L-force catalogue

Automation systems
Drive solutions

Controls
Inverter
Motors
Gearboxes
Engineering Tools

Motors: IE2 MH three-phase AC motors, IE1 MD three-phase AC motors

Gearboxes: g500-H helical gearboxes, g500-S shaft-mounted helical gearbox, g500-B bevel gearbox

Lenze
As easy as that.

Contents of the L-force catalogue

Selected portfolio

Additional portfolio

Lenze makes many things easy for you.

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

1

Developing ideas

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

2

Drafting concepts

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

3

Implementing solutions

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

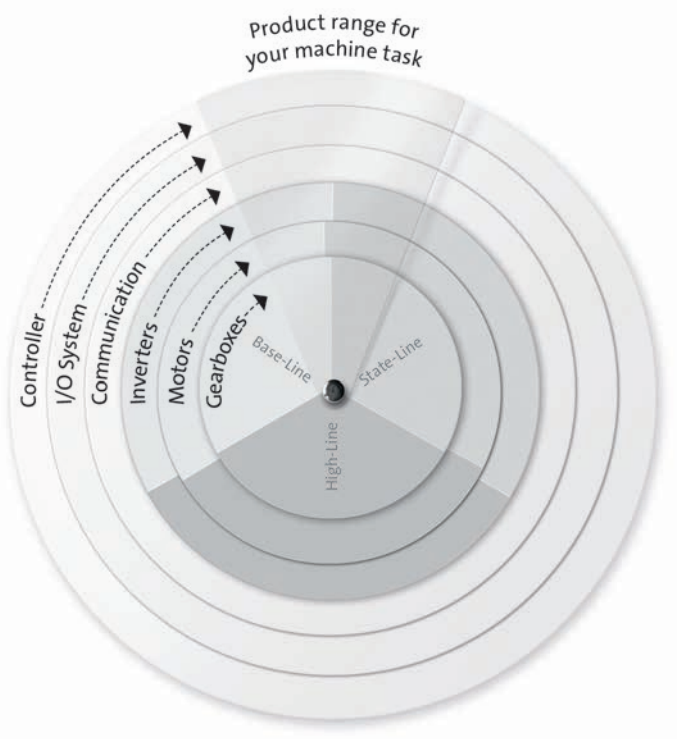
A matter of principle: the right products for every application.

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.

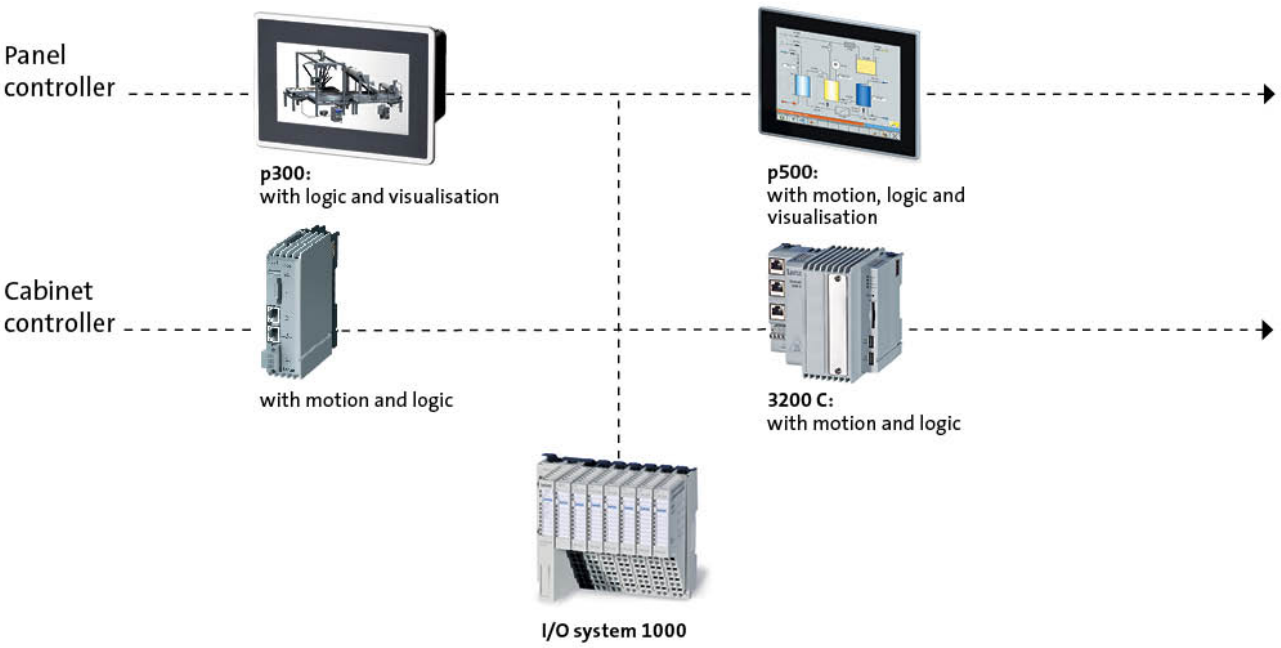
Powerful products with a major impact:
- Easy handling
- High quality and durability
- Reliable technologies in tune with the latest developments

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!

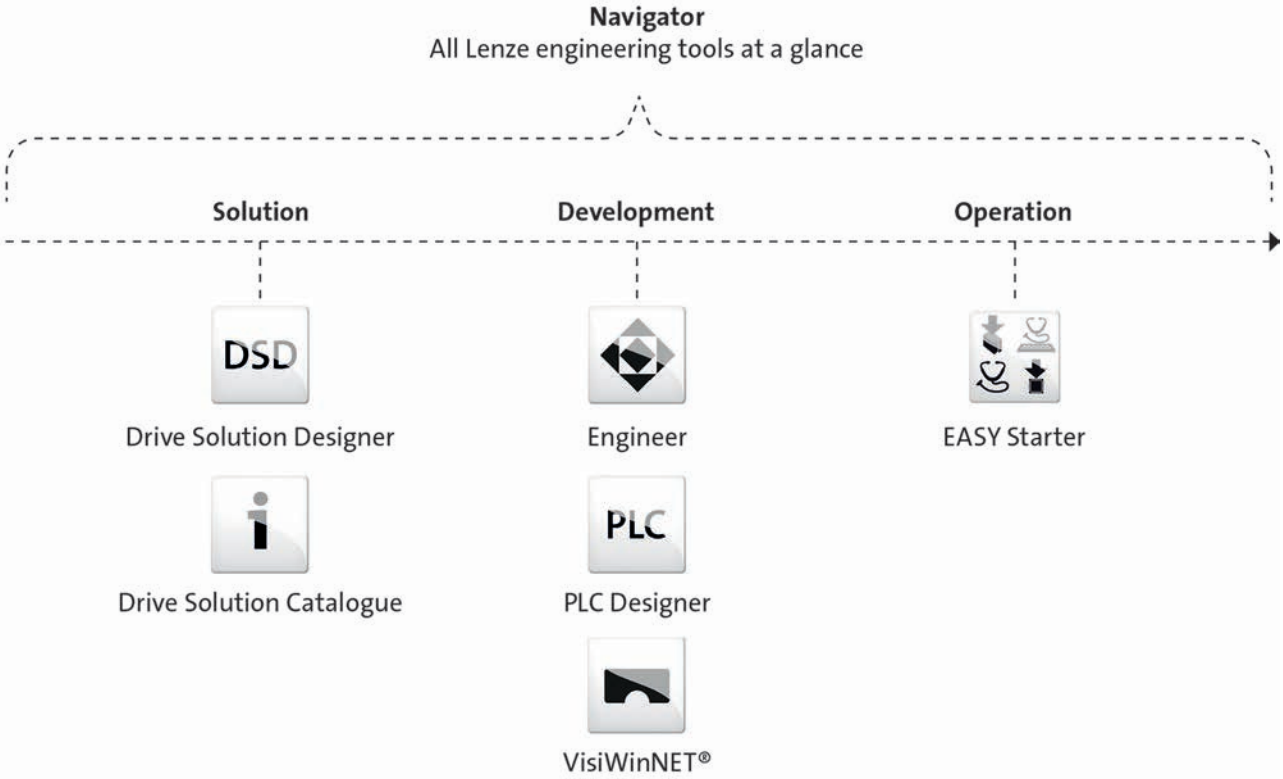


L-force product portfolio

Controls

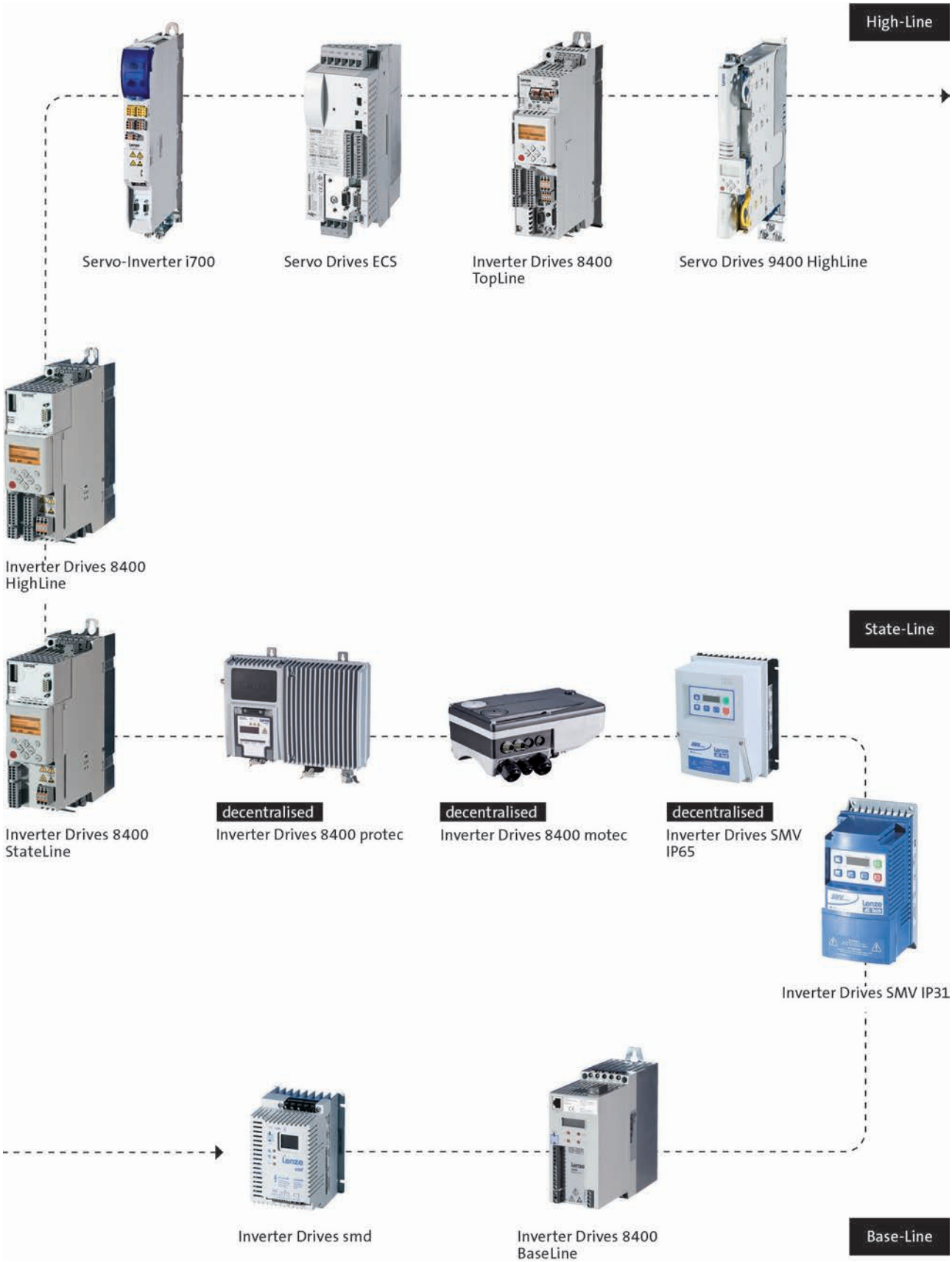


Engineering Tools



L-force product portfolio

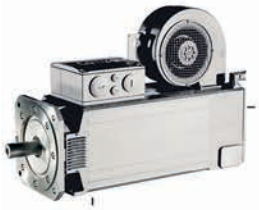
Inverter



L-force product portfolio

Motors

High-Line



MQA asynchronous servo motors

SDSGS synchronous servo motors

MDXKS synchronous servo motors

Synchronous servo motors MCS

Asynchronous servo motors MCA

Asynchronous servo motors SDSGA

State-Line

MF three-phase AC motors

MH three-phase AC motors

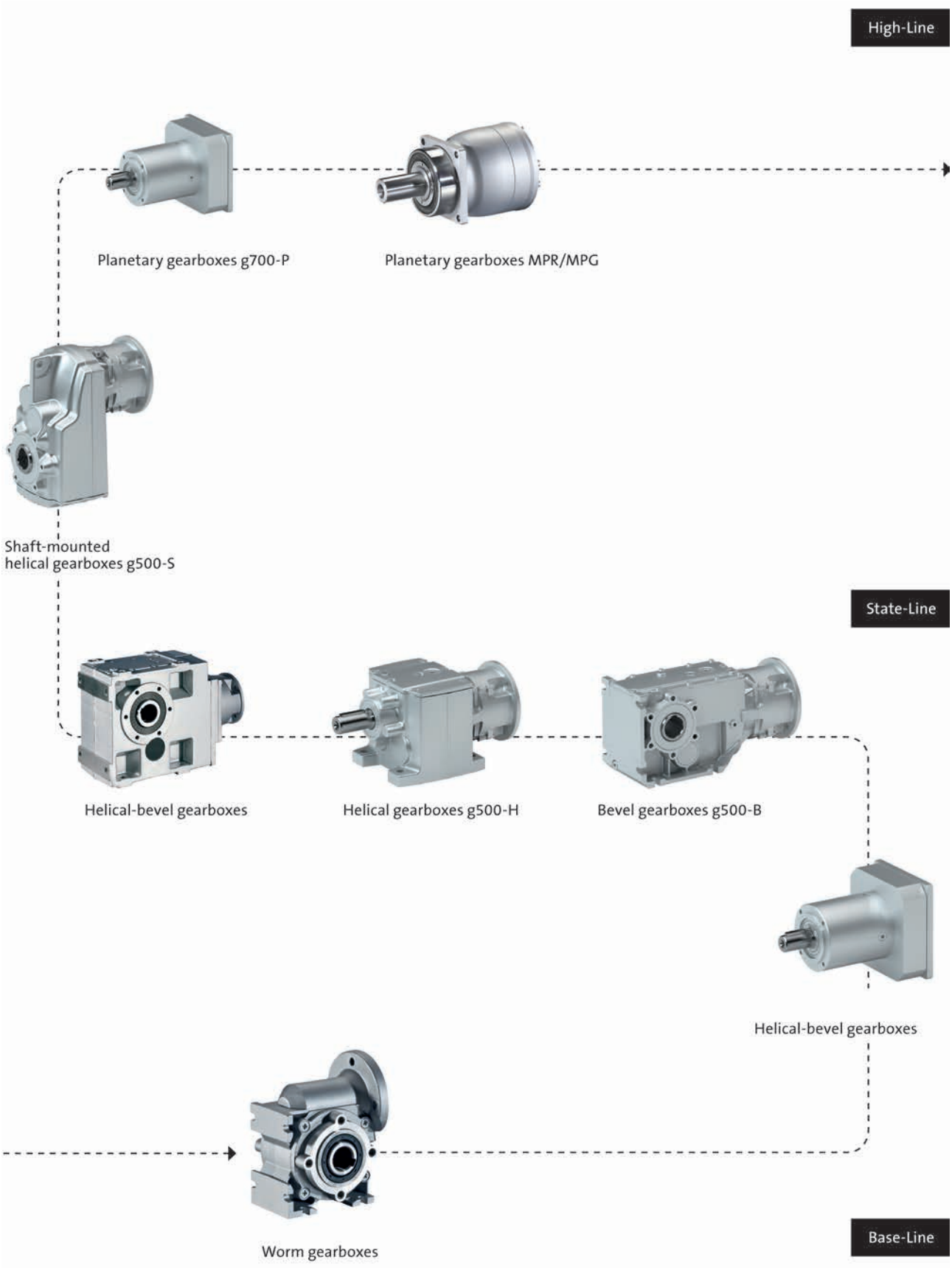
MD three-phase AC motors

Basic MD/MH three-phase AC motors

Base-Line

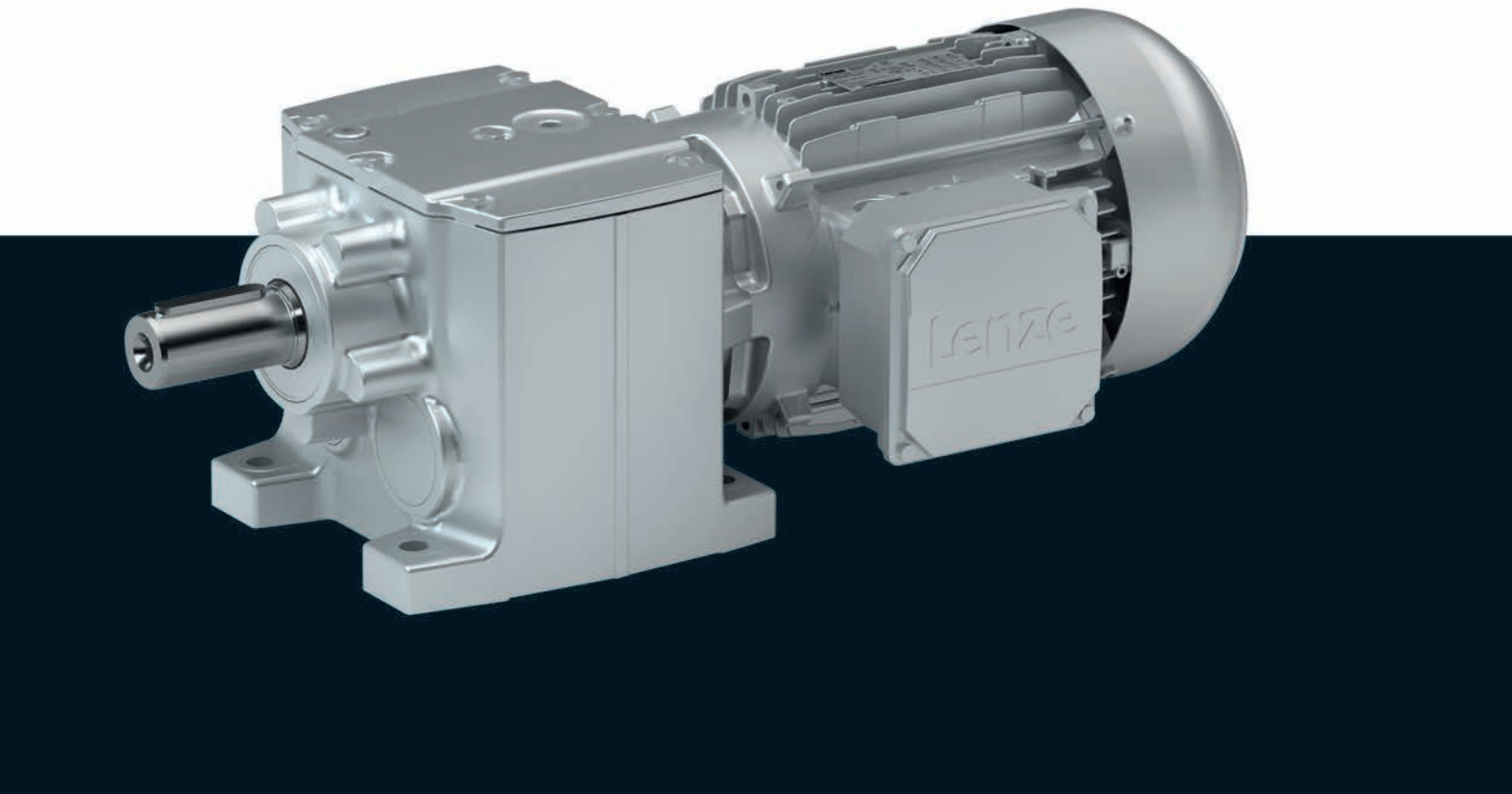
L-force product portfolio

Gearboxes



g500-H helical geared motors

0.06 ... 0.55 kW (efficiency class IE1)
0.75 ... 7.5 kW (efficiency class IE2)



g500-H helical geared motors

Contents

List of abbreviations

α	[rad/s²]	Max. permissible angular acceleration
$\eta_{50\,\%}$	[%]	Efficiency
$\eta_{75\,\%}$	[%]	Efficiency
$\eta_{100\,\%}$	[%]	Efficiency
η_a		Efficiency
$\eta_{c=1}$		Efficiency
c		Load capacity
cos φ		Power factor
du/dt	[kV/µs]	Insulation resistance
$F_{ax,-}$	[N]	Min. axial force
$F_{ax,+}$	[N]	Max. axial force
$F_{ax,max}$	[N]	Max. axial force
$f_{in,max}$	[Hz]	Max. input frequency
f_{max}	[kHz]	Limit frequency
f_{max}	[kHz]	Max. switching frequency
f_N	[Hz]	Rated frequency
$F_{rad,max}$	[N]	Max. radial force
f_z		Additional radial force factor
H_{max}	[m]	Site altitude
I_0	[A]	Standstill current
i		Ratio
$I_{in,max}$	[A]	Max. input current
I_{max}	[A]	Max. current consumption
I_{max}	[A]	Max. current
I_{max}	[A]	Max. current consumption
I_{max}	[A]	Max. current
I_{max}	[A]	Max. short-time DC-bus current
I_{max}	[A]	Max. DC-bus current
I_N	[A]	Rated current
$I_{N,\Delta}$	[A]	Rated current
$I_{N,Y}$	[A]	Rated current
J	[kgcm²]	Moment of inertia
J_{MB}	[kgcm²]	Moment of inertia
$KE_{LL\,150\,°C}$	[V /(1000 r/min)]	Voltage constant
$Kt_{0\,150\,°C}$	[Nm/A]	Torque constant
L_{10}	[h]	Bearing service life
L	[mH]	Mutual inductance
$L_{1\sigma}$	[mH]	Stator leakage inductance
$L_{2\sigma}$	[mH]	Rotor leakage inductance
L_N	[mH]	Rated inductance
m	[kg]	Mass
M_2	[Nm]	Output torque
M_{22}	[Nm]	Output torque
M_0	[Nm]	Stall torque
$M_{0,max}$	[Nm]	Max. standstill torque
$M_{2,GM}$	[Nm]	Output torque
$M_{2,max}$	[Nm]	Max. output torque
$M_{2,not}$	[Nm]	Emergency off-torque

M_a	[Nm]	Starting torque
$M_{a\_,1}$	[Nm]	Starting torque
$M_{a\_,2}$	[Nm]	Starting torque
M_{av}	[Nm]	Average dynamic torque
M_b	[Nm]	Stalling torque
M_B	[Nm]	Braking torque
M_k	[Nm]	Rated torque
M_{max}	[Nm]	Max. torque
M_N	[Nm]	Rated torque
n_2	[r/min]	Output speed
n_{21}	[r/min]	Output speed
n_{22}	[r/min]	Output speed
$n_{1,max}$	[r/min]	Max. gearbox input speed
$n_{1,max\,50\%}$	[r/min]	Max. gearbox input speed
n_{eto}	[r/min]	Transition speed
n_k	[r/min]	Speed
n_{max}	[r/min]	Max. speed
n_N	[r/min]	Rated speed
P_{max}	[kW]	Max. power input
Q_{BW}	[MJ]	Friction energy
Q_E	[J]	Maximum switching energy
Q_E	[KJ]	Maximum switching energy
R_1	[Ω]	Stator impedance
R_2	[Ω]	Rotor impedance
R	[Ω]	Insulation resistance
R	[Ω]	Min. insulation resistance
$R_{UV\,150\,°C}$	[Ω]	Stator impedance
$R_{UV\,20\,°C}$	[Ω]	Stator impedance
$S_{hü}$	[1/h]	Transition operating frequency
t_1	[ms]	Engagement time
t_2	[ms]	Disengagement time
t_{11}	[ms]	Delay time
t_{12}	[ms]	Rise time
T	[°C]	Max. surface temperature
T	[°C]	Min. ambient temperature for transport
T	[°C]	Max. ambient temperature for transport
T	[°C]	Max. ambient temperature of bearing
T	[°C]	Min. ambient storage temperature
T	[°C]	Ambient temperature
T	[°C]	Operating temperature
T	[°C]	Rated temperature
t	[h]	Service life
T_{opr}		Ambient operating temperature
$T_{opr,max}$	[°C]	Max. ambient operating temperature
$T_{opr,min}$	[°C]	Min. ambient operating temperature
t_{re}	[s]	Recovery time
$t_{ü}$	[ms]	Overexcitation time
U_Δ	[V]	Voltage range
U_{AC}	[V]	Mains voltage range

List of abbreviations

U_{AC}	[V]	Mains voltage
$U_{in,max}$	[V]	Max. input voltage
$U_{in,min}$	[V]	Min. input voltage
U_{max}	[V]	Max. input voltage
U_{max}	[V]	Max. mains voltage
U_{min}	[V]	Min. mains voltage
$U_{N, \Delta}$	[V]	Rated voltage
$U_{N, AC}$	[V]	Rated voltage
$U_{N, DC}$	[V]	Rated voltage
$U_{N, Y}$	[V]	Rated voltage
z_g		Number of teeth
Z_{ro}	[Ω]	Rotor impedance
Z_{rs}	[Ω]	Impedance
Z_{so}	[Ω]	Stator impedance
z_t		Number of teeth

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)

Product information

In combination with three-phase AC motors, our 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 robust helical gearboxes feature high permissible radial forces, closely stepped ratios and a low backlash. They are available in 2-pole and 3-pole design with a output torque up to 450 Nm and a ratio of up to i= 370.

Versions

- Fine-scaling of size / torque provides for an optimum machine adaptation
- Standardised shaft and flange dimensions for an easy machine integration
- High efficiency

The right three-phase AC motor for the application

In a power range from 0.06 to 45 kW, Lenze offers an easy-to-scale modular system of robust three-phase AC motors. This modular system comprises three-phase AC motors for the common efficiency classes as well as the m300 Lenze Smart motor.

- IE1 motors up to a power of 0.55 kW
- IE2 motors from 0.75 to 45 kW
- IE3 motors from 7.5 kW to 45 kW,

and for optimum operation in the field of materials handling technology, the Lenze Smart Motor for 1.5 and 5 Nm, thus providing the optimum drives for mains operation.

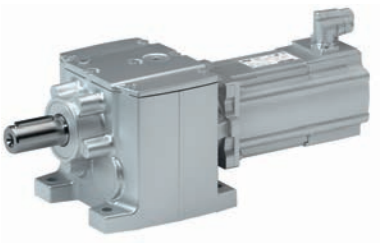
The IE1, IE2 and IE3 motors are designed for operation on an inverter. The same modular system additionally provides an inverter-optimised motor in the power range up to 22 kW for a setting range of 1:24. A scaled modular system offering the optimum solution for each application and which, as decentralised drive solution, in the power range up to 7.5 kW can be equipped with the integrated 8400 motec inverter.

The product name

Gearbox type	Product range		Design	Rated torque [Nm]	Product
Helical gearbox	g500	-	H	45	g500-H45
				100	g500-H100
				140	g500-H140
				210	g500-H210
				320	g500-H320
				450	g500-H450

g500-H helical gearbox with three-phase AC motor

g500-H helical gearbox with three-phase AC motor and motec

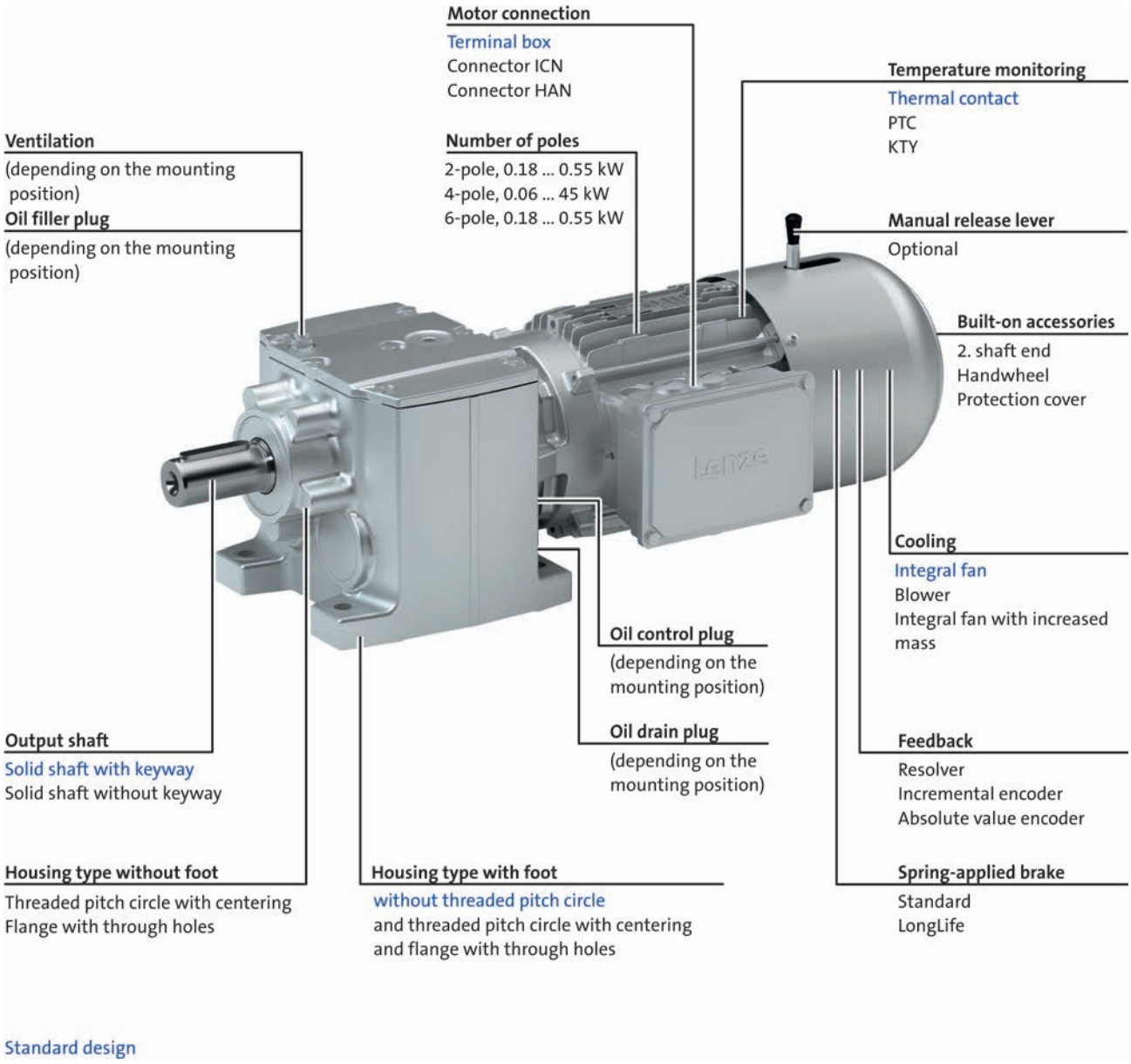


g500-H helical gearbox with servo motor

Equipment

Overview

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



Standard design

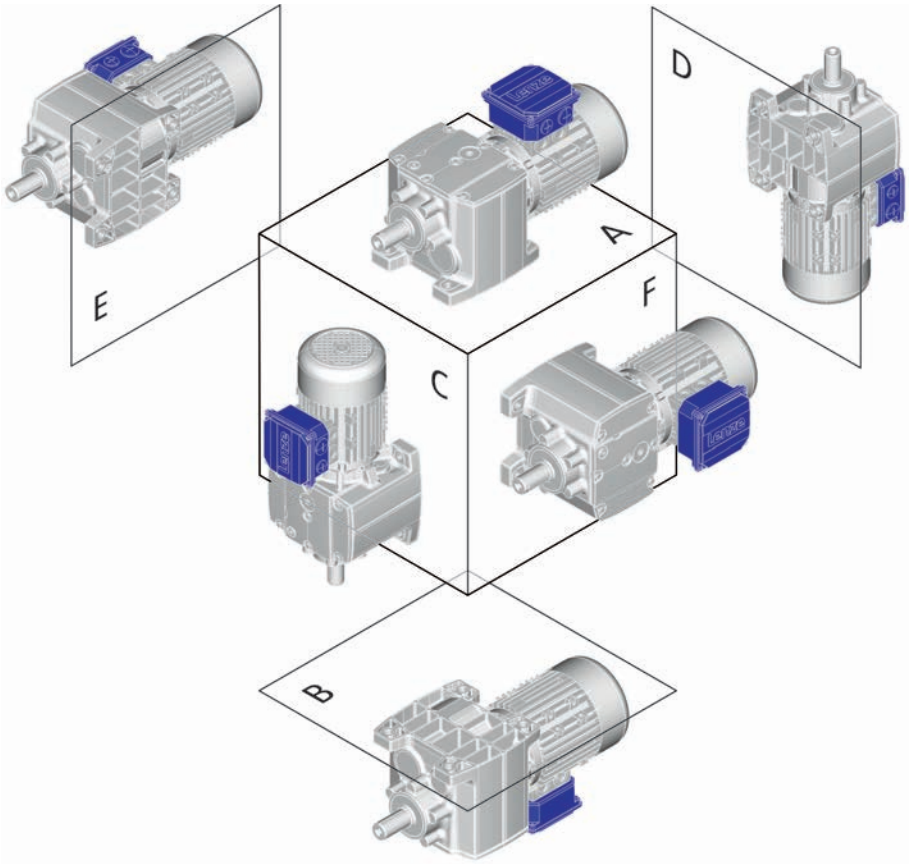
6.3

Equipment

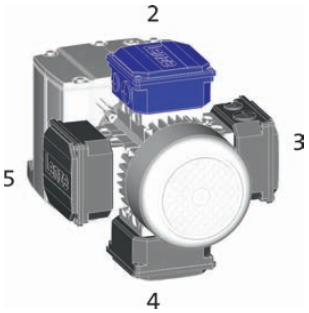
Mounting position, position of system components

- In the following graphics, the terminal box in position 2 is colour-coded.
  If the mounting position (A ... F) changes, the terminal box positions 2 ... 5 are rotated accordingly.
- To reduce the number of different versions, the gearboxes can also be ordered with combined mounting positions:
  - g500-H45 in mounting position ABCDEF
  - g500-H100 ... H450 in mounting position AEF

Mounting positions A ... F



Terminal box positions 2 ... 5



Cable entry positions 1 ... 5

- For details regarding the cable entry see motor chapter/product extensions.

The geared motor kit

Product						
Gearbox	g500-H45	g500-H100	g500-H140	g500-H210	g500-H320	g500-H450
Motor assignment min.	063	063	063	063	063	063
Motor assignment max.	071	090	090	100	112	132
Technical data						
Output torque max.	45 Nm	100 Nm	140 Nm	210 Nm	320 Nm	450 Nm
Drive power min.	0.06 kW	0.12 kW	0.12 kW	0.12 kW	0.12 kW	0.12 kW
Drive power max.	0.55 kW	1.5 kW	1.5 kW	3.0 kW	4 kW	7.5 kW
Dimensions [mm]						
Solid shaft with featherkey	14 x 28 20 x 40	20 x 40	25 x 50	25 x 50	30 x 60	30 x 60 35 x 70
Solid shaft without keyway	20 x 40	20 x 40	25 x 50	25 x 50	30 x 60	35 x 70
Output flange	120/140/160	120/140/160	120/140/160	120/140/160/200	160/200	160/200/250

► Values printed in bold are standard versions.
Values not printed in bold are possible extensions, some for an additional charge.

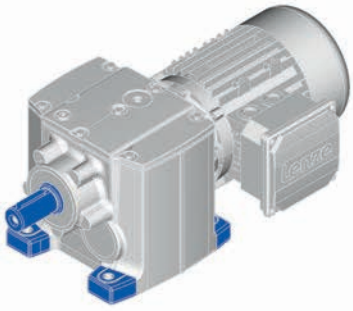
Design	
Conformity	**CE** EAC
Approval	**Without** CCC/CSA/cURus
Degree of protection	**IP55** IP65/IP66
Surface and corrosion protection	**Without** Different types of OKS
Colour	**Not coated** Primed/RAL colours
Solid shaft	**With keyway** Without keyway
Shaft material	**Steel** stainless steel
Shaft sealing ring material	**NBR** FKM or FPM (Viton)
Shaft bearings	**Normal** Reinforced
Paste for shaft mounting	**Without** Enclosed
Gearbox type	**With foot (VBR)** **With centering (VCR)** With foot and centering (VAR) With foot and flange (VAK) With output flange (VCK)
Lubricant	**Mineral oil** Synthetic oil Food-compatible oil

Design	
Mounting position	**A/B/C/D/E/F** Combined
Backlash	**Normal**
Power connection	**Terminal box** Plug connectors
Spring-applied brake	**Without** Brake design: Standard/Longlife Brake version: Standard/Overexcited/Cold Brake
Feedback	**Without** Resolver Absolute value encoder Incremental encoder
Cooling	**Integral fan** Blower Grey iron fan (increased centrifugal mass)
Temperature monitoring	**TKO thermal contact** PTC thermistor KTY thermal detector
Built-on accessories fan side	**Without** Protection cover 2nd shaft end/handwheel

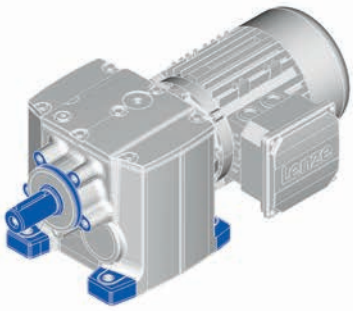
The geared motor kit

Gearbox details

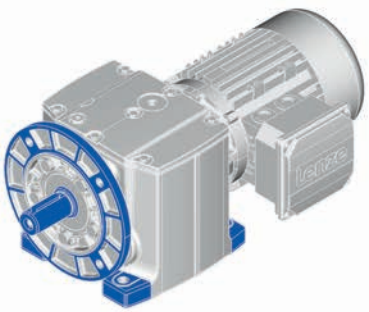
Solid shaft



Foot mounting (VBR)

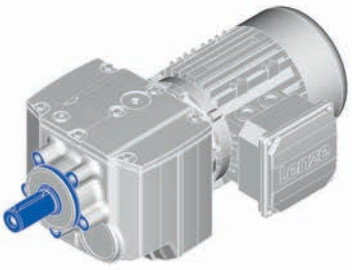


Foot mounting
With centering (VAR)

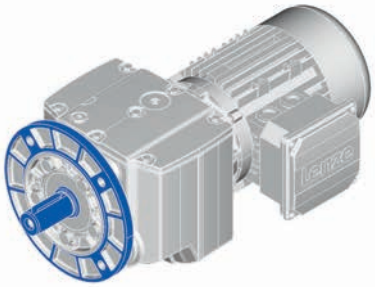


Foot mounting
Flange with through holes (VAK)

Solid shaft



With centering (VCR)



Flange with through holes (VCK)

General information about the data provided in this catalogue

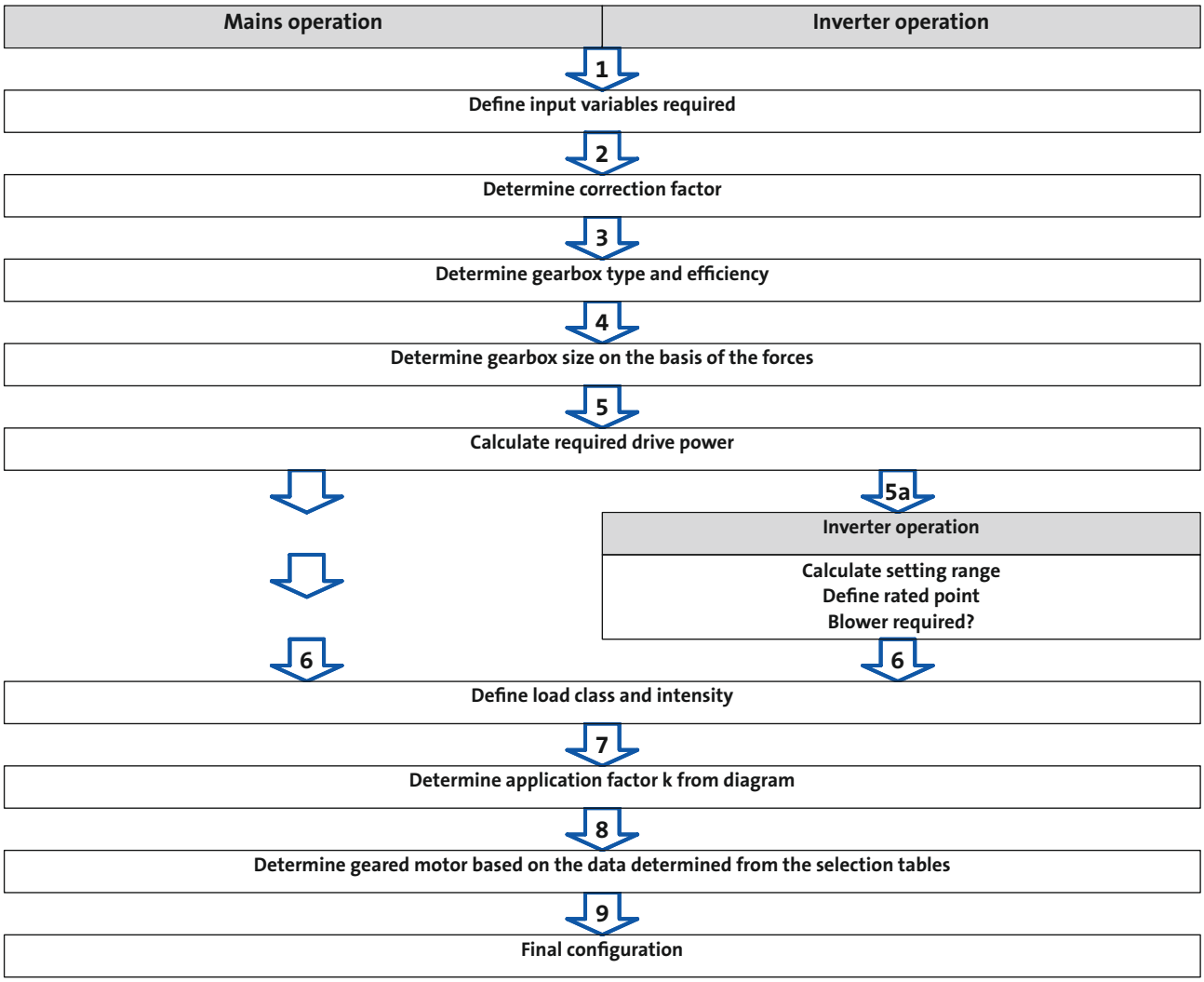
The powers, torques and speeds specified in this catalogue are rounded values and are valid under the following conditions:

- 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 °C for gearboxes,
  T_{amb} = 40 °C for motors (in accordance with EN 60034)
- Site altitude < = 1000 m amsl
- The selection tables provide the permissible mechanical powers and torques. For notes on the thermal power limit, see chapter drive dimensioning.
- The rated power specified for motors and geared motors applies to operating mode S1 (in accordance with EN 60034).

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

Procedure of a configuration process

Workflow



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.

Procedure of a configuration process

1 required input variables

Load torque		$M_{L,max}$=	[Nm]
	In inverter operation	$M_{L,min}$=	[Nm]
Load speed		$n_{L,max}$=	[r/min]
	In inverter operation	$n_{L,min}$=	[r/min]
External moments of inertia		J_{ext}=	[kgcm^2]
Operating time / day		BD =	[h]
Switching operations per h		S_h=	[1/h]
Runtime for $M_{L,max}$	In inverter operation		[%]

2 determine correction factor

Operating modes and operating time						
S1	ED	[%]	100			
	k_L =		1.0			
S2	ED	[%]	10	30	60	90
	k_L =		1.4 - 1.5	1.15 - 1.2	1.07 - 1.1	1.0 - 1.05
S3	ED	[%]	15	25	40	60
	k_L =		1.4 - 1.5	1.3 - 1.4	1.15 - 1.2	1.05 - 1.1
S6	ED	[%]	15	25	40	60
	k_L =		1.5 - 1.6	1.4 - 1.5	1.3 - 1.4	1.15 - 1.2
Site altitude						
	H	[m]	≤ 1000	≤ 2000	≤ 3000	≤ 4000
	k_H =		1	0.95	0.9	0.8
Ambient temperature						
	T_U =	[°C]	≤ 40	≤ 45	≤ 50	≤ 55
	k_{TU} =		1	0.95	0.9	0.8

21 - Operating modes

Procedure of a configuration process

3 determine gearbox type and efficiency

Gearbox type			Axial gearboxes		Right-angle gearboxes
			Helical gearbox	Shaft-mounted	Bevel gearbox
Product			g500-H	g500-S	g500-B
Gearbox efficiency	2-stage gearboxes	η_G	0.96	0.96	0.96
	3-stage gearboxes	η_G	0.95	0.95	0.95

4 determine gearbox size based on the forces on the output

Transmission element		Gear wheels	Sprockets	Toothed belt pulleys (depending on the initial stress)	Narrow V-belt (depending on the initial stress)
Additional radial force factor	f_z =	≥ 17 teeth = 1.0 < 17 teeth = 1.15	≥ 20 teeth = 1.0 < 20 teeth = 1.25 < 13 teeth = 1.4	With belt tightener = 2.0 - 2.5 Without belt tightener = 2.5 - 3.0	1.5 - 2.0
		Calculation		**Check**	
Radial force	[N]	$F_{rad} = 2000 \times \frac{M_{L,max} \times f_z}{dw}$		$F_{rad} \le f_w \times F_{rad,max}$	
Axial force	[N]			$F_{ax} \le F_{rad,max} \times 0.5$	

44 - Permissible radial and axial forces at output

5 calculate drive power

		Calculation	
Drive power required	[kW]	$P_1 = \frac{M_{L,max} \times n_{L,max}}{9549 \times k_L \times k_H \times k_{Tu} \times n_g}$	

6.3

Procedure of a configuration process - mains operation

6 calculate intensity and determine duty class

Load class	Load type	Intensity
I	Smooth operation, small or light jolts	$F_I \leq 1.25$
II	Uneven operation, average jolts	$1.25 < F_I \leq 4$
III	Uneven operation, severe jolts and/or alternating load	$F_I > 4$

	Calculation	
Intensity	$F_I = \frac{\frac{J_L}{i^2} + J_M + J_B + J_Z}{J_M + J_B + J_Z}$	

i= gearbox ratio
J_L= moment of inertia of the load
J_M= moment of inertia of the motor
J_B= moment of inertia of the brake
J_Z= additional moment of inertia (handwheel, 2nd shaft end ...)

7 determine application factor k from diagram

25 - Load capacity and application factor

Procedure of a configuration process - mains operation

8 determine geared motor based on the data determined from the selection tables

Selection table		Check
Drive power P_N	[kW]	$P_1 \leq P_N$
Output speed n_2	[r/min]	$n_{L,max} \approx n_2$
Output torque M_2	[Nm]	$M_{L,max} \leq M_2$
Load factor c		$k \leq c$
Order information		**Example**
Number of stages		2
Ratio i		3.267
Product gearbox		g500-H140
Product motor		MDxMAxx090-32

25 - Load capacity and application factor

Example: structure of a selection table

50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW ← Rated power P_N

2-stage gearboxes ← Number of the gear stage

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
432	32	2.6	44	23	184	32	432	32	2.6	771	32	2.1	3.267	-H140	090-32	82
420	33	1.9	43	24	179	33	420	33	1.9	751	33	1.6	3.354	-H100	090-32	79

Output speed n_2
Output torque M_2
Load capacity c
Ratio i
Product Gearbox
Product Motor

Procedure of a configuration process - inverter operation

5a calculate range of adjustment and determine rated point

		Calculation	
Setting range		$V = \frac{n_{L,max}}{n_{L,min}}$	
Setting range	Motor with integral fan	≤ 2.5 (20 ... 50 Hz)	≤ 4.35 (20 ... 87 Hz)
	Motor with blower	≤ 10 (5 ... 50 Hz)	≤ 17.4 (5 ... 87 Hz)
Rated point at		50 Hz	87 Hz

6 calculate intensity and determine duty class

	Calculation		
Intensity	$M_I = \frac{M_{L,max}}{M_{L,min}}$	**For alternating load, select load class III!**	
Load class	Load type		Intensity
I	Smooth operation, small or light jolts		$M_I \leq 1.5$
II	Uneven operation, average jolts		$1.5 < M_I \leq 2$
III	Uneven operation, severe jolts and/or alternating load		$2 < M_I \leq 2.5$

22 - Duty classes

7 determine application factor k from diagram

25 - Load capacity and application factor

Procedure of a configuration process - inverter operation

8 determine geared motor based on the data determined from the selection tables

Selection table			Check	
Drive power P_N		[kW]	$P_1 \leq P_N$	
Max. output speed n_2		[r/min]	$n_{L,max} \approx n_2$	
Min. output speed n_{21}	Self-ventilated	[r/min]	$n_{L,min} \approx n_{21}$	Setting range 2.5 (50 Hz) Setting range ≤ 4.35 (87 Hz)
Min. output speed n_{22}	Forced-ventilated	[r/min]	$n_{L,min} \approx n_{22}$	Setting range ≤ 10 (50 Hz) Setting range ≤ 17.4 (87 Hz)
	Self-ventilated (Reduced output torque)	[r/min]	$n_{L,min} \approx n_{22}$	
Output torque M_2		[Nm]	$M_{L,max} \leq M_2$	
Load factor c			k ≤ c	

Order information	Example
Number of stages	2
Ratio i	3.267
Product gearbox	g500-H140
Product motor	MDxMAxx090-32

25 - Load capacity and application factor

28 - Torque derating at low motor frequencies

Example: structure of a selection table

50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW ← Rated power P_N

2-stage gearboxes ← Number of the gear stage

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
432	32	2.6	44	23	184	32	432	32	2.6	771	32	2.1	3.267	-H140	090-32	82
420	33	1.9	43	24	179	33	420	33	1.9	751	33	1.6	3.354	-H100	090-32	79

Min. Output speed n_{22}
Min. Output torque M_2
Min. Output speed n_{21}
Max. Output speed n_2
Max. Output torque M_2
Load capacity c
Ratio i
Product Gearbox
Product Motor

Procedure of a configuration process

9 Final configuration

More information regarding the final configuration can be found under: - The modular geared motor system - Product extensions for gearboxes, motors	
Check operating conditions	- Operating temperature (observe lubricant, material of shaft sealing ring) - Degree of protection - Supply voltage - Surface protection required - Approvals - Conformity
Check and define connection dimensions	- Driven shaft - Foot, output flange, centering with threaded pitch circle
Determine mounting position and position of the system blocks	- Mounting position A/B/C/D/E/F or combined - Terminal box position, shaft position, flange position
Select product extensions at the gearbox (differing depending on the gearbox type)	- Torque plate at the base, threaded pitch circle, rubber buffer - Hollow shaft cover, shrink disc cover
Select product extensions at the motor	- Connection type (terminal box, connector) - Brake - Blower (inverter operation) - Feedback - Temperature monitoring - Protection cover (for vertical operation) - Handwheel (for manual set-up) - 2. shaft end

Standards

Approvals

CCC	China Compulsory Certification documents the compliance with the legal product safety requirements of the PR of China - GB standards.
cCSAus	CSA certificate, tested according to US and Canada standards
CE	Communauté Européenne documents the declaration of the manufacturer that EC Directives are complied with.
CEL	China Energy Label documents the compliance with the legal energy efficiency requirements for motors, tested according to PR of China standards
CSA	Canadian Standards Association CSA - certificate, tested according to Canada standards
CSAULE	Energy Verified Certificate Determining the energy efficiency according to CSA C390 for products within the scope of energy efficiency requirements in the USA and Canada
cULus	UL certificate for products, tested according to US and Canada standards
cURus	UL certificate for components, tested according to US and Canada standards
EAC	Certificate of Russia-Belarus-Kazakhstan Customs Union documents the declaration of the manufacturer that the specifications for the Eurasian conformity (EAC) required for placing electronic and electromechanical products on the market of the entire territory of the Customs Union (Russia, Belarus, Kazakhstan) are complied with.
UL	Underwriters Laboratory Listed Product
UR	Underwriters Laboratory Recognized Product UL certificate for components, tested according to US standards

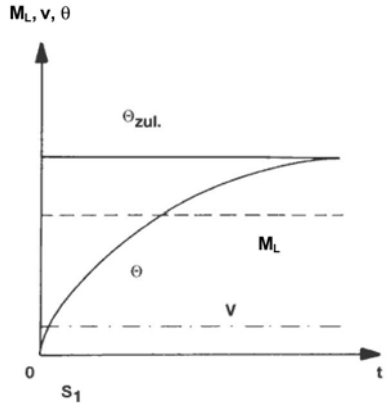
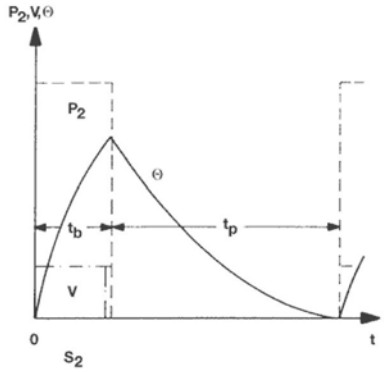
Standards

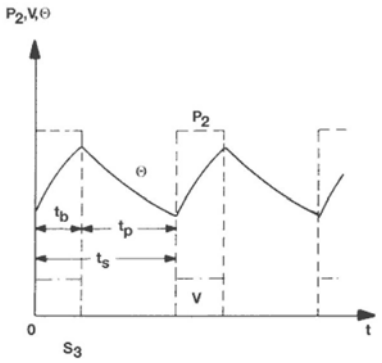
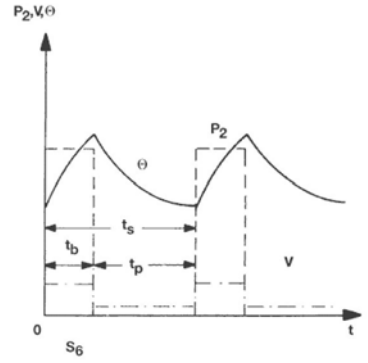
Operating modes

Operating modes S1 ... S10 as specified by EN 60034-1 describe the basic stress of an electrical machine.

In continuous operation a motor reaches its permissible temperature limit if it outputs the rated power dimensioned for continuous operation. However, if the motor is only subjected to load for a short time, the power output by the motor may be greater without the motor reaching its permissible temperature limit. This behaviour is referred to as overload capacity.
Depending on the duration of the load and the resulting temperature rise, the required motor can be selected reduced by the overload capacity.

The most important operating modes

Continuous operation S1	Short-time operation S2
	
Operation with a constant load until the motor reaches the thermal steady state. The motor may be actuated continuously with its rated power.	Operation with constant load; however, the motor does not reach the thermal steady state. During the following standstill, the motor winding cools down to the ambient temperature again. The increase in power depends on the load duration.

Intermittent operation S3	Non-intermittent periodic operation S6
	
Sequence of identical duty cycles comprising operation with a constant load and subsequent standstill. Start-up and braking processes do not have an impact on the winding temperature. The steady-state is not reached. The guide values apply to a cycle duration of 10 minutes. The power increase depends on the cycle duration and on the load period/downtime ratio.	Sequence of identical duty cycles comprising operation with a constant load and subsequent no-load operation. The motor cools down during the no-load phase. Start-up and braking processes do not have an impact on the winding temperature. The steady-state is not reached. The guide values apply to a cycle duration of 10 minutes. The power increase depends on the cycle duration and on the load period/idle time ratio.

Standards

Duty classes

Depending on the load type, the duty classes or impacts are divided as follows:

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

In order to support you in classifying your driven machine regarding the right duty class, the following shows sample applications with the corresponding duty class. Depending on, for instance, the operating frequency, driven machines can also have a higher impact.
In case of uncertainties, please contact your Lenze sales office.

Drive	Duty class
Construction machines	II
Chemical industry	II
Conveyors	II
Fans	II
Plastics industry	II
Wood working	III
Hoists	III
Metal working	III
Food	II
Paper industry	III
Stones	III
Textile industry	II

Standards

Degrees of protection

The degree of protection indicates the suitability of a motor for specific ambient conditions with regard to humidity as well as the protection against contact and the ingress of foreign particles. The degrees of protectionare classified by EN 60529.

The first code number after the code letters IP indicates the protection against the ingress of foreign particles and dust.
The second code number refers to the protection against the ingress of humidity.

Code number 1	Degree of protection	Code number 2	Degree of protection
0	No protection	0	No protection
1	Protection against the ingress of foreign particles d > 50 mm. No protection in the case of deliberate access	1	Protection against vertically dripping water (dripping water).
2	Protection against medium-sized foreign particles, d > 12 mm, keeping away fingers or similar	2	Protection against diagonally falling water (dripping water), 15 ° compared to normal service position.
3	Protection against small foreign particles d > 2.5 mm. Keeping away tools, wires and the like	3	Protection against spraying water, up to 60 ° to the vertical
4	Protection against granular foreign particles, d > 1 mm, keeping away tools, wires and the like	4	Protection against spraying water from all directions.
5	Protection against dust deposits (dust-protected), complete protection against contact.	5	Protection against water jets from all directions.
6	Protection against the ingress of dust (dust-proof), complete protection against contact.	6	Protection against choppy seas or heavy water jets (flood protection).

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

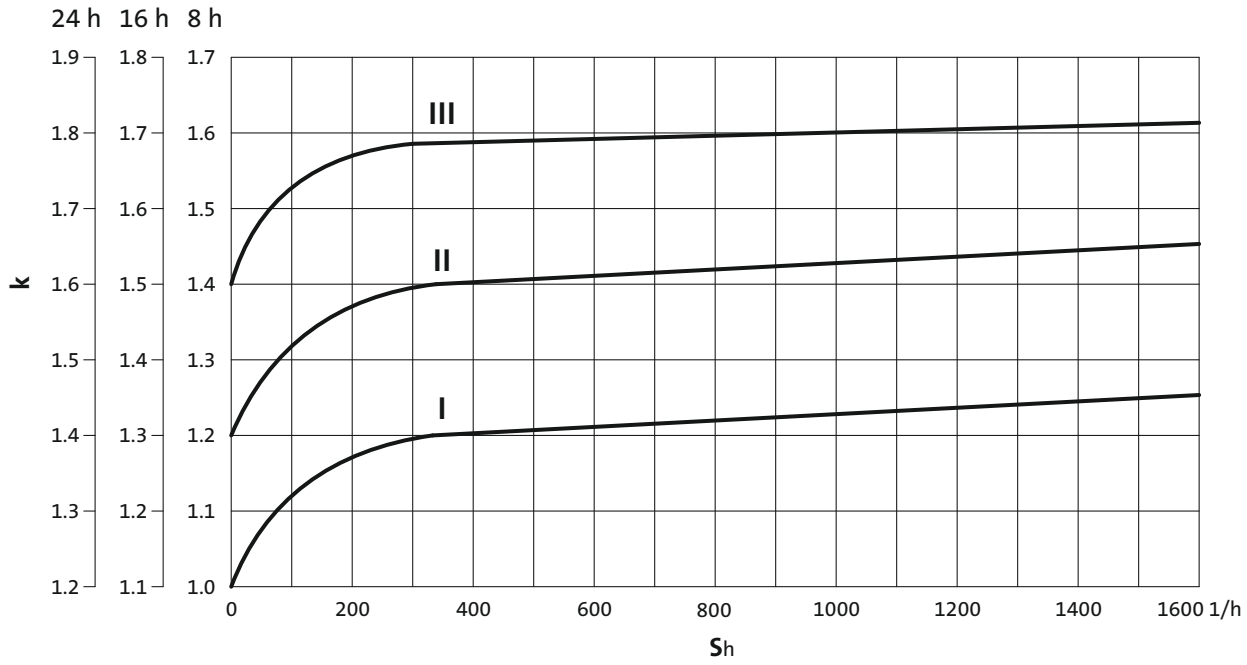
Load capacity and application factor

Load capacity c of gearboxes
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.

Required: c ≥ k

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

Application factor k



► S_h= switchings/h

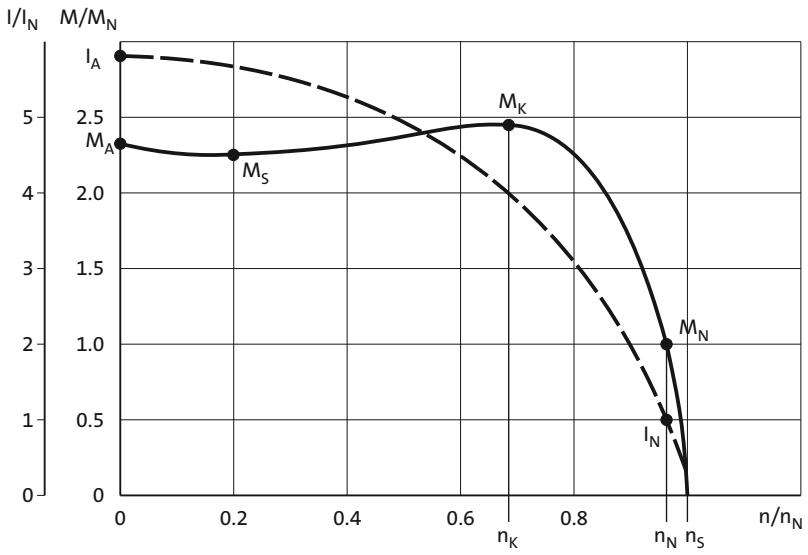
Operational performance of three-phase AC geared motors

The g500 geared motors can be actuated directly on the mains or via an inverter. When actuated in mains operation, the motor runs at a fixed speed, for inverter operation the speed is variable. Thanks to their high degree of protection, the robust three-phase drives can be basically used in a variety of applications.

Mains operation

During mains operation, when switched on, the three-phase AC motor starts up according to the speed-torque characteristic. It passes through this characteristic until it reaches its stable operating point. This operating point has been reached if the load torque or rated torque (M_N) is lower than the starting torque (M_A) and the pull-up torque (M_S). 2-, 4- and 6-pole motors are used. The rated speed (n_{rated}) of the drive is always lower than the calculated synchronous speed (n_S). The difference between rated speed and synchronous speed relating to the synchronous speed is referred to as the "slip".

Speed-torque characteristic



Operational performance of three-phase AC geared motors

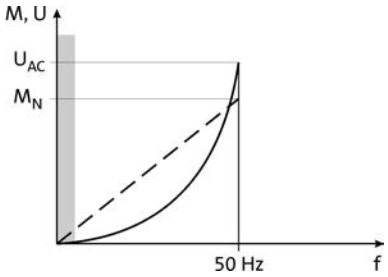
Operation on the inverter

An inverter enables energy-efficient operation of a system in virtually all application cases. The various operating modes, which can be created by making just a few simple settings, facilitate this. The following characteristics and corresponding specifications listed on the following pages can be used to calculate the optimum operating mode during the project planning phase.

Standard setting

In its initial state when delivered, the inverter is set up for basic operation with a three-phase AC motor with vector control. When operated in this mode, the rated torque of the motor is available in a setting range up to 50 Hz.

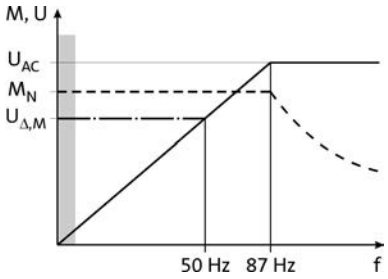
V/f at 50 Hz



Extended setting range up to 87 Hz

If the V/f reference point on the inverter is set to 87 Hz, the rated torque can be used across an extended setting range. Here, a 230/400V motor is for example used and operated in a delta layout with a 400V inverter. The setting range is then increased by 40 %. The inverter must be dimensioned for a rated motor current of 230 V.

V/f at 87 Hz

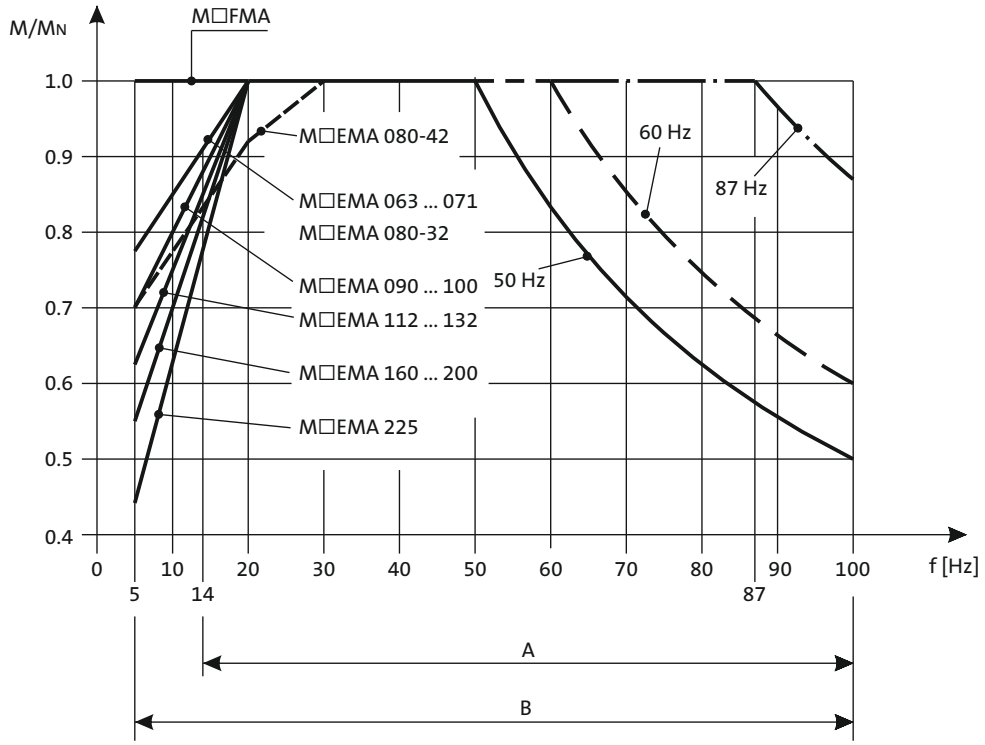


Operational performance of three-phase AC geared motors

Torque derating at low motor frequencies

The diagram shows the motor frame size-dependent torque reduction for self-ventilated motors, taking the thermal behaviour during actuation of the inverter into consideration.

Torque characteristics



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

Combinatorics of geared motors

The following tables contain the most important data of the gearbox with the motors that can be attached for an approximate dimensioning process of a geared motor. Detailed information can be found in the following chapters.

The data given in the tables apply to
- input speed n_1= 1400 r/min
- application factor c= 1.0

The data for the max. radial force refer to
- foot mounting (VBR)
- normal storage
- application factor c= 1.3

For further designs see the "Technical data" chapter.

► The rated torque can be gathered from the last digits of the product name e.g. g500-H45 (45 Nm).

In order to calculate the exact ratio, the number of teeth z_g (driven) can be divided by the number of teeth z_t (driving). These are cancelled values.

g500-H45, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
539	18	1.05	2.597	896	345	470	40.8	063-32 ... 071-42
410	19	0.84	3.413	256	75	620	38.9	063-32 ... 071-42
321	21	0.73	4.368	1376	315	670	38.2	063-32 ... 071-42
264	27	0.77	5.312	1344	253	700	28.2	063-32 ... 071-42
235	29	0.73	5.965	686	115	720	27.5	063-32 ... 071-42
201	30	0.65	6.982	384	55	760	27.3	063-12 ... 071-42
179	32	0.62	7.840	196	25	780	26.7	063-12 ... 071-42
157	33	0.56	8.935	688	77	810	27.0	063-12 ... 071-42
140	35	0.53	10.033	301	30	840	26.4	063-12 ... 071-42
123	35	0.46	11.429	80	7	870	26.2	063-12 ... 071-42
109	38	0.45	12.833	77	6	900	25.6	063-12 ... 071-42
94.4	39	0.40	14.836	816	55	950	25.9	063-12 ... 071-32
84.0	41	0.37	16.660	833	50	1000	25.4	063-12 ... 071-32
73.6	42	0.33	19.013	1464	77	1050	25.7	063-02 ... 071-32
65.6	44	0.31	21.350	427	20	1090	25.2	063-02 ... 071-32
56.9	45	0.28	24.595	2976	121	1170	25.1	063-02 ... 063-42
50.7	45	0.25	27.618	1519	55	1250	24.6	063-02 ... 063-42
43.8	45	0.21	32.000	32	1	1340	25.4	063-02 ... 063-42
39.0	45	0.19	35.933	539	15	1400	24.9	063-02 ... 063-32
33.8	45	0.16	41.455	456	11	1450	25.3	063-02 ... 063-32
30.1	45	0.15	46.550	931	20	1470	24.8	063-02 ... 063-22
26.5	45	0.13	52.909	582	11	1500	25.2	063-02 ... 063-22
23.6	45	0.11	59.413	4753	80	1500	24.7	063-02 ... 063-22

Combinatorics of geared motors

g500-H100, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
417	62	2.79	3.354	161	48	1180	28.5	063-42 ... 090-32
304	72	2.37	4.600	23	5	1360	27.3	063-42 ... 090-32
271	75	2.19	5.167	31	6	1410	24.1	063-42 ... 090-32
238	81	2.08	5.887	989	168	1490	26.9	063-42 ... 090-32
217	83	1.95	6.440	161	25	1560	26.5	063-32 ... 090-32
198	86	1.83	7.086	248	35	1620	23.4	063-42 ... 090-32
170	92	1.69	8.214	115	14	1720	27.0	063-32 ... 090-32
154	96	1.60	9.068	1333	147	1780	23.1	063-42 ... 090-32
139	99	1.49	10.063	161	16	1880	26.6	063-42 ... 090-32
123	100	1.33	11.360	284	25	1980	21.6	063-32 ... 090-32
111	100	1.19	12.653	620	49	2050	23.2	063-32 ... 090-32
96.6	100	1.04	14.490	710	49	2160	21.9	063-32 ... 080-42
90.3	100	0.97	15.500	31	2	2240	22.9	063-42 ... 080-42
78.9	100	0.85	17.750	71	4	2370	21.7	063-42 ... 080-32
71.8	100	0.78	19.486	682	35	2460	22.7	063-12 ... 080-32
62.7	100	0.68	22.314	781	35	2560	21.5	063-12 ... 080-32
55.8	100	0.60	25.095	527	21	2590	22.6	063-12 ... 080-32
48.7	100	0.53	28.738	1207	42	2620	21.4	063-12 ... 071-42
44.0	100	0.48	31.805	2449	77	2640	22.0	063-12 ... 071-32
38.4	100	0.41	36.422	5609	154	2650	20.9	063-12 ... 071-32
35.1	100	0.38	39.857	279	7	2650	21.9	063-12 ... 071-32
30.7	100	0.33	45.643	639	14	2650	20.8	063-12 ... 071-32
26.7	70	0.20	52.510	2573	49	2650	21.8	063-12 ... 063-32
23.3	80	0.20	60.133	5893	98	2650	20.7	063-12 ... 063-32

Combinatorics of geared motors

g500-H140, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
429	82	3.79	3.267	49	15	1750	25.0	063-42 ... 090-32
313	94	3.17	4.480	112	25	2000	23.8	063-42 ... 090-32
244	103	2.71	5.733	86	15	2180	23.3	063-42 ... 090-32
223	105	2.53	6.272	784	125	2260	22.9	063-32 ... 090-32
193	106	2.20	7.269	189	26	2370	17.8	063-42 ... 090-32
175	117	2.21	8.000	8	1	2430	23.4	063-32 ... 090-32
155	117	1.96	9.029	316	35	2540	18.1	063-42 ... 090-32
143	125	1.93	9.800	49	5	2630	23.0	063-42 ... 090-32
121	128	1.67	11.554	3397	294	2800	17.9	063-42 ... 090-32
111	132	1.58	12.640	316	25	2880	17.7	063-32 ... 090-32
100	136	1.47	13.957	4536	325	2950	16.9	063-32 ... 090-32
86.8	140	1.31	16.122	790	49	3050	17.9	063-32 ... 090-32
78.6	140	1.19	17.802	1620	91	3150	17.1	063-32 ... 080-42
70.9	140	1.07	19.750	79	4	3210	17.8	063-42 ... 080-42
64.2	140	0.97	21.808	567	26	3300	16.9	063-42 ... 080-42
56.4	140	0.85	24.829	869	35	3400	17.6	063-12 ... 080-32
51.1	140	0.77	27.415	1782	65	3520	16.8	063-12 ... 080-32
43.8	140	0.66	31.976	1343	42	3630	17.5	063-12 ... 080-32
39.7	140	0.60	35.308	459	13	3730	16.7	063-12 ... 080-32
34.5	140	0.52	40.526	6241	154	3850	17.0	063-12 ... 071-32
31.3	140	0.47	44.748	6399	143	3920	16.3	063-12 ... 071-32
27.6	129	0.38	50.786	711	14	4000	17.0	063-12 ... 071-32
25.0	140	0.38	56.077	729	13	4050	16.2	063-12 ... 071-32
20.9	89	0.20	66.908	6557	98	4100	16.9	063-12 ... 063-32
18.9	98	0.20	73.879	6723	91	4150	16.1	063-12 ... 063-32

Combinatorics of geared motors

g500-H210, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
413	126	5.62	3.389	61	18	1980	22.2	071-42 ... 100-32
301	143	4.65	4.648	488	105	2250	22.2	080-42 ... 100-32
251	159	4.30	5.583	67	12	2400	18.1	071-42 ... 100-32
224	158	3.82	6.250	25	4	2500	17.1	071-42 ... 100-32
183	172	3.39	7.657	268	35	2680	18.1	080-42 ... 100-32
163	171	3.01	8.571	60	7	2780	17.1	080-42 ... 100-32
143	182	2.81	9.799	2881	294	2960	17.9	071-42 ... 100-32
131	189	2.66	10.720	268	25	3030	17.7	063-42 ... 100-32
117	186	2.34	12.000	12	1	3200	16.7	063-42 ... 100-12
102	201	2.22	13.673	670	49	3350	17.4	063-42 ... 100-12
91.5	200	1.97	15.306	750	49	3470	16.5	063-42 ... 100-12
83.6	210	1.89	16.750	67	4	3590	17.2	071-42 ... 100-12
74.7	210	1.69	18.750	75	4	3720	16.3	071-42 ... 090-32
64.2	210	1.46	21.802	2747	126	3870	17.1	063-42 ... 090-32
57.4	210	1.30	24.405	1025	42	3900	16.2	063-42 ... 090-32
51.6	210	1.17	27.119	1139	42	3900	17.0	063-42 ... 080-42
46.1	210	1.05	30.357	425	14	3900	16.1	063-42 ... 080-42
39.9	210	0.90	35.095	737	21	3900	16.9	063-12 ... 080-32
35.6	210	0.81	39.286	275	7	4020	16.0	063-12 ... 080-32
32.9	183	0.65	42.593	5963	140	4100	16.4	063-12 ... 080-32
29.4	206	0.65	47.679	1335	28	4220	15.6	063-12 ... 080-32
25.7	137	0.38	54.438	871	16	4350	16.4	063-12 ... 071-32
23.0	155	0.38	60.938	975	16	4450	15.6	063-12 ... 071-32

Combinatorics of geared motors

g500-H210, 3-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
32.3	210	0.74	43.390	4556	105	4120	16.6	063-32 ... 080-32
28.8	210	0.66	48.571	340	7	4240	15.7	063-12 ... 080-32
25.2	210	0.58	55.529	48977	882	4350	16.5	063-12 ... 071-42
22.5	210	0.52	62.160	18275	294	4470	15.6	063-12 ... 071-42
19.7	210	0.45	71.026	62645	882	4620	16.4	063-12 ... 071-42
17.6	210	0.41	79.507	23375	294	4740	15.5	063-12 ... 071-32
15.2	210	0.35	92.205	19363	210	4800	16.3	063-12 ... 071-32
13.6	210	0.31	103.214	1445	14	4800	15.5	063-12 ... 071-32
11.8	210	0.27	118.162	69479	588	4800	16.3	063-12 ... 063-42
10.6	210	0.24	132.270	25925	196	4800	15.4	063-12 ... 063-42
9.20	210	0.21	152.853	35309	231	4800	16.2	063-12 ... 063-42
8.20	210	0.19	171.104	13175	77	4800	15.3	063-12 ... 063-32
7.00	210	0.16	198.873	12529	63	4800	16.2	063-12 ... 063-32
6.30	210	0.14	222.619	4675	21	4800	15.4	063-12 ... 063-12
5.40	210	0.13	257.631	21641	84	4800	16.2	063-12 ... 063-12
4.90	210	0.11	288.393	8075	28	4800	15.4	063-12 ... 063-12

Combinatorics of geared motors

g500-H320, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
413	165	7.37	3.389	61	18	2180	20.0	071-42 ... 112-32
301	189	6.15	4.648	488	105	2460	20.0	080-42 ... 112-32
230	227	5.65	6.083	73	12	2670	15.6	071-42 ... 112-32
203	218	4.77	6.910	539	78	2800	15.0	071-42 ... 112-32
168	249	4.51	8.343	292	35	2950	15.6	080-42 ... 112-32
148	238	3.80	9.477	616	65	3100	15.0	080-42 ... 112-22
131	265	3.75	10.677	3139	294	3250	15.4	071-42 ... 112-22
120	271	3.51	11.680	292	25	3330	15.2	063-42 ... 112-22
115	254	3.16	12.128	473	39	3360	14.8	071-42 ... 112-22
106	262	2.98	13.268	4312	325	3440	14.6	063-42 ... 100-32
94.0	294	2.98	14.898	730	49	3600	14.9	063-42 ... 100-32
82.7	281	2.51	16.923	220	13	3760	14.4	063-42 ... 100-32
76.7	313	2.59	18.250	73	4	3870	14.8	071-42 ... 100-32
67.5	299	2.18	20.731	539	26	4020	14.3	071-42 ... 100-12
58.9	320	2.04	23.754	2993	126	4210	14.7	063-42 ... 090-32
51.9	320	1.79	26.983	3157	117	4420	14.2	063-42 ... 090-32
47.4	320	1.64	29.548	1241	42	4540	14.6	063-42 ... 090-32
41.7	320	1.44	33.564	1309	39	4750	14.1	063-42 ... 090-32
36.6	251	0.99	38.238	803	21	4970	14.5	063-12 ... 080-32
32.2	285	0.99	43.436	1694	39	5190	14.0	063-12 ... 080-32
30.2	218	0.71	46.407	6497	140	5310	14.1	063-12 ... 080-32
26.6	248	0.71	52.715	6853	130	5550	13.6	063-12 ... 080-32

Combinatorics of geared motors

g500-H320, 3-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
29.6	320	1.04	47.276	4964	105	5350	14.9	063-32 ... 080-42
26.1	320	0.91	53.703	10472	195	5570	14.3	063-32 ... 080-42
23.1	320	0.81	60.502	53363	882	5600	14.8	063-32 ... 080-32
20.4	320	0.71	68.726	8041	117	5670	14.2	063-32 ... 080-32
18.1	320	0.63	77.387	68255	882	5680	14.7	063-12 ... 080-32
15.9	320	0.56	87.906	10285	117	5700	14.1	063-12 ... 071-42
13.9	320	0.49	100.462	21097	210	5700	14.6	063-12 ... 071-42
12.3	320	0.43	114.118	22253	195	5700	14.1	063-12 ... 071-32
10.9	320	0.38	128.743	75701	588	5700	14.6	063-12 ... 071-32
9.60	320	0.34	146.244	11407	78	5700	14.1	063-12 ... 071-32
8.40	320	0.29	166.541	38471	231	5700	14.5	063-12 ... 071-32
7.40	320	0.26	189.180	7378	39	5700	14.0	063-12 ... 063-42
6.50	315	0.22	216.683	13651	63	5700	14.6	063-12 ... 063-42
5.70	320	0.20	246.137	28798	117	5700	14.0	063-12 ... 063-32
5.00	269	0.15	280.702	23579	84	5700	14.5	063-12 ... 063-12
4.40	305	0.15	318.859	24871	78	5700	14.0	063-12 ... 063-12

Combinatorics of geared motors

g500-H450, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
407	256	11.2	3.444	31	9	2550	18.9	100-12 ... 132-32
296	293	9.37	4.724	496	105	2850	17.2	100-12 ... 132-32
247	315	8.39	5.678	511	90	3010	14.9	100-12 ... 132-32
232	323	8.07	6.045	2666	441	3070	16.9	080-42 ... 132-32
212	334	7.63	6.613	496	75	3160	16.6	080-42 ... 132-32
180	354	6.88	7.787	584	75	3350	13.9	100-12 ... 132-22
159	370	6.35	8.800	44	5	3470	13.3	100-12 ... 132-22
141	385	5.83	9.965	3139	315	3650	13.7	080-42 ... 132-22
124	400	5.37	11.262	473	42	3800	13.1	080-42 ... 112-32
114	411	5.04	12.320	308	25	3900	12.9	080-42 ... 112-32
101	426	4.63	13.905	292	21	4030	13.3	071-42 ... 112-32
89.1	441	4.24	15.714	110	7	4240	12.7	071-42 ... 112-22
82.2	450	3.99	17.033	511	30	4360	13.1	080-42 ... 112-22
72.7	448	3.52	19.250	77	4	4520	12.6	080-42 ... 112-22
63.1	450	3.07	22.170	2993	135	4700	13.1	071-42 ... 100-32
55.9	450	2.71	25.056	451	18	4920	12.5	071-42 ... 100-32
50.8	450	2.47	27.578	1241	45	5090	13.0	071-42 ... 100-32
44.9	450	2.18	31.167	187	6	5280	12.5	071-42 ... 100-12
39.2	450	1.91	35.689	1606	45	5490	12.9	063-42 ... 090-32
34.7	450	1.69	40.333	121	3	5880	12.4	063-42 ... 090-32
32.3	322	1.12	43.313	6497	150	6000	12.9	063-42 ... 080-42
28.6	366	1.13	48.950	979	20	6300	12.4	063-42 ... 080-42
25.6	273	0.75	54.750	219	4	6500	12.5	063-42 ... 080-32
22.6	307	0.75	61.875	495	8	6700	12.1	063-42 ... 080-32

Combinatorics of geared motors

g500-H450, 3-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
31.7	450	1.56	44.124	9928	225	6050	13.6	063-42 ... 090-32
28.1	450	1.38	49.867	748	15	6320	13.0	063-42 ... 090-32
24.8	450	1.22	56.469	53363	945	6550	13.6	063-42 ... 090-32
22.7	450	1.12	61.774	69496	1125	6700	13.5	063-32 ... 080-42
20.1	450	0.99	69.813	5236	75	6860	12.9	063-32 ... 080-42
17.8	450	0.88	78.794	4964	63	7000	13.6	063-32 ... 080-32
15.7	450	0.78	89.048	1870	21	7100	12.9	063-32 ... 080-32
14.5	450	0.72	96.522	8687	90	7100	13.5	063-42 ... 080-32
12.8	450	0.63	109.083	1309	12	7100	12.9	063-42 ... 080-32
11.5	450	0.57	121.342	27302	225	7100	13.5	063-12 ... 071-42
10.2	450	0.50	137.133	2057	15	7100	12.9	063-12 ... 071-42
9.00	450	0.44	156.274	21097	135	7100	13.5	063-12 ... 071-42
7.90	450	0.39	176.611	3179	18	7100	12.9	063-12 ... 071-32
7.10	450	0.35	198.059	98039	495	7100	13.4	063-12 ... 071-32
6.30	450	0.31	223.833	1343	6	7100	12.8	063-12 ... 071-32
5.60	450	0.28	248.200	1241	5	7100	13.4	063-12 ... 063-42
5.00	450	0.25	280.500	561	2	7100	12.8	063-12 ... 063-42
4.30	428	0.20	326.994	103003	315	7100	13.4	063-12 ... 063-32
3.80	450	0.19	369.548	15521	42	7100	12.8	063-12 ... 063-32

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 corresponding to corrosivity category C1 (subject to 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 corresponding to corrosivity category C2 (subject to 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 corresponding to corrosivity category C3 (subject to 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
OKS-XL (extra Large) [1)]	• External installation • Air humidity above 95 % • Chemical industry plants • Food industry • Coastal areas with moderate salinity	• Surface coating corresponding to corrosivity category C4 (subject to EN 12944-2) Additional measures for surface and corrosion protection system L: • Rotor package and stator in the inner area primed with finishing varnish • Feedback in protection class IP65

[1)] On request

Surface and corrosion protection

Structure of surface coating

Surface and corrosion protection	Corrosivity category	Surface coating	Colour	Coating thickness
	DIN EN ISO 12944-2	Structure		
Without OKS(uncoated)		• Dipping primer of the grey iron parts		30 ... 50 µm
OKS-G (primed)		• Dipping primer of the grey iron parts • 2K PUR priming coat		60 ... 90 µm
OKS-S (small)	Comparable to C1	• Dipping primer of the grey iron parts • 2K-PUR top coat	• Standard: RAL 7012 • Optional: RAL Classic	80 ... 120 µm
OKS-M (medium)	Comparable to C2	• Dipping primer of the grey iron parts • 2K PUR priming coat • 2K-PUR top coat		110 ... 160 µm
OKS-L (large)	Comparable to C3			140 ... 200 µm
OKS-XL (extra Large) [1)]	Comparable to C4	• Dipping primer of the grey iron parts • 2K-EP priming coat (two times) • 2K-PUR top coat		160 ... 240 µm

[1)] On request

Lubricants

Gearboxes and geared motors of Lenze come supplied with a lubricant specifically adapted to the drive and design. When placing the order, the mounting position and design are decisive for the lubricant amount.
The lubricant amount and type contained in the gearbox are indicated on the nameplate.

The following gearboxes are lubricated for life:
- Helical gearbox g500-H45 ... 140
- Shaft-mounted helical gearbox g500-S130
- Bevel gearbox g500-B45 ... 240

The lubricants listed in the lubricant table are approved for 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	
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	
bremer & leguil			Cassida Fluid GL 220

► 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.

Ventilation

Non-ventilated gearboxes

No ventilation is required for gearboxes g500-H45 to H210.

Ventilated gearboxes

The g500-H320 H450 gearbox is supplied with a breather element as standard.

Gearbox in combined mounting position

For reducing the number of versions, the gearboxes can also be ordered in a combined mounting position:

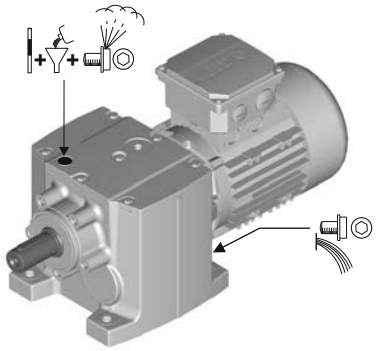
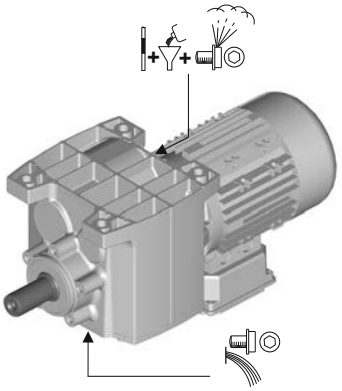
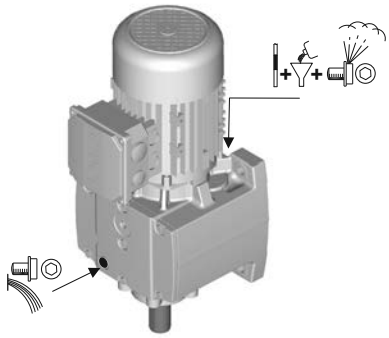
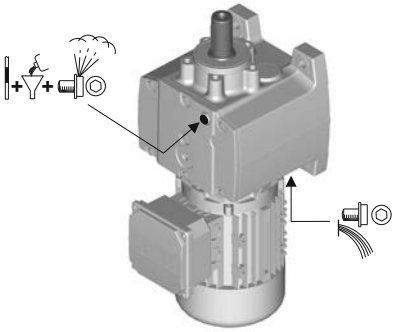
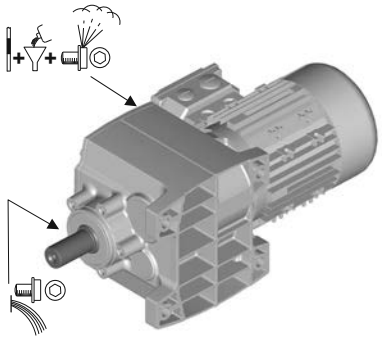
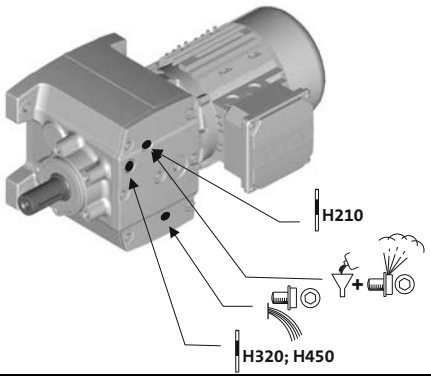
- g500-H45 in mounting position ABCDEF
- g500-H100 ... H450 in mounting position AEF

In these gearboxes, the lubricant amount has been optimised for the use in different mounting positions. The breather elements are loosely enclosed and have to be mounted before commissioning depending on the mounting position.
A gearbox can be used for several mounting positions.

Ventilation

Position of ventilation, sealing elements and oil level check

► **A ... F** mounting position

A	B
	
C	**D**
	
E	**F**
	

	Filling		Drain
	Ventilation		Check

Standards and operating conditions

Geared motor data

Degree of protection			
EN 60529			IP65 [1] IP55 [1] IP66 [1]
Energy efficiency class			
IEC 60034-30			IE2
IEC 60034-2-1			Methodology for measuring efficiency
Conformity			
CE			Low-Voltage Directive
			2006/95/EC
EAC			TP TC 004/2011 (TR CU 004/2011)
Approval			
CCC			GB Standard 12350-2009
CSA			CSA 22.2 No. 100 CSA C390-10
cURus [2]			UL 1004-1 UL 1004-8 Power Conversion Equipment (File-No. E210321)
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.
[2] Motor frame size 225, in preparation.

► In the European Union, the ErP Directive stipulates minimum efficiency levels for three-phase AC motors. Geared three-phase AC motors that do not conform with this Directive do not meet CE requirements and must not be marketed in the European Economic Area. For further information about the ErP Directive and the Lenze products to which it relates, please refer to the brochure entitled "International efficiency directives for three-phase AC motors".

Permissible radial and axial forces at output

Permissible radial force

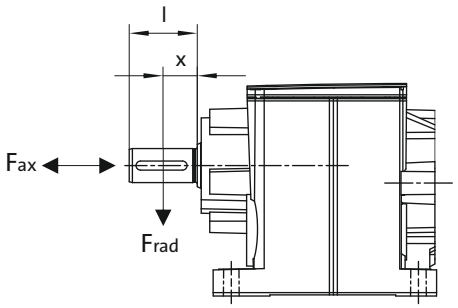
$F_{rad,perm} = f_w \times F_{rad,max}$

Permissible axial force

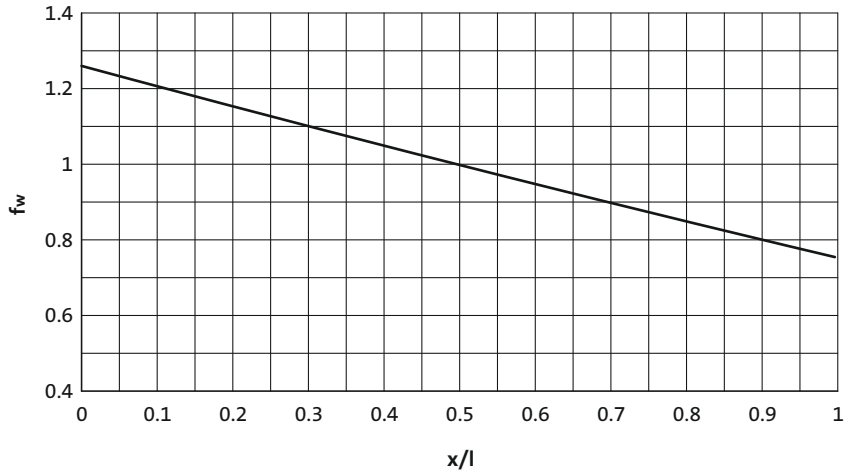
If there is no radial force, the maximum permissible axial force is 50 % of the table value $F_{rad,max}$

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

Application of forces



Additional load factor f_w at output shaft



6.3

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.

Gearbox with foot with threaded pitch circle (VBR)

Product	n_2 [r/min]									
	1000	630	400	250	160	100	63	40	25	≤16
	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]
g500-H45	300	400	600	700	800	900	1100	1400	1500	1500
g500-H100	800	1000	1200	1500	1800	2100	2600	2700	2700	2700
g500-H140	1000	1400	1800	2200	2500	3000	3300	3700	4100	4200
g500-H210	1200	1600	2000	2400	2800	3400	3900	3900	4400	4800
g500-H320	1500	1900	2200	2600	3000	3500	4100	4800	5600	5700
g500-H450	1900	2200	2600	3000	3500	4100	4700	5500	6600	7100

Reinforced bearings

	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]
g500-H100	1000	1300	1500	1800	2200	2700	3200	3300	3300	3300
g500-H140	1300	1800	2300	2700	3100	3700	4100	4600	5100	5300
g500-H210	1400	2000	2500	3000	3500	4200	4900	4900	5500	6000
g500-H320	1900	2400	2800	3300	3800	4400	5100	6000	7000	7100
g500-H450	2400	2800	3200	3800	4300	5100	5900	6900	8300	8900

Gearbox with/without foot with threaded pitch circle (VAR/VCR)
Gearbox with/without foot with flange (VAK/VCK)

Product	n_2 [r/min]									
	1000	630	400	250	160	100	63	40	25	≤16
	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]
g500-H45	300	400	600	700	800	900	1100	1400	1500	1500
g500-H100	800	1000	1200	1500	1700	1700	1700	1700	1700	1700
g500-H140	1000	1400	1800	2200	2500	2600	2600	2600	2600	2600
g500-H210	1200	1600	2000	2400	2800	3000	3000	3000	3000	3000
g500-H320	1500	1900	2200	2600	3000	3500	3600	3600	3600	3600
g500-H450	1900	2200	2600	3000	3500	4100	4400	4400	4400	4400

Reinforced bearings

	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]	$F_{rad,max}$ [N]
g500-H100	1000	1300	1500	1700	1700	1700	1700	1700	1700	1700
g500-H140	1300	1800	2300	2600	2600	2600	2600	2600	2600	2600
g500-H210	1400	2000	2500	3000	3000	3000	3000	3000	3000	3000
g500-H320	1900	2400	2800	3300	3600	3600	3600	3600	3600	3600
g500-H450	2400	2800	3200	3800	4300	4400	4400	4400	4400	4400

Selection tables, notes

Notes on the selection tables with 4-pole motors

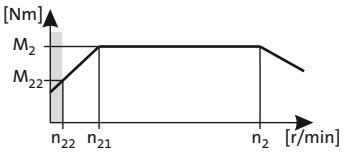
The selection tables show the available combinations of gearbox type, number of stages, ratio and motor. They are used only to provide basic orientation.
The following legend indicates the structure of the selection tables.

Rated power Prated of the drive motor depending on the rated frequency

50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW

2-stufige Getriebe ← **Number of the gear stage of the gearbox**

Torque diagram



Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
432	32	2.6	44	23	184	32	432	32	2.6	771	32	2.1	3.267	-H140	090-32	82
420	33	1.9	43	24	179	33	420	33	1.9	751	33	1.6	3.354	-H100	090-32	79

Product Gearbox

Product Motor

Ratio i

Page number for dimensions

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

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

Mains operation
Output speed **n2**
Output torque **M2**

Inverter operation
The speed and torque data are valid for self-ventilated and forced ventilated drives. Forced ventilated drives can always output the torque **M2** in the entire setting ranges. In the case of self-ventilated drives, a reduction to **M22** is required in the lower speed range.

The following applies to self-ventilated geared motors:
n22 is the minimum speed where the torque **M22** is permissible, from **n21** to **n2**, the maximum torque is **M2**
The following applies to forced ventilated geared motors:
From the minimum speed **n22** to **n2**, the maximum torque is **M2**

Motor voltages

The power values and torques indicated in the selection tables relate to the following motor voltages:
- 50 Hz : Δ 230 V / Y 400 V
- 60 Hz : 230 V or 460 V
- 87 Hz : Δ 400 V

Operation at 87 Hz

In 87 Hz operation, the three-phase AC motor (which is designed for a voltage of Δ 230 V / Y 400 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.

Selection tables, notes

Notes on the selection tables with 2-pole and 6-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.

Rated power Prated of the drive motor depending on the rated frequency

50 Hz: P_N = 0.18 kW

2-stufige Getriebe ← **Number of the gear stage of the gearbox**

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
141	12	5.8	19.486	-H100	063-11	97
123	14	5.8	22.314	-H100	063-11	97

Mains operation
Output speed **n2**
Output torque **M2**

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

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

Product Gearbox

Product Motor

Ratio i

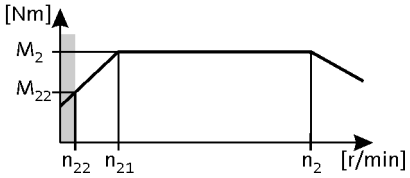
Page number for dimensions

Motor voltages

The power values and torques indicated in the selection tables relate to the following motor voltages:
- 50 Hz : Δ 230 V / Y 400 V
- 60 Hz : 230 V or 460 V

6.3

Selection tables, 4-pole motors

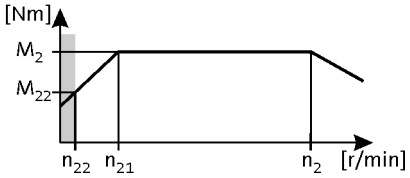


50 Hz: P_N = 0.06 kW
87 Hz: P_N = 0.11 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
75	7.0	5.7	7.6	7.4	32	7.0	75	7.0	5.7	133	8.0	5.2	19.013	-H45	063-02	95
67	8.0	5.3	6.8	8.3	28	8.0	67	8.0	5.3	119	9.0	4.9	21.350	-H45	063-02	95
58	10	4.7	5.9	9.6	24	10	58	10	4.7	103	10	4.3	24.595	-H45	063-02	95
52	11	4.2	5.3	11	22	11	52	11	4.2	92	11	3.9	27.618	-H45	063-02	95
45	12	3.6	4.5	13	19	12	45	12	3.6	79	13	3.3	32.000	-H45	063-02	95
40	14	3.2	4.0	14	17	14	40	14	3.2	71	14	3.0	35.933	-H45	063-02	95
34	16	2.8	3.5	16	15	16	34	16	2.8	61	17	2.6	41.455	-H45	063-02	95
31	18	2.5	3.1	18	13	18	31	18	2.5	55	19	2.4	46.550	-H45	063-02	95
27	21	2.2	2.7	21	11	21	27	21	2.2	48	21	2.1	52.909	-H45	063-02	95
24	23	1.9	2.4	23	10	23	24	23	1.9	43	24	1.9	59.413	-H45	063-02	95

Selection tables, 4-pole motors

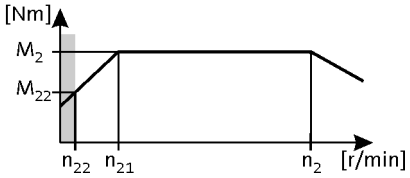


50 Hz: P_N = 0.09 kW
87 Hz: P_N = 0.16 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
137	6.0	5.8	15	6.0	60	6.0	137	6.0	5.8	248	6.0	4.9	10.033	-H45	063-22	95
120	7.0	5.1	13	6.8	53	7.0	120	7.0	5.1	217	7.0	4.3	11.429	-H45	063-22	95
107	8.0	4.9	11	7.7	47	8.0	107	8.0	4.9	194	8.0	4.2	12.833	-H45	063-22	95
93	9.0	4.3	9.8	8.9	40	9.0	93	9.0	4.3	168	9.0	3.7	14.836	-H45	063-22	95
83	10	4.1	8.7	10	36	10	83	10	4.1	149	10	4.0	16.660	-H45	063-22	95
72	12	3.6	7.6	11	32	11	72	12	3.6	131	11	3.6	19.013	-H45	063-22	95
64	13	3.4	6.8	13	28	13	64	13	3.4	116	13	3.3	21.350	-H45	063-22	95
56	15	3.0	5.9	15	24	15	56	15	3.0	101	15	3.0	24.595	-H45	063-22	95
50	17	2.7	5.3	17	22	16	50	17	2.7	90	16	2.6	27.618	-H45	063-22	95
43	19	2.3	4.5	19	19	19	43	19	2.3	78	19	2.3	32.000	-H45	063-22	95
38	22	2.1	4.0	21	17	21	38	22	2.1	69	21	2.0	35.933	-H45	063-22	95
33	25	1.8	3.5	25	15	25	33	25	1.8	60	25	1.8	41.455	-H45	063-22	95
30	28	1.6	3.1	28	13	28	30	28	1.6	53	28	1.6	46.550	-H45	063-22	95
26	32	1.4	2.7	32	11	32	26	32	1.4	47	32	1.4	52.909	-H45	063-22	95
23	36	1.3	2.4	35	10	35	23	36	1.3	42	35	1.3	59.413	-H45	063-22	95

Selection tables, 4-pole motors

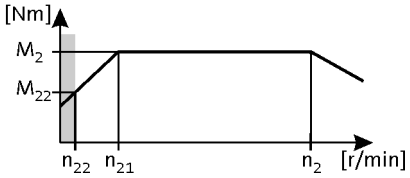


50 Hz: P_N = 0.12 kW
87 Hz: P_N = 0.21 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
204	5.0	5.5	21	4.2	86	5.0	204	5.0	5.5	363	5.0	4.7	6.982	-H45	063-12	95
182	6.0	5.2	19	4.7	77	6.0	182	6.0	5.2	323	6.0	4.5	7.840	-H45	063-12	95
160	7.0	4.7	16	5.4	67	7.0	160	7.0	4.7	284	7.0	4.0	8.935	-H45	063-12	95
142	8.0	4.5	15	6.0	60	8.0	142	8.0	4.5	253	8.0	3.8	10.033	-H45	063-12	95
125	9.0	3.9	13	6.9	53	9.0	125	9.0	3.9	222	9.0	3.4	11.429	-H45	063-12	95
111	10	3.8	11	7.7	47	10	111	10	3.8	198	10	3.2	12.833	-H45	063-12	95
96	12	3.4	9.8	8.9	40	11	96	12	3.4	171	11	2.9	14.836	-H45	063-12	95
86	13	3.2	8.7	10	36	13	86	13	3.2	152	13	3.1	16.660	-H45	063-12	95
75	15	2.8	7.6	11	32	15	75	15	2.8	133	15	2.8	19.013	-H45	063-12	95
73	15	5.5	7.4	12	31	15	73	15	5.5	130	15	4.7	19.486	-H100	063-12	98
67	17	2.6	6.8	13	28	16	67	17	2.6	119	16	2.6	21.350	-H45	063-12	95
64	17	5.5	6.5	13	27	17	64	17	5.5	114	17	4.7	22.314	-H100	063-12	98
58	19	2.4	5.9	15	24	19	58	19	2.4	103	19	2.3	24.595	-H45	063-12	95
57	20	4.6	5.8	15	24	19	57	20	4.6	101	19	3.9	25.095	-H100	063-12	98
52	22	2.1	5.3	17	22	21	52	22	2.1	92	21	2.0	27.618	-H45	063-12	95
50	22	4.5	5.0	17	21	22	50	22	4.5	88	22	4.3	28.738	-H100	063-12	98
45	25	4.0	4.6	19	19	24	45	25	4.0	80	24	3.9	31.805	-H100	063-12	98
45	25	1.8	4.5	19	19	25	45	25	1.8	79	25	1.8	32.000	-H45	063-12	95
40	28	1.6	4.0	22	17	28	40	28	1.6	71	28	1.6	35.933	-H45	063-12	95
39	28	3.5	4.0	22	17	28	39	28	3.5	70	28	3.4	36.422	-H100	063-12	98
36	31	3.2	3.6	24	15	31	36	31	3.2	64	31	3.1	39.857	-H100	063-12	98
34	32	1.4	3.5	25	15	32	34	32	1.4	61	32	1.4	41.455	-H45	063-12	95
31	36	2.8	3.2	27	13	35	31	36	2.8	56	35	2.9	45.643	-H100	063-12	98
31	36	1.2	3.1	28	13	36	31	36	1.2	55	36	1.3	46.550	-H45	063-12	95
27	41	1.7	2.8	32	11	40	27	41	1.7	48	40	1.7	52.510	-H100	063-12	98
27	41	1.1	2.7	32	11	41	27	41	1.1	48	41	1.1	52.909	-H45	063-12	95
26	42	3.1	2.7	33	11	42	26	42	3.1	47	42	3.2	54.438	-H210	063-12	104
25	44	3.2	2.6	34	11	43	25	44	3.2	45	43	3.3	56.077	-H140	063-12	101
24	46	1.0	2.4	36	10	46	24	46	1.0	43	46	1.0	59.413	-H45	063-12	95
24	47	1.7	2.4	36	10	46	24	47	1.7	42	46	1.7	60.133	-H100	063-12	98
23	48	3.1	2.4	37	9.8	47	23	48	3.1	42	47	3.2	60.938	-H210	063-12	104
21	52	1.7	2.2	40	9.0	51	21	52	1.7	38	51	1.7	66.908	-H140	063-12	101
19	58	1.7	2.0	44	8.1	57	19	58	1.7	34	57	1.7	73.879	-H140	063-12	101

Selection tables, 4-pole motors

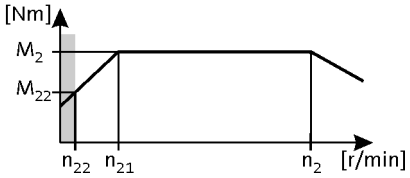


50 Hz: P_N = 0.12 kW
87 Hz: P_N = 0.21 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
18	61	3.4	1.8	47	7.5	60	18	61	3.4	32	60	3.3	79.507	-H210	063-12	104
16	71	3.0	1.6	55	6.5	70	16	71	3.0	28	70	3.0	92.205	-H210	063-12	104
14	79	2.7	1.4	61	5.8	78	14	79	2.7	25	78	2.7	103.214	-H210	063-12	104
12	91	2.3	1.2	70	5.1	89	12	91	2.3	22	89	2.4	118.162	-H210	063-12	104
11	99	3.2	1.1	76	4.7	97	11	99	3.2	20	97	3.3	128.743	-H320	063-12	107
11	102	2.1	1.1	78	4.5	100	11	102	2.1	19	100	2.1	132.270	-H210	063-12	104
9.7	112	2.9	1.0	87	4.1	111	9.7	112	2.9	17	111	2.9	146.244	-H320	063-12	107
9.3	117	1.8	0.9	91	3.9	116	9.3	117	1.8	17	116	1.8	152.853	-H210	063-12	104
8.6	128	2.5	0.9	99	3.6	126	8.6	128	2.5	15	126	2.5	166.541	-H320	063-12	107
8.3	131	1.6	0.8	101	3.5	129	8.3	131	1.6	15	129	1.6	171.104	-H210	063-12	104
7.5	145	2.2	0.8	112	3.2	143	7.5	145	2.2	13	143	2.2	189.179	-H320	063-12	107
7.2	152	3.0	0.7	117	3.0	150	7.2	152	3.0	13	150	3.0	198.059	-H450	063-12	110
7.2	153	1.4	0.7	118	3.0	150	7.2	153	1.4	13	150	1.4	198.873	-H210	063-12	104
6.6	167	1.9	0.7	128	2.8	164	6.6	167	1.9	12	164	1.9	216.683	-H320	063-12	107
6.4	171	1.2	0.7	132	2.7	168	6.4	171	1.2	11	168	1.3	222.619	-H210	063-12	104
6.4	172	2.6	0.6	133	2.7	169	6.4	172	2.6	11	169	2.7	223.833	-H450	063-12	110
5.8	189	1.7	0.6	146	2.4	186	5.8	189	1.7	10	186	1.7	246.137	-H320	063-12	107
5.7	191	2.4	0.6	147	2.4	188	5.7	191	2.4	10	188	2.4	248.200	-H450	063-12	110
5.5	198	1.1	0.6	153	2.3	195	5.5	198	1.1	9.8	195	1.1	257.631	-H210	063-12	104
5.1	216	2.1	0.5	166	2.1	212	5.1	216	2.1	9.0	212	2.1	280.500	-H450	063-12	110
5.1	216	1.3	0.5	166	2.1	212	5.1	216	1.3	9.0	212	1.3	280.702	-H320	063-12	107
4.9	222	1.0	0.5	171	2.1	218	4.9	222	1.0	8.8	218	1.0	288.393	-H210	063-12	104
4.5	245	1.3	0.5	189	1.9	241	4.5	245	1.3	8.0	241	1.3	318.859	-H320	063-12	107
4.4	251	1.7	0.4	194	1.8	247	4.4	251	1.7	7.8	247	1.7	326.994	-H450	063-12	110
3.9	284	1.6	0.4	219	1.6	279	3.9	284	1.6	6.9	279	1.6	369.548	-H450	063-12	110

Selection tables, 4-pole motors

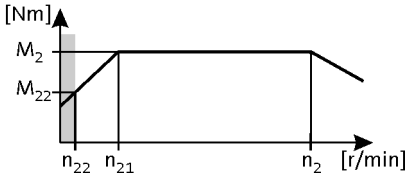


50 Hz: P_N = 0.18 kW
87 Hz: P_N = 0.33 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
526	3.0	4.7	56	2.4	231	3.0	526	3.0	4.7	953	3.0	3.9	2.597	-H45	063-32	95
400	4.0	4.5	43	3.2	176	4.0	400	4.0	4.5	725	4.0	3.7	3.413	-H45	063-32	95
313	5.0	3.9	33	4.1	137	5.0	313	5.0	3.9	567	5.0	3.3	4.368	-H45	063-32	95
257	6.0	4.2	27	5.0	113	6.0	257	6.0	4.2	466	7.0	3.5	5.312	-H45	063-32	95
229	7.0	4.0	24	5.6	101	7.0	229	7.0	4.0	415	7.0	3.3	5.965	-H45	063-32	95
212	8.0	4.5	23	6.1	93	8.0	212	8.0	4.5	384	8.0	3.7	6.440	-H100	063-32	98
196	9.0	3.5	21	6.6	86	9.0	196	9.0	3.5	355	9.0	2.9	6.982	-H45	063-32	95
174	10	3.3	19	7.4	77	10	174	10	3.3	316	10	2.8	7.840	-H45	063-32	95
166	10	4.1	18	7.7	73	10	166	10	4.1	301	10	3.5	8.214	-H100	063-32	98
153	11	3.0	16	8.4	67	11	153	11	3.0	277	11	2.5	8.935	-H45	063-32	95
136	12	2.9	15	9.4	60	12	136	12	2.9	247	12	2.4	10.033	-H45	063-32	95
120	14	4.5	13	11	53	14	120	14	4.5	218	14	3.7	11.360	-H100	063-32	98
119	14	2.5	13	11	53	14	119	14	2.5	217	14	2.1	11.429	-H45	063-32	95
108	15	4.1	12	12	47	15	108	15	4.1	196	16	3.5	12.653	-H100	063-32	98
106	16	2.4	11	12	47	16	106	16	2.4	193	16	2.0	12.833	-H45	063-32	95
94	18	4.1	10	14	41	18	94	18	4.1	171	18	3.5	14.490	-H100	063-32	98
92	18	2.2	9.8	14	40	18	92	18	2.2	167	18	1.8	14.836	-H45	063-32	95
85	20	4.1	9.0	15	37	20	85	20	4.1	154	20	3.5	16.122	-H140	063-32	101
82	20	2.0	8.7	16	36	20	82	20	2.0	149	21	1.9	16.660	-H45	063-32	95
77	22	4.1	8.1	17	34	22	77	22	4.1	139	22	3.5	17.802	-H140	063-32	101
72	23	1.8	7.6	18	32	23	72	23	1.8	130	23	1.7	19.013	-H45	063-32	95
70	24	3.5	7.4	18	31	24	70	24	3.5	127	24	2.9	19.486	-H100	063-32	98
64	26	1.7	6.8	20	28	26	64	26	1.7	116	26	1.6	21.350	-H45	063-32	95
61	27	3.5	6.5	21	27	27	61	27	3.5	111	28	2.9	22.314	-H100	063-32	98
56	30	1.5	5.9	23	24	30	56	30	1.5	101	30	1.4	24.595	-H45	063-32	95
54	31	2.9	5.8	24	24	31	54	31	2.9	99	31	2.5	25.095	-H100	063-32	98
49	34	1.3	5.3	26	22	34	49	34	1.3	90	34	1.3	27.618	-H45	063-32	95
48	35	2.9	5.0	27	21	35	48	35	2.9	86	36	2.7	28.738	-H100	063-32	98
43	39	2.6	4.6	30	19	39	43	39	2.6	78	39	2.4	31.805	-H100	063-32	98
43	39	2.9	4.5	30	19	39	43	39	2.9	77	40	2.8	31.976	-H140	063-32	101
43	39	1.2	4.5	30	19	39	43	39	1.2	77	40	1.1	32.000	-H45	063-32	95
39	43	2.9	4.1	33	17	43	39	43	2.9	71	43	2.8	35.095	-H210	063-32	104
39	43	2.9	4.1	33	17	43	39	43	2.9	70	44	2.8	35.308	-H140	063-32	101
38	44	1.0	4.0	34	17	44	38	44	1.0	69	44	1.0	35.933	-H45	063-32	95
38	44	2.3	4.0	34	17	44	38	44	2.3	68	45	2.1	36.422	-H100	063-32	98

Selection tables, 4-pole motors



50 Hz: P_N = 0.18 kW
87 Hz: P_N = 0.33 kW

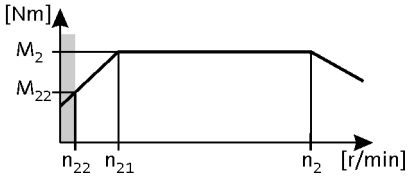
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
36	47	2.9	3.8	36	16	47	36	47	2.9	65	47	2.8	38.238	-H320	063-32	107
35	48	2.9	3.7	37	15	48	35	48	2.9	63	49	2.8	39.286	-H210	063-32	104
34	49	2.1	3.6	38	15	49	34	49	2.1	62	49	2.0	39.857	-H100	063-32	98
34	50	2.6	3.6	38	15	50	34	50	2.6	61	50	2.5	40.526	-H140	063-32	101
33	51	0.9	3.5	39	15	51	33	51	0.9	60	51	0.8	41.455	-H45	063-32	95
32	52	2.6	3.4	40	14	52	32	52	2.6	58	53	2.5	42.593	-H210	063-32	104
31	53	2.9	3.3	41	14	53	31	53	2.9	57	54	2.9	43.436	-H320	063-32	107
31	55	2.6	3.2	42	13	55	31	55	2.6	55	55	2.5	44.748	-H140	063-32	101
30	56	1.8	3.2	43	13	56	30	56	1.8	54	56	1.8	45.643	-H100	063-32	98
29	57	2.6	3.1	44	13	57	29	57	2.6	53	57	2.5	46.407	-H320	063-32	107
29	58	2.6	3.0	45	13	58	29	58	2.6	52	59	2.5	47.679	-H210	063-32	104
27	62	2.1	2.9	48	12	62	27	62	2.1	49	63	2.1	50.786	-H140	063-32	101
26	64	1.1	2.8	49	11	64	26	64	1.1	47	65	1.1	52.510	-H100	063-32	98
26	64	2.6	2.8	50	11	64	26	64	2.6	47	65	2.5	52.715	-H320	063-32	107
25	67	2.0	2.7	51	11	67	25	67	2.0	46	67	2.0	54.438	-H210	063-32	104
24	69	2.0	2.6	53	11	69	24	69	2.0	44	69	2.0	56.077	-H140	063-32	101
23	73	1.1	2.4	57	10	73	23	73	1.1	41	74	1.1	60.133	-H100	063-32	98
22	74	2.0	2.4	57	9.8	74	22	74	2.0	41	75	2.0	60.938	-H210	063-32	104
20	82	1.1	2.2	63	9.0	82	20	82	1.1	37	83	1.1	66.908	-H140	063-32	101
19	90	1.1	2.0	70	8.1	90	19	90	1.1	34	91	1.1	73.879	-H140	063-32	101

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
25	67	3.1	2.6	52	11	67	25	67	3.1	45	68	3.0	55.529	-H210	063-32	104
22	75	2.8	2.3	58	9.7	75	22	75	2.8	40	76	2.7	62.160	-H210	063-32	104
19	85	2.5	2.0	66	8.4	85	19	85	2.5	35	86	2.3	71.026	-H210	063-32	104
17	96	2.2	1.8	74	7.5	96	17	96	2.2	31	97	2.1	79.507	-H210	063-32	104
16	106	3.0	1.6	82	6.8	106	16	106	3.0	28	107	3.0	87.906	-H320	063-32	107
15	111	1.9	1.6	85	6.5	111	15	111	1.9	27	112	1.9	92.205	-H210	063-32	104
14	121	2.7	1.4	93	6.0	121	14	121	2.7	25	122	2.6	100.462	-H320	063-32	107
13	124	1.7	1.4	96	5.8	124	13	124	1.7	24	126	1.7	103.214	-H210	063-32	104
12	137	2.3	1.3	106	5.3	137	12	137	2.3	22	139	2.3	114.118	-H320	063-32	107
12	142	1.5	1.2	110	5.1	142	12	142	1.5	21	144	1.5	118.162	-H210	063-32	104
11	146	3.1	1.2	112	4.9	146	11	146	3.1	20	148	3.1	121.342	-H450	063-32	110
11	155	2.1	1.1	119	4.7	155	11	155	2.1	19	157	2.0	128.743	-H320	063-32	107
10	159	1.3	1.1	123	4.5	159	10	159	1.3	19	161	1.3	132.270	-H210	063-32	104
10	165	2.7	1.1	127	4.4	165	10	165	2.7	18	167	2.7	137.133	-H450	063-32	110
9.3	176	1.8	1.0	136	4.1	176	9.3	176	1.8	17	178	1.8	146.244	-H320	063-32	107

Selection tables, 4-pole motors

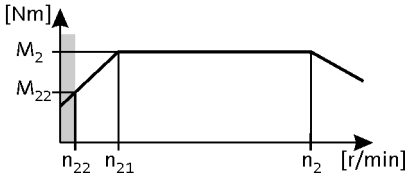


50 Hz: P_N = 0.18 kW
87 Hz: P_N = 0.33 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
8.9	184	1.1	0.9	142	3.9	184	8.9	184	1.1	16	186	1.1	152.853	-H210	063-32	104
8.7	188	2.4	0.9	145	3.8	188	8.7	188	2.4	16	190	2.4	156.274	-H450	063-32	110
8.2	200	1.6	0.9	154	3.6	200	8.2	200	1.6	15	203	1.6	166.541	-H320	063-32	107
8.0	206	1.0	0.8	159	3.5	206	8.0	206	1.0	15	208	1.0	171.104	-H210	063-32	104
7.7	213	2.1	0.8	164	3.4	213	7.7	213	2.1	14	215	2.1	176.611	-H450	063-32	110
7.2	228	1.4	0.8	175	3.2	228	7.2	228	1.4	13	230	1.4	189.179	-H320	063-32	107
6.9	238	1.9	0.7	184	3.0	238	6.9	238	1.9	13	241	1.9	198.059	-H450	063-32	110
6.9	239	0.9	0.7	184	3.0	239	6.9	239	0.9	12	242	0.9	198.873	-H210	063-32	104
6.3	261	1.2	0.7	201	2.8	261	6.3	261	1.2	11	264	1.2	216.683	-H320	063-32	107
6.1	269	1.7	0.6	207	2.7	269	6.1	269	1.7	11	272	1.7	223.833	-H450	063-32	110
5.5	296	1.1	0.6	228	2.4	296	5.5	296	1.1	10	299	1.1	246.137	-H320	063-32	107
5.5	299	1.5	0.6	230	2.4	299	5.5	299	1.5	10	302	1.5	248.200	-H450	063-32	110
4.9	338	1.3	0.5	260	2.1	338	4.9	338	1.3	8.8	341	1.3	280.500	-H450	063-32	110
4.2	394	1.1	0.4	303	1.8	394	4.2	394	1.1	7.6	398	1.1	326.994	-H450	063-32	110
3.7	445	1.0	0.4	342	1.6	445	3.7	445	1.0	6.7	450	1.0	369.548	-H450	063-32	110

Selection tables, 4-pole motors

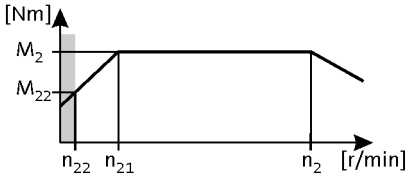


50 Hz: P_N = 0.25 kW
87 Hz: P_N = 0.45 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
528	4.0	4.1	56	3.4	231	4.0	528	4.0	4.1	955	4.0	3.5	2.597	-H45	063-42	95
419	6.0	5.6	44	4.3	184	5.0	419	6.0	5.6	759	5.0	4.8	3.267	-H140	063-42	101
408	6.0	5.6	43	4.4	179	6.0	408	6.0	5.6	739	6.0	4.8	3.354	-H100	063-42	98
401	6.0	3.3	43	4.4	176	6.0	401	6.0	3.3	727	6.0	2.8	3.413	-H45	063-42	95
314	7.0	2.8	33	5.7	137	7.0	314	7.0	2.8	568	7.0	2.4	4.368	-H45	063-42	95
298	8.0	5.6	32	6.0	130	8.0	298	8.0	5.6	539	8.0	4.8	4.600	-H100	063-42	98
265	9.0	5.6	28	6.7	116	9.0	265	9.0	5.6	480	9.0	4.8	5.167	-H100	063-42	98
258	9.0	3.0	27	6.9	113	9.0	258	9.0	3.0	467	9.0	2.6	5.312	-H45	063-42	95
233	10	5.2	25	7.7	102	10	233	10	5.2	421	10	4.4	5.887	-H100	063-42	98
230	10	2.9	24	7.8	101	10	230	10	2.9	416	10	2.5	5.965	-H45	063-42	95
213	11	5.2	23	8.4	93	11	213	11	5.2	385	11	4.4	6.440	-H100	063-42	98
196	12	2.5	21	9.1	86	12	196	12	2.5	355	12	2.2	6.982	-H45	063-42	95
193	12	5.6	21	9.2	85	12	193	12	5.6	350	12	4.8	7.086	-H100	063-42	98
175	13	2.4	19	10	77	13	175	13	2.4	316	13	2.1	7.840	-H45	063-42	95
167	14	4.8	18	11	73	14	167	14	4.8	302	14	4.1	8.214	-H100	063-42	98
153	15	2.2	16	12	67	15	153	15	2.2	278	15	1.9	8.935	-H45	063-42	95
151	15	5.2	16	12	66	15	151	15	5.2	274	15	4.4	9.068	-H100	063-42	98
137	17	2.1	15	13	60	17	137	17	2.1	247	17	1.8	10.033	-H45	063-42	95
136	17	4.3	14	13	60	17	136	17	4.3	247	17	3.7	10.063	-H100	063-42	98
121	19	5.2	13	15	53	19	121	19	5.2	218	19	4.4	11.360	-H100	063-42	98
120	19	1.8	13	15	53	19	120	19	1.8	217	19	1.5	11.429	-H45	063-42	95
108	21	4.7	12	17	47	21	108	21	4.7	196	21	4.0	12.653	-H100	063-42	98
107	22	1.8	11	17	47	22	107	22	1.8	193	22	1.5	12.833	-H45	063-42	95
95	24	4.1	10	19	41	24	95	24	4.1	171	24	3.5	14.490	-H100	063-42	98
92	25	1.6	9.8	19	40	25	92	25	1.6	167	25	1.3	14.836	-H45	063-42	95
88	26	3.8	9.4	20	39	26	88	26	3.8	160	26	3.3	15.500	-H100	063-42	98
82	28	1.5	8.7	22	36	28	82	28	1.5	149	28	1.4	16.660	-H45	063-42	95
77	30	3.3	8.2	23	34	30	77	30	3.3	140	30	2.8	17.750	-H100	063-42	98
72	32	1.3	7.6	25	32	32	72	32	1.3	130	32	1.3	19.013	-H45	063-42	95
70	33	3.0	7.4	25	31	33	70	33	3.0	127	33	2.6	19.486	-H100	063-42	98
64	36	1.2	6.8	28	28	36	64	36	1.2	116	36	1.2	21.350	-H45	063-42	95
61	38	2.7	6.5	29	27	38	61	38	2.7	111	38	2.3	22.314	-H100	063-42	98
56	42	1.1	5.9	32	24	41	56	42	1.1	101	41	1.1	24.595	-H45	063-42	95
55	42	2.4	5.8	33	24	42	55	42	2.4	99	42	2.0	25.095	-H100	063-42	98
50	46	3.0	5.3	36	22	46	50	46	3.0	91	46	2.9	27.415	-H140	063-42	101

Selection tables, 4-pole motors



50 Hz: P_N = 0.25 kW
87 Hz: P_N = 0.45 kW

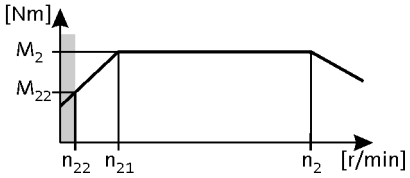
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
50	47	1.0	5.3	36	22	46	50	47	1.0	90	46	0.9	27.618	-H45	063-42	95
48	49	2.1	5.0	37	21	48	48	49	2.1	86	48	2.0	28.738	-H100	063-42	98
43	54	1.9	4.6	41	19	53	43	54	1.9	78	53	1.8	31.805	-H100	063-42	98
43	54	2.6	4.5	42	19	54	43	54	2.6	78	54	2.5	31.976	-H140	063-42	101
43	54	0.8	4.5	42	19	54	43	54	0.8	78	54	0.8	32.000	-H45	063-42	95
39	60	2.4	4.1	46	17	59	39	60	2.4	70	59	2.3	35.308	-H140	063-42	101
38	62	1.6	4.0	47	17	61	38	62	1.6	68	61	1.6	36.422	-H100	063-42	98
35	66	3.2	3.7	51	15	66	35	66	3.2	63	66	3.1	39.286	-H210	063-42	104
34	67	1.2	3.6	52	15	67	34	67	1.2	62	67	1.2	39.857	-H100	063-42	98
34	69	2.0	3.6	53	15	68	34	69	2.0	61	68	2.1	40.526	-H140	063-42	101
32	72	2.5	3.4	55	14	72	32	72	2.5	58	72	2.6	42.593	-H210	063-42	104
32	73	3.2	3.3	56	14	73	32	73	3.2	57	73	3.2	43.313	-H450	063-42	110
31	76	1.9	3.2	58	13	75	31	76	1.9	55	75	1.9	44.748	-H140	063-42	101
30	77	1.2	3.2	59	13	77	30	77	1.2	54	77	1.2	45.643	-H100	063-42	98
30	78	2.8	3.1	60	13	78	30	78	2.8	53	78	2.8	46.407	-H320	063-42	107
29	81	2.6	3.0	62	13	80	29	81	2.6	52	80	2.6	47.679	-H210	063-42	104
28	83	3.2	3.0	64	12	82	28	83	3.2	51	82	3.2	48.950	-H450	063-42	110
27	86	1.2	2.9	66	12	85	27	86	1.2	49	85	1.2	50.786	-H140	063-42	101
26	89	2.8	2.8	69	11	89	26	89	2.8	47	89	2.8	52.715	-H320	063-42	107
25	92	1.4	2.7	71	11	92	25	92	1.4	46	92	1.4	54.438	-H210	063-42	104
25	93	2.6	2.6	71	11	92	25	93	2.6	45	92	2.6	54.750	-H450	063-42	110
24	95	1.2	2.6	73	11	94	24	95	1.2	44	94	1.2	56.077	-H140	063-42	101
23	103	1.4	2.4	79	9.8	102	23	103	1.4	41	102	1.4	60.938	-H210	063-42	104
22	105	2.6	2.3	81	9.7	104	22	105	2.6	40	104	2.6	61.875	-H450	063-42	110

