diameter		
	d	i	J
	[mm]		[kgcm²]
g700-P260	11	60.000	1.332
	11	80.000	1.532
	11	100.000	1.522
	11	120.000	2.532
	11	160.000	1.332
	11	200.000	1.332
	11	256.000	1.332
	11	320.000	1.332
	11	512.000	1.332
	14	60.000	1.325
	14	80.000	1.525
	14	100.000	1.515
	14	120.000	2.525
	14	160.000	1.325
	14	200.000	1.325
	14	256.000	1.325
	14	320.000	1.325
	14	512.000	1.325
	19	60.000	1.300
	19	80.000	1.500
	19	100.000	1.490
	19	120.000	2.500
	19	160.000	1.300
	19	200.000	1.300
	19	256.000	1.300
	19	320.000	1.300
	19	512.000	1.300
	24	60.000	1.244
	24	80.000	1.444
	24	100.000	1.434
	24	120.000	2.444
	24	160.000	1.244
	24	200.000	1.244
	24	256.000	1.244
	24	320.000	1.244
	24	512.000	1.244
	28	60.000	3.567
	28	80.000	3.767
	28	100.000	3.757
	28	120.000	4.767
	28	160.000	3.567
	28	200.000	3.567
	28	256.000	3.567
	28	320.000	3.567
	28	512.000	3.567

MCA asynchronous servo motors

2 to 1,100 Nm



MCA asynchronous servo motors

Contents

List of abbreviations

$\eta_{100\,\%}$	[%]	Efficiency
cos φ		Power factor
du/dt	[kV/µs]	Insulation resistance
$F_{ax,-}$	[N]	Min. axial force
$F_{ax,+}$	[N]	Max. axial force
$f_{in,max}$	[Hz]	Max. input frequency
f_{max}	[kHz]	Limit frequency
f_{max}	[kHz]	Max. switching frequency
f_N	[Hz]	Rated frequency
F_{rad}	[N]	Max. radial force
H_{max}	[m]	Site altitude
I_0	[A]	Standstill current
I_{max}	[A]	Max. short-time DC-bus current
I_{max}	[A]	Max. current
I_{max}	[A]	Max. current consumption
I_{max}	[A]	Max. current
I_{max}	[A]	Max. DC-bus current
I_N	[A]	Rated current
J	[kgcm²]	Moment of inertia
J_{MB}	[kgcm²]	Moment of inertia
$KE_{LL\,150\,°C}$	[V /1000 rp]	Voltage constant
$Kt_{0\,150\,°C}$	[Nm/A]	Torque constant
L	[mH]	Mutual inductance
$L_{1\sigma}$	[mH]	Stator leakage inductance
$L_{2\sigma}$	[mH]	Rotor leakage inductance
L_N	[mH]	Rated inductance
m	[kg]	Mass
M_0	[Nm]	Stall torque
$M_{0,\,max}$	[Nm]	Max. standstill torque
M_{av}	[Nm]	Average dynamic torque
M_{max}	[Nm]	Max. torque
M_N	[Nm]	Rated torque
n_{eto}	[r/min]	Transition speed
n_k	[r/min]	Speed
n_{max}	[r/min]	Max. speed

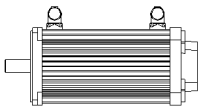
n_N	[r/min]	Rated speed
P_N	[kW]	Rated power
Q_E	[J]	Maximum switching energy
R	[Ω]	Insulation resistance
R	[Ω]	Min. insulation resistance
R_1	[Ω]	Stator impedance
R_2	[Ω]	Charging resistor
R_2	[Ω]	Rotor impedance
$R_{UV\,150\,°C}$	[Ω]	Stator impedance
$R_{UV\,20\,°C}$	[Ω]	Stator impedance
$S_{hü}$	[1/h]	Transition operating frequency
T	[°C]	Operating temperature
T	[°C]	Rated temperature
T	[°C]	Max. ambient temperature of bearing
T	[°C]	Max. surface temperature
T	[°C]	Max. ambient temperature for transport
T	[°C]	Min. ambient storage temperature
T	[°C]	Min. ambient temperature for transport
T	[°C]	Ambient temperature
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
$U_{in,max}$	[V]	Max. input voltage
$U_{in,min}$	[V]	Min. input voltage
U_{max}	[V]	Max. mains voltage
U_{max}	[V]	Min. input voltage
U_{min}	[V]	Min. mains voltage
$U_{N,\,AC}$	[V]	Rated voltage
$U_{N,\,DC}$	[V]	Rated voltage
Z_{ro}	[Ω]	Rotor impedance
Z_{rs}	[Ω]	Impedance
Z_{so}	[Ω]	Stator impedance

List of abbreviations

CE	Communauté Européenne
CSA	Canadian Standards Association
DIN	Deutsches Institut für Normung e.V.
EMC	Electromagnetic compatibility
EN	European standard
GOST	Certificate for Russian Federation
IEC	International Electrotechnical Commission
IM	International Mounting Code
IP	International Protection Code
NEMA	National Electrical Manufacturers Association
UkrSEPRO	Certificate for Ukraine
UL	Underwriters Laboratory Listed Product
UR	Underwriters Laboratory Recognized Product
VDE	Verband deutscher Elektrotechniker (Association of German Electrical Engineers)

Product key

Motor type	Motor size	Rated speed	Mains voltage	Speed/angle sensor	Brake	Standard design	Shaft diameter	Concentricity+ vibration level/ Bearing
MCA								
Asynchronous servo motor	(Example: 14L)	value in 100 rpm (example: 2000 = 20)					(Example: 24)	



Mains voltage

- 400 V: -

Speed/angle sensor

- RS0: Resolver
- SRS: SinCos absolute encoder single- turn, Hiperface, AS1024-8V-H (SRS50)
- SRM: SinCos absolute encoder multi-turn, Hiperface, AM1024-8V-H (SRM50)
- ECN: SinCos absolute encoder single- turn, EnDat, AS2048-5V-E (ECN 1313)
- EQN: SinCos absolute encoder multi- turn, EnDat, AM2048-5V-E (EQN 1325)
- EQI: SinCos absolute encoder multi- turn, EnDat, AM32-5V-E (EQI 1331) [2)]
- S20: Incremental sin-cos encoder IG2048-5V-S (ITD 22)
- T20: TTL incremental encoder, IG2048-5V-T (ITD 21)
- T40: TTL incremental encoder, IG4096-5V-T (ITD 21)
- RV0: Safety resolver, RV03
- S1S: Safety incremental Sin-cos encoder, IG1024-5V-V3

Brake

- B0: No brake
- P1: PM brake DC 24V
- P2: PM brake DC 24V, heavy-duty
- P5: PM brake DC 205 V [1)]
- P6: PM brake DC 205 V, heavy-duty [1)]
- F1: Spring-applied brake DC 24 V
- F2: Spring-applied brake DC 24 V, heavy-duty
- FG: Spring-applied brake AC 230 V [1)]
- FH: Spring-applied brake AC 230 V, heavy-duty [1)]

Standard design

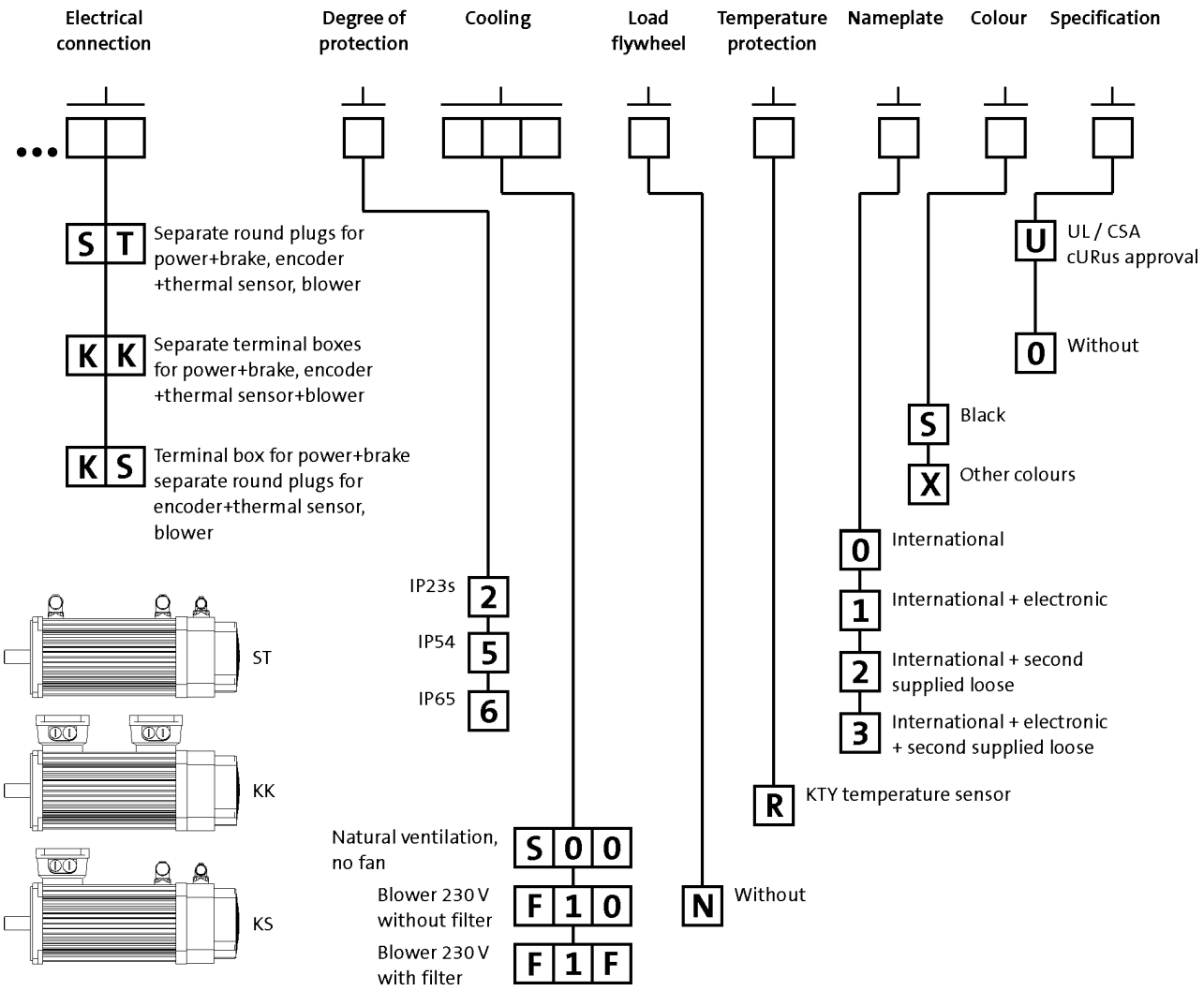
- A: Standard flange form A / FF (B5), shaft without keyway
- B: Standard flange form A / FF (B5), shaft with keyway
- C: Standard flange form C / FT (B14), shaft without keyway
- N: Standard flange form C / FT (B14), shaft with keyway
- F: Like standard design A, but with large flange (MCA20/21/26)
- G: Like standard design B, but with large flange (MCA20/21/26)
- O: B3 foot mounting, shaft without keyway
- P: B3 foot mounting, shaft with keyway

Concentricity+ vibration level/ Bearing

- N: normal vibrational severity standard bearing
- R: reduced vibrational severity standard bearing
- V: normal vibrational severity reinforced bearing

[1)] Not possible for UL design.
[2)] Not possible for motor frame sizes 20, 22 and 26.

Product key



6.11

Product information

An application-oriented structure, low moments of inertia, compact dimensions and a high degree of intrinsic operational reliability characterise these robust and dynamic motors.

The compact design and the low moment of inertia allow these motors to be used in dynamic applications. If your application calls for a broad speed setting range and a robust construction, then the choice is easy: MCA asynchronous servo motors from Lenze.
Whether as a self-ventilated version or with a blower – with a power range from 0.8 to 53.8 kW, the MCA asynchronous servo motors offer rated torque values of up to 280 Nm and peak torque values of up to 1100 Nm. In comparison to standard three-phase AC motors, these servo motors have the edge in terms of lower moments of inertia, lower weight and higher maximum speeds.

Advantages
- High dynamic performance thanks to low moments of inertia
- Compact size with high power density
- Robust regenerative resolver system – alternatively SinCos and incremental encoder for the highest precision
- Easy to install and service friendly thanks to use of SpeedTec connectors
- Terminal box optional up to MCA21 MCA22 and 26 with three-part terminal box
- Protection: IP23, IP54, IP65 optional for naturally ventilated servo motors
- cURus-approved, GOST-certified, CE, RoHS-compliant
- High maximum speeds
- Wide speed setting range
- Field weakening operation usable
- Electronic nameplate

MCA21 asynchronous servo motor

Functions and features

	MCA10	MCA13	MCA14	MCA17	MCA19
Design					
	B14-FT85 B5-FF100	B14-FT130 B5-FF130	B14-FT130 B5-FF165		B14-FT130 B5-FF215
Shaft end (with and without keyway)					
	14 x 30	19 x 40	24 x 50		28 x 60
A end shield					
	Oil-tight Not oil-tight				
Brake					
Spring-applied brake					
Permanent magnetic brake	DC 24 V AC 230 V [1] DC 205 V [1]				
Speed and angle encoder					
	Resolver SinCos single-turn/multi-turn Incremental encoder				
Cooling					
Without blower	Naturally ventilated				
Axial blower, 1 phase	230 V; 50 Hz				
Temperature sensor					
Thermal detector	KTY				
Motor connection: plug connector					
	Power + brake Encoder + thermal sensor Blower				
Motor connection: terminal box					
	Power + brake Encoder + thermal sensor	Power + brake Encoder + thermal sensor + blower			
Motor connection: Terminal box + plug connector					
Terminal box	Power + brake Encoder + thermal sensor				
Plug connector		Blower			
Shaft bearings					
Bearing type	Deep-groove ball bearing with high-temperature resistant grease, sealing disc or cover plate				
Position of the locating bearing	Drive end Standard motors (B3, B5, B14): side B Motors for gearbox direct mounting: side A				
Installation of the locating bearing					
Colour					
	RAL9005M				

[1] Not possible for UR version.

Functions and features

	MCA20	MCA21	MCA22	MCA26
Design				
	B3 B35-FF215 B35-FF265	B14-FT130 B5-FF215 B5-FF265	B3 B35-FF265	B3 B35-FF265 B35-FF350
Shaft end (with and without keyway)				
	38 x 80			55 x 110
A end shield				
	Oil-tight Not oil-tight			
Brake				
Spring-applied brake	DC 24 V AC 230 V [1]		DC 24 V AC 230 V [1]	
Permanent magnetic brake		DC 24 V AC 230 V [1] DC 205 V [1]		
Speed and angle encoder				
	Resolver SinCos single-turn/multi-turn Incremental encoder			
Cooling				
Without blower		Naturally ventilated		
Axial blower, 1 phase	230 V; 50 Hz 230 V; 60 Hz	230 V; 50 Hz	230 V; 50 Hz 230 V; 60 Hz	
Temperature sensor				
Thermal detector	KTY			
Motor connection: plug connector				
	Power + brake Encoder + thermal sensor Blower			
Motor connection: terminal box				
		Power + brake Encoder + thermal sensor + blower		
Motor connection: Terminal box + plug connector				
Terminal box	Power + brake	Power + brake Encoder + thermal sensor	Power + brake	
Plug connector	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 Standard motors (B3, B5, B14): side B Motors for gearbox direct mounting: side A	Non-drive end	
Installation of the locating bearing	insulation		insulation	
Colour				
	RAL9005M			

[1] Not possible for UR version.

Dimensioning

Speed-dependent safety functions

Single encoder concepts with resolvers

Servo motors can perform speed-dependent safety functions for safe speed and / or safe relative position monitoring in a drive system with the Servo Drives 9400. The SM301 safety module, which can be integrated in the Servo Drives 9400, is used to implement these functions. When planning systems/installations of this kind, the following must always be observed:

When using just one single feedback system in the environment of these safety applications, the applicable safety engineering standard IEC 61800-5-2 [Adjustable speed electrical power drive systems - Part: 5-2: Safety requirements - Functional] stipulates special requirements for the connection between feedback system and motor shaft. This is due to the fact that two-channel safety systems at this point in the mechanical system are actually designed as single-channel systems. If this mechanical connection is designed with considerable overdimensioning, the standard permits exclusion of the fault "encoder-shaft breakage" or "encoder-shaft slip".
As such, acceleration limit values must not be exceeded for the individual drive solutions. You can find the limit values in the corresponding feedback data of the individual motor ranges.

Speed-dependent safety functions in connection with the SM301 safety module

For the following speed-dependent safety functions, the motor-feedback system combinations listed in the following table are available:
- Safe stop 1 (SS1)
- Safe operational stop (SOS)
- Safely Limited Speed (SLS)
- Safe Maximum Speed (SMS)
- Safe direction (SDI)
- Operation mode selector (OMS) with confirmation (ES)
- Safe speed monitor (SSM)
- Safely limited increment (SLI).

Encoder type	Encoder type	Product key	Feedback	Safe speed monitoring
			Design	
SinCos incremental	Single-turn	IG1024-5V-V3		PL e/SIL 3
Resolver		RV03		
			2-encoder concept	up to PL e / SIL 3

Dimensioning

Cooling effect of mounting flange

Mounting on a thermally conducting / insulating plate or machine chassis has an influence on heating up the motor, particularly when using naturally ventilated motors.

The motor rating data specified in the catalogue applies when mounting on a steel plate with free convection with the following dimensions:
- MCA10 / 13: 270 x 270 mm
- MCA14 / 17: 330 x 330 mm
- MCA19 to 26: 450 x 450 mm

Vibrational severity

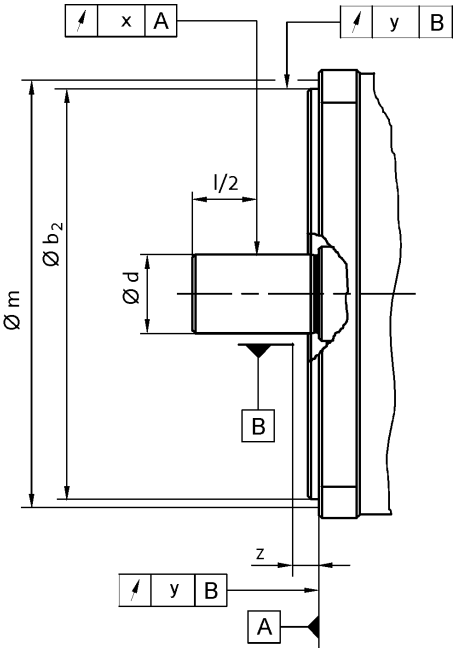
		MCA10	MCA13	MCA14	MCA17	MCA19	MCA20	MCA21	MCA22	MCA26
Vibrational severity										
IEC/EN 60034-14		A		B			A	B	A	
Maximum r.m.s. value of the vibration velocity [1]	[mm/s]	1.60		0.70			1.60	0.70	1.60	

[1] Free suspension

► at n = 600 to 3,600 rpm

Dimensioning

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													
IEC 60072				Normal class				Precision class					
Value	y		[mm]	0.080		0.10		0.050					
Linear movement													
IEC 60072				Normal class				Precision class					
Value	y		[mm]	0.080		0.10		0.050					
Smooth running													
IEC 60072				Normal class				Precision class					
Value	x		[mm]	0.035		0.040		0.021					

► Limit values for checking the smooth running of the shaft ends as well as the concentricity and axial run-out of the mounting flange to IEC 60072

Dimensioning

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

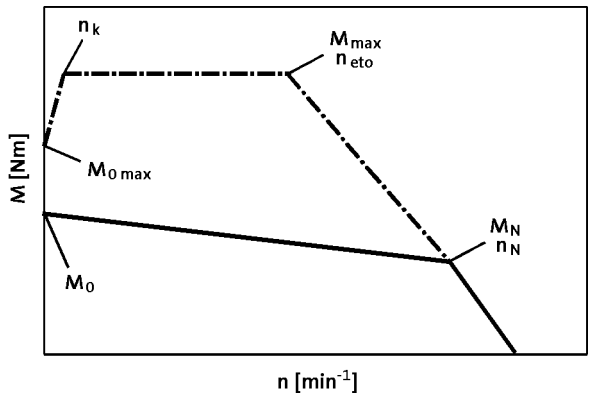
				MCA20		MCA21			MCA22	MCA26
Flange size										
				FF215	FF265	FF215	FF265	FT130	FF265	FF350
Dimensions										
	b_2	j6	[mm]	180	230	180	230	110	230	
	b_2	h6	[mm]							300
	d	k6	[mm]			38				
	d	m6	[mm]							55
Distance										
Measuring diameter	m		[mm]	239	289	239	289	149	289	384
Dial gauge holder for flange check	z	+/- 1	[mm]			10.0				
Concentricity										
IEC 60072				Normal class		Precision class			Normal class	
Value	y		[mm]	0.10		0.050			0.10	
Linear movement										
IEC 60072				Normal class		Precision class			Normal class	
Value	y		[mm]	0.10		0.050			0.10	
Smooth running										
IEC 60072				Normal class		Precision class			Normal class	
Value	x		[mm]	0.050		0.060			0.050	0.060

► Limit values for checking the smooth running of the shaft ends as well as the concentricity and axial run-out of the mounting flange to IEC 60072

Dimensioning

Notes on the selection tables

Graphical display of the operating points



	n_k
	[r/min]
MCA	150
MQA	

Further selection tables with different switching frequencies are available with the following codes:
- DS_ZT_MCS_0001
- DS_ZT_MCA_0001
- DS_ZT_MDSKS_0001
- DS_ZT_MDFKS_0001

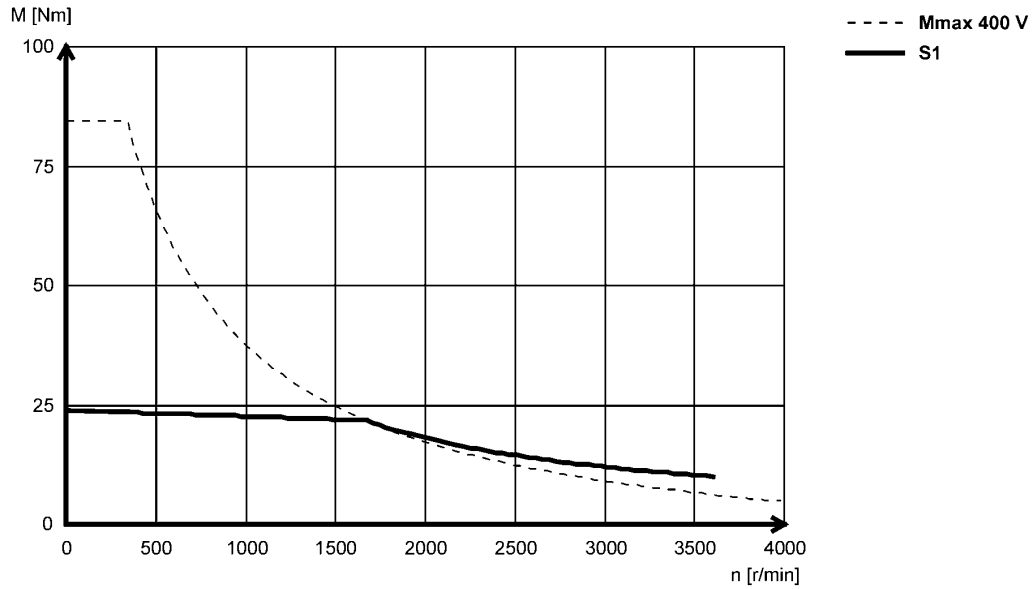
Simply enter this code (e.g. DS_ZT_MCS_0001) as a search string at **www.lenze.de/dsc** and you will be given the information immediately in the form of a PDF format.

Please note:
- With an active load (e.g. vertical drive axes, hoists, test benches, unwinders), $M_{0\,max}$ must be taken into account
- With a passive load (e.g. horizontal drive axes), M_{max} can generally be used
- At speeds < n_k, the inverter-specific torque $M_{0\,max}$ that can be achieved is lower than M_{max}
- On the servo inverters, the switching frequency-dependent overload capacity has been taken into account in the factory settings. For further information, please refer to the Servo-Inverters catalogue.

Dimensioning

Notes on the torque characteristics

Graph of the torque characteristics



With asynchronous servo motors, two characteristics are shown in each case. The characteristics for continuous operation (S1) show the speed-dependent constant torque of the motor when operating with a servo inverter that itself is operated at a constant switching frequency. The limit torque characteristics correspond to those that come about during operation of the motor with the largest possible 9400 Servo Drive in each case (see selection tables). The servo inverter is set to a variable switching frequency here.

