

Automation systems Drive solutions

Controls
Inverters

Motors

Gearboxes

Engineering Tools

Motors: MF three-phase AC motors

Gearboxes: g500-S shaft-mounted helical gearbox

Contents of the L-force catalogue

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

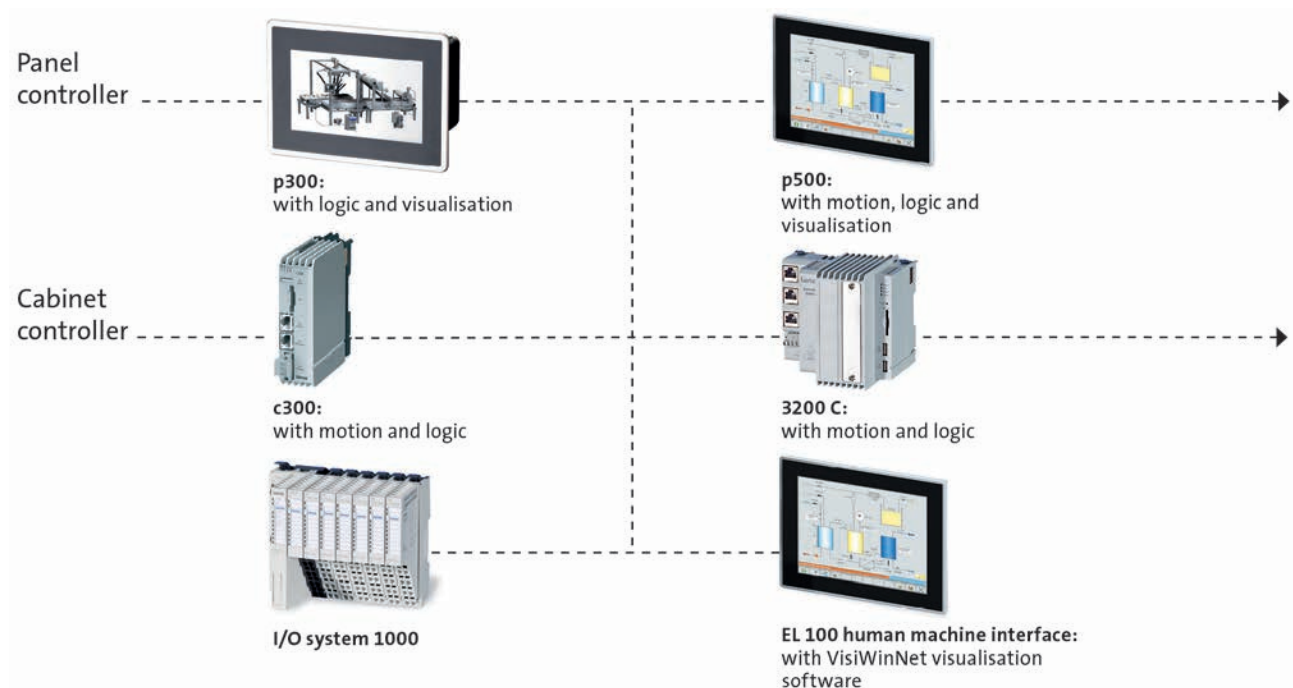
- Easy handling
- High quality and durability
- Reliable technologies in tune with the latest developments

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!

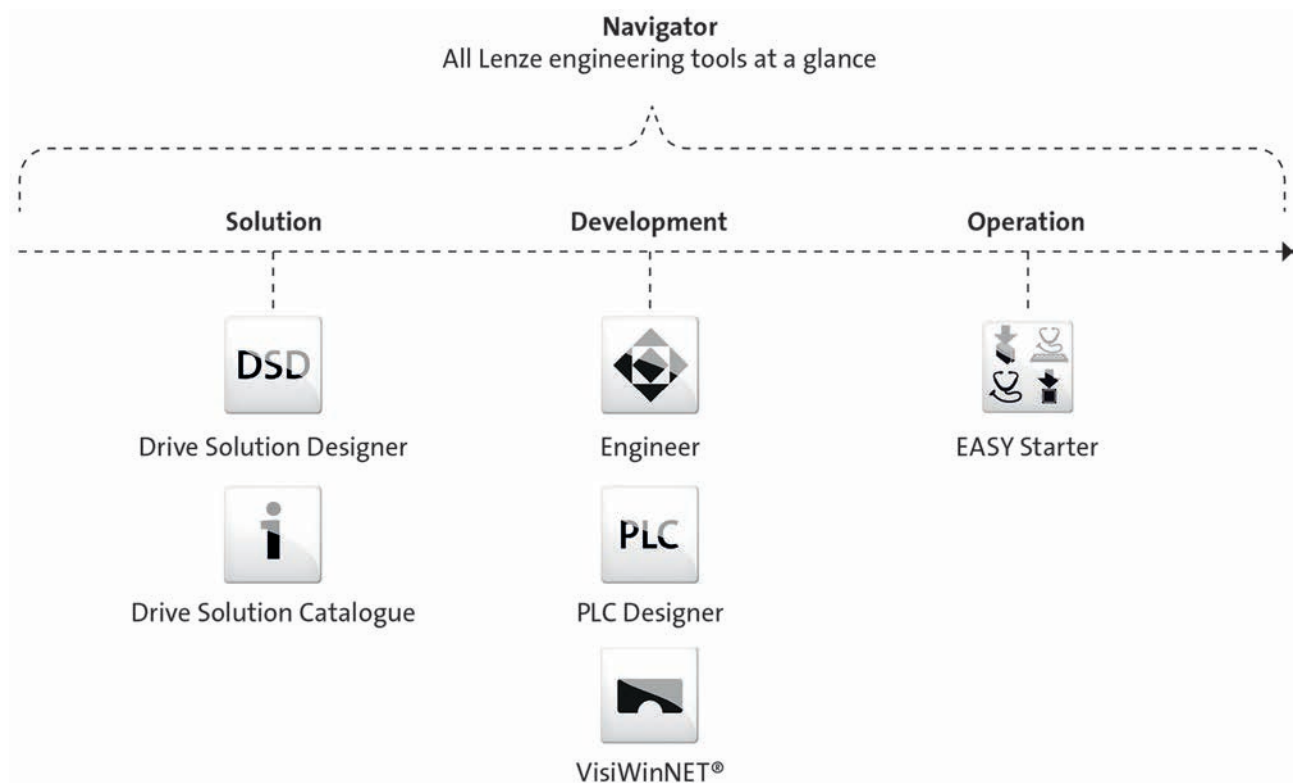


L-force product portfolio

Controls

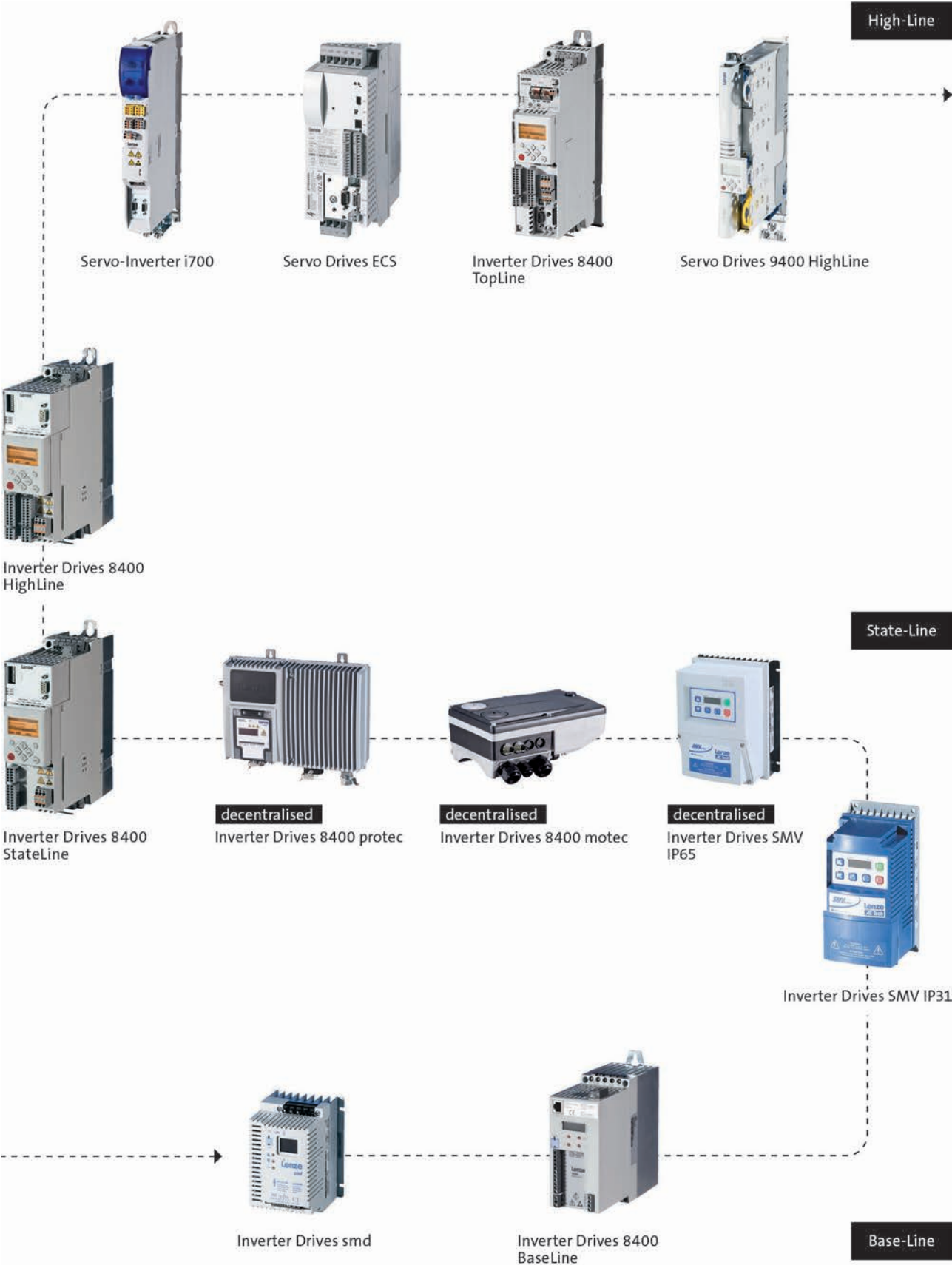


Engineering Tools



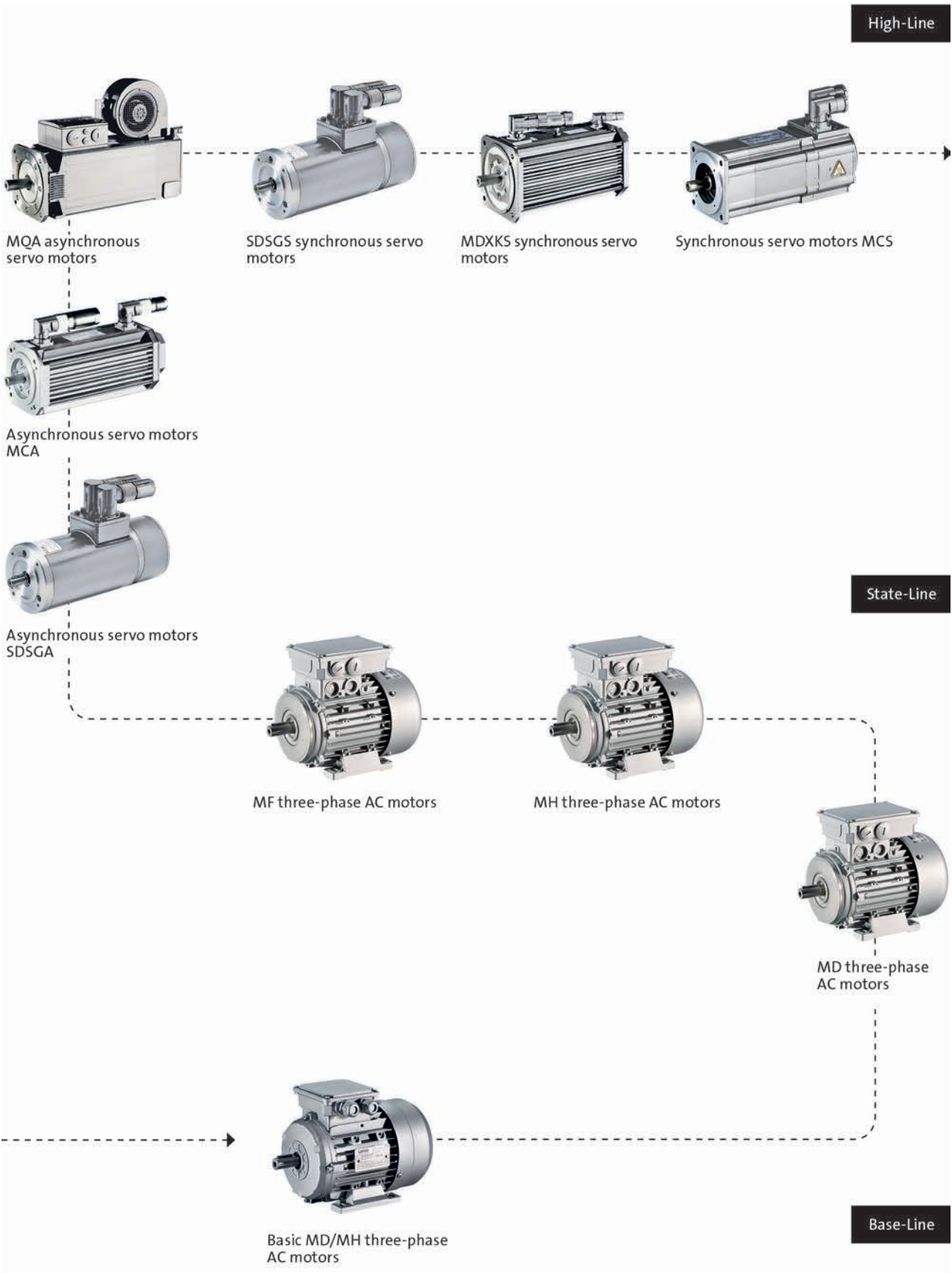
L-force product portfolio

Inverters



L-force product portfolio

Motors



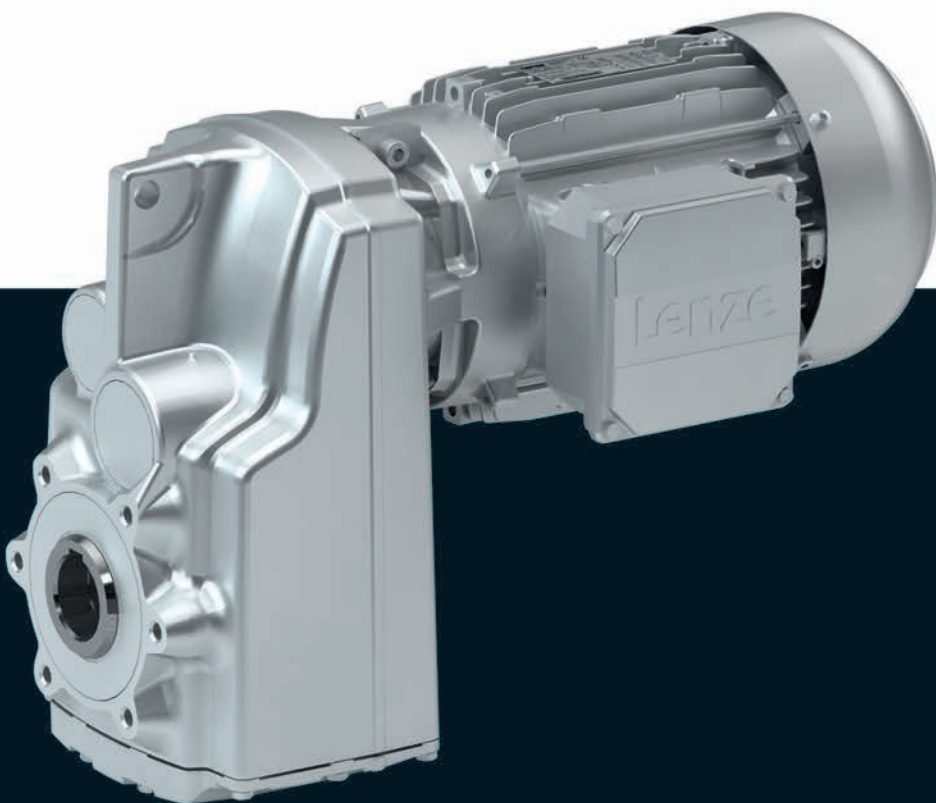
L-force product portfolio

Gearboxes



g500-S shaft-mounted helical geared motors

0.55 to 7.5 kW (efficiency class better than IE2)



g500-S shaft-mounted helical geared motors

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g500-S shaft-mounted helical geared motors

Contents



g500-S shaft-mounted helical geared motors

General information



List of abbreviations

c		Load capacity
i		Ratio
m	[kg]	Mass
M ₂	[Nm]	Output torque
M ₂₂	[Nm]	Output torque
M _{a,1}	[Nm]	Starting torque
M _{a,2}	[Nm]	Starting torque
n ₂	[r/min]	Output speed
n ₂₁	[r/min]	Output speed
n ₂₂	[r/min]	Output 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)

g500-S shaft-mounted helical geared motors

General information



Product information

In combination with three-phase AC motors, our shaft-mounted helical gearboxes form a compact and powerful drive unit. Numerous options at the input and output end provide for the drive to be exactly adapted to your application.

The slim shaft-mounted helical gearboxes feature high reliable radial forces, closely stepped gear reductions and a low backlash. They are available in 2-pole and 3-pole design with a torque up to 660 Nm and a ratio of up to $i = 495$.

Versions

- Slimline design saves installation space of the machine
- Solid shaft, hollow shaft and shrink disc for direct integration into the machine
- High accuracy with axial output provide for the highest efficiency
- With three-phase AC motors better than IE2 in the power range 0.55 ... 7.5 kW

Inverters for motor-proximity installation

The Drive Package with decentralised Inverter Drives 8400 motec covers a power range up to 7.5 kW.

The product name

Gearbox type	Product range		Design	Rated torque [Nm]	Product
Shaft-mounted helical gearbox	g500	-	S	130	g500-S130
				220	g500-S220
				400	g500-S400
				660	g500-S660

g500-S shaft-mounted helical geared motors

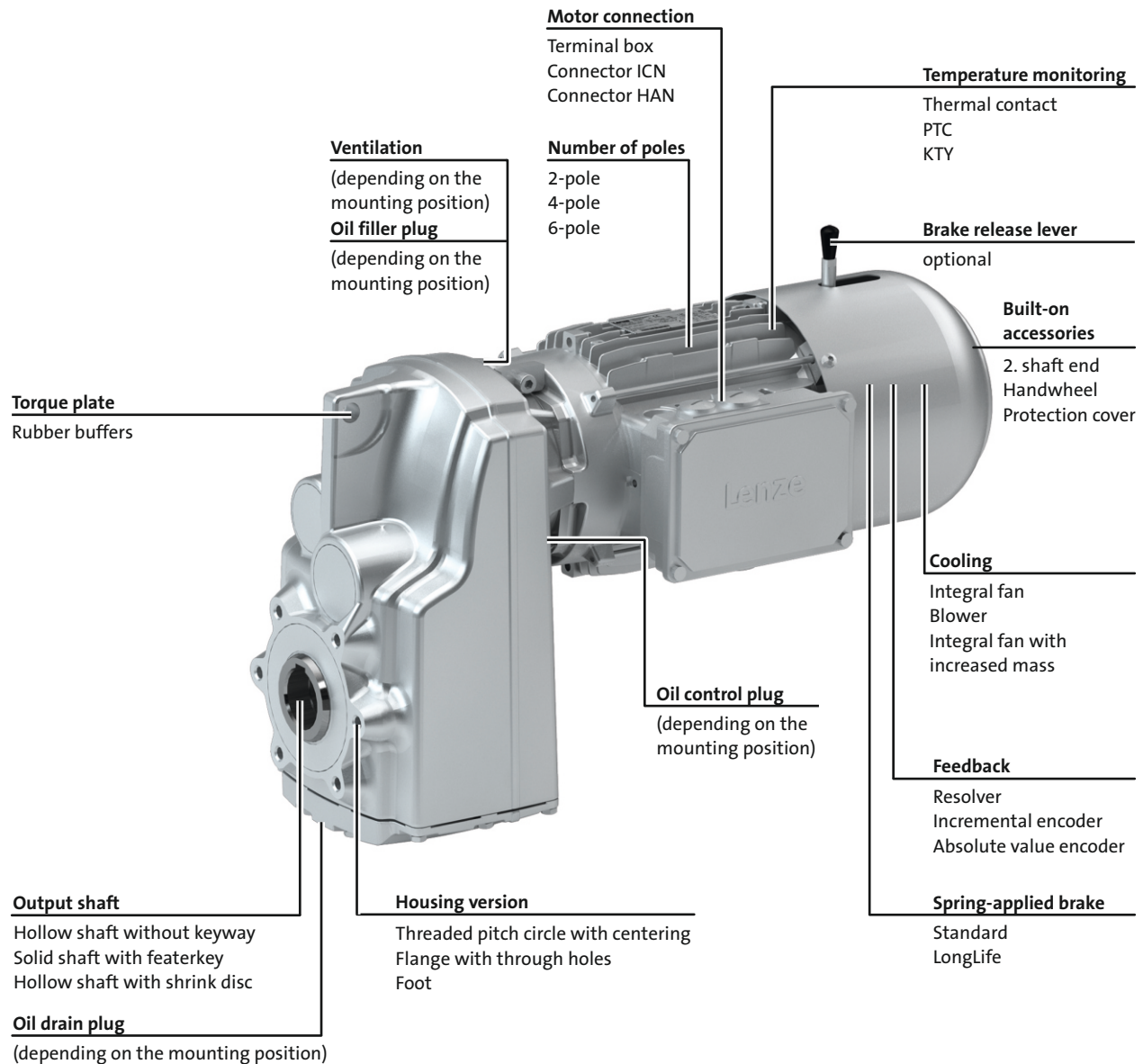
General information



Equipment

Overview

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



g500-S shaft-mounted helical geared motors

General information



The gearbox kit

Geared motor

Product	g500-S130	g500-S220	g500-S400	g500-S660
Motor type	MF□MA AC motors			
Efficiency class better than IE2				
4-pole motor				
0.55 - 0.75 kW	063			
1.1 - 1.5 kW	071			
2.2 - 3.0 kW	080			
4.0 kW				090
5.5 - 7.5 kW				100
Technical data				
Rated power	See selection table			
Mains voltage				
Mains frequency				
Output torque	See selection table			
Output speed	See selection table			
Ratio	See selection table			
Load capacity	See selection table			
Mounting position				
Standard	A/B/C/D/E/F			
Combined	AEF			
Colour				
	Not coated 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)			

g500-S shaft-mounted helical geared motors

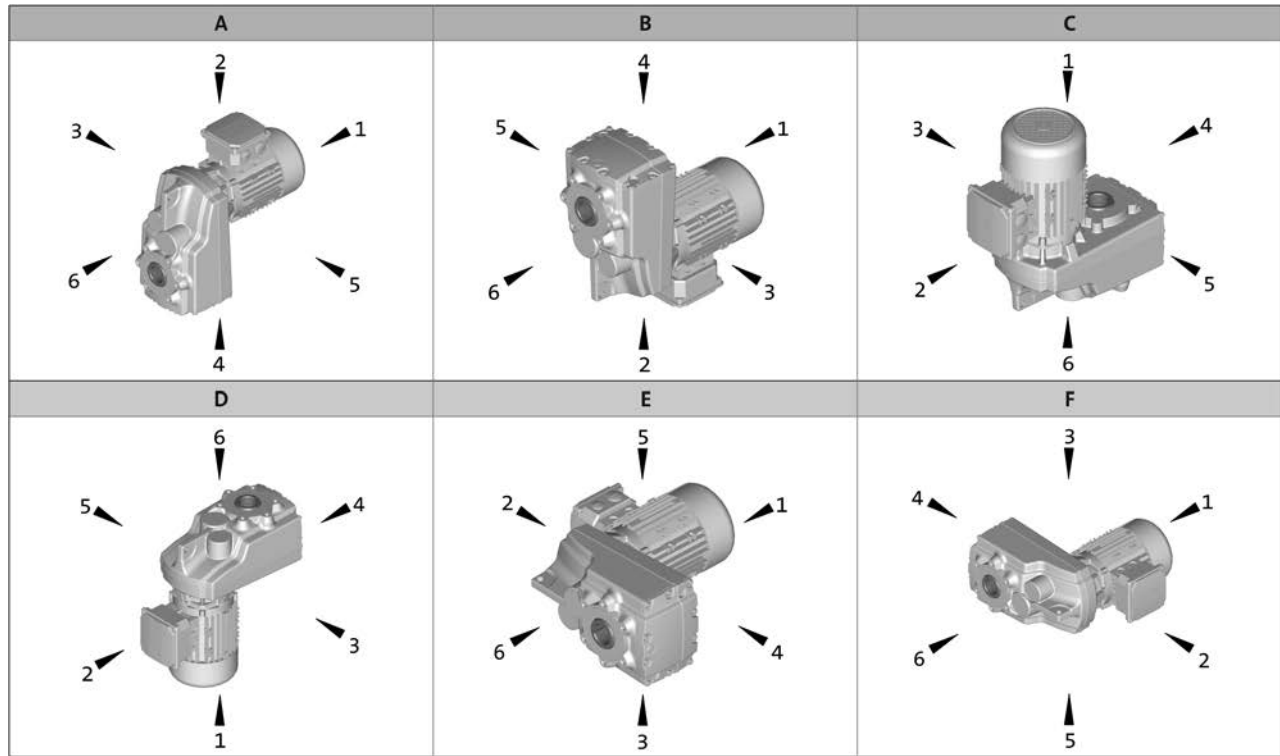
General information



The gearbox kit

Mounting positions

- Mounting position (A to F) and position of system blocks (1 to 6)



Hollow shaft: 0
Solid shaft: 6
Hollow shaft with shrink disc: 1, 6

Without foot: 0
Foot: 3, 4
Terminal box / motec: 2, 3, 4, 5

g500-S shaft-mounted helical geared motors

General information



The gearbox kit

Motor details

Product	MF□MA□□					
	063-32 063-42	071-32	071-42	080-32 080-42	090-32	100-12 100-32
Connection type	Terminal box ICN connector HAN-10E connector HAN-Modular connector					
Spring-applied brake						
Rated torque [Nm]	4		4 8	8 16		16 32
Brake voltage [V]	DC 24/180/205 AC 230/400/460					
Brake design	Standard LongLife					
	Standard Overexcited Cold Brake					
Options	Manual release lever Low noise With cover ring					
Feedback	With absolute value encoder With incremental encoder With resolver					
Cooling	Without blower/integral fan Blower Integral fan with increased mass					
Temperature monitoring	TKO thermal contact KTY83-110 thermal detector KTY84-130 thermal detector PTC thermistor					
Approval	cURus CCC					
Degree of protection	IP55					
Further options	Protection cover 2nd shaft end Handwheel					

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

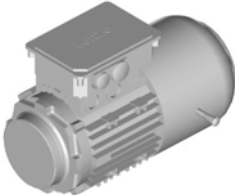
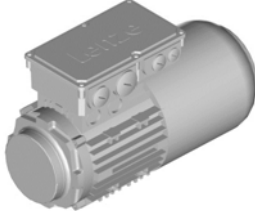
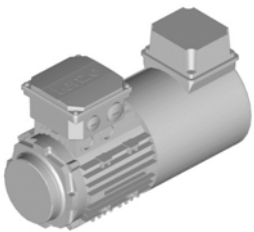
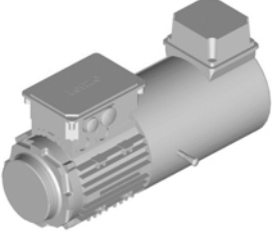
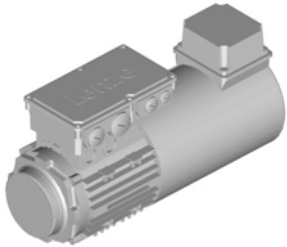
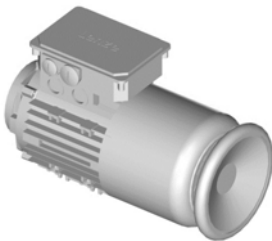
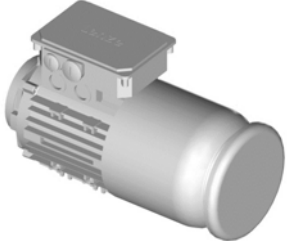
g500-S shaft-mounted helical geared motors

General information



The gearbox kit

Motor details

Connection type		
		
Terminal box	ICN connector	HAN connector
Cooling: integral fan		
		
Without built-on accessories	With spring-applied brake With or without manual release lever	With feedback With feedback and spring-applied brake
Cooling: blower		
		
Without built-on accessories	With spring-applied brake With or without manual release lever	With feedback With feedback and spring-applied brake
Further options		
		
With 2nd shaft end Only integral fan	With handwheel Only integral fan	With protection cover

g500-S shaft-mounted helical geared motors

General information



The gearbox kit

Gearbox details

Product						
	g500-S130	g500-S220	g500-S400	g500-S660		
Driven shaft						
Solid shaft with featherkey [mm]	25x50		30x60	35x70 40x80		
Hollow shaft with keyway [mm]	25	25/30	30/35	40/45		
Hollow shaft with shrink disc [mm]	25	25/30	35	40		
Design	Standard stainless steel					
Gasket	Standard FPM (Viton)					
Bearing	Standard					
Fitting grease	Not enclosed Enclosed					
Housing						
Housing version	With foot without centring With centering					
Output flange						
flange diameter [mm]	160		200	200/250 ¹⁾		
Lubricant						
Type	CLP 460 ²⁾ CLP HC 320 CLP HC 220 CLP HC 220 USDA H1					
Oil-level inspection	Without inspection With inspection					
Breather element	Without		Standard mounting position: Mounted Combined mounting position: loosely enclosed			
Backlash						
Backlash	Standard					
Accessories						
Torque plate	Rubber buffers					
Shaft cover	Shrink disc: Rotating cover Shrink disc: Fixed cover					

¹⁾ 200 mm flange diameter only possible on hollow shaft version.

²⁾ Not suitable for geared servo motors.

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

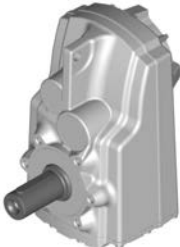
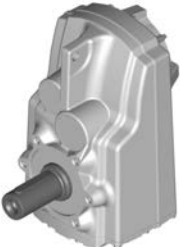
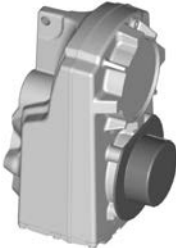
g500-S shaft-mounted helical geared motors

General information



The gearbox kit

Gearbox details

Solid shaft		
		
without centring	With centering	Flange with through holes
Hollow shaft		
		
without centring	With centering	Flange with through holes
Hollow shaft with shrink disc		
		
without centring	With centering	Flange with through holes
Accessories		
		
Foot mounting	With rubber buffer	Shrink disc cover

6.5

g500-S shaft-mounted helical geared motors

General information



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
- $T_{amb} = 20\text{ °C}$ for gearboxes,
 $T_{amb} = 40\text{ °C}$ for motors (in accordance with EN 60034)
- Site altitude $< = 1000\text{ m amsl}$
- 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.

g500-S shaft-mounted helical geared motors

General information



Dimensioning

Thermal power limit

The thermal power limit, defined by the heat balance, limits the permissible gearbox continuous power. It may be less than the mechanical power ratings listed in the selection tables.

The thermal power limit is affected by:

- the churning losses in the lubricant. These are determined by the mounting position and the circumferential speed of the gears;
- the load and the speed
- the ambient conditions: temperature, air circulation, input or dissipation via shafts and the foundation

If the following input speeds n_1 are exceeded, please contact Lenze:

Motor frame size	Mounting position A, B, E, F	Mounting position C, D
063 ... 100	4000 r/min	3000 r/min
112 ... 132	3000 r/min	1500 r/min

- For a short period of time up to 5 min, 30 % higher speeds are permissible

Possible ways of extending the application area

- synthetic lubricant (option)
- shaft sealing rings made from FP material/Viton (option)
- reduction in lubricant quantity
- cooling of the geared motor by means of air convection on the machine/system

g500-S shaft-mounted helical geared motors

General information



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.