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
32	72	2.9	3.3	56	14	72	32	72	2.9	57	72	2.5	43.390	-H210	063-42	104
28	81	2.6	3.0	62	12	80	28	81	2.6	51	80	2.5	48.571	-H210	063-42	104
25	92	2.3	2.6	71	11	92	25	92	2.3	45	92	2.2	55.529	-H210	063-42	104
23	101	3.2	2.4	78	9.9	100	23	101	3.2	41	100	3.1	60.502	-H320	063-42	107
22	104	2.0	2.3	80	9.7	103	22	104	2.0	40	103	2.0	62.160	-H210	063-42	104
20	114	2.8	2.1	88	8.7	114	20	114	2.8	36	114	2.7	68.726	-H320	063-42	107
19	118	1.8	2.0	91	8.4	118	19	118	1.8	35	118	1.7	71.026	-H210	063-42	104
18	129	2.5	1.9	99	7.8	128	18	129	2.5	32	128	2.4	77.387	-H320	063-42	107
17	132	1.6	1.8	102	7.5	132	17	132	1.6	31	132	1.5	79.507	-H210	063-42	104
16	146	2.2	1.6	113	6.8	146	16	146	2.2	28	146	2.2	87.906	-H320	063-42	107
15	148	3.0	1.6	114	6.7	147	15	148	3.0	28	147	3.1	89.048	-H450	063-42	110

Selection tables, 4-pole motors

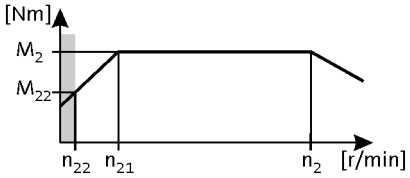


50 Hz: P_N = 0.25 kW
87 Hz: P_N = 0.45 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
15	154	1.4	1.6	118	6.5	153	15	154	1.4	27	153	1.4	92.205	-H210	063-42	104
14	161	2.8	1.5	124	6.2	160	14	161	2.8	26	160	2.8	96.522	-H450	063-42	110
14	167	1.9	1.4	129	6.0	166	14	167	1.9	25	166	1.9	100.462	-H320	063-42	107
13	172	1.2	1.4	132	5.8	171	13	172	1.2	24	171	1.2	103.214	-H210	063-42	104
13	182	2.5	1.3	140	5.5	181	13	182	2.5	23	181	2.5	109.083	-H450	063-42	110
12	190	1.7	1.3	146	5.3	189	12	190	1.7	22	189	1.7	114.118	-H320	063-42	107
12	197	1.1	1.2	152	5.1	196	12	197	1.1	21	196	1.1	118.162	-H210	063-42	104
11	202	2.2	1.2	156	4.9	201	11	202	2.2	20	201	2.2	121.342	-H450	063-42	110
11	214	1.5	1.1	165	4.7	213	11	214	1.5	19	213	1.5	128.743	-H320	063-42	107
10	220	1.0	1.1	170	4.5	219	10	220	1.0	19	219	1.0	132.270	-H210	063-42	104
10	228	2.0	1.1	176	4.4	227	10	228	2.0	18	227	2.0	137.133	-H450	063-42	110
9.4	244	1.3	1.0	188	4.1	242	9.4	244	1.3	17	242	1.3	146.244	-H320	063-42	107
9.0	255	0.8	0.9	196	3.9	253	9.0	255	0.8	16	253	0.8	152.853	-H210	063-42	104
8.8	260	1.7	0.9	200	3.8	259	8.8	260	1.7	16	259	1.7	156.274	-H450	063-42	110
8.2	277	1.2	0.9	214	3.6	276	8.2	277	1.2	15	276	1.2	166.541	-H320	063-42	107
7.8	294	1.5	0.8	227	3.4	292	7.8	294	1.5	14	292	1.5	176.611	-H450	063-42	110
7.2	315	1.0	0.8	243	3.2	313	7.2	315	1.0	13	313	1.0	189.179	-H320	063-42	107
6.9	330	1.4	0.7	254	3.0	328	6.9	330	1.4	13	328	1.4	198.059	-H450	063-42	110
6.3	361	0.9	0.7	278	2.8	359	6.3	361	0.9	11	359	0.9	216.683	-H320	063-42	107
6.1	373	1.2	0.6	287	2.7	371	6.1	373	1.2	11	371	1.2	223.833	-H450	063-42	110
5.5	413	1.1	0.6	318	2.4	411	5.5	413	1.1	10	411	1.1	248.200	-H450	063-42	110
4.9	467	1.0	0.5	360	2.1	464	4.9	467	1.0	8.8	464	1.0	280.500	-H450	063-42	110

Selection tables, 4-pole motors

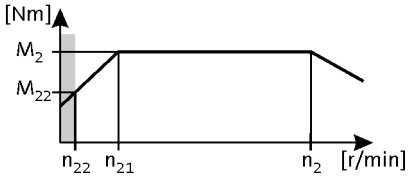


50 Hz: P_N = 0.37 kW
87 Hz: P_N = 0.66 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
543	6.0	2.9	56	4.9	231	6.0	543	6.0	2.9	970	6.0	2.4	2.597	-H45	071-32	95
432	8.0	4.9	44	6.1	184	8.0	432	8.0	4.9				3.267	-H140	071-32	101
420	8.0	4.9	43	6.3	179	8.0	420	8.0	4.9				3.354	-H100	071-32	98
413	8.0	2.3	43	6.4	176	8.0	413	8.0	2.3	738	8.0	1.9	3.413	-H45	071-32	95
323	11	2.0	33	8.2	137	11	323	11	2.0	577	11	1.7	4.368	-H45	071-32	95
307	11	4.9	32	8.6	130	11	307	11	4.9				4.600	-H100	071-32	98
273	13	4.9	28	9.7	116	13	273	13	4.9				5.167	-H100	071-32	98
265	13	2.1	27	9.9	113	13	265	13	2.1	474	13	1.8	5.312	-H45	071-32	95
240	14	4.5	25	11	102	14	240	14	4.5				5.887	-H100	071-32	98
236	15	2.0	24	11	101	14	236	15	2.0	422	14	1.7	5.965	-H45	071-32	95
219	16	4.5	23	12	93	16	219	16	4.5				6.440	-H100	071-32	98
202	17	1.8	21	13	86	17	202	17	1.8	361	17	1.5	6.982	-H45	071-32	95
199	17	4.9	21	13	85	17	199	17	4.9				7.086	-H100	071-32	98
180	19	1.7	19	15	77	19	180	19	1.7	321	19	1.4	7.840	-H45	071-32	95
172	20	4.2	18	15	73	20	172	20	4.2				8.214	-H100	071-32	98
158	22	1.5	16	17	67	22	158	22	1.5	282	22	1.3	8.935	-H45	071-32	95
156	22	4.4	16	17	66	22	156	22	4.4				9.068	-H100	071-32	98
141	24	1.4	15	19	60	24	141	24	1.4	251	24	1.2	10.033	-H45	071-32	95
140	24	3.7	14	19	60	24	140	24	3.7				10.063	-H100	071-32	98
124	28	3.6	13	21	53	28	124	28	3.6				11.360	-H100	071-32	98
123	28	1.3	13	21	53	28	123	28	1.3	221	28	1.1	11.429	-H45	071-32	95
111	31	3.3	12	24	47	31	111	31	3.3	199	31	2.7	12.653	-H100	071-32	98
110	31	1.2	11	24	47	31	110	31	1.2	196	31	1.0	12.833	-H45	071-32	95
97	35	2.8	10	27	41	35	97	35	2.8	174	35	2.4	14.490	-H100	071-32	98
95	36	1.1	9.8	28	40	36	95	36	1.1	170	36	0.9	14.836	-H45	071-32	95
91	38	2.7	9.4	29	39	38	91	38	2.7	163	38	2.2	15.500	-H100	071-32	98
85	41	1.0	8.7	31	36	40	85	41	1.0	151	40	1.0	16.660	-H45	071-32	95
79	43	2.3	8.2	33	34	43	79	43	2.3	142	43	2.0	17.750	-H100	071-32	98
79	43	3.2	8.1	33	34	43	79	43	3.2	142	43	2.7	17.802	-H140	071-32	101
74	46	0.9	7.6	36	32	46	74	46	0.9	133	46	0.9	19.013	-H45	071-32	95
72	47	2.1	7.4	37	31	47	72	47	2.1	129	47	1.8	19.486	-H100	071-32	98
71	48	2.9	7.3	37	30	48	71	48	2.9	128	48	2.5	19.750	-H140	071-32	101
66	52	0.9	6.8	40	28	52	66	52	0.9	118	52	0.8	21.350	-H45	071-32	95
65	53	2.6	6.6	41	28	53	65	53	2.6	116	53	2.2	21.808	-H140	071-32	101
63	54	1.8	6.5	42	27	54	63	54	1.8	113	54	1.6	22.314	-H100	071-32	98

Selection tables, 4-pole motors

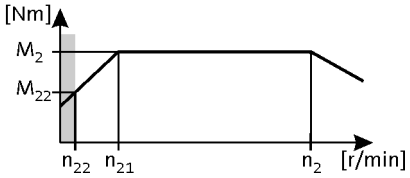


50 Hz: P_N = 0.37 kW
87 Hz: P_N = 0.66 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
57	60	2.3	5.8	47	24	60	57	60	2.3	102	60	2.0	24.829	-H140	071-32	101
56	61	1.6	5.8	47	24	61	56	61	1.6	100	61	1.4	25.095	-H100	071-32	98
52	66	3.2	5.3	51	22	66	52	66	3.2	93	66	3.0	27.119	-H210	071-32	104
51	67	2.1	5.3	51	22	67	51	67	2.1	92	67	2.0	27.415	-H140	071-32	101
49	70	1.4	5.0	54	21	70	49	70	1.4	88	70	1.4	28.738	-H100	071-32	98
48	72	3.2	4.9	55	20	72	48	72	3.2				29.548	-H320	071-32	107
46	74	2.9	4.8	57	20	74	46	74	2.9	83	74	2.7	30.357	-H210	071-32	104
44	77	1.3	4.6	60	19	77	44	77	1.3	79	77	1.2	31.805	-H100	071-32	98
44	78	1.8	4.5	60	19	78	44	78	1.8	79	78	1.7	31.976	-H140	071-32	101
42	82	3.2	4.3	63	18	82	42	82	3.2				33.564	-H320	071-32	107
40	85	2.5	4.1	66	17	85	40	85	2.5	72	85	2.4	35.095	-H210	071-32	104
40	86	1.6	4.1	66	17	86	40	86	1.6	71	86	1.6	35.308	-H140	071-32	101
40	87	3.2	4.1	67	17	87	40	87	3.2				35.689	-H450	071-32	110
39	89	1.1	4.0	68	17	88	39	89	1.1	69	88	1.1	36.422	-H100	071-32	98
37	93	2.7	3.8	72	16	93	37	93	2.7	66	93	2.6	38.238	-H320	071-32	107
36	96	2.2	3.7	74	15	95	36	96	2.2	64	95	2.1	39.286	-H210	071-32	104
35	97	1.0	3.6	75	15	97	35	97	1.0	63	97	1.0	39.857	-H100	071-32	98
35	98	3.2	3.6	76	15	98	35	98	3.2				40.333	-H450	071-32	110
35	99	1.4	3.6	76	15	98	35	99	1.4	62	98	1.4	40.526	-H140	071-32	101
33	104	1.8	3.4	80	14	103	33	104	1.8	59	103	1.8	42.593	-H210	071-32	104
33	105	2.8	3.3	81	14	105	33	105	2.8	58	105	2.8	43.313	-H450	071-32	110
33	106	2.7	3.3	81	14	105	33	106	2.7	58	105	2.7	43.436	-H320	071-32	107
32	109	1.3	3.2	84	13	109	32	109	1.3	56	109	1.3	44.748	-H140	071-32	101
31	111	0.9	3.2	85	13	111	31	111	0.9	55	111	0.9	45.643	-H100	071-32	98
30	113	1.9	3.1	87	13	113	30	113	1.9	54	113	1.9	46.407	-H320	071-32	107
30	116	1.8	3.0	89	13	116	30	116	1.8	53	116	1.8	47.679	-H210	071-32	104
29	119	2.8	3.0	92	12	119	29	119	2.8	52	119	2.8	48.950	-H450	071-32	110
28	123	1.1	2.9	95	12	123	28	123	1.1	50	123	1.1	50.786	-H140	071-32	101
27	128	1.9	2.8	99	11	128	27	128	1.9	48	128	1.9	52.715	-H320	071-32	107
26	132	1.0	2.7	102	11	132	26	132	1.0	46	132	1.0	54.438	-H210	071-32	104
26	133	2.1	2.6	103	11	133	26	133	2.1	46	133	2.1	54.750	-H450	071-32	110
25	136	1.0	2.6	105	11	136	25	136	1.0	45	136	1.0	56.077	-H140	071-32	101
23	148	1.1	2.4	114	9.8	148	23	148	1.1	41	148	1.1	60.938	-H210	071-32	104
23	150	2.0	2.3	116	9.7	150	23	150	2.0	41	150	2.0	61.875	-H450	071-32	110

Selection tables, 4-pole motors

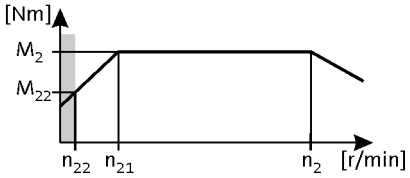


50 Hz: P_N = 0.37 kW
87 Hz: P_N = 0.66 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
33	104	2.0	3.3	80	14	104	33	104	2.0	58	104	1.7	43.390	-H210	071-32	104
30	113	2.8	3.1	87	13	113	30	113	2.8	53	113	2.7	47.276	-H320	071-32	107
29	116	1.8	3.0	90	12	116	29	116	1.8	52	116	1.7	48.571	-H210	071-32	104
26	129	2.5	2.7	99	11	128	26	129	2.5	47	128	2.4	53.703	-H320	071-32	107
25	133	1.6	2.6	102	11	133	25	133	1.6	45	133	1.5	55.529	-H210	071-32	104
23	145	2.2	2.4	112	9.9	145	23	145	2.2	42	145	2.1	60.502	-H320	071-32	107
23	148	3.0	2.3	114	9.7	148	23	148	3.0	41	148	2.9	61.774	-H450	071-32	110
23	149	1.4	2.3	115	9.7	149	23	149	1.4	41	149	1.4	62.160	-H210	071-32	104
21	165	1.9	2.1	127	8.7	164	21	165	1.9	37	164	1.9	68.726	-H320	071-32	107
20	167	2.7	2.1	129	8.6	167	20	167	2.7	36	167	2.6	69.813	-H450	071-32	110
20	170	1.2	2.0	131	8.4	170	20	170	1.2	36	170	1.2	71.026	-H210	071-32	104
18	185	1.7	1.9	143	7.8	185	18	185	1.7	33	185	1.7	77.387	-H320	071-32	107
18	189	2.4	1.8	145	7.6	188	18	189	2.4	32	188	2.3	78.794	-H450	071-32	110
18	190	1.1	1.8	147	7.5	190	18	190	1.1	32	190	1.1	79.507	-H210	071-32	104
16	211	1.5	1.6	162	6.8	210	16	211	1.5	29	210	1.5	87.906	-H320	071-32	107
16	213	2.1	1.6	164	6.7	213	16	213	2.1	28	213	2.1	89.048	-H450	071-32	110
15	221	1.0	1.6	170	6.5	220	15	221	1.0	27	220	1.0	92.205	-H210	071-32	104
15	231	2.0	1.5	178	6.2	231	15	231	2.0	26	231	2.0	96.522	-H450	071-32	110
14	241	1.3	1.4	185	6.0	240	14	241	1.3	25	240	1.3	100.462	-H320	071-32	107
14	247	0.9	1.4	190	5.8	247	14	247	0.9	24	247	0.9	103.214	-H210	071-32	104
13	261	1.7	1.3	201	5.5	261	13	261	1.7	23	261	1.7	109.083	-H450	071-32	110
12	273	1.2	1.3	210	5.3	273	12	273	1.2	22	273	1.2	114.118	-H320	071-32	107
12	291	1.6	1.2	224	4.9	290	12	291	1.6	21	290	1.6	121.342	-H450	071-32	110
11	308	1.0	1.1	237	4.7	308	11	308	1.0	20	308	1.0	128.743	-H320	071-32	107
10	328	1.4	1.1	253	4.4	328	10	328	1.4	18	328	1.4	137.133	-H450	071-32	110
9.6	350	0.9	1.0	270	4.1	350	9.6	350	0.9	17	350	0.9	146.244	-H320	071-32	107
9.0	374	1.2	0.9	288	3.8	374	9.0	374	1.2	16	374	1.2	156.274	-H450	071-32	110
8.5	399	0.8	0.9	307	3.6	398	8.5	399	0.8	15	398	0.8	166.541	-H320	071-32	107
8.0	423	1.1	0.8	326	3.4	422	8.0	423	1.1	14	422	1.1	176.611	-H450	071-32	110
7.1	474	1.0	0.7	365	3.0	473	7.1	474	1.0	13	473	1.0	198.059	-H450	071-32	110
6.3	536	0.8	0.6	413	2.7	535	6.3	536	0.8	11	535	0.8	223.833	-H450	071-32	110

Selection tables, 4-pole motors

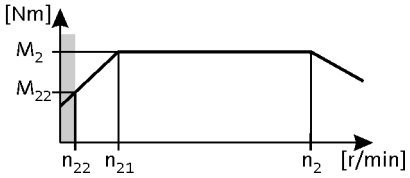


50 Hz: P_N = 0.55 kW
87 Hz: P_N = 1.0 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
541	9.0	1.9	56	7.3	231	10	541	9.0	1.9	968	10	1.6	2.597	-H45	071-42	95
430	12	4.5	44	9.1	184	12	430	12	4.5				3.267	-H140	071-42	101
419	12	4.5	43	9.4	179	12	419	12	4.5				3.354	-H100	071-42	98
412	12	1.5	43	9.5	176	12	412	12	1.5	737	13	1.3	3.413	-H45	071-42	95
322	16	1.3	33	12	137	16	322	16	1.3	576	16	1.1	4.368	-H45	071-42	95
305	17	4.3	32	13	130	17	305	17	4.3				4.600	-H100	071-42	98
272	19	4.0	28	14	116	19	272	19	4.0				5.167	-H100	071-42	98
265	19	1.4	27	15	113	19	265	19	1.4	473	20	1.2	5.312	-H45	071-42	95
239	21	3.8	25	16	102	21	239	21	3.8				5.887	-H100	071-42	98
236	22	1.3	24	17	101	22	236	22	1.3	422	22	1.1	5.965	-H45	071-42	95
218	23	3.6	23	18	93	23	218	23	3.6				6.440	-H100	071-42	98
201	25	1.2	21	20	86	25	201	25	1.2	360	26	1.0	6.982	-H45	071-42	95
198	26	3.4	21	20	85	26	198	26	3.4				7.086	-H100	071-42	98
179	28	1.1	19	22	77	28	179	28	1.1	321	29	0.9	7.840	-H45	071-42	95
171	30	3.1	18	23	73	30	171	30	3.1	306	30	2.6	8.214	-H100	071-42	98
157	32	1.0	16	25	67	32	157	32	1.0	282	33	0.8	8.935	-H45	071-42	95
155	33	2.9	16	25	66	33	155	33	2.9	277	33	2.4	9.068	-H100	071-42	98
140	36	1.0	15	28	60	36	140	36	1.0				10.033	-H45	071-42	95
140	36	2.7	14	28	60	36	140	36	2.7	250	37	2.3	10.063	-H100	071-42	98
124	41	2.4	13	32	53	41	124	41	2.4	221	42	2.0	11.360	-H100	071-42	98
123	41	0.8	13	32	53	41	123	41	0.8				11.429	-H45	071-42	95
122	42	3.1	13	32	52	42	122	42	3.1	218	43	2.5	11.554	-H140	071-42	101
111	46	2.9	12	35	48	46	111	46	2.9	199	47	2.4	12.640	-H140	071-42	101
111	46	2.2	12	35	47	46	111	46	2.2	199	47	1.8	12.653	-H100	071-42	98
110	47	0.8	11	36	47	47	110	47	0.8				12.833	-H45	071-42	95
101	51	2.7	10	39	43	51	101	51	2.7	180	51	2.2	13.957	-H140	071-42	101
97	53	1.9	10	41	41	53	97	53	1.9	174	53	1.6	14.490	-H100	071-42	98
91	56	1.8	9.4	43	39	56	91	56	1.8	162	57	1.5	15.500	-H100	071-42	98
87	58	2.4	9.0	45	37	58	87	58	2.4	156	59	2.0	16.122	-H140	071-42	101
79	64	1.6	8.2	50	34	64	79	64	1.6	142	65	1.3	17.750	-H100	071-42	98
79	65	2.2	8.1	50	34	65	79	65	2.2	141	66	1.8	17.802	-H140	071-42	101
75	68	3.1	7.7	52	32	68	75	68	3.1	134	69	2.6	18.750	-H210	071-42	104
72	71	1.4	7.4	54	31	71	72	71	1.4	129	72	1.2	19.486	-H100	071-42	98
71	72	2.0	7.3	55	30	72	71	72	2.0	127	73	1.6	19.750	-H140	071-42	101
64	79	2.7	6.7	61	28	79	64	79	2.7	115	80	2.2	21.802	-H210	071-42	104

Selection tables, 4-pole motors



50 Hz: P_N = 0.55 kW
87 Hz: P_N = 1.0 kW

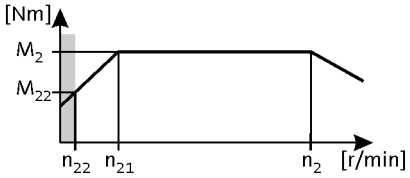
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
64	79	1.8	6.6	61	28	79	64	79	1.8	115	80	1.5	21.808	-H140	071-42	101
63	81	1.2	6.5	62	27	81	63	81	1.2	113	82	1.0	22.314	-H100	071-42	98
58	89	2.4	5.9	68	25	89	58	89	2.4	103	90	2.0	24.405	-H210	071-42	104
57	90	1.6	5.8	69	24	90	57	90	1.6	101	91	1.3	24.829	-H140	071-42	101
56	91	1.1	5.8	70	24	91	56	91	1.1	100	92	0.9	25.095	-H100	071-42	98
52	98	2.1	5.3	76	22	100	52	98	2.1	93	100	2.0	27.119	-H210	071-42	104
51	99	1.4	5.3	77	22	101	51	99	1.4	92	101	1.3	27.415	-H140	071-42	101
51	100	3.2	5.3	77	22	100	51	100	3.2	91	102	3.0	27.578	-H450	071-42	110
49	104	1.0	5.0	80	21	104	49	104	1.0	88	106	0.9	28.738	-H100	071-42	98
48	107	2.9	4.9	83	20	107	48	107	2.9	85	109	2.7	29.548	-H320	071-42	107
46	110	1.9	4.8	85	20	110	46	110	1.9	83	112	1.8	30.357	-H210	071-42	104
45	113	3.2	4.7	87	19	113	45	113	3.2	81	115	3.0	31.167	-H450	071-42	110
44	116	1.2	4.5	89	19	116	44	116	1.2	79	118	1.1	31.976	-H140	071-42	101
42	122	2.6	4.3	94	18	122	42	122	2.6	75	124	2.5	33.564	-H320	071-42	107
40	127	1.7	4.1	98	17	127	40	127	1.7	72	129	1.6	35.095	-H210	071-42	104
40	128	1.1	4.1	99	17	128	40	128	1.1	71	130	1.0	35.308	-H140	071-42	101
39	129	2.9	4.1	100	17	129	39	129	2.9	71	131	2.7	35.689	-H450	071-42	110
37	139	1.8	3.8	107	16	139	37	139	1.8	66	141	1.7	38.238	-H320	071-42	107
36	142	1.5	3.7	110	15	142	36	142	1.5	64	145	1.4	39.286	-H210	071-42	104
35	146	2.9	3.6	113	15	146	35	146	2.9	62	149	2.8	40.333	-H450	071-42	110
33	154	1.2	3.4	119	14	154	33	154	1.2	59	157	1.2	42.593	-H210	071-42	104
32	157	2.1	3.3	121	14	157	32	157	2.1	58	160	2.0	43.313	-H450	071-42	110
32	158	1.8	3.3	121	14	158	32	158	1.8	58	160	1.8	43.436	-H320	071-42	107
30	168	1.3	3.1	130	13	168	30	168	1.3	54	171	1.3	46.407	-H320	071-42	107
30	173	1.2	3.0	133	13	173	30	173	1.2	53	176	1.2	47.679	-H210	071-42	104
29	178	2.1	3.0	137	12	178	29	178	2.1	51	180	2.0	48.950	-H450	071-42	110
27	191	1.3	2.8	147	11	191	27	191	1.3	48	194	1.3	52.715	-H320	071-42	107
26	199	1.4	2.6	153	11	199	26	199	1.4	46	202	1.3	54.750	-H450	071-42	110
23	224	1.4	2.3	173	9.7	224	23	224	1.4	41	228	1.3	61.875	-H450	071-42	110

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
32	155	1.4	3.3	119	14	155	32	155	1.4	58	157	1.1	43.390	-H210	071-42	104
32	158	2.9	3.3	121	14	158	32	158	2.9	57	160	2.4	44.124	-H450	071-42	110
30	169	1.9	3.1	130	13	169	30	169	1.9	53	172	1.8	47.276	-H320	071-42	107
29	174	1.2	3.0	134	12	174	29	174	1.2	52	176	1.1	48.571	-H210	071-42	104
28	178	2.5	2.9	137	12	178	28	178	2.5	50	181	2.4	49.867	-H450	071-42	110
26	192	1.7	2.7	148	11	192	26	192	1.7	47	195	1.6	53.703	-H320	071-42	107

Selection tables, 4-pole motors

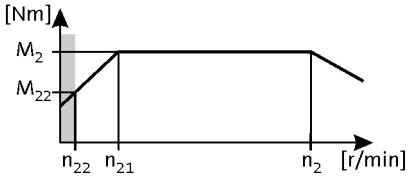


50 Hz: P_N = 0.55 kW
87 Hz: P_N = 1.0 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
25	198	1.1	2.6	153	11	198	25	198	1.1	45	201	1.0	55.529	-H210	071-42	104
25	202	2.2	2.6	155	11	202	25	202	2.2	45	205	2.1	56.469	-H450	071-42	110
23	216	1.5	2.4	166	9.9	216	23	216	1.5	42	220	1.4	60.502	-H320	071-42	107
23	221	2.0	2.3	170	9.7	221	23	221	2.0	41	224	1.9	61.774	-H450	071-42	110
23	222	1.0	2.3	171	9.7	222	23	222	1.0	41	226	0.9	62.160	-H210	071-42	104
20	246	1.3	2.1	189	8.7	246	20	246	1.3	37	249	1.2	68.726	-H320	071-42	107
20	249	1.8	2.1	192	8.6	249	20	249	1.8	36	253	1.7	69.813	-H450	071-42	110
20	254	0.8	2.0	195	8.4	254	20	254	0.8				71.026	-H210	071-42	104
18	276	1.2	1.9	213	7.8	276	18	276	1.2	33	281	1.1	77.387	-H320	071-42	107
18	281	1.6	1.8	217	7.6	281	18	281	1.6	32	286	1.5	78.794	-H450	071-42	110
16	314	1.0	1.6	242	6.8	314	16	314	1.0	29	319	1.0	87.906	-H320	071-42	107
16	318	1.4	1.6	245	6.7	318	16	318	1.4	28	323	1.4	89.048	-H450	071-42	110
15	345	1.3	1.5	266	6.2	345	15	345	1.3	26	350	1.3	96.522	-H450	071-42	110
14	359	0.9	1.4	276	6.0	359	14	359	0.9	25	365	0.9	100.462	-H320	071-42	107
13	390	1.2	1.3	300	5.5	390	13	390	1.2	23	396	1.1	109.083	-H450	071-42	110
12	433	1.0	1.2	334	4.9	433	12	433	1.0	21	440	1.0	121.342	-H450	071-42	110
10	490	0.9	1.1	377	4.4	490	10	490	0.9	18	498	0.9	137.133	-H450	071-42	110
9.0	558	0.8	0.9	430	3.8	558	9.0	558	0.8				156.274	-H450	071-42	110

Selection tables, 4-pole motors

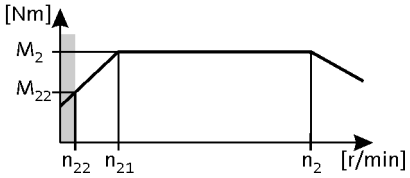


50 Hz: P_N = 0.75 kW
87 Hz: P_N = 1.35 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
432	16	4.2	44	12	184	16	432	16	4.2				3.267	-H140	080-32	101
420	17	3.8	43	13	179	17	420	17	3.8				3.354	-H100	080-32	98
307	23	3.2	32	18	130	23	307	23	3.2	548	23	2.7	4.600	-H100	080-32	98
273	25	3.0	28	20	116	25	273	25	3.0	488	26	2.5	5.167	-H100	080-32	98
240	29	2.8	25	22	102	29	240	29	2.8	428	29	2.3	5.887	-H100	080-32	98
219	32	2.6	23	24	93	32	219	32	2.6	391	32	2.2	6.440	-H100	080-32	98
199	35	2.5	21	27	85	35	199	35	2.5	356	35	2.1	7.086	-H100	080-32	98
194	36	3.0	20	28	83	36	194	36	3.0	347	36	2.5	7.269	-H140	080-32	101
176	39	3.0	18	30	75	39	176	39	3.0	315	40	2.5	8.000	-H140	080-32	101
172	40	2.3	18	31	73	40	172	40	2.3	307	41	1.9	8.214	-H100	080-32	98
156	44	2.6	16	34	67	44	156	44	2.6	279	45	2.2	9.029	-H140	080-32	101
156	45	2.2	16	34	66	45	156	45	2.2	278	45	1.8	9.068	-H100	080-32	98
144	48	2.6	15	37	61	48	144	48	2.6	257	49	2.2	9.800	-H140	080-32	101
140	50	2.0	14	38	60	50	140	50	2.0	250	50	1.7	10.063	-H100	080-32	98
124	56	1.8	13	43	53	56	124	56	1.8	222	56	1.5	11.360	-H100	080-32	98
122	57	2.3	13	44	52	57	122	57	2.3	218	57	1.9	11.554	-H140	080-32	101
118	59	3.2	12	46	50	59	118	59	3.2	210	60	2.6	12.000	-H210	080-32	104
112	62	2.1	12	48	48	62	112	62	2.1	199	63	1.8	12.640	-H140	080-32	101
111	62	1.6	12	48	47	62	111	62	1.6	199	63	1.3	12.653	-H100	080-32	98
103	67	3.0	11	52	44	67	103	67	3.0	184	68	2.5	13.673	-H210	080-32	104
101	69	2.0	10	53	43	69	101	69	2.0	181	69	1.7	13.957	-H140	080-32	101
97	71	1.4	10	55	41	71	97	71	1.4	174	72	1.2	14.490	-H100	080-32	98
92	75	2.7	9.5	58	39	75	92	75	2.7	165	76	2.2	15.306	-H210	080-32	104
91	76	1.3	9.4	59	39	76	91	76	1.3	163	77	1.1	15.500	-H100	080-32	98
88	79	1.8	9.0	61	37	79	88	79	1.8	156	80	1.5	16.122	-H140	080-32	101
84	83	2.5	8.7	64	36	83	84	83	2.5	150	83	2.1	16.750	-H210	080-32	104
79	87	1.1	8.2	67	34	87	79	87	1.1	142	88	1.0	17.750	-H100	080-32	98
79	88	1.6	8.1	68	34	88	79	88	1.6	142	88	1.3	17.802	-H140	080-32	101
75	92	2.3	7.7	71	32	92	75	92	2.3	134	93	1.9	18.750	-H210	080-32	104
72	96	1.0	7.4	74	31	96	72	96	1.0	129	97	0.9	19.486	-H100	080-32	98
71	97	1.4	7.3	75	30	97	71	97	1.4	128	98	1.2	19.750	-H140	080-32	101
68	102	2.9	7.0	79	29	102	68	102	2.9	122	103	2.5	20.731	-H320	080-32	107
65	107	2.0	6.7	83	28	107	65	107	2.0	116	108	1.6	21.802	-H210	080-32	104
65	107	1.3	6.6	83	28	107	65	107	1.3	116	108	1.1	21.808	-H140	080-32	101
63	110	0.9	6.5	85	27	110	63	110	0.9				22.314	-H100	080-32	98

Selection tables, 4-pole motors



50 Hz: P_N = 0.75 kW
87 Hz: P_N = 1.35 kW

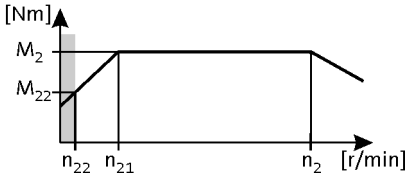
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
59	117	2.7	6.1	90	25	117	59	117	2.7	106	118	2.3	23.754	-H320	080-32	107
58	120	1.8	5.9	93	25	120	58	120	1.8	103	121	1.5	24.405	-H210	080-32	104
57	122	1.1	5.8	94	24	122	57	122	1.1	102	123	1.0	24.829	-H140	080-32	101
56	124	0.8	5.8	95	24	124	56	124	0.8				25.095	-H100	080-32	98
52	133	2.4	5.4	102	22	133	52	133	2.4	93	134	2.3	26.983	-H320	080-32	107
52	134	1.6	5.3	103	22	134	52	134	1.6	93	135	1.5	27.119	-H210	080-32	104
51	135	1.0	5.3	104	22	135	51	135	1.0	92	136	1.0	27.415	-H140	080-32	101
51	136	2.9	5.3	105	22	136	51	136	2.9				27.578	-H450	080-32	110
48	146	2.2	4.9	112	20	146	48	146	2.2	85	147	2.1	29.548	-H320	080-32	107
46	150	1.4	4.8	115	20	150	46	150	1.4	83	151	1.3	30.357	-H210	080-32	104
45	154	2.9	4.7	118	19	154	45	154	2.9	81	155	2.8	31.167	-H450	080-32	110
44	158	0.9	4.5	121	19	158	44	158	0.9	79	159	0.8	31.976	-H140	080-32	101
42	165	1.9	4.3	127	18	165	42	165	1.9	75	167	1.8	33.564	-H320	080-32	107
40	173	1.2	4.1	133	17	173	40	173	1.2	72	174	1.2	35.095	-H210	080-32	104
40	174	0.8	4.1	134	17	174	40	174	0.8				35.308	-H140	080-32	101
40	176	2.6	4.1	135	17	176	40	176	2.6	71	177	2.4	35.689	-H450	080-32	110
37	188	1.3	3.8	145	16	188	37	188	1.3	66	190	1.3	38.238	-H320	080-32	107
36	194	1.1	3.7	149	15	194	36	194	1.1	64	195	1.0	39.286	-H210	080-32	104
35	199	2.3	3.6	153	15	199	35	199	2.3	63	200	2.3	40.333	-H450	080-32	110
33	210	0.9	3.4	162	14	210	33	210	0.9	59	211	0.9	42.593	-H210	080-32	104
33	213	1.5	3.3	164	14	213	33	213	1.5	58	215	1.5	43.313	-H450	080-32	110
33	214	1.3	3.3	165	14	214	33	214	1.3	58	216	1.3	43.436	-H320	080-32	107
30	229	1.0	3.1	176	13	229	30	229	1.0	54	230	1.0	46.407	-H320	080-32	107
30	235	0.9	3.0	181	13	235	30	235	0.9	53	237	0.9	47.679	-H210	080-32	104
29	241	1.5	3.0	186	12	241	29	241	1.5	52	243	1.5	48.950	-H450	080-32	110
27	260	1.0	2.8	200	11	260	27	260	1.0	48	262	1.0	52.715	-H320	080-32	107
26	270	1.0	2.6	208	11	270	26	270	1.0	46	272	1.0	54.750	-H450	080-32	110
23	305	1.0	2.3	235	9.7	305	23	305	1.0	41	307	1.0	61.875	-H450	080-32	110

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
33	211	1.0	3.3	162	14	211	33	211	1.0	58	212	0.8	43.390	-H210	080-32	104
32	214	2.1	3.3	165	14	214	32	214	2.1	57	216	1.8	44.124	-H450	080-32	110
30	229	1.4	3.1	177	13	229	30	229	1.4	53	231	1.3	47.276	-H320	080-32	107
29	236	0.9	3.0	182	12	236	29	236	0.9	52	237	0.9	48.571	-H210	080-32	104
28	242	1.9	2.9	186	12	242	28	242	1.9	51	244	1.8	49.867	-H450	080-32	110
26	261	1.2	2.7	201	11	261	26	261	1.2	47	263	1.2	53.703	-H320	080-32	107
25	274	1.6	2.6	211	11	274	25	274	1.6	45	276	1.6	56.469	-H450	080-32	110

Selection tables, 4-pole motors

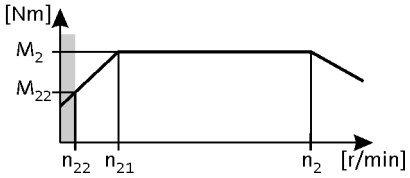


50 Hz: P_N = 0.75 kW
87 Hz: P_N = 1.35 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
23	294	1.1	2.4	226	9.9	294	23	294	1.1	42	296	1.0	60.502	-H320	080-32	107
23	300	1.5	2.3	231	9.7	300	23	300	1.5	41	302	1.4	61.774	-H450	080-32	110
21	334	1.0	2.1	257	8.7	334	21	334	1.0	37	336	0.9	68.726	-H320	080-32	107
20	339	1.3	2.1	261	8.6	339	20	339	1.3	36	341	1.3	69.813	-H450	080-32	110
18	376	0.9	1.9	289	7.8	376	18	376	0.9	33	378	0.8	77.387	-H320	080-32	107
18	382	1.2	1.8	294	7.6	382	18	382	1.2	32	385	1.1	78.794	-H450	080-32	110
16	432	1.0	1.6	333	6.7	432	16	432	1.0	28	435	1.0	89.048	-H450	080-32	110
15	469	1.0	1.5	361	6.2	469	15	469	1.0	26	472	1.0	96.522	-H450	080-32	110
13	530	0.9	1.3	408	5.5	530	13	530	0.9	23	533	0.8	109.083	-H450	080-32	110

Selection tables, 4-pole motors

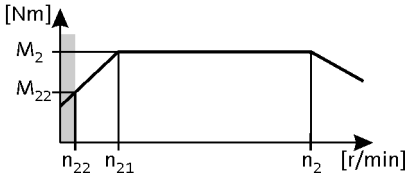


50 Hz: P_N = 1.1 kW
87 Hz: P_N = 2.0 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
438	23	3.5	44	16	184	23	438	23	3.5	778	24	2.9	3.267	-H140	090-12	101
426	24	2.6	43	17	179	24	426	24	2.6	757	24	2.1	3.354	-H100	090-12	98
319	32	2.9	32	22	134	32	319	32	2.9	567	33	2.4	4.480	-H140	090-12	101
311	33	2.2	32	23	130	33	311	33	2.2	552	34	1.8	4.600	-H100	090-12	98
277	37	2.0	28	26	116	37	277	37	2.0	492	38	1.7	5.167	-H100	090-12	98
249	41	2.5	25	29	105	41	249	41	2.5	443	42	2.1	5.733	-H140	090-12	101
243	42	1.9	25	29	102	42	243	42	1.9	432	43	1.6	5.887	-H100	090-12	98
228	45	2.4	23	31	96	45	228	45	2.4	405	46	1.9	6.272	-H140	090-12	101
222	46	1.8	23	32	93	46	222	46	1.8	394	47	1.5	6.440	-H100	090-12	98
202	50	1.7	21	35	85	50	202	50	1.7	359	52	1.4	7.086	-H100	090-12	98
197	52	2.1	20	36	83	52	197	52	2.1	349	53	1.7	7.269	-H140	090-12	101
187	55	3.2	19	38	78	55	187	55	3.2	332	56	2.6	7.657	-H210	090-12	104
179	57	2.1	18	40	75	57	179	57	2.1	318	58	1.7	8.000	-H140	090-12	101
174	59	1.6	18	41	73	59	174	59	1.6	309	60	1.3	8.214	-H100	090-12	98
167	61	2.8	17	43	70	61	167	61	2.8	296	63	2.3	8.571	-H210	090-12	104
158	64	1.8	16	45	67	64	158	64	1.8	281	66	1.5	9.029	-H140	090-12	101
158	65	1.5	16	45	66	65	158	65	1.5	280	66	1.2	9.068	-H100	090-12	98
146	70	2.6	15	49	61	70	146	70	2.6	259	71	2.1	9.799	-H210	090-12	104
146	70	1.8	15	49	61	70	146	70	1.8	259	71	1.5	9.800	-H140	090-12	101
142	72	1.4	14	50	60	72	142	72	1.4	252	73	1.1	10.063	-H100	090-12	98
133	76	2.5	14	54	56	76	133	76	2.5	237	78	2.0	10.720	-H210	090-12	104
126	81	1.2	13	57	53	81	126	81	1.2	224	83	1.0	11.360	-H100	090-12	98
124	82	1.6	13	58	52	82	124	82	1.6	220	84	1.3	11.554	-H140	090-12	101
119	86	2.2	12	60	50	86	119	86	2.2	212	88	1.8	12.000	-H210	090-12	104
118	86	2.9	12	61	50	86	118	86	2.9	209	88	2.4	12.128	-H320	090-12	107
113	90	1.5	12	63	48	90	113	90	1.5	201	92	1.2	12.640	-H140	090-12	101
113	90	1.1	12	63	47	90	113	90	1.1	201	92	0.9	12.653	-H100	090-12	98
108	95	2.8	11	66	45	95	108	95	2.8	191	97	2.3	13.268	-H320	090-12	107
105	97	2.1	11	68	44	100	105	97	2.1	186	100	1.7	13.673	-H210	090-12	104
103	99	1.4	10	70	43	102	103	99	1.4	182	102	1.1	13.957	-H140	090-12	101
99	103	1.0	10	72	41	103	99	103	1.0				14.490	-H100	090-12	98
96	106	2.8	9.7	74	40	106	96	106	2.8	171	109	2.3	14.898	-H320	090-12	107
93	109	1.8	9.5	76	39	109	93	109	1.8	166	112	1.5	15.306	-H210	090-12	104
92	110	0.9	9.4	77	39	110	92	110	0.9				15.500	-H100	090-12	98
89	115	1.2	9.0	80	37	115	89	115	1.2	158	118	1.0	16.122	-H140	090-12	101

Selection tables, 4-pole motors



50 Hz: P_N = 1.1 kW
87 Hz: P_N = 2.0 kW

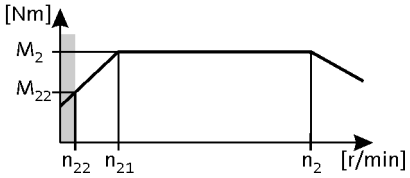
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
85	119	1.8	8.7	84	36	119	85	119	1.8	152	122	1.4	16.750	-H210	090-12	104
85	121	2.3	8.6	84	36	121	85	121	2.3	150	123	1.9	16.923	-H320	090-12	107
80	127	1.1	8.1	89	34	127	80	127	1.1	143	130	0.9	17.802	-H140	090-12	101
78	130	2.4	7.9	91	33	130	78	130	2.4	139	133	2.0	18.250	-H320	090-12	107
76	134	1.6	7.7	94	32	134	76	134	1.6	136	137	1.3	18.750	-H210	090-12	104
72	141	1.0	7.3	99	30	141	72	141	1.0	129	144	0.8	19.750	-H140	090-12	101
69	148	2.0	7.0	103	29	148	69	148	2.0	123	151	1.7	20.731	-H320	090-12	107
66	155	1.4	6.7	109	28	155	66	155	1.4	117	159	1.1	21.802	-H210	090-12	104
66	155	0.9	6.6	109	28	155	66	155	0.9				21.808	-H140	090-12	101
65	158	2.9	6.5	111	27	158	65	158	2.9	115	162	2.3	22.170	-H450	090-12	110
60	169	1.9	6.1	119	25	169	60	169	1.9	107	173	1.6	23.754	-H320	090-12	107
59	174	1.2	5.9	122	25	174	59	174	1.2	104	178	1.0	24.405	-H210	090-12	104
57	179	2.5	5.8	125	24	179	57	179	2.5	101	183	2.1	25.056	-H450	090-12	110
53	192	1.7	5.4	135	22	192	53	192	1.7	94	197	1.6	26.983	-H320	090-12	107
53	193	1.1	5.3	135	22	193	53	193	1.1	94	198	1.0	27.119	-H210	090-12	104
52	197	2.3	5.3	138	22	197	52	197	2.3	92	201	2.1	27.578	-H450	090-12	110
48	211	1.5	4.9	147	20	211	48	211	1.5	86	216	1.4	29.548	-H320	090-12	107
47	216	1.0	4.8	152	20	216	47	216	1.0	84	221	0.9	30.357	-H210	090-12	104
46	222	2.0	4.7	156	19	222	46	222	2.0	82	227	1.9	31.167	-H450	090-12	110
43	239	1.3	4.3	168	18	239	43	239	1.3	76	245	1.3	33.564	-H320	090-12	107
40	254	1.8	4.1	178	17	254	40	254	1.8	71	260	1.7	35.689	-H450	090-12	110
36	287	1.6	3.6	201	15	287	36	287	1.6	63	294	1.5	40.333	-H450	090-12	110
33	309	1.0	3.3	216	14	309	33	309	1.0	59	316	1.0	43.313	-H450	090-12	110
29	349	1.1	3.0	244	12	349	29	349	1.1	52	357	1.0	48.950	-H450	090-12	110

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
32	310	1.5	3.3	217	14	310	32	310	1.5	58	317	1.2	44.124	-H450	090-12	110
29	350	1.3	2.9	245	12	350	29	350	1.3	51	358	1.2	49.867	-H450	090-12	110
25	396	1.1	2.6	278	11	396	25	396	1.1	45	406	1.1	56.469	-H450	090-12	110
23	434	1.0	2.3	304	9.7	434	23	434	1.0	41	444	1.0	61.774	-H450	090-12	110
21	490	0.9	2.1	343	8.6	490	21	490	0.9	36	502	0.9	69.813	-H450	090-12	110
18	553	0.8	1.8	387	7.6	553	18	553	0.8				78.794	-H450	090-12	110

Selection tables, 4-pole motors

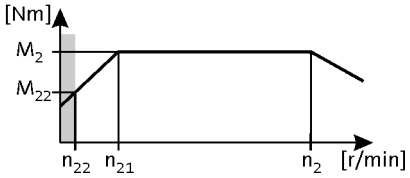


50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
439	32	2.6	44	22	184	32	439	32	2.6	779	32	2.1	3.267	-H140	090-32	101
428	32	1.9	43	23	179	32	428	32	1.9	759	33	1.6	3.354	-H100	090-32	98
320	43	2.2	32	30	134	43	320	43	2.2	568	44	1.8	4.480	-H140	090-32	101
312	45	1.6	32	31	130	45	312	45	1.6	553	45	1.3	4.600	-H100	090-32	98
309	45	3.2	31	32	129	45	309	45	3.2	548	46	2.6	4.648	-H210	090-32	104
278	50	1.5	28	35	116	50	278	50	1.5				5.167	-H100	090-32	98
257	54	2.9	26	38	108	54	257	54	2.9	456	55	2.4	5.583	-H210	090-32	104
250	56	1.9	25	39	105	56	250	56	1.9	444	56	1.5	5.733	-H140	090-32	101
244	57	1.4	25	40	102	57	244	57	1.4	432	58	1.2	5.887	-H100	090-32	98
230	61	2.6	23	42	96	61	230	61	2.6				6.250	-H210	090-32	104
229	61	1.7	23	43	96	61	229	61	1.7	406	62	1.4	6.272	-H140	090-32	101
223	62	1.3	23	44	93	62	223	62	1.3	395	63	1.1	6.440	-H100	090-32	98
203	69	1.3	21	48	85	69	203	69	1.3	359	70	1.0	7.086	-H100	090-32	98
197	70	1.5	20	49	83	70	197	70	1.5				7.269	-H140	090-32	101
187	74	2.3	19	52	78	74	187	74	2.3	332	75	1.9	7.657	-H210	090-32	104
179	77	1.5	18	54	75	77	179	77	1.5	318	79	1.3	8.000	-H140	090-32	101
175	80	1.2	18	56	73	80	175	80	1.2	310	81	1.0	8.214	-H100	090-32	98
172	81	3.1	17	57	72	81	172	81	3.1	305	82	2.6	8.343	-H320	090-32	107
167	83	2.1	17	58	70	83	167	83	2.1	297	84	1.7	8.571	-H210	090-32	104
159	87	1.3	16	61	67	87	159	87	1.3	282	89	1.1	9.029	-H140	090-32	101
158	88	1.1	16	62	66	88	158	88	1.1	281	89	0.9	9.068	-H100	090-32	98
151	92	2.6	15	64	63	92	151	92	2.6	269	93	2.1	9.477	-H320	090-32	107
146	95	1.9	15	66	61	95	146	95	1.9	260	96	1.6	9.799	-H210	090-32	104
146	95	1.3	15	66	61	95	146	95	1.3	260	96	1.1	9.800	-H140	090-32	101
143	97	1.0	14	68	60	97	143	97	1.0	253	99	0.8	10.063	-H100	090-32	98
134	103	2.6	14	72	56	103	134	103	2.6	238	105	2.1	10.677	-H320	090-32	107
134	104	1.8	14	73	56	104	134	104	1.8	237	105	1.5	10.720	-H210	090-32	104
126	110	0.9	13	77	53	110	126	110	0.9				11.360	-H100	090-32	98
124	112	1.1	13	78	52	112	124	112	1.1	220	114	0.9	11.554	-H140	090-32	101
123	113	2.4	12	79	51	113	123	113	2.4	218	115	2.0	11.680	-H320	090-32	107
120	116	1.6	12	81	50	116	120	116	1.6	212	118	1.3	12.000	-H210	090-32	104
118	117	2.2	12	82	50	117	118	117	2.2	210	119	1.8	12.128	-H320	090-32	107
114	122	1.1	12	86	48	122	114	122	1.1	201	124	0.9	12.640	-H140	090-32	101
113	123	0.8	12	86	47	123	113	123	0.8				12.653	-H100	090-32	98
108	128	2.0	11	90	45	128	108	128	2.0	192	130	1.7	13.268	-H320	090-32	107

Selection tables, 4-pole motors



50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW

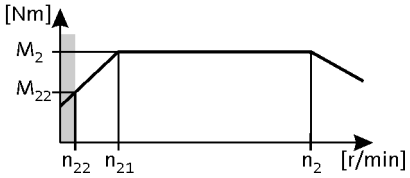
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
105	132	1.5	11	93	44	132	105	132	1.5	186	134	1.3	13.673	-H210	090-32	104
103	135	3.2	10	94	43	135	103	135	3.2	183	137	2.6	13.905	-H450	090-32	110
103	135	1.0	10	95	43	135	103	135	1.0	182	137	0.8	13.957	-H140	090-32	101
96	144	2.0	9.7	101	40	144	96	144	2.0	171	146	1.7	14.898	-H320	090-32	107
94	148	1.4	9.5	104	39	148	94	148	1.4	166	150	1.1	15.306	-H210	090-32	104
91	152	2.9	9.2	107	38	152	91	152	2.9	162	154	2.4	15.714	-H450	090-32	110
89	156	0.9	9.0	109	37	156	89	156	0.9				16.122	-H140	090-32	101
86	162	1.3	8.7	114	36	162	86	162	1.3	152	165	1.1	16.750	-H210	090-32	104
85	164	1.7	8.6	115	36	164	85	164	1.7	150	166	1.4	16.923	-H320	090-32	107
84	165	2.7	8.5	116	35	165	84	165	2.7	149	167	2.3	17.033	-H450	090-32	110
81	172	0.8	8.1	121	34	172	81	172	0.8				17.802	-H140	090-32	101
79	177	1.8	7.9	124	33	177	79	177	1.8	140	179	1.5	18.250	-H320	090-32	107
77	182	1.2	7.7	127	32	182	77	182	1.2	136	184	1.0	18.750	-H210	090-32	104
75	186	2.4	7.5	131	31	186	75	186	2.4	132	189	2.0	19.250	-H450	090-32	110
69	201	1.5	7.0	141	29	201	69	201	1.5	123	204	1.2	20.731	-H320	090-32	107
66	211	1.0	6.7	148	28	211	66	211	1.0	117	214	0.8	21.802	-H210	090-32	104
65	215	2.1	6.5	150	27	215	65	215	2.1	115	218	1.7	22.170	-H450	090-32	110
60	230	1.4	6.1	161	25	230	60	230	1.4	107	233	1.2	23.754	-H320	090-32	107
59	236	0.9	5.9	166	25	236	59	236	0.9				24.405	-H210	090-32	104
57	243	1.9	5.8	170	24	243	57	243	1.9	102	246	1.5	25.056	-H450	090-32	110
53	261	1.2	5.4	183	22	261	53	261	1.2	94	265	1.2	26.983	-H320	090-32	107
52	267	1.7	5.3	187	22	267	52	267	1.7	92	271	1.6	27.578	-H450	090-32	110
49	286	1.1	4.9	200	20	286	49	286	1.1	86	290	1.1	29.548	-H320	090-32	107
46	302	1.5	4.7	211	19	302	46	302	1.5	82	306	1.4	31.167	-H450	090-32	110
43	325	1.0	4.3	228	18	325	43	325	1.0	76	330	0.9	33.564	-H320	090-32	107
40	346	1.3	4.1	242	17	346	40	346	1.3	71	351	1.2	35.689	-H450	090-32	110
36	391	1.2	3.6	273	15	391	36	391	1.2	63	396	1.1	40.333	-H450	090-32	110

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
33	421	1.1	3.3	295	14	421	33	421	1.1	58	427	0.9	44.124	-H450	090-32	110
29	476	1.0	2.9	333	12	476	29	476	1.0	51	483	0.9	49.867	-H450	090-32	110
25	539	0.8	2.6	377	11	539	25	539	0.8				56.469	-H450	090-32	110

Selection tables, 4-pole motors

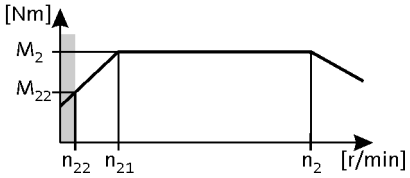


50 Hz: P_N = 2.2 kW
87 Hz: P_N = 3.9 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
426	48	2.6	43	33	177	48	426	48	2.6				3.389	-H210	100-12	104
311	66	2.2	31	46	129	66	311	66	2.2	550	66	1.8	4.648	-H210	100-12	104
311	66	2.9	31	46	129	66	311	66	2.9	550	66	2.4	4.648	-H320	100-12	107
259	79	2.0	26	55	108	79	259	79	2.0				5.583	-H210	100-12	104
238	86	2.7	24	60	99	86	238	86	2.7				6.083	-H320	100-12	107
231	88	1.8	23	62	96	88	231	88	1.8				6.250	-H210	100-12	104
209	97	2.2	21	68	87	97	209	97	2.2				6.910	-H320	100-12	107
189	108	1.6	19	75	78	108	189	108	1.6				7.657	-H210	100-12	104
186	110	3.2	19	77	77	110	186	110	3.2	328	110	2.7	7.787	-H450	100-12	110
173	118	2.1	17	82	72	118	173	118	2.1	306	118	1.8	8.343	-H320	100-12	107
169	121	1.4	17	84	70	121	169	121	1.4				8.571	-H210	100-12	104
164	124	3.0	17	87	68	124	164	124	3.0	290	124	2.5	8.800	-H450	100-12	110
153	134	1.8	15	93	63	134	153	134	1.8				9.477	-H320	100-12	107
148	138	1.3	15	97	61	138	148	138	1.3				9.799	-H210	100-12	104
145	141	2.7	15	98	60	141	145	141	2.7	256	141	2.3	9.965	-H450	100-12	110
135	151	1.8	14	105	56	151	135	151	1.8	239	151	1.5	10.677	-H320	100-12	107
135	151	1.3	14	106	56	151	135	151	1.3	238	152	1.0	10.720	-H210	100-12	104
128	159	2.5	13	111	53	159	128	159	2.5	227	159	2.1	11.262	-H450	100-12	110
124	165	1.7	12	115	51	165	124	165	1.7	219	165	1.4	11.680	-H320	100-12	107
120	169	1.1	12	118	50	169	120	169	1.1				12.000	-H210	100-12	104
119	171	1.5	12	119	50	171	119	171	1.5	211	172	1.2	12.128	-H320	100-12	107
117	174	2.4	12	121	49	174	117	174	2.4	207	174	2.0	12.320	-H450	100-12	110
109	187	1.4	11	131	45	187	109	187	1.4	193	188	1.2	13.268	-H320	100-12	107
106	193	1.0	11	135	44	193	106	193	1.0	187	193	0.9	13.673	-H210	100-12	104
104	196	2.2	10	137	43	196	104	196	2.2				13.905	-H450	100-12	110
97	210	1.4	9.7	147	40	210	97	210	1.4	172	211	1.2	14.898	-H320	100-12	107
94	216	0.9	9.5	151	39	216	94	216	0.9				15.306	-H210	100-12	104
92	222	2.0	9.2	155	38	222	92	222	2.0	163	222	1.7	15.714	-H450	100-12	110
86	236	0.9	8.7	165	36	236	86	236	0.9				16.750	-H210	100-12	104
85	239	1.2	8.6	167	36	239	85	239	1.2	151	239	1.0	16.923	-H320	100-12	107
85	240	1.9	8.5	168	35	240	85	240	1.9	150	241	1.6	17.033	-H450	100-12	110
79	257	1.2	7.9	180	33	257	79	257	1.2	140	258	1.0	18.250	-H320	100-12	107
75	272	1.7	7.5	190	31	272	75	272	1.7	133	272	1.4	19.250	-H450	100-12	110
70	292	1.0	7.0	204	29	292	70	292	1.0	123	293	0.9	20.731	-H320	100-12	107
65	313	1.4	6.5	218	27	313	65	313	1.4	115	314	1.2	22.170	-H450	100-12	110

Selection tables, 4-pole motors

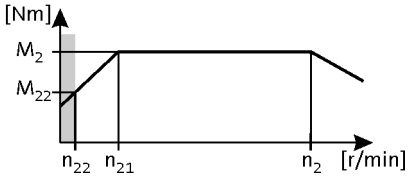


50 Hz: P_N = 2.2 kW
87 Hz: P_N = 2.2 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
58	353	1.3	5.8	247	24	353	58	353	1.3	102	354	1.1	25.056	-H450	100-12	110
52	389	1.2	5.3	272	22	389	52	389	1.2	93	390	1.1	27.578	-H450	100-12	110
46	440	1.0	4.7	307	19	440	46	440	1.0	82	441	1.0	31.167	-H450	100-12	110

Selection tables, 4-pole motors

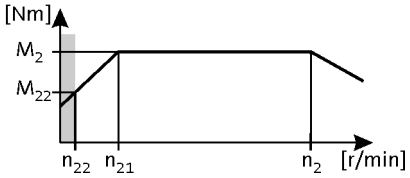


50 Hz: P_N = 3.0 kW
87 Hz: P_N = 5.4 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
426	65	1.9	43	46	177	65	426	65	1.9				3.389	-H210	100-32	104
426	65	2.5	43	46	177	65	426	65	2.5				3.389	-H320	100-32	107
311	89	1.6	31	63	129	89	311	89	1.6				4.648	-H210	100-32	104
311	89	2.1	31	63	129	89	311	89	2.1	550	91	1.7	4.648	-H320	100-32	107
306	91	3.2	31	64	127	91	306	91	3.2	541	92	2.7	4.724	-H450	100-32	110
259	107	1.5	26	75	108	107	259	107	1.5				5.583	-H210	100-32	104
255	109	2.9	26	76	106	109	255	109	2.9				5.678	-H450	100-32	110
239	116	2.8	24	81	99	116	239	116	2.8	423	118	2.3	6.045	-H450	100-32	110
238	117	1.9	24	82	99	117	238	117	1.9				6.083	-H320	100-32	107
231	120	1.3	23	84	96	120	231	120	1.3				6.250	-H210	100-32	104
219	127	2.6	22	89	91	127	219	127	2.6	386	129	2.2	6.613	-H450	100-32	110
209	133	1.6	21	93	87	133	209	133	1.6				6.910	-H320	100-32	107
189	147	1.2	19	103	78	147	189	147	1.2				7.657	-H210	100-32	104
186	150	2.4	19	105	77	150	186	150	2.4				7.787	-H450	100-32	110
173	160	1.6	17	112	72	160	173	160	1.6				8.343	-H320	100-32	107
169	165	1.0	17	115	70	165	169	165	1.0				8.571	-H210	100-32	104
164	169	2.2	17	118	68	169	164	169	2.2				8.800	-H450	100-32	110
153	182	1.3	15	127	63	182	153	182	1.3				9.477	-H320	100-32	107
148	188	1.0	15	132	61	188	148	188	1.0				9.799	-H210	100-32	104
145	192	2.0	15	134	60	192	145	192	2.0				9.965	-H450	100-32	110
135	205	1.3	14	144	56	205	135	205	1.3				10.677	-H320	100-32	107
135	206	0.9	14	144	56	206	135	206	0.9				10.720	-H210	100-32	104
128	217	1.9	13	151	53	217	128	217	1.9				11.262	-H450	100-32	110
124	225	1.2	12	157	51	225	124	225	1.2				11.680	-H320	100-32	107
120	231	0.8	12	161	50	231	120	231	0.8				12.000	-H210	100-32	104
119	233	1.1	12	163	50	233	119	233	1.1				12.128	-H320	100-32	107
117	237	1.7	12	166	49	237	117	237	1.7				12.320	-H450	100-32	110
109	255	1.0	11	178	45	255	109	255	1.0				13.268	-H320	100-32	107
104	267	1.6	10	187	43	267	104	267	1.6				13.905	-H450	100-32	110
97	287	1.0	9.7	200	40	287	97	287	1.0				14.898	-H320	100-32	107
92	302	1.5	9.2	211	38	302	92	302	1.5	163	308	1.2	15.714	-H450	100-32	110
85	326	0.9	8.6	228	36	326	85	326	0.9				16.923	-H320	100-32	107
85	328	1.4	8.5	229	35	328	85	328	1.4	150	334	1.1	17.033	-H450	100-32	110
79	351	0.9	7.9	245	33	351	79	351	0.9				18.250	-H320	100-32	107
75	370	1.2	7.5	259	31	370	75	370	1.2	133	377	1.0	19.250	-H450	100-32	110

Selection tables, 4-pole motors

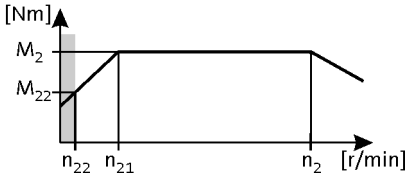


50 Hz: P_N = 3.0 kW
87 Hz: P_N = 5.4 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
65	426	1.1	6.5	298	27	426	65	426	1.1	115	434	0.9	22.170	-H450	100-32	110
58	482	0.9	5.8	337	24	482	58	482	0.9				25.056	-H450	100-32	110
52	530	0.9	5.3	371	22	530	52	530	0.9				27.578	-H450	100-32	110

Selection tables, 4-pole motors

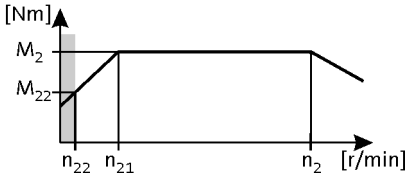


50 Hz: P_N = 4.0 kW
87 Hz: P_N = 7.1 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
429	86	1.9	43	54	177	86	429	86	1.9				3.389	-H320	112-22	107
422	88	2.9	42	55	174	88	422	88	2.9				3.444	-H450	112-22	110
313	118	1.6	31	74	129	118	313	118	1.6				4.648	-H320	112-22	107
308	120	2.4	31	75	127	120	308	120	2.4				4.724	-H450	112-22	110
256	145	2.2	26	91	106	145	256	145	2.2				5.678	-H450	112-22	110
241	154	2.1	24	96	99	154	241	154	2.1	424	155	1.7	6.045	-H450	112-22	110
239	155	1.5	24	97	99	155	239	155	1.5				6.083	-H320	112-22	107
220	168	2.0	22	106	91	168	220	168	2.0	388	170	1.7	6.613	-H450	112-22	110
211	176	1.2	21	110	87	176	211	176	1.2				6.910	-H320	112-22	107
187	198	1.8	19	124	77	198	187	198	1.8				7.787	-H450	112-22	110
174	212	1.2	17	133	72	212	174	212	1.2				8.343	-H320	112-22	107
165	224	1.7	17	140	68	224	165	224	1.7				8.800	-H450	112-22	110
154	241	1.0	15	151	63	241	154	241	1.0				9.477	-H320	112-22	107
146	254	1.5	15	159	60	254	146	254	1.5				9.965	-H450	112-22	110
136	272	1.0	14	170	56	272	136	272	1.0				10.677	-H320	112-22	107
129	287	1.4	13	180	53	287	129	287	1.4				11.262	-H450	112-22	110
125	297	0.9	12	186	51	297	125	297	0.9				11.680	-H320	112-22	107
120	309	0.8	12	193	50	309	120	309	0.8				12.128	-H320	112-22	107
118	314	1.3	12	197	49	314	118	314	1.3				12.320	-H450	112-22	110
105	354	1.2	10	222	43	354	105	354	1.2				13.905	-H450	112-22	110
93	400	1.1	9.2	251	38	400	93	400	1.1				15.714	-H450	112-22	110
85	434	1.0	8.5	272	35	434	85	434	1.0				17.033	-H450	112-22	110
76	490	0.9	7.5	307	31	490	76	490	0.9				19.250	-H450	112-22	110

Selection tables, 4-pole motors

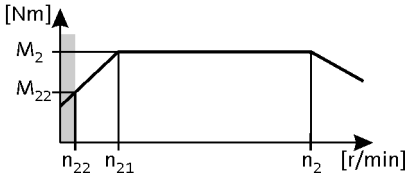


50 Hz: P_N = 5.5 kW
87 Hz: P_N = 9.7 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
427	119	2.1	42	75	174	119	427	119	2.1				3.444	-H450	132-12	110
311	164	1.8	31	102	127	164	311	164	1.8				4.724	-H450	132-12	110
259	197	1.6	26	123	106	197	259	197	1.6				5.678	-H450	132-12	110
243	210	1.5	24	131	99	210	243	210	1.5				6.045	-H450	132-12	110
222	229	1.5	22	143	91	229	222	229	1.5				6.613	-H450	132-12	110
189	270	1.3	19	169	77	270	189	270	1.3				7.787	-H450	132-12	110
167	305	1.2	17	191	68	305	167	305	1.2				8.800	-H450	132-12	110
148	345	1.1	15	216	60	345	148	345	1.1				9.965	-H450	132-12	110
131	390	1.0	13	244	53	390	131	390	1.0				11.262	-H450	132-12	110
119	427	1.0	12	267	49	427	119	427	1.0				12.320	-H450	132-12	110
106	482	0.9	10	301	43	482	106	482	0.9				13.905	-H450	132-12	110
94	545	0.8	9.2	340	38	545	94	545	0.8				15.714	-H450	132-12	110

Selection tables, 4-pole motors



50 Hz: P_N = 7.5 kW
87 Hz: P_N = 13.2 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
424	164	1.6	42	103	174	164	424	164	1.6				3.444	-H450	132-22	110
309	225	1.3	31	141	127	225	309	225	1.3				4.724	-H450	132-22	110
257	270	1.2	26	169	106	270	257	270	1.2				5.678	-H450	132-22	110
242	288	1.1	24	180	99	288	242	288	1.1				6.045	-H450	132-22	110
221	315	1.1	22	197	91	315	221	315	1.1				6.613	-H450	132-22	110
188	371	1.0	19	232	77	371	188	371	1.0				7.787	-H450	132-22	110
166	419	0.9	17	262	68	419	166	419	0.9				8.800	-H450	132-22	110
147	474	0.8	15	297	60	474	147	474	0.8				9.965	-H450	132-22	110

Selection tables, 2-pole motors

50 Hz: P_N = 0.18 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
141	12	5.8	19.486	-H100	063-11	116
123	14	5.8	22.314	-H100	063-11	116
109	15	4.8	25.095	-H100	063-11	116
95	17	5.3	28.738	-H100	063-11	116
106	19	4.8	31.805	-H100	063-11	116
75	22	4.2	36.422	-H100	063-11	116
69	24	3.8	39.857	-H100	063-11	116
60	28	3.6	45.643	-H100	063-11	116
52	32	2.2	52.510	-H100	063-11	116
50	33	4.0	54.438	-H210	063-11	122
46	37	2.2	60.133	-H100	063-11	116
41	41	2.2	66.908	-H140	063-11	119
37	45	2.2	73.879	-H140	063-11	119

Selection tables, 2-pole motors

50 Hz: P_N = 0.25 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
421	6.0	5.2	6.440	-H100	063-31	116
330	7.0	4.9	8.214	-H100	063-31	116
239	10	5.2	11.360	-H100	063-31	116
214	11	4.9	12.653	-H100	063-31	116
187	12	4.9	14.490	-H100	063-31	116
168	14	4.9	16.122	-H140	063-31	119
152	15	4.9	17.802	-H140	063-31	119
139	17	4.1	19.486	-H100	063-31	116
121	19	4.1	22.314	-H100	063-31	116
108	21	3.4	25.095	-H100	063-31	116
118	25	3.8	28.738	-H100	063-31	116
107	27	3.4	31.805	-H100	063-31	116
74	31	3.0	36.422	-H100	063-31	116
68	34	2.7	39.857	-H100	063-31	116
59	39	2.6	45.643	-H100	063-31	116
53	43	3.0	50.786	-H140	063-31	119
52	45	1.6	52.510	-H100	063-31	116
50	47	2.8	54.438	-H210	063-31	122
48	48	2.9	56.077	-H140	063-31	119
45	51	1.6	60.133	-H100	063-31	116
45	52	2.8	60.938	-H210	063-31	122
41	57	1.6	66.908	-H140	063-31	119
37	63	1.6	73.879	-H140	063-31	119

Selection tables, 2-pole motors

50 Hz: P_N = 0.37 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
270	13	5.9	10.063	-H100	071-11	116
239	14	5.7	11.360	-H100	071-11	116
215	16	5.1	12.653	-H100	071-11	116
188	18	4.5	14.490	-H100	071-11	116
176	20	4.2	15.500	-H100	071-11	116
153	22	3.7	17.750	-H100	071-11	116
140	25	3.3	19.486	-H100	071-11	116
122	28	2.9	22.314	-H100	071-11	116
108	32	2.6	25.095	-H100	071-11	116
117	36	2.6	28.738	-H100	071-11	116
106	40	2.3	31.805	-H100	071-11	116
85	40	3.2	31.976	-H140	071-11	119
77	44	2.9	35.308	-H140	071-11	119
75	46	2.0	36.422	-H100	071-11	116
68	50	1.9	39.857	-H100	071-11	116
67	51	2.7	40.526	-H140	071-11	119
61	56	2.5	44.748	-H140	071-11	119
60	58	1.7	45.643	-H100	071-11	116
54	64	2.0	50.786	-H140	071-11	119
50	69	2.0	54.438	-H210	071-11	122
49	71	2.0	56.077	-H140	071-11	119
45	77	2.0	60.938	-H210	071-11	122

Selection tables, 2-pole motors

50 Hz: P_N = 0.55 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
805	6.0	5.1	3.267	-H140	071-31	119
784	6.0	5.1	3.354	-H100	071-31	116
572	9.0	5.1	4.600	-H100	071-31	116
509	10	5.1	5.167	-H100	071-31	116
447	11	4.7	5.887	-H100	071-31	116
408	12	4.7	6.440	-H100	071-31	116
371	14	5.1	7.086	-H100	071-31	116
320	16	4.3	8.214	-H100	071-31	116
290	18	4.5	9.068	-H100	071-31	116
261	19	3.9	10.063	-H100	071-31	116
232	22	3.8	11.360	-H100	071-31	116
208	25	3.4	12.653	-H100	071-31	116
182	28	3.0	14.490	-H100	071-31	116
170	30	2.8	15.500	-H100	071-31	116
148	34	2.4	17.750	-H100	071-31	116
135	38	2.2	19.486	-H100	071-31	116
133	38	3.0	19.750	-H140	071-31	119
121	42	2.8	21.808	-H140	071-31	119
118	43	1.9	22.314	-H100	071-31	116
106	48	2.4	24.829	-H140	071-31	119
105	49	1.7	25.095	-H100	071-31	116
118	53	2.5	27.415	-H140	071-31	119
113	56	1.7	28.738	-H100	071-31	116
102	62	1.5	31.805	-H100	071-31	116
101	62	2.1	31.976	-H140	071-31	119
75	68	2.9	35.095	-H210	071-31	122
75	68	1.9	35.308	-H140	071-31	119
72	71	1.3	36.422	-H100	071-31	116
69	74	3.2	38.238	-H320	071-31	125
67	76	2.6	39.286	-H210	071-31	122
66	77	1.2	39.857	-H100	071-31	116
65	79	1.8	40.526	-H140	071-31	119
62	83	2.2	42.593	-H210	071-31	122
59	87	1.6	44.748	-H140	071-31	119
58	88	1.1	45.643	-H100	071-31	116
57	90	2.4	46.407	-H320	071-31	125
55	92	2.2	47.679	-H210	071-31	122

Selection tables, 2-pole motors

50 Hz: P_N = 0.55 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
52	98	1.3	50.786	-H140	071-31	119
50	102	2.4	52.715	-H320	071-31	125
48	105	1.3	54.438	-H210	071-31	122
48	106	2.6	54.750	-H450	071-31	128
47	109	1.3	56.077	-H140	071-31	119
43	118	1.3	60.938	-H210	071-31	122
43	120	2.6	61.875	-H450	071-31	128

Selection tables, 6-pole motors

50 Hz: P_N = 0.18 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
113	15	5.7	8.214	-H100	071-13	116
103	16	5.9	9.068	-H100	071-13	116
92	18	5.1	10.063	-H100	071-13	116
82	20	4.9	11.360	-H100	071-13	116
74	23	4.4	12.653	-H100	071-13	116
64	26	3.9	14.490	-H100	071-13	116
60	28	3.6	15.500	-H100	071-13	116
52	32	3.1	17.750	-H100	071-13	116
48	35	2.9	19.486	-H100	071-13	116
42	40	2.5	22.314	-H100	071-13	116
38	45	3.1	24.829	-H140	071-13	119
37	45	2.2	25.095	-H100	071-13	116
34	49	2.9	27.415	-H140	071-13	119
32	52	1.9	28.738	-H100	071-13	116
29	57	1.8	31.805	-H100	071-13	116
29	57	2.4	31.976	-H140	071-13	119
26	63	2.2	35.308	-H140	071-13	119
26	65	1.5	36.422	-H100	071-13	116
24	70	3.0	39.286	-H210	071-13	122
23	71	1.4	39.857	-H100	071-13	116
23	73	1.9	40.526	-H140	071-13	119
22	76	2.4	42.593	-H210	071-13	122
21	80	1.7	44.748	-H140	071-13	119
20	82	1.2	45.643	-H100	071-13	116
20	83	2.6	46.407	-H320	071-13	125
20	85	2.4	47.679	-H210	071-13	122
18	91	1.4	50.786	-H140	071-13	119
18	95	2.6	52.715	-H320	071-13	125
17	98	1.4	54.438	-H210	071-13	122
17	98	2.8	54.750	-H450	071-13	128
17	101	1.4	56.077	-H140	071-13	119
15	109	1.4	60.938	-H210	071-13	122
15	111	2.8	61.875	-H450	071-13	128

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
21	77	2.7	43.390	-H210	071-13	122
19	86	2.5	48.571	-H210	071-13	122
17	98	2.1	55.529	-H210	071-13	122
15	107	3.0	60.502	-H320	071-13	125

Selection tables, 6-pole motors

50 Hz: P_N = 0.18 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
15	110	1.9	62.160	-H210	071-13	122
14	121	2.6	68.726	-H320	071-13	125
13	125	1.7	71.026	-H210	071-13	122
12	137	2.3	77.387	-H320	071-13	125
12	139	3.2	78.794	-H450	071-13	128
12	140	1.5	79.507	-H210	071-13	122
11	155	2.1	87.906	-H320	071-13	125
10	157	2.9	89.048	-H450	071-13	128
10	163	1.3	92.205	-H210	071-13	122
12	170	2.6	96.522	-H450	071-13	128
11	177	1.8	100.462	-H320	071-13	125
11	182	1.2	103.214	-H210	071-13	122
11	193	2.3	109.083	-H450	071-13	128
10	202	1.6	114.118	-H320	071-13	125
7.9	209	1.0	118.162	-H210	071-13	122
7.7	214	2.1	121.342	-H450	071-13	128
7.2	227	1.4	128.743	-H320	071-13	125
7.0	234	0.9	132.270	-H210	071-13	122
6.8	242	1.9	137.133	-H450	071-13	128
6.4	258	1.2	146.244	-H320	071-13	125
6.0	276	1.6	156.274	-H450	071-13	128
5.6	294	1.1	166.541	-H320	071-13	125
5.3	312	1.4	176.611	-H450	071-13	128
4.9	334	1.0	189.179	-H320	071-13	125
4.7	350	1.3	198.059	-H450	071-13	128
4.3	383	0.8	216.683	-H320	071-13	125
4.2	395	1.1	223.833	-H450	071-13	128
3.7	438	1.0	248.200	-H450	071-13	128
3.3	495	0.9	280.500	-H450	071-13	128

Selection tables, 6-pole motors

50 Hz: P_N = 0.25 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
285	8.0	4.7	3.267	-H140	071-33	119
277	8.0	4.7	3.354	-H100	071-33	116
202	11	4.7	4.600	-H100	071-33	116
180	13	4.7	5.167	-H100	071-33	116
158	15	4.4	5.887	-H100	071-33	116
144	16	4.4	6.440	-H100	071-33	116
131	18	4.7	7.086	-H100	071-33	116
113	20	4.1	8.214	-H100	071-33	116
103	23	4.3	9.068	-H100	071-33	116
113	25	3.7	10.063	-H100	071-33	116
100	28	3.5	11.360	-H100	071-33	116
74	32	3.2	12.653	-H100	071-33	116
64	36	2.8	14.490	-H100	071-33	116
60	39	2.6	15.500	-H100	071-33	116
52	44	2.3	17.750	-H100	071-33	116
52	44	3.2	17.802	-H140	071-33	119
48	49	2.1	19.486	-H100	071-33	116
47	49	2.9	19.750	-H140	071-33	119
43	54	2.6	21.808	-H140	071-33	119
42	56	1.8	22.314	-H100	071-33	116
38	62	2.3	24.829	-H140	071-33	119
37	63	1.6	25.095	-H100	071-33	116
34	68	3.1	27.119	-H210	071-33	122
34	68	2.1	27.415	-H140	071-33	119
32	72	1.4	28.738	-H100	071-33	116
32	74	3.1	29.548	-H320	071-33	125
31	76	2.8	30.357	-H210	071-33	122
29	79	1.3	31.805	-H100	071-33	116
29	80	1.8	31.976	-H140	071-33	119
28	84	3.1	33.564	-H320	071-33	125
27	87	2.4	35.095	-H210	071-33	122
26	88	1.6	35.308	-H140	071-33	119
26	89	3.1	35.689	-H450	071-33	128
26	91	1.1	36.422	-H100	071-33	116
24	95	2.6	38.238	-H320	071-33	125
24	98	2.2	39.286	-H210	071-33	122
23	99	1.0	39.857	-H100	071-33	116

Selection tables, 6-pole motors

50 Hz: P_N = 0.25 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
23	100	3.1	40.333	-H450	071-33	128
23	101	1.4	40.526	-H140	071-33	119
22	106	1.7	42.593	-H210	071-33	122
22	108	2.7	43.313	-H450	071-33	128
21	108	2.6	43.436	-H320	071-33	125
21	111	1.3	44.748	-H140	071-33	119
20	116	1.9	46.407	-H320	071-33	125
20	119	1.7	47.679	-H210	071-33	122
19	122	2.7	48.950	-H450	071-33	128
18	126	1.0	50.786	-H140	071-33	119
18	131	1.9	52.715	-H320	071-33	125
17	136	1.0	54.438	-H210	071-33	122
17	136	2.0	54.750	-H450	071-33	128
17	140	1.0	56.077	-H140	071-33	119
15	152	1.0	60.938	-H210	071-33	122
15	154	2.0	61.875	-H450	071-33	128

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
21	106	2.0	43.390	-H210	071-33	122
20	116	2.8	47.276	-H320	071-33	125
19	119	1.8	48.571	-H210	071-33	122
17	132	2.4	53.703	-H320	071-33	125
17	136	1.5	55.529	-H210	071-33	122
17	139	3.3	56.469	-H450	071-33	128
15	148	2.2	60.502	-H320	071-33	125
15	152	3.0	61.774	-H450	071-33	128
15	152	1.4	62.160	-H210	071-33	122
14	169	1.9	68.726	-H320	071-33	125
13	171	2.6	69.813	-H450	071-33	128
13	174	1.2	71.026	-H210	071-33	122
12	190	1.7	77.387	-H320	071-33	125
12	193	2.3	78.794	-H450	071-33	128
12	195	1.1	79.507	-H210	071-33	122
11	216	1.5	87.906	-H320	071-33	125
10	218	2.1	89.048	-H450	071-33	128
10	226	0.9	92.205	-H210	071-33	122
12	237	1.9	96.522	-H450	071-33	128
11	246	1.3	100.462	-H320	071-33	125
11	253	0.8	103.214	-H210	071-33	122

Selection tables, 6-pole motors

50 Hz: P_N = 0.25 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
11	268	1.7	109.083	-H450	071-33	128
10	280	1.1	114.118	-H320	071-33	125
7.7	298	1.5	121.342	-H450	071-33	128
7.2	316	1.0	128.743	-H320	071-33	125
6.8	336	1.3	137.133	-H450	071-33	128
6.4	359	0.9	146.244	-H320	071-33	125
6.0	383	1.2	156.274	-H450	071-33	128
5.3	433	1.0	176.611	-H450	071-33	128
4.7	486	0.9	198.059	-H450	071-33	128
4.2	549	0.8	223.833	-H450	071-33	128

Selection tables, 6-pole motors

50 Hz: P_N = 0.37 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
291	12	5.7	3.267	-H140	080-13	119
283	12	5.1	3.354	-H100	080-13	116
207	17	4.3	4.600	-H100	080-13	116
184	19	4.0	5.167	-H100	080-13	116
161	21	3.8	5.887	-H100	080-13	116
148	23	3.6	6.440	-H100	080-13	116
134	26	3.4	7.086	-H100	080-13	116
116	30	3.1	8.214	-H100	080-13	116
105	33	2.9	9.068	-H100	080-13	116
115	36	2.7	10.063	-H100	080-13	116
102	41	2.4	11.360	-H100	080-13	116
82	42	3.1	11.554	-H140	080-13	119
75	46	2.9	12.640	-H140	080-13	119
75	46	2.2	12.653	-H100	080-13	116
68	50	2.7	13.957	-H140	080-13	119
66	52	1.9	14.490	-H100	080-13	116
61	56	1.8	15.500	-H100	080-13	116
59	58	2.4	16.122	-H140	080-13	119
54	64	1.6	17.750	-H100	080-13	116
53	64	2.2	17.802	-H140	080-13	119
51	68	3.1	18.750	-H210	080-13	122
49	70	1.4	19.486	-H100	080-13	116
48	71	2.0	19.750	-H140	080-13	119
44	79	2.7	21.802	-H210	080-13	122
44	79	1.8	21.808	-H140	080-13	119
43	81	1.2	22.314	-H100	080-13	116
39	88	2.4	24.405	-H210	080-13	122
38	90	1.6	24.829	-H140	080-13	119
38	91	1.1	25.095	-H100	080-13	116
35	98	2.2	27.119	-H210	080-13	122
35	99	1.4	27.415	-H140	080-13	119
33	104	1.0	28.738	-H100	080-13	116
32	107	3.0	29.548	-H320	080-13	125
31	110	1.9	30.357	-H210	080-13	122
30	115	1.2	31.976	-H140	080-13	119
28	121	2.6	33.564	-H320	080-13	125
27	127	1.7	35.095	-H210	080-13	122

Selection tables, 6-pole motors

50 Hz: P_N = 0.37 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
27	127	1.1	35.308	-H140	080-13	119
25	138	1.8	38.238	-H320	080-13	125
24	142	1.5	39.286	-H210	080-13	122
24	146	3.1	40.333	-H450	080-13	128
22	154	1.2	42.593	-H210	080-13	122
22	156	2.1	43.313	-H450	080-13	128
22	157	1.8	43.436	-H320	080-13	125
21	167	1.3	46.407	-H320	080-13	125
20	172	1.2	47.679	-H210	080-13	122
19	177	2.1	48.950	-H450	080-13	128
18	190	1.3	52.715	-H320	080-13	125
17	198	1.4	54.750	-H450	080-13	128
15	223	1.4	61.875	-H450	080-13	128

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
22	154	1.4	43.390	-H210	080-13	122
22	157	2.9	44.124	-H450	080-13	128
20	168	1.9	47.276	-H320	080-13	125
20	173	1.2	48.571	-H210	080-13	122
19	177	2.5	49.867	-H450	080-13	128
18	191	1.7	53.703	-H320	080-13	125
17	197	1.1	55.529	-H210	080-13	122
17	201	2.2	56.469	-H450	080-13	128
16	215	1.5	60.502	-H320	080-13	125
15	220	2.1	61.774	-H450	080-13	128
15	221	1.0	62.160	-H210	080-13	122
14	244	1.3	68.726	-H320	080-13	125
14	248	1.8	69.813	-H450	080-13	128
13	252	0.8	71.026	-H210	080-13	122
12	275	1.2	77.387	-H320	080-13	125
12	280	1.6	78.794	-H450	080-13	128
11	312	1.0	87.906	-H320	080-13	125
11	317	1.4	89.048	-H450	080-13	128
12	343	1.3	96.522	-H450	080-13	128
12	357	0.9	100.462	-H320	080-13	125
11	388	1.2	109.083	-H450	080-13	128
7.8	431	1.0	121.342	-H450	080-13	128
6.9	487	0.9	137.133	-H450	080-13	128
6.1	555	0.8	156.274	-H450	080-13	128

Selection tables, 6-pole motors

50 Hz: P_N = 0.55 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
285	18	3.7	3.267	-H140	080-33	119
277	18	3.4	3.354	-H100	080-33	116
202	25	2.9	4.600	-H100	080-33	116
180	28	2.7	5.167	-H100	080-33	116
158	32	2.5	5.887	-H100	080-33	116
148	34	3.1	6.272	-H140	080-33	119
144	35	2.4	6.440	-H100	080-33	116
131	39	2.2	7.086	-H100	080-33	116
128	40	2.7	7.269	-H140	080-33	119
116	44	2.7	8.000	-H140	080-33	119
113	45	2.0	8.214	-H100	080-33	116
103	49	2.4	9.029	-H140	080-33	119
103	50	1.9	9.068	-H100	080-33	116
116	54	2.3	9.800	-H140	080-33	119
113	55	1.8	10.063	-H100	080-33	116
87	59	3.2	10.720	-H210	080-33	122
100	62	1.6	11.360	-H100	080-33	116
81	63	2.0	11.554	-H140	080-33	119
78	66	2.8	12.000	-H210	080-33	122
74	69	1.9	12.640	-H140	080-33	119
74	69	1.4	12.653	-H100	080-33	116
68	75	2.7	13.673	-H210	080-33	122
67	76	1.8	13.957	-H140	080-33	119
64	79	1.3	14.490	-H100	080-33	116
61	84	2.4	15.306	-H210	080-33	122
60	85	1.2	15.500	-H100	080-33	116
58	88	1.6	16.122	-H140	080-33	119
56	92	2.3	16.750	-H210	080-33	122
55	93	3.0	16.923	-H320	080-33	125
52	97	1.0	17.750	-H100	080-33	116
52	98	1.4	17.802	-H140	080-33	119
51	100	3.1	18.250	-H320	080-33	125
50	103	2.0	18.750	-H210	080-33	122
48	107	0.9	19.486	-H100	080-33	116
47	108	1.3	19.750	-H140	080-33	119
45	114	2.6	20.731	-H320	080-33	125
43	119	1.8	21.802	-H210	080-33	122

Selection tables, 6-pole motors

50 Hz: P_N = 0.55 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
43	119	1.2	21.808	-H140	080-33	119
42	121	3.1	22.170	-H450	080-33	128
42	122	0.8	22.314	-H100	080-33	116
39	130	2.5	23.754	-H320	080-33	125
38	134	1.6	24.405	-H210	080-33	122
38	136	1.0	24.829	-H140	080-33	119
37	137	3.1	25.056	-H450	080-33	128
35	148	2.2	26.983	-H320	080-33	125
34	149	1.4	27.119	-H210	080-33	122
34	150	0.9	27.415	-H140	080-33	119
34	151	2.6	27.578	-H450	080-33	128
32	162	2.0	29.548	-H320	080-33	125
31	166	1.3	30.357	-H210	080-33	122
30	171	2.6	31.167	-H450	080-33	128
28	184	1.7	33.564	-H320	080-33	125
27	192	1.1	35.095	-H210	080-33	122
26	196	2.3	35.689	-H450	080-33	128
24	210	1.2	38.238	-H320	080-33	125
24	215	1.0	39.286	-H210	080-33	122
23	221	2.0	40.333	-H450	080-33	128
22	237	1.4	43.313	-H450	080-33	128
21	238	1.2	43.436	-H320	080-33	125
20	254	0.9	46.407	-H320	080-33	125
19	268	1.4	48.950	-H450	080-33	128
18	289	0.9	52.715	-H320	080-33	125
17	300	0.9	54.750	-H450	080-33	128
15	339	0.9	61.875	-H450	080-33	128

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
21	234	0.9	43.390	-H210	080-33	122
21	238	1.9	44.124	-H450	080-33	128
20	255	1.3	47.276	-H320	080-33	125
19	262	0.8	48.571	-H210	080-33	122
19	269	1.7	49.867	-H450	080-33	128
17	290	1.1	53.703	-H320	080-33	125
17	305	1.5	56.469	-H450	080-33	128
15	327	1.0	60.502	-H320	080-33	125
15	333	1.4	61.774	-H450	080-33	128
14	371	0.9	68.726	-H320	080-33	125

Selection tables, 6-pole motors

50 Hz: P_N = 0.55 kW

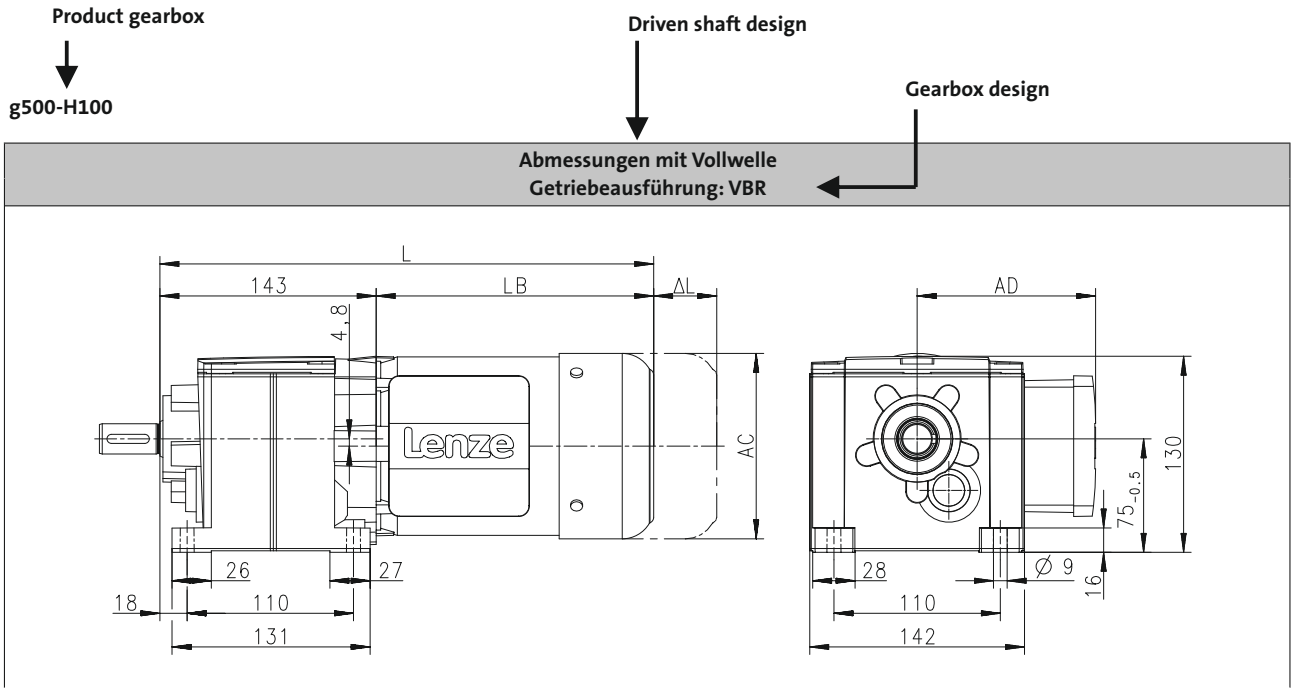
3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
13	377	1.2	69.813	-H450	080-33	128
12	425	1.1	78.794	-H450	080-33	128
10	481	0.9	89.048	-H450	080-33	128
12	521	0.9	96.522	-H450	080-33	128

Dimensions, notes

Notes on the dimensions

The following legend shows the layout of the dimension sheets.



Product Motor

Produkt			MD□MA□□							
			063-12	063-32	063-42	071-32	071-42	080-32	080-42	090-32
Abmessungen										
Gesamtlänge	**L**	**[mm]**		326		346		369		402
Länge Motor	**LB**	**[mm]**		183		203		226		259
Länge Motoranbauten	**Δ L**	**[mm]**		170		165		183		181
Motordurchmesser	**AC**	**[mm]**		123		139		156		176
Abstand Motor/Anschluss	**AD**	**[mm]**		100		109		150		157

Distance of motor centre to the end of terminal box

Total length of the drive without built-on accessories

Motor diameter

Motor length without built-on accessories

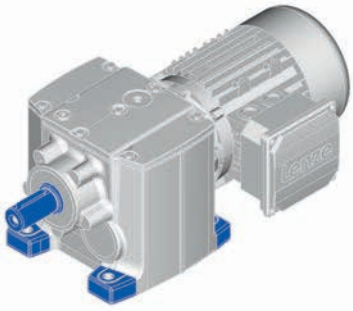
Additional length of the built-on accessories (longest version)

► If the mounting surface (surface on which base is placed) is longer in the direction of the motor than the base of the gearbox, collision with the mounting surface occurs in the case of some motors.

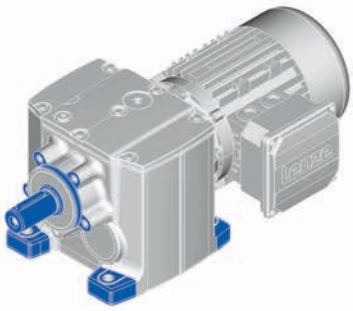
Dimensions, notes

Gearbox designs

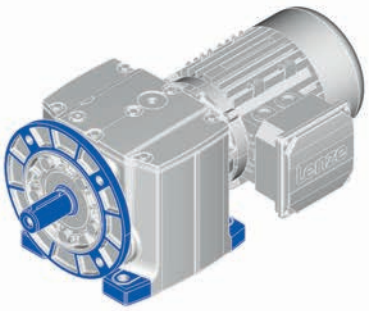
Solid shaft



Foot mounting (VBR)

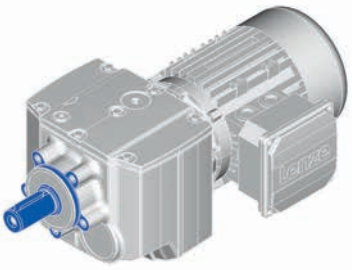


Foot mounting
With centering (VAR)

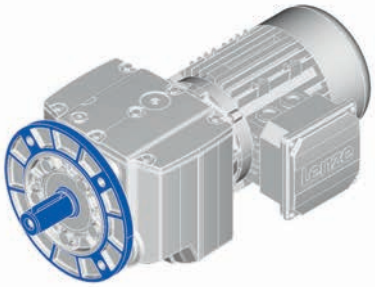


Foot mounting
Flange with through holes (VAK)

Solid shaft



With centering (VCR)

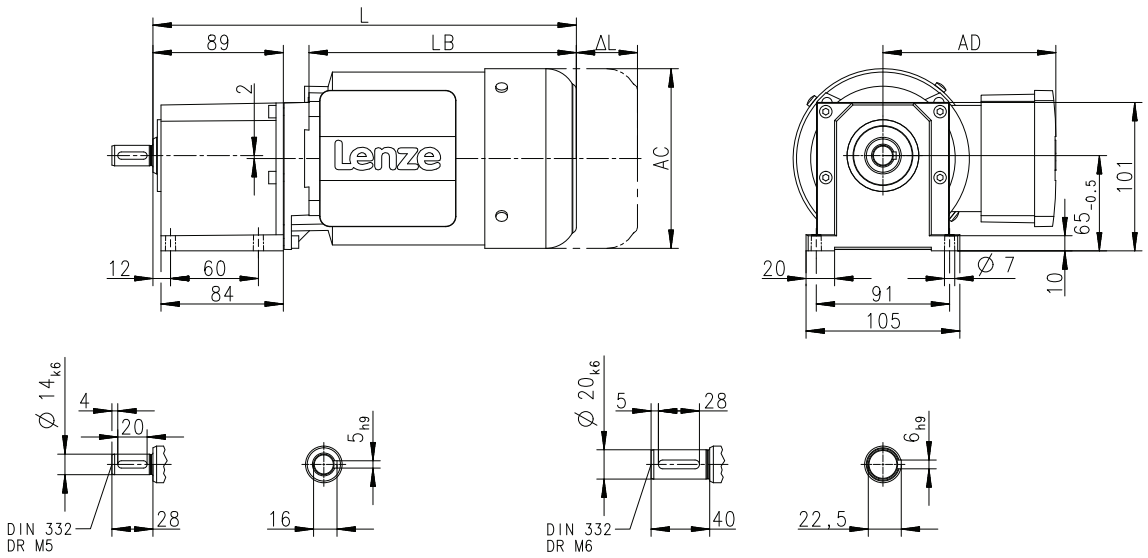


Flange with through holes (VCK)

Dimensions, 4-pole motors

g500-H45

Dimensions with solid shaft
Gearbox design: VBR



8800067-00

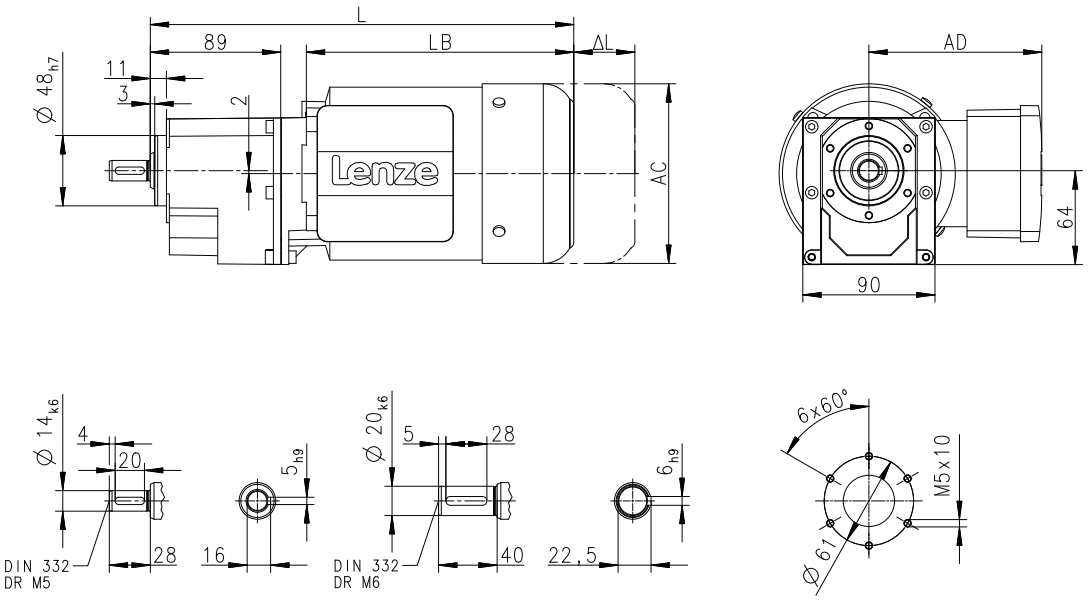
Product			MD□MA□□						
			063-02	063-12	063-22	063-32	063-42	071-32	071-42
Dimensions									
Total length	**L**	**[mm]**	261	288	261	288		308	
Motor length	**LB**	**[mm]**	156	183	156	183		203	
Length of motor options	**Δ L**	**[mm]**	135	170	135	170		165	
Motor diameter	**AC**	**[mm]**	123					139	
Distance motor/connection	**AD**	**[mm]**	100					109	

6.3

Dimensions, 4-pole motors

g500-H45

Dimensions with solid shaft and centering
Gearbox design: VCR



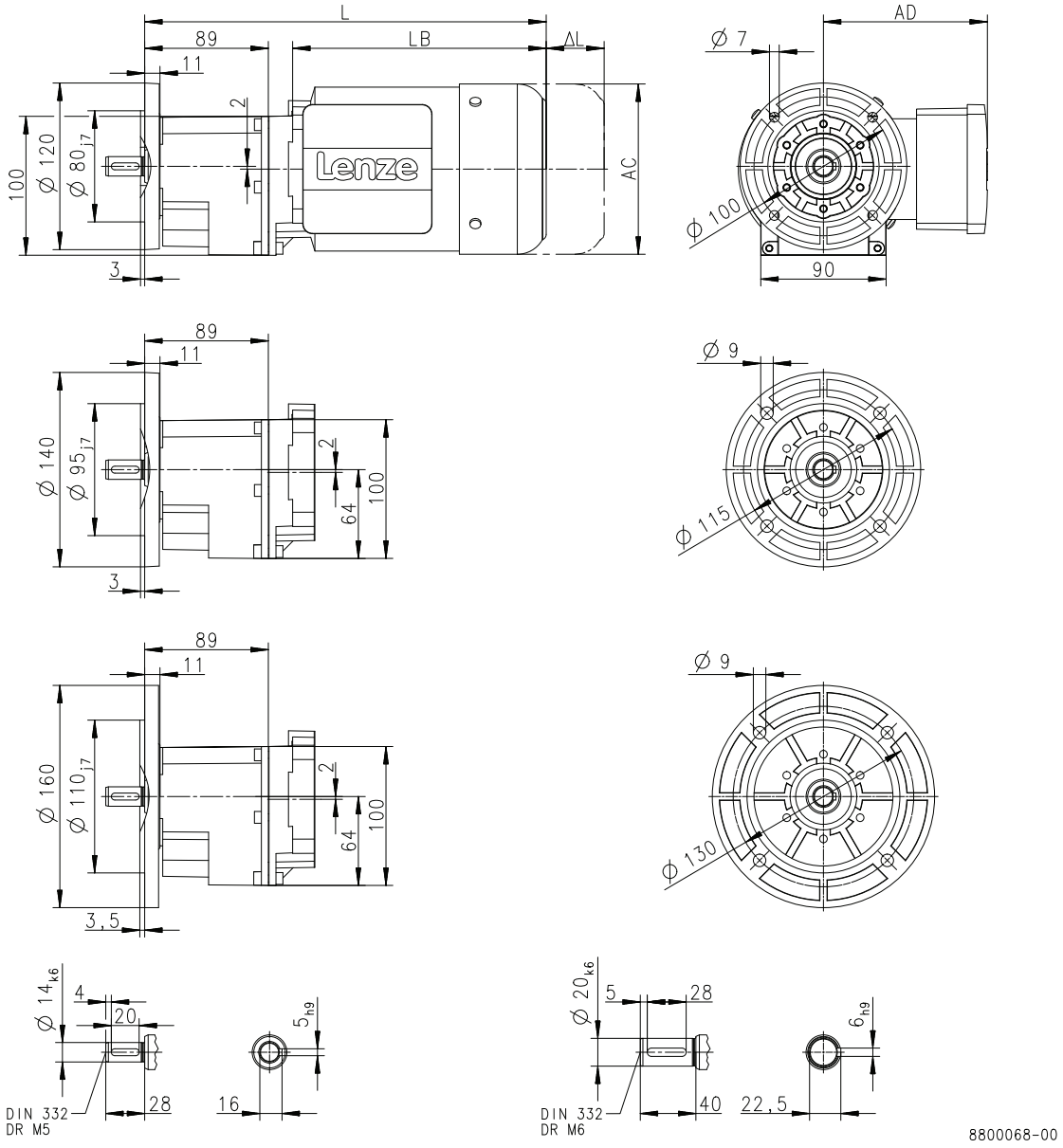
8800069-00

Product			MD□MA□□						
			063-02	063-12	063-22	063-32	063-42	071-32	071-42
Dimensions									
Total length	**L**	**[mm]**	261	288	261	288		308	
Motor length	**LB**	**[mm]**	156	183	156	183		203	
Length of motor options	**Δ L**	**[mm]**	135	170	135	170		165	
Motor diameter	**AC**	**[mm]**	123					139	
Distance motor/connection	**AD**	**[mm]**	100					109	

Dimensions, 4-pole motors

g500-H45

Dimensions with solid shaft and flange
Gearbox design: VCK

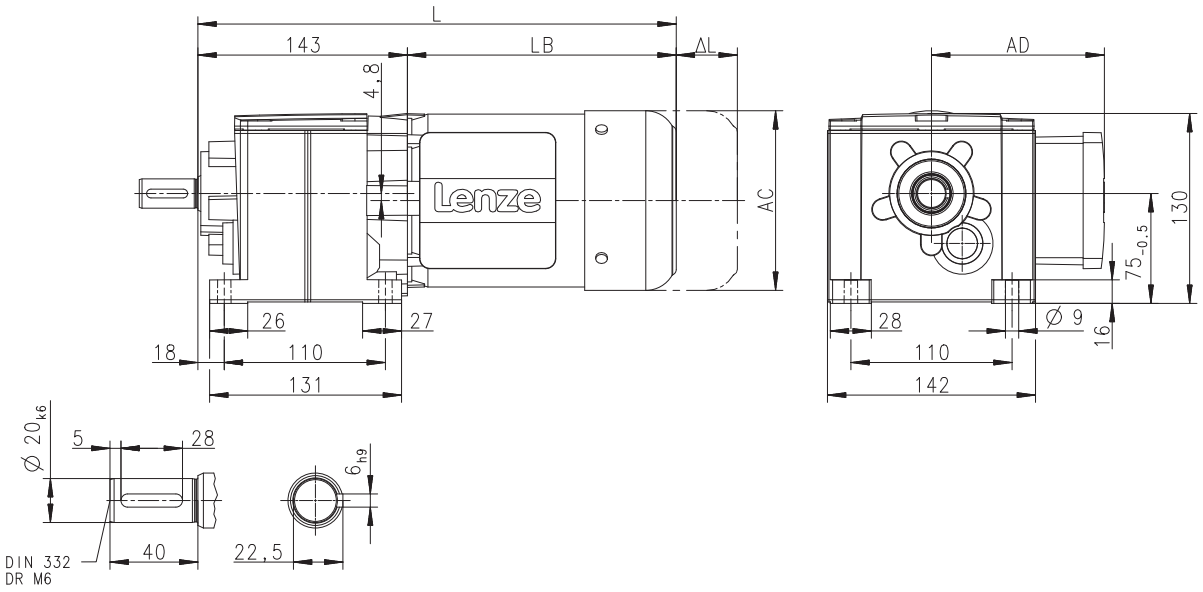


Product			MD□MA□□						
			063-02	063-12	063-22	063-32	063-42	071-32	071-42
Dimensions									
Total length	**L**	**[mm]**	261	288	261	288		308	
Motor length	**LB**	**[mm]**	156	183	156	183		203	
Length of motor options	**Δ L**	**[mm]**	135	170	135	170		165	
Motor diameter	**AC**	**[mm]**	123					139	
Distance motor/connection	**AD**	**[mm]**	100					109	

Dimensions, 4-pole motors

g500-H100

Dimensions with solid shaft
Gearbox design: VBR

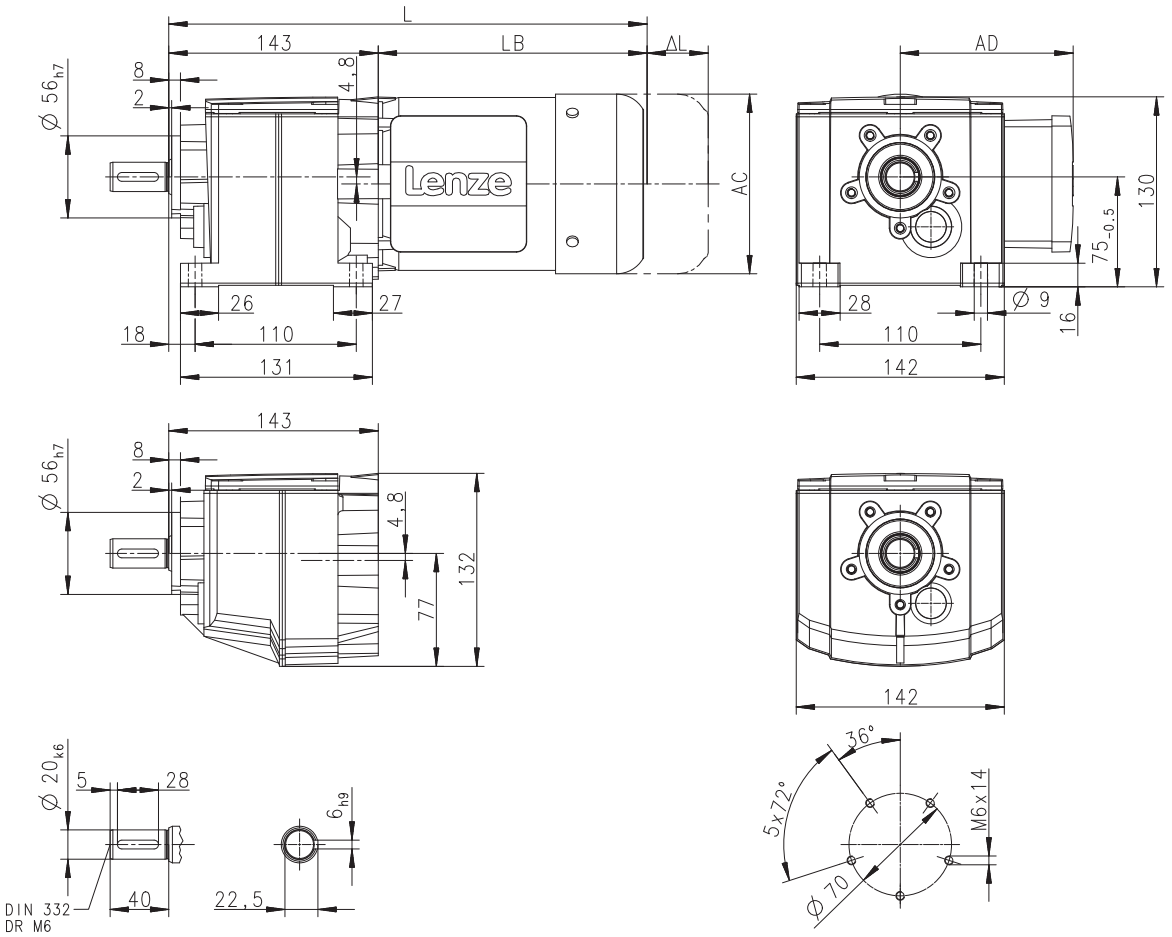


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	326			346		369	428	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-H100

Dimensions with solid shaft and centering
Gearbox design: VAR, VCR

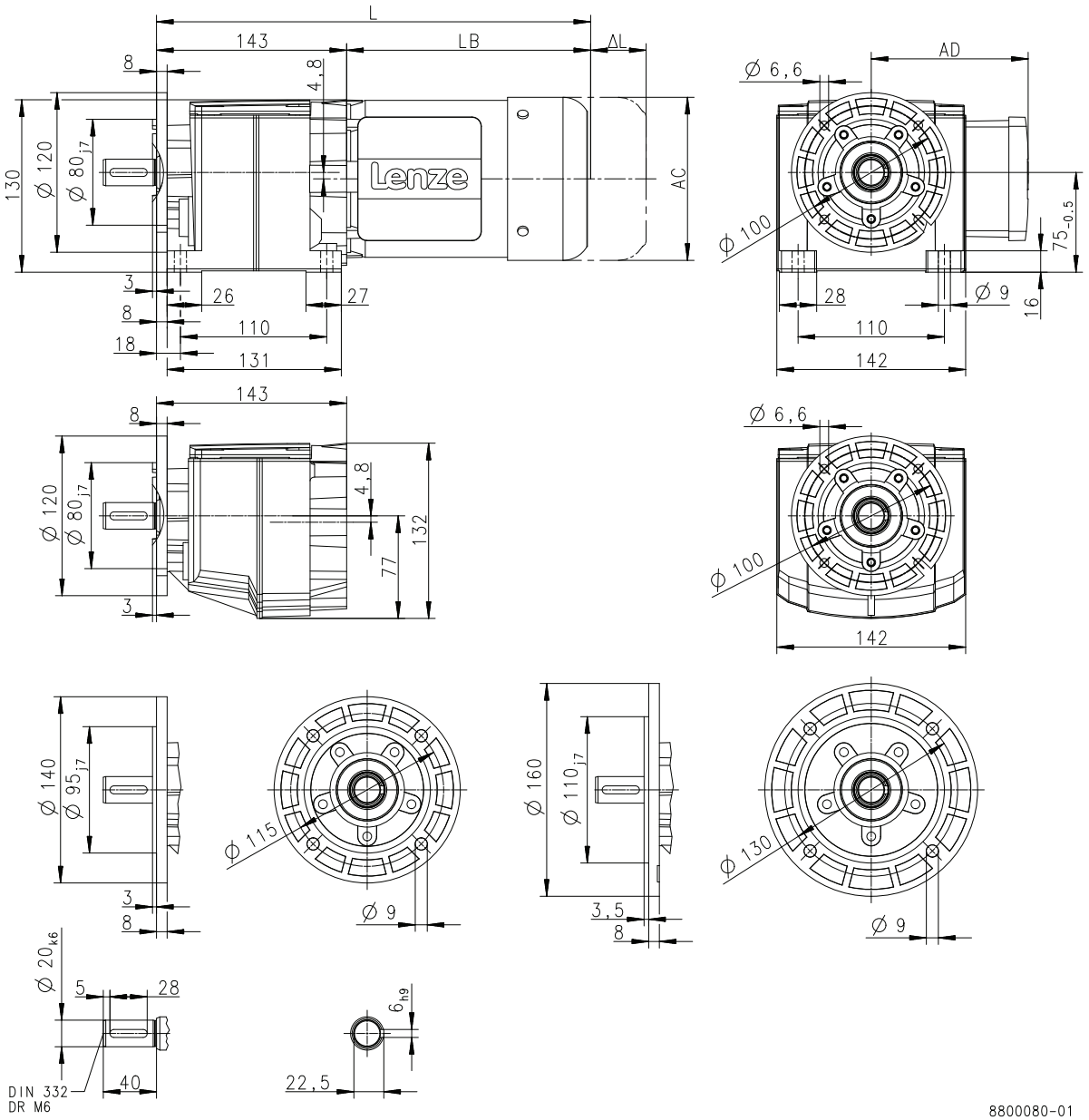


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	326			346		369	428	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-H100

Dimensions with solid shaft and flange
Gearbox design: VAK, VCK

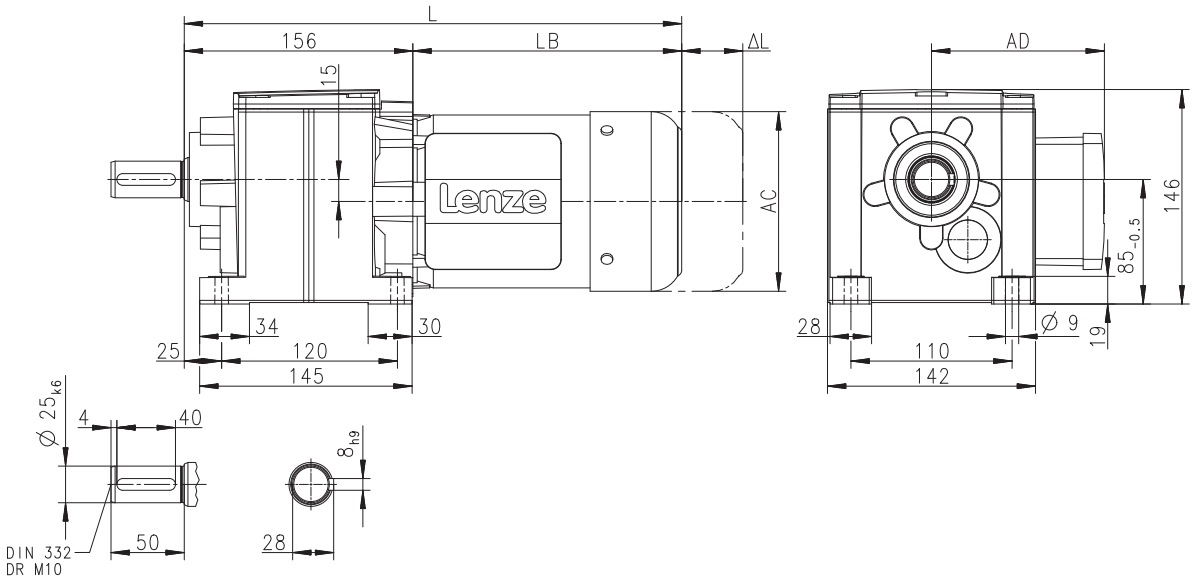


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	326			346		369	428	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-H140

Dimensions with solid shaft
Gearbox design: VBR

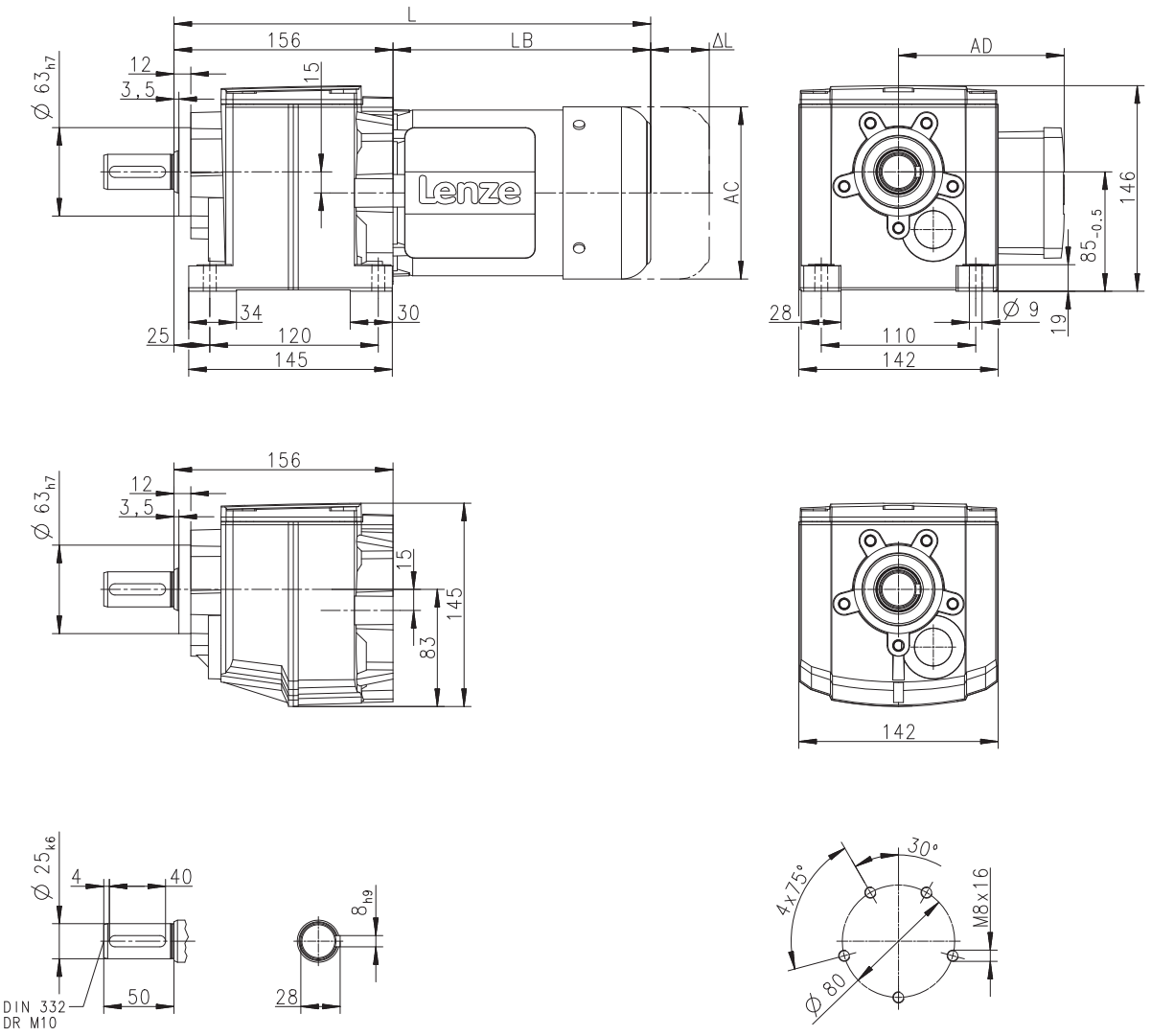


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	339			359		382	441	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-H140

Dimensions with solid shaft and centering
Gearbox design: VAR, VCR

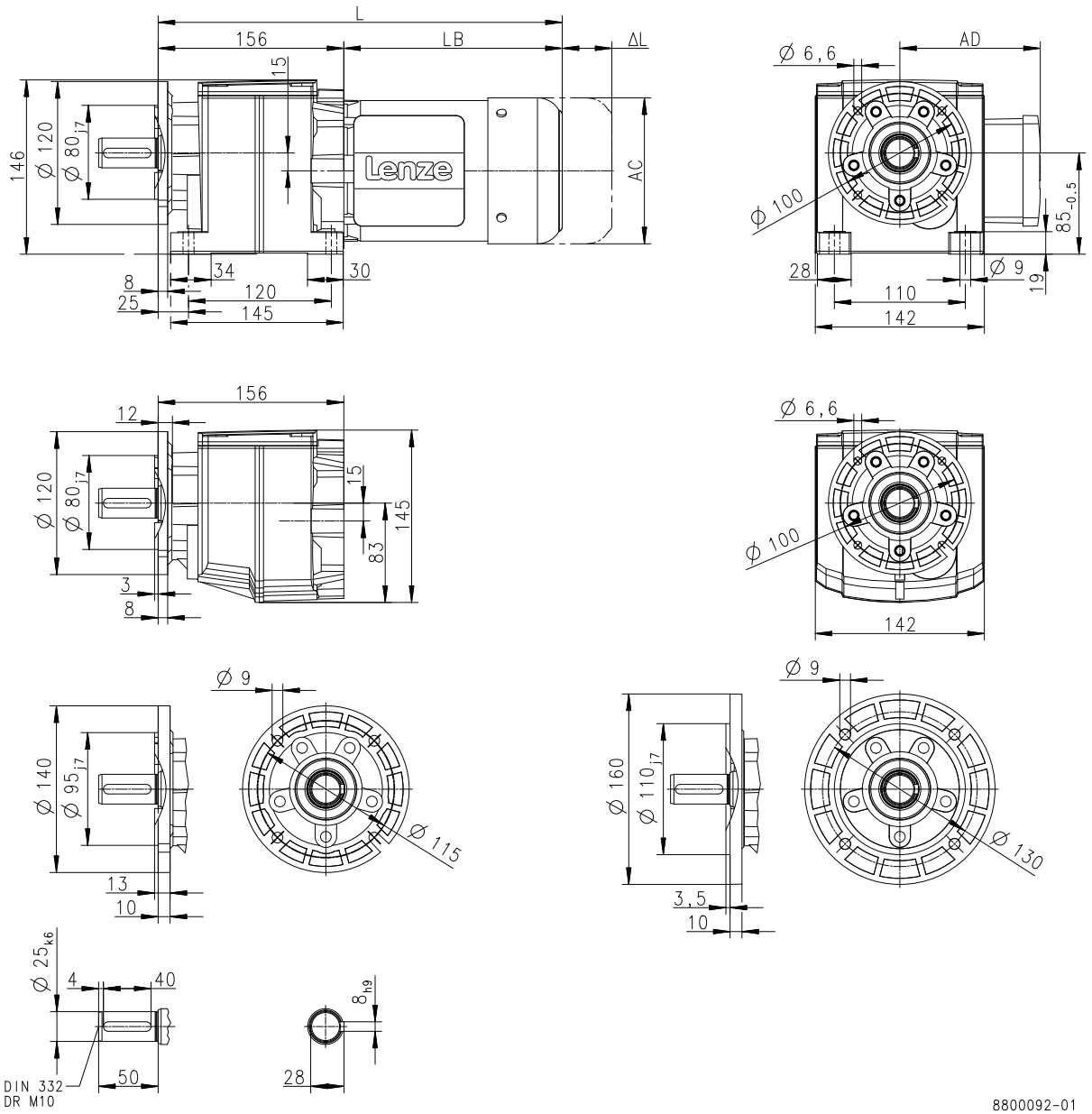


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	339			359		382	441	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-H140

Dimensions with solid shaft and flange
Gearbox design: VAK, VCK

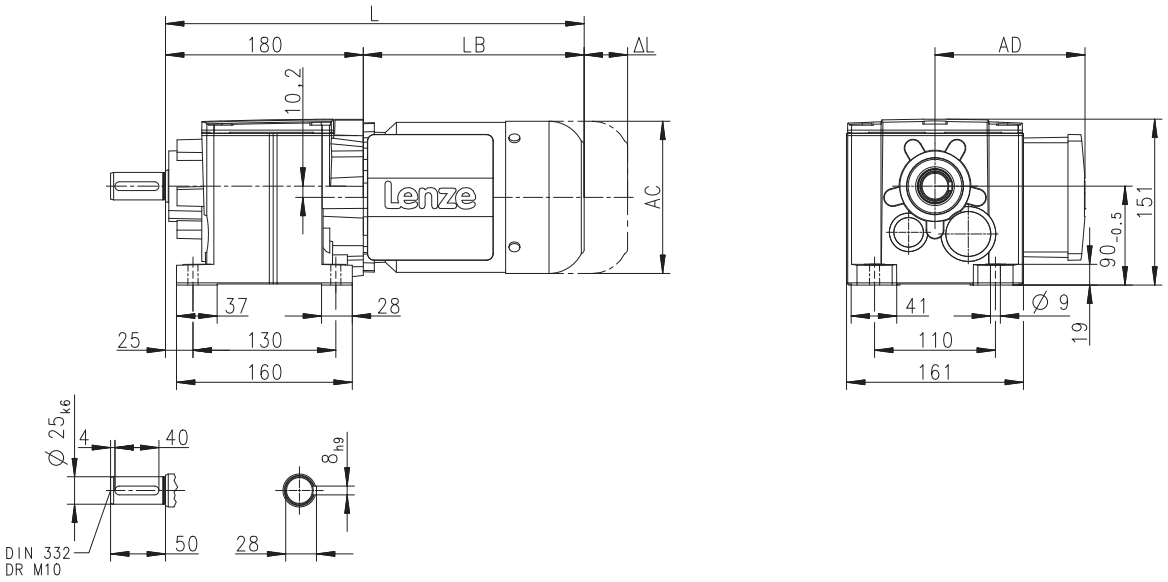


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	339			359		382	441	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-H210