Characteristics in the Internet

You can find the torque characteristic for inverter-motor combinations on the Internet at **www.lenze.de/dsc**. This lists all useful combinations with the servo inverters 9400, 9300, ECS and Inverter Drives 8400 TopLine. These characteristics are each determined using the factory default settings of the inverters:

- 9400 with variables switching frequency.
  This means that up to 6-fold overcurrent can be applied in borderline cases.
- 9300 and ECS with fixed switching frequency.
- 8400 TopLine with variables switching frequency.

The continuous operation characteristics (S1) show the inverter-independent motor rating values

6.11

Further information on the terms switching frequency and factory default settings can be found in the operating manual of the respective servo inverter.

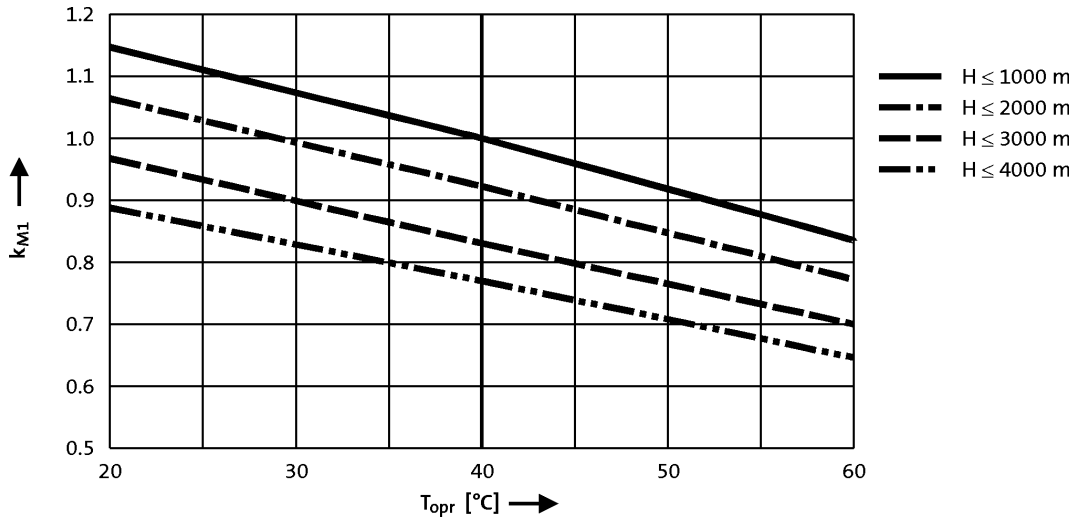
Dimensioning

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...M_N) in the event of differing installation conditions.

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

Torque correction factor k_{m1}



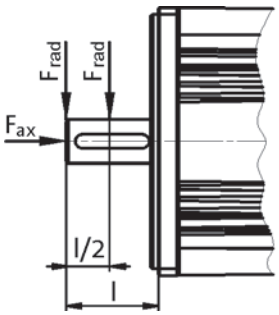
Standards and operating conditions

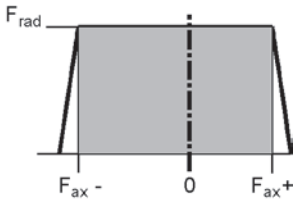
			MCA	
Cooling type				
			Naturally ventilated	Blower
Degree of protection				
EN 60529			IP54 IP65	IP54 IP23s [2]
Temperature class				
IEC/EN 60034-1; utilisation			F	
IEC/EN 60034-1; insulation system (enamel-insulated wire)			H	
Approval				
Class			cURus [4, 5] GOST-R UkrSepro	
Max. voltage load				
IEC/TS 60034-25			Pulse voltage limiting curve A	
Smooth running				
IEC 60072			Precision class [1] Normal class	
Linear movement				
IEC 60072			Precision class [1] Normal class	
Concentricity				
IEC 60072			Precision class [1] Normal class	
Mechanical ambient conditions (vibration)				
IEC/EN 60721-3-3			3M6	
Min. ambient operating temperature				
Without brake	$T_{opr,min}$	[°C]	-20	-15
With brake	$T_{opr,min}$	[°C]	-10	
Max. ambient temperature for operation				
	$T_{opr,max}$	[°C]	40	
Max. surface temperature				
	T	[°C]	140	110
Mechanical tolerance				
Flange centring diameter			$b_2 \leq 230$ mm = j6 $b_2 > 230$ mm = h6	
Shaft diameter			$d \leq 50$ mm = k6 $d > 50$ mm = m6	
Site altitude				
Amsl	H_{max}	[m]	4000	

[1] MCA14, 17, 19 and 21.
[2] MCA20, 22 and 26.
[3] Not possible on MCA20.
[4] Recognized component File No. E 210321.
[5] MCA20X29, MCA21X35 with circular connector for motor connection only UR

Permissible radial and axial forces

Application of forces





Application of force at l/2

Bearing service life L_{10}															
	5000 h			10000 h			20000 h			30000 h			50000 h		
	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]
MCA10	630	-130	320	500	-60	250	400	-30	210	330	-10	190	230	0	200
MCA13	850	-110	570	700	-10	450	470	0	450		0	450			
MCA14	1000	-140	500	780	-60	420	550	-30	380	400	-10	360	250	0	350
MCA17	1380	-180	790	1040	-70	680	660	-40	650	440	-20	630	280		610
MCA19	1880	-50	1530	1080	-30	1510	500	-100	1490	160	0	1470			
MCA20	3400	-1330	690	2500	-1020	380	1950	-780	140	1700	-690	40			
MCA21	3200	-260	1740	2360	-70	1550	1470	-20	1504	1030	0	1480			
MCA22	3600	-2370	1700	2800	-1740	1090	2200	-1280	640	1900	-1080	440	1600	-880	240
MCA26	6950	-2500	1580	5400	-1800	880	4300	-1300	380	3700	-1090	160			

Application of force at l

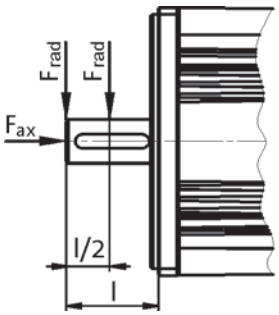
Bearing service life L_{10}															
	5000 h			10000 h			20000 h			30000 h			50000 h		
	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]
MCA10	590	-130	320	470	-60	250	370	-30	210	310	-10	190	220	0	200
MCA13	780	-110	570	640	-10	450	430	0	450	300	0	450			
MCA14	930	-140	500	710	-60	420	490	-30	380	370	-10	360	230	0	350
MCA17	1270	-180	790	960	-70	680	610	-40	650	400	-20	630	260		610
MCA19	1740	-50	1530	1000	-30	1510	420	-100	1490	140	0	1470			
MCA20	3150	-1170	530	2300	-920	280	1800	-710	70	1400	-650	0			
MCA21	2940	-260	1740	2160	-70	1550	1350	-20	1504	950	0	1480			
MCA22	3500	-2240	1600	2600	-1640	1100	2050	-1200	560	1800	-1020	380	1450	-850	200
MCA26	6400	-2080	1150	5000	-1600	680	4000	-1160	230	3400	-1090	50			

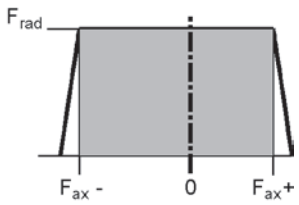
► The values for the bearing service life L_{10} relate to an average speed of 4000 r/min. For MCA20/22/26 the speed is 3000 r/min. Depending on the ambient temperatures, the service life of the bearings is also reduced by the grease lifetime.

Permissible radial and axial forces

► Reinforced bearings

Application of forces





Application of force at l/2

Bearing service life L_{10}															
	5000 h			10000 h			20000 h			30000 h			50000 h		
	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]
MCA20	7100	-970	330	5100	-800	160	3900	-640	0						
MCA22	8500	-1850	1200	7000	-1400	760	5600	-1030	390	4350	-930	290	3200	-800	160
MCA26	10500	-2180	1250	8370	-1530	600	6670	-1130	200	5840	-960	30			

Application of force at l

Bearing service life L_{10}															
	5000 h			10000 h			20000 h			30000 h			50000 h		
	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]	F_{rad} [N]	$F_{ax,-}$ [N]	$F_{ax,+}$ [N]
MCA20	6350	-720	80	4100	-680	40	2800	-640	0						
MCA22	7000	-1750	1100	5500	-1300	660	4700	-920	280	3900	-820	180	3000	-700	60
MCA26	9600	-2200	1280	7700	-1280	360	6000	-960	30						

► The values for the bearing service life L_{10} refer to an average speed of 3000 r/min. Depending on the ambient temperatures, the service life of the bearings is also reduced by the grease lifetime.

Rated data, non-ventilated

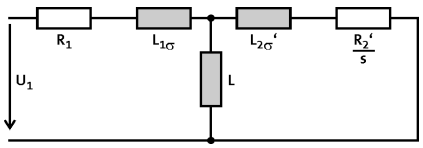
► The data applies to a mains connection voltage of 3 x 400 V.

	n_N	M_0	M_N	M_{max}	P_N	I_0	I_N	$U_{N, AC}$	f_N	J [1]	$\eta_{100\,\%}$
	[r/min]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[V]	[Hz]	[kgcm²]	[%]
MCA10I40	3950	2.30	2.00	10.0	0.80	2.60	2.40	390	140	2.40	0.70
MCA13I41	4050	4.60	4.00	32.0	1.70	4.60	4.40	390	140	8.30	75.0
MCA14L20	2000	8.00	6.70	60.0	1.40	3.90	3.30	390	70	19.2	84.0
MCA14L41	4100	8.00	5.40	60.0	2.30	7.70	5.80	390	140	19.2	78.0
MCA17N23	2300	12.8	10.8	100	2.60	6.00	5.50	390	80	36.0	86.0
MCA17N41	4110	12.8	9.50	100	4.10	12.0	10.2	350	140	36.0	83.0
MCA19S23	2340	22.5	16.3	180	4.00	9.90	8.20	390	80	72.0	90.0
MCA19S42	4150	22.5	12.0	180	5.20	19.7	14.0	330	140	72.0	83.0
MCA21X25	2490	39.0	24.6	300	6.40	15.9	13.5	390	85	180	85.0
MCA21X42	4160	39.0	17.0	300	7.40	31.8	19.8	320	140	180	84.0

	R_1	$R_{UV\,20\,°C}$	$R_{UV\,150\,°C}$	R_2	$L_{1\sigma}$	L	$L_{2\sigma}$	n_{max} [2]	m [1]
	[Ω]	[Ω]	[Ω]	[Ω]	[mH]	[mH]	[mH]	[r/min]	[kg]
MCA10I40	4.70	9.40	12.7	5.20	9.80	169	10.0	8000	6.40
MCA13I41	1.70	3.40	4.60	1.41	5.40	92.6	4.90		10.4
MCA14L20	3.00	6.00	8.10	3.13	10.0	269	10.0		15.1
MCA14L41	0.75	1.50	2.00	0.78	2.50	65.8	2.50		
MCA17N23	1.52	3.04	4.10	1.37	6.20	176	6.80		22.9
MCA17N41	0.38	0.76	1.00	0.34	1.50	43.4	1.70		
MCA19S23	0.69	1.38	1.90	0.62	3.20	111	3.90		44.7
MCA19S42	0.18	0.35	0.50	0.15	0.80	28.0	1.00		
MCA21X25	0.36	0.72	1.00	0.36	2.30	78.1	2.80		60.0
MCA21X42	0.090	0.18	0.20	0.090	0.60	19.5	0.70		

[1] Without brake.
[2] Mechanically permissible maximum speed.

The data in the R_1, $L_{1\sigma}$, L, R_2' and $L_{2\sigma}'$ columns is based on a single-phase equivalent circuit diagram at 20°C.



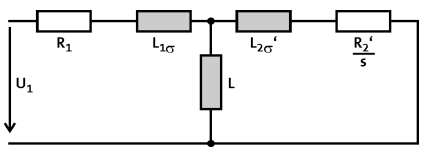
Rated data, IP54 forced ventilated

► The data applies to a mains connection voltage of 3 x 400 V.

	n_N	M_0	M_N	M_{max}	P_N	I_0	I_N	$U_{N,AC}$	f_N	J [1]	$\eta_{100\,\%}$
	[r/min]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[V]	[Hz]	[kgcm²]	[%]
MCA13I34	3410	7.00	6.30	32.0	2.20	6.30	6.00	390	120	8.30	72.0
MCA14L16	1635	13.5	12.0	60.0	2.10	5.30	4.80	390	60	19.2	80.0
MCA14L35	3455	13.5	10.8	60.0	3.90	10.5	9.10	390	120	19.2	79.0
MCA17N17	1680	23.9	21.5	100	3.80	9.10	8.50	390	60	36.0	83.0
MCA17N35	3480	23.9	19.0	100	6.90	18.1	15.8	390	120	36.0	81.0
MCA19S17	1700	40.0	36.3	180	6.40	15.4	13.9	390	60	72.0	82.0
MCA19S35	3510	40.0	36.0	180	13.2	30.8	28.7	390	120	72.0	85.0
MCA21X17	1710	75.0	61.4	300	11.0	25.8	22.5	390	60	180	85.0
MCA21X35	3520	75.0	55.0	300	20.3	49.5	42.5	390	120	180	88.0
MCA22P08...5F□□	760	120	110	500	8.75	23.4	22.1	345	28	487	80.0
MCA22P14...5F□□	1425	120	107	500	16.0	40.5	37.7	350	50	487	87.0
MCA22P17...5F□□	1670	120	106	500	18.5	46.7	42.7	360	58	487	88.0
MCA22P29...5F□□	2935	120	100	500	30.7	80.9	72.1	360	100	487	87.0
MCA26T05...5F□□	550	220	216	1100	12.4	35.4	34.9	350	19	1335	83.0
MCA26T10...5F□□	1030	220	210	1100	22.7	62.9	61.5	350	36	1335	88.0
MCA26T12...5F□□	1200	220	207	1100	26.0	78.4	75.1	350	41	1335	87.0
MCA26T22...5F□□	2235	220	195	1100	45.6	125	113	340	76	1335	92.0

	R_1	$R_{UV\,20\,°C}$	$R_{UV\,150\,°C}$	R_2	$L_{1\sigma}$	L	$L_{2\sigma}$	n_{max} [2]	m [1]
	[Ω]	[Ω]	[Ω]	[Ω]	[mH]	[mH]	[mH]	[r/min]	[kg]
MCA13I34	1.70	3.40	4.60	1.41	4.90	76.7	4.40	8000	12.0
MCA14L16	3.00	6.00	8.10	3.13	9.50	224	9.30		16.9
MCA14L35	0.75	1.50	2.00	0.78	2.40	56.7	2.30		
MCA17N17	1.52	3.04	4.10	1.37	5.60	144	6.00		25.5
MCA17N35	0.38	0.76	1.00	0.34	1.40	36.9	1.50		
MCA19S17	0.69	1.38	1.90	0.62	2.60	80.9	3.10		48.2
MCA19S35	0.18	0.35	0.50	0.15	0.70	20.3	0.80		
MCA21X17	0.36	0.72	1.00	0.36	2.10	68.9	2.60		63.5
MCA21X35	0.090	0.18	0.20	0.090	0.50	16.8	0.60		
MCA22P08...5F□□	0.54	1.07	1.62	0.48	3.56	94.9	4.80	6500	105
MCA22P14...5F□□		0.36	0.54		3.60	94.2	4.85		
MCA22P17...5F□□	0.13	0.27	0.40	0.12	0.90	23.4	1.21		
MCA22P29...5F□□		0.080	0.12			22.9			
MCA26T05...5F□□	0.29	0.59	0.89	0.25	2.86	66.8	5.04		194
MCA26T10...5F□□		0.20	0.30		2.93	69.2	5.12		
MCA26T12...5F□□	0.080	0.15	0.23	0.062	0.74	18.1	1.29		
MCA26T22...5F□□		0.050	0.075		0.78	19.8			

[1] Without brake.
[2] Mechanically permissible maximum speed.
The data in the R_1, $L_{1\sigma}$, L, R_2' and $L_{2\sigma}$' columns is based on a single-phase equivalent circuit diagram at 20°C.



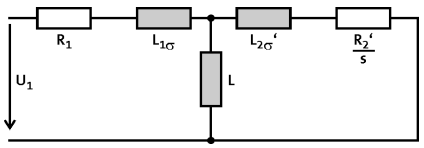
Rated data, IP23s forced ventilated

► The data applies to a mains connection voltage of 3 x 400 V.

	n_N	M_0	M_N	M_{max}	P_N	I_0	I_N	$U_{N, AC}$	f_N	J [1]	$\eta_{100\,\%}$
	[r/min]	[Nm]	[Nm]	[Nm]	[kW]	[A]	[A]	[V]	[Hz]	[kgcm²]	[%]
MCA20X14...2F□□	1420	68.0	61.0	250	9.07	26.0	23.0	350	50	171	82.0
MCA20X29...2F□□	2930	68.0	53.5	250	16.4	52.0	42.4	350	100	171	87.0
MCA22P08...2F□□	760	135	120	500	9.55	26.0	23.5	355	28	487	80.0
MCA22P14...2F□□	1425	135	115	500	17.2	45.1	40.0	360	50	487	86.0
MCA22P17...2F□□	1670	135	112	500	19.6	52.1	44.5	360	58	487	88.0
MCA22P29...2F□□	2935	135	110	500	33.8	90.2	77.8	360	100	487	89.0
MCA26T05...2F□□	550	290	280	1100	16.1	44.0	42.4	350	20	1335	81.0
MCA26T10...2F□□	1030	290	260	1100	28.0	78.0	69.6	350	36	1335	87.0
MCA26T12...2F□□	1200	290	255	1100	32.0	101	83.3	350	41	1335	87.0
MCA26T22...2F□□	2235	290	230	1100	53.8	160	127	340	76	1335	92.0

	R_1	$R_{UV\,20\,°C}$	$R_{UV\,150\,°C}$	R_2	$L_{1\sigma}$	L	$L_{2\sigma}$	n_{max} [2]	m [1]
	[Ω]	[Ω]	[Ω]	[Ω]	[mH]	[mH]	[mH]	[r/min]	[kg]
MCA20X14...2F□□	0.37	0.73	1.10	0.36	2.01	60.2	2.14	6500	64.0
MCA20X29...2F□□	0.090	0.18	0.28	0.090	0.50	14.3	0.54		
MCA22P08...2F□□	0.54	1.07	1.62	0.48	3.50	91.9	4.74		105
MCA22P14...2F□□		0.36	0.54		3.55	90.9	4.79		
MCA22P17...2F□□	0.13	0.27	0.40	0.12	0.90	23.5	1.22		
MCA22P29...2F□□		0.080	0.12			22.9	1.21		
MCA26T05...2F□□	0.29	0.59	0.89	0.25	3.11	72.1	5.08		194
MCA26T10...2F□□		0.20	0.30		3.17	71.4	5.14		
MCA26T12...2F□□	0.080	0.15	0.23	0.062	0.78	18.6	1.30		
MCA26T22...2F□□		0.050	0.077			20.2			

[1] Without brake.
[2] Mechanically permissible maximum speed.
The data in the R_1, $L_{1\sigma}$, L, R_2' and $L_{2\sigma}'$ columns is based on a single-phase equivalent circuit diagram at 20°C.



Selection tables, Servo Drives 9400 HighLine

Non-ventilated motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 4 kHz.

					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}					-	-	-	-	

► I... [A], M... [Nm], n... [r/min], P... [kW]

Selection tables, Servo Drives 9400 HighLine

Non-ventilated motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 4 kHz.

					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
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... [r/min], P... [kW]

Selection tables, Servo Drives 9400 HighLine

Forced ventilated IP54 motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 4 kHz.

					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
13I34	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... [r/min], P... [kW]

Selection tables, Servo Drives 9400 HighLine

Forced ventilated IP54 motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

					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	45.60	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... [r/min], P... [kW]
► If the motors are operated at a lower switching frequency, please contact your Lenze sales office!
► When operating at 4 kHz, the motor generates just 95 % of its rated torque with increased noise emissions.

Selection tables, Servo Drives 9400 HighLine

Forced ventilated IP23s motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

					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	66.0										
					M_N	32.5	61.0										
					$M_{0,max}$	154.2	190.0										
					M_{max}	154.2	190.0										
					n_{eto}	-	-										
20X29-...2F□□	53.5	2930	42.4	16.40	M_0			28.0	51.6	51.6							
					M_N			28.0	51.6	51.6							
					$M_{0,max}$			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}						-	-	-				

► I... [A], M... [Nm], n... [r/min], P... [kW]
► If the motors are operated at a lower switching frequency, please contact your Lenze sales office!
► When operating at 4 kHz, the motor generates just 95 % of its rated torque with increased noise emissions.

Selection tables, Servo Drives 9400 HighLine

Forced ventilated IP23s motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

					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
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... [r/min], P... [kW]
► If the motors are operated at a lower switching frequency, please contact your Lenze sales office!
► When operating at 4 kHz, the motor generates just 95 % of its rated torque with increased noise emissions.