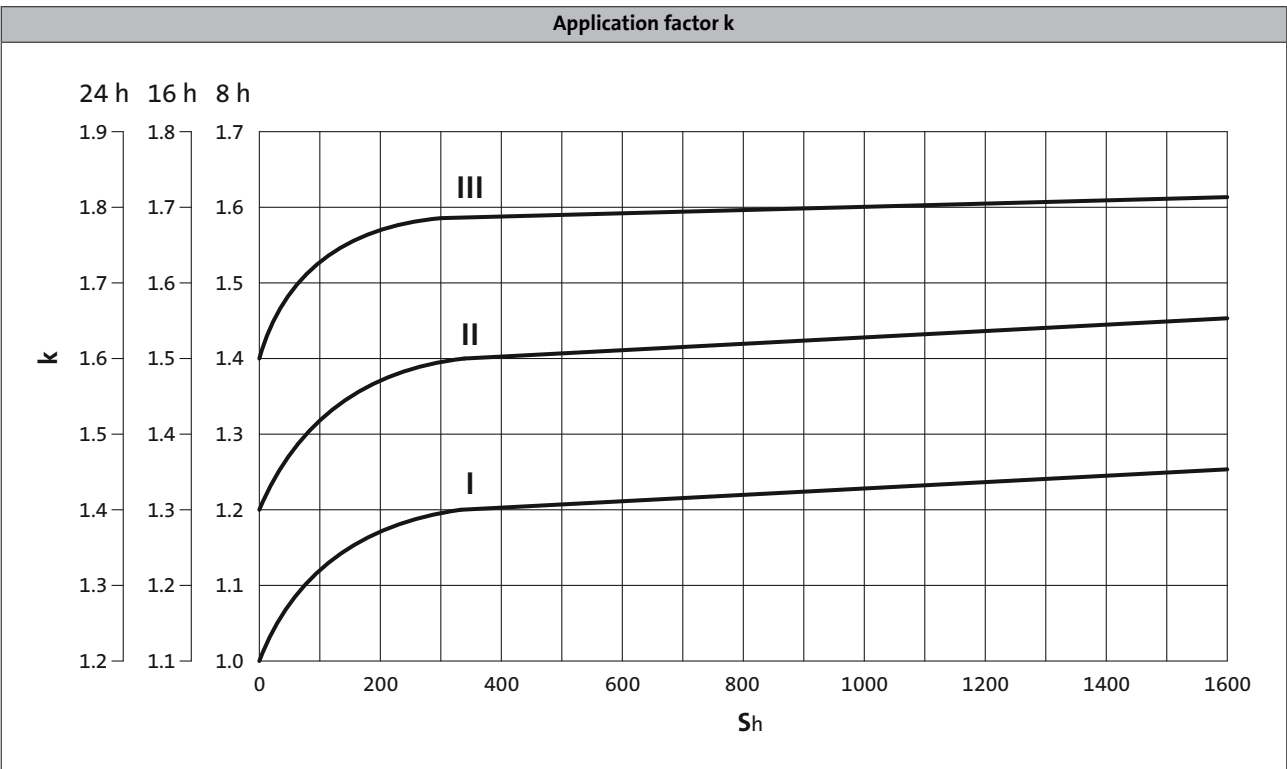
Application factor k (according to DIN 3990)

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



► S_h = switchings/h

g500-S shaft-mounted helical geared motors

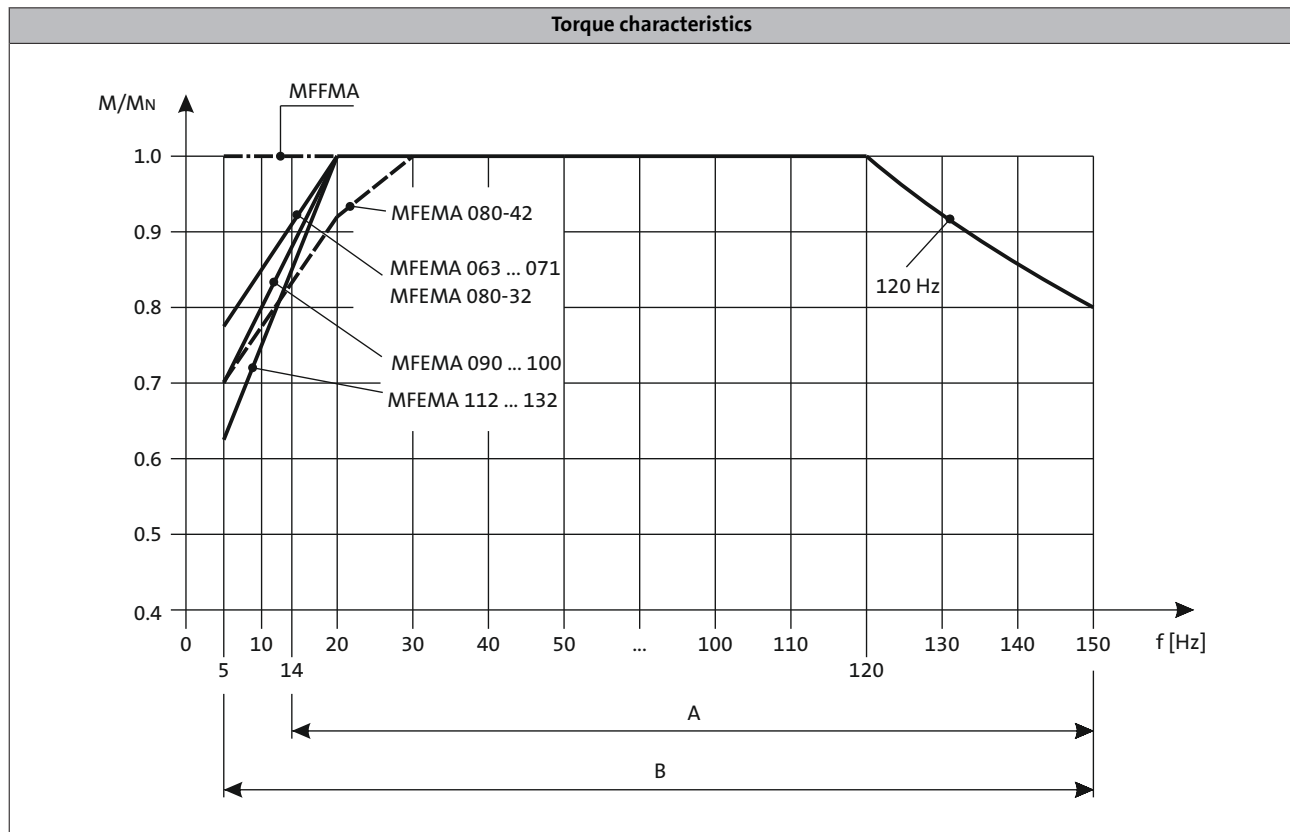
General information



Dimensioning

Torque derating at low motor frequencies

Motor size-dependent torque reduction, taking into account the thermal response during operation on the inverter.



A = Operation with integral fan and brake

B = Operation with integral fan and brake control "Holding current reduction"

You can use the Drive Solution Designer for precise drive dimensioning.

The Drive Solution Designer helps you to carry out a fast and high-quality drive dimensioning.

The software includes well-founded and proven knowledge on drive applications and electro-mechanical drive components.

Please contact your Lenze sales office.

g500-S shaft-mounted helical geared motors

General information



Dimensioning

Weights

The values given in the tables consider the following gearbox/motor combination:

- Gearbox with hollow shaft without foot and flange including lubricant amount for mounting position A
- Motor without built-on accessories (with integral fan)

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

The respective values can be found for:

- Geared motors without built-on accessories
 - > Chapter: Geared motors/Technical data
- Gearbox options
 - > Chapter: Gearboxes/Technical data and accessories
- Motor options: Spring-applied brake, feedback, 2. Shaft end, handwheel and increased centrifugal mass
 - > 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 gearbox, motor and accessories have to be added.

The respective values can be found for:

- Gearboxes
 - > Chapter: Gearbox/Technical data
- Motors without built-on accessories
 - > Chapter: Motors/Technical data/Rated data
- Motor options: Spring-applied brake, feedback, 2. Shaft end, handwheel and increased centrifugal mass
 - > Chapter: Motors/Accessories

g500-S shaft-mounted helical geared motors

Technical data

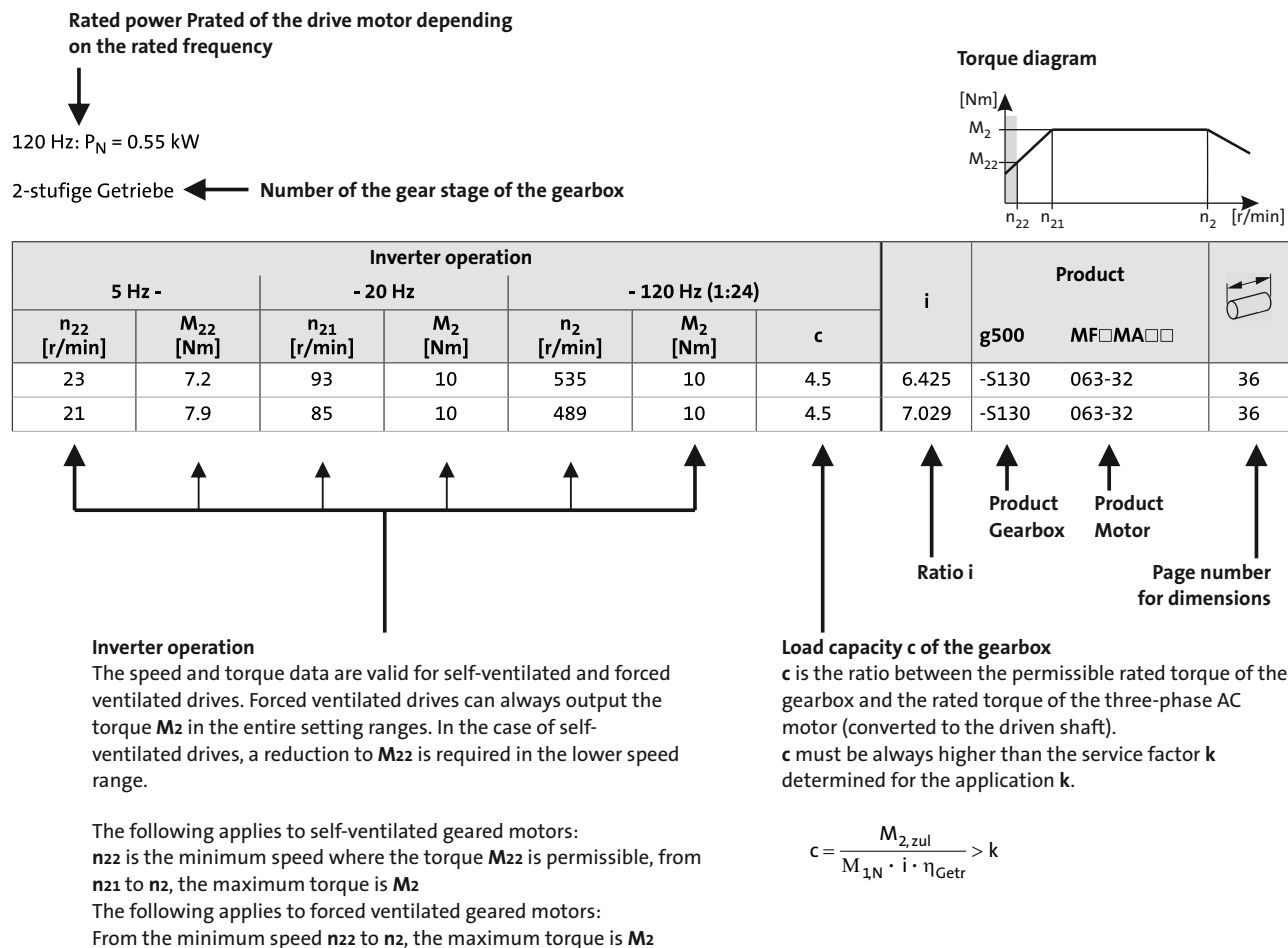


Selection tables, notes

Notes on the selection tables with 4-pole motors

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.



Motor voltages

The power values and torques indicated in the selection tables relate to the following motor voltages:

- 50 Hz : $\Delta 230 \text{ V} / Y 400 \text{ V}$
- 60 Hz : 230 V or 460 V
- 87 Hz : $\Delta 400 \text{ V}$

Operation at 87 Hz

In 87 Hz operation, the three-phase AC motor (which is designed for a voltage of $\Delta 230 \text{ V} / Y 400 \text{ V}$ at 50 Hz) is operated on an inverter with 400 V rated voltage in a delta connection. It is important to note here that the inverter must be configured for 87Hz output.

This offers the following advantages over 50 Hz operation:

- the setting range of the motor is increased by a factor of 1.73.
- the motor can then provide around 1.73 times greater output, which in turn allows a smaller and more affordable motor to be selected for the application.
- the efficiency of the motor is also improved.

g500-S shaft-mounted helical geared motors

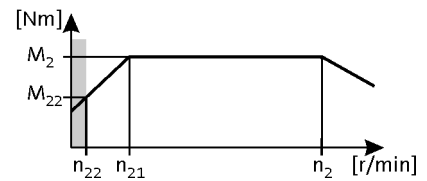
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 0.55 \text{ kW}$

2-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
23	7.2	93	10	535	10	4.5	6.425	-S130	063-32	36
21	7.9	85	10	489	10	4.5	7.029	-S130	063-32	36
9.9	16	41	22	236	22	4.5	14.606	-S130	063-32	36
9.1	18	38	24	215	24	4.2	15.979	-S130	063-32	36
8.0	20	33	27	190	27	4.2	18.069	-S130	063-32	36
7.1	23	29	30	169	30	3.7	20.381	-S130	063-32	36
6.3	26	26	34	149	34	3.3	23.048	-S130	063-32	36
5.8	28	24	37	138	37	3.0	24.967	-S130	063-32	36
5.1	32	21	42	122	42	2.7	28.233	-S130	063-32	36
4.6	35	19	46	110	46	2.7	31.387	-S130	063-32	36
4.1	40	17	53	97	53	2.4	35.493	-S130	063-32	36
3.6	45	15	60	85	60	2.1	40.422	-S130	063-32	36
3.2	51	13	68	75	68	1.8	45.711	-S130	063-32	36
3.0	54	13	71	71	71	2.9	48.190	-S220	063-32	40
2.8	57	12	76	67	76	1.6	51.230	-S130	063-32	36
2.8	58	12	76	67	76	2.8	51.620	-S220	063-32	40
2.5	64	11	84	60	84	3.0	56.960	-S400	063-32	44
2.5	65	10	86	59	86	1.5	57.933	-S130	063-32	36
2.5	66	10	87	59	87	2.4	58.486	-S220	063-32	40
2.3	72	9.3	95	54	95	1.3	64.200	-S130	063-32	36
2.3	72	9.3	95	54	95	3.0	64.354	-S400	063-32	44
2.2	74	9.1	98	52	98	1.5	65.975	-S220	063-32	40
2.0	81	8.3	108	47	108	1.2	72.600	-S130	063-32	36
1.9	84	8.0	111	46	111	1.5	74.750	-S220	063-32	40

3-stage gearboxes

6.5

Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
2.2	74	8.9	98	51	98	1.9	67.298	-S220	063-32	40
1.9	84	7.9	111	45	111	1.9	76.249	-S220	063-32	40
1.7	93	7.2	122	41	122	3.1	83.900	-S400	063-32	44
1.7	95	7.0	126	40	126	1.7	86.079	-S220	063-32	40
1.5	105	6.3	139	36	139	2.8	94.984	-S400	063-32	44
1.5	108	6.2	142	35	142	1.5	97.528	-S220	063-32	40
1.4	119	5.6	157	32	157	2.4	107.314	-S400	063-32	44
1.3	123	5.4	163	31	163	1.3	111.747	-S220	063-32	40
1.2	136	4.9	180	28	180	2.1	123.307	-S400	063-32	44
1.1	140	4.7	185	27	185	1.1	126.610	-S220	063-32	40
1.1	151	4.4	200	25	200	3.2	137.133	-S660	063-32	48

g500-S shaft-mounted helical geared motors

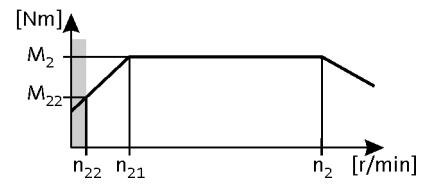
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 0.55 \text{ kW}$

3-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
1.0	154	4.3	203	25	203	1.9	139.313	-S400	063-32	44
1.0	158	4.2	209	24	209	1.0	143.205	-S220	063-32	40
0.9	173	3.8	228	22	228	2.8	156.249	-S660	063-32	48
0.9	175	3.8	231	22	231	1.7	158.019	-S400	063-32	44
0.8	195	3.4	258	20	258	2.5	176.611	-S660	063-32	48
0.8	197	3.4	260	19	260	1.5	178.531	-S400	063-32	44
0.7	222	3.0	294	17	294	2.2	201.230	-S660	063-32	48
0.7	226	2.9	298	17	298	1.3	204.412	-S400	063-32	44
0.6	247	2.7	327	15	327	1.9	223.833	-S660	063-32	48
0.6	255	2.6	337	15	337	1.1	230.946	-S400	063-32	44
0.6	282	2.4	372	14	372	1.7	255.034	-S660	063-32	48
0.5	310	2.1	409	12	409	1.3	280.500	-S660	063-32	48
0.5	353	1.9	466	11	466	1.3	319.600	-S660	063-32	48

g500-S shaft-mounted helical geared motors

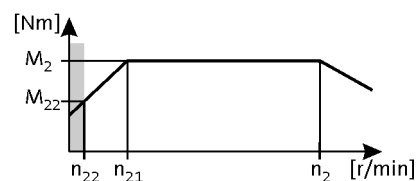
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 0.75$ kW

2-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
23	9.8	93	13	529	13	3.3	6.425	-S130	063-42	36
21	11	85	14	484	14	3.3	7.029	-S130	063-42	36
9.9	22	41	30	233	30	3.3	14.606	-S130	063-42	36
9.1	24	38	33	213	33	3.0	15.979	-S130	063-42	36
8.0	28	33	37	188	37	3.0	18.069	-S130	063-42	36
7.1	31	29	42	167	42	2.7	20.381	-S130	063-42	36
6.3	35	26	47	148	47	2.4	23.048	-S130	063-42	36
5.8	38	24	51	136	51	2.2	24.967	-S130	063-42	36
5.5	40	23	54	129	54	3.1	26.422	-S220	063-42	40
5.1	43	21	58	120	58	2.0	28.233	-S130	063-42	36
5.0	45	21	60	117	60	3.1	29.156	-S400	063-42	44
4.8	46	20	61	114	61	3.1	29.937	-S220	063-42	40
4.6	48	19	64	108	64	1.9	31.387	-S130	063-42	36
4.4	50	18	67	103	67	2.9	32.867	-S220	063-42	40
4.1	54	17	73	96	73	1.7	35.493	-S130	063-42	36
4.0	55	17	74	94	74	2.9	36.267	-S400	063-42	44
3.9	57	16	76	91	76	2.8	37.238	-S220	063-42	40
3.6	62	15	82	84	82	2.9	40.333	-S660	063-42	48
3.6	62	15	83	84	83	1.5	40.422	-S130	063-42	36
3.5	63	15	84	83	84	2.9	40.974	-S400	063-42	44
3.4	65	14	87	80	87	2.4	42.533	-S220	063-42	40
3.2	70	13	93	74	93	1.3	45.711	-S130	063-42	36
3.2	70	13	94	74	94	2.9	45.956	-S660	063-42	48
3.1	72	13	96	72	96	2.6	46.933	-S400	063-42	44
3.0	74	13	98	71	98	2.1	48.190	-S220	063-42	40
3.0	75	12	100	70	100	2.5	48.950	-S660	063-42	48
2.8	78	12	105	66	105	1.2	51.230	-S130	063-42	36
2.8	79	12	105	66	105	2.0	51.620	-S220	063-42	40
2.7	81	11	108	64	108	2.6	53.026	-S400	063-42	44
2.6	85	11	114	61	114	2.5	55.773	-S660	063-42	48
2.5	87	11	116	60	116	2.2	56.960	-S400	063-42	44
2.5	89	10	118	59	118	1.1	57.933	-S130	063-42	36
2.5	89	10	120	58	120	1.8	58.486	-S220	063-42	40
2.3	98	9.3	132	53	132	2.2	64.354	-S400	063-42	44
2.2	101	9.1	135	52	135	1.1	65.975	-S220	063-42	40

6.5

g500-S shaft-mounted helical geared motors

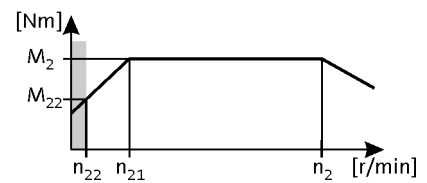
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 0.75$ kW

2-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)		g500		MF□MA□□		
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]				c	
1.9	114	8.0	153	46	153	1.1	74.750	-S220 063-42	40	

3-stage gearboxes

Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
2.2	101	8.9	135	51	135	1.4	67.298	-S220	063-42	40
2.0	112	8.1	149	46	149	2.6	74.260	-S400	063-42	44
1.9	115	7.9	153	45	153	1.4	76.249	-S220	063-42	40
1.7	126	7.2	169	41	169	2.3	83.900	-S400	063-42	44
1.7	130	7.0	173	40	173	1.2	86.079	-S220	063-42	40
1.5	143	6.3	191	36	191	2.0	94.984	-S400	063-42	44
1.5	147	6.2	196	35	196	1.1	97.528	-S220	063-42	40
1.4	153	5.9	204	34	204	3.1	101.460	-S660	063-42	48
1.4	162	5.6	216	32	216	1.8	107.314	-S400	063-42	44
1.3	164	5.5	220	31	220	2.9	109.083	-S660	063-42	48
1.2	186	4.9	248	28	248	1.6	123.307	-S400	063-42	44
1.2	187	4.8	250	27	250	2.5	124.289	-S660	063-42	48
1.1	207	4.4	276	25	276	2.3	137.133	-S660	063-42	48
1.0	210	4.3	280	24	280	1.4	139.313	-S400	063-42	44
0.9	235	3.8	315	22	315	2.0	156.249	-S660	063-42	48
0.9	238	3.8	318	22	318	1.2	158.019	-S400	063-42	44
0.8	266	3.4	356	19	356	1.8	176.611	-S660	063-42	48
0.8	269	3.4	359	19	359	1.1	178.531	-S400	063-42	44
0.7	303	3.0	405	17	405	1.6	201.230	-S660	063-42	48
0.6	337	2.7	451	15	451	1.4	223.833	-S660	063-42	48
0.6	384	2.4	513	13	513	1.2	255.034	-S660	063-42	48

g500-S shaft-mounted helical geared motors

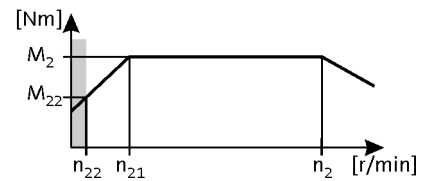
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 1.1 \text{ kW}$

2-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
25	13	102	17	596	17	4.2	5.860	-S400	071-32	44
23	14	93	19	543	19	3.5	6.425	-S130	071-32	36
21	16	85	21	497	21	3.4	7.029	-S130	071-32	36
9.9	33	41	43	239	43	2.3	14.606	-S130	071-32	36
9.8	33	41	43	236	43	4.2	14.806	-S400	071-32	44
9.1	36	38	47	218	47	2.1	15.979	-S130	071-32	36
8.0	41	33	53	193	53	2.1	18.069	-S130	071-32	36
7.1	46	30	59	172	59	3.2	20.300	-S220	071-32	40
7.1	46	29	60	171	60	1.9	20.381	-S130	071-32	36
6.3	52	26	67	152	67	2.8	23.000	-S220	071-32	40
6.3	52	26	67	151	67	1.7	23.048	-S130	071-32	36
5.8	56	24	73	140	73	1.5	24.967	-S130	071-32	36
5.5	59	23	77	132	77	2.4	26.422	-S220	071-32	40
5.1	63	21	82	124	82	1.4	28.233	-S130	071-32	36
4.8	67	20	87	117	87	2.2	29.937	-S220	071-32	40
4.6	70	19	92	111	92	1.4	31.387	-S130	071-32	36
4.4	74	18	96	106	96	2.2	32.867	-S220	071-32	40
4.1	80	17	104	98	104	1.2	35.493	-S130	071-32	36
3.9	84	16	109	94	109	1.9	37.238	-S220	071-32	40
3.6	91	15	118	86	118	1.1	40.422	-S130	071-32	36
3.5	92	15	120	85	120	3.2	40.974	-S400	071-32	44
3.4	95	14	124	82	124	1.7	42.533	-S220	071-32	40
3.1	105	13	137	74	137	2.2	46.933	-S400	071-32	44
3.0	108	13	141	72	141	1.5	48.190	-S220	071-32	40
3.0	110	12	143	71	143	2.8	48.950	-S660	071-32	48
2.8	116	12	151	68	151	1.4	51.620	-S220	071-32	40
2.7	119	11	155	66	155	2.1	53.026	-S400	071-32	44
2.6	125	11	163	63	163	2.8	55.773	-S660	071-32	48
2.5	128	11	166	61	166	1.5	56.960	-S400	071-32	44
2.5	131	10	171	60	171	1.2	58.486	-S220	071-32	40
2.3	144	9.3	188	54	188	1.5	64.354	-S400	071-32	44

3-stage gearboxes

Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)		g500		MF□MA□□		
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]				c	
2.3	141	9.4	184	55	184	3.1	63.817	-S660	071-32	48
2.1	154	8.6	201	50	201	2.8	69.813	-S660	071-32	48
2.0	161	8.3	209	48	209	3.0	72.713	-S660	071-32	48
2.0	164	8.1	214	47	214	1.8	74.260	-S400	071-32	44

g500-S shaft-mounted helical geared motors

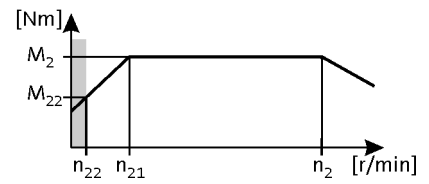
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 1.1 \text{ kW}$

3-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
1.8	176	7.5	229	44	229	2.7	79.545	-S660	071-32	48
1.7	185	7.2	241	42	241	1.6	83.900	-S400	071-32	44
1.6	197	6.7	256	39	256	2.5	89.048	-S660	071-32	48
1.5	210	6.3	273	37	273	1.4	94.984	-S400	071-32	44
1.4	224	5.9	292	34	292	2.2	101.460	-S660	071-32	48
1.4	237	5.6	309	33	309	1.2	107.314	-S400	071-32	44
1.3	241	5.5	314	32	314	2.0	109.083	-S660	071-32	48
1.2	272	4.9	355	28	355	1.1	123.307	-S400	071-32	44
1.2	275	4.8	358	28	358	1.8	124.289	-S660	071-32	48
1.1	303	4.4	394	25	394	1.6	137.133	-S660	071-32	48
0.9	345	3.8	449	22	449	1.4	156.249	-S660	071-32	48
0.8	390	3.4	508	20	508	1.2	176.611	-S660	071-32	48
0.7	444	3.0	579	17	579	1.1	201.230	-S660	071-32	48

g500-S shaft-mounted helical geared motors

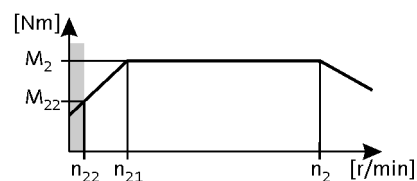
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 1.5 \text{ kW}$

2-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
25	18	102	24	589	24	3.1	5.860	-S400	071-42	44
23	20	94	26	538	26	3.1	6.411	-S400	071-42	44
23	20	93	26	537	26	2.6	6.425	-S130	071-42	36
21	22	85	28	491	28	2.5	7.029	-S130	071-42	36
12	36	51	48	291	48	3.1	11.876	-S220	071-42	40
11	40	46	52	266	52	3.1	12.992	-S220	071-42	40
11	40	46	53	263	53	3.1	13.105	-S400	071-42	44
11	41	45	54	256	54	3.1	13.456	-S220	071-42	40
10	44	42	58	241	58	3.1	14.336	-S400	071-42	44
9.9	45	41	59	236	59	1.7	14.606	-S130	071-42	36
9.9	45	41	59	234	59	2.8	14.720	-S220	071-42	40
9.8	45	41	60	233	60	3.1	14.806	-S400	071-42	44
9.2	48	38	63	220	63	3.1	15.714	-S660	071-42	48
9.1	49	38	64	216	64	1.5	15.979	-S130	071-42	36
9.0	50	37	65	213	65	3.1	16.197	-S400	071-42	44
8.8	51	36	67	208	67	2.5	16.571	-S220	071-42	40
8.1	55	34	72	193	72	3.1	17.905	-S660	071-42	48
8.0	55	33	73	191	73	1.5	18.069	-S130	071-42	36
7.9	56	33	74	189	74	3.3	18.286	-S400	071-42	44
7.7	57	32	76	184	76	2.5	18.776	-S220	071-42	40
7.1	62	30	82	170	82	2.3	20.300	-S220	071-42	40
7.1	62	29	82	169	82	1.4	20.381	-S130	071-42	36
7.0	63	29	83	167	83	3.3	20.659	-S400	071-42	44
6.5	69	27	90	154	90	2.9	22.400	-S400	071-42	44
6.3	70	26	93	150	93	2.0	23.000	-S220	071-42	40
6.3	71	26	93	150	93	1.2	23.048	-S130	071-42	36
5.8	76	24	101	138	101	1.1	24.967	-S130	071-42	36
5.8	77	24	101	138	101	2.9	25.056	-S660	071-42	48
5.7	77	24	102	136	102	2.9	25.308	-S400	071-42	44
5.5	81	23	106	131	106	1.8	26.422	-S220	071-42	40
5.1	87	21	115	121	115	2.9	28.548	-S660	071-42	48
5.0	89	21	117	118	117	2.6	29.156	-S400	071-42	44
4.8	92	20	121	115	121	1.6	29.937	-S220	071-42	40
4.7	95	19	126	111	126	2.7	31.167	-S660	071-42	48
4.4	101	18	132	105	132	1.6	32.867	-S220	071-42	40

6.5

g500-S shaft-mounted helical geared motors

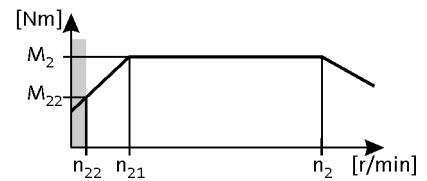
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 1.5 \text{ kW}$

2-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
4.4	101	18	133	105	133	2.9	32.940	-S400	071-42	44
4.1	109	17	143	97	143	2.7	35.511	-S660	071-42	48
4.0	111	17	146	95	146	2.5	36.267	-S400	071-42	44
3.9	114	16	150	93	150	1.4	37.238	-S220	071-42	40
3.6	123	15	162	86	162	2.5	40.333	-S660	071-42	48
3.5	125	15	165	84	165	2.3	40.974	-S400	071-42	44
3.4	130	14	171	81	171	1.2	42.533	-S220	071-42	40
3.2	141	13	185	75	185	2.5	45.956	-S660	071-42	48
3.1	144	13	189	74	189	1.6	46.933	-S400	071-42	44
3.0	147	13	194	72	194	1.1	48.190	-S220	071-42	40
3.0	150	12	197	71	197	2.1	48.950	-S660	071-42	48
2.8	158	12	208	67	208	1.0	51.620	-S220	071-42	40
2.7	162	11	214	65	214	1.6	53.026	-S400	071-42	44
2.6	171	11	225	62	225	2.1	55.773	-S660	071-42	48
2.5	174	11	229	61	229	1.1	56.960	-S400	071-42	44
2.3	197	9.3	259	54	259	1.1	64.354	-S400	071-42	44

3-stage gearboxes

Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
2.3	192	9.4	253	54	253	2.2	63.817	-S660	071-42	48
2.1	210	8.6	277	49	277	2.1	69.813	-S660	071-42	48
2.0	219	8.3	289	47	289	2.2	72.713	-S660	071-42	48
2.0	224	8.1	295	47	295	1.3	74.260	-S400	071-42	44
1.8	240	7.5	316	43	316	2.0	79.545	-S660	071-42	48
1.7	253	7.2	333	41	333	1.2	83.900	-S400	071-42	44
1.6	268	6.7	353	39	353	1.8	89.048	-S660	071-42	48
1.5	286	6.3	377	36	377	1.0	94.984	-S400	071-42	44
1.4	306	5.9	403	34	403	1.6	101.460	-S660	071-42	48
1.3	329	5.5	433	32	433	1.5	109.083	-S660	071-42	48
1.2	374	4.8	493	28	493	1.3	124.289	-S660	071-42	48
1.1	413	4.4	544	25	544	1.2	137.133	-S660	071-42	48
0.9	471	3.8	620	22	620	1.0	156.249	-S660	071-42	48

g500-S shaft-mounted helical geared motors

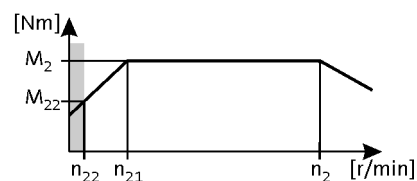
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 2.2 \text{ kW}$

2-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
25	26	102	34	597	34	4.0	5.860	-S400	080-32	44
23	28	93	37	545	37	1.8	6.425	-S130	080-32	36
21	31	85	41	498	41	1.7	7.029	-S130	080-32	36
12	52	51	69	295	69	2.4	11.876	-S220	080-32	40
11	57	46	76	269	76	2.2	12.992	-S220	080-32	40
11	59	45	78	260	78	2.1	13.456	-S220	080-32	40
9.9	64	41	85	240	85	1.2	14.606	-S130	080-32	36
9.9	64	41	86	238	86	1.9	14.720	-S220	080-32	40
9.8	65	41	86	236	86	3.5	14.806	-S400	080-32	44
9.1	70	38	93	219	93	1.1	15.979	-S130	080-32	36
9.0	71	37	94	216	94	3.2	16.197	-S400	080-32	44
8.8	72	36	97	211	97	1.7	16.571	-S220	080-32	40
8.0	79	33	105	194	105	1.1	18.069	-S130	080-32	36
7.9	80	33	106	191	106	3.2	18.286	-S400	080-32	44
7.7	82	32	109	186	109	1.7	18.776	-S220	080-32	40
7.1	89	30	118	172	118	1.6	20.300	-S220	080-32	40
7.0	90	29	120	169	120	2.9	20.659	-S400	080-32	44
6.5	98	27	130	156	130	2.6	22.400	-S400	080-32	44
6.3	100	26	134	152	134	1.4	23.000	-S220	080-32	40
5.7	111	24	147	138	147	2.3	25.308	-S400	080-32	44
5.5	115	23	154	133	154	1.2	26.422	-S220	080-32	40
5.0	127	21	170	120	170	2.0	29.156	-S400	080-32	44
4.8	131	20	174	117	174	1.1	29.937	-S220	080-32	40
4.4	144	18	191	107	191	1.1	32.867	-S220	080-32	40
4.4	144	18	192	106	192	2.0	32.940	-S400	080-32	44
4.1	155	17	207	99	207	3.0	35.511	-S660	080-32	48
4.0	158	17	211	97	211	1.8	36.267	-S400	080-32	44
3.6	176	15	235	87	235	2.2	40.333	-S660	080-32	48
3.5	179	15	239	85	239	1.6	40.974	-S400	080-32	44
3.2	201	13	268	76	268	2.2	45.956	-S660	080-32	48
3.0	214	12	285	72	285	1.5	48.950	-S660	080-32	48
2.6	244	11	325	63	325	1.5	55.773	-S660	080-32	48

3-stage gearboxes

Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)		g500		MF□MA□□		
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]				c	
2.3	274	9.4	366	55	366	1.5	63.817	-S660	080-32	48
2.1	300	8.6	400	50	400	1.4	69.813	-S660	080-32	48
2.0	313	8.3	417	48	417	1.5	72.713	-S660	080-32	48

g500-S shaft-mounted helical geared motors

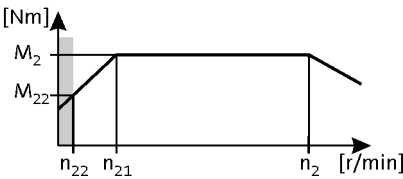
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 2.2 \text{ kW}$