Dimensions with solid shaft
Gearbox design: VBR

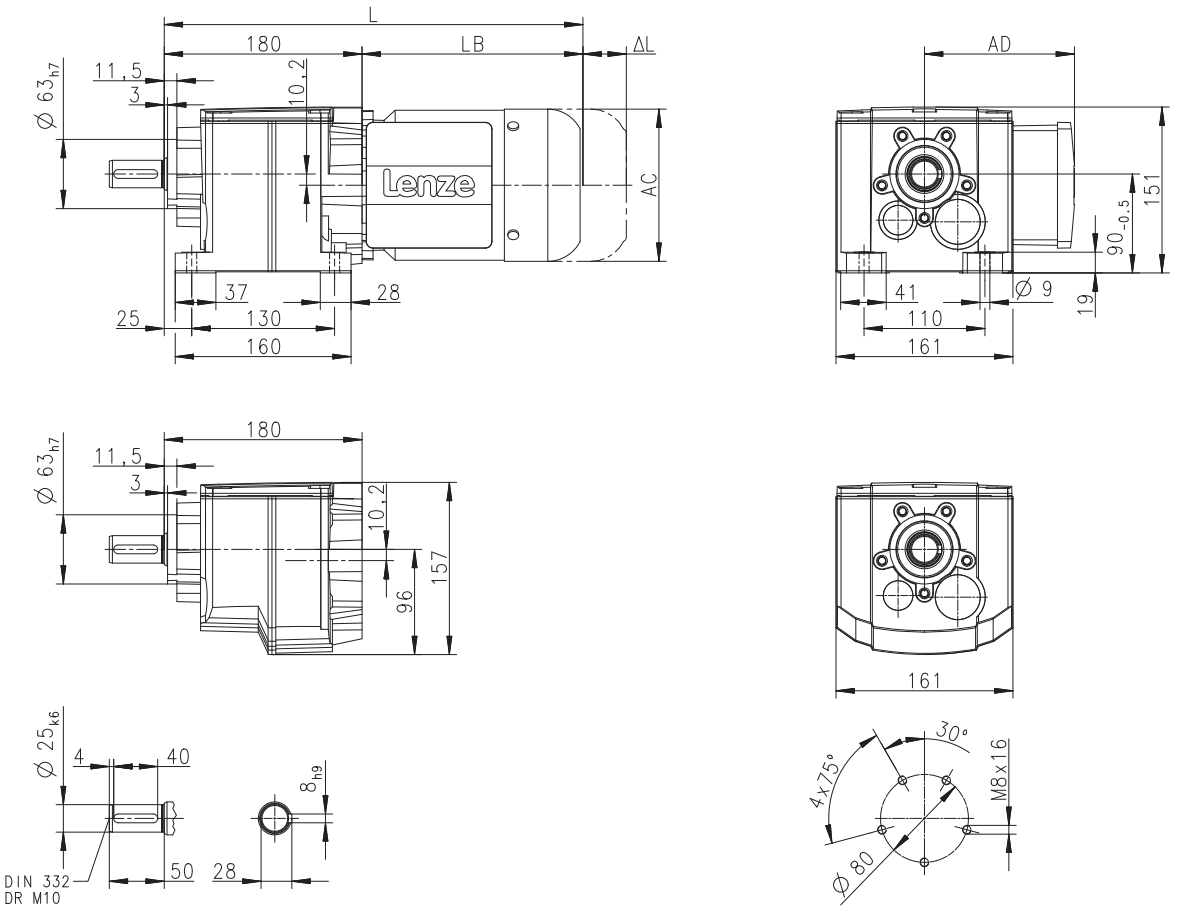


Product			MD□MA□□					MH□MA□□				
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32
Dimensions												
Total length	**L**	**[mm]**	363			383		406	465		501	517
Motor length	**LB**	**[mm]**	183			203		226	285		321	337
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170	
Motor diameter	**AC**	**[mm]**	123			139		156	176		194	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166	

Dimensions, 4-pole motors

g500-H210

Dimensions with solid shaft and centering
Gearbox design: VAR, VCR

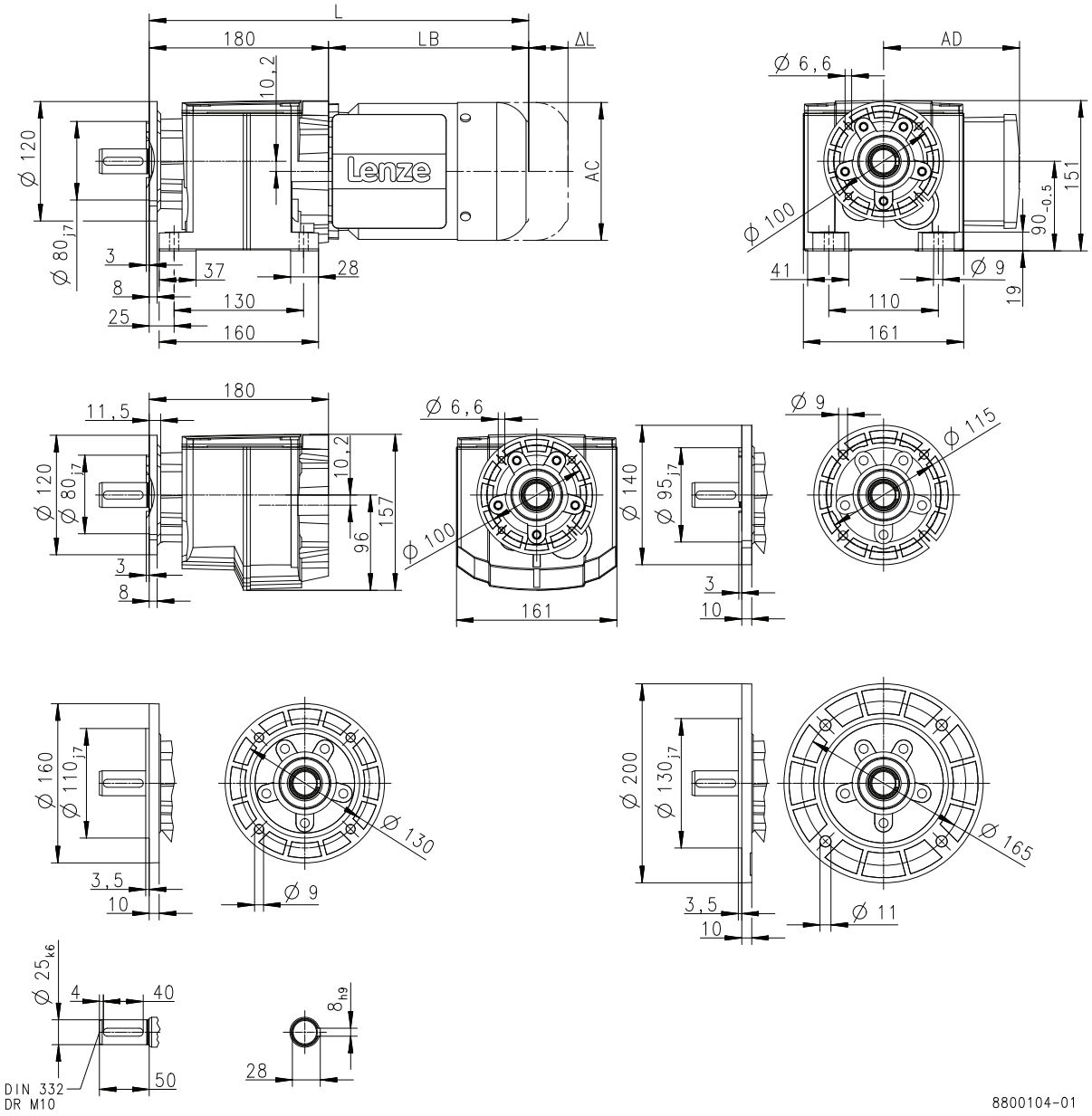


Product			MD□MA□□					MH□MA□□				
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32
Dimensions												
Total length	**L**	**[mm]**	363			383		406	465		501	517
Motor length	**LB**	**[mm]**	183			203		226	285		321	337
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170	
Motor diameter	**AC**	**[mm]**	123			139		156	176		194	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166	

Dimensions, 4-pole motors

g500-H210

Dimensions with solid shaft and flange
Gearbox design: VAK, VCK

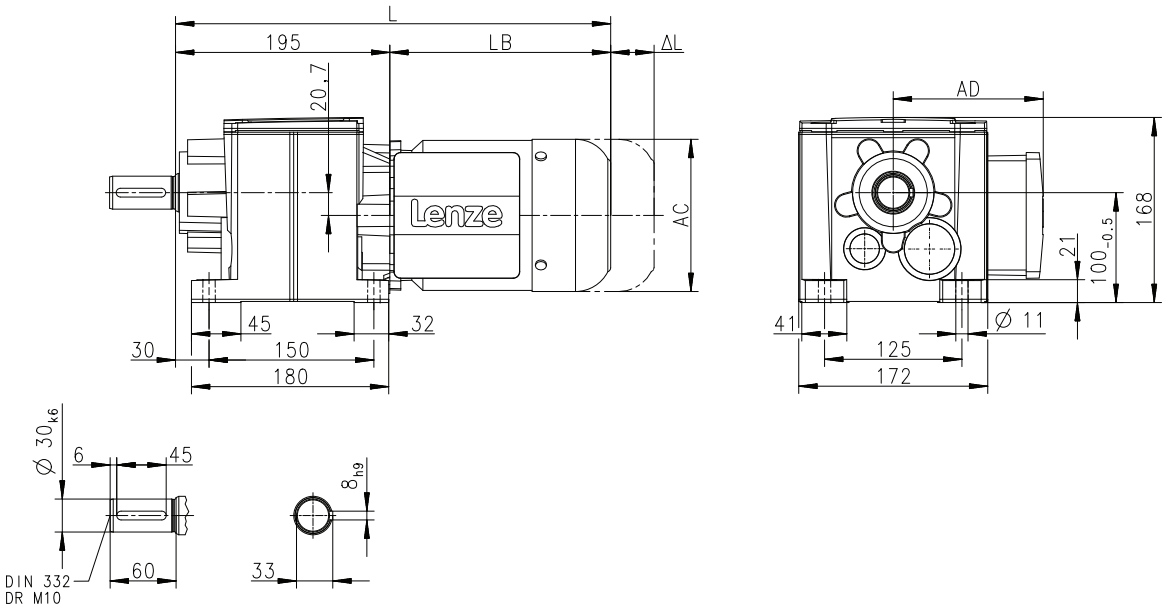


Product			MD□MA□□					MH□MA□□				
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32
Dimensions												
Total length	**L**	**[mm]**	363			383		406	465		501	517
Motor length	**LB**	**[mm]**	183			203		226	285		321	337
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170	
Motor diameter	**AC**	**[mm]**	123			139		156	176		194	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166	

Dimensions, 4-pole motors

g500-H320

Dimensions with solid shaft
Gearbox design: VBR



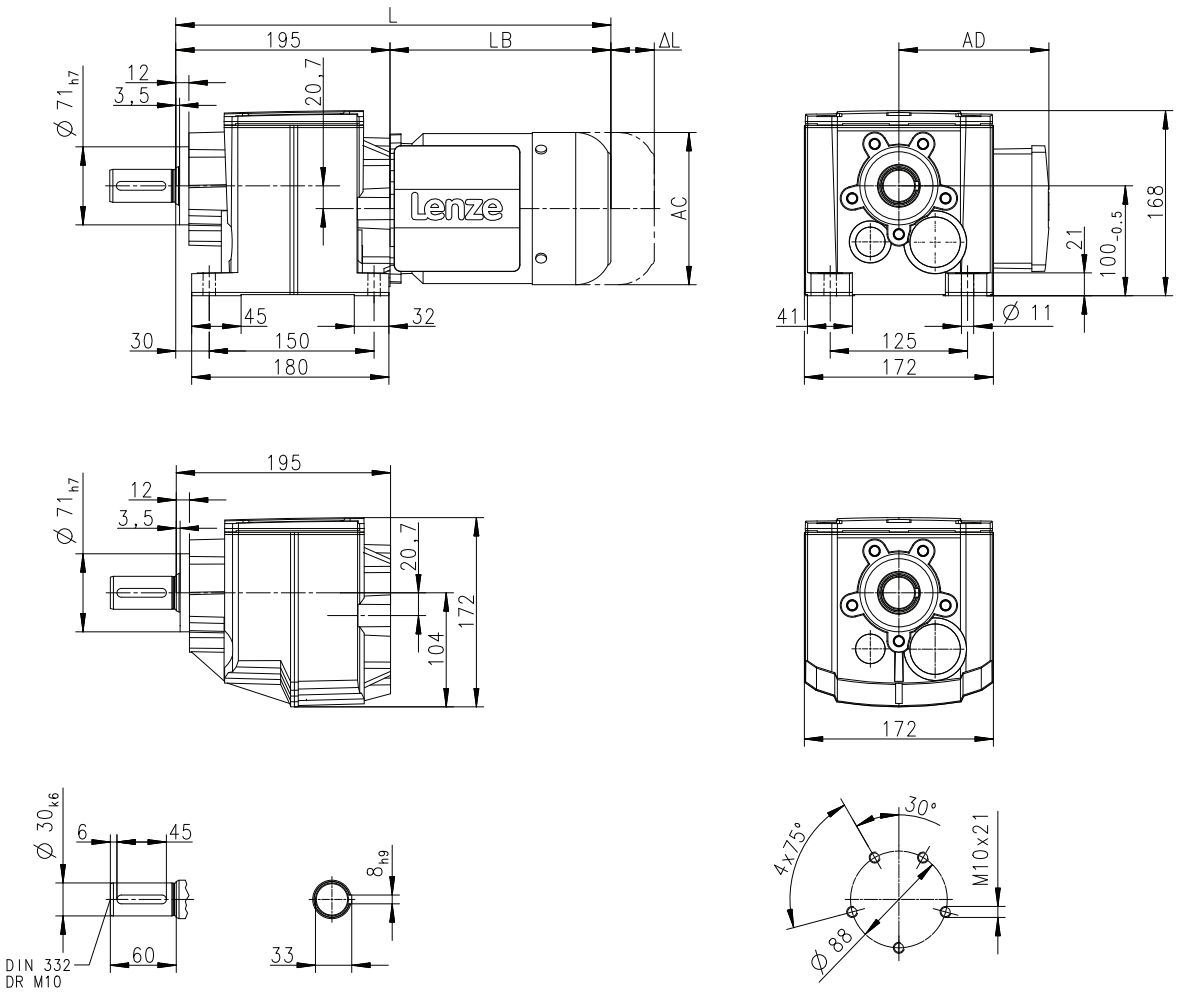
8800115-00

Product			MD□MA□□					MH□MA□□					
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32	112-22
Dimensions													
Total length	**L**	**[mm]**	383			403		426	485		521	537	580
Motor length	**LB**	**[mm]**	183			203		226	285		321	337	380
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170		183
Motor diameter	**AC**	**[mm]**	123			139		156	176		194		218
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166		176

Dimensions, 4-pole motors

g500-H320

Dimensions with solid shaft and centering
Gearbox design: VAR, VCR



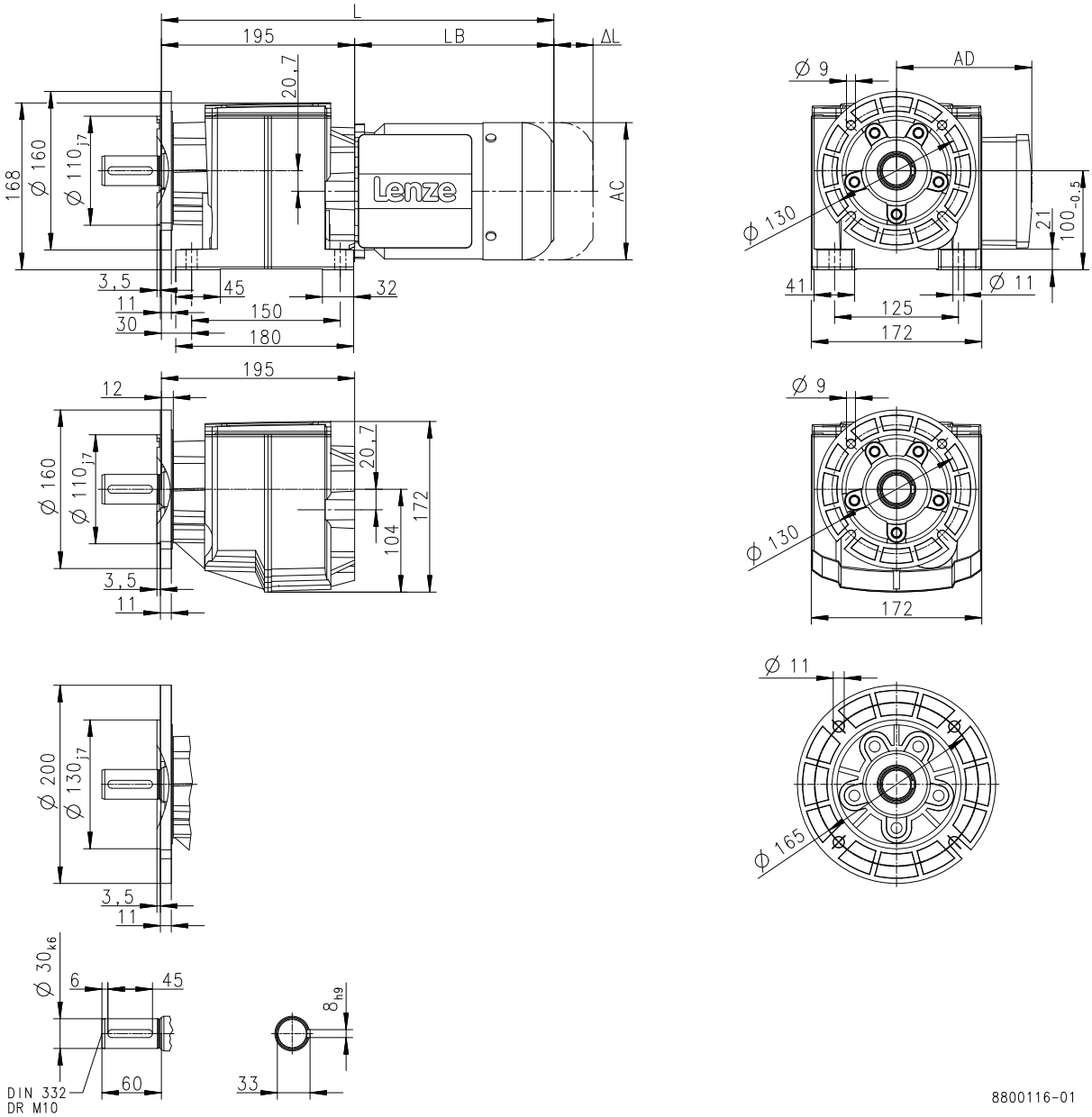
8800117-00

Product			MD□MA□□					MH□MA□□					
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32	112-22
Dimensions													
Total length	**L**	**[mm]**	383			403		426	485		521	537	580
Motor length	**LB**	**[mm]**	183			203		226	285		321	337	380
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170		183
Motor diameter	**AC**	**[mm]**	123			139		156	176		194		218
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166		176

Dimensions, 4-pole motors

g500-H320

Dimensions with solid shaft and flange
Gearbox design: VAK, VCK

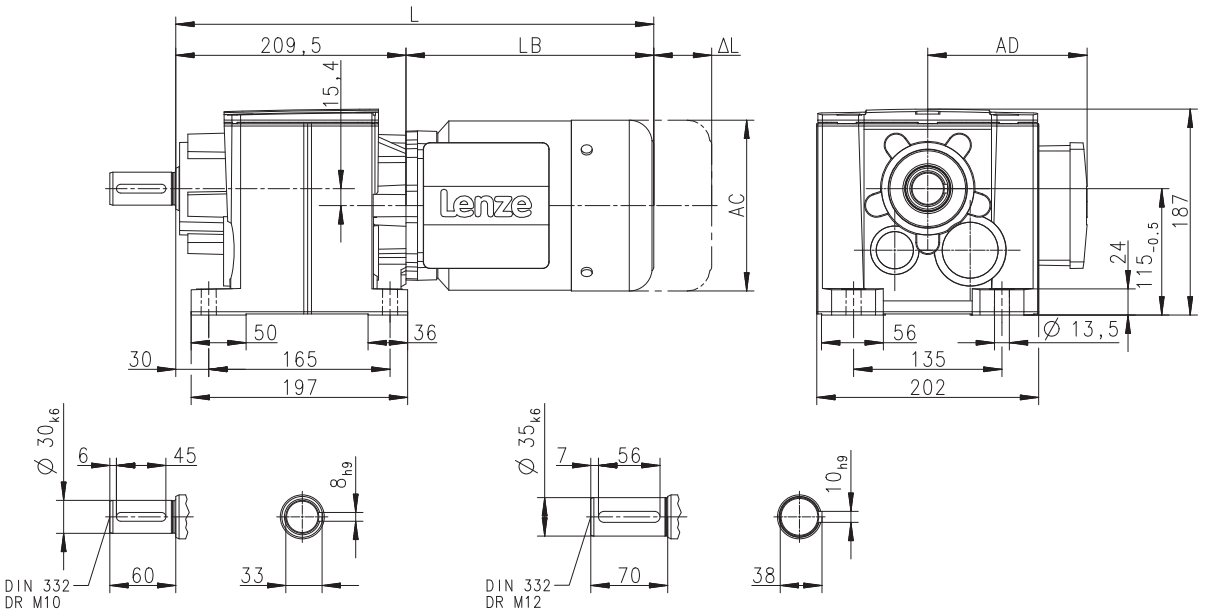


Product			MD□MA□□					MH□MA□□					
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32	112-22
Dimensions													
Total length	**L**	**[mm]**	383			403		426	485		521	537	580
Motor length	**LB**	**[mm]**	183			203		226	285		321	337	380
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170		183
Motor diameter	**AC**	**[mm]**	123			139		156	176		194		218
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166		176

Dimensions, 4-pole motors

g500-H450

Dimensions with solid shaft
Gearbox design: VBR



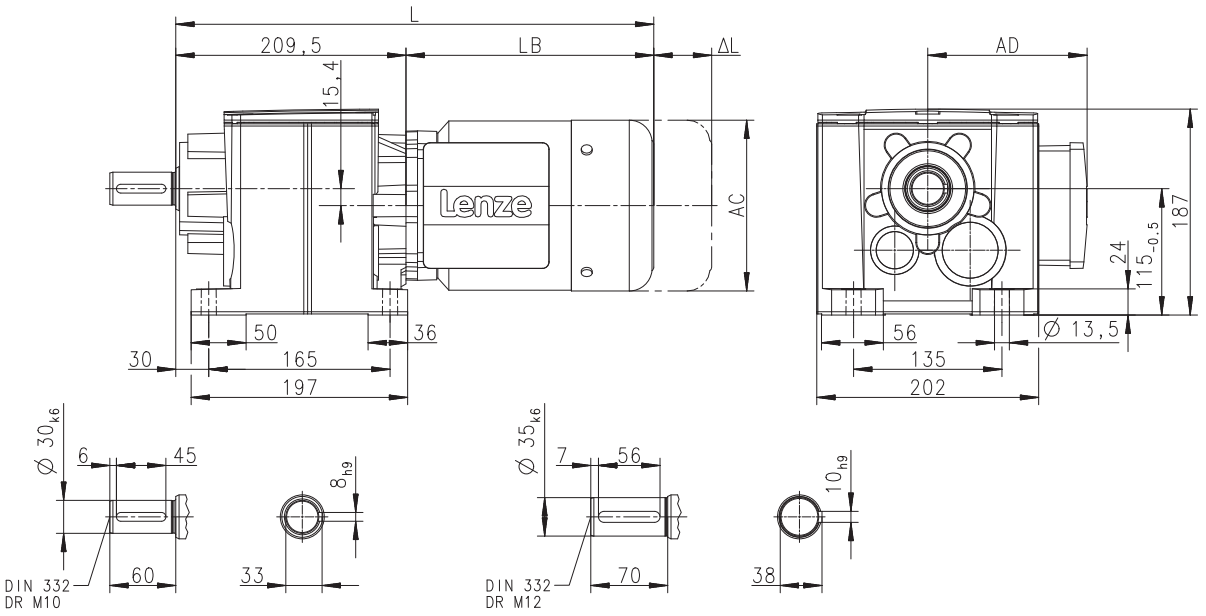
8800127-00

Product			MD□MA□□					MH□MA□□
			063-12	063-32	063-42	071-32	071-42	080-32
Dimensions								
Total length	**L**	**[mm]**	393			413		436
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-H450

Dimensions with solid shaft
Gearbox design: VBR



8800127-00

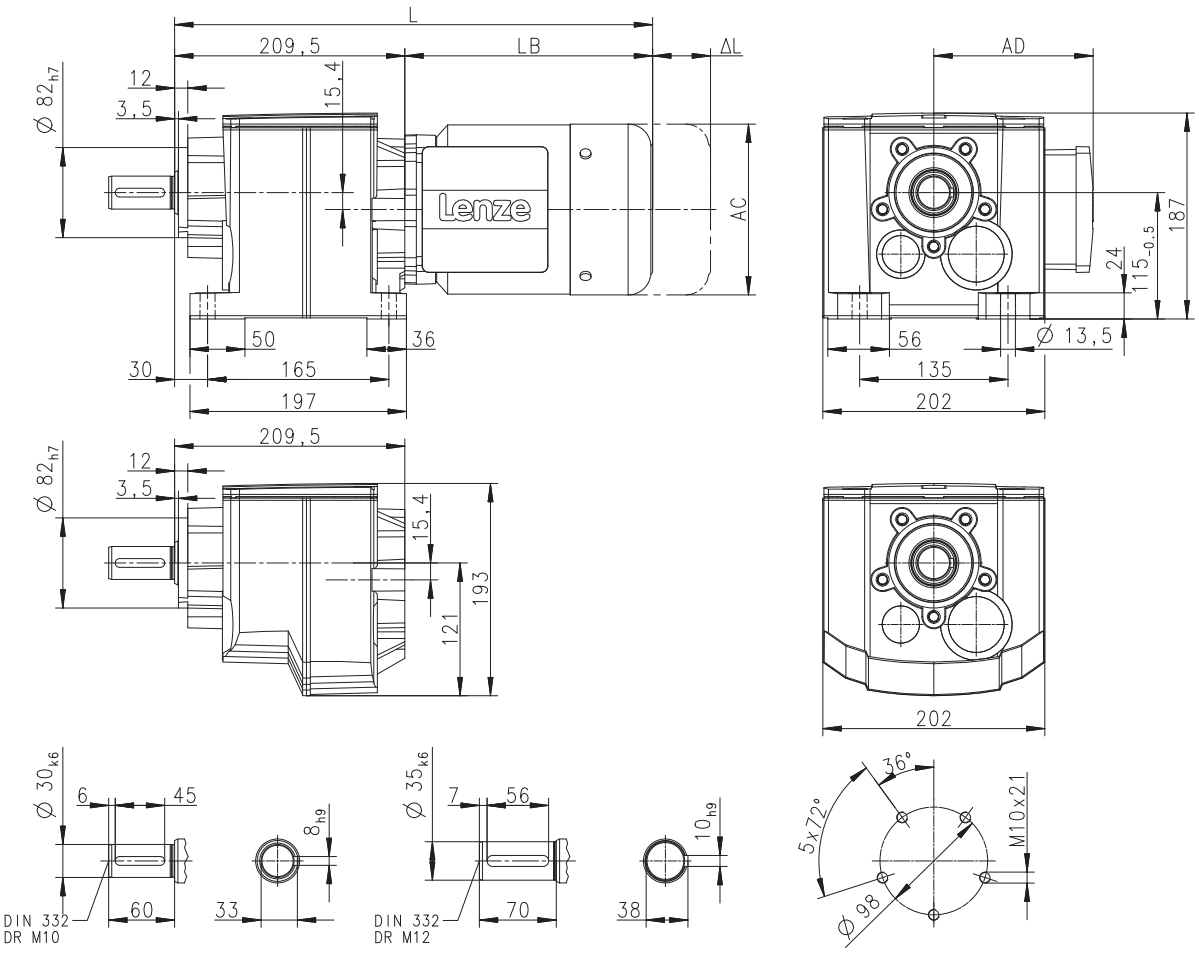
Product			MH□MA□□						
			090-12	090-32	100-12	100-32	112-22	132-12	132-22
Dimensions									
Total length	**L**	**[mm]**	495		531	547	590	638	
Motor length	**LB**	**[mm]**	285		321	337	380	428	
Length of motor options	**Δ L**	**[mm]**	181		170		183	202	
Motor diameter	**AC**	**[mm]**	176		194		218	258	
Distance motor/connection	**AD**	**[mm]**	152	157	166		176	195	

6.3

Dimensions, 4-pole motors

g500-H450

Dimensions with solid shaft and centering
Gearbox design: VAR, VCR

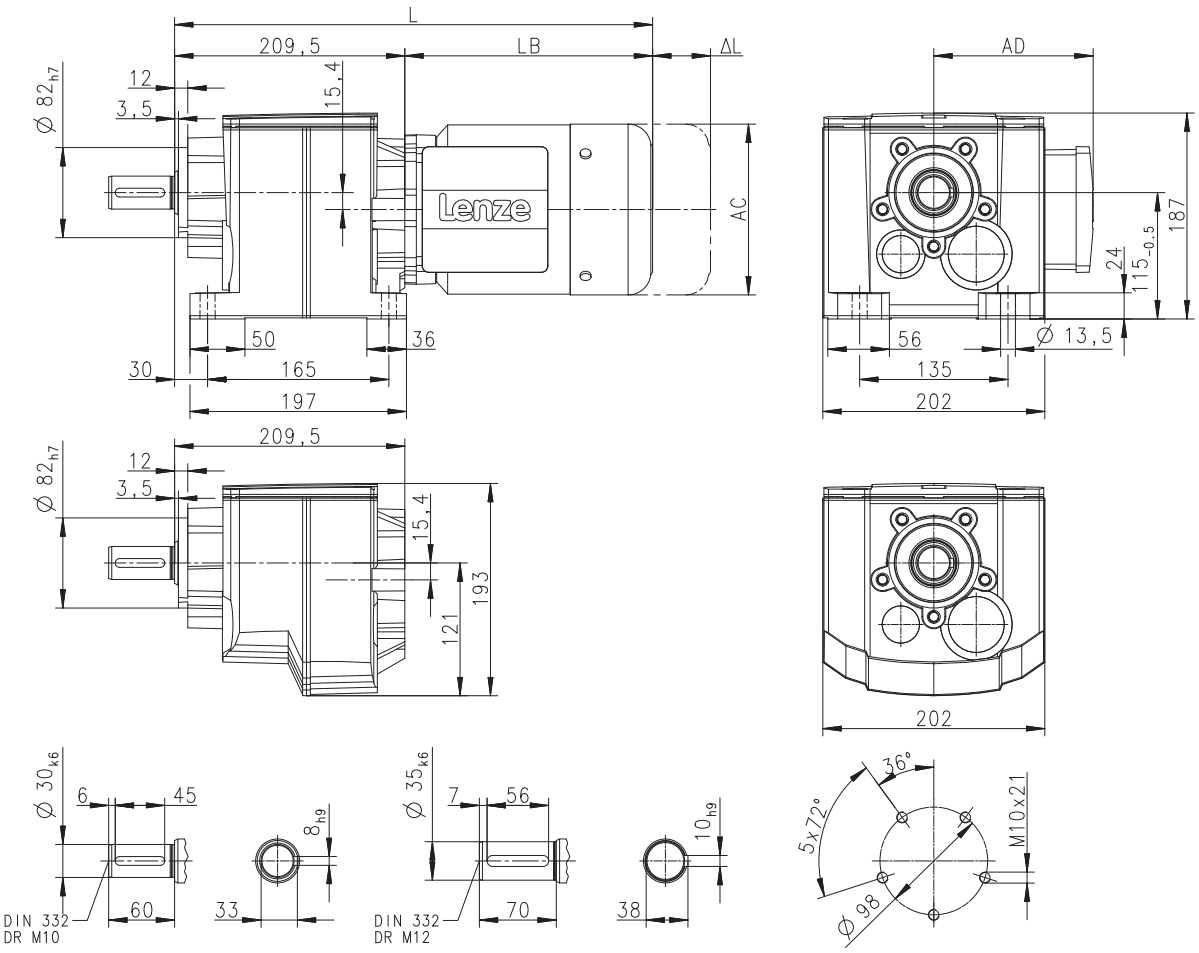


Product			MD□MA□□					MH□MA□□
			063-12	063-32	063-42	071-32	071-42	080-32
Dimensions								
Total length	**L**	**[mm]**	393			413		436
Motor length	**LB**	**[mm]**	183			203		226
Length of motor options	**Δ L**	**[mm]**	170			165		183
Motor diameter	**AC**	**[mm]**	123			139		156
Distance motor/connection	**AD**	**[mm]**	100			109		150

Dimensions, 4-pole motors

g500-H450

Dimensions with solid shaft and centering
Gearbox design: VAR, VCR



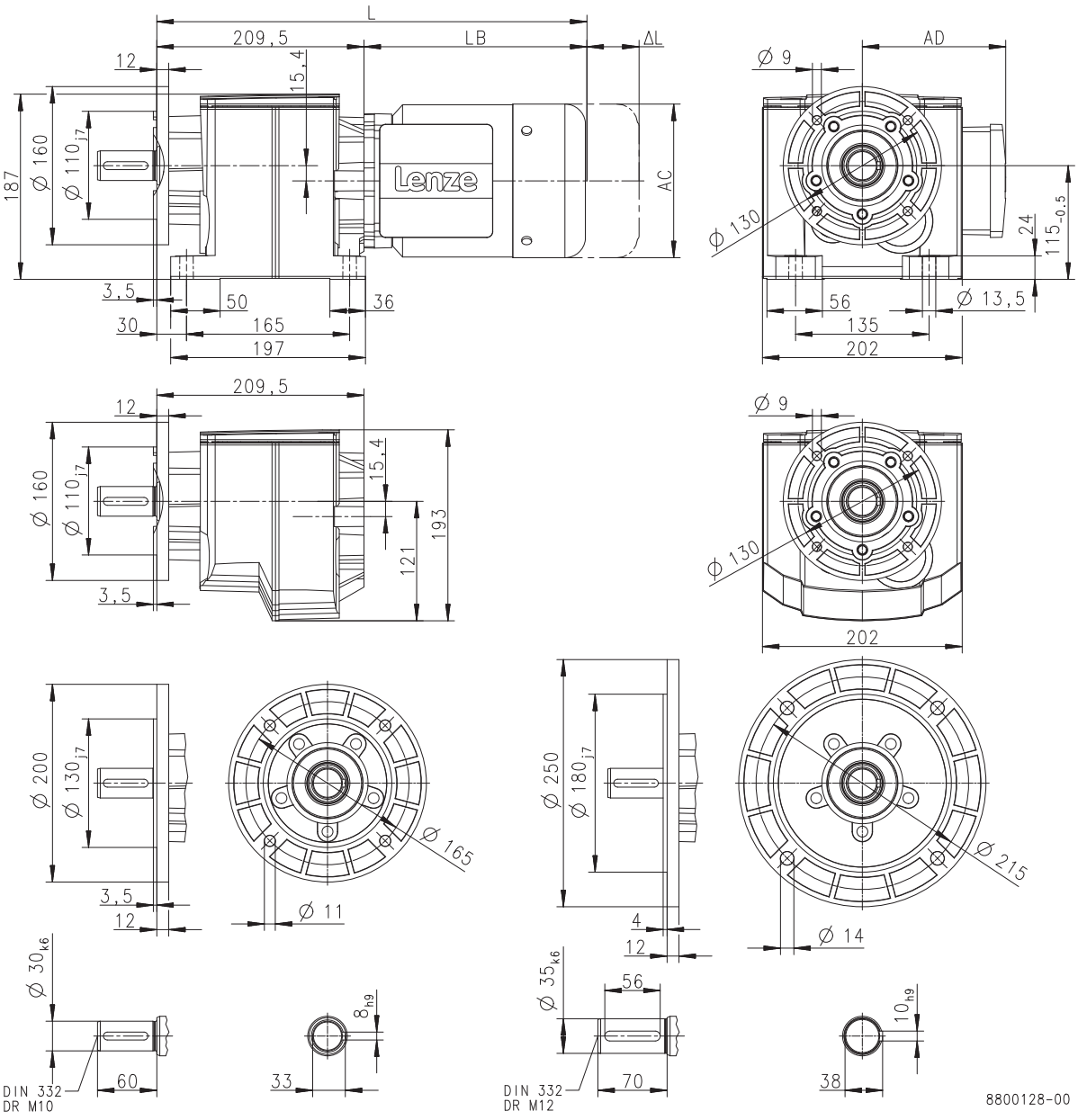
8800129-00

Product			MH□MA□□						
			090-12	090-32	100-12	100-32	112-22	132-12	132-22
Dimensions									
Total length	**L**	[mm]	495		531	547	590	638	
Motor length	**LB**	[mm]	285		321	337	380	428	
Length of motor options	**Δ L**	[mm]	181		170		183	202	
Motor diameter	**AC**	[mm]	176		194		218	258	
Distance motor/connection	**AD**	[mm]	152	157	166		176	195	

Dimensions, 4-pole motors

g500-H450

Dimensions with solid shaft and flange
Gearbox design: VAK, VCK

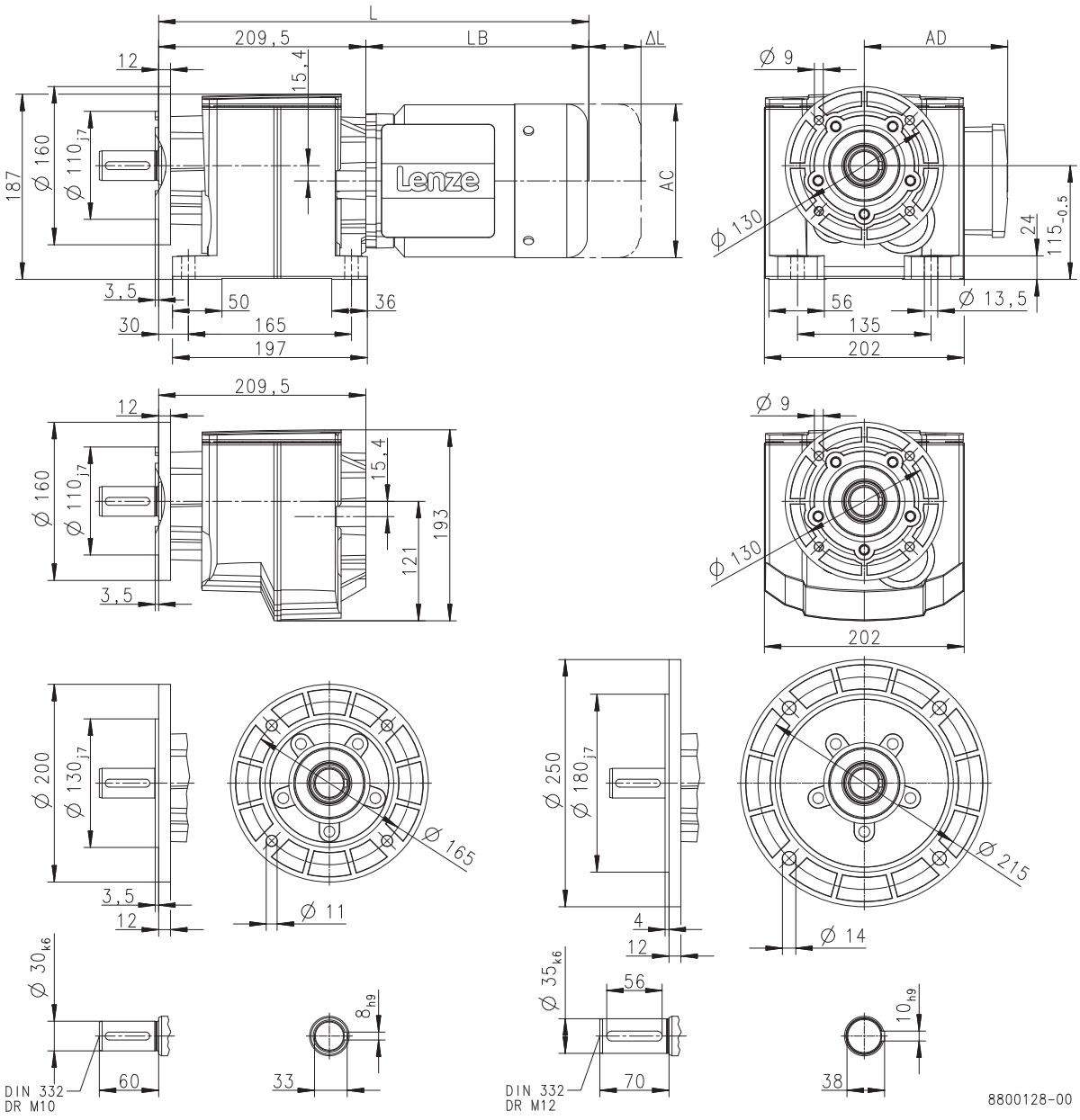


Product			MD□MA□□					MH□MA□□
			063-12	063-32	063-42	071-32	071-42	080-32
Dimensions								
Total length	**L**	**[mm]**	393			413		436
Motor length	**LB**	**[mm]**	183			203		226
Length of motor options	**Δ L**	**[mm]**	170			165		183
Motor diameter	**AC**	**[mm]**	123			139		156
Distance motor/connection	**AD**	**[mm]**	100			109		150

Dimensions, 4-pole motors

g500-H450

Dimensions with solid shaft and flange
Gearbox design: VAK, VCK

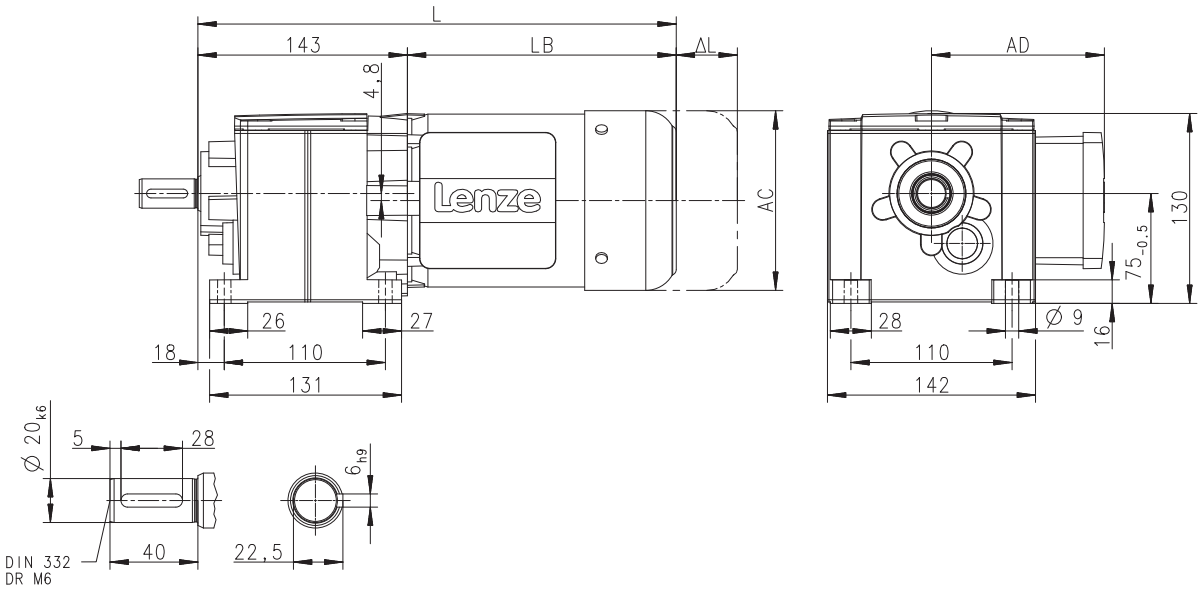


Product			MH□MA□□						
			090-12	090-32	100-12	100-32	112-22	132-12	132-22
Dimensions									
Total length	**L**	**[mm]**	495		531	547	590	638	
Motor length	**LB**	**[mm]**	285		321	337	380	428	
Length of motor options	**Δ L**	**[mm]**	181		170		183	202	
Motor diameter	**AC**	**[mm]**	176		194		218	258	
Distance motor/connection	**AD**	**[mm]**	152	157	166		176	195	

Dimensions, 2-pole and 6-pole motors

g500-H100

Dimensions with solid shaft
Gearbox design: VBR

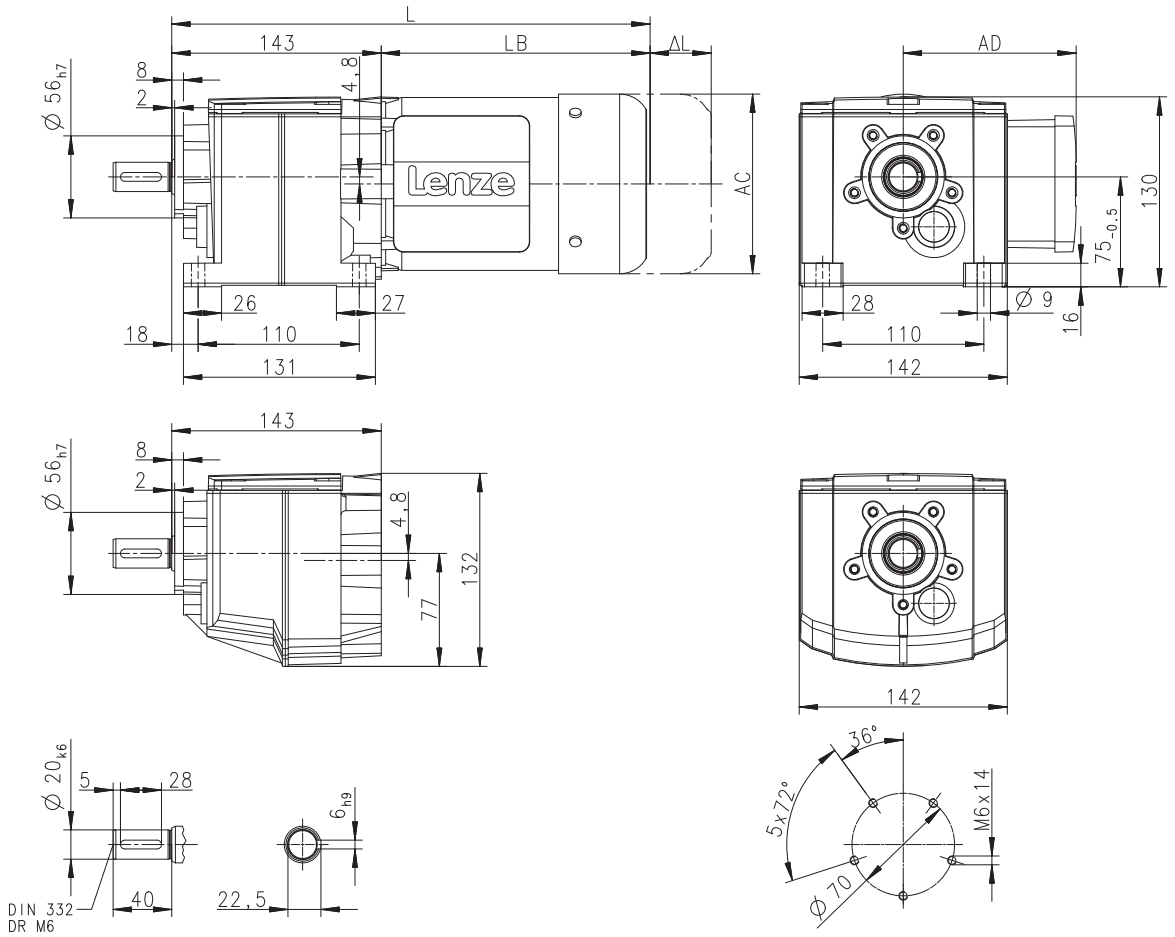


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	326		346				369	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-H100

Dimensions with solid shaft and centering
Gearbox design: VAR, VCR



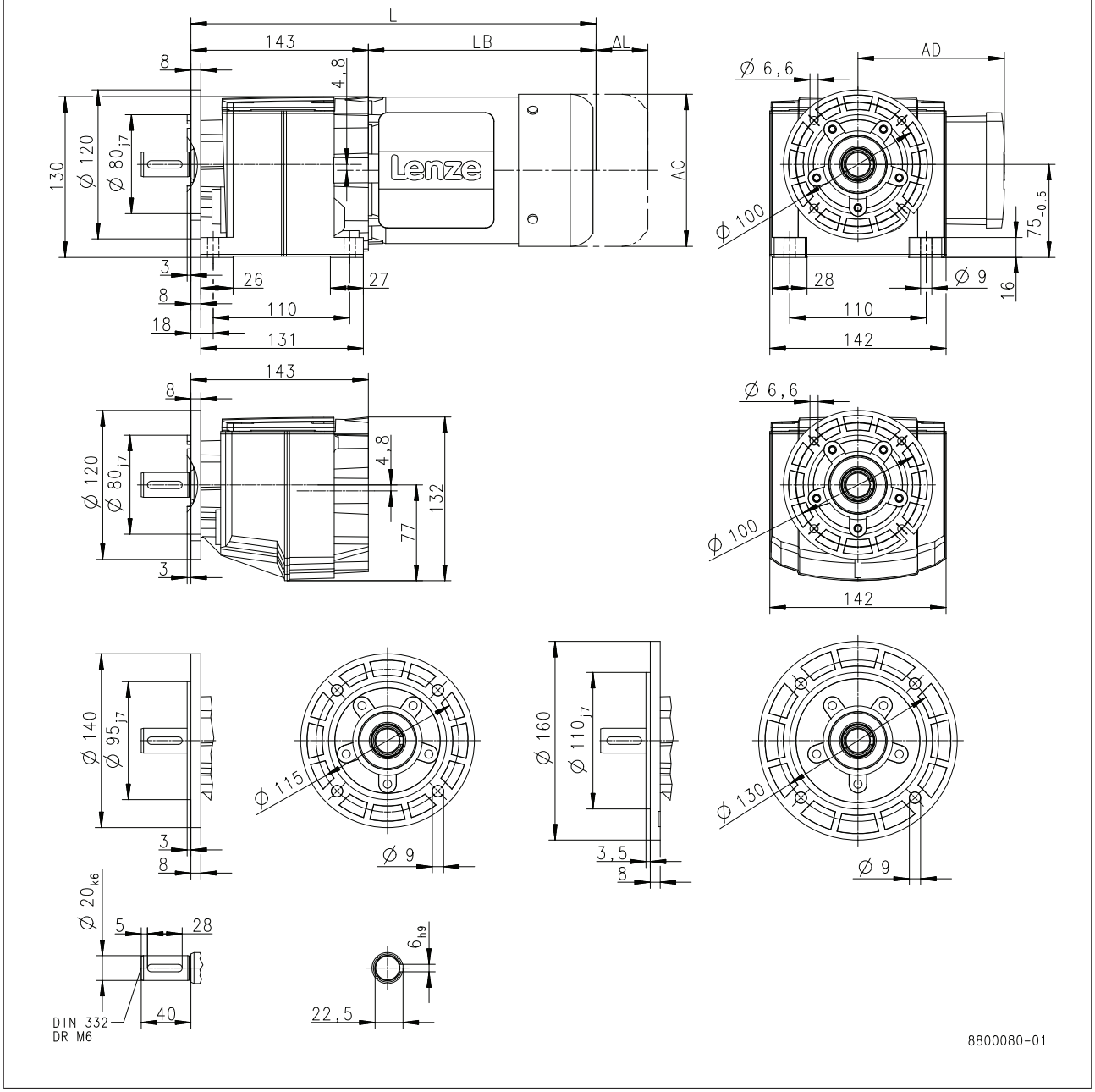
8800081-00

Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	326		346				369	
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, 2-pole and 6-pole motors

g500-H100

Dimensions with solid shaft and flange
Gearbox design: VAK, VCK

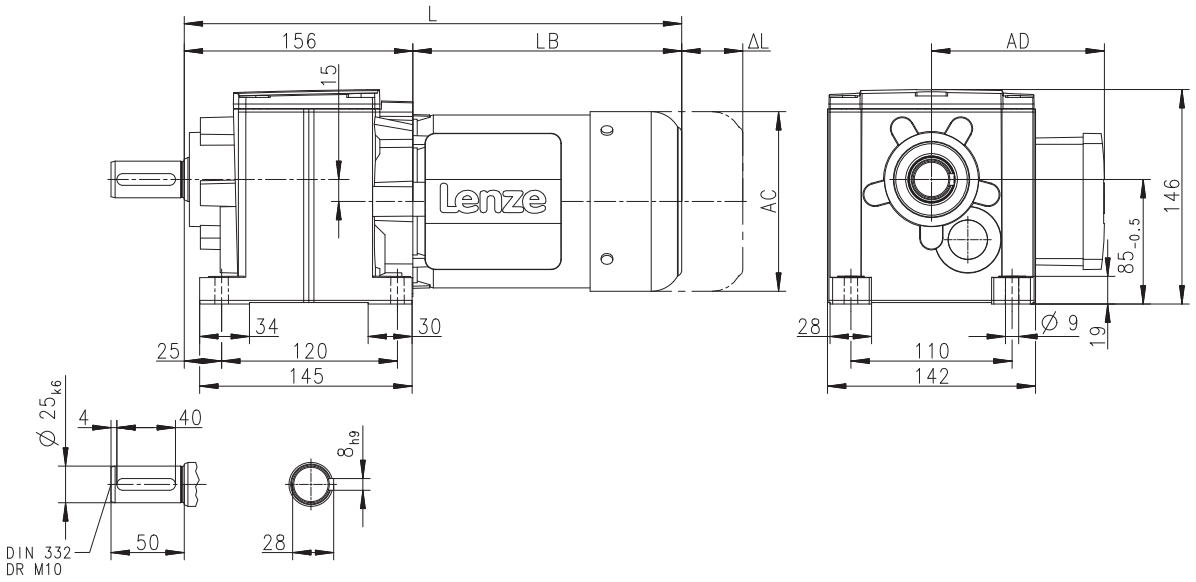


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	326		346				369	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-H140

Dimensions with solid shaft
Gearbox design: VBR



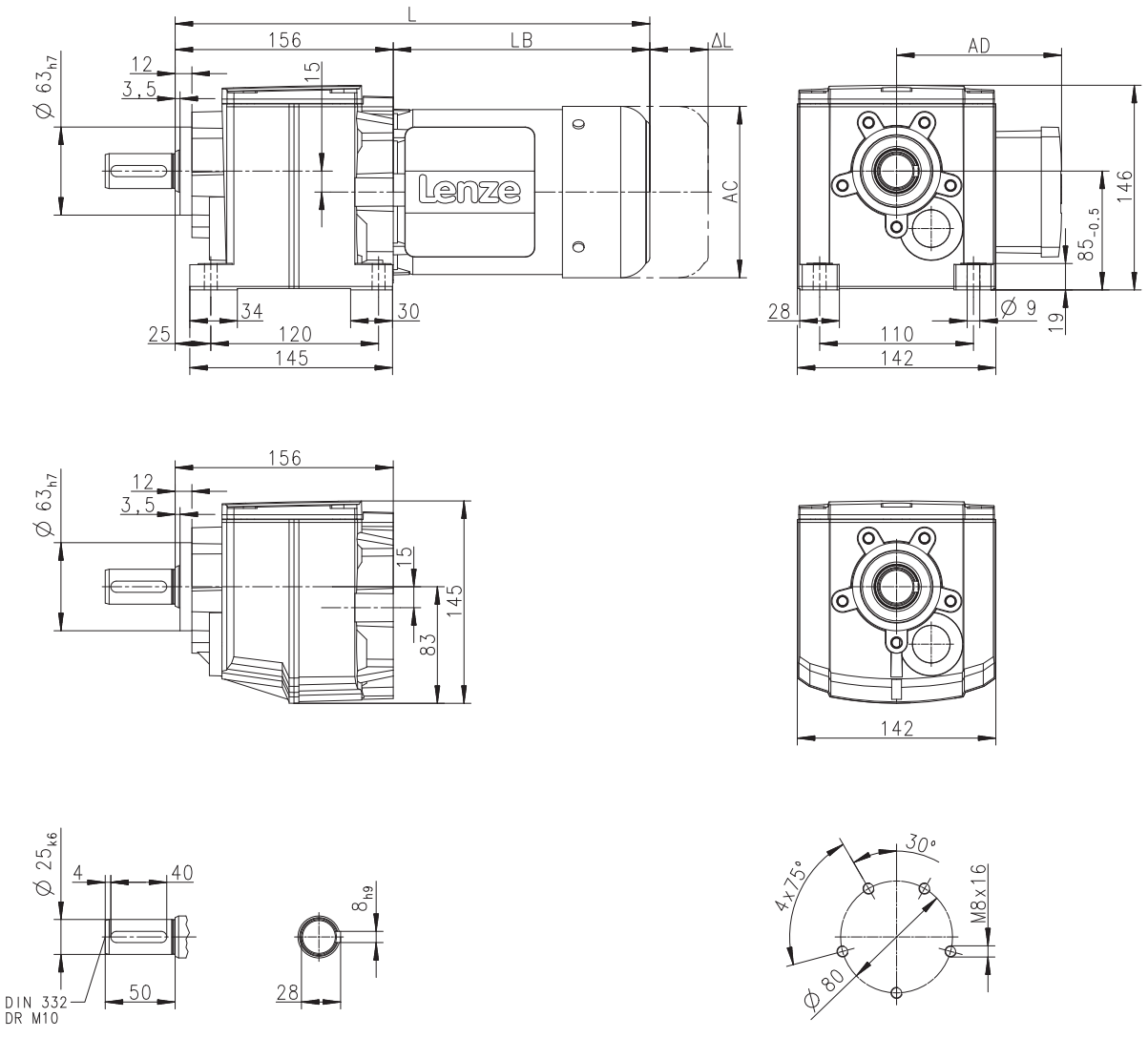
8800091-00

Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	339		359				382	
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, 2-pole and 6-pole motors

g500-H140

Dimensions with solid shaft and centering
Gearbox design: VAR, VCR



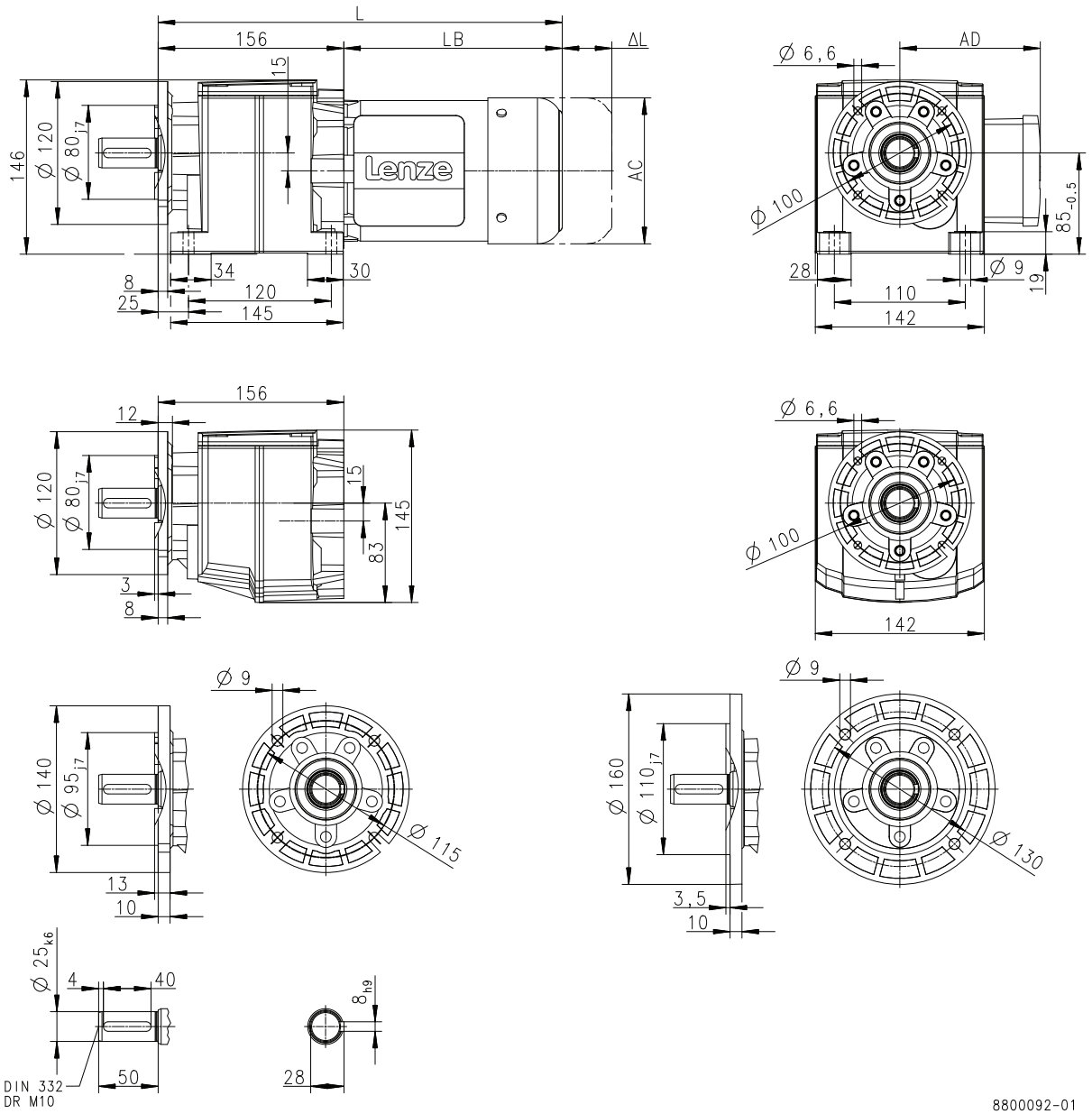
8800093-00

Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	339		359				382	
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, 2-pole and 6-pole motors

g500-H140

Dimensions with solid shaft and flange
Gearbox design: VAK, VCK

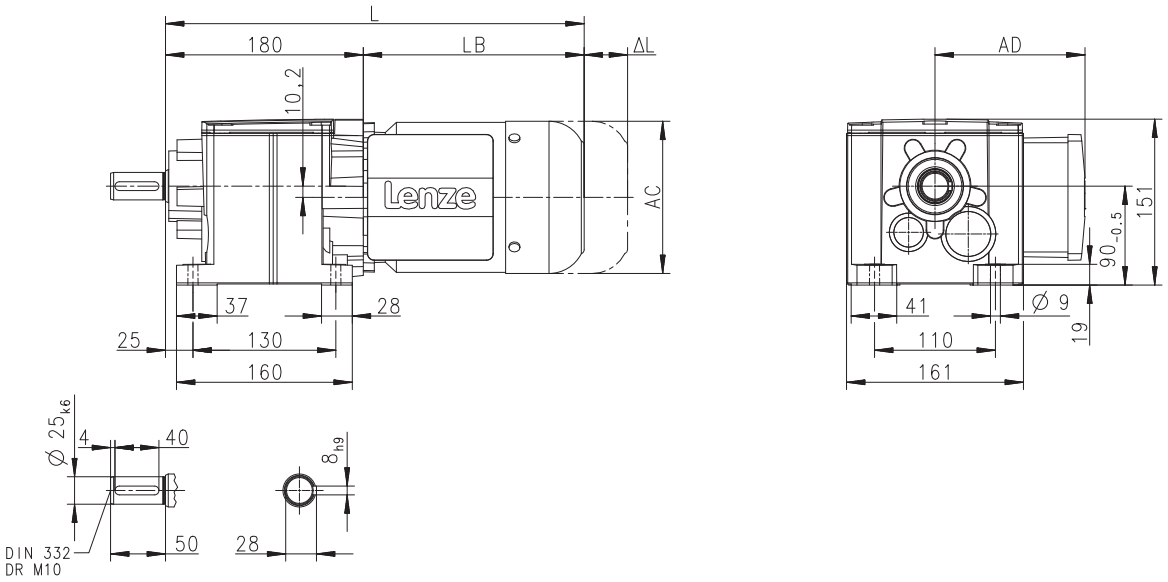


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	339		359				382	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-H210

Dimensions with solid shaft
Gearbox design: VBR

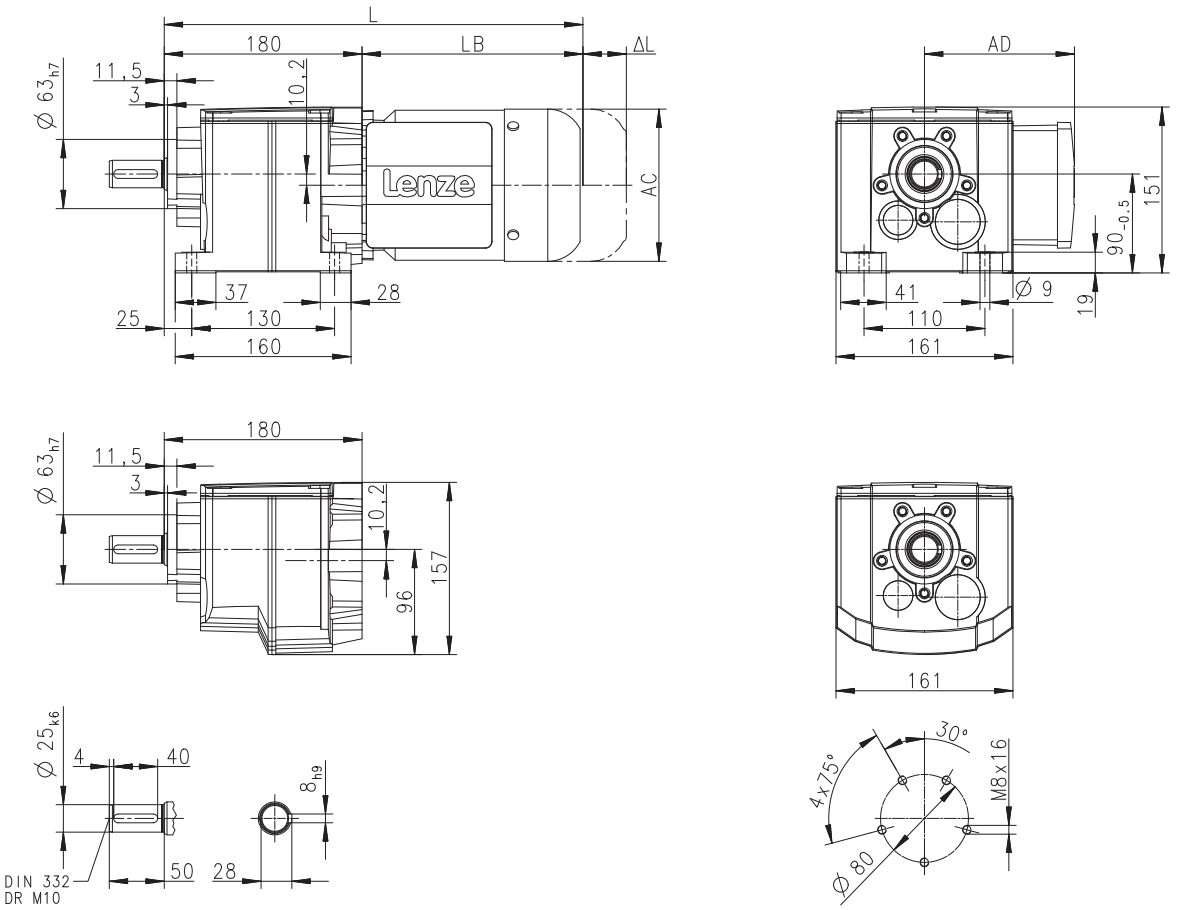


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	363		383				406	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-H210

Dimensions with solid shaft and centering
Gearbox design: VAR, VCR



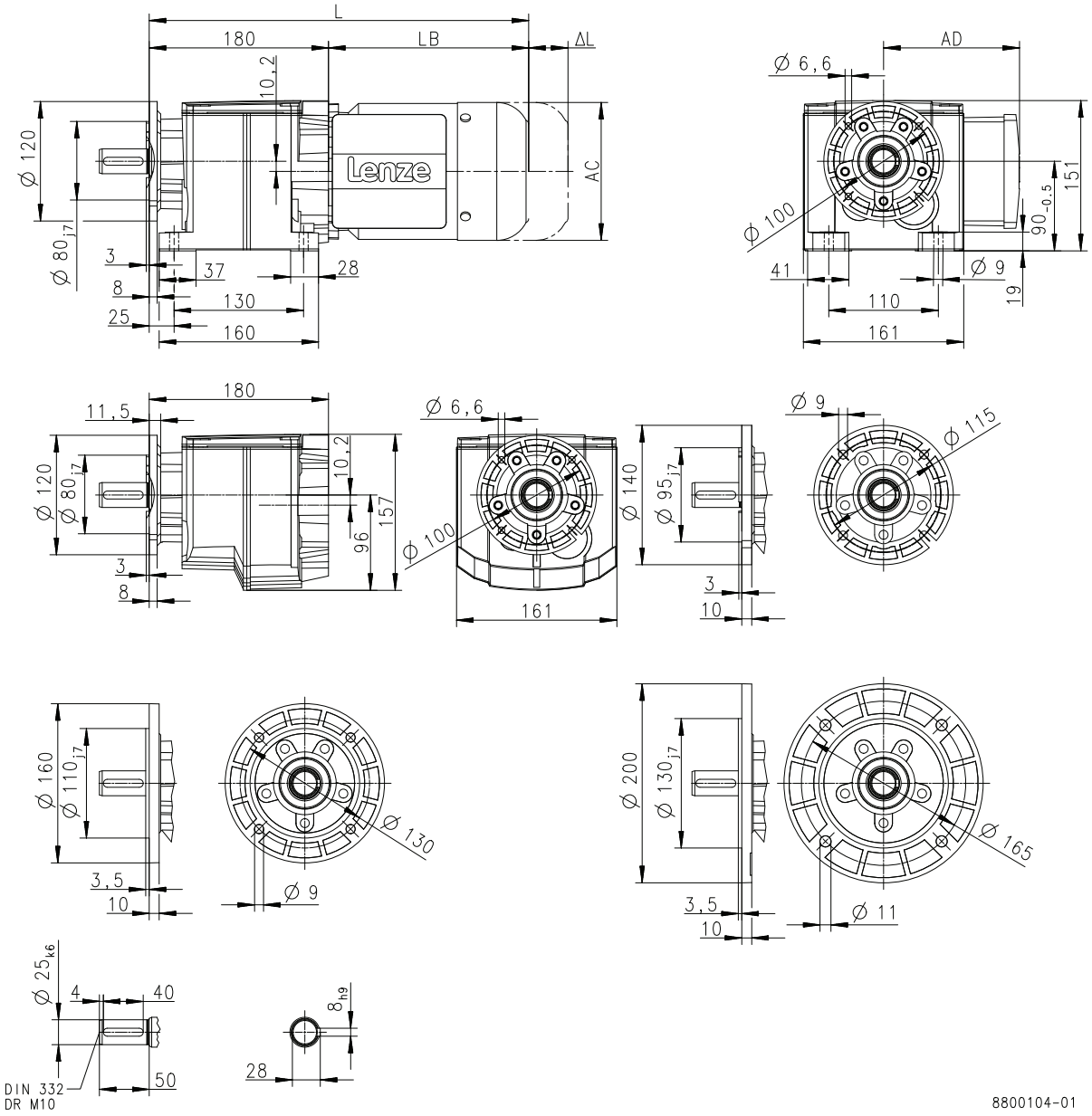
8800105-00

Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	363		383				406	
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, 2-pole and 6-pole motors

g500-H210

Dimensions with solid shaft and flange
Gearbox design: VAK, VCK

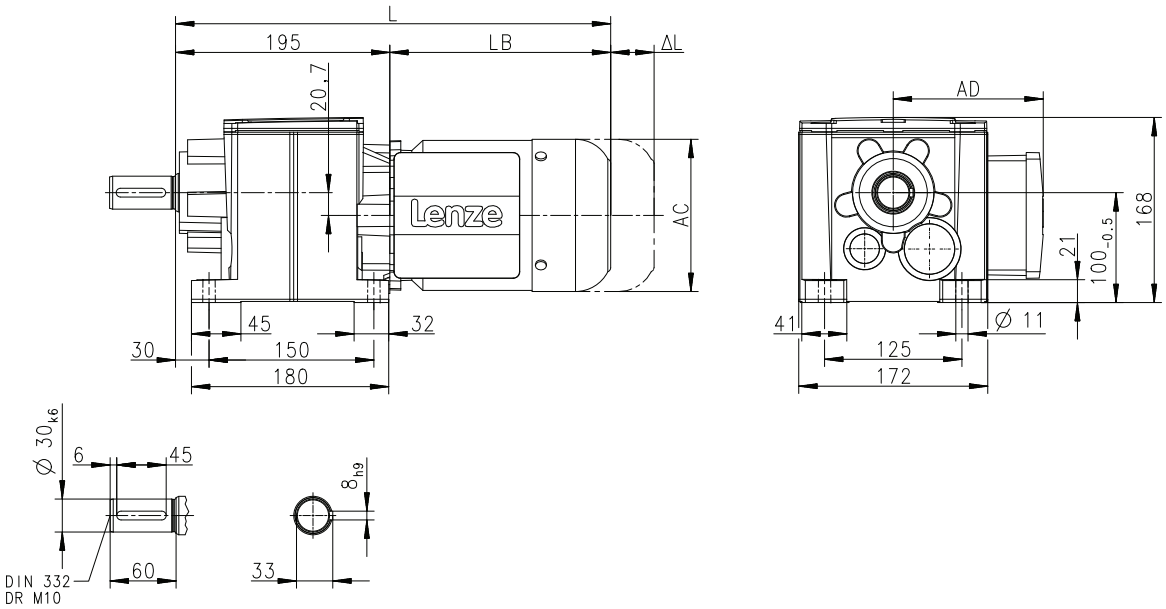


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	363		383				406	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-H320

Dimensions with solid shaft
Gearbox design: VBR

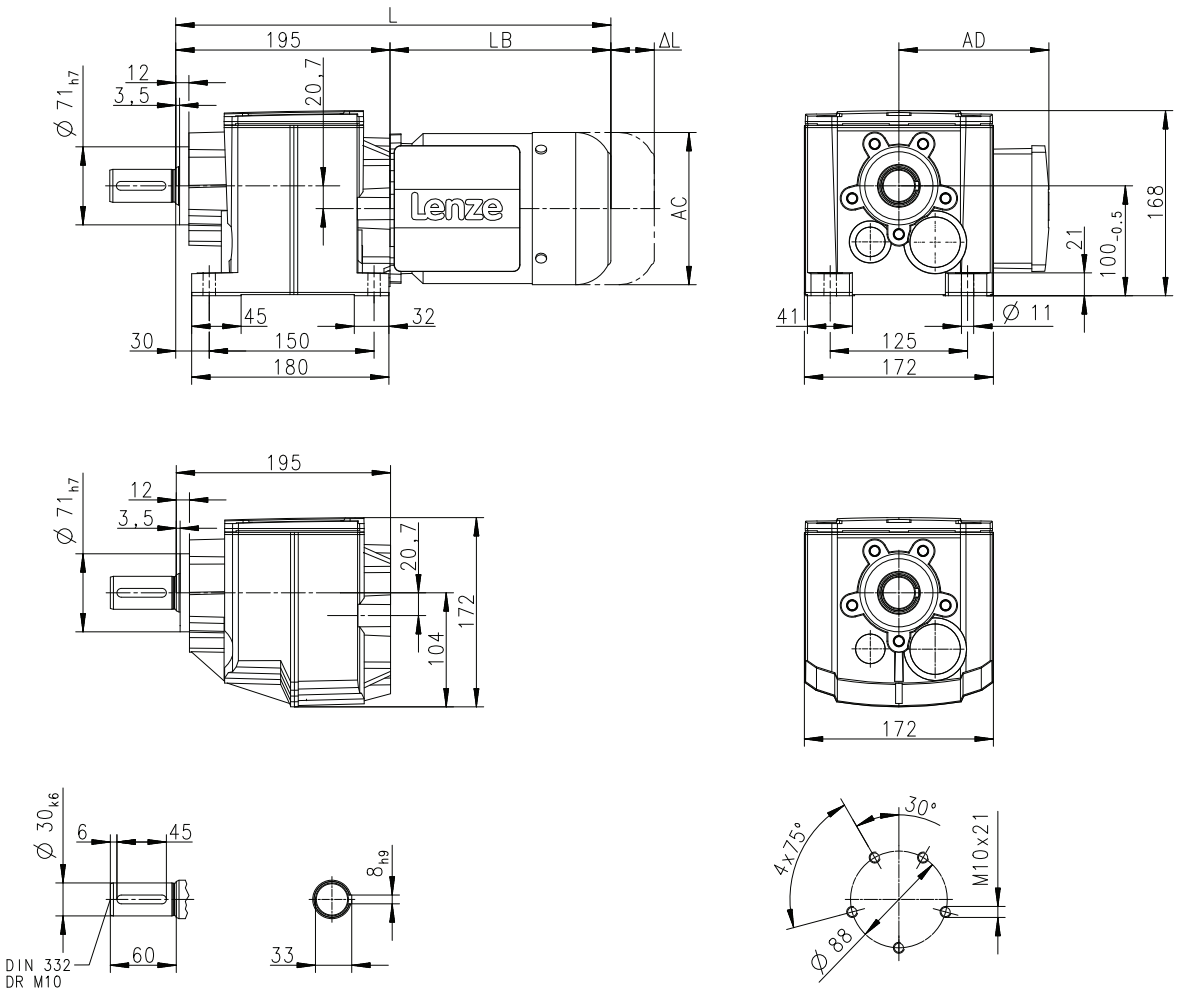


Product			MD□MA□□				
			071-13	071-31	071-33	080-13	080-33
Dimensions							
Total length	**L**	**[mm]**	403			426	
Motor length	**LB**	**[mm]**	203			226	
Length of motor options	**Δ L**	**[mm]**	165			183	
Motor diameter	**AC**	**[mm]**	139			156	
Distance motor/connection	**AD**	**[mm]**	109			150	

Dimensions, 2-pole and 6-pole motors

g500-H320

Dimensions with solid shaft and centering
Gearbox design: VAR, VCR



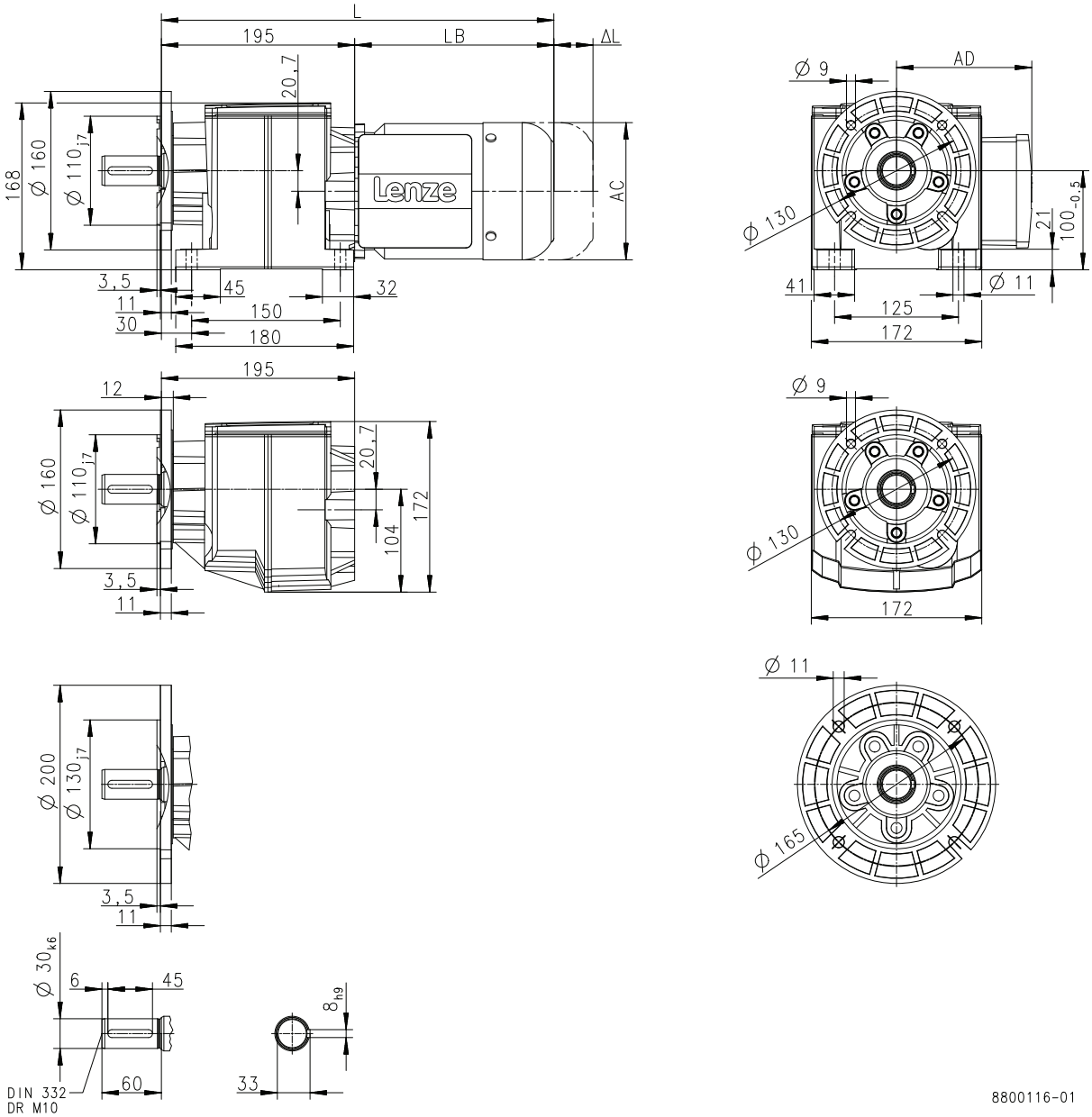
8800117-00

Product			MD□MA□□				
			071-13	071-31	071-33	080-13	080-33
Dimensions							
Total length	**L**	**[mm]**	403			426	
Motor length	**LB**	**[mm]**	203			226	
Length of motor options	**Δ L**	**[mm]**	165			183	
Motor diameter	**AC**	**[mm]**	139			156	
Distance motor/connection	**AD**	**[mm]**	109			150	

Dimensions, 2-pole and 6-pole motors

g500-H320

Dimensions with solid shaft and flange
Gearbox design: VAK, VCK



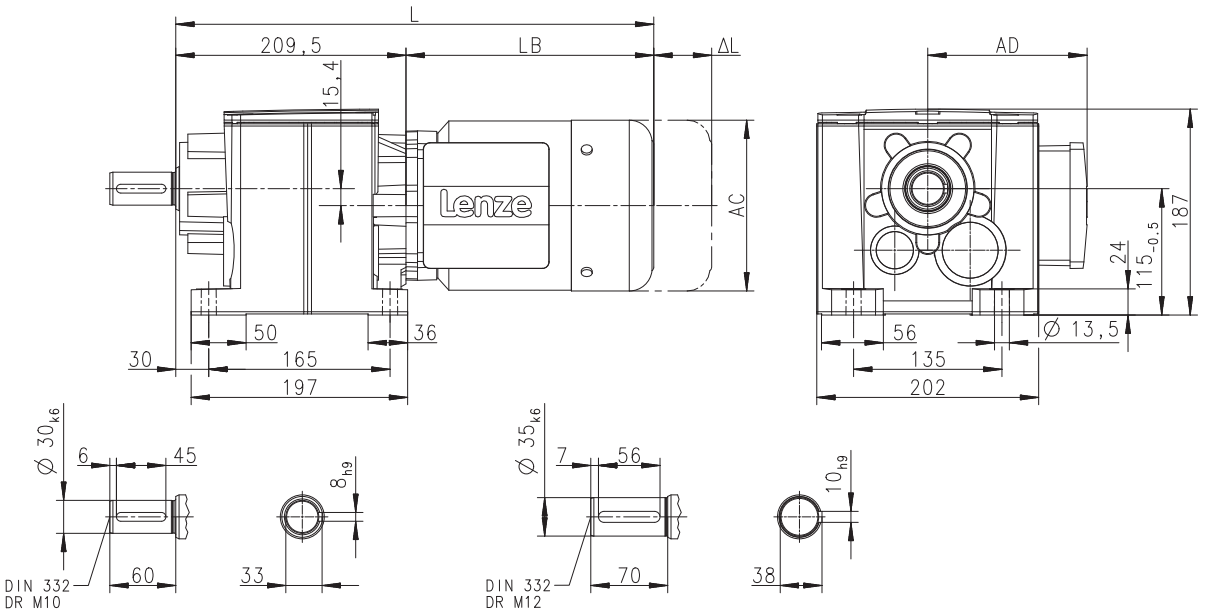
Product			MD□MA□□				
			071-13	071-31	071-33	080-13	080-33
Dimensions							
Total length	**L**	**[mm]**	403			426	
Motor length	**LB**	**[mm]**	203			226	
Length of motor options	**Δ L**	**[mm]**	165			183	
Motor diameter	**AC**	**[mm]**	139			156	
Distance motor/connection	**AD**	**[mm]**	109			150	

6.3

Dimensions, 2-pole and 6-pole motors

g500-H450

Dimensions with solid shaft
Gearbox design: VBR



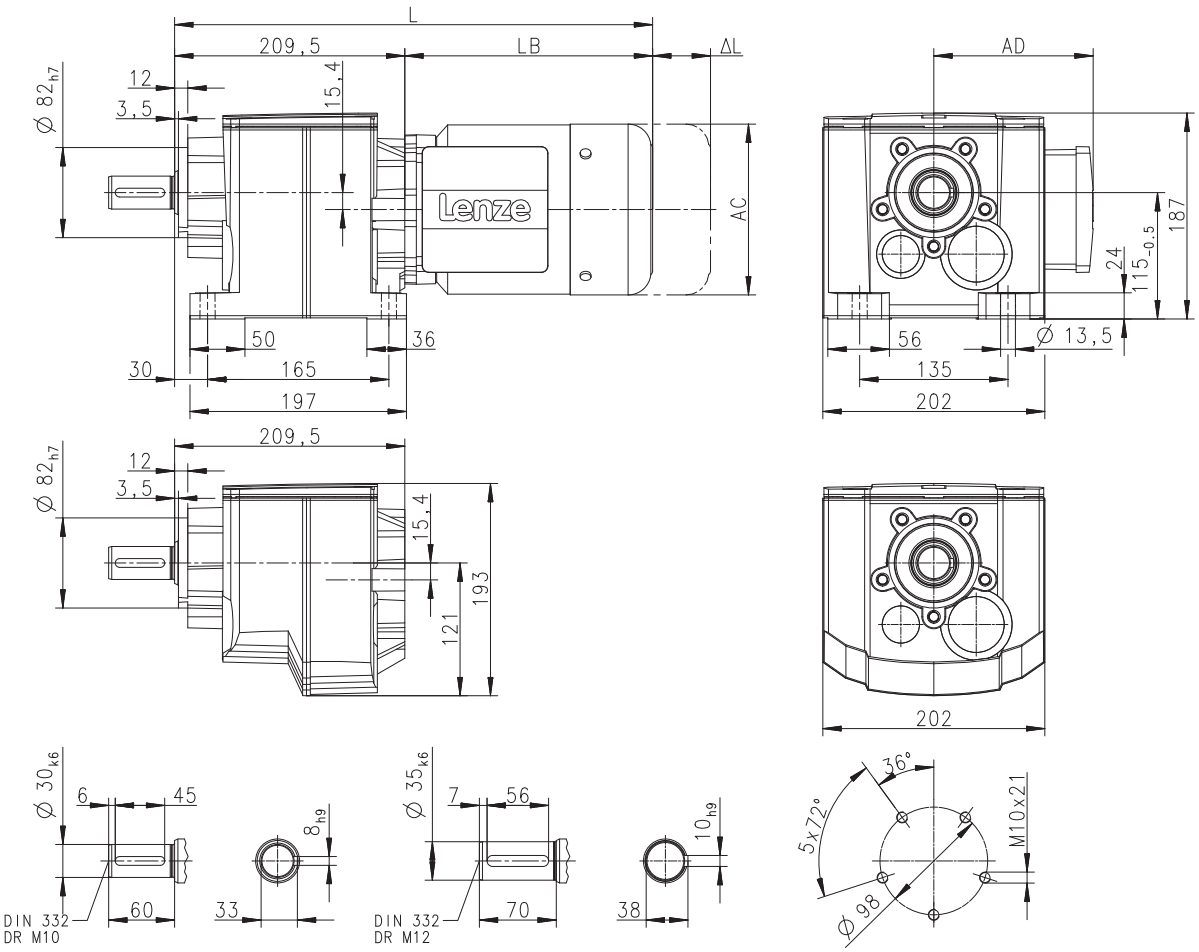
8800127-00

Product			MD□MA□□				
			071-13	071-31	071-33	080-13	080-33
Dimensions							
Total length	**L**	**[mm]**	413			436	
Motor length	**LB**	**[mm]**	203			226	
Length of motor options	**Δ L**	**[mm]**	165			183	
Motor diameter	**AC**	**[mm]**	139			156	
Distance motor/connection	**AD**	**[mm]**	109			150	

Dimensions, 2-pole and 6-pole motors

g500-H450

Dimensions with solid shaft and centering
Gearbox design: VAR, VCR

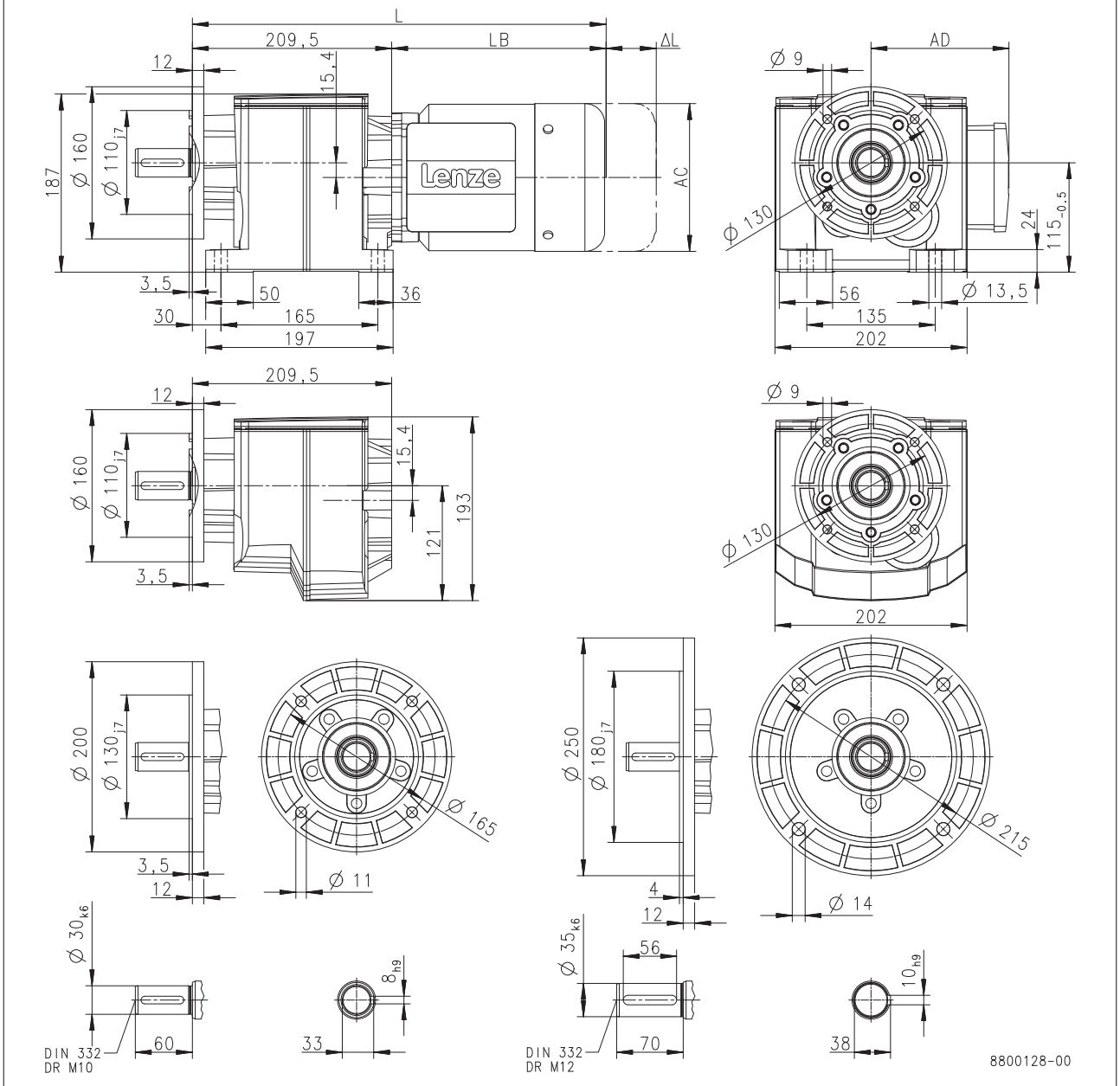


Product			MD□MA□□				
			071-13	071-31	071-33	080-13	080-33
Dimensions							
Total length	**L**	**[mm]**	413			436	
Motor length	**LB**	**[mm]**	203			226	
Length of motor options	**Δ L**	**[mm]**	165			183	
Motor diameter	**AC**	**[mm]**	139			156	
Distance motor/connection	**AD**	**[mm]**	109			150	

Dimensions, 2-pole and 6-pole motors

g500-H450

Dimensions with solid shaft and flange
Gearbox design: VAK, VCK



Product			MD□MA□□				
			071-13	071-31	071-33	080-13	080-33
Dimensions							
Total length	**L**	**[mm]**	413			436	
Motor length	**LB**	**[mm]**	203			226	
Length of motor options	**Δ L**	**[mm]**	165			183	
Motor diameter	**AC**	**[mm]**	139			156	
Distance motor/connection	**AD**	**[mm]**	109			150	

Additional length of the built-on accessories

Dimensions, self-ventilated (4-pole)

Product			MD□MA□□			MH□MA□□				
			063-02 063-22	063-12 063-32 063-42	071-32 071-42	080-32	090-12 090-32	100-12 100-32	112-22	132-12 132-22
Built-on accessories										
Brake										
	Δ L	[mm]	71.0	40.0	52.0	73.0	68.0	76.0	90.0	110
Feedback										
	Δ L	[mm]	71.0	56.0	52.0	111	87.0	81.0	80.0	103
Handwheel										
	Δ L	[mm]			70.0	91.0	80.0	94.0	107	126
2. shaft end										
	Δ L	[mm]			47.0	68.0	57.0	71.0	84.0	101
Grey iron fan										
	Δ L	[mm]			0.000	4.00	0.000	76.0	0.000	
Brake + Feedback										
	Δ L	[mm]	135	103	96.0	111	105	101	120	125
Brake + Handwheel										
	Δ L	[mm]			70.0	91.0	80.0	94.0	107	126
Brake + 2. shaft end										
	Δ L	[mm]			47.0	68.0	57.0	71.0	84.0	101
Brake + Grey iron fan										
	Δ L	[mm]			52.0	73.0	68.0	76.0	90.0	110

Dimensions, self-ventilated (2-pole)

Product			MD□MA□□	
			063-11 063-31	071-11 071-31
Built-on accessories				
Brake				
	Δ L	[mm]	40.0	52.0
Grey iron fan				
	Δ L	[mm]		0.000
Brake + 2. shaft end				
	Δ L	[mm]		47.0
Brake + Grey iron fan				
	Δ L	[mm]		52.0

Further dimensions on the handwheel, 2nd shaft end and protection cover can be found in the motor chapter under product extensions.

Additional length of the built-on accessories

Dimensions, self-ventilated (6-pole)

Product			MD□MA□□	
			071-13 071-33	080-13 080-33
Built-on accessories				
Brake				
	Δ L	[mm]	52.0	73.0
Feedback				
	Δ L	[mm]	52.0	111
Handwheel				
	Δ L	[mm]	70.0	91.0
2. shaft end				
	Δ L	[mm]	47.0	68.0
Grey iron fan				
	Δ L	[mm]	0.000	4.00
Brake + Feedback				
	Δ L	[mm]	96.0	111
Brake + Handwheel				
	Δ L	[mm]	70.0	91.0
Brake + 2. shaft end				
	Δ L	[mm]	47.0	68.0
Brake + Grey iron fan				
	Δ L	[mm]	52.0	73.0

Further dimensions on the handwheel, 2nd shaft end and protection cover can be found in the motor chapter under product extensions.

Dimensions, forced ventilated (4-pole)

Product			MD□MA□□		MH□MA□□				
			063-12 063-32 063-42	071-32 071-42	080-32	090-12 090-32	100-12 100-32	112-22	132-12 132-22
Built-on accessories									
Blower									
	Δ L	[mm]	128				109	102	115
Brake									
	Δ L	[mm]	170	165	183	181	170	183	202
Feedback									
	Δ L	[mm]	128				109	183	202
Brake + Feedback									
	Δ L	[mm]	170	165	183	181	170	183	202

Further dimensions for the blower can be found in the motor chapter under product extensions.

Weights, 4-pole motors

2-stage gearboxes

				MD□MA□□							MH□MA□□
				063-02	063-12	063-22	063-32	063-42	071-32	071-42	080-32
g500	-H45	m	[kg]	5.2	5.5	5.2	5.5	5.8	7.2	7.8	
	-H100	m	[kg]		7.3		7.3	7.6	9.0	9.6	14
	-H140	m	[kg]		8.4		8.4	8.7	10	11	15
	-H210	m	[kg]		9.7		9.7	10	11	12	16
	-H320	m	[kg]				12		13	14	18
	-H450	m	[kg]					15	16	17	22

				MH□MA□□						
				090-12	090-32	100-12	100-32	112-22	132-12	132-22
g500	-H100	m	[kg]	19	21					
	-H140	m	[kg]	20	22					
	-H210	m	[kg]	21	23	29	32			
	-H320	m	[kg]	23	25	31	34	45		
	-H450	m	[kg]	26	28	34	37	48	66	74

3-stage gearboxes

				MD□MA□□			MH□MA□□		
				063-12 063-32	063-42	071-32 071-42	080-32	090-12	090-32
g500	-H210	m	[kg]	9.9	10	12	17		
	-H320	m	[kg]	12		14	19		
	-H450	m	[kg]	15		17	22	27	29

Weights, 2-pole motors

2-stage gearboxes

				MD□MA□□			
				063-11	063-31	071-11	071-31
g500	-H100	m	[kg]	7.1	7.0	9.2	9.7
	-H140	m	[kg]	8.2	8.1	10	11
	-H210	m	[kg]	9.5	9.4	12	
	-H320	m	[kg]				14
	-H450	m	[kg]				17

Weights, 6-pole motors

2-stage gearboxes

				MD□MA□□	
				071-13 071-33	080-13 080-33
g500	-H100	m	[kg]	9.7	14
	-H140	m	[kg]	11	15
	-H210	m	[kg]	12	16
	-H320	m	[kg]	14	18
	-H450	m	[kg]	17	22

3-stage gearboxes

				MD□MA□□	
				071-13 071-33	080-13 080-33
g500	-H210	m	[kg]	12	17
	-H320	m	[kg]	14	19
	-H450	m	[kg]	18	22

Additional weights for gearboxes

Product			g500-H45	g500-H100	g500-H140	g500-H210	g500-H320	g500-H450
Foot	m	[kg]	0.1	0.1	0.2	0.1	0.1	0.2
Flange	m	[kg]	0.3	0.4	0.6	0.6	0.8	0.9

Additional weights for motors

4-pole motors

Product			MD□MA□□			MH□MA□□				
			063-02 063-22	063-12 063-32 063-42	071-32 071-42	080-32	090-12 090-32	100-12 100-32	112-22	132-12 132-22
Built-on accessories										
Brake			06		06 08	08 10		10 12	12	14 16
	m	[kg]	0.9		0.9 1.5	1.5 2.6		2.6 4.2	4.2	5.8 8.7
Blower										
	m	[kg]		2.0	2.1	2.3	2.7	3.0	3.1	4.2
Grey iron fan										
	m	[kg]			1.2	1.4	2.0	2.5	3.8	6.0
Handwheel										
	m	[kg]			0.6					1.8

2-pole motors

Product			MD□MA□□	
			063-11 063-31	071-11 071-31
Built-on accessories				
Brake			06	06 08
	m	[kg]	0.9	0.9 1.5
Grey iron fan				
	m	[kg]		1.2

6-pole motors

Product			MD□MA□□	
			071-13 071-33	080-13 080-33
Built-on accessories				
Brake			06 08	08 10
	m	[kg]	0.9 1.5	1.5 2.6
Grey iron fan				
	m	[kg]	1.2	1.4
Handwheel				
	m	[kg]	0.6	

Gearbox code

Example	G	50	A	H	045	M	V	B	R	2	C

Meaning	Variant
Product family	G
Generation	A
Gearbox type	H
Output torque	045
	110
	114
	121
	132
	145
Mounting	M
Shaft type	V
	G
Housing type	A
	B
	C
Flange mounting	R
	k
Number of stages	2
	3
Motor mounting	C
	N

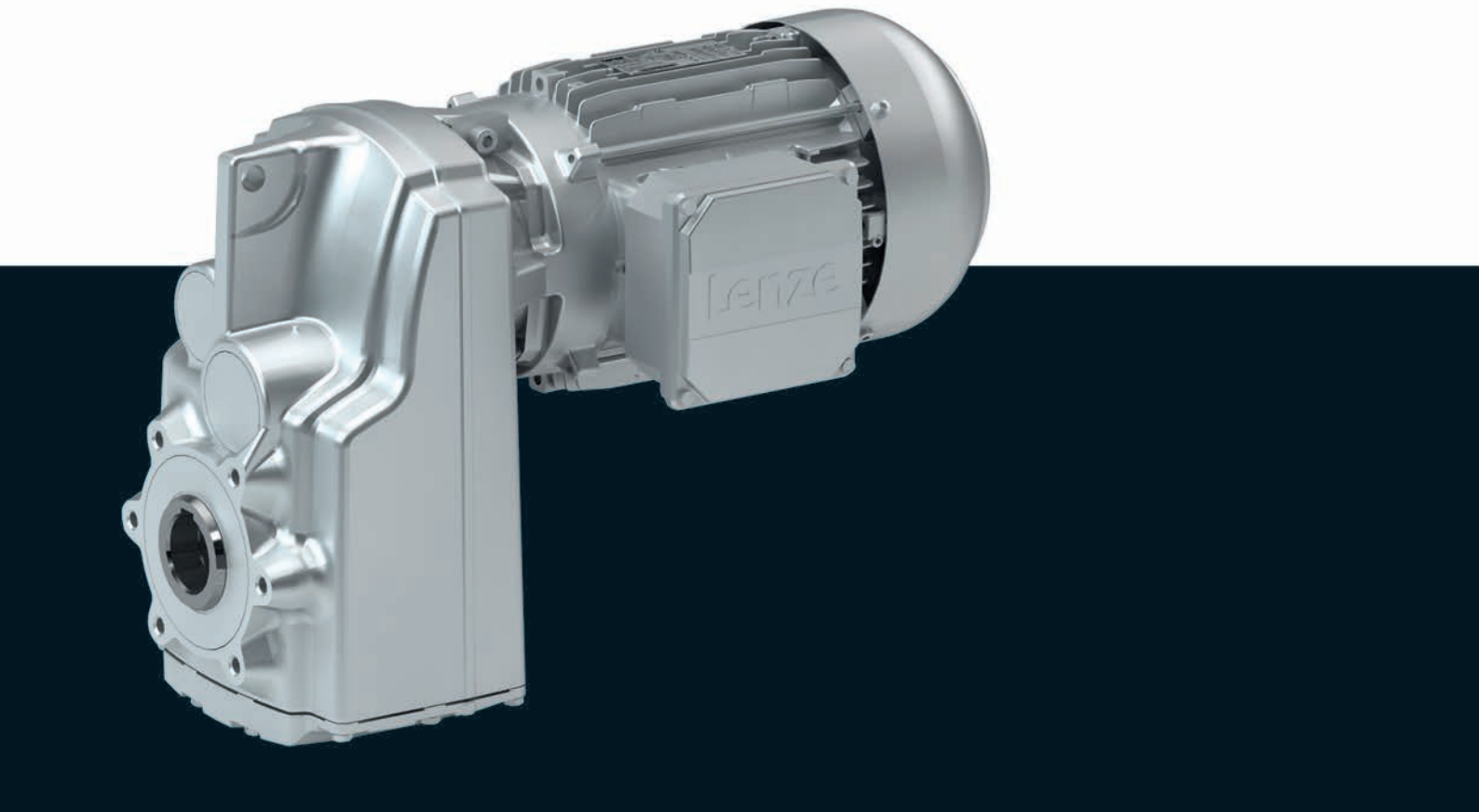
Motor code

Example	M	D	E	MA	XX	063	-	4	2	C1	C

Meaning	Variant	Motor code
Product family		M
Efficiency class	IE1	D
	IE2	H
Cooling	Natural ventilation	S
	Integral fan	E
	Blower	F
Internal key		MA
Built-on accessories	Without built-on accessories	XX
	Brake	BR
	Brake + resolver	BS
	Brake + incremental encoder	BI
	Brake + SinCos absolute value encoder	BA
	Brake + 2. shaft end	BZ
	Brake + handwheel	BH
	Brake + grey iron fan	BL
	Resolver	RS
	Incremental encoder	IG
	SinCos absolute value encoder	AG
	2nd shaft end	ZE
	Handwheel	HA
	Grey iron fan	LL
	Grey iron fan + 2. shaft end	LZ
	Grey iron fan + handwheel	LH
Size		063
		071
		080
		090
		100
		112
		132
		160
		180
		200
		225
Overall length		0
		1
		- 2
		3
		4
Number of pole pairs	4-pole motors	2
	2-pole motors	1
	6-pole motors	3
Internal key		C1
Approval	CE	C
	cURus	U
	CCC	3

g500-S shaft-mounted helical geared motors

0.12 ... 0.55 kW (efficiency class IE1)
0.75 ... 7.5 kW (efficiency class IE2)



g500-S shaft-mounted helical geared motors

Contents

List of abbreviations

α	[rad/s²]	Max. permissible angular acceleration
$\eta_{50\,\%}$	[%]	Efficiency
$\eta_{75\,\%}$	[%]	Efficiency
$\eta_{100\,\%}$	[%]	Efficiency
η_a		Efficiency
$\eta_{c=1}$		Efficiency
c		Load capacity
cos φ		Power factor
du/dt	[kV/µs]	Insulation resistance
$F_{ax,-}$	[N]	Min. axial force
$F_{ax,+}$	[N]	Max. axial force
$F_{ax,max}$	[N]	Max. axial force
$f_{in,max}$	[Hz]	Max. input frequency
f_{max}	[kHz]	Limit frequency
f_{max}	[kHz]	Max. switching frequency
f_N	[Hz]	Rated frequency
$F_{rad,max}$	[N]	Max. radial force
f_z		Additional radial force factor
H_{max}	[m]	Site altitude
I_0	[A]	Standstill current
i		Ratio
$I_{in,max}$	[A]	Max. input current
I_{max}	[A]	Max. current consumption
I_{max}	[A]	Max. current
I_{max}	[A]	Max. current consumption
I_{max}	[A]	Max. current
I_{max}	[A]	Max. short-time DC-bus current
I_{max}	[A]	Max. DC-bus current
I_N	[A]	Rated current
$I_{N,\Delta}$	[A]	Rated current
$I_{N,Y}$	[A]	Rated current
J	[kgcm²]	Moment of inertia
J_{MB}	[kgcm²]	Moment of inertia
$KE_{LL\,150\,°C}$	[V /(1000 r/min)]	Voltage constant
$Kt_{0\,150\,°C}$	[Nm/A]	Torque constant
L_{10}	[h]	Bearing service life
L	[mH]	Mutual inductance
$L_{1\sigma}$	[mH]	Stator leakage inductance
$L_{2\sigma}$	[mH]	Rotor leakage inductance
L_N	[mH]	Rated inductance
m	[kg]	Mass
M_2	[Nm]	Output torque
M_{22}	[Nm]	Output torque
M_0	[Nm]	Stall torque
$M_{0,max}$	[Nm]	Max. standstill torque
$M_{2,GM}$	[Nm]	Output torque
$M_{2,max}$	[Nm]	Max. output torque
$M_{2,not}$	[Nm]	Emergency off-torque

M_a	[Nm]	Starting torque
$M_{a\_,1}$	[Nm]	Starting torque
$M_{a\_,2}$	[Nm]	Starting torque
M_{av}	[Nm]	Average dynamic torque
M_b	[Nm]	Stalling torque
M_B	[Nm]	Braking torque
M_k	[Nm]	Rated torque
M_{max}	[Nm]	Max. torque
M_N	[Nm]	Rated torque
n_2	[r/min]	Output speed
n_{21}	[r/min]	Output speed
n_{22}	[r/min]	Output speed
$n_{1,max}$	[r/min]	Max. gearbox input speed
$n_{1,max\,50\%}$	[r/min]	Max. gearbox input speed
n_{eto}	[r/min]	Transition speed
n_k	[r/min]	Speed
n_{max}	[r/min]	Max. speed
n_N	[r/min]	Rated speed
P_{max}	[kW]	Max. power input
Q_{BW}	[MJ]	Friction energy
Q_E	[J]	Maximum switching energy
Q_E	[KJ]	Maximum switching energy
R_1	[Ω]	Stator impedance
R_2	[Ω]	Rotor impedance
R	[Ω]	Insulation resistance
R	[Ω]	Min. insulation resistance
$R_{UV\,150\,°C}$	[Ω]	Stator impedance
$R_{UV\,20\,°C}$	[Ω]	Stator impedance
$S_{hü}$	[1/h]	Transition operating frequency
t_1	[ms]	Engagement time
t_2	[ms]	Disengagement time
t_{11}	[ms]	Delay time
t_{12}	[ms]	Rise time
T	[°C]	Max. surface temperature
T	[°C]	Min. ambient temperature for transport
T	[°C]	Max. ambient temperature for transport
T	[°C]	Max. ambient temperature of bearing
T	[°C]	Min. ambient storage temperature
T	[°C]	Ambient temperature
T	[°C]	Operating temperature
T	[°C]	Rated temperature
t	[h]	Service life
T_{opr}		Ambient operating temperature
$T_{opr,max}$	[°C]	Max. ambient operating temperature
$T_{opr,min}$	[°C]	Min. ambient operating temperature
t_{re}	[s]	Recovery time
$t_{ü}$	[ms]	Overexcitation time
U_Δ	[V]	Voltage range
U_{AC}	[V]	Mains voltage range

List of abbreviations

U_{AC}	[V]	Mains voltage
$U_{in,max}$	[V]	Max. input voltage
$U_{in,min}$	[V]	Min. input voltage
U_{max}	[V]	Max. input voltage
U_{max}	[V]	Max. mains voltage
U_{min}	[V]	Min. mains voltage
$U_{N, \Delta}$	[V]	Rated voltage
$U_{N, AC}$	[V]	Rated voltage
$U_{N, DC}$	[V]	Rated voltage
$U_{N, Y}$	[V]	Rated voltage
z_g		Number of teeth
Z_{ro}	[Ω]	Rotor impedance
Z_{rs}	[Ω]	Impedance
Z_{so}	[Ω]	Stator impedance
z_t		Number of teeth

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)

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

The right three-phase AC motor for the application

In a power range from 0.06 to 45 kW, Lenze offers an easy-to-scale modular system of robust three-phase AC motors. This modular system comprises three-phase AC motors for the common efficiency classes as well as the m300 Lenze Smart motor.

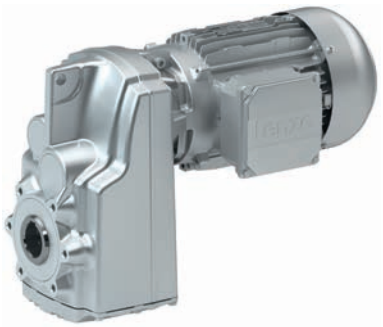
- IE1 motors up to a power of 0.55 kW
- IE2 motors from 0.75 to 45 kW
- IE3 motors from 7.5 kW to 45 kW,

and for optimum operation in the field of materials handling technology, the Lenze Smart Motor for 1.5 and 5 Nm, thus providing the optimum drives for mains operation.

The IE1, IE2 and IE3 motors are designed for operation on an inverter. The same modular system additionally provides an inverter-optimised motor in the power range up to 22 kW for a setting range of 1:24. A scaled modular system offering the optimum solution for each application and which, as decentralised drive solution, in the power range up to 7.5 kW can be equipped with the integrated 8400 motec inverter.

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 with three-phase AC motor

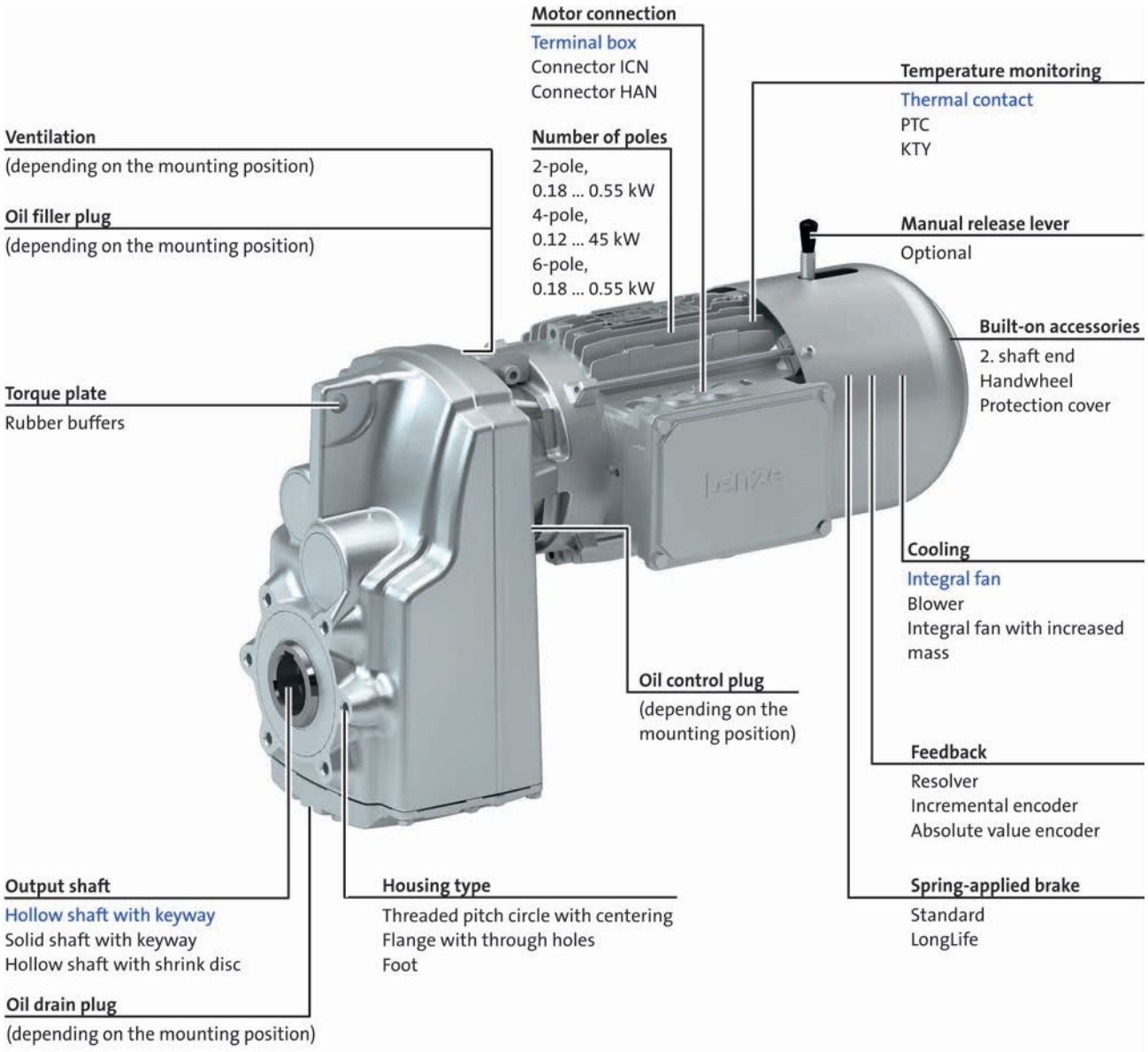
g500-S shaft-mounted helical gearbox with three-phase AC motor and motec

g500-S shaft-mounted helical gearbox with servo motor

Equipment

Overview

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



Standard design

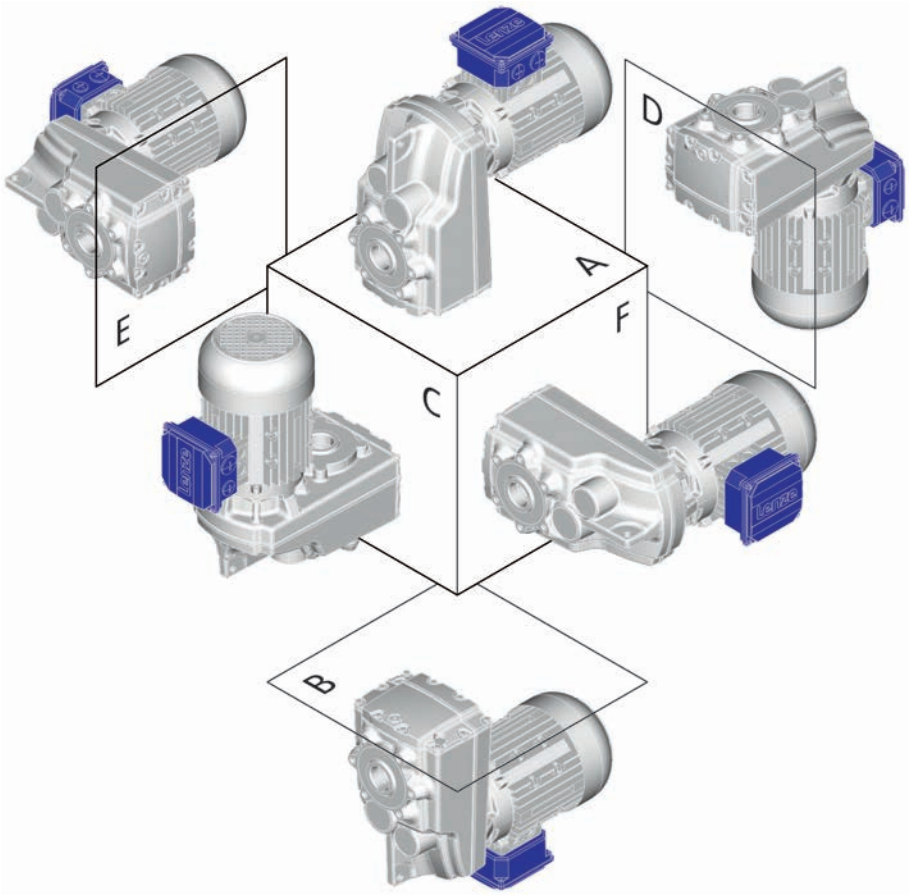
6.4

Equipment

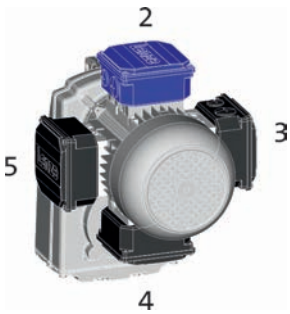
Mounting position, position of system components

- In the following graphics, the terminal box in position 2 is colour-coded.
  If the mounting position (A ... F) changes, the terminal box positions 2 ... 5 are rotated accordingly.
- To reduce the number of different versions, the gearboxes can also be ordered with combined mounting positions:
  - g500-S130 ... S660 in mounting position AEF

Mounting positions A ... F



Terminal box positions 2 ... 5

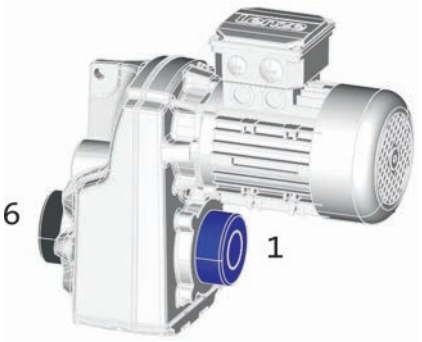


Cable entry positions 1 ... 5

- For details regarding the cable entry see motor chapter/product extensions.

Equipment

Mounting position, position of system components

Shrink disc position 1 or 6


► Solid shaft and flange are only possible in position 6.

The geared motor kit

Product				
Gearbox	g500-S130	g500-S220	g500-S400	g500-S660
Motor assignment min.	063	063	063	063
Motor assignment max.	090	100	112	132
Technical data				
Output torque max.	130 Nm	220 Nm	400 Nm	660 Nm
Drive power min.	0.12 kW	0.12 kW	0.12 kW	0.12 kW
Drive power max.	1.5 kW	3.0 kW	4 kW	7.5 kW
Dimensions [mm]				
Solid shaft with featherkey	25 x 50	25 x 50	30 x 60	35 x 70 40 x 80
Hollow shaft with keyway	25	25/30	30/35	40/45
Hollow shaft with shrink disc	25	25/30	35	40
Output flange	160	160	200	200/250

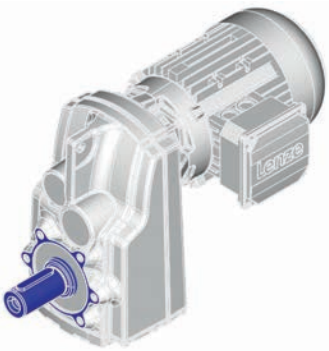
► Values printed in bold are standard versions.
Values not printed in bold are possible extensions, some for an additional charge.

Design	
Conformity	**CE** EAC
Approval	**Without** CCC/CSA/cURus
Degree of protection	**IP55** IP65/IP66
Surface and corrosion protection	**Without** Different types of OKS
Colour	**Not coated** Primed/RAL colours
Hollow shaft	**With keyway**
Hollow shaft with shrink disc	Without keyway
Solid shaft	With keyway
Shaft material	**Steel**
Shaft sealing ring material	**NBR** FKM or FPM (Viton)
Shaft bearings	**Normal**
Paste for shaft mounting	**Without** Enclosed
Gearbox type	**Housing (□DR)** With foot (VBR) With centering (□CR) With output flange (□CK)
Lubricant	**Mineral oil** Synthetic oil Food-compatible oil

Design	
Mounting position	**A/B/C/D/E/F** Combined
Backlash	**Normal**
Power connection	**Terminal box** Plug connectors
Spring-applied brake	**Without** Brake design: Standard/Longlife Brake version: Standard/Overexcited/Cold Brake
Feedback	**Without** Resolver Absolute value encoder Incremental encoder
Cooling	**Integral fan** Blower Grey iron fan (increased centrifugal mass)
Temperature monitoring	**TKO thermal contact** PTC thermistor KTY thermal detector
Built-on accessories fan side	**Without** Protection cover 2nd shaft end/handwheel

The gearbox kit

Gearbox details

Solid shaft		
		
Without centring (VDR)	With centering (VCR)	Flange with through holes (VCK)

Hollow shaft		
		
Without centring (HDR)	With centering (HCR)	Flange with through holes (HCK)

6.4

The gearbox kit

Gearbox details

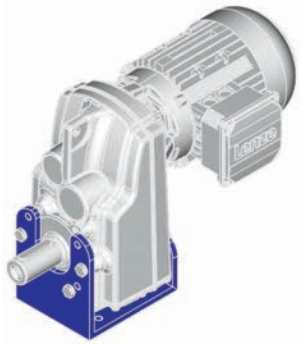
Hollow shaft with shrink disc

Without centring (SDR)

With centering (SCR)

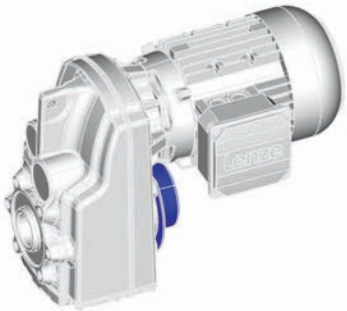
Flange with through holes (SCK)

Accessories



Foot mounting (VBR)

With rubber buffer



Shrink disc cover

6.4

General information about the data provided in this catalogue

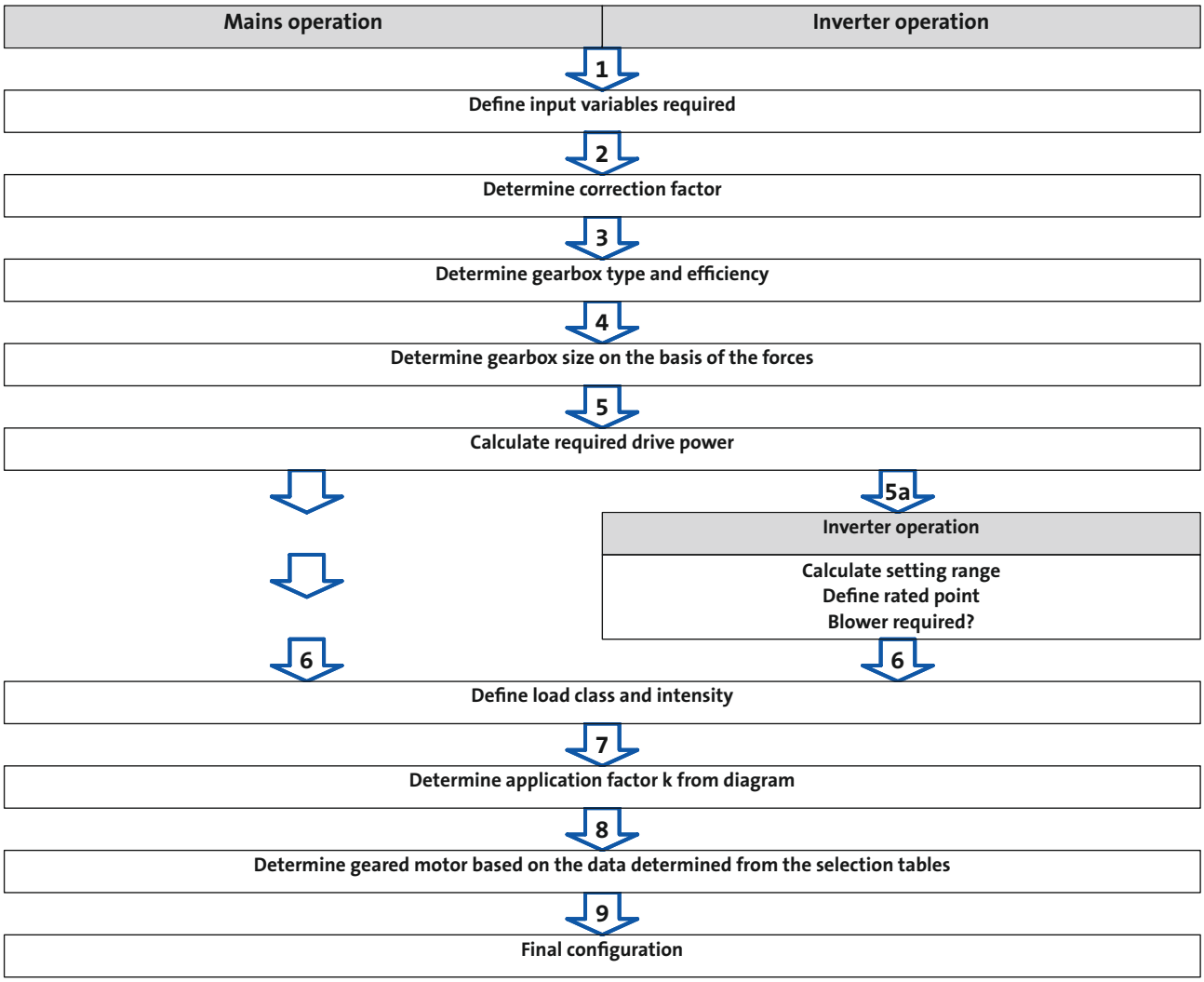
The powers, torques and speeds specified in this catalogue are rounded values and are valid under the following conditions:

- 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 °C for gearboxes,
  T_{amb} = 40 °C for motors (in accordance with EN 60034)
- Site altitude < = 1000 m amsl
- The selection tables provide the permissible mechanical powers and torques. For notes on the thermal power limit, see chapter drive dimensioning.
- The rated power specified for motors and geared motors applies to operating mode S1 (in accordance with EN 60034).

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

Procedure of a configuration process

Workflow



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.

Procedure of a configuration process

1 required input variables

Load torque		$M_{L,max}$=	[Nm]
	In inverter operation	$M_{L,min}$=	[Nm]
Load speed		$n_{L,max}$=	[r/min]
	In inverter operation	$n_{L,min}$=	[r/min]
External moments of inertia		J_{ext}=	[kgcm^2]
Operating time / day		BD =	[h]
Switching operations per h		S_h=	[1/h]
Runtime for $M_{L,max}$	In inverter operation		[%]

2 determine correction factor

Operating modes and operating time						
S1	ED	[%]	100			
	k_L =		1.0			
S2	ED	[%]	10	30	60	90
	k_L =		1.4 - 1.5	1.15 - 1.2	1.07 - 1.1	1.0 - 1.05
S3	ED	[%]	15	25	40	60
	k_L =		1.4 - 1.5	1.3 - 1.4	1.15 - 1.2	1.05 - 1.1
S6	ED	[%]	15	25	40	60
	k_L =		1.5 - 1.6	1.4 - 1.5	1.3 - 1.4	1.15 - 1.2
Site altitude						
	H	[m]	≤ 1000	≤ 2000	≤ 3000	≤ 4000
	k_H =		1	0.95	0.9	0.8
Ambient temperature						
	T_U =	[°C]	≤ 40	≤ 45	≤ 50	≤ 55
	k_{TU} =		1	0.95	0.9	0.8

23 - Operating modes

Procedure of a configuration process

3 determine gearbox type and efficiency

Gearbox type			Axial gearboxes		Right-angle gearboxes
			Helical gearbox	Shaft-mounted	Bevel gearbox
Product			g500-H	g500-S	g500-B
Gearbox efficiency	2-stage gearboxes	η_G	0.96	0.96	0.96
	3-stage gearboxes	η_G	0.95	0.95	0.95

4 determine gearbox size based on the forces on the output

Transmission element		Gear wheels	Sprockets	Toothed belt pulleys (depending on the initial stress)	Narrow V-belt (depending on the initial stress)
Additional radial force factor	f_z =	≥ 17 teeth = 1.0 < 17 teeth = 1.15	≥ 20 teeth = 1.0 < 20 teeth = 1.25 < 13 teeth = 1.4	With belt tightener = 2.0 - 2.5 Without belt tightener = 2.5 - 3.0	1.5 - 2.0
		Calculation		**Check**	
Radial force	[N]	$F_{rad} = 2000 \times \frac{M_{L,max} \times f_z}{dw}$		$F_{rad} \le f_w \times F_{rad,max}$	
Axial force	[N]			$F_{ax} \le F_{rad,max} \times 0.5$	

44 - Permissible radial and axial forces at output

5 calculate drive power

		Calculation	
Drive power required	[kW]	$P_1 = \frac{M_{L,max} \times n_{L,max}}{9549 \times k_L \times k_H \times k_{Tu} \times n_g}$	

6.4

Procedure of a configuration process - mains operation

6 calculate intensity and determine duty class

Load class	Load type	Intensity
I	Smooth operation, small or light jolts	$F_I \leq 1.25$
II	Uneven operation, average jolts	$1.25 < F_I \leq 4$
III	Uneven operation, severe jolts and/or alternating load	$F_I > 4$

	Calculation	
Intensity	$F_I = \frac{\frac{J_L}{i^2} + J_M + J_B + J_Z}{J_M + J_B + J_Z}$	

i= gearbox ratio
J_L= moment of inertia of the load
J_M= moment of inertia of the motor
J_B= moment of inertia of the brake
J_Z= additional moment of inertia (handwheel, 2nd shaft end ...)