Selection tables, Inverter Drives 8400 TopLine

Non-ventilated motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

					E84AVTC	□5514	□7514	□1124	□1524	□2224	□3024	□4024	□5524	□7524	□1134	□1534	□1834
					I_N	1.8	2.4	3.2	3.9	5.9	7.3	9.5	13.0	16.5	23.5	32.0	39.0
					$I_{0,max}$	2.7	3.6	4.8	5.9	8.4	11.0	14.3	19.5	26.4	32.9	43.2	60.0
MCA	M_N	n_N	I_N	P_N	I_{max}	3.6	4.8	6.4	7.8	11.8	14.6	19.0	26.0	33.0	47.0	64.0	78.0
10I40	2.0	3950	2.4	0.80	M_0	-	2.3	2.3	2.3	2.3							
					M_N	-	1.9	1.9	1.9	1.9							
					$M_{0,max}$	4.2	5.8	8.0	9.8	10.0							
					M_{max}	4.2	5.8	8.0	9.8	10.0							
					n_{eto}	-	-	-	-	-							
13I41	4.0	4050	4.4	1.70	M_0			-	-	4.6	4.6	4.6					
					M_N			-	-	4.0	4.0	4.0					
					$M_{0,max}$			7.6	9.6	14.3	18.9	22.9					
					M_{max}			7.6	9.6	14.3	18.9	22.9					
					n_{eto}			-	-	-	-	-					
14L20	6.7	2000	3.3	1.40	M_0		-	-	8.0	8.0	8.0						
					M_N		-	-	6.7	6.7	6.7						
					$M_{0,max}$		11.6	16.2	20.1	29.4	34.7						
					M_{max}		11.6	16.2	20.1	29.4	34.7						
					n_{eto}		-	-	-	-	-						
14L41	5.4	4100	5.8	2.30	M_0					-	8.0	8.0	8.0				
					M_N					-	5.4	5.4	5.4				
					$M_{0,max}$					14.1	19.0	25.1	31.0				
					M_{max}					14.1	19.0	25.1	31.0				
					n_{eto}					-	-	-	-				
17N23	10.8	2300	5.5	2.60	M_0				-	12.8	12.8	12.8	12.8				
					M_N				-	10.8	10.8	10.8	10.8				
					$M_{0,max}$				17.1	25.3	33.3	43.8	51.1				
					M_{max}				17.1	25.3	33.3	43.8	51.1				
					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		
					$M_{0,max}$						16.5	22.3	31.1	39.9	49.5		
					M_{max}						16.5	22.3	31.1	39.9	49.5		
					n_{eto}						-	-	-	-	-		
19S23	16.3	2340	8.2	4.00	M_0						-	22.5	22.5	22.5			
					M_N						-	16.3	16.3	16.3			
					$M_{0,max}$						32.8	43.6	60.9	77.5			
					M_{max}						32.8	43.7	61.0	77.5			
					n_{eto}						-	-	-	-			
19S42	12.0	4150	14.0	5.20	M_0								-	22.5	22.5	22.5	
					M_N								-	12.0	12.0	12.0	
					$M_{0,max}$								28.5	37.0	53.7	64.7	
					M_{max}								28.5	37.0	53.8	64.7	
					n_{eto}								-	-	-	-	
21X25	24.6	2490	13.5	6.40	M_0							-	-	39.0	39.0	39.0	
					M_N							-	-	24.5	24.5	24.5	
					$M_{0,max}$							33.6	46.7	59.3	85.9	97.3	
					M_{max}							33.6	46.7	59.3	85.9	97.6	
					n_{eto}							-	-	-	-	-	

► I... [A], M... [Nm], n... [r/min], P... [kW]

Selection tables, Inverter Drives 8400 TopLine

Non-ventilated motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

					E84AVTC	□5514	□7514	□1124	□1524	□2224	□3024	□4024	□5524	□7524	□1134	□1534	□1834
					I_N	1.8	2.4	3.2	3.9	5.9	7.3	9.5	13.0	16.5	23.5	32.0	39.0
					$I_{0,max}$	2.7	3.6	4.8	5.9	8.4	11.0	14.3	19.5	26.4	32.9	43.2	60.0
MCA	**M_N**	**n_N**	**I_N**	**P_N**	I_{max}	3.6	4.8	6.4	7.8	11.8	14.6	19.0	26.0	33.0	47.0	64.0	78.0
21X42	17.0	4160	19.8	7.40	M_0									-	39.0	39.0	39.0
					M_N									-	17.0	17.0	17.0
					$M_{0,max}$									35.3	52.2	72.1	88.5
					M_{max}									35.3	52.2	72.1	88.5
					n_{eto}									-	-	-	-

► I... [A], M... [Nm], n... [r/min], P... [kW]

Selection tables, Inverter Drives 8400 TopLine

Forced ventilated IP54 motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

					E84AVTC	□1524	□2224	□3024	□4024	□5524	□7524
					I_N	3.9	5.9	7.3	9.5	13.0	16.5
					$I_{0,max}$	5.9	8.4	11.0	14.3	19.5	26.4
MCA	M_N	n_N	I_N	P_N	I_{max}	7.8	11.8	14.6	19.0	26.0	33.0
13I34	6.3	3410	6.0	2.20	M_0		-	7.0	7.0	7.0	
					M_N		-	6.2	6.2	6.2	
					$M_{0,max}$		16.0	21.4	28.2	32.0	
					M_{max}		16.0	21.4	28.2	32.0	
					n_{eto}		-	-	-	-	
14L16	12.0	1635	4.8	2.10	M_0	-	13.5	13.5	13.5		
					M_N	-	12.3	12.3	12.3		
					$M_{0,max}$	23.4	34.7	45.5	50.8		
					M_{max}	23.4	34.7	45.5	50.8		
					n_{eto}	-	-	-	-		
14L35	10.8	3455	9.1	3.90	M_0			-	13.5	13.5	13.5
					M_N			-	10.8	10.8	10.8
					$M_{0,max}$			21.1	28.4	39.8	51.1
					M_{max}			21.1	28.4	39.8	51.1
					n_{eto}			-	-	-	-
17N17	21.5	1680	8.5	3.80	M_0			-	23.9	23.9	23.9
					M_N			-	21.6	21.6	21.6
					$M_{0,max}$			42.1	55.9	77.5	93.3
					M_{max}			42.2	56.0	77.5	93.3
					n_{eto}			-	-	-	-
17N35	19.0	3480	15.8	6.90	M_0					-	23.9
					M_N					-	18.9
					$M_{0,max}$					38.0	49.5
					M_{max}					38.0	49.5
					n_{eto}					-	-
19S17	36.3	1700	13.9	6.40	M_0					-	40.0
					M_N					-	36.0
					$M_{0,max}$					71.6	94.7
					M_{max}					71.6	94.7
					n_{eto}					-	-
19S35	36.0	3510	28.7	13.20	M_0						
					M_N						
					$M_{0,max}$						
					M_{max}						
					n_{eto}						
21X17	61.4	1710	22.5	11.00	M_0						-
					M_N						-
					$M_{0,max}$						99.0
					M_{max}						99.0
					n_{eto}						-
21X35	55.0	3520	42.5	20.30	M_0						
					M_N						
					$M_{0,max}$						
					M_{max}						
					n_{eto}						

► I... [A], M... [Nm], n... [r/min], P... [kW]

Selection tables, Inverter Drives 8400 TopLine

Forced ventilated IP54 motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

□1134	□1534	□1834	□2234	□3034	□3734	□4534	E84AVTC					
23.5	32.0	39.0	47.0	61.0	76.0	89.0	I_N					
32.9	43.2	60.0	70.5	91.5	114.0	133.5	$I_{0,max}$					
47.0	64.0	78.0	94.0	122.0	152.0	178.0	I_{max}	P_N	I_N	n_N	M_N	MCA
							M_0	2.20	6.0	3410	6.3	13I34
							M_N					
							$M_{0,max}$					
							M_{max}					
							n_{eto}					
							M_0	2.10	4.8	1635	12.0	14L16
							M_N					
							$M_{0,max}$					
							M_{max}					
							n_{eto}					
13.5							M_0	3.90	9.1	3455	10.8	14L35
10.8							M_N					
56.5							$M_{0,max}$					
56.6							M_{max}					
-							n_{eto}					
							M_0	3.80	8.5	1680	21.5	17N17
							M_N					
							$M_{0,max}$					
							M_{max}					
							n_{eto}					
23.9	23.9						M_0	6.90	15.8	3480	19.0	17N35
18.9	18.9						M_N					
72.5	97.8						$M_{0,max}$					
72.5	97.8						M_{max}					
-	-						n_{eto}					
40.0	40.0						M_0	6.40	13.9	1700	36.3	19S17
36.0	36.0						M_N					
138.9	165.2						$M_{0,max}$					
139.0	165.3						M_{max}					
-	-						n_{eto}					
-	40.0	40.0	40.0	40.0			M_0	13.20	28.7	3510	36.0	19S35
-	35.9	35.9	35.9	35.9			M_N					
55.1	78.8	97.8	112.8	146.2			$M_{0,max}$					
55.1	78.8	97.8	112.9	146.2			M_{max}					
-	-	-	-	-			n_{eto}					
75.0	75.0	75.0	75.0				M_0	11.00	22.5	1710	61.4	21X17
61.4	61.4	61.4	61.4				M_N					
143.7	198.5	242.2	277.2				$M_{0,max}$					
144.0	198.7	242.3	277.2				M_{max}					
-	-	-	-				n_{eto}					
	-	-	75.0	75.0	75.0	75.0	M_0	20.30	42.5	3520	55.0	21X35
	-	-	55.1	55.1	55.1	55.1	M_N					
	97.5	120.6	138.5	177.5	216.7	267.8	$M_{0,max}$					
	97.5	120.6	138.6	178.0	217.5	269.8	M_{max}					
	-	-	-	-	-	-	n_{eto}					

► I... [A], M... [Nm], n... [r/min], P... [kW]

Selection tables, Inverter Drives 8400 TopLine

Forced ventilated IP54 motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

					E84AVTC	□7524	□1134	□1534	□1834	□2234	□3034	□3734	□4534
					I_N	16.5	23.5	32.0	39.0	47.0	61.0	76.0	89.0
					$I_{0,max}$	26.4	32.9	43.2	60.0	70.5	91.5	114.0	133.5
MCA	**M_N**	**n_N**	**I_N**	**P_N**	I_{max}	33.0	47.0	64.0	78.0	94.0	122.0	152.0	178.0
22P08-...5F□□	110.0	760	22.1	8.80	M_0	-	120.0	120.0	120.0	120.0			
					M_N	-	110.6	110.6	110.6	110.6			
					$M_{0,max}$	157.8	233.4	323.3	396.6	394.3			
					M_{max}	157.8	233.5	323.3	396.6	394.3			
					n_{eto}	-	-	-	-	-			
22P14-...5F□□	107.0	1425	37.7	16.00	M_0			-	120.0	120.0	120.0	120.0	120.0
					M_N			-	107.2	107.2	107.2	107.2	107.2
					$M_{0,max}$			186.5	232.5	268.8	345.7	422.7	458.8
					M_{max}			186.7	232.7	269.0	346.3	423.7	460.9
					n_{eto}			-	-	-	-	-	-
22P17-...5F□□	105.0	1670	42.7	18.50	M_0			-	-	120.0	120.0	120.0	120.0
					M_N			-	-	105.8	105.8	105.8	105.8
					$M_{0,max}$			162.7	204.2	236.9	307.8	374.9	461.2
					M_{max}			162.7	204.2	237.1	308.3	377.0	462.4
					n_{eto}			-	-	-	-	-	-
22P29-...5F□□	100.0	2935	72.1	30.70	M_0						-	120.0	120.0
					M_N						-	99.9	99.9
					$M_{0,max}$						180.5	224.5	270.5
					M_{max}						180.8	226.0	271.4
					n_{eto}						-	-	-

► I... [A], M... [Nm], n... [r/min], P... [kW]
► If the motors are operated at a lower switching frequency, please contact your Lenze sales office!

Selection tables, Inverter Drives 8400 TopLine

Forced ventilated IP23s motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

					E84AVTC	□7524	□1134	□1534	□1834	□2234	□3034	□3734	□4534
					I_N	16.5	23.5	32.0	39.0	47.0	61.0	76.0	89.0
					$I_{0,max}$	26.4	32.9	43.2	60.0	70.5	91.5	114.0	133.5
MCA	M_N	n_N	I_N	P_N	I_{max}	33.0	47.0	64.0	78.0	94.0	122.0	152.0	178.0
20X14-...2F□□	61.0	1420	23.0	9.10	M_0	-	67.0	68.0	68.0	68.0			
					M_N	-	61.2	61.2	61.2	61.2			
					$M_{0,max}$	94.8	139.9	192.6	235.5	250.0			
					M_{max}	94.9	139.9	192.8	235.7	250.0			
					n_{eto}	-	-	-	-	-			
20X29-...2F□□	53.5	2930	42.4	16.40	M_0			-	-	57.0	68.0	68.0	68.0
					M_N			-	-	53.4	53.4	53.4	53.4
					$M_{0,max}$			96.8	121.2	140.3	182.5	222.1	250.0
					M_{max}			96.8	121.2	140.4	182.6	223.0	250.0
					n_{eto}			-	-	-	-	-	-
22P08-...2F□□	120.0	760	23.5	9.60	M_0	-	135.0	135.0	135.0	135.0			
					M_N	-	120.6	120.6	120.6	120.6			
					$M_{0,max}$	157.8	234.2	325.4	401.4	400.9			
					M_{max}	157.8	234.8	325.8	401.4	400.9			
					n_{eto}	-	-	-	-	-			
22P14-...2F□□	115.0	1425	40.0	17.20	M_0			-	-	135.0	135.0	135.0	135.0
					M_N			-	-	115.3	115.3	115.3	115.3
					$M_{0,max}$			188.4	235.1	270.8	350.2	425.8	493.6
					M_{max}			188.7	235.1	271.0	350.3	428.1	496.1
					n_{eto}			-	-	-	-	-	-
22P17-...2F□□	112.0	1670	44.5	19.60	M_0			-	-	135.0	135.0	135.0	135.0
					M_N			-	-	112.1	112.1	112.1	112.1
					$M_{0,max}$			163.1	204.6	237.9	309.7	376.9	463.1
					M_{max}			163.1	204.6	238.2	310.6	379.0	465.2
					n_{eto}			-	-	-	-	-	-
22P29-...2F□□	110.0	2935	77.8	33.80	M_0						-	-	135.0
					M_N						-	-	110.0
					$M_{0,max}$						180.0	224.4	268.2
					M_{max}						180.7	225.0	269.4
					n_{eto}						-	-	-

► I... [A], M... [Nm], n... [r/min], P... [kW]
► If the motors are operated at a lower switching frequency, please contact your Lenze sales office!

Selection tables, Servo Drives ECS

Non-ventilated motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 4 kHz.

					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}			-	-	

► I... [A], M... [Nm], n... [r/min], P... [kW]

Selection tables, Servo Drives ECS

Non-ventilated motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 4 kHz.

					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
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... [r/min], P... [kW]

Selection tables, Servo Drives ECS

Forced ventilated IP54 motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 4 kHz.

					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
13I34	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	60.0	
					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... [r/min], P... [kW]

Selection tables, Servo Inverter 9300

Non-ventilated motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

					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}				-	-	-		

► I... [A], M... [Nm], n... [r/min], P... [kW]

Selection tables, Servo Inverter 9300

Non-ventilated motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

					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
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... [r/min], P... [kW]

Selection tables, Servo Inverter 9300

Forced ventilated IP54 motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

					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... [r/min], P... [kW]

Selection tables, Servo Inverter 9300

Forced ventilated IP54 motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 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
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	160.0	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	45.60	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... [r/min], P... [kW]
► If the motors are operated at a lower switching frequency, please contact your Lenze sales office!

Selection tables, Servo Inverter 9300

Forced ventilated IP23s motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 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
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}				-	-	-	

► I... [A], M... [Nm], n... [r/min], P... [kW]
► If the motors are operated at a lower switching frequency, please contact your Lenze sales office!

Selection tables, Servo Inverter 9300

Forced ventilated IP23s motors

► The data applies to a mains connection voltage of 3 x 400 V and an inverter switching frequency of 8 kHz.

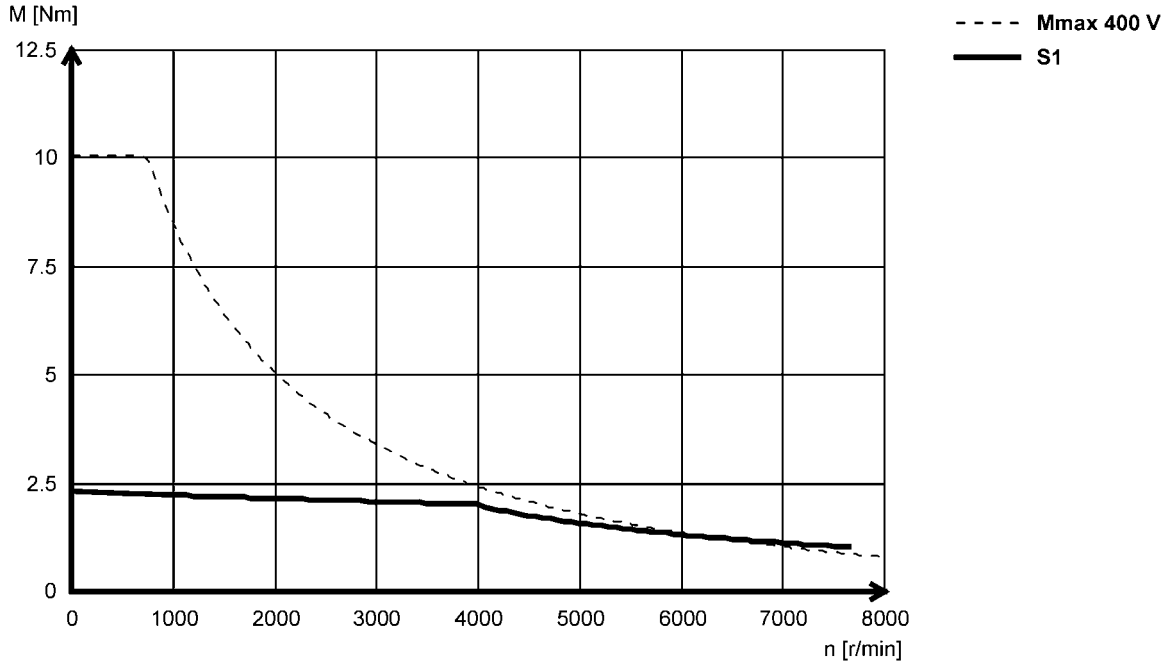
					EVS	9326-E□	9327-E□	9328-E□	9329-E□	9330-E□	9331-E□	9332-E□
					I_N	23.5	32.0	47.0	59.0	89.0	110.0	145.0
					$I_{0,max}$	23.5	32.0	47.0	52.0	80.0	110.0	126.0
MCA	**M_N**	**n_N**	**I_N**	**P_N**	I_{max}	35.3	48.0	70.5	88.5	133.5	165.0	217.5
26T12-...2F□□	255.0	1200	83.3	32.00	M_0					232.0	290.0	290.0
					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... [r/min], P... [kW]
► If the motors are operated at a lower switching frequency, please contact your Lenze sales office!

Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

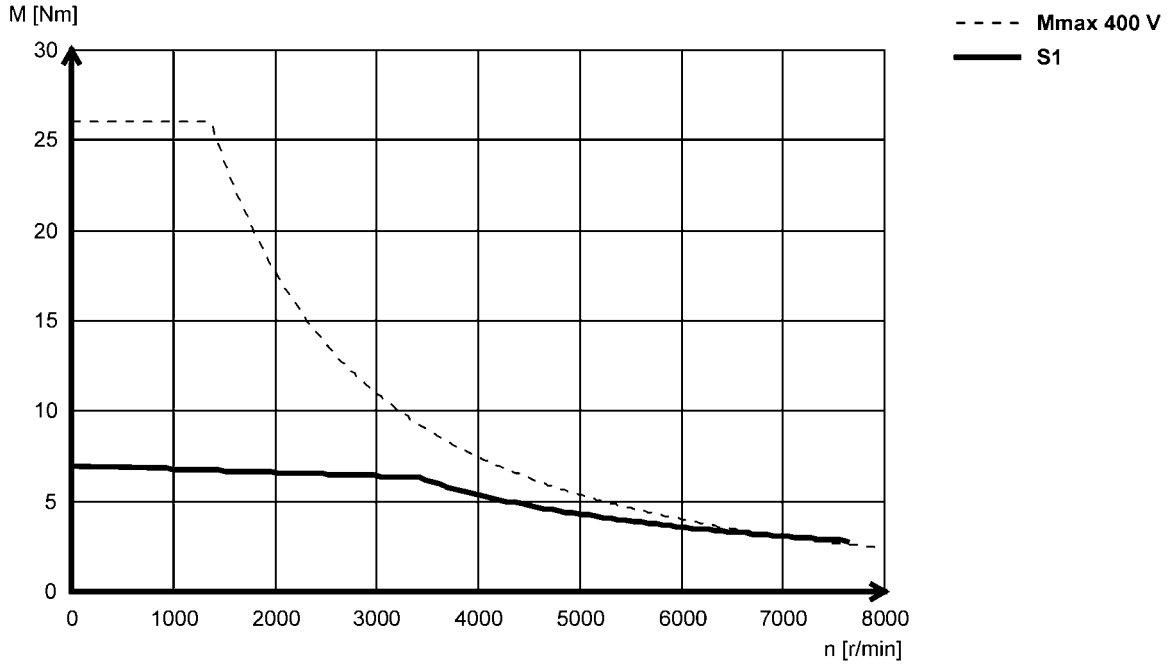
MCA10I40 (non-ventilated)



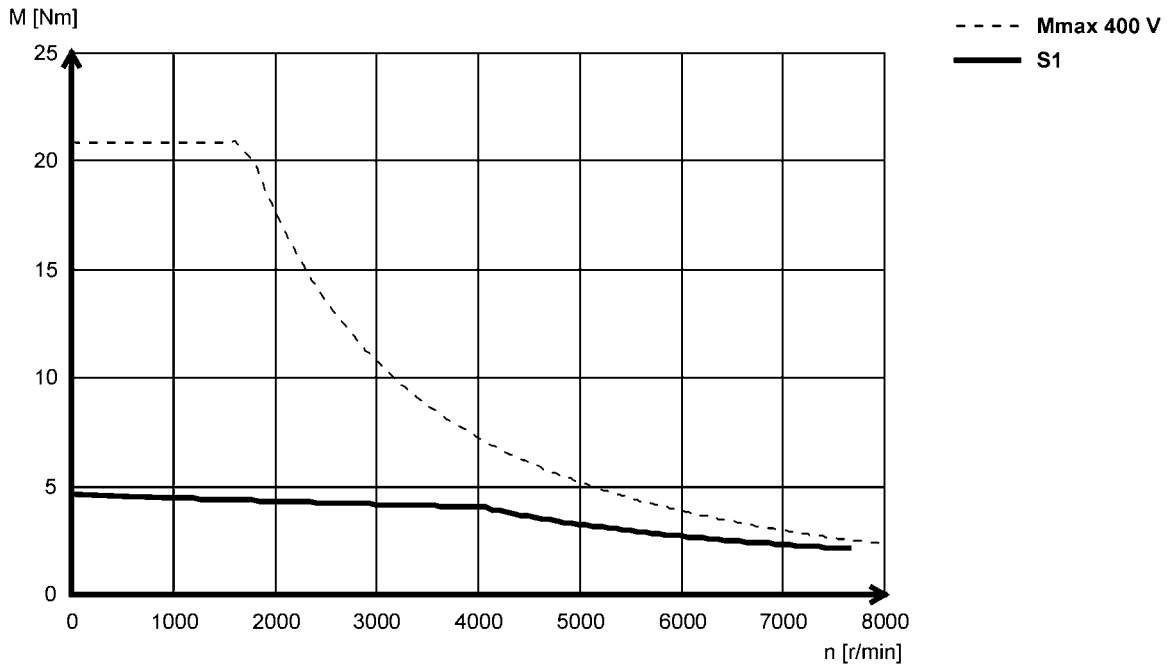
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA13I34 (forced ventilated)



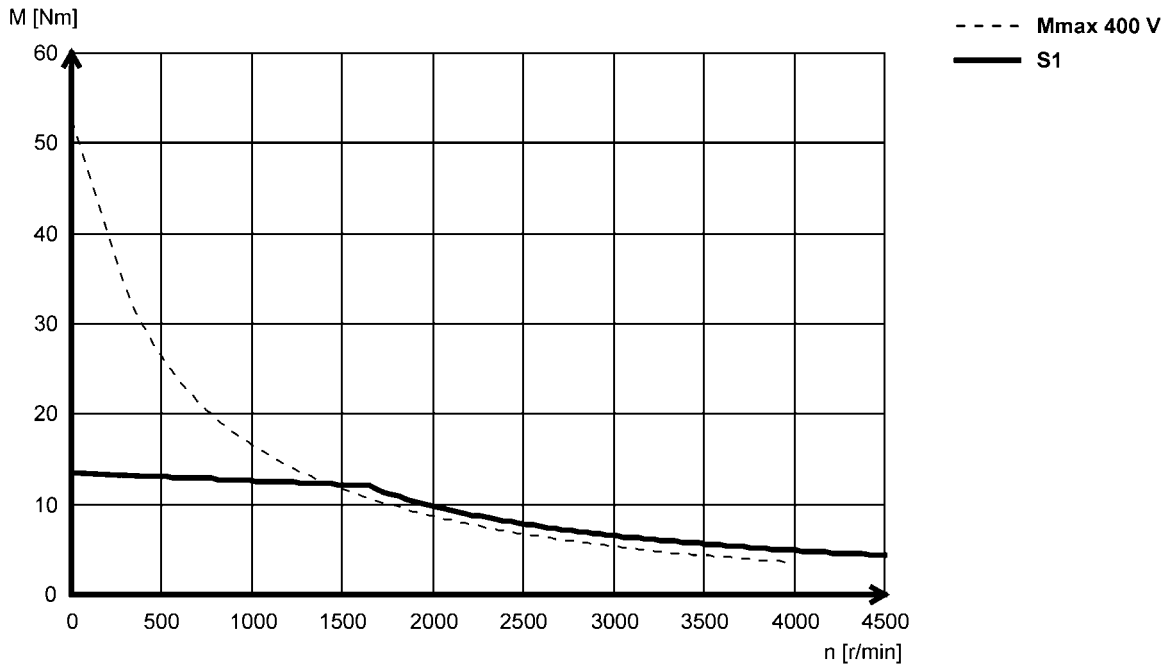
MCA13I41 (non-ventilated)