3-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
1.8	342	7.5	456	44	456	1.4	79.545	-S660	080-32	48
1.6	383	6.7	511	39	511	1.2	89.048	-S660	080-32	48
1.4	436	5.9	582	35	582	1.1	101.460	-S660	080-32	48
1.3	469	5.5	626	32	626	1.0	109.083	-S660	080-32	48

g500-S shaft-mounted helical geared motors

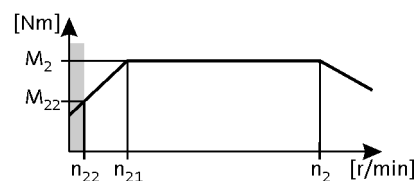
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 3.0 \text{ kW}$

2-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 30 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
25	35	154	47	594	47	2.9	5.860	-S400	080-42	44
23	38	140	51	543	51	2.9	6.411	-S400	080-42	44
23	39	140	51	542	51	1.3	6.425	-S130	080-42	36
21	41	131	55	506	55	3.1	6.880	-S660	080-42	48
21	42	128	56	495	56	1.2	7.029	-S130	080-42	36
13	68	80	90	309	90	3.1	11.262	-S660	080-42	48
12	71	76	95	293	95	1.8	11.876	-S220	080-42	40
12	74	73	98	283	98	3.1	12.320	-S660	080-42	48
11	77	70	102	271	102	3.1	12.832	-S660	080-42	48
11	78	69	104	268	104	1.6	12.992	-S220	080-42	40
11	79	69	105	266	105	2.9	13.105	-S400	080-42	44
11	81	67	107	259	107	1.6	13.456	-S220	080-42	40
10	84	64	112	248	112	3.1	14.037	-S660	080-42	48
10	86	63	115	243	115	2.6	14.336	-S400	080-42	44
9.9	88	61	118	236	118	1.4	14.720	-S220	080-42	40
9.8	89	61	118	235	118	2.6	14.806	-S400	080-42	44
9.2	94	57	126	222	126	2.9	15.714	-S660	080-42	48
9.0	97	56	129	215	129	2.3	16.197	-S400	080-42	44
8.8	99	54	132	210	132	1.3	16.571	-S220	080-42	40
8.1	107	50	143	194	143	2.9	17.905	-S660	080-42	48
7.9	110	49	146	190	146	2.4	18.286	-S400	080-42	44
7.7	113	48	150	185	150	1.3	18.776	-S220	080-42	40
7.5	115	47	154	181	154	2.9	19.250	-S660	080-42	48
7.1	122	44	162	171	162	1.2	20.300	-S220	080-42	40
7.0	124	44	165	168	165	2.1	20.659	-S400	080-42	44
6.6	131	41	175	159	175	2.9	21.933	-S660	080-42	48
6.5	134	40	179	155	179	1.9	22.400	-S400	080-42	44
6.3	138	39	184	151	184	1.0	23.000	-S220	080-42	40
5.8	150	36	200	139	200	2.5	25.056	-S660	080-42	48
5.7	152	36	202	138	202	1.7	25.308	-S400	080-42	44
5.1	171	32	228	122	228	2.5	28.548	-S660	080-42	48
5.0	175	31	233	119	233	1.5	29.156	-S400	080-42	44
4.7	187	29	249	112	249	2.5	31.167	-S660	080-42	48
4.4	197	27	263	106	263	1.5	32.940	-S400	080-42	44
4.1	213	25	284	98	284	2.2	35.511	-S660	080-42	48

g500-S shaft-mounted helical geared motors

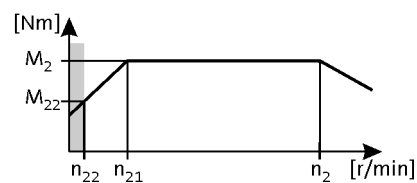
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 3.0 \text{ kW}$

2-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 30 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
4.0	217	25	290	96	290	1.3	36.267	-S400	080-42	44
3.6	242	22	322	86	322	1.6	40.333	-S660	080-42	48
3.5	245	22	327	85	327	1.2	40.974	-S400	080-42	44
3.2	275	20	367	76	367	1.6	45.956	-S660	080-42	48
3.0	293	18	391	71	391	1.1	48.950	-S660	080-42	48
2.6	334	16	445	62	445	1.1	55.773	-S660	080-42	48

3-stage gearboxes

Inverter operation							i	Product		
5 Hz -		- 30 Hz		- 120 Hz (1:24)		g500		MF□MA□□		
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]				c	
2.3	377	14	502	55	502	1.1	63.817	-S660	080-42	48
2.1	412	13	549	50	549	1.0	69.813	-S660	080-42	48
2.0	429	12	572	48	572	1.1	72.713	-S660	080-42	48
1.8	469	11	626	44	626	1.0	79.545	-S660	080-42	48

g500-S shaft-mounted helical geared motors

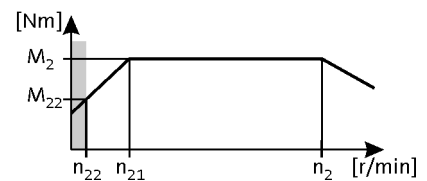
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 4.0 \text{ kW}$

2-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
25	44	102	62	594	62	2.7	5.860	-S400	090-32	44
23	48	94	68	543	68	2.7	6.411	-S400	090-32	44
21	51	87	73	506	73	2.9	6.880	-S660	090-32	48
13	84	53	120	309	120	2.9	11.262	-S660	090-32	48
12	92	49	131	283	131	2.9	12.320	-S660	090-32	48
11	96	47	137	271	137	2.9	12.832	-S660	090-32	48
11	98	46	140	266	140	2.2	13.105	-S400	090-32	44
10	105	43	149	248	149	2.9	14.037	-S660	090-32	48
10	107	42	153	243	153	2.0	14.336	-S400	090-32	44
9.8	110	41	158	235	158	1.9	14.806	-S400	090-32	44
9.2	117	38	167	222	167	2.7	15.714	-S660	090-32	48
9.0	121	37	172	215	172	1.8	16.197	-S400	090-32	44
8.1	134	34	191	194	191	2.6	17.905	-S660	090-32	48
7.9	136	33	195	190	195	1.8	18.286	-S400	090-32	44
7.5	144	31	205	181	205	2.8	19.250	-S660	090-32	48
7.0	154	29	220	168	220	1.6	20.659	-S400	090-32	44
6.6	164	27	234	159	234	2.4	21.933	-S660	090-32	48
6.5	167	27	239	155	239	1.4	22.400	-S400	090-32	44
5.8	187	24	267	139	267	1.9	25.056	-S660	090-32	48
5.7	189	24	270	138	270	1.3	25.308	-S400	090-32	44
5.1	213	21	304	122	304	1.9	28.548	-S660	090-32	48
5.0	217	21	310	119	310	1.1	29.156	-S400	090-32	44
4.7	232	19	332	112	332	1.9	31.167	-S660	090-32	48
4.4	246	18	351	106	351	1.1	32.940	-S400	090-32	44
4.1	265	17	378	98	378	1.7	35.511	-S660	090-32	48
3.6	301	15	430	86	430	1.2	40.333	-S660	090-32	48
3.2	343	13	489	76	489	1.2	45.956	-S660	090-32	48

g500-S shaft-mounted helical geared motors

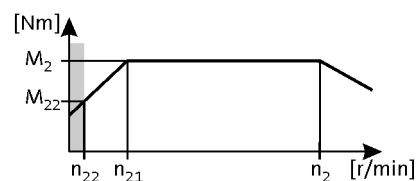
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 5.5 \text{ kW}$

2-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
25	59	102	85	602	85	2.3	5.860	-S400	100-12	44
23	65	94	93	550	93	2.1	6.411	-S400	100-12	44
13	114	53	163	313	163	3.1	11.262	-S660	100-12	48
12	125	49	178	286	178	2.8	12.320	-S660	100-12	48
11	130	47	185	275	185	2.7	12.832	-S660	100-12	48
11	133	46	189	269	189	1.6	13.105	-S400	100-12	44
10	142	43	203	251	203	2.5	14.037	-S660	100-12	48
10	145	42	207	246	207	1.5	14.336	-S400	100-12	44
9.2	159	38	227	224	227	2.2	15.714	-S660	100-12	48
8.1	181	34	259	197	259	1.9	17.905	-S660	100-12	48
7.9	185	33	264	193	264	1.3	18.286	-S400	100-12	44
7.5	195	31	278	183	278	2.0	19.250	-S660	100-12	48
7.0	209	29	299	171	299	1.1	20.659	-S400	100-12	44
6.6	222	27	317	161	317	1.8	21.933	-S660	100-12	48
6.5	227	27	324	157	324	1.1	22.400	-S400	100-12	44
5.8	254	24	362	141	362	1.4	25.056	-S660	100-12	48
5.1	289	21	413	124	413	1.4	28.548	-S660	100-12	48
4.7	315	19	451	113	451	1.4	31.167	-S660	100-12	48
4.1	359	17	513	99	513	1.2	35.511	-S660	100-12	48

g500-S shaft-mounted helical geared motors

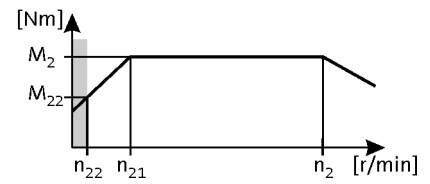
Technical data



Selection tables, 4-pole motors

120 Hz: $P_N = 7.5 \text{ kW}$

2-stage gearboxes



Inverter operation							i	Product		
5 Hz -		- 20 Hz		- 120 Hz (1:24)				g500	MF□MA□□	
n ₂₂ [r/min]	M ₂₂ [Nm]	n ₂₁ [r/min]	M ₂ [Nm]	n ₂ [r/min]	M ₂ [Nm]	c				
25	81	102	116	600	116	1.7	5.860	-S400	100-32	44
23	89	94	127	548	127	1.6	6.411	-S400	100-32	44
21	95	87	136	511	136	2.6	6.880	-S660	100-32	48
13	156	53	223	312	223	2.2	11.262	-S660	100-32	48
12	171	49	244	285	244	2.0	12.320	-S660	100-32	48
11	178	47	254	274	254	2.0	12.832	-S660	100-32	48
9.2	218	38	311	224	311	1.6	15.714	-S660	100-32	48
7.5	266	31	381	183	381	1.5	19.250	-S660	100-32	48
6.6	304	27	434	160	434	1.3	21.933	-S660	100-32	48
5.8	347	24	495	140	495	1.0	25.056	-S660	100-32	48
5.1	395	21	564	123	564	1.0	28.548	-S660	100-32	48
4.7	431	19	616	113	616	1.0	31.167	-S660	100-32	48

g500-S shaft-mounted helical geared motors

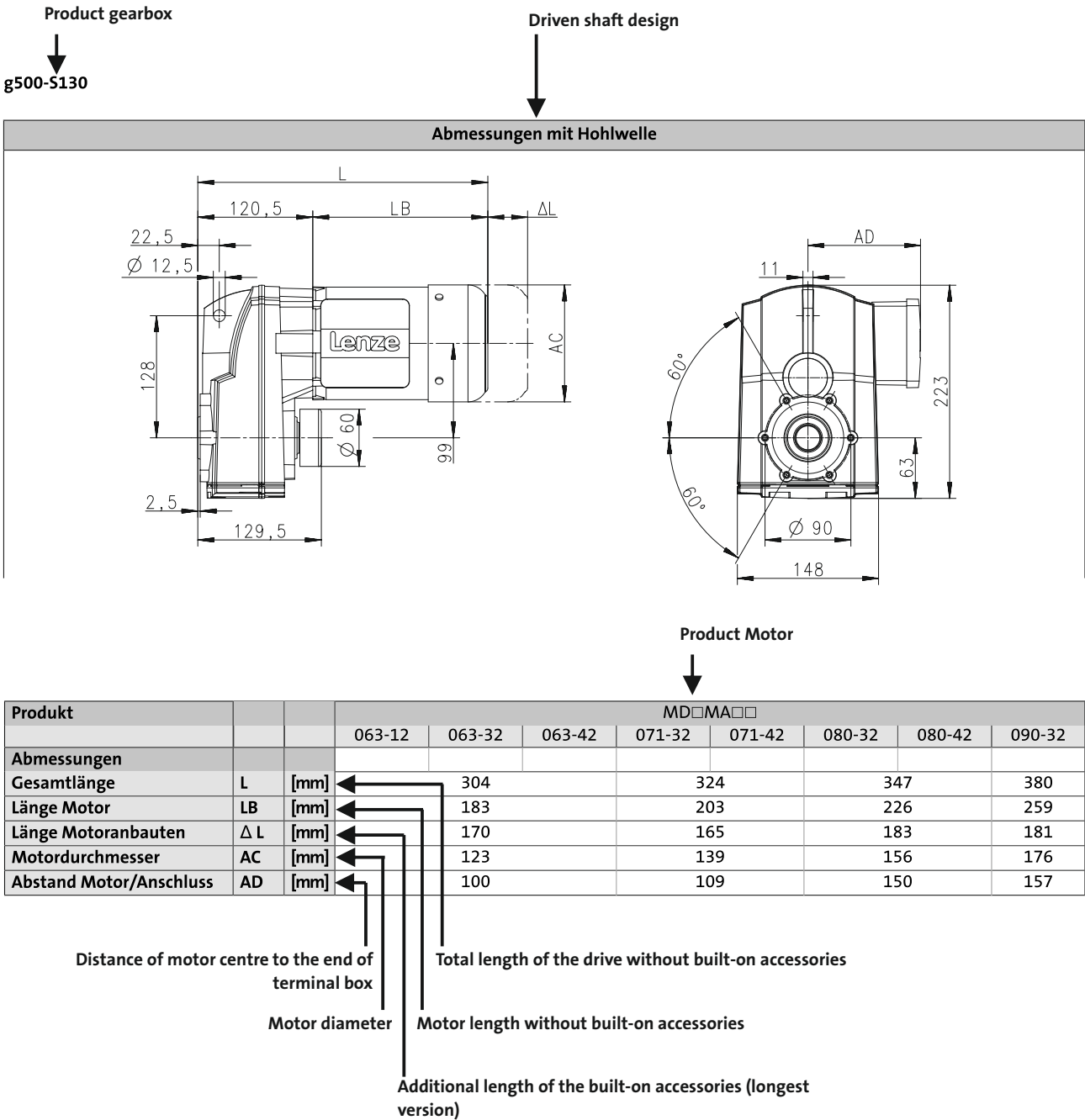
Technical data



Dimensions, notes

Notes on the dimensions

The following legend shows the layout of the dimension sheets.



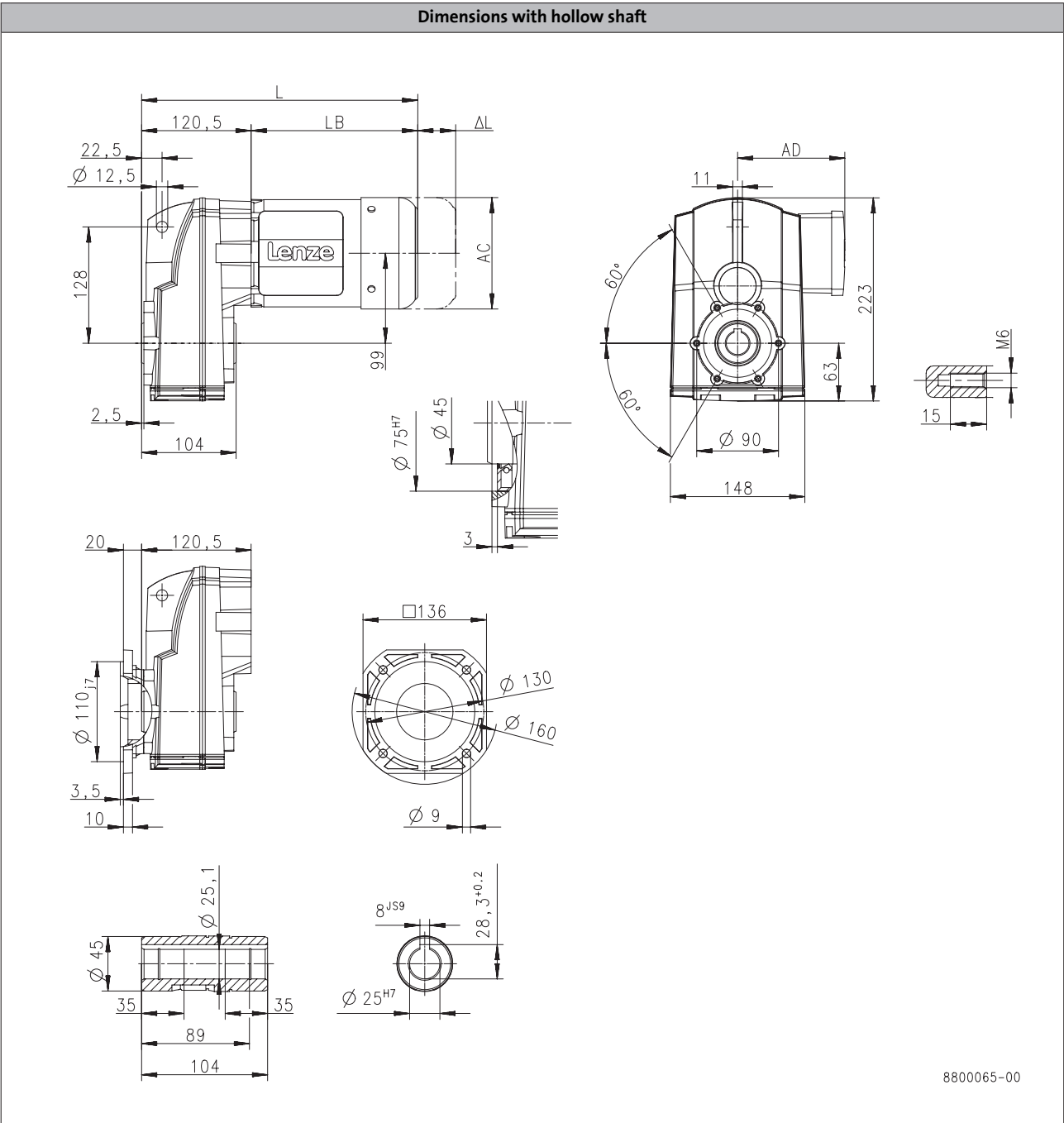
g500-S shaft-mounted helical geared motors

Technical data



Dimensions, 4-pole motors

g500-S130



Product			MF□MA□□					
			063-32	063-42	071-32	071-42	080-32	080-42
Dimensions								
Total length	L	[mm]	304		324		347	
Motor length	LB	[mm]	183		203		226	
Length of motor options	Δ L	[mm]	170		165		183	
Motor diameter	AC	[mm]	123		139		156	
Distance motor/connection	AD	[mm]	100		109		150	

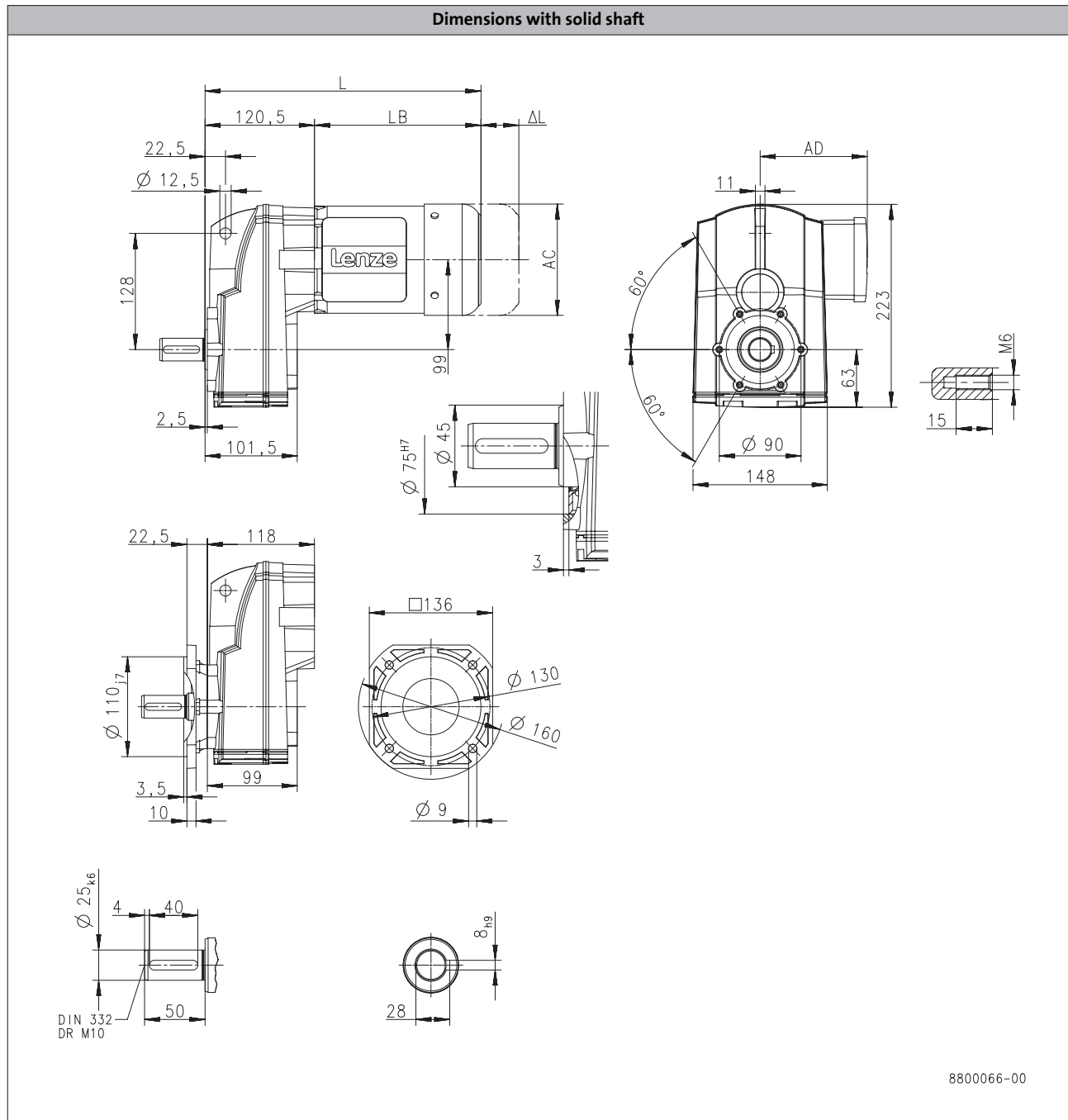
g500-S shaft-mounted helical geared motors

Technical data



Dimensions, 4-pole motors

g500-S130



6.5

Product			MF□MA□□					
			063-32	063-42	071-32	071-42	080-32	080-42
Dimensions								
Total length	L	[mm]	304		324		347	
Motor length	LB	[mm]	183		203		226	
Length of motor options	Δ L	[mm]	170		165		183	
Motor diameter	AC	[mm]	123		139		156	
Distance motor/connection	AD	[mm]	100		109		150	

Motor

Dimensions, 4-pole motors

g500-S130

Technical drawing of a Lenze motor with dimensions in mm. The drawing includes a side view, a front view, a top view, and a detail of the mounting bracket. Dimensions include: 5.5, 120.5, L, LB, ΔL, 22.5, Ø 12.5, 128, 28, 4, 26, 62, 114.5, 99, 5.5, AD, R 30, Ø 11, 80, 110, 260, 11, Ø 11, 18, 8, 100, 110, 80, 4, 62, 26, 114.5, Ø 25_{k6}, 50.

6.5

6.5 - 38

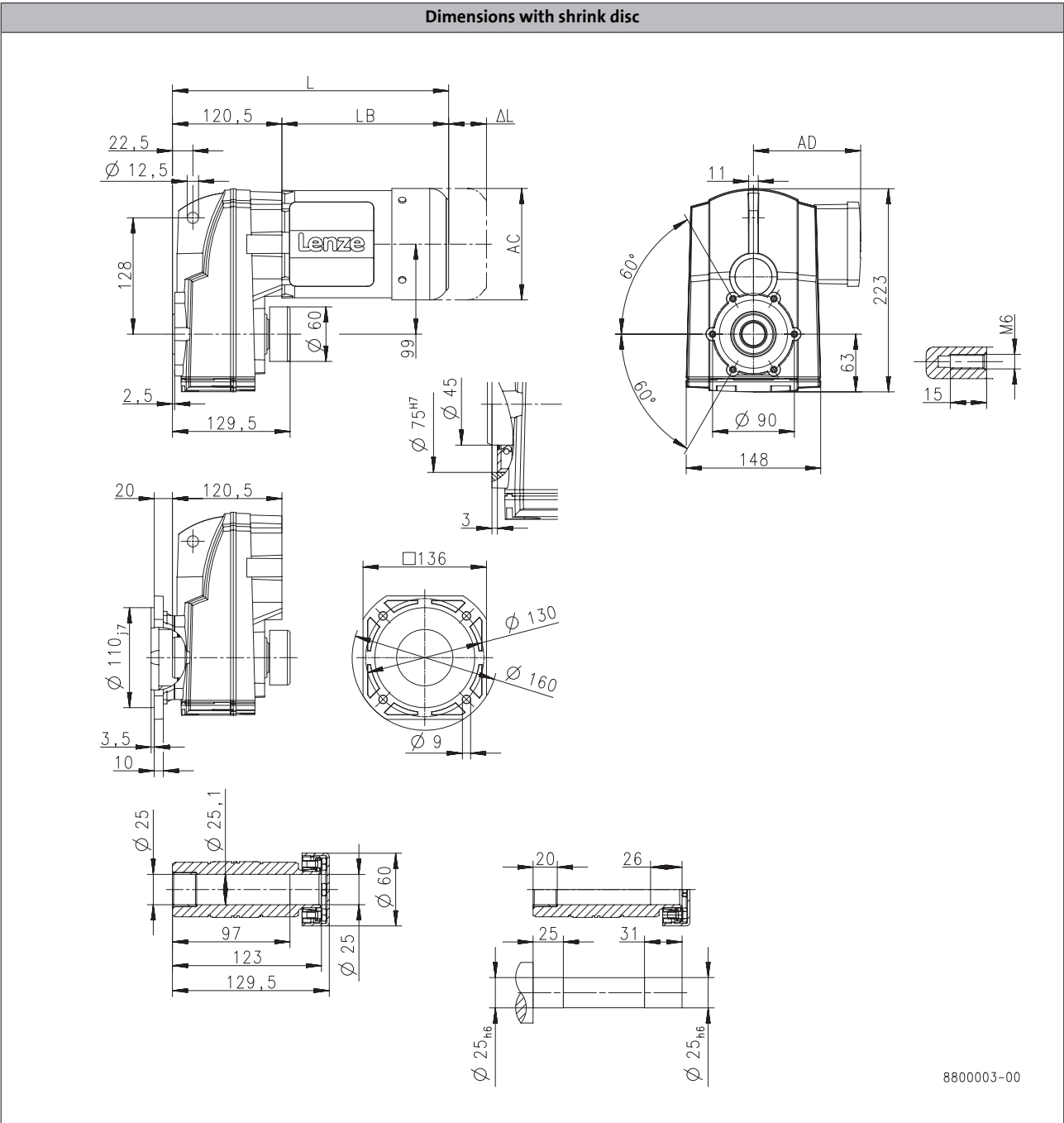
g500-S shaft-mounted helical geared motors

Technical data



Dimensions, 4-pole motors

g500-S130



Product			MF□MA□□					
			063-32	063-42	071-32	071-42	080-32	080-42
Dimensions								
Total length	L	[mm]	304		324		347	
Motor length	LB	[mm]	183		203		226	
Length of motor options	Δ L	[mm]	170		165		183	
Motor diameter	AC	[mm]	123		139		156	
Distance motor/connection	AD	[mm]	100		109		150	

Dimensions, 4-pole motors

Technical drawing of a Lenze motor with a hollow shaft, showing multiple views and dimensions. The drawing includes a side view, a front view, a top view, and a cross-section view. The motor is labeled "Lenze".

Dimensions:

- Overall length: L
- Motor body length: $136,5$
- Shaft length: LB
- Shaft diameter: ΔL
- Motor body diameter: 128
- Motor body width: 112
- Motor body height: 242
- Motor body width (front view): 148
- Motor body width (top view): 136
- Motor body width (cross-section): $\phi 130$
- Motor body width (cross-section): $\phi 160$
- Motor body width (cross-section): $\phi 9$
- Motor body width (cross-section): $\phi 25^{H7}$
- Motor body width (cross-section): $\phi 30^{H7}$
- Motor body width (cross-section): $\phi 45$
- Motor body width (cross-section): $\phi 25,1$
- Motor body width (cross-section): $\phi 30,1$
- Motor body width (cross-section): $\phi 33,3^{+0,2}$
- Motor body width (cross-section): $\phi 28,3^{+0,2}$
- Motor body width (cross-section): $\phi 40$
- Motor body width (cross-section): $\phi 105$
- Motor body width (cross-section): $\phi 120$
- Motor body width (cross-section): $\phi 110,7$
- Motor body width (cross-section): $\phi 3,5$
- Motor body width (cross-section): $\phi 10$
- Motor body width (cross-section): $\phi 2,5$
- Motor body width (cross-section): $\phi 12,5$
- Motor body width (cross-section): $\phi 22,5$
- Motor body width (cross-section): $\phi 75^{H7}$
- Motor body width (cross-section): $\phi 3$
- Motor body width (cross-section): $\phi 11$
- Motor body width (cross-section): $\phi 69$
- Motor body width (cross-section): $\phi 15$
- Motor body width (cross-section): $\phi M6$

Product			MF□MA□□					
			063-32	063-42	071-32	071-42	080-32	080-42
Dimensions								
Total length	L	[mm]	320		340		363	
Motor length	LB	[mm]	183		203		226	
Length of motor options	Δ L	[mm]	170		165		183	
Motor diameter	AC	[mm]	123		139		156	
Distance motor/connection	AD	[mm]	100		109		150	

Dimensions, 4-pole motors

g500-S220

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Lenze | V01-en_GB-04/2014

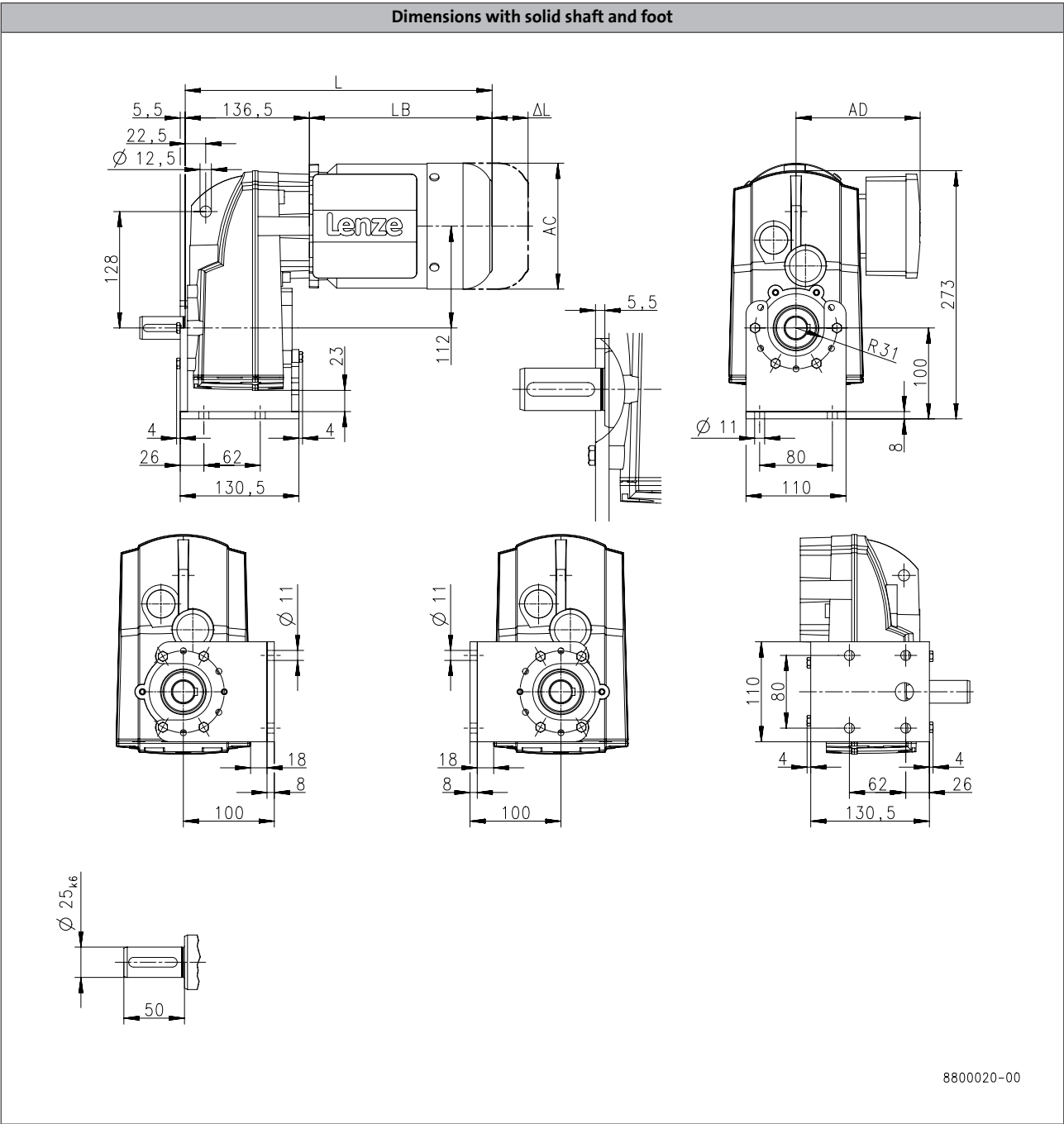
g500-S shaft-mounted helical geared motors

Technical data



Dimensions, 4-pole motors

g500-S220



Product			MF□MA□□					
			063-32	063-42	071-32	071-42	080-32	080-42
Dimensions								
Total length	L	[mm]	320		340		363	
Motor length	LB	[mm]	183		203		226	
Length of motor options	ΔL	[mm]	170		165		183	
Motor diameter	AC	[mm]	123		139		156	
Distance motor/connection	AD	[mm]	100		109		150	