7 determine application factor k from diagram

27 - Load capacity and application factor

Procedure of a configuration process - mains operation

8 determine geared motor based on the data determined from the selection tables

Selection table		Check
Drive power P_N	[kW]	$P_1 \leq P_N$
Output speed n_2	[r/min]	$n_{L,max} \approx n_2$
Output torque M_2	[Nm]	$M_{L,max} \leq M_2$
Load factor c		$k \leq c$
Order information		**Example**
Number of stages		2
Ratio i		3.267
Product gearbox		g500-H140
Product motor		MDxMAxx090-32

27 - Load capacity and application factor

Example: structure of a selection table

50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW ← Rated power P_N

2-stage gearboxes ← Number of the gear stage

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
432	32	2.6	44	23	184	32	432	32	2.6	771	32	2.1	3.267	-H140	090-32	82
420	33	1.9	43	24	179	33	420	33	1.9	751	33	1.6	3.354	-H100	090-32	79

Output speed n_2 ↑ Output torque M_2 ↑ Load capacity c ↑ Ratio i ↑ Product Gearbox ↑ Product Motor ↑

Procedure of a configuration process - inverter operation

5a calculate range of adjustment and determine rated point

		Calculation	
Setting range		$V = \frac{n_{L,max}}{n_{L,min}}$	
Setting range	Motor with integral fan	≤ 2.5 (20 ... 50 Hz)	≤ 4.35 (20 ... 87 Hz)
	Motor with blower	≤ 10 (5 ... 50 Hz)	≤ 17.4 (5 ... 87 Hz)
Rated point at		50 Hz	87 Hz

6 calculate intensity and determine duty class

	Calculation		
Intensity	$M_I = \frac{M_{L,max}}{M_{L,min}}$	**For alternating load, select load class III!**	
Load class	Load type		Intensity
I	Smooth operation, small or light jolts		$M_I \leq 1.5$
II	Uneven operation, average jolts		$1.5 < M_I \leq 2$
III	Uneven operation, severe jolts and/or alternating load		$2 < M_I \leq 2.5$

24 - Duty classes

7 determine application factor k from diagram

27 - Load capacity and application factor

Procedure of a configuration process - inverter operation

8 determine geared motor based on the data determined from the selection tables

Selection table			Check	
Drive power P_N		[kW]	$P_1 \leq P_N$	
Max. output speed n_2		[r/min]	$n_{L,max} \approx n_2$	
Min. output speed n_{21}	Self-ventilated	[r/min]	$n_{L,min} \approx n_{21}$	Setting range 2.5 (50 Hz) Setting range ≤ 4.35 (87 Hz)
Min. output speed n_{22}	Forced-ventilated	[r/min]	$n_{L,min} \approx n_{22}$	Setting range ≤ 10 (50 Hz) Setting range ≤ 17.4 (87 Hz)
	Self-ventilated (Reduced output torque)	[r/min]	$n_{L,min} \approx n_{22}$	
Output torque M_2		[Nm]	$M_{L,max} \leq M_2$	
Load factor c			k ≤ c	

Order information	Example
Number of stages	2
Ratio i	3.267
Product gearbox	g500-H140
Product motor	MDxMAxx090-32

27 - Load capacity and application factor

30 - Torque derating at low motor frequencies

Example: structure of a selection table

50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW ← Rated power P_N

2-stage gearboxes ← Number of the gear stage

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
432	32	2.6	44	23	184	32	432	32	2.6	771	32	2.1	3.267	-H140	090-32	82
420	33	1.9	43	24	179	33	420	33	1.9	751	33	1.6	3.354	-H100	090-32	79

Min. Output speed n_{22}
Min. Output torque M_2
Min. Output speed n_{21}
Max. Output speed n_2
Max. Output torque M_2
Load capacity c
Ratio i
Product Gearbox
Product Motor

Procedure of a configuration process

9 Final configuration

More information regarding the final configuration can be found under: **- The modular geared motor system** **- Product extensions for gearboxes, motors**	
Check operating conditions	- Operating temperature (observe lubricant, material of shaft sealing ring) - Degree of protection - Supply voltage - Surface protection required - Approvals - Conformity
Check and define connection dimensions	- Driven shaft - Foot, output flange, centering with threaded pitch circle
Determine mounting position and position of the system blocks	- Mounting position A/B/C/D/E/F or combined - Terminal box position, shaft position, flange position
Select product extensions at the gearbox (differing depending on the gearbox type)	- Torque plate at the base, threaded pitch circle, rubber buffer - Hollow shaft cover, shrink disc cover
Select product extensions at the motor	- Connection type (terminal box, connector) - Brake - Blower (inverter operation) - Feedback - Temperature monitoring - Protection cover (for vertical operation) - Handwheel (for manual set-up) - 2. shaft end

Standards

Approvals

CCC	China Compulsory Certification documents the compliance with the legal product safety requirements of the PR of China - GB standards.
cCSAus	CSA certificate, tested according to US and Canada standards
CE	Communauté Européenne documents the declaration of the manufacturer that EC Directives are complied with.
CEL	China Energy Label documents the compliance with the legal energy efficiency requirements for motors, tested according to PR of China standards
CSA	Canadian Standards Association CSA - certificate, tested according to Canada standards
CSAULE	Energy Verified Certificate Determining the energy efficiency according to CSA C390 for products within the scope of energy efficiency requirements in the USA and Canada
cULus	UL certificate for products, tested according to US and Canada standards
cURus	UL certificate for components, tested according to US and Canada standards
EAC	Certificate of Russia-Belarus-Kazakhstan Customs Union documents the declaration of the manufacturer that the specifications for the Eurasian conformity (EAC) required for placing electronic and electromechanical products on the market of the entire territory of the Customs Union (Russia, Belarus, Kazakhstan) are complied with.
UL	Underwriters Laboratory Listed Product
UR	Underwriters Laboratory Recognized Product UL certificate for components, tested according to US standards

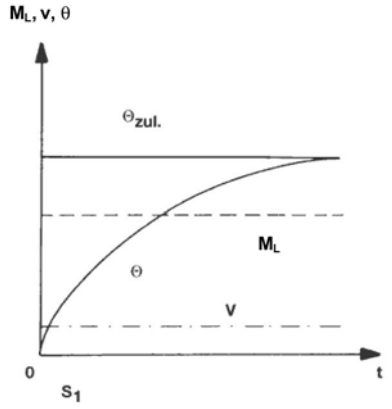
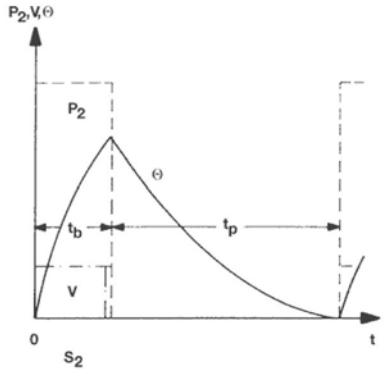
Standards

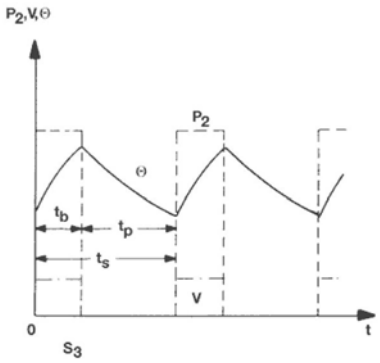
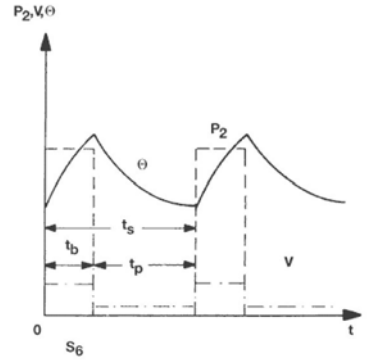
Operating modes

Operating modes S1 ... S10 as specified by EN 60034-1 describe the basic stress of an electrical machine.

In continuous operation a motor reaches its permissible temperature limit if it outputs the rated power dimensioned for continuous operation. However, if the motor is only subjected to load for a short time, the power output by the motor may be greater without the motor reaching its permissible temperature limit. This behaviour is referred to as overload capacity.
Depending on the duration of the load and the resulting temperature rise, the required motor can be selected reduced by the overload capacity.

The most important operating modes

Continuous operation S1	Short-time operation S2
	
Operation with a constant load until the motor reaches the thermal steady state. The motor may be actuated continuously with its rated power.	Operation with constant load; however, the motor does not reach the thermal steady state. During the following standstill, the motor winding cools down to the ambient temperature again. The increase in power depends on the load duration.

Intermittent operation S3	Non-intermittent periodic operation S6
	
Sequence of identical duty cycles comprising operation with a constant load and subsequent standstill. Start-up and braking processes do not have an impact on the winding temperature. The steady-state is not reached. The guide values apply to a cycle duration of 10 minutes. The power increase depends on the cycle duration and on the load period/downtime ratio.	Sequence of identical duty cycles comprising operation with a constant load and subsequent no-load operation. The motor cools down during the no-load phase. Start-up and braking processes do not have an impact on the winding temperature. The steady-state is not reached. The guide values apply to a cycle duration of 10 minutes. The power increase depends on the cycle duration and on the load period/idle time ratio.

Standards

Duty classes

Depending on the load type, the duty classes or impacts are divided as follows:

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

In order to support you in classifying your driven machine regarding the right duty class, the following shows sample applications with the corresponding duty class. Depending on, for instance, the operating frequency, driven machines can also have a higher impact.
In case of uncertainties, please contact your Lenze sales office.

Drive	Duty class
Construction machines	II
Chemical industry	II
Conveyors	II
Fans	II
Plastics industry	II
Wood working	III
Hoists	III
Metal working	III
Food	II
Paper industry	III
Stones	III
Textile industry	II

Standards

Degrees of protection

The degree of protection indicates the suitability of a motor for specific ambient conditions with regard to humidity as well as the protection against contact and the ingress of foreign particles. The degrees of protectionare classified by EN 60529.

The first code number after the code letters IP indicates the protection against the ingress of foreign particles and dust.
The second code number refers to the protection against the ingress of humidity.

Code number 1	Degree of protection	Code number 2	Degree of protection
0	No protection	0	No protection
1	Protection against the ingress of foreign particles d > 50 mm. No protection in the case of deliberate access	1	Protection against vertically dripping water (dripping water).
2	Protection against medium-sized foreign particles, d > 12 mm, keeping away fingers or similar	2	Protection against diagonally falling water (dripping water), 15 ° compared to normal service position.
3	Protection against small foreign particles d > 2.5 mm. Keeping away tools, wires and the like	3	Protection against spraying water, up to 60 ° to the vertical
4	Protection against granular foreign particles, d > 1 mm, keeping away tools, wires and the like	4	Protection against spraying water from all directions.
5	Protection against dust deposits (dust-protected), complete protection against contact.	5	Protection against water jets from all directions.
6	Protection against the ingress of dust (dust-proof), complete protection against contact.	6	Protection against choppy seas or heavy water jets (flood protection).

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

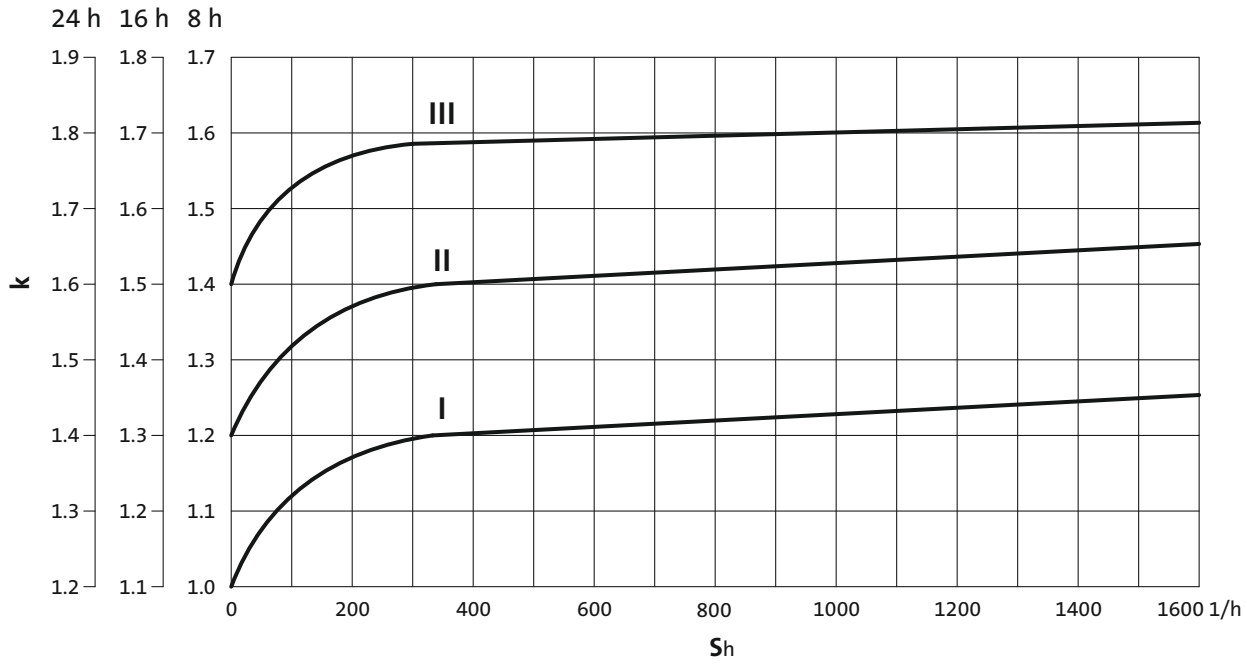
Load capacity and application factor

Load capacity c of gearboxes
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.

Required: c ≥ k

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

Application factor k



► S_h= switchings/h

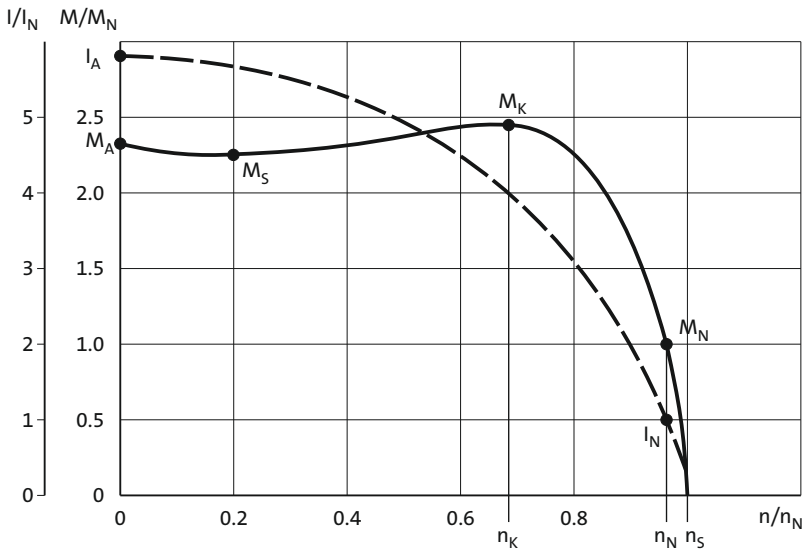
Operational performance of three-phase AC geared motors

The g500 geared motors can be actuated directly on the mains or via an inverter. When actuated in mains operation, the motor runs at a fixed speed, for inverter operation the speed is variable. Thanks to their high degree of protection, the robust three-phase drives can be basically used in a variety of applications.

Mains operation

During mains operation, when switched on, the three-phase AC motor starts up according to the speed-torque characteristic. It passes through this characteristic until it reaches its stable operating point. This operating point has been reached if the load torque or rated torque (M_N) is lower than the starting torque (M_A) and the pull-up torque (M_S). 2-, 4- and 6-pole motors are used. The rated speed (n_{rated}) of the drive is always lower than the calculated synchronous speed (n_S). The difference between rated speed and synchronous speed relating to the synchronous speed is referred to as the "slip".

Speed-torque characteristic



Operational performance of three-phase AC geared motors

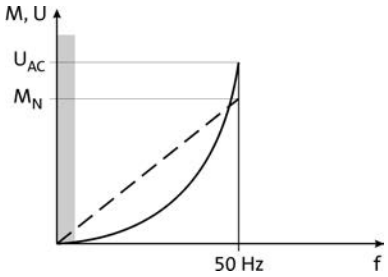
Operation on the inverter

An inverter enables energy-efficient operation of a system in virtually all application cases. The various operating modes, which can be created by making just a few simple settings, facilitate this. The following characteristics and corresponding specifications listed on the following pages can be used to calculate the optimum operating mode during the project planning phase.

Standard setting

In its initial state when delivered, the inverter is set up for basic operation with a three-phase AC motor with vector control. When operated in this mode, the rated torque of the motor is available in a setting range up to 50 Hz.

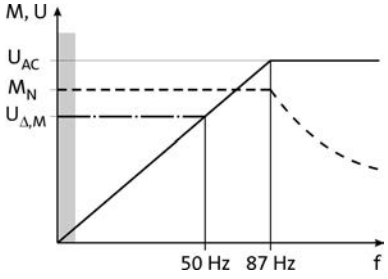
V/f at 50 Hz



Extended setting range up to 87 Hz

If the V/f reference point on the inverter is set to 87 Hz, the rated torque can be used across an extended setting range. Here, a 230/400V motor is for example used and operated in a delta layout with a 400V inverter. The setting range is then increased by 40 %. The inverter must be dimensioned for a rated motor current of 230 V.

V/f at 87 Hz

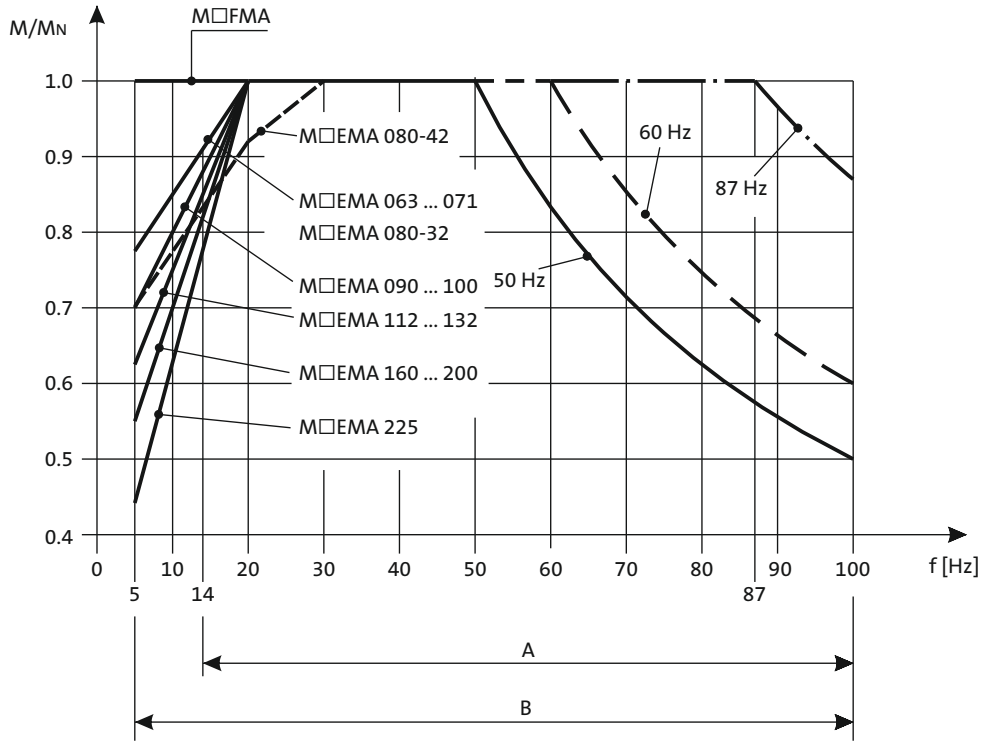


Operational performance of three-phase AC geared motors

Torque derating at low motor frequencies

The diagram shows the motor frame size-dependent torque reduction for self-ventilated motors, taking the thermal behaviour during actuation of the inverter into consideration.

Torque characteristics



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

Combinatorics of geared motors

The following tables contain the most important data of the gearbox with the motors that can be attached for an approximate dimensioning process of a geared motor. Detailed information can be found in the following chapters.

The data given in the tables apply to
- input speed n_1= 1400 r/min
- application factor c= 1.0

The data for the max. radial force refer to
- solid shaft without flange
- normal storage
- application factor c= 1.3

For further designs see the "Technical data" chapter.

► The rated torque can be gathered from the last digits of the product name e.g. g500-H45 (45 Nm).

In order to calculate the exact ratio, the number of teeth z_g (driven) can be divided by the number of teeth z_t (driving). These are cancelled values.

g500-S130, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
382	63	2.60	3.661	637	174	1352	19.3	063-42 ... 090-32
279	76	2.29	5.021	728	145	1425	18.3	063-42 ... 090-32
199	92	1.98	7.029	5096	725	1532	17.6	063-32 ... 090-32
168	116	2.11	8.322	749	90	1601	13.0	063-42 ... 090-32
149	125	2.01	9.411	847	90	1660	12.4	063-42 ... 090-32
218	87	2.05	6.425	559	87	1500	17.9	063-42 ... 090-32
123	130	1.72	11.413	856	75	1994	12.6	063-42 ... 090-32
109	130	1.52	12.907	968	75	2103	12.0	063-42 ... 090-32
95.8	130	1.34	14.606	4601	315	2225	12.4	063-42 ... 090-32
87.6	130	1.23	15.979	5992	375	2320	12.3	063-32 ... 090-32
77.5	130	1.09	18.069	6776	375	2461	11.8	063-32 ... 080-42
68.7	130	0.96	20.381	428	21	2610	12.5	063-32 ... 080-42
60.7	130	0.85	23.048	484	21	2776	11.9	063-32 ... 080-32
56.1	130	0.79	24.967	749	30	2889	12.3	063-42 ... 080-32
49.6	130	0.70	28.233	847	30	3073	11.8	063-42 ... 080-32
44.6	130	0.63	31.387	2354	75	3240	12.2	063-12 ... 080-32
39.4	130	0.55	35.493	2662	75	3440	11.7	063-12 ... 071-42
34.6	130	0.49	40.422	1819	45	3656	12.1	063-12 ... 071-42
30.6	130	0.43	45.711	2057	45	3860	11.6	063-12 ... 071-32
27.3	130	0.38	51.230	8453	165	4043	11.8	063-12 ... 071-32
24.2	130	0.34	57.933	869	15	4225	11.3	063-12 ... 071-32
21.8	130	0.31	64.200	321	5	4357	11.7	063-12 ... 071-32
19.3	130	0.27	72.600	363	5	4500	11.3	063-12 ... 063-42
16.6	102	0.18	84.581	8881	105	4500	11.7	063-12 ... 063-32

Combinatorics of geared motors

g500-S220, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
365	178	7.00	3.840	553	144	2360	15.9	071-42 ... 100-32
266	181	5.19	5.267	79	15	2650	15.9	080-42 ... 100-32
207	220	4.91	6.767	203	30	2900	12.5	071-42 ... 100-32
183	217	4.28	7.667	23	3	3050	12.0	071-42 ... 100-32
151	220	3.58	9.280	232	25	3250	12.5	080-42 ... 100-32
133	220	3.16	10.514	368	35	3400	12.0	080-42 ... 100-32
118	220	2.80	11.876	1247	105	3500	12.3	071-42 ... 100-32
108	220	2.56	12.992	1624	125	3550	12.2	063-42 ... 100-32
104	220	2.47	13.456	1978	147	3600	11.8	071-42 ... 100-32
95.1	220	2.26	14.720	368	25	3600	11.7	063-42 ... 100-12
84.5	220	2.01	16.571	116	7	3600	12.0	063-42 ... 100-12
74.6	220	1.77	18.776	920	49	3600	11.5	063-42 ... 100-12
69.0	220	1.64	20.300	203	10	3600	11.8	071-42 ... 090-32
60.9	220	1.45	23.000	23	1	3600	11.4	071-42 ... 090-32
53.0	220	1.26	26.422	1189	45	3600	11.7	063-42 ... 090-32
46.8	220	1.11	29.937	1886	63	3600	11.3	063-42 ... 080-42
42.6	220	1.01	32.867	493	15	3600	11.7	063-42 ... 080-42
37.6	220	0.89	37.238	782	21	3600	11.2	063-42 ... 080-42
32.9	220	0.78	42.533	638	15	3600	11.6	063-12 ... 080-32
29.1	220	0.69	48.190	1012	21	3600	11.1	063-12 ... 080-32
27.1	220	0.64	51.620	2581	50	3600	11.2	063-12 ... 080-32
23.9	220	0.57	58.486	2047	35	3600	10.8	063-12 ... 071-42
21.2	171	0.39	65.975	2639	40	3600	11.2	063-12 ... 071-32
18.7	194	0.39	74.750	299	4	3600	10.8	063-12 ... 071-32

Combinatorics of geared motors

g500-S220, 3-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
35.0	220	0.84	40.012	13804	345	3600	12.5	063-32 ... 071-32
30.9	220	0.74	45.333	136	3	3600	12.0	063-32 ... 071-32
26.6	220	0.64	52.587	3944	75	3600	12.4	063-12 ... 080-32
23.5	220	0.57	59.581	6256	105	3600	11.9	063-12 ... 071-42
20.8	220	0.50	67.298	21199	315	3600	12.3	063-12 ... 071-42
18.4	220	0.44	76.249	33626	441	3600	11.8	063-12 ... 071-42
16.3	220	0.39	86.079	5423	63	3600	12.2	063-12 ... 071-32
14.4	220	0.35	97.528	43010	441	3600	11.7	063-12 ... 071-32
12.5	220	0.30	111.747	8381	75	3600	12.2	063-12 ... 071-32
11.1	220	0.27	126.610	13294	105	3600	11.7	063-12 ... 063-42
9.80	220	0.24	143.205	30073	210	3600	12.2	063-12 ... 063-42
8.60	220	0.21	162.252	23851	147	3600	11.7	063-12 ... 063-42
7.60	220	0.18	185.249	30566	165	3600	12.1	063-12 ... 063-32
6.70	220	0.16	209.888	48484	231	3600	11.6	063-12 ... 063-32
5.80	220	0.14	241.022	10846	45	3600	12.1	063-12 ... 063-12
5.10	220	0.12	273.079	17204	63	3600	11.6	063-12 ... 063-12
4.50	220	0.11	312.233	9367	30	3600	12.1	063-12 ... 063-12
4.00	220	0.10	353.762	7429	21	3600	11.6	063-12 ... 063-12

Combinatorics of geared motors

g500-S400, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
419	203	9.20	3.339	581	174	2360	16.0	071-42 ... 112-32
306	243	8.03	4.579	664	145	2560	15.9	080-42 ... 112-32
239	258	6.64	5.860	3569	609	2750	12.5	071-42 ... 112-32
218	261	6.16	6.411	4648	725	2820	12.0	063-42 ... 112-32
188	365	7.38	7.467	112	15	2980	12.5	071-42 ... 112-32
166	380	6.80	8.436	329	39	3150	12.0	071-42 ... 112-32
137	400	5.90	10.240	256	25	3450	12.3	080-42 ... 112-32
121	400	5.22	11.569	752	65	3650	12.2	080-42 ... 112-32
107	400	4.61	13.105	1376	105	3900	11.8	071-42 ... 112-32
97.7	400	4.22	14.336	1792	125	4000	11.7	063-42 ... 112-22
94.6	400	4.08	14.806	4042	273	4100	12.0	071-42 ... 112-22
86.4	400	3.73	16.197	5264	325	4200	11.5	063-42 ... 112-22
76.6	400	3.31	18.286	128	7	4400	11.8	063-42 ... 112-22
67.8	400	2.93	20.659	1880	91	4650	11.4	063-42 ... 100-32
62.5	400	2.70	22.400	112	5	4800	11.7	071-42 ... 100-32
55.3	400	2.39	25.308	329	13	5100	11.3	071-42 ... 100-32
48.0	400	2.07	29.156	1312	45	5500	11.7	063-42 ... 090-32
42.5	400	1.83	32.940	3854	117	5750	11.2	063-42 ... 090-32
38.6	400	1.67	36.267	544	15	5850	11.6	063-42 ... 090-32
34.2	400	1.48	40.974	1598	39	5980	11.1	063-42 ... 090-32
29.8	314	1.01	46.933	704	15	6100	11.2	063-12 ... 080-32
26.4	348	0.99	53.026	2068	39	6200	10.8	063-12 ... 080-32
24.6	268	0.71	56.960	1424	25	6200	11.2	063-12 ... 080-32
21.8	303	0.71	64.354	4183	65	6200	10.8	063-12 ... 080-32

Combinatorics of geared motors

g500-S400, 3-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
24.1	400	1.06	58.027	4352	75	6200	11.0	063-32 ... 080-42
21.4	400	0.94	65.559	12784	195	6200	10.9	063-32 ... 080-42
18.9	400	0.83	74.260	23392	315	6200	11.0	063-32 ... 080-32
16.7	400	0.73	83.900	68714	819	6200	10.8	063-32 ... 080-32
14.7	400	0.65	94.984	5984	63	6200	10.9	063-12 ... 080-32
13.0	399	0.57	107.314	87890	819	6200	10.7	063-12 ... 071-42
11.4	400	0.50	123.307	9248	75	6200	10.9	063-12 ... 071-42
10.0	399	0.44	139.313	27166	195	6200	10.7	063-12 ... 071-42
8.90	400	0.39	158.019	16592	105	6200	10.9	063-12 ... 071-32
7.80	400	0.34	178.531	48739	273	6200	10.7	063-12 ... 071-32
6.80	400	0.30	204.412	33728	165	6200	10.8	063-12 ... 071-32
6.10	396	0.26	230.946	99076	429	6200	10.6	063-12 ... 063-42
5.30	388	0.22	265.956	11968	45	6200	10.8	063-12 ... 063-42
4.70	400	0.20	300.479	35156	117	6200	10.7	063-12 ... 063-32
4.10	330	0.15	344.533	5168	15	6200	10.8	063-12 ... 063-12
3.60	373	0.15	389.256	15181	39	6200	10.7	063-12 ... 063-12

Combinatorics of geared motors

g500-S660, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
357	419	16.1	3.920	98	25	3320	13.9	100-12 ... 132-32
260	492	13.8	5.376	672	125	3580	12.7	100-12 ... 132-32
218	601	14.2	6.417	77	12	3660	11.0	100-12 ... 132-32
204	496	10.9	6.880	172	25	3690	12.5	080-42 ... 132-32
192	593	12.3	7.311	329	45	3720	10.5	100-12 ... 132-32
159	638	11.0	8.800	44	5	3900	10.3	100-12 ... 132-32
140	625	9.42	10.027	752	75	4200	9.9	100-12 ... 132-32
124	660	8.86	11.262	473	42	4500	10.1	080-42 ... 132-32
114	660	8.10	12.320	308	25	4750	10.0	080-42 ... 132-32
109	660	7.77	12.832	4042	315	4850	9.7	080-42 ... 132-32
99.7	660	7.10	14.037	5264	375	5100	9.6	080-42 ... 132-22
89.1	660	6.35	15.714	110	7	5450	9.9	071-42 ... 132-22
78.2	660	5.57	17.905	376	21	5800	9.5	071-42 ... 112-32
72.7	660	5.18	19.250	77	4	6000	9.8	080-42 ... 112-32
63.8	660	4.55	21.933	329	15	6450	9.4	080-42 ... 112-32
55.9	578	3.49	25.056	451	18	7050	9.7	071-42 ... 112-22
49.0	660	3.49	28.548	3854	135	7700	9.3	071-42 ... 112-22
44.9	660	3.20	31.167	187	6	8100	9.6	071-42 ... 100-32
39.4	660	2.81	35.511	1598	45	8500	9.3	071-42 ... 100-32
34.7	545	2.04	40.333	121	3	8750	9.6	063-42 ... 090-32
30.5	620	2.04	45.956	2068	45	8850	9.2	063-42 ... 090-32
28.6	446	1.38	48.950	979	20	8900	9.6	063-42 ... 090-32
25.1	508	1.38	55.773	4183	75	9000	9.2	063-42 ... 090-32

Combinatorics of geared motors

g500-S660, 3-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2,\,max}$	$P_{1,\,max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
28.1	625	1.92	49.867	748	15	9000	10.4	063-42 ... 090-32
24.6	650	1.76	56.818	12784	225	9000	9.9	063-42 ... 090-32
21.9	660	1.59	63.817	8041	126	9000	10.4	063-42 ... 090-32
20.1	660	1.45	69.813	5236	75	9000	10.3	063-32 ... 090-32
19.3	660	1.39	72.713	68714	945	9000	9.9	063-42 ... 090-32
17.6	660	1.27	79.545	89488	1125	9000	9.9	063-32 ... 090-32
15.7	660	1.14	89.048	1870	21	9000	10.4	063-32 ... 080-42
13.8	660	1.00	101.460	6392	63	9000	9.9	063-32 ... 080-42
12.8	660	0.93	109.083	1309	12	9000	10.3	063-42 ... 080-42
11.3	660	0.81	124.289	5593	45	9000	9.9	063-42 ... 080-32
10.2	660	0.74	137.133	2057	15	9000	10.3	063-12 ... 080-32
9.00	660	0.65	156.249	35156	225	9000	9.8	063-12 ... 080-32
7.90	660	0.57	176.611	3179	18	9000	10.3	063-12 ... 071-42
7.00	660	0.50	201.230	27166	135	9000	9.8	063-12 ... 071-42
6.30	660	0.45	223.833	1343	6	9000	10.2	063-12 ... 071-32
5.50	660	0.40	255.034	126242	495	9000	9.8	063-12 ... 071-32
5.00	603	0.33	280.500	561	2	9000	10.2	063-12 ... 071-32
4.40	660	0.32	319.600	1598	5	9000	9.8	063-12 ... 071-32
3.80	447	0.19	369.548	15521	42	9000	10.2	063-12 ... 063-32
3.30	511	0.19	421.060	132634	315	9000	9.8	063-12 ... 063-32

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 corresponding to corrosivity category C1 (subject to 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 corresponding to corrosivity category C2 (subject to 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 corresponding to corrosivity category C3 (subject to 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
OKS-XL (extra Large) [1)]	• External installation • Air humidity above 95 % • Chemical industry plants • Food industry • Coastal areas with moderate salinity	• Surface coating corresponding to corrosivity category C4 (subject to EN 12944-2) Additional measures for surface and corrosion protection system L: • Rotor package and stator in the inner area primed with finishing varnish • Feedback in protection class IP65

6.4

[1)] On request

Surface and corrosion protection

Structure of surface coating

Surface and corrosion protection	Corrosivity category	Surface coating	Colour	Coating thickness
	DIN EN ISO 12944-2	Structure		
Without OKS(uncoated)		• Dipping primer of the grey iron parts		30 ... 50 µm
OKS-G (primed)		• Dipping primer of the grey iron parts • 2K PUR priming coat		60 ... 90 µm
OKS-S (small)	Comparable to C1	• Dipping primer of the grey iron parts • 2K-PUR top coat	• Standard: RAL 7012 • Optional: RAL Classic	80 ... 120 µm
OKS-M (medium)	Comparable to C2	• Dipping primer of the grey iron parts • 2K PUR priming coat • 2K-PUR top coat		110 ... 160 µm
OKS-L (large)	Comparable to C3			140 ... 200 µm
OKS-XL (extra Large) [1)]	Comparable to C4	• Dipping primer of the grey iron parts • 2K-EP priming coat (two times) • 2K-PUR top coat		160 ... 240 µm

[1)] On request

Lubricants

Gearboxes and geared motors of Lenze come supplied with a lubricant specifically adapted to the drive and design. When placing the order, the mounting position and design are decisive for the lubricant amount.
The lubricant amount and type contained in the gearbox are indicated on the nameplate.

The following gearboxes are lubricated for life:
- Helical gearbox g500-H45 ... 140
- Shaft-mounted helical gearbox g500-S130
- Bevel gearbox g500-B45 ... 240

The lubricants listed in the lubricant table are approved for 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	
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	
bremer & leguil			Cassida Fluid GL 220

► 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.

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.

Gearbox in combined mounting position

For reducing the number of versions, the gearboxes can also be ordered in a combined mounting position:

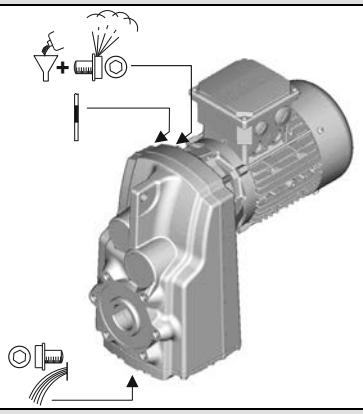
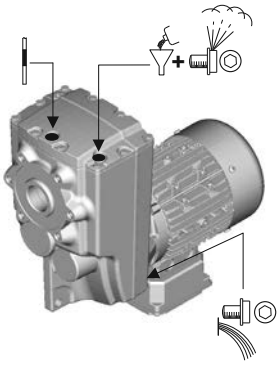
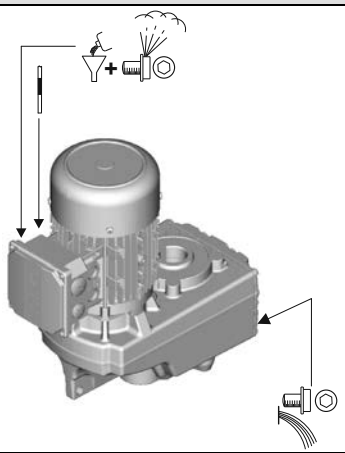
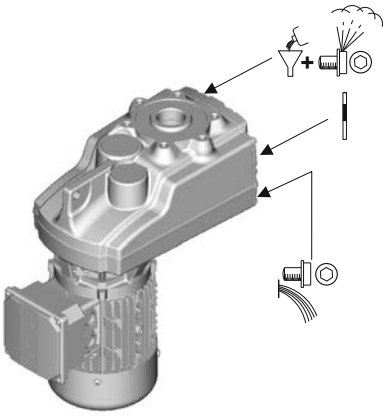
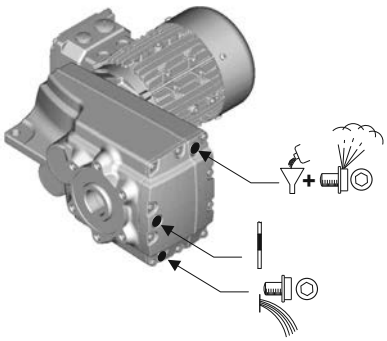
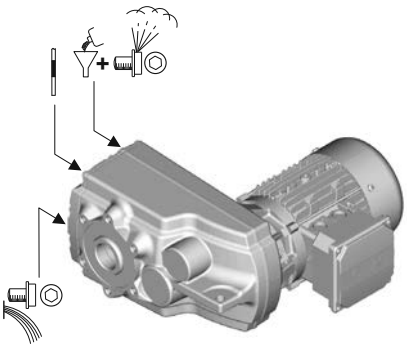
- g500-S130 ... S660 in mounting position AEF

In these gearboxes, the lubricant amount has been optimised for the use in different mounting positions. -H45 in mounting position AB-CDEFg500-H100 ... H450 in mounting position AEF In these gearboxes, the lubricant amount has been optimised for the use in different mounting positions. The breather elements are loosely enclosed and have to be mounted before commissioning depending on the mounting position.
A gearbox can be used for several mounting positions.

Ventilation

Position of ventilation, sealing elements and oil level check

► **A ... F** mounting position

A	B
	
C	**D**
	
E	**F**
	

	Filling		Drain
	Ventilation		Check

Standards and operating conditions

Geared motor data

Degree of protection			
EN 60529			IP65 [1] IP55 [1] IP66 [1]
Energy efficiency class			
IEC 60034-30			IE2
IEC 60034-2-1			Methodology for measuring efficiency
Conformity			
CE			Low-Voltage Directive
			2006/95/EC
EAC			TP TC 004/2011 (TR CU 004/2011)
Approval			
CCC			GB Standard 12350-2009
CSA			CSA 22.2 No. 100 CSA C390-10
cURus [2]			UL 1004-1 UL 1004-8 Power Conversion Equipment (File-No. E210321)
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.
[2] Motor frame size 225, in preparation.

► In the European Union, the ErP Directive stipulates minimum efficiency levels for three-phase AC motors. Geared three-phase AC motors that do not conform with this Directive do not meet CE requirements and must not be marketed in the European Economic Area. For further information about the ErP Directive and the Lenze products to which it relates, please refer to the brochure entitled "International efficiency directives for three-phase AC motors".

Permissible radial and axial forces at output

Permissible radial force

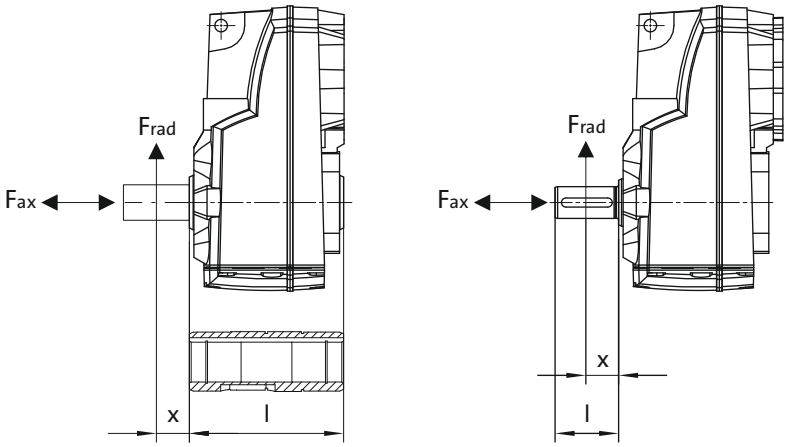
$F_{rad,perm} = f_w \times F_{rad,max}$

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

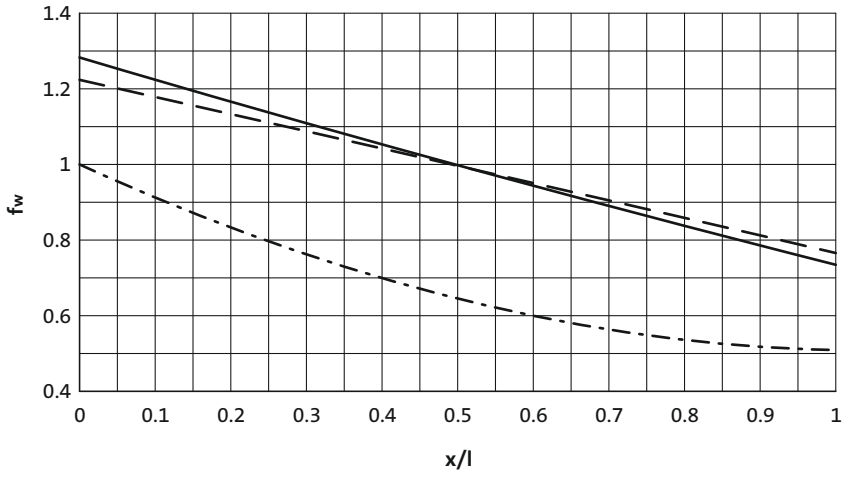
Permissible axial force

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



6.4

——— Solid shaft
— — — Solid shaft with flange
— · — Hollow shaft

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.

► Neither radial nor axial forces are permissible for the hollow shaft with shrink disc.

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

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

Selection tables, notes

Notes on the selection tables with 4-pole motors

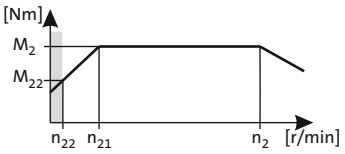
The selection tables show the available combinations of gearbox type, number of stages, ratio and motor. They are used only to provide basic orientation.
The following legend indicates the structure of the selection tables.

Rated power Prated of the drive motor depending on the rated frequency

50 Hz: P_N = 1.1 kW
87 Hz: P_N = 2.0 kW

2-stufige Getriebe ← **Number of the gear stage of the gearbox**

Torque diagram



Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 30 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
38	266	1.5	4.0	154	25	266	38	266	1.5	69	269	1.5	36.267	-S400	080-42	73
35	296	1.8	3.6	171	22	296	35	296	1.8	62	299	1.8	40.333	-S660	080-42	77

Product Gearbox
Product Motor
Ratio i
Page number for dimensions

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

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

Mains operation
Output speed **n2**
Output torque **M2**

Inverter operation
The speed and torque data are valid for self-ventilated and forced ventilated drives. Forced ventilated drives can always output the torque **M2** in the entire setting ranges. In the case of self-ventilated drives, a reduction to **M22** is required in the lower speed range.

The following applies to self-ventilated geared motors:
n22 is the minimum speed where the torque **M22** is permissible, from **n21** to **n2**, the maximum torque is **M2**
The following applies to forced ventilated geared motors:
From the minimum speed **n22** to **n2**, the maximum torque is **M2**

Motor voltages

The power values and torques indicated in the selection tables relate to the following motor voltages:
- 50 Hz : Δ 230 V / Y 400 V
- 60 Hz : 230 V or 460 V
- 87 Hz : Δ 400 V

Operation at 87 Hz

In 87 Hz operation, the three-phase AC motor (which is designed for a voltage of Δ 230 V / Y 400 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.

Selection tables, notes

Notes on the selection tables with 2-pole and 6-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.

Rated power Prated of the drive motor depending on the rated frequency

50 Hz: P_N = 0.18 kW

2-stufige Getriebe ← **Number of the gear stage of the gearbox**

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
68	25	5.3	40.422	-S130	063-11	85
60	28	4.7	45.711	-S130	063-11	85

Mains operation
Output speed **n_2**
Output torque **M_2**

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

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

Ratio i

Product Gearbox

Product Motor

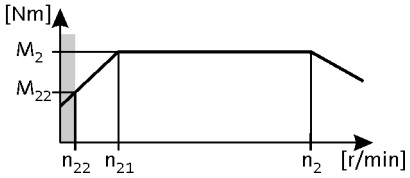
Page number for dimensions

Motor voltages

The power values and torques indicated in the selection tables relate to the following motor voltages:
- 50 Hz : Δ 230 V / Y 400 V
- 60 Hz : 230 V or 460 V

6.4

Selection tables, 4-pole motors



50 Hz: P_N = 0.12 kW
87 Hz: P_N = 0.21 kW

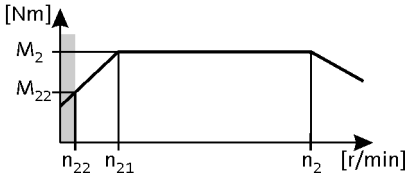
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
45	24	5.3	4.6	19	19	24	45	24	5.3	81	24	5.4	31.387	-S130	063-12	86
40	28	4.7	4.1	21	17	27	40	28	4.7	71	27	4.8	35.493	-S130	063-12	86
35	32	4.1	3.6	24	15	31	35	32	4.1	63	31	4.2	40.422	-S130	063-12	86
31	36	3.7	3.2	28	13	35	31	36	3.7	56	35	3.7	45.711	-S130	063-12	86
28	40	3.3	2.8	31	12	39	28	40	3.3	50	39	3.3	51.230	-S130	063-12	86
25	45	2.9	2.5	35	10	44	25	45	2.9	44	44	2.9	57.933	-S130	063-12	86
22	50	2.6	2.3	39	9.3	49	22	50	2.6	40	49	2.6	64.200	-S130	063-12	86
22	51	3.1	2.2	40	9.1	51	22	51	3.1	38	51	3.2	65.975	-S220	063-12	90
20	57	2.3	2.0	44	8.3	56	20	57	2.3	35	56	2.3	72.600	-S130	063-12	86
19	58	3.1	1.9	45	8.0	57	19	58	3.1	34	57	3.2	74.750	-S220	063-12	90
17	66	1.6	1.7	51	7.1	65	17	66	1.6	30	65	1.6	84.581	-S130	063-12	86
15	75	1.5	1.5	58	6.3	73	15	75	1.5	27	73	1.6	95.648	-S130	063-12	86

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
15	75	2.9	1.5	58	6.2	74	15	75	2.9	26	74	3.0	97.528	-S220	063-12	90
13	86	2.6	1.3	66	5.4	84	13	86	2.6	23	84	2.6	111.747	-S220	063-12	90
11	97	2.3	1.1	75	4.7	96	11	97	2.3	20	96	2.3	126.610	-S220	063-12	90
10	110	2.0	1.0	85	4.2	108	10	110	2.0	18	108	2.0	143.205	-S220	063-12	90
8.8	125	1.8	0.9	96	3.7	123	8.8	125	1.8	16	123	1.8	162.252	-S220	063-12	90
8.0	137	2.9	0.8	106	3.4	135	8.0	137	2.9	14	135	3.0	178.531	-S400	063-12	94
7.7	142	1.6	0.8	110	3.2	140	7.7	142	1.6	14	140	1.6	185.248	-S220	063-12	90
7.0	157	2.6	0.7	121	2.9	155	7.0	157	2.6	12	155	2.6	204.412	-S400	063-12	94
6.8	161	1.4	0.7	124	2.9	159	6.8	161	1.4	12	159	1.4	209.887	-S220	063-12	90
6.2	177	2.2	0.6	137	2.6	175	6.2	177	2.2	11	175	2.3	230.946	-S400	063-12	94
5.9	185	1.2	0.6	143	2.5	182	5.9	185	1.2	11	182	1.2	241.022	-S220	063-12	90
5.4	204	1.9	0.5	157	2.3	201	5.4	204	1.9	9.5	201	1.9	265.956	-S400	063-12	94
5.2	210	1.1	0.5	162	2.2	206	5.2	210	1.1	9.3	206	1.1	273.079	-S220	063-12	90
5.1	216	2.8	0.5	166	2.1	212	5.1	216	2.8	9.0	212	2.8	280.500	-S660	063-12	98
4.7	231	1.7	0.5	178	2.0	227	4.7	231	1.7	8.4	227	1.8	300.479	-S400	063-12	94
4.6	240	0.9	0.5	185	1.9	236	4.6	240	0.9	8.1	236	0.9	312.233	-S220	063-12	90
4.5	246	2.7	0.5	189	1.9	242	4.5	246	2.7	7.9	242	2.7	319.600	-S660	063-12	98
4.1	265	1.3	0.4	204	1.7	260	4.1	265	1.3	7.4	260	1.3	344.533	-S400	063-12	94
4.0	272	0.8	0.4	209	1.7	267	4.0	272	0.8	7.2	267	0.8	353.762	-S220	063-12	90
3.9	284	1.6	0.4	219	1.6	279	3.9	284	1.6	6.9	279	1.6	369.548	-S660	063-12	98
3.7	299	1.3	0.4	230	1.5	294	3.7	299	1.3	6.5	294	1.3	389.256	-S400	063-12	94
3.4	324	1.6	0.3	249	1.4	318	3.4	324	1.6	6.0	318	1.6	421.060	-S660	063-12	98

Selection tables, 4-pole motors



50 Hz: P_N = 0.18 kW
87 Hz: P_N = 0.33 kW

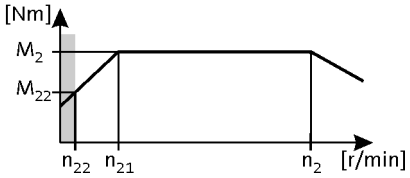
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product g500	MD□MA□□	
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c				
194	9.0	4.5	21	6.6	85	9.0	194	9.0	4.5	352	9.0	3.7	7.029	-S130	063-32	86
85	20	4.5	9.1	15	38	20	85	20	4.5	155	20	3.7	15.979	-S130	063-32	86
76	22	4.5	8.0	17	33	22	76	22	4.5	137	22	4.2	18.069	-S130	063-32	86
67	25	4.1	7.1	19	29	25	67	25	4.1	121	25	3.9	20.381	-S130	063-32	86
59	28	4.1	6.3	22	26	28	59	28	4.1	107	28	3.9	23.048	-S130	063-32	86
44	38	3.4	4.6	30	19	38	44	38	3.4	79	39	3.4	31.387	-S130	063-32	86
39	43	3.0	4.1	33	17	43	39	43	3.0	70	44	3.0	35.493	-S130	063-32	86
34	49	2.6	3.6	38	15	49	34	49	2.6	61	50	2.6	40.422	-S130	063-32	86
32	52	2.9	3.4	40	14	52	32	52	2.9	58	53	2.9	42.533	-S220	063-32	90
30	56	2.3	3.2	43	13	56	30	56	2.3	54	56	2.3	45.711	-S130	063-32	86
29	57	2.9	3.1	44	13	57	29	57	2.9	53	58	2.9	46.933	-S400	063-32	94
28	59	2.9	3.0	45	13	59	28	59	2.9	51	60	2.9	48.190	-S220	063-32	90
27	63	2.1	2.8	48	12	63	27	63	2.1	48	63	2.1	51.230	-S130	063-32	86
26	63	2.6	2.8	49	12	63	26	63	2.6	48	64	2.5	51.620	-S220	063-32	90
26	65	2.9	2.7	50	11	65	26	65	2.9	47	66	2.9	53.026	-S400	063-32	94
24	70	2.6	2.5	54	11	70	24	70	2.6	44	70	2.5	56.960	-S400	063-32	94
24	71	1.8	2.5	55	10	71	24	71	1.8	43	72	1.8	57.933	-S130	063-32	86
23	71	2.6	2.5	55	10	71	23	71	2.6	42	72	2.5	58.486	-S220	063-32	90
21	78	1.7	2.3	60	9.3	78	21	78	1.7	39	79	1.6	64.200	-S130	063-32	86
21	79	2.6	2.3	61	9.3	79	21	79	2.6	39	79	2.5	64.354	-S400	063-32	94
21	81	2.0	2.2	62	9.1	81	21	81	2.0	38	82	2.0	65.975	-S220	063-32	90
19	89	1.5	2.0	68	8.3	89	19	89	1.5	34	90	1.5	72.600	-S130	063-32	86
18	91	2.0	1.9	70	8.0	91	18	91	2.0	33	92	2.0	74.750	-S220	063-32	90
16	103	1.0	1.7	80	7.1	103	16	103	1.0	29	104	1.0	84.581	-S130	063-32	86
14	117	1.0	1.5	90	6.3	117	14	117	1.0	26	118	1.0	95.648	-S130	063-32	86

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product g500	MD□MA□□	
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c				
23	72	3.1	2.4	55	10	72	23	72	3.1	42	72	2.9	59.581	-S220	063-32	90
20	81	2.7	2.2	62	8.9	81	20	81	2.7	37	82	2.6	67.298	-S220	063-32	90
18	92	2.4	1.9	71	7.9	92	18	92	2.4	33	93	2.4	76.249	-S220	063-32	90
16	104	2.1	1.7	80	7.0	104	16	104	2.1	29	105	2.1	86.079	-S220	063-32	90
14	117	1.9	1.5	90	6.2	117	14	117	1.9	25	119	1.9	97.528	-S220	063-32	90
13	129	3.1	1.4	99	5.6	129	13	129	3.1	23	131	3.1	107.314	-S400	063-32	94
12	134	1.6	1.3	104	5.4	134	12	134	1.6	22	136	1.6	111.747	-S220	063-32	90
11	148	2.7	1.2	114	4.9	148	11	148	2.7	20	150	2.7	123.307	-S400	063-32	94
11	152	1.4	1.1	117	4.7	152	11	152	1.4	20	154	1.4	126.610	-S220	063-32	90
9.8	168	2.4	1.0	129	4.3	168	9.8	168	2.4	18	170	2.4	139.313	-S400	063-32	94

Selection tables, 4-pole motors

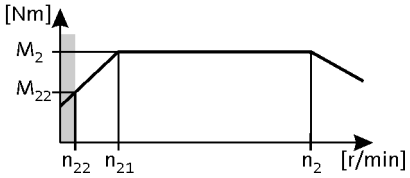


50 Hz: P_N = 0.18 kW
87 Hz: P_N = 0.33 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
9.5	172	1.3	1.0	133	4.2	172	9.5	172	1.3	17	174	1.3	143.205	-S220	063-32	90
8.6	190	2.1	0.9	146	3.8	190	8.6	190	2.1	16	192	2.1	158.019	-S400	063-32	94
8.4	195	1.1	0.9	150	3.7	195	8.4	195	1.1	15	197	1.1	162.252	-S220	063-32	90
7.7	213	2.9	0.8	164	3.4	213	7.7	213	2.9	14	215	2.9	176.611	-S660	063-32	98
7.6	215	1.9	0.8	165	3.4	215	7.6	215	1.9	14	217	1.8	178.531	-S400	063-32	94
7.4	223	1.0	0.8	172	3.2	223	7.4	223	1.0	13	225	1.0	185.248	-S220	063-32	90
6.8	242	2.7	0.7	187	3.0	242	6.8	242	2.7	12	245	2.7	201.230	-S660	063-32	98
6.7	246	1.6	0.7	189	2.9	246	6.7	246	1.6	12	249	1.6	204.412	-S400	063-32	94
6.5	253	0.9	0.7	195	2.9	253	6.5	253	0.9	12	255	0.9	209.887	-S220	063-32	90
6.1	269	2.5	0.6	207	2.7	269	6.1	269	2.5	11	272	2.4	223.833	-S660	063-32	98
5.9	278	1.4	0.6	214	2.6	278	5.9	278	1.4	11	281	1.4	230.946	-S400	063-32	94
5.4	307	2.2	0.6	236	2.4	307	5.4	307	2.2	9.7	310	2.1	255.034	-S660	063-32	98
5.1	320	1.2	0.5	246	2.3	320	5.1	320	1.2	9.3	324	1.2	265.956	-S400	063-32	94
4.9	338	1.8	0.5	260	2.1	338	4.9	338	1.8	8.8	341	1.8	280.500	-S660	063-32	98
4.5	362	1.1	0.5	278	2.0	362	4.5	362	1.1	8.2	366	1.1	300.479	-S400	063-32	94
4.3	385	1.7	0.5	296	1.9	385	4.3	385	1.7	7.7	389	1.7	319.600	-S660	063-32	98
3.7	445	1.0	0.4	342	1.6	445	3.7	445	1.0	6.7	450	1.0	369.548	-S660	063-32	98
3.2	507	1.0	0.3	390	1.4	507	3.2	507	1.0	5.9	512	1.0	421.060	-S660	063-32	98

Selection tables, 4-pole motors

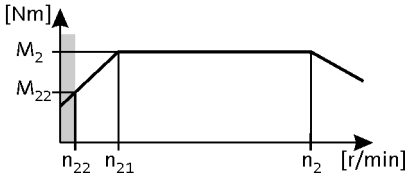


50 Hz: P_N = 0.25 kW
87 Hz: P_N = 0.45 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
374	6.0	5.6	40	4.8	164	6.0	374	6.0	5.6	677	6.0	4.8	3.661	-S130	063-42	86
273	8.0	5.6	29	6.5	120	8.0	273	8.0	5.6	494	8.0	4.8	5.021	-S130	063-42	86
213	11	5.2	23	8.4	93	11	213	11	5.2	386	11	4.4	6.425	-S130	063-42	86
195	12	5.2	21	9.2	85	12	195	12	5.2	353	12	4.4	7.029	-S130	063-42	86
165	14	5.6	17	11	72	14	165	14	5.6	298	14	4.8	8.322	-S130	063-42	86
146	16	5.6	15	12	64	16	146	16	5.6	264	16	4.8	9.411	-S130	063-42	86
120	19	5.6	13	15	53	19	120	19	5.6	217	19	4.8	11.413	-S130	063-42	86
106	22	5.6	11	17	47	22	106	22	5.6	192	22	4.8	12.907	-S130	063-42	86
94	25	5.2	9.9	19	41	25	94	25	5.2	170	25	4.4	14.606	-S130	063-42	86
86	27	4.8	9.1	21	38	27	86	27	4.8	155	27	4.1	15.979	-S130	063-42	86
76	31	4.3	8.0	24	33	30	76	31	4.3	137	30	4.1	18.069	-S130	063-42	86
67	34	3.8	7.1	27	29	34	67	34	3.8	122	34	3.7	20.381	-S130	063-42	86
59	39	3.3	6.3	30	26	39	59	39	3.3	108	39	3.2	23.048	-S130	063-42	86
55	42	3.1	5.8	33	24	42	55	42	3.1	99	42	3.0	24.967	-S130	063-42	86
49	48	2.7	5.1	37	21	47	49	48	2.7	88	47	2.6	28.233	-S130	063-42	86
44	53	2.5	4.6	41	19	53	44	53	2.5	79	53	2.5	31.387	-S130	063-42	86
39	60	2.2	4.1	46	17	60	39	60	2.2	70	60	2.2	35.493	-S130	063-42	86
34	68	1.9	3.6	53	15	68	34	68	1.9	61	68	1.9	40.422	-S130	063-42	86
32	72	3.1	3.4	55	14	72	32	72	3.1	58	72	3.1	42.533	-S220	063-42	90
30	77	1.7	3.2	60	13	77	30	77	1.7	54	77	1.7	45.711	-S130	063-42	86
28	81	2.7	3.0	63	13	81	28	81	2.7	52	81	2.7	48.190	-S220	063-42	90
28	83	3.2	3.0	64	12	82	28	83	3.2	51	82	3.2	48.950	-S660	063-42	98
27	87	1.5	2.8	67	12	86	27	87	1.5	48	86	1.5	51.230	-S130	063-42	86
27	87	2.5	2.8	67	12	87	27	87	2.5	48	87	2.5	51.620	-S220	063-42	90
25	94	3.2	2.6	73	11	94	25	94	3.2	45	94	3.2	55.773	-S660	063-42	98
24	96	2.8	2.5	74	11	96	24	96	2.8	44	96	2.8	56.960	-S400	063-42	94
24	98	1.3	2.5	75	10	97	24	98	1.3	43	97	1.3	57.933	-S130	063-42	86
23	99	2.2	2.5	76	10	98	23	99	2.2	42	98	2.2	58.486	-S220	063-42	90
21	109	1.2	2.3	84	9.3	108	21	109	1.2	39	108	1.2	64.200	-S130	063-42	86
21	109	2.8	2.3	84	9.3	108	21	109	2.8	39	108	2.8	64.354	-S400	063-42	94
21	112	1.4	2.2	86	9.1	111	21	112	1.4	38	111	1.4	65.975	-S220	063-42	90
19	123	1.1	2.0	95	8.3	122	19	123	1.1	34	122	1.1	72.600	-S130	063-42	86
18	126	1.4	1.9	97	8.0	126	18	126	1.4	33	126	1.4	74.750	-S220	063-42	90

Selection tables, 4-pole motors

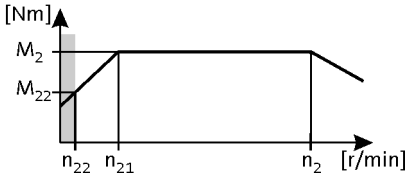


50 Hz: P_N = 0.25 kW
87 Hz: P_N = 0.45 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
30	75	2.9	3.2	58	13	75	30	75	2.9	55	75	2.5	45.333	-S220	063-42	90
26	88	2.5	2.8	67	11	87	26	88	2.5	47	87	2.4	52.587	-S220	063-42	90
23	99	2.2	2.4	76	10	99	23	99	2.2	42	99	2.1	59.581	-S220	063-42	90
20	112	2.0	2.2	86	8.9	111	20	112	2.0	37	111	1.9	67.298	-S220	063-42	90
18	124	3.2	2.0	95	8.1	123	18	124	3.2	33	123	3.3	74.260	-S400	063-42	94
18	127	1.7	1.9	98	7.9	126	18	127	1.7	33	126	1.7	76.249	-S220	063-42	90
16	140	2.9	1.7	108	7.2	139	16	140	2.9	30	139	2.9	83.900	-S400	063-42	94
16	143	1.5	1.7	110	7.0	143	16	143	1.5	29	143	1.5	86.079	-S220	063-42	90
14	158	2.5	1.5	122	6.3	157	14	158	2.5	26	157	2.5	94.984	-S400	063-42	94
14	162	1.4	1.5	125	6.2	161	14	162	1.4	25	161	1.4	97.528	-S220	063-42	90
13	179	2.2	1.4	138	5.6	178	13	179	2.2	23	178	2.3	107.314	-S400	063-42	94
12	186	1.2	1.3	143	5.4	185	12	186	1.2	22	185	1.2	111.747	-S220	063-42	90
11	205	2.0	1.2	158	4.9	204	11	205	2.0	20	204	2.0	123.307	-S400	063-42	94
11	207	3.2	1.2	159	4.8	206	11	207	3.2	20	206	3.2	124.289	-S660	063-42	98
11	211	1.0	1.1	162	4.7	210	11	211	1.0	20	210	1.1	126.610	-S220	063-42	90
10	228	2.9	1.1	176	4.4	227	10	228	2.9	18	227	2.9	137.133	-S660	063-42	98
9.8	232	1.7	1.0	179	4.3	231	9.8	232	1.7	18	231	1.7	139.313	-S400	063-42	94
9.6	238	0.9	1.0	184	4.2	237	9.6	238	0.9	17	237	0.9	143.205	-S220	063-42	90
8.8	260	2.5	0.9	200	3.8	259	8.8	260	2.5	16	259	2.6	156.249	-S660	063-42	98
8.7	263	1.5	0.9	203	3.8	262	8.7	263	1.5	16	262	1.5	158.019	-S400	063-42	94
8.4	270	0.8	0.9	208	3.7	269	8.4	270	0.8	15	269	0.8	162.252	-S220	063-42	90
7.8	294	2.2	0.8	227	3.4	292	7.8	294	2.2	14	292	2.3	176.611	-S660	063-42	98
7.7	297	1.3	0.8	229	3.4	296	7.7	297	1.3	14	296	1.4	178.531	-S400	063-42	94
6.8	335	2.0	0.7	258	3.0	333	6.8	335	2.0	12	333	2.0	201.230	-S660	063-42	98
6.7	340	1.2	0.7	262	2.9	338	6.7	340	1.2	12	338	1.2	204.412	-S400	063-42	94
6.1	373	1.8	0.6	287	2.7	371	6.1	373	1.8	11	371	1.8	223.833	-S660	063-42	98
5.9	385	1.0	0.6	296	2.6	382	5.9	385	1.0	11	382	1.0	230.946	-S400	063-42	94
5.4	425	1.6	0.6	327	2.4	422	5.4	425	1.6	9.7	422	1.6	255.034	-S660	063-42	98
5.2	443	0.9	0.5	341	2.3	440	5.2	443	0.9	9.3	440	0.9	265.956	-S400	063-42	94
4.9	467	1.2	0.5	360	2.1	464	4.9	467	1.2	8.8	464	1.2	280.500	-S660	063-42	98
			0.5	385	2.0	498				8.3	498	0.8	300.479	-S400	063-42	94
4.3	532	1.2	0.5	410	1.9	529	4.3	532	1.2	7.8	529	1.2	319.600	-S660	063-42	98

Selection tables, 4-pole motors

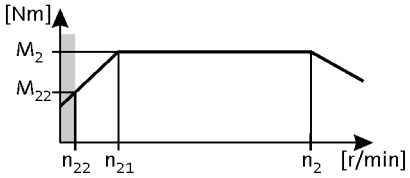


50 Hz: P_N = 0.37 kW
87 Hz: P_N = 0.66 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
385	9.0	4.9	40	6.9	164	9.0	385	9.0	4.9				3.661	-S130	071-32	86
281	12	4.9	29	9.4	120	12	281	12	4.9				5.021	-S130	071-32	86
219	16	4.5	23	12	93	16	219	16	4.5				6.425	-S130	071-32	86
201	17	4.5	21	13	85	17	201	17	4.5				7.029	-S130	071-32	86
169	20	4.9	17	16	72	20	169	20	4.9				8.322	-S130	071-32	86
150	23	4.9	15	18	64	23	150	23	4.9				9.411	-S130	071-32	86
124	28	4.7	13	21	53	28	124	28	4.7				11.413	-S130	071-32	86
109	31	4.1	11	24	47	31	109	31	4.1				12.907	-S130	071-32	86
97	36	3.7	9.9	27	41	36	97	36	3.7				14.606	-S130	071-32	86
88	39	3.4	9.1	30	38	39	88	39	3.4				15.979	-S130	071-32	86
78	44	3.0	8.0	34	33	44	78	44	3.0	140	44	2.8	18.069	-S130	071-32	86
69	50	2.6	7.1	38	29	49	69	50	2.6	124	49	2.5	20.381	-S130	071-32	86
61	56	2.3	6.3	43	26	56	61	56	2.3	109	56	2.2	23.048	-S130	071-32	86
57	61	2.1	5.8	47	24	61	57	61	2.1	101	61	2.1	24.967	-S130	071-32	86
50	69	1.9	5.1	53	21	69	50	69	1.9	89	69	1.8	28.233	-S130	071-32	86
47	73	3.0	4.8	56	20	73	47	73	3.0	84	73	2.9	29.937	-S220	071-32	90
45	76	1.7	4.6	59	19	76	45	76	1.7	80	76	1.7	31.387	-S130	071-32	86
43	80	2.8	4.4	62	18	80	43	80	2.8	77	80	2.8	32.867	-S220	071-32	90
40	86	1.5	4.1	66	17	86	40	86	1.5	71	86	1.5	35.493	-S130	071-32	86
39	88	3.2	4.0	68	17	88	39	88	3.2				36.267	-S400	071-32	94
38	91	2.4	3.9	70	16	90	38	91	2.4	68	90	2.4	37.238	-S220	071-32	90
35	98	3.2	3.6	76	15	98	35	98	3.2				40.333	-S660	071-32	98
35	98	1.3	3.6	76	15	98	35	98	1.3	62	98	1.3	40.422	-S130	071-32	86
34	100	3.2	3.5	77	15	100	34	100	3.2				40.974	-S400	071-32	94
33	103	2.1	3.4	80	14	103	33	103	2.1	59	103	2.1	42.533	-S220	071-32	90
31	111	1.2	3.2	86	13	111	31	111	1.2	55	111	1.2	45.711	-S130	071-32	86
31	112	3.2	3.2	86	13	112	31	112	3.2				45.956	-S660	071-32	98
30	114	2.8	3.1	88	13	114	30	114	2.8	54	114	2.8	46.933	-S400	071-32	94
29	117	1.9	3.0	90	13	117	29	117	1.9	52	117	1.9	48.190	-S220	071-32	90
29	119	2.8	3.0	92	12	119	29	119	2.8	52	119	2.8	48.950	-S660	071-32	98
28	125	1.0	2.8	96	12	124	28	125	1.0	49	124	1.1	51.230	-S130	071-32	86
27	126	1.8	2.8	97	12	125	27	126	1.8	49	125	1.8	51.620	-S220	071-32	90
27	129	2.7	2.7	99	11	129	27	129	2.7	48	129	2.7	53.026	-S400	071-32	94
25	136	2.8	2.6	104	11	135	25	136	2.8	45	135	2.8	55.773	-S660	071-32	98
25	138	1.9	2.5	107	11	138	25	138	1.9	44	138	1.9	56.960	-S400	071-32	94

Selection tables, 4-pole motors



50 Hz: P_N = 0.37 kW
87 Hz: P_N = 0.66 kW

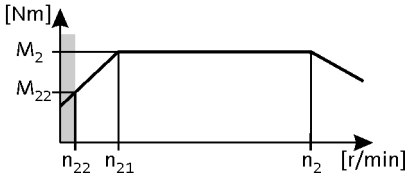
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
24	141	0.9	2.5	109	10	141	24	141	0.9	44	141	0.9	57.933	-S130	071-32	86
24	142	1.6	2.5	110	10	142	24	142	1.6	43	142	1.6	58.486	-S220	071-32	90
22	156	0.8	2.3	120	9.3	156	22	156	0.8	39	156	0.8	64.200	-S130	071-32	86
22	156	1.9	2.3	121	9.3	156	22	156	1.9	39	156	1.9	64.354	-S400	071-32	94
21	160	1.1	2.2	124	9.1	160	21	160	1.1	38	160	1.1	65.975	-S220	071-32	90
19	182	1.1	1.9	140	8.0	181	19	182	1.1	34	181	1.1	74.750	-S220	071-32	90

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
35	96	2.3	3.6	74	15	96	35	96	2.3	63	96	1.9	40.012	-S220	071-32	90
31	109	2.0	3.2	84	13	108	31	109	2.0	56	108	1.7	45.333	-S220	071-32	90
27	126	1.8	2.8	97	11	126	27	126	1.8	48	126	1.7	52.587	-S220	071-32	90
24	139	2.9	2.5	107	10	139	24	139	2.9	43	139	2.8	58.027	-S400	071-32	94
24	143	1.5	2.4	110	10	142	24	143	1.5	42	142	1.5	59.581	-S220	071-32	90
22	157	2.6	2.2	121	9.2	157	22	157	2.6	38	157	2.4	65.559	-S400	071-32	94
21	161	1.4	2.2	124	8.9	161	21	161	1.4	37	161	1.3	67.298	-S220	071-32	90
19	178	2.3	2.0	137	8.1	177	19	178	2.3	34	177	2.3	74.260	-S400	071-32	94
19	183	1.2	1.9	141	7.9	182	19	183	1.2	33	182	1.2	76.249	-S220	071-32	90
17	201	2.0	1.7	155	7.2	201	17	201	2.0	30	201	2.0	83.900	-S400	071-32	94
16	206	1.1	1.7	159	7.0	206	16	206	1.1	29	206	1.1	86.079	-S220	071-32	90
16	213	3.1	1.6	164	6.7	213	16	213	3.1	28	213	3.1	89.048	-S660	071-32	98
15	227	1.8	1.5	175	6.3	227	15	227	1.8	27	227	1.8	94.984	-S400	071-32	94
15	234	0.9	1.5	180	6.2	233	15	234	0.9	26	233	0.9	97.528	-S220	071-32	90
14	243	2.7	1.4	187	5.9	243	14	243	2.7	25	243	2.7	101.460	-S660	071-32	98
13	257	1.6	1.4	198	5.6	256	13	257	1.6	24	256	1.6	107.314	-S400	071-32	94
13	261	2.5	1.3	201	5.5	261	13	261	2.5	23	261	2.5	109.083	-S660	071-32	98
13	268	0.8	1.3	206	5.4	267	13	268	0.8	23	267	0.8	111.747	-S220	071-32	90
11	295	1.4	1.2	227	4.9	295	11	295	1.4	20	295	1.4	123.307	-S400	071-32	94
11	298	2.2	1.2	229	4.8	297	11	298	2.2	20	297	2.2	124.289	-S660	071-32	98
10	328	2.0	1.1	253	4.4	328	10	328	2.0	18	328	2.0	137.133	-S660	071-32	98
10	334	1.2	1.0	257	4.3	333	10	334	1.2	18	333	1.2	139.313	-S400	071-32	94
9.0	374	1.8	0.9	288	3.8	373	9.0	374	1.8	16	373	1.8	156.249	-S660	071-32	98
8.9	378	1.1	0.9	291	3.8	378	8.9	378	1.1	16	378	1.1	158.019	-S400	071-32	94
8.0	423	1.6	0.8	326	3.4	422	8.0	423	1.6	14	422	1.6	176.611	-S660	071-32	98
7.9	428	0.9	0.8	329	3.4	427	7.9	428	0.9	14	427	0.9	178.531	-S400	071-32	94
7.0	482	1.4	0.7	371	3.0	481	7.0	482	1.4	13	481	1.4	201.230	-S660	071-32	98
6.9	490	0.8	0.7	377	2.9	489	6.9	490	0.8	12	489	0.8	204.412	-S400	071-32	94
6.3	536	1.2	0.6	413	2.7	535	6.3	536	1.2	11	535	1.2	223.833	-S660	071-32	98

Selection tables, 4-pole motors

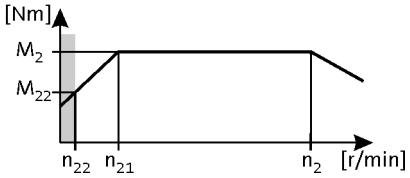


50 Hz: P_N = 0.37 kW
87 Hz: P_N = 0.66 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
5.5	611	1.1	0.6	470	2.4	610	5.5	611	1.1	9.9	610	1.1	255.034	-S660	071-32	98
5.0	672	0.9	0.5	517	2.1	670	5.0	672	0.9	9.0	670	0.9	280.500	-S660	071-32	98
4.4	765	0.9	0.5	589	1.9	764	4.4	765	0.9	7.9	764	0.9	319.600	-S660	071-32	98

Selection tables, 4-pole motors

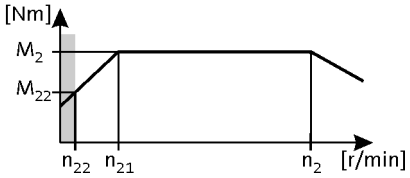


50 Hz: P_N = 0.55 kW
87 Hz: P_N = 1.0 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
384	13	4.5	40	10	164	13	384	13	4.5				3.661	-S130	071-42	86
280	18	4.2	29	14	120	18	280	18	4.2				5.021	-S130	071-42	86
240	21	4.5	25	16	102	21	240	21	4.5				5.860	-S400	071-42	94
219	23	3.7	23	18	93	23	219	23	3.7				6.425	-S130	071-42	86
200	25	3.6	21	20	85	25	200	25	3.6				7.029	-S130	071-42	86
169	30	3.8	17	23	72	30	169	30	3.8				8.322	-S130	071-42	86
149	34	3.7	15	26	64	34	149	34	3.7				9.411	-S130	071-42	86
123	41	3.1	13	32	53	41	123	41	3.1	220	42	2.6	11.413	-S130	071-42	86
109	47	2.8	11	36	47	47	109	47	2.8	195	48	2.3	12.907	-S130	071-42	86
96	53	2.5	9.9	41	41	53	96	53	2.5	172	54	2.0	14.606	-S130	071-42	86
95	54	4.5	9.8	41	41	54	95	54	4.5				14.806	-S400	071-42	94
88	58	2.2	9.1	45	38	58	88	58	2.2	157	59	1.9	15.979	-S130	071-42	86
78	66	2.0	8.0	51	33	66	78	66	2.0	139	67	1.9	18.069	-S130	071-42	86
75	68	3.2	7.7	52	32	68	75	68	3.2	134	69	3.0	18.776	-S220	071-42	90
69	74	3.0	7.1	57	30	74	69	74	3.0	124	75	2.8	20.300	-S220	071-42	90
69	74	1.8	7.1	57	29	74	69	74	1.8	123	75	1.7	20.381	-S130	071-42	86
61	83	2.6	6.3	64	26	83	61	83	2.6	109	85	2.5	23.000	-S220	071-42	90
61	84	1.6	6.3	64	26	84	61	84	1.6	109	85	1.5	23.048	-S130	071-42	86
56	91	1.4	5.8	70	24	91	56	91	1.4	101	92	1.4	24.967	-S130	071-42	86
53	96	2.3	5.5	74	23	96	53	96	2.3	95	97	2.2	26.422	-S220	071-42	90
50	102	1.3	5.1	79	21	102	50	102	1.3	89	104	1.2	28.233	-S130	071-42	86
47	109	2.0	4.8	84	20	109	47	109	2.0	84	110	1.9	29.937	-S220	071-42	90
45	113	3.2	4.7	87	19	113	45	113	3.2	81	115	3.1	31.167	-S660	071-42	98
45	114	1.1	4.6	88	19	114	45	114	1.1	80	116	1.1	31.387	-S130	071-42	86
43	119	1.9	4.4	92	18	119	43	119	1.9	77	121	1.8	32.867	-S220	071-42	90
40	129	1.0	4.1	99	17	129	40	129	1.0	71	131	1.0	35.493	-S130	071-42	86
40	129	3.2	4.1	99	17	129	40	129	3.2	71	131	3.1	35.511	-S660	071-42	98
39	132	2.9	4.0	101	17	132	39	132	2.9	69	134	2.8	36.267	-S400	071-42	94
38	135	1.6	3.9	104	16	135	38	135	1.6	68	137	1.6	37.238	-S220	071-42	90
35	146	2.9	3.6	113	15	146	35	146	2.9	62	149	2.8	40.333	-S660	071-42	98
35	147	0.9	3.6	113	15	147	35	147	0.9	62	149	0.9	40.422	-S130	071-42	86
34	149	2.7	3.5	114	15	149	34	149	2.7	61	151	2.7	40.974	-S400	071-42	94
33	154	1.4	3.4	119	14	154	33	154	1.4	59	157	1.4	42.533	-S220	071-42	90
31	167	2.9	3.2	128	13	167	31	167	2.9	55	169	2.8	45.956	-S660	071-42	98
30	170	1.9	3.1	131	13	170	30	170	1.9	54	173	1.8	46.933	-S400	071-42	94

Selection tables, 4-pole motors



50 Hz: P_N = 0.55 kW
87 Hz: P_N = 1.0 kW

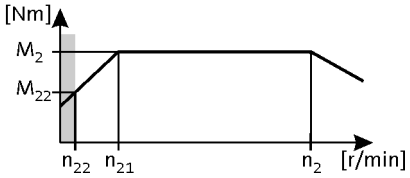
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
29	175	1.3	3.0	135	13	175	29	175	1.3	52	178	1.2	48.190	-S220	071-42	90
29	178	2.4	3.0	137	12	178	29	178	2.4	51	180	2.4	48.950	-S660	071-42	98
27	187	1.2	2.8	144	12	187	27	187	1.2	49	190	1.2	51.620	-S220	071-42	90
27	192	1.8	2.7	148	11	192	27	192	1.8	47	195	1.8	53.026	-S400	071-42	94
25	202	2.4	2.6	156	11	202	25	202	2.4	45	205	2.4	55.773	-S660	071-42	98
25	207	1.3	2.5	159	11	207	25	207	1.3	44	210	1.3	56.960	-S400	071-42	94
24	212	1.0	2.5	163	10	212	24	212	1.0	43	215	1.0	58.486	-S220	071-42	90
22	233	1.3	2.3	180	9.3	233	22	233	1.3	39	237	1.3	64.354	-S400	071-42	94

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
25	203	3.2	2.6	156	11	203	25	203	3.2	44	206	3.0	56.818	-S660	071-42	98
24	207	1.9	2.5	160	10	207	24	207	1.9	43	211	1.8	58.027	-S400	071-42	94
22	228	2.9	2.3	176	9.4	228	22	228	2.9	39	232	2.7	63.817	-S660	071-42	98
21	234	1.7	2.2	180	9.2	234	21	234	1.7	38	238	1.6	65.559	-S400	071-42	94
20	249	2.7	2.1	192	8.6	249	20	249	2.7	36	253	2.5	69.813	-S660	071-42	98
19	260	2.5	2.0	200	8.3	260	19	260	2.5	35	264	2.5	72.713	-S660	071-42	98
19	265	1.5	2.0	204	8.1	265	19	265	1.5	34	269	1.5	74.260	-S400	071-42	94
18	284	2.3	1.8	219	7.5	284	18	284	2.3	32	289	2.3	79.545	-S660	071-42	98
17	300	1.3	1.7	231	7.2	300	17	300	1.3	30	304	1.3	83.900	-S400	071-42	94
16	318	2.1	1.6	245	6.7	318	16	318	2.1	28	323	2.0	89.048	-S660	071-42	98
15	339	1.2	1.5	261	6.3	339	15	339	1.2	27	345	1.2	94.984	-S400	071-42	94
14	362	1.8	1.4	279	5.9	362	14	362	1.8	25	368	1.8	101.460	-S660	071-42	98
13	383	1.0	1.4	295	5.6	383	13	383	1.0	23	389	1.0	107.314	-S400	071-42	94
13	390	1.7	1.3	300	5.5	390	13	390	1.7	23	396	1.7	109.083	-S660	071-42	98
11	441	0.9	1.2	339	4.9	441	11	441	0.9	20	447	0.9	123.307	-S400	071-42	94
11	444	1.5	1.2	342	4.8	444	11	444	1.5	20	451	1.5	124.289	-S660	071-42	98
10	490	1.4	1.1	377	4.4	490	10	490	1.4	18	498	1.3	137.133	-S660	071-42	98
10	498	0.8	1.0	383	4.3	498	10	498	0.8				139.313	-S400	071-42	94
9.0	558	1.2	0.9	430	3.8	558	9.0	558	1.2	16	567	1.2	156.249	-S660	071-42	98
8.0	631	1.1	0.8	486	3.4	631	8.0	631	1.1	14	641	1.0	176.611	-S660	071-42	98
7.0	719	0.9	0.7	554	3.0	719	7.0	719	0.9	13	730	0.9	201.230	-S660	071-42	98

Selection tables, 4-pole motors

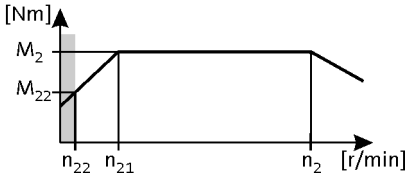


50 Hz: P_N = 0.75 kW
87 Hz: P_N = 1.35 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
385	18	3.5	40	14	164	18	385	18	3.5				3.661	-S130	080-32	86
281	25	3.1	29	19	120	25	281	25	3.1	502	25	2.6	5.021	-S130	080-32	86
241	29	4.1	25	22	102	29	241	29	4.1	430	29	3.5	5.860	-S400	080-32	94
219	32	2.8	23	24	93	32	219	32	2.8	392	32	2.3	6.425	-S130	080-32	86
201	35	2.7	21	27	85	35	201	35	2.7	359	35	2.2	7.029	-S130	080-32	86
169	41	2.8	17	32	72	41	169	41	2.8	303	41	2.4	8.322	-S130	080-32	86
150	46	2.7	15	36	64	46	150	46	2.7	268	47	2.3	9.411	-S130	080-32	86
124	56	2.3	13	43	53	56	124	56	2.3	221	57	1.9	11.413	-S130	080-32	86
109	64	2.0	11	49	47	64	109	64	2.0	195	64	1.7	12.907	-S130	080-32	86
97	72	1.8	9.9	55	41	72	97	72	1.8	173	72	1.5	14.606	-S130	080-32	86
96	73	3.0	9.9	56	41	73	96	73	3.0	171	73	2.5	14.720	-S220	080-32	90
95	73	4.1	9.8	56	41	73	95	73	4.1				14.806	-S400	080-32	94
88	79	1.7	9.1	61	38	79	88	79	1.7	158	79	1.4	15.979	-S130	080-32	86
85	82	2.7	8.8	63	36	82	85	82	2.7	152	82	2.3	16.571	-S220	080-32	90
78	89	1.5	8.0	69	33	89	78	89	1.5	140	90	1.4	18.069	-S130	080-32	86
75	93	2.4	7.7	71	32	93	75	93	2.4	134	93	2.3	18.776	-S220	080-32	90
70	100	2.2	7.1	77	30	100	70	100	2.2	124	101	2.1	20.300	-S220	080-32	90
69	100	1.3	7.1	77	29	100	69	100	1.3	124	101	1.2	20.381	-S130	080-32	86
61	113	1.9	6.3	87	26	113	61	113	1.9	110	114	1.8	23.000	-S220	080-32	90
61	114	1.1	6.3	87	26	114	61	114	1.1	109	114	1.1	23.048	-S130	080-32	86
57	123	1.1	5.8	95	24	123	57	123	1.1	101	124	1.0	24.967	-S130	080-32	86
56	125	3.2	5.7	96	24	125	56	125	3.2	100	126	3.0	25.308	-S400	080-32	94
53	130	1.7	5.5	100	23	130	53	130	1.7	95	131	1.6	26.422	-S220	080-32	90
50	139	0.9	5.1	107	21	139	50	139	0.9	89	140	0.9	28.233	-S130	080-32	86
48	144	2.8	5.0	111	21	144	48	144	2.8	86	145	2.6	29.156	-S400	080-32	94
47	148	1.5	4.8	114	20	148	47	148	1.5	84	149	1.4	29.937	-S220	080-32	90
45	154	2.9	4.7	118	19	154	45	154	2.9				31.167	-S660	080-32	98
45	155	0.8	4.6	119	19	155	45	155	0.8	80	156	0.8	31.387	-S130	080-32	86
43	162	1.4	4.4	125	18	162	43	162	1.4	77	163	1.4	32.867	-S220	080-32	90
43	162	2.5	4.4	125	18	162	43	162	2.5	77	163	2.5	32.940	-S400	080-32	94
40	175	2.9	4.1	135	17	175	40	175	2.9				35.511	-S660	080-32	98
39	179	2.2	4.0	138	17	179	39	179	2.2	70	180	2.2	36.267	-S400	080-32	94
38	184	1.2	3.9	141	16	184	38	184	1.2	68	185	1.2	37.238	-S220	080-32	90
35	199	2.6	3.6	153	15	199	35	199	2.6	63	200	2.6	40.333	-S660	080-32	98
34	202	2.0	3.5	155	15	202	34	202	2.0	62	203	2.0	40.974	-S400	080-32	94

Selection tables, 4-pole motors



50 Hz: P_N = 0.75 kW
87 Hz: P_N = 1.35 kW

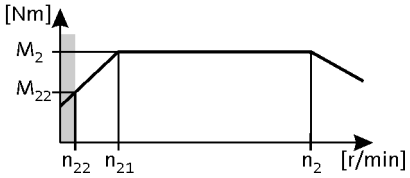
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
33	210	1.1	3.4	161	14	210	33	210	1.1	59	211	1.0	42.533	-S220	080-32	90
31	226	2.6	3.2	174	13	226	31	226	2.6	55	228	2.6	45.956	-S660	080-32	98
30	231	1.4	3.1	178	13	231	30	231	1.4	54	233	1.4	46.933	-S400	080-32	94
29	237	0.9	3.0	183	13	237	29	237	0.9	52	239	0.9	48.190	-S220	080-32	90
29	241	1.9	3.0	186	12	241	29	241	1.9	52	243	1.8	48.950	-S660	080-32	98
27	254	0.9	2.8	196	12	254	27	254	0.9	49	256	0.9	51.620	-S220	080-32	90
27	261	1.3	2.7	201	11	261	27	261	1.3	48	263	1.3	53.026	-S400	080-32	94
25	275	1.9	2.6	212	11	275	25	275	1.9	45	277	1.8	55.773	-S660	080-32	98
25	281	1.0	2.5	216	11	281	25	281	1.0	44	283	1.0	56.960	-S400	080-32	94
22	317	1.0	2.3	244	9.3	317	22	317	1.0	39	319	1.0	64.354	-S400	080-32	94

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
28	242	2.6	2.9	186	12	242	28	242	2.6	51	244	2.5	49.867	-S660	080-32	98
27	255	0.9	2.8	197	11	255	27	255	0.9	48	257	0.8	52.587	-S220	080-32	90
25	276	2.4	2.6	212	11	276	25	276	2.4	44	278	2.2	56.818	-S660	080-32	98
24	282	1.4	2.5	217	10	282	24	282	1.4	43	284	1.4	58.027	-S400	080-32	94
22	310	2.1	2.3	239	9.4	310	22	310	2.1	40	312	2.0	63.817	-S660	080-32	98
22	318	1.3	2.2	245	9.2	318	22	318	1.3	38	321	1.2	65.559	-S400	080-32	94
20	339	2.0	2.1	261	8.6	339	20	339	2.0	36	341	1.9	69.813	-S660	080-32	98
19	353	1.9	2.0	272	8.3	353	19	353	1.9	35	355	1.9	72.713	-S660	080-32	98
19	360	1.1	2.0	278	8.1	360	19	360	1.1	34	363	1.1	74.260	-S400	080-32	94
18	386	1.7	1.8	297	7.5	386	18	386	1.7	32	389	1.7	79.545	-S660	080-32	98
17	407	1.0	1.7	314	7.2	407	17	407	1.0	30	410	1.0	83.900	-S400	080-32	94
16	432	1.5	1.6	333	6.7	432	16	432	1.5	28	435	1.5	89.048	-S660	080-32	98
15	461	0.9	1.5	355	6.3	461	15	461	0.9	27	464	0.9	94.984	-S400	080-32	94
14	493	1.3	1.4	379	5.9	493	14	493	1.3	25	496	1.3	101.460	-S660	080-32	98
13	530	1.3	1.3	408	5.5	530	13	530	1.3	23	533	1.2	109.083	-S660	080-32	98
11	603	1.1	1.2	464	4.8	603	11	603	1.1	20	608	1.1	124.289	-S660	080-32	98
10	666	1.0	1.1	512	4.4	666	10	666	1.0	18	670	1.0	137.133	-S660	080-32	98
9.0	758	0.9	0.9	584	3.8	758	9.0	758	0.9	16	764	0.9	156.249	-S660	080-32	98

Selection tables, 4-pole motors

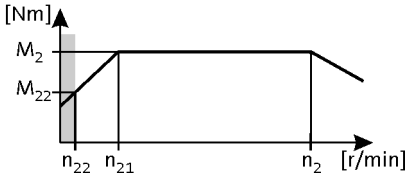


50 Hz: P_N = 1.1 kW
87 Hz: P_N = 2.0 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
391	26	2.4	40	18	164	26	391	26	2.4	694	27	2.0	3.661	-S130	090-12	86
312	33	5.8	32	23	131	33	312	33	5.8				4.579	-S400	090-12	94
285	36	2.1	29	25	120	36	285	36	2.1	506	37	1.7	5.021	-S130	090-12	86
244	42	5.4	25	29	102	42	244	42	5.4				5.860	-S400	090-12	94
223	46	1.9	23	32	93	46	223	46	1.9	395	47	1.6	6.425	-S130	090-12	86
203	50	1.8	21	35	85	50	203	50	1.8	361	51	1.5	7.029	-S130	090-12	86
172	59	2.0	17	42	72	59	172	59	2.0	305	61	1.6	8.322	-S130	090-12	86
152	67	1.9	15	47	64	67	152	67	1.9	270	69	1.5	9.411	-S130	090-12	86
136	75	2.9	14	53	57	75	136	75	2.9	242	77	2.4	10.514	-S220	090-12	90
125	81	1.6	13	57	53	81	125	81	1.6	223	83	1.3	11.413	-S130	090-12	86
120	85	2.6	12	59	51	85	120	85	2.6	214	87	2.1	11.876	-S220	090-12	90
111	92	1.4	11	64	47	92	111	92	1.4	197	94	1.2	12.907	-S130	090-12	86
110	93	2.4	11	65	46	93	110	93	2.4	196	95	2.0	12.992	-S220	090-12	90
106	96	2.3	11	67	45	96	106	96	2.3	189	98	1.9	13.456	-S220	090-12	90
98	104	1.3	9.9	73	41	104	98	104	1.3	174	107	1.0	14.606	-S130	090-12	86
97	105	2.1	9.9	73	41	105	97	105	2.1	173	107	1.7	14.720	-S220	090-12	90
97	106	3.8	9.8	74	41	106	97	106	3.8				14.806	-S400	090-12	94
90	114	1.1	9.1	80	38	114	90	114	1.1	159	117	0.9	15.979	-S130	090-12	86
86	118	1.9	8.8	83	36	118	86	118	1.9	153	121	1.5	16.571	-S220	090-12	90
79	129	1.0	8.0	90	33	129	79	129	1.0	141	132	0.9	18.069	-S130	090-12	86
78	130	3.1	7.9	91	33	130	78	130	3.1	139	133	2.9	18.286	-S400	090-12	94
76	134	1.6	7.7	94	32	134	76	134	1.6	135	137	1.5	18.776	-S220	090-12	90
70	145	1.5	7.1	101	30	145	70	145	1.5	125	148	1.4	20.300	-S220	090-12	90
70	145	0.9	7.1	102	29	145	70	145	0.9	125	149	0.8	20.381	-S130	090-12	86
69	147	2.7	7.0	103	29	147	69	147	2.7	123	151	2.5	20.659	-S400	090-12	94
64	160	2.5	6.5	112	27	160	64	160	2.5	113	163	2.3	22.400	-S400	090-12	94
62	164	1.3	6.3	115	26	164	62	164	1.3	110	168	1.3	23.000	-S220	090-12	90
57	179	3.2	5.8	125	24	179	57	179	3.2	101	183	3.0	25.056	-S660	090-12	98
57	180	2.2	5.7	126	24	180	57	180	2.2	100	185	2.1	25.308	-S400	090-12	94
54	188	1.2	5.5	132	23	188	54	188	1.2	96	193	1.1	26.422	-S220	090-12	90
50	203	3.2	5.1	142	21	203	50	203	3.2	89	208	3.0	28.548	-S660	090-12	98
49	208	1.9	5.0	146	21	208	49	208	1.9	87	213	1.8	29.156	-S400	090-12	94
48	213	1.0	4.8	149	20	213	48	213	1.0	85	218	1.0	29.937	-S220	090-12	90
46	222	3.0	4.7	156	19	222	46	222	3.0	82	227	2.9	31.167	-S660	090-12	98
44	234	0.9	4.4	164	18	234	44	234	0.9	77	240	0.9	32.867	-S220	090-12	90

Selection tables, 4-pole motors



50 Hz: P_N = 1.1 kW
87 Hz: P_N = 2.0 kW

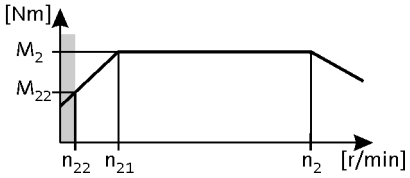
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
43	235	1.7	4.4	164	18	235	43	235	1.7	77	240	1.7	32.940	-S400	090-12	94
40	253	2.6	4.1	177	17	253	40	253	2.6	72	259	2.6	35.511	-S660	090-12	98
39	258	1.6	4.0	181	17	258	39	258	1.6	70	265	1.5	36.267	-S400	090-12	94
38	265	0.8	3.9	186	16	265	38	265	0.8	68	272	0.8	37.238	-S220	090-12	90
36	287	1.9	3.6	201	15	287	36	287	1.9	63	294	1.9	40.333	-S660	090-12	98
35	292	1.4	3.5	204	15	292	35	292	1.4	62	299	1.3	40.974	-S400	090-12	94
31	328	1.9	3.2	229	13	328	31	328	1.9	55	335	1.9	45.956	-S660	090-12	98
29	349	1.3	3.0	244	12	349	29	349	1.3	52	357	1.3	48.950	-S660	090-12	98
26	397	1.3	2.6	278	11	397	26	397	1.3	46	407	1.3	55.773	-S660	090-12	98

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
29	350	1.8	2.9	245	12	350	29	350	1.8	51	358	1.7	49.867	-S660	090-12	98
25	399	1.6	2.6	279	11	399	25	399	1.6	45	408	1.5	56.818	-S660	090-12	98
22	448	1.5	2.3	314	9.4	448	22	448	1.5	40	459	1.4	63.817	-S660	090-12	98
21	490	1.4	2.1	343	8.6	490	21	490	1.4	36	502	1.3	69.813	-S660	090-12	98
20	510	1.3	2.0	357	8.3	510	20	510	1.3	35	523	1.3	72.713	-S660	090-12	98
18	558	1.2	1.8	391	7.5	558	18	558	1.2	32	572	1.2	79.545	-S660	090-12	98
16	625	1.1	1.6	438	6.7	625	16	625	1.1	29	640	1.0	89.048	-S660	090-12	98
14	712	0.9	1.4	499	5.9	712	14	712	0.9	25	729	0.9	101.460	-S660	090-12	98
13	766	0.9	1.3	536	5.5	766	13	766	0.9	23	784	0.8	109.083	-S660	090-12	98

Selection tables, 4-pole motors

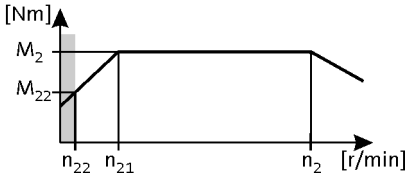


50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
392	35	1.8	40	25	164	35	392	35	1.8	695	36	1.5	3.661	-S130	090-32	86
313	44	4.3	32	31	131	44	313	44	4.3				4.579	-S400	090-32	94
286	49	1.6	29	34	120	49	286	49	1.6	507	49	1.3	5.021	-S130	090-32	86
245	57	4.0	25	40	102	57	245	57	4.0				5.860	-S400	090-32	94
223	62	1.4	23	44	93	62	223	62	1.4	396	63	1.2	6.425	-S130	090-32	86
204	68	1.4	21	48	85	68	204	68	1.4	362	69	1.1	7.029	-S130	090-32	86
187	74	2.9	19	52	78	74	187	74	2.9	332	75	2.4	7.667	-S220	090-32	90
172	81	1.4	17	56	72	81	172	81	1.4				8.322	-S130	090-32	86
155	90	2.5	16	63	65	90	155	90	2.5	274	91	2.0	9.280	-S220	090-32	90
153	91	1.4	15	64	64	91	153	91	1.4				9.411	-S130	090-32	86
137	102	2.2	14	71	57	102	137	102	2.2	242	103	1.8	10.514	-S220	090-32	90
126	111	1.2	13	77	53	111	126	111	1.2				11.413	-S130	090-32	86
121	115	1.9	12	81	51	115	121	115	1.9	214	117	1.6	11.876	-S220	090-32	90
111	125	1.0	11	88	47	125	111	125	1.0				12.907	-S130	090-32	86
111	126	1.8	11	88	46	126	111	126	1.8	196	128	1.4	12.992	-S220	090-32	90
110	127	3.2	11	89	46	127	110	127	3.2	194	129	2.6	13.105	-S400	090-32	94
107	130	1.7	11	91	45	130	107	130	1.7	189	132	1.4	13.456	-S220	090-32	90
100	139	2.9	10	97	42	139	100	139	2.9	178	141	2.4	14.336	-S400	090-32	94
98	141	0.9	9.9	99	41	141	98	141	0.9				14.606	-S130	090-32	86
98	143	1.5	9.9	100	41	143	98	143	1.5	173	145	1.3	14.720	-S220	090-32	90
97	143	2.8	9.8	100	41	143	97	143	2.8	172	146	2.3	14.806	-S400	090-32	94
90	155	0.8	9.1	108	38	155	90	155	0.8				15.979	-S130	090-32	86
89	157	2.6	9.0	110	37	157	89	157	2.6	157	159	2.1	16.197	-S400	090-32	94
87	160	1.4	8.8	112	36	160	87	160	1.4	154	163	1.1	16.571	-S220	090-32	90
79	177	2.3	7.9	124	33	177	79	177	2.3	139	180	2.1	18.286	-S400	090-32	94
76	182	1.2	7.7	127	32	182	76	182	1.2	136	185	1.1	18.776	-S220	090-32	90
71	197	1.1	7.1	138	30	197	71	197	1.1	125	200	1.1	20.300	-S220	090-32	90
70	200	2.0	7.0	140	29	200	70	200	2.0	123	203	1.9	20.659	-S400	090-32	94
65	212	3.1	6.6	149	27	212	65	212	3.1	116	216	2.9	21.933	-S660	090-32	98
64	217	1.8	6.5	152	27	217	64	217	1.8	114	220	1.7	22.400	-S400	090-32	94
62	223	1.0	6.3	156	26	223	62	223	1.0	111	226	0.9	23.000	-S220	090-32	90
57	243	2.4	5.8	170	24	243	57	243	2.4	102	246	2.2	25.056	-S660	090-32	98
57	245	1.6	5.7	172	24	245	57	245	1.6	101	249	1.5	25.308	-S400	090-32	94
54	256	0.9	5.5	179	23	256	54	256	0.9	96	260	0.8	26.422	-S220	090-32	90
50	276	2.4	5.1	194	21	276	50	276	2.4	89	281	2.2	28.548	-S660	090-32	98

Selection tables, 4-pole motors



50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW

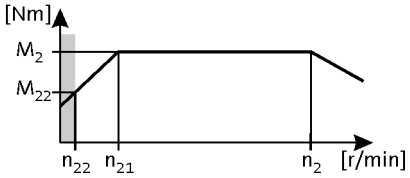
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
49	282	1.4	5.0	198	21	282	49	282	1.4	87	287	1.3	29.156	-S400	090-32	94
46	302	2.2	4.7	211	19	302	46	302	2.2	82	306	2.2	31.167	-S660	090-32	98
44	319	1.3	4.4	223	18	319	44	319	1.3	77	324	1.2	32.940	-S400	090-32	94
40	344	1.9	4.1	241	17	344	40	344	1.9	72	349	1.9	35.511	-S660	090-32	98
40	351	1.1	4.0	246	17	351	40	351	1.1	70	356	1.1	36.267	-S400	090-32	94
36	391	1.4	3.6	273	15	391	36	391	1.4	63	396	1.4	40.333	-S660	090-32	98
35	397	1.0	3.5	278	15	397	35	397	1.0	62	403	1.0	40.974	-S400	090-32	94
31	445	1.4	3.2	312	13	445	31	445	1.4	55	452	1.4	45.956	-S660	090-32	98
			3.0	332	12	481				52	481	0.9	48.950	-S660	090-32	98
			2.6	378	11	548				46	548	0.9	55.773	-S660	090-32	98

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
29	476	1.3	2.9	333	12	476	29	476	1.3	51	483	1.2	49.867	-S660	090-32	98
25	542	1.2	2.6	379	11	542	25	542	1.2	45	550	1.1	56.818	-S660	090-32	98
23	609	1.1	2.3	426	9.4	609	23	609	1.1	40	618	1.0	63.817	-S660	090-32	98
21	666	1.0	2.1	466	8.6	666	21	666	1.0	37	676	0.9	69.813	-S660	090-32	98
20	694	1.0	2.0	486	8.3	694	20	694	1.0	35	704	0.9	72.713	-S660	090-32	98
18	759	0.9	1.8	531	7.5	759	18	759	0.9	32	770	0.9	79.545	-S660	090-32	98

Selection tables, 4-pole motors

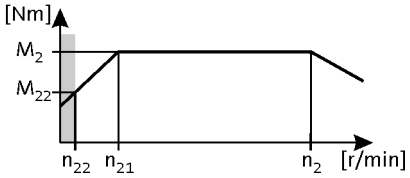


50 Hz: P_N = 2.2 kW
87 Hz: P_N = 3.9 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
376	54	3.3	38	38	156	54	376	54	3.3	665	54	2.7	3.840	-S220	100-12	90
369	55	5.6	37	39	153	55	369	55	5.6				3.920	-S660	100-12	98
316	65	3.8	32	45	131	65	316	65	3.8	558	65	3.2	4.579	-S400	100-12	94
274	74	2.4	28	52	114	74	274	74	2.4	485	74	2.0	5.267	-S220	100-12	90
247	83	3.1	25	58	102	83	247	83	3.1	436	83	2.6	5.860	-S400	100-12	94
225	90	2.9	23	63	94	90	225	90	2.9	399	91	2.4	6.411	-S400	100-12	94
214	95	2.3	21	67	89	95	214	95	2.3				6.767	-S220	100-12	90
194	105	3.5	19	74	80	105	194	105	3.5	342	106	2.9	7.467	-S400	100-12	94
189	108	2.0	19	76	78	108	189	108	2.0				7.667	-S220	100-12	90
171	119	3.2	17	83	71	119	171	119	3.2	303	119	2.7	8.436	-S400	100-12	94
156	131	1.7	16	91	65	131	156	131	1.7				9.280	-S220	100-12	90
141	144	2.8	14	101	59	144	141	144	2.8	250	145	2.3	10.240	-S400	100-12	94
137	148	1.5	14	104	57	148	137	148	1.5				10.514	-S220	100-12	90
125	163	2.5	13	114	52	163	125	163	2.5	221	164	2.1	11.569	-S400	100-12	94
122	168	1.3	12	117	51	168	122	168	1.3				11.876	-S220	100-12	90
111	183	1.2	11	128	46	183	111	183	1.2				12.992	-S220	100-12	90
110	185	2.2	11	129	46	185	110	185	2.2	195	185	1.8	13.105	-S400	100-12	94
107	190	1.2	11	133	45	190	107	190	1.2				13.456	-S220	100-12	90
101	202	2.0	10	141	42	202	101	202	2.0	178	203	1.7	14.336	-S400	100-12	94
98	208	1.1	9.9	145	41	208	98	208	1.1				14.720	-S220	100-12	90
98	209	1.9	9.8	146	41	209	98	209	1.9	173	209	1.6	14.806	-S400	100-12	94
92	222	3.0	9.2	155	38	222	92	222	3.0	163	222	2.5	15.714	-S660	100-12	98
89	228	1.8	9.0	160	37	228	89	228	1.8	158	229	1.5	16.197	-S400	100-12	94
87	234	0.9	8.8	163	36	234	87	234	0.9				16.571	-S220	100-12	90
81	253	2.6	8.1	176	34	253	81	253	2.6	143	253	2.2	17.905	-S660	100-12	98
79	258	1.6	7.9	180	33	258	79	258	1.6	140	259	1.5	18.286	-S400	100-12	94
77	265	0.8	7.7	185	32	265	77	265	0.8				18.776	-S220	100-12	90
75	272	2.4	7.5	190	31	272	75	272	2.4	133	272	2.3	19.250	-S660	100-12	98
70	291	1.4	7.0	203	29	291	70	291	1.4	124	292	1.3	20.659	-S400	100-12	94
66	309	2.1	6.6	216	27	309	66	309	2.1	117	310	2.0	21.933	-S660	100-12	98
65	316	1.3	6.5	221	27	316	65	316	1.3	114	317	1.2	22.400	-S400	100-12	94
58	353	1.6	5.8	247	24	353	58	353	1.6	102	354	1.6	25.056	-S660	100-12	98
57	357	1.1	5.7	249	24	357	57	357	1.1	101	358	1.1	25.308	-S400	100-12	94
51	403	1.6	5.1	281	21	403	51	403	1.6	90	404	1.6	28.548	-S660	100-12	98
46	440	1.5	4.7	307	19	440	46	440	1.5	82	441	1.5	31.167	-S660	100-12	98

Selection tables, 4-pole motors

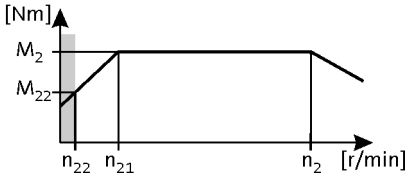


50 Hz: P_N = 2.2 kW
87 Hz: P_N = 3.9 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
41	501	1.3	4.1	350	17	501	41	501	1.3	72	502	1.3	35.511	-S660	100-12	98

Selection tables, 4-pole motors

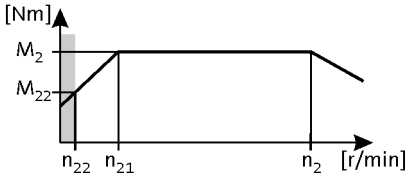


50 Hz: P_N = 3.0 kW
87 Hz: P_N = 5.4 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
433	64	3.2	43	45	180	64	433	64	3.2	765	65	2.6	3.339	-S400	100-32	94
376	74	2.4	38	52	156	74	376	74	2.4				3.840	-S220	100-32	90
369	75	4.1	37	53	153	75	369	75	4.1				3.920	-S660	100-32	98
316	88	2.8	32	62	131	88	316	88	2.8	558	90	2.3	4.579	-S400	100-32	94
274	101	1.8	28	71	114	101	274	101	1.8				5.267	-S220	100-32	90
247	113	2.3	25	79	102	113	247	113	2.3	436	115	1.9	5.860	-S400	100-32	94
225	123	2.1	23	86	94	123	225	123	2.1	399	126	1.7	6.411	-S400	100-32	94
214	130	1.7	21	91	89	130	214	130	1.7				6.767	-S220	100-32	90
194	144	2.5	19	100	80	144	194	144	2.5				7.467	-S400	100-32	94
189	147	1.5	19	103	78	147	189	147	1.5				7.667	-S220	100-32	90
171	162	2.3	17	113	71	162	171	162	2.3				8.436	-S400	100-32	94
156	179	1.2	16	125	65	179	156	179	1.2				9.280	-S220	100-32	90
144	193	3.2	15	135	60	193	144	193	3.2	255	196	2.7	10.027	-S660	100-32	98
141	197	2.0	14	138	59	197	141	197	2.0	250	201	1.7	10.240	-S400	100-32	94
137	202	1.1	14	141	57	202	137	202	1.1				10.514	-S220	100-32	90
128	217	3.1	13	151	53	217	128	217	3.1	227	221	2.5	11.262	-S660	100-32	98
125	223	1.8	13	156	52	223	125	223	1.8				11.569	-S400	100-32	94
122	228	1.0	12	160	51	228	122	228	1.0				11.876	-S220	100-32	90
117	237	2.8	12	166	49	237	117	237	2.8	207	241	2.3	12.320	-S660	100-32	98
113	247	2.7	11	173	47	247	113	247	2.7	199	251	2.2	12.832	-S660	100-32	98
111	250	0.9	11	175	46	250	111	250	0.9				12.992	-S220	100-32	90
110	252	1.6	11	176	46	252	110	252	1.6	195	257	1.3	13.105	-S400	100-32	94
107	259	0.9	11	181	45	259	107	259	0.9				13.456	-S220	100-32	90
103	270	2.4	10	189	43	270	103	270	2.4	182	275	2.0	14.037	-S660	100-32	98
101	276	1.5	10	193	42	276	101	276	1.5	178	281	1.2	14.336	-S400	100-32	94
98	285	1.4	9.8	199	41	285	98	285	1.4				14.806	-S400	100-32	94
92	302	2.2	9.2	211	38	302	92	302	2.2	163	308	1.8	15.714	-S660	100-32	98
89	312	1.3	9.0	218	37	312	89	312	1.3	158	317	1.1	16.197	-S400	100-32	94
81	344	1.9	8.1	241	34	344	81	344	1.9	143	351	1.6	17.905	-S660	100-32	98
79	352	1.1	7.9	246	33	352	79	352	1.1	140	358	1.1	18.286	-S400	100-32	94
75	370	1.8	7.5	259	31	370	75	370	1.8	133	377	1.7	19.250	-S660	100-32	98
70	397	1.0	7.0	278	29	397	70	397	1.0	124	405	0.9	20.659	-S400	100-32	94
66	422	1.6	6.6	295	27	422	66	422	1.6	117	429	1.5	21.933	-S660	100-32	98
65	431	0.9	6.5	301	27	431	65	431	0.9	114	439	0.9	22.400	-S400	100-32	94
58	482	1.2	5.8	337	24	482	58	482	1.2	102	491	1.1	25.056	-S660	100-32	98

Selection tables, 4-pole motors

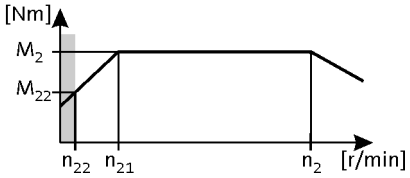


50 Hz: P_N = 3.0 kW
87 Hz: P_N = 5.4 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
57	487	0.8	5.7	340	24	487	57	487	0.8				25.308	-S400	100-32	94
51	549	1.2	5.1	384	21	549	51	549	1.2	90	559	1.1	28.548	-S660	100-32	98
46	599	1.1	4.7	419	19	599	46	599	1.1	82	610	1.1	31.167	-S660	100-32	98
41	683	1.0	4.1	478	17	683	41	683	1.0	72	695	1.0	35.511	-S660	100-32	98

Selection tables, 4-pole motors

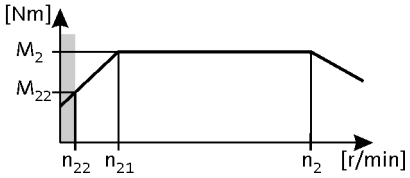


50 Hz: P_N = 4.0 kW
87 Hz: P_N = 7.1 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
436	85	2.4	43	53	180	85	436	85	2.4				3.339	-S400	112-22	94
371	100	3.4	37	63	153	100	371	100	3.4				3.920	-S660	112-22	98
318	117	2.1	32	73	131	117	318	117	2.1	560	117	1.7	4.579	-S400	112-22	94
248	149	1.7	25	94	102	149	248	149	1.7	438	150	1.4	5.860	-S400	112-22	94
227	163	1.6	23	102	94	163	227	163	1.6	400	164	1.3	6.411	-S400	112-22	94
212	175	2.8	21	110	87	175	212	175	2.8	373	176	2.4	6.880	-S660	112-22	98
199	186	3.2	20	117	82	186	199	186	3.2				7.311	-S660	112-22	98
195	190	1.9	19	119	80	190	195	190	1.9				7.467	-S400	112-22	94
173	215	1.8	17	135	71	215	173	215	1.8				8.436	-S400	112-22	94
165	224	2.9	17	140	68	224	165	224	2.9				8.800	-S660	112-22	98
145	255	2.5	15	160	60	255	145	255	2.5				10.027	-S660	112-22	98
142	261	1.5	14	163	59	261	142	261	1.5				10.240	-S400	112-22	94
129	287	2.3	13	180	53	287	129	287	2.3	228	289	1.9	11.262	-S660	112-22	98
126	295	1.4	13	185	52	295	126	295	1.4				11.569	-S400	112-22	94
118	314	2.1	12	197	49	314	118	314	2.1	208	316	1.8	12.320	-S660	112-22	98
113	327	2.0	11	205	47	327	113	327	2.0	200	329	1.7	12.832	-S660	112-22	98
111	334	1.2	11	209	46	334	111	334	1.2				13.105	-S400	112-22	94
104	358	1.9	10	224	43	358	104	358	1.9				14.037	-S660	112-22	98
102	365	1.1	10	229	42	365	102	365	1.1				14.336	-S400	112-22	94
98	377	1.1	9.8	236	41	377	98	377	1.1				14.806	-S400	112-22	94
93	400	1.7	9.2	251	38	400	93	400	1.7	163	403	1.4	15.714	-S660	112-22	98
90	413	1.0	9.0	258	37	413	90	413	1.0				16.197	-S400	112-22	94
81	456	1.5	8.1	286	34	456	81	456	1.5	143	459	1.2	17.905	-S660	112-22	98
80	466	0.9	7.9	292	33	466	80	466	0.9				18.286	-S400	112-22	94
76	490	1.4	7.5	307	31	490	76	490	1.4	133	494	1.3	19.250	-S660	112-22	98
66	559	1.2	6.6	350	27	559	66	559	1.2	117	562	1.1	21.933	-S660	112-22	98
58	638	0.9	5.8	400	24	638	58	638	0.9	102	643	0.9	25.056	-S660	112-22	98
51	727	0.9	5.1	455	21	727	51	727	0.9	90	732	0.9	28.548	-S660	112-22	98

Selection tables, 4-pole motors

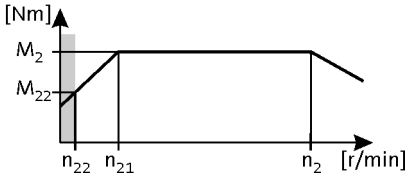


50 Hz: P_N = 5.5 kW
87 Hz: P_N = 9.7 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
375	136	3.1	37	85	153	136	375	136	3.1				3.920	-S660	132-12	98
273	186	2.6	27	116	112	186	273	186	2.6				5.376	-S660	132-12	98
229	222	2.7	23	139	94	222	229	222	2.7				6.417	-S660	132-12	98
214	238	2.1	21	149	87	238	214	238	2.1				6.880	-S660	132-12	98
201	253	2.3	20	158	82	253	201	253	2.3				7.311	-S660	132-12	98
167	305	2.1	17	191	68	305	167	305	2.1				8.800	-S660	132-12	98
147	348	1.8	15	217	60	348	147	348	1.8				10.027	-S660	132-12	98
131	390	1.7	13	244	53	390	131	390	1.7				11.262	-S660	132-12	98
119	427	1.6	12	267	49	427	119	427	1.6				12.320	-S660	132-12	98
115	445	1.5	11	278	47	445	115	445	1.5				12.832	-S660	132-12	98
105	487	1.4	10	304	43	487	105	487	1.4				14.037	-S660	132-12	98
94	545	1.2	9.2	340	38	545	94	545	1.2				15.714	-S660	132-12	98
82	621	1.1	8.1	388	34	621	82	621	1.1				17.905	-S660	132-12	98
76	667	1.0	7.5	417	31	667	76	667	1.0				19.250	-S660	132-12	98
67	760	0.9	6.6	475	27	760	67	760	0.9				21.933	-S660	132-12	98

Selection tables, 4-pole motors



50 Hz: P_N = 7.5 kW
87 Hz: P_N = 13.2 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
372	187	2.3	37	117	153	187	372	187	2.3				3.920	-S660	132-22	98
272	256	1.9	27	160	112	256	272	256	1.9				5.376	-S660	132-22	98
228	305	2.0	23	191	94	305	228	305	2.0				6.417	-S660	132-22	98
212	327	1.5	21	205	87	327	212	327	1.5				6.880	-S660	132-22	98
200	348	1.7	20	218	82	348	200	348	1.7				7.311	-S660	132-22	98
166	419	1.5	17	262	68	419	166	419	1.5				8.800	-S660	132-22	98
146	477	1.3	15	299	60	477	146	477	1.3				10.027	-S660	132-22	98
130	536	1.2	13	335	53	536	130	536	1.2				11.262	-S660	132-22	98
119	586	1.1	12	367	49	586	119	586	1.1				12.320	-S660	132-22	98
114	611	1.1	11	382	47	611	114	611	1.1				12.832	-S660	132-22	98
104	668	1.0	10	418	43	668	104	668	1.0				14.037	-S660	132-22	98
93	748	0.9	9.2	468	38	748	93	748	0.9				15.714	-S660	132-22	98

Selection tables, 2-pole motors

50 Hz: P_N = 0.18 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
68	25	5.3	40.422	-S130	063-11	106
60	28	4.7	45.711	-S130	063-11	106
54	31	4.2	51.230	-S130	063-11	106
47	35	3.7	57.933	-S130	063-11	106
43	39	3.3	64.200	-S130	063-11	106
38	44	2.9	72.600	-S130	063-11	106
32	51	2.0	84.581	-S130	063-11	106
29	58	2.0	95.648	-S130	063-11	106

Selection tables, 2-pole motors

50 Hz: P_N = 0.25 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
386	6.0	5.2	7.029	-S130	063-31	106
170	14	5.2	15.979	-S130	063-31	106
150	15	5.9	18.069	-S130	063-31	106
133	17	5.5	20.381	-S130	063-31	106
118	20	5.5	23.048	-S130	063-31	106
108	27	4.9	31.387	-S130	063-31	106
76	30	4.3	35.493	-S130	063-31	106
67	35	3.8	40.422	-S130	063-31	106
59	39	3.3	45.711	-S130	063-31	106
53	44	3.0	51.230	-S130	063-31	106
47	50	2.6	57.933	-S130	063-31	106
42	55	2.4	64.200	-S130	063-31	106
41	56	2.8	65.975	-S220	063-31	110
37	62	2.1	72.600	-S130	063-31	106
36	64	2.8	74.750	-S220	063-31	110
32	72	1.4	84.581	-S130	063-31	106
28	82	1.4	95.648	-S130	063-31	106

Selection tables, 2-pole motors

50 Hz: P_N = 0.37 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
186	18	5.8	14.606	-S130	071-11	106
170	20	5.3	15.979	-S130	071-11	106
151	23	5.3	18.069	-S130	071-11	106
134	26	4.7	20.381	-S130	071-11	106
118	29	4.2	23.048	-S130	071-11	106
109	31	3.9	24.967	-S130	071-11	106
119	36	3.4	28.233	-S130	071-11	106
107	40	3.3	31.387	-S130	071-11	106
77	45	2.9	35.493	-S130	071-11	106
67	51	2.6	40.422	-S130	071-11	106
60	58	2.3	45.711	-S130	071-11	106
53	65	2.0	51.230	-S130	071-11	106
47	73	1.8	57.933	-S130	071-11	106
47	74	3.0	58.486	-S220	071-11	110
42	81	1.6	64.200	-S130	071-11	106
41	83	2.1	65.975	-S220	071-11	110
38	91	1.4	72.600	-S130	071-11	106
36	94	2.1	74.750	-S220	071-11	110

Selection tables, 2-pole motors

50 Hz: P_N = 0.55 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
718	7.0	5.1	3.661	-S130	071-31	106
524	10	5.1	5.021	-S130	071-31	106
409	12	4.7	6.425	-S130	071-31	106
374	14	4.7	7.029	-S130	071-31	106
316	16	5.1	8.322	-S130	071-31	106
280	18	5.1	9.411	-S130	071-31	106
230	22	4.9	11.413	-S130	071-31	106
204	25	4.3	12.907	-S130	071-31	106
180	28	3.8	14.606	-S130	071-31	106
165	31	3.5	15.979	-S130	071-31	106
146	35	3.5	18.069	-S130	071-31	106
129	39	3.1	20.381	-S130	071-31	106
114	45	2.7	23.048	-S130	071-31	106
105	48	2.5	24.967	-S130	071-31	106
115	55	2.2	28.233	-S130	071-31	106
103	61	2.1	31.387	-S130	071-31	106
74	69	1.9	35.493	-S130	071-31	106
71	72	3.1	37.238	-S220	071-31	110
65	78	1.7	40.422	-S130	071-31	106
62	82	2.7	42.533	-S220	071-31	110
58	89	1.5	45.711	-S130	071-31	106
55	93	2.4	48.190	-S220	071-31	110
51	99	1.3	51.230	-S130	071-31	106
51	100	2.2	51.620	-S220	071-31	110
46	110	2.4	56.960	-S400	071-31	114
45	112	1.2	57.933	-S130	071-31	106
45	113	1.9	58.486	-S220	071-31	110
41	124	1.1	64.200	-S130	071-31	106
41	125	2.4	64.354	-S400	071-31	114
40	128	1.3	65.975	-S220	071-31	110
36	141	0.9	72.600	-S130	071-31	106
35	145	1.3	74.750	-S220	071-31	110

Selection tables, 6-pole motors

50 Hz: P_N = 0.18 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
72	23	5.6	12.907	-S130	071-13	106
64	26	5.0	14.606	-S130	071-13	106
58	29	4.5	15.979	-S130	071-13	106
52	32	4.0	18.069	-S130	071-13	106
46	37	3.6	20.381	-S130	071-13	106
40	41	3.2	23.048	-S130	071-13	106
37	45	2.9	24.967	-S130	071-13	106
33	51	2.6	28.233	-S130	071-13	106
30	56	2.3	31.387	-S130	071-13	106
26	64	2.0	35.493	-S130	071-13	106
23	72	1.8	40.422	-S130	071-13	106
22	76	2.9	42.533	-S220	071-13	110
20	82	1.6	45.711	-S130	071-13	106
19	86	2.6	48.190	-S220	071-13	110
18	92	1.4	51.230	-S130	071-13	106
18	93	2.4	51.620	-S220	071-13	110
16	102	2.6	56.960	-S400	071-13	114
16	104	1.3	57.933	-S130	071-13	106
16	105	2.1	58.486	-S220	071-13	110
15	115	1.1	64.200	-S130	071-13	106
15	115	2.6	64.354	-S400	071-13	114
14	118	1.5	65.975	-S220	071-13	110
13	130	1.0	72.600	-S130	071-13	106
12	134	1.5	74.750	-S220	071-13	110

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
23	71	3.1	40.012	-S220	071-13	110
21	80	2.8	45.333	-S220	071-13	110
18	93	2.4	52.587	-S220	071-13	110
16	105	2.1	59.581	-S220	071-13	110
14	119	1.9	67.298	-S220	071-13	110
13	131	3.1	74.260	-S400	071-13	114
12	135	1.6	76.249	-S220	071-13	110
11	148	2.7	83.900	-S400	071-13	114
11	152	1.5	86.079	-S220	071-13	110
12	168	2.4	94.984	-S400	071-13	114
12	172	1.3	97.528	-S220	071-13	110
11	190	2.1	107.314	-S400	071-13	114
10	197	1.1	111.747	-S220	071-13	110

Selection tables, 6-pole motors

50 Hz: P_N = 0.18 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
7.5	218	1.8	123.307	-S400	071-13	114
7.5	220	3.0	124.289	-S660	071-13	118
7.3	224	1.0	126.610	-S220	071-13	110
6.8	242	2.7	137.133	-S660	071-13	118
6.7	246	1.6	139.313	-S400	071-13	114
6.5	253	0.9	143.205	-S220	071-13	110
6.0	276	2.4	156.249	-S660	071-13	118
5.9	279	1.4	158.019	-S400	071-13	114
5.3	312	2.1	176.611	-S660	071-13	118
5.2	315	1.3	178.531	-S400	071-13	114
4.6	355	1.9	201.230	-S660	071-13	118
4.5	361	1.1	204.412	-S400	071-13	114
4.2	395	1.7	223.833	-S660	071-13	118
4.0	408	1.0	230.946	-S400	071-13	114
3.6	450	1.5	255.034	-S660	071-13	118
3.5	470	0.8	265.956	-S400	071-13	114
3.3	495	1.2	280.500	-S660	071-13	118
2.9	565	1.2	319.600	-S660	071-13	118

Selection tables, 6-pole motors

50 Hz: P_N = 0.25 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
254	9.0	4.7	3.661	-S130	071-33	106
185	13	4.7	5.021	-S130	071-33	106
145	16	4.4	6.425	-S130	071-33	106
132	18	4.4	7.029	-S130	071-33	106
112	21	4.7	8.322	-S130	071-33	106
121	23	4.7	9.411	-S130	071-33	106
82	28	4.6	11.413	-S130	071-33	106
72	32	4.0	12.907	-S130	071-33	106
64	36	3.6	14.606	-S130	071-33	106
58	40	3.3	15.979	-S130	071-33	106
52	45	2.9	18.069	-S130	071-33	106
46	51	2.6	20.381	-S130	071-33	106
40	57	2.3	23.048	-S130	071-33	106
37	62	2.1	24.967	-S130	071-33	106
33	70	1.9	28.233	-S130	071-33	106
31	75	3.0	29.937	-S220	071-33	110
30	78	1.7	31.387	-S130	071-33	106
28	82	2.7	32.867	-S220	071-33	110
26	88	1.5	35.493	-S130	071-33	106
26	90	3.1	36.267	-S400	071-33	114
25	93	2.4	37.238	-S220	071-33	110
23	100	3.1	40.333	-S660	071-33	118
23	101	1.3	40.422	-S130	071-33	106
23	102	3.1	40.974	-S400	071-33	114
22	106	2.1	42.533	-S220	071-33	110
20	114	1.1	45.711	-S130	071-33	106
20	114	3.1	45.956	-S660	071-33	118
20	117	2.7	46.933	-S400	071-33	114
19	120	1.8	48.190	-S220	071-33	110
19	122	2.7	48.950	-S660	071-33	118
18	128	1.0	51.230	-S130	071-33	106
18	129	1.7	51.620	-S220	071-33	110
18	132	2.6	53.026	-S400	071-33	114
17	139	2.7	55.773	-S660	071-33	118
16	142	1.9	56.960	-S400	071-33	114
16	144	0.9	57.933	-S130	071-33	106
16	146	1.5	58.486	-S220	071-33	110

Selection tables, 6-pole motors

50 Hz: P_N = 0.25 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
15	160	1.9	64.354	-S400	071-33	114
14	164	1.0	65.975	-S220	071-33	110
12	186	1.0	74.750	-S220	071-33	110

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
23	98	2.2	40.012	-S220	071-33	110
21	111	2.0	45.333	-S220	071-33	110
18	129	1.7	52.587	-S220	071-33	110
16	142	2.8	58.027	-S400	071-33	114
16	146	1.5	59.581	-S220	071-33	110
14	161	2.5	65.559	-S400	071-33	114
14	165	1.3	67.298	-S220	071-33	110
13	182	2.2	74.260	-S400	071-33	114
12	187	1.2	76.249	-S220	071-33	110
11	206	1.9	83.900	-S400	071-33	114
11	211	1.0	86.079	-S220	071-33	110
10	218	3.0	89.048	-S660	071-33	118
12	233	1.7	94.984	-S400	071-33	114
12	239	0.9	97.528	-S220	071-33	110
11	249	2.7	101.460	-S660	071-33	118
11	263	1.5	107.314	-S400	071-33	114
11	268	2.5	109.083	-S660	071-33	118
10	274	0.8	111.747	-S220	071-33	110
7.5	302	1.3	123.307	-S400	071-33	114
7.5	305	2.2	124.289	-S660	071-33	118
6.8	336	2.0	137.133	-S660	071-33	118
6.7	342	1.2	139.313	-S400	071-33	114
6.0	383	1.7	156.249	-S660	071-33	118
5.9	388	1.0	158.019	-S400	071-33	114
5.3	433	1.5	176.611	-S660	071-33	118
5.2	438	0.9	178.531	-S400	071-33	114
4.6	494	1.3	201.230	-S660	071-33	118
4.2	549	1.2	223.833	-S660	071-33	118
3.6	626	1.1	255.034	-S660	071-33	118

Selection tables, 6-pole motors

50 Hz: P_N = 0.37 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
260	13	4.8	3.661	-S130	080-13	106
189	18	4.2	5.021	-S130	080-13	106
162	21	5.7	5.860	-S400	080-13	114
148	23	3.8	6.425	-S130	080-13	106
135	25	3.6	7.029	-S130	080-13	106
114	30	3.9	8.322	-S130	080-13	106
101	34	3.7	9.411	-S130	080-13	106
102	41	3.2	11.413	-S130	080-13	106
74	47	2.8	12.907	-S130	080-13	106
65	53	2.5	14.606	-S130	080-13	106
64	53	5.7	14.806	-S400	080-13	114
60	58	2.3	15.979	-S130	080-13	106
53	65	2.0	18.069	-S130	080-13	106
51	68	3.3	18.776	-S220	080-13	110
47	73	3.0	20.300	-S220	080-13	110
47	74	1.8	20.381	-S130	080-13	106
41	83	2.7	23.000	-S220	080-13	110
41	83	1.6	23.048	-S130	080-13	106
38	90	1.4	24.967	-S130	080-13	106
36	95	2.3	26.422	-S220	080-13	110
34	102	1.3	28.233	-S130	080-13	106
32	108	2.0	29.937	-S220	080-13	110
30	113	1.2	31.387	-S130	080-13	106
29	119	1.9	32.867	-S220	080-13	110
27	128	1.0	35.493	-S130	080-13	106
26	131	3.1	36.267	-S400	080-13	114
26	134	1.6	37.238	-S220	080-13	110
24	146	0.9	40.422	-S130	080-13	106
23	148	2.7	40.974	-S400	080-13	114
22	153	1.4	42.533	-S220	080-13	110
20	169	1.9	46.933	-S400	080-13	114
20	174	1.3	48.190	-S220	080-13	110
19	177	2.5	48.950	-S660	080-13	118
18	186	1.2	51.620	-S220	080-13	110
18	191	1.8	53.026	-S400	080-13	114
17	201	2.5	55.773	-S660	080-13	118
17	206	1.3	56.960	-S400	080-13	114

Selection tables, 6-pole motors

50 Hz: P_N = 0.37 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
16	211	1.0	58.486	-S220	080-13	110
15	232	1.3	64.354	-S400	080-13	114

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
18	187	1.2	52.587	-S220	080-13	110
17	202	3.2	56.818	-S660	080-13	118
16	206	1.9	58.027	-S400	080-13	114
16	212	1.0	59.581	-S220	080-13	110
15	227	2.9	63.817	-S660	080-13	118
15	233	1.7	65.559	-S400	080-13	114
14	239	0.9	67.298	-S220	080-13	110
14	248	2.7	69.813	-S660	080-13	118
13	258	2.6	72.713	-S660	080-13	118
13	264	1.5	74.260	-S400	080-13	114
13	271	0.8	76.249	-S220	080-13	110
12	283	2.3	79.545	-S660	080-13	118
11	298	1.3	83.900	-S400	080-13	114
11	317	2.1	89.048	-S660	080-13	118
10	338	1.2	94.984	-S400	080-13	114
11	361	1.8	101.460	-S660	080-13	118
11	381	1.1	107.314	-S400	080-13	114
11	388	1.7	109.083	-S660	080-13	118
7.7	438	0.9	123.307	-S400	080-13	114
7.6	442	1.5	124.289	-S660	080-13	118
6.9	487	1.4	137.133	-S660	080-13	118
6.8	495	0.8	139.313	-S400	080-13	114
6.1	555	1.2	156.249	-S660	080-13	118
5.4	628	1.1	176.611	-S660	080-13	118
4.7	715	0.9	201.230	-S660	080-13	118

Selection tables, 6-pole motors

50 Hz: P_N = 0.55 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
254	20	3.1	3.661	-S130	080-33	106
185	28	2.8	5.021	-S130	080-33	106
159	32	3.7	5.860	-S400	080-33	114
145	35	2.5	6.425	-S130	080-33	106
132	39	2.4	7.029	-S130	080-33	106
112	46	2.5	8.322	-S130	080-33	106
121	52	2.4	9.411	-S130	080-33	106
82	63	2.1	11.413	-S130	080-33	106
72	71	1.8	12.907	-S130	080-33	106
72	71	3.1	12.992	-S220	080-33	110
69	74	3.0	13.456	-S220	080-33	110
64	80	1.6	14.606	-S130	080-33	106
63	81	2.7	14.720	-S220	080-33	110
63	81	3.7	14.806	-S400	080-33	114
58	88	1.5	15.979	-S130	080-33	106
56	91	2.4	16.571	-S220	080-33	110
52	99	1.3	18.069	-S130	080-33	106
50	103	2.1	18.776	-S220	080-33	110
46	111	2.0	20.300	-S220	080-33	110
46	112	1.2	20.381	-S130	080-33	106
42	123	3.1	22.400	-S400	080-33	114
40	126	1.8	23.000	-S220	080-33	110
40	126	1.0	23.048	-S130	080-33	106
37	137	1.0	24.967	-S130	080-33	106
37	137	3.1	25.056	-S660	080-33	118
37	139	2.9	25.308	-S400	080-33	114
35	145	1.5	26.422	-S220	080-33	110
33	155	0.8	28.233	-S130	080-33	106
33	156	3.1	28.548	-S660	080-33	118
32	160	2.5	29.156	-S400	080-33	114
31	164	1.3	29.937	-S220	080-33	110
30	171	2.6	31.167	-S660	080-33	118
28	180	1.2	32.867	-S220	080-33	110
28	180	2.2	32.940	-S400	080-33	114
26	195	2.6	35.511	-S660	080-33	118
26	199	2.0	36.267	-S400	080-33	114
25	204	1.1	37.238	-S220	080-33	110

Selection tables, 6-pole motors

50 Hz: P_N = 0.55 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
23	221	2.4	40.333	-S660	080-33	118
23	225	1.8	40.974	-S400	080-33	114
22	233	0.9	42.533	-S220	080-33	110
20	252	2.4	45.956	-S660	080-33	118
20	257	1.2	46.933	-S400	080-33	114
19	264	0.8	48.190	-S220	080-33	110
19	268	1.7	48.950	-S660	080-33	118
18	291	1.2	53.026	-S400	080-33	114
17	306	1.7	55.773	-S660	080-33	118
16	312	0.9	56.960	-S400	080-33	114
15	353	0.9	64.354	-S400	080-33	114

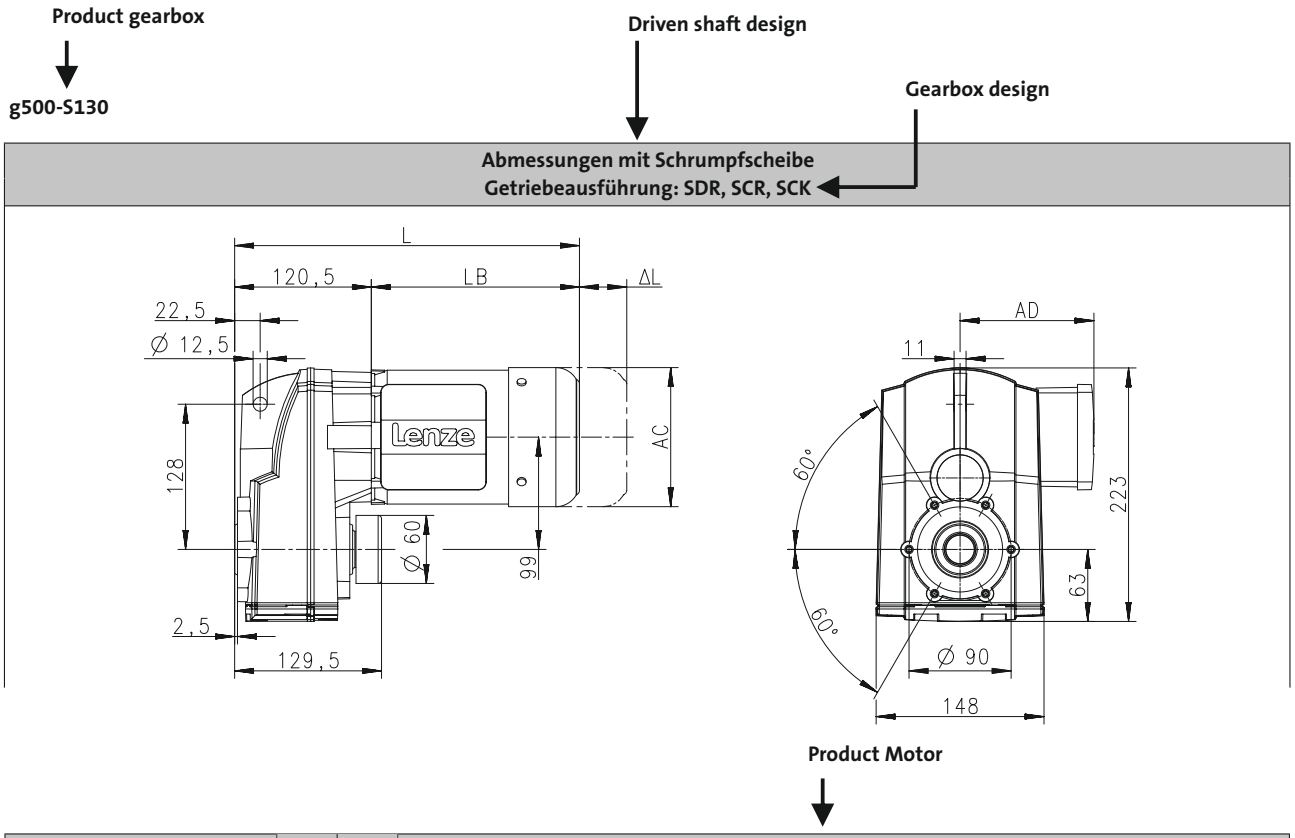
3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
19	269	2.3	49.867	-S660	080-33	118
16	307	2.1	56.818	-S660	080-33	118
16	313	1.3	58.027	-S400	080-33	114
15	344	1.9	63.817	-S660	080-33	118
14	354	1.1	65.559	-S400	080-33	114
13	377	1.8	69.813	-S660	080-33	118
13	392	1.7	72.713	-S660	080-33	118
13	401	1.0	74.260	-S400	080-33	114
12	429	1.5	79.545	-S660	080-33	118
11	453	0.9	83.900	-S400	080-33	114
10	481	1.4	89.048	-S660	080-33	118
11	548	1.2	101.460	-S660	080-33	118
11	589	1.1	109.083	-S660	080-33	118
7.5	671	1.0	124.289	-S660	080-33	118
6.8	740	0.9	137.133	-S660	080-33	118

Dimensions, notes

Notes on the dimensions

The following legend shows the layout of the dimension sheets.