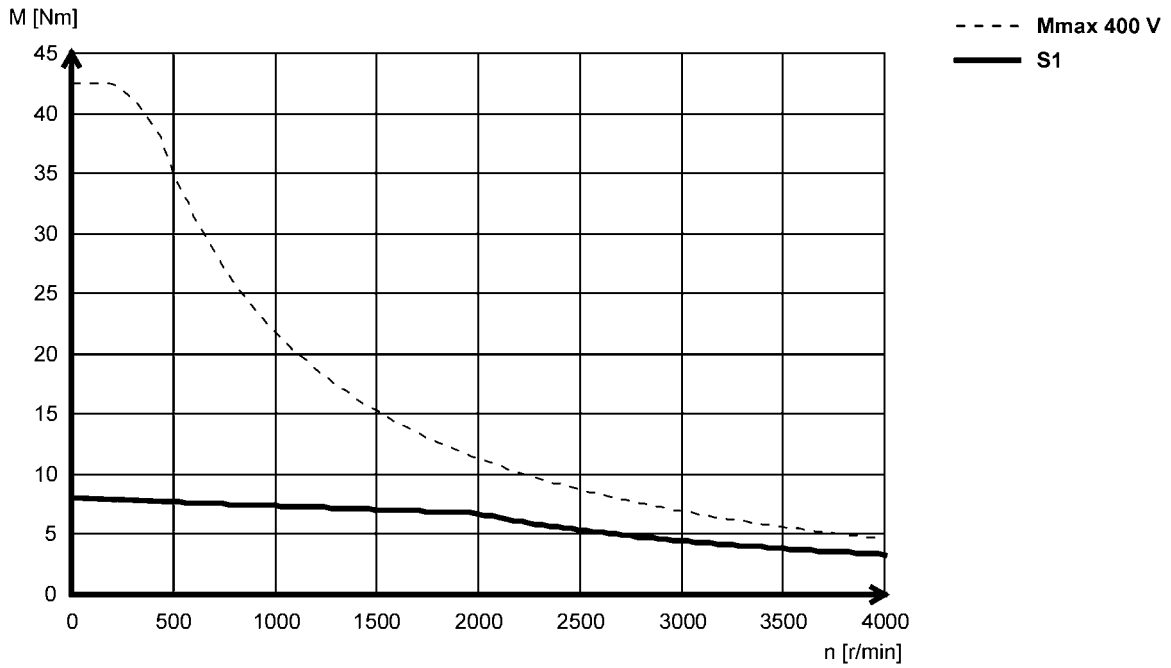
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA14L16 (forced ventilated)



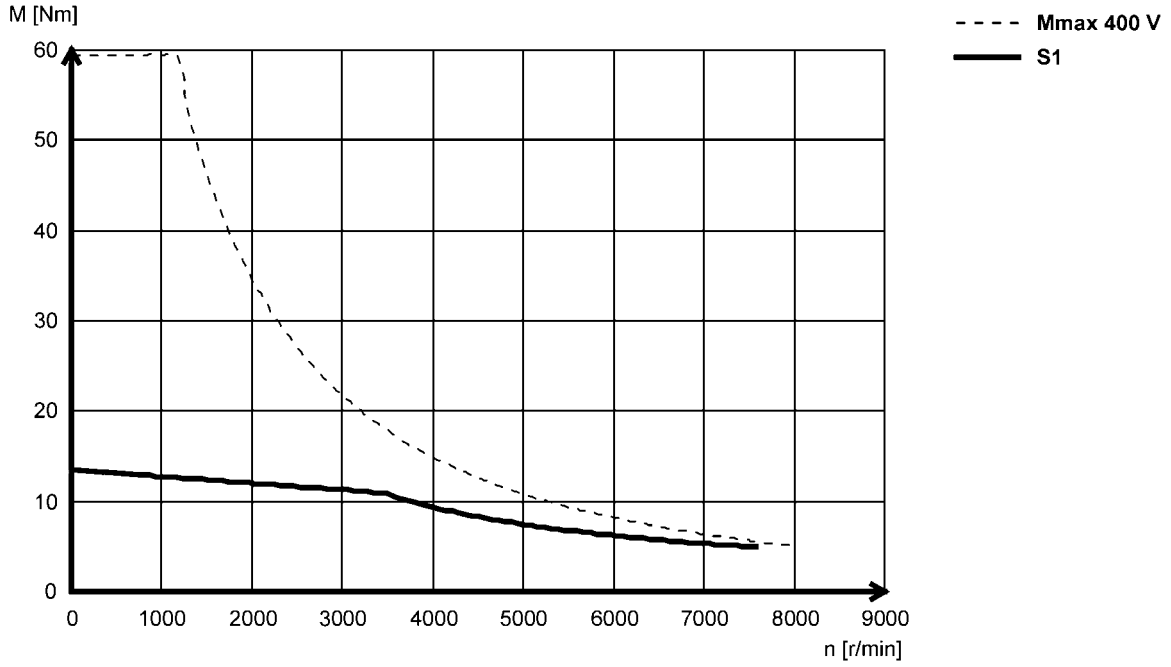
MCA14L20 (non-ventilated)



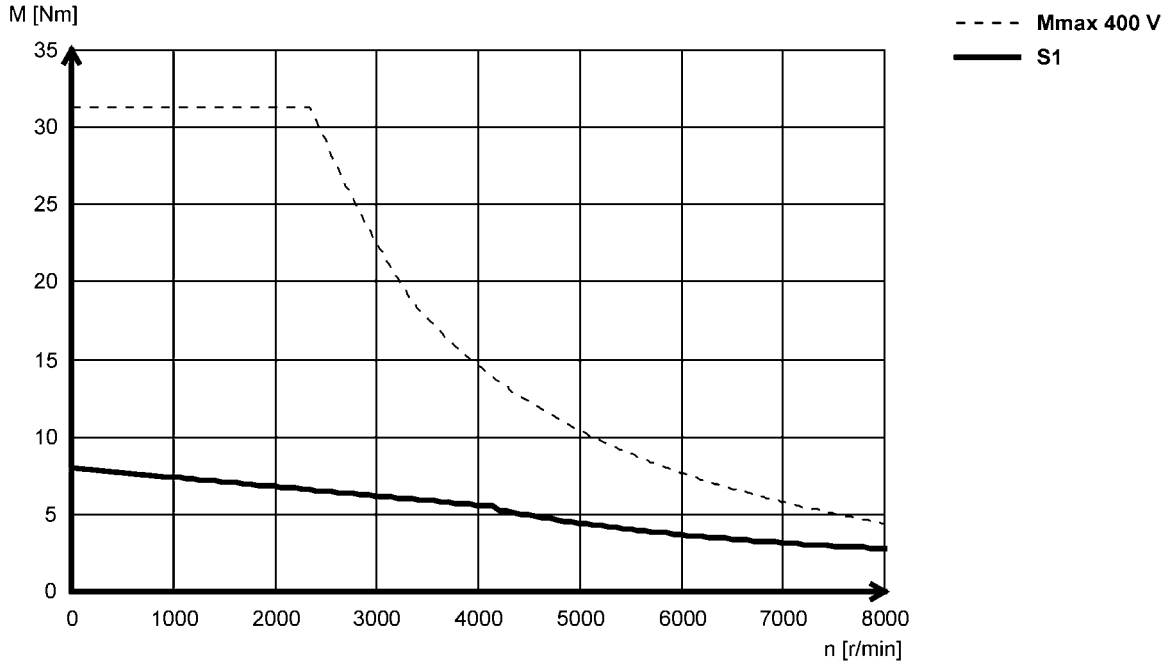
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA14L35 (forced ventilated)



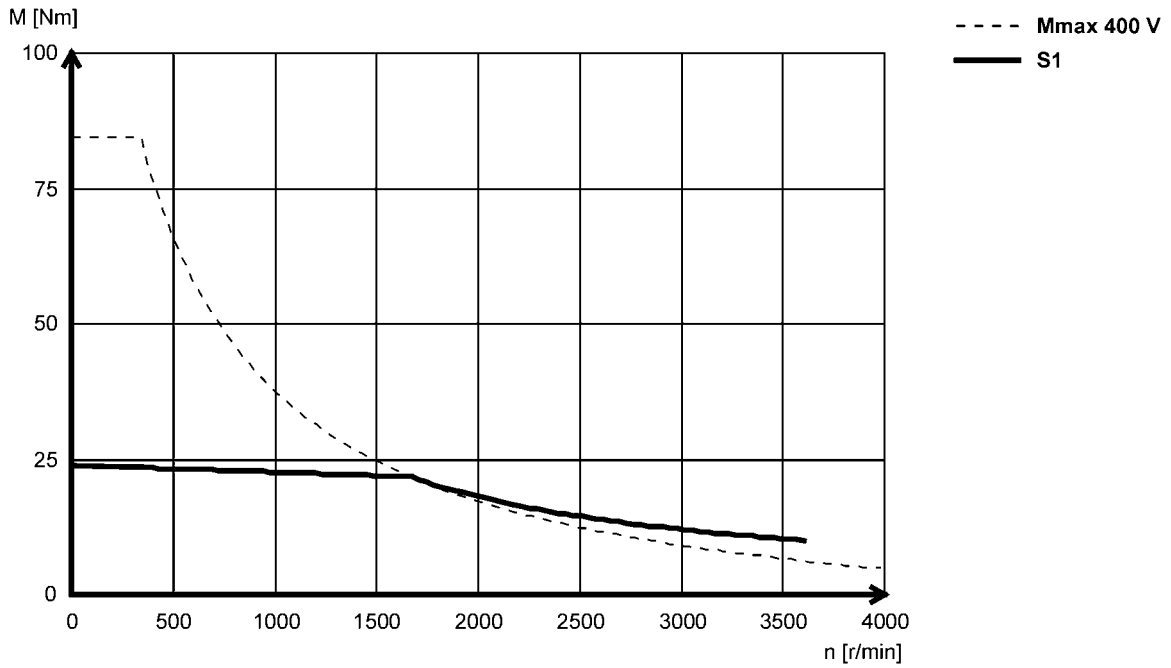
MCA14L41 (non-ventilated)



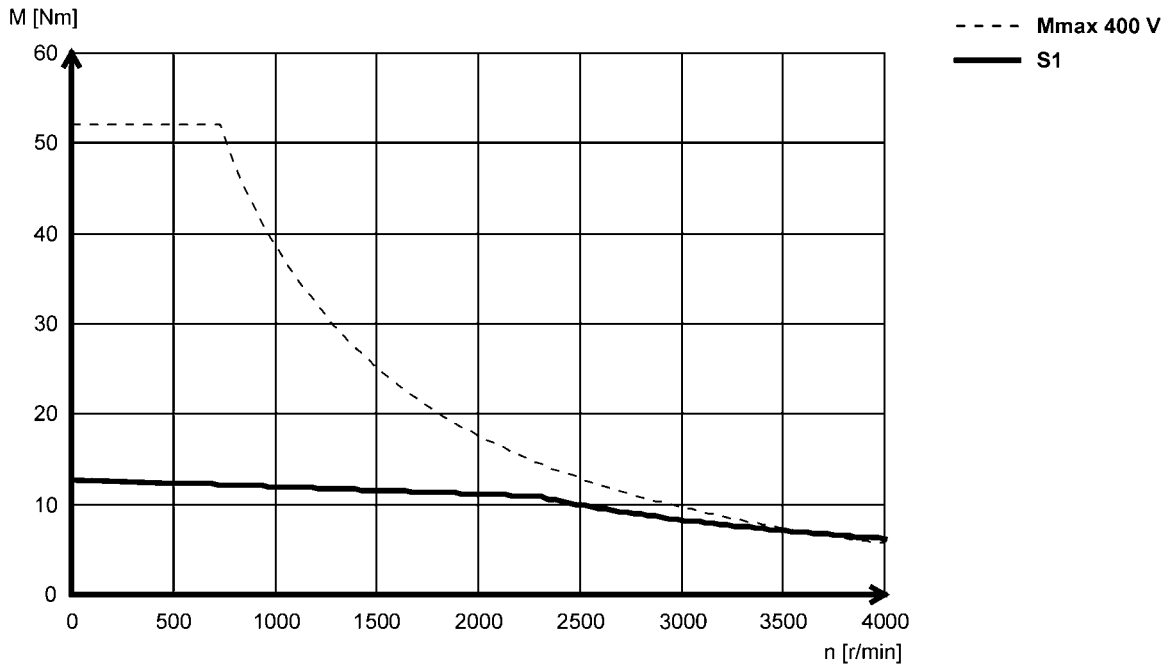
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA17N17 (forced ventilated)



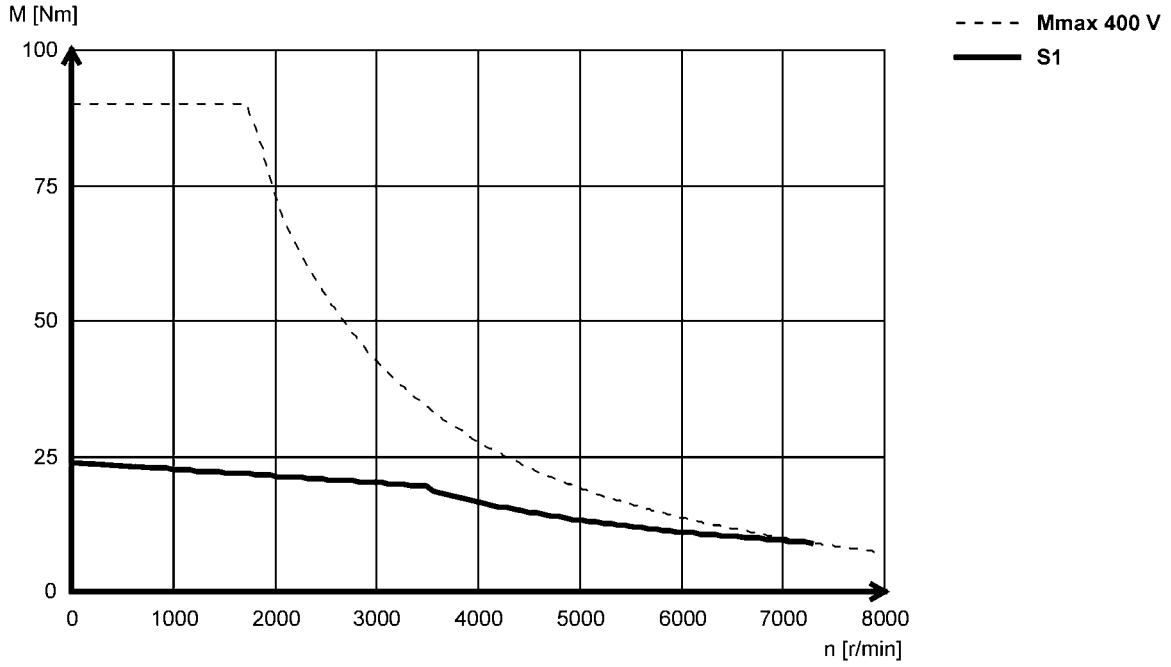
MCA17N23 (non-ventilated)



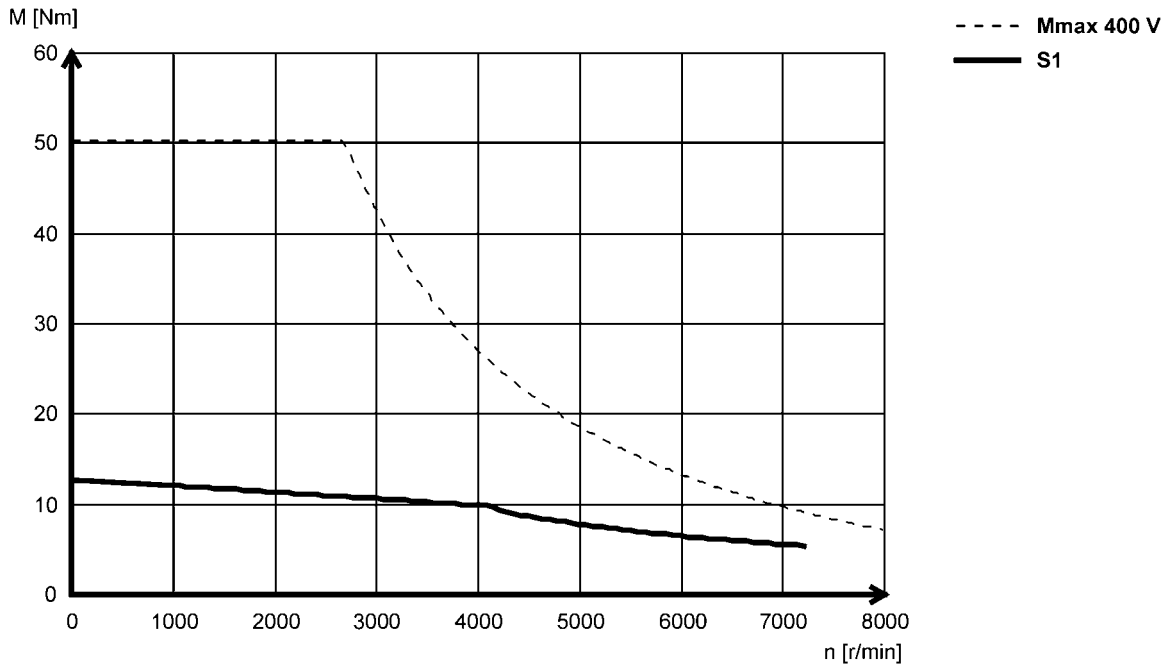
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA17N35 (forced ventilated)



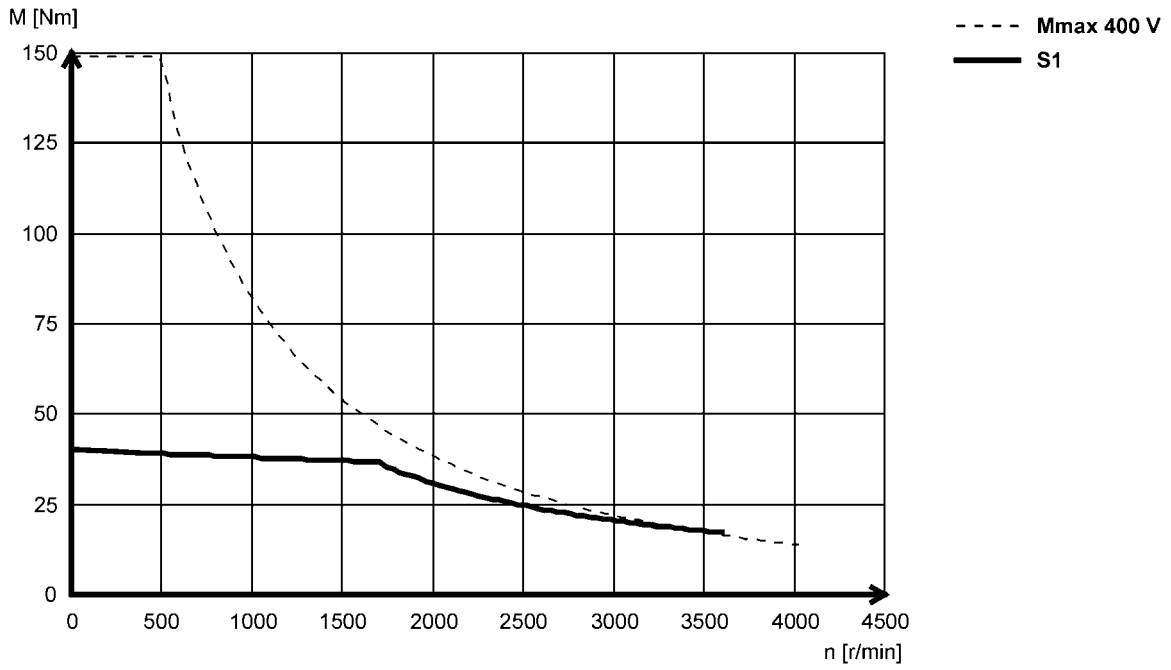
MCA17N41 (non-ventilated)



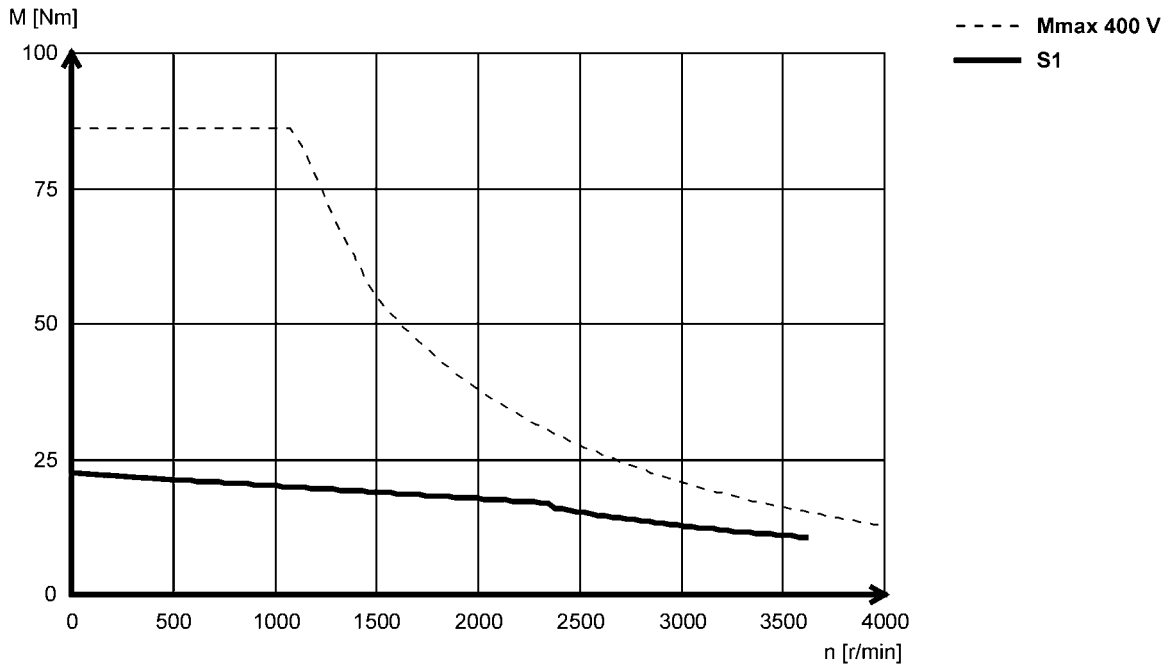
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA19S17 (forced ventilated)



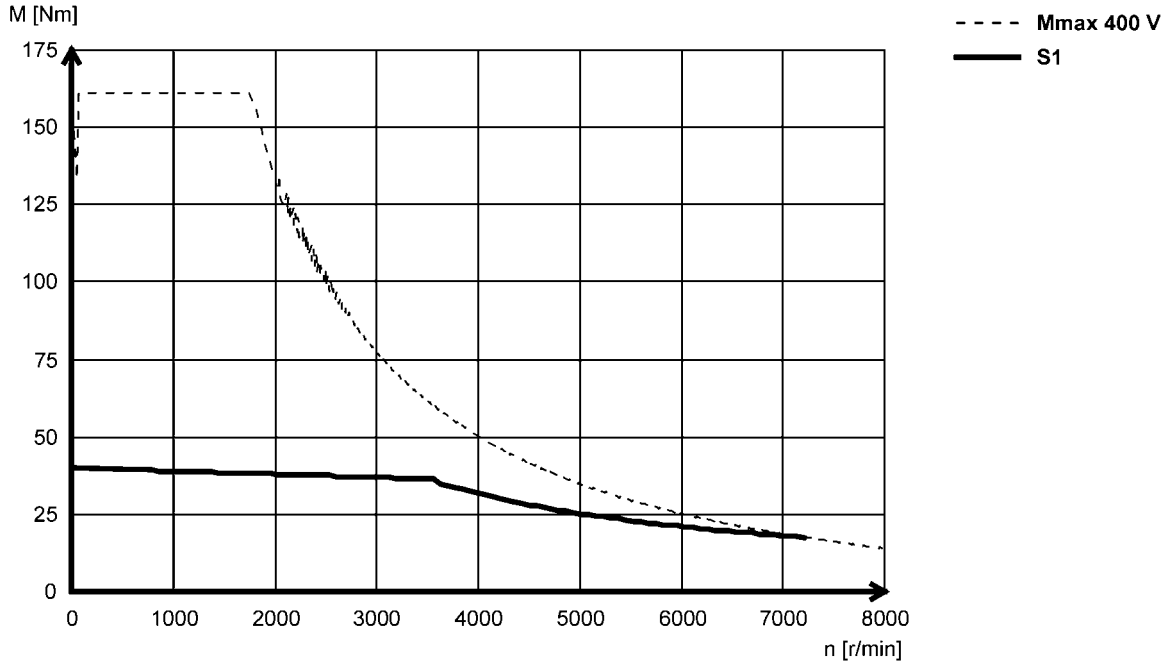
MCA19S23 (non-ventilated)