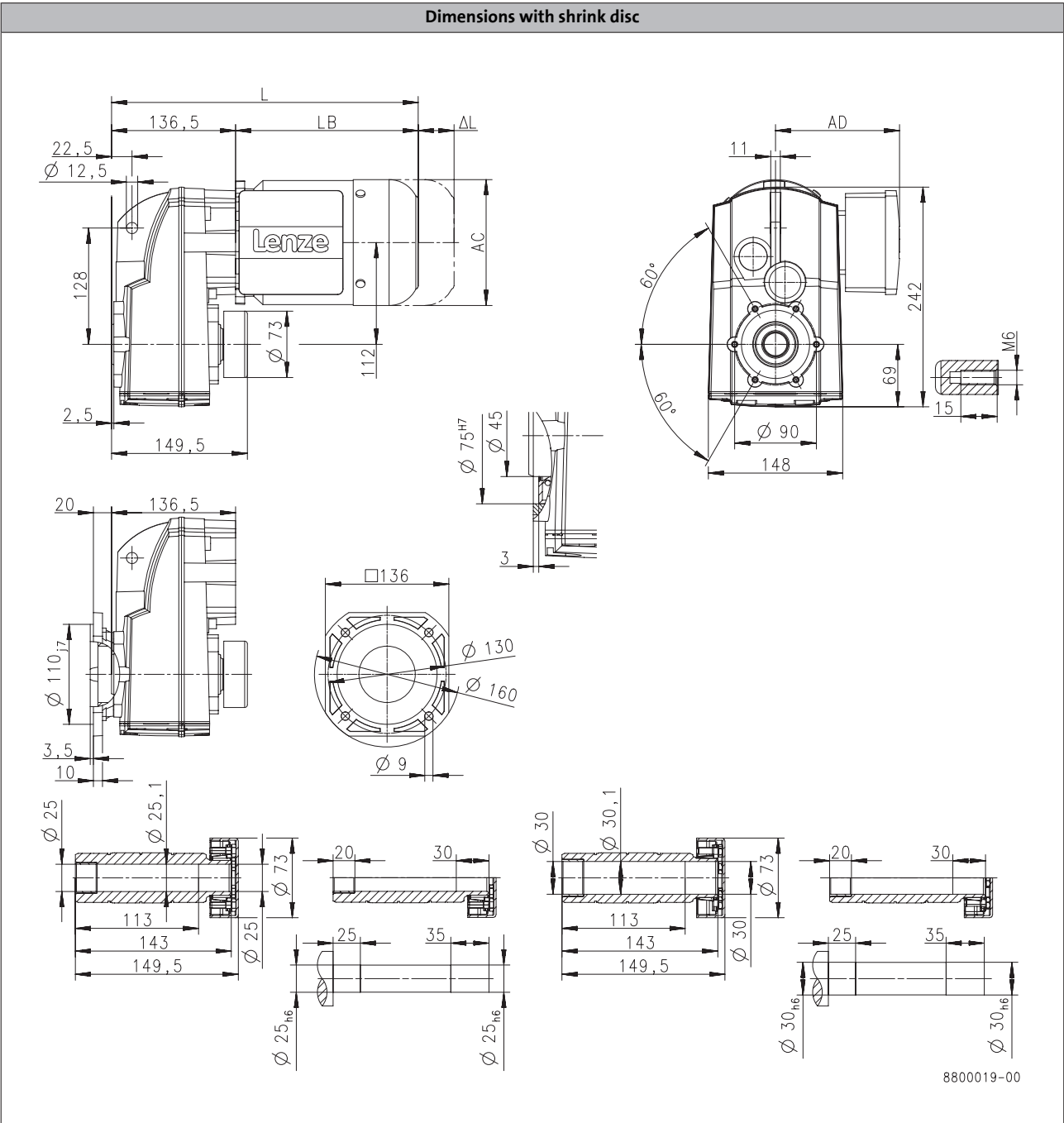
g500-S shaft-mounted helical geared motors

Technical data



Dimensions, 4-pole motors

g500-S220



Product			MF□MA□□					
			063-32	063-42	071-32	071-42	080-32	080-42
Dimensions								
Total length	L	[mm]	320		340		363	
Motor length	LB	[mm]	183		203		226	
Length of motor options	Δ L	[mm]	170		165		183	
Motor diameter	AC	[mm]	123		139		156	
Distance motor/connection	AD	[mm]	100		109		150	

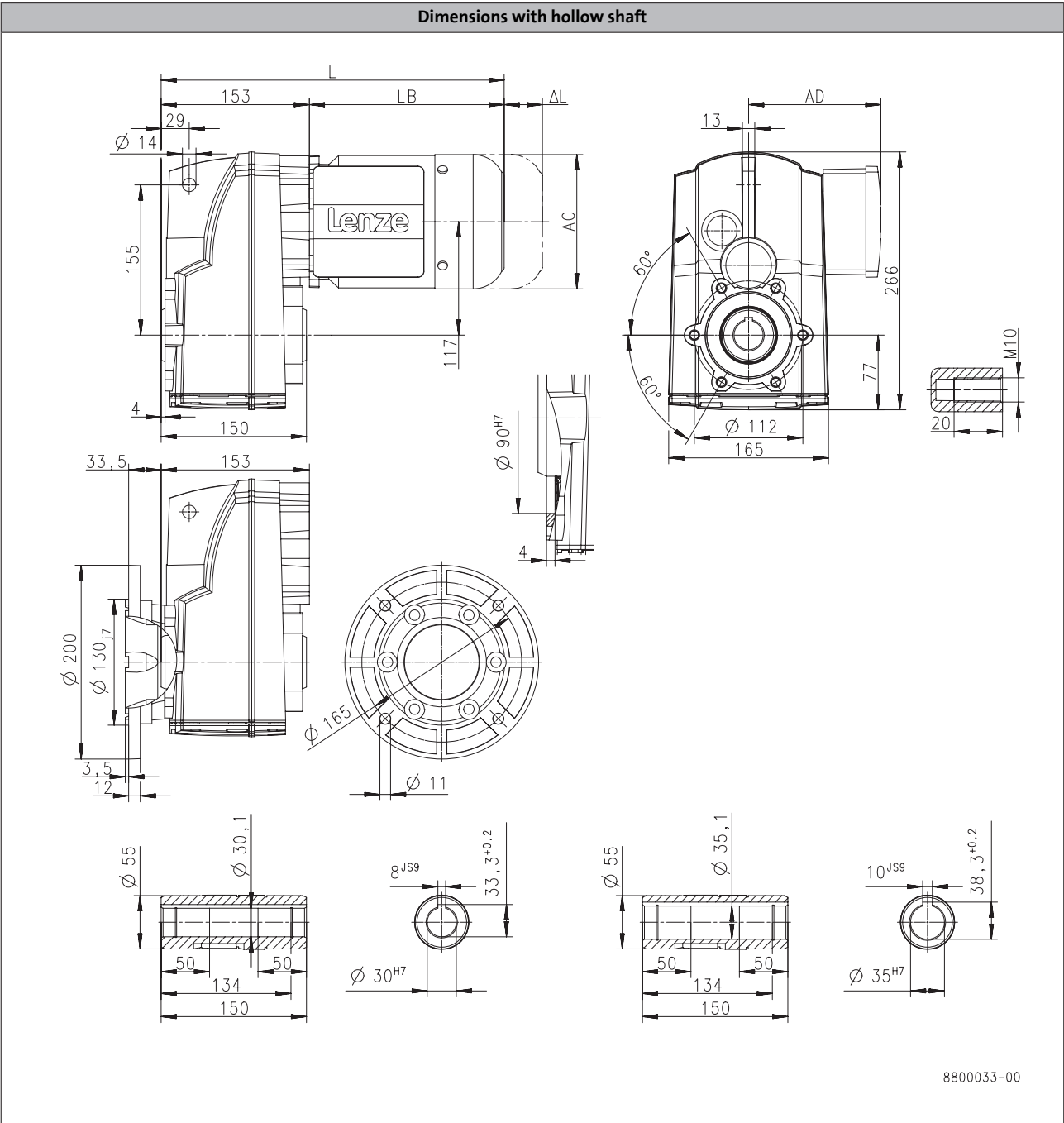
g500-S shaft-mounted helical geared motors

Technical data



Dimensions, 4-pole motors

g500-S400



Product			MF□MA□□								
			063-32	063-42	071-32	071-42	080-32	080-42	090-32	100-12	100-32
Dimensions											
Total length	L	[mm]	336		356		379		427		474
Motor length	LB	[mm]	183		203		226		274		321
Length of motor options	Δ L	[mm]	170		165		183		181		170
Motor diameter	AC	[mm]	123		139		156		176		194
Distance motor/connection	AD	[mm]	100		109		150		157		166

Dimensions, 4-pole motors

g500-S400

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Lenze | V01-en_GB-04/2014

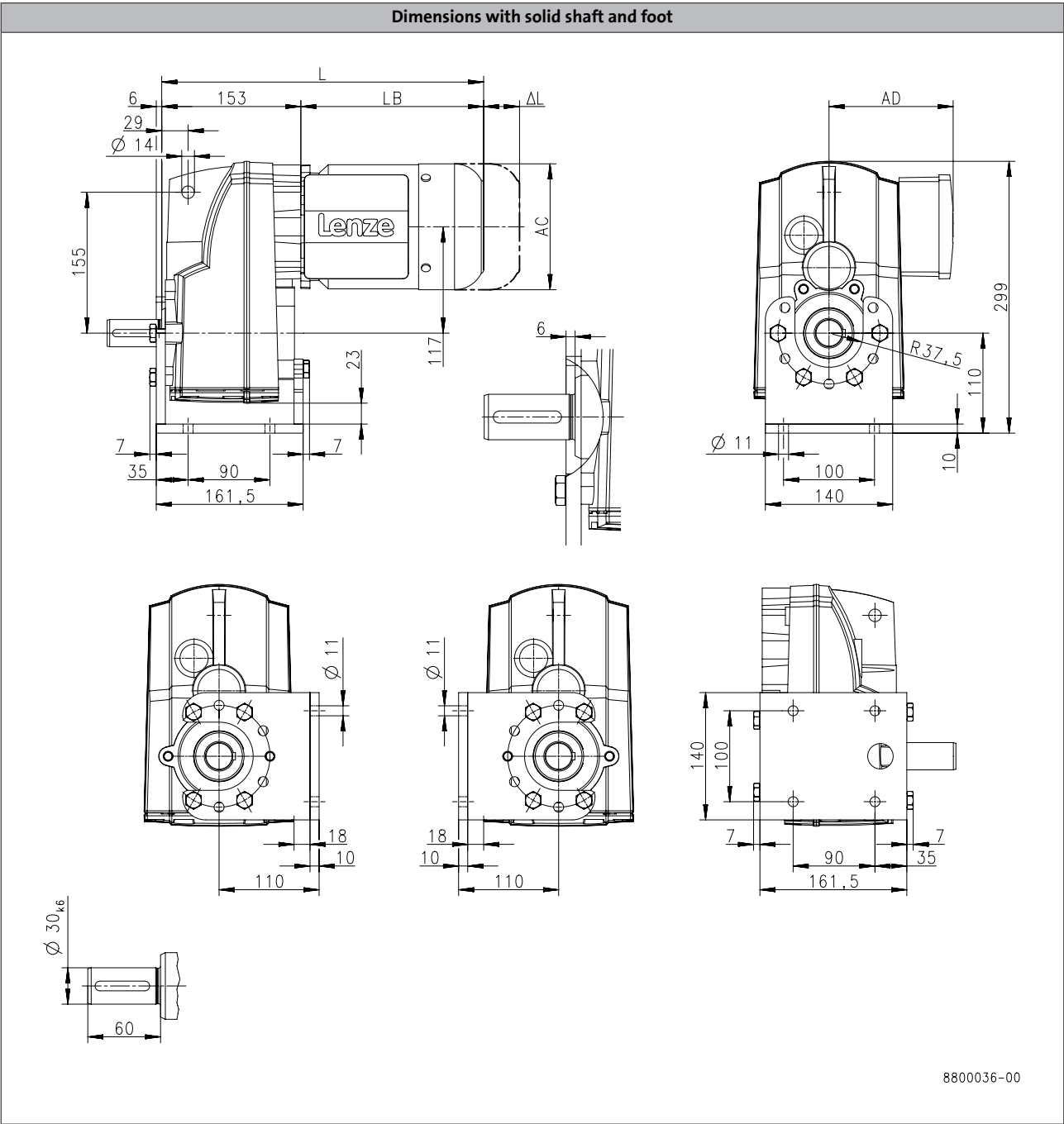
g500-S shaft-mounted helical geared motors

Technical data



Dimensions, 4-pole motors

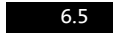
g500-S400



Product			MF□MA□□							
			063-32	063-42	071-32	071-42	080-32	080-42	090-32	100-12
Dimensions										
Total length	L	[mm]	336		356		379		427	474
Motor length	LB	[mm]	183		203		226		274	321
Length of motor options	Δ L	[mm]	170		165		183		181	170
Motor diameter	AC	[mm]	123		139		156		176	194
Distance motor/connection	AD	[mm]	100		109		150		157	166

Dimensions, 4-pole motors

g500-S400



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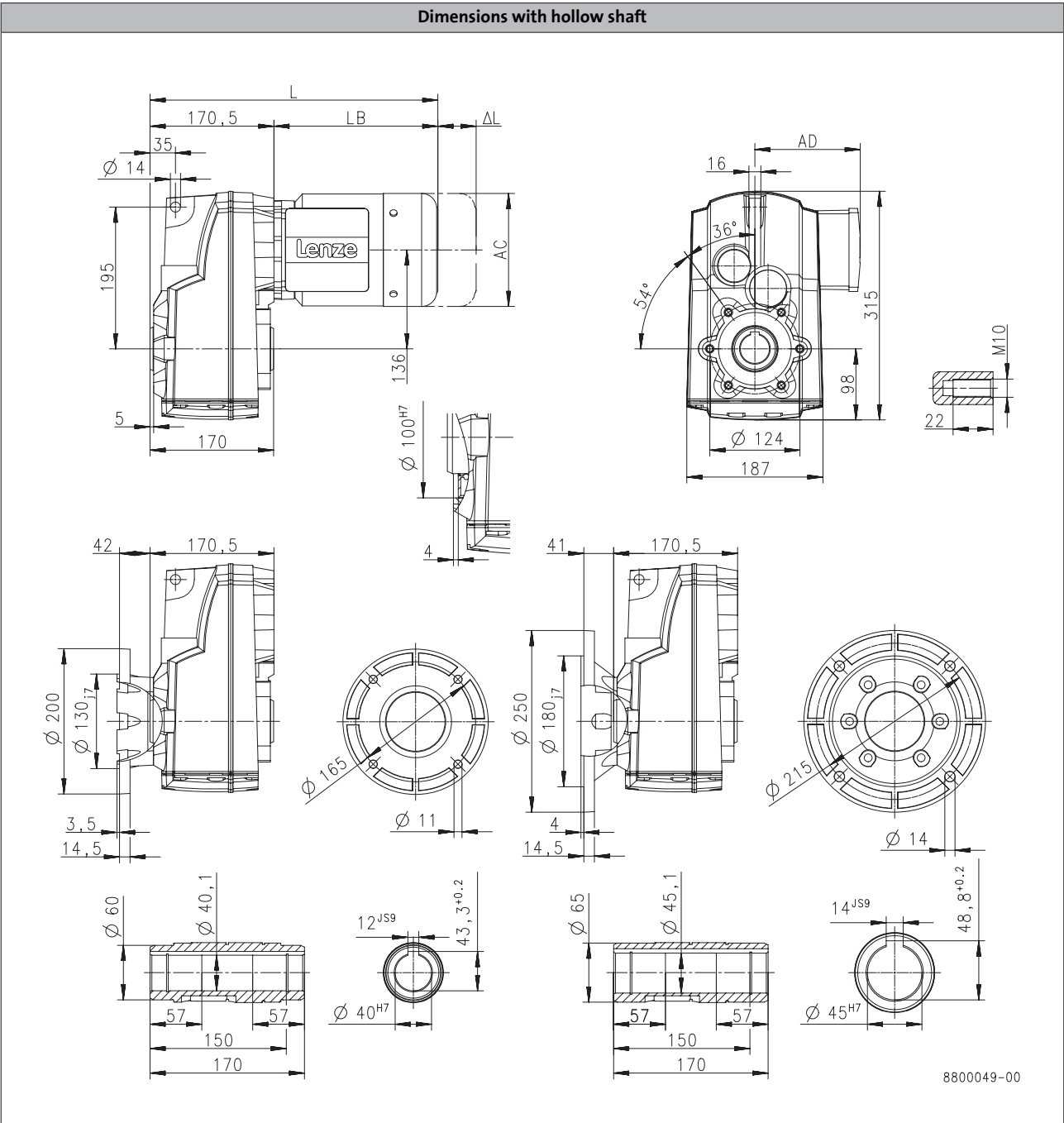
g500-S shaft-mounted helical geared motors

Technical data



Dimensions, 4-pole motors

g500-S660



6.5

Product			MF□MA□□								
			063-32	063-42	071-32	071-42	080-32	080-42	090-32	100-12	100-32
Dimensions											
Total length	L	[mm]	354		374		397		445		492
Motor length	LB	[mm]	183		203		226		274		321
Length of motor options	Δ L	[mm]	170		165		183		181		170
Motor diameter	AC	[mm]	123		139		156		176		194
Distance motor/connection	AD	[mm]	100		109		150		157		166

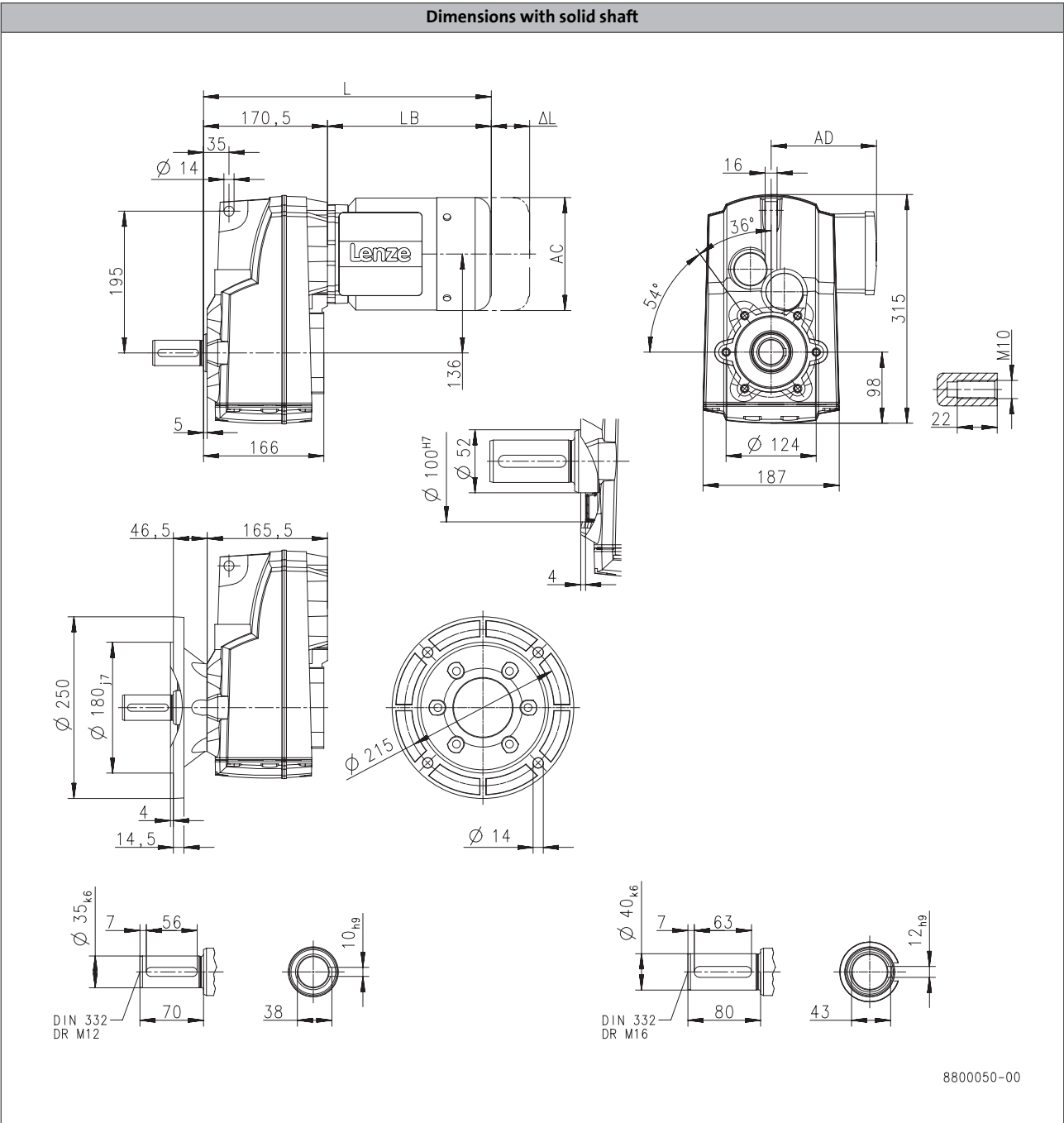
g500-S shaft-mounted helical geared motors

Technical data



Dimensions, 4-pole motors

g500-S660



Product			MF□MA□□								
			063-32	063-42	071-32	071-42	080-32	080-42	090-32	100-12	100-32
Dimensions											
Total length	L	[mm]	354		374		397		445		492
Motor length	LB	[mm]	183		203		226		274		321
Length of motor options	Δ L	[mm]	170		165		183		181		170
Motor diameter	AC	[mm]	123		139		156		176		194
Distance motor/connection	AD	[mm]	100		109		150		157		166

Dimensions, 4-pole motors

g500-S660

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6.5 - 50

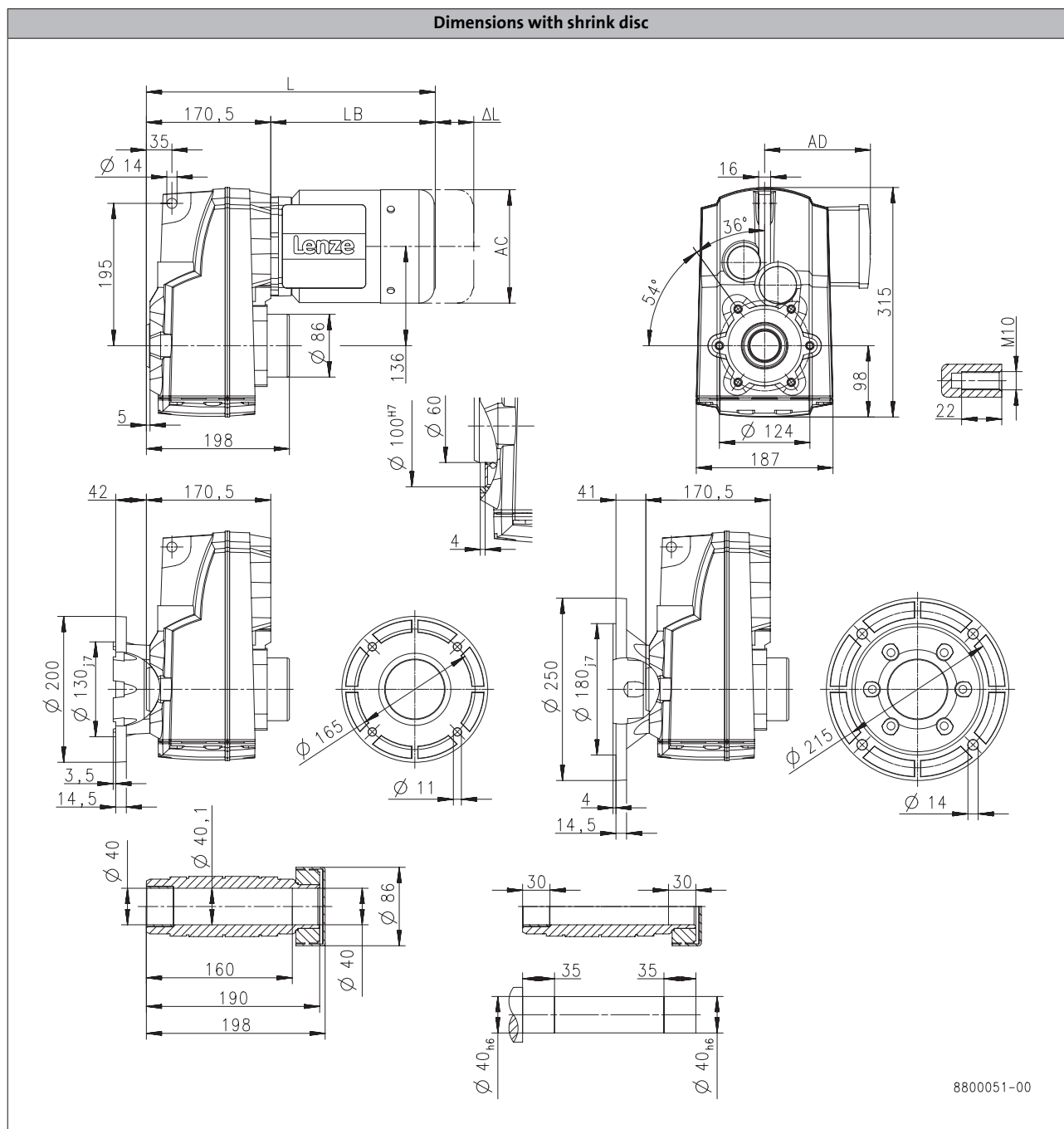
g500-S shaft-mounted helical geared motors

Technical data



Dimensions, 4-pole motors

g500-S660



6.5

Product			MF□MA□□								
			063-32	063-42	071-32	071-42	080-32	080-42	090-32	100-12	100-32
Dimensions											
Total length	L	[mm]	354		374		397		445	492	
Motor length	LB	[mm]	183		203		226		274	321	
Length of motor options	Δ L	[mm]	170		165		183		181	170	
Motor diameter	AC	[mm]	123		139		156		176	194	
Distance motor/connection	AD	[mm]	100		109		150		157	166	

g500-S shaft-mounted helical geared motors

Technical data



Weights, 4-pole motors

2-stage gearboxes

				MF□MA□□					
				063-32	063-42	071-32 071-42	080-32 080-42	090-32	100-12 100-32
g500	-S130	m	[kg]	9.5		12	16		
	-S220	m	[kg]	11		13	17		
	-S400	m	[kg]	14		16	20	27	36
	-S660	m	[kg]	18		20	25	32	40

3-stage gearboxes

				MF□MA□□		
				063-32 063-42	071-32 071-42	080-32 080-42
g500	-S220	m	[kg]	11		
	-S400	m	[kg]	14	16	
	-S660	m	[kg]	19	21	25

g500-S shaft-mounted helical geared motors

Technical data



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

g500-S shaft-mounted helical geared motors

Technical data



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	
OKS-L (large)	C3	2K-PUR top coat	

g500-S shaft-mounted helical geared motors

Technical data



g500-S shaft-mounted helical geared motors

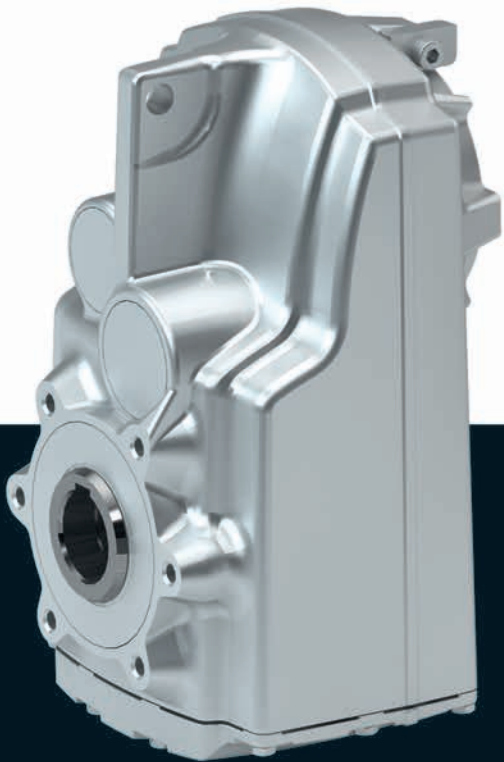
Technical data



Gearboxes

g500-S shaft-mounted helical gearbox

130 to 660 Nm



g500-S shaft-mounted helical gearbox

Contents



General information	List of abbreviations	6.5 - 5
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	Ventilation	6.5 - 12
Technical data	Permissible radial and axial forces at output	6.5 - 15
	Moments of inertia	6.5 - 17
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Accessories	Torque plate	6.5 - 21
	Shaft cover	6.5 - 22

g500-S shaft-mounted helical gearbox

Contents



g500-S shaft-mounted helical gearbox

General information



List of abbreviations

$F_{ax,max}$	[N]	Max. axial force
$F_{rad,max}$	[N]	Max. radial force
i		Ratio
J	[kgcm ²]	Moment of inertia
m	[kg]	Mass

g500-S shaft-mounted helical gearbox

General information



Product information

The slim shaft-mounted helical gearboxes feature high reliable radial forces, closely stepped gear reductions and a low backlash. They are available in 2-pole and 3-pole design with a torque up to 660 Nm and a ratio of up to $i=495$.

Versions

- Slimline design saves installation space of the machine
- Solid shaft, hollow shaft and shrink disc for direct integration into the machine
- High accuracy with axial output provide for the highest efficiency

The product name

Gearbox type	Product range		Design	Rated torque [Nm]	Product
Shaft-mounted helical gearbox	g500	-	S	130	g500-S130
				220	g500-S220
				400	g500-S400
				660	g500-S660

g500-S shaft-mounted helical gearbox

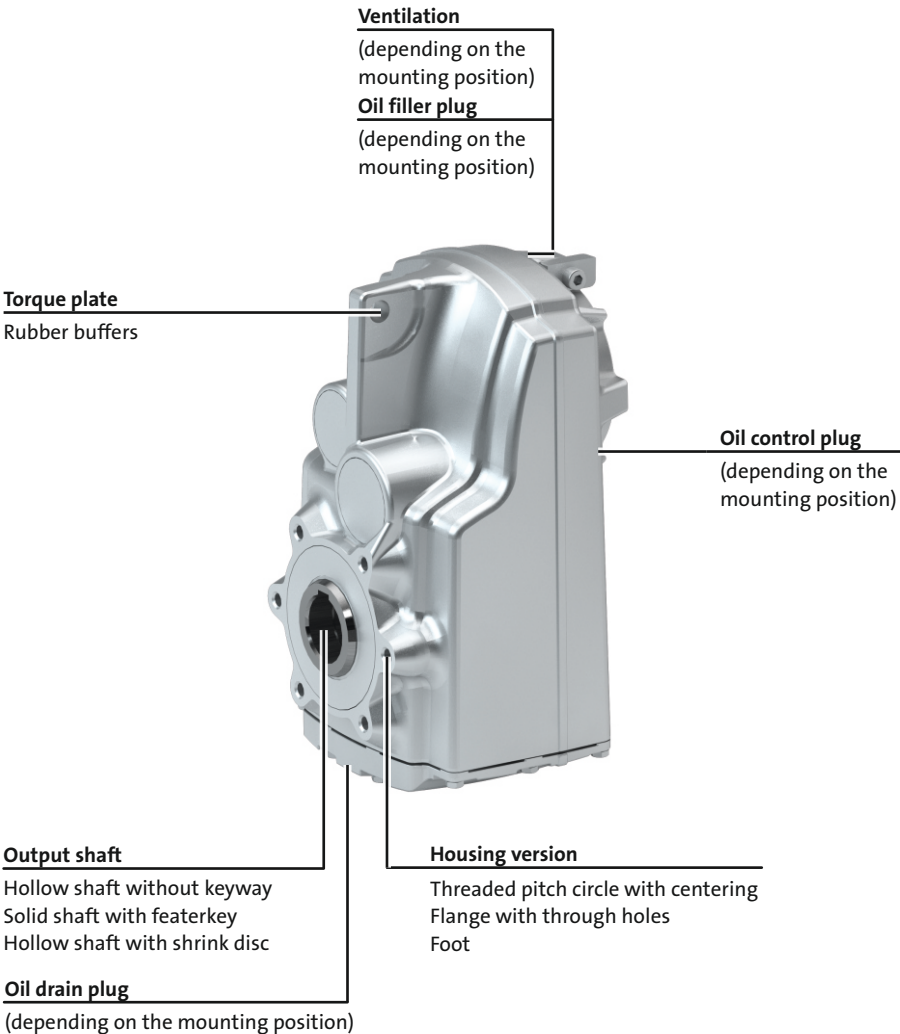
General information



Equipment

Overview

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



g500-S shaft-mounted helical gearbox

General information



The gearbox kit

Gearbox details

Product				
	g500-S130	g500-S220	g500-S400	g500-S660
Driven shaft				
Solid shaft with featherkey [mm]	25x50		30x60	35x70 40x80
Hollow shaft with keyway [mm]	25	25/30	30/35	40/45
Hollow shaft with shrink disc [mm]	25	25/30	35	40
Design	Standard stainless steel			
Gasket	Standard FPM (Viton)			
Bearing	Standard			
Fitting grease	Not enclosed Enclosed			
Housing				
Housing version	With foot without centring With centering			
Output flange				
flange diameter [mm]	160		200	200/250 ¹⁾
Lubricant				
Type	CLP 460 ²⁾ CLP HC 320 CLP HC 220 CLP HC 220 USDA H1			
Oil-level inspection	Without inspection With inspection			
Breather element	Without		Standard mounting position: Mounted Combined mounting position: loosely enclosed	
Backlash				
Backlash	Standard			
Accessories				
Torque plate	Rubber buffers			
Shaft cover	Shrink disc: Rotating cover Shrink disc: Fixed cover			

¹⁾ 200 mm flange diameter only possible on hollow shaft version.

²⁾ Not suitable for geared servo motors.