Produkt			MD□MA□□							
			063-12	063-32	063-42	071-32	071-42	080-32	080-42	090-32
Abmessungen										
Gesamtlänge	**L**	**[mm]**		304		324		347		380
Länge Motor	**LB**	**[mm]**		183		203		226		259
Länge Motoranbauten	**Δ L**	**[mm]**		170		165		183		181
Motordurchmesser	**AC**	**[mm]**		123		139		156		176
Abstand Motor/Anschluss	**AD**	**[mm]**		100		109		150		157

Distance of motor centre to the end of terminal box

Total length of the drive without built-on accessories

Motor diameter

Motor length without built-on accessories

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

Dimensions, notes

Gearbox designs

Hollow shaft

Without centring (HDR)

With centering (HCR)

Flange with through holes (HCK)

Hollow shaft with shrink disc

Without centring (SDR)

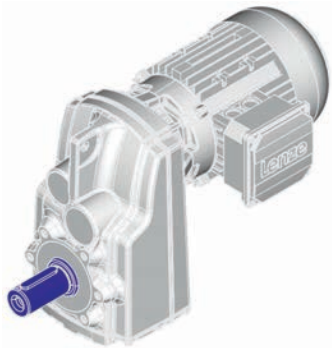
With centering (SCR)

Flange with through holes (SCK)

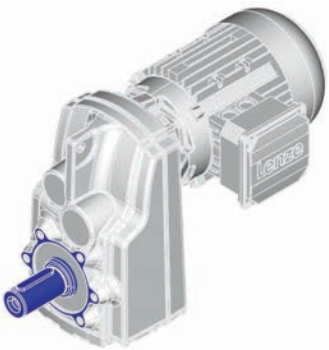
Dimensions, notes

Gearbox designs

Solid shaft



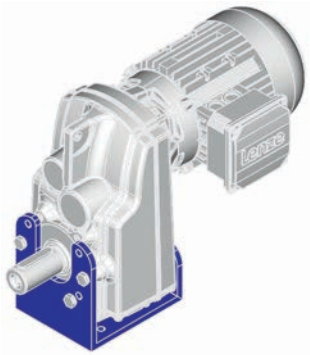
Without centring (VDR)



With centering (VCR)

Flange with through holes (VCK)

Solid shaft

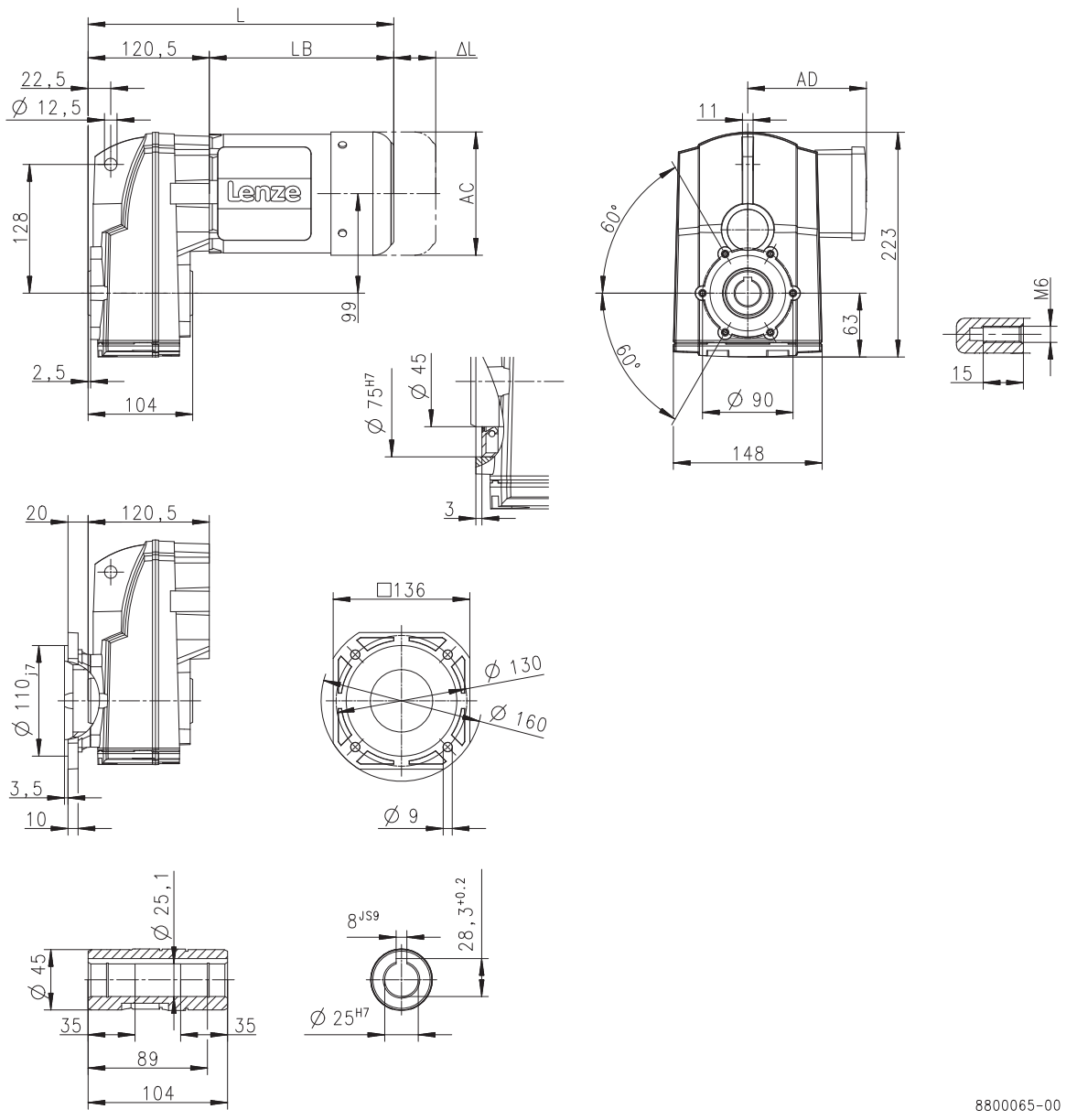


Foot mounting (VBR)

Dimensions, 4-pole motors

g500-S130

Dimensions with hollow shaft
Gearbox design: HDR, HCR, HCK

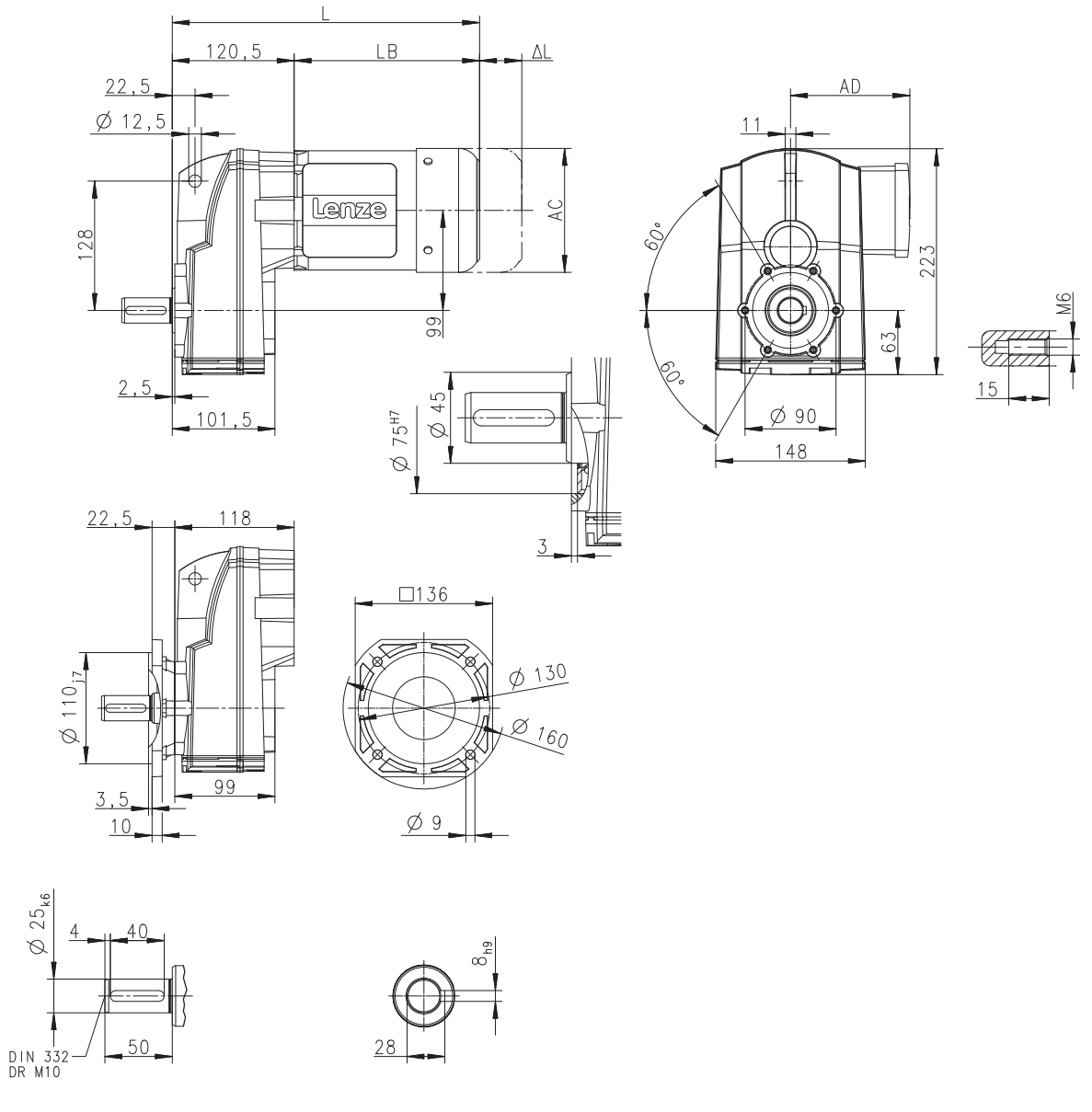


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	304			324		347	406	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-S130

Dimensions with solid shaft
Gearbox design: VDR, VCR, VCK

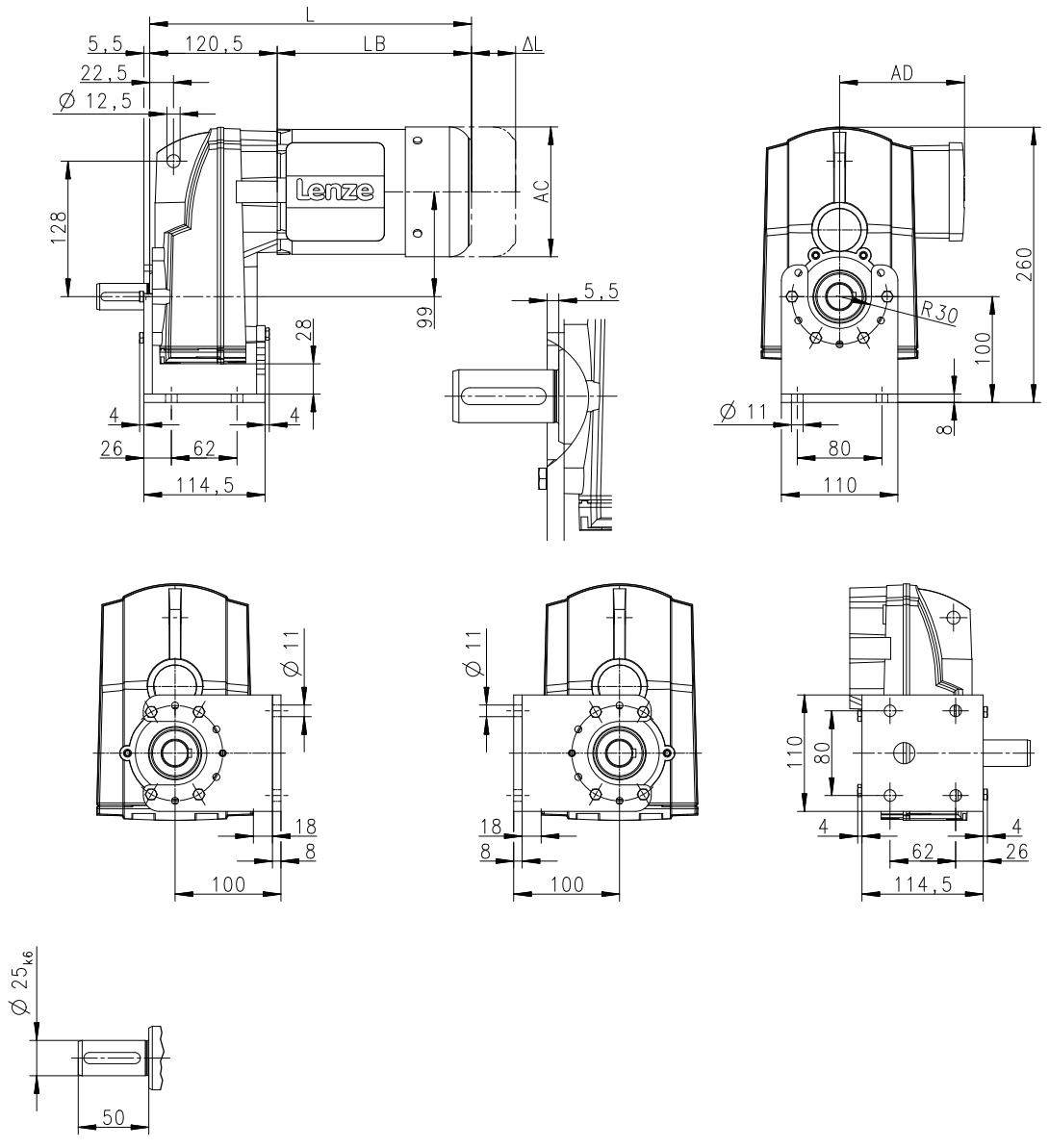


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	304			324		347	406	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-S130

Dimensions with solid shaft
Gearbox design: VBR

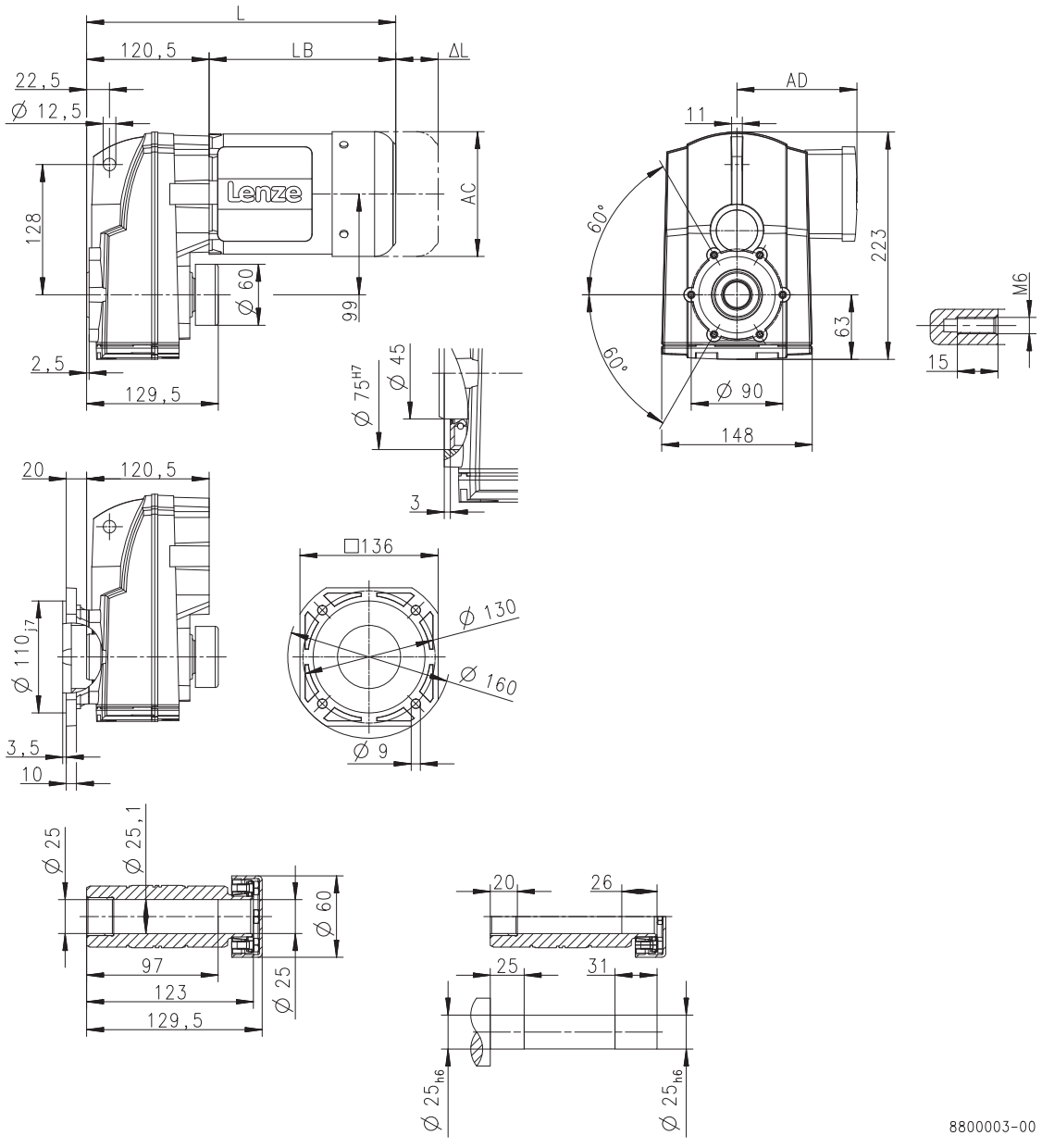


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	304			324		347	406	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-S130

Dimensions with shrink disc
Gearbox design: SDR, SCR, SCK

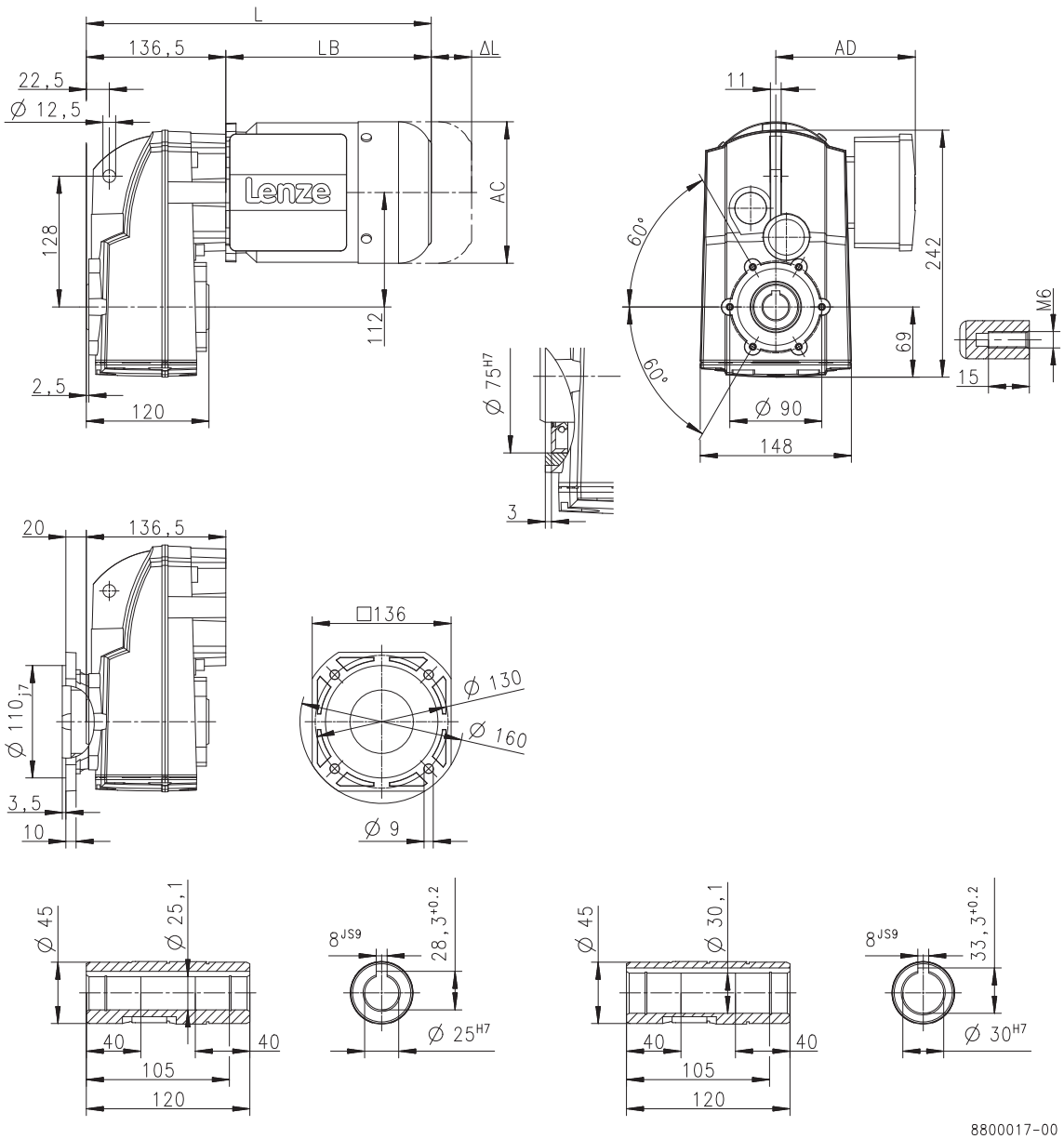


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	304			324		347	406	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-S220

Dimensions with hollow shaft
Gearbox design: HDR, HCR, HCK

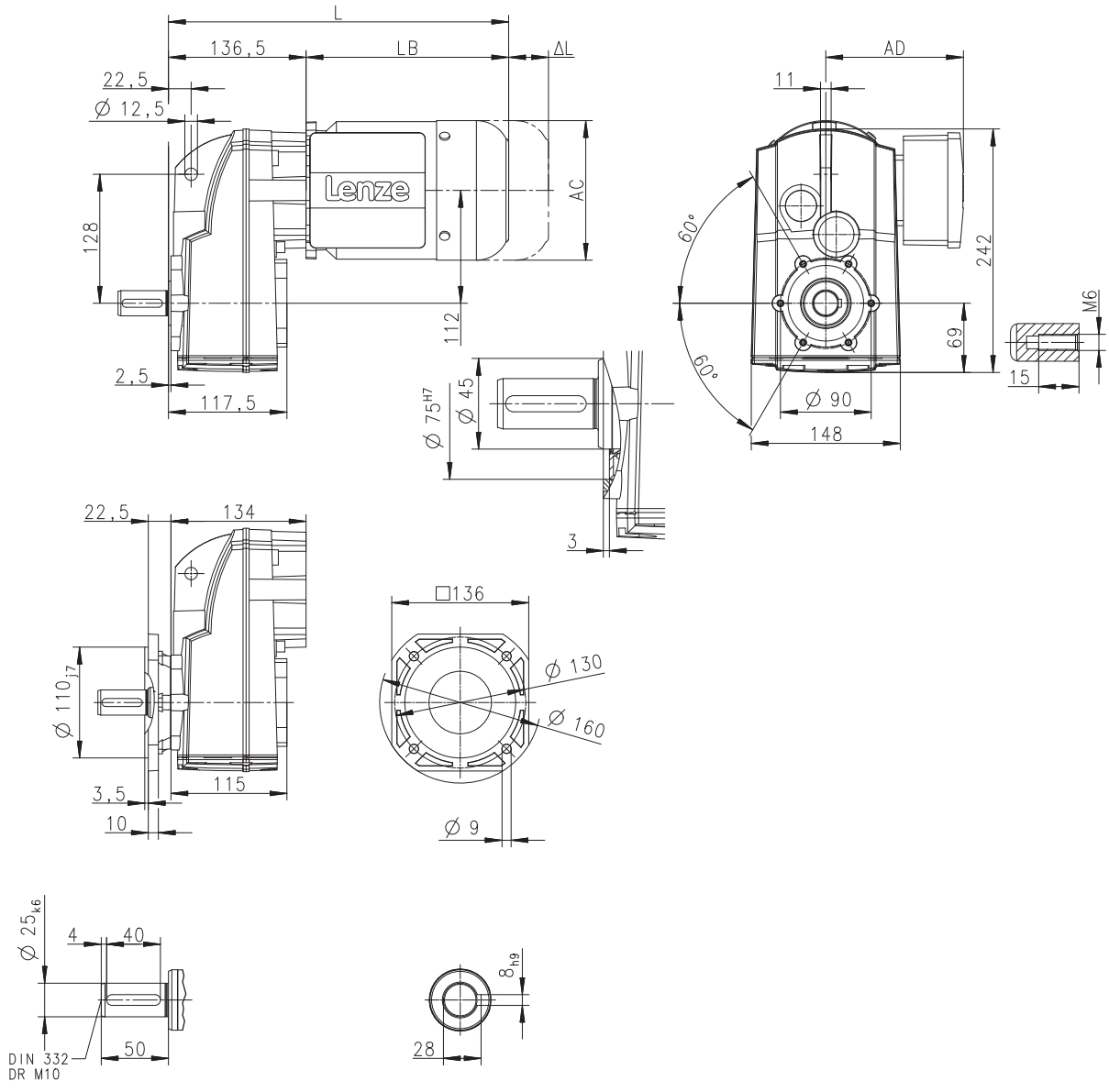


Product			MD□MA□□					MH□MA□□				
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32
Dimensions												
Total length	**L**	**[mm]**	320			340		363	422		458	474
Motor length	**LB**	**[mm]**	183			203		226	285		321	337
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170	
Motor diameter	**AC**	**[mm]**	123			139		156	176		194	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166	

Dimensions, 4-pole motors

g500-S220

Dimensions with solid shaft
Gearbox design: VDR, VCR, VCK

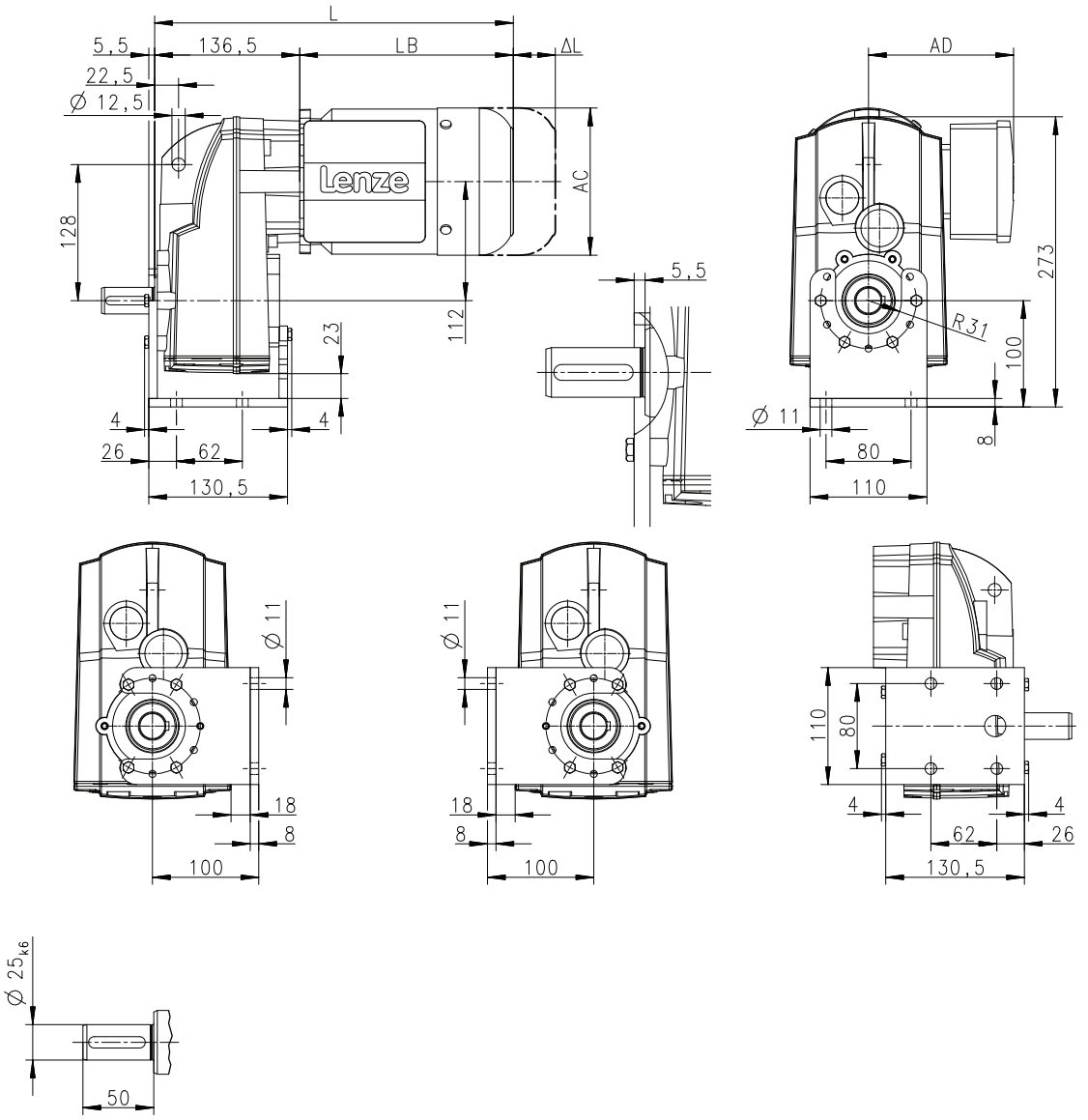


Product			MD□MA□□					MH□MA□□				
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32
Dimensions												
Total length	**L**	**[mm]**	320			340		363	422		458	474
Motor length	**LB**	**[mm]**	183			203		226	285		321	337
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170	
Motor diameter	**AC**	**[mm]**	123			139		156	176		194	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166	

Dimensions, 4-pole motors

g500-S220

Dimensions with solid shaft
Gearbox design: VBR



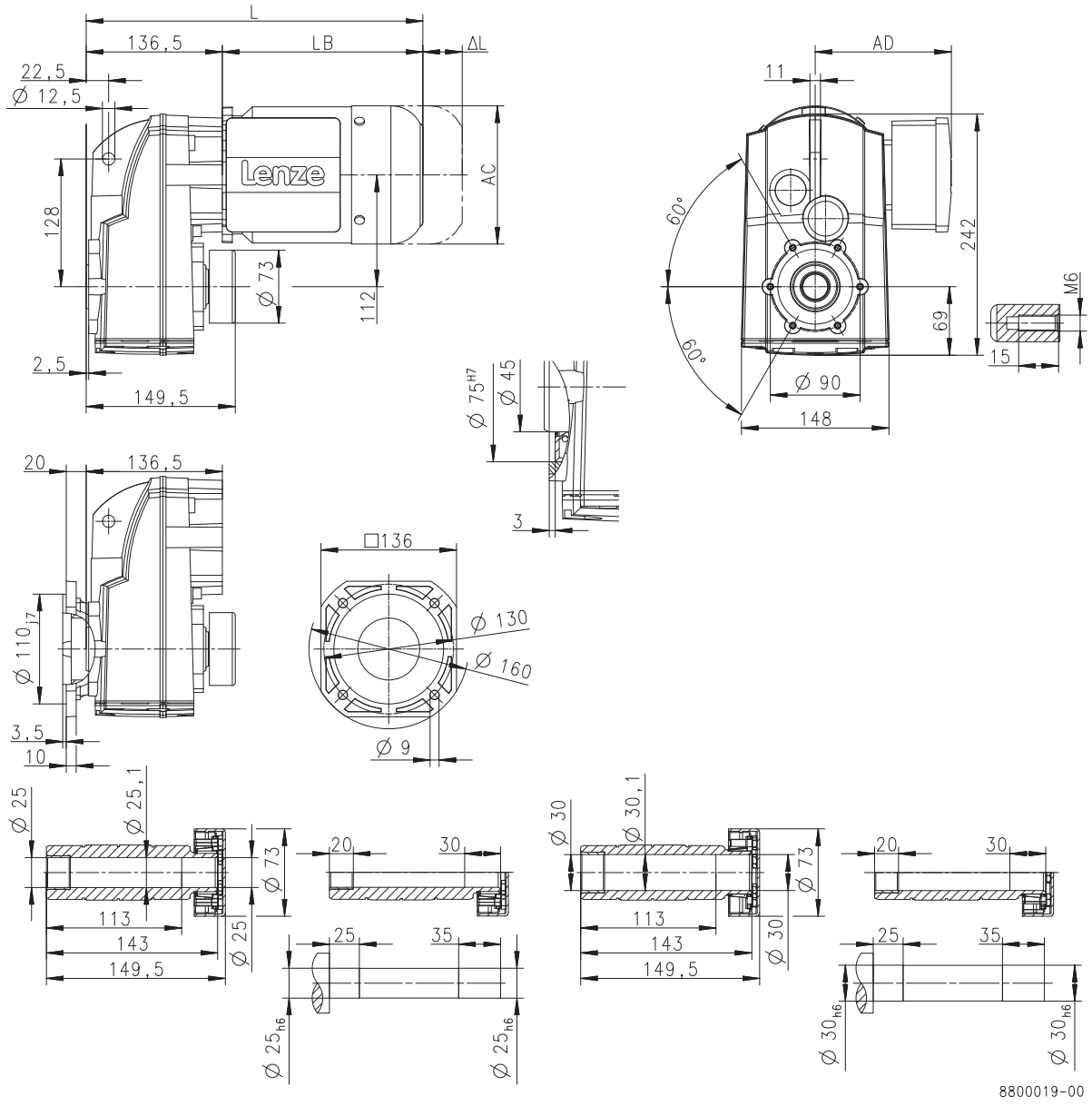
8800020-00

Product			MD□MA□□					MH□MA□□				
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32
Dimensions												
Total length	**L**	**[mm]**	320			340		363	422		458	474
Motor length	**LB**	**[mm]**	183			203		226	285		321	337
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	152	157	166	

Dimensions, 4-pole motors

g500-S220

Dimensions with shrink disc
Gearbox design: SDR, SCR, SCK

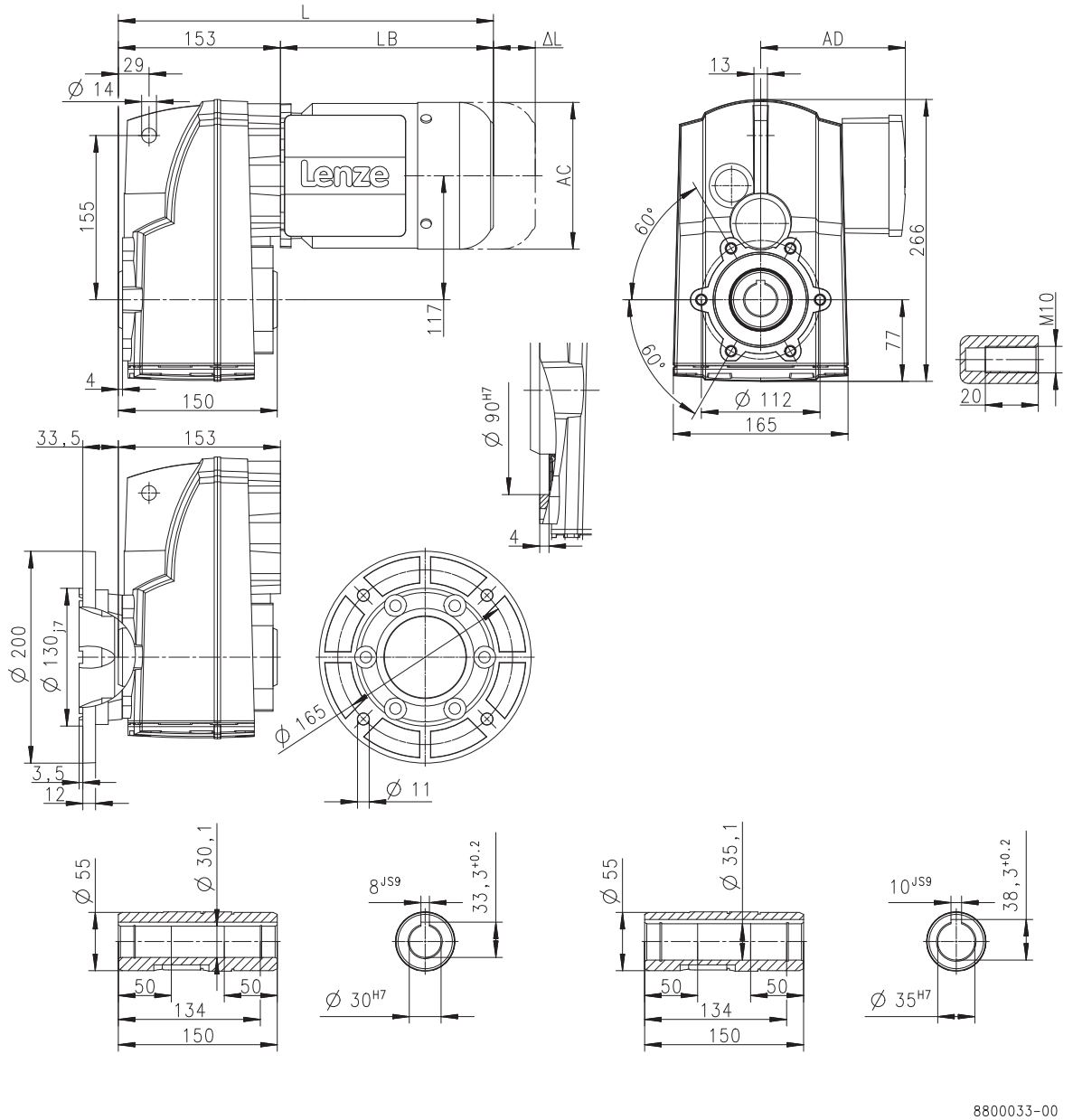


Product			MD□MA□□					MH□MA□□				
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32
Dimensions												
Total length	**L**	**[mm]**	320			340		363	422		458	474
Motor length	**LB**	**[mm]**	183			203		226	285		321	337
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170	
Motor diameter	**AC**	**[mm]**	123			139		156	176		194	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166	

Dimensions, 4-pole motors

g500-S400

Dimensions with hollow shaft
Gearbox design: HDR, HCR, HCK

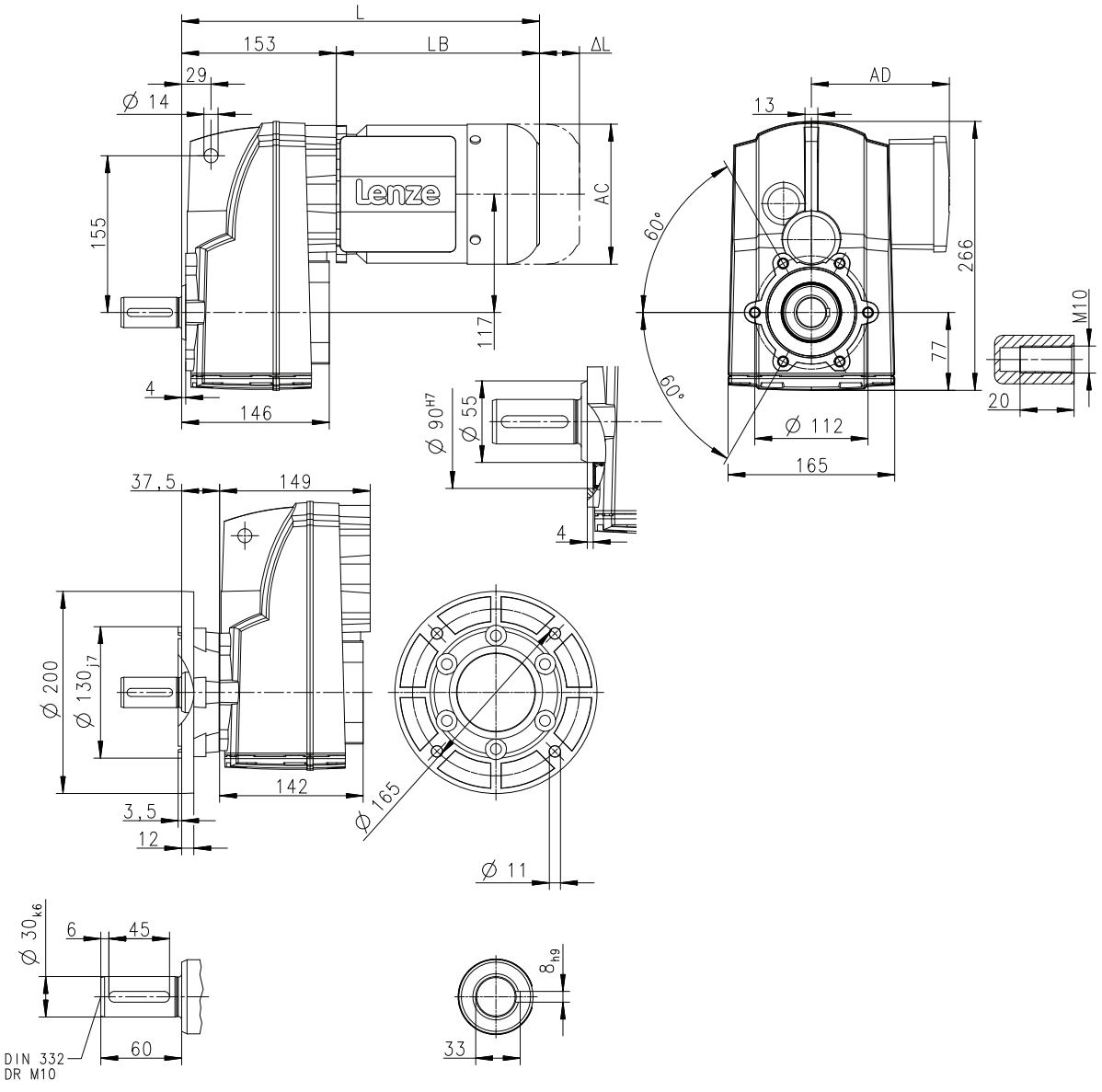


Product			MD□MA□□					MH□MA□□					
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32	112-22
Dimensions													
Total length	**L**	**[mm]**	336			356		379	438		474	490	533
Motor length	**LB**	**[mm]**	183			203		226	285		321	337	380
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170		183
Motor diameter	**AC**	**[mm]**	123			139		156	176		194		218
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166		176

Dimensions, 4-pole motors

g500-S400

Dimensions with solid shaft
Gearbox design: VDR, VCR, VCK

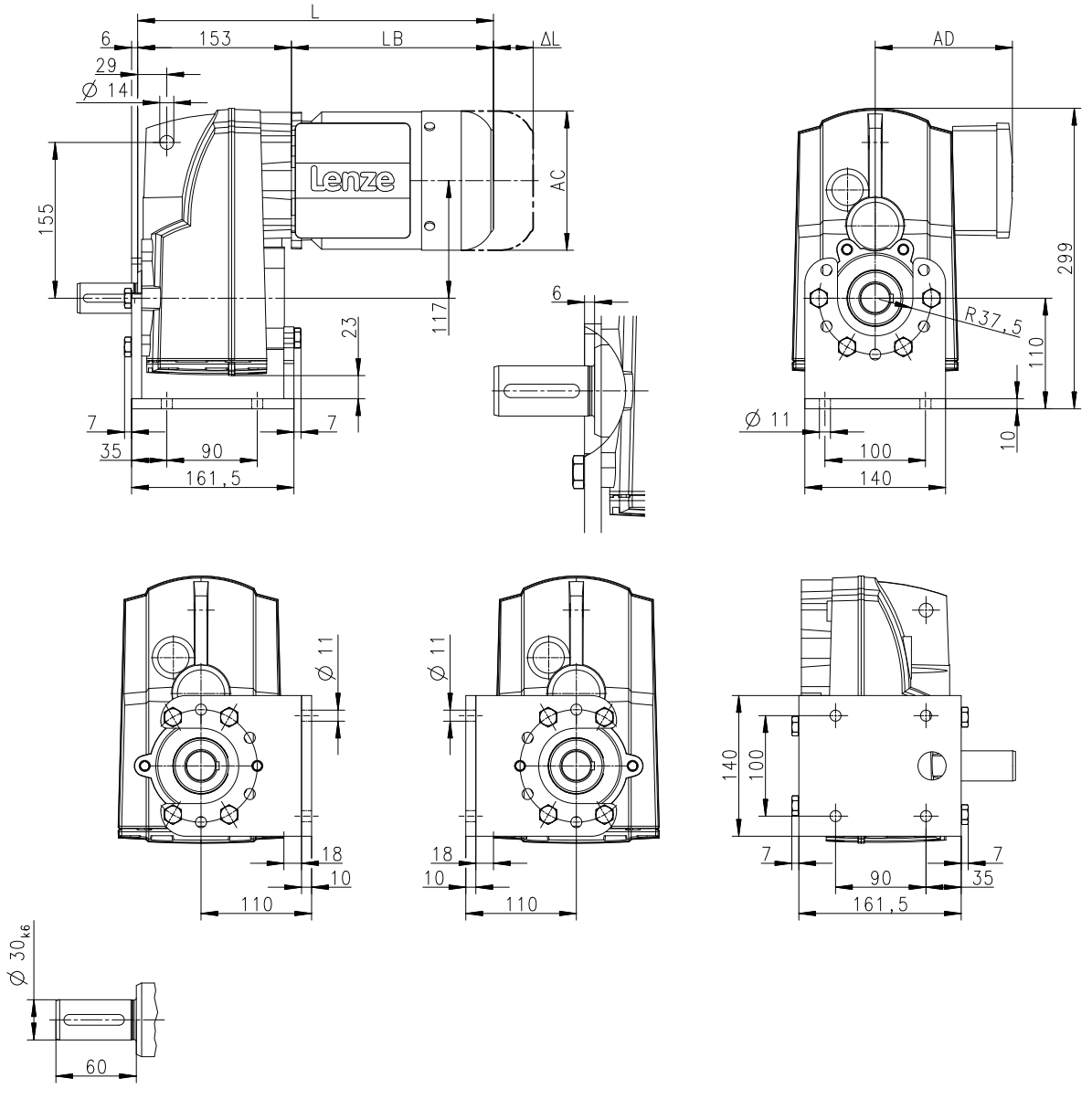


Product			MD□MA□□					MH□MA□□					
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32	112-22
Dimensions													
Total length	**L**	**[mm]**	336			356		379	438		474	490	533
Motor length	**LB**	**[mm]**	183			203		226	285		321	337	380
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170		183
Motor diameter	**AC**	**[mm]**	123			139		156	176		194		218
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166		176

Dimensions, 4-pole motors

g500-S400

Dimensions with solid shaft
Gearbox design: VBR

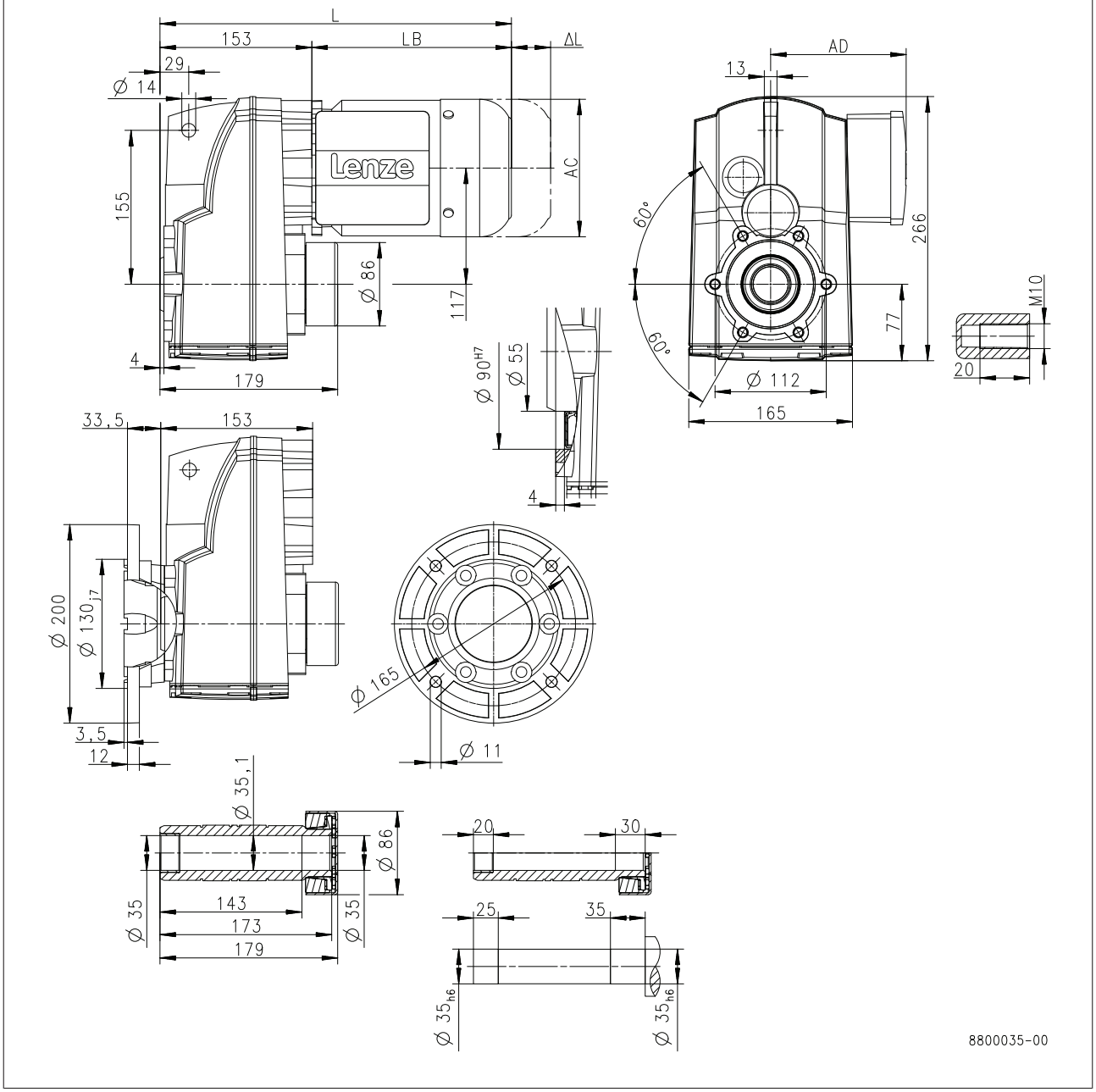


Product			MD□MA□□					MH□MA□□					
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32	112-22
Dimensions													
Total length	**L**	**[mm]**	336			356		379	438		474	490	533
Motor length	**LB**	**[mm]**	183			203		226	285		321	337	380
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170		183
Motor diameter	**AC**	**[mm]**	123			139		156	176		194		218
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166		176

Dimensions, 4-pole motors

g500-S400

Dimensions with shrink disc
Gearbox design: SDR, SCR, SCK

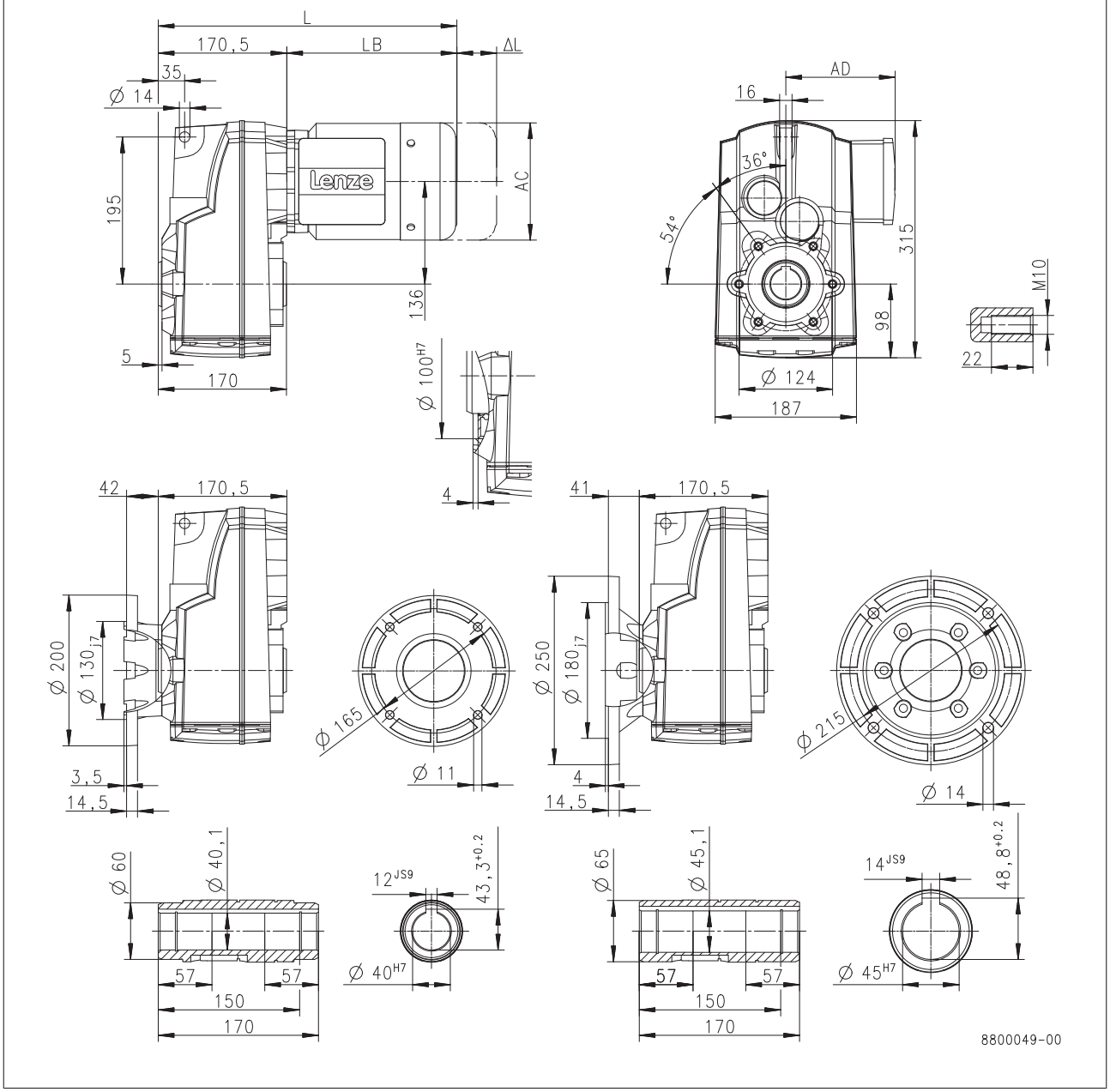


Product			MD□MA□□					MH□MA□□					
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32	112-22
Dimensions													
Total length	**L**	**[mm]**	336			356		379	438		474	490	533
Motor length	**LB**	**[mm]**	183			203		226	285		321	337	380
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170		183
Motor diameter	**AC**	**[mm]**	123			139		156	176		194		218
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166		176

Dimensions, 4-pole motors

g500-S660

Dimensions with hollow shaft
Gearbox design: HDR, HCR, HCK

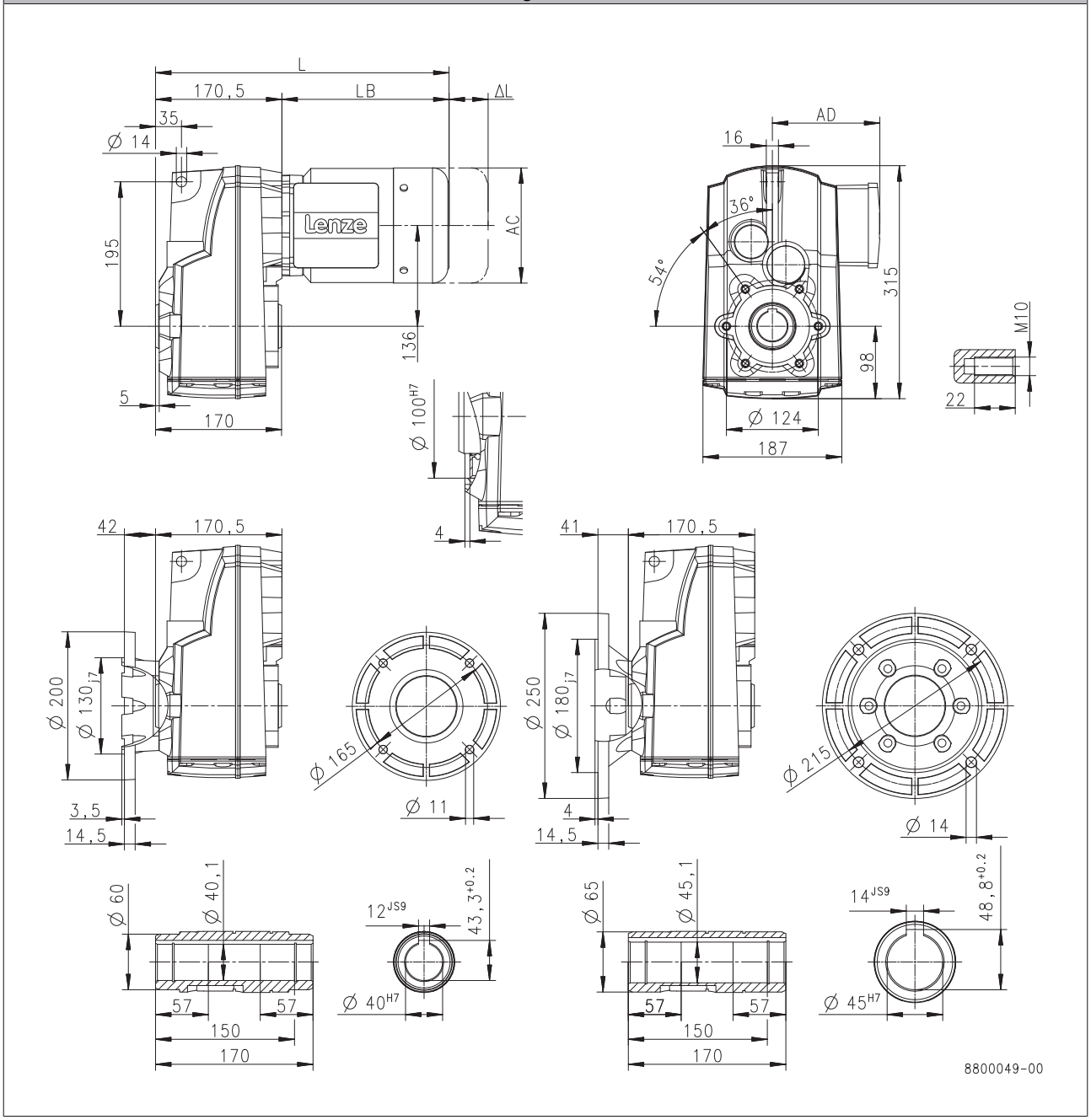


Product			MD□MA□□					MH□MA□□
			063-12	063-32	063-42	071-32	071-42	080-32
Dimensions								
Total length	**L**	**[mm]**	354			374		397
Motor length	**LB**	**[mm]**	183			203		226
Length of motor options	**Δ L**	**[mm]**	170			165		183
Motor diameter	**AC**	**[mm]**	123			139		156
Distance motor/connection	**AD**	**[mm]**	100			109		150

Dimensions, 4-pole motors

g500-S660

Dimensions with hollow shaft
Gearbox design: HDR, HCR, HCK

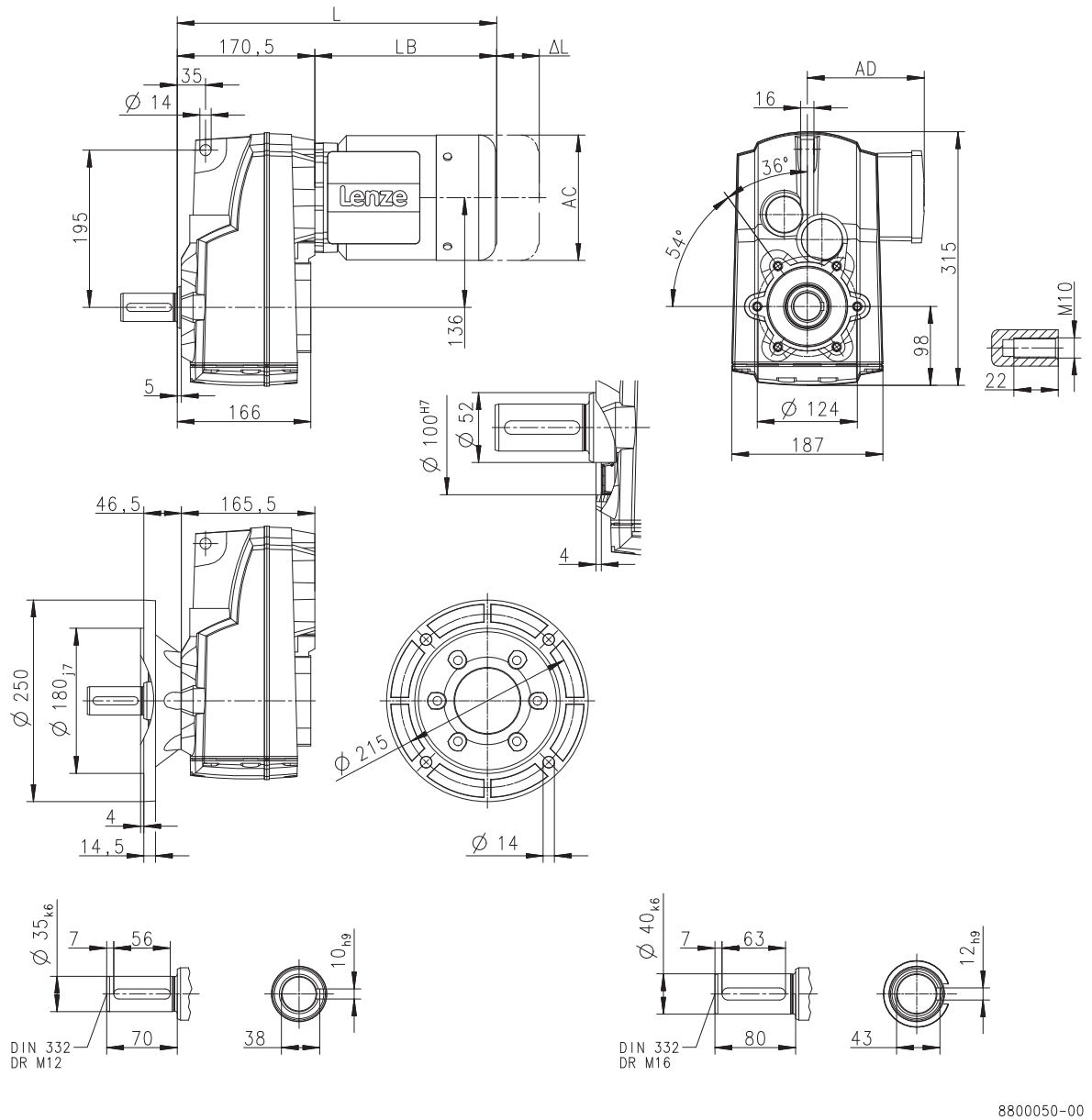


Product			MH□MA□□						
			090-12	090-32	100-12	100-32	112-22	132-12	132-22
Dimensions									
Total length	**L**	**[mm]**	456		492	508	551	599	
Motor length	**LB**	**[mm]**	285		321	337	380	428	
Length of motor options	**Δ L**	**[mm]**	181		170		183	202	
Motor diameter	**AC**	**[mm]**	176		194		218	258	
Distance motor/connection	**AD**	**[mm]**	152	157	166		176	195	

Dimensions, 4-pole motors

g500-S660

Dimensions with solid shaft
Gearbox design: VDR, VCR, VCK

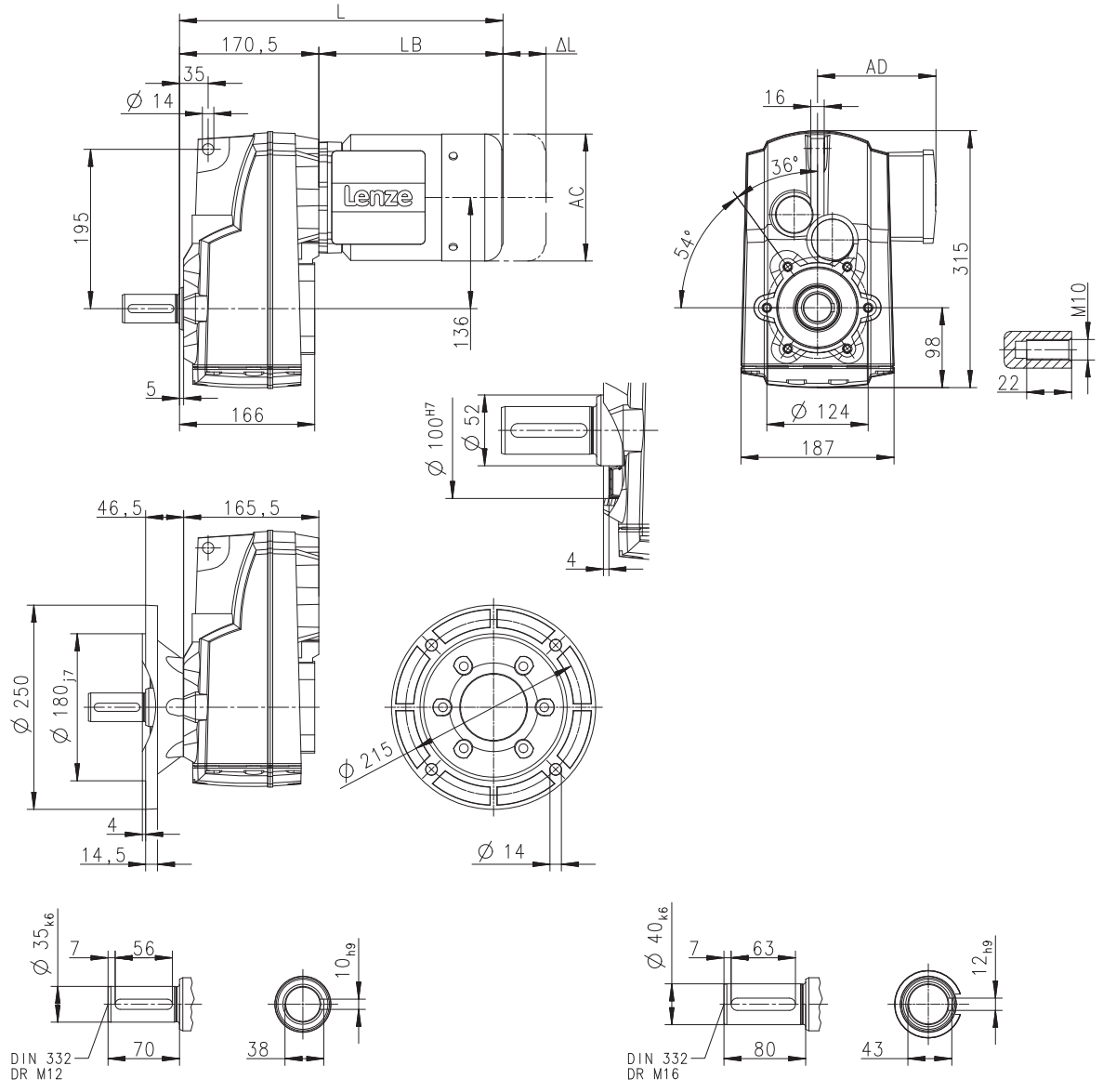


Product			MD□MA□□					MH□MA□□
			063-12	063-32	063-42	071-32	071-42	080-32
Dimensions								
Total length	**L**	**[mm]**	354			374		397
Motor length	**LB**	**[mm]**	183			203		226
Length of motor options	**Δ L**	**[mm]**	170			165		183
Motor diameter	**AC**	**[mm]**	123			139		156
Distance motor/connection	**AD**	**[mm]**	100			109		150

Dimensions, 4-pole motors

g500-S660

Dimensions with solid shaft
Gearbox design: VDR, VCR, VCK

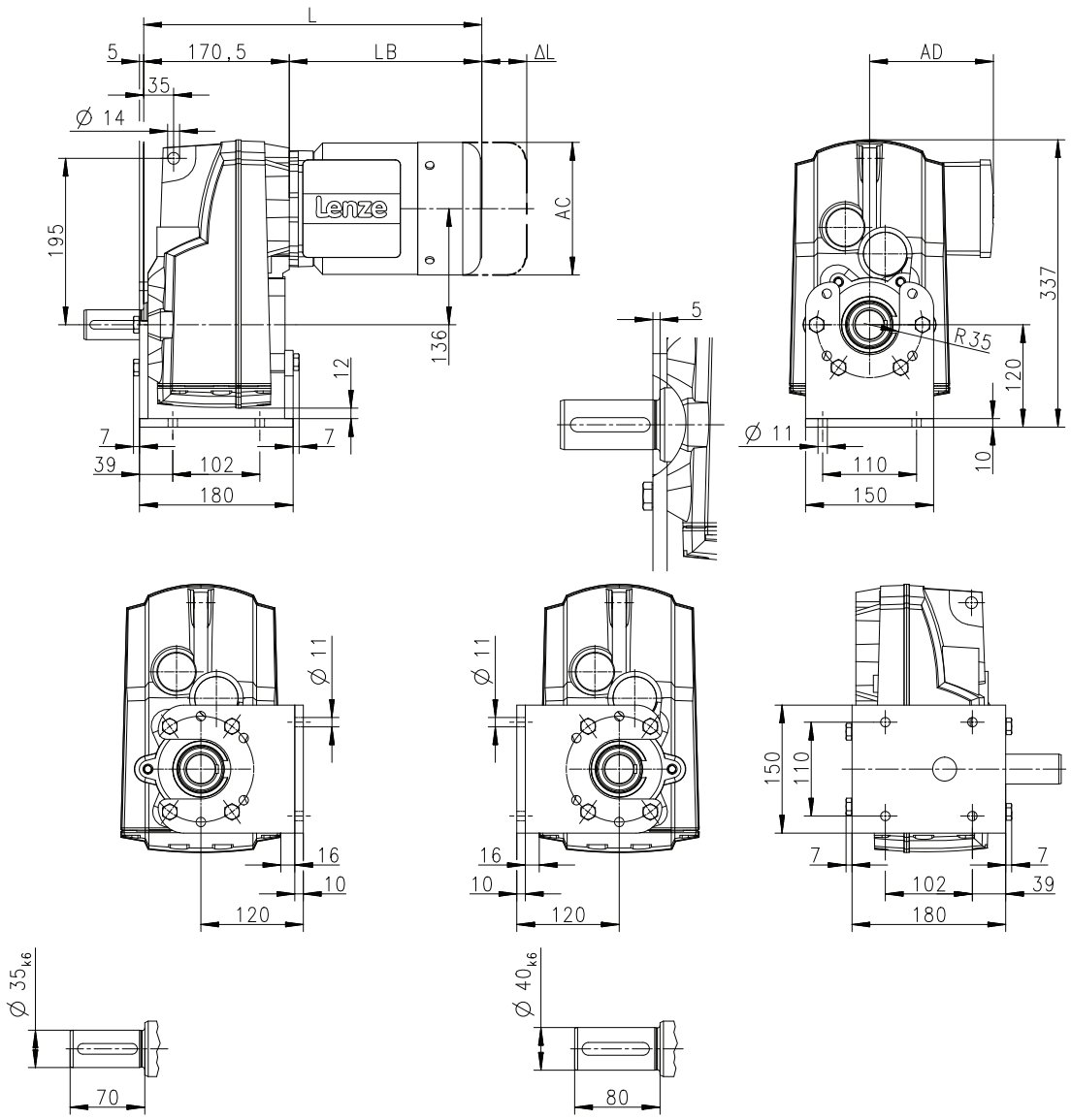


Product			MH□MA□□						
			090-12	090-32	100-12	100-32	112-22	132-12	132-22
Dimensions									
Total length	**L**	**[mm]**	456		492	508	551	599	
Motor length	**LB**	**[mm]**	285		321	337	380	428	
Length of motor options	**Δ L**	**[mm]**	181		170		183	202	
Motor diameter	**AC**	**[mm]**	176		194		218	258	
Distance motor/connection	**AD**	**[mm]**	152	157	166		176	195	

Dimensions, 4-pole motors

g500-S660

Dimensions with solid shaft
Gearbox design: VBR

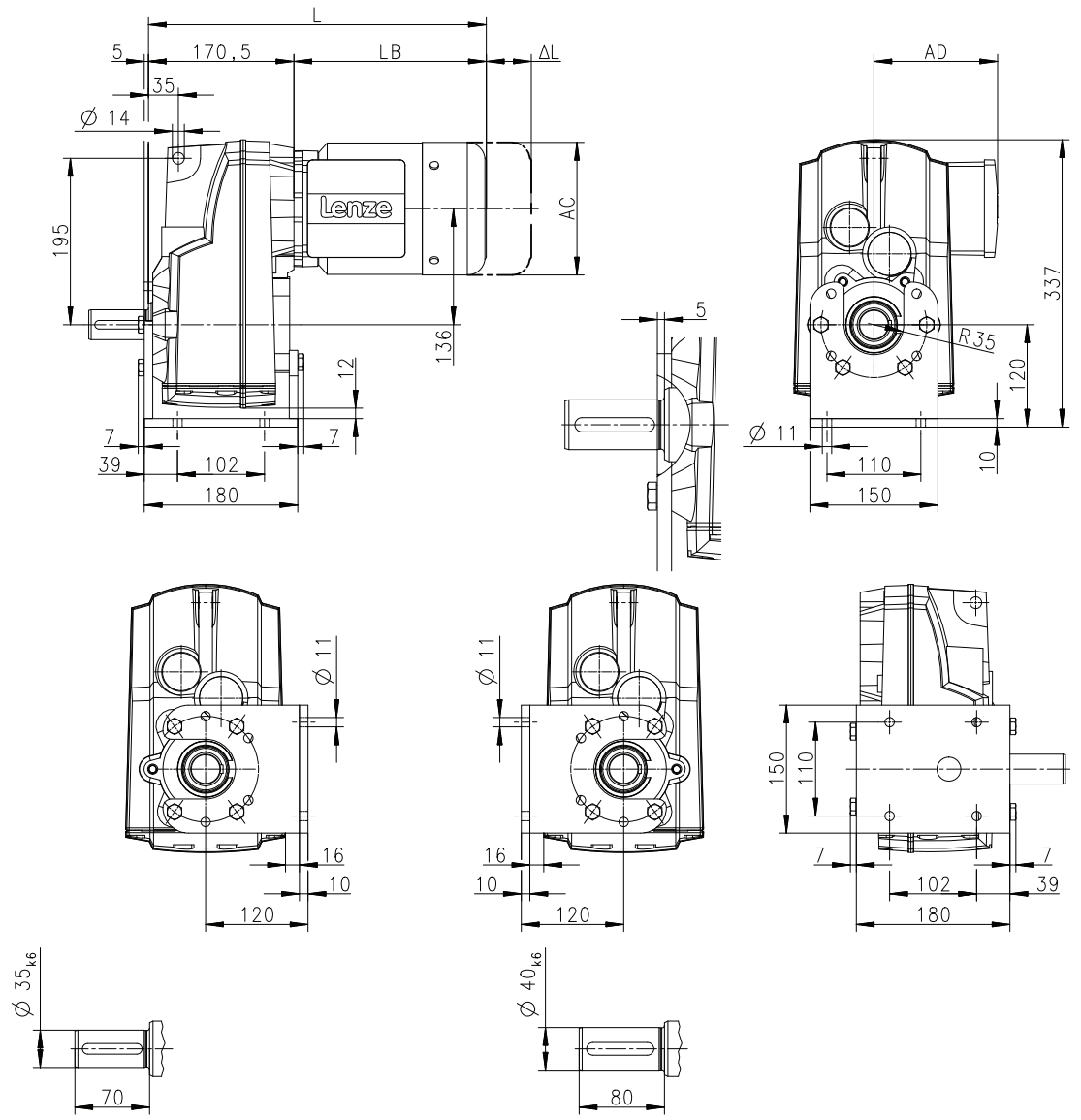


Product			MD□MA□□					MH□MA□□
			063-12	063-32	063-42	071-32	071-42	080-32
Dimensions								
Total length	**L**	**[mm]**	354			374		397
Motor length	**LB**	**[mm]**	183			203		226
Length of motor options	**Δ L**	**[mm]**	170			165		183
Motor diameter	**AC**	**[mm]**	123			139		156
Distance motor/connection	**AD**	**[mm]**	100			109		150

Dimensions, 4-pole motors

g500-S660

Dimensions with solid shaft
Gearbox design: VBR



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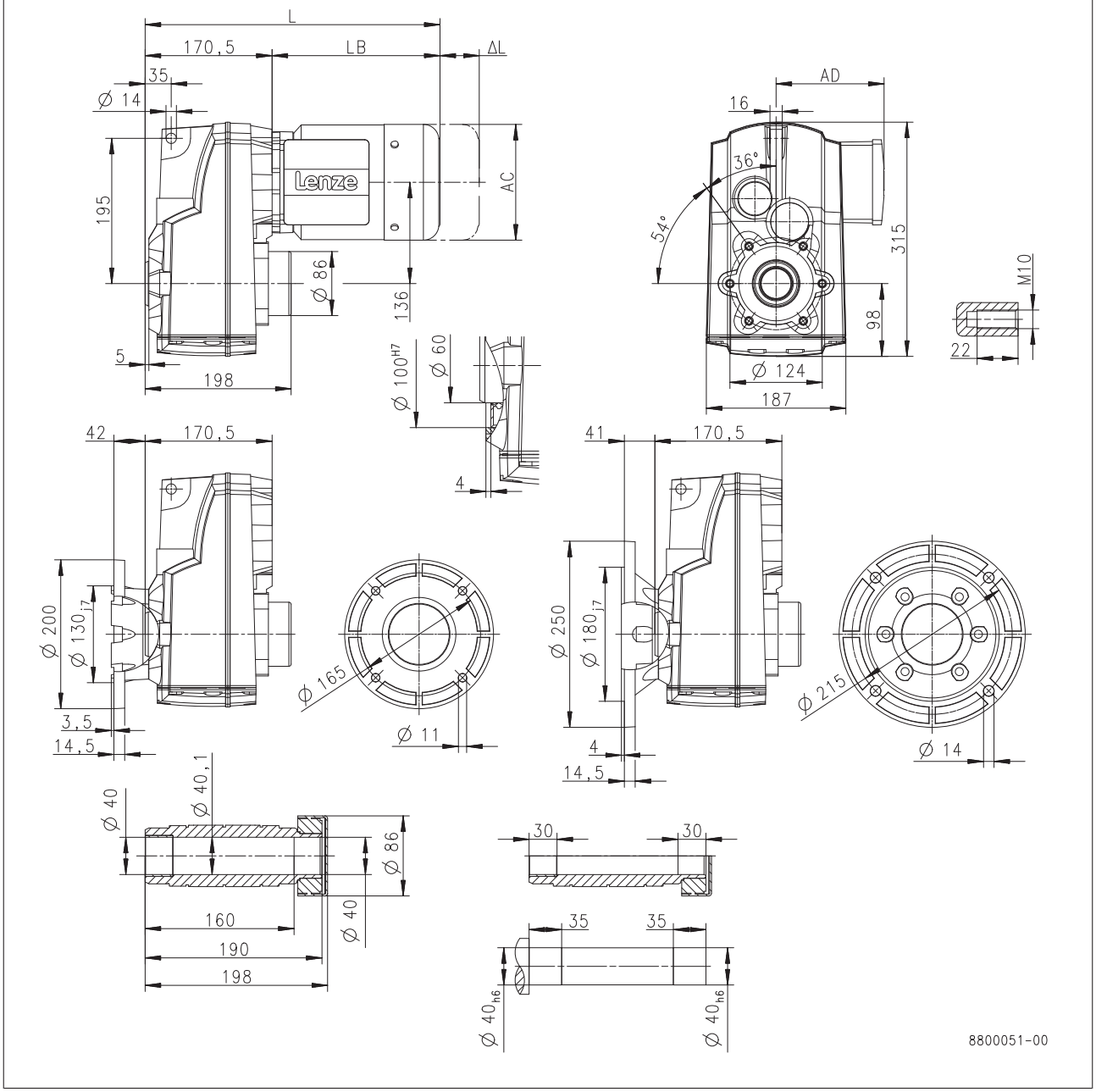
Product			MH□MA□□						
			090-12	090-32	100-12	100-32	112-22	132-12	132-22
Dimensions									
Total length	**L**	**[mm]**	456		492	508	551	599	
Motor length	**LB**	**[mm]**	285		321	337	380	428	
Length of motor options	**Δ L**	**[mm]**	181		170		183	202	
Motor diameter	**AC**	**[mm]**	176		194		218	258	
Distance motor/connection	**AD**	**[mm]**	152	157	166		176	195	

Dimensions, 4-pole motors

g500-S660

Dimensions with shrink disc
Gearbox design: SDR, SCR, SCK

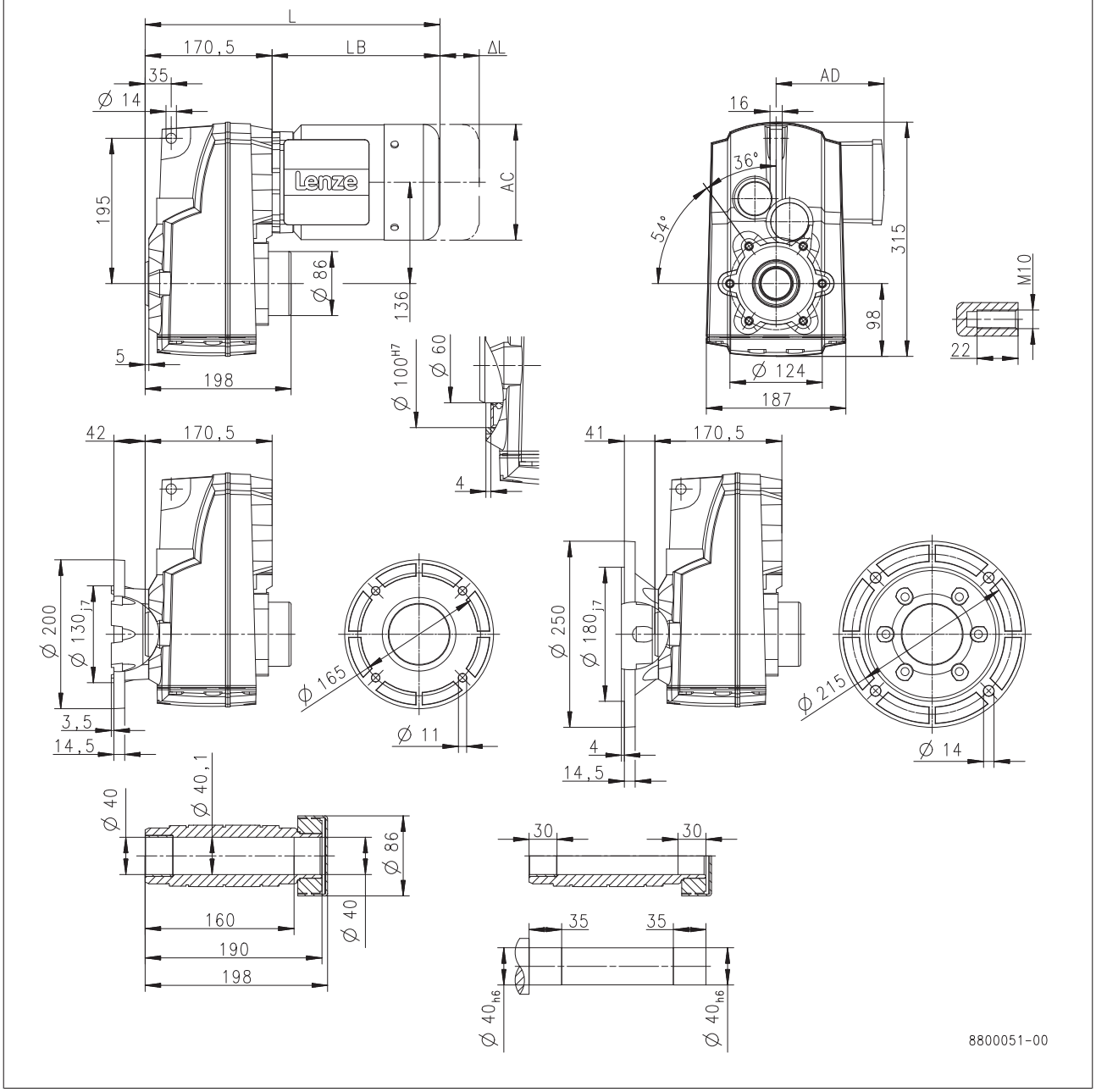


Product			MD□MA□□					MH□MA□□
			063-12	063-32	063-42	071-32	071-42	080-32
Dimensions								
Total length	**L**	**[mm]**	354			374		397
Motor length	**LB**	**[mm]**	183			203		226
Length of motor options	**Δ L**	**[mm]**	170			165		183
Motor diameter	**AC**	**[mm]**	123			139		156
Distance motor/connection	**AD**	**[mm]**	100			109		150

Dimensions, 4-pole motors

g500-S660

Dimensions with shrink disc
Gearbox design: SDR, SCR, SCK

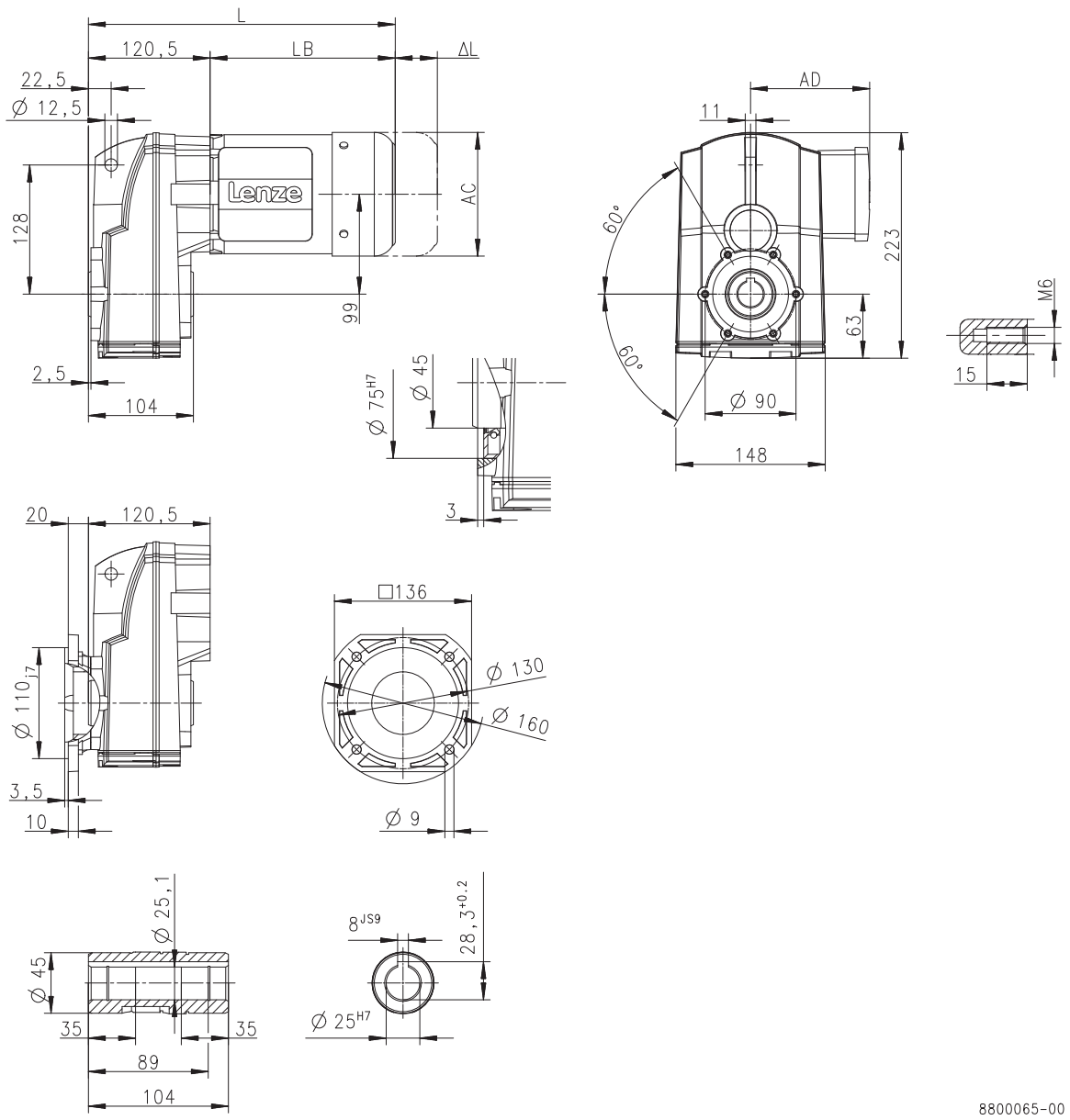


Product			MH□MA□□						
			090-12	090-32	100-12	100-32	112-22	132-12	132-22
Dimensions									
Total length	**L**	**[mm]**	456		492	508	551	599	
Motor length	**LB**	**[mm]**	285		321	337	380	428	
Length of motor options	**Δ L**	**[mm]**	181		170		183	202	
Motor diameter	**AC**	**[mm]**	176		194		218	258	
Distance motor/connection	**AD**	**[mm]**	152	157	166		176	195	

Dimensions, 2-pole and 6-pole motors

g500-S130

Dimensions with hollow shaft
Gearbox design: HDR, HCR, HCK

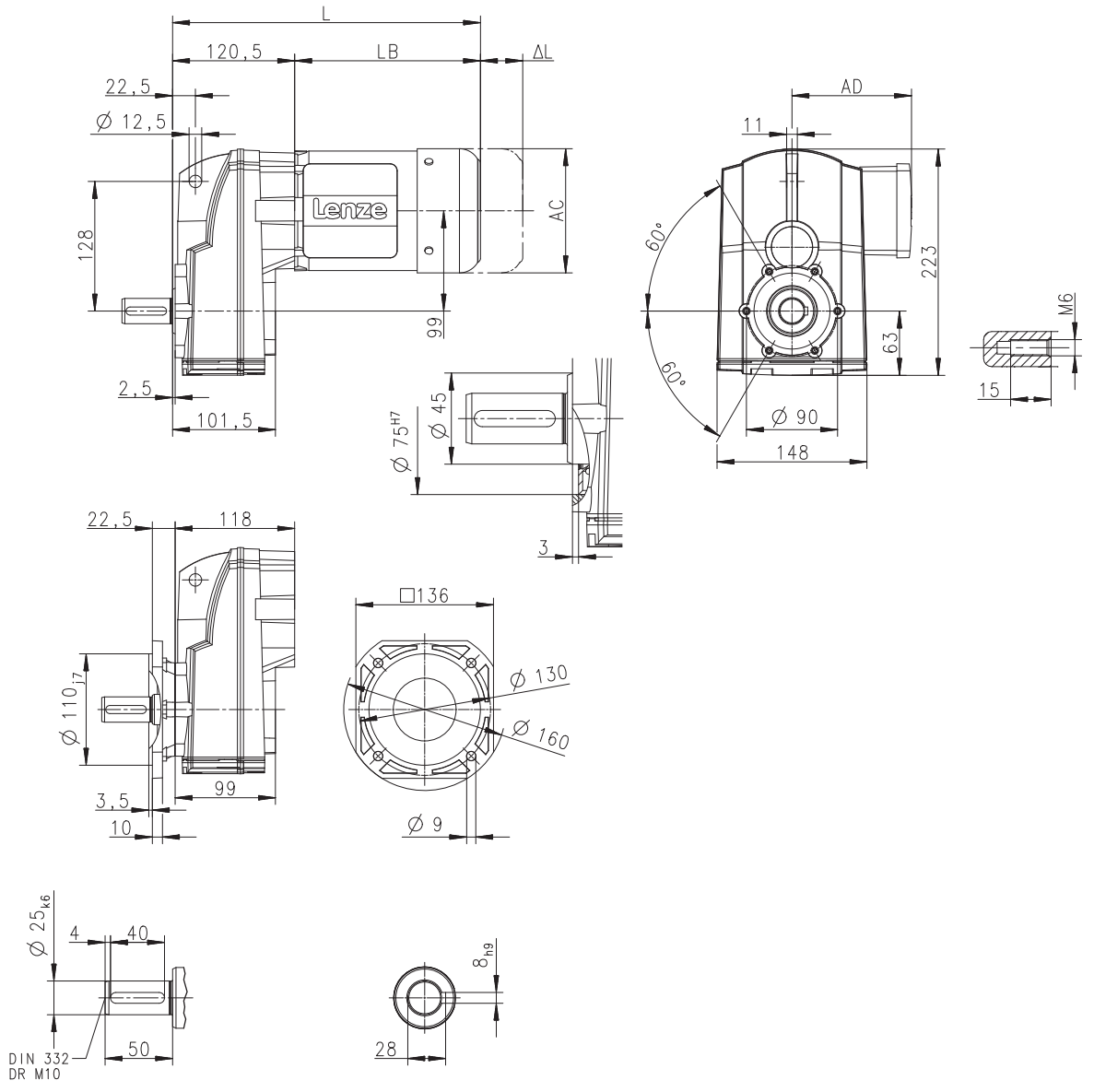


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	304		324				347	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-S130

Dimensions with solid shaft
Gearbox design: VDR, VCR, VCK

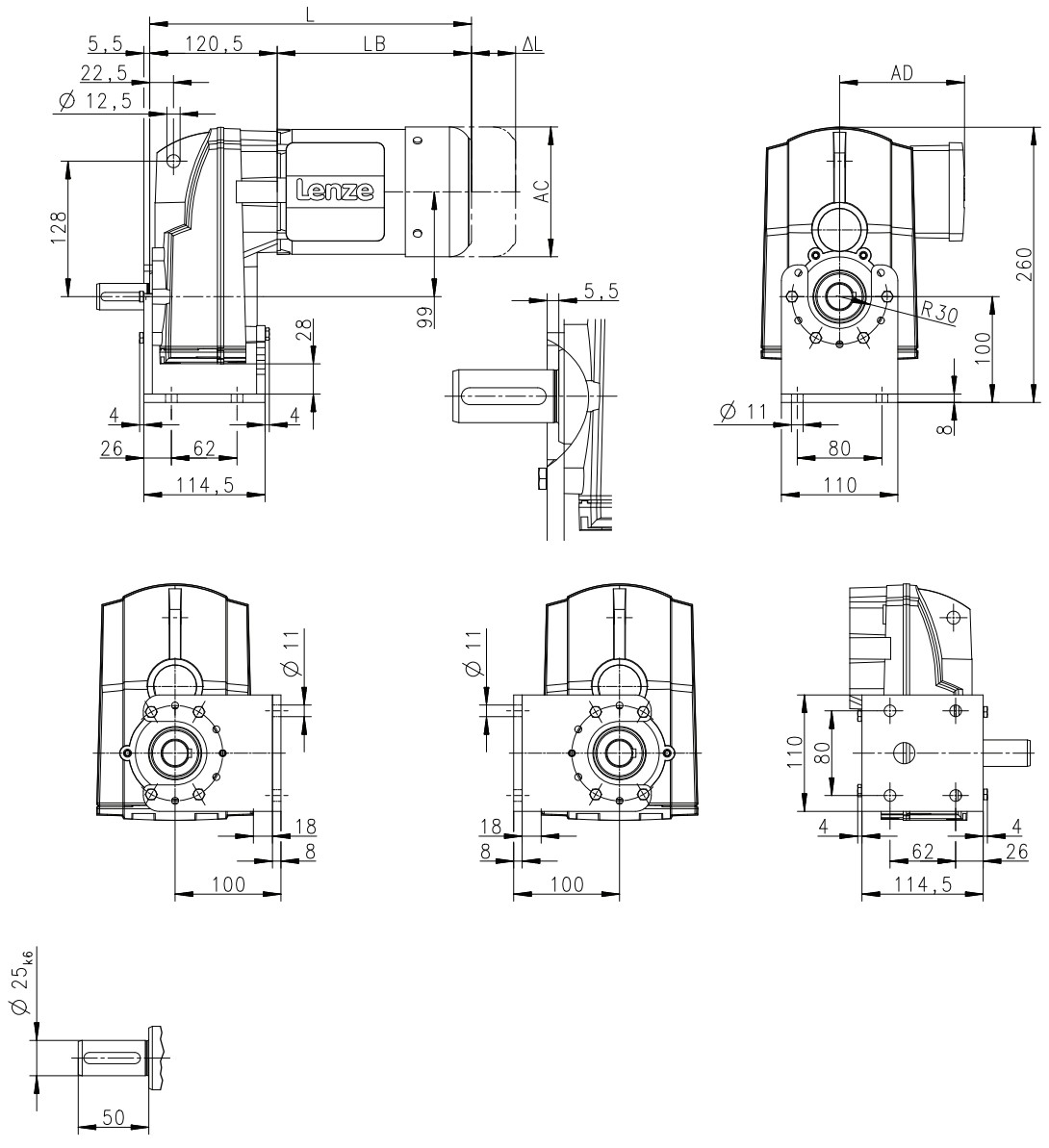


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	304		324				347	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-S130

Dimensions with solid shaft
Gearbox design: VBR

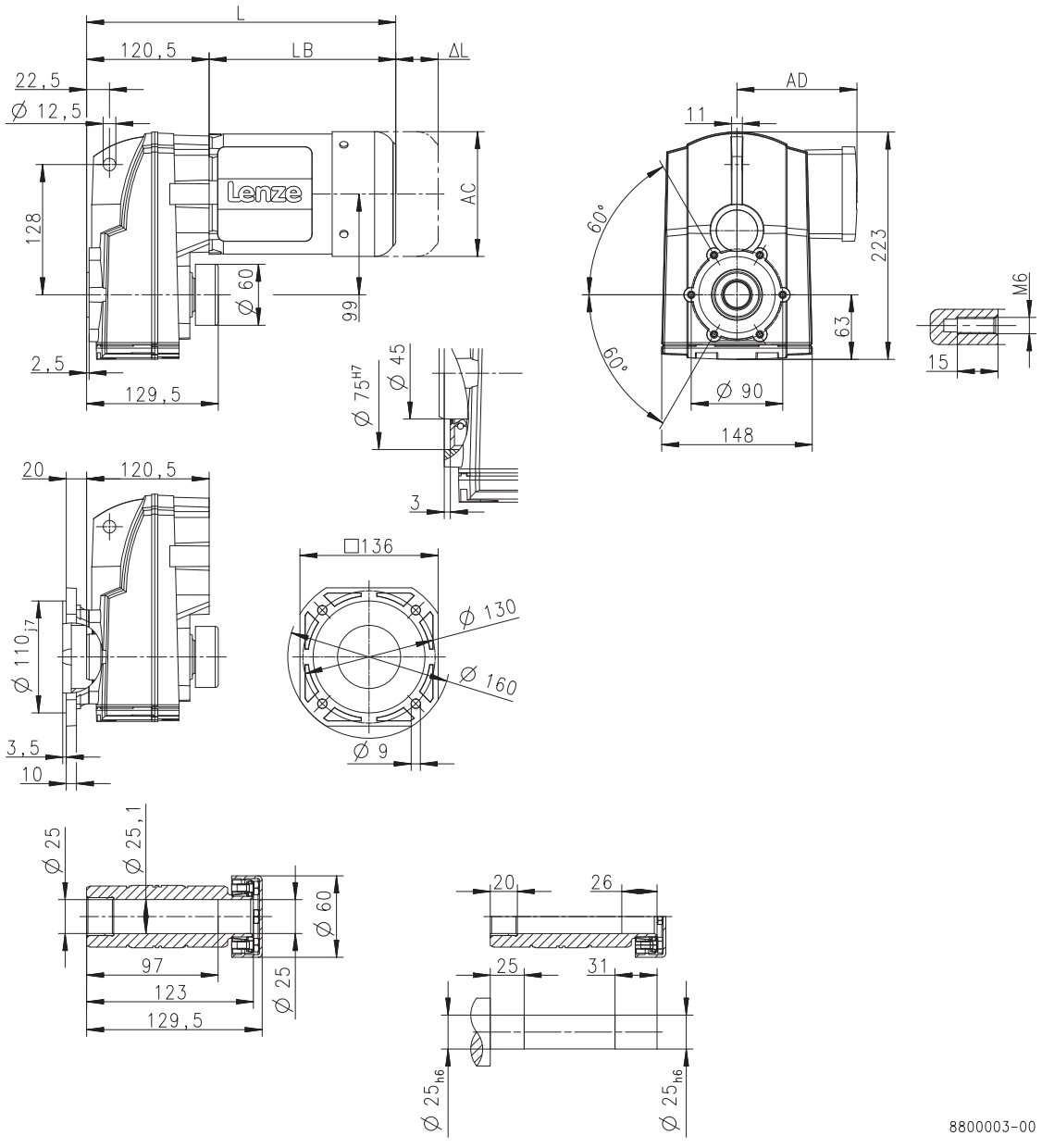


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	304		324				347	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-S130

Dimensions with shrink disc
Gearbox design: SDR, SCR, SCK

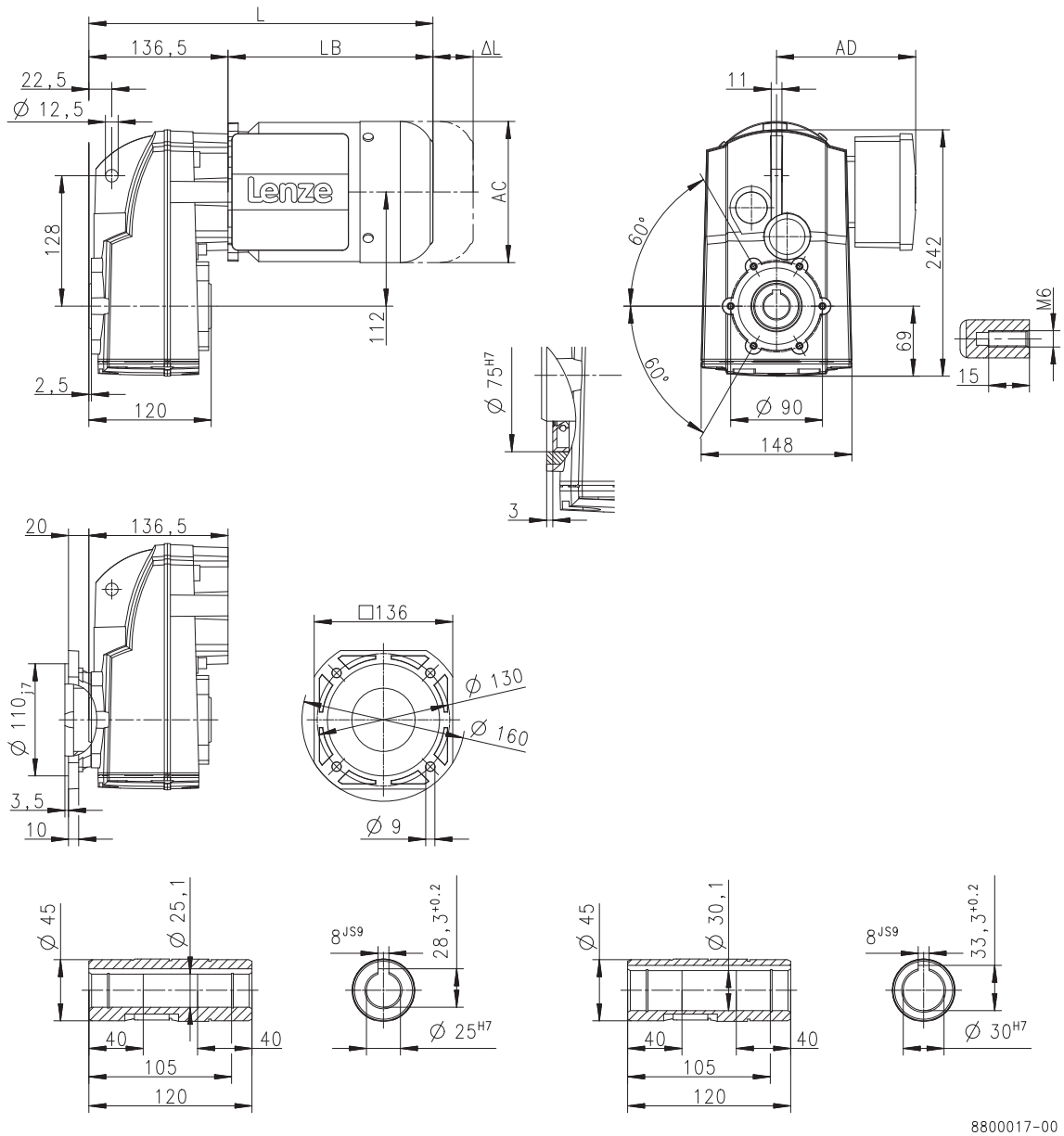


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	304		324				347	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-S220

Dimensions with hollow shaft
Gearbox design: HDR, HCR, HCK

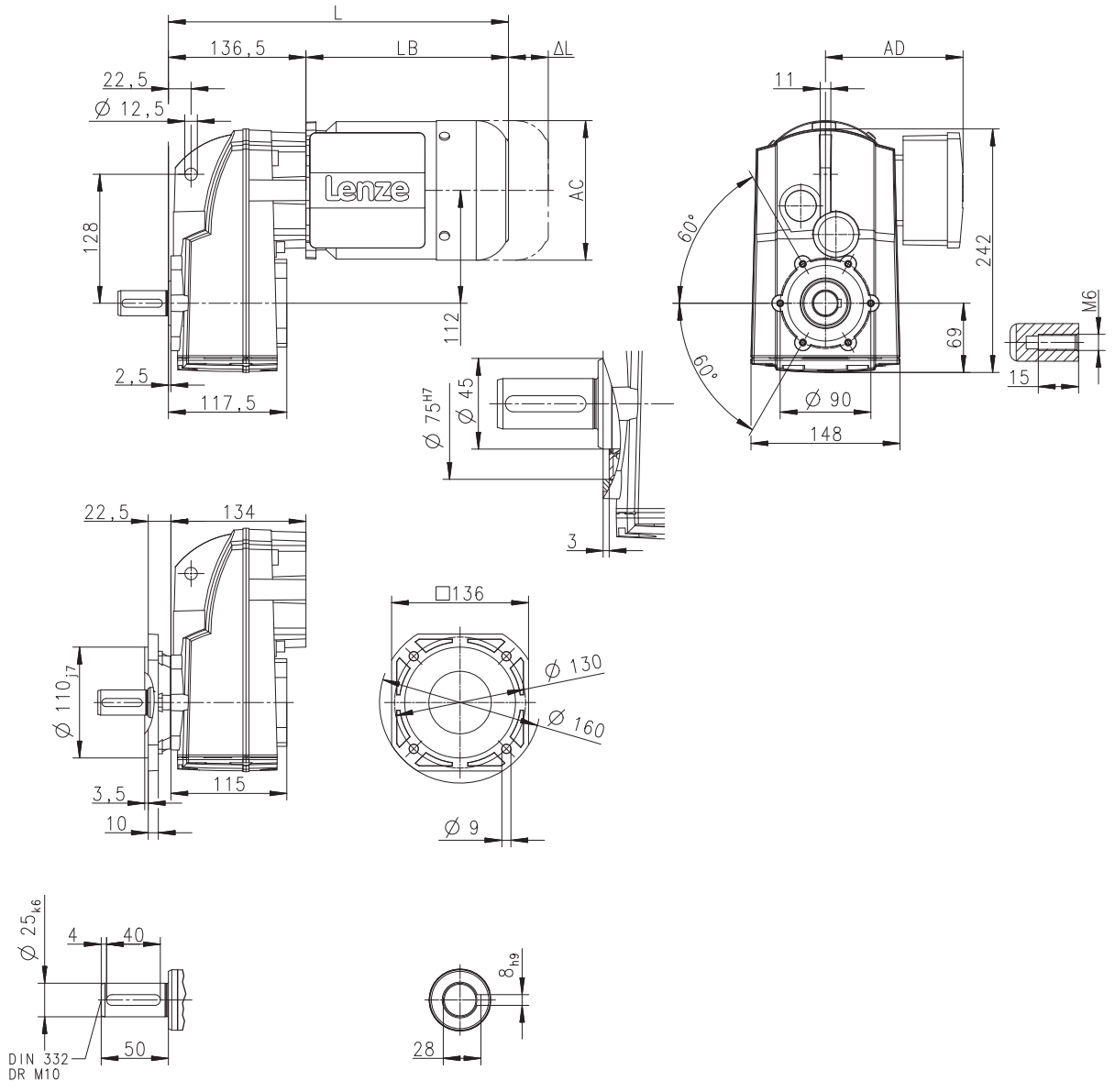


Product			MD□MA□□						
			063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions									
Total length	**L**	**[mm]**	320	340				363	
Motor length	**LB**	**[mm]**	183	203				226	
Length of motor options	**Δ L**	**[mm]**	170	165				183	
Motor diameter	**AC**	**[mm]**	123	139				156	
Distance motor/connection	**AD**	**[mm]**	100	109				150	

Dimensions, 2-pole and 6-pole motors

g500-S220

Dimensions with solid shaft
Gearbox design: VDR, VCR, VCK

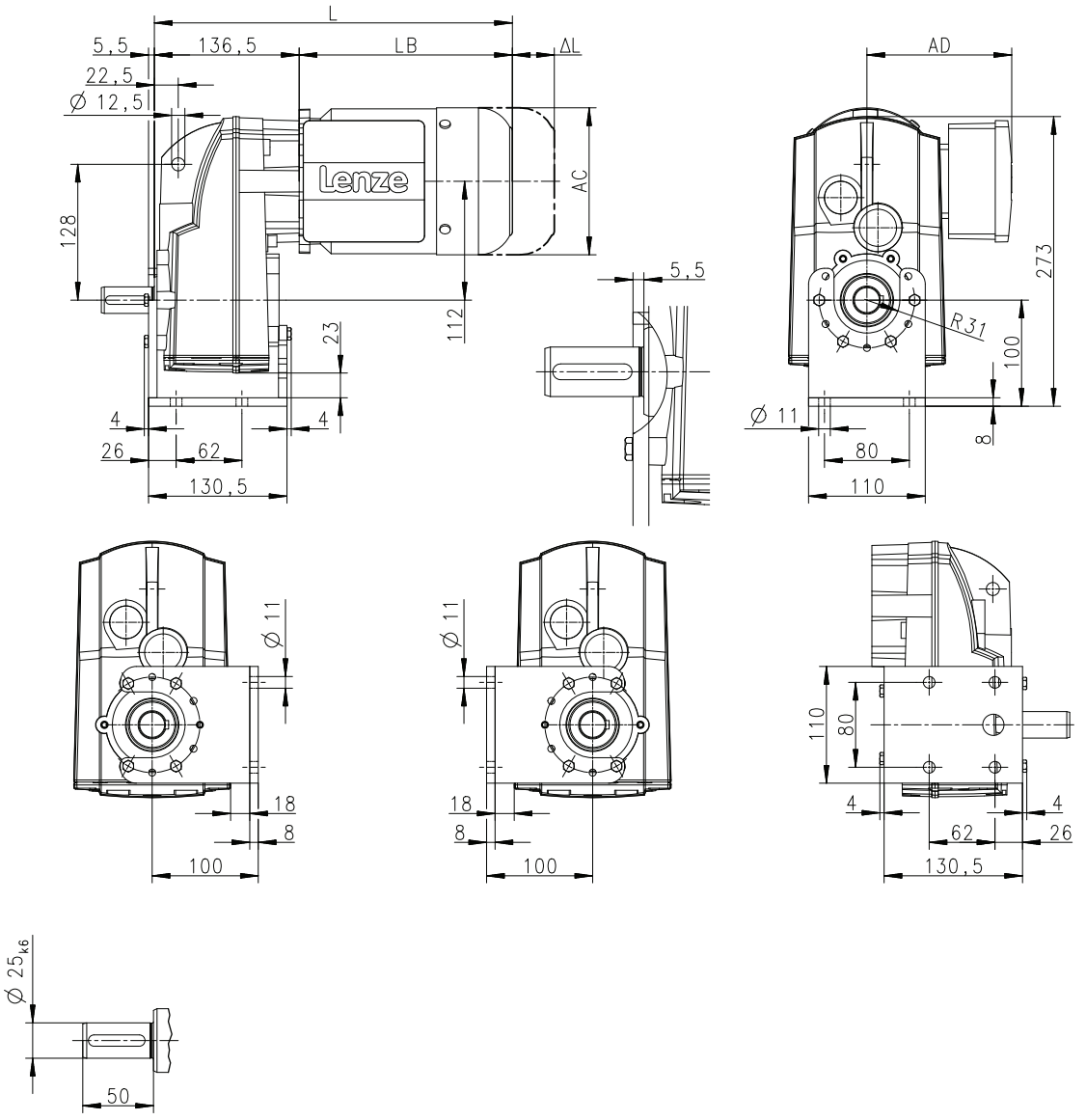


Product			MD□MA□□						
			063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions									
Total length	**L**	**[mm]**	320	340				363	
Motor length	**LB**	**[mm]**	183	203				226	
Length of motor options	**Δ L**	**[mm]**	170	165				183	
Motor diameter	**AC**	**[mm]**	123	139				156	
Distance motor/connection	**AD**	**[mm]**	100	109				150	