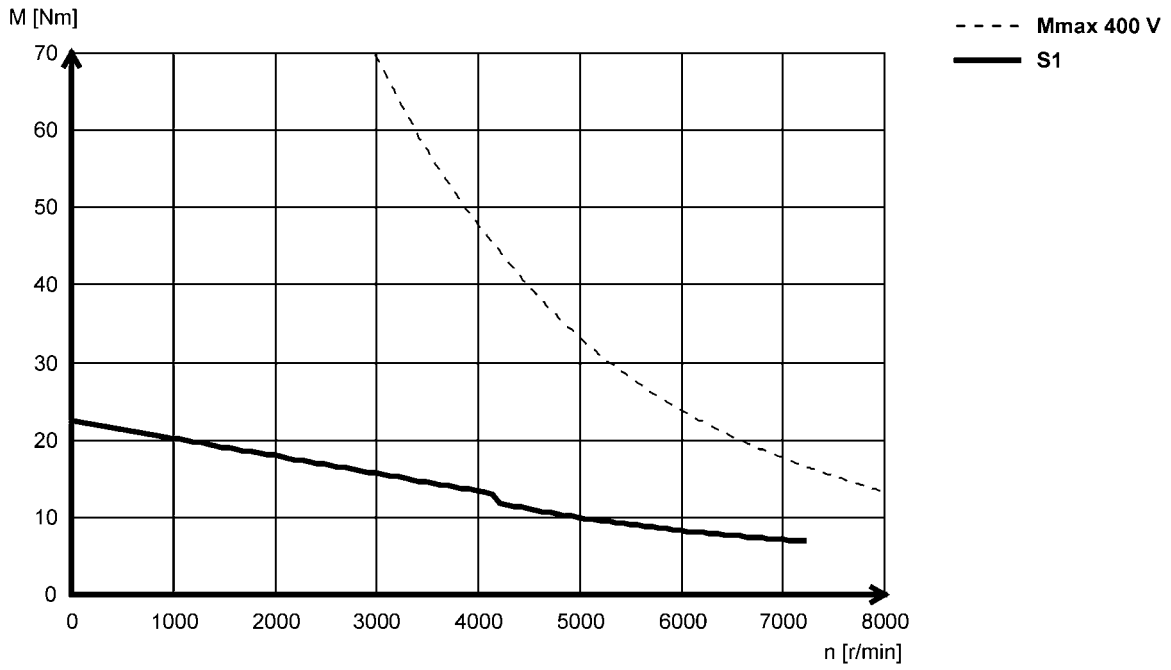
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA19S35 (forced ventilated)



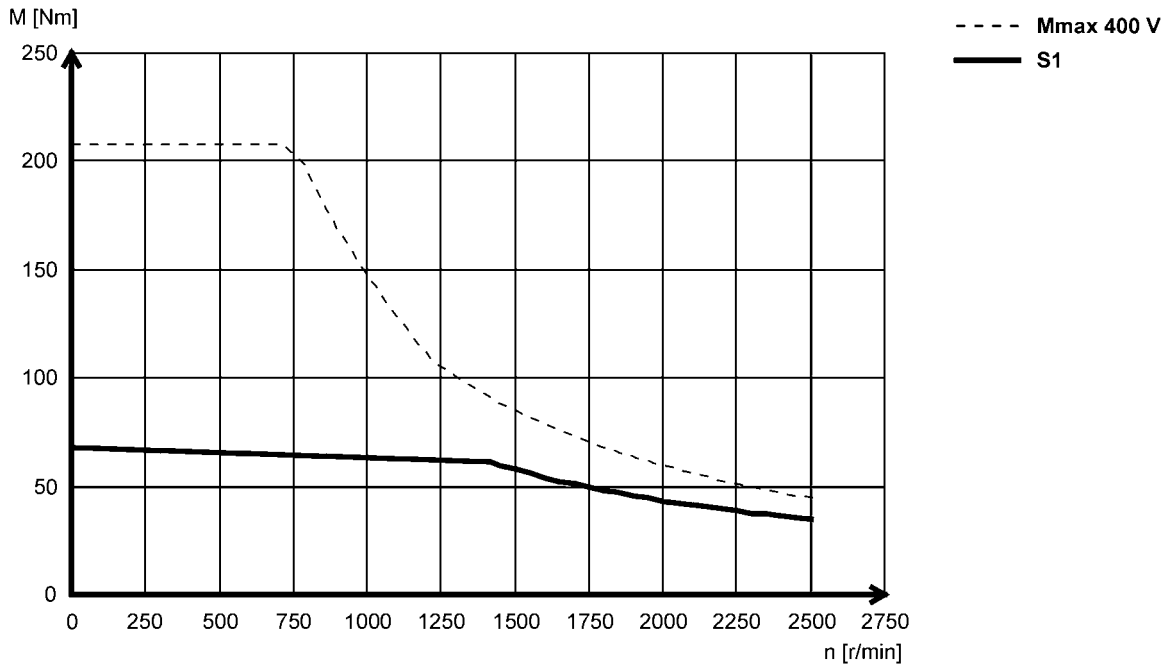
MCA19S42 (non-ventilated)



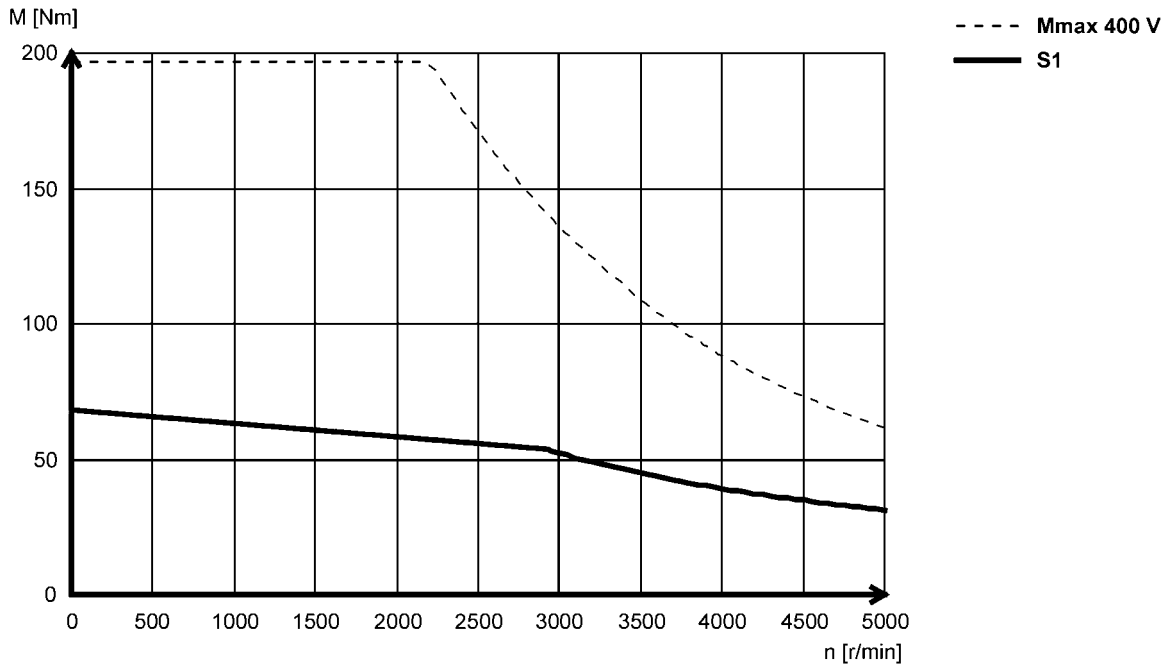
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA20X14...2F□□ (forced ventilated)



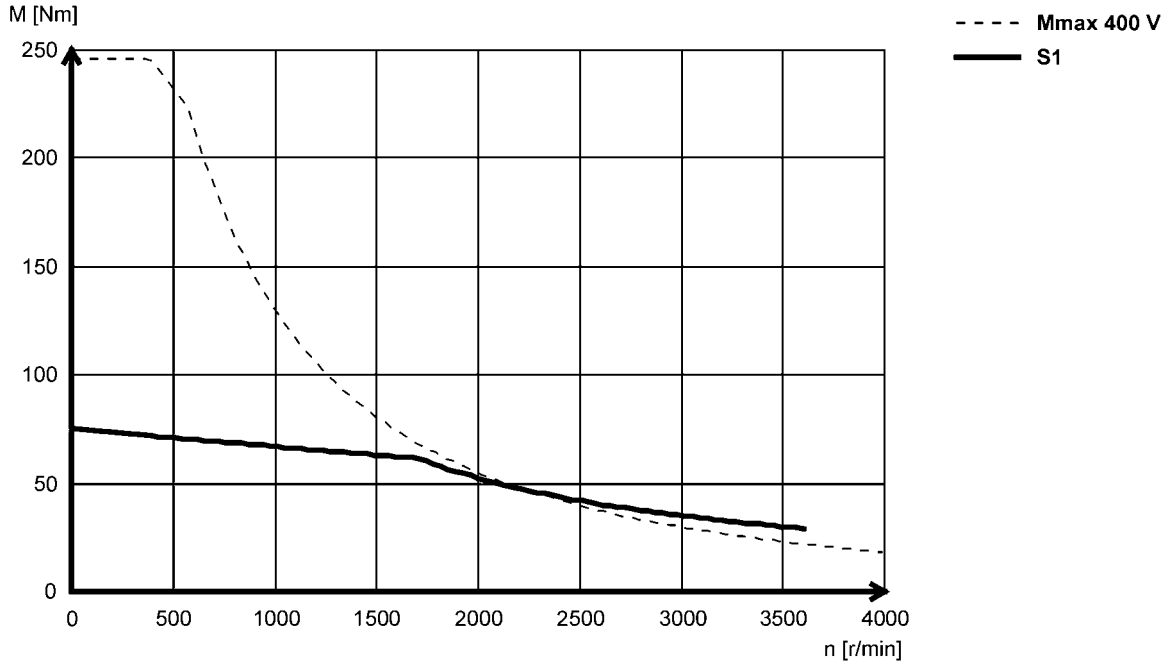
MCA20X29...2F□□ (forced ventilated)



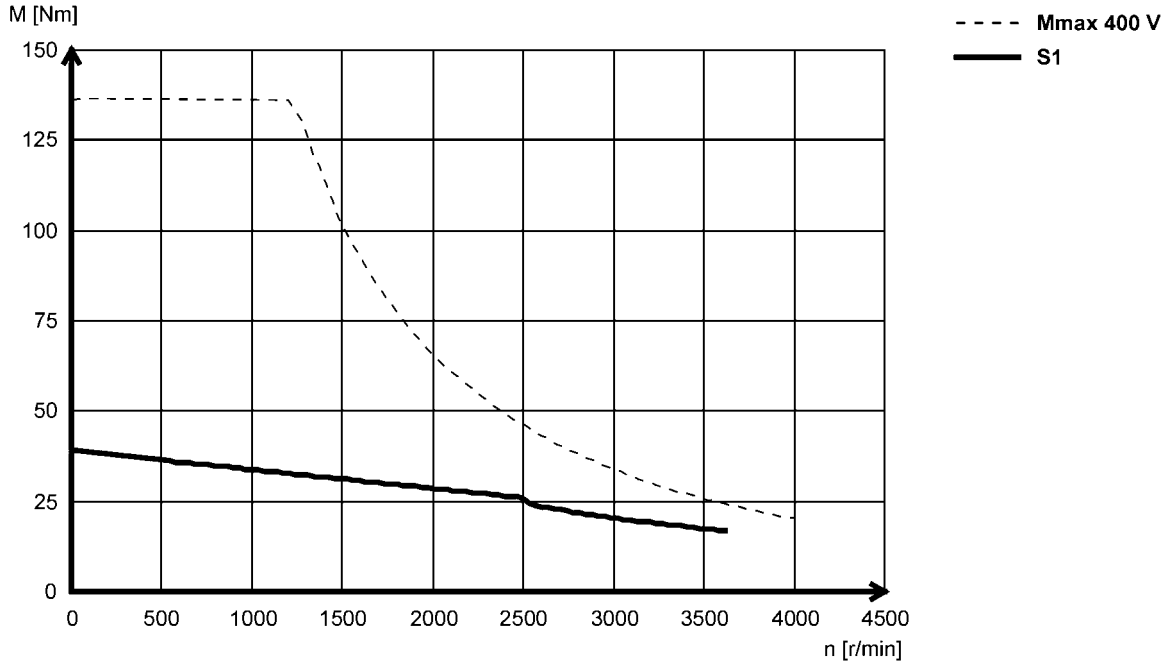
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA21X17 (forced ventilated)



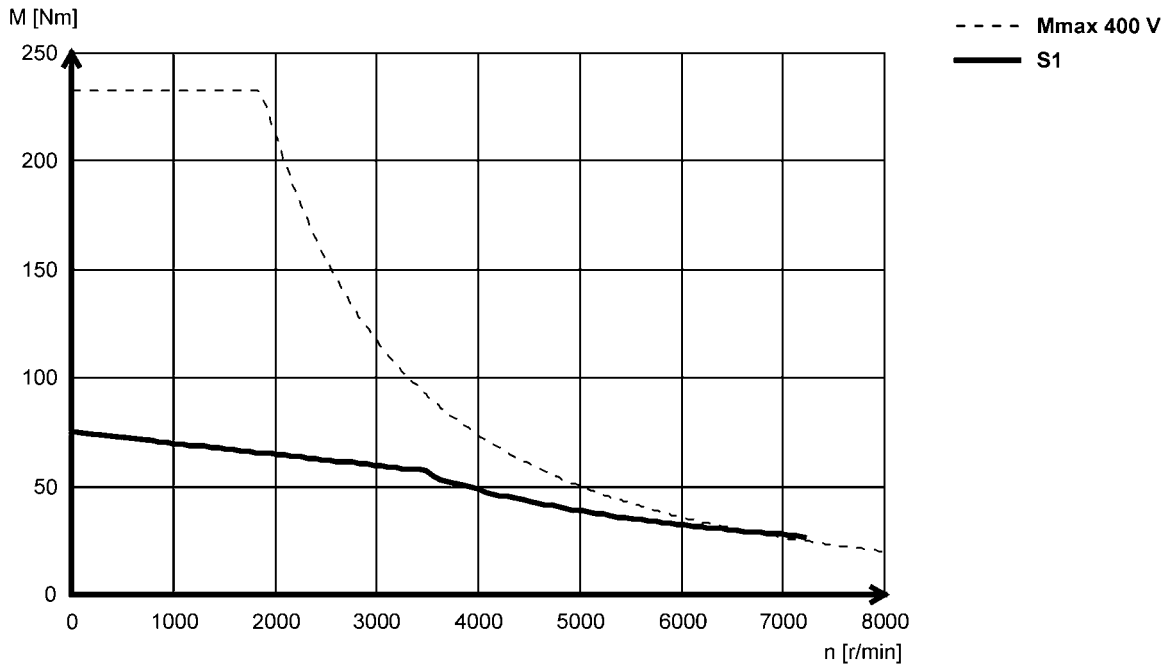
MCA21X25 (non-ventilated)



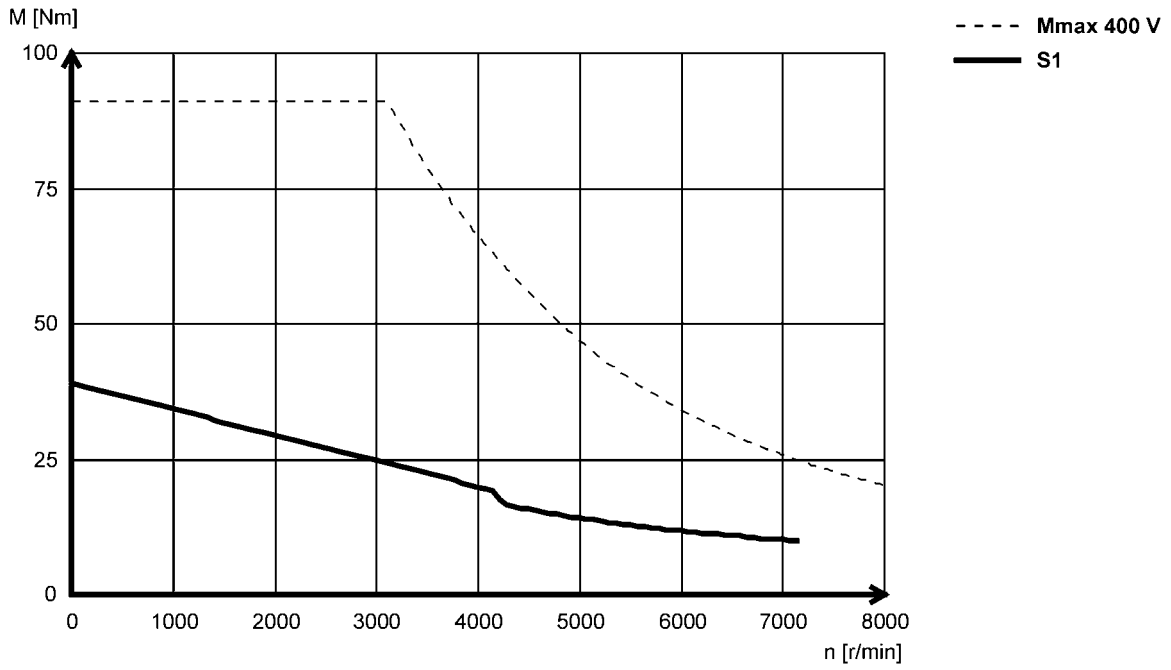
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA21X35 (forced ventilated)



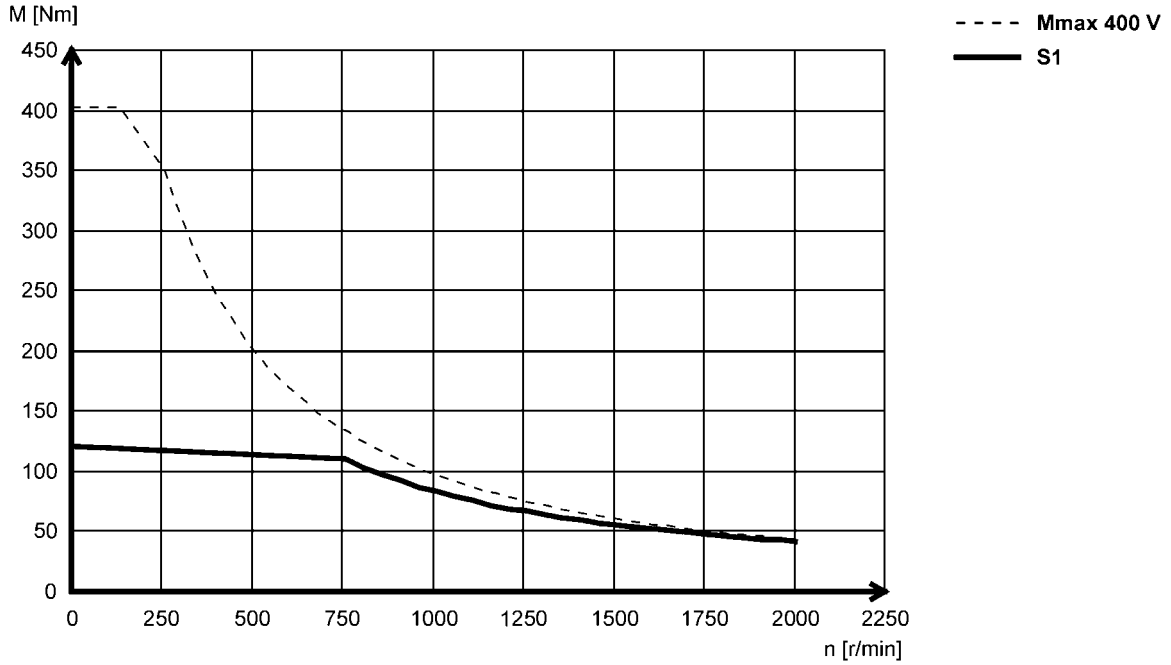
MCA21X42 (non-ventilated)



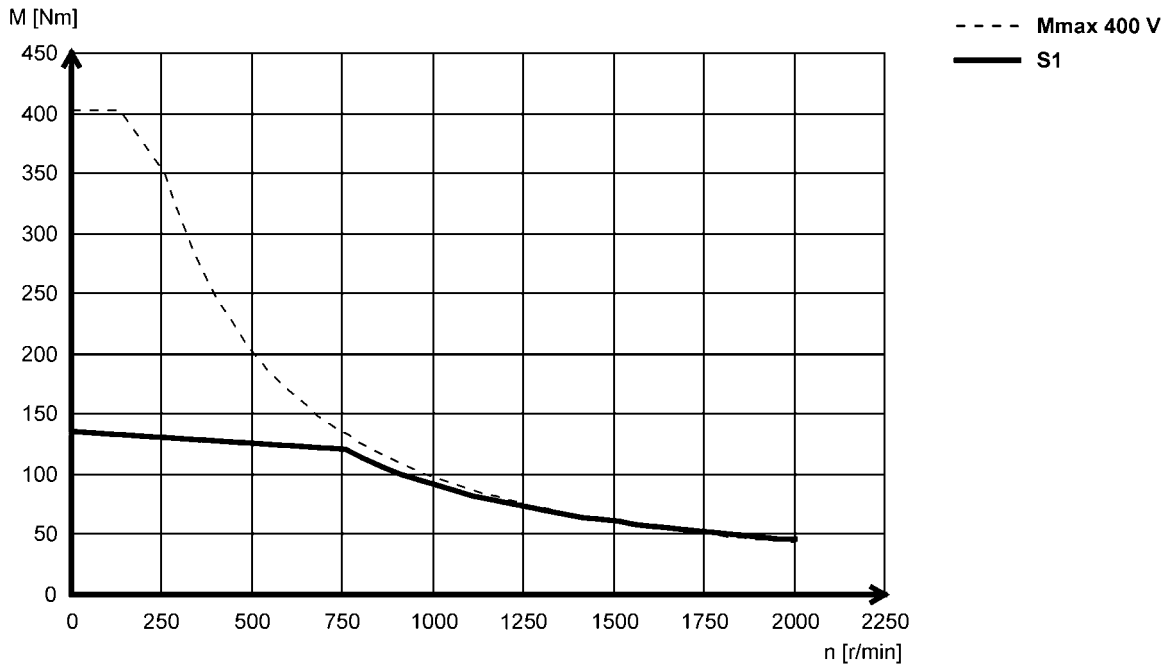
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA22P08...5F□□ (forced ventilated)



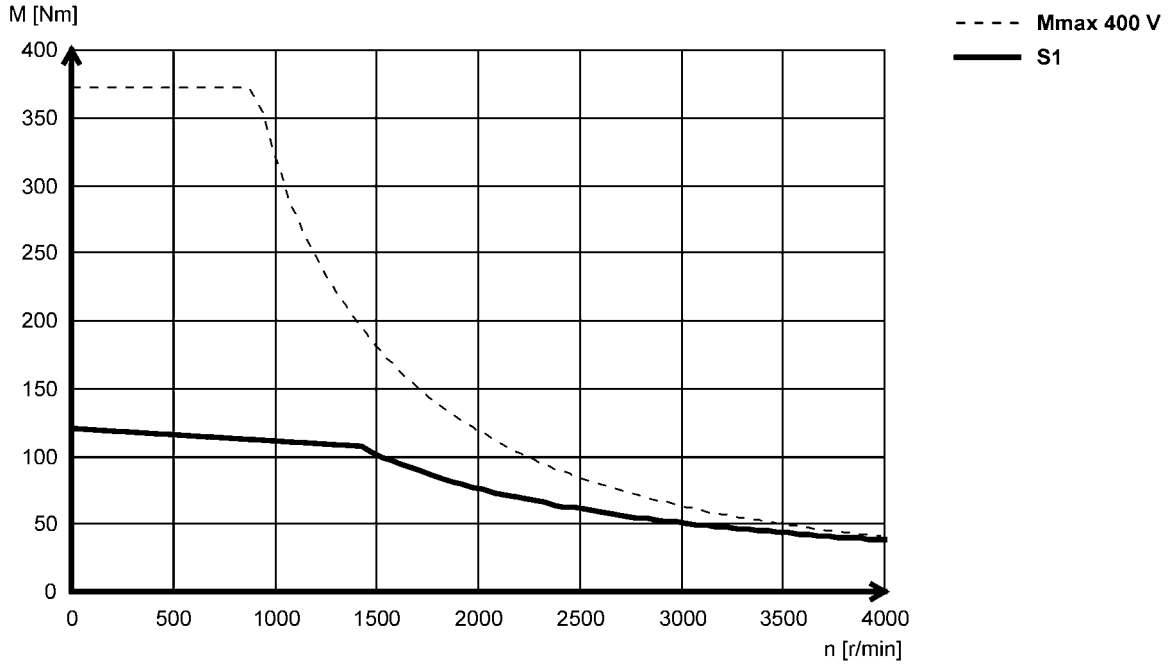
MCA22P08...2F□□ (forced ventilated)