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

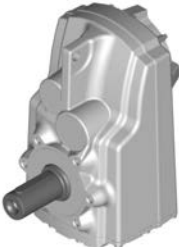
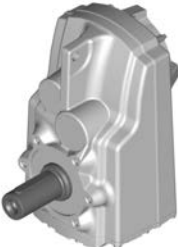
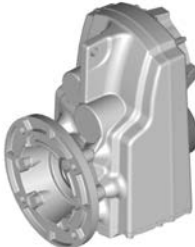
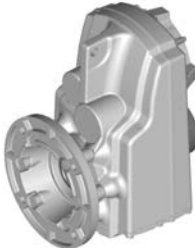
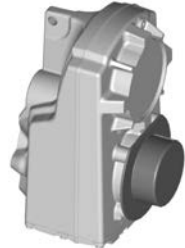
g500-S shaft-mounted helical gearbox

General information



The gearbox kit

Gearbox details

Solid shaft		
		
without centring	With centering	Flange with through holes
Hollow shaft		
		
without centring	With centering	Flange with through holes
Hollow shaft with shrink disc		
		
without centring	With centering	Flange with through holes
Accessories		
		
Foot mounting	With rubber buffer	Shrink disc cover

6.5

g500-S shaft-mounted helical gearbox

General information



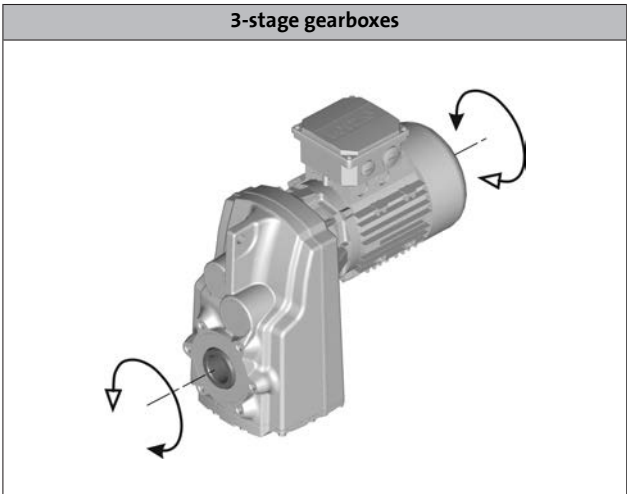
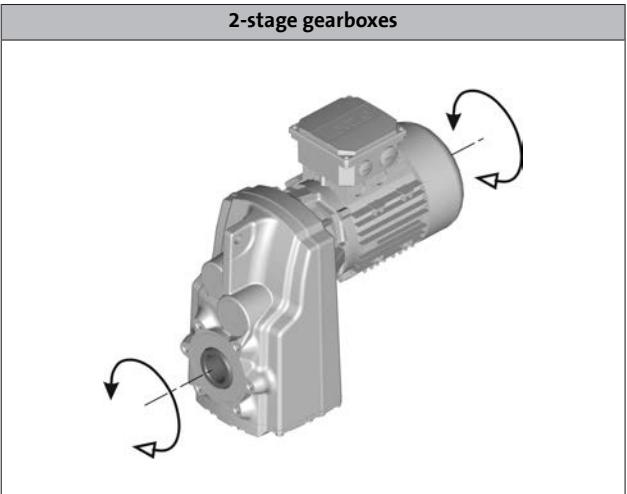
Functions and features

Product	g500-S130	g500-S220	g500-S400	g500-S660
Housing				
Design	Cuboid			
Material	Aluminium			
Solid shaft				
Design	with keyway to DIN 6885			
Tolerance	Shaft diameter ≤ 50 mm: k6 Shaft diameter > 50 mm: m6			
Material	Tempered steel C45 Nirosta X46Cr13			
Hollow shaft				
Design	With keyway Without keyway (for shrink disc)			
Tolerance	Bore H7			
Material	Tempered steel C45 Nirosta X46Cr13			
Toothed parts				
Design	Ground tooth flanks Optimised tooth flank geometry			
Material	Case-hardened steel			
Shaft-hub joint				
	1st and 2nd step: Force-fit 3rd step: positive-fit			
Shaft sealing rings				
Design	With dust lip			
Material	NB / FP			
Bearing				
Design	Ball bearing / tapered-roller bearing depending on size and design			
Lubricants				
	Standard: mineral oil Optional: synthetic oil ¹⁾			
Quantities	Corresponding to mounting position (see nameplate)			
Mechanical efficiency				
2-stage gearboxes [$\eta_{c=1}$]	0.96			
3-stage gearboxes [$\eta_{c=1}$]	0.95			

¹⁾ Standard for geared servo motors.

Direction of rotation

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g500-S shaft-mounted helical gearbox

General information



Lubricants

Lenze gearboxes and geared motors are ready for operation on delivery and are filled with lubricants specific to both the drive and the design. The mounting position and design specified in the order are key factors in choosing the volume of lubricant.

The lubricants listed in the lubricant table are approved for use in Lenze drives.

Lubricant table

Mode	CLP 460	CLP HC 320	CLP HC 220 USDA H1
Ambient temperature [°C]	0 ... +40	-25 ... +50	-20 ... +40
Specification	Mineral based oil with additives	Synthetic-based oil (synthetic hydrocarbon / poly-alpha-olefin oil)	
Changing interval	16000 operating hours not later than after three years (oil temperature 70 to 80 °C)	25000 operating hours not later than after three years (oil temperature 70 to 80 °C)	16000 operating hours not later than after three years (oil temperature 70 to 80 °C)
Fuchs	Fuchs Renolin CLP 460	Fuchs Renolin Unisyn CLP 320	bremer & leguil Cassida Fluid GL 220
Klüber	Klüberoil GEM1-460 N	Klübersynth GEM4-320 N	Klüberoil 4 UH1-220 N
Shell	Shell Omala S2 G 460	Shell Omala S4 GX HD 320	

- Please contact your Lenze sales office if you are operating at ambient temperatures in areas up to < -20 °C bzw. > or up to +40°C.

Shaft sealing rings

By default, the gearboxes come with NBR shaft sealing rings at the output end. At high speed and unfavourable ambient conditions as high temperature, reduced circulation of air etc., Lenze recommends the use of Viton shaft sealing rings.

Please consider this in your order.

g500-S shaft-mounted helical gearbox

General information



Ventilation

Non-ventilated gearboxes

No ventilation is required for gearboxes g500-S130 to S220.

Ventilated gearboxes

The g500-S400 S660 gearbox is supplied with a breather element as standard.

Gearboxes in combined mounting position

To reduce the number of different versions, the gearboxes can also be ordered with combined mounting positions.

Depending on the gearbox in question, the following combinations are available:

g500-S130 to S660 in combined mounting position AEF
The breather elements are supplied loose.

g500-S shaft-mounted helical gearbox

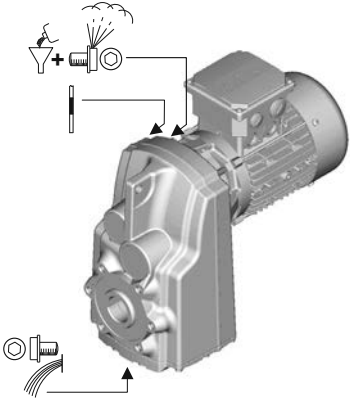
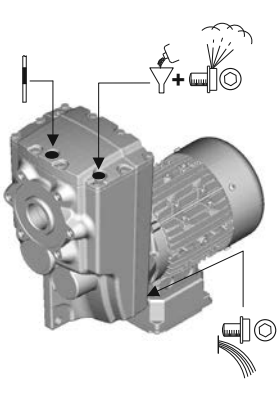
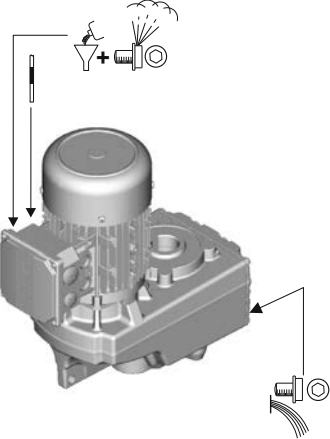
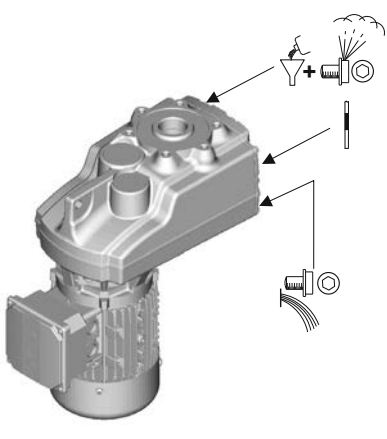
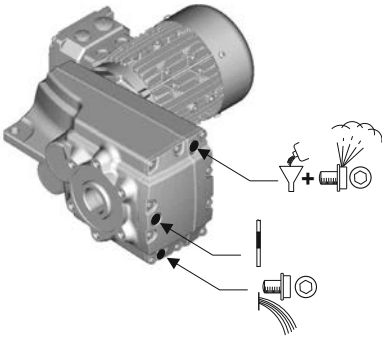
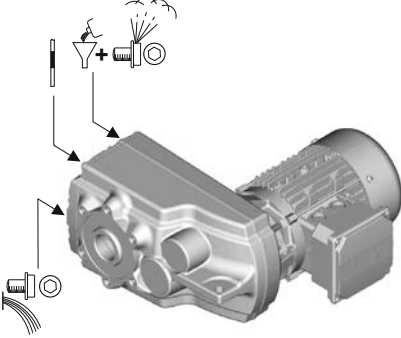
General information



Ventilation

Position of ventilation, sealing elements and oil level check

► A ... F mounting position

A 	B 
C 	D 
E 	F 
 Filling	 Drain
 Ventilation	 Check

g500-S shaft-mounted helical gearbox

General information



g500-S shaft-mounted helical gearbox

Technical data



Permissible radial and axial forces at output

Permissible radial force

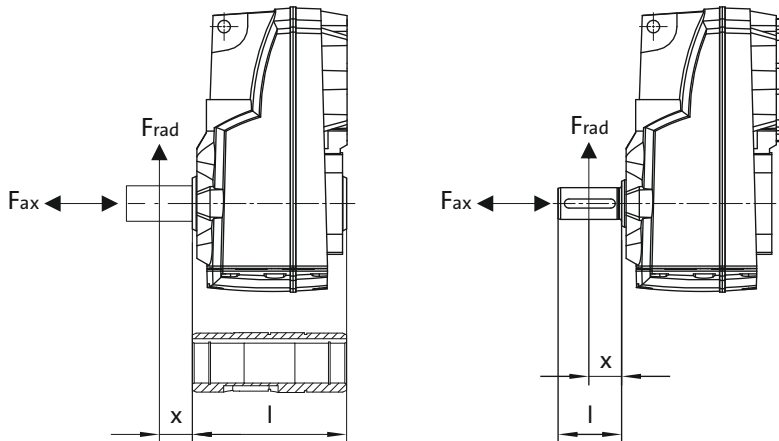
$$F_{rad,perm} = f_w \times F_{rad,max}$$

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

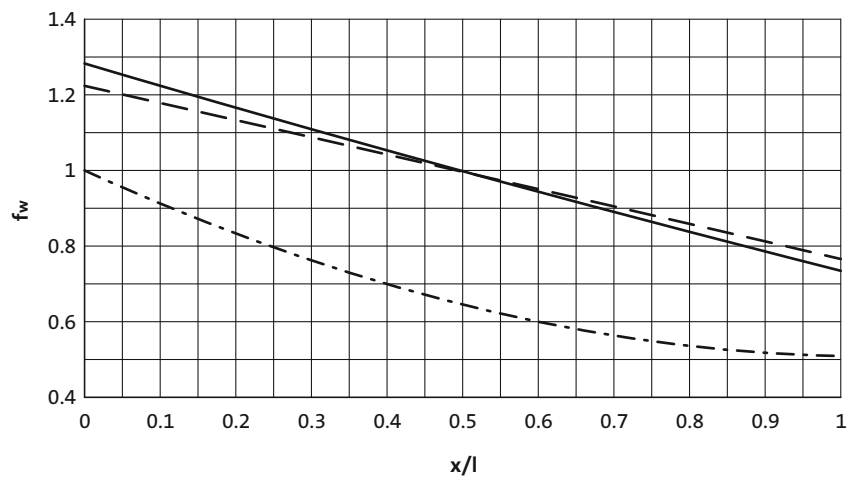
Permissible axial force

If there is no radial force, the maximum permissible axial force is 50 % of the table value $F_{rad,max}$

Application of forces



Additional load factor f_w at output shaft



- Solid shaft
- - - Solid shaft with flange
- · - Hollow shaft
- · · (Unlabeled)

g500-S shaft-mounted helical gearbox

Technical data



Permissible radial and axial forces at output

The values given in the table refer to the center shaft end force application point and are minimum values calculated according to the most unfavourable conditions (force application angle, mounting position, direction of rotation). The values were calculated for the motor/gearbox combination with a load capacity of $c = 1.3$ and an input speed of 1400 rpm.

In case of different operating conditions, considerably higher forces can be transmitted. Please contact Lenze.

- If the torque is transmitted via the flange face, max 50 % of the radial force $F_{rad,max}$ are permissible.
- Neither radial nor axial forces are permissible for the hollow shaft with shrink disc.

Product	n_2 [r/min]									
	1000	630	400	250	160	100	63	40	25	≤16

Max. radial force, Hollow shaft										
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
g500-S130	1000	1150	1350	1500	1650	2200	2750	3450	4200	4500
g500-S220	2100	2700	2800	3200	3800	4600	5500	6300	7000	7000
g500-S400	1800	2400	3000	3400	4100	5000	6000	7100	8000	8000
g500-S660	2400	3300	4300	4700	5000	6600	8500	10800	12000	12000

Max. radial force, Solid shaft without flange										
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
g500-S130	1000	1150	1350	1500	1650	2200	2750	3450	4200	4500
g500-S220	1650	2100	2300	2700	3200	3600	3600	3600	3600	3600
g500-S400	1400	1900	2400	2700	3200	4000	4800	5800	6200	6200
g500-S660	1850	2500	3200	3600	3900	5100	6500	8400	9000	9000

Max. radial force, Solid shaft with flange										
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
g500-S130	1000	1150	1350	1500	1650	2200	2750	3450	4200	4500
g500-S220	2300	2800	3200	3700	4400	4600	4600	4600	4600	4600
g500-S400	2900	3700	4300	5100	5900	6800	7000	7000	7000	7000
g500-S660	4000	5000	6100	7000	7800	9600	10000	10000	10000	10000

g500-S shaft-mounted helical gearbox

Technical data



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.

2-stage gearboxes

Product	Ratio	Moment of inertia
	i	J
		[kgcm ²]
g500-S130	3.661	1.56
	5.021	0.89
	6.425	0.57
	7.029	0.49
	8.322	0.69
	9.411	1.03
	11.413	0.42
	12.907	0.60
	14.606	0.29
	15.979	0.25
	18.069	0.34
	20.381	0.17
	23.048	0.23
	24.967	0.13
	28.233	0.17
	31.387	0.087
	35.493	0.11
	40.422	0.059
	45.711	0.074
	51.230	0.039
g500-S220	57.933	0.048
	64.200	0.027
	72.600	0.032
	84.581	0.016
	95.648	0.019
	3.840	2.60
	5.267	1.54
	6.767	1.64
	7.667	1.50
	9.280	1.04
	10.514	0.96
	11.876	0.72
	12.992	0.62
	13.456	0.67
	14.720	0.58
	16.571	0.44
	18.776	0.42
	20.300	0.34
	23.000	0.32
	26.422	0.21
	29.937	0.20
	32.867	0.15
	37.238	0.14
	42.533	0.095
	48.190	0.091
	51.620	0.069
	58.486	0.067
	65.975	0.044
	74.750	0.043

Product	Ratio	Moment of inertia
	i	J
		[kgcm ²]
g500-S400	3.339	5.16
	4.579	2.91
	5.860	1.86
	6.411	1.58
	7.467	2.18
	8.436	1.95
	10.240	1.32
	11.569	1.20
	13.105	0.89
	14.336	0.77
	14.806	0.82
	16.197	0.70
	18.286	0.53
	20.659	0.49
	22.400	0.40
	25.308	0.37
	29.156	0.24
	32.940	0.23
	36.267	0.17
	40.974	0.16
g500-S660	46.933	0.11
	53.026	0.10
	56.960	0.079
	64.354	0.074
	3.920	8.80
	5.376	5.26
	6.417	5.48
	6.880	3.48
	7.311	4.90
	8.800	3.50
	10.027	3.19
	11.262	2.41
	12.320	2.12
	12.832	2.22
	14.037	1.96
	15.714	1.51
	17.905	1.42
	19.250	1.15
	21.933	1.09
	25.056	0.65
	28.548	0.61
	31.167	0.47
	35.511	0.44
	40.333	0.29
	45.956	0.28
	48.950	0.21
	55.773	0.20

g500-S shaft-mounted helical gearbox

Technical data



Moments of inertia

3-stage gearboxes

Product	Ratio	Moment of inertia
	i	J
		[kgcm ²]
g500-S220	40.012	0.20
	45.333	0.20
	52.587	0.13
	59.581	0.13
	67.298	0.092
	76.249	0.091
	86.079	0.062
	97.528	0.061
	111.747	0.044
	126.610	0.043
	143.205	0.030
	162.252	0.030
	241.022	0.014
	273.079	0.014
	312.233	0.003
	353.762	0.003
	398.508	0.006
	451.512	0.006
g500-S400	58.027	0.14
	65.559	0.14
	74.260	0.098
	83.900	0.095
	94.984	0.066
	107.314	0.064
	123.307	0.046
	139.313	0.045
	158.019	0.032
	178.531	0.031
	204.412	0.021
	230.946	0.021
	265.956	0.014
	300.479	0.014
	344.533	0.004
	389.256	0.004
	439.733	0.006
	496.814	0.006

Product	Ratio	Moment of inertia
	i	J
		[kgcm ²]
g500-S660	49.867	0.39
	56.818	0.38
	63.817	0.27
	69.813	0.23
	72.713	0.26
	79.545	0.23
	89.048	0.17
	101.460	0.16
	109.083	0.13
	124.289	0.12
	137.133	0.083
	156.249	0.082
	176.611	0.056
	201.230	0.056
	223.833	0.037
	255.034	0.037
	280.500	0.026
	319.600	0.025
	369.548	0.016
	421.060	0.015

g500-S shaft-mounted helical gearbox

Technical data



Additional weights for gearboxes

Product			g500-S130	g500-S220	g500-S400	g500-S660
Mass						
Solid shaft	m	[kg]	0.5	0.5	1.7	2.5
Shrink disc	m	[kg]	0.2	0.4	0.6	0.6
Foot	m	[kg]	1.7	1.8	3.3	4.3
Flange	m	[kg]	0.4	0.4	0.9	1.7

g500-S shaft-mounted helical gearbox

Technical data



g500-S shaft-mounted helical gearbox

Accessories

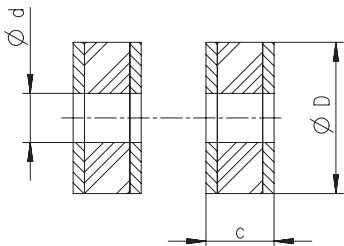
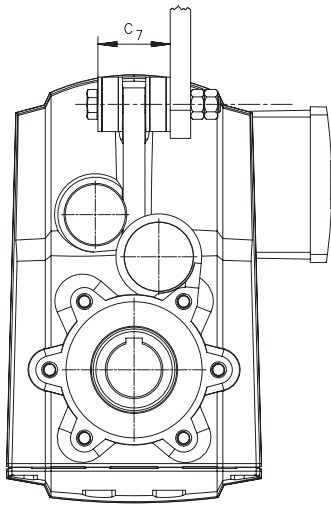


Torque plate

The torque is usually supported via the foot or the flange. Another simple option is the integrated torque plate at the housing. Here, the torque is supported only via one point and is, among other things, suitable for shaft-mounted gearboxes. Moreover, the suitable rubber buffers provide for a low-tension installation and absorb slight shocks.

The rubber buffers can be ordered optionally.

Rubber buffer for torque plate



Product	Dimensions				Mass
	d	D	c	c ₇	m
	[mm]	[mm]	[mm]	[mm]	[kg]
g500-S130	11.0	30.0	17.0	45.0	0.050
g500-S220	11.0	30.0	17.0	45.0	0.050
g500-S400	13.0	40.0	18.0	49.0	0.10
g500-S660	13.0	40.0	18.0	52.0	0.10

g500-S shaft-mounted helical gearbox

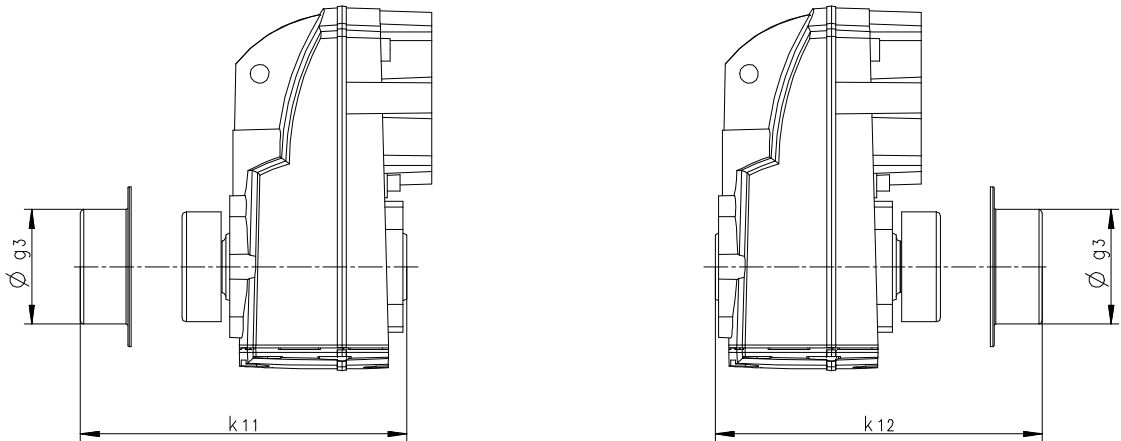
Accessories



Shaft cover

Shrink disc cover

The cover is provided for the shrink disc to be protected from contact.



Product	Dimensions			Mass
	g ₃ [mm]	k ₁₁ [mm]	k ₁₂ [mm]	m [kg]
g500-S130	63.0	132	132	0.050
g500-S220	76.0	152	152	0.050
g500-S400	90.0	182	182	0.050
g500-S660	90.0	200	202	0.050

g500-S shaft-mounted helical gearbox

Accessories



g500-S shaft-mounted helical gearbox

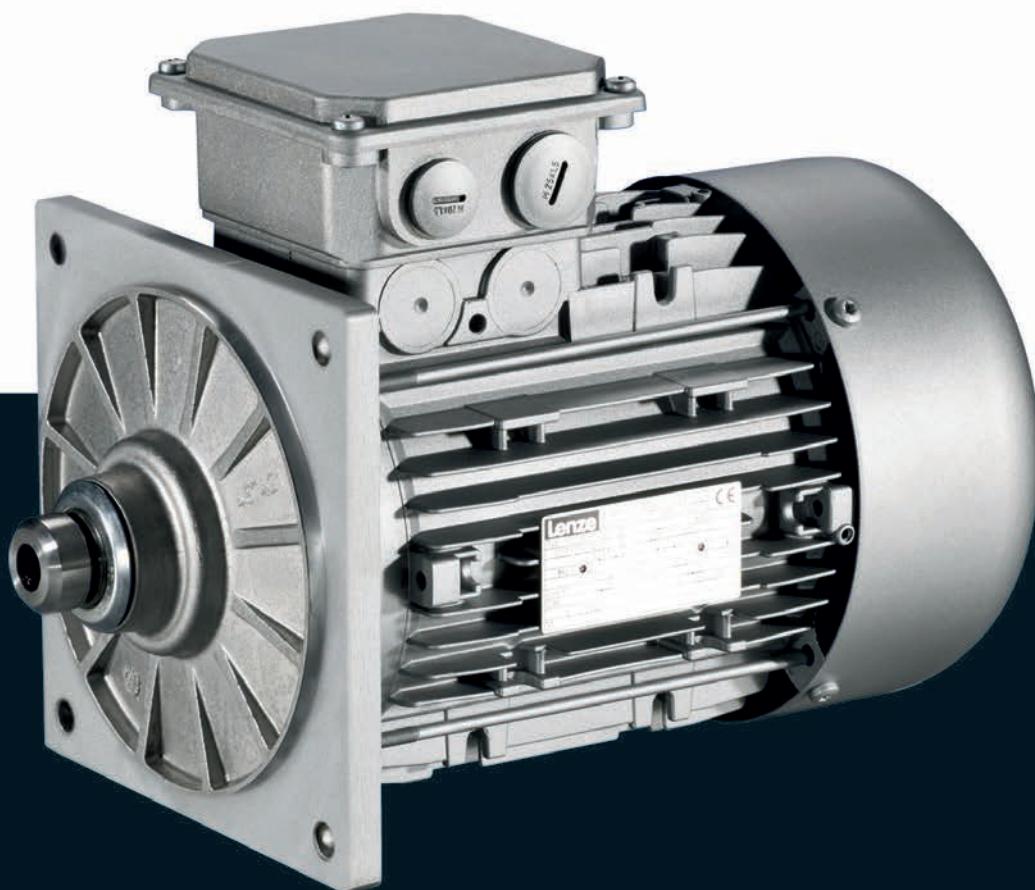
Accessories



Motors

MF three-phase AC motors

0.55 to 22 kW



MF three-phase AC motors

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MF three-phase AC motors

General information



List of abbreviations

$\eta_{100\%}$	[%]	Efficiency
$\eta_{75\%}$	[%]	Efficiency
$\eta_{50\%}$	[%]	Efficiency
$\cos \phi$		Power factor
I_N	[A]	Rated current
$I_{\max}$	[A]	Max. current consumption
J	[kgcm ²]	Moment of inertia
m	[kg]	Mass
M_a	[Nm]	Starting torque
M_b	[Nm]	Stalling torque
$M_{\max}$	[Nm]	Max. torque
M_N	[Nm]	Rated torque
n_N	[r/min]	Rated speed
P_N	[kW]	Rated power
$P_{\max}$	[kW]	Max. power input

$U_{\max}$	[V]	Max. mains voltage
$U_{\min}$	[V]	Min. mains voltage
$U_{N, \Delta}$	[V]	Rated voltage
$U_{N, Y}$	[V]	Rated voltage

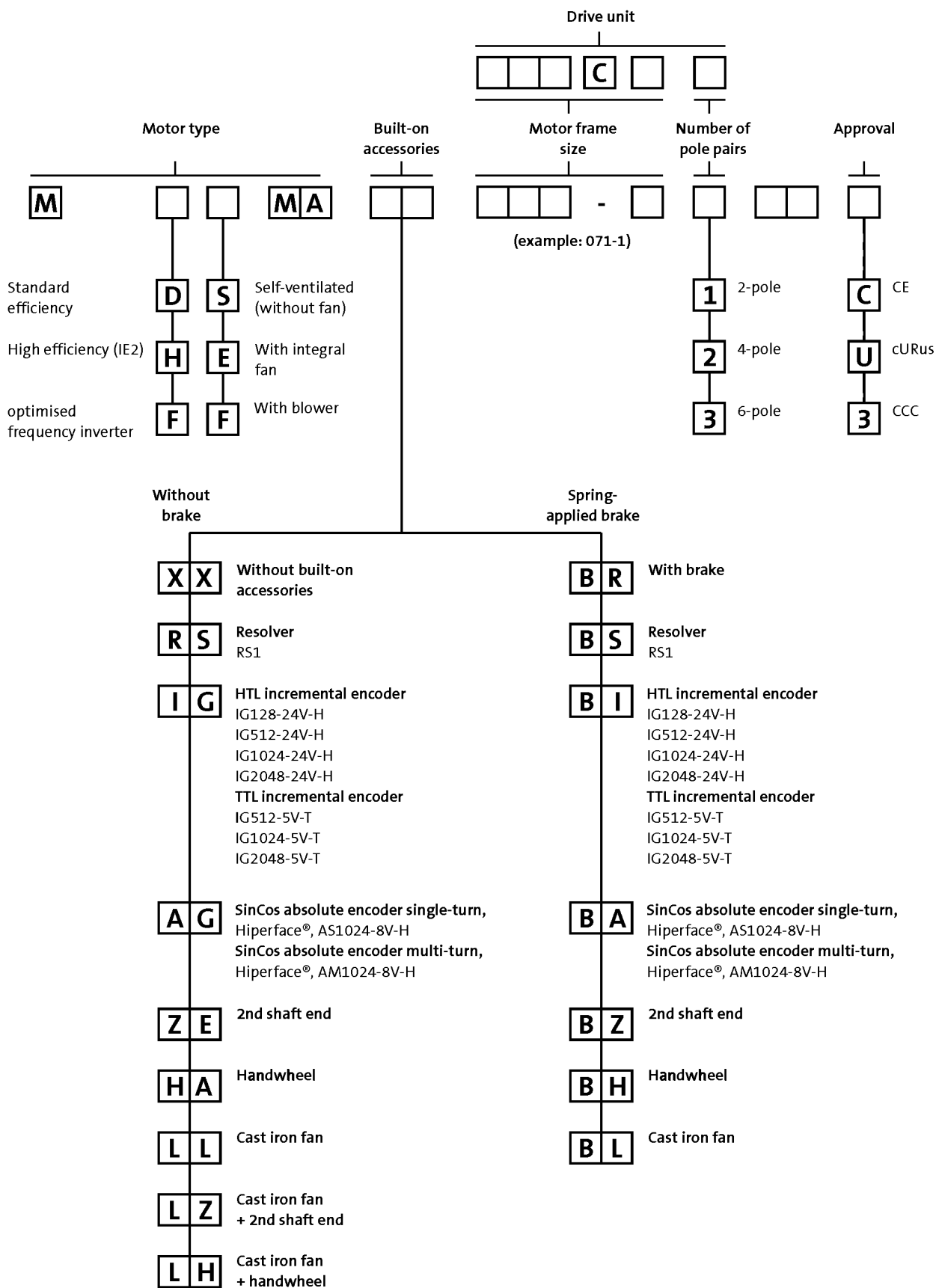
CE	Communauté Européenne
CSA	Canadian Standards Association
DIN	Deutsches Institut für Normung e.V.
EMC	Electromagnetic compatibility
EN	European standard
IEC	International Electrotechnical Commission
IM	International Mounting Code
IP	International Protection Code
NEMA	National Electrical Manufacturers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

MF three-phase AC motors

General information



Product key



MF three-phase AC motors

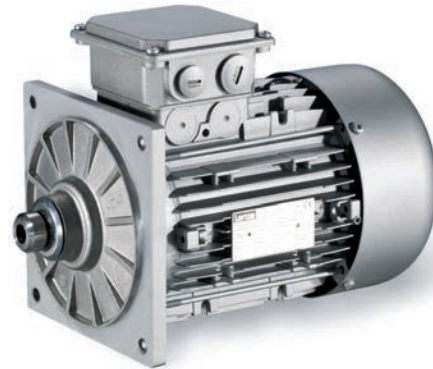
General information



Product information

Special motors have been designed for direct attachment to Lenze gearboxes.

These motors are attached to the gearbox without the use of a clutch. Torque transmission between the toothing and the motor shaft is friction-locked via a tapered connection here. This motor design means that the geared motors only require a small installation space.



L-force MF three-phase AC motors are available in a power range from 0.55 to 22 kW and have been fully optimised for inverter operation.

The benefits for you:

- Up to sizes smaller than standard three-phase AC motors
- The motors exceed the minimum efficiency levels of efficiency class IE2
- Large speed setting range: 1:24 (without field weakening)
- Dynamic thanks to a low moment of inertia

Basic versions

- The thermal sensors integrated as standard allow for permanent temperature monitoring and are coordinated to the motor winding's temperature class F (155°C).
- The motors of the basic version are adapted to ambient conditions by enclosure IP55.
- In tough operating conditions, the surface and corrosion protection system is provided to reliably protect the motor from corrosive media.

Options

- Various brake sizes – each available with several braking torques – can be combined with the three-phase AC motors.
- The LongLife version of the brake can easily reach 10×10^6 switching cycles.
- A resolver and various incremental and absolute value encoders can be fitted for speed and position detection.
- For fast commissioning, the motors are also available with connectors for the power connection, brake, blower and feedback.
- Instead of an integral fan, the motor can optionally be equipped with a blower. No torque reduction is then necessary, even at speeds below 20 Hz.
- For drive tasks in decentralised applications, the motor can be ordered with the motec inverter connected to the terminal box.
- The motors are available with cURus, GOST-R, CCC and UkrSepr approval.
- Smooth start/braking is possible by increasing the motor's centrifugal mass with a cast iron fan.
- The motor can be equipped with a handwheel for manual setup or emergency operations.
- To protect the fan from objects falling in, the fan cover can be equipped with a protection cover.
- A 2nd shaft end is available for further modifications.

MF three-phase AC motors

General information



Functions and features

Size				
Motor	063	071	080	090
Spring-applied brake				
Design	Standard or LongLife design Reduced or standard braking torque With rectifier With manual release lever Low noise		Standard or LongLife design Reduced, standard or increased braking torque With rectifier With manual release lever Low noise	
Feedback				
Design	Resolver Incremental encoder Absolute value encoder (multi-turn)			
Temperature sensor				
Thermal contact	TKO			
Thermal detector	KTY83-110 KTY84-130			
PTC thermistor	PTC			
Motor connection				
Power connection	Terminal box ICN connector HAN10E connector HAN modular connector			
Brake connection	Terminal box ICN connector HAN modular connector HAN10E connector			
Blower connection	Terminal box ICN connector			
Feedback connection	Terminal box ICN connector			
Temperature sensor connection	Terminal box TKO or PTC at connector in the power connection KTY at connector in the feedback connection			
Shaft bearings				
Position of the locating bearing	Standard motors (B3, B5, B14): side B Motors for gearbox direct mounting: side A			
Bearing type	Deep-groove ball bearing with high-temperature resistant grease, 2 sealing discs or cover plates			
Colour				
	Not coated Primed Paint in various corrosion-protection designs in accordance with RAL colours			
Further options				
	Protection cover	Protection cover 2nd shaft end		

MF three-phase AC motors

General information



Functions and features

Size	100	112	132
Motor			
Spring-applied brake			
Design	Standard or LongLife design Reduced, standard or increased braking torque With rectifier With manual release lever Low noise	Standard design Reduced, standard or increased braking torque With rectifier With manual release lever Low noise	
Feedback			
Design	Resolver Incremental encoder Absolute value encoder (multi-turn)		
Temperature sensor			
Thermal contact	TKO		
Thermal detector	KTY83-110 KTY84-130		
PTC thermistor	PTC		
Motor connection			
Power connection	Terminal box ICN connector HAN10E connector HAN modular connector	Terminal box	Terminal box HAN modular connector
Brake connection	Terminal box ICN connector HAN modular connector HAN10E connector	Terminal box	Terminal box HAN modular connector
Blower connection	Terminal box ICN connector		
Feedback connection	Terminal box ICN connector		
Temperature sensor connection	Terminal box TKO or PTC at connector in the power connection KTY at connector in the feedback connection	Terminal box KTY at connector in the feedback connection	
Shaft bearings			
Position of the locating bearing	Standard motors (B3, B5, B14): side B Motors for gearbox direct mounting: side A		
Bearing type	Deep-groove ball bearing with high-temperature resistant grease, 2 sealing discs or cover plates		
Colour			
	Not coated Primed Paint in various corrosion-protection designs in accordance with RAL colours		
Further options			
	Protection cover 2nd shaft end		

MF three-phase AC motors

General information



Functions and features

Surface and corrosion protection

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

Various surface coatings ensure that the motors operate reliably even at high air humidity, in outdoor installation or in the presence of atmospheric impurities. Any colour from the RAL Classic collection can be chosen for the top coat. The three-phase AC motors are also available unpainted (no surface and corrosion protection).