Dimensions, 2-pole and 6-pole motors

g500-S220

Dimensions with solid shaft
Gearbox design: VBR



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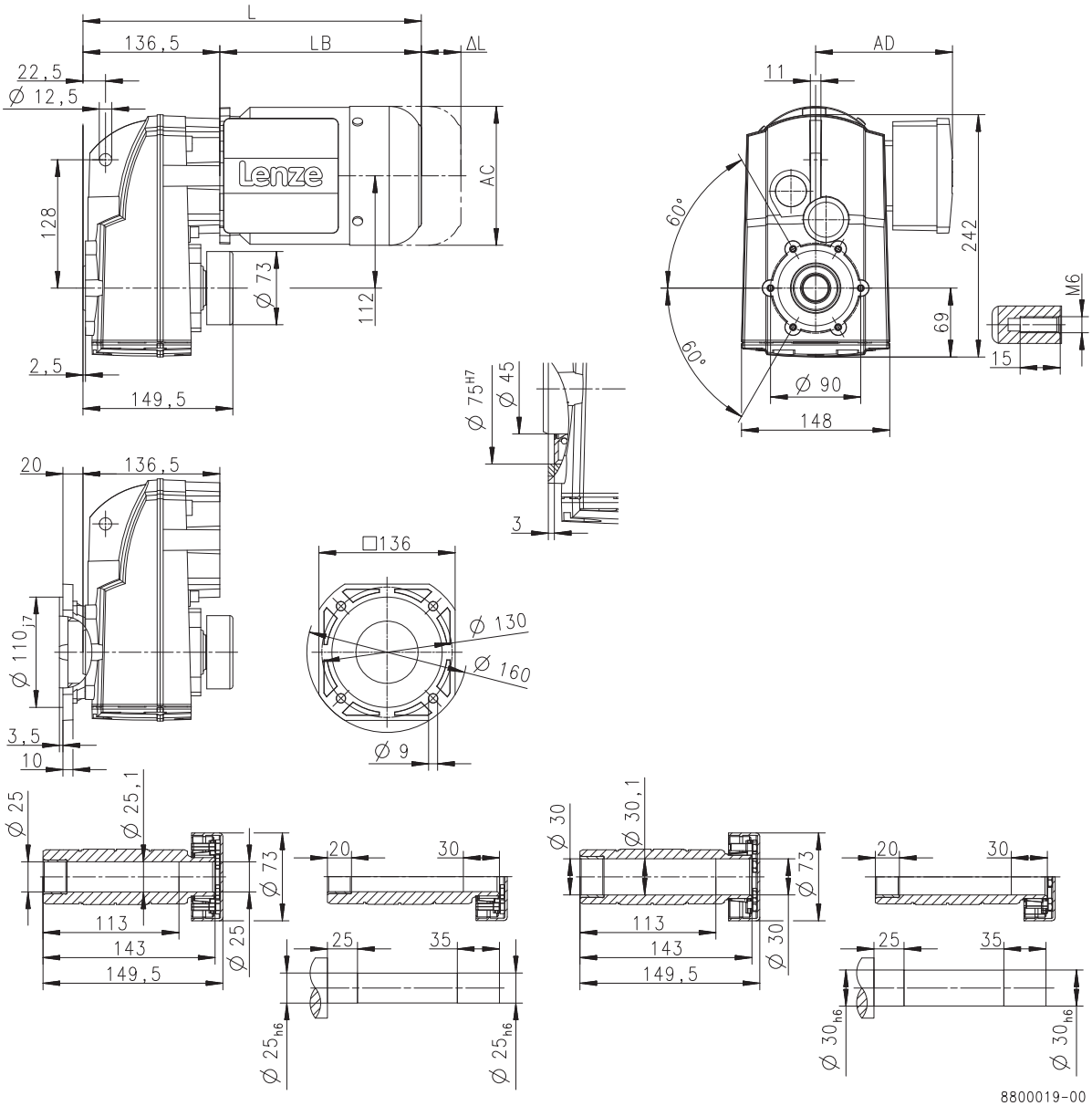
Product			MD□MA□□						
			063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions									
Total length	**L**	**[mm]**	320	340				363	
Motor length	**LB**	**[mm]**	183	203				226	
Length of motor options	**Δ L**	**[mm]**	170	165				183	
Motor diameter	**AC**	**[mm]**	123	139				156	
Distance motor/connection	**AD**	**[mm]**	100	109				150	

Dimensions, 2-pole and 6-pole motors

g500-S220

Dimensions with shrink disc
Gearbox design: SDR, SCR, SCK

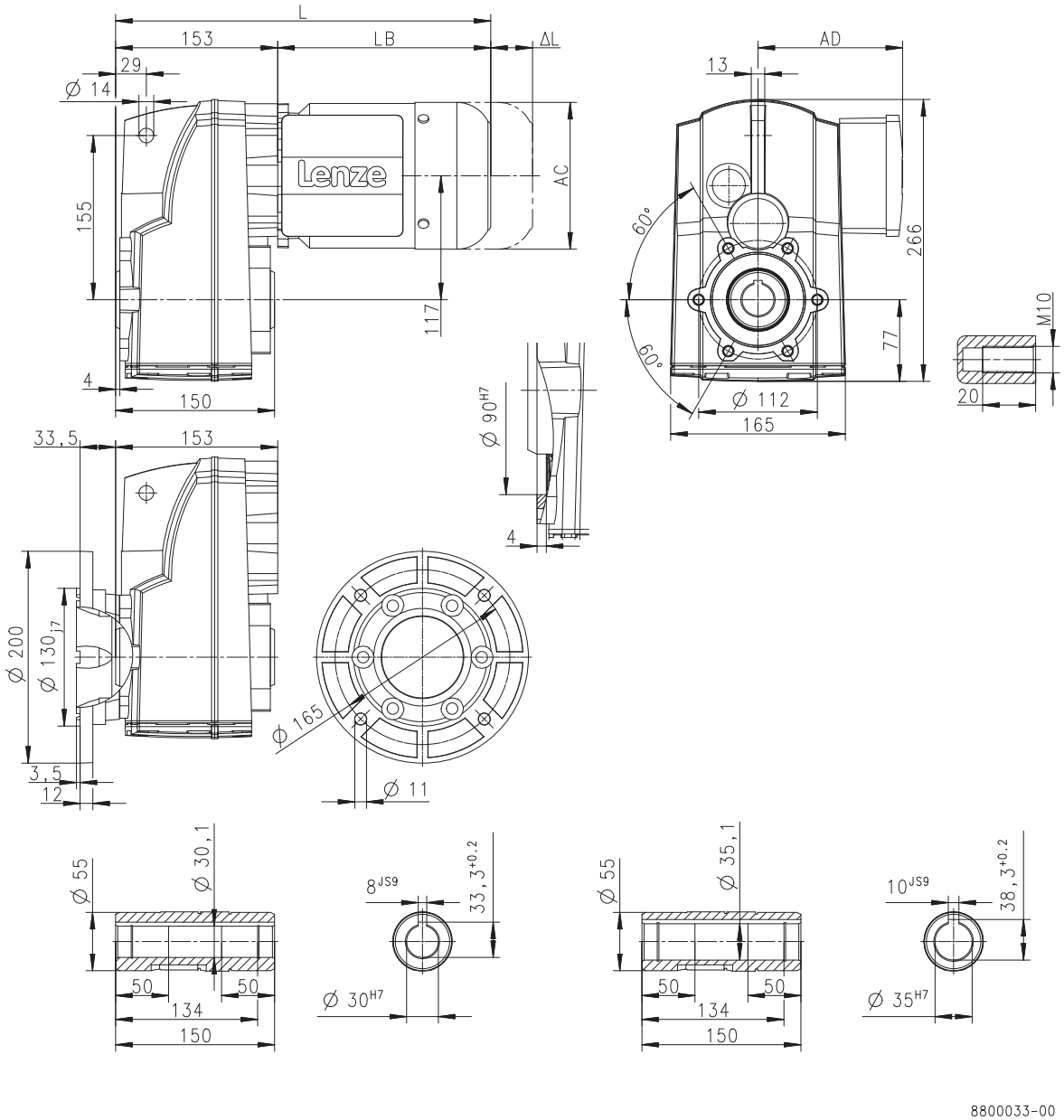


Product			MD□MA□□						
			063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions									
Total length	**L**	**[mm]**	320	340				363	
Motor length	**LB**	**[mm]**	183	203				226	
Length of motor options	**Δ L**	**[mm]**	170	165				183	
Motor diameter	**AC**	**[mm]**	123	139				156	
Distance motor/connection	**AD**	**[mm]**	100	109				150	

Dimensions, 2-pole and 6-pole motors

g500-S400

Dimensions with hollow shaft
Gearbox design: HDR, HCR, HCK

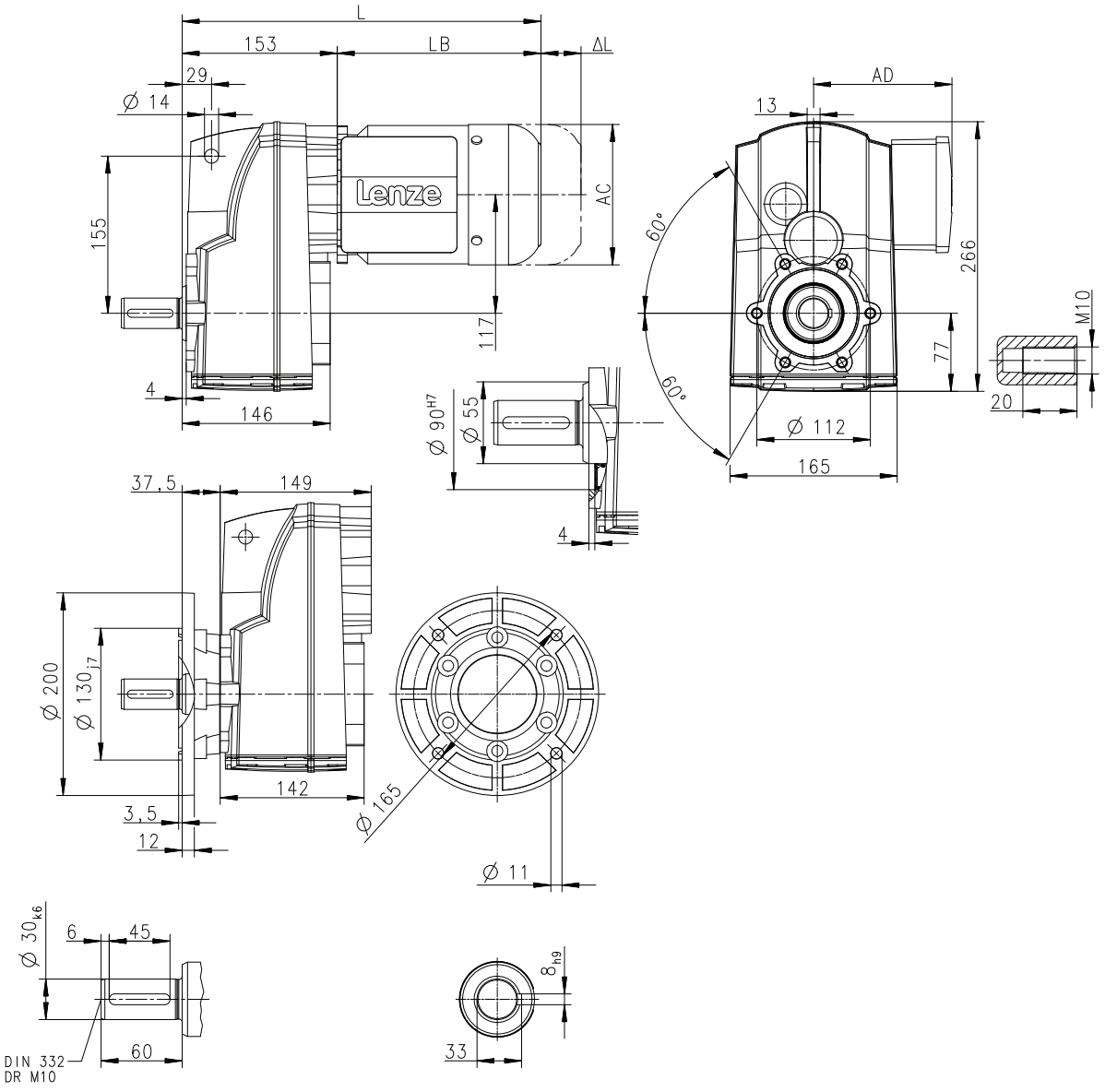


Product			MD□MA□□				
			071-13	071-31	071-33	080-13	080-33
Dimensions							
Total length	**L**	**[mm]**	356			379	
Motor length	**LB**	**[mm]**	203			226	
Length of motor options	**Δ L**	**[mm]**	165			183	
Motor diameter	**AC**	**[mm]**	139			156	
Distance motor/connection	**AD**	**[mm]**	109			150	

Dimensions, 2-pole and 6-pole motors

g500-S400

Dimensions with solid shaft
Gearbox design: VDR, VCR, VCK

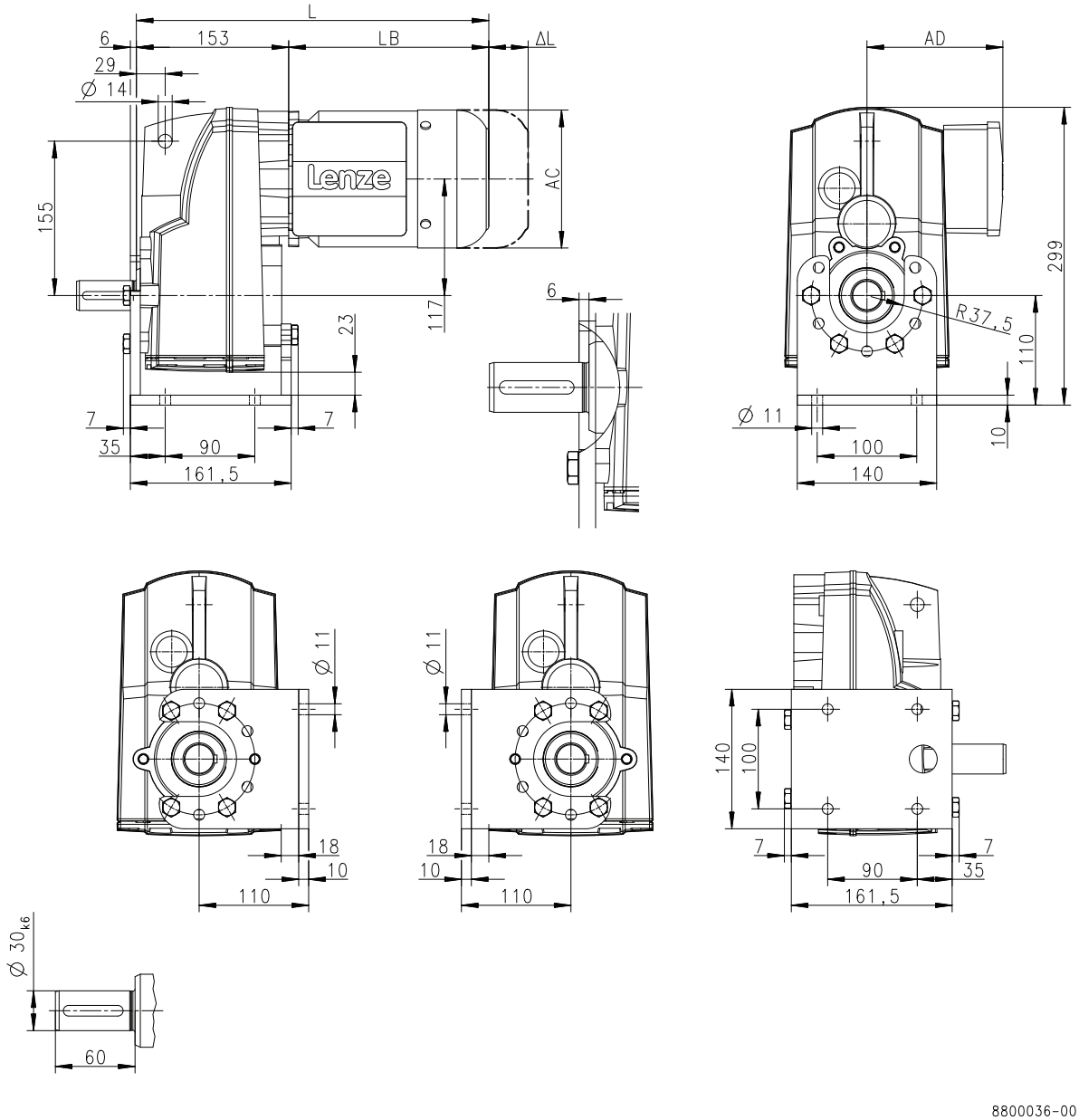


Product			MD□MA□□				
			071-13	071-31	071-33	080-13	080-33
Dimensions							
Total length	**L**	**[mm]**	356			379	
Motor length	**LB**	**[mm]**	203			226	
Length of motor options	**Δ L**	**[mm]**	165			183	
Motor diameter	**AC**	**[mm]**	139			156	
Distance motor/connection	**AD**	**[mm]**	109			150	

Dimensions, 2-pole and 6-pole motors

g500-S400

Dimensions with solid shaft
Gearbox design: VBR

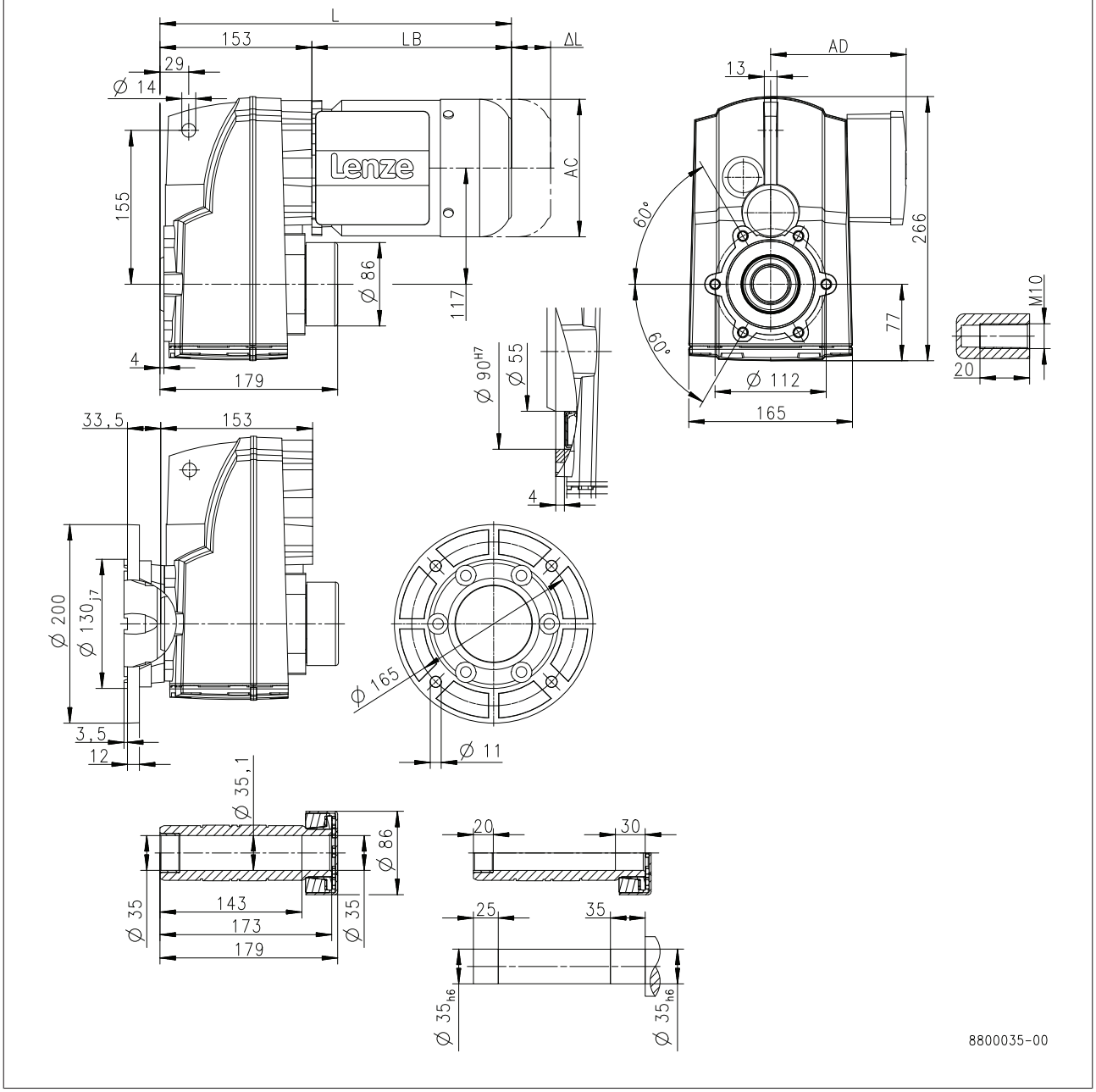


Product			MD□MA□□				
			071-13	071-31	071-33	080-13	080-33
Dimensions							
Total length	**L**	**[mm]**	356			379	
Motor length	**LB**	**[mm]**	203			226	
Length of motor options	**Δ L**	**[mm]**	165			183	
Motor diameter	**AC**	**[mm]**	139			156	
Distance motor/connection	**AD**	**[mm]**	109			150	

Dimensions, 2-pole and 6-pole motors

g500-S400

Dimensions with shrink disc
Gearbox design: SDR, SCR, SCK

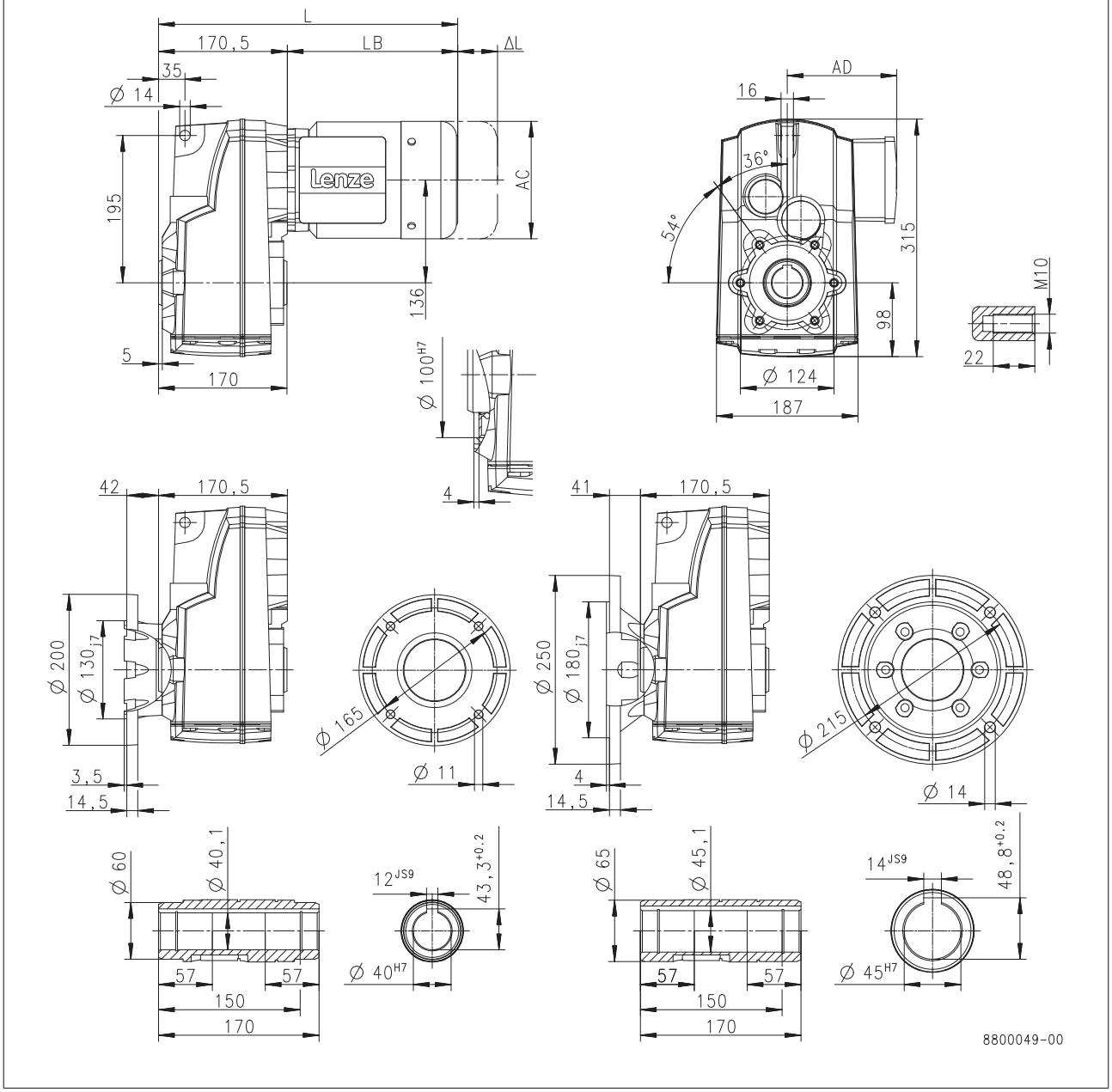


Product			MD□MA□□				
			071-13	071-31	071-33	080-13	080-33
Dimensions							
Total length	**L**	**[mm]**	356			379	
Motor length	**LB**	**[mm]**	203			226	
Length of motor options	**Δ L**	**[mm]**	165			183	
Motor diameter	**AC**	**[mm]**	139			156	
Distance motor/connection	**AD**	**[mm]**	109			150	

Dimensions, 2-pole and 6-pole motors

g500-S660

Dimensions with hollow shaft
Gearbox design: HDR, HCR, HCK

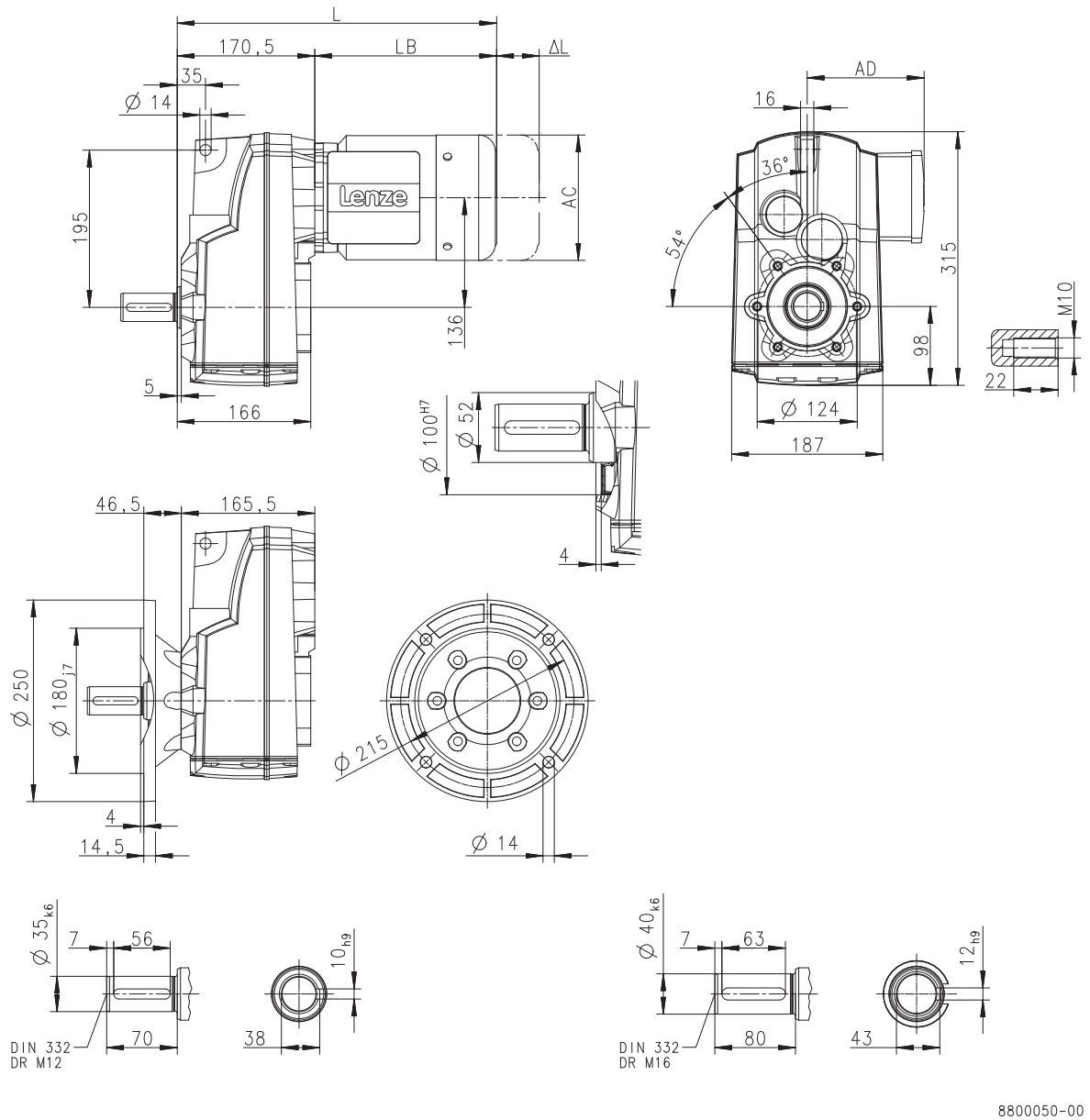


Product			MD□MA□□			
			071-13	071-33	080-13	080-33
Dimensions						
Total length	**L**	**[mm]**	374		397	
Motor length	**LB**	**[mm]**	203		226	
Length of motor options	**Δ L**	**[mm]**	165		183	
Motor diameter	**AC**	**[mm]**	139		156	
Distance motor/connection	**AD**	**[mm]**	109		150	

Dimensions, 2-pole and 6-pole motors

g500-S660

Dimensions with solid shaft
Gearbox design: VDR, VCR, VCK

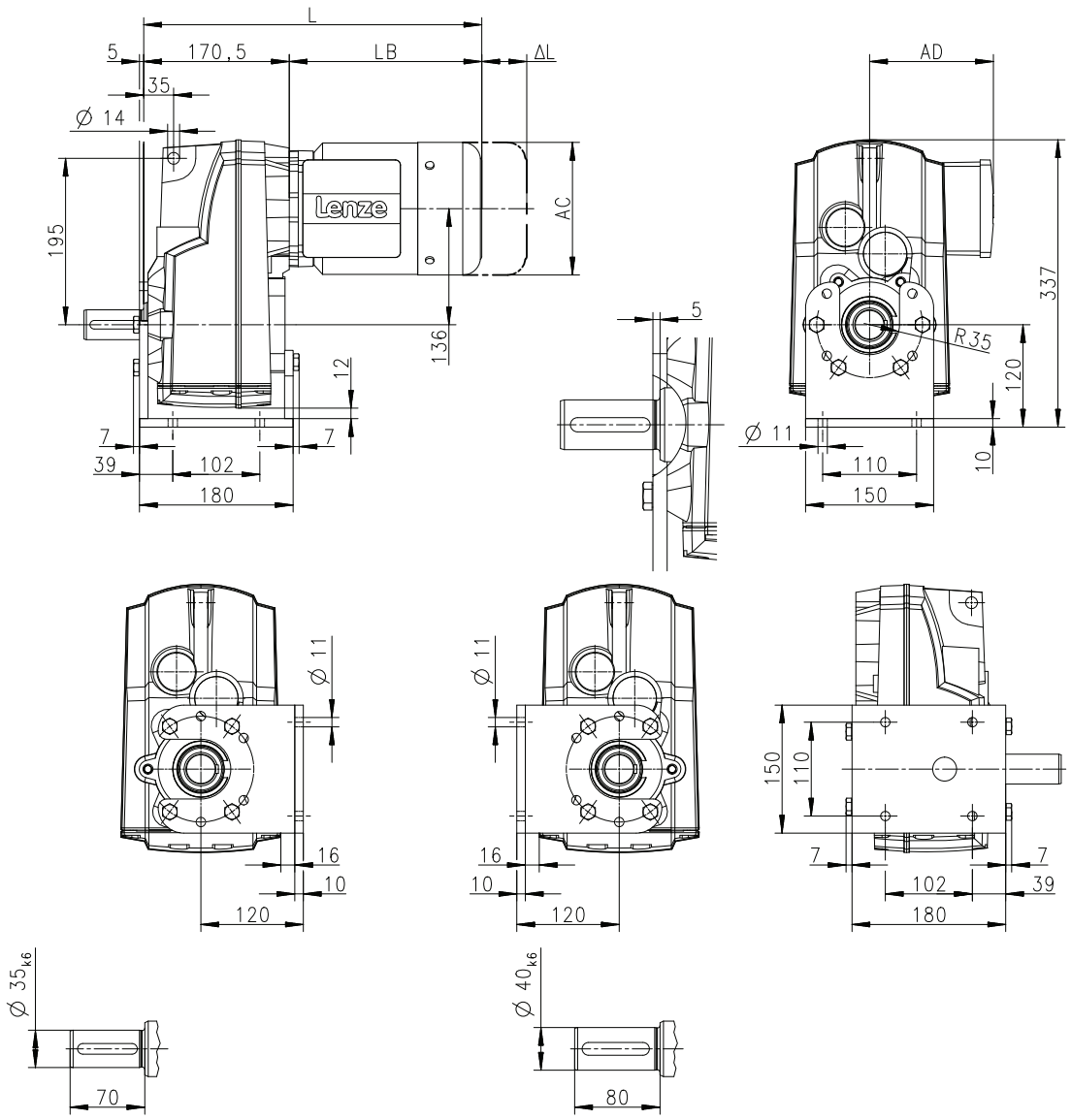


Product			MD□MA□□			
			071-13	071-33	080-13	080-33
Dimensions						
Total length	**L**	**[mm]**	374		397	
Motor length	**LB**	**[mm]**	203		226	
Length of motor options	**Δ L**	**[mm]**	165		183	
Motor diameter	**AC**	**[mm]**	139		156	
Distance motor/connection	**AD**	**[mm]**	109		150	

Dimensions, 2-pole and 6-pole motors

g500-S660

Dimensions with solid shaft
Gearbox design: VBR

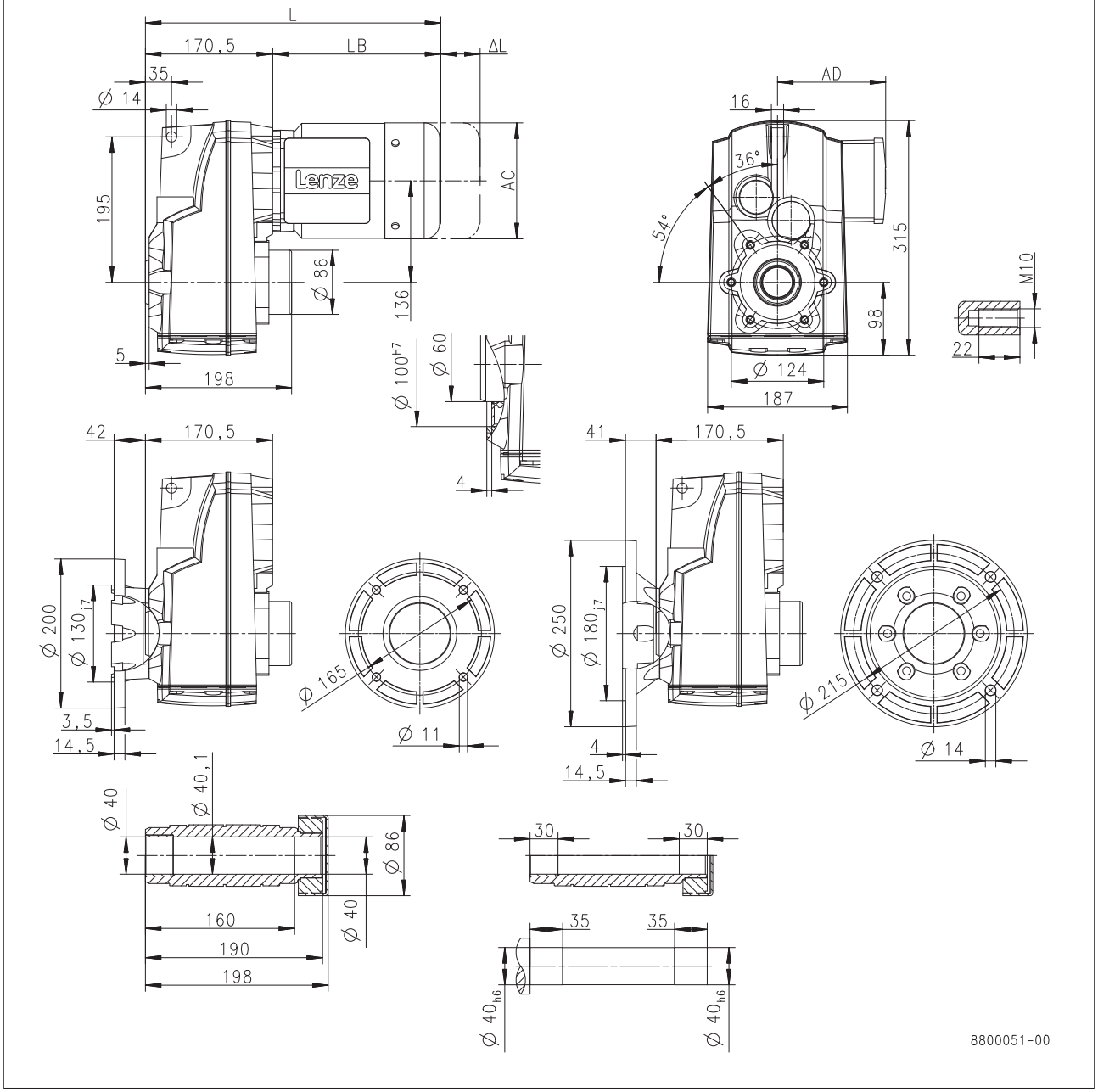


Product			MD□MA□□			
			071-13	071-33	080-13	080-33
Dimensions						
Total length	**L**	**[mm]**	374		397	
Motor length	**LB**	**[mm]**	203		226	
Length of motor options	**Δ L**	**[mm]**	165		183	
Motor diameter	**AC**	**[mm]**	139		156	
Distance motor/connection	**AD**	**[mm]**	109		150	

Dimensions, 2-pole and 6-pole motors

g500-S660

Dimensions with shrink disc
Gearbox design: SDR, SCR, SCK



Product			MD□MA□□			
			071-13	071-33	080-13	080-33
Dimensions						
Total length	**L**	**[mm]**	374		397	
Motor length	**LB**	**[mm]**	203		226	
Length of motor options	**Δ L**	**[mm]**	165		183	
Motor diameter	**AC**	**[mm]**	139		156	
Distance motor/connection	**AD**	**[mm]**	109		150	

Additional length of the built-on accessories

Dimensions, self-ventilated (4-pole)

Product			MD□MA□□			MH□MA□□				
			063-02 063-22	063-12 063-32 063-42	071-32 071-42	080-32	090-12 090-32	100-12 100-32	112-22	132-12 132-22
Built-on accessories										
Brake										
	Δ L	[mm]	71.0	40.0	52.0	73.0	68.0	76.0	90.0	110
Feedback										
	Δ L	[mm]	71.0	56.0	52.0	111	87.0	81.0	80.0	103
Handwheel										
	Δ L	[mm]			70.0	91.0	80.0	94.0	107	126
2. shaft end										
	Δ L	[mm]			47.0	68.0	57.0	71.0	84.0	101
Grey iron fan										
	Δ L	[mm]			0.000	4.00	0.000	76.0	0.000	
Brake + Feedback										
	Δ L	[mm]	135	103	96.0	111	105	101	120	125
Brake + Handwheel										
	Δ L	[mm]			70.0	91.0	80.0	94.0	107	126
Brake + 2. shaft end										
	Δ L	[mm]			47.0	68.0	57.0	71.0	84.0	101
Brake + Grey iron fan										
	Δ L	[mm]			52.0	73.0	68.0	76.0	90.0	110

Dimensions, self-ventilated (2-pole)

Product			MD□MA□□	
			063-11 063-31	071-11 071-31
Built-on accessories				
Brake				
	Δ L	[mm]	40.0	52.0
Grey iron fan				
	Δ L	[mm]		0.000
Brake + 2. shaft end				
	Δ L	[mm]		47.0
Brake + Grey iron fan				
	Δ L	[mm]		52.0

Further dimensions on the handwheel, 2nd shaft end and protection cover can be found in the motor chapter under product extensions.

Additional length of the built-on accessories

Dimensions, self-ventilated (6-pole)

Product			MD□MA□□	
			071-13 071-33	080-13 080-33
Built-on accessories				
Brake				
	Δ L	[mm]	52.0	73.0
Feedback				
	Δ L	[mm]	52.0	111
Handwheel				
	Δ L	[mm]	70.0	91.0
2. shaft end				
	Δ L	[mm]	47.0	68.0
Grey iron fan				
	Δ L	[mm]	0.000	4.00
Brake + Feedback				
	Δ L	[mm]	96.0	111
Brake + Handwheel				
	Δ L	[mm]	70.0	91.0
Brake + 2. shaft end				
	Δ L	[mm]	47.0	68.0
Brake + Grey iron fan				
	Δ L	[mm]	52.0	73.0

Further dimensions on the handwheel, 2nd shaft end and protection cover can be found in the motor chapter under product extensions.

Dimensions, forced ventilated (4-pole)

Product			MD□MA□□		MH□MA□□				
			063-12 063-32 063-42	071-32 071-42	080-32	090-12 090-32	100-12 100-32	112-22	132-12 132-22
Built-on accessories									
Blower									
	Δ L	[mm]	128				109	102	115
Brake									
	Δ L	[mm]	170	165	183	181	170	183	202
Feedback									
	Δ L	[mm]	128				109	183	202
Brake + Feedback									
	Δ L	[mm]	170	165	183	181	170	183	202

Further dimensions for the blower can be found in the motor chapter under product extensions.

Weights, 4-pole motors

2-stage gearboxes

				MD□MA□□					MH□MA□□	
				063-12	063-32	063-42	071-32	071-42	080-32	090-12
g500	-S130	m	[kg]	9.2		9.5	11	12	16	21
	-S220	m	[kg]	11			12	13	17	22
	-S400	m	[kg]		14		15	16	20	25
	-S660	m	[kg]			18	20		25	30

				MH□MA□□					
				090-32	100-12	100-32	112-22	132-12	132-22
g500	-S130	m	[kg]	23					
	-S220	m	[kg]	24	30	33			
	-S400	m	[kg]	27	33	36	47		
	-S660	m	[kg]	32	38	40	52	70	77

3-stage gearboxes

				MD□MA□□				MH□MA□□		
				063-12 063-32	063-42	071-32	071-42	080-32	090-12	090-32
g500	-S220	m	[kg]	11		12		18		
	-S400	m	[kg]	14		16		21		
	-S660	m	[kg]	18	19	20	21	25	30	32

Weights, 2-pole motors

2-stage gearboxes

				MD□MA□□			
				063-11	063-31	071-11	071-31
g500	-S130	m	[kg]	9.0	8.9	11	12
	-S220	m	[kg]		10	12	13
	-S400	m	[kg]				16

Weights, 6-pole motors

2-stage gearboxes

				MD□MA□□		
				071-13	**071-33**	**080-13 080-33**
g500	**-S130**	m	[kg]	12		16
	-S220	m	[kg]	13		17
	-S400	m	[kg]	16		20
	-S660	m	[kg]		20	25

3-stage gearboxes

				MD□MA□□		
				071-13 071-33	**080-13**	**080-33**
g500	**-S220**	m	[kg]	13	18	
	-S400	m	[kg]	16	21	
	-S660	m	[kg]	21	25	

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

Additional weights for motors

4-pole motors

Product			MD□MA□□			MH□MA□□				
			063-02 063-22	063-12 063-32 063-42	071-32 071-42	080-32	090-12 090-32	100-12 100-32	112-22	132-12 132-22
Built-on accessories										
Brake			06		06 08	08 10		10 12	12	14 16
	m	[kg]	0.9		0.9 1.5	1.5 2.6		2.6 4.2	4.2	5.8 8.7
Blower										
	m	[kg]		2.0	2.1	2.3	2.7	3.0	3.1	4.2
Grey iron fan										
	m	[kg]			1.2	1.4	2.0	2.5	3.8	6.0
Handwheel										
	m	[kg]					0.6			1.8

2-pole motors

Product			MD□MA□□	
			063-11 063-31	071-11 071-31
Built-on accessories				
Brake			06	06 08
	m	[kg]	0.9	0.9 1.5
Grey iron fan				
	m	[kg]		1.2

Additional weights for motors

6-pole motors

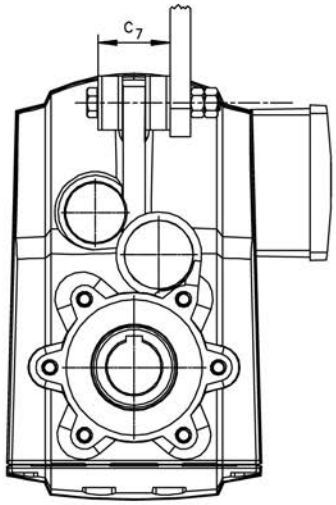
Product			MD□MA□□	
			071-13 071-33	080-13 080-33
Built-on accessories				
Brake			06 08	08 10
	m	[kg]	0.9 1.5	1.5 2.6
Grey iron fan				
	m	[kg]	1.2	1.4
Handwheel				
	m	[kg]	0.6	

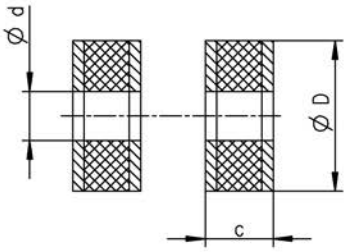
Torque plate

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





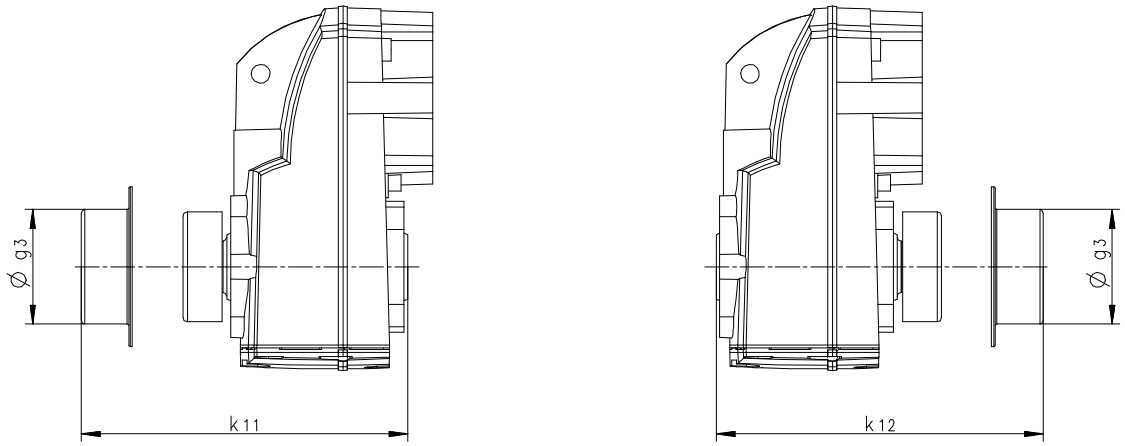
6.4

Product	Dimensions				Mass
	d	D	c	c_7	m
	[mm]	[mm]	[mm]	[mm]	[kg]
g500-S130	11.0	30.0	17.0	45.0	0.1
g500-S220	11.0	30.0	17.0	45.0	0.1
g500-S400	13.0	40.0	18.0	49.0	0.1
g500-S660	13.0	40.0	18.0	52.0	0.1

Shaft cover

Shrink disc cover

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



Product	Dimensions			Mass
	g_3	k_{11}	k_{12}	m
	[mm]	[mm]	[mm]	[kg]
g500-S130	63.0	132	132	0.1
g500-S220	76.0	152	152	0.1
g500-S400	90.0	182	182	0.1
g500-S660	90.0	200	202	0.1

Gearbox code

Example	G	50	A	S	113	M	H	D	R	2	C

Meaning	Variant											
Product family		G	50									
Generation				A								
Gearbox type	Shaft-mounted helical gearbox				S							
Output torque	130 Nm					113						
	220 Nm					122						
	400 Nm					140						
	660 Nm					166						
Mounting	Motor						M					
Shaft type	Solid shaft with feather key							V				
	Hollow shaft with keyway							H				
	Hollow shaft with shrink disc							S				
Housing type	Foot mounting + centering								A			
	Foot mounting								B			
	Centering								C			
	Threaded pitch circle								D			
Flange mounting	Without flange									R		
	Flange with through holes									k		
Number of stages	2-stage										2	
	3-stage										3	
Motor mounting	Integrated											C
	IEC motor											N

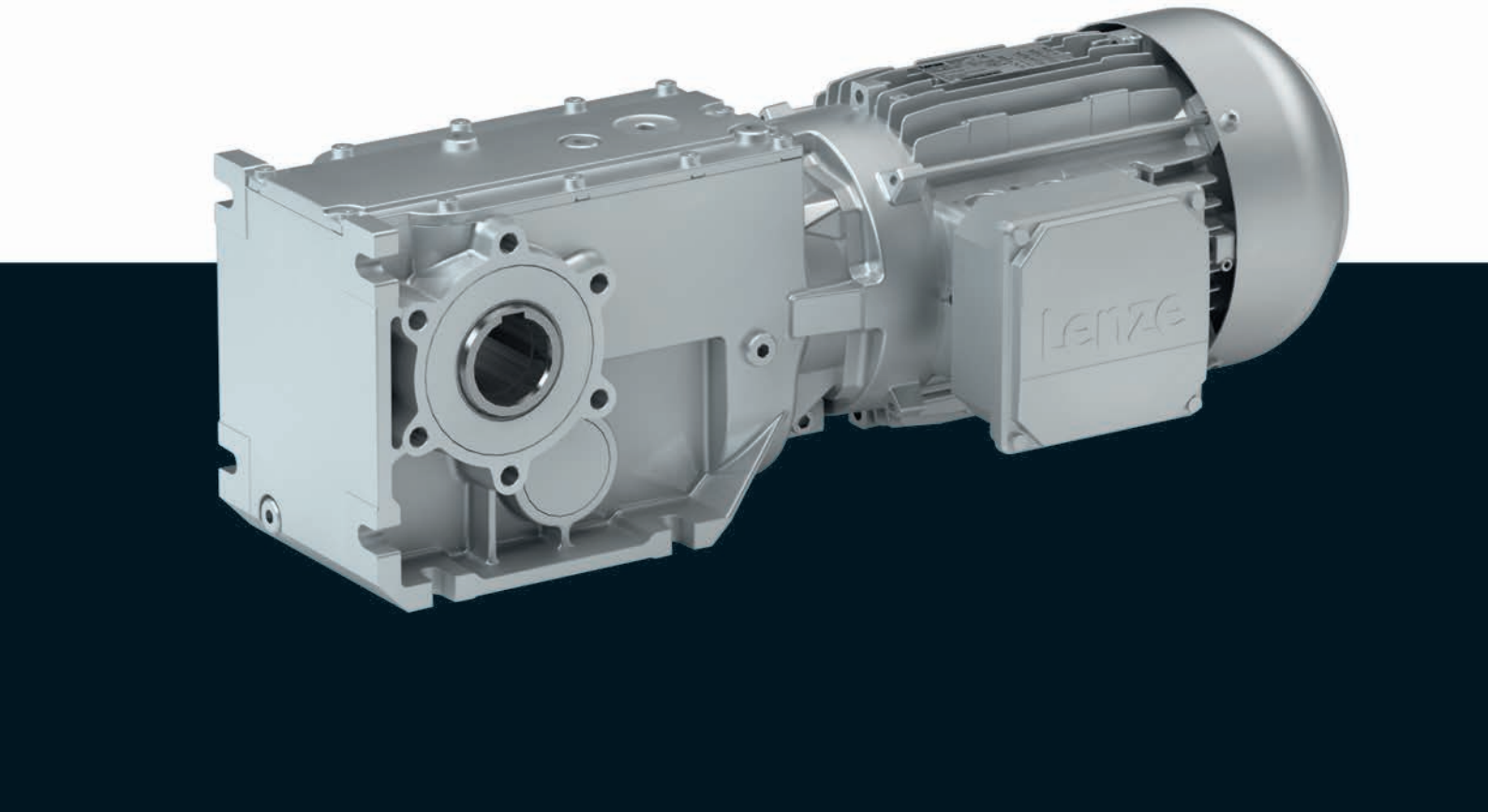
Motor code

Example	M	D	E	MA	XX	063	-	4	2	C1	C

Meaning	Variant	Motor code
Product family		M
Efficiency class	IE1	D
	IE2	H
Cooling	Natural ventilation	S
	Integral fan	E
	Blower	F
Internal key		MA
Built-on accessories	Without built-on accessories	XX
	Brake	BR
	Brake + resolver	BS
	Brake + incremental encoder	BI
	Brake + SinCos absolute value encoder	BA
	Brake + 2. shaft end	BZ
	Brake + handwheel	BH
	Brake + grey iron fan	BL
	Resolver	RS
	Incremental encoder	IG
	SinCos absolute value encoder	AG
	2nd shaft end	ZE
	Handwheel	HA
	Grey iron fan	LL
	Grey iron fan + 2. shaft end	LZ
	Grey iron fan + handwheel	LH
Size		063
		071
		080
		090
		100
		112
		132
		160
		180
		200
		225
Overall length		0
		1
		- 2
		3
		4
Number of pole pairs	4-pole motors	2
	2-pole motors	1
	6-pole motors	3
Internal key		C1
Approval	CE	C
	cURus	U
	CCC	3

g500-B bevel geared motors

0.06 ... 0.55 kW (efficiency class IE1)
0.75 ... 4 kW (efficiency class IE2)



g500-B bevel geared motors

Contents

List of abbreviations

α	[rad/s²]	Max. permissible angular acceleration
$\eta_{50\,\%}$	[%]	Efficiency
$\eta_{75\,\%}$	[%]	Efficiency
$\eta_{100\,\%}$	[%]	Efficiency
η_a		Efficiency
$\eta_{c=1}$		Efficiency
c		Load capacity
cos φ		Power factor
du/dt	[kV/µs]	Insulation resistance
$F_{ax,-}$	[N]	Min. axial force
$F_{ax,+}$	[N]	Max. axial force
$F_{ax,max}$	[N]	Max. axial force
$f_{in,max}$	[Hz]	Max. input frequency
f_{max}	[kHz]	Limit frequency
f_{max}	[kHz]	Max. switching frequency
f_N	[Hz]	Rated frequency
$F_{rad,max}$	[N]	Max. radial force
f_z		Additional radial force factor
H_{max}	[m]	Site altitude
I_0	[A]	Standstill current
i		Ratio
$I_{in,max}$	[A]	Max. input current
I_{max}	[A]	Max. current consumption
I_{max}	[A]	Max. current
I_{max}	[A]	Max. current consumption
I_{max}	[A]	Max. current
I_{max}	[A]	Max. short-time DC-bus current
I_{max}	[A]	Max. DC-bus current
I_N	[A]	Rated current
$I_{N,\Delta}$	[A]	Rated current
$I_{N,Y}$	[A]	Rated current
J	[kgcm²]	Moment of inertia
J_{MB}	[kgcm²]	Moment of inertia
$KE_{LL\,150\,°C}$	[V /(1000 r/min)]	Voltage constant
$Kt_{0\,150\,°C}$	[Nm/A]	Torque constant
L_{10}	[h]	Bearing service life
L	[mH]	Mutual inductance
$L_{1\sigma}$	[mH]	Stator leakage inductance
$L_{2\sigma}$	[mH]	Rotor leakage inductance
L_N	[mH]	Rated inductance
m	[kg]	Mass
M_2	[Nm]	Output torque
M_{22}	[Nm]	Output torque
M_0	[Nm]	Stall torque
$M_{0,max}$	[Nm]	Max. standstill torque
$M_{2,GM}$	[Nm]	Output torque
$M_{2,max}$	[Nm]	Max. output torque
$M_{2,not}$	[Nm]	Emergency off-torque

M_a	[Nm]	Starting torque
$M_{a\_,1}$	[Nm]	Starting torque
$M_{a\_,2}$	[Nm]	Starting torque
M_{av}	[Nm]	Average dynamic torque
M_b	[Nm]	Stalling torque
M_B	[Nm]	Braking torque
M_k	[Nm]	Rated torque
M_{max}	[Nm]	Max. torque
M_N	[Nm]	Rated torque
n_2	[r/min]	Output speed
n_{21}	[r/min]	Output speed
n_{22}	[r/min]	Output speed
$n_{1,max}$	[r/min]	Max. gearbox input speed
$n_{1,max\,50\%}$	[r/min]	Max. gearbox input speed
n_{eto}	[r/min]	Transition speed
n_k	[r/min]	Speed
n_{max}	[r/min]	Max. speed
n_N	[r/min]	Rated speed
P_{max}	[kW]	Max. power input
Q_{BW}	[MJ]	Friction energy
Q_E	[J]	Maximum switching energy
Q_E	[KJ]	Maximum switching energy
R_1	[Ω]	Stator impedance
R_2	[Ω]	Rotor impedance
R	[Ω]	Insulation resistance
R	[Ω]	Min. insulation resistance
$R_{UV\,150\,°C}$	[Ω]	Stator impedance
$R_{UV\,20\,°C}$	[Ω]	Stator impedance
$S_{hü}$	[1/h]	Transition operating frequency
t_1	[ms]	Engagement time
t_2	[ms]	Disengagement time
t_{11}	[ms]	Delay time
t_{12}	[ms]	Rise time
T	[°C]	Max. surface temperature
T	[°C]	Min. ambient temperature for transport
T	[°C]	Max. ambient temperature for transport
T	[°C]	Max. ambient temperature of bearing
T	[°C]	Min. ambient storage temperature
T	[°C]	Ambient temperature
T	[°C]	Operating temperature
T	[°C]	Rated temperature
t	[h]	Service life
T_{opr}		Ambient operating temperature
$T_{opr,max}$	[°C]	Max. ambient operating temperature
$T_{opr,min}$	[°C]	Min. ambient operating temperature
t_{re}	[s]	Recovery time
$t_{ü}$	[ms]	Overexcitation time
U_Δ	[V]	Voltage range
U_{AC}	[V]	Mains voltage range

List of abbreviations

U_{AC}	[V]	Mains voltage
$U_{in,max}$	[V]	Max. input voltage
$U_{in,min}$	[V]	Min. input voltage
U_{max}	[V]	Max. input voltage
U_{max}	[V]	Max. mains voltage
U_{min}	[V]	Min. mains voltage
$U_{N, \Delta}$	[V]	Rated voltage
$U_{N, AC}$	[V]	Rated voltage
$U_{N, DC}$	[V]	Rated voltage
$U_{N, Y}$	[V]	Rated voltage
z_g		Number of teeth
Z_{ro}	[Ω]	Rotor impedance
Z_{rs}	[Ω]	Impedance
Z_{so}	[Ω]	Stator impedance
z_t		Number of teeth

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)

Product information

In combination with three-phase AC motors, our bevel 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 efficient bevel 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 450 Nm and a ratio of up to i= 360.

Versions

- High-efficient right-angle gearbox in a compact design for space-saving installation
- Standardised shaft and flange dimensions for an easy machine integration
- Low backlash and high torsional stiffness provide for exact results in positioning applications

The right three-phase AC motor for the application

In a power range from 0.06 to 45 kW, Lenze offers an easy-to-scale modular system of robust three-phase AC motors. This modular system comprises three-phase AC motors for the common efficiency classes as well as the m300 Lenze Smart motor.

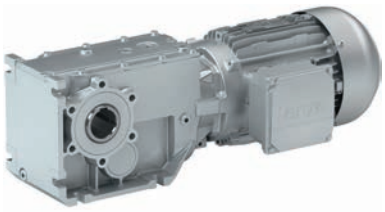
- IE1 motors up to a power of 0.55 kW
- IE2 motors from 0.75 to 45 kW
- IE3 motors from 7.5 kW to 45 kW,

and for optimum operation in the field of materials handling technology, the Lenze Smart Motor for 1.5 and 5 Nm, thus providing the optimum drives for mains operation.

The IE1, IE2 and IE3 motors are designed for operation on an inverter. The same modular system additionally provides an inverter-optimised motor in the power range up to 22 kW for a setting range of 1:24. A scaled modular system offering the optimum solution for each application and which, as decentralised drive solution, in the power range up to 7.5 kW can be equipped with the integrated 8400 motec inverter.

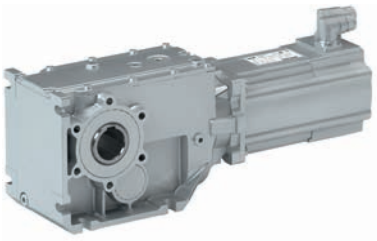
The product name

Gearbox type	Product range		Type	Rated torque [Nm]	Product
Bevel gearbox	g500	-	B	45	g500-B45
				110	g500-B110
				240	g500-B240
				450	g500-B450



g500-B bevel gearbox with three-phase AC motor

g500-B bevel gearbox with three-phase AC motor and motec

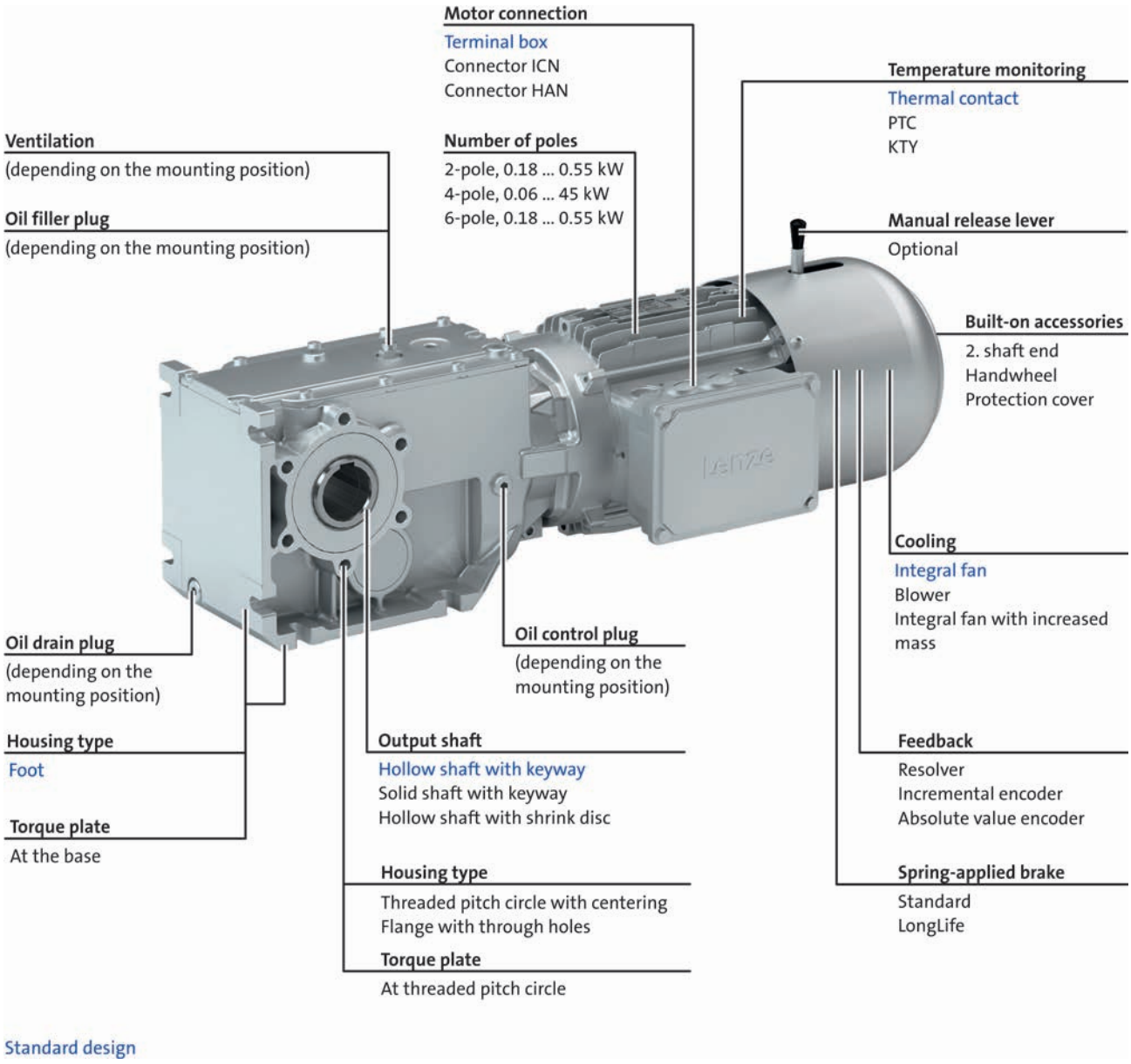


g500-B bevel gearbox with servo motor

Equipment

Overview

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



Standard design

6.5

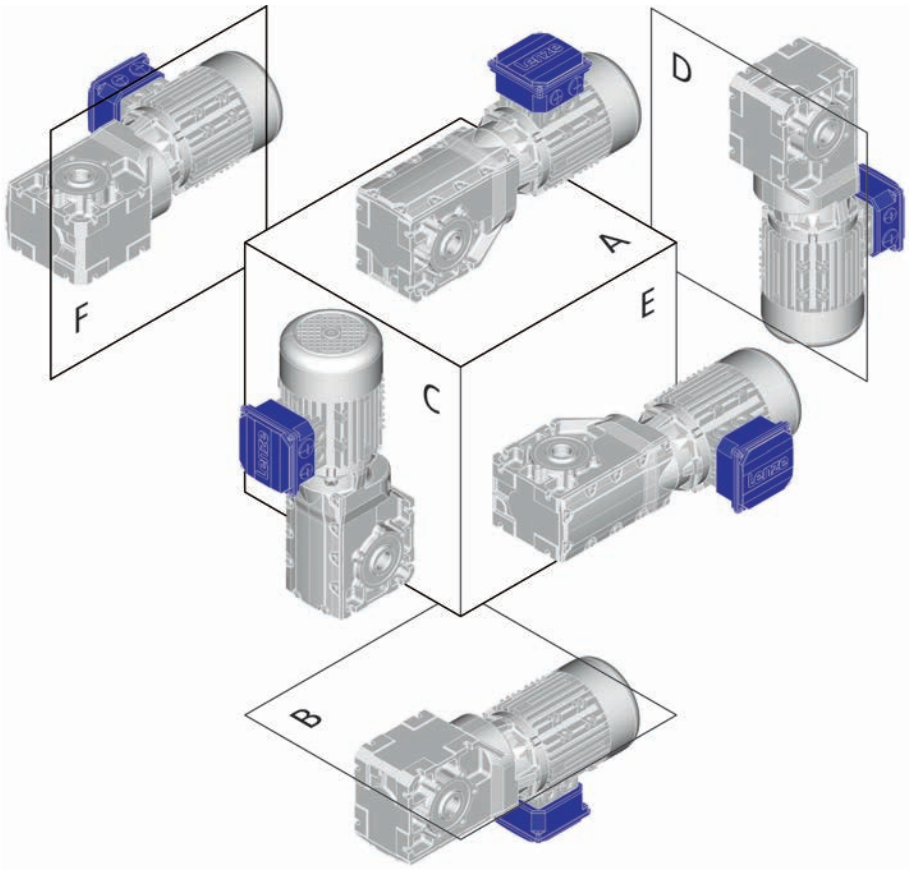
Equipment

Mounting position, position of system components

► In the following graphics, the terminal box in position 2 is colour-coded.
If the mounting position (A ... F) changes, the terminal box positions 2 ... 5 are rotated accordingly.

► To reduce the number of different versions, the gearboxes can also be ordered with combined mounting positions:
- g500-B45 in mounting position ABCDEF
- g500-B110 ... B450 in mounting position AEF

Mounting positions A ... F



Terminal box positions 2 ... 5

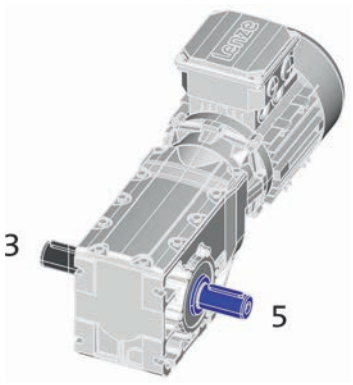
Cable entry positions 1 ... 5

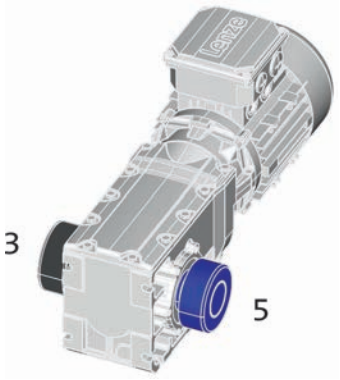
► For details regarding the cable entry see motor chapter/product extensions.

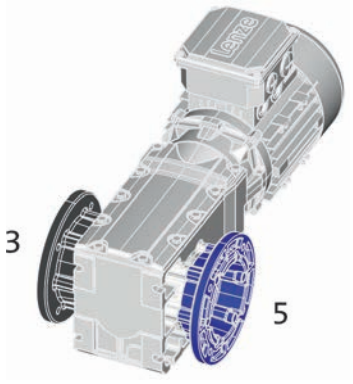
6.5

Equipment

Mounting position, position of system components

Solid shaft position 3 or 5


Shrink disc position 3 or 5


Flange position 3 or 5


The geared motor kit

Product				
Gearbox	g500-B45	g500-B110	g500-B240	g500-B450
Motor assignment min.	063	063	063	063
Motor assignment max.	071	090	100	112
Technical data				
Output torque max.	45 Nm	110 Nm	240 Nm	450 Nm
Drive power min.	0.06 kW	0.12 kW	0.12 kW	0.12 kW
Drive power max.	0.55 kW	1.5 kW	3.0 kW	4 kW
Dimensions [mm]				
Solid shaft with featherkey	20 x 40	20 x 40	30 x 60	30 x 60
Hollow shaft with keyway	18/20	20/25	30/35	35/40
Hollow shaft with shrink disc	20	20	30/35	35
Output flange	110/120	120/160	160/200	200

► Values printed in bold are standard versions.
Values not printed in bold are possible extensions, some for an additional charge.

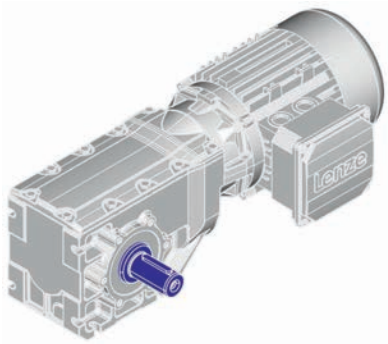
Type	
Conformity	**CE** EAC
Approval	**Without** CCC/CSA/cURus
Degree of protection	**IP55** IP65/IP66
Surface and corrosion protection	**Without** Different types of OKS
Colour	**Not coated** Primed/RAL colours
Hollow shaft	**With keyway**
Hollow shaft with shrink disc	Without keyway
Solid shaft	With keyway
Shaft material	**Steel**
Shaft sealing ring material	**NBR** FKM or FPM (Viton)
Shaft bearings	**Normal**
Paste for shaft mounting	**Without** Enclosed
Gearbox type	**With foot (□BR)** With centering (□AR) With output flange (□AK)
Lubricant	**Mineral oil** Synthetic oil Food-compatible oil

Type	
Mounting position	**A/B/C/D/E/F** Combined
Backlash	**Normal**
Power connection	**Terminal box** Plug connectors
Spring-applied brake	**Without** Brake design: Standard/Longlife Brake version: Standard/Overexcited/Cold Brake
Feedback	**Without** Resolver Absolute value encoder Incremental encoder
Cooling	**Integral fan** Blower Grey iron fan (increased centrifugal mass)
Temperature monitoring	**TKO thermal contact** PTC thermistor KTY thermal detector
Built-on accessories fan side	**Without** Protection cover 2nd shaft end/handwheel

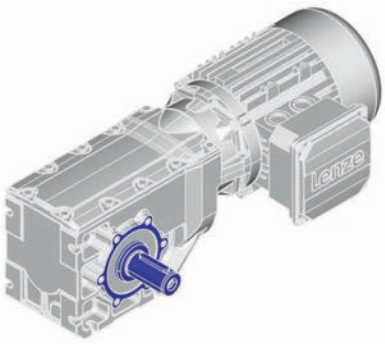
The geared motor kit

Gearbox details

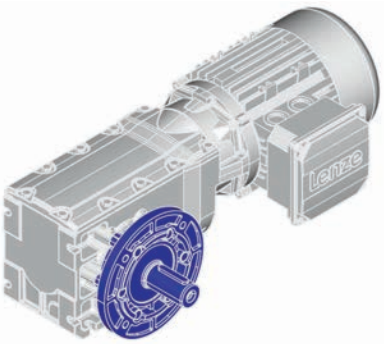
Solid shaft



Without centring (VBR)

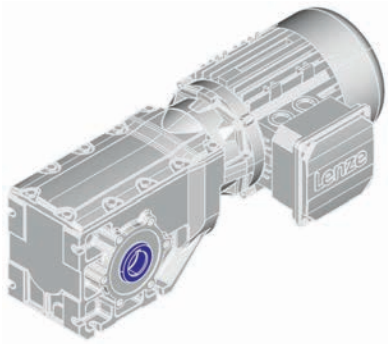


With centering (VAR)

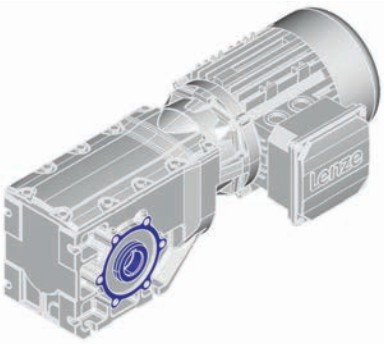


Flange with through holes (VAK)

Hollow shaft



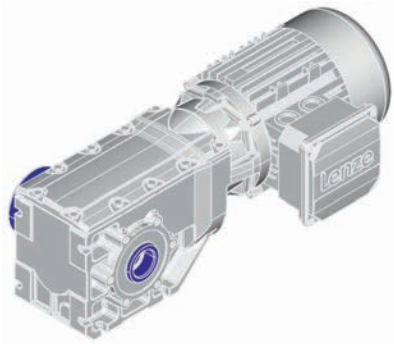
Without centring (HBR)



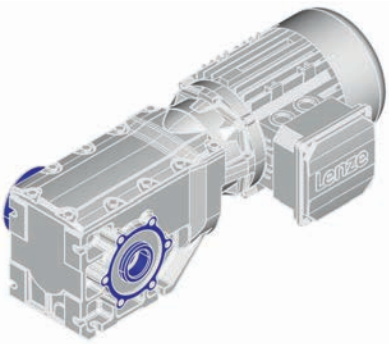
With centering (HAR)

Flange with through holes (HAK)

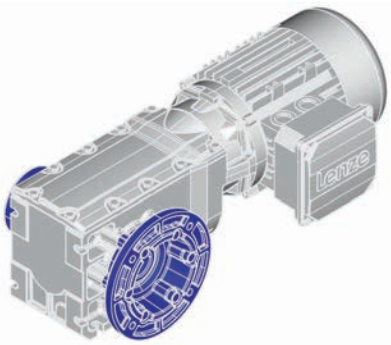
Hollow shaft with shrink disc



Without centring (SBR)



With centering (SAR)

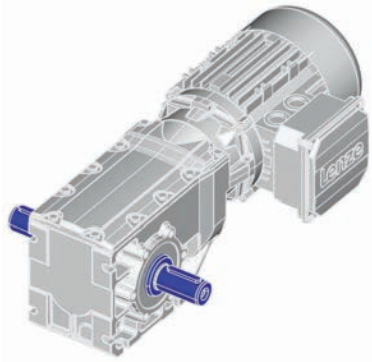


Flange with through holes (SAK)

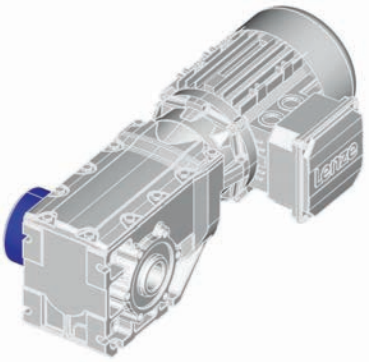
The geared motor kit

Gearbox details

Accessories

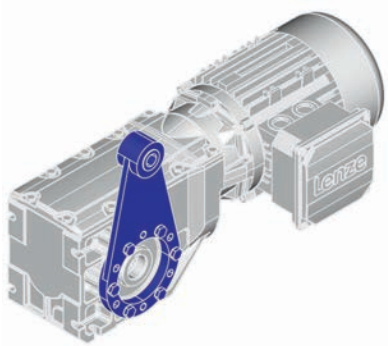


2nd output shaft end

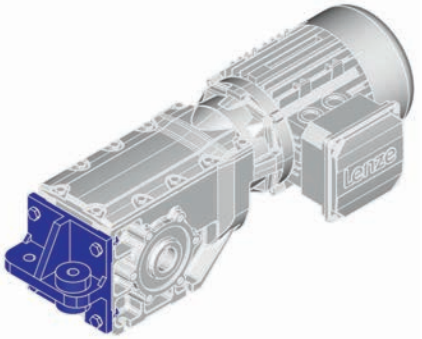


Cover
Hollow shaft/shrink disc

Accessories



Torque plate
at threaded pitch circle



Torque plate
at foot

General information about the data provided in this catalogue

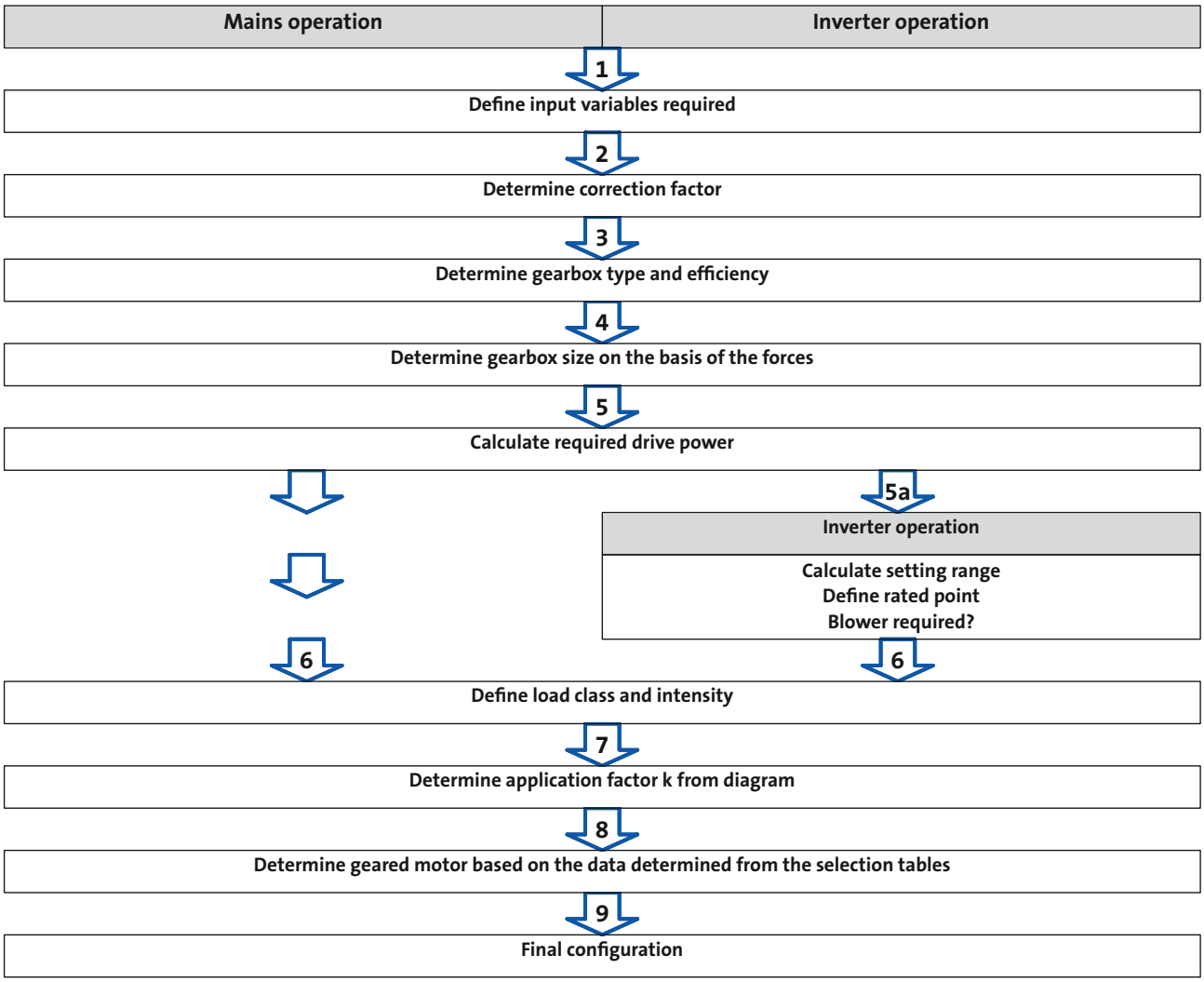
The powers, torques and speeds specified in this catalogue are rounded values and are valid under the following conditions:

- 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 °C for gearboxes,
  T_{amb} = 40 °C for motors (in accordance with EN 60034)
- Site altitude < = 1000 m amsl
- The selection tables provide the permissible mechanical powers and torques. For notes on the thermal power limit, see chapter drive dimensioning.
- The rated power specified for motors and geared motors applies to operating mode S1 (in accordance with EN 60034).

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

Procedure of a configuration process

Workflow



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.

Procedure of a configuration process

1 required input variables

Load torque		$M_{L,max}$=	[Nm]
	In inverter operation	$M_{L,min}$=	[Nm]
Load speed		$n_{L,max}$=	[r/min]
	In inverter operation	$n_{L,min}$=	[r/min]
External moments of inertia		J_{ext}=	[kgcm^2]
Operating time / day		BD =	[h]
Switching operations per h		S_h=	[1/h]
Runtime for $M_{L,max}$	In inverter operation		[%]

2 determine correction factor

Operating modes and operating time						
S1	ED	[%]	100			
	k_L =		1.0			
S2	ED	[%]	10	30	60	90
	k_L =		1.4 - 1.5	1.15 - 1.2	1.07 - 1.1	1.0 - 1.05
S3	ED	[%]	15	25	40	60
	k_L =		1.4 - 1.5	1.3 - 1.4	1.15 - 1.2	1.05 - 1.1
S6	ED	[%]	15	25	40	60
	k_L =		1.5 - 1.6	1.4 - 1.5	1.3 - 1.4	1.15 - 1.2
Site altitude						
	H	[m]	≤ 1000	≤ 2000	≤ 3000	≤ 4000
	k_H =		1	0.95	0.9	0.8
Ambient temperature						
	T_U =	[°C]	≤ 40	≤ 45	≤ 50	≤ 55
	k_{TU} =		1	0.95	0.9	0.8

23 - Operating modes

Procedure of a configuration process

3 determine gearbox type and efficiency

Gearbox type			Axial gearboxes		Right-angle gearboxes
			Helical gearbox	Shaft-mounted	Bevel gearbox
Product			g500-H	g500-S	g500-B
Gearbox efficiency	2-stage gearboxes	η_G	0.96	0.96	0.96
	3-stage gearboxes	η_G	0.95	0.95	0.95

4 determine gearbox size based on the forces on the output

Transmission element		Gear wheels	Sprockets	Toothed belt pulleys (depending on the initial stress)	Narrow V-belt (depending on the initial stress)
Additional radial force factor	f_z =	≥ 17 teeth = 1.0 < 17 teeth = 1.15	≥ 20 teeth = 1.0 < 20 teeth = 1.25 < 13 teeth = 1.4	With belt tightener = 2.0 - 2.5 Without belt tightener = 2.5 - 3.0	1.5 - 2.0
		Calculation		**Check**	
Radial force	[N]	$F_{rad} = 2000 \times \frac{M_{L,max} \times f_z}{dw}$		$F_{rad} \leq f_w \times F_{rad,max}$	
Axial force	[N]			$F_{ax} \leq F_{rad,max} \times 0.5$	

44 - Permissible radial and axial forces at output

5 calculate drive power

		Calculation	
Drive power required	[kW]	$P_1 = \frac{M_{L,max} \times n_{L,max}}{9549 \times k_L \times k_H \times k_{Tu} \times \eta_g}$	

Procedure of a configuration process - mains operation

6 calculate intensity and determine duty class

Load class	Load type	Intensity
I	Smooth operation, small or light jolts	$F_I \leq 1.25$
II	Uneven operation, average jolts	$1.25 < F_I \leq 4$
III	Uneven operation, severe jolts and/or alternating load	$F_I > 4$

	Calculation	
Intensity	$F_I = \frac{\frac{J_L}{i^2} + J_M + J_B + J_Z}{J_M + J_B + J_Z}$	

i= gearbox ratio
J_L= moment of inertia of the load
J_M= moment of inertia of the motor
J_B= moment of inertia of the brake
J_Z= additional moment of inertia (handwheel, 2nd shaft end ...)

7 determine application factor k from diagram

27 - Load capacity and application factor

Procedure of a configuration process - mains operation

8 determine geared motor based on the data determined from the selection tables

Selection table		Check
Drive power P_N	[kW]	$P_1 \leq P_N$
Output speed n_2	[r/min]	$n_{L,max} \approx n_2$
Output torque M_2	[Nm]	$M_{L,max} \leq M_2$
Load factor c		$k \leq c$
Order information		**Example**
Number of stages		2
Ratio i		3.267
Product gearbox		g500-H140
Product motor		MDxMAxx090-32

27 - Load capacity and application factor

Example: structure of a selection table

50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW ← Rated power P_N

2-stage gearboxes ← Number of the gear stage

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
432	32	2.6	44	23	184	32	432	32	2.6	771	32	2.1	3.267	-H140	090-32	82
420	33	1.9	43	24	179	33	420	33	1.9	751	33	1.6	3.354	-H100	090-32	79

Output speed n_2 ↑ Output torque M_2 ↑ Load capacity c ↑ Ratio i ↑ Product Gearbox ↑ Product Motor ↑

Procedure of a configuration process - inverter operation

5a calculate range of adjustment and determine rated point

		Calculation	
Setting range		$V = \frac{n_{L,max}}{n_{L,min}}$	
Setting range	Motor with integral fan	≤ 2.5 (20 ... 50 Hz)	≤ 4.35 (20 ... 87 Hz)
	Motor with blower	≤ 10 (5 ... 50 Hz)	≤ 17.4 (5 ... 87 Hz)
Rated point at		50 Hz	87 Hz

6 calculate intensity and determine duty class

	Calculation		
Intensity	$M_I = \frac{M_{L,max}}{M_{L,min}}$	**For alternating load, select load class III!**	
Load class	Load type		Intensity
I	Smooth operation, small or light jolts		$M_I \leq 1.5$
II	Uneven operation, average jolts		$1.5 < M_I \leq 2$
III	Uneven operation, severe jolts and/or alternating load		$2 < M_I \leq 2.5$

24 - Duty classes

7 determine application factor k from diagram

27 - Load capacity and application factor

Procedure of a configuration process - inverter operation

8 determine geared motor based on the data determined from the selection tables

Selection table			**Check**	
Drive power P_N		[kW]	$P_1 \leq P_N$	
Max. output speed n_2		[r/min]	$n_{L,max} \approx n_2$	
Min. output speed n_{21}	Self-ventilated	[r/min]	$n_{L,min} \approx n_{21}$	Setting range 2.5 (50 Hz) Setting range ≤ 4.35 (87 Hz)
Min. output speed n_{22}	Forced-ventilated	[r/min]	$n_{L,min} \approx n_{22}$	Setting range ≤ 10 (50 Hz) Setting range ≤ 17.4 (87 Hz)
	Self-ventilated (Reduced output torque)	[r/min]	$n_{L,min} \approx n_{22}$	
Output torque M_2		[Nm]	$M_{L,max} \leq M_2$	
Load factor c			k ≤ c	

Order information	**Example**
Number of stages	2
Ratio i	3.267
Product gearbox	g500-H140
Product motor	MDxMAxx090-32

27 - Load capacity and application factor

30 - Torque derating at low motor frequencies

Example: structure of a selection table

50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW ← Rated power P_N

2-stage gearboxes ← Number of the gear stage

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
432	32	2.6	44	23	184	32	432	32	2.6	771	32	2.1	3.267	-H140	090-32	82
420	33	1.9	43	24	179	33	420	33	1.9	751	33	1.6	3.354	-H100	090-32	79

Min. Output speed n_{22}
Min. Output torque M_2
Min. Output speed n_{21}
Max. Output speed n_2
Max. Output torque M_2
Load capacity **c**
Ratio i
Product Gearbox
Product Motor

Procedure of a configuration process

9 Final configuration

More information regarding the final configuration can be found under: **- The modular geared motor system** **- Product extensions for gearboxes, motors**	
Check operating conditions	- Operating temperature (observe lubricant, material of shaft sealing ring) - Degree of protection - Supply voltage - Surface protection required - Approvals - Conformity
Check and define connection dimensions	- Driven shaft - Foot, output flange, centering with threaded pitch circle
Determine mounting position and position of the system blocks	- Mounting position A/B/C/D/E/F or combined - Terminal box position, shaft position, flange position
Select product extensions at the gearbox (differing depending on the gearbox type)	- Torque plate at the base, threaded pitch circle, rubber buffer - Hollow shaft cover, shrink disc cover
Select product extensions at the motor	- Connection type (terminal box, connector) - Brake - Blower (inverter operation) - Feedback - Temperature monitoring - Protection cover (for vertical operation) - Handwheel (for manual set-up) - 2. shaft end

Standards

Approvals

CCC	China Compulsory Certification documents the compliance with the legal product safety requirements of the PR of China - GB standards.
cCSAus	CSA certificate, tested according to US and Canada standards
CE	Communauté Européenne documents the declaration of the manufacturer that EC Directives are complied with.
CEL	China Energy Label documents the compliance with the legal energy efficiency requirements for motors, tested according to PR of China standards
CSA	Canadian Standards Association CSA - certificate, tested according to Canada standards
CSAULE	Energy Verified Certificate Determining the energy efficiency according to CSA C390 for products within the scope of energy efficiency requirements in the USA and Canada
cULus	UL certificate for products, tested according to US and Canada standards
cURus	UL certificate for components, tested according to US and Canada standards
EAC	Certificate of Russia-Belarus-Kazakhstan Customs Union documents the declaration of the manufacturer that the specifications for the Eurasian conformity (EAC) required for placing electronic and electromechanical products on the market of the entire territory of the Customs Union (Russia, Belarus, Kazakhstan) are complied with.
UL	Underwriters Laboratory Listed Product
UR	Underwriters Laboratory Recognized Product UL certificate for components, tested according to US standards

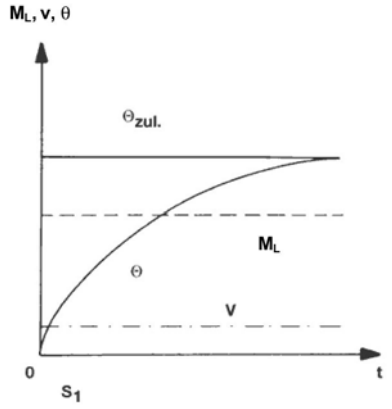
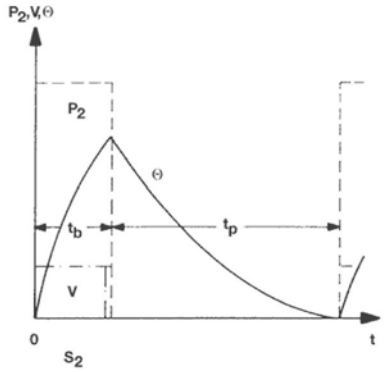
Standards

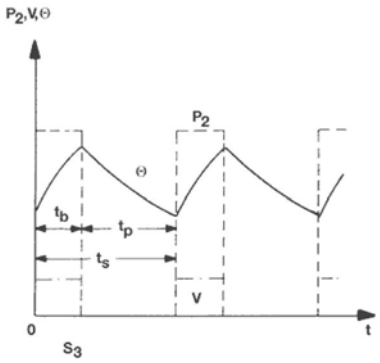
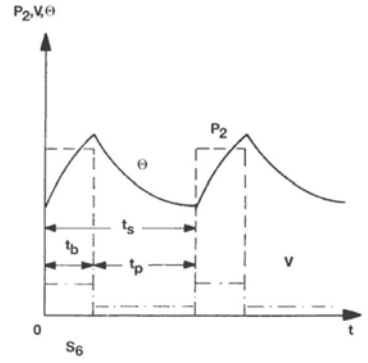
Operating modes

Operating modes S1 ... S10 as specified by EN 60034-1 describe the basic stress of an electrical machine.

In continuous operation a motor reaches its permissible temperature limit if it outputs the rated power dimensioned for continuous operation. However, if the motor is only subjected to load for a short time, the power output by the motor may be greater without the motor reaching its permissible temperature limit. This behaviour is referred to as overload capacity.
Depending on the duration of the load and the resulting temperature rise, the required motor can be selected reduced by the overload capacity.

The most important operating modes

Continuous operation S1	Short-time operation S2
	
Operation with a constant load until the motor reaches the thermal steady state. The motor may be actuated continuously with its rated power.	Operation with constant load; however, the motor does not reach the thermal steady state. During the following standstill, the motor winding cools down to the ambient temperature again. The increase in power depends on the load duration.

Intermittent operation S3	Non-intermittent periodic operation S6
	
Sequence of identical duty cycles comprising operation with a constant load and subsequent standstill. Start-up and braking processes do not have an impact on the winding temperature. The steady-state is not reached. The guide values apply to a cycle duration of 10 minutes. The power increase depends on the cycle duration and on the load period/downtime ratio.	Sequence of identical duty cycles comprising operation with a constant load and subsequent no-load operation. The motor cools down during the no-load phase. Start-up and braking processes do not have an impact on the winding temperature. The steady-state is not reached. The guide values apply to a cycle duration of 10 minutes. The power increase depends on the cycle duration and on the load period/idle time ratio.

Standards

Duty classes

Depending on the load type, the duty classes or impacts are divided as follows:

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

In order to support you in classifying your driven machine regarding the right duty class, the following shows sample applications with the corresponding duty class. Depending on, for instance, the operating frequency, driven machines can also have a higher impact.
In case of uncertainties, please contact your Lenze sales office.

Drive	Duty class
Construction machines	II
Chemical industry	II
Conveyors	II
Fans	II
Plastics industry	II
Wood working	III
Hoists	III
Metal working	III
Food	II
Paper industry	III
Stones	III
Textile industry	II

Standards

Degrees of protection

The degree of protection indicates the suitability of a motor for specific ambient conditions with regard to humidity as well as the protection against contact and the ingress of foreign particles. The degrees of protectionare classified by EN 60529.

The first code number after the code letters IP indicates the protection against the ingress of foreign particles and dust.
The second code number refers to the protection against the ingress of humidity.

Code number 1	Degree of protection	Code number 2	Degree of protection
0	No protection	0	No protection
1	Protection against the ingress of foreign particles d > 50 mm. No protection in the case of deliberate access	1	Protection against vertically dripping water (dripping water).
2	Protection against medium-sized foreign particles, d > 12 mm, keeping away fingers or similar	2	Protection against diagonally falling water (dripping water), 15 ° compared to normal service position.
3	Protection against small foreign particles d > 2.5 mm. Keeping away tools, wires and the like	3	Protection against spraying water, up to 60 ° to the vertical
4	Protection against granular foreign particles, d > 1 mm, keeping away tools, wires and the like	4	Protection against spraying water from all directions.
5	Protection against dust deposits (dust-protected), complete protection against contact.	5	Protection against water jets from all directions.
6	Protection against the ingress of dust (dust-proof), complete protection against contact.	6	Protection against choppy seas or heavy water jets (flood protection).

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

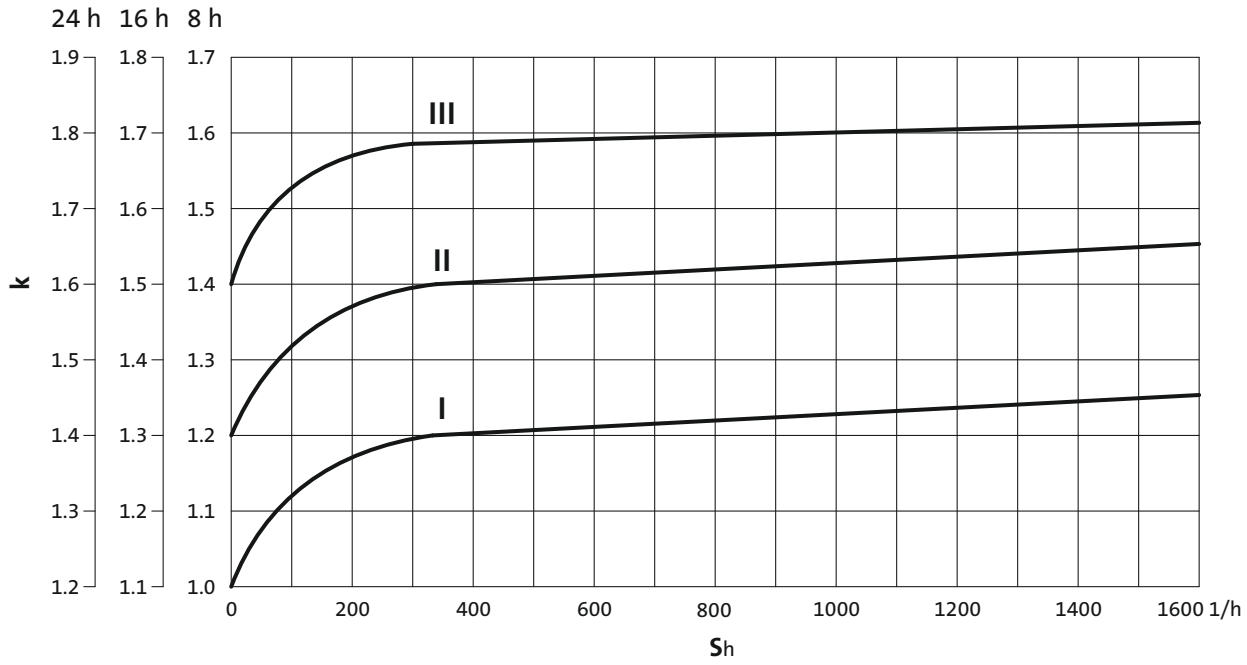
Load capacity and application factor

Load capacity c of gearboxes
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.

Required: c ≥ k

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

Application factor k



► S_h= switchings/h

6.5

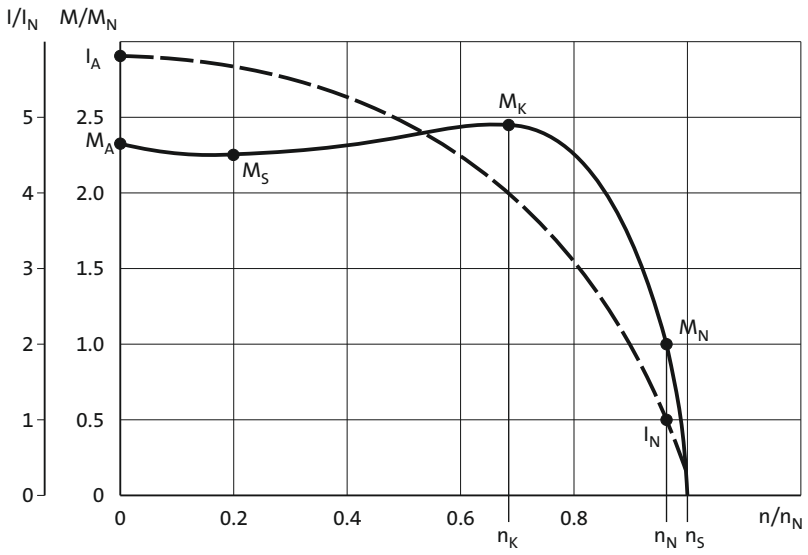
Operational performance of three-phase AC geared motors

The g500 geared motors can be actuated directly on the mains or via an inverter. When actuated in mains operation, the motor runs at a fixed speed, for inverter operation the speed is variable. Thanks to their high degree of protection, the robust three-phase drives can be basically used in a variety of applications.

Mains operation

During mains operation, when switched on, the three-phase AC motor starts up according to the speed-torque characteristic. It passes through this characteristic until it reaches its stable operating point. This operating point has been reached if the load torque or rated torque (M_N) is lower than the starting torque (M_A) and the pull-up torque (M_S). 2-, 4- and 6-pole motors are used. The rated speed (n_{rated}) of the drive is always lower than the calculated synchronous speed (n_S). The difference between rated speed and synchronous speed relating to the synchronous speed is referred to as the "slip".

Speed-torque characteristic



Operational performance of three-phase AC geared motors

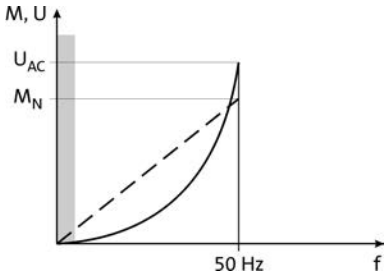
Operation on the inverter

An inverter enables energy-efficient operation of a system in virtually all application cases. The various operating modes, which can be created by making just a few simple settings, facilitate this. The following characteristics and corresponding specifications listed on the following pages can be used to calculate the optimum operating mode during the project planning phase.

Standard setting

In its initial state when delivered, the inverter is set up for basic operation with a three-phase AC motor with vector control. When operated in this mode, the rated torque of the motor is available in a setting range up to 50 Hz.

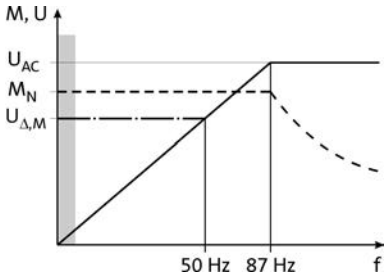
V/f at 50 Hz



Extended setting range up to 87 Hz

If the V/f reference point on the inverter is set to 87 Hz, the rated torque can be used across an extended setting range. Here, a 230/400V motor is for example used and operated in a delta layout with a 400V inverter. The setting range is then increased by 40 %. The inverter must be dimensioned for a rated motor current of 230 V.

V/f at 87 Hz

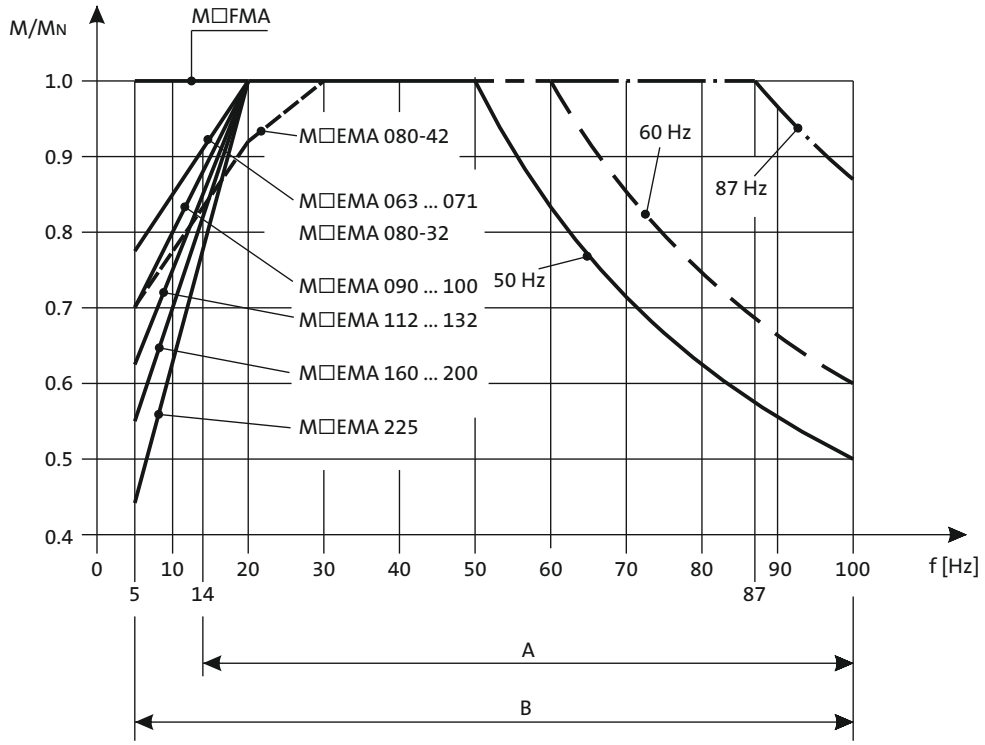


Operational performance of three-phase AC geared motors

Torque derating at low motor frequencies

The diagram shows the motor frame size-dependent torque reduction for self-ventilated motors, taking the thermal behaviour during actuation of the inverter into consideration.

Torque characteristics



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

Combinatorics of geared motors

The following tables contain the most important data of the gearbox with the motors that can be attached for an approximate dimensioning process of a geared motor. Detailed information can be found in the following chapters.

The data given in the tables apply to
- input speed n_1= 1400 r/min
- application factor c= 1.0

The data for the max. radial force refer to
- solid shaft without flange
- normal storage
- application factor c= 1.3

For further designs see the "Technical data" chapter.

► The rated torque can be gathered from the last digits of the product name e.g. g500-H45 (45 Nm).

In order to calculate the exact ratio, the number of teeth z_g (driven) can be divided by the number of teeth z_t (driving). These are cancelled values.

g500-B45, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
259	39	1.11	5.411	1120	207	2080	26.4	063-32 ... 071-42
225	41	1.00	6.222	56	9	2180	25.2	063-32 ... 071-42
197	43	0.93	7.111	64	9	2275	25.2	063-32 ... 071-42
171	44	0.83	8.178	368	45	2360	24.2	063-32 ... 071-42
154	45	0.76	9.101	1720	189	2440	24.8	063-32 ... 071-42
134	45	0.66	10.466	1978	189	2580	23.8	063-12 ... 071-42
120	45	0.60	11.640	2200	189	2660	23.9	063-12 ... 071-42
105	45	0.52	13.386	2530	189	2770	23.0	063-12 ... 071-42
92.6	45	0.46	15.111	136	9	2840	23.6	063-12 ... 071-42
80.6	45	0.40	17.378	782	45	2900	22.7	063-12 ... 071-32
72.3	45	0.36	19.365	1220	63	2950	23.4	063-12 ... 071-32
62.9	45	0.31	22.270	1403	63	3000	22.5	063-02 ... 071-32
55.9	45	0.28	25.051	2480	99	3000	22.5	063-02 ... 063-42
48.6	45	0.24	28.808	2852	99	3000	21.8	063-02 ... 063-42
43.0	45	0.21	32.593	880	27	3000	22.9	063-02 ... 063-42
37.4	45	0.19	37.481	1012	27	3000	22.1	063-02 ... 063-32
33.2	45	0.16	42.222	380	9	3000	22.8	063-02 ... 063-32
28.8	45	0.14	48.556	437	9	3000	22.0	063-02 ... 063-22
26.0	45	0.13	53.889	485	9	3000	22.7	063-02 ... 063-22
22.6	45	0.11	61.972	2231	36	3000	21.9	063-02 ... 063-22

Combinatorics of geared motors

g500-B110, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
270	69	2.05	5.185	140	27	2450	20.7	063-42 ... 090-32
235	72	1.86	5.963	161	27	2530	20.3	063-42 ... 090-32
197	77	1.67	7.111	64	9	2620	19.9	063-42 ... 090-32
171	81	1.53	8.178	368	45	2670	19.6	063-42 ... 090-32
154	84	1.42	9.101	1720	189	2730	19.6	063-42 ... 090-32
134	89	1.31	10.466	1978	189	2830	19.3	063-42 ... 090-32
122	90	1.21	11.449	2576	225	2890	19.1	063-32 ... 090-32
110	90	1.09	12.698	800	63	2950	19.7	063-32 ... 080-42
95.9	90	0.95	14.603	920	63	3000	19.4	063-32 ... 080-42
90.0	92	0.91	15.556	140	9	3000	19.4	063-42 ... 080-42
78.3	96	0.83	17.889	161	9	3000	19.2	063-42 ... 080-32
71.6	100	0.79	19.556	176	9	3000	19.2	063-12 ... 080-32
62.3	104	0.71	22.489	1012	45	3000	18.9	063-12 ... 080-32
55.6	108	0.66	25.185	680	27	3000	19.1	063-12 ... 080-32
48.3	110	0.59	28.963	782	27	3000	18.9	063-12 ... 071-42
43.9	108	0.52	31.919	3160	99	3000	18.4	063-12 ... 071-32
38.1	110	0.46	36.707	3634	99	3000	18.3	063-12 ... 071-32
37.4	106	0.44	37.400	187	5	3000	18.2	063-12 ... 071-32
35.0	100	0.38	40.000	40	1	3000	18.3	063-12 ... 071-32
30.4	110	0.37	46.000	46	1	3000	18.2	063-12 ... 071-32
29.1	110	0.35	48.167	289	6	3000	18.0	063-12 ... 071-32
26.6	69	0.20	52.698	3320	63	3000	18.2	063-12 ... 063-32
23.1	79	0.20	60.603	3818	63	3000	18.0	063-12 ... 063-32
22.9	110	0.28	61.045	1343	22	3000	18.0	063-12 ... 063-42
18.3	110	0.22	76.500	153	2	3000	18.0	063-12 ... 063-42
13.9	110	0.17	100.786	1411	14	3000	18.0	063-12 ... 063-32

Combinatorics of geared motors

g500-B240, 2-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
393	138	5.97	3.565	385	108	3030	15.4	071-42 ... 100-32
286	147	4.64	4.889	44	9	3450	15.5	080-42 ... 100-32
224	156	3.85	6.257	2365	378	3860	15.1	071-42 ... 100-32
203	179	4.01	6.883	413	60	4070	11.7	071-42 ... 100-32
179	187	3.69	7.817	469	60	4300	11.3	071-42 ... 100-32
148	191	3.12	9.440	236	25	4600	11.8	080-42 ... 100-32
131	204	2.94	10.720	268	25	4740	11.3	080-42 ... 100-32
116	208	2.66	12.081	2537	210	4860	11.6	071-42 ... 100-32
102	217	2.44	13.719	2881	210	4980	11.2	071-42 ... 100-32
93.3	223	2.29	15.008	1876	125	5180	11.0	063-42 ... 100-12
83.1	240	2.20	16.857	118	7	5440	11.3	063-42 ... 100-12
73.1	240	1.93	19.143	134	7	5710	10.9	063-42 ... 100-12
67.8	240	1.79	20.650	413	20	5860	11.2	071-42 ... 100-12
59.7	240	1.58	23.450	469	20	6070	10.8	071-42 ... 090-32
52.1	240	1.38	26.878	2419	90	6230	11.1	063-42 ... 090-32
45.9	240	1.21	30.522	2747	90	6370	10.7	063-42 ... 090-32
41.9	240	1.11	33.433	1003	30	6500	11.0	063-42 ... 080-42
36.9	240	0.98	37.967	1139	30	6500	10.7	063-42 ... 080-42
32.4	240	0.86	43.267	649	15	6500	10.9	063-12 ... 080-32
28.5	240	0.75	49.133	737	15	6500	10.6	063-12 ... 080-32
26.7	233	0.68	52.510	5251	100	6500	10.7	063-12 ... 080-32
23.5	240	0.62	59.630	5963	100	6500	10.3	063-12 ... 080-32
20.9	178	0.41	67.113	5369	80	6500	10.6	063-12 ... 071-32
18.4	202	0.41	76.213	6097	80	6500	10.3	063-12 ... 071-32

Combinatorics of geared motors

g500-B240, 3-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
20.5	240	0.56	68.459	43129	630	6500	12.8	063-12 ... 071-42
18.0	240	0.49	77.741	48977	630	6500	12.3	063-12 ... 071-42
16.0	240	0.43	87.563	11033	126	6500	12.7	063-12 ... 071-32
14.1	240	0.38	99.437	12529	126	6500	12.2	063-12 ... 071-32
12.3	240	0.33	113.673	17051	150	6500	12.6	063-12 ... 071-32
10.8	240	0.29	129.087	19363	150	6500	12.2	063-12 ... 071-32
9.60	240	0.26	145.674	61183	420	6500	12.6	063-12 ... 063-42
8.50	240	0.23	165.426	69479	420	6500	12.1	063-12 ... 063-42
7.40	240	0.20	188.442	31093	165	6500	12.5	063-12 ... 063-32
6.50	240	0.18	213.994	35309	165	6500	12.1	063-12 ... 063-32
5.70	240	0.15	245.178	11033	45	6500	12.5	063-12 ... 063-32
5.00	240	0.14	278.422	12529	45	6500	12.1	063-12 ... 063-12
4.40	240	0.12	317.617	19057	60	6500	12.5	063-12 ... 063-12
3.90	240	0.11	360.683	21641	60	6500	12.1	063-12 ... 063-12

Combinatorics of geared motors

g500-B450, 3-stage gearboxes

Output speed	Max. output torque	Max. drive power	Ratio	Number of teeth		Max. radial force	Backlash	Size
							Standard	Motor
n_2	$M_{2, max}$	$P_{1, max}$	i	z_g	z_t	$F_{rad,max}$		
							± 20 %	
[r/min]	[Nm]	[kW]				[N]	[arcmin]	
280	280	8.64	5.002	2401	480	3760	20.9	071-42 ... 132-32
204	308	6.93	6.860	343	50	4030	20.9	080-42 ... 132-22
150	368	6.10	9.315	3577	384	4370	14.6	071-42 ... 132-22
136	384	5.74	10.328	2107	204	4500	13.6	071-42 ... 112-32
110	404	4.88	12.775	511	40	4830	14.6	080-42 ... 112-32
98.8	422	4.60	14.165	1204	85	5010	13.7	080-42 ... 112-32
85.6	434	4.10	16.349	3139	192	5280	14.4	071-42 ... 112-22
78.3	446	3.85	17.885	3577	200	5470	14.3	063-42 ... 112-22
70.6	450	3.50	19.831	8428	425	5710	13.4	063-42 ... 112-22
61.4	450	3.04	22.813	365	16	6060	14.2	063-42 ... 100-32
55.3	450	2.75	25.294	430	17	6340	13.3	063-42 ... 100-32
50.1	450	2.49	27.945	3577	128	6640	14.1	071-42 ... 100-32
45.2	450	2.24	30.985	2107	68	6960	13.2	071-42 ... 100-12
38.5	450	1.91	36.373	20951	576	7520	14.0	063-42 ... 090-32
34.7	450	1.72	40.330	12341	306	7800	13.2	063-42 ... 090-32
30.9	450	1.54	45.245	8687	192	7800	14.0	063-42 ... 090-32
27.9	450	1.38	50.167	301	6	7800	13.1	063-42 ... 090-32
24.9	450	1.24	56.154	730	13	7800	12.4	063-42 ... 090-32
22.5	450	1.12	62.262	13760	221	7800	11.7	063-42 ... 080-42
20.4	450	1.01	68.788	3577	52	7800	12.4	071-42 ... 080-42
18.4	450	0.91	76.271	16856	221	7800	11.7	071-42 ... 080-42
15.6	450	0.78	89.534	20951	234	7800	12.3	063-42 ... 080-32
14.1	450	0.70	99.274	197456	1989	7800	11.6	063-42 ... 080-32
12.6	450	0.62	111.372	8687	78	7800	12.3	063-42 ... 080-32
11.3	450	0.56	123.487	4816	39	7800	11.6	063-42 ... 071-42
9.70	450	0.48	144.128	5621	39	7800	12.3	063-12 ... 071-42
8.80	450	0.43	159.807	105952	663	7800	11.6	063-12 ... 071-32
8.00	450	0.40	174.919	45479	260	7800	12.2	063-12 ... 071-32
7.20	450	0.36	193.948	214312	1105	7800	11.5	063-12 ... 071-32
6.30	450	0.31	223.563	3577	16	7800	12.2	063-12 ... 071-32
5.60	450	0.28	247.882	4214	17	7800	11.5	063-12 ... 063-42

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 corresponding to corrosivity category C1 (subject to 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 corresponding to corrosivity category C2 (subject to 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 corresponding to corrosivity category C3 (subject to 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
OKS-XL (extra Large) [1)]	• External installation • Air humidity above 95 % • Chemical industry plants • Food industry • Coastal areas with moderate salinity	• Surface coating corresponding to corrosivity category C4 (subject to EN 12944-2) Additional measures for surface and corrosion protection system L: • Rotor package and stator in the inner area primed with finishing varnish • Feedback in protection class IP65

[1)] On request

Surface and corrosion protection

Structure of surface coating

Surface and corrosion protection	Corrosivity category	Surface coating	Colour	Coating thickness
	DIN EN ISO 12944-2	Structure		
Without OKS(uncoated)		• Dipping primer of the grey iron parts		30 ... 50 µm
OKS-G (primed)		• Dipping primer of the grey iron parts • 2K PUR priming coat		60 ... 90 µm
OKS-S (small)	Comparable to C1	• Dipping primer of the grey iron parts • 2K-PUR top coat	• Standard: RAL 7012 • Optional: RAL Classic	80 ... 120 µm
OKS-M (medium)	Comparable to C2	• Dipping primer of the grey iron parts • 2K PUR priming coat • 2K-PUR top coat		110 ... 160 µm
OKS-L (large)	Comparable to C3			140 ... 200 µm
OKS-XL (extra Large) [1)]	Comparable to C4	• Dipping primer of the grey iron parts • 2K-EP priming coat (two times) • 2K-PUR top coat		160 ... 240 µm

[1)] On request

Lubricants

Gearboxes and geared motors of Lenze come supplied with a lubricant specifically adapted to the drive and design. When placing the order, the mounting position and design are decisive for the lubricant amount.
The lubricant amount and type contained in the gearbox are indicated on the nameplate.

The following gearboxes are lubricated for life:
- Helical gearbox g500-H45 ... 140
- Shaft-mounted helical gearbox g500-S130
- Bevel gearbox g500-B45 ... 240

The lubricants listed in the lubricant table are approved for 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	
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	
bremer & leguil			Cassida Fluid GL 220

► 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.

Ventilation

Gearboxes without ventilation

The g500-B45 ... B240 gearboxes do not require any ventilation measures.

Gearboxes with ventilation

The g500-B240 gearbox can be optionally ordered with ventilation units.
The g500-B450 gearbox is generally delivered with ventilation units.

Gearbox in combined mounting position

For reducing the number of versions, the gearboxes can also be ordered in a combined mounting position:

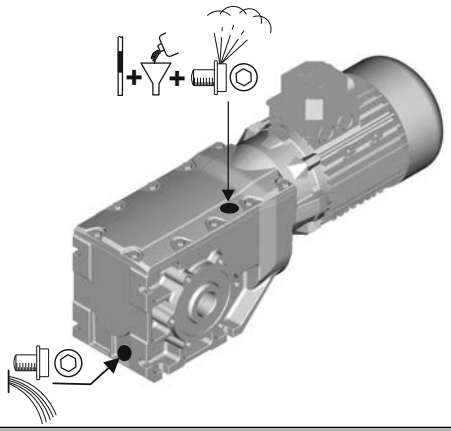
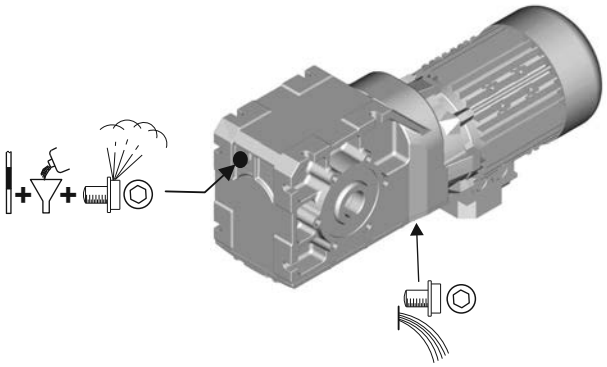
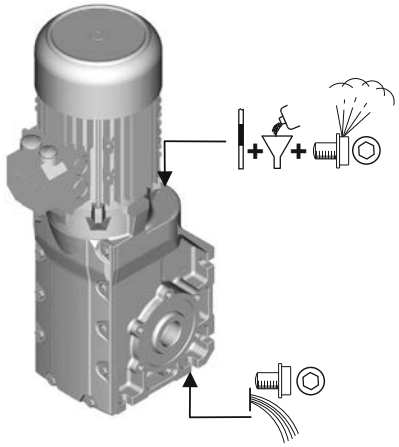
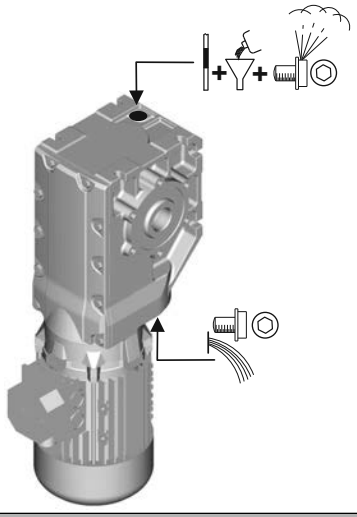
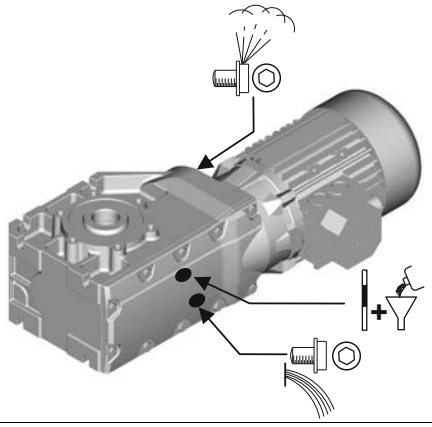
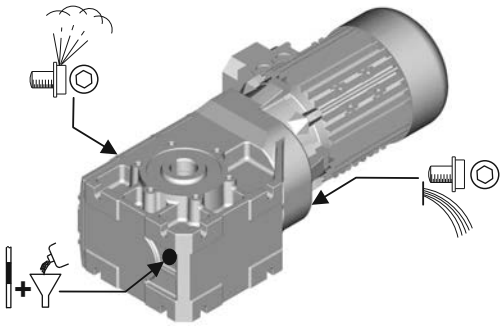
- g500-B45 in mounting position ABCDEF
- g500-B110 ... B450 in mounting position AEF

In these gearboxes, the lubricant amount has been optimised for the use in different mounting positions. The breather elements are loosely enclosed and have to be mounted before commissioning depending on the mounting position.
A gearbox can be used for several mounting positions.

Ventilation

g500-B240

► **A ... F** mounting position

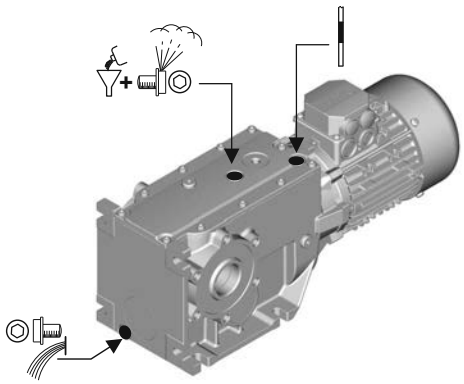
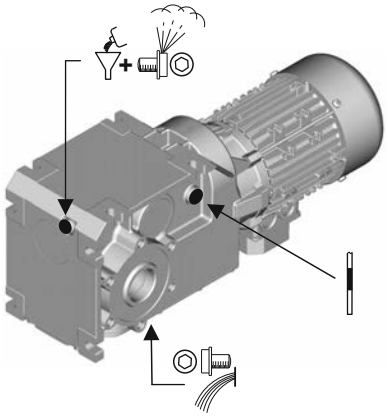
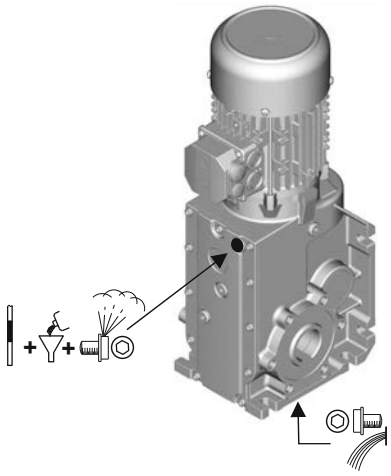
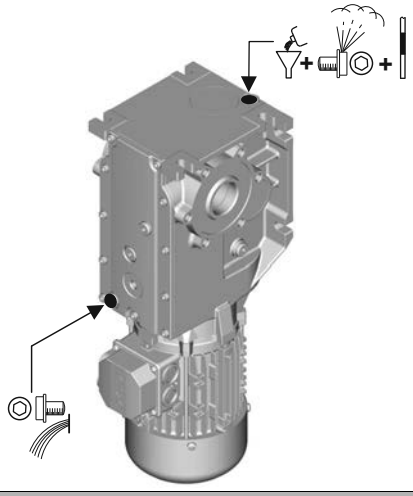
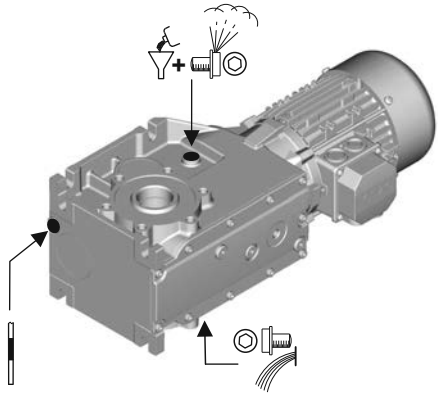
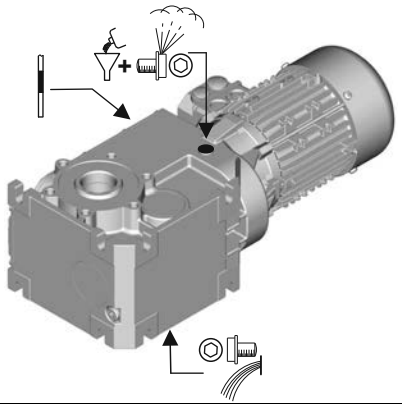
A	B
	
C	**D**
	
E	**F**
	

	Filler		Drain
	Breather element		Check

Ventilation

g500-B450

► **A ... F** mounting position

A	B
	
C	**D**
	
E	**F**
	

	Filler		Drain
	Breather element		Check

Standards and operating conditions

Geared motor data

Enclosure			
EN 60529			IP65 [1] IP55 [1] IP66 [1]
Energy efficiency class			
IEC 60034-30			IE2
IEC 60034-2-1			Methodology for measuring efficiency
Conformity			
CE			Low-Voltage Directive
			2006/95/EC
EAC			TP TC 004/2011 (TR CU 004/2011)
Approval			
CCC			GB Standard 12350-2009
CSA			CSA 22.2 No. 100 CSA C390-10
cURus [2]			UL 1004-1 UL 1004-8 Power Conversion Equipment (File-No. E210321)
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.
[2] Motor frame size 225, in preparation.

► In the European Union, the ErP Directive stipulates minimum efficiency levels for three-phase AC motors. Geared three-phase AC motors that do not conform with this Directive do not meet CE requirements and must not be marketed in the European Economic Area. For further information about the ErP Directive and the Lenze products to which it relates, please refer to the brochure entitled "International efficiency directives for three-phase AC motors".

Permissible radial and axial forces at output

Permissible radial force

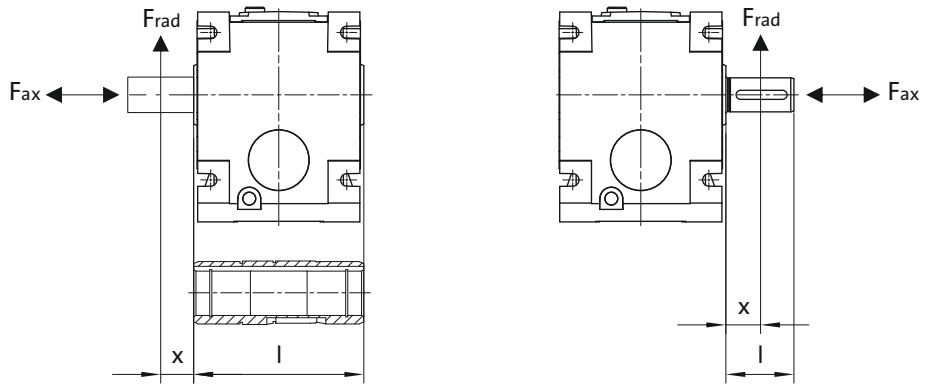
$F_{rad,perm} = f_w \times F_{rad,max}$

Permissible axial force

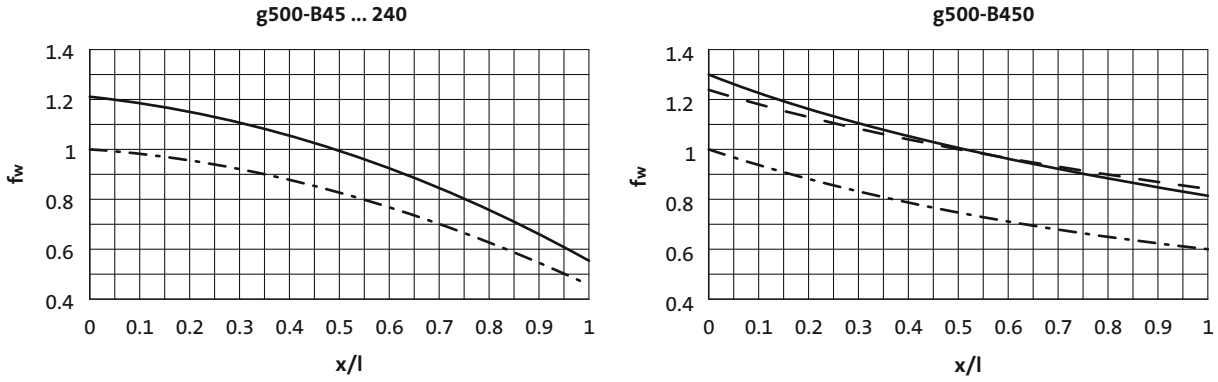
If there is no radial force, the maximum permissible axial force is 50 % of the table value $F_{rad,max}$

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

Application of forces



Additional load factor f_w at output shaft



——— Solid shaft
— — — Solid shaft with flange
— · — Hollow shaft

6.5

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.