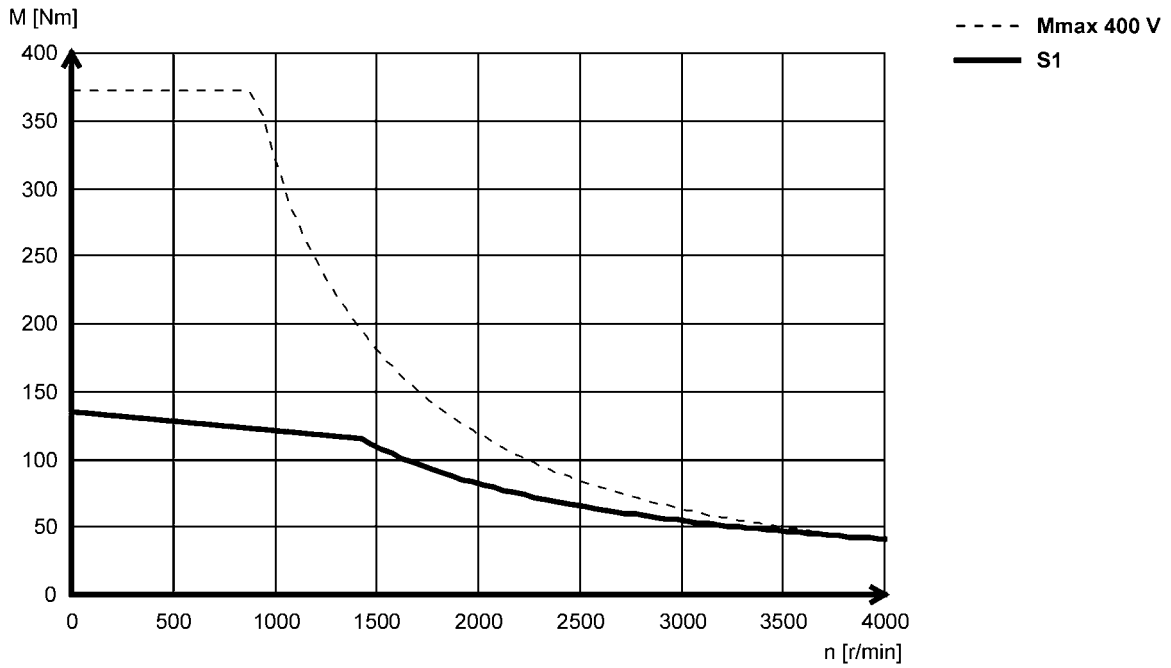
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA22P14...5F□□ (forced ventilated)



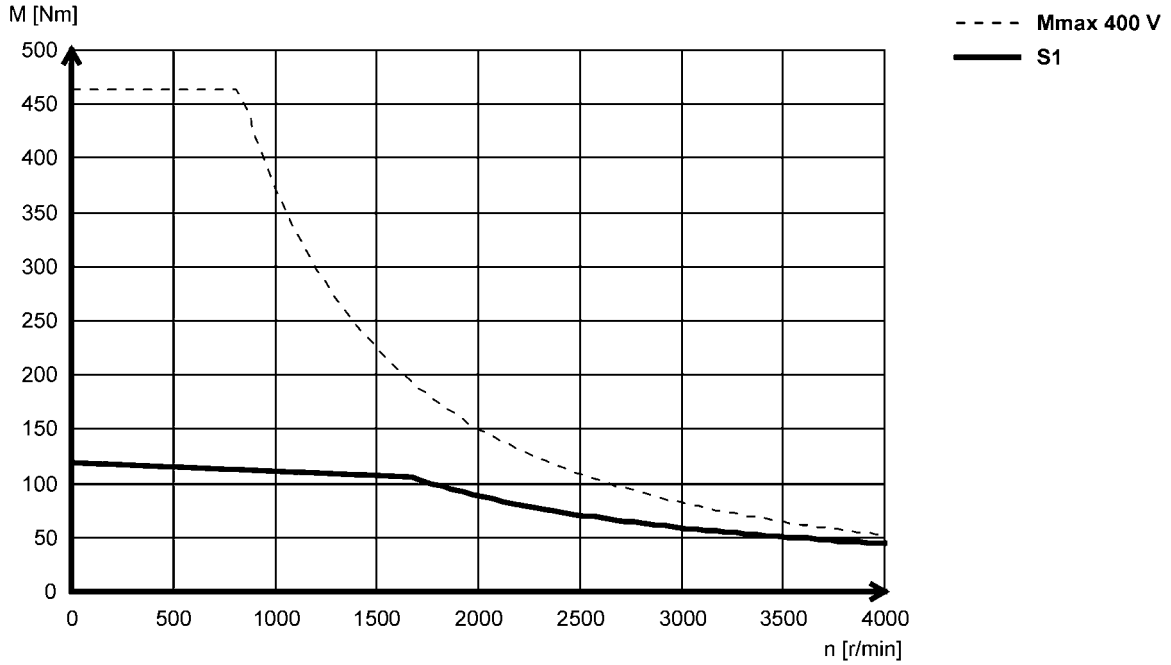
MCA22P14...2F□□ (forced ventilated)



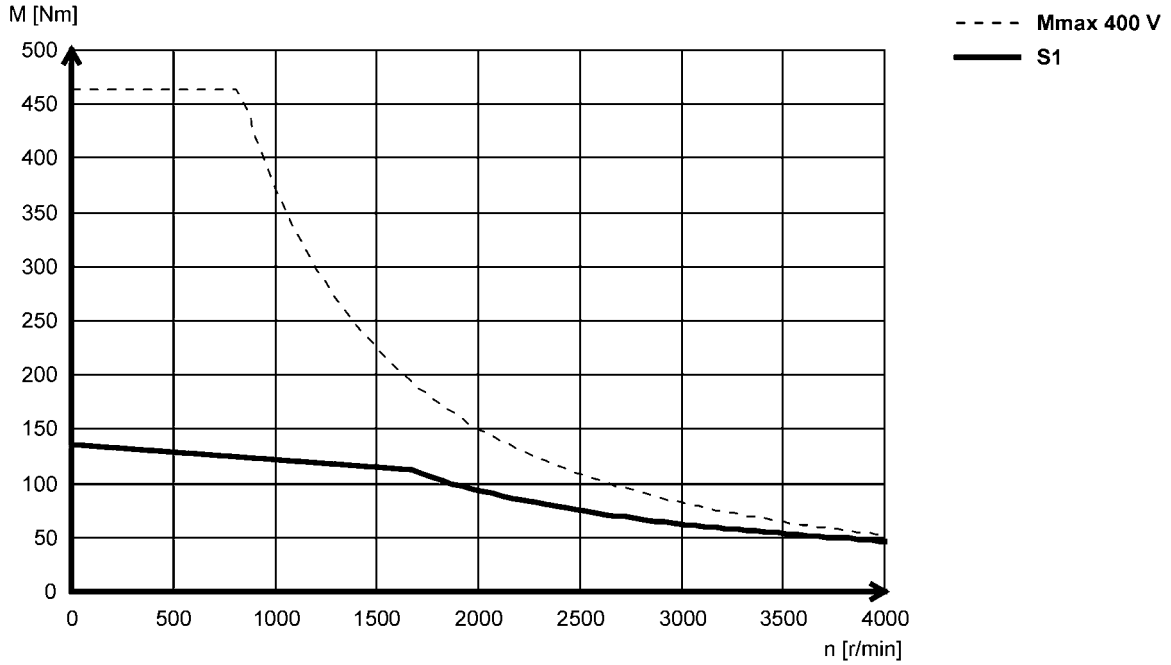
Torque characteristics

- ► The data applies to a mains connection voltage of 3 x 400 V.
- ► You can find further torque characteristics at **www.lenze.de/dsc**.

MCA22P17...5F□□ (forced ventilated)



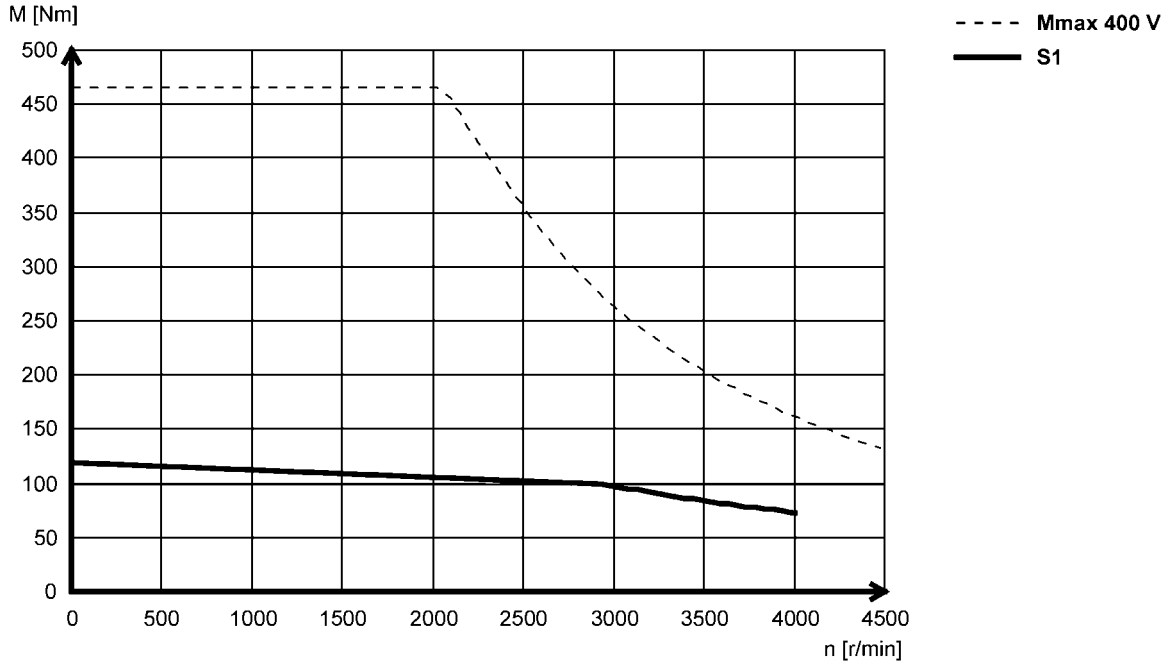
MCA22P17...2F□□ (forced ventilated)



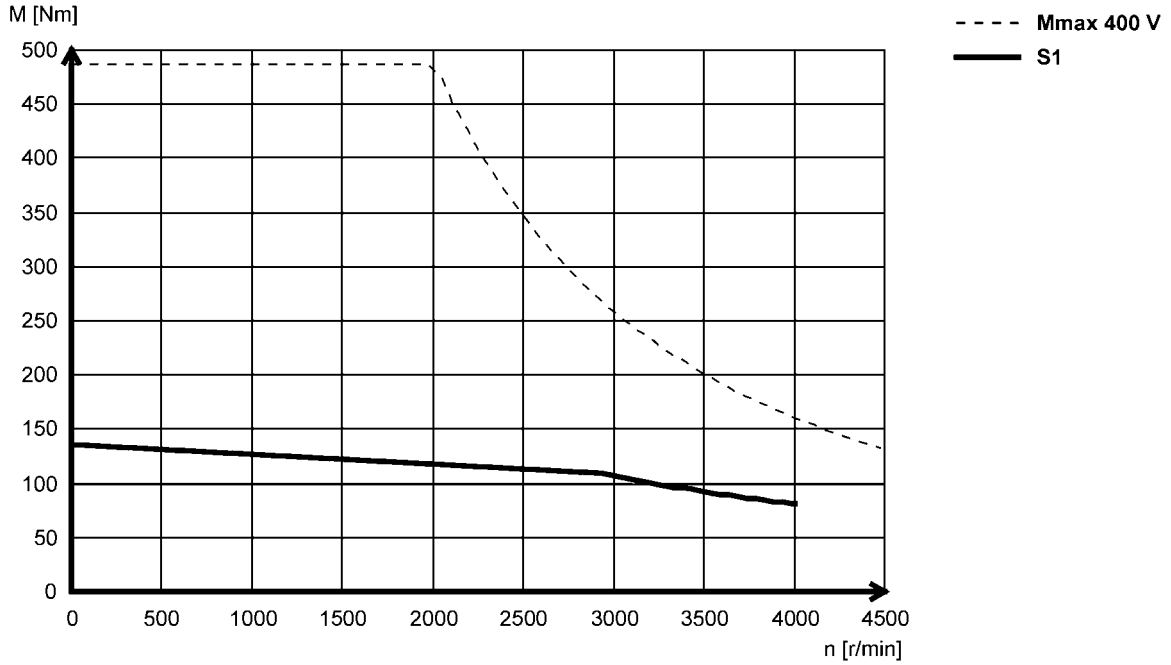
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA22P29...5F□□ (forced ventilated)



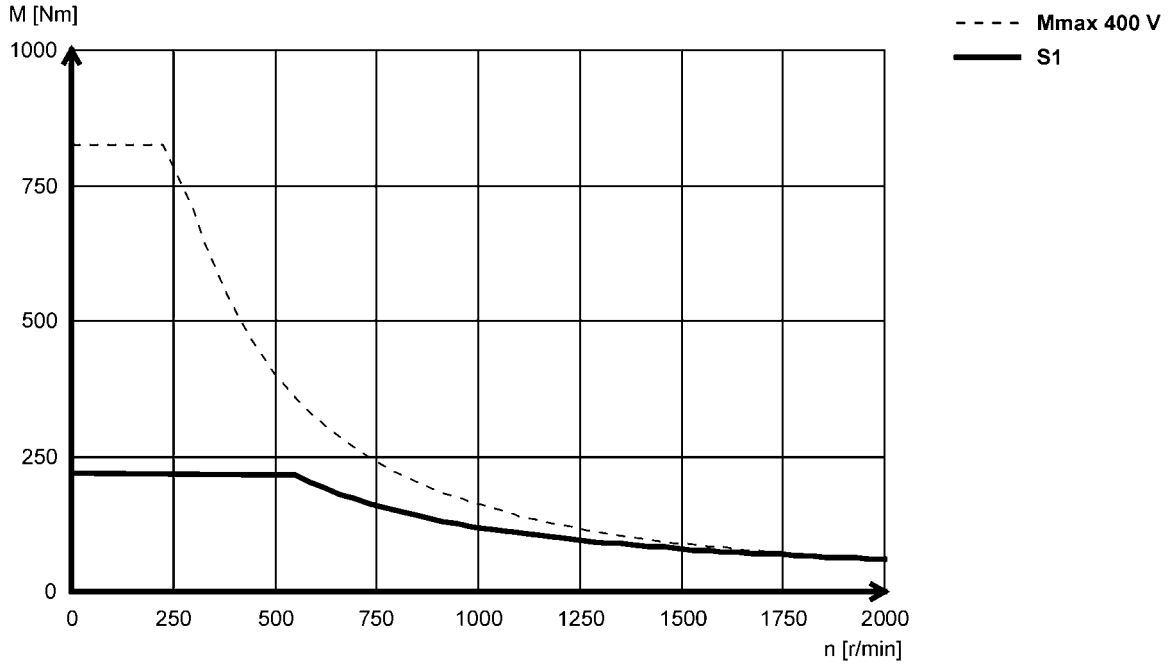
MCA22P29...2F□□ (forced ventilated)



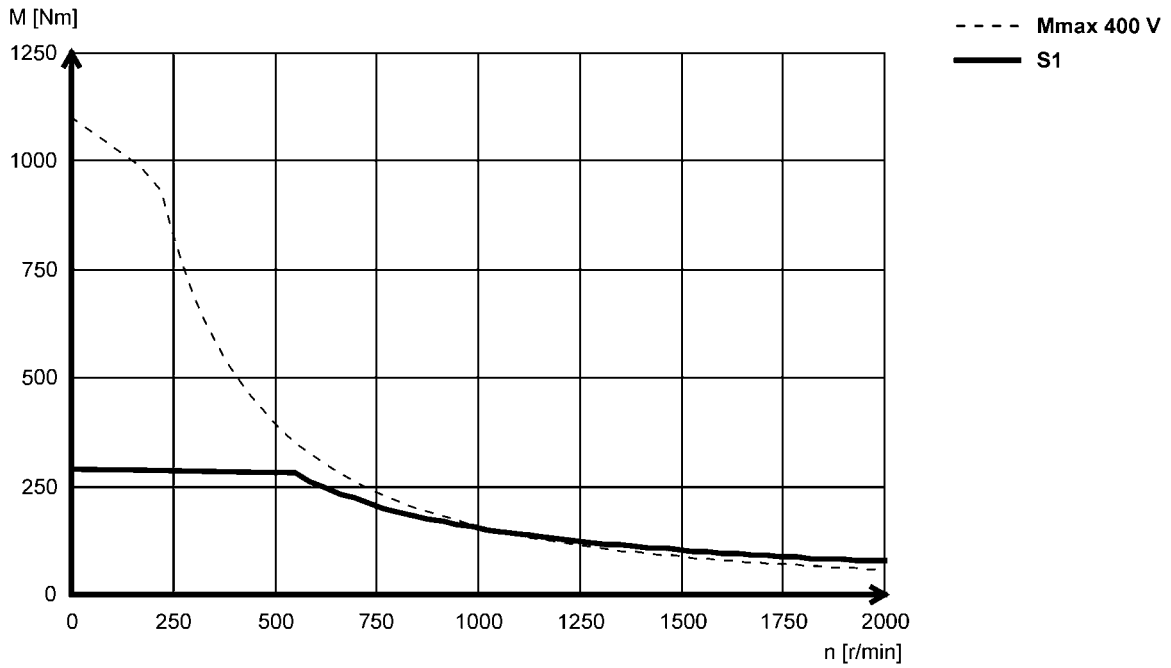
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA26T05...5F□□ (forced ventilated)



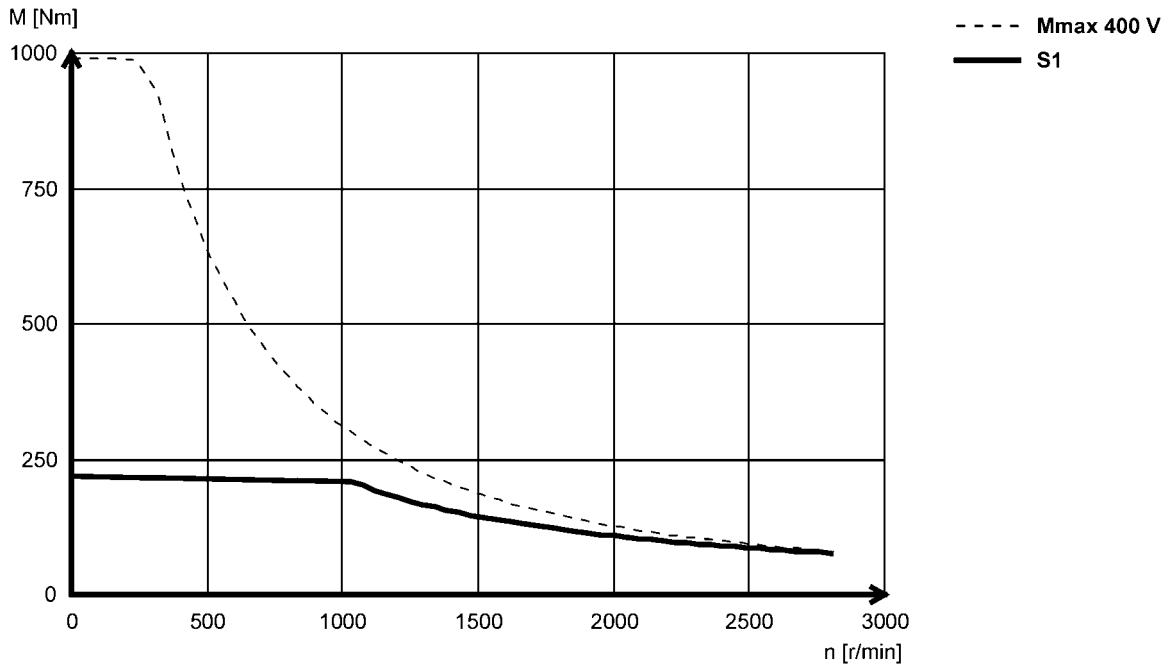
MCA26T05...2F□□ (forced ventilated)



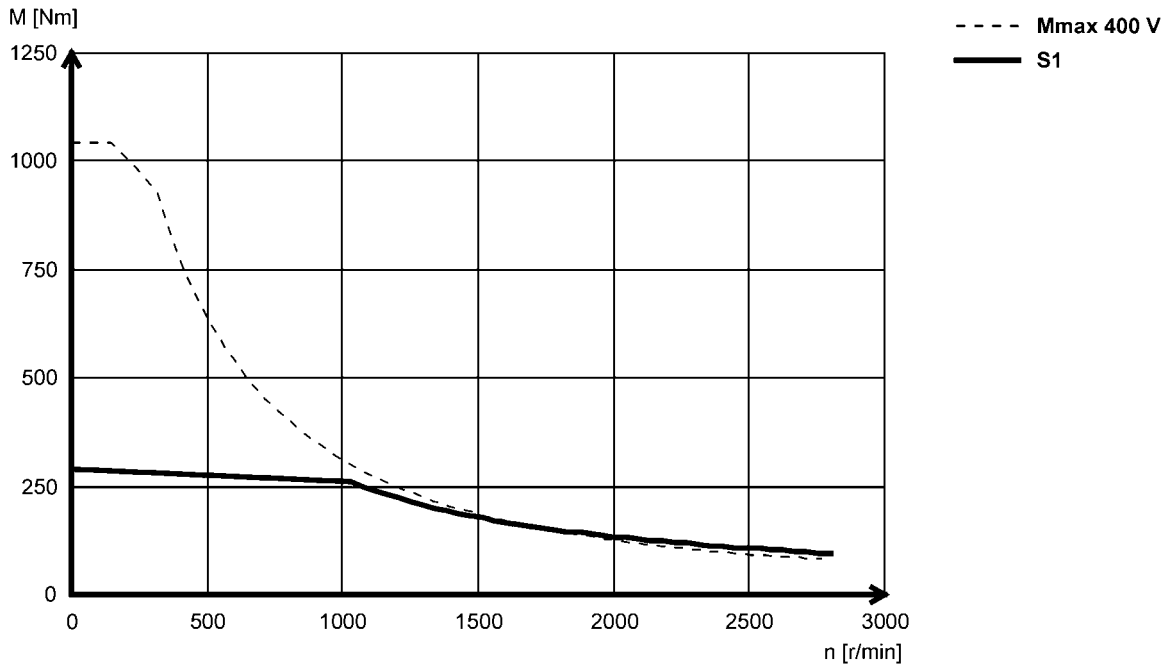
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA26T10...5F□□ (forced ventilated)



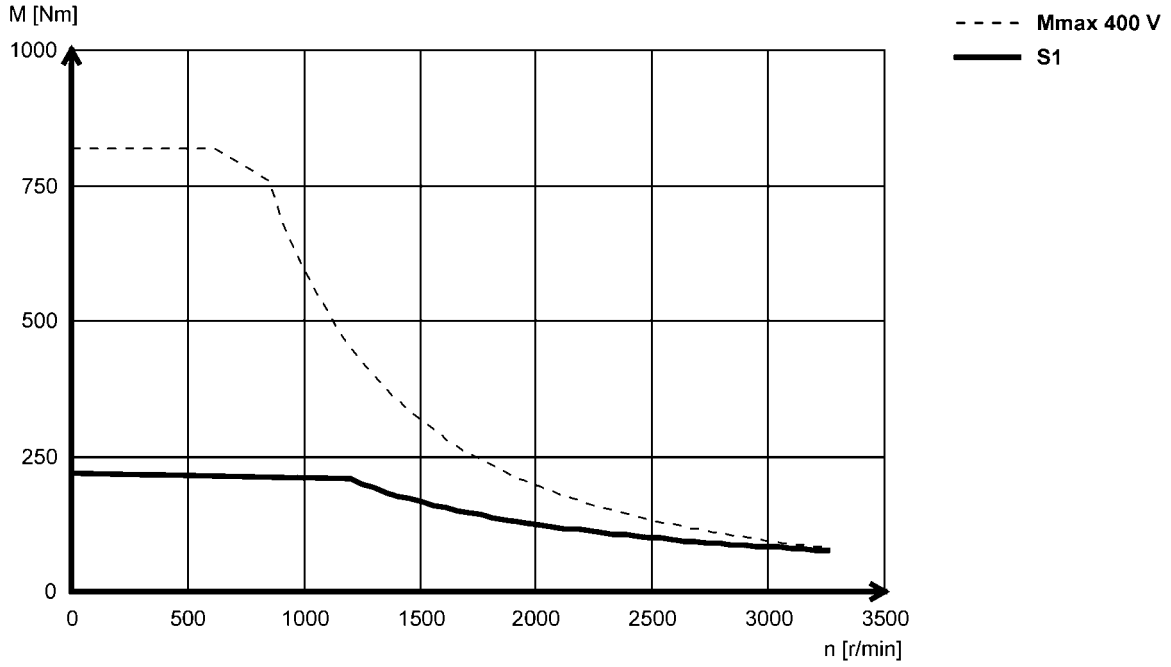
MCA26T10...2F□□ (forced ventilated)