Surface and corrosion protection system	Applications	Measures
OKS-G (primed)	Dependent on subsequent top coat applied	2K PUR priming coat (grey)
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)
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)
OKS-L (high)	- 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 - Screws zinc-coated - Cable glands with gaskets - Corrosion-resistant brake with cover ring, stainless friction plate, and chrome-plated armature plate (on request) Optional measures: - Motor recesses sealed off (on request)

Structure of surface coating

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

MF three-phase AC motors

General information



Motor – inverter assignment

Rated frequency 120 Hz

- Decentralised inverter 8400 motec (E84DVB)
- Inverter Drives 8400 (E84AV)

Rated power	Product key		
	Motor	Inverter	
P _N			
[kW]			
0.55	MF□□□□□063-32	E84DVB□5514S□□□2□	
0.75	MF□□□□□063-42	E84DVB□7514S□□□2□	
1.10	MF□□□□□071-32	E84DVB□1124S□□□2□	
1.50	MF□□□□□071-42	E84DVB□1524S□□□2□	
2.20	MF□□□□□080-32	E84DVB□2224S□□□2□	
3.00	MF□□□□□080-42	E84DVB□3024S□□□2□	
4.00	MF□□□□□090-32	E84DVB□4024S□□□2□	
5.50	MF□□□□□100-12	E84DVB□5524S□□□2□	
7.50	MF□□□□□100-32	E84DVB□7524S□□□2□	
11.0	MF□□□□□112-22		
15.0	MF□□□□□132-12		
18.5	MF□□□□□132-22		
22.0	MF□□□□□132-32		

MF three-phase AC motors

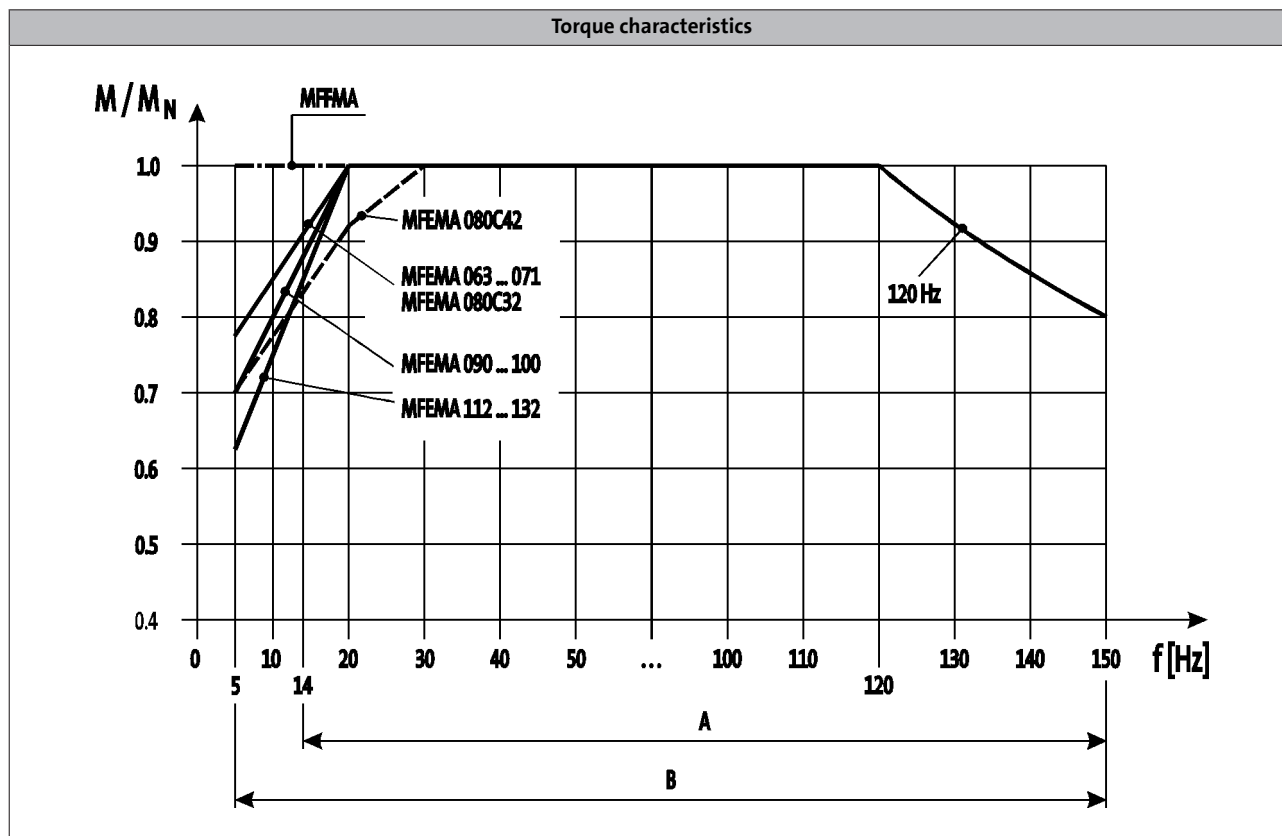
General information



Dimensioning

Torque derating at low motor frequencies

Motor size-dependent torque reduction, taking into account the thermal response during operation on the inverter.



A = Operation with integral fan and brake

B = Operation with integral fan and brake control "Holding current reduction"

- The motor specifications stated in this catalogue for inverter operation apply to operation with a Lenze inverter. If you are uncertain, get in touch with the manufacturer of the inverter to ask whether the device is capable of driving the motor with the stated specifications (e.g. setting range, base frequency).

You can use the Drive Solution Designer for precise drive dimensioning.

The Drive Solution Designer helps you to carry out a fast and high-quality drive dimensioning. The software includes well-founded and proven knowledge on drive applications and electro-mechanical drive components.

Please contact your Lenze sales office.

MF three-phase AC motors

General information



MF three-phase AC motors

Technical data



Standards and operating conditions

Degree of protection			
EN 60529			IP55 ¹⁾ IP65 ¹⁾ IP66 ¹⁾
Approval			
Class			cURus CCC GOST-R UkrSepro
Temperature class			
IEC/EN 60034-1; utilisation			B
IEC/EN 60034-1; insulation system (enamel-insulated wire)			F
Min. ambient operating temperature			
	T _{opr,min}	[°C]	-20
Max. ambient temperature for operation			
	T _{opr,max}	[°C]	40
With power reduction	T _{opr,max}	[°C]	60
Site altitude			
Amsl	H _{max}	[m]	4000
Max. speed			
	n _{max}	[r/min]	4500

¹⁾ Designs with different degrees of protection:
 IP55 with brake (IP54 with manual release lever).
 IP54 with resolver RS1.
 IP54 with HTL incremental encoder IG128-24V-H.

MF three-phase AC motors

Technical data



Rated data for 120 Hz

4-pole motors

	P_N	n_N	$U_{N,\Delta}$	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$
			$\pm 10\%$		$\pm 10\%$	
	[kW]	[r/min]	[V]	[A]	[V]	[A]
MF□□□□□063-32	0.55	3440	200	3.20	345	1.80
MF□□□□□063-42	0.75	3400	210	4.00	370	2.30
MF□□□□□071-32	1.10	3490	200	5.50	345	3.20
MF□□□□□071-42	1.50	3450	205	6.80	360	3.90
MF□□□□□080-32	2.20	3500	200	9.10	345	5.30
MF□□□□□080-42	3.00	3480	210	11.4	370	6.60
MF□□□□□090-32	4.00	3480			370	8.50
MF□□□□□100-12	5.50	3525			340	12.9
MF□□□□□100-32	7.50	3515			375	15.9
MF□□□□□112-22	11.0	3530			370	23.5
MF□□□□□132-12	15.0	3560			370	31.2
MF□□□□□132-22	18.5	3560			360	39.0
MF□□□□□132-32	22.0	3550			380	44.5

	M_N	M_{max}	$\cos \phi$	$\eta_{75\%}$	$\eta_{100\%}$	$J^{1)}$	$m^{1)}$
	[Nm]	[Nm]		[%]	[%]	[kgcm ²]	[kg]
MF□□□□□063-32	1.53	6.00	0.68	75.0	75.0	3.70	4.40
MF□□□□□063-42	2.11	8.00	0.69	79.6	79.6	3.70	4.40
MF□□□□□071-32	3.01	12.0	0.77	81.4	81.4	12.8	6.40
MF□□□□□071-42	4.15	16.0	0.80	82.8	82.8	12.8	6.40
MF□□□□□080-32	6.00	24.0	0.86	84.3	84.3	28.0	11.0
MF□□□□□080-42	8.20	32.0	0.86	85.5	85.5	28.0	11.0
MF□□□□□090-32	10.9	44.0	0.85	87.0	86.6	32.0	18.0
MF□□□□□100-12	14.9	60.0	0.81	87.9	87.7	61.0	26.5
MF□□□□□100-32	20.3	80.0	0.81	88.9	88.7	61.0	26.5
MF□□□□□112-22	29.7	120	0.78	89.8	89.8	107	38.0
MF□□□□□132-12	40.3	160	0.84	88.9	90.6	336	66.0
MF□□□□□132-22	49.6	200	0.84	89.9	91.2	336	66.0
MF□□□□□132-32	59.2	240	0.83	90.5	91.6	336	66.0

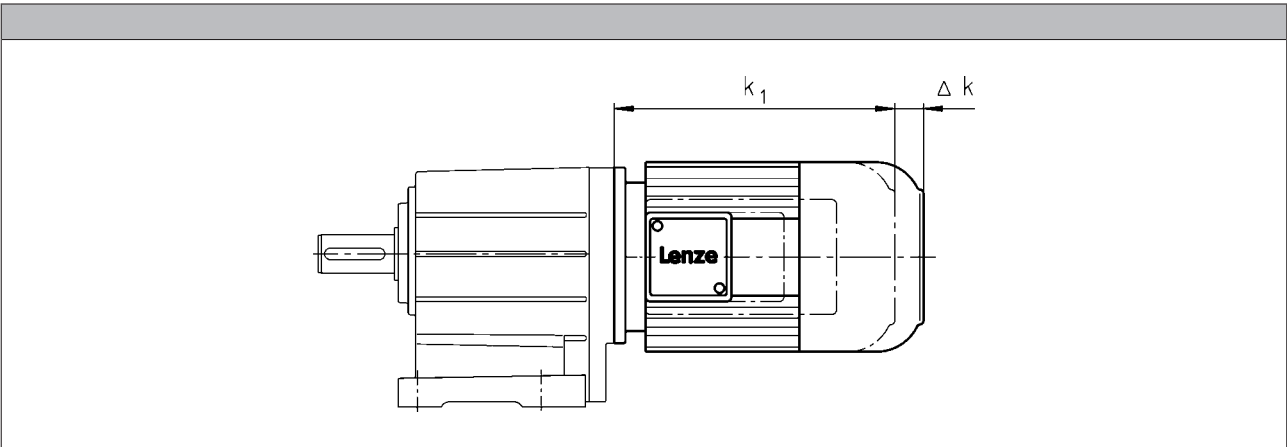
¹⁾ Without accessories

MF three-phase AC motors

Technical data



Dimensions, self-ventilated (4-pole)



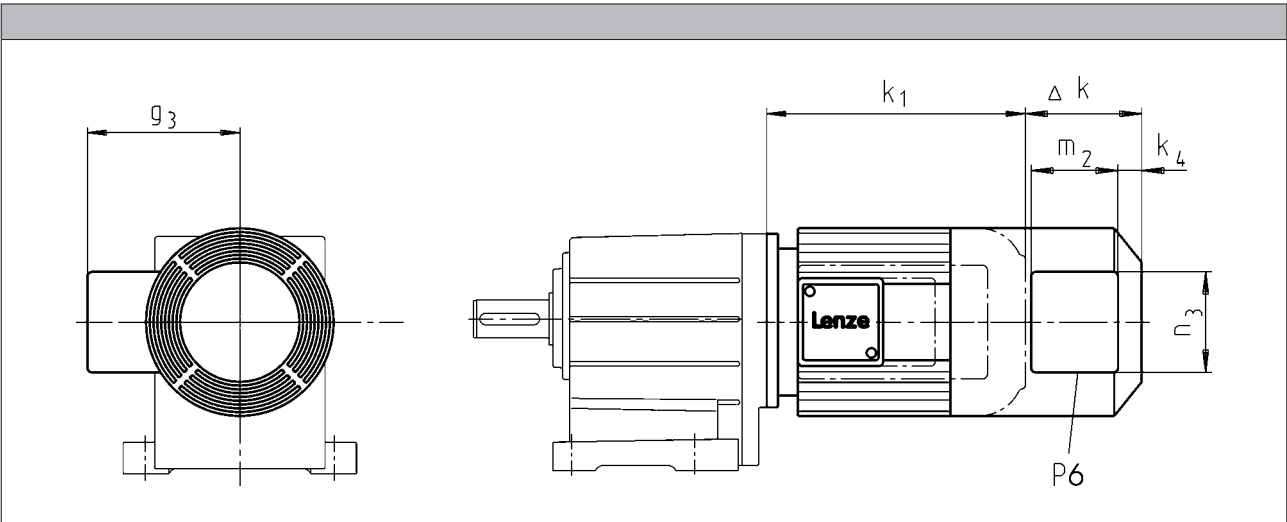
Motor type				
	MFEMAXX	MFEMABR	MFEMABS MFEMABI MFEMABA	MFEMARS MFEMAIG MFEMAAG
Motor frame size				
	Δ k [mm]	Δ k [mm]	Δ k [mm]	Δ k [mm]
063-32 063-42	0	40	103	56
071-32 071-42		52	96	52
080-32 080-42		73	111	111
090-32		68	105	87
100-12 100-32		76	101	81
112-22		90	120	80
132-12 132-22 132-32		110	125	103

MF three-phase AC motors

Technical data



Dimensions, forced ventilated (4-pole)



Motor type									
	MFFMAXX	MFFMABR	MFFMABS MFFMABI MFFMABA	MFFMARS MFFMAIG MFFMAAG					

Motor frame size										
	Δ k	Δ k	Δ k	Δ k	k ₄	g ₃	m ₂	n ₃	P ₆	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
063-32 063-42	128	170	170	128	12	115	95	105	1xM16x1.5	
071-32 071-42		165	165			122				
080-32 080-42		183	183		13	132	96	106		
090-32		181	181		22	141	95	105		
100-12 100-32	109	170	170	109		150				
112-22	102	183	183	183		162				
132-12 132-22 132-32	115	202	202	202	32	182				

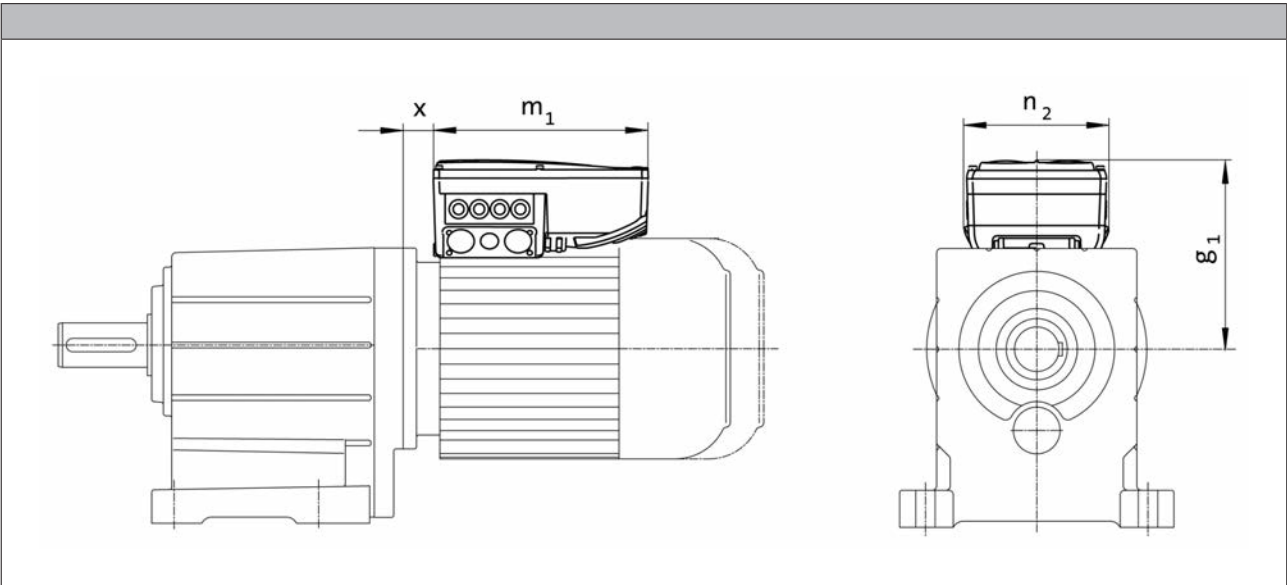
MF three-phase AC motors

Technical data



Dimensions, 8400 motec inverter

Rated frequency 120 Hz



Product key					
Motor	Inverter				
		g ₁ , 120Hz	m ₁ , 120Hz	n ₂ , 120Hz	x _{120Hz}
		[mm]	[mm]	[mm]	[mm]
MF□□□□063-32	E84DVB□5514S□□□2□	154	241	161	18.8
MF□□□□063-42	E84DVB□7514S□□□2□				21.0
MF□□□□071-32	E84DVB□1124S□□□2□	163	260	176	
MF□□□□071-42	E84DVB□1524S□□□2□				261
MF□□□□080-32	E84DVB□2224S□□□2□	201	325	195	
MF□□□□080-42	E84DVB□3024S□□□2□				272
MF□□□□090-32	E84DVB□4024S□□□2□	272			
MF□□□□100-12	E84DVB□5524S□□□2□				
MF□□□□100-32	E84DVB□7524S□□□2□				

MF three-phase AC motors

Technical data



MF three-phase AC motors

Accessories



Spring-applied brakes

Three-phase AC motors can be fitted with a spring-applied brake. This is activated after the supply voltage is switched off (closed-circuit principle). For optimum adjustment of the brake motor to the application, a range of braking torques and control modes is available for every motor frame size. For applications with very high operating frequencies the brake is also available in a LongLife version, with reinforced mechanical brake components.

Features

Versions

- **Standard**
 - 1 x 10⁶ repeating switching cycles
 - 1 x 10⁶ reversing switching cycles
- **LongLife**
 - 10 x 10⁶ repeating switching cycles
 - 15 x 10⁶ reversing switching cycles

Control

- DC supply
- AC supply via rectifier in the terminal box

Enclosure

- Without manual release IP55
- With manual release IP54

Friction lining

- Non-asbestos, low wearing

Options

- Manual release
- UL/CSA approval
- Noise-reduced

Motor – brake assignment

Design	Standard		LongLife	
Motor frame size	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
063-32	06	2.50	06	4.00
063-42	06	4.00		
071-32	06	2.50	06	4.00
	06	4.00	08	3.50
	08	3.50		
071-42	06	2.50	06	4.00
	06	4.00	08	3.50
	08	3.50	08	8.00
	08	8.00		
080-32	08	3.50	08	8.00
	08	8.00	10	7.00
	10	7.00		
080-42	08	3.50	08	8.00
	08	8.00	10	7.00
	10	7.00	10	16.0
	10	16.0		

MF three-phase AC motors

Accessories



Spring-applied brakes

Motor – brake assignment

Design								
	Standard		LongLife					
Motor frame size	Size	Rated torque	Size	Rated torque				
	Brake		Brake					
		M _k		M _k				
		[Nm]		[Nm]				
090-32	08	3.50	08 10 10	8.00 7.00 16.0				
	08	8.00						
	10	7.00						
	10	16.0						
	10	23.0						
100-12	10	7.00	10 12 12	16.0				
	10	16.0						
	12	14.0						
	12	32.0						
100-32	10	7.00		12 12	14.0 32.0			
	10	16.0						
	12	14.0						
	12	32.0						
	12	46.0						
112-22	12	14.0						
	12	32.0						
	14	35.0						
	14	60.0						
132-12	14	35.0						
	14	60.0						
	16	60.0						
	16	80.0						
132-22 132-32	14	35.0						
	14	60.0						
	16	60.0						
	16	80.0						
	16	100						



Spring-applied brakes

Direct connection without rectifier

If the brake is activated directly without a rectifier, a freewheeling diode or a spark suppressor is required to protect against induction peaks.

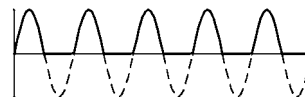
- Supply voltages
 - DC 24 V
 - DC 180 V
 - DC 205 V

Connection via mains voltage with brake rectifier

If the brake is not directly supplied with DC voltage, a rectifier is required. This is included in the scope of supply and is located in the terminal box of the motor. The rectifier converts the AC voltage of the connection into DC voltage. The following rectifiers are available:

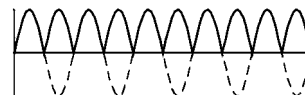
Half-wave rectifier, 6-pole

- Ratio of supply voltage to brake coil voltage = 2.22
- Approved by UL/CSA
- Supply voltages
 - AC 230 V
 - AC 400 V
 - AC 460 V



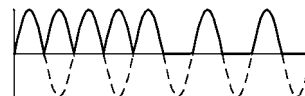
Bridge rectifier, 6-pole

- Ratio of supply voltage to brake coil voltage = 1.11
- Supply voltage
 - AC 230 V



Bridge/half-wave rectifier, 6-pole

- Ratio of supply voltage to brake coil voltage
 - up to overexcitation time = 1.11
 - beyond overexcitation time = 2.22



Supply voltages:

- AC 230 V
- AC 400 V



Spring-applied brakes

Connection via mains voltage with brake rectifier

Bridge/half-wave rectifier, 6-pole

- Ratio of supply voltage to brake coil voltage
up to overexcitation time = 1.11
beyond overexcitation time = 2.22



Supply voltages:

- AC 230 V
- AC 400 V

During the switching operation the bridge/half-wave rectifier functions as a bridge rectifier for the overexcitation time t_{ij} and then as a half-wave rectifier. This combination optimises the performance of the brake – depending on the assignment of brake coil voltage and supply voltage:

- **Short-time overexcitation of the brake coil**

Activating the brake coil for the overexcitation time t_{ij} with twice the rated voltage allows the disengagement time to be reduced. The brake opens more quickly and wear on the friction lining is reduced.

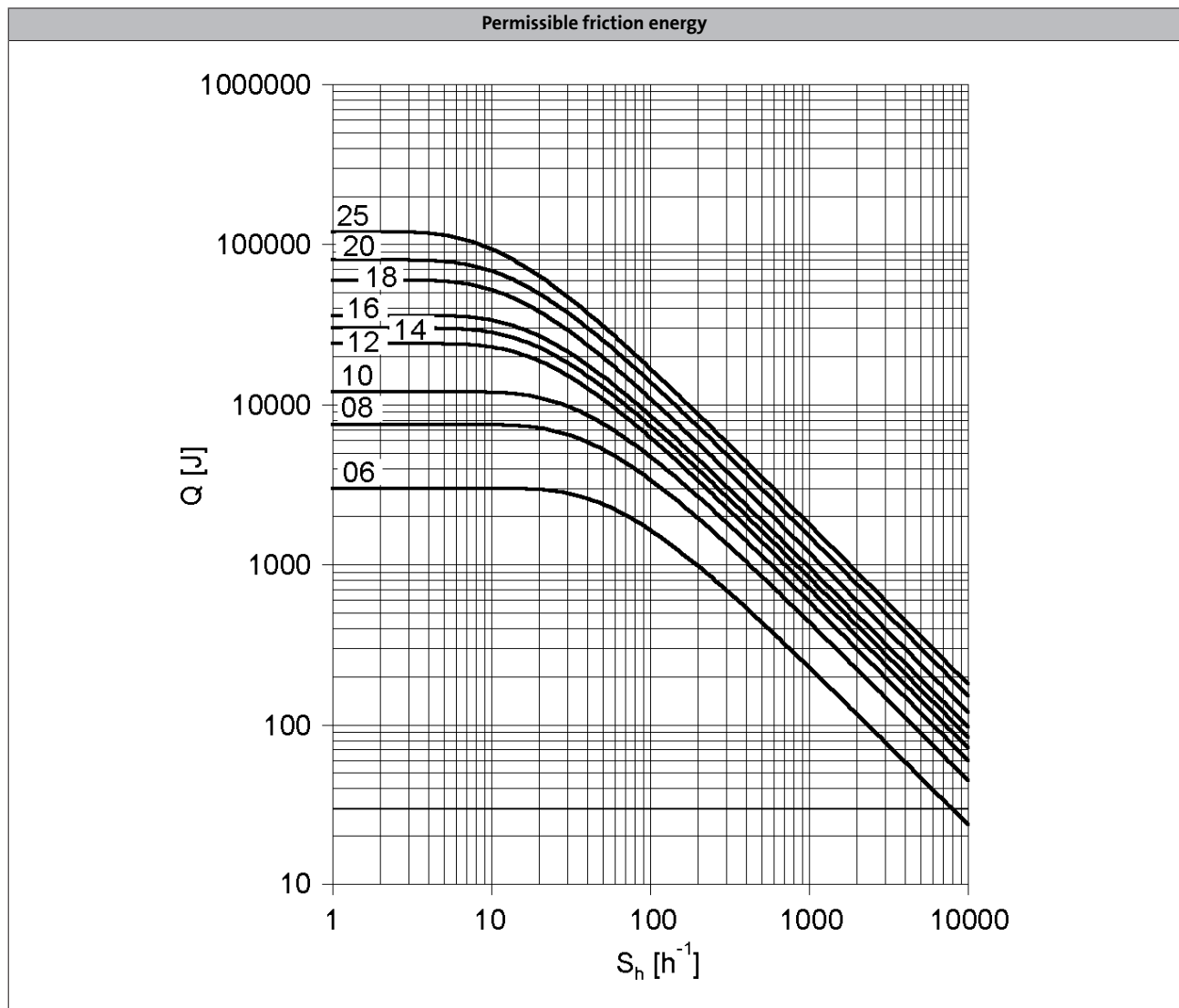
These features make this activation version particularly suitable for lifting applications. It is therefore only available in combination with a brake with increased braking torque.

- **Holding current reduction (cold brake)**

By reducing the holding current, the bridge/half-wave rectifier is able to reduce the power input to the open brake. As the brake heats up less, this type of activation is known as "cold brake".



Spring-applied brakes



Q = Switching energy per switching cycle

S_h = Operating frequency

Brake size = 06 to 25

MF three-phase AC motors

Accessories



Spring-applied brakes

Rated data with reduced braking torque

- Please enquire for braking torques and maximum switching work values not listed here.

Size			06	08	10	12	14	16	18	20	25
Power input											
	P_{in}	[kW]	0.020	0.025	0.030	0.040	0.050	0.055	0.085	0.10	0.11
Braking torque											
100	M_B	[Nm]	2.50	3.50	7.00	14.0	35.0	60.0	80.0	145	265
1000	M_B	[Nm]	2.30	3.10	6.10	12.0	30.0	50.0	65.0	115	203
1200	M_B	[Nm]	2.30	3.10	6.00	12.0	29.0	48.0	63.0	112	199
1500	M_B	[Nm]	2.20	3.00	5.80	11.0	28.0	47.0	61.0	109 ¹⁾	193 ¹⁾
1800	M_B	[Nm]	2.10	2.90	5.70	11.0	28.0	46.0	60.0 ¹⁾		
3000	M_B	[Nm]	2.00	2.80	5.30	10.0	26.0 ¹⁾	43.0 ¹⁾			
3600	M_B	[Nm]	2.00	2.70	5.20	10.0 ¹⁾					
Maximum switching energy											
100	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1000	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1200	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1500	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	24.0 ¹⁾	36.0 ¹⁾
1800	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	36.0 ¹⁾		
3000	Q_E	[KJ]	3.00	7.50	12.0	24.0	18.0 ¹⁾	11.0 ¹⁾			
3600	Q_E	[KJ]	3.00	7.50	12.0	7.00 ¹⁾					
Transition operating frequency											
	$S_{h\ddot{u}}$	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia											
	J	[kgcm ²]	0.015	0.061	0.20	0.45	0.63	1.50	2.90	7.30	20.0
Mass											
	m	[kg]	0.90	1.50	2.60	4.20	5.80	8.70	12.6	19.5	31.0

¹⁾ In the region of the load limit the value for friction energy Q_{BW} can be reduced to 40 %.

MF three-phase AC motors

Accessories



Spring-applied brakes

Rated data with reduced braking torque

- Activation via half-wave or bridge rectifier

Size			06	08	10	12	14	16	18	20	25
Friction energy											
	Q_{BW}	[MJ]	113	210	264	706	761	966	1542	2322	3522
Delay time											
Engaging	t_{11}	[ms]	11.0	14.0	20.0	21.0	37.0	53.0	32.0	47.0	264
Rise time											
Braking torque	t_{12}	[ms]	13.0	10.0	17.0	19.0	22.0	30.0	20.0	100	120
Engagement time											
	t_1	[ms]	24.0		37.0	40.0	59.0	83.0	52.0	147	384
Disengagement time											
	t_2	[ms]	35.0	37.0	57.0	65.0	148	169	230	207	269

- Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)								
Size			06	08	10	12	14	16	18	20	25
Friction energy											
	Q_{BW}	[MJ]	113	210	264	706	761	966	1542	2322	3522
Overexcitation time											
	$t_{\bar{u}}$	[ms]	300						1300		
Min. rest time											
	t	[ms]	900						3900		
Delay time											
Engaging	t_{11}	[ms]	12.0	22.0	35.0	49.0	61.0	114	83.0	126	304
Rise time											
Braking torque	t_{12}	[ms]	14.0	16.0	30.0	45.0	37.0	65.0	52.0	269	138
Engagement time											
	t_1	[ms]	26.0	38.0	66.0	93.0	97.0	180	134	395	443
Disengagement time											
	t_2	[ms]	35.0	37.0	57.0	65.0	148	169	230	207	269

- The brake response and application times are guide values. The engagement time is 10 times longer with AC-side switching. With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.

MF three-phase AC motors

Accessories



Spring-applied brakes

Rated data with standard braking torque

- Please enquire for braking torques and maximum switching work values not listed here.

Size			06	08	10	12	14	16	18	20	25
Power input											
	P_{in}	[kW]	0.020	0.025	0.030	0.040	0.050	0.055	0.085	0.10	0.11
Braking torque											
100	M_B	[Nm]	4.00	8.00	16.0	32.0	60.0	80.0	150	260	400
1000	M_B	[Nm]	3.70	7.20	14.0	27.0	51.0	66.0	121	206	307
1200	M_B	[Nm]	3.60	7.00	14.0	27.0	50.0	65.0	118	201	300
1500	M_B	[Nm]	3.50	6.80	13.0	26.0	48.0	63.0	115	195 ¹⁾	291 ¹⁾
1800	M_B	[Nm]	3.40	6.70	13.0	26.0	47.0	61.0	112 ¹⁾		
3000	M_B	[Nm]	3.20	6.30	12.0	24.0	44.0 ¹⁾	57.0 ¹⁾			
3600	M_B	[Nm]	3.20	6.10	12.0	23.0 ¹⁾					
Maximum switching energy											
100	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1000	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1200	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1500	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	24.0 ¹⁾	36.0 ¹⁾
1800	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	36.0 ¹⁾		
3000	Q_E	[KJ]	3.00	7.50	12.0	24.0	18.0 ¹⁾	11.0 ¹⁾			
3600	Q_E	[KJ]	3.00	7.50	12.0	7.00 ¹⁾					
Transition operating frequency											
	$S_{h\ddot{u}}$	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia											
	J	[kgcm ²]	0.015	0.061	0.20	0.45	0.63	1.50	2.90	7.30	20.0
Mass											
	m	[kg]	0.90	1.50	2.60	4.20	5.80	8.70	12.6	19.5	31.0

¹⁾ In the region of the load limit the value for friction energy Q_{BW} can be reduced to 40 %.

MF three-phase AC motors

Accessories



Spring-applied brakes

Rated data with standard braking torque

- Activation via half-wave or bridge rectifier

Size											
			06	08	10	12	14	16	18	20	25
Friction energy											
	Q _{BW}	[MJ]	85.0	158	264	530	571	966	1542	2322	3522
Delay time											
Engaging	t ₁₁	[ms]	15.0		28.0		17.0	27.0	33.0	65.0	110
Rise time											
Braking torque	t ₁₂	[ms]	13.0	16.0	19.0	25.0		30.0	45.0	100	120
Engagement time											
	t ₁	[ms]	28.0	31.0	47.0	53.0	42.0	57.0	78.0	165	230
Disengagement time											
	t ₂	[ms]	45.0	57.0	76.0	115	210	220	270	340	390

- Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)								
Size			06	08	10	12	14	16	18	20	25
Friction energy											
	Q _{BW}	[MJ]	85.0	158	264	530	571	966	1542	2322	3522
Overexcitation time											
	t _ü	[ms]	300				1300				
Min. rest time											
	t	[ms]	900				3900				
Delay time											
Engaging	t ₁₁	[ms]	16.0	25.0	31.0	48.0	33.0	58.0	80.0	102	154
Rise time											
Braking torque	t ₁₂	[ms]	14.0	27.0	21.0	43.0	49.0	64.0	109	157	168
Engagement time											
	t ₁	[ms]	30.0	52.0		90.0	82.0	122	189	259	322
Disengagement time											
	t ₂	[ms]	45.0	57.0	76.0	115	210	220	270	340	390

- The brake response and application times are guide values. The engagement time is 10 times longer with AC-side switching. With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.