► Neither radial nor axial forces are permissible for the hollow shaft with shrink disc.

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

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-B45	900	1200	2200	2500	2800	3000	3000	3000	3000	3000
g500-B110	1000	2200	2550	3000	3300	3600	3600	3600	3600	3600
g500-B240	1500	2250	3800	4500	5100	6200	7400	7800	7800	7800
g500-B450	3000	3800	5000	5200	5200	5500	7000	9000	9000	9000

	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-B45	900	1200	1800	2100	2400	2800	3000	3000	3000	3000
g500-B110	1000	1800	2100	2500	2700	3000	3000	3000	3000	3000
g500-B240	1500	2350	3000	3600	4500	5000	6000	6500	6500	6500
g500-B450	1800	2800	3600	3900	4300	5000	6000	7600	7800	7800

	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-B45	900	1200	1800	2100	2400	2800	3000	3000	3000	3000
g500-B110	1000	1800	2100	2500	2700	3000	3000	3000	3000	3000
g500-B240	2400	3600	5200	6000	6500	6500	6500	6500	6500	6500
g500-B450	3000	4000	4700	5100	5600	6400	7700	7800	7800	7800

Selection tables, notes

Notes on the selection tables with 4-pole motors

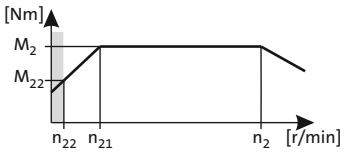
The selection tables show the available combinations of gearbox type, number of stages, ratio and motor. They are used only to provide basic orientation.
The following legend indicates the structure of the selection tables.

Rated power Prated of the drive motor depending on the rated frequency

50 Hz: P_N = 0.75 kW
87 Hz: P_N = 1.35 kW

2-stufige Getriebe ← **Number of the gear stage of the gearbox**

Torque diagram



Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
396	17	4.7	41	13	168	17	396	17	4.7	707	17	3.9	3.565	-B240	080-32	66
272	25	2.8	28	19	116	25	272	25	2.8	486	25	2.3	5.185	-B110	080-32	63

Product Gearbox

Product Motor

Ratio i

Page number for dimensions

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

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

Mains operation
Output speed **n2**
Output torque **M2**

Inverter operation
The speed and torque data are valid for self-ventilated and forced ventilated drives. Forced ventilated drives can always output the torque **M2** in the entire setting ranges. In the case of self-ventilated drives, a reduction to **M22** is required in the lower speed range.

The following applies to self-ventilated geared motors:
n22 is the minimum speed where the torque **M22** is permissible, from **n21** to **n2**, the maximum torque is **M2**
The following applies to forced ventilated geared motors:
From the minimum speed **n22** to **n2**, the maximum torque is **M2**

Motor voltages

The power values and torques indicated in the selection tables relate to the following motor voltages:
- 50 Hz : Δ 230 V / Y 400 V
- 60 Hz : 230 V or 460 V
- 87 Hz : Δ 400 V

Operation at 87 Hz

In 87 Hz operation, the three-phase AC motor (which is designed for a voltage of Δ 230 V / Y 400 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.

Selection tables, notes

Notes on the selection tables with 2-pole and 6-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.

Rated power Prated of the drive motor depending on the rated frequency

50 Hz: P_N = 0.18 kW

2-stufige Getriebe ← **Number of the gear stage of the gearbox**

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
239	7.0	5.7	11.449	-B110	063-11	72
216	8.0	5.3	12.698	-B110	063-11	72

Mains operation
Output speed **n_2**
Output torque **M_2**

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

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

Ratio i

Product Gearbox

Product Motor

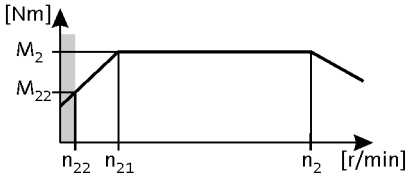
Page number for dimensions

Motor voltages

The power values and torques indicated in the selection tables relate to the following motor voltages:
- 50 Hz : Δ 230 V / Y 400 V
- 60 Hz : 230 V or 460 V

6.5

Selection tables, 4-pole motors

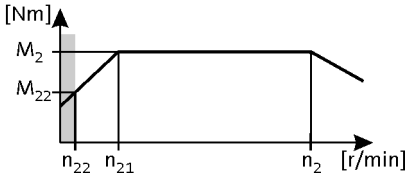


50 Hz: P_N = 0.06 kW
87 Hz: P_N = 0.11 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
64	9.0	5.3	6.5	8.5	27	9.0	64	9.0	5.3	114	9.0	4.3	22.270	-B45	063-02	85
57	10	4.7	5.8	9.6	24	10	57	10	4.7	101	10	4.4	25.051	-B45	063-02	85
50	11	4.1	5.0	11	21	11	50	11	4.1	88	11	3.8	28.808	-B45	063-02	85
44	12	3.6	4.4	12	18	12	44	12	3.6	78	13	3.4	32.593	-B45	063-02	85
38	14	3.1	3.9	14	16	14	38	14	3.1	68	15	2.9	37.481	-B45	063-02	85
34	16	2.8	3.4	16	14	16	34	16	2.8	60	17	2.7	42.222	-B45	063-02	85
29	19	2.4	3.0	19	12	19	29	19	2.4	52	19	2.4	48.556	-B45	063-02	85
26	21	2.2	2.7	21	11	21	26	21	2.2	47	21	2.1	53.889	-B45	063-02	85
23	24	1.9	2.3	24	9.7	24	23	24	1.9	41	24	1.8	61.972	-B45	063-02	85

Selection tables, 4-pole motors

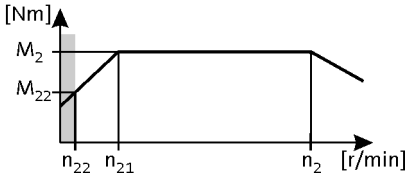


50 Hz: P_N = 0.09 kW
87 Hz: P_N = 0.16 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
103	8.0	5.7	11	7.8	45	8.0	103	8.0	5.7	186	8.0	4.9	13.386	-B45	063-22	85
91	9.0	5.0	9.6	8.8	40	9.0	91	9.0	5.0	164	9.0	4.3	15.111	-B45	063-22	85
79	10	4.4	8.3	10	35	10	79	10	4.4	143	10	3.8	17.378	-B45	063-22	85
71	11	3.9	7.5	11	31	11	71	11	3.9	128	11	3.4	19.365	-B45	063-22	85
62	13	3.4	6.5	13	27	13	62	13	3.4	112	13	2.9	22.270	-B45	063-22	85
55	15	3.0	5.8	15	24	15	55	15	3.0	99	15	3.0	25.051	-B45	063-22	85
48	17	2.6	5.0	17	21	17	48	17	2.6	86	17	2.6	28.808	-B45	063-22	85
42	19	2.3	4.4	19	18	19	42	19	2.3	76	19	2.3	32.593	-B45	063-22	85
37	22	2.0	3.9	22	16	22	37	22	2.0	66	22	2.0	37.481	-B45	063-22	85
33	25	1.8	3.4	25	14	25	33	25	1.8	59	25	1.8	42.222	-B45	063-22	85
28	29	1.6	3.0	28	12	28	28	29	1.6	51	28	1.6	48.556	-B45	063-22	85
26	32	1.4	2.7	32	11	31	26	32	1.4	46	31	1.4	53.889	-B45	063-22	85
22	37	1.2	2.3	36	9.7	36	22	37	1.2	40	36	1.2	61.972	-B45	063-22	85

Selection tables, 4-pole motors

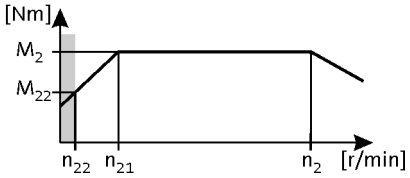


50 Hz: P_N = 0.12 kW
87 Hz: P_N = 0.21 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
			20	4.2	84	5.0				357	5.0	6.0	7.111	-B45	063-12	85
			18	4.8	73	6.0				310	6.0	6.0	8.178	-B45	063-12	85
			16	5.4	66	7.0				279	7.0	5.5	9.101	-B45	063-12	85
136	8.0	5.6	14	6.2	57	8.0	136	8.0	5.6	242	8.0	4.8	10.466	-B45	063-12	85
122	9.0	5.1	13	6.8	52	9.0	122	9.0	5.1	218	9.0	4.3	11.640	-B45	063-12	85
			11	7.5	47	10				200	10	5.5	12.698	-B110	063-12	88
107	10	4.4	11	7.9	45	10	107	10	4.4	189	10	3.8	13.386	-B45	063-12	85
94	12	3.9	9.6	8.9	40	11	94	12	3.9	168	11	3.3	15.111	-B45	063-12	85
82	13	3.4	8.3	10	35	13	82	13	3.4	146	13	2.9	17.378	-B45	063-12	85
74	15	3.0	7.5	11	31	15	74	15	3.0	131	15	2.6	19.365	-B45	063-12	85
73	15	5.5	7.4	12	31	15	73	15	5.5	130	15	4.7	19.556	-B110	063-12	88
64	17	2.6	6.5	13	27	17	64	17	2.6	114	17	2.3	22.270	-B45	063-12	85
63	17	5.5	6.4	13	27	17	63	17	5.5	113	17	4.7	22.489	-B110	063-12	88
57	19	2.4	5.8	15	24	19	57	19	2.4	101	19	2.3	25.051	-B45	063-12	85
57	19	4.6	5.8	15	24	19	57	19	4.6	101	19	3.9	25.185	-B110	063-12	88
50	22	2.0	5.0	17	21	22	50	22	2.0	88	22	2.0	28.808	-B45	063-12	85
49	22	4.6	5.0	17	21	22	49	22	4.6	88	22	3.9	28.963	-B110	063-12	88
45	24	4.0	4.5	19	19	24	45	24	4.0	79	24	3.4	31.919	-B110	063-12	88
44	25	1.8	4.4	19	18	24	44	25	1.8	78	24	1.8	32.593	-B45	063-12	85
38	29	3.7	3.9	22	16	28	38	29	3.7	68	28	3.2	37.400	-B110	063-12	88
38	29	1.6	3.9	22	16	28	38	29	1.6	68	28	1.5	37.481	-B45	063-12	85
36	31	3.3	3.6	24	15	30	36	31	3.3	63	30	3.2	40.000	-B110	063-12	88
34	32	1.4	3.4	25	14	32	34	32	1.4	60	32	1.4	42.222	-B45	063-12	85
31	35	3.1	3.2	27	13	35	31	35	3.1	55	35	3.0	46.000	-B110	063-12	88
30	37	3.0	3.0	28	13	36	30	37	3.0	53	36	2.9	48.167	-B110	063-12	88
29	37	1.2	3.0	29	12	36	29	37	1.2	52	36	1.2	48.556	-B45	063-12	85
27	40	1.7	2.8	31	11	40	27	40	1.7	48	40	1.7	52.698	-B110	063-12	88
26	41	1.1	2.7	32	11	40	26	41	1.1	47	40	1.1	53.889	-B45	063-12	85
24	46	1.7	2.4	36	9.9	46	24	46	1.7	42	46	1.7	60.603	-B110	063-12	88
23	47	2.4	2.4	36	9.8	46	23	47	2.4	42	46	2.4	61.045	-B110	063-12	88
23	47	1.0	2.3	37	9.7	47	23	47	1.0	41	47	1.0	61.972	-B45	063-12	85
21	51	3.1	2.2	40	8.9	50	21	51	3.1	38	50	3.2	67.113	-B240	063-12	91
19	58	3.1	1.9	45	7.9	57	19	58	3.1	33	57	3.2	76.213	-B240	063-12	91
19	58	1.9	1.9	45	7.8	57	19	58	1.9	33	57	1.9	76.500	-B110	063-12	88
14	77	1.4	1.4	59	6.0	76	14	77	1.4	25	76	1.5	100.786	-B110	063-12	88

Selection tables, 4-pole motors

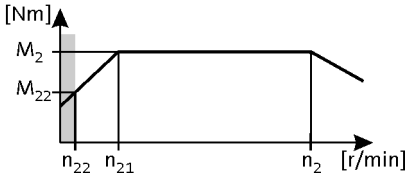


50 Hz: P_N = 0.12 kW
87 Hz: P_N = 0.21 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
21	51	4.7	2.1	39	8.8	50	21	51	4.7	37	50	4.6	68.459	-B240	063-12	91
16	65	3.7	1.7	50	6.9	64	16	65	3.7	29	64	3.6	87.563	-B240	063-12	91
14	74	3.2	1.5	57	6.0	73	14	74	3.2	26	73	3.1	99.437	-B240	063-12	91
13	85	2.8	1.3	65	5.3	83	13	85	2.8	22	83	2.9	113.673	-B240	063-12	91
11	96	2.5	1.1	74	4.6	95	11	96	2.5	20	95	2.5	129.087	-B240	063-12	91
9.8	108	2.2	1.0	84	4.1	107	9.8	108	2.2	17	107	2.3	145.674	-B240	063-12	91
8.6	123	2.0	0.9	95	3.6	121	8.6	123	2.0	15	121	2.0	165.426	-B240	063-12	91
7.6	140	1.7	0.8	108	3.2	138	7.6	140	1.7	14	138	1.7	188.442	-B240	063-12	91
7.3	148	3.0	0.7	114	3.1	146	7.3	148	3.0	13	146	3.1	193.948	-B450	063-12	94
6.7	159	1.5	0.7	123	2.8	157	6.7	159	1.5	12	157	1.5	213.994	-B240	063-12	91
6.4	171	2.6	0.6	132	2.7	168	6.4	171	2.6	11	168	2.7	223.563	-B450	063-12	94
5.8	183	1.3	0.6	141	2.4	180	5.8	183	1.3	10	180	1.3	245.178	-B240	063-12	91
5.7	189	2.4	0.6	146	2.4	186	5.7	189	2.4	10	186	2.4	247.882	-B450	063-12	94
5.1	207	1.2	0.5	160	2.2	204	5.1	207	1.2	9.1	204	1.2	278.422	-B240	063-12	91
4.5	237	1.0	0.5	182	1.9	233	4.5	237	1.0	8.0	233	1.0	317.617	-B240	063-12	91
4.0	269	0.9	0.4	207	1.7	264	4.0	269	0.9	7.0	264	0.9	360.683	-B240	063-12	91

Selection tables, 4-pole motors

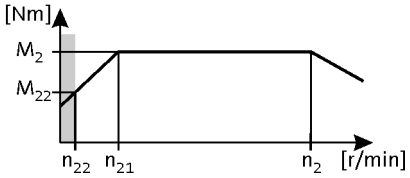


50 Hz: P_N = 0.18 kW
87 Hz: P_N = 0.33 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
252	6.0	4.7	27	5.0	111	6.0	252	6.0	4.7	457	7.0	3.9	5.411	-B45	063-32	85
219	7.0	4.7	23	5.7	96	7.0	219	7.0	4.7	398	8.0	3.9	6.222	-B45	063-32	85
192	9.0	4.5	20	6.6	84	9.0	192	9.0	4.5	348	9.0	3.7	7.111	-B45	063-32	85
167	10	4.5	18	7.5	73	10	167	10	4.5	303	10	3.7	8.178	-B45	063-32	85
150	11	4.1	16	8.4	66	11	150	11	4.1	272	11	3.5	9.101	-B45	063-32	85
130	13	3.6	14	9.6	57	13	130	13	3.6	237	13	3.0	10.466	-B45	063-32	85
119	14	4.5	13	11	52	14	119	14	4.5	216	14	3.7	11.449	-B110	063-32	88
117	14	3.2	13	11	52	14	117	14	3.2	213	14	2.7	11.640	-B45	063-32	85
108	15	4.1	11	12	47	15	108	15	4.1	195	15	3.5	12.698	-B110	063-32	88
102	16	2.8	11	12	45	16	102	16	2.8	185	16	2.4	13.386	-B45	063-32	85
94	17	4.1	9.9	14	41	17	94	17	4.1	170	18	3.5	14.603	-B110	063-32	88
90	18	2.5	9.6	14	40	18	90	18	2.5	164	18	2.1	15.111	-B45	063-32	85
79	21	2.2	8.3	16	35	21	79	21	2.2	142	21	1.8	17.378	-B45	063-32	85
71	23	1.9	7.5	18	31	23	71	23	1.9	128	23	1.6	19.365	-B45	063-32	85
70	23	3.5	7.4	18	31	23	70	23	3.5	127	24	2.9	19.556	-B110	063-32	88
61	27	1.7	6.5	21	27	27	61	27	1.7	111	27	1.4	22.270	-B45	063-32	85
61	27	3.5	6.4	21	27	27	61	27	3.5	110	27	2.9	22.489	-B110	063-32	88
55	30	1.5	5.8	23	24	30	55	30	1.5	99	30	1.4	25.051	-B45	063-32	85
54	30	2.9	5.8	23	24	30	54	30	2.9	98	30	2.5	25.185	-B110	063-32	88
47	34	1.3	5.0	27	21	34	47	34	1.3	86	35	1.2	28.808	-B45	063-32	85
47	35	2.9	5.0	27	21	35	47	35	2.9	86	35	2.5	28.963	-B110	063-32	88
43	38	2.6	4.5	29	19	38	43	38	2.6	78	39	2.2	31.919	-B110	063-32	88
42	39	1.2	4.4	30	18	39	42	39	1.2	76	39	1.1	32.593	-B45	063-32	85
37	44	2.5	4.0	34	16	44	37	44	2.5	67	44	2.1	36.707	-B110	063-32	88
37	45	2.4	3.9	35	16	45	37	45	2.4	66	45	2.0	37.400	-B110	063-32	88
36	45	1.0	3.9	35	16	45	36	45	1.0	66	45	1.0	37.481	-B45	063-32	85
34	48	2.1	3.6	37	15	48	34	48	2.1	62	48	2.0	40.000	-B110	063-32	88
32	51	0.9	3.4	39	14	51	32	51	0.9	59	51	0.9	42.222	-B45	063-32	85
32	52	2.9	3.4	40	14	52	32	52	2.9	57	52	2.8	43.267	-B240	063-32	91
30	55	2.0	3.2	42	13	55	30	55	2.0	54	56	1.9	46.000	-B110	063-32	88
28	58	1.9	3.0	44	13	58	28	58	1.9	51	58	1.8	48.167	-B110	063-32	88
28	59	2.9	3.0	45	12	59	28	59	2.9	50	59	2.8	49.133	-B240	063-32	91
26	63	2.6	2.8	48	11	63	26	63	2.6	47	64	2.4	52.510	-B240	063-32	91
26	63	1.1	2.8	49	11	63	26	63	1.1	47	64	1.0	52.698	-B110	063-32	88
23	71	2.6	2.4	55	10	71	23	71	2.6	42	72	2.4	59.630	-B240	063-32	91

Selection tables, 4-pole motors



50 Hz: P_N = 0.18 kW
87 Hz: P_N = 0.33 kW

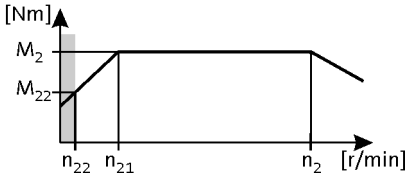
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
23	73	1.1	2.4	56	9.9	73	23	73	1.1	41	73	1.1	60.603	-B110	063-32	88
22	73	1.5	2.4	56	9.8	73	22	73	1.5	41	74	1.5	61.045	-B110	063-32	88
20	80	2.0	2.2	62	8.9	80	20	80	2.0	37	81	2.0	67.113	-B240	063-32	91
18	91	2.0	1.9	70	7.9	91	18	91	2.0	33	92	2.0	76.213	-B240	063-32	91
18	92	1.2	1.9	71	7.8	92	18	92	1.2	32	93	1.2	76.500	-B110	063-32	88
14	121	0.9	1.4	93	6.0	121	14	121	0.9	25	122	0.9	100.786	-B110	063-32	88

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
20	80	3.0	2.1	62	8.8	80	20	80	3.0	36	81	2.9	68.459	-B240	063-32	91
18	91	2.7	1.9	70	7.7	91	18	91	2.7	32	92	2.5	77.741	-B240	063-32	91
16	102	2.4	1.7	79	6.9	102	16	102	2.4	28	103	2.2	87.563	-B240	063-32	91
14	116	2.1	1.5	89	6.0	116	14	116	2.1	25	117	2.0	99.437	-B240	063-32	91
12	133	1.8	1.3	102	5.3	133	12	133	1.8	22	134	1.8	113.673	-B240	063-32	91
11	151	1.6	1.1	116	4.6	151	11	151	1.6	19	152	1.6	129.087	-B240	063-32	91
9.5	172	2.6	1.0	133	4.2	172	9.5	172	2.6	17	174	2.6	144.128	-B450	063-32	94
9.4	170	1.4	1.0	131	4.1	170	9.4	170	1.4	17	172	1.4	145.674	-B240	063-32	91
8.5	191	2.4	0.9	147	3.8	191	8.5	191	2.4	16	193	2.3	159.807	-B450	063-32	94
8.3	193	1.2	0.9	149	3.6	193	8.3	193	1.2	15	195	1.2	165.426	-B240	063-32	91
7.8	209	2.2	0.8	161	3.4	209	7.8	209	2.2	14	212	2.1	174.919	-B450	063-32	94
7.2	220	1.1	0.8	169	3.2	220	7.2	220	1.1	13	222	1.1	188.442	-B240	063-32	91
7.0	232	1.9	0.7	179	3.1	232	7.0	232	1.9	13	235	1.9	193.948	-B450	063-32	94
6.4	250	1.0	0.7	192	2.8	250	6.4	250	1.0	12	252	1.0	213.994	-B240	063-32	91
6.1	267	1.7	0.6	206	2.7	267	6.1	267	1.7	11	270	1.7	223.563	-B450	063-32	94
5.6	286	0.8	0.6	220	2.4	286	5.6	286	0.8	10	289	0.8	245.178	-B240	063-32	91
5.5	296	1.5	0.6	228	2.4	296	5.5	296	1.5	10	300	1.5	247.882	-B450	063-32	94

Selection tables, 4-pole motors

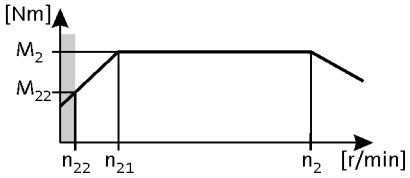


50 Hz: P_N = 0.25 kW
87 Hz: P_N = 0.45 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
264	9.0	5.6	28	6.6	116	9.0	264	9.0	5.6	478	9.0	4.8	5.185	-B110	063-42	88
253	9.0	4.4	27	6.9	111	9.0	253	9.0	4.4	458	9.0	3.7	5.411	-B45	063-42	85
230	10	5.6	24	7.6	101	10	230	10	5.6	416	10	4.8	5.963	-B110	063-42	88
220	10	3.9	23	7.9	96	10	220	10	3.9	399	10	3.3	6.222	-B45	063-42	85
193	12	3.7	20	9.1	84	12	193	12	3.7	349	12	3.1	7.111	-B45	063-42	85
193	12	5.6	20	9.1	84	12	193	12	5.6	349	12	4.8	7.111	-B110	063-42	88
168	14	3.3	18	10	73	13	168	14	3.3	303	13	2.8	8.178	-B45	063-42	85
168	14	5.6	18	10	73	13	168	14	5.6	303	13	4.8	8.178	-B110	063-42	88
151	15	3.0	16	12	66	15	151	15	3.0	273	15	2.5	9.101	-B45	063-42	85
151	15	5.2	16	12	66	15	151	15	5.2	273	15	4.4	9.101	-B110	063-42	88
131	17	2.6	14	13	57	17	131	17	2.6	237	17	2.2	10.466	-B45	063-42	85
131	17	5.1	14	13	57	17	131	17	5.1	237	17	4.4	10.466	-B110	063-42	88
120	19	4.8	13	15	52	19	120	19	4.8	217	19	4.0	11.449	-B110	063-42	88
118	19	2.3	13	15	52	19	118	19	2.3	213	19	2.0	11.640	-B45	063-42	85
108	21	4.3	11	16	47	21	108	21	4.3	195	21	3.6	12.698	-B110	063-42	88
102	22	2.0	11	17	45	22	102	22	2.0	185	22	1.7	13.386	-B45	063-42	85
94	24	3.7	9.9	19	41	24	94	24	3.7	170	24	3.2	14.603	-B110	063-42	88
91	25	1.8	9.6	19	40	25	91	25	1.8	164	25	1.5	15.111	-B45	063-42	85
88	26	3.6	9.3	20	39	26	88	26	3.6	159	26	3.0	15.556	-B110	063-42	88
79	29	1.6	8.3	22	35	29	79	29	1.6	143	29	1.3	17.378	-B45	063-42	85
77	30	3.2	8.1	23	34	29	77	30	3.2	139	29	2.8	17.889	-B110	063-42	88
71	32	1.4	7.5	25	31	32	71	32	1.4	128	32	1.2	19.365	-B45	063-42	85
70	32	3.1	7.4	25	31	32	70	32	3.1	127	32	2.6	19.556	-B110	063-42	88
62	37	1.2	6.5	28	27	37	62	37	1.2	111	37	1.0	22.270	-B45	063-42	85
61	37	2.8	6.4	29	27	37	61	37	2.8	110	37	2.4	22.489	-B110	063-42	88
55	41	1.1	5.8	32	24	41	55	41	1.1	99	41	1.1	25.051	-B45	063-42	85
54	42	2.6	5.8	32	24	41	54	42	2.6	99	41	2.2	25.185	-B110	063-42	88
48	48	0.9	5.0	37	21	47	48	48	0.9	86	47	0.9	28.808	-B45	063-42	85
47	48	2.3	5.0	37	21	48	47	48	2.3	86	48	2.0	28.963	-B110	063-42	88
43	53	2.0	4.5	41	19	53	43	53	2.0	78	53	1.7	31.919	-B110	063-42	88
42	54	0.8	4.4	42	18	54	42	54	0.8	76	54	0.8	32.593	-B45	063-42	85
37	61	1.8	4.0	47	16	60	37	61	1.8	68	60	1.5	36.707	-B110	063-42	88
37	62	1.7	3.9	48	16	62	37	62	1.7	66	62	1.5	37.400	-B110	063-42	88
34	66	1.2	3.6	51	15	66	34	66	1.2	62	66	1.2	40.000	-B110	063-42	88
30	76	1.2	3.2	59	13	76	30	76	1.2	54	76	1.2	46.000	-B110	063-42	88

Selection tables, 4-pole motors



50 Hz: P_N = 0.25 kW
87 Hz: P_N = 0.45 kW

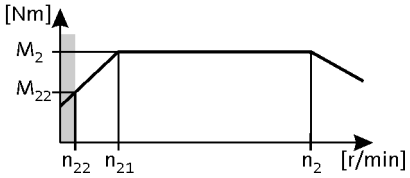
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
28	80	1.4	3.0	61	13	79	28	80	1.4	52	79	1.3	48.167	-B110	063-42	88
28	81	3.0	3.0	63	12	81	28	81	3.0	51	81	2.9	49.133	-B240	063-42	91
26	87	2.7	2.8	67	11	86	26	87	2.7	47	86	2.6	52.510	-B240	063-42	91
23	99	2.4	2.4	76	10	98	23	99	2.4	42	98	2.4	59.630	-B240	063-42	91
22	101	1.1	2.4	78	9.8	100	22	101	1.1	41	100	1.1	61.045	-B110	063-42	88
20	111	1.4	2.2	86	8.9	110	20	111	1.4	37	110	1.4	67.113	-B240	063-42	91
18	126	1.4	1.9	97	7.9	125	18	126	1.4	33	125	1.4	76.213	-B240	063-42	91
18	127	0.9	1.9	98	7.8	126	18	127	0.9	32	126	0.9	76.500	-B110	063-42	88

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
20	110	2.2	2.1	85	8.8	110	20	110	2.2	36	110	2.1	68.459	-B240	063-42	91
18	125	1.9	1.9	97	7.7	125	18	125	1.9	32	125	1.9	77.741	-B240	063-42	91
16	141	1.7	1.7	109	6.9	140	16	141	1.7	28	140	1.6	87.563	-B240	063-42	91
15	148	3.0	1.6	114	6.7	147	15	148	3.0	28	147	2.9	89.534	-B450	063-42	94
14	164	2.7	1.5	127	6.0	163	14	164	2.7	25	163	2.7	99.274	-B450	063-42	94
14	160	1.5	1.5	124	6.0	160	14	160	1.5	25	160	1.5	99.437	-B240	063-42	91
12	184	2.4	1.3	142	5.4	183	12	184	2.4	22	183	2.5	111.372	-B450	063-42	94
12	183	1.3	1.3	141	5.3	182	12	183	1.3	22	182	1.3	113.673	-B240	063-42	91
11	204	2.2	1.2	157	4.9	203	11	204	2.2	20	203	2.2	123.487	-B450	063-42	94
11	208	1.2	1.1	160	4.6	207	11	208	1.2	19	207	1.2	129.087	-B240	063-42	91
9.5	239	1.9	1.0	184	4.2	237	9.5	239	1.9	17	237	1.9	144.128	-B450	063-42	94
9.4	235	1.0	1.0	181	4.1	234	9.4	235	1.0	17	234	1.0	145.674	-B240	063-42	91
8.6	265	1.7	0.9	204	3.8	263	8.6	265	1.7	16	263	1.7	159.807	-B450	063-42	94
8.3	267	0.9	0.9	206	3.6	265	8.3	267	0.9	15	265	0.9	165.426	-B240	063-42	91
7.8	290	1.6	0.8	223	3.4	288	7.8	290	1.6	14	288	1.6	174.919	-B450	063-42	94
7.1	321	1.4	0.7	247	3.1	319	7.1	321	1.4	13	319	1.4	193.948	-B450	063-42	94
6.1	370	1.2	0.6	285	2.7	368	6.1	370	1.2	11	368	1.2	223.563	-B450	063-42	94
5.5	410	1.1	0.6	316	2.4	408	5.5	410	1.1	10	408	1.1	247.882	-B450	063-42	94

Selection tables, 4-pole motors

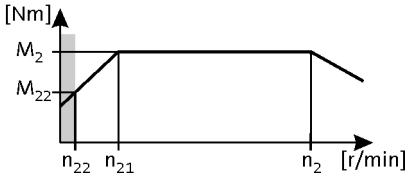


50 Hz: P_N = 0.37 kW
87 Hz: P_N = 0.66 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
272	12	4.9	28	9.5	116	12	272	12	4.9				5.185	-B110	071-32	88
261	13	3.0	27	9.9	111	13	261	13	3.0	466	13	2.6	5.411	-B45	071-32	85
237	14	4.9	24	11	101	14	237	14	4.9				5.963	-B110	071-32	88
227	15	2.7	23	11	96	15	227	15	2.7	405	15	2.3	6.222	-B45	071-32	85
198	17	2.5	20	13	84	17	198	17	2.5	354	17	2.1	7.111	-B45	071-32	85
198	17	4.6	20	13	84	17	198	17	4.6				7.111	-B110	071-32	88
172	19	2.3	18	15	73	19	172	19	2.3	308	19	1.9	8.178	-B45	071-32	85
172	19	4.2	18	15	73	19	172	19	4.2				8.178	-B110	071-32	88
155	22	2.1	16	17	66	22	155	22	2.1	277	22	1.8	9.101	-B45	071-32	85
155	22	3.9	16	17	66	22	155	22	3.9				9.101	-B110	071-32	88
135	25	1.8	14	19	57	25	135	25	1.8	241	25	1.5	10.466	-B45	071-32	85
135	25	3.6	14	19	57	25	135	25	3.6				10.466	-B110	071-32	88
123	27	3.3	13	21	52	27	123	27	3.3				11.449	-B110	071-32	88
121	28	1.6	13	21	52	28	121	28	1.6	217	28	1.4	11.640	-B45	071-32	85
111	30	3.0	11	23	47	30	111	30	3.0	198	30	2.5	12.698	-B110	071-32	88
105	32	1.4	11	25	45	32	105	32	1.4	188	32	1.2	13.386	-B45	071-32	85
97	35	2.6	9.9	27	41	35	97	35	2.6	173	35	2.2	14.603	-B110	071-32	88
93	36	1.3	9.6	28	40	36	93	36	1.3	167	36	1.1	15.111	-B45	071-32	85
91	37	2.5	9.3	29	39	37	91	37	2.5	162	37	2.1	15.556	-B110	071-32	88
81	41	1.1	8.3	32	35	41	81	41	1.1	145	41	0.9	17.378	-B45	071-32	85
79	43	2.3	8.1	33	34	43	79	43	2.3	141	43	1.9	17.889	-B110	071-32	88
73	46	1.0	7.5	36	31	46	73	46	1.0	130	46	0.8	19.365	-B45	071-32	85
72	47	2.2	7.4	36	31	46	72	47	2.2	129	46	1.8	19.556	-B110	071-32	88
63	53	0.9	6.5	41	27	53	63	53	0.9				22.270	-B45	071-32	85
63	54	1.9	6.4	41	27	53	63	54	1.9	112	53	1.6	22.489	-B110	071-32	88
56	60	1.8	5.8	46	24	60	56	60	1.8	100	60	1.5	25.185	-B110	071-32	88
49	69	1.6	5.0	53	21	69	49	69	1.6	87	69	1.3	28.963	-B110	071-32	88
44	76	1.4	4.5	59	19	76	44	76	1.4	79	76	1.2	31.919	-B110	071-32	88
42	80	3.0	4.3	61	18	79	42	80	3.0	75	79	2.5	33.433	-B240	071-32	91
38	87	1.3	4.0	67	16	87	38	87	1.3	69	87	1.1	36.707	-B110	071-32	88
38	89	1.2	3.9	69	16	89	38	89	1.2	67	89	1.0	37.400	-B110	071-32	88
37	90	2.7	3.8	70	16	90	37	90	2.7	66	90	2.2	37.967	-B240	071-32	91
35	95	1.1	3.6	73	15	95	35	95	1.1	63	95	1.0	40.000	-B110	071-32	88
33	103	2.3	3.4	79	14	103	33	103	2.3	58	103	2.2	43.267	-B240	071-32	91
31	110	1.0	3.2	84	13	109	31	110	1.0	55	109	1.0	46.000	-B110	071-32	88

Selection tables, 4-pole motors



50 Hz: P_N = 0.37 kW
87 Hz: P_N = 0.66 kW

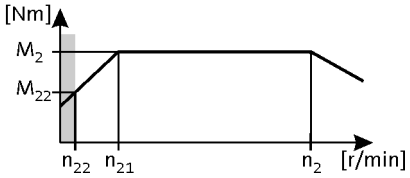
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
29	115	1.0	3.0	88	13	114	29	115	1.0	52	114	0.9	48.167	-B110	071-32	88
29	117	2.1	3.0	90	12	117	29	117	2.1	51	117	2.0	49.133	-B240	071-32	91
27	125	1.9	2.8	96	11	125	27	125	1.9	48	125	1.8	52.510	-B240	071-32	91
24	142	1.7	2.4	109	10	142	24	142	1.7	42	142	1.6	59.630	-B240	071-32	91
21	160	1.1	2.2	123	8.9	159	21	160	1.1	38	159	1.1	67.113	-B240	071-32	91
19	181	1.1	1.9	140	7.9	181	19	181	1.1	33	181	1.1	76.213	-B240	071-32	91

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
31	108	3.2	3.2	83	13	108	31	108	3.2				45.245	-B450	071-32	94
28	119	3.2	2.9	92	12	119	28	119	3.2				50.167	-B450	071-32	94
23	148	3.0	2.3	114	9.6	148	23	148	3.0	41	148	2.9	62.262	-B450	071-32	94
21	159	1.5	2.1	122	8.8	159	21	159	1.5	37	159	1.5	68.459	-B240	071-32	91
18	180	1.3	1.9	139	7.7	180	18	180	1.3	32	180	1.3	77.741	-B240	071-32	91
16	203	1.2	1.7	157	6.9	203	16	203	1.2	29	203	1.1	87.563	-B240	071-32	91
16	213	2.1	1.6	164	6.7	213	16	213	2.1	28	213	2.0	89.534	-B450	071-32	94
14	236	1.9	1.5	182	6.0	236	14	236	1.9	25	236	1.8	99.274	-B450	071-32	94
14	231	1.0	1.5	178	6.0	230	14	231	1.0	25	230	1.0	99.437	-B240	071-32	91
13	265	1.7	1.3	204	5.4	265	13	265	1.7	23	265	1.7	111.372	-B450	071-32	94
12	264	0.9	1.3	203	5.3	263	12	264	0.9	22	263	0.9	113.673	-B240	071-32	91
11	294	1.5	1.2	226	4.9	293	11	294	1.5	20	293	1.5	123.487	-B450	071-32	94
11	300	0.8	1.1	231	4.6	299	11	300	0.8	20	299	0.8	129.087	-B240	071-32	91
9.8	343	1.3	1.0	264	4.2	342	9.8	343	1.3	18	342	1.3	144.128	-B450	071-32	94
8.8	380	1.2	0.9	293	3.8	380	8.8	380	1.2	16	380	1.2	159.807	-B450	071-32	94
8.1	416	1.1	0.8	321	3.4	416	8.1	416	1.1	14	416	1.1	174.919	-B450	071-32	94
7.3	462	1.0	0.7	356	3.1	461	7.3	462	1.0	13	461	1.0	193.948	-B450	071-32	94
6.3	532	0.9	0.6	410	2.7	531	6.3	532	0.9	11	531	0.9	223.563	-B450	071-32	94

Selection tables, 4-pole motors

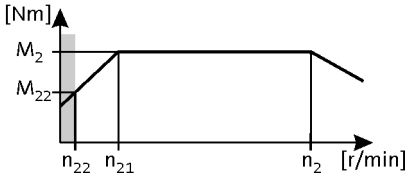


50 Hz: P_N = 0.55 kW
87 Hz: P_N = 1.0 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
394	13	5.1	41	9.7	168	13	394	13	5.1				3.565	-B240	071-42	91
271	18	3.8	28	14	116	18	271	18	3.8				5.185	-B110	071-42	88
260	19	2.0	27	15	111	19	260	19	2.0	465	20	1.7	5.411	-B45	071-42	85
236	21	3.4	24	16	101	21	236	21	3.4				5.963	-B110	071-42	88
226	22	1.8	23	17	96	22	226	22	1.8	404	22	1.5	6.222	-B45	071-42	85
225	22	4.5	23	17	96	22	225	22	4.5				6.257	-B240	071-42	91
198	25	1.7	20	19	84	25	198	25	1.7	354	26	1.4	7.111	-B45	071-42	85
198	25	3.1	20	19	84	25	198	25	3.1	354	26	2.5	7.111	-B110	071-42	88
172	29	1.5	18	22	73	29	172	29	1.5	308	29	1.3	8.178	-B45	071-42	85
172	29	2.8	18	22	73	29	172	29	2.8	308	29	2.3	8.178	-B110	071-42	88
154	32	1.4	16	25	66	32	154	32	1.4	276	33	1.2	9.101	-B45	071-42	85
154	32	2.6	16	25	66	32	154	32	2.6	276	33	2.2	9.101	-B110	071-42	88
134	37	1.2	14	29	57	37	134	37	1.2	240	38	1.0	10.466	-B45	071-42	85
134	37	2.4	14	29	57	37	134	37	2.4	240	38	2.0	10.466	-B110	071-42	88
123	41	2.2	13	31	52	41	123	41	2.2	220	41	1.8	11.449	-B110	071-42	88
121	41	1.1	13	32	52	41	121	41	1.1	216	42	0.9	11.640	-B45	071-42	85
111	45	2.0	11	35	47	45	111	45	2.0	198	46	1.7	12.698	-B110	071-42	88
105	48	1.0	11	37	45	48	105	48	1.0				13.386	-B45	071-42	85
96	52	1.7	9.9	40	41	52	96	52	1.7	172	53	1.4	14.603	-B110	071-42	88
93	54	0.8	9.6	41	40	54	93	54	0.8				15.111	-B45	071-42	85
90	55	1.7	9.3	43	39	55	90	55	1.7	162	56	1.4	15.556	-B110	071-42	88
79	64	1.5	8.1	49	34	64	79	64	1.5	141	65	1.3	17.889	-B110	071-42	88
72	69	1.4	7.4	54	31	69	72	69	1.4	129	71	1.2	19.556	-B110	071-42	88
63	80	1.3	6.4	62	27	80	63	80	1.3	112	81	1.1	22.489	-B110	071-42	88
60	83	2.9	6.2	64	26	83	60	83	2.9	107	85	2.4	23.450	-B240	071-42	91
56	89	1.2	5.8	69	24	89	56	89	1.2	100	91	1.0	25.185	-B110	071-42	88
52	95	2.5	5.4	74	22	95	52	95	2.5	94	97	2.1	26.878	-B240	071-42	91
49	103	1.1	5.0	79	21	103	49	103	1.1	87	104	0.9	28.963	-B110	071-42	88
46	108	2.2	4.8	84	20	108	46	108	2.2	82	110	1.8	30.522	-B240	071-42	91
42	119	2.0	4.3	91	18	119	42	119	2.0	75	121	1.7	33.433	-B240	071-42	91
37	135	1.8	3.8	104	16	135	37	135	1.8	66	137	1.5	37.967	-B240	071-42	91
33	154	1.6	3.4	118	14	154	33	154	1.6	58	156	1.5	43.267	-B240	071-42	91
29	174	1.4	3.0	134	12	174	29	174	1.4	51	177	1.3	49.133	-B240	071-42	91
27	186	1.3	2.8	144	11	186	27	186	1.3	48	189	1.2	52.510	-B240	071-42	91
24	212	1.1	2.4	163	10	212	24	212	1.1	42	215	1.1	59.630	-B240	071-42	91

Selection tables, 4-pole motors

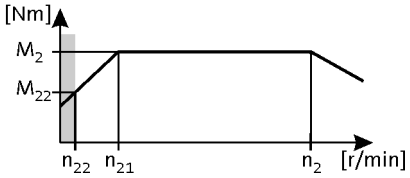


50 Hz: P_N = 0.55 kW
87 Hz: P_N = 1.0 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
35	143	3.1	3.6	110	15	143	35	143	3.1	62	145	3.0	40.330	-B450	071-42	94
31	161	2.8	3.2	124	13	161	31	161	2.8	56	163	2.6	45.245	-B450	071-42	94
28	178	2.5	2.9	137	12	178	28	178	2.5	50	181	2.4	50.167	-B450	071-42	94
25	199	2.3	2.6	154	11	199	25	199	2.3	45	203	2.1	56.154	-B450	071-42	94
23	221	2.0	2.3	170	9.6	221	23	221	2.0	40	225	1.9	62.262	-B450	071-42	94
21	237	1.0	2.1	183	8.8	237	21	237	1.0				68.459	-B240	071-42	91
20	244	1.8	2.1	188	8.7	244	20	244	1.8	37	248	1.7	68.788	-B450	071-42	94
18	271	1.7	1.9	209	7.9	271	18	271	1.7	33	275	1.6	76.271	-B450	071-42	94
18	269	0.9	1.9	207	7.7	269	18	269	0.9				77.741	-B240	071-42	91
16	318	1.4	1.6	245	6.7	318	16	318	1.4	28	323	1.3	89.534	-B450	071-42	94
14	352	1.3	1.5	271	6.0	352	14	352	1.3	25	358	1.2	99.274	-B450	071-42	94
13	395	1.1	1.3	305	5.4	395	13	395	1.1	23	402	1.1	111.372	-B450	071-42	94
11	438	1.0	1.2	338	4.9	438	11	438	1.0	20	445	1.0	123.487	-B450	071-42	94
9.7	512	0.9	1.0	394	4.2	512	9.7	512	0.9	17	520	0.9	144.128	-B450	071-42	94

Selection tables, 4-pole motors



50 Hz: P_N = 0.75 kW
87 Hz: P_N = 1.35 kW

2-stage gearboxes

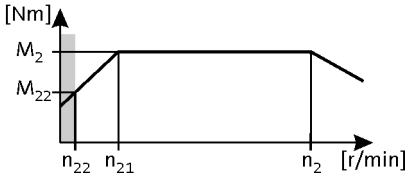
Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product g500	MH□MA□□	
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c				
396	17	4.7	41	13	168	17	396	17	4.7	707	17	3.9	3.565	-B240	080-32	91
272	25	2.8	28	19	116	25	272	25	2.8	486	25	2.3	5.185	-B110	080-32	88
237	29	2.5	24	22	101	29	237	29	2.5	423	29	2.1	5.963	-B110	080-32	88
225	30	4.1	23	23	96	30	225	30	4.1				6.257	-B240	080-32	91
198	34	2.2	20	26	84	34	198	34	2.2	354	35	1.9	7.111	-B110	080-32	88
172	39	2.1	18	30	73	39	172	39	2.1	308	40	1.7	8.178	-B110	080-32	88
155	44	1.9	16	34	66	44	155	44	1.9	277	44	1.6	9.101	-B110	080-32	88
135	51	1.8	14	39	57	51	135	51	1.8	241	51	1.5	10.466	-B110	080-32	88
123	55	1.6	13	43	52	55	123	55	1.6	220	56	1.4	11.449	-B110	080-32	88
111	61	1.5	11	47	47	61	111	61	1.5	198	62	1.2	12.698	-B110	080-32	88
97	70	1.3	9.9	54	41	70	97	70	1.3	173	71	1.1	14.603	-B110	080-32	88
94	72	3.1	9.7	56	40	72	94	72	3.1	168	73	2.6	15.008	-B240	080-32	91
91	75	1.2	9.3	58	39	75	91	75	1.2	162	76	1.0	15.556	-B110	080-32	88
84	81	3.0	8.6	63	36	81	84	81	3.0	150	82	2.5	16.857	-B240	080-32	91
79	86	1.1	8.1	67	34	86	79	86	1.1	141	87	0.9	17.889	-B110	080-32	88
74	92	2.6	7.6	71	31	92	74	92	2.6	132	93	2.2	19.143	-B240	080-32	91
72	94	1.1	7.4	73	31	94	72	94	1.1	129	95	0.9	19.556	-B110	080-32	88
68	100	2.4	7.0	77	29	100	68	100	2.4	122	100	2.0	20.650	-B240	080-32	91
63	109	1.0	6.4	84	27	109	63	109	1.0	112	109	0.8	22.489	-B110	080-32	88
60	113	2.1	6.2	87	26	113	60	113	2.1	108	114	1.8	23.450	-B240	080-32	91
56	122	0.9	5.8	94	24	122	56	122	0.9				25.185	-B110	080-32	88
53	130	1.9	5.4	100	22	130	53	130	1.9	94	131	1.6	26.878	-B240	080-32	91
46	147	1.6	4.8	113	20	147	46	147	1.6	83	148	1.4	30.522	-B240	080-32	91
42	161	1.5	4.3	124	18	161	42	161	1.5	75	162	1.2	33.433	-B240	080-32	91
37	183	1.3	3.8	141	16	183	37	183	1.3	66	185	1.1	37.967	-B240	080-32	91
33	209	1.2	3.4	161	14	209	33	209	1.2	58	210	1.1	43.267	-B240	080-32	91
29	237	1.0	3.0	183	12	237	29	237	1.0	51	239	1.0	49.133	-B240	080-32	91
27	253	0.9	2.8	195	11	253	27	253	0.9	48	255	0.9	52.510	-B240	080-32	91
24	288	0.8	2.4	222	10	288	24	288	0.8				59.630	-B240	080-32	91

6.5

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product g500	MH□MA□□	
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c				
46	149	3.0	4.7	115	19	149	46	149	3.0	81	151	2.5	30.985	-B450	080-32	94
39	175	2.6	4.0	135	17	175	39	175	2.6	69	177	2.1	36.373	-B450	080-32	94
35	195	2.3	3.6	150	15	195	35	195	2.3	63	196	2.2	40.330	-B450	080-32	94
31	218	2.1	3.2	168	13	218	31	218	2.1	56	220	2.0	45.245	-B450	080-32	94
28	242	1.9	2.9	186	12	242	28	242	1.9	50	244	1.8	50.167	-B450	080-32	94
25	271	1.7	2.6	209	11	271	25	271	1.7	45	273	1.6	56.154	-B450	080-32	94

Selection tables, 4-pole motors

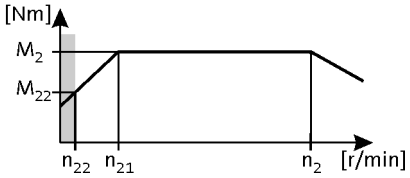


50 Hz: P_N = 0.75 kW
87 Hz: P_N = 1.35 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
23	300	1.5	2.3	231	9.6	300	23	300	1.5	41	303	1.4	62.262	-B450	080-32	94
21	332	1.4	2.1	256	8.7	332	21	332	1.4	37	334	1.3	68.788	-B450	080-32	94
19	368	1.2	1.9	283	7.9	368	19	368	1.2	33	371	1.2	76.271	-B450	080-32	94
16	432	1.0	1.6	333	6.7	432	16	432	1.0	28	435	1.0	89.534	-B450	080-32	94
14	479	0.9	1.5	369	6.0	479	14	479	0.9	25	482	0.9	99.274	-B450	080-32	94
13	537	0.8	1.3	414	5.4	537	13	537	0.8	23	541	0.8	111.372	-B450	080-32	94

Selection tables, 4-pole motors



50 Hz: P_N = 1.1 kW
87 Hz: P_N = 2.0 kW

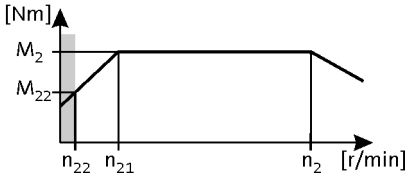
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
401	25	5.6	41	17	168	25	401	25	5.6				3.565	-B240	090-12	91
276	36	1.9	28	25	116	36	276	36	1.9	490	37	1.6	5.185	-B110	090-12	88
240	42	1.7	24	29	101	42	240	42	1.7				5.963	-B110	090-12	88
229	44	3.6	23	31	96	44	229	44	3.6				6.257	-B240	090-12	91
201	50	1.6	20	35	84	50	201	50	1.6	357	51	1.3	7.111	-B110	090-12	88
175	57	1.4	18	40	73	57	175	57	1.4	311	58	1.2	8.178	-B110	090-12	88
157	64	1.3	16	45	66	64	157	64	1.3	279	65	1.1	9.101	-B110	090-12	88
152	66	2.9	15	46	64	66	152	66	2.9	269	67	2.4	9.440	-B240	090-12	91
137	73	1.2	14	51	57	73	137	73	1.2	243	75	1.0	10.466	-B110	090-12	88
133	75	2.7	14	52	56	75	133	75	2.7	237	77	2.2	10.720	-B240	090-12	91
125	80	1.1	13	56	52	80	125	80	1.1	222	82	0.9	11.449	-B110	090-12	88
118	84	2.5	12	59	50	84	118	84	2.5	210	86	2.0	12.081	-B240	090-12	91
113	89	1.0	11	62	47	89	113	89	1.0	200	91	0.8	12.698	-B110	090-12	88
104	96	2.3	11	67	44	96	104	96	2.3	185	98	1.9	13.719	-B240	090-12	91
98	102	0.9	9.9	71	41	102	98	102	0.9				14.603	-B110	090-12	88
95	105	2.1	9.7	73	40	105	95	105	2.1	169	107	1.8	15.008	-B240	090-12	91
92	109	0.9	9.3	76	39	109	92	109	0.9				15.556	-B110	090-12	88
85	118	2.0	8.6	82	36	118	85	118	2.0	151	120	1.7	16.857	-B240	090-12	91
75	134	1.8	7.6	94	31	134	75	134	1.8	133	137	1.5	19.143	-B240	090-12	91
69	144	1.7	7.0	101	29	144	69	144	1.7	123	148	1.4	20.650	-B240	090-12	91
61	164	1.5	6.2	115	26	164	61	164	1.5	108	168	1.2	23.450	-B240	090-12	91
53	188	1.3	5.4	131	22	188	53	188	1.3	95	192	1.1	26.878	-B240	090-12	91
47	213	1.1	4.8	149	20	213	47	213	1.1	83	218	0.9	30.522	-B240	090-12	91
43	233	1.0	4.3	163	18	233	43	233	1.0	76	239	0.8	33.433	-B240	090-12	91
38	265	0.9	3.8	186	16	265	38	265	0.9				37.967	-B240	090-12	91

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
72	138	3.3	7.3	97	30	138	72	138	3.3	128	142	2.7	19.831	-B450	090-12	94
63	159	2.8	6.4	111	26	159	63	159	2.8	111	163	2.3	22.813	-B450	090-12	94
57	176	2.6	5.7	124	24	176	57	176	2.6	100	181	2.1	25.294	-B450	090-12	94
51	195	2.3	5.2	137	22	195	51	195	2.3	91	200	1.9	27.945	-B450	090-12	94
46	216	2.1	4.7	151	19	216	46	216	2.1	82	221	1.7	30.985	-B450	090-12	94
39	254	1.8	4.0	178	17	254	39	254	1.8	70	260	1.5	36.373	-B450	090-12	94
36	281	1.6	3.6	197	15	281	36	281	1.6	63	288	1.5	40.330	-B450	090-12	94
32	316	1.4	3.2	221	13	316	32	316	1.4	56	323	1.3	45.245	-B450	090-12	94
29	350	1.3	2.9	245	12	350	29	350	1.3	51	358	1.2	50.167	-B450	090-12	94
26	392	1.2	2.6	274	11	392	26	392	1.2	45	401	1.1	56.154	-B450	090-12	94

Selection tables, 4-pole motors

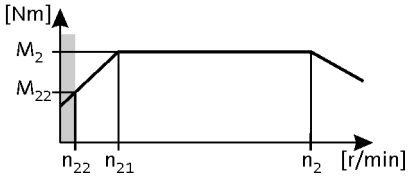


50 Hz: P_N = 1.1 kW
87 Hz: P_N = 2.0 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
23	434	1.0	2.3	304	9.6	434	23	434	1.0	41	445	1.0	62.262	-B450	090-12	94
21	480	0.9	2.1	336	8.7	480	21	480	0.9	37	491	0.9	68.788	-B450	090-12	94
19	532	0.9	1.9	373	7.9	532	19	532	0.9				76.271	-B450	090-12	94

Selection tables, 4-pole motors



50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW

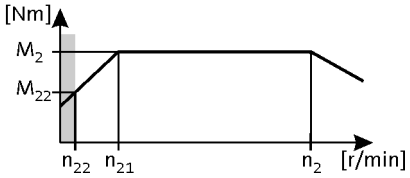
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
403	34	4.1	41	24	168	34	403	34	4.1				3.565	-B240	090-32	91
294	46	3.2	30	33	123	46	294	46	3.2	521	47	2.6	4.889	-B240	090-32	91
277	49	1.4	28	34	116	49	277	49	1.4				5.185	-B110	090-32	88
241	57	1.3	24	40	101	57	241	57	1.3				5.963	-B110	090-32	88
229	59	2.6	23	42	96	59	229	59	2.6	407	60	2.2	6.257	-B240	090-32	91
209	65	2.7	21	46	87	65	209	65	2.7	370	66	2.3	6.883	-B240	090-32	91
202	67	1.1	20	47	84	67	202	67	1.1				7.111	-B110	090-32	88
184	74	2.5	19	52	77	74	184	74	2.5				7.817	-B240	090-32	91
176	78	1.0	18	54	73	78	176	78	1.0				8.178	-B110	090-32	88
158	86	1.0	16	60	66	86	158	86	1.0				9.101	-B110	090-32	88
152	90	2.1	15	63	64	90	152	90	2.1	270	91	1.8	9.440	-B240	090-32	91
137	99	0.9	14	70	57	99	137	99	0.9				10.466	-B110	090-32	88
134	102	2.0	14	71	56	102	134	102	2.0	237	103	1.7	10.720	-B240	090-32	91
125	109	0.8	13	76	52	109	125	109	0.8				11.449	-B110	090-32	88
119	115	1.8	12	80	50	115	119	115	1.8	211	116	1.5	12.081	-B240	090-32	91
105	130	1.7	11	91	44	130	105	130	1.7	186	132	1.4	13.719	-B240	090-32	91
96	142	1.6	9.7	100	40	142	96	142	1.6	170	144	1.3	15.008	-B240	090-32	91
85	160	1.5	8.6	112	36	160	85	160	1.5	151	162	1.2	16.857	-B240	090-32	91
75	182	1.3	7.6	127	31	182	75	182	1.3	133	184	1.1	19.143	-B240	090-32	91
70	196	1.2	7.0	137	29	196	70	196	1.2	123	199	1.0	20.650	-B240	090-32	91
61	222	1.1	6.2	156	26	222	61	222	1.1	109	226	0.9	23.450	-B240	090-32	91
53	255	0.9	5.4	178	22	255	53	255	0.9				26.878	-B240	090-32	91
47	289	0.8	4.8	203	20	289	47	289	0.8				30.522	-B240	090-32	91

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
101	134	3.1	10	94	42	134	101	134	3.1	180	136	2.6	14.165	-B450	090-32	94
88	155	2.8	8.9	109	37	155	88	155	2.8	156	157	2.3	16.349	-B450	090-32	94
80	170	2.6	8.1	119	34	170	80	170	2.6	142	172	2.2	17.885	-B450	090-32	94
72	188	2.4	7.3	132	30	188	72	188	2.4	128	191	2.0	19.831	-B450	090-32	94
63	216	2.1	6.4	151	26	216	63	216	2.1	112	220	1.7	22.813	-B450	090-32	94
57	240	1.9	5.7	168	24	240	57	240	1.9	101	243	1.6	25.294	-B450	090-32	94
51	265	1.7	5.2	186	22	265	51	265	1.7	91	269	1.4	27.945	-B450	090-32	94
46	294	1.5	4.7	206	19	294	46	294	1.5	82	298	1.3	30.985	-B450	090-32	94
40	345	1.3	4.0	241	17	345	40	345	1.3	70	350	1.1	36.373	-B450	090-32	94
36	382	1.2	3.6	268	15	382	36	382	1.2	63	388	1.1	40.330	-B450	090-32	94
32	429	1.1	3.2	300	13	429	32	429	1.1	56	435	1.0	45.245	-B450	090-32	94
29	476	1.0	2.9	333	12	476	29	476	1.0	51	483	0.9	50.167	-B450	090-32	94

Selection tables, 4-pole motors

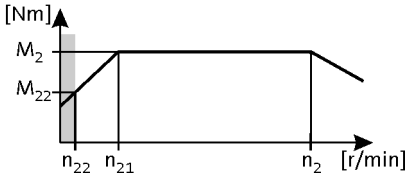


50 Hz: P_N = 1.5 kW
87 Hz: P_N = 2.7 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
26	532	0.9	2.6	373	11	532	26	532	0.9				56.154	-B450	090-32	94

Selection tables, 4-pole motors



50 Hz: P_N = 2.2 kW
87 Hz: P_N = 3.9 kW

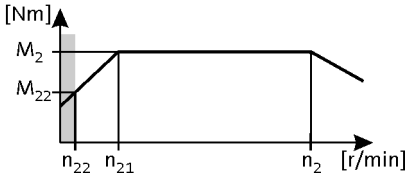
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
405	49	2.8	41	34	168	49	405	49	2.8	717	49	2.3	3.565	-B240	100-12	91
296	68	2.2	30	47	123	68	296	68	2.2	523	68	1.8	4.889	-B240	100-12	91
231	86	1.8	23	60	96	86	231	86	1.8	408	87	1.5	6.257	-B240	100-12	91
210	95	1.9	21	66	87	95	210	95	1.9				6.883	-B240	100-12	91
185	108	1.7	19	75	77	108	185	108	1.7				7.817	-B240	100-12	91
153	130	1.5	15	91	64	130	153	130	1.5				9.440	-B240	100-12	91
135	148	1.4	14	103	56	148	135	148	1.4				10.720	-B240	100-12	91
120	167	1.3	12	117	50	167	120	167	1.3				12.081	-B240	100-12	91
105	189	1.2	11	132	44	189	105	189	1.2				13.719	-B240	100-12	91
96	207	1.1	9.7	145	40	207	96	207	1.1				15.008	-B240	100-12	91
86	233	1.0	8.6	163	36	233	86	233	1.0				16.857	-B240	100-12	91
76	264	0.9	7.6	185	31	264	76	264	0.9				19.143	-B240	100-12	91
70	285	0.8	7.0	199	29	285	70	285	0.8				20.650	-B240	100-12	91

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
211	95	3.3	21	66	88	95	211	95	3.3	372	95	2.7	6.860	-B450	100-12	94
155	129	2.9	16	90	64	129	155	129	2.9	274	129	2.4	9.315	-B450	100-12	94
140	143	2.7	14	100	58	143	140	143	2.7	247	143	2.3	10.328	-B450	100-12	94
113	176	2.3	11	123	47	176	113	176	2.3	200	177	1.9	12.775	-B450	100-12	94
102	196	2.2	10	137	42	196	102	196	2.2	180	196	1.8	14.165	-B450	100-12	94
88	226	1.9	8.9	158	37	226	88	226	1.9	156	226	1.6	16.349	-B450	100-12	94
81	247	1.8	8.1	172	34	247	81	247	1.8	143	248	1.5	17.885	-B450	100-12	94
73	274	1.6	7.3	191	30	274	73	274	1.6	129	275	1.4	19.831	-B450	100-12	94
63	315	1.4	6.4	220	26	315	63	315	1.4	112	316	1.2	22.813	-B450	100-12	94
57	349	1.3	5.7	244	24	349	57	349	1.3	101	350	1.1	25.294	-B450	100-12	94
52	386	1.2	5.2	269	22	386	52	386	1.2	91	387	1.0	27.945	-B450	100-12	94
47	428	1.1	4.7	299	19	428	47	428	1.1	83	429	0.9	30.985	-B450	100-12	94

Selection tables, 4-pole motors



50 Hz: P_N = 3.0 kW
87 Hz: P_N = 5.4 kW

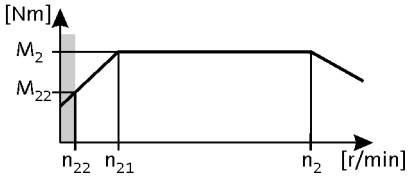
2-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
405	67	2.1	41	47	168	67	405	67	2.1				3.565	-B240	100-32	91
296	92	1.6	30	64	123	92	296	92	1.6				4.889	-B240	100-32	91
231	118	1.3	23	82	96	118	231	118	1.3				6.257	-B240	100-32	91
210	130	1.4	21	91	87	130	210	130	1.4				6.883	-B240	100-32	91
185	147	1.3	19	103	77	147	185	147	1.3				7.817	-B240	100-32	91
153	178	1.1	15	124	64	178	153	178	1.1				9.440	-B240	100-32	91
135	202	1.0	14	141	56	202	135	202	1.0				10.720	-B240	100-32	91
120	228	0.9	12	159	50	228	120	228	0.9				12.081	-B240	100-32	91
105	258	0.8	11	181	44	258	105	258	0.8				13.719	-B240	100-32	91

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
289	94	3.0	29	66	120	94	289	94	3.0	511	96	2.4	5.002	-B450	100-32	94
211	129	2.4	21	90	88	129	211	129	2.4	372	132	2.0	6.860	-B450	100-32	94
155	175	2.1	16	123	64	175	155	175	2.1				9.315	-B450	100-32	94
140	195	2.0	14	136	58	195	140	195	2.0				10.328	-B450	100-32	94
113	241	1.7	11	168	47	241	113	241	1.7				12.775	-B450	100-32	94
102	267	1.6	10	187	42	267	102	267	1.6				14.165	-B450	100-32	94
88	308	1.4	8.9	215	37	308	88	308	1.4				16.349	-B450	100-32	94
81	337	1.3	8.1	236	34	337	81	337	1.3	143	343	1.1	17.885	-B450	100-32	94
73	373	1.2	7.3	261	30	373	73	373	1.2				19.831	-B450	100-32	94
63	430	1.1	6.4	300	26	430	63	430	1.1				22.813	-B450	100-32	94
57	476	0.9	5.7	333	24	476	57	476	0.9				25.294	-B450	100-32	94
52	526	0.9	5.2	368	22	526	52	526	0.9				27.945	-B450	100-32	94

Selection tables, 4-pole motors



50 Hz: P_N = 4.0 kW
87 Hz: P_N = 7.1 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			Inverter operation 5 Hz -		- 20 Hz		- 50 Hz (1:10)			- 87 Hz (1:17.4)			i	Product		
n_2 [r/min]	M_2 [Nm]	c	n_{22} [r/min]	M_{22} [Nm]	n_{21} [r/min]	M_2 [Nm]	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c		g500	MH□MA□□	
291	125	2.2	29	78	120	125	291	125	2.2				5.002	-B450	112-22	94
212	171	1.8	21	107	88	171	212	171	1.8				6.860	-B450	112-22	94
156	232	1.6	16	145	64	232	156	232	1.6				9.315	-B450	112-22	94
141	258	1.5	14	161	58	258	141	258	1.5				10.328	-B450	112-22	94
114	319	1.3	11	200	47	319	114	319	1.3				12.775	-B450	112-22	94
103	353	1.2	10	221	42	353	103	353	1.2				14.165	-B450	112-22	94
89	408	1.1	8.9	255	37	408	89	408	1.1				16.349	-B450	112-22	94
81	446	1.0	8.1	279	34	446	81	446	1.0				17.885	-B450	112-22	94
73	494	0.9	7.3	310	30	494	73	494	0.9				19.831	-B450	112-22	94

Selection tables, 2-pole motors

50 Hz: P_N = 0.18 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
140	12	5.8	19.556	-B110	063-11	97
122	13	5.8	22.489	-B110	063-11	97
109	15	4.8	25.185	-B110	063-11	97
116	17	4.8	28.963	-B110	063-11	97
106	19	4.2	31.919	-B110	063-11	97
73	22	3.9	37.400	-B110	063-11	97
69	24	3.9	40.000	-B110	063-11	97
60	27	3.7	46.000	-B110	063-11	97
52	31	2.0	52.698	-B110	063-11	97
45	36	2.2	60.603	-B110	063-11	97
45	36	3.0	61.045	-B110	063-11	97
36	46	2.4	76.500	-B110	063-11	97
27	60	1.8	100.786	-B110	063-11	97

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
40	40	5.6	68.459	-B240	063-11	100
31	51	4.4	87.563	-B240	063-11	100
24	66	3.6	113.673	-B240	063-11	100
21	75	3.2	129.087	-B240	063-11	100
19	85	2.8	145.674	-B240	063-11	100
17	96	2.5	165.426	-B240	063-11	100
15	109	2.2	188.442	-B240	063-11	100
14	116	3.9	193.948	-B450	063-11	103
13	124	1.9	213.994	-B240	063-11	100
11	142	1.7	245.178	-B240	063-11	100
11	148	3.1	247.882	-B450	063-11	103
12	162	1.5	278.422	-B240	063-11	100
11	185	1.3	317.617	-B240	063-11	100
7.6	210	1.2	360.683	-B240	063-11	100

Selection tables, 2-pole motors

50 Hz: P_N = 0.25 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
237	10	5.2	11.449	-B110	063-31	97
213	11	4.9	12.698	-B110	063-31	97
186	12	4.9	14.603	-B110	063-31	97
139	16	4.1	19.556	-B110	063-31	97
121	19	4.1	22.489	-B110	063-31	97
108	21	3.4	25.185	-B110	063-31	97
117	24	3.4	28.963	-B110	063-31	97
106	27	3.0	31.919	-B110	063-31	97
74	31	2.9	36.707	-B110	063-31	97
73	31	2.8	37.400	-B110	063-31	97
68	33	2.8	40.000	-B110	063-31	97
59	38	2.7	46.000	-B110	063-31	97
56	40	2.6	48.167	-B110	063-31	97
51	44	1.5	52.698	-B110	063-31	97
45	51	1.6	60.603	-B110	063-31	97
44	51	2.2	61.045	-B110	063-31	97
40	56	2.8	67.113	-B240	063-31	100
36	64	2.8	76.213	-B240	063-31	100
35	64	1.7	76.500	-B110	063-31	97
27	84	1.3	100.786	-B110	063-31	97

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
40	56	4.0	68.459	-B240	063-31	100
31	71	3.1	87.563	-B240	063-31	100
27	81	2.8	99.437	-B240	063-31	100
24	93	2.6	113.673	-B240	063-31	100
21	105	2.3	129.087	-B240	063-31	100
19	119	2.0	145.674	-B240	063-31	100
16	135	1.8	165.426	-B240	063-31	100
16	146	3.1	174.919	-B450	063-31	103
14	154	1.6	188.442	-B240	063-31	100
14	162	2.8	193.948	-B450	063-31	103
13	175	1.4	213.994	-B240	063-31	100
12	187	2.4	223.563	-B450	063-31	103
11	200	1.2	245.178	-B240	063-31	100
11	207	2.2	247.882	-B450	063-31	103
12	227	1.1	278.422	-B240	063-31	100
11	259	0.9	317.617	-B240	063-31	100
7.5	294	0.8	360.683	-B240	063-31	100

Selection tables, 2-pole motors

50 Hz: P_N = 0.37 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
260	13	5.7	10.466	-B110	071-11	97
238	14	5.2	11.449	-B110	071-11	97
214	16	4.7	12.698	-B110	071-11	97
186	18	4.1	14.603	-B110	071-11	97
175	19	3.9	15.556	-B110	071-11	97
152	22	3.6	17.889	-B110	071-11	97
139	24	3.4	19.556	-B110	071-11	97
121	28	3.1	22.489	-B110	071-11	97
108	31	2.9	25.185	-B110	071-11	97
116	36	2.5	28.963	-B110	071-11	97
105	39	2.3	31.919	-B110	071-11	97
74	45	2.0	36.707	-B110	071-11	97
73	46	1.9	37.400	-B110	071-11	97
68	49	1.9	40.000	-B110	071-11	97
59	57	1.8	46.000	-B110	071-11	97
57	59	1.7	48.167	-B110	071-11	97
46	74	3.0	59.630	-B240	071-11	100
45	75	1.5	61.045	-B110	071-11	97
41	83	2.2	67.113	-B240	071-11	100
36	94	2.2	76.213	-B240	071-11	100
36	94	1.2	76.500	-B110	071-11	97

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
40	82	2.7	68.459	-B240	071-11	100
35	94	2.4	77.741	-B240	071-11	100
31	105	2.1	87.563	-B240	071-11	100
27	120	1.9	99.437	-B240	071-11	100
24	137	1.8	113.673	-B240	071-11	100
22	152	3.0	123.487	-B450	071-11	103
21	155	1.6	129.087	-B240	071-11	100
19	178	2.5	144.128	-B450	071-11	103
19	175	1.4	145.674	-B240	071-11	100
17	197	2.3	159.807	-B450	071-11	103
16	199	1.2	165.426	-B240	071-11	100
16	216	2.1	174.919	-B450	071-11	103
14	227	1.1	188.442	-B240	071-11	100
14	239	1.9	193.948	-B450	071-11	103
13	257	0.9	213.994	-B240	071-11	100
12	276	1.6	223.563	-B450	071-11	103

Selection tables, 2-pole motors

50 Hz: P_N = 0.37 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
11	295	0.8	245.178	-B240	071-11	100
11	306	1.5	247.882	-B450	071-11	103

Selection tables, 2-pole motors

50 Hz: P_N = 0.55 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
507	10	5.1	5.185	-B110	071-31	97
441	11	5.1	5.963	-B110	071-31	97
370	13	4.7	7.111	-B110	071-31	97
322	16	4.3	8.178	-B110	071-31	97
289	17	4.0	9.101	-B110	071-31	97
251	20	3.7	10.466	-B110	071-31	97
230	22	3.4	11.449	-B110	071-31	97
207	24	3.1	12.698	-B110	071-31	97
180	28	2.7	14.603	-B110	071-31	97
169	30	2.6	15.556	-B110	071-31	97
147	34	2.4	17.889	-B110	071-31	97
135	37	2.2	19.556	-B110	071-31	97
117	43	2.0	22.489	-B110	071-31	97
104	48	1.9	25.185	-B110	071-31	97
112	55	1.7	28.963	-B110	071-31	97
102	61	1.5	31.919	-B110	071-31	97
79	63	3.1	33.433	-B240	071-31	100
72	70	1.3	36.707	-B110	071-31	97
70	71	1.2	37.400	-B110	071-31	97
69	72	2.8	37.967	-B240	071-31	100
66	76	1.2	40.000	-B110	071-31	97
61	82	2.8	43.267	-B240	071-31	100
57	87	1.2	46.000	-B110	071-31	97
55	91	1.1	48.167	-B110	071-31	97
54	93	2.4	49.133	-B240	071-31	100
50	100	2.2	52.510	-B240	071-31	100
44	113	2.0	59.630	-B240	071-31	100
43	116	1.0	61.045	-B110	071-31	97
39	127	1.4	67.113	-B240	071-31	100
35	145	1.4	76.213	-B240	071-31	100

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
38	127	1.8	68.459	-B240	071-31	100
34	144	1.6	77.741	-B240	071-31	100
30	162	1.4	87.563	-B240	071-31	100
29	170	2.5	89.534	-B450	071-31	103
27	188	2.3	99.274	-B450	071-31	103
26	184	1.2	99.437	-B240	071-31	100
24	211	2.1	111.372	-B450	071-31	103

Selection tables, 2-pole motors

50 Hz: P_N = 0.55 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
23	210	1.1	113.673	-B240	071-31	100
21	234	1.9	123.487	-B450	071-31	103
20	239	1.0	129.087	-B240	071-31	100
18	273	1.7	144.128	-B450	071-31	103
18	269	0.9	145.674	-B240	071-31	100
17	303	1.5	159.807	-B450	071-31	103
15	332	1.4	174.919	-B450	071-31	103
14	368	1.2	193.948	-B450	071-31	103
12	424	1.1	223.563	-B450	071-31	103
11	470	1.0	247.882	-B450	071-31	103

Selection tables, 6-pole motors

50 Hz: P_N = 0.18 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
114	14	5.6	8.178	-B110	071-13	97
102	16	5.3	9.101	-B110	071-13	97
109	18	4.8	10.466	-B110	071-13	97
81	20	4.5	11.449	-B110	071-13	97
73	22	4.0	12.698	-B110	071-13	97
64	26	3.5	14.603	-B110	071-13	97
60	27	3.4	15.556	-B110	071-13	97
52	31	3.1	17.889	-B110	071-13	97
48	34	2.9	19.556	-B110	071-13	97
41	39	2.6	22.489	-B110	071-13	97
37	44	2.4	25.185	-B110	071-13	97
32	51	2.2	28.963	-B110	071-13	97
29	56	1.9	31.919	-B110	071-13	97
25	64	1.7	36.707	-B110	071-13	97
25	66	1.6	37.400	-B110	071-13	97
23	70	1.4	40.000	-B110	071-13	97
22	76	3.2	43.267	-B240	071-13	100
20	81	1.4	46.000	-B110	071-13	97
19	85	1.3	48.167	-B110	071-13	97
19	86	2.8	49.133	-B240	071-13	100
18	92	2.5	52.510	-B240	071-13	100
16	105	2.3	59.630	-B240	071-13	100
15	107	1.0	61.045	-B110	071-13	97
14	118	1.5	67.113	-B240	071-13	100
12	134	1.5	76.213	-B240	071-13	100
12	134	0.8	76.500	-B110	071-13	97

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
14	117	2.1	68.459	-B240	071-13	100
12	133	1.8	77.741	-B240	071-13	100
11	150	1.6	87.563	-B240	071-13	100
10	157	2.9	89.534	-B450	071-13	103
12	174	2.6	99.274	-B450	071-13	103
12	170	1.4	99.437	-B240	071-13	100
10	196	2.3	111.372	-B450	071-13	103
10	195	1.2	113.673	-B240	071-13	100
7.5	217	2.1	123.487	-B450	071-13	103
7.2	221	1.1	129.087	-B240	071-13	100
6.5	253	1.8	144.128	-B450	071-13	103

Selection tables, 6-pole motors

50 Hz: P_N = 0.18 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
6.4	249	1.0	145.674	-B240	071-13	100
5.8	281	1.6	159.807	-B450	071-13	103
5.6	283	0.9	165.426	-B240	071-13	100
5.3	307	1.5	174.919	-B450	071-13	103
4.8	340	1.3	193.948	-B450	071-13	103
4.2	392	1.2	223.563	-B450	071-13	103
3.8	435	1.0	247.882	-B450	071-13	103

Selection tables, 6-pole motors

50 Hz: P_N = 0.25 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
179	13	4.7	5.185	-B110	071-33	97
156	15	4.7	5.963	-B110	071-33	97
131	17	4.4	7.111	-B110	071-33	97
114	20	4.1	8.178	-B110	071-33	97
102	22	3.8	9.101	-B110	071-33	97
109	26	3.5	10.466	-B110	071-33	97
81	28	3.2	11.449	-B110	071-33	97
73	31	2.9	12.698	-B110	071-33	97
64	36	2.5	14.603	-B110	071-33	97
60	38	2.4	15.556	-B110	071-33	97
52	44	2.2	17.889	-B110	071-33	97
48	48	2.1	19.556	-B110	071-33	97
41	55	1.9	22.489	-B110	071-33	97
37	61	1.8	25.185	-B110	071-33	97
32	71	1.6	28.963	-B110	071-33	97
31	74	3.2	30.522	-B240	071-33	100
29	78	1.4	31.919	-B110	071-33	97
28	82	2.9	33.433	-B240	071-33	100
25	90	1.2	36.707	-B110	071-33	97
25	91	1.2	37.400	-B110	071-33	97
25	93	2.6	37.967	-B240	071-33	100
23	98	1.0	40.000	-B110	071-33	97
22	106	2.3	43.267	-B240	071-33	100
19	117	0.9	48.167	-B110	071-33	97
19	120	2.0	49.133	-B240	071-33	100
18	128	1.8	52.510	-B240	071-33	100
16	145	1.7	59.630	-B240	071-33	100
14	164	1.1	67.113	-B240	071-33	100
12	186	1.1	76.213	-B240	071-33	100

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
21	110	3.1	45.245	-B450	071-33	103
19	122	3.1	50.167	-B450	071-33	103
15	152	3.0	62.262	-B450	071-33	103
14	163	1.5	68.459	-B240	071-33	100
12	185	1.3	77.741	-B240	071-33	100
11	208	1.2	87.563	-B240	071-33	100
10	218	2.1	89.534	-B450	071-33	103
12	242	1.9	99.274	-B450	071-33	103

Selection tables, 6-pole motors

50 Hz: P_N = 0.25 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
12	236	1.0	99.437	-B240	071-33	100
10	272	1.7	111.372	-B450	071-33	103
10	270	0.9	113.673	-B240	071-33	100
7.5	301	1.5	123.487	-B450	071-33	103
6.5	351	1.3	144.128	-B450	071-33	103
5.8	390	1.2	159.807	-B450	071-33	103
5.3	427	1.1	174.919	-B450	071-33	103
4.8	473	1.0	193.948	-B450	071-33	103
4.2	545	0.8	223.563	-B450	071-33	103

Selection tables, 6-pole motors

50 Hz: P_N = 0.37 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
183	18	3.8	5.185	-B110	080-13	97
159	21	3.4	5.963	-B110	080-13	97
152	22	5.7	6.257	-B240	080-13	100
134	25	3.1	7.111	-B110	080-13	97
116	29	2.8	8.178	-B110	080-13	97
104	32	2.6	9.101	-B110	080-13	97
111	37	2.4	10.466	-B110	080-13	97
101	40	2.2	11.449	-B110	080-13	97
75	45	2.0	12.698	-B110	080-13	97
65	52	1.7	14.603	-B110	080-13	97
61	55	1.7	15.556	-B110	080-13	97
53	63	1.5	17.889	-B110	080-13	97
49	69	1.5	19.556	-B110	080-13	97
42	79	1.3	22.489	-B110	080-13	97
41	83	2.9	23.450	-B240	080-13	100
38	89	1.2	25.185	-B110	080-13	97
35	95	2.5	26.878	-B240	080-13	100
33	102	1.1	28.963	-B110	080-13	97
31	108	2.2	30.522	-B240	080-13	100
28	118	2.0	33.433	-B240	080-13	100
25	132	0.8	37.400	-B110	080-13	97
25	134	1.8	37.967	-B240	080-13	100
22	153	1.6	43.267	-B240	080-13	100
19	174	1.4	49.133	-B240	080-13	100
18	186	1.3	52.510	-B240	080-13	100
16	211	1.1	59.630	-B240	080-13	100

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
24	142	3.2	40.330	-B450	080-13	103
21	160	2.8	45.245	-B450	080-13	103
19	177	2.5	50.167	-B450	080-13	103
17	198	2.3	56.154	-B450	080-13	103
15	220	2.1	62.262	-B450	080-13	103
14	236	1.0	68.459	-B240	080-13	100
14	243	1.9	68.788	-B450	080-13	103
13	269	1.7	76.271	-B450	080-13	103
12	268	0.9	77.741	-B240	080-13	100
11	316	1.4	89.534	-B450	080-13	103
12	351	1.3	99.274	-B450	080-13	103

Selection tables, 6-pole motors

50 Hz: P_N = 0.37 kW

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
10	393	1.1	111.372	-B450	080-13	103
7.7	436	1.0	123.487	-B450	080-13	103
6.6	509	0.9	144.128	-B450	080-13	103

Selection tables, 6-pole motors

50 Hz: P_N = 0.55 kW

2-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
261	19	4.2	3.565	-B240	080-33	100
179	28	2.5	5.185	-B110	080-33	97
156	32	2.3	5.963	-B110	080-33	97
149	34	3.7	6.257	-B240	080-33	100
131	38	2.0	7.111	-B110	080-33	97
114	44	1.9	8.178	-B110	080-33	97
102	49	1.7	9.101	-B110	080-33	97
109	56	1.6	10.466	-B110	080-33	97
81	61	1.5	11.449	-B110	080-33	97
77	65	3.2	12.081	-B240	080-33	100
73	68	1.3	12.698	-B110	080-33	97
68	74	3.0	13.719	-B240	080-33	100
64	78	1.2	14.603	-B110	080-33	97
62	81	2.8	15.008	-B240	080-33	100
60	83	1.1	15.556	-B110	080-33	97
55	90	2.7	16.857	-B240	080-33	100
52	96	1.0	17.889	-B110	080-33	97
49	103	2.3	19.143	-B240	080-33	100
48	105	1.0	19.556	-B110	080-33	97
45	111	2.2	20.650	-B240	080-33	100
41	121	0.9	22.489	-B110	080-33	97
40	126	1.9	23.450	-B240	080-33	100
35	144	1.7	26.878	-B240	080-33	100
31	164	1.5	30.522	-B240	080-33	100
28	179	1.3	33.433	-B240	080-33	100
25	204	1.2	37.967	-B240	080-33	100
22	232	1.0	43.267	-B240	080-33	100
19	264	0.9	49.133	-B240	080-33	100
18	282	0.8	52.510	-B240	080-33	100

3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
33	150	3.0	27.945	-B450	080-33	103
30	166	2.7	30.985	-B450	080-33	103
26	195	2.3	36.373	-B450	080-33	103
23	216	2.1	40.330	-B450	080-33	103
21	243	1.9	45.245	-B450	080-33	103
19	269	1.7	50.167	-B450	080-33	103
17	301	1.5	56.154	-B450	080-33	103
15	334	1.4	62.262	-B450	080-33	103

Selection tables, 6-pole motors

50 Hz: P_N = 0.55 kW

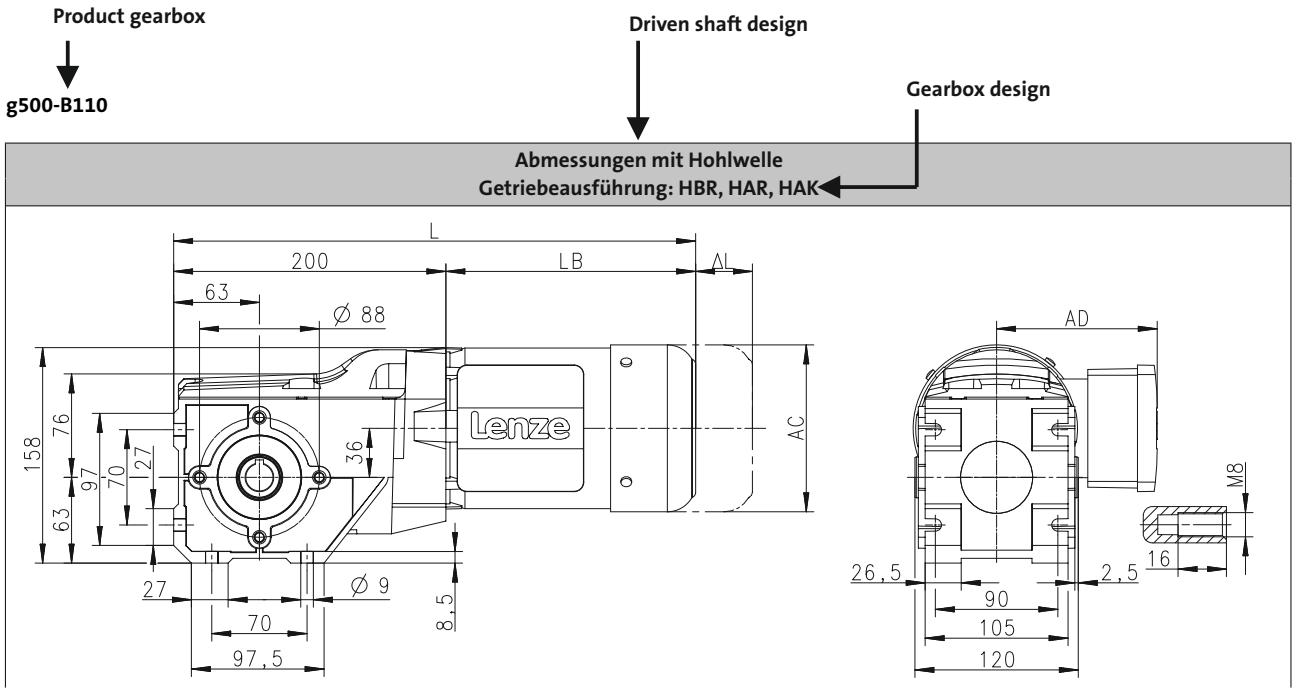
3-stage gearboxes

Mains operation 400 V, 50 Hz			i	Product		
n_2 [r/min]	M_2 [Nm]	c		g500	MD□MA□□	
14	369	1.2	68.788	-B450	080-33	103
12	409	1.1	76.271	-B450	080-33	103
10	480	0.9	89.534	-B450	080-33	103
12	533	0.9	99.274	-B450	080-33	103

Dimensions, notes

Notes on the dimensions

The following legend shows the layout of the dimension sheets.



Product Motor

Produkt			MD□MA□□							
			063-12	063-32	063-42	071-32	071-42	080-32	080-42	090-32
Abmessungen										
Gesamtlänge	**L**	**[mm]**		358		378		395		419
Länge Motor	**LB**	**[mm]**		187		207		224.5		248
Länge Motoranbauten	**Δ L**	**[mm]**		170		165		183		181
Motordurchmesser	**AC**	**[mm]**		123		139		156		176
Abstand Motor/Anschluss	**AD**	**[mm]**		100		109		150		157

Distance of motor centre to the end of terminal box

Total length of the drive without built-on accessories

Motor diameter

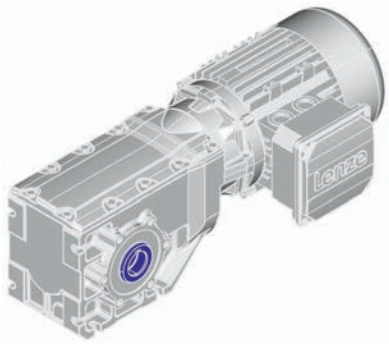
Motor length without built-on accessories

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

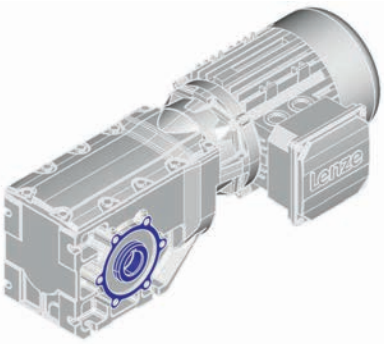
Dimensions, notes

Gearbox designs

Hollow shaft



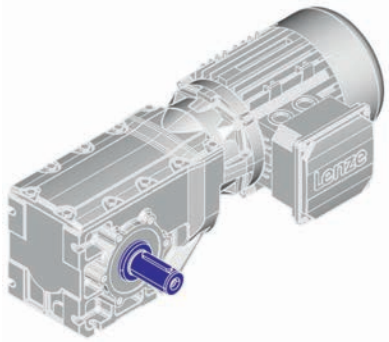
Without centring (HBR)



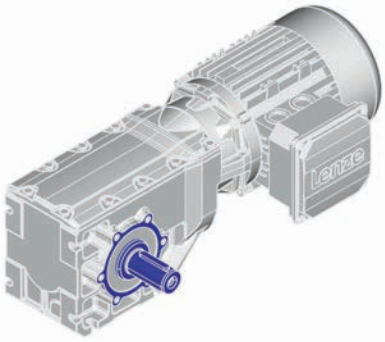
With centering (HAR)

Flange with through holes (HAK)

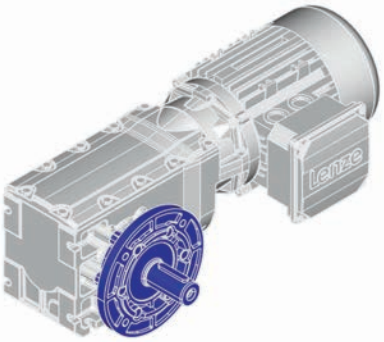
Solid shaft



Without centring (VBR)

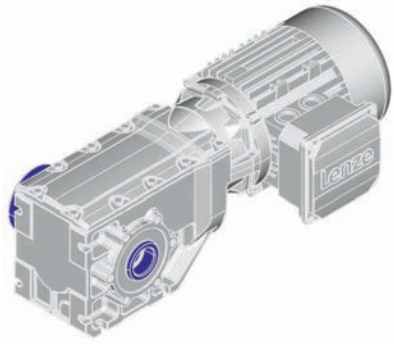


With centering (VAR)

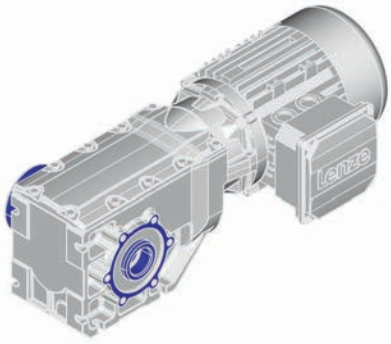


Flange with through holes (VAK)

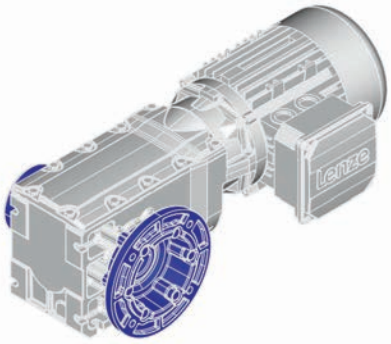
Hollow shaft with shrink disc



Without centring (SBR)



With centering (SAR)

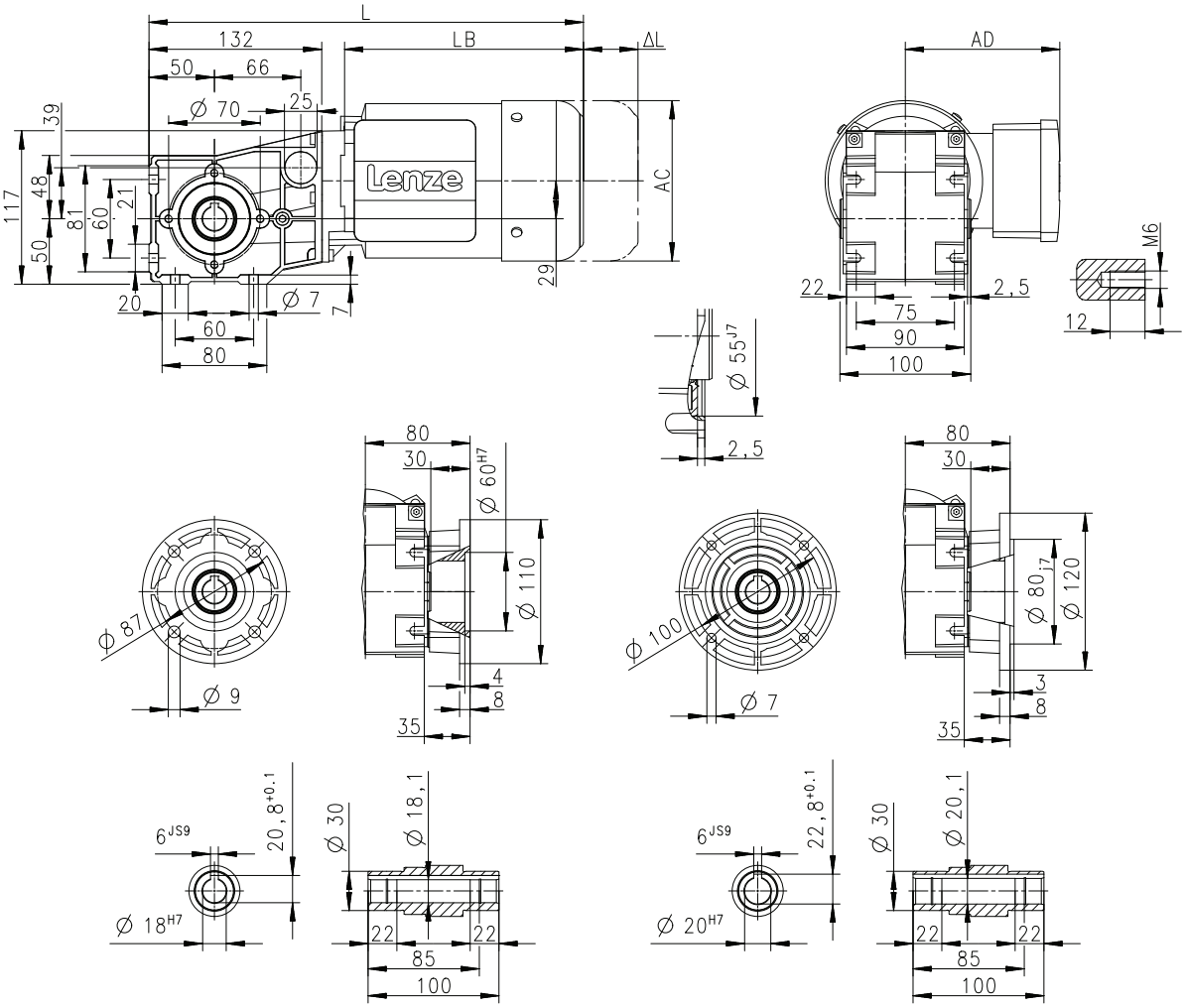


Flange with through holes (SAK)

Dimensions, 4-pole motors

g500-B45

Dimensions with hollow shaft
Gearbox design: HBR, HAR, HAK



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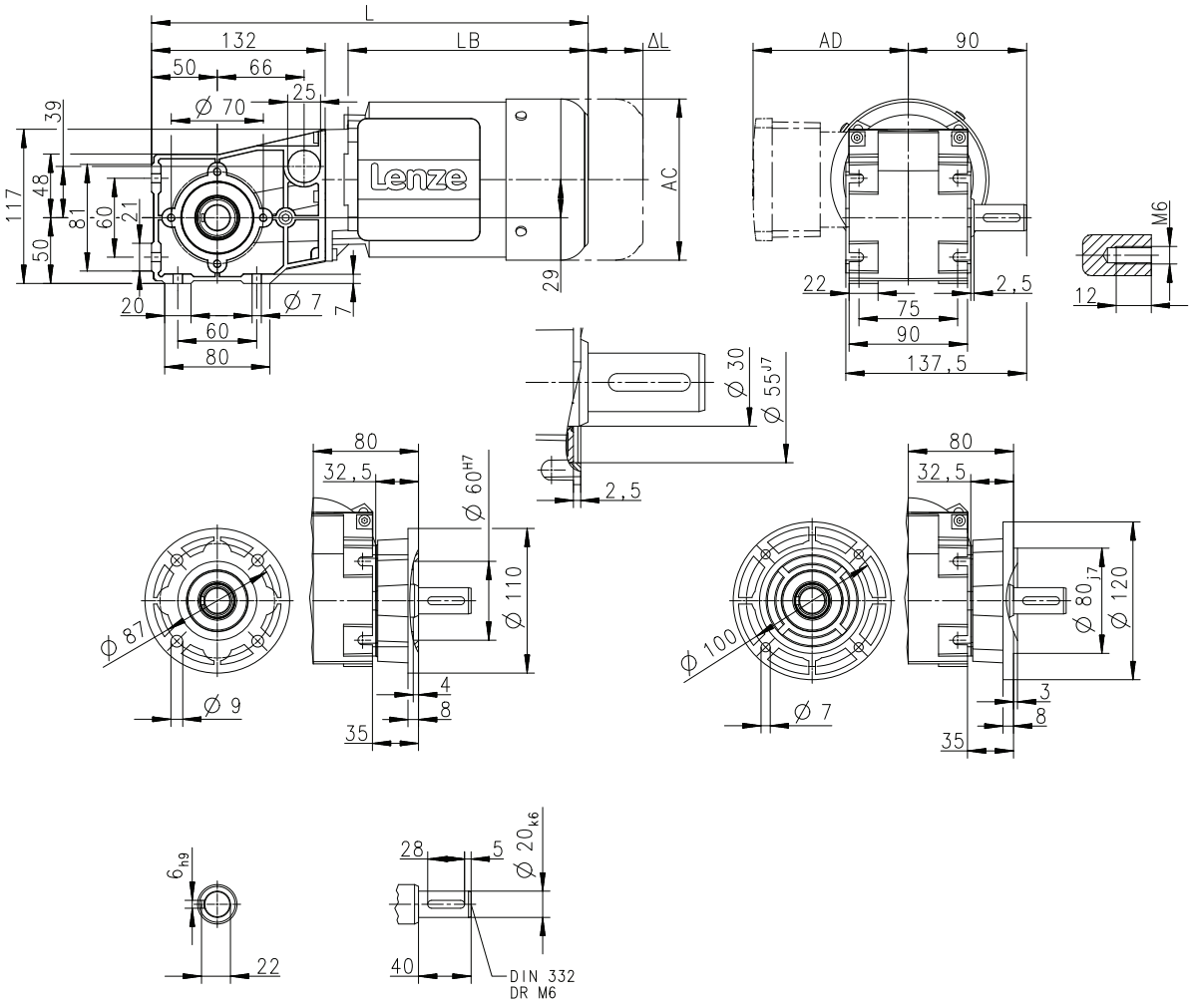
6.5

Product			MD□MA□□						
			063-02	063-12	063-22	063-32	063-42	071-32	071-42
Dimensions									
Total length	**L**	**[mm]**	305	332	305	332		352	
Motor length	**LB**	**[mm]**	156	183	156	183		203	
Length of motor options	**Δ L**	**[mm]**	135	170	135	170		165	
Motor diameter	**AC**	**[mm]**	123					139	
Distance motor/connection	**AD**	**[mm]**	100					109	

Dimensions, 4-pole motors

g500-B45

Dimensions with solid shaft
Gearbox design: VBR, VAR, VAK

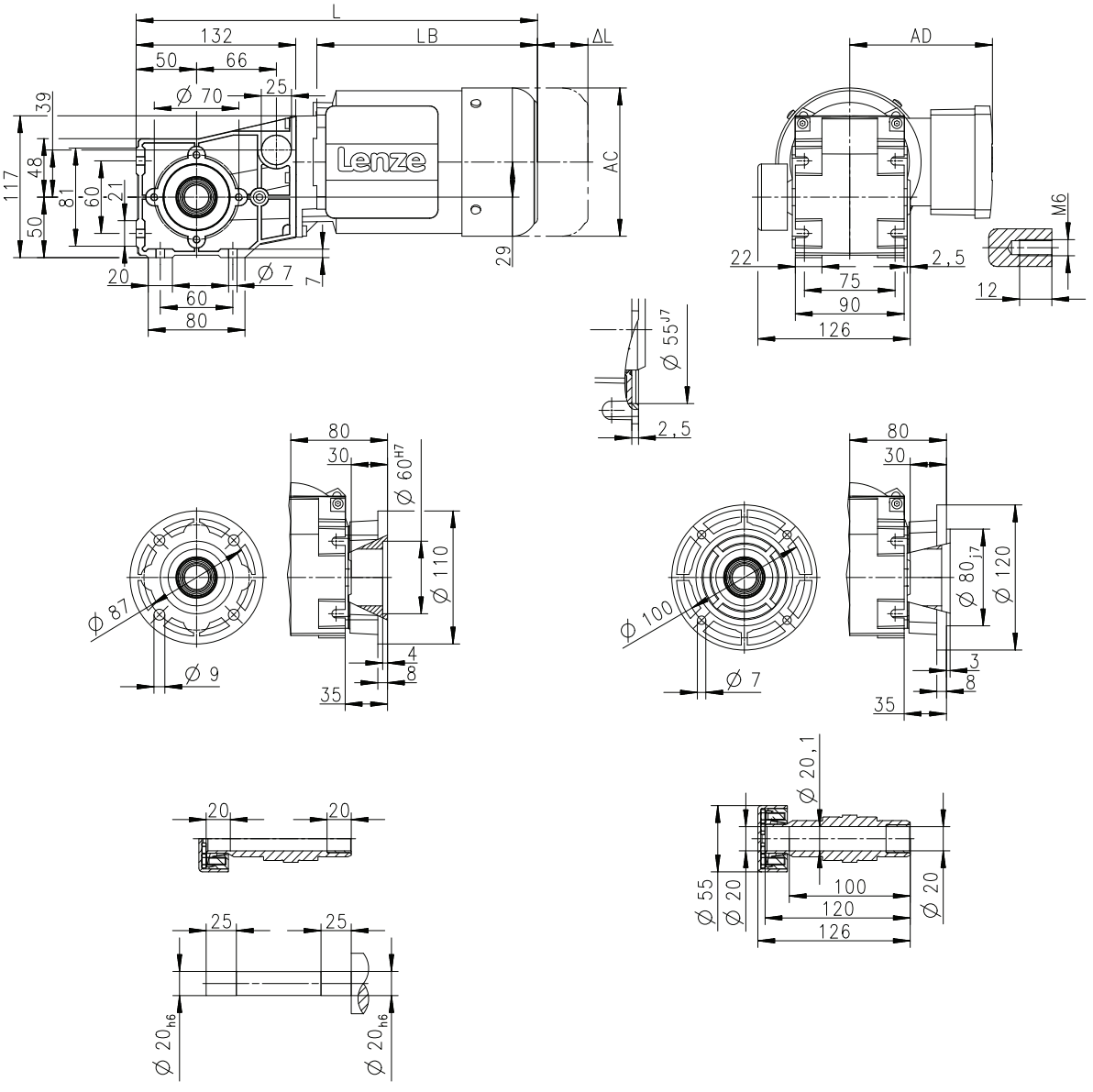


Product			MD□MA□□						
			063-02	063-12	063-22	063-32	063-42	071-32	071-42
Dimensions									
Total length	**L**	**[mm]**	305	332	305	332		352	
Motor length	**LB**	**[mm]**	156	183	156	183		203	
Length of motor options	**Δ L**	**[mm]**	135	170	135	170		165	
Motor diameter	**AC**	**[mm]**	123					139	
Distance motor/connection	**AD**	**[mm]**	100					109	

Dimensions, 4-pole motors

g500-B45

Dimensions with shrink disc
Gearbox design: SBR, SAR, SAK

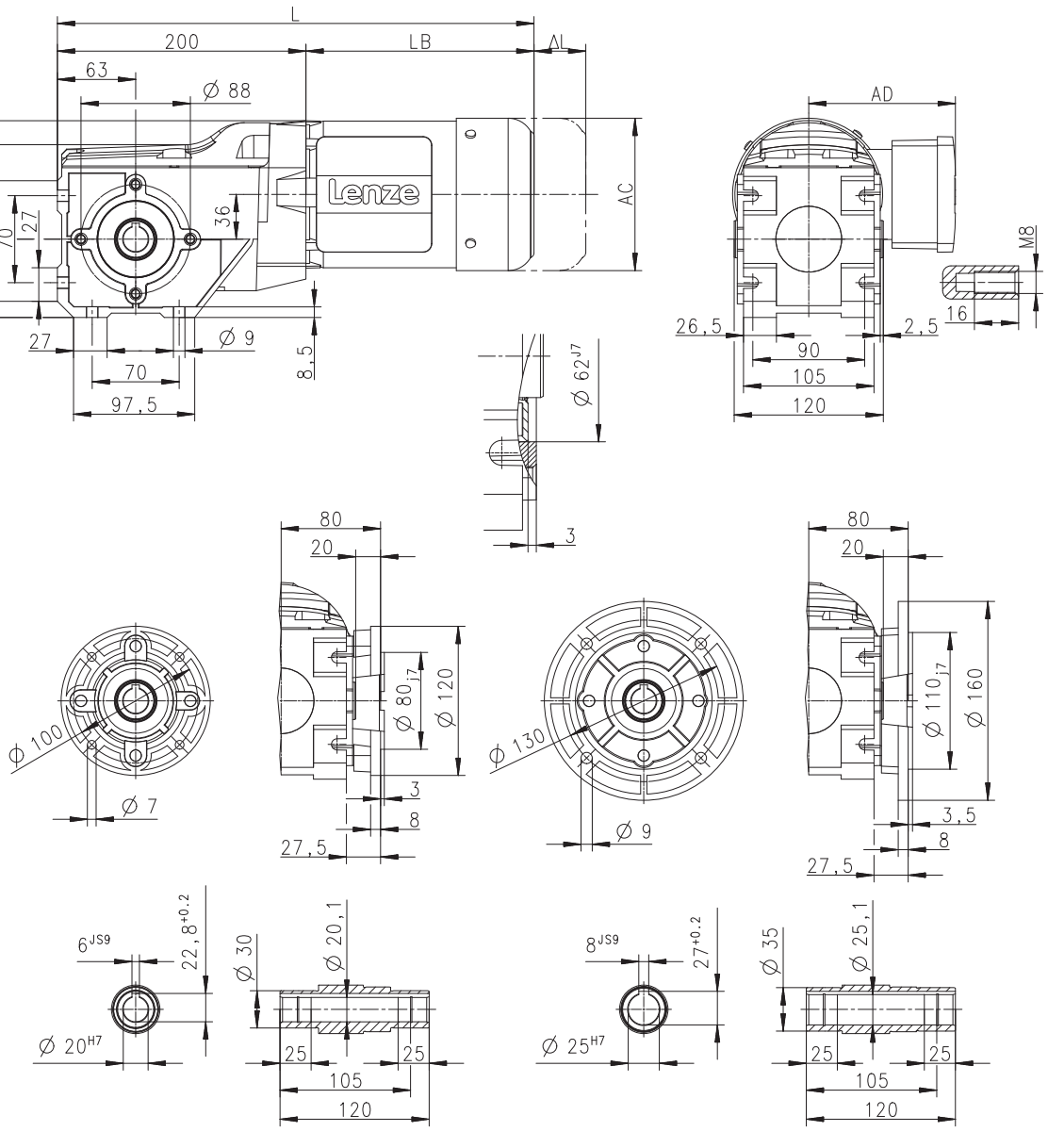


Product			MD□MA□□						
			063-02	063-12	063-22	063-32	063-42	071-32	071-42
Dimensions									
Total length	**L**	**[mm]**	305	332	305	332		352	
Motor length	**LB**	**[mm]**	156	183	156	183		203	
Length of motor options	**Δ L**	**[mm]**	135	170	135	170		165	
Motor diameter	**AC**	**[mm]**	123					139	
Distance motor/connection	**AD**	**[mm]**	100					109	

Dimensions, 4-pole motors

g500-B110

Dimensions with hollow shaft
Gearbox design: HBR, HAR, HAK

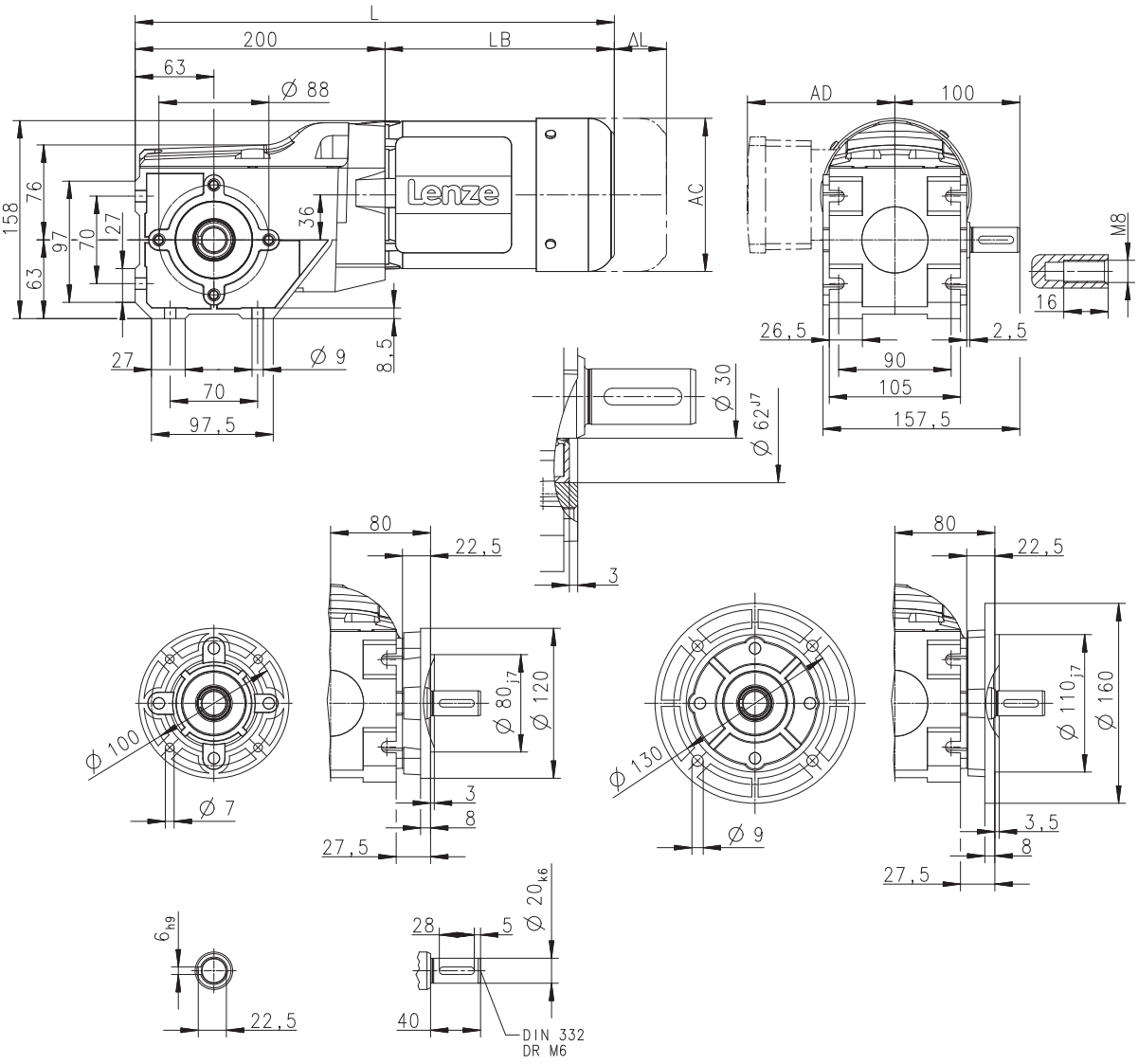


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	383			403		426	485	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-B110

Dimensions with solid shaft
Gearbox design: VBR, VAR, VAK

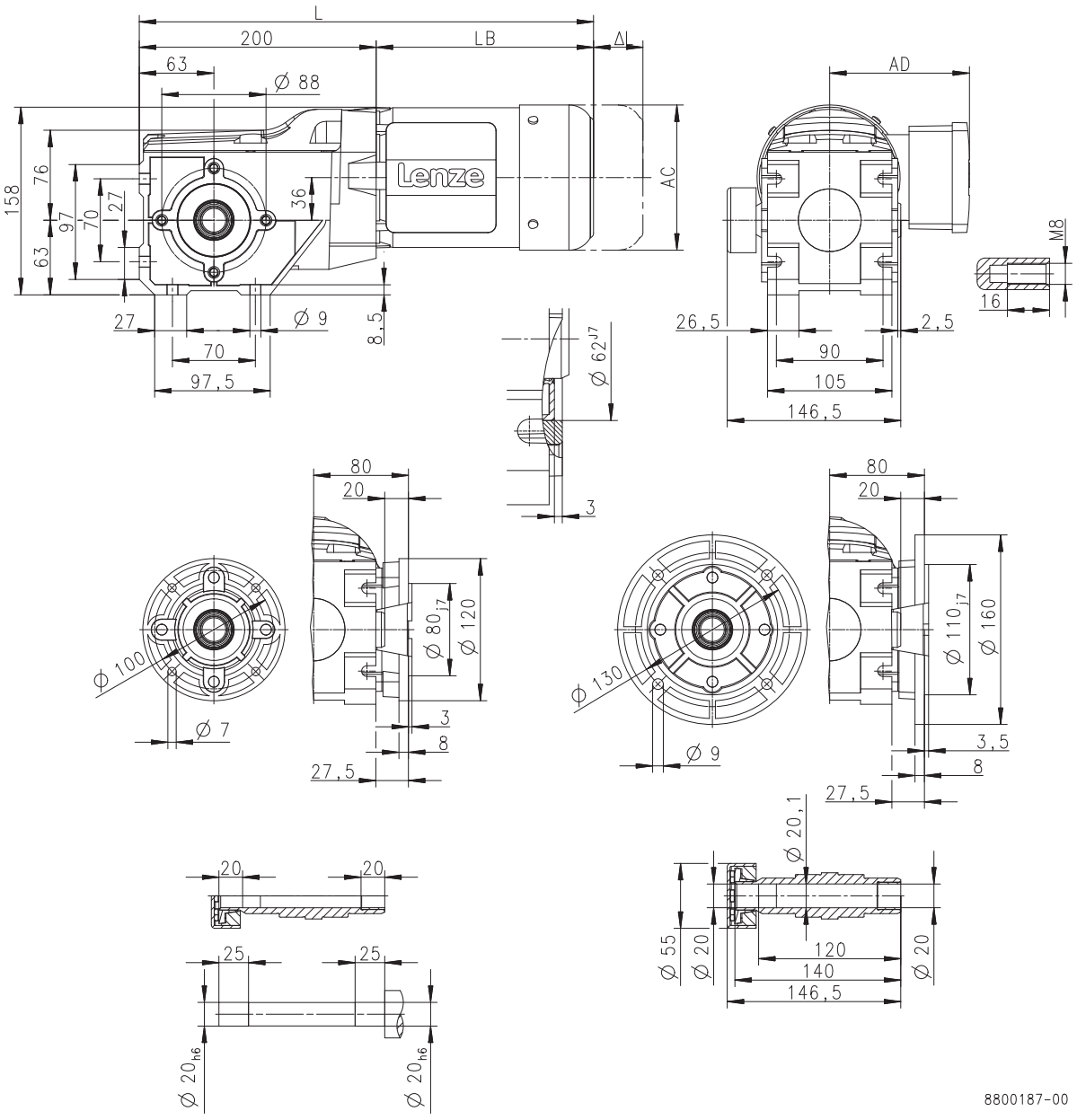


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	383			403		426	485	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-B110

Dimensions with shrink disc
Gearbox design: SBR, SAR, SAK

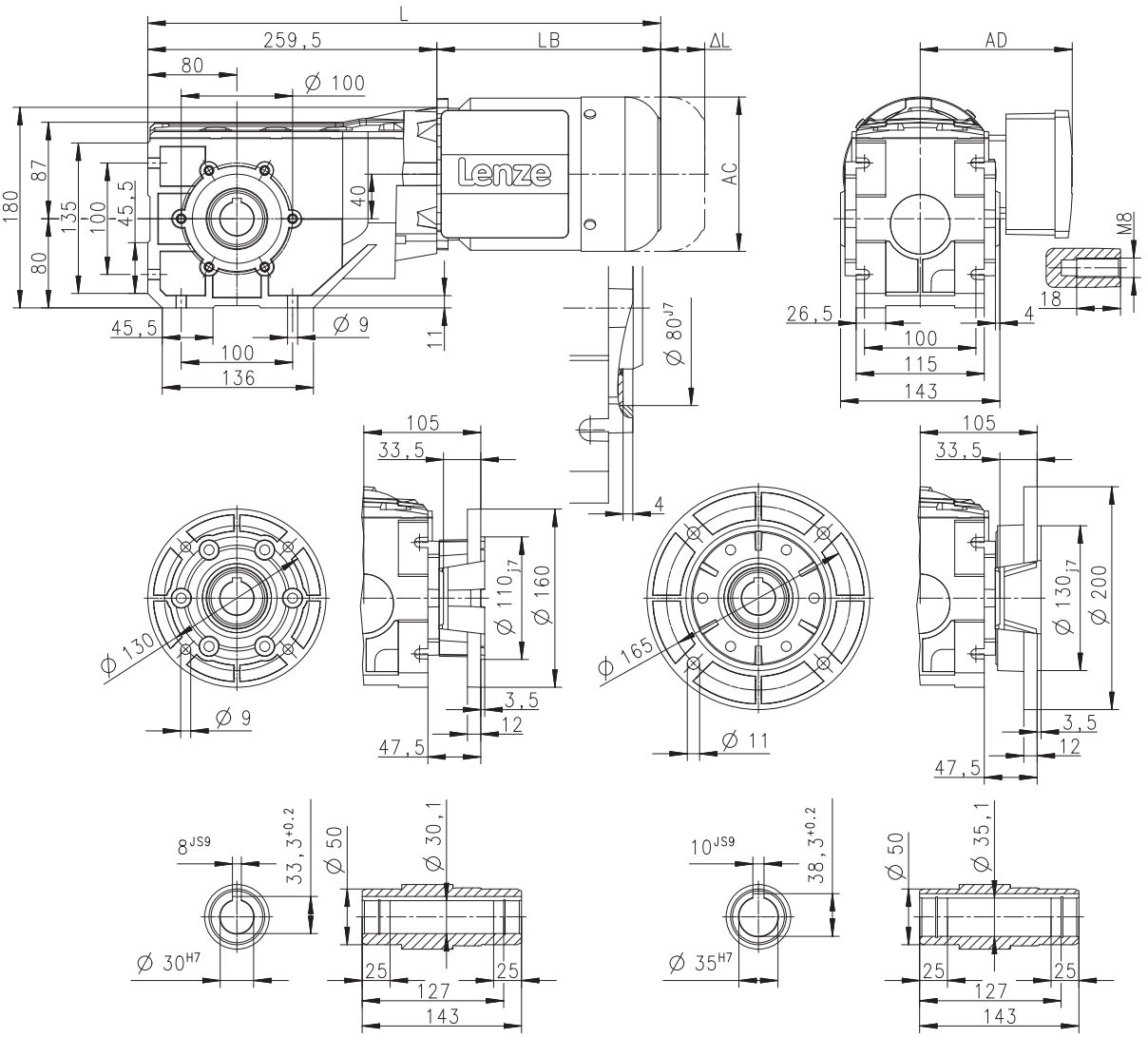


Product			MD□MA□□					MH□MA□□		
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32
Dimensions										
Total length	**L**	**[mm]**	383			403		426	485	
Motor length	**LB**	**[mm]**	183			203		226	285	
Length of motor options	**Δ L**	**[mm]**	170			165		183	181	
Motor diameter	**AC**	**[mm]**	123			139		156	176	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157

Dimensions, 4-pole motors

g500-B240

Dimensions with hollow shaft
Gearbox design: HBR, HAR, HAK

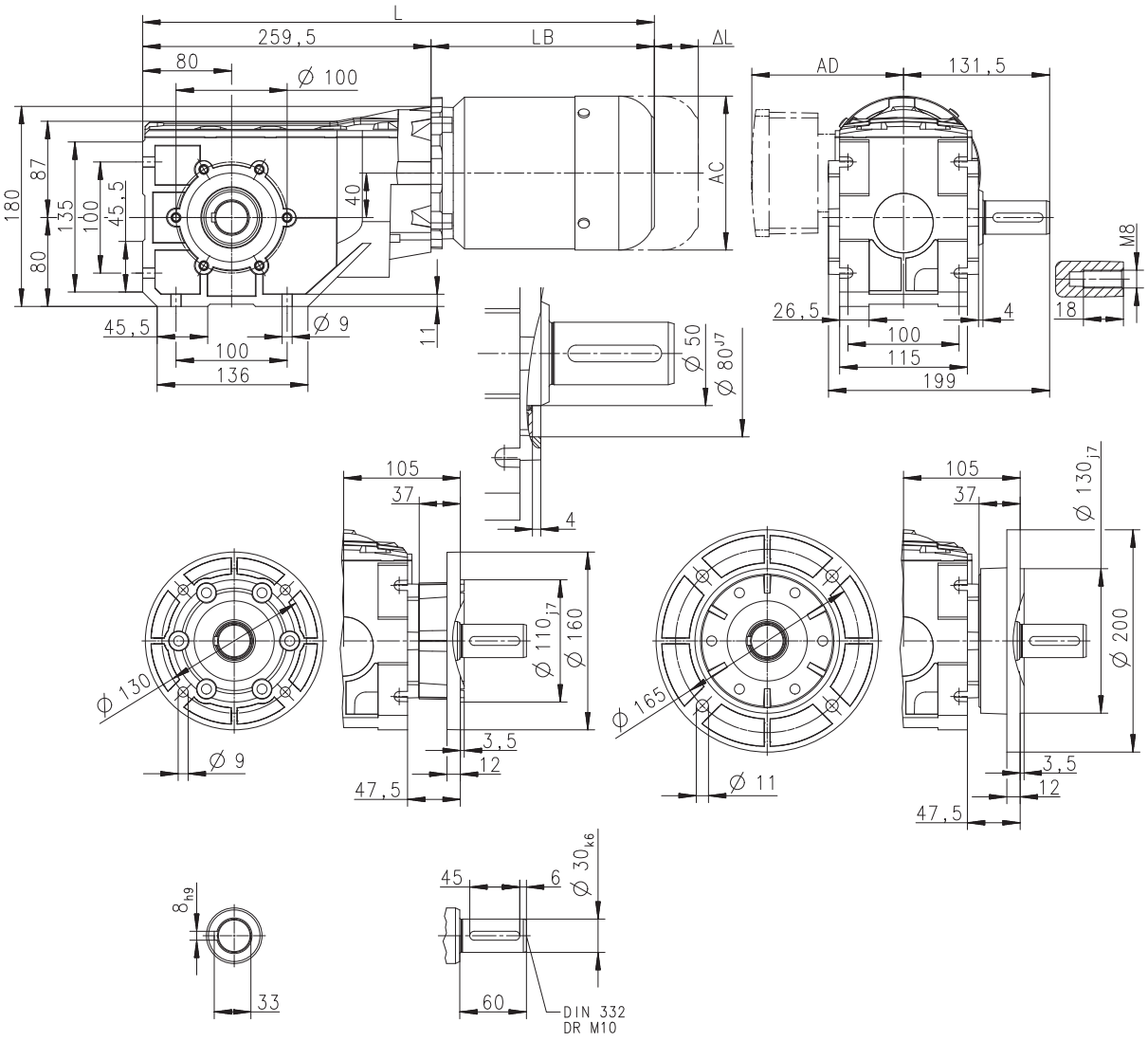


Product			MD□MA□□					MH□MA□□				
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32
Dimensions												
Total length	**L**	**[mm]**	443			463		486	545		581	597
Motor length	**LB**	**[mm]**	183			203		226	285		321	337
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170	
Motor diameter	**AC**	**[mm]**	123			139		156	176		194	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166	

Dimensions, 4-pole motors

g500-B240

Dimensions with solid shaft
Gearbox design: VBR, VAR, VAK

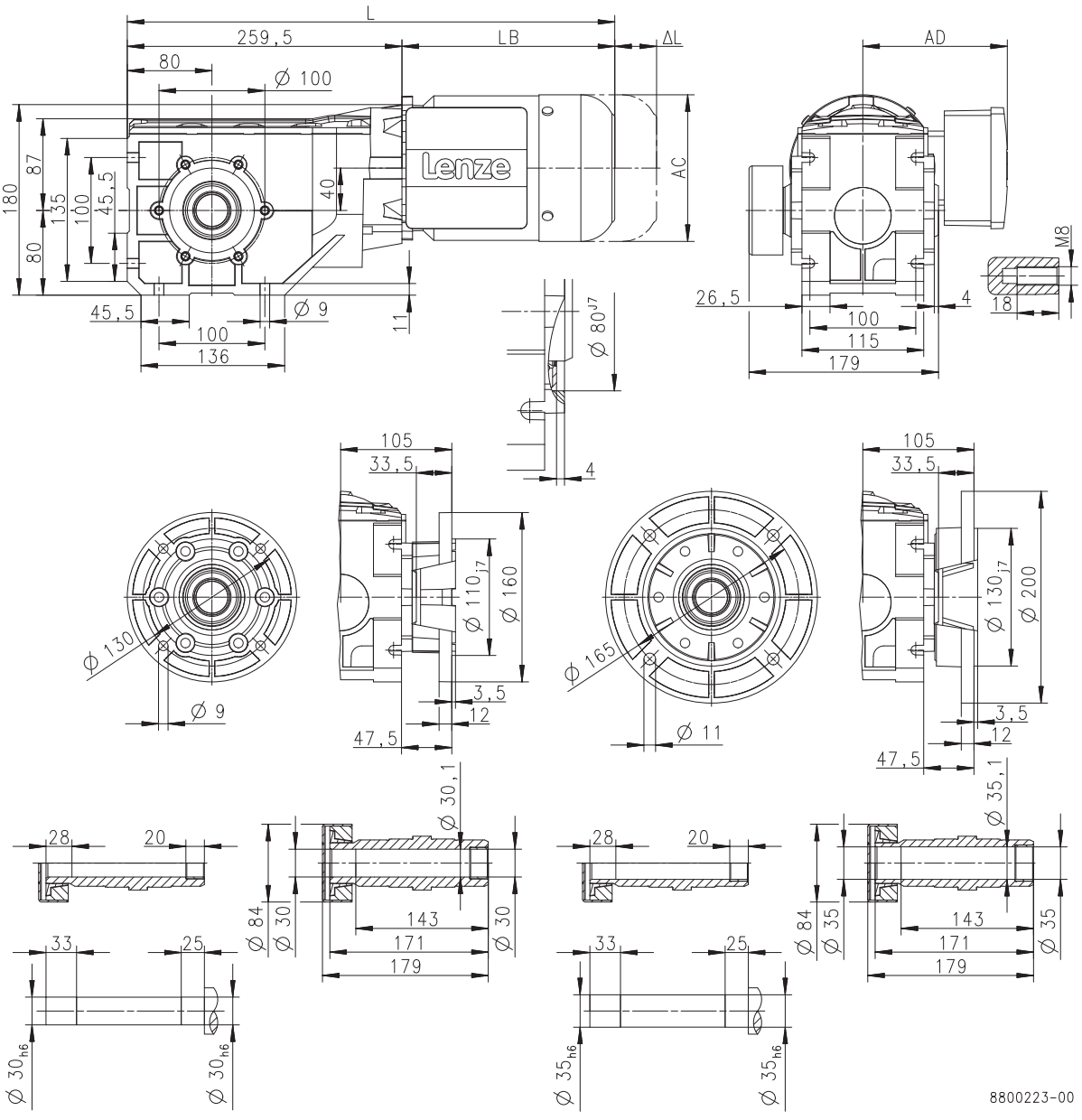


Product			MD□MA□□					MH□MA□□				
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32
Dimensions												
Total length	**L**	**[mm]**	443			463		486	545		581	597
Motor length	**LB**	**[mm]**	183			203		226	285		321	337
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170	
Motor diameter	**AC**	**[mm]**	123			139		156	176		194	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166	