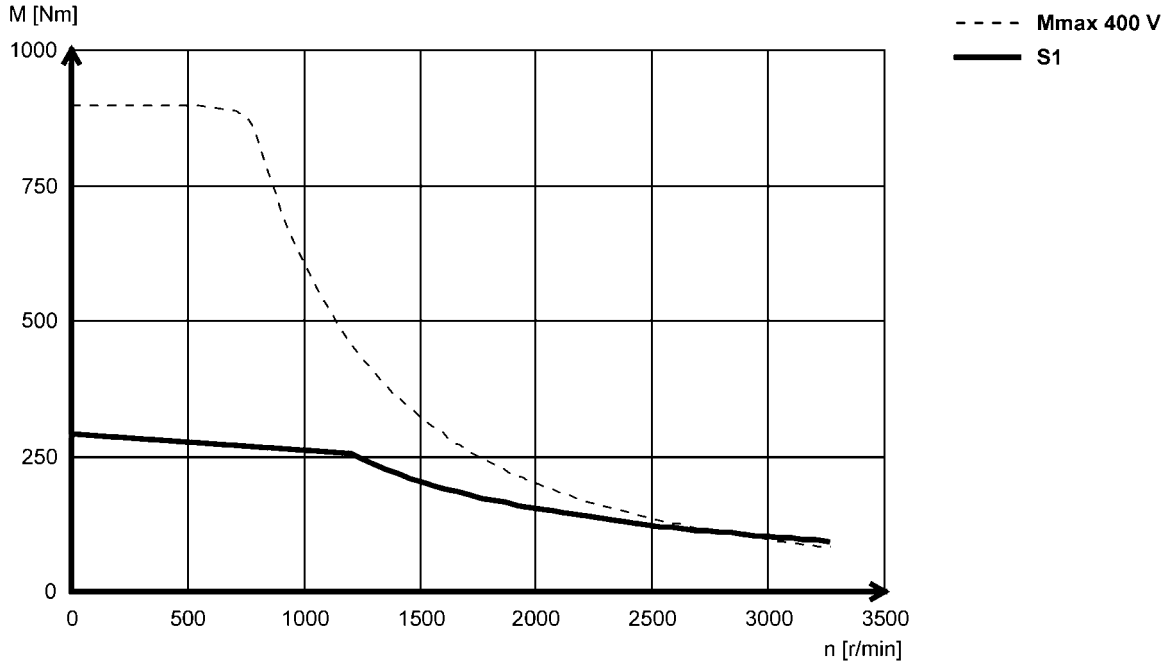
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

MCA26T12...5F□□ (forced ventilated)



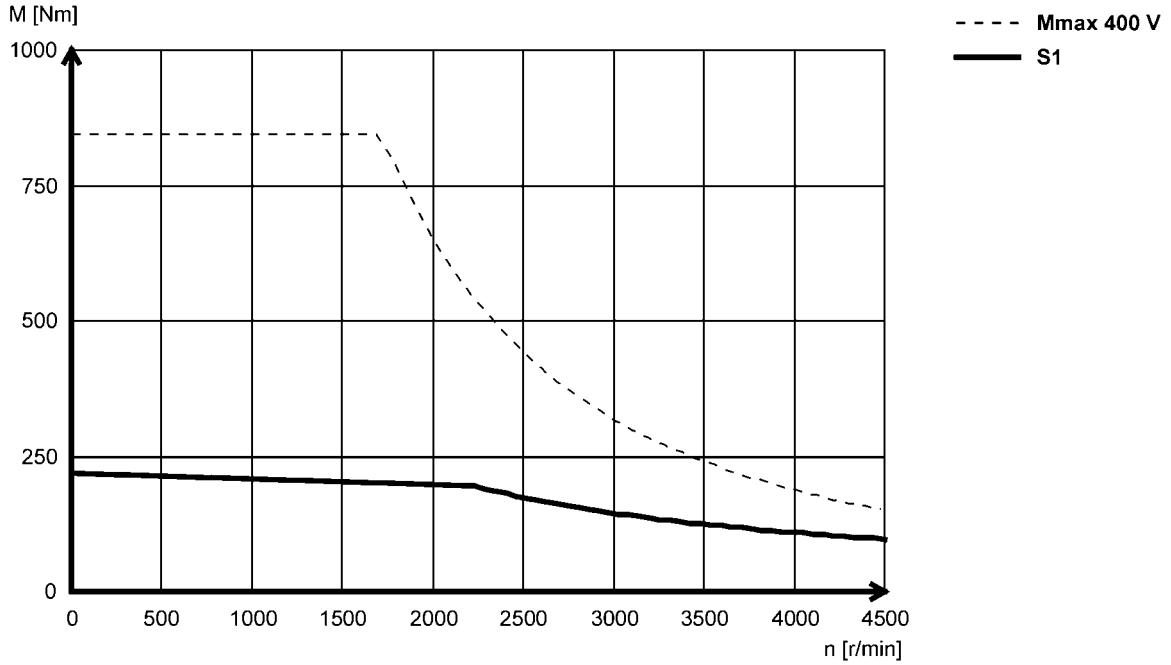
MCA26T12...2F□□ (forced ventilated)



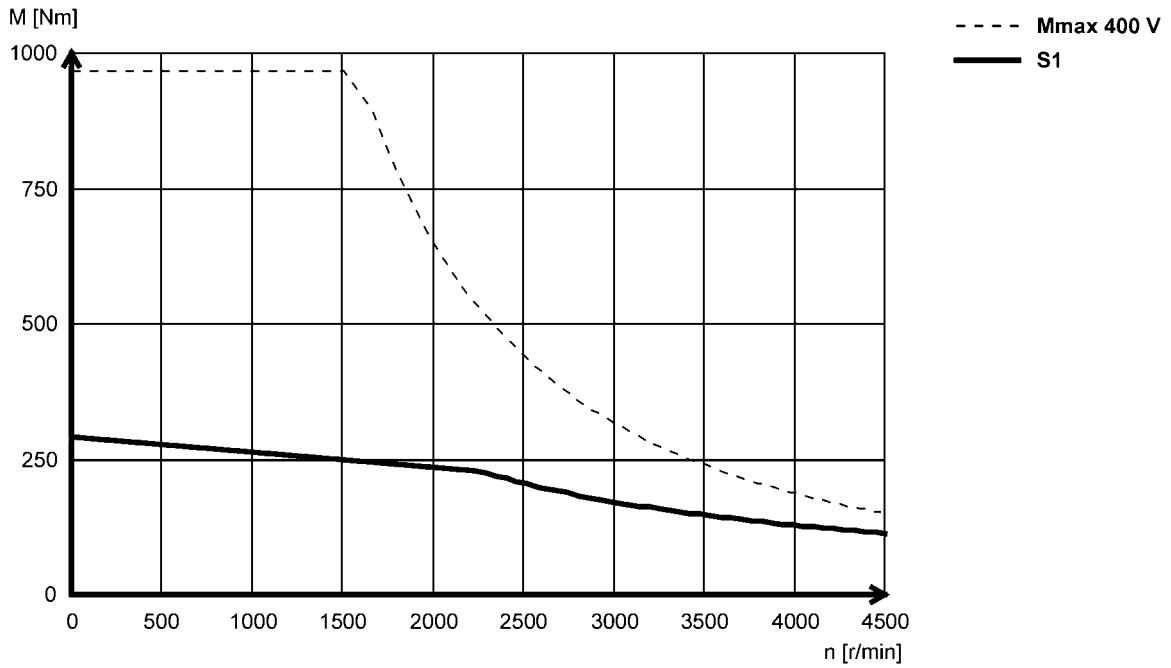
Torque characteristics

- The data applies to a mains connection voltage of 3 x 400 V.
- You can find further torque characteristics at **www.lenze.de/dsc**.

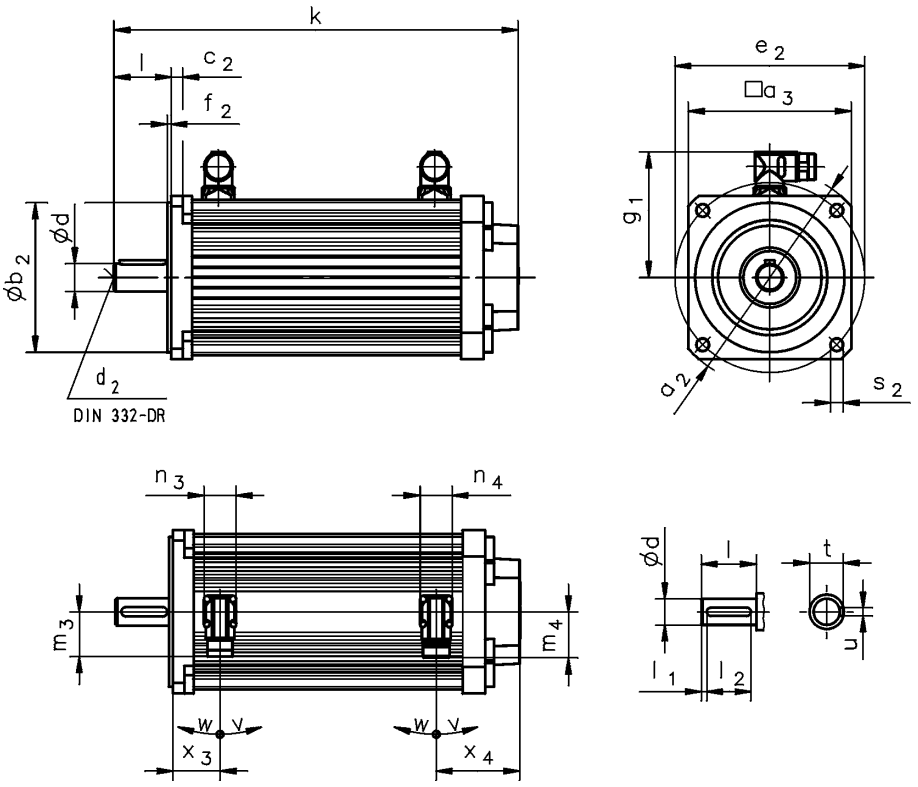
MCA26T22...5F□□ (forced ventilated)



MCA26T22...2F□□ (forced ventilated)



Dimensions, self-ventilated



			MCA10I40	MCA13I41	MCA14L20	MCA17N23	MCA19S23	MCA21X25
					MCA14L41	MCA17N41	MCA19S42	MCA21X42
R□0 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
R□0 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 / 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 / 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

► Speed/angle sensor: RS0 / S□□ / E□□ / T20
► Brake: B0 / P□

Dimensions, self-ventilated

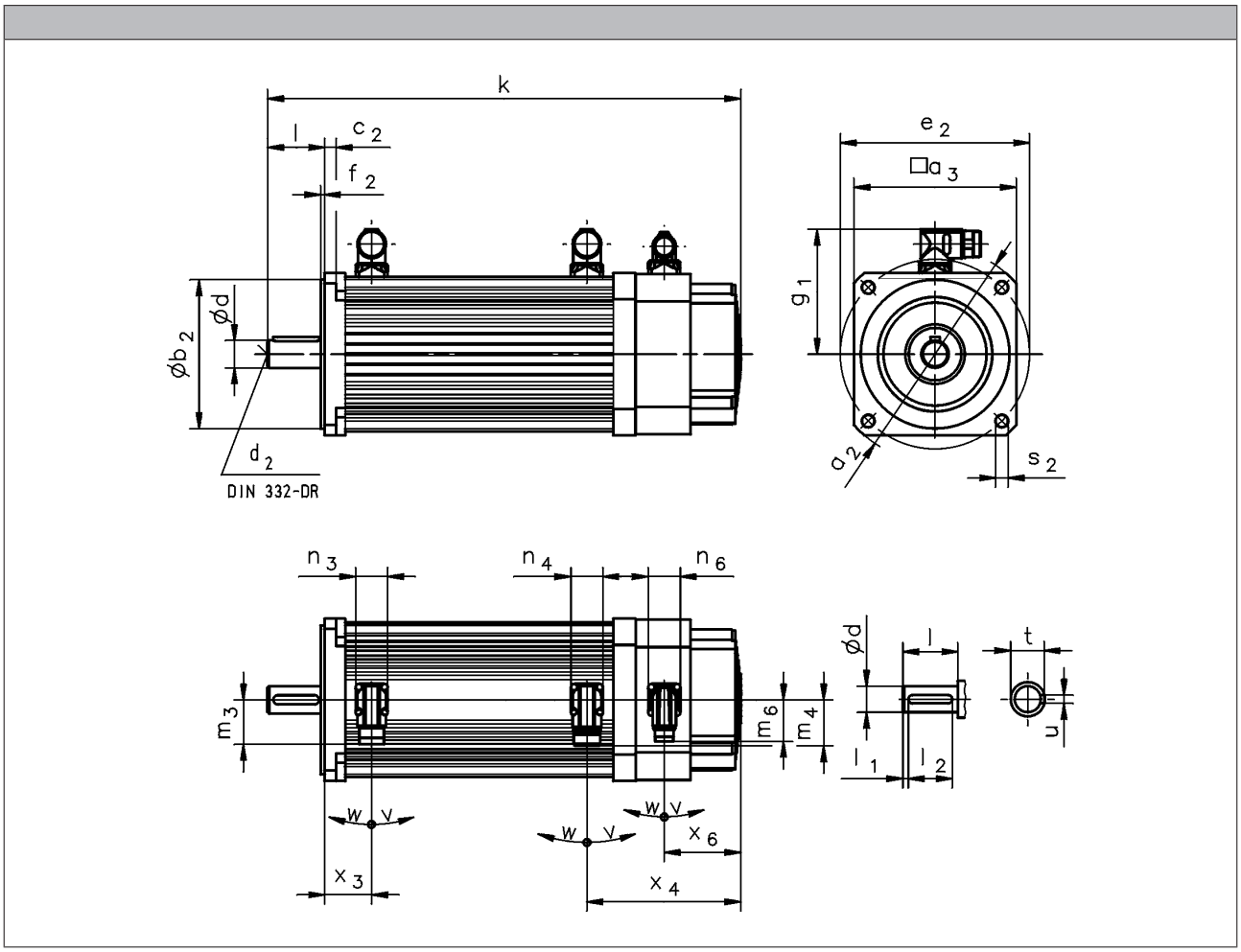
	g_1	n_3	n_4	m_3	m_4	v	w
	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[°]
MCA10I40	90	28	28	40	40	195	80
MCA13I41	102						
MCA14L20	109						
MCA14L41							
MCA17N23	118						
MCA17N41							
MCA19S23	151	40		71			
MCA19S42							
MCA21X25	162						
MCA21X42							

	d	d_2	l	l_1	l_2	u	t
	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA10	14	M5	30	2.5	25	5.0	16.0
MCA13	19	M6	40	2.0	36	6.0	21.5
MCA14	24	M8	50	5.0	40	8.0	27.0
MCA17							
MCA19	28	M10	60		50		31.0
MCA21	38	M12	80		70	10.0	41.0

	a_2	a_3	b_2	c_2	e_2	f_2	s_2
			j6				
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA10	120	102	80	8	100	3.0	7
			70		85	2.5	M6
MCA13	160	130	110	9	130	3.5	9.0
							M8
MCA14	188	142	130	10	165		11.0
			110		130		M8
MCA17	200	165	130	12	165		11.0
			110		130		M8
MCA19	250	192	180	11	215	4.0	13.0
			110		130	3.5	M8
MCA21		214	180		215	4.0	13.0
	300	250	230	12	265		
	250	214	110	11	130	3.5	M8

Dimensions, forced ventilated

Motors MCA13 to 19/21



			MCA13I34	MCA14L16	MCA17N17	MCA19S17	MCA21X17
				MCA14L35	MCA17N35	MCA19S35	MCA21X35
R□0 B0	k	[mm]	379	414	476	558	646
	x_3	[mm]	45	41	43	56	62
	x_4	[mm]	133	135	159	170	174
R□0 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 / 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 / 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

► Speed/angle sensor: RS0 / S□□ / E□□ / T20
► Brake: B0 / P□

Dimensions, forced ventilated

Motors MCA13 to 19/21

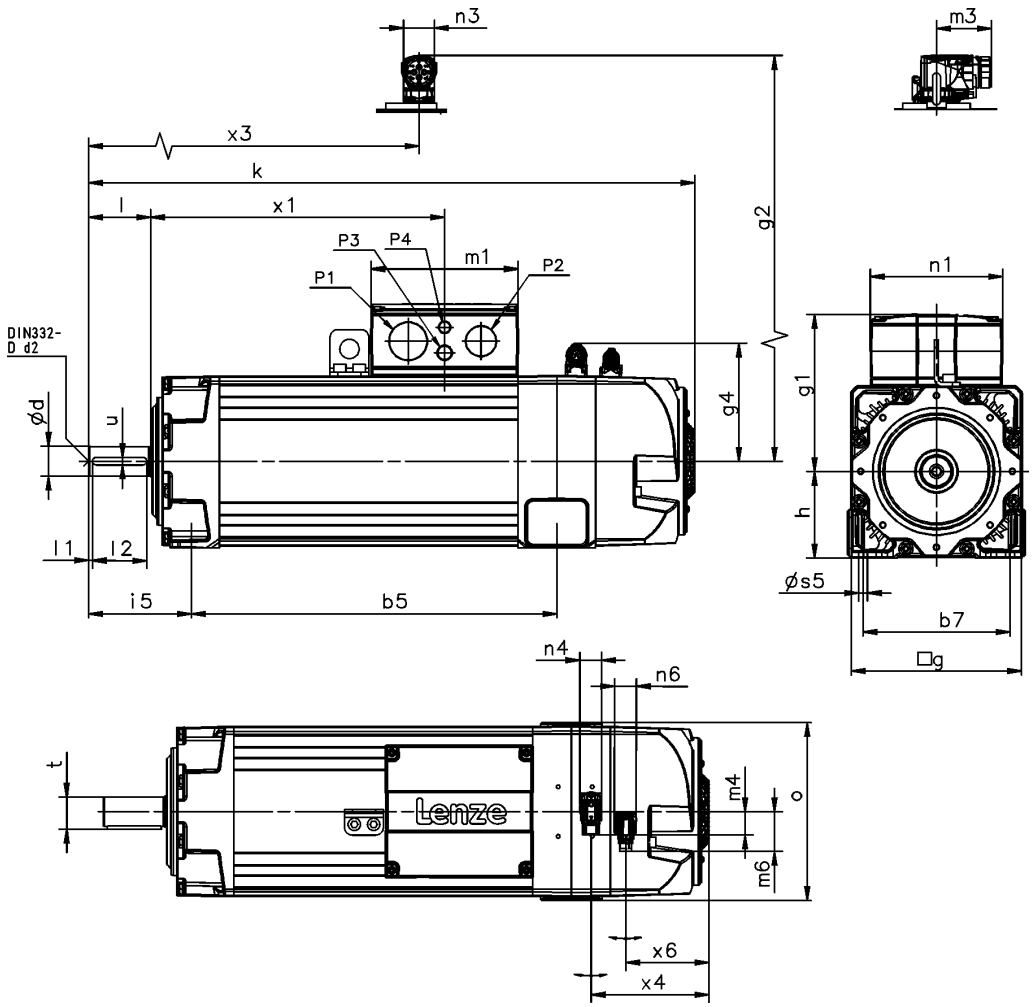
	g_1	n_3	n_4	n_6	m_3	m_4	m_6	v	w
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[°]	[°]
MCA13I34	102	28	28	28	40	40	37	195	80
MCA14L16	109								
MCA14L35									
MCA17N17	118								
MCA17N35									
MCA19S17	151	40			71				
MCA19S35									
MCA21X17	162								
MCA21X35									

	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	21.5
MCA14	24	M8	50	5.0	40	8.0	27.0
MCA17							
MCA19	28	M10	60		50		31.0
MCA21	38	M12	80		70	10.0	41.0

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

Dimensions, forced ventilated

MCA20/22/26 motors in B3 design



			MCA20	MCA22	MCA26
R□0 / E□□ / T□□ / S□□ / B0...F10	k	[mm]	666	783	970
R□0 / E□□ / T□□ / S□□ / B0...F1F	k	[mm]	754	865	1022
R□0 / E□□ / T□□ / S□□ / B0	x_4	[mm]	146	153	194
	m_4	[mm]	25.0	31.0	25.0
R□0 F1...F10	k	[mm]	753	878	1125
R□0 F1...F1F	k	[mm]	842	959	1177
R□0 F1	x_4	[mm]	151	157	201
	m_4	[mm]		31.0	
E□□ / T□□ / S□□ / F1...F10	k	[mm]	797	916	1163
E□□ / T□□ / S□□ / F1...F1F	k	[mm]	885	998	1215
E□□ / T□□ / S□□ / F1	x_4	[mm]	146	162	200
	m_4	[mm]		31.0	
R□0 / E□□ / T□□ / S□□ / F2...F10	k	[mm]	822	948	1163
R□0 / E□□ / T□□ / S□□ / F2...F1F	k	[mm]	910	1030	1215
R□0 / E□□ / T□□ / S□□ / F2	x_4	[mm]	146	162	200
	m_4	[mm]		31.0	

Dimensions, forced ventilated

MCA20/22/26 motors in B3 design

	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	171	168	141	154	72	51	128	40	28	28
MCA22	220	203		153	190			171			
MCA26	260	256		173	234			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	299	422	101
MCA22	230	M50x1.5	M40x1.5			380		108
MCA26	269	M63x1.5	M50x1.5			465		152

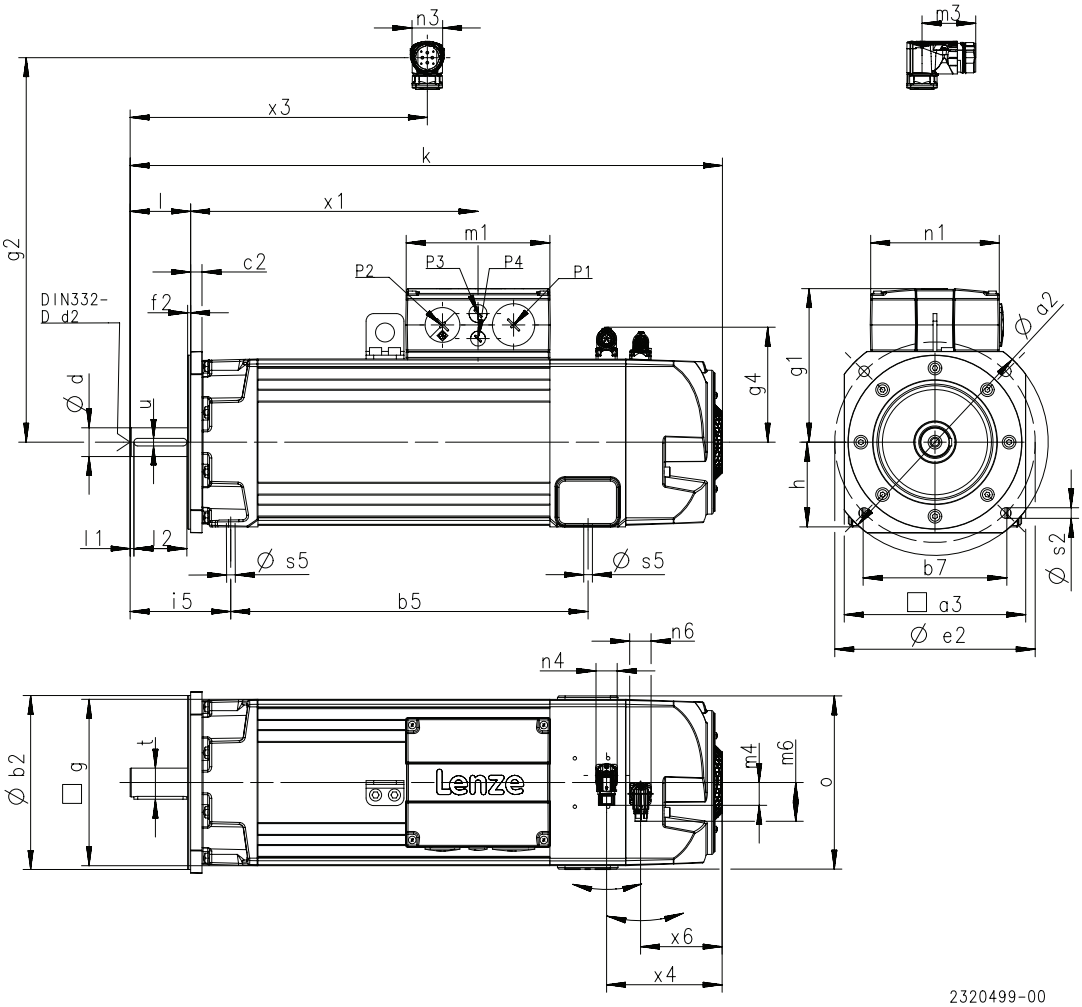
	d	d	d_2	l	l_1	l_2	u	t
	k6	m6		-0.7 ... 0.3				
	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[mm]
MCA20	38		M12	80	5.0	70	10.0	41.0
MCA22								
MCA26		55	M20	110		100	16.0	59.0