MF three-phase AC motors

Accessories



Spring-applied brakes

Rated data with increased braking torque

- Please enquire for braking torques and maximum switching work values not listed here.

Size			10	12	14	16	16	18	20	20	25	25
Power input												
	P_{in}	[kW]	0.030	0.040	0.050	0.055	0.055	0.085	0.10	0.10	0.11	0.11
Braking torque												
100	M_B	[Nm]	23.0	46.0	75.0	100	125	200	315	400	490	600
1000	M_B	[Nm]	20.0	39.0	64.0	83.0	103	162	249	317	376	461
1200	M_B	[Nm]	20.0	39.0	62.0	81.0	101	158	244	309	367	449
1500	M_B	[Nm]	19.0	38.0	60.0	78.0	98.0	153	237 ¹⁾	300 ¹⁾	356 ¹⁾	436 ¹⁾
1800	M_B	[Nm]	19.0	37.0	59.0	77.0	96.0	150 ¹⁾				
3000	M_B	[Nm]	17.0	34.0	55.0 ¹⁾	71.0 ¹⁾	89.0 ¹⁾					
3600	M_B	[Nm]	17.0	33.0 ¹⁾								
Maximum switching energy												
100	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1000	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1200	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1500	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	24.0 ¹⁾	24.0 ¹⁾	36.0 ¹⁾	36.0 ¹⁾
1800	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	36.0 ¹⁾				
3000	Q_E	[KJ]	12.0	24.0	18.0 ¹⁾	11.0 ¹⁾	11.0 ¹⁾					
3600	Q_E	[KJ]	12.0	7.00 ¹⁾								
Transition operating frequency												
	$S_{h\ddot{u}}$	[1/h]	40.0	30.0	28.0	27.0	27.0	20.0	19.0	19.0	15.0	15.0
Moment of inertia												
	J	[kgcm ²]	0.20	0.45	0.63	1.50	1.50	2.90	7.30	7.30	20.0	20.0
Mass												
	m	[kg]	2.60	4.20	5.80	8.70	8.70	12.6	19.5	19.5	31.0	31.0

¹⁾ In the region of the load limit the value for friction energy Q_{BW} can be reduced to 40 %.

- Activation via half-wave or bridge rectifier

Size												
			10	12	14	16		18	20		25	
Friction energy												
	Q _{BW}	[MJ]	198	353	253	563	241	578	1596	580	2465	1409
Delay time												
Engaging	t ₁₁	[ms]	10.0	16.0	11.0	22.0	17.0	24.0	46.0	17.0	77.0	38.0
Rise time												
Braking torque	t ₁₂	[ms]	19.0	25.0		30.0		45.0	100		120	
Engagement time												
	t ₁	[ms]	29.0	41.0	36.0	52.0	47.0	69.0	146	117	197	158
Disengagement time												
	t ₂	[ms]	109	193	308	297	435	356	378	470	451	532

MF three-phase AC motors

Accessories



Spring-applied brakes

Rated data with increased braking torque

- Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)									
Size			10	12	14	16	18	20	25			
Friction energy	Q_{BW}	[MJ]	198	353	253	563	241	578	1596	580	2465	1409
Overexcitation time	$t_{\bar{u}}$	[ms]	300		1300							
Min. rest time	t	[ms]	900		3900							
Delay time												
Engaging	t_{11}	[ms]	24.0	27.0	17.0	41.0	21.0	60.0	69.0	17.0	123	85.0
Rise time												
Braking torque	t_{12}	[ms]	44.0	43.0	37.0	55.0	37.0	113	148	100	190	270
Engagement time	t_1	[ms]	68.0	70.0	54.0	97.0	57.0	173	217	334	313	355
Disengagement time	t_2	[ms]	109	193	308	297	435	356	378	470	451	532

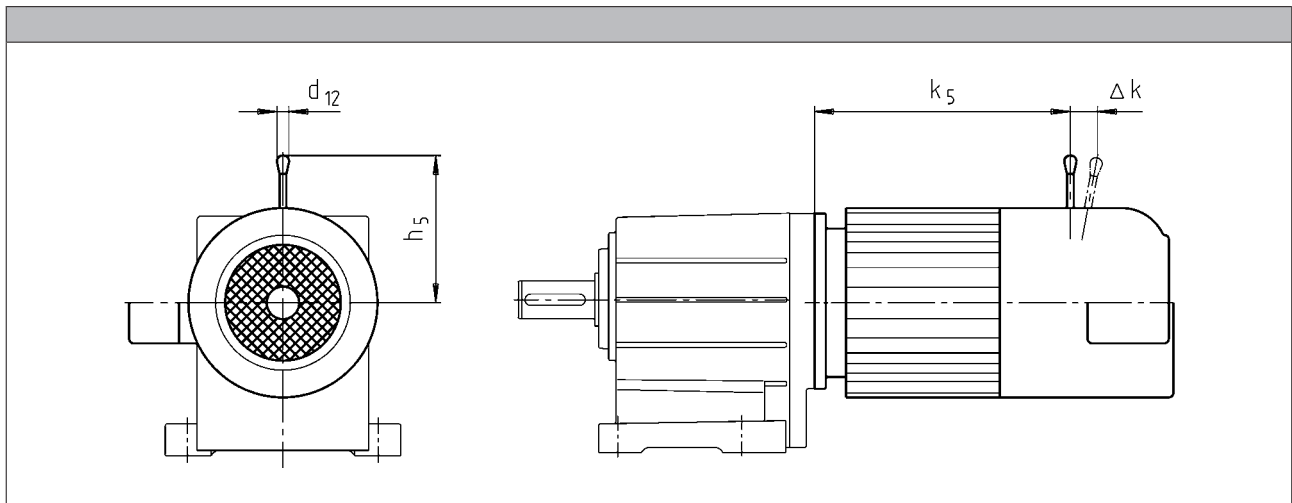
Design			Over-excitation									
Size			10	12	14	16	18	20	25			
Friction energy	Q_{BW}	[MJ]	264	706	761	966	1542	2322	3522			
Overexcitation time	$t_{\bar{u}}$	[ms]	300		1300							
Min. rest time	t	[ms]	900		3900							
Delay time												
Engaging	t_{11}	[ms]	29.0	54.0	31.0	70.0	46.0	86.0	103	55.0	171	135
Rise time												
Braking torque	t_{12}	[ms]	53.0	87.0	68.0	93.0	83.0	160	222	319	266	430
Engagement time	t_1	[ms]	82.0	141	99.0	163	129	246	325	374	437	565
Disengagement time	t_2	[ms]	53.0	81.0	117	141	168	151	160	167	184	204

- The brake response and application times are guide values. The engagement time is 10 times longer with AC-side switching. With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.



Spring-applied brakes

Manual release lever



Motor frame size	Size				
	Brake				
		k_5	Δk	h_5	d_{12}
		[mm]	[mm]	[mm]	[mm]
063-32 063-42	06	173	29	107	13.0
071-32 071-42	06 08	186 187	29 27	107 116	13.0 13.0
080-32 080-42	06 08	207 218	29 27	107 116	13.0 13.0
090-32	08 10	245 256	27 28	116 132	13.0 13.0
100-12 100-32	10 12	294 296	28 37	132 161	13.0 13.0
112-22	12 14	292 296	37 41	161 195	13.0 24.0
132-12 132-22 132-32	14 16	373 373	41 55	195 240	24.0 24.0

The following combinations with manual release lever and motor connection in the same position are not possible:

- HAN connector with connection in position 1
- Inverter motec
- Terminal box of motor sizes 071, 080, 090 for brake and retracting (M□□MA BR/BS/BA/BI)

MF three-phase AC motors

Accessories



Resolver

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

- The three-phase AC motors with resolver cannot be used for speed-dependent safety functions in connection with the SM 301 safety module.

Product key				RS1
Accuracy				
			[°]	-10 ... 10
Absolute positioning				
				1 revolution
Max. input voltage				
DC	$U_{in,max}$		[V]	10.0
Max. input frequency				
	$f_{in,max}$		[kHz]	4.00
Ratio				
Stator / rotor		$\pm 5 \%$		0.30
Rotor impedance				
	Z_{ro}		[Ω]	51 + j90
Stator impedance				
	Z_{so}		[Ω]	102 + j150
Impedance				
	Z_{rs}		[Ω]	44 + j76
Min. insulation resistance				
At DC 500 V	R		[MΩ]	10.0
Number of pole pairs				
				1

MF three-phase AC motors

Accessories



Incremental encoder and SinCos absolute value encoder

- The three-phase AC motors with incremental encoders or SinCos absolute value encoders cannot be used for speed-dependent safety functions in connection with the SM 301 safety module.

Encoder type			HTL incremental				TTL incremental			SinCos absolute value
Product key			IG128-24V-H	IG512-24V-H	IG1024-24V-H	IG2048-24V-H	IG512-5V-T	IG1024-5V-T	IG2048-5V-T	AM1024-8V-H
Encoder type										Multi-turn
Pulses										
			128	512	1024	2048	512	1024	2048	1024
Output signals			HTL				TTL			1 Vss
Interfaces										
			A, B track	A, B, N track and inverted						Hiperface
Absolute revolutions										
			0							4096
Accuracy										
		[°]	-22.5 ... 22.5	-2 ... 2						-0.8 ... 0.8
Min. input voltage										
DC	U _{in,min}	[V]	8.00				4.75			7.00
Max. input voltage										
DC	U _{in,max}	[V]	26.0	30.0			5.25			12.0
Max. current consumption										
	I _{max}	[A]	0.040	0.15						0.080
Limit frequency										
	f _{max}	[kHz]	30.0	160			300			200
Inverter assignment										
			E84AVSC E84AVHC	E84AVHC			E84AVTC E94A ECS EVS93			

Inverters

- Inverter Drives 8400 StateLine (E84AVSC)
- Inverter Drives 8400 HighLine (E84AVHC)
- Inverter Drives 8400 TopLine (E84AVTC)

Servo-Inverters

- Servo Drives 9400 (E94A)
- 9300 servo inverters (EVS93)
- Servo Drives ECS

MF three-phase AC motors

Accessories



Blowers

- The use of a blower enables operation below 20 Hz without torque derating.

Rated data for 50 Hz

Size	Number of phases	Connection method						
Motor								
			U _{min}	U _{max}	P _{max}	I _{max}	m	
			[V]	[V]	[kW]	[A]	[kg]	
063	1		230	277	0.027	0.11	2.00	
	3	Δ	200	303	0.028	0.12		
		Y	346	525		0.070		
071	1		230	277	0.027	0.10	2.10	
	3	Δ	200	303	0.031	0.11		
		Y	346	525		0.060		
080	1		230	277	0.029	0.11	2.30	
	3	Δ	200	303	0.031			
		Y	346	525		0.060		
090	1		220	277	0.065	0.29	2.70	
	3	Δ	200	303	0.091	0.38		
		Y	346	525		0.22		
100	1		220	277	0.066	0.28	3.00	
	3	Δ	200	303	0.091	0.37		
		Y	346	525		0.22		
112	1		220	277	0.071	0.28	3.10	
	3	Δ	200	303	0.097	0.35		
		Y	346	525		0.20		
132	1		230	277	0.098	0.40	4.20	
	3	Δ	200	303	0.12	0.58		
		Y	346	525		0.33		
160	1		230	277	0.25	0.97	6.20	
	3	Δ	200	303		0.87		
		Y	346	525		0.50		
180	1		230	277		0.97	0.87	8.00
	3	Δ	200	303				
		Y	346	525				

MF three-phase AC motors

Accessories



Blowers

Rated data for 50 Hz

Size	Number of phases	Connection method					
Motor							
			U _{min}	U _{max}	P _{max}	I _{max}	m
			[V]	[V]	[kW]	[A]	[kg]
200	1		230	277	0.25	0.97	8.00
	3	Δ	200	303		0.87	
		Y	346	525		0.50	
225	3	Δ	200	400	0.28	1.10	15.0
		Y	346	525	0.17	0.35	

Rated data for 60 Hz

Size	Number of phases	Connection method					
Motor							
			U _{min}	U _{max}	P _{max}	I _{max}	m
			[V]	[V]	[kW]	[A]	[kg]
063	1		230	277	0.032	0.12	2.00
	3	Δ	220	332	0.028	0.10	
		Y	380	575		0.060	
071	1		230	277	0.033	0.12	2.10
	3	Δ	220	332	0.029	0.10	
		Y	380	575		0.060	
080	1		230	277	0.037	0.14	2.30
	3	Δ	220	332	0.034	0.10	
		Y	380	575		0.060	
090	1		220	277	0.065	0.25	2.70
	3	Δ		332	0.077	0.33	
		Y	380	575		0.19	
100	1		220	277	0.075	0.30	3.00
	3	Δ		332	0.087	0.31	
		Y	380	575		0.18	
112	1		220	277	0.094	0.37	3.10
	3	Δ		332	0.10	0.31	
		Y	380	575		0.18	
132	1		230	277	0.15	0.57	4.20
	3	Δ	220	332		0.44	
		Y	380	575		0.25	
160	3	Δ	220	332	0.36	0.93	6.20
Y		380	575	0.56			
180		Δ	220	332		0.93	8.00
		Y	380	575		0.56	
200		Δ	220	332		0.93	8.00
		Y	380	575		0.56	
225	Δ	220	400	0.28	0.76	15.0	
	Y	380	575	0.26	0.43		

MF three-phase AC motors

Accessories



Temperature monitoring

- The thermal sensors are integrated in the windings. The use of an additional motor protection switch is recommended.

TKO thermal contacts

Function	Operating temperature	Min. reset temperature	Max. reset temperature	Max. input current	Max. input voltage
	T	$T_{\min}$	$T_{\max}$	$I_{\text{in,max}}$	AC $U_{\text{in,max}}$
	-5 ... 5 [°C]				
	[°C]	[°C]	[°C]	[A]	[V]
NC contact	150	90.0	135	2.50	250

PTC thermistor

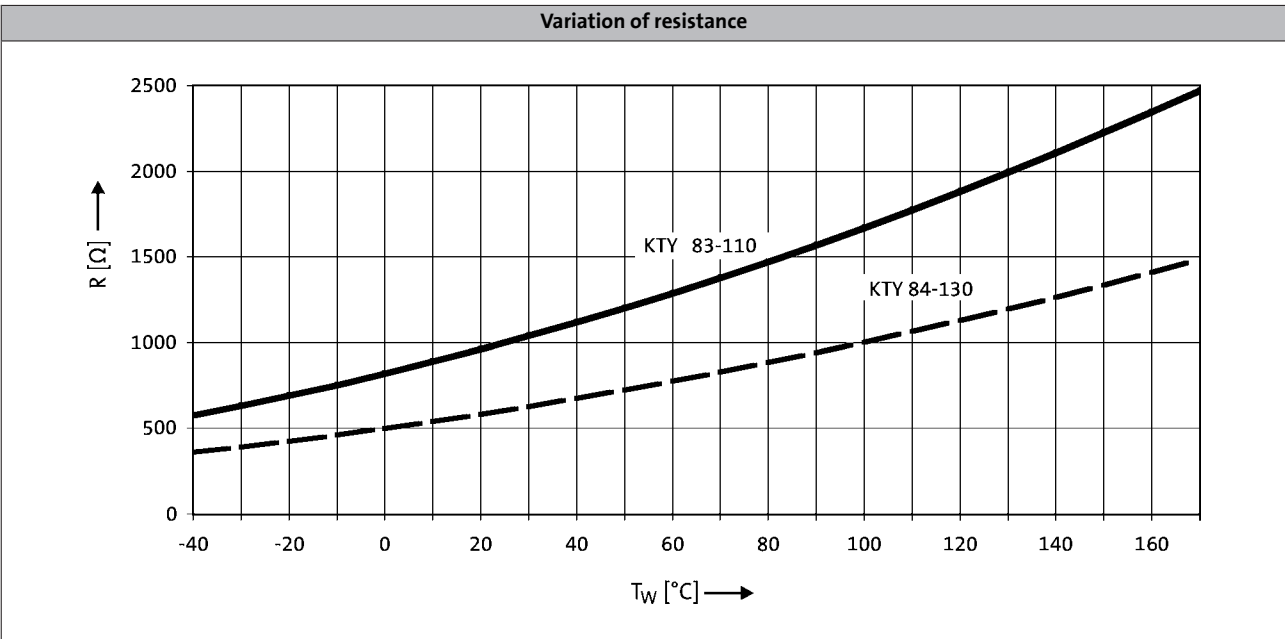
Function	Operating temperature	Rated resistance			Standard
		155 °C	-20 °C	140 °C	
	T	R_N	R_N	R_N	
	-5 ... 5 [°C]				
	[°C]	[Ω]	[Ω]	[Ω]	
Sudden change in resistance	150	550	30.0	250	DIN 44080 DIN VDE 0660 Part 303



Temperature monitoring

KTY temperature sensor

	Function	Rated resistance			Max. input current	
		25 °C	150 °C	170 °C	25 °C	170 °C
		R_N [Ω]	R_N [Ω]	R_N [Ω]	$I_{in,max}$ [A]	$I_{in,max}$ [A]
KTY83-110	Continuous resistance change	1000	2225	2471	0.010	0.002
KTY84-130	Continuous resistance change	603	1334	1482	0.010	0.002



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

MF three-phase AC motors

Accessories



Terminal box

The MF three-phase AC motors are designed specifically for inverter operation. With a base frequency of 120Hz, the rated voltage has been specified at approximately 200 V in delta connection (up to 2.2 kW) and approximately 350V in star configurations.

In the standard version, the motors are connected in the terminal box. As an option, the motors are also available with the connectors described on the following pages as long as the permissible ratings are not exceeded.

Motor terminal box - built-on accessories assignment: 4-pole / 6-pole motors

Motor type	M□□MAXX	M□□MARS M□□MAIG M□□MAAG	M□□MAZE
------------	---------	-------------------------------	---------

Motor frame size	Terminal box		
063-32 063-42	KK1	KK2	
071-32 071-42	KK1	KK2	KK2
080-32 080-42	KK1	KK2	KK2
090-32	KK1	KK2	KK2
100-12 100-32	KK1	KK2	KK2
112-22	KK1	KK2	KK2
132-12 132-22 132-32	KK1	KK3	KK3

Motor type	M□□MABR	M□□MABS M□□MABI M□□MABA	M□□MABZ
------------	---------	-------------------------------	---------

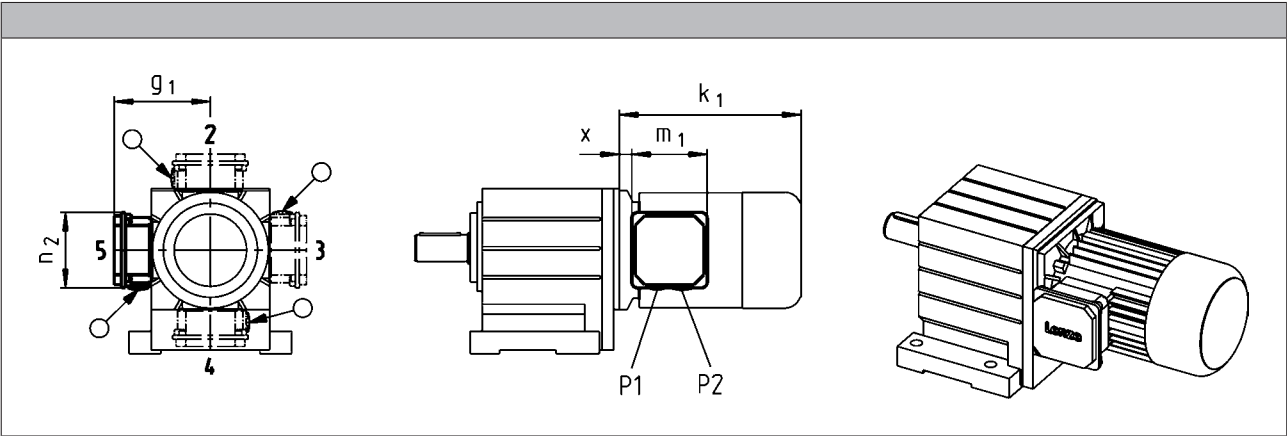
Motor frame size	Terminal box		
063-32 063-42	KK2	KK3	
071-32 071-42	KK2	KK3	KK2
080-32 080-42	KK2	KK3	KK2
090-32	KK2	KK3	KK2
100-12 100-32	KK2	KK3	KK2
112-22	KK2	KK3	KK2
132-12 132-22 132-32	KK3	KK3	KK3



Terminal box

Dimensions of KK1

- For motors with motor terminal box KK1, the connector position can be selected in accordance with the terminal box position.
- If preferred positions are not specified in the order, the cable entry will be positioned as circled on the diagram below.



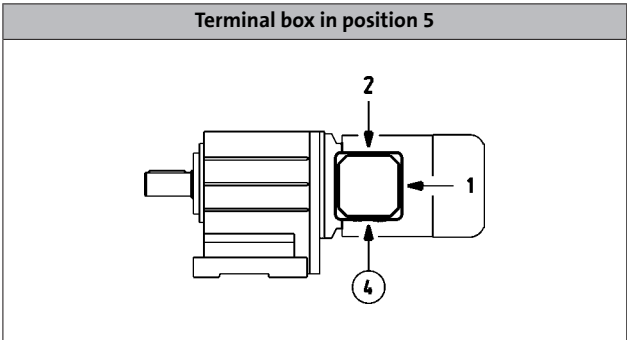
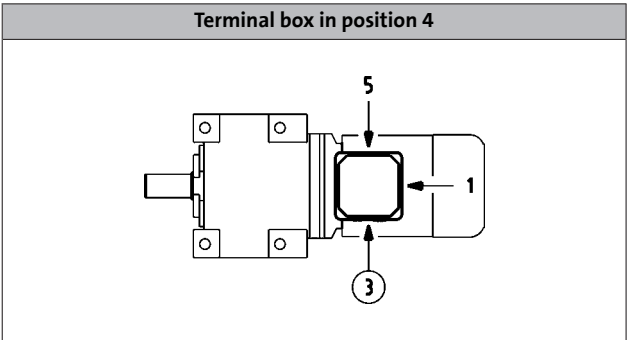
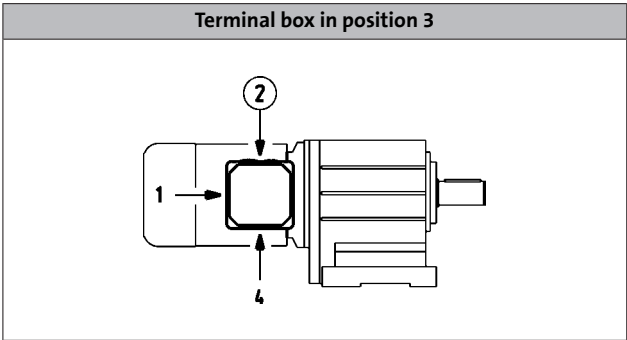
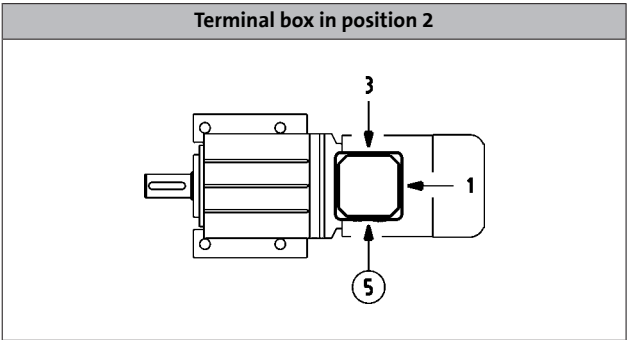
Size						
Motor						
	x	g ₁	m ₁	n ₂	P ₁	P ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	21	100	75.0 93.0 ¹⁾	75.0 93.0 ¹⁾	M16x1.5 M20x1.5 ¹⁾	M20x1.5 M20x1.5
071	12 ¹⁾	117 ¹⁾				
	24	109	115	115	M20x1.5	M25x1.5
080	15 ¹⁾	126 ¹⁾				
090	14	150				
100	19	157				
112	20	166	122	122	M32x1.5	M32x1.5
132	22	176				
	33	195				

¹⁾ UL/CSA approval: cURus



Terminal box

Cable entry position when using KK1



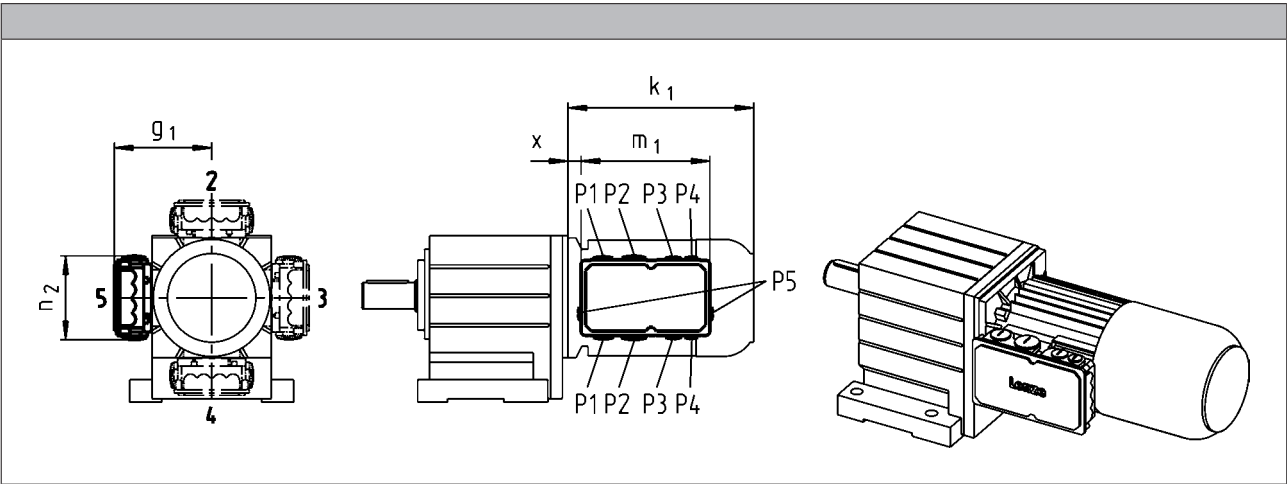
MF three-phase AC motors

Accessories



Terminal box

Dimensions of KK2

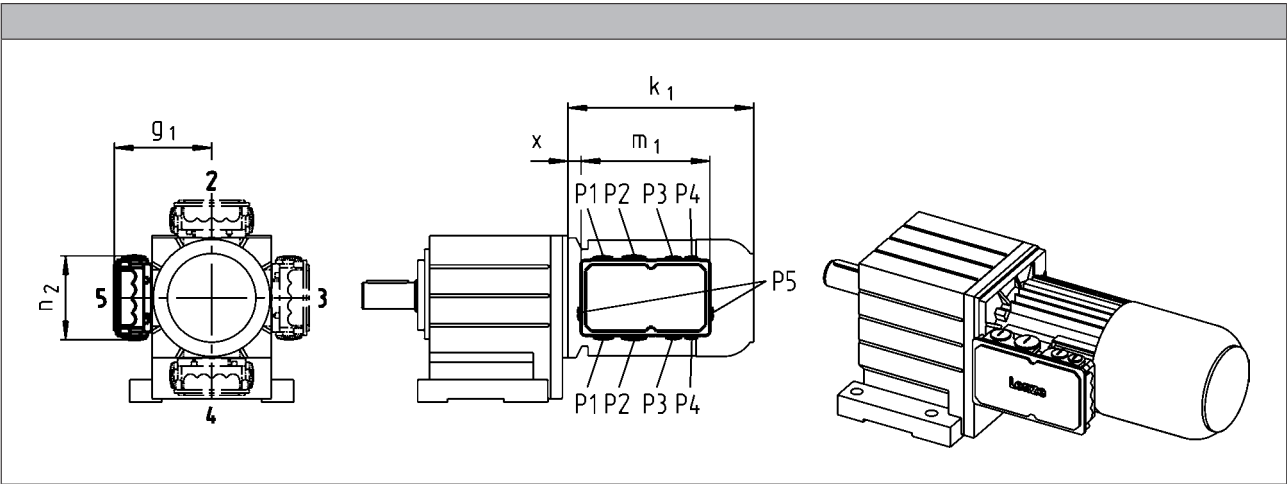


Size						
Motor						
	x	g ₁	m ₁	n ₂	P ₁	P ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	13	107	136	103	M16x1.5	M20x1.5
071	15	118				
080	17	132				
090	22	137	152	121	M20x1.5	M25x1.5
100	23	147				
112	25	158				



Terminal box

Dimensions of KK3



Size									
Motor									
	x	g ₁	m ₁	n ₂	P ₁	P ₂	P ₃	P ₄	P ₅
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	2	124	195	125	M25x1.5	M32x1.5	M20x1.5	M20x1.5	
071	5	133							
080	15	142							
090	20	147							
100	21	158							
112	23	168							
132	38	187	226	127	M50x1.5	M16x1.5		M16x1.5	
160	35	210							
180	73	230							
225	95	346	354	205		M63x1.5 ¹⁾	M50x1.5 ¹⁾		M16x1.5

¹⁾ Cable entry only possible at one position.
Terminal box position 2: cable entry at position 5.
Terminal box position 3: cable entry at position 2.
Terminal box position 4: cable entry at position 3.
Terminal box position 5: cable entry at position 4.

MF three-phase AC motors

Accessories

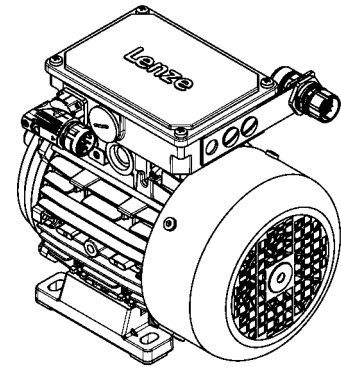


Plug connectors

ICN, HAN and M12 connectors (only for IG128-24V-H incremental encoder) are available for the three-phase AC motors.

ICN connector

A connector is used for power, brake and temperature monitoring. The connections to the feedback system and the blower each employ a separate connector.



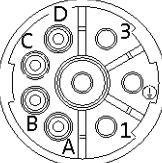
Connection for power, brake and temperature monitoring

The connectors can be rotated through 270° and are fitted with a bayonet catch for SpeedTec connectors. As this connector is also compatible with conventional union nuts, existing mating connectors can continue to be used without difficulty. The motor connection is determined in the terminal box and must be checked before commissioning.

► ICN 6-pole

Pin assignment			
Contact	Designation	Meaning	
1	BD1 / BA1	Brake +/AC	
2	BD2 / BA2	Brake /AC	
PE	PE	PE conductor	
4	U	Phase U power	
5	V	Phase V power	
6	W	Phase W power	

► ICN 8-pole

Pin assignment			
Contact	Designation	Meaning	
1	U	Phase U power	
PE	PE	PE conductor	
3	V	Phase V power	
4	W	Phase W power	
A	TB1 / TP1 / R1	Thermal sensor: TKO/PTC/ +KTY	
B	TB2 / TP2 / R2	Thermal sensor: TKO/PTC/ -KTY	
C	BD1 / BA1	Brake +/AC	
D	BD2 / BA2	Brake /AC	

MF three-phase AC motors

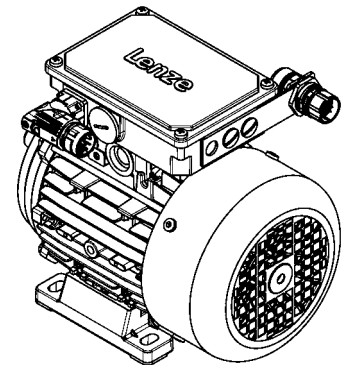
Accessories



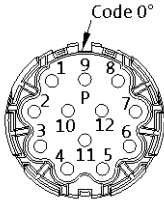
ICN connector

Feedback connection

All encoder systems (apart from IG128-24V-H) are also available with an ICN connector fixed to the motor terminal box for exceptionally fast commissioning. The connectors are fitted with a bayonet fixing, which is also compatible with conventional union nuts. Existing mating connectors can therefore continue to be used without difficulty.

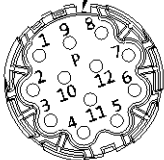


► Resolver

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	



MF three-phase AC motors

Accessories



ICN connector

Motor terminal box with ICN connectors - built-on accessories assignment: 4-pole / 6-pole motors

Motor type	M□□MAXX	M□□MARS M□□MAIG M□□MAAG	M□□MAZE
------------	---------	-------------------------------	---------

Motor frame size	Terminal box		
063-32 063-42	KK1	KK2	
071-32 071-42	KK1	KK2	KK2
080-32 080-42	KK1	KK2	KK2
090-32	KK1	KK2	KK2
100-12 100-32	KK1	KK2	KK2

Motor type	M□□MABR	M□□MABS M□□MABI M□□MABA	M□□MABZ
------------	---------	-------------------------------	---------

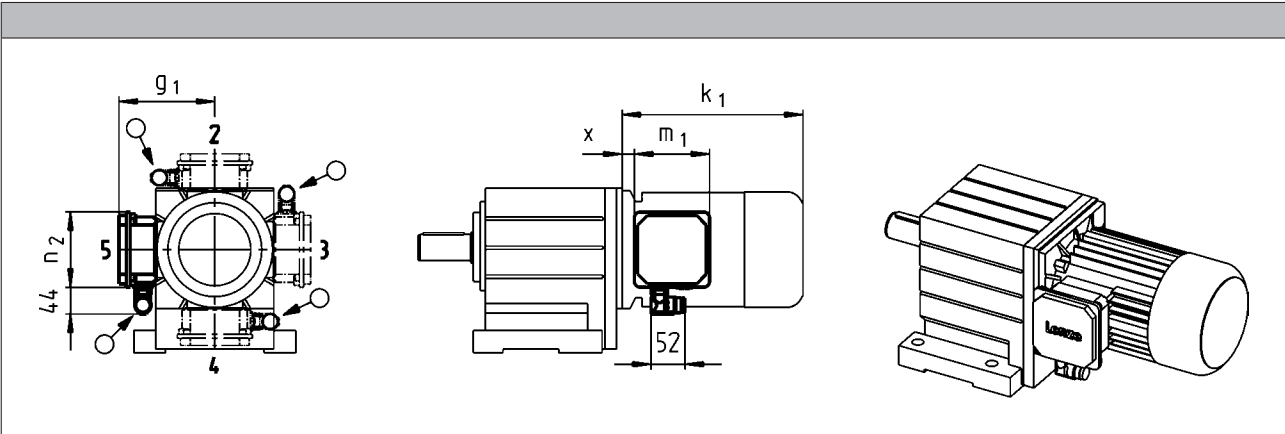
Motor frame size	Terminal box		
063-32 063-42	KK2	KK3	
071-32 071-42	KK2	KK3	KK2
080-32 080-42	KK2	KK3	KK2
090-32	KK2	KK3	KK2
100-12 100-32	KK2	KK3	KK2



ICN connector

Dimensions of KK1

- For motors with connectors, the connector position can be selected in accordance with the terminal box position.
- If preferred positions are not specified in the order, the connector will be positioned as circled on the diagram below.