Dimensions, 4-pole motors

g500-B240

Dimensions with shrink disc
Gearbox design: SBR, SAR, SAK

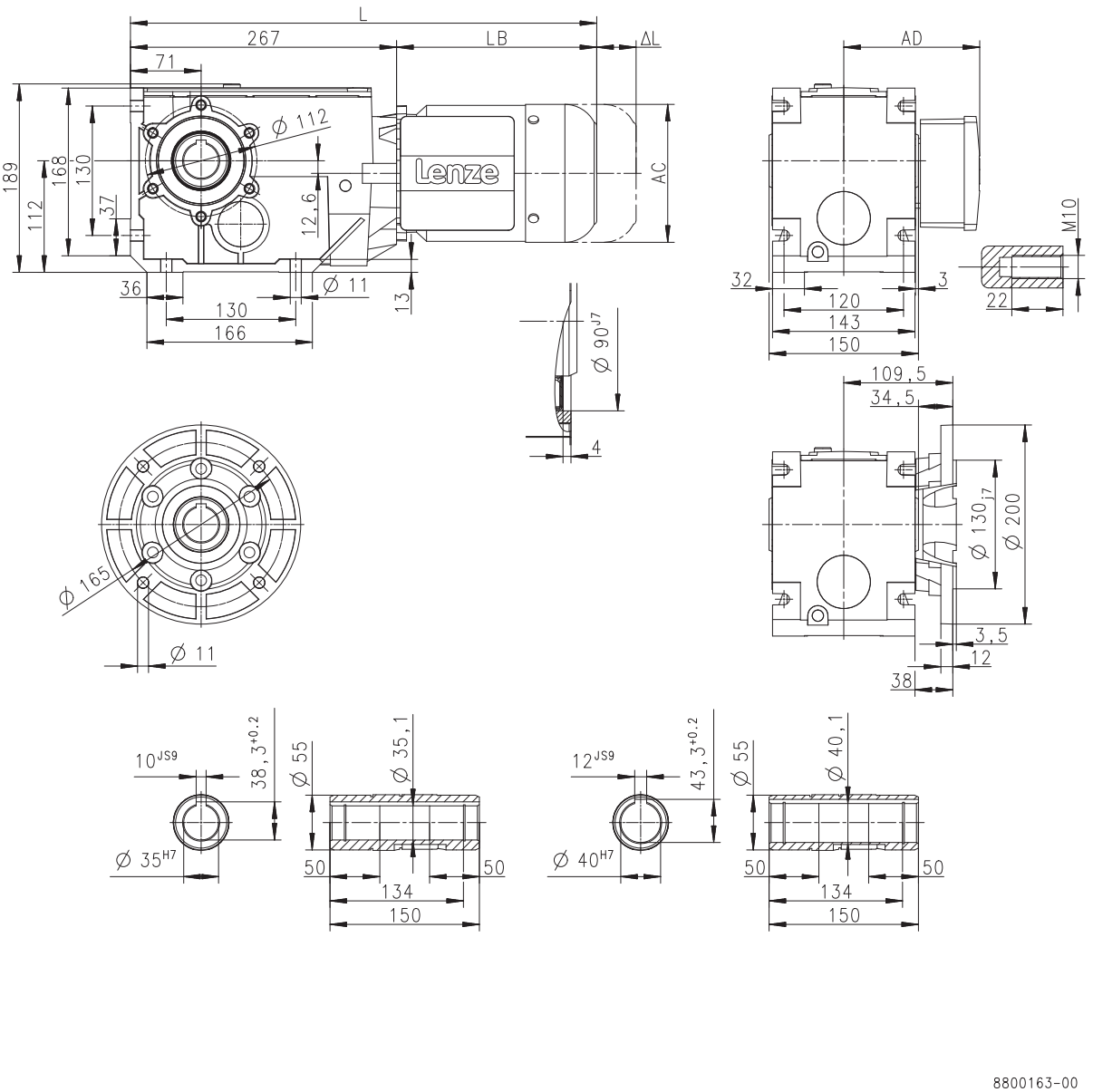


Product			MD□MA□□					MH□MA□□				
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32
Dimensions												
Total length	**L**	**[mm]**	443			463		486	545		581	597
Motor length	**LB**	**[mm]**	183			203		226	285		321	337
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170	
Motor diameter	**AC**	**[mm]**	123			139		156	176		194	
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166	

Dimensions, 4-pole motors

g500-B450

Dimensions with hollow shaft
Gearbox design: HBR, HAR, HAK

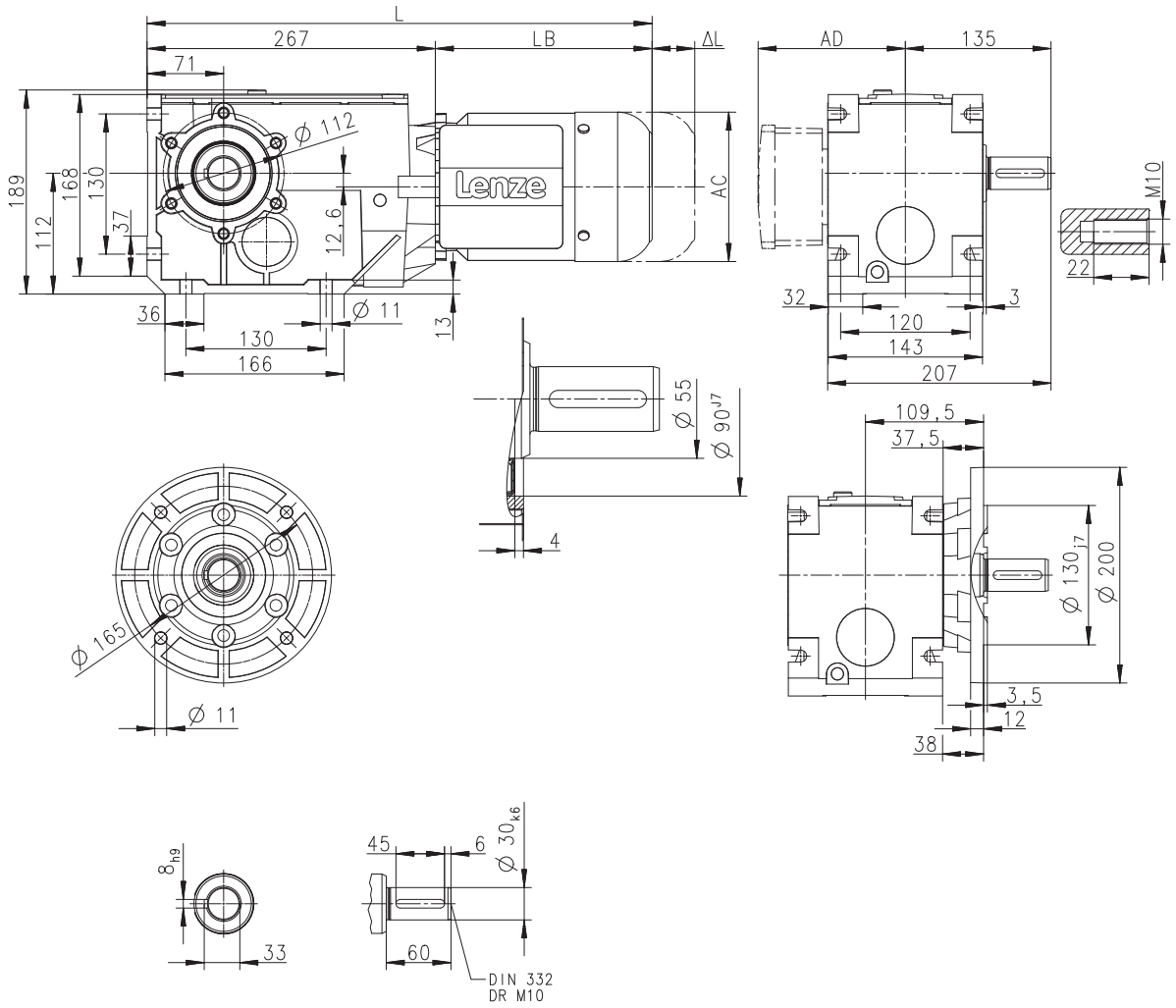


Product			MD□MA□□					MH□MA□□					
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32	112-22
Dimensions													
Total length	**L**	**[mm]**	450			470		493	552		588	604	647
Motor length	**LB**	**[mm]**	183			203		226	285		321	337	380
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170		183
Motor diameter	**AC**	**[mm]**	123			139		156	176		194		218
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166		176

Dimensions, 4-pole motors

g500-B450

Dimensions with solid shaft
Gearbox design: VBR, VAR, VAK

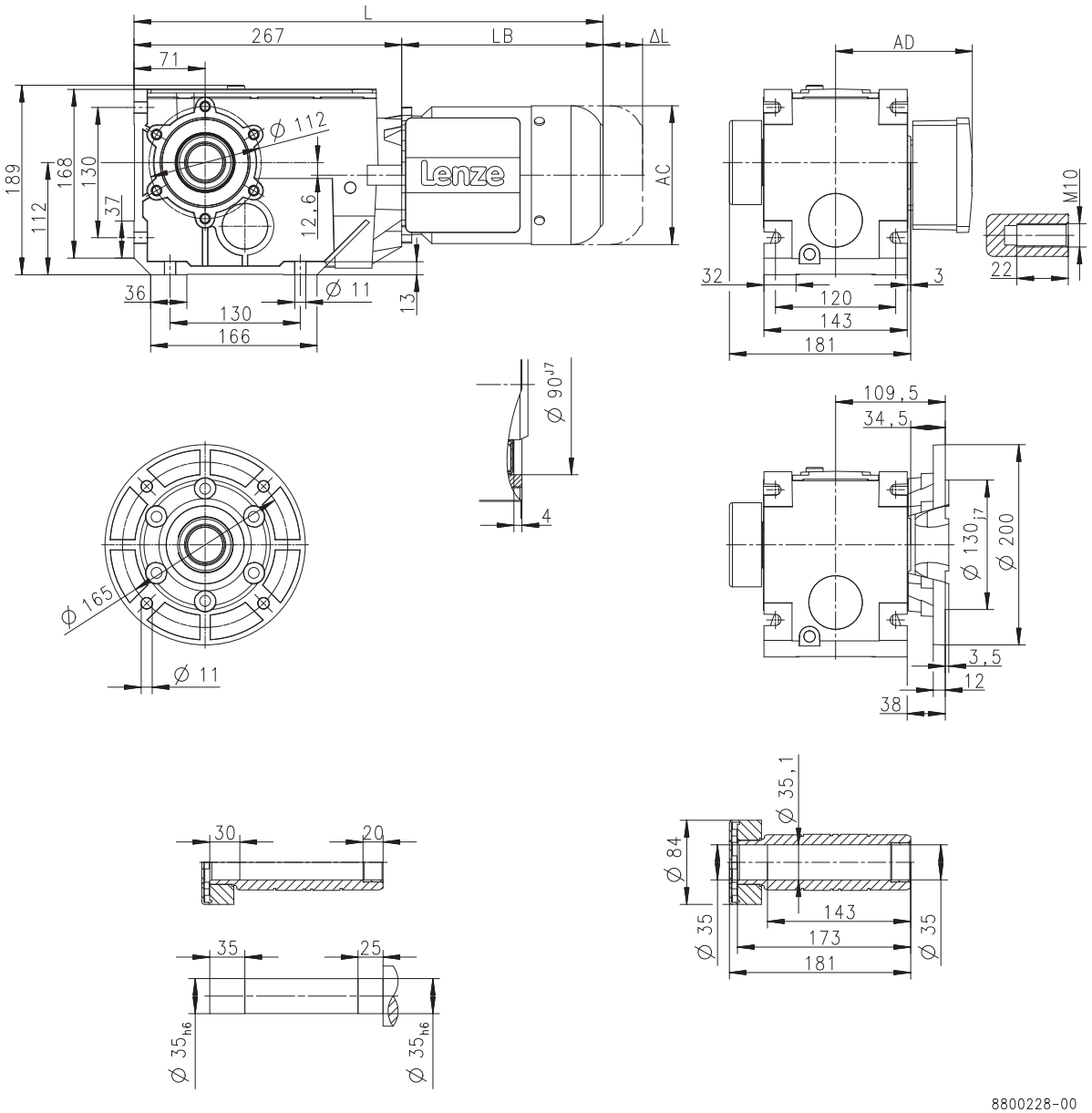


Product			MD□MA□□					MH□MA□□					
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32	112-22
Dimensions													
Total length	**L**	**[mm]**	450			470		493	552		588	604	647
Motor length	**LB**	**[mm]**	183			203		226	285		321	337	380
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170		183
Motor diameter	**AC**	**[mm]**	123			139		156	176		194		218
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166		176

Dimensions, 4-pole motors

g500-B450

Dimensions with shrink disc
Gearbox design: SBR, SAR, SAK

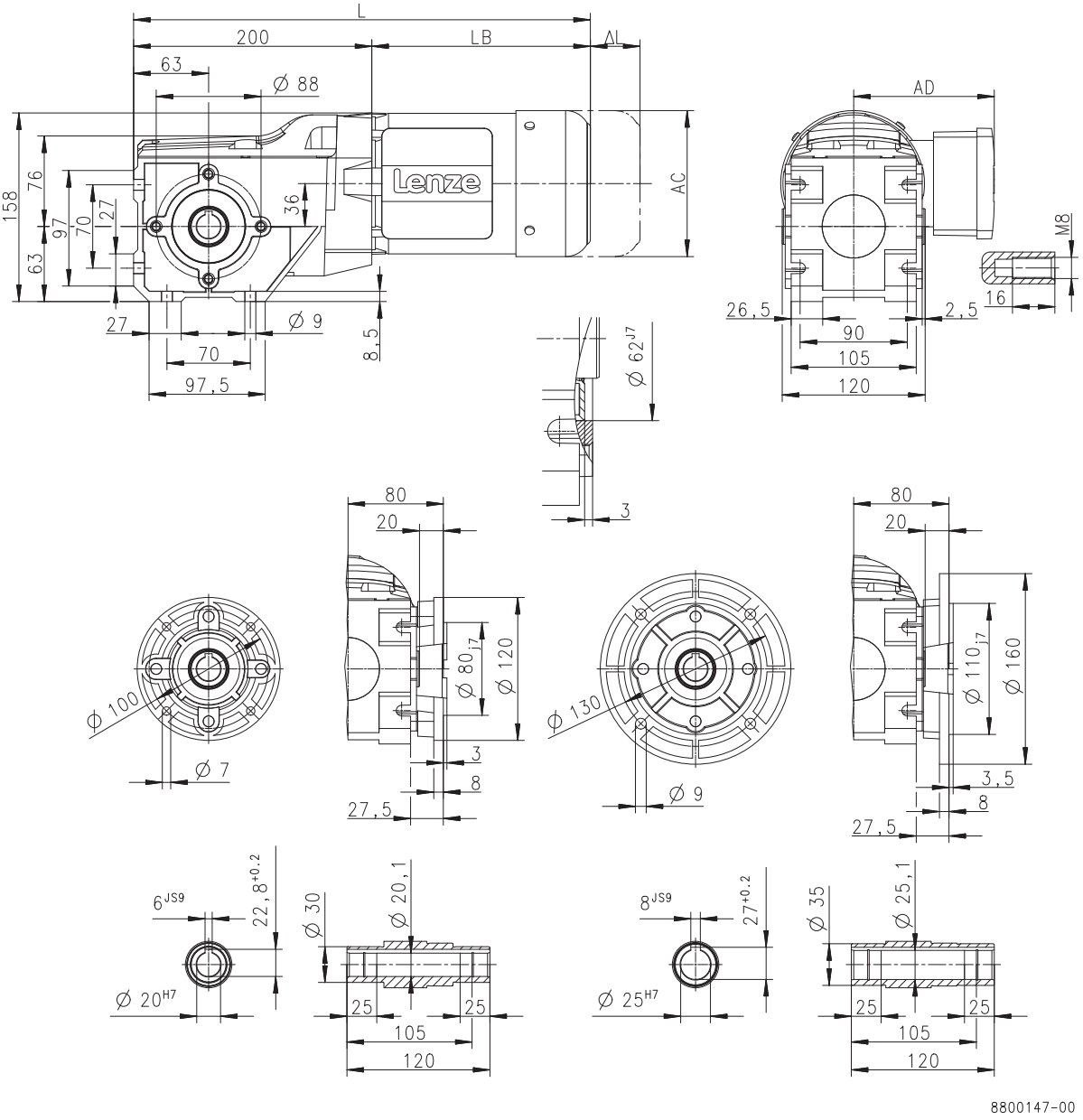


Product			MD□MA□□					MH□MA□□					
			063-12	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32	112-22
Dimensions													
Total length	**L**	**[mm]**	450			470		493	552		588	604	647
Motor length	**LB**	**[mm]**	183			203		226	285		321	337	380
Length of motor options	**Δ L**	**[mm]**	170			165		183	181		170		183
Motor diameter	**AC**	**[mm]**	123			139		156	176		194		218
Distance motor/connection	**AD**	**[mm]**	100			109		150	152	157	166		176

Dimensions, 2-pole and 6-pole motors

g500-B110

Dimensions with hollow shaft
Gearbox design: HBR, HAR, HAK

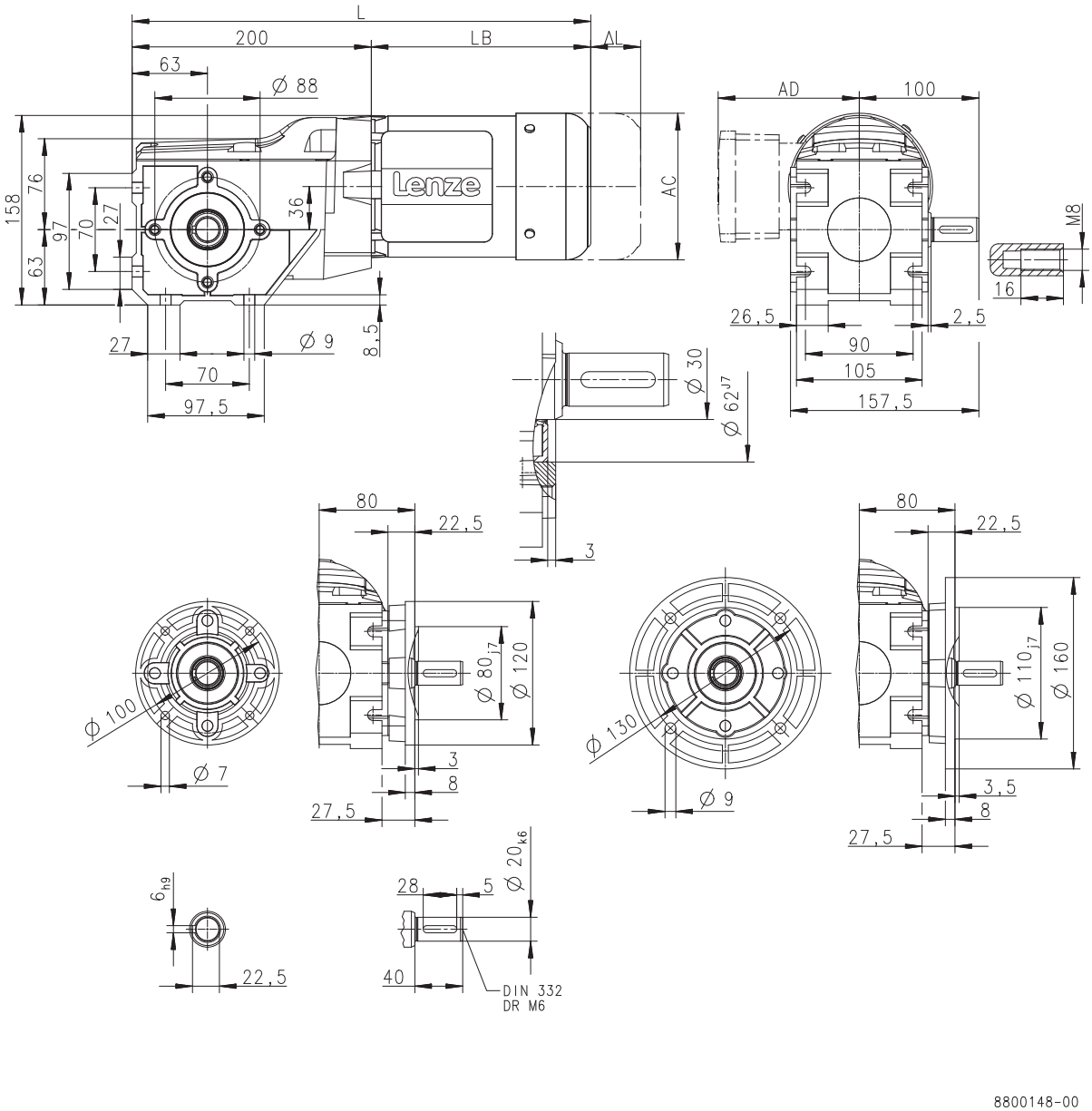


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	383		403				426	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-B110

Dimensions with solid shaft
Gearbox design: VBR, VAR, VAK

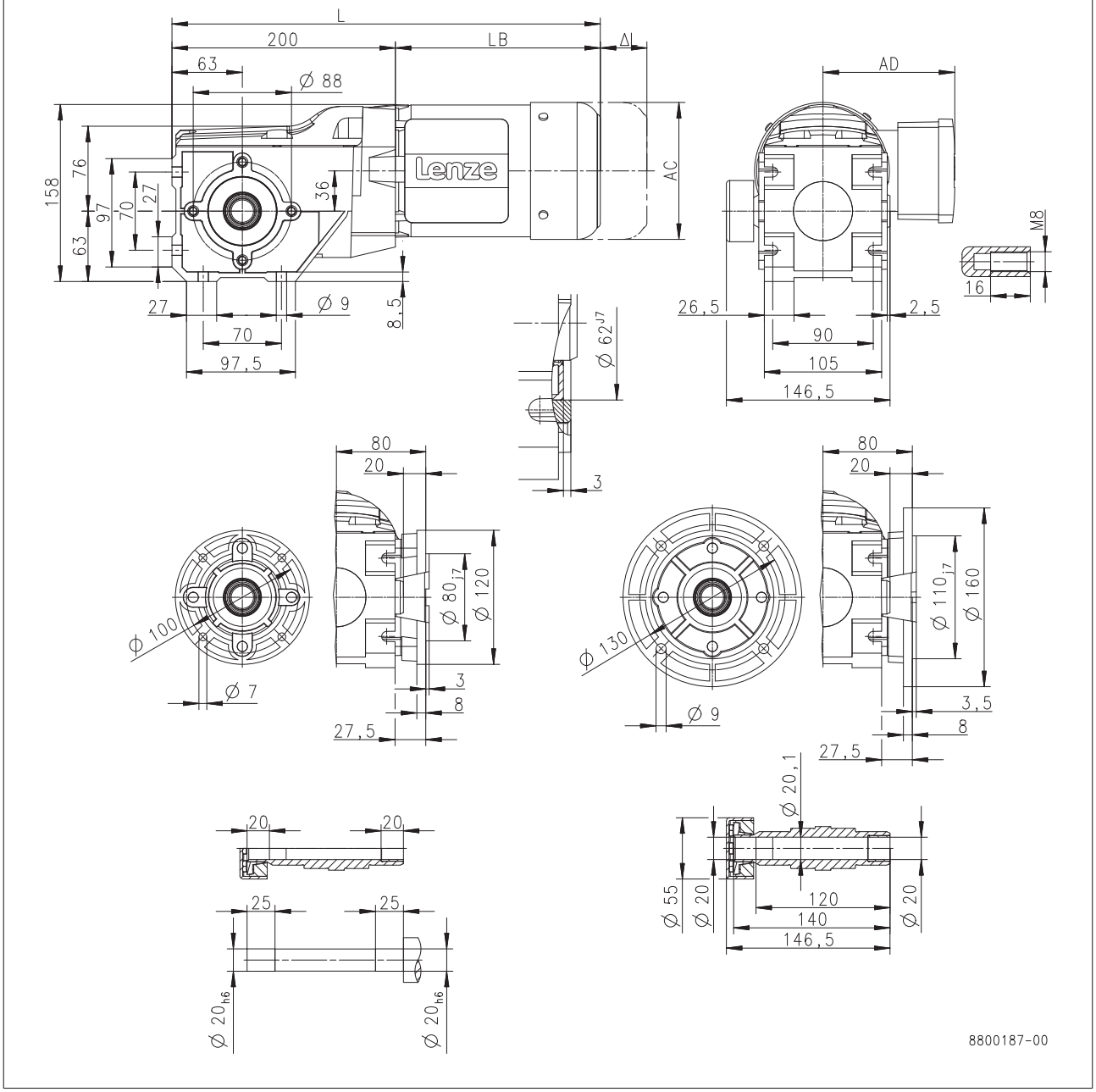


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	383		403				426	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-B110

Dimensions with shrink disc
Gearbox design: SBR, SAR, SAK

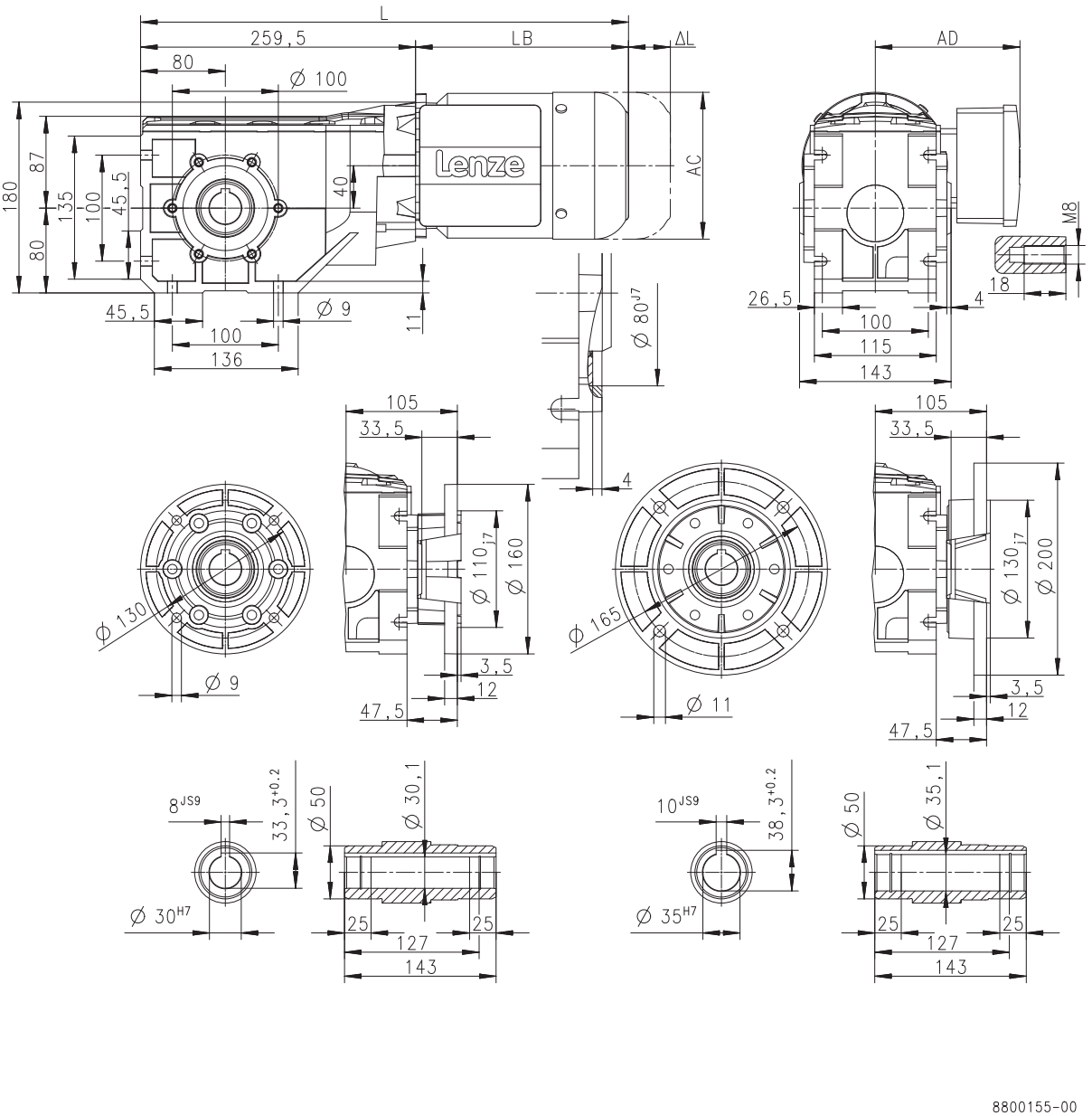


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	383		403				426	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-B240

Dimensions with hollow shaft
Gearbox design: HBR, HAR, HAK



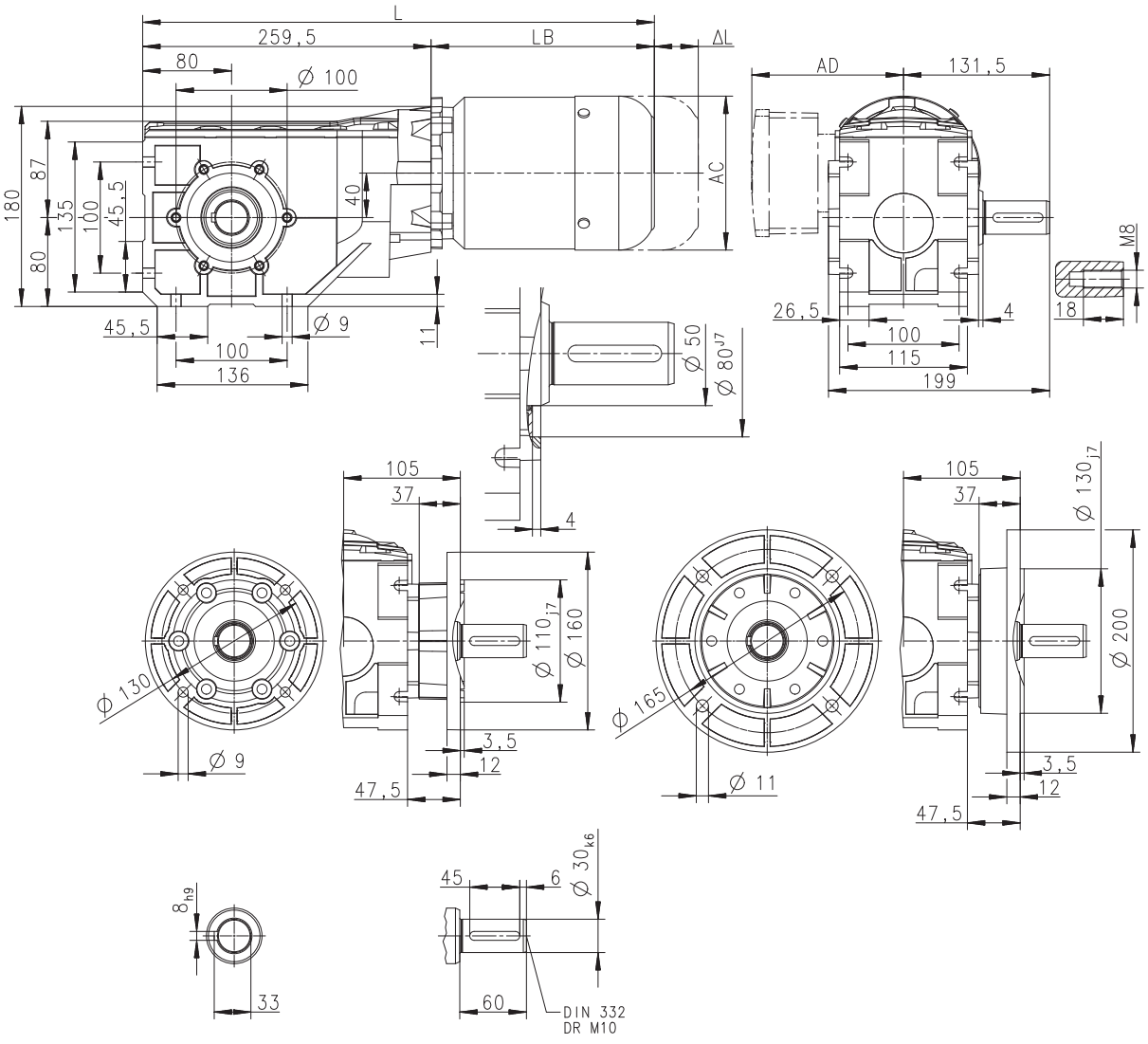
8800155-00

Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	443		463				486	
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, 2-pole and 6-pole motors

g500-B240

Dimensions with solid shaft
Gearbox design: VBR, VAR, VAK

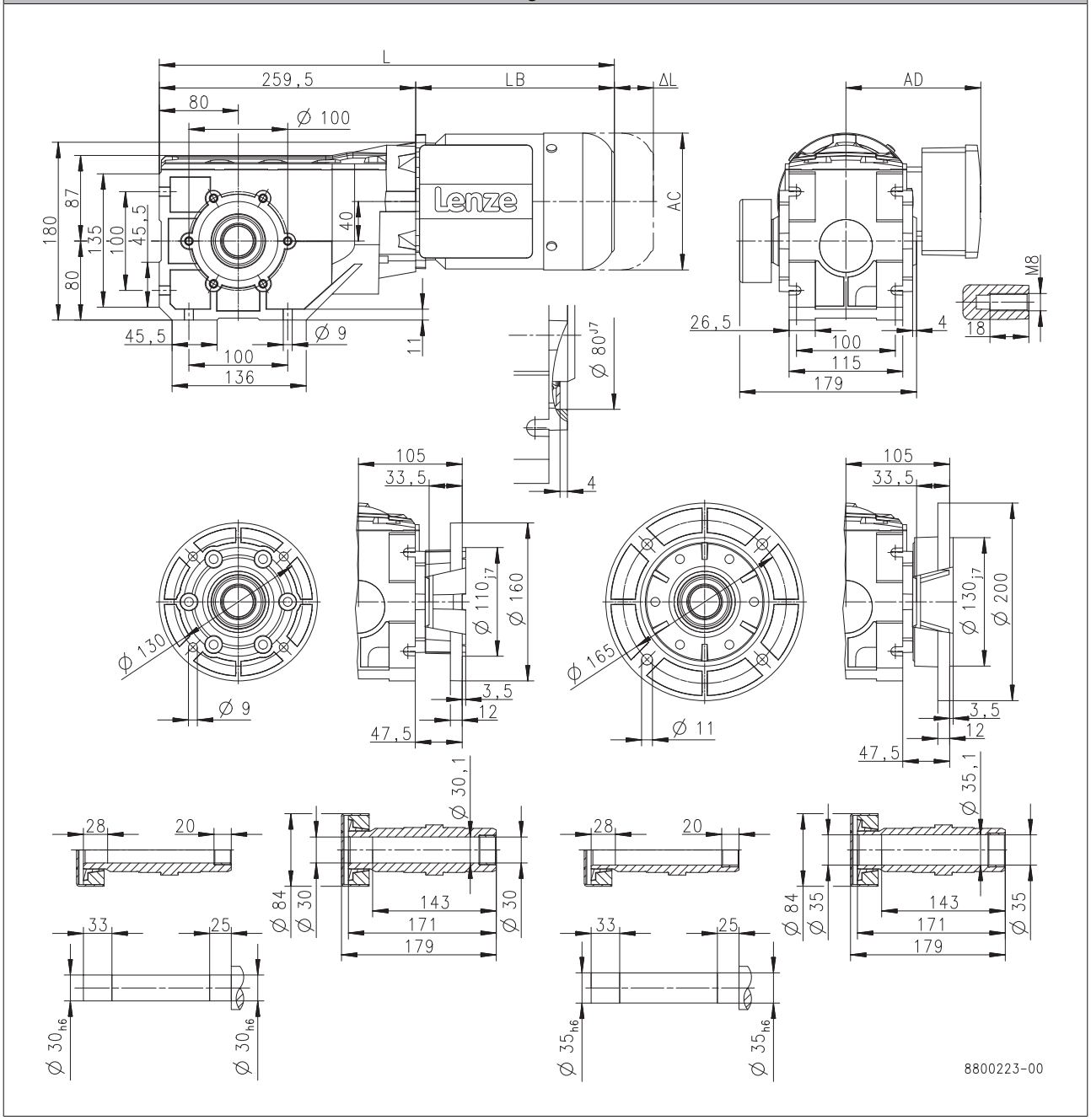


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	443		463				486	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-B240

Dimensions with shrink disc
Gearbox design: SBR, SAR, SAK

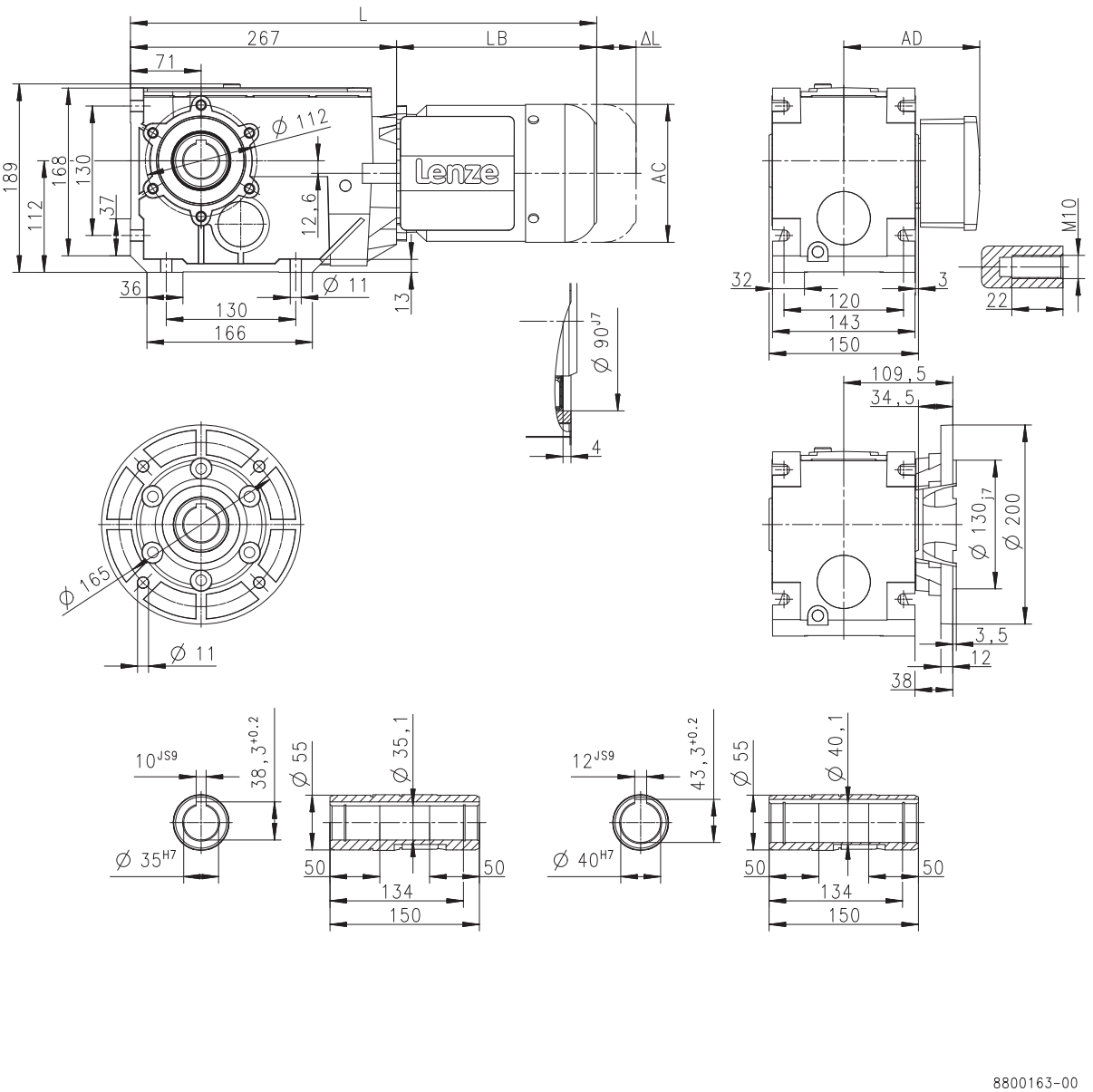


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	443		463				486	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-B450

Dimensions with hollow shaft
Gearbox design: HBR, HAR, HAK

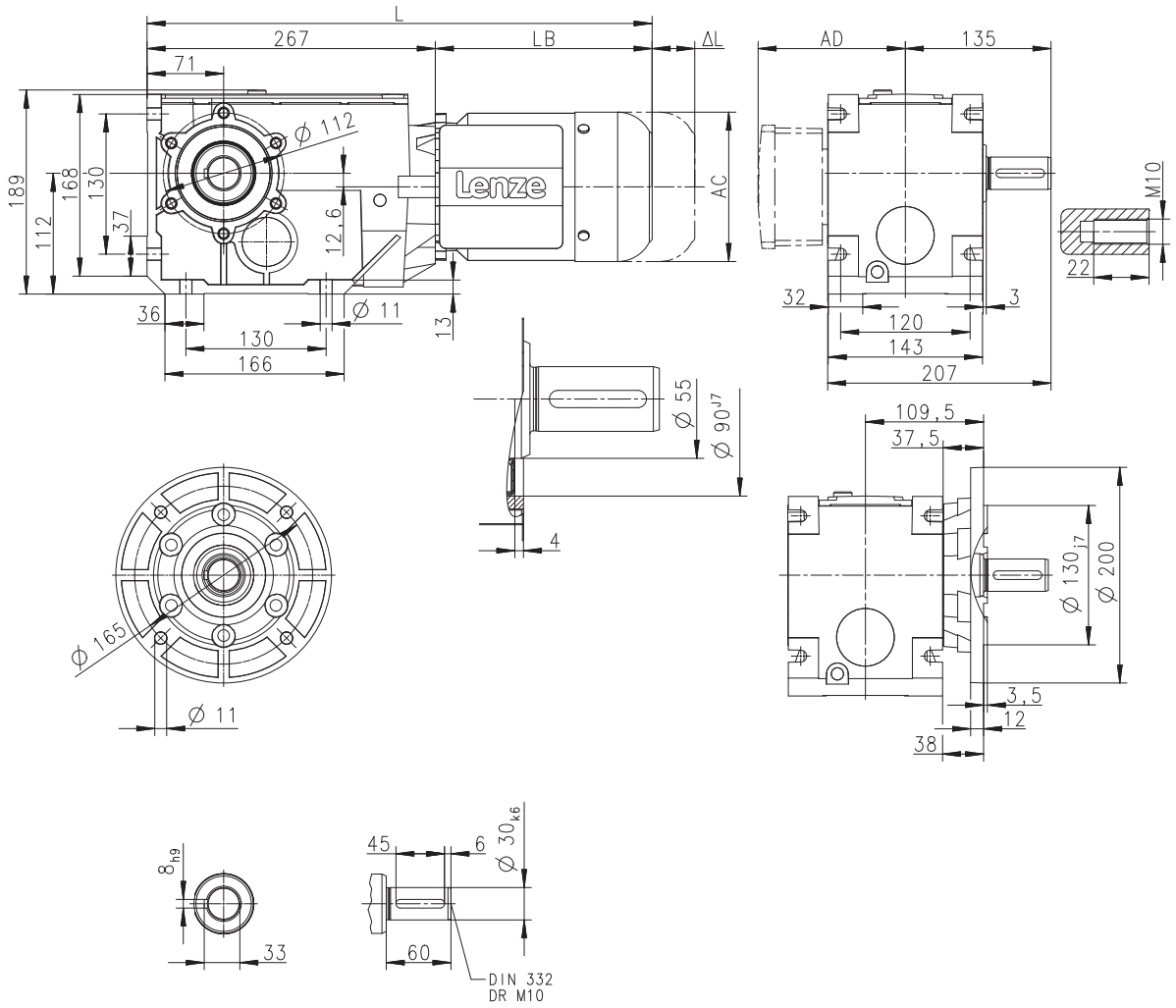


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	450		470				493	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-B450

Dimensions with solid shaft
Gearbox design: VBR, VAR, VAK

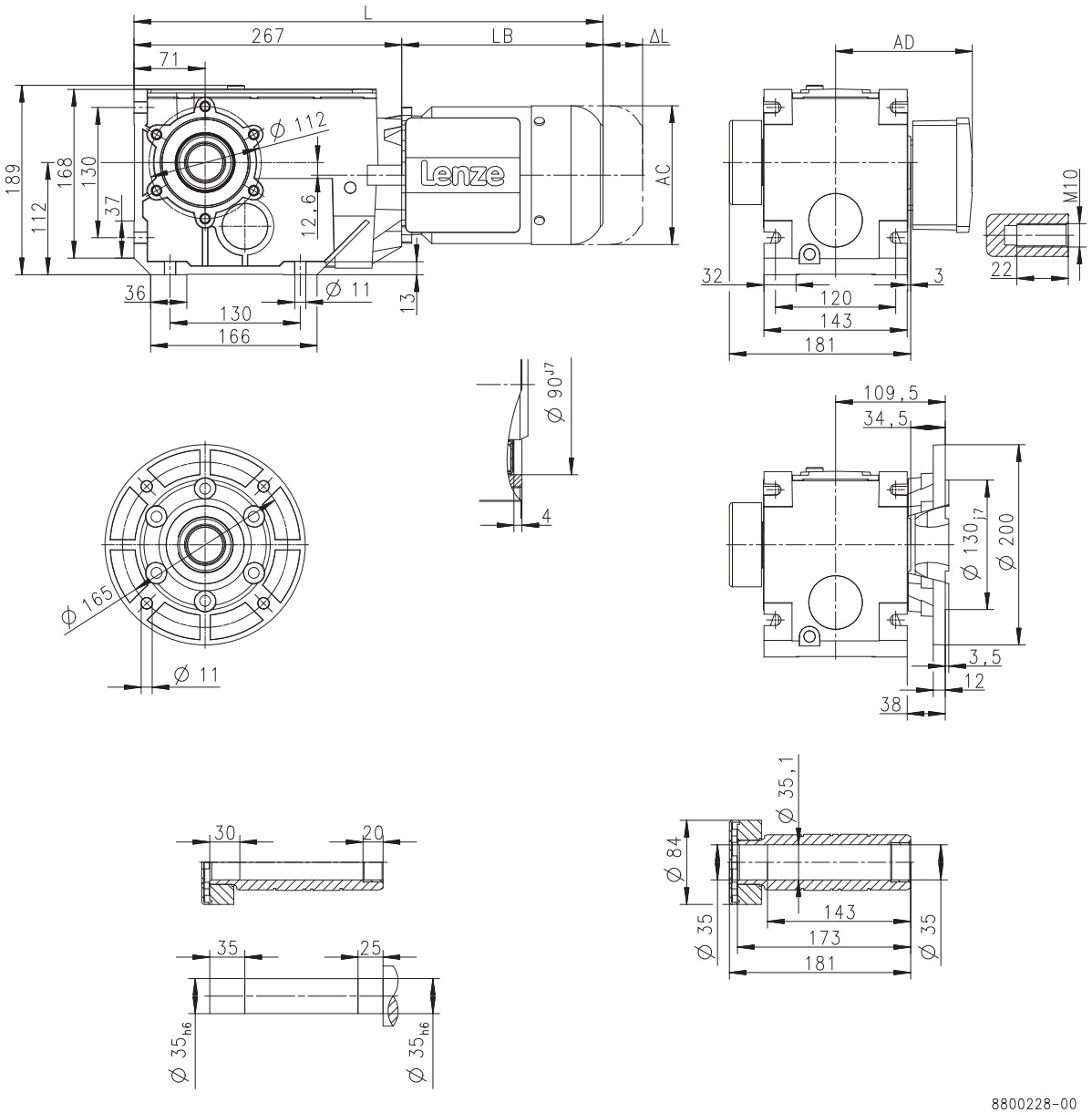


Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	450		470				493	
Motor length	**LB**	**[mm]**	183		203				226	
Length of motor options	**Δ L**	**[mm]**	170		165				183	
Motor diameter	**AC**	**[mm]**	123		139				156	
Distance motor/connection	**AD**	**[mm]**	100		109				150	

Dimensions, 2-pole and 6-pole motors

g500-B450

Dimensions with shrink disc
Gearbox design: SBR, SAR, SAK



Product			MD□MA□□							
			063-11	063-31	071-11	071-13	071-31	071-33	080-13	080-33
Dimensions										
Total length	**L**	**[mm]**	450		470				493	
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	

Additional length of the built-on accessories

Dimensions, self-ventilated (4-pole)

Product			MD□MA□□			MH□MA□□				
			063-02 063-22	063-12 063-32 063-42	071-32 071-42	080-32	090-12 090-32	100-12 100-32	112-22	132-12 132-22
Built-on accessories										
Brake										
	Δ L	[mm]	71.0	40.0	52.0	73.0	68.0	76.0	90.0	110
Feedback										
	Δ L	[mm]	71.0	56.0	52.0	111	87.0	81.0	80.0	103
Handwheel										
	Δ L	[mm]			70.0	91.0	80.0	94.0	107	126
2. shaft end										
	Δ L	[mm]			47.0	68.0	57.0	71.0	84.0	101
Grey iron fan										
	Δ L	[mm]			0.000	4.00	0.000	76.0	0.000	
Brake + Feedback										
	Δ L	[mm]	135	103	96.0	111	105	101	120	125
Brake + Handwheel										
	Δ L	[mm]			70.0	91.0	80.0	94.0	107	126
Brake + 2. shaft end										
	Δ L	[mm]			47.0	68.0	57.0	71.0	84.0	101
Brake + Grey iron fan										
	Δ L	[mm]			52.0	73.0	68.0	76.0	90.0	110

Dimensions, self-ventilated (2-pole)

Product			MD□MA□□	
			063-11 063-31	071-11 071-31
Built-on accessories				
Brake				
	Δ L	[mm]	40.0	52.0
Grey iron fan				
	Δ L	[mm]		0.000
Brake + 2. shaft end				
	Δ L	[mm]		47.0
Brake + Grey iron fan				
	Δ L	[mm]		52.0

Further dimensions on the handwheel, 2nd shaft end and protection cover can be found in the motor chapter under product extensions.

Additional length of the built-on accessories

Dimensions, self-ventilated (6-pole)

Product			MD□MA□□	
			071-13 071-33	080-13 080-33
Built-on accessories				
Brake				
	Δ L	[mm]	52.0	73.0
Feedback				
	Δ L	[mm]	52.0	111
Handwheel				
	Δ L	[mm]	70.0	91.0
2. shaft end				
	Δ L	[mm]	47.0	68.0
Grey iron fan				
	Δ L	[mm]	0.000	4.00
Brake + Feedback				
	Δ L	[mm]	96.0	111
Brake + Handwheel				
	Δ L	[mm]	70.0	91.0
Brake + 2. shaft end				
	Δ L	[mm]	47.0	68.0
Brake + Grey iron fan				
	Δ L	[mm]	52.0	73.0

Further dimensions on the handwheel, 2nd shaft end and protection cover can be found in the motor chapter under product extensions.

Dimensions, forced ventilated (4-pole)

Product			MD□MA□□		MH□MA□□				
			063-12 063-32 063-42	071-32 071-42	080-32	090-12 090-32	100-12 100-32	112-22	132-12 132-22
Built-on accessories									
Blower									
	Δ L	[mm]	128				109	102	115
Brake									
	Δ L	[mm]	170	165	183	181	170	183	202
Feedback									
	Δ L	[mm]	128				109	183	202
Brake + Feedback									
	Δ L	[mm]	170	165	183	181	170	183	202

Further dimensions for the blower can be found in the motor chapter under product extensions.

Weights, 4-pole motors

2-stage gearboxes

				MD□MA□□							MH□MA□□				
				063-02	063-12	063-22	063-32	063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32
g500	-B45	m	[kg]	6.7	7.0	6.7	7.0	7.3	8.7	9.3					
	-B110	m	[kg]		8.6		8.6	8.9	10	11	15	20	22		
	-B240	m	[kg]		12		12	13	14	15	19	24	26	32	35

3-stage gearboxes

				MD□MA□□			MH□MA□□					
				063-12 063-32 063-42	071-32	071-42	080-32	090-12	090-32	100-12	100-32	112-22
g500	-B240	m	[kg]	13	14	15						
	-B450	m	[kg]	16	17	18	22	27	29	35	38	49

Weights, 2-pole motors

2-stage gearboxes

				MD□MA□□			
				063-11	063-31	071-11	071-31
g500	-B110	m	[kg]	8.4	8.3	10	11
	-B240	m	[kg]		12	14	15

3-stage gearboxes

				MD□MA□□		
				063-11 063-31	071-11	071-31
g500	-B240	m	[kg]	12	14	15
	-B450	m	[kg]	15	18	

Weights, 6-pole motors

2-stage gearboxes

				MD□MA□□	
				071-13 071-33	080-13 080-33
g500	-B110	m	[kg]	11	15
	-B240	m	[kg]	15	19

6.5

3-stage gearboxes

				MD□MA□□		
				071-13 071-33	080-13	080-33
g500	-B240	m	[kg]	15	19	
	-B450	m	[kg]	18	22	

Additional weights for gearboxes

Product			g500-B45	g500-B110	g500-B240	g500-B450
Mass						
Solid shaft	m	[kg]	0.4	0.5	1.4	1.3
Shrink disc	m	[kg]	0.2	0.2	0.7	0.6
Flange	m	[kg]	0.3	0.4	0.7	0.9

Additional weights for motors

4-pole motors

Product			MD□MA□□			MH□MA□□				
			063-02 063-22	063-12 063-32 063-42	071-32 071-42	080-32	090-12 090-32	100-12 100-32	112-22	132-12 132-22
Built-on accessories										
Brake			06		06 08	08 10		10 12	12	14 16
	m	[kg]	0.9		0.9 1.5	1.5 2.6		2.6 4.2	4.2	5.8 8.7
Blower										
	m	[kg]		2.0	2.1	2.3	2.7	3.0	3.1	4.2
Grey iron fan										
	m	[kg]			1.2	1.4	2.0	2.5	3.8	6.0
Handwheel										
	m	[kg]					0.6			1.8

2-pole motors

Product			MD□MA□□	
			063-11 063-31	071-11 071-31
Built-on accessories				
Brake			06	06 08
	m	[kg]	0.9	0.9 1.5
Grey iron fan				
	m	[kg]		1.2

Additional weights for motors

6-pole motors

Product			MD□MA□□	
			071-13 071-33	080-13 080-33
Built-on accessories				
Brake			06 08	08 10
	m	[kg]	0.9 1.5	1.5 2.6
Grey iron fan				
	m	[kg]	1.2	1.4
Handwheel				
	m	[kg]	0.6	

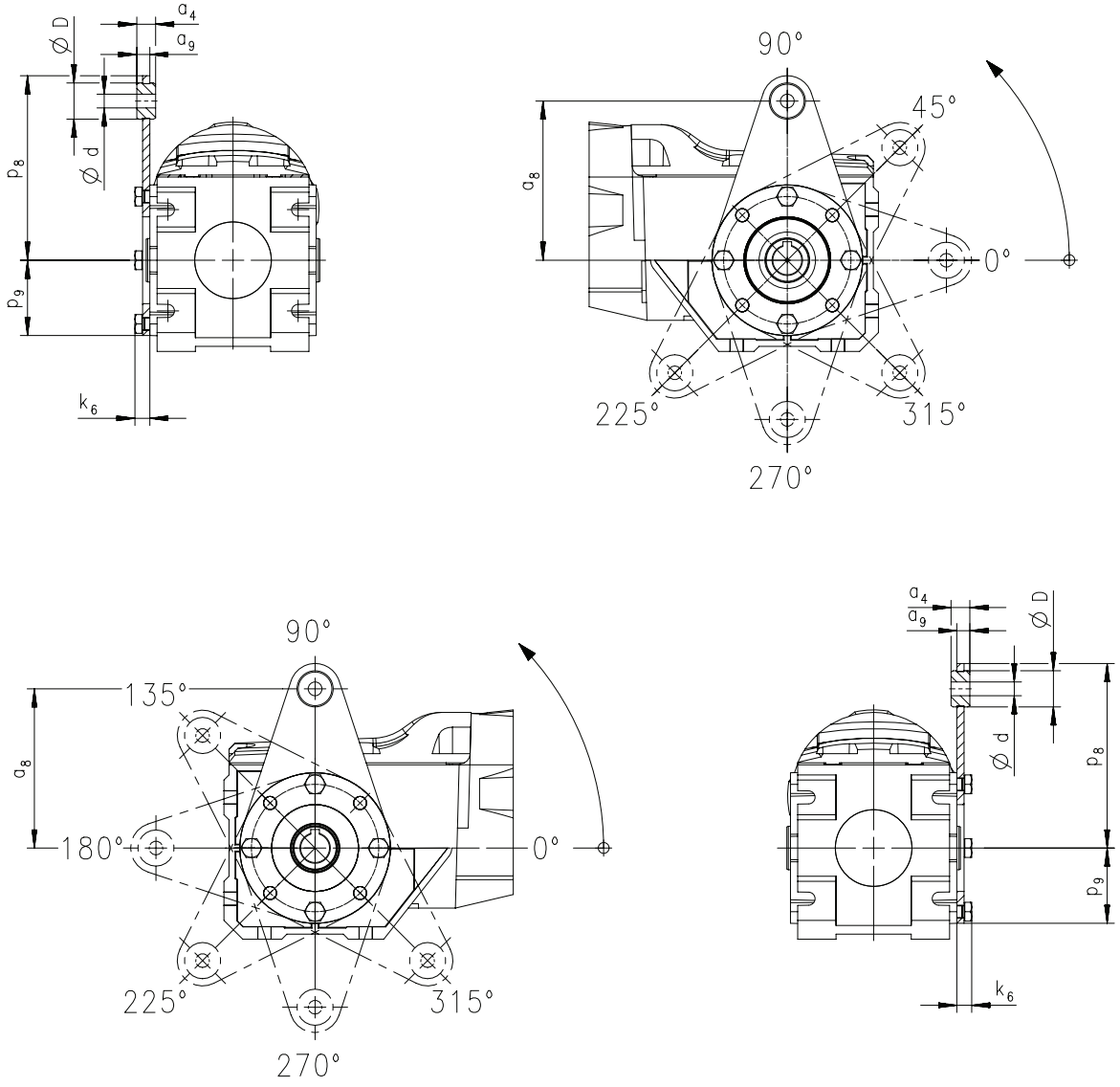
Torque plate

Torque support is usually effected by means of the foot or flange. Another simple possibility is provided by the attachable torque plates. Here, torque support is implemented solely via one point, which, among other things, is suitable for shaft-mounted gearboxes. Supplied rubber buffers provide for mounting with minimum stress and absorb light shocks.
The torque plates are available in two designs, for mounting on the available threaded pitch circle, or for the gearbox foot.

In addition, torque support for the g500-B45 gearbox can be effected via the holding fixture of the housing, which is integrated on both sides, by means of a rubber buffer.
The rubber buffers can be ordered optionally.

Torque plate

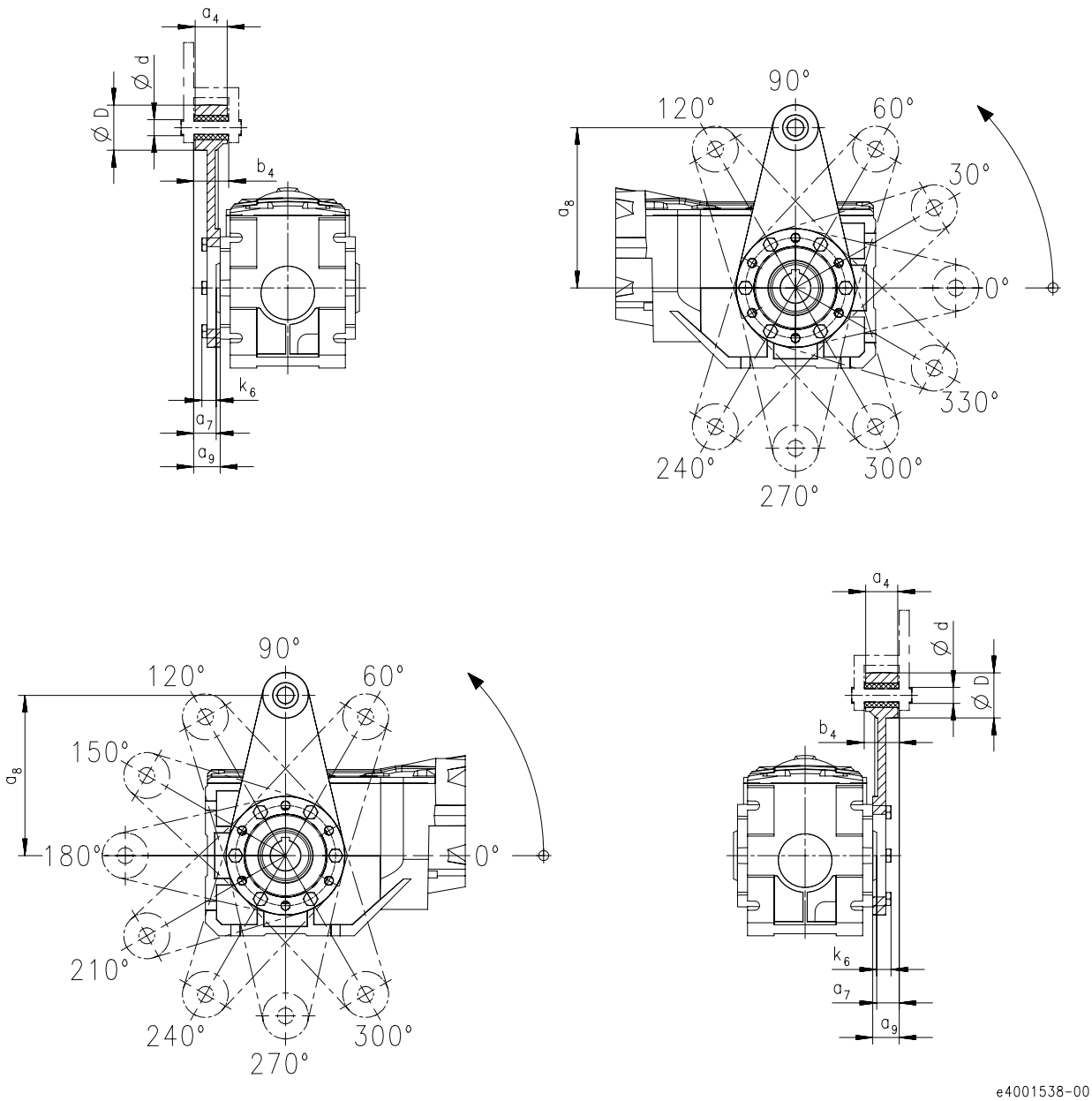
Torque plate on threaded pitch circle



Product	Dimensions								Mass
	a_4	a_8	a_9	d	D	p_8	p_9	k_6	m
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
g500-B45	12.0	100	8.0	8.0	20.0	115	42.0	9.0	0.3
g500-B110	13.0	110	9.0	10.0	25.0	128	54.0	11.0	0.5

Torque plate

Torque plate on threaded pitch circle

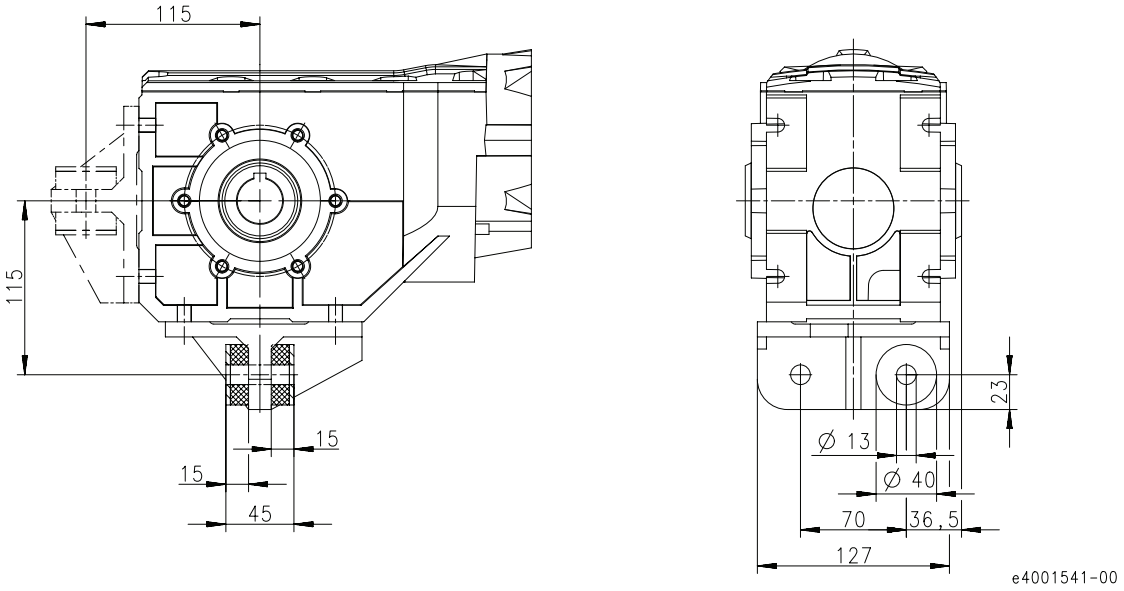


Product	Dimensions								Mass
	a_4	a_7	a_8	a_9	b_4	d	D	k_6	m
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
g500-B240	34.0	23.5	160	27.5	38.5	16.0	45.0	15.0	1.3
g500-B450	40.0	29.0	200	32.0	44.5	20.0	50.0	18.0	2.5

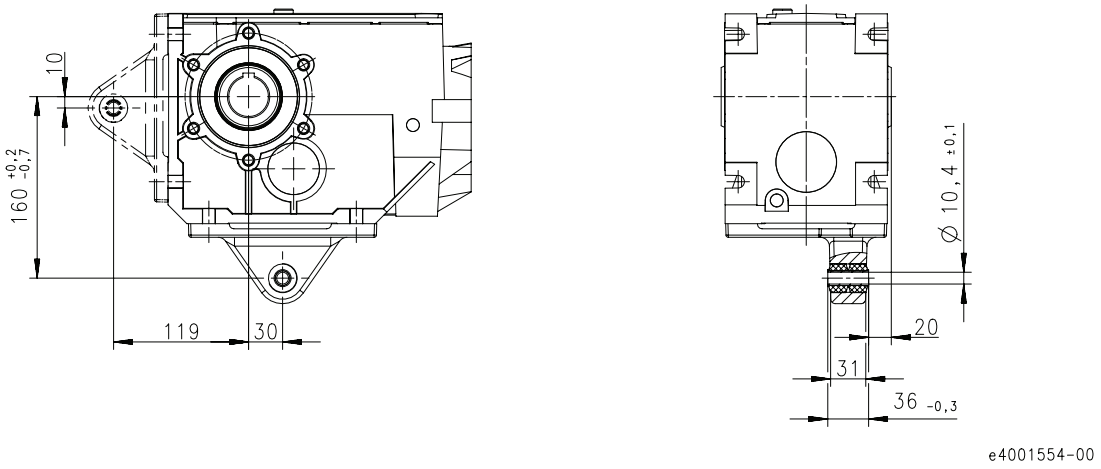
Torque plate

Torque plate at housing foot

g500-B240



g500-B450



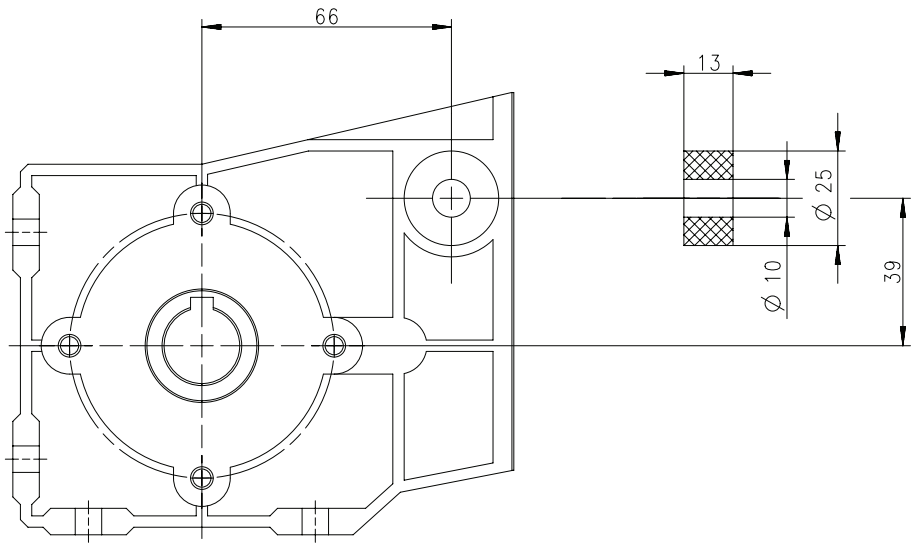
Product	Mass
	m
	[kg]
g500-B240	2.4
g500-B450	1.1

6.5

Torque plate

Rubber buffer for torque plate

g500-B45

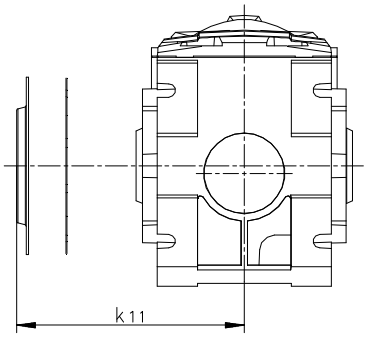


Shaft cover

Hoseproof hollow shaft cover

The cover protects the hollow shaft from objects falling in. It is sealed by a flat gasket between cover and housing. Thus, the hollow shaft is protected from dust and water jets.

The cover is loosely enclosed and can be mounted on both sides of the hollow shaft bore.

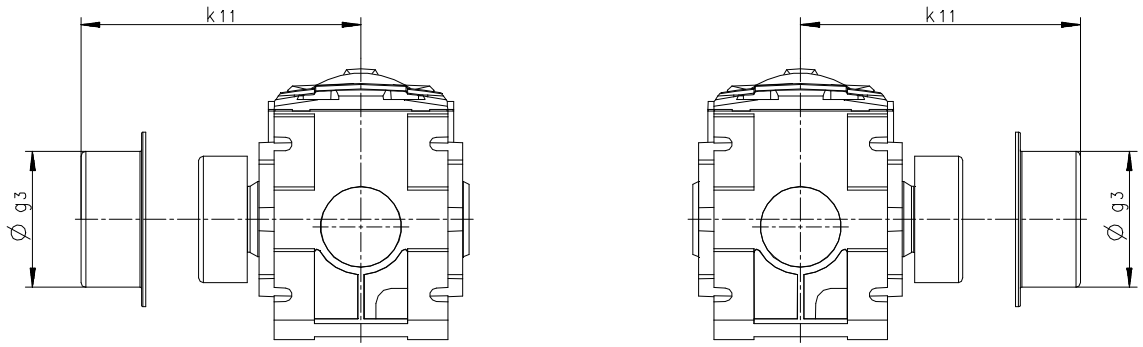


Product	Dimensions	Mass
	k_{11}	m
	[mm]	[kg]
g500-B45	55.0	0.1
g500-B110	65.0	0.1
g500-B240	75.0	0.1
g500-B450	79.5	0.2

Shaft cover

Shrink disc cover

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



Product	Dimensions		Mass
	g_3	k_{11}	m
	[mm]	[mm]	[kg]
g500-B45	65.0	87.5	0.1
g500-B110	79.0	97.5	0.1
g500-B240	90.0	111	0.1
g500-B450	90.0	108	0.1

Gearbox code

Example	G	50	A	B	045	M	H	B	R	2	C

Meaning	Variant											
Product family		G	50									
Generation				A								
Gearbox type	Bevel gearbox				B							
Output torque	45 Nm					045						
	110 Nm					111						
	240 Nm					124						
	450 Nm					145						
Mounting	Motor						M					
Shaft type	Solid shaft with feather key							V				
	Hollow shaft with keyway							H				
	Hollow shaft with shrink disc							S				
Housing type	Foot mounting + centering								A			
	Foot mounting								B			
	Centering								C			
Flange mounting	Without flange									R		
	Flange with through holes									k		
Number of stages	2-stage										2	
	3-stage										3	
Motor mounting	Integrated											C
	IEC motor											N

Motor code

Example	M	D	E	MA	XX	063	-	4	2	C1	C

Meaning	Variant	Motor code
Product family		M
Efficiency class	IE1	D
	IE2	H
Cooling	Natural ventilation	S
	Integral fan	E
	Blower	F
Internal key		MA
Built-on accessories	Without built-on accessories	XX
	Brake	BR
	Brake + resolver	BS
	Brake + incremental encoder	BI
	Brake + SinCos absolute value encoder	BA
	Brake + 2. shaft end	BZ
	Brake + handwheel	BH
	Brake + grey iron fan	BL
	Resolver	RS
	Incremental encoder	IG
	SinCos absolute value encoder	AG
	2nd shaft end	ZE
	Handwheel	HA
	Grey iron fan	LL
	Grey iron fan + 2. shaft end	LZ
	Grey iron fan + handwheel	LH
Size		063
		071
		080
		090
		100
		112
		132
		160
		180
		200
		225
Overall length		0
		1
		- 2
		3
		4
Number of pole pairs	4-pole motors	2
	2-pole motors	1
	6-pole motors	3
Internal key		C1
Approval	CE	C
	cURus	U
	CCC	3

Motor data

Motor data

Contents

Rated data for 50 Hz

2-pole motors

	P_N	n_N	$U_{N,\Delta}$	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a/I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MD□□□□□063-11	0.18	2740	230	0.80	400	0.46	4.30
MD□□□□□063-31	0.25	2710	230	1.10	400	0.60	3.70
MD□□□□□071-11	0.37	2720	230	1.50	400	0.90	4.40
MD□□□□□071-31	0.55	2630	230	2.40	400	1.40	3.80

	M_N	M_a	M_b	cos φ	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[kgcm²]	[kg]
MD□□□□□063-11	0.63	1.50	1.50	0.88	66.5	66.0	1.70	3.90
MD□□□□□063-31	0.90	1.90	2.00	0.89	67.0	66.0	1.70	3.80
MD□□□□□071-11	1.29	3.10	2.90	0.92	71.0	69.0	5.10	6.00
MD□□□□□071-31	2.00	3.80	4.20	0.93	70.0	63.0	5.10	6.50

4-pole motors

	P_N	n_N	$U_{N,\Delta}$ [2]	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a/I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MD□□□□□063-02	0.060	1425	230	0.42	400	0.24	3.50
MD□□□□□063-22	0.090	1375	230	0.48	400	0.28	2.90
MD□□□□□063-12	0.12	1425	230	0.85	400	0.49	3.10
MD□□□□□063-32	0.18	1365	230	1.00	400	0.58	2.70
MD□□□□□063-42	0.25	1370	230	1.40	400	0.82	2.90
MD□□□□□071-32	0.37	1410	230	1.60	400	0.95	3.30
MD□□□□□071-42	0.55	1405	230	2.40	400	1.40	3.50

	M_N	M_a	M_b	cos φ	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[kgcm²]	[kg]
MD□□□□□063-02	0.40	1.30	1.36	0.57	59.0	63.0	3.30	3.90
MD□□□□□063-22	0.63	1.30	1.39	0.71	63.0	65.0	3.30	3.90
MD□□□□□063-12	0.80	2.50	2.64	0.56	58.0	63.0	3.30	4.10
MD□□□□□063-32	1.26	2.50	2.61	0.70	63.0	64.0	3.30	4.10
MD□□□□□063-42	1.74	3.80	4.10	0.67	65.0	66.0	3.70	4.40
MD□□□□□071-32	2.51	4.76	5.81	0.77	73.0	73.0	10.7	5.80
MD□□□□□071-42	3.74	7.85	9.12	0.77	74.0	74.0	12.8	6.40

[1] Without accessories

[2] Operation at 87 Hz is possible with 4-pole motors whose rated data at 50 Hz displays the voltage values Δ 230 V.
With motor frame sizes 132-12 to 225-22, the required voltage must also be specified in your order.

Rated data for 50 Hz

4-pole motors

	P_N	n_N	$U_{N,\Delta}$ [2]	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a/I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MH□□□□□080-32	0.75	1410	230	3.10	400	1.80	5.00
MH□□□□□090-12	1.10	1430	230	4.60	400	2.70	5.40
MH□□□□□090-32	1.50	1435	230	5.80	400	3.30	6.30
MH□□□□□100-12	2.20	1445	230	8.60	400	5.00	6.00
MH□□□□□100-32	3.00	1445	230	12.1	400	7.00	6.50
MH□□□□□112-22	4.00	1455	230	14.5	400	8.40	6.00
MH□□□□□132-12	5.50	1470	230 400 [3]	20.6 11.9	400	11.9	6.10
MH□□□□□132-22	7.50	1460	230 400 [3]	27.0 15.6	400	15.6	8.50
MH□□□□□160-22	11.0	1470	230 400 [3]	37.7 21.8	400	21.8	8.00
MH□□□□□160-32	15.0	1470	230 400 [3]	50.3 29.1	400	29.1	8.20
MH□□□□□180-12	18.5	1475	230 400 [3]	58.8 34.0	400	34.0	8.40
MH□□□□□180-32	22.0	1470	230 400 [3]	68.9 39.8	400	39.8	7.80
MH□□□□□180-42	30.0	1465	230 400 [3]	93.8 53.9	400	53.9	7.00
MH□□□□□225-12	37.0	1483	230 400 [3]	113 65.0	400	65.0	7.50
MH□□□□□225-22	45.0	1480	230 400 [3]	137 79.0	400	79.0	7.60

	M_N	M_a	M_b	cos φ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[%]	[kgcm²]	[kg]
MH□□□□□080-32	5.08	12.0	12.1	0.84	74.9	79.6	79.6	28.0	11.0
MH□□□□□090-12	7.35	20.3	24.2	0.76	77.4	81.6	82.0	32.0	16.0
MH□□□□□090-32	10.0	33.0	34.0	0.76	82.2	83.4	82.8	36.0	18.0
MH□□□□□100-12	14.5	48.0	55.0	0.80	85.4	86.7	86.3	61.0	24.0
MH□□□□□100-32	19.8	67.0	76.0	0.73	83.8	85.6	85.5	66.0	26.5
MH□□□□□112-22	26.3	81.0	100	0.80	86.3	88.2	88.3	135	38.0
MH□□□□□132-12	35.7	90.0	108	0.77	88.2	89.3	89.2	290	59.0
MH□□□□□132-22	49.1	110	175	0.79	87.6	88.9	88.7	336	66.0
MH□□□□□160-22	71.5	164	243	0.82	89.4	90.0	89.8	570	109
MH□□□□□160-32	97.4	224	292	0.82	90.2	90.8	90.6	760	124
MH□□□□□180-12	120	359	371	0.86	90.8	91.4	91.2	1390	175
MH□□□□□180-32	143	400	372	0.87	91.4	92.0	91.6	1440	180
MH□□□□□180-42	196	469	528	0.87	91.9	92.5	92.3	1850	200
MH□□□□□225-12	238	620	620	0.87	94.0	94.6	94.3	4610	395
MH□□□□□225-22	290	698	669	0.88	93.7	94.5	94.3	5300	415

[1] Without accessories
[2] Operation at 87 Hz is possible with 4-pole motors whose rated data at 50 Hz displays the voltage values Δ 230 V.
With motor frame sizes 132-12 to 225-22, the required voltage must also be specified in your order.
[3] Star/delta start-up possible at 400 V.

Rated data for 50 Hz

6-pole motors

	P_N	n_N	$U_{N,\Delta}$	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a/I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MD□□□□□071-13	0.18	930	230	1.10	400	0.60	3.90
MD□□□□□071-33	0.25	930	230	1.80	400	1.10	2.80
MD□□□□□080-13	0.37	950	230	2.20	400	1.30	4.00
MD□□□□□080-33	0.55	930	230	2.90	400	1.70	3.50

	M_N	M_a	M_b	cos φ	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[kgcm²]	[kg]
MD□□□□□071-13	1.80	5.00	5.00	0.66	67.0	69.0	12.5	6.50
MD□□□□□071-33	2.50	6.60	6.60	0.66	67.0	68.0	12.5	6.50
MD□□□□□080-13	3.70	10.1	10.7	0.63	68.0	69.0	26.0	11.0
MD□□□□□080-33	5.60	12.2	12.8	0.70	68.0	68.0	26.0	11.0

[1] Without accessories

Rated data for 87 Hz

4-pole motors

	P_N	n_N	M_N	M_{max}	$U_{N,\Delta}$	$I_{N,\Delta}$	cos φ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
					± 10 %							
	[kW]	[r/min]	[Nm]	[Nm]	[V]	[A]		[%]	[%]	[%]	[kgcm²]	[kg]
MD□□□□□063-02	0.11	2535	0.40	1.60	400	0.42	0.55		62.0	67.0	3.30	3.90
MD□□□□□063-22	0.16	2485	0.63	2.50	400	0.48	0.67		66.0	70.0	3.30	3.90
MD□□□□□063-12	0.21	2535	0.80	3.20	400	0.85	0.52		61.0	66.0	3.30	4.10
MD□□□□□063-32	0.33	2475	1.26	5.00	400	1.00	0.65		68.0	71.0	3.30	4.10
MD□□□□□063-42	0.45	2480	1.74	7.00	400	1.40	0.63		66.0	73.0	3.70	4.40
MD□□□□□071-32	0.66	2520	2.51	10.0	400	1.60	0.72		76.0	78.0	10.7	5.80
MD□□□□□071-42	1.00	2515	3.74	15.0	400	2.40	0.74		79.0	80.0	12.8	6.40
MH□□□□□080-32	1.35	2520	5.12	20.0	400	3.10	0.84	77.3	81.6	83.5	28.0	11.0
MH□□□□□090-12	2.00	2540	7.52	30.0	400	4.60	0.78	80.4	84.9	86.5	32.0	16.0
MH□□□□□090-32	2.70	2545	10.1	40.0	400	5.80	0.76	82.3	85.5	86.0	36.0	18.0
MH□□□□□100-12	3.90	2555	14.6	60.0	400	8.60	0.83	85.7	89.6	90.0	61.0	24.0
MH□□□□□100-32	5.40	2555	20.2	80.0	400	12.1	0.76	84.7	87.9	88.5	66.0	26.5
MH□□□□□112-22	7.10	2565	26.4	106	400	14.5	0.83	87.4	90.2	90.9	135	38.0
MH□□□□□132-12	9.70	2580	35.9	144	400	20.6	0.82	88.2	91.4	91.8	290	59.0
MH□□□□□132-22	13.2	2570	49.1	196	400	27.0	0.82	88.2	90.1	90.7	336	66.0
MH□□□□□160-22	19.4	2580	71.8	287	400	37.7	0.81	90.6	91.0	91.6	570	109
MH□□□□□160-32	26.4	2580	97.7	391	400	50.3	0.81	91.4	91.0	91.6	760	124
MH□□□□□180-12	32.5	2585	120	480	400	58.8	0.86	92.0	92.2	92.8	1390	175
MH□□□□□180-32	38.7	2580	143	573	400	68.9	0.87	92.1	92.9	93.4	1440	180
MH□□□□□180-42	52.7	2575	196	782	400	92.6	0.87	92.6	92.7	93.2	1850	200
MH□□□□□225-12	64.0	2593	236	920	400	113	0.87	93.0	94.4	94.8	4610	395
MH□□□□□225-22	78.0	2590	288	1150	400	137	0.85	93.5	94.3	94.7	5300	415

[1] Without accessories

Motor – inverter assignment

Rated frequency 50/60 Hz

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

Rated power	Product key		
	Motor	Inverter	
P_N			
[kW]			
0.12	MD□□□□□063-12		E84AV□□□2512□□0
0.18	MD□□□□□063-32		
0.25	MD□□□□□063-42 MD□□□□□071-12		
0.37	MD□□□□□071-32	E84DVB□3714S□□□2□	E84AV□□□3714□□0
0.55	MD□□□□□071-42 MD□□□□□080-12	E84DVB□5514S□□□2□	E84AV□□□5514□□0
0.75	MH□□□□□080-32	E84DVB□7514S□□□2□	E84AV□□□7514□□0
1.10	MH□□□□□090-12	E84DVB□1124S□□□2□	E84AV□□□1124□□0
1.50	MH□□□□□090-32	E84DVB□1524S□□□2□	E84AV□□□1524□□0
2.20	MH□□□□□100-12	E84DVB□2224S□□□2□	E84AV□□□2224□□0
3.00	MH□□□□□100-32	E84DVB□3024S□□□2□	E84AV□□□3024□□0
4.00	MH□□□□□112-22	E84DVB□4024S□□□2□	E84AV□□□4024□□0
5.50	MH□□□□□132-12	E84DVB□5524S□□□2□	E84AV□□□5524□□0
7.50	MH□□□□□132-22	E84DVB□7524S□□□2□	E84AV□□□7524□□0
11.0	MH□□□□□160-22		E84AV□□□1134□□0
15.0	MH□□□□□160-32		E84AV□□□1534□□0
18.5	MH□□□□□180-12		E84AV□□□1834□□0
22.0	MH□□□□□180-32		E84AV□□□2234□□0
30.0	MH□□□□□200-32		E84AV□□□3034□□0
37.0	MH□□□□□225-12		E84AV□□□3734□□0
45.0	MH□□□□□225-22		E84AV□□□4534□□0

Motor – inverter assignment

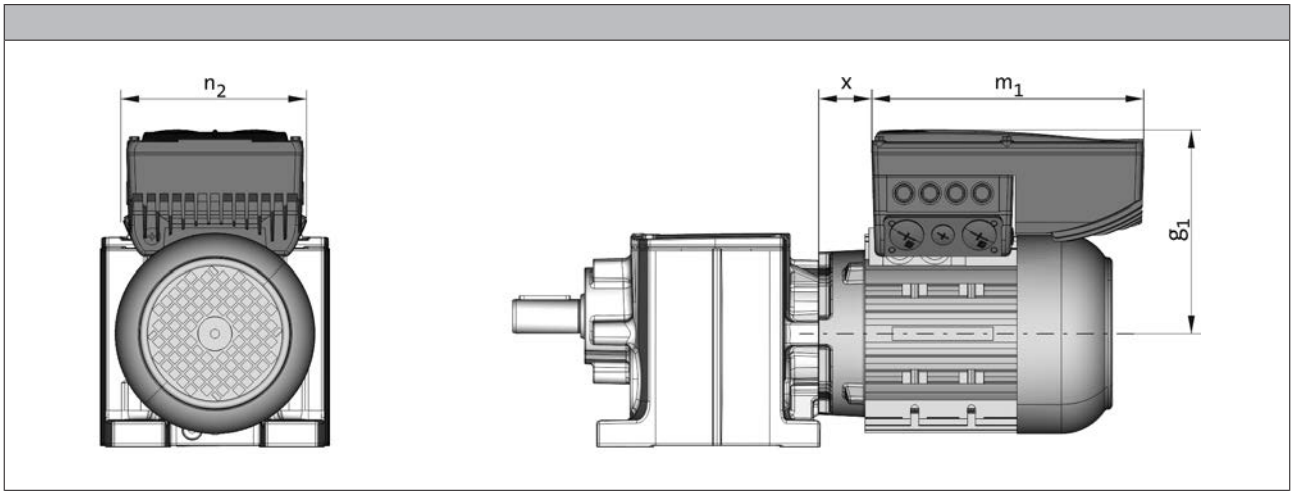
Rated frequency 87 Hz

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

Rated power	Product key		
	Motor	Inverter	
P_N			
[kW]			
0.21	MD□□□□□063-12	E84DVB□5514S□□□2□	E84AV□□□5514□□0
0.33	MD□□□□□063-32		
0.45	MD□□□□□063-42 MD□□□□□071-12		
0.66	MD□□□□□071-32	E84DVB□7514S□□□2□	E84AV□□□7514□□0
1.00	MD□□□□□071-42 MD□□□□□080-12	E84DVB□1124S□□□2□	E84AV□□□1124□□0
1.35	MH□□□□□080-32	E84DVB□1524S□□□2□	E84AV□□□1524□□0
2.00	MH□□□□□090-12	E84DVB□2224S□□□2□	E84AV□□□2224□□0
2.70	MH□□□□□090-32	E84DVB□3024S□□□2□	E84AV□□□3024□□0
3.90	MH□□□□□100-12	E84DVB□4024S□□□2□	E84AV□□□4024□□0
5.40	MH□□□□□100-32	E84DVB□5524S□□□2□	E84AV□□□5524□□0
7.10	MH□□□□□112-22	E84DVB□7524S□□□2□	E84AV□□□7524□□0
9.70	MH□□□□□132-12		E84AV□□□1134□□0
13.2	MH□□□□□132-22		E84AV□□□1534□□0
19.4	MH□□□□□160-22		E84AV□□□2234□□0
26.4	MH□□□□□160-32		E84AV□□□3034□□0
32.5	MH□□□□□180-12		E84AV□□□3734□□0

Dimensions, 8400 motec inverter

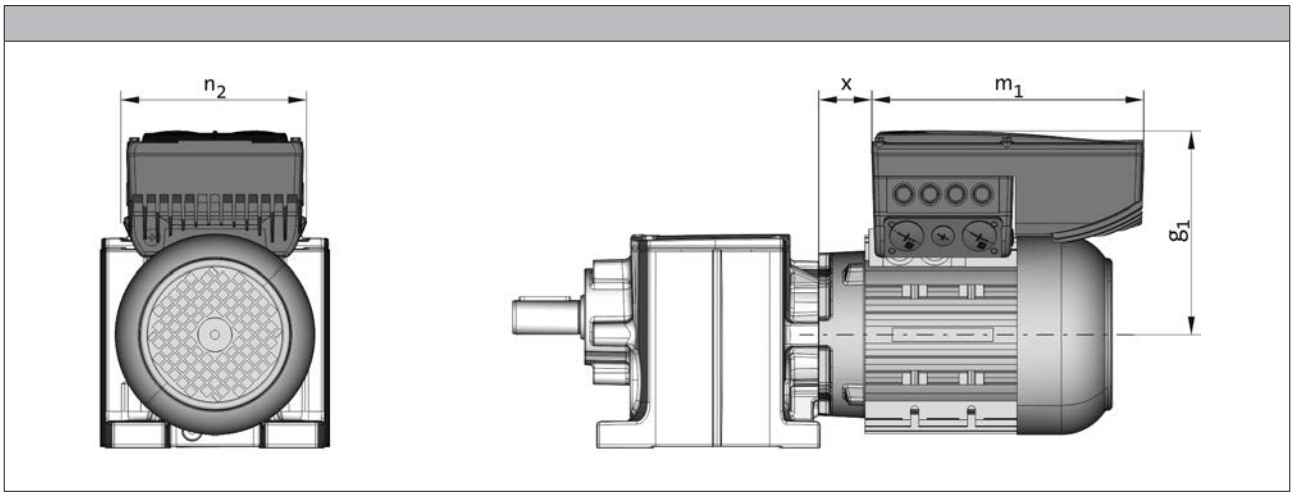
Rated frequency 50/60 Hz



Product key					
Motor	Inverter				
		$g_{1,\ 50Hz}$	$m_{1,\ 50Hz}$	$n_{2,\ 50Hz}$	x_{50Hz}
		[mm]	[mm]	[mm]	[mm]
MD□□□□□071-32	E84DVB□3714S□□□2□	163	241	161	17.0
MD□□□□□071-42	E84DVB□5514S□□□2□				
MH□□□□□080-32	E84DVB□7514S□□□2□	172			26.5
MH□□□□□090-12	E84DVB□1124S□□□2□	177			39.8
MH□□□□□090-32	E84DVB□1524S□□□2□				
MH□□□□□100-12	E84DVB□2224S□□□2□	217	260	176	40.6
MH□□□□□100-32	E84DVB□3024S□□□2□				
MH□□□□□112-22	E84DVB□4024S□□□2□	282	325	195	36.0
MH□□□□□132-12	E84DVB□5524S□□□2□	301			59.5
MH□□□□□132-22	E84DVB□7524S□□□2□				

Dimensions, 8400 motec inverter

Rated frequency 87 Hz



Product key					
Motor	Inverter				
		$g_{1,\ 87Hz}$	$m_{1,\ 87Hz}$	$n_{2,\ 87Hz}$	x_{87Hz}
		[mm]	[mm]	[mm]	[mm]
MD□□□□□063-32	E84DVB□3714S□□□2□	154	241	161	14.8
MD□□□□□063-42	E84DVB□5514S□□□2□				
MD□□□□□071-32	E84DVB□7514S□□□2□	163			17.0
MD□□□□□071-42	E84DVB□1124S□□□2□				
MH□□□□□080-32	E84DVB□1524S□□□2□	172			26.5
MH□□□□□090-12	E84DVB□2224S□□□2□	206	260	176	38.8
MH□□□□□090-32	E84DVB□3024S□□□2□				
MH□□□□□100-12	E84DVB□4024S□□□2□	272	325	195	28.1
MH□□□□□100-32	E84DVB□5524S□□□2□				
MH□□□□□112-22	E84DVB□7524S□□□2□	282			36.0

Motor connection

The three-phase AC motors are designed for operation at a constant mains frequency and with an inverter.
For 50 Hz operation, the motors are operated in Δconfiguration at 230 V or in star configuration at 400 V.
For inverter operation, the base frequency has been specified as 87 Hz at a rated voltage of 400 V in Δconfiguration.

The standard connection is implemented via a terminal box. Furthermore ICN and HAN connectors are provided to quickly carry out commissioning or maintenance operations.

Overview of the connection options

Product	MD□MA□□				MH□MA□□							
Motor frame size	063-02 063-22 063-12 063-32 063-42	071-32 071-42	063-11 063-31 071-11 071-31	071-13 071-33 080-13 080-33	080-32	090-12 090-32	100-12 100-32	112-22	132-12 132-22	160-22 160-32	180-12 180-32 180-42	225-12 225-22
Power connection/brake connection												
Terminal box	●	●	●	●	●	●	●	●	●	●	●	●
ICN connector	●	●	●	●	●	●	●	●	●			
HAN-10E connector	●	●	●	●	●	●	●	●				
HAN modular connector	●	●	●	●	●	●	●	●	●	●		
Feedback connection												
Terminal box	●	●			●	●	●	●	●	●	●	●
ICN connector	●	●			●	●	●	●	●			
Blower connection												
Terminal box	●	●			●	●	●	●	●	●	●	●
ICN connector	●	●			●	●	●	●	●	●	●	●
Temperature sensor connection												
Terminal box	●	●	●	●	●	●	●	●	●	●	●	●
ICN connector [1)]	●	●	●	●	●	●	●	●	●			
HAN-10E connector	●	●	●	●	●	●	●	●				
HAN modular connector	●	●	●	●	●	●	●	●	●	●		

[1)] TCO or PTC connected in the power connection and KTY connected in the feedback connection.

Motor connection

Assignment: motor terminal box - built-on accessories

► Depending on the motor version, terminal boxes of different sizes (KK1 ... KK3) are used.

Product	MD□MA□□					MH□MA□□	
Motor frame size	063-02 063-22 063-12 063-32 063-42	071-32 071-42	063-11 063-31	071-31 071-31	071-13 071-33 080-13 080-33	080-32	090-12 090-32
Built-on accessories							
Without							
	KK1	KK1	KK1	KK1	KK1	KK1	KK1
	KK1 + ICN	KK1 + ICN	KK1 + ICN	KK1 + ICN	KK1 + ICN	KK1 + ICN	KK1 + ICN
	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
Brake							
	KK2	KK2	KK2	KK2	KK2	KK2	KK2
	KK2 + ICN	KK2 + ICN	KK2 + ICN	KK2 + ICN	KK2 + ICN	KK2 + ICN	KK2 + ICN
	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
Feedback							
	KK2	KK2			KK2	KK2	KK2
	KK2 + ICN	KK2 + ICN			KK2 + ICN	KK2 + ICN	KK2 + ICN
Handwheel							
		KK2			KK2	KK2	KK2
		KK2 + ICN			KK2 + ICN	KK2 + ICN	KK2 + ICN
		HAN-10E HAN modular			HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
2. shaft end							
		KK2		KK2	KK2	KK2	KK2
		KK2 + ICN		KK2 + ICN	KK2 + ICN	KK2 + ICN	KK2 + ICN
		HAN-10E HAN modular		HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
Grey iron fan							
		KK1		KK1	KK1	KK1	KK1
		KK1 + ICN		KK1 + ICN	KK1 + ICN	KK1 + ICN	KK1 + ICN
		HAN-10E HAN modular		HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
Brake + Feedback							
	KK3	KK3			KK3	KK3	KK3
	KK2 + ICN	KK2 + ICN			KK2 + ICN	KK2 + ICN	KK2 + ICN
Brake + Handwheel							
		KK2			KK2	KK2	KK2
		KK2 + ICN			KK2 + ICN	KK2 + ICN	KK2 + ICN
		HAN-10E HAN modular			HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
Brake + 2. shaft end							
		KK2		KK2	KK2	KK2	KK2
		KK2 + ICN		KK2 + ICN	KK2 + ICN	KK2 + ICN	KK2 + ICN
		HAN-10E HAN modular		HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
Brake + Grey iron fan							
		KK2		KK2	KK2	KK2	KK2
		KK2 + ICN		KK2 + ICN	KK2 + ICN	KK2 + ICN	KK2 + ICN
		HAN-10E HAN modular		HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular

Motor connection

Assignment: motor terminal box - built-on accessories

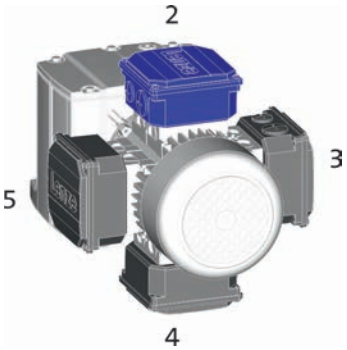
Product	MH□MA□□					
Motor frame size	100-12 100-32	112-22	132-22 132-22	160-22 160-32	180-12 180-32 180-42	225-12 225-22
Built-on accessories						
Without						
	KK1	KK1	KK1	KK3	KK3	KK3
	KK1 + ICN	KK1 + ICN	KK1 + ICN			
	HAN-10E HAN modular	HAN-10E HAN modular	HAN modular	HAN modular		
Brake						
	KK2	KK2	KK3	KK3	KK3	KK3
	KK2 + ICN	KK2 + ICN	KK3 + ICN			
	HAN-10E HAN modular	HAN-10E HAN modular	HAN modular	HAN modular		
Feedback						
	KK2	KK2	KK3	KK3	KK3	KK3
	KK2 + ICN	KK2 + ICN	KK3 + ICN			
Handwheel						
	KK2	KK2	KK3			
	KK2 + ICN	KK2 + ICN	KK3 + ICN			
	HAN-10E HAN modular	HAN-10E HAN modular	HAN modular			
2. shaft end						
	KK2	KK2	KK3			
	KK2 + ICN	KK2 + ICN	KK3 + ICN			
	HAN-10E HAN modular	HAN-10E HAN modular	HAN modular			
Grey iron fan						
	KK2	KK1	KK1			
	KK2 + ICN	KK1 + ICN	KK1 + ICN			
	HAN-10E HAN modular	HAN-10E HAN modular	HAN modular			
Brake + Feedback						
	KK3	KK3	KK3	KK3	KK3	KK3
	KK2 + ICN	KK2 + ICN	KK3 + ICN			
Brake + Handwheel						
	KK2	KK2	KK3			
	KK2 + ICN	KK2 + ICN	KK3 + ICN			
	HAN-10E HAN modular	HAN-10E HAN modular	HAN modular			
Brake + 2. shaft end						
	KK2	KK2	KK3			
	KK2 + ICN	KK2 + ICN	KK3 + ICN			
	HAN-10E HAN modular	HAN-10E HAN modular	HAN modular			
Brake + Grey iron fan						
	KK2	KK2	KK3			
	KK2 + ICN	KK2 + ICN	KK3 + ICN			
	HAN-10E HAN modular	HAN-10E HAN modular	HAN modular			

Motor connection

Position of cable entry/connector

For geared motors, the position of the cable entry must be selected as a function of the terminal box position.

Terminal box positions 2 ... 5



Cable entry positions 1 ... 5

Terminal box position	2	3	4	5
	Cable entry positions			
KK1	1/3/5*	1/2*/4	1/3*/5	1/2/4*
KK2	3+5	2+4	3+5	2+4
KK3 [1)]	3+5	2+4	3+5	2+4
HAN	1/3/5	1/2/4	1/3/5	1/2/4
	Connector position			
KK1 + ICN	1/3/5*	1/2*/4	1/3*/5	1/2/4*
KK2 + ICN	3/5*	2*/4	3/5*	2/4*

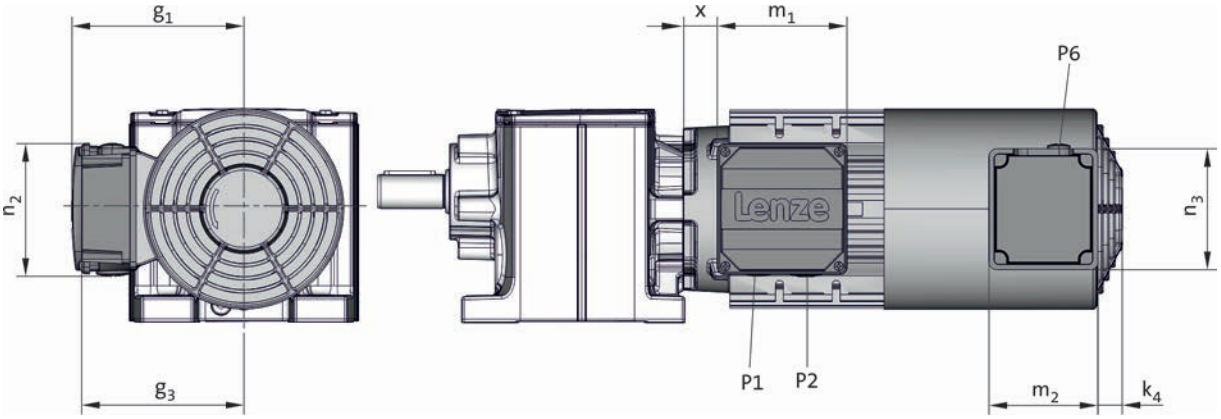
[1)] In case of motor frame size 225, only one cable entry position per terminal box position is provided:
Terminal box position/cable entry position
2/5 - 3/2 - 4/3 - 5/4)

► If preferred positions are not specified in the order, the connector will be positioned as indicated by * on the diagram below.

Connection via terminal box

Dimensions of KK1

The connection in the terminal box is implemented by means of conventional cable glands.

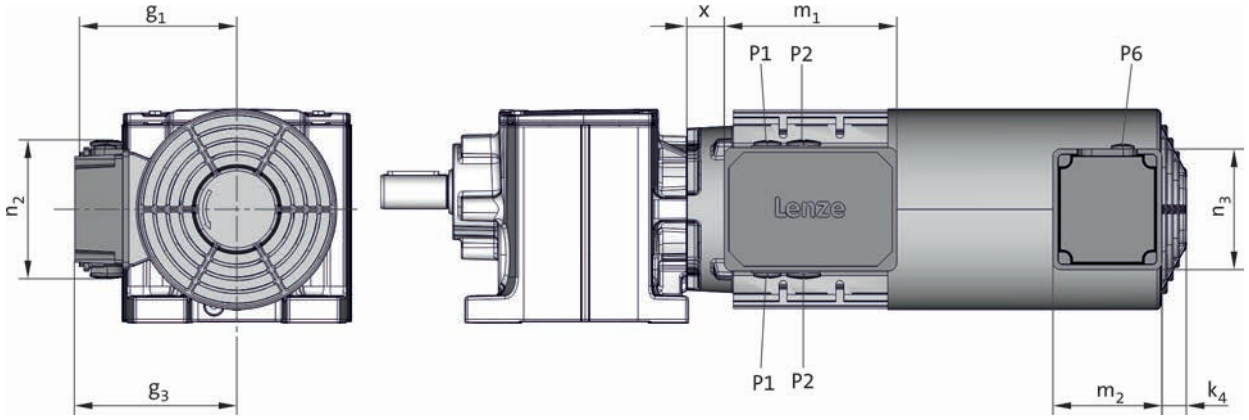


Size									
Motor			063	071	080	090	100	112	132
Dimensions									
	x	[mm]	17.0	20.0	15.0	30.0	31.0	39.0	58.0
	g_1	[mm]	100	109	150	157	166	176	195
	m_1	[mm]	75.0	75.0	115	115	115	115	122
	n_2	[mm]	75.0	75.0	115	115	115	115	122
	P_1	[mm]	M16x1.5	M16x1.5	M20x1.5	M20x1.5	M20x1.5	M20x1.5	M32x1.5
	P_2	[mm]	M20x1.5	M20x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M32x1.5
	k_4	[mm]	12	12	13	22	22	22	32
	g_3	[mm]	115	122	132	141	150	162	182
	m_2	[mm]	95	95	96	95	95	95	95
	n_3	[mm]	105	105	106	105	105	105	105
	P_6	[mm]	1x M16x1.5	1x M16x1.5	1x M16x1.5	1x M16x1.5	1x M16x1.5	1x M16x1.5	1x M16x1.5

Connection via terminal box

Dimensions of KK2

The connection in the terminal box is implemented by means of conventional cable glands.

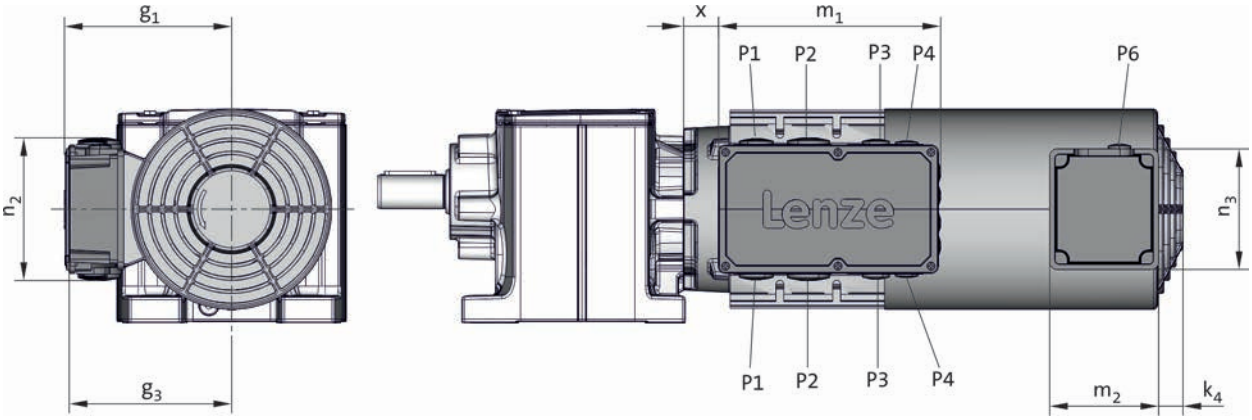


Size								
Motor			063	071	080	090	100	112
Dimensions								
	x	[mm]	9.00	11.0	18.0	33.0	34.0	42.0
	g_1	[mm]	107	118	132	137	147	158
	m_1	[mm]	136	136	152	152	152	152
	n_2	[mm]	103	103	121	121	121	121
	P_1	[mm]	M16x1.5	M16x1.5	M20x1.5	M20x1.5	M20x1.5	M20x1.5
	P_2	[mm]	M20x1.5	M20x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5
	k_4	[mm]	12	12	13	22	22	22
	g_3	[mm]	115	122	132	141	150	162
	m_2	[mm]	95	95	96	95	95	95
	n_3	[mm]	105	105	106	105	105	105
	P_6	[mm]	1x M16x1.5	1x M16x1.5	1x M16x1.5	1x M16x1.5	1x M16x1.5	1x M16x1.5

Connection via terminal box

Dimensions of KK3

The connection in the terminal box is implemented by means of conventional cable glands.



Size									
Motor			063	071	080	090	100	112	132
Dimensions									
	x	[mm]	-2.000	1.00	16.0	31.0	32.0	40.0	63.0
	g_1	[mm]	124	133	142	147	158	168	187
	m_1	[mm]	195	195	195	195	195	195	195
	n_2	[mm]	125	125	125	125	125	125	125
	P_1	[mm]	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5	M25x1.5
	P_2	[mm]	M32x1.5	M32x1.5	M32x1.5	M32x1.5	M32x1.5	M32x1.5	M32x1.5
	P_3	[mm]	M20x1.5	M20x1.5	M20x1.5	M20x1.5	M20x1.5	M20x1.5	M20x1.5
	P_4	[mm]	M20x1.5	M20x1.5	M20x1.5	M20x1.5	M20x1.5	M20x1.5	M20x1.5
	k_4	[mm]	12	12	13	22	22	22	32
	g_3	[mm]	115	122	132	141	150	162	182
	m_2	[mm]	95	95	96	95	95	95	95
	n_3	[mm]	105	105	106	105	105	105	105
	P_6	[mm]	1x M16x1.5	1x M16x1.5	1x M16x1.5	1x M16x1.5	1x M16x1.5	1x M16x1.5	1x M16x1.5

Connections via ICN connectors

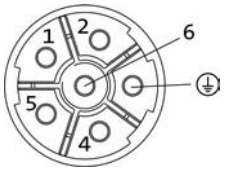
A connector is used for the power connection, connection of the brake, and the temperature monitoring connection.
The feedback and blower connections are implemented via a separate connector in each case.

Connection for power, brake and temperature monitoring

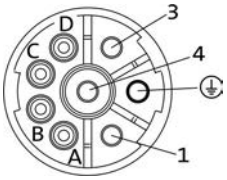
For the power connection of the connector, a max. rated motor current of 16 A is permissible.
The connectors can be rotated by 270° and are equipped with a bayonet catch for SpeedTec connectors. As the connector fixing is also compatible with conventional box nuts, existing mating connectors can still be used without difficulty. The motor connection is determined in the terminal box.

► ICN 6-pole

No connection of temperature monitoring possible!

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	W	Phase W power	
4	V	Phase V 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	

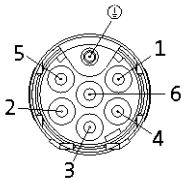
Connections via ICN connectors

Blower connection

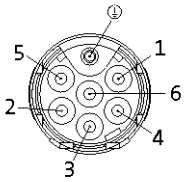
The blower is also optionally available with an ICN connector fixed to the terminal box of the blower for exceptionally fast commissioning. The connectors are fitted with a bayonet fixing, which is also compatible with conventional union nuts. Existing counter plugs can therefore continue to be used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

For the blower, the terminal box cover including the connector can be rotated by 90 ° step by step, if required.

► 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

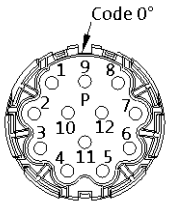
Pin assignment			
Contact	Designation	Meaning	
PE	PE	PE conductor	
1	U	Phase U power	
2		Not assigned	
3	V	Phase V power	
4		Not assigned	
5			
6	W	Phase W power	

Connections via ICN connectors

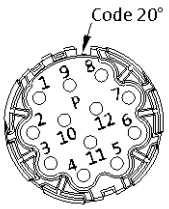
Feedback connection

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.
The feedback connector is located on the terminal box side opposite to the power connection

► Resolver

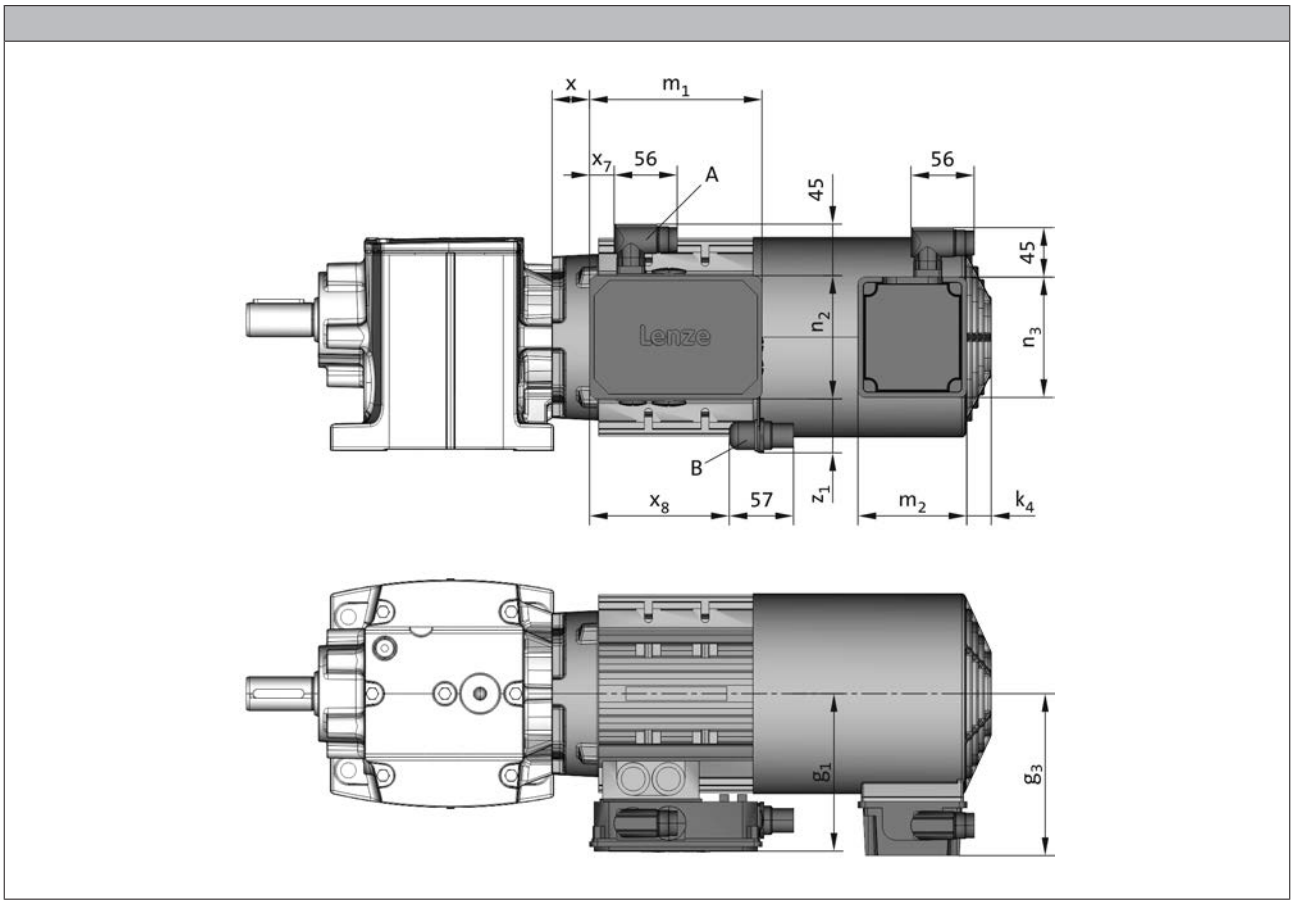
Pin assignment			
Contact	Designation	Meaning	
1	+Ref	Transformer windings	
2	-Ref		
3	+VCC ETS	Supply: Electronic nameplate	
4	+COS	Cosine stator windings	
5	-COS		
6	+SIN	Sine stator windings	
7	-SIN		
8		Not assigned	
9			
10			
11	+KTY	KTY temperature sensor	
12	-KTY		

► Hiperface incremental encoder and SinCos absolute value encoder

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

Connections via ICN connectors

Dimensions KK1+ICN

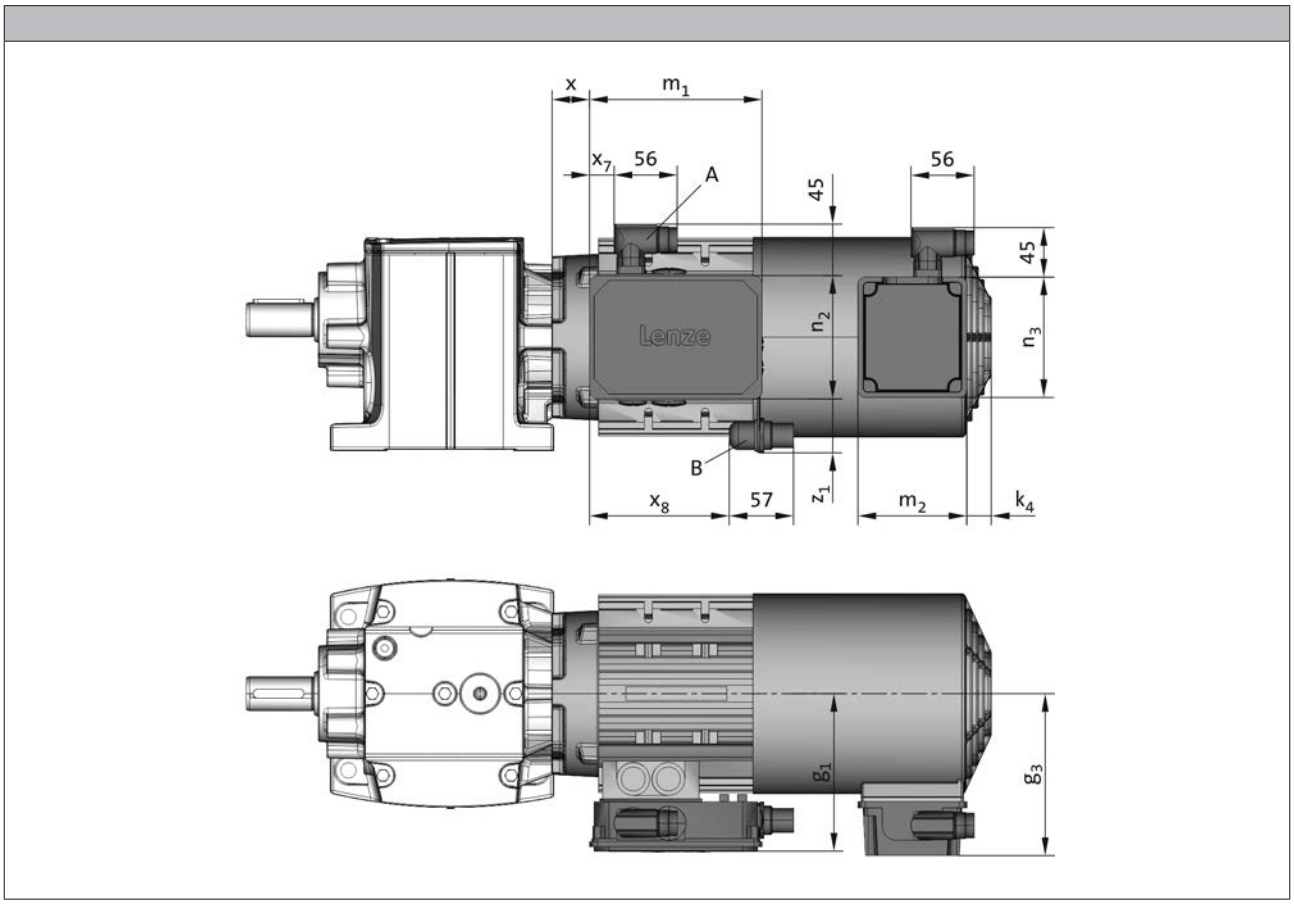


Size									
Motor			063	071	080	090	100	112	132
Dimensions									
	x	[mm]	8.00	11.0	15.0	30.0	31.0	39.0	58.0
	g_1	[mm]	117	126	150	157	166	176	195
	m_1	[mm]	93.0	93.0	115	115	115	115	122
	n_2	[mm]	93.0	93.0	115	115	115	115	122
	x_7	[mm]	16	16	23	23	23	23	27
	k_4	[mm]	12	12	13	22	22	22	32
	g_3	[mm]	115	122	132	141	150	162	182
	m_2	[mm]	95	95	96	95	95	95	95
	n_3	[mm]	105	105	106	105	105	105	105

A= power connection
B= feedback connection (not for KK1)

Connections via ICN connectors

Dimensions KK2+ICN and KK3+ICN



Size									
Motor			063	071	080	090	100	112	132
Dimensions									
	x	[mm]	9.00	11.0	18.0	33.0	34.0	42.0	63.0
	g_1	[mm]	107	118	132	137	147	158	187
	m_1	[mm]	136	136	152	152	152	152	195
	n_2	[mm]	103	103	121	121	121	121	125
	x_7	[mm]	16	16	23	23	23	23	27
	x_8	[mm]	109	109	125	125	125	125	166
	$z_{1, max}$	[mm]	43	43	41	41	41	41	71
	k_4	[mm]	12	12	13	22	22	22	32
	g_3	[mm]	115	122	132	141	150	162	182
	m_2	[mm]	95	95	96	95	95	95	95
	n_3	[mm]	105	105	106	105	105	105	105

A= power connection
B= feedback connection (not for KK1)

Connection via M12 connector

IG128-24V-H incremental encoder connection

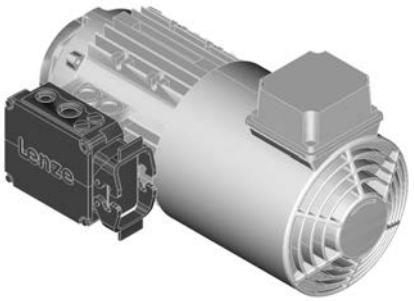
As a standard this incremental encoder is equipped with a connection cable of about 0.5 m length and with a common industry standard M12 connector at its end.

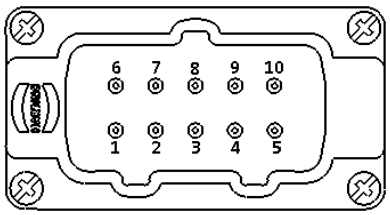
Pin assignment			
Contact	Designation	Meaning	
1	$+U_B$	Supply +	
2	B	Track B	
3	GND	Mass	
4	A	Track A	

Connections via HAN connectors

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.

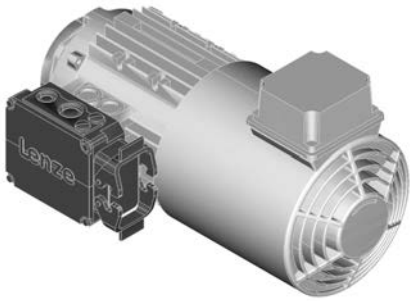


Pin assignment		
Contact	Meaning	
1	Terminal board: U1	
2	Terminal board: V1	
3	Terminal board: W1	
4	Brake +/AC	
5	Brake -/AC	
6	Terminal board: W2	
7	Terminal board: U2	
8	Terminal board: V2	
9	Thermal sensor: +KTY/PTC/TKO	
10	Thermal sensor: KTY/PTC/TKO	

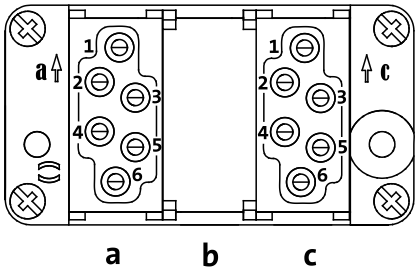
Connections via HAN connectors

HAN modular

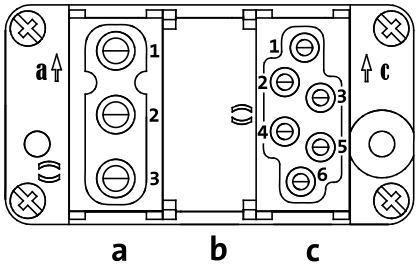
The connector is available with two different power modules (16 A or 40 A), depending on the rated motor current. The motor connection is determined in the terminal box and must be checked before commissioning.



► HAN modular 16 A

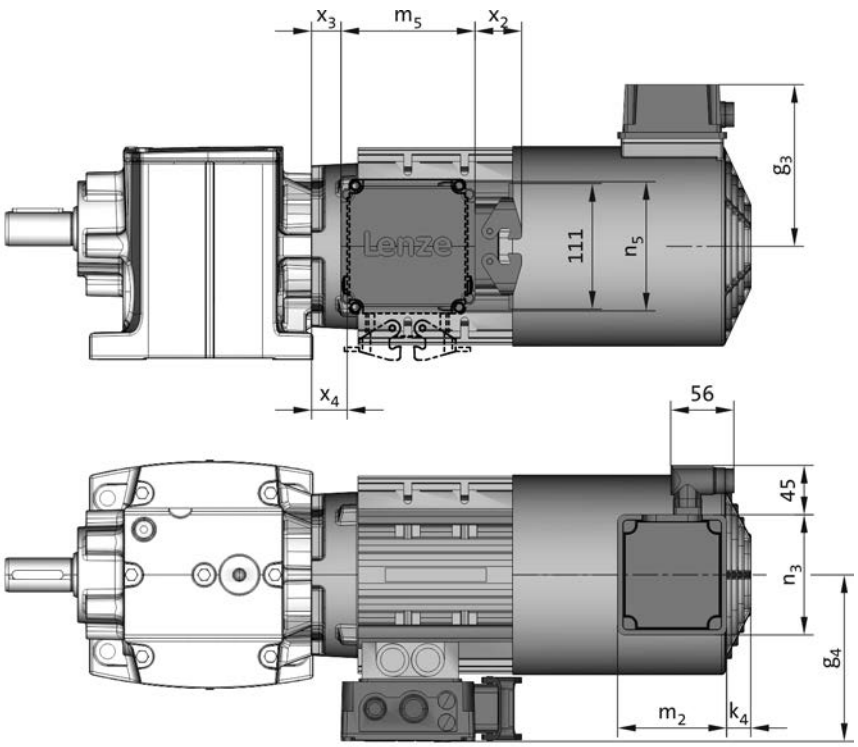
Pin assignment			
Module	Contact	Meaning	
A	1	Terminal board: U1	
	2	Terminal board: V1	
	3	Terminal board: W1	
B		Dummy module	
C	1	Thermal sensor: +KTY/PTC/TKO	
	2	Brake +/AC	
	3	Brake -/AC	
	4	Rectifier: Switching contact	
	5		
	6	Thermal sensor: KTY/PTC/TKO	

► 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	

Connections via HAN connectors

Dimensions



Size									
Motor			063	071	080	090	100	112	132
Dimensions									
	g_4	[mm]	120	129	138	143	154	164	233
	x_3	[mm]	1.00	3.00	12.0	26.0	27.0	30.5	59.5
	x_4	[mm]	2.00	4.00	20.0	34.0	35.0	38.5	29.5
	k_4	[mm]	12	12	13	22	22	22	32
	g_3	[mm]	115	122	132	141	150	162	182
	m_2	[mm]	95	95	96	95	95	95	95
	n_3	[mm]	105	105	106	105	105	105	105

Spring-applied brake

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 10^6 repeating switching cycles
  - 1 x 10^6 reversing switching cycles
- **LongLife**
  - 10 x 10^6 repeating switching cycles
  - 15 x 10^6 reversing switching cycles

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

Degree of protection
- Without manual release IP55
- With manual release IP54

Friction lining
- Non-asbestos, low wearing

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

Assignment of 2-pole motors and brakes

Design	Standard		LongLife	
Motor frame size	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
063-11 063-31	06 06	2.50 4.00	06 06	2.50 4.00
071-11 071-31	06 06 08	2.50 4.00 3.50	06 08	4.00 3.50

Spring-applied brake

Assignment of 4-pole motors and brakes

Design	Standard	LongLife

Motor frame size	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
063-02 063-12 063-22 063-32 063-42	06 06	2.50 4.00	06	4.00
071-12 071-32	06 06 08	2.50 4.00 3.50	06 08	4.00 3.50
071-42	06 06 08 08	2.50 4.00 3.50 8.00	06 08 08	4.00 3.50 8.00
080-32	08 08 10	3.50 8.00 7.00	08 10	8.00 7.00
090-12 090-32	08 08 10 10 10	3.50 8.00 7.00 16.0 23.0	08 10 10	8.00 7.00 16.0
100-12	10 10 12 12	7.00 16.0 14.0 32.0	10 12 12	16.0 14.0 32.0
100-32	10 10 12 12 12	7.00 16.0 14.0 32.0 46.0		

Spring-applied brake

Assignment of 4-pole motors and brakes

Design	Standard		LongLife	
Motor frame size	**Size**	**Rated torque**	**Size**	**Rated torque**
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
112-22	12 12 14 14	14.0 32.0 35.0 60.0		
132-12	14 14 16 16	35.0 60.0 60.0 80.0		
132-22	14 14 16 16 16	35.0 60.0 60.0 80.0 100		
160-22	16 16 18 18	60.0 80.0 80.0 150		
160-32	18 18 18	80.0 150 200		
180-12	18 18 20 20	80.0 150 145 260		
180-32	18 18 20 20 20	80.0 150 145 260 315		
200-32	18 18 20 20 20 20	80.0 150 145 260 315 400		
225-12	25 25 25	265 400 490		
225-22	25 25 25 25	265 400 490 600		

Spring-applied brake

Assignment of 6-pole motors and brakes

Design	Standard	LongLife

Motor frame size	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
071-13 071-33	06 06 08	2.50 4.00 3.50	06 08	4.00 3.50
080-13 080-33	08 08 10	3.50 8.00 7.00	08 08 10	3.50 8.00 7.00

Spring-applied brake

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

- Supply voltage / brake coil voltage ratio
  up to the overexcitation time = 1.11
  From the overexcitation time = 2.22
- Supply voltages
  AC 230 V
  AC 400 V

Spring-applied brake

Connection via mains voltage with brake rectifier

Bridge/half-wave rectifier, 6-pole