	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

- ► Speed/angle sensor: RS0 / S□□ / E□□ / T□□
- ► Brake: B0 / F1 / F2
- ► Blower: F10 / F1F

Dimensions, forced ventilated

MCA20/22/26 motors in B35 design



			MCA20	MCA22	MCA26
R□0 / E□□ / T□□ / S□□ / B0...F10	k	[mm]	666	783	970
R□0 / E□□ / T□□ / S□□ / B0...F1F	k	[mm]	754	865	1022
R□0 / E□□ / T□□ / S□□ / B0	x_4	[mm]	146	153	194
	m_4	[mm]	25.0	31.0	25.0
R□0 F1...F10	k	[mm]	753	878	1125
R□0 F1...F1F	k	[mm]	842	959	1177
R□0 F1	x_4	[mm]	151	157	201
	m_4	[mm]		31.0	
E□□ / T□□ / S□□ / F1...F10	k	[mm]	797	916	1163
E□□ / T□□ / S□□ / F1...F1F	k	[mm]	885	998	1215
E□□ / T□□ / S□□ / F1	x_4	[mm]	146	162	200
	m_4	[mm]		31.0	
R□0 / E□□ / T□□ / S□□ / F2...F10	k	[mm]	822	948	1163
R□0 / E□□ / T□□ / S□□ / F2...F1F	k	[mm]	910	1030	1215
R□0 / E□□ / T□□ / S□□ / F2	x_4	[mm]	146	162	200
	m_4	[mm]		31.0	

Dimensions, forced ventilated

MCA20/22/26 motors in B35 design

	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	171	168	141	154	72	51	128	40	28	28
MCA22	220	203		153	190			171			
MCA26	260	256		173	234			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	299	422	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		-0.7 ... 0.3				
	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[mm]
MCA20	38		M12	80	5.0	70	10.0	41.0
MCA22								
MCA26		55	M20	110		100	16.0	59.0

	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

	a_2	a_3	b_2	b_2	c_2	e_2	f_2	s_2
			j6	h6				
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
MCA20	250	196	180		15	215	4.0	14
MCA22	300	240	230			265		
MCA26	400	320		300		350	5.0	18

- ► Speed/angle sensor: RS0 / S□□ / E□□ / T□□
- ► Brake: B0 / F1 / F2
- ► Blower: F10 / F1F

Permanent magnet holding brake

The asynchronous servo motors MCA10 to 19 and 21 can be fitted with integral permanent magnet holding brakes.
In the case of permanent magnet brakes, the rated torque applies solely as holding torque at standstill. This is due to the nature of their design. During braking from full motor speed, e.g. in the event of emergency stops, the braking torque is significantly reduced.
As such, they may not be used as safety elements (particularly with lifting axes) without additional measures being implemented.
The brakes are activated when the supply voltage is disconnected (closed-circuit principle). When using the brakes purely as holding brakes, virtually no wear occurs on the friction surfaces.

For traversing axes, adherence to the permissible load/brake motor (J_L / J_{MB}) moment of inertia ensures that the permissible maximum switching rate of the brake will not be exceeded and at least 2,000 emergency stop functions can be performed from a speed of 3,000 rpm.
For lifting axes, the load torque resulting from the weight acts additionally. In this case the specifications for J_L / J_{MB} do not apply.

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:

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

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

Permanent magnet holding brake

Rated data with standard braking torque

► The figures stated apply to servo motors. They only apply to geared servo motors when the servo motor is connected via a mounting flange.

	$U_{N, DC}$ [3, 4, 7]	$U_{N, AC}$ [5, 7]	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]	[kgcm²]	[ms]	[ms]	[J]	[kg]	[kgcm²]	
MCA10	24		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		25.0	50.0	1200		39.6	5.10
	205					0.090							
MCA19	24		46.0	40.0	18.0	1.00	9.50		73.0	1900	2.70	81.5	3.70
	205					0.12							
MCA21	24		88.0	80.0	35.0	1.46	31.8	53.0	97.0	2800	5.00	212	1.70
	205					0.18							

[1] Engagement and disengagement times are valid for rated voltage (± 0 %) and protective circuit for brakes with varistor for DC switching. The times may increase without a protective circuit.
[2] The currents are the maximum values when the brake is cold (value used for dimensioning the current 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 a 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 at n = 3000 r/min for at least 2000 emergency stops.
[7] Voltage tolerance: permanent magnet brakes -10% to +5%
spring-applied brakes ±10%

Permanent magnet holding brake

Rated data with increased braking torque

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

	$U_{N, DC}$ [3, 4, 7]	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]	[Nm]	[Nm]	[Nm]	[A]	[kgcm²]	[ms]	[ms]	[J]	[kg]	[kgcm²]	
MCA10	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 are valid for rated voltage (± 0 %) and protective circuit for brakes with varistor for DC switching. The times may increase without a protective circuit.
[2] The currents are the maximum values when the brake is cold (value used for dimensioning the current 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 a 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 at n = 3000 r/min for at least 2000 emergency stops.
[7] Voltage tolerance: permanent magnet brakes -10% to +5%
spring-applied brakes ±10%

Spring-applied holding brake

Spring-operated holding brakes are available for the asynchronous servo motors MCA20, 22 and 26.
The brakes are activated when the supply voltage is disconnected (closed-circuit principle). When using the brakes purely as holding brakes, virtually no wear occurs 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:

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

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.

Spring-applied holding brake

Spring-applied holding brake

Rated data with standard braking torque

► The figures stated apply to servo motors. They only apply to geared servo motors when the servo motor is connected via a mounting flange.

	$U_{N, DC}$ [3, 4, 7]	$U_{N, AC}$ [5, 7]	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]	[kgcm²]	[ms]	[ms]	[J]	[kg]	[kgcm²]	
MCA20	24		90.0	80.0	50.0	3.13	6.88	70.0	220	18000	13.0	177	19.6
		230				0.37							
MCA22	24		150	130	80.0	3.75	18.1	50.0	260	23000	20.5	505	8.20
		230				0.44		130					
MCA26	24		300	260	160	3.75	36.3	175	320	39000	26.0	1405	12.7
		230			200	0.37	70.4		360	51000	30.7		

Rated data with increased braking torque

► The figures stated apply to servo motors. They only apply to geared servo motors when the servo motor is connected via a mounting flange.

	$U_{N, DC}$ [3, 4, 7]	$U_{N, AC}$ [5, 7]	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]	[kgcm²]	[ms]	[ms]	[J]	[kg]	[kgcm²]	
MCA20	24		150	130	100	2.58	14.1	70.0	240	31000	15.4	189	33.0
		230				0.30							
MCA22	24		300	260	160	3.75	36.3	175	320	39000	26.0	523	14.1
		230				0.44		130	310				
MCA26	24		500	430	260	3.75	70.4	175	390	51000	30.8	1405	12.7
		230				0.44							

[1] Engagement and disengagement times are valid for rated voltage (± 0 %) and protective circuit for brakes with varistor for DC switching. The times may increase without a protective circuit.
[2] The currents are the maximum values when the brake is cold (value used for dimensioning the current 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 a 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 at n = 3000 r/min for at least 2000 emergency stops.
[7] Voltage tolerance: permanent magnet brakes -10% to +5%
spring-applied brakes ±10%

Resolver

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

Speed/angle sensor					
	1)			RS0	RV0
Product key					
				RS0	RV03
Resolution					
Angle			[']	0.80	
Accuracy					
			[']	-10 ... 10	
Absolute positioning					
				1 revolution	
Max. speed					
	n_{max}		[r/min]	8000	
Max. input voltage					
DC	$U_{in,max}$		[V]	10.0	
Max. input frequency					
	$f_{in,max}$		[Hz]	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		[Ω]	10.0	
Number of pole pairs					
				1	
Max. angle error					
			[']	-10 ... 10	
Inverter assignment					
				E84AVTC E94A ECS EVS93	

1) 6 - Product key > speed/angle sensor

Speed-dependent safety functions

Suitable for safety function				
			No	Yes
Max. permissible angular acceleration				
MCA10 ... MCA19 2)	α	[rad/s²]		22000
MCA20 ... MCA26 2)	α	[rad/s²]		22000
Functional safety				
IEC 61508				SIL3
EN 13849-1				Up to Performance Level e

2) 1 - Single encoder concepts with resolvers

Incremental encoder and SinCos absolute value encoder

Encoder type			TTL incremental		SinCos incremental	
Speed/angle sensor						
	1)		T20	T40	S20	S1S
Product key						
			IG2048-5V-T	IG4096-5V-T	IG2048-5V-S	IG1024-5V-V3
Encoder type						
					Single-turn	
Pulses						
			2048	4096	2048	1024
Output signals						
			TTL		1 Vss	
Interfaces						
			A, B, N track and inverted			
Absolute revolutions						
			0			
Resolution						
Angle 2)		[']	2.60	1.30	0.40	
Accuracy						
		[']	-2 ... 2		-0.8 ... 0.8	
Min. input voltage						
DC	$U_{in,min}$	[V]	4.75		4.50	4.75
Max. input voltage						
DC	$U_{in,max}$	[V]	5.25		5.50	5.25
Max. speed						
	n_{max}	[r/min]	8789		5273	8000
Max. current consumption						
	I_{max}	[A]	0.15		0.10	0.070
Limit frequency						
	f_{max}	[kHz]	300		180	200
Inverter assignment						
			E84AVTC E94A ECS EVS93			E94A

1) 6 - Product key > speed/angle sensor

2) Inverter-dependent.

Speed-dependent safety functions

Suitable for safety function						
			No	No	No	Yes
Max. permissible angular acceleration						
MQA20 ... MQA26	α	[rad/s²]				73000
Functional safety						
IEC 61508						SIL3
EN 13849-1						Up to Performance Level e

Incremental encoder and SinCos absolute value encoder

Encoder type			SinCos absolute value				
Speed/angle sensor	[1]		EQI	SRS	SRM	ECN	EQN
Product key			AM32-5V-E	AS1024-8V-H	AM1024-8V-H	AS2048-5V-E	AM2048-5V-E
Encoder type			Multi-turn	Single-turn	Multi-turn	Single-turn	Multi-turn
Pulses			32	1024		2048	
Output signals			1 Vss				
Interfaces			EnDat	Hiperface		EnDat	
Absolute revolutions			4096	1	4096	1	4096
Resolution							
Angle		[']	0.40				
Accuracy							
		[']	-5 ... 5	-0.8 ... 0.8		-0.6 ... 0.6	
Min. input voltage							
DC	$U_{in,min}$	[V]	4.75	7.00		4.75	
Max. input voltage							
DC	$U_{in,max}$	[V]	5.25	12.0		5.25	
Max. speed							
	n_{max}	[r/min]	12000	6000		12000	
Max. current consumption							
	I_{max}	[A]	0.17	0.080		0.15	0.25
Limit frequency							
	f_{max}	[kHz]	6.00	200			
Inverter assignment			E94A	E84AVTC E94A ECS EVS93		E94A	

[1] 6 - Product key > speed/angle sensor

Blowers

Rated data for 50 Hz

		Degree of protection	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								
MCA17							0.040	0.25
MCA19								
MCA20	F10 F1F	IP23s			250		0.17	0.73
MCA21	F10	IP54			240		0.060	0.26
MCA22	F10 F1F	IP54 IP23s			250		0.24	1.05
MCA26							0.40	1.75

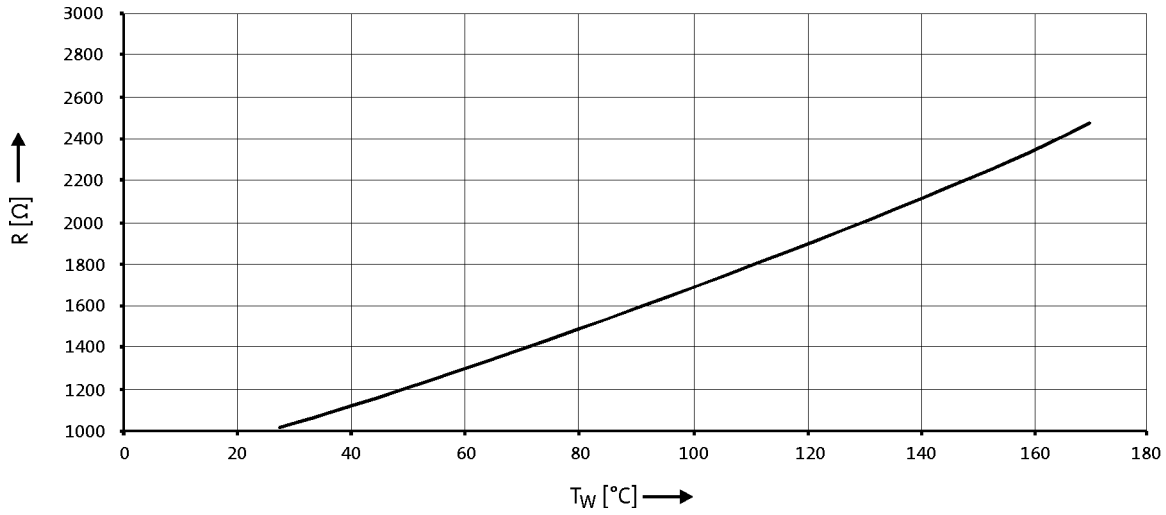
Rated data for 60 Hz

		Degree of protection	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								
MCA17							0.040	0.25
MCA19								
MCA20	F10 F1F	IP23s			250		0.20	0.90
MCA21	F10	IP54			240		0.060	0.26
MCA22	F10 F1F	IP54 IP23s			250		0.28	1.23
MCA26							0.41	1.82

Temperature monitoring

The thermal sensors (1x KTY 83-110) used 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.

Variation of resistance



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

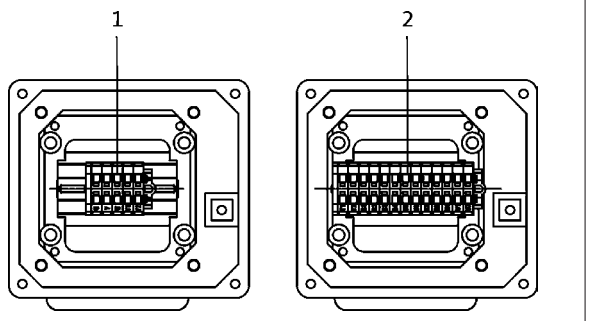
Terminal box

Motors MCA10 to 19/21

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.

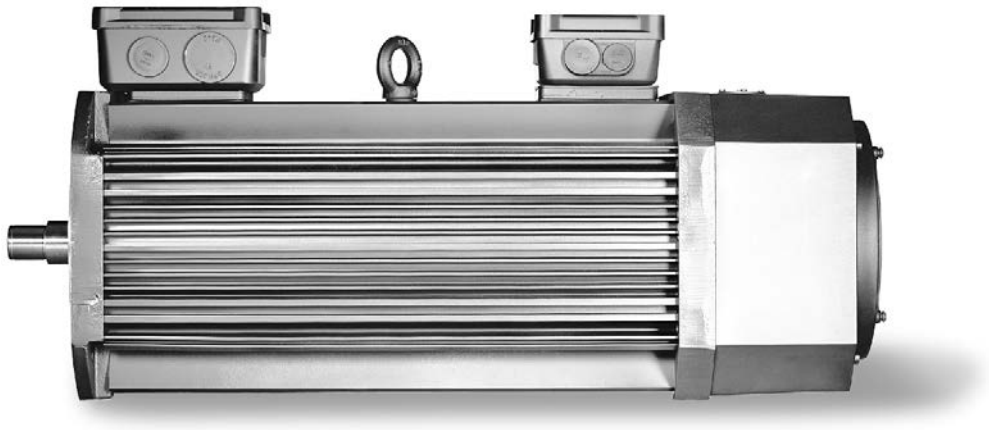
The motor can either be fitted with a terminal box for the power connection and motor holding brake or a second terminal box provided to connect the motor feedback and blower (if applicable).

Connections



1: Power connection + brake connection + PE connection.

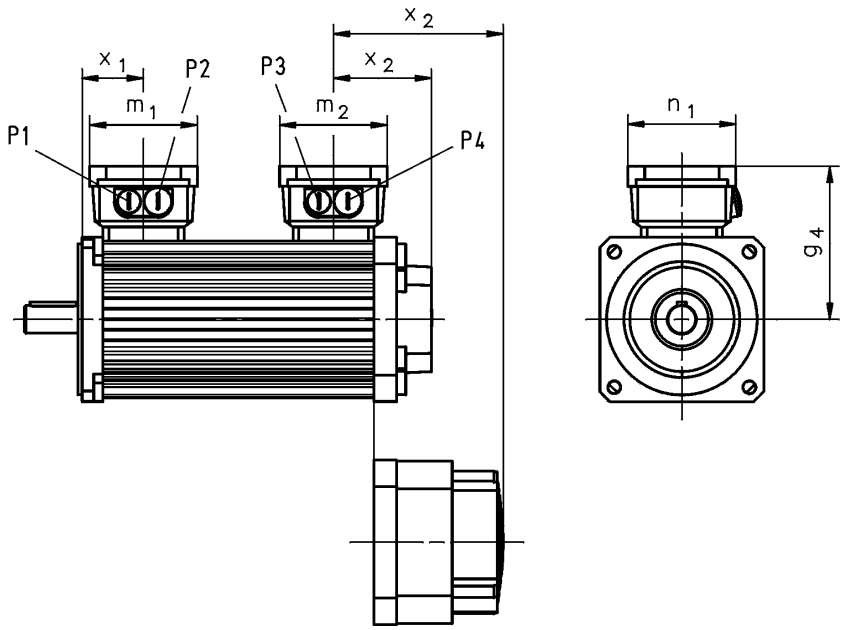
2: Angle/speed sensor connection + thermal sensor connection



MCA asynchronous servo motors with blower and terminal box

Terminal box

Motors MCA10 to 19/21



			MCA10I40	MCA13I41	MCA14L20	MCA17N23	MCA19S23	MCA21X25
					MCA14L41	MCA17N41	MCA19S42	MCA21X42
R□0 B0	x_2	[mm]	78	77	85		93	97
R□0 P□	x_2	[mm]	78	77	85		93	97
S□□ / E□□ / T20 / B0	x_2	[mm]	132	131	140	139	143	147
S□□ / E□□ / T20 / P□	x_2	[mm]	132	131	140	139	143	147

			MCA13I34	MCA14L16	MCA17N17	MCA19S17	MCA21X17
				MCA14L35	MCA17N35	MCA19S35	MCA21X35
R□0 B0	x_2	[mm]	145	147	171	190	193
R□0 P□	x_2	[mm]	145	147	171	190	193
S□□ / E□□ / T20 / B0	x_2	[mm]	199	202	225	240	243
S□□ / E□□ / T20 / P□	x_2	[mm]	199	202	225	240	243

► Speed/angle sensor: RS0 / S□□ / E□□ / T20
► Brake: B0 / P□

	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	M20x1.5	M20x1.5	M20x1.5	M20x1.5
MCA13	125				57				
MCA14	133				53				
MCA17	141				55				
MCA19	158	115	115	115	64	M25x1.5	M32x1.5		
MCA21	169				70				

ICN connector

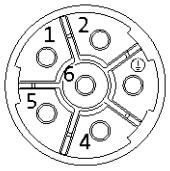
Servo motors MCA10 to 21 provide ICN connectors as standard for electrical connection. Servo motors MCA22 and MCA26 provide a terminal box for electrical connection.

A connector is used for the connection of motor and brake.
The connections to the feedback system/temperature monitoring and the blower each employ a separate connector.

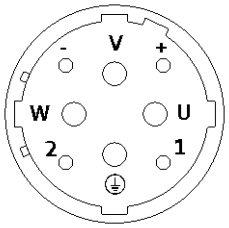
The connectors can be rotated through 270° and are fitted with a bayonet catch for SpeedTec connectors. As the connector fixing is also compatible with conventional union nuts. Existing mating connectors can therefore still be used without difficulty.

Connection for power and brake

► MCA10 to 17

Pin assignment			
Contact	Designation	Meaning	
1	BD1	Holding brake +	
2	BD2	Holding brake -	
PE	PE	PE conductor	
4	U	Phase U power	
5	V	Phase V power	
6	W	Phase W power	

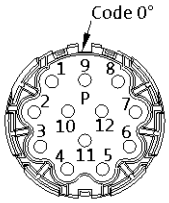
► MCA19 to 21

Pin assignment			
Contact	Designation	Meaning	
1		Not assigned	
2			
+	BD1	Holding brake +	
-	BD2	Holding brake -	
PE	PE	PE conductor	
U	U	Phase U power	
V	V	Phase V power	
W	W	Phase W power	

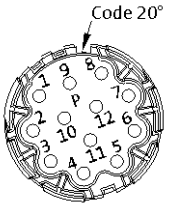
ICN connector

Feedback connection

► Resolver

Pin assignment			
Contact	Designation	Meaning	
1	+Ref	Transformer windings	
2	-Ref		
3	+VCC ETS	Supply: Electronic nameplate	
4	+COS	Cosine stator windings	
5	-COS		
6	+SIN	Sine stator windings	
7	-SIN		
8		Not assigned	
9			
10			
11	+KTY	KTY temperature sensor	
12	-KTY		

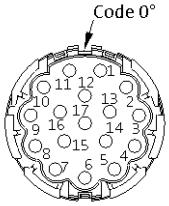
► Hiperface incremental encoder and SinCos absolute value encoder

Pin assignment			
Contact	Designation	Meaning	
1	B	Track B/+SIN	
2	A^-	Track A inverse/-COS	
3	A	Track A/+COS	
4	$+U_B$	Supply +	
5	GND	Mass	
6	Z^-	Zero track inverse/-RS485	
7	Z	Zero track/+RS485	
8		Not assigned	
9	B^-	Track B inverse/-SIN	
10		Not assigned	
11	+KTY	KTY temperature sensor	
12	-KTY		

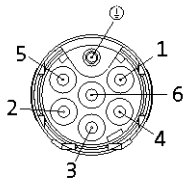
ICN connector

Feedback connection

► SinCos absolute value encoder with EnDat interface

Pin assignment			
Contact	Designation	Meaning	
1	U_P sensor	Supply: UP sensor	
2		Not assigned	
3			
4	0 V sensor	Supply: 0 V sensor	
5	+KTY	KTY temperature sensor	
6	-KTY		
7	$+U_B$	Supply +	
8	Cycle	EnDat interface cycle	
9	Cycle$^-$	EnDat interface inverse cycle	
10	GND	Mass	
11	Shield	Encoder housing screen	
12	B	Track B	
13	B$^-$	Track B inverse/-SIN	
14	Data	EnDat interface data	
15	A	Track A	
16	A$^-$	Track A inverse	
17	Data$^-$	EnDat interface inverse data	

Blower connection

Pin assignment			
Contact	Designation	Meaning	
PE	PE	PE conductor	
1	U1	Fan	
2	U2		
3		Not assigned	
4			
5			
6			

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