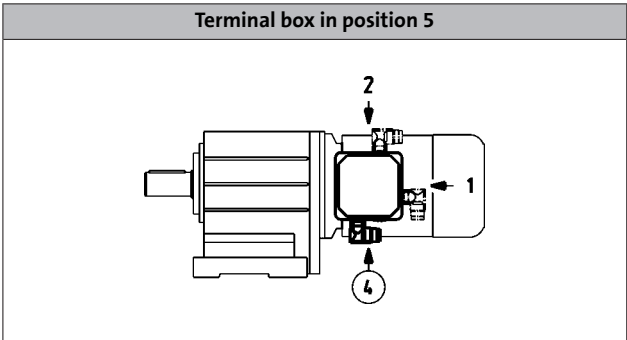
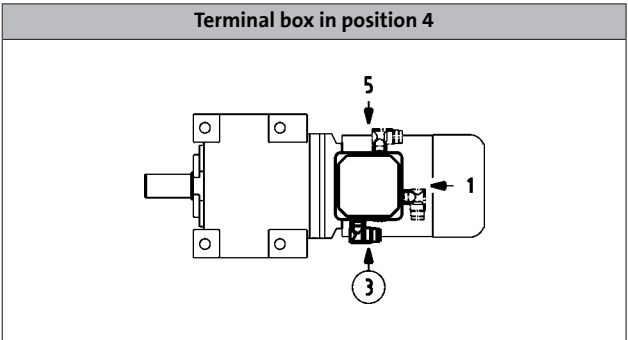
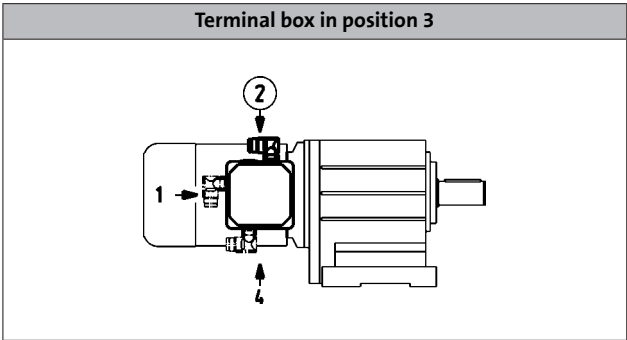
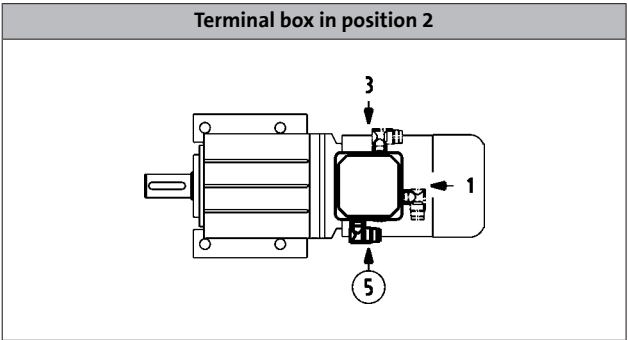


Size				
Motor				
	x	g ₁	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]
063	12	117	93.0	93.0
071	15	126		
080	14	150		
090	19	157	115	115
100	20	166		
112	22	176		
132	33	195	122	122



ICN connector

Connector position when using KK1

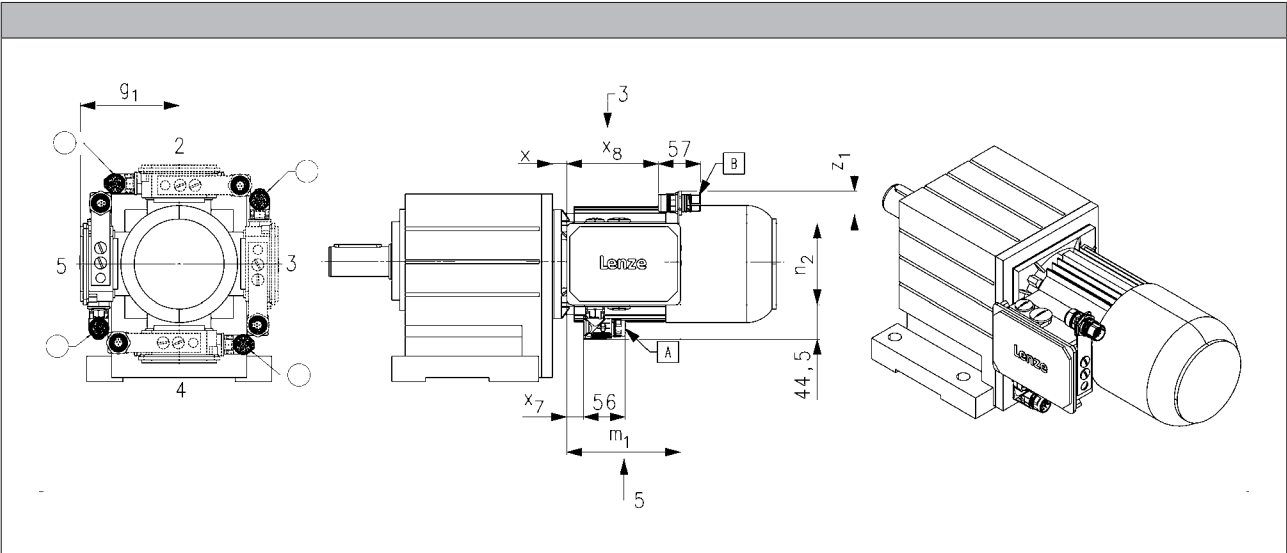




ICN connector

Dimensions of KK2/KK3

- For motors with connectors, the connector position can be selected in accordance with the terminal box position.
- If preferred positions are not specified in the order, the connector will be positioned as circled on the diagram below.

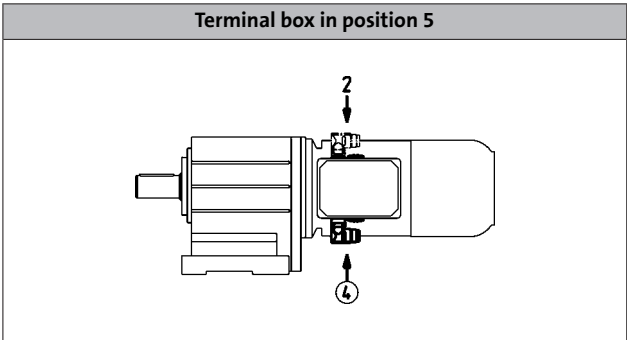
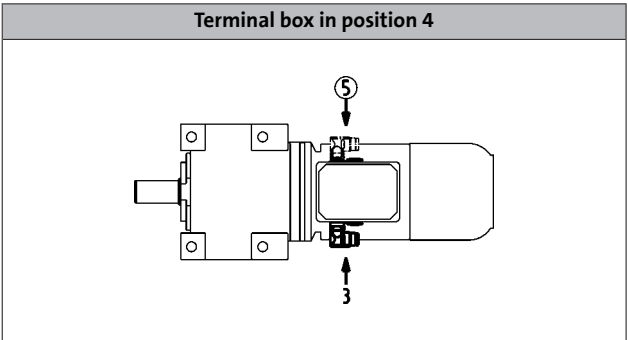
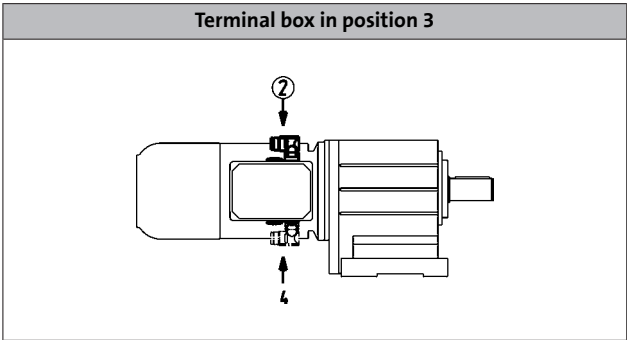
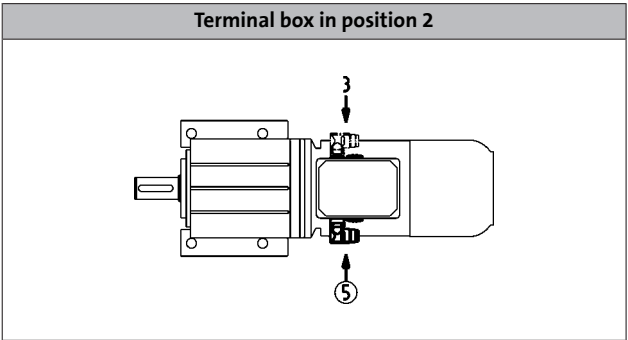


Size							
Motor							
	x	g ₁	m ₁	n ₂	x ₇	x ₈	z _{1, max}
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	13	107	136	103	16	109	43
071	15	118					
080	17	132	152	121	23	125	41
090	22	137					
100	23	147					
112	25	158	195	125	27	166	71
132	38	187					



ICN connector

Connector position when using KK2/KK3



MF three-phase AC motors

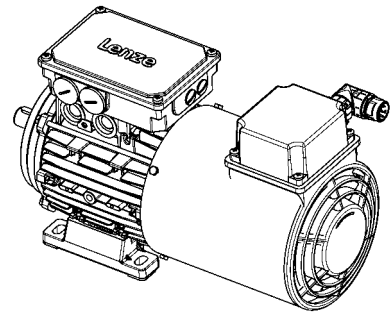
Accessories



ICN connector

Blower connection

The blower is also optionally available with an ICN connector fixed to the terminal box of the blower for exceptionally fast commissioning. The connectors are fitted with a bayonet fixing, which is also compatible with conventional union nuts. Existing counter plugs can therefore continue to be used without difficulty.



► Blower 1-ph

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

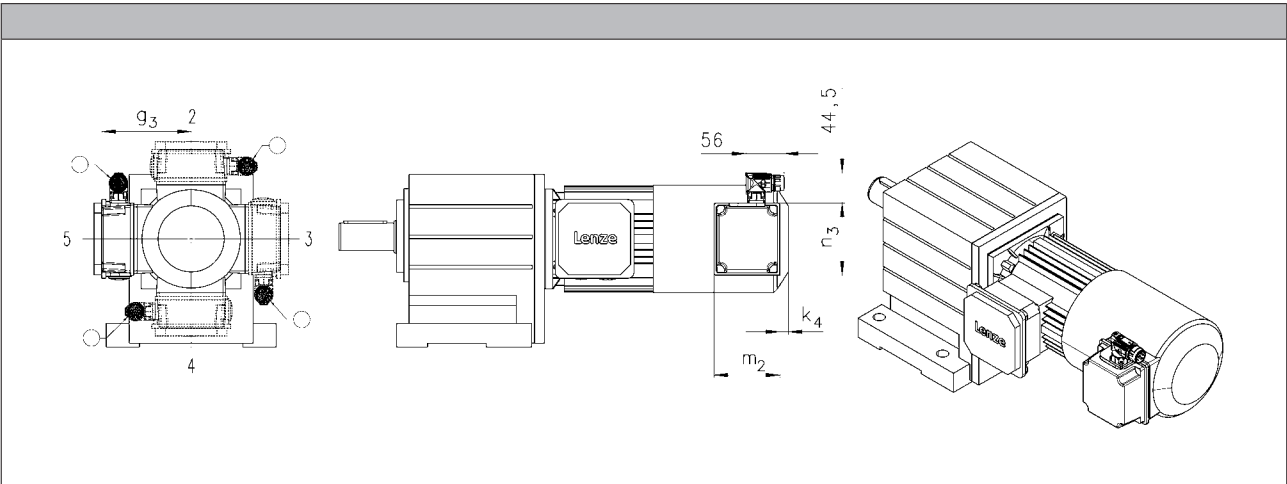
► Blower 3-ph

Pin assignment			
Contact	Designation	Meaning	
PE	PE	PE conductor	
1	U	Phase U power	
2		Not assigned	
3	V	Phase V power	
4		Not assigned	
5			
6	W	Phase W power	



ICN connector

Dimensions of blower



Size				
Motor				
	k ₄	g ₃	m ₂	n ₃
	[mm]	[mm]	[mm]	[mm]
063	12	115	95	105
071		122		
080	13	132	96	106
090	22	141	95	105
100		150		
112		162		
132		182		
160	31	209	96	106
180				
225				

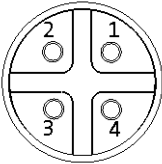
- In addition, the cover of the blower terminal box (including connectors) can be rotated progressively through 90° if necessary.



M12 connector

IG128-24V-H incremental encoder connection

As a standard this incremental encoder is equipped with a connection cable of about 0.5 m length and with a common industry standard M12 connector at its end.

Pin assignment			
Contact	Designation	Meaning	
1	+U _B	Supply +	
2	B	Track B	
3	GND	Mass	
4	A	Track A	

MF three-phase AC motors

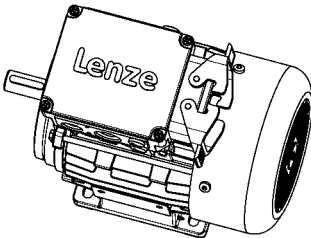
Accessories



HAN connector

10E

In the case of the rectangular HAN-10E connectors, all six ends of the three winding phases are taken out to the power contacts. The motor circuit is therefore determined in the mating connector.



Pin assignment		
Contact	Meaning	
1	Terminal board: U1	
2	Terminal board: V1	
3	Terminal board: W1	
4	Brake +/-AC	
5	Brake -/AC	
6	Terminal board: W2	
7	Terminal board: U2	
8	Terminal board: V2	
9	Thermal sensor: +KTY/PTC/TKO	
10	Thermal sensor: KTY/PTC/TKO	

MF three-phase AC motors

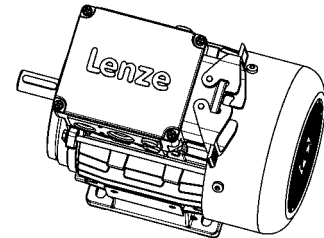
Accessories



HAN connector

Modular

The connector is available with two different power modules (16 A or 40 A), depending on the rated motor current. The motor connection is determined in the terminal box and must be checked before commissioning.



► HAN modular 16 A

Pin assignment			
Module	Contact	Meaning	
B		Dummy module	
C	1	Thermal sensor: +KTY/PTC/TKO	
	2	Brake +/AC	
	3	Brake -/AC	
	4	Rectifier: Switching contact	
	5		
	6	Thermal sensor: KTY/PTC/TKO	

► HAN modular 40 A

Pin assignment			
Module	Contact	Meaning	
A	1	Terminal board: U1	
	2	Terminal board: V1	
	3	Terminal board: W1	
B		Dummy module	
C	1	Thermal sensor: +KTY/PTC/TKO	
	2	Brake +/AC	
	3	Brake -/AC	
	4	Rectifier: Switching contact	
	5		
	6	Thermal sensor: KTY/PTC/TKO	

MF three-phase AC motors

Accessories



HAN connector

Motor type		
	M□□MAXX M□□MABR	M□□MAZE M□□MABZ

Motor frame size	Terminal box with HAN connector	
063-32 063-42	HAN-10E HAN modular	
071-32 071-42	HAN-10E HAN modular	HAN-10E HAN modular
080-32 080-42	HAN-10E HAN modular	HAN-10E HAN modular
090-32	HAN-10E HAN modular	HAN-10E HAN modular
100-12 100-32	HAN-10E HAN modular	HAN-10E HAN modular
112-22		
132-12 132-22 132-32	HAN modular	HAN modular

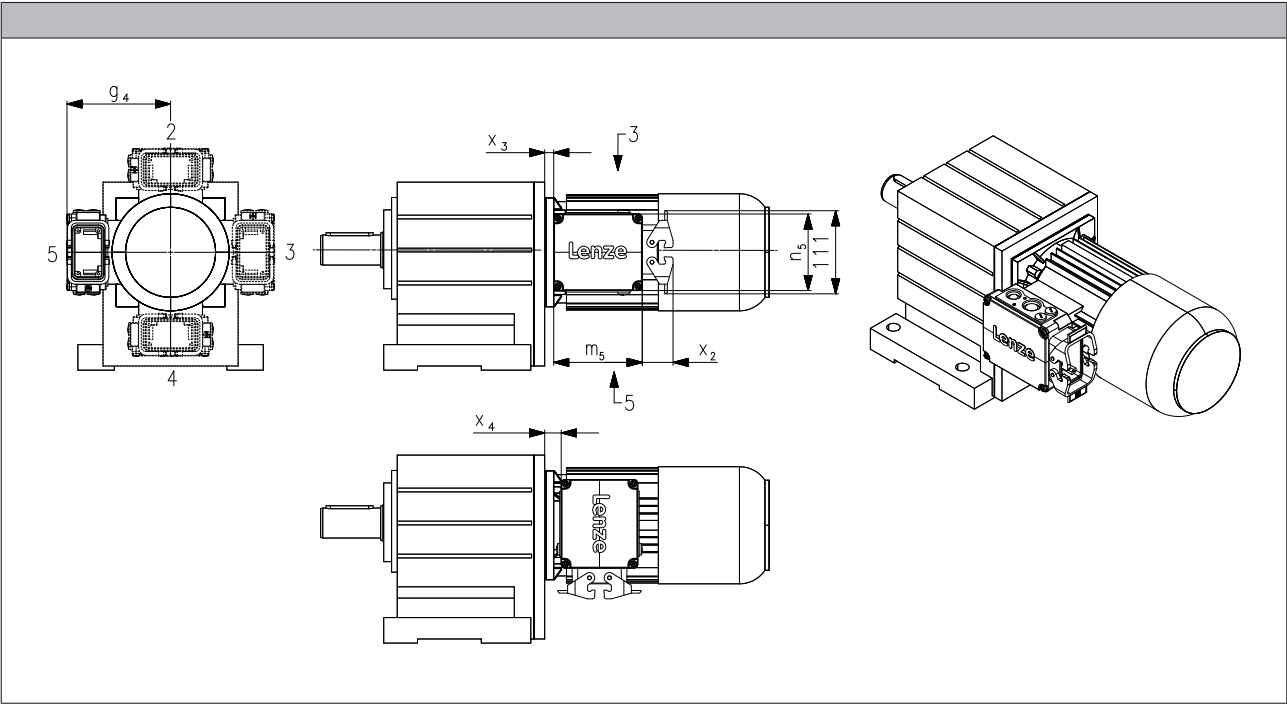
Motor terminal box with HAN connectors - built-on accessories as-
signment: 4-pole / 6-pole motors



HAN connector

Dimensions

- For motors with connectors, the connector position can be selected in accordance with the terminal box position.
- Unless the connector position is specified, it will be supplied in position 1.

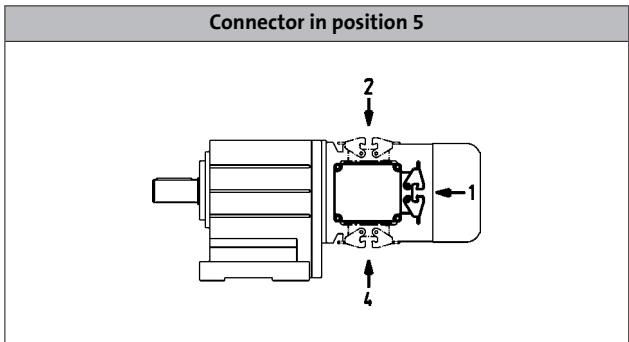
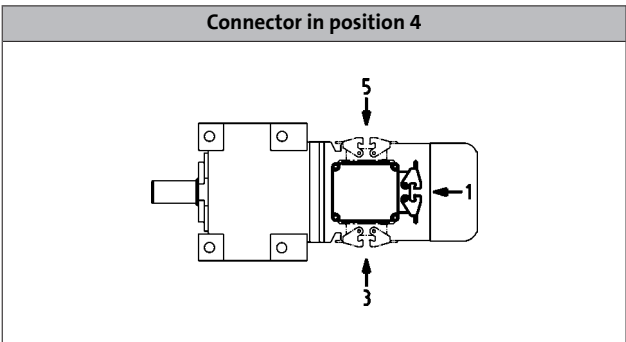
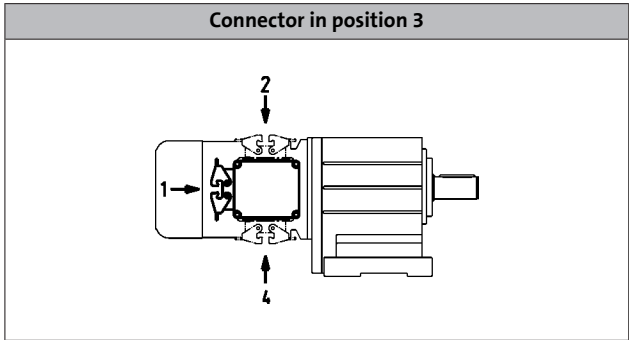
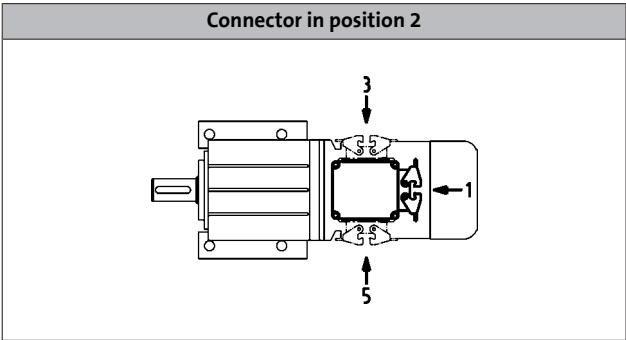


Size			
Motor			
	g ₄	x ₃	x ₄
	[mm]	[mm]	[mm]
063	120	5.00	6.00
071	129	7.00	8.00
080	138	11.0	19.0
090	143	15.0	23.0
100	154	16.0	24.0
112	164	13.5	21.5
132	233	34.5	4.50
160	248	39.0	9.00



HAN connector

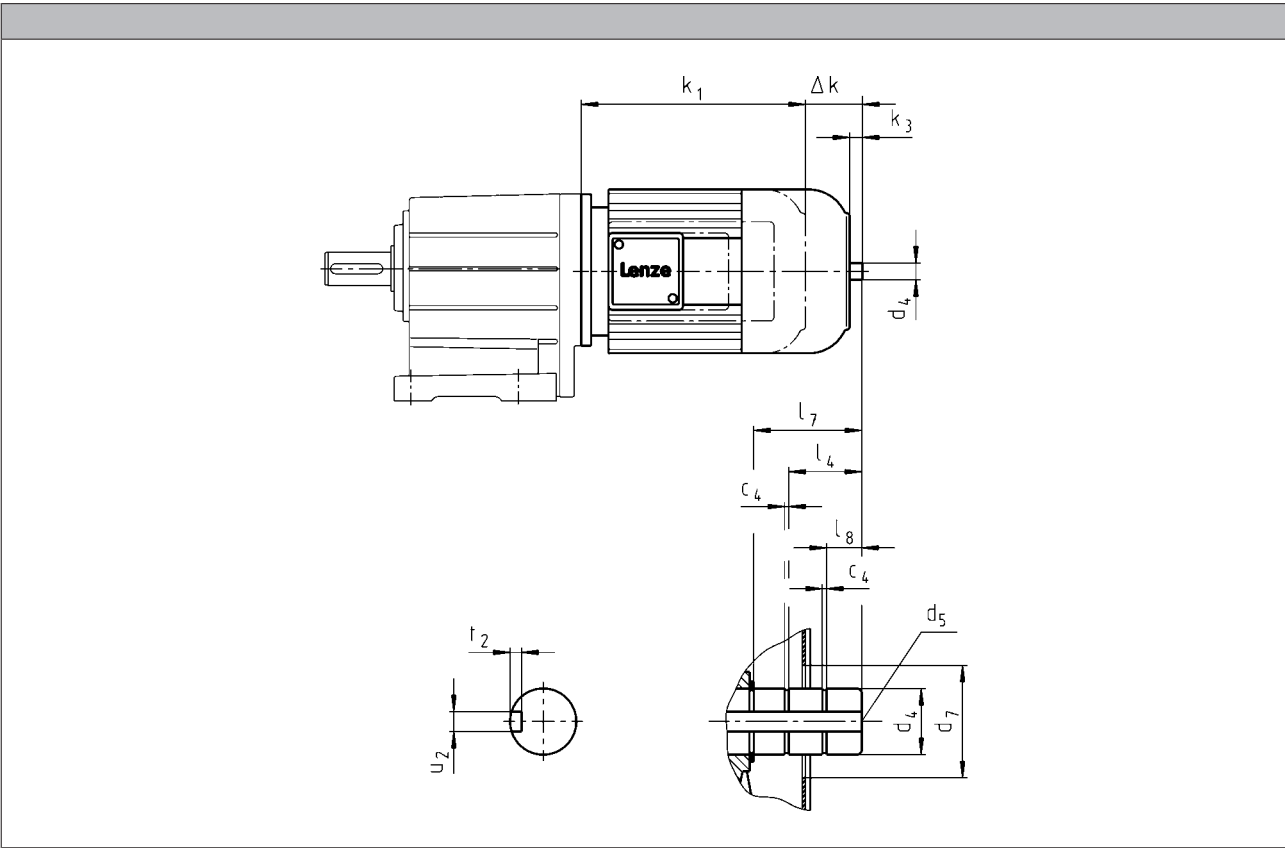
Position of connector





2nd shaft end

Dimensions, self-ventilated (4/6-pole)



Motor type	M□□MAZE M□□MABZ
Built-on accessories	

Motor frame size												
	Δ k	k ₃	c ₄	d ₄	d ₄	d ₅	d ₇	l ₄	l ₇	l ₈	u ₂	t ₂
	[mm]	[mm]	[mm]	h6	j6	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071-32 071-42	47	11.0	1.10	14.0		M5	34.0		19.0	3.00	5.00	3.00
080-32 080-42	68	9.00	1.10	14.0		M5	34.0		19.0	4.50	5.00	3.00
090-32	57	9.00	1.10	14.0		M5	34.0		19.0	5.00	5.00	3.00
100-12 100-32	71	18.5	1.30		20.0	M6	34.0	17.0	32.5	10.5	6.00	3.50
112-22	84	16.0	1.30		20.0	M6	34.0	17.0	28.5	7.00	6.00	3.50
132-12 132-22 132-32	101	24.5	1.60		30.0	M10	46.0	24.5	42.0	8.50	8.00	4.00

¹⁾ During operation, appropriate measures must be taken to make fan cover opening safe.

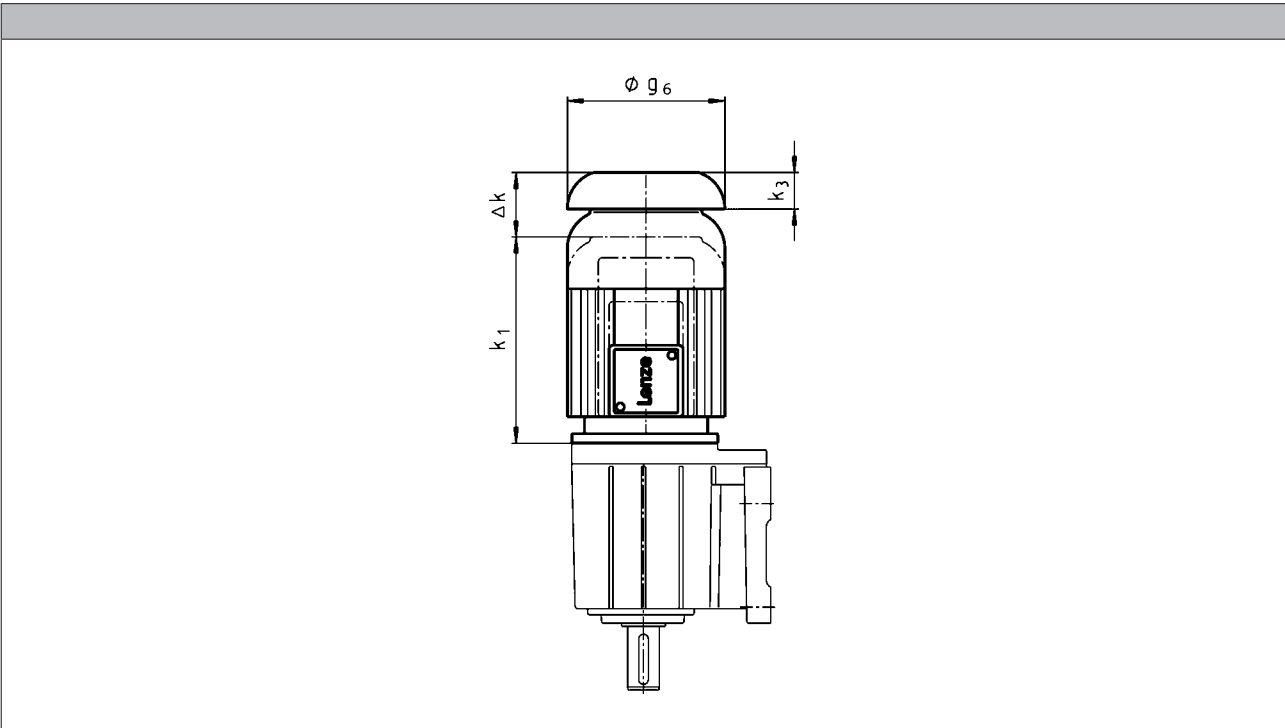
MF three-phase AC motors

Accessories



Protection cover

Dimensions, self-ventilated (4/6-pole)

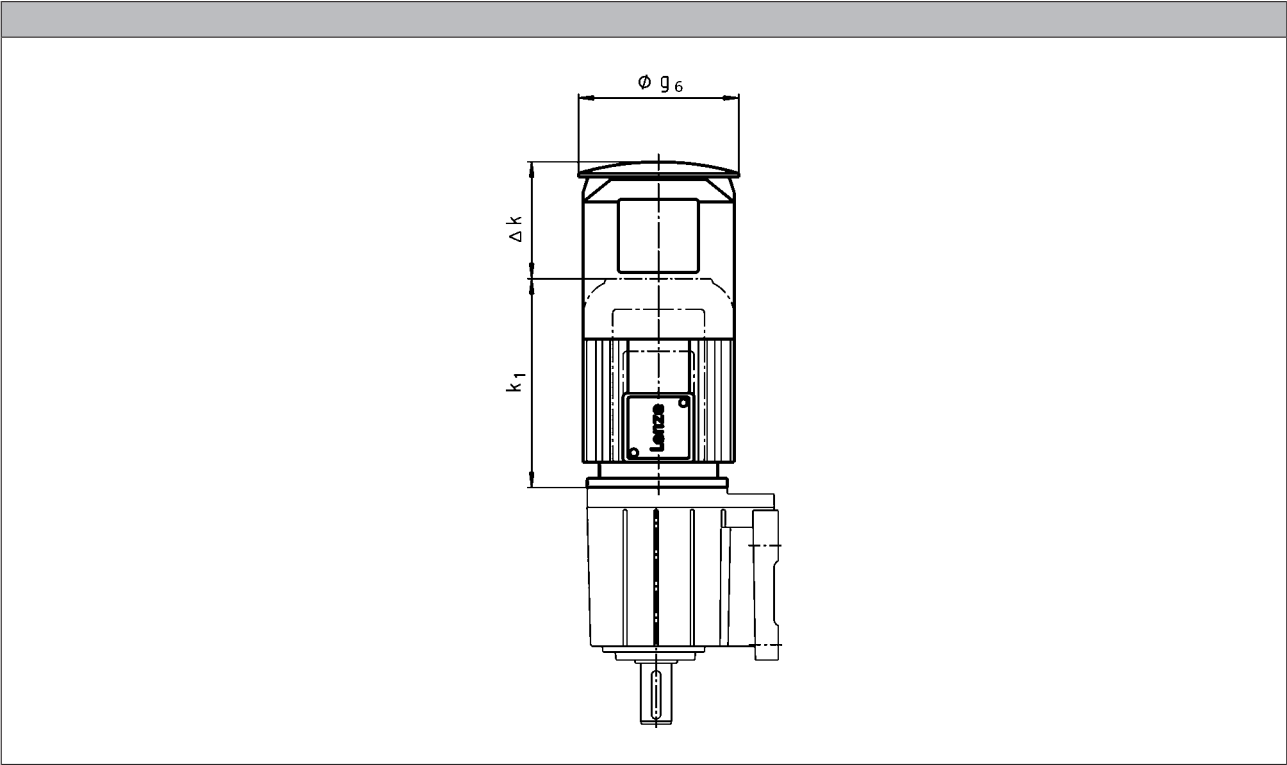


Motor type						
	M□□MAXX	M□□MABR	M□□MABS M□□MABI M□□MABA	M□□MARS M□□MAIG M□□MAAG		
Motor frame size	Δ k	Δ k	Δ k	Δ k	k ₃	g ₆
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063-32 063-42	26	66	129	82	11.0	123
071-32 071-42	26	78	122	78	12.0	138
080-32 080-42	26	99	137	127	16.0	156
090-32	26	94	131	113	15.0	176
100-12 100-32	31	107	132	112	17.0	194
112-22	31	121	151	111	18.0	218
132-12 132-22 132-32	31	141	156	134	20.0	257



Protection cover

Dimensions, forced ventilated (4/6-pole)



Motor type				
	M□□MAXX	M□□MABR M□□MABS M□□MABI	M□□MARS M□□MAIG M□□MAAG	
Motor frame size				
	Δ k	Δ k	Δ k	g ₆
	[mm]	[mm]	[mm]	[mm]
063-32 063-42	169	209	169	133
071-32 071-42	165	202	165	150
080-32 080-42	168	224	168	170
090-32	157	210	157	188
100-12 100-32	137	198	137	210
112-22	135	216	216	249
132-12 132-22 132-32	140	226	226	300

MF three-phase AC motors

Accessories



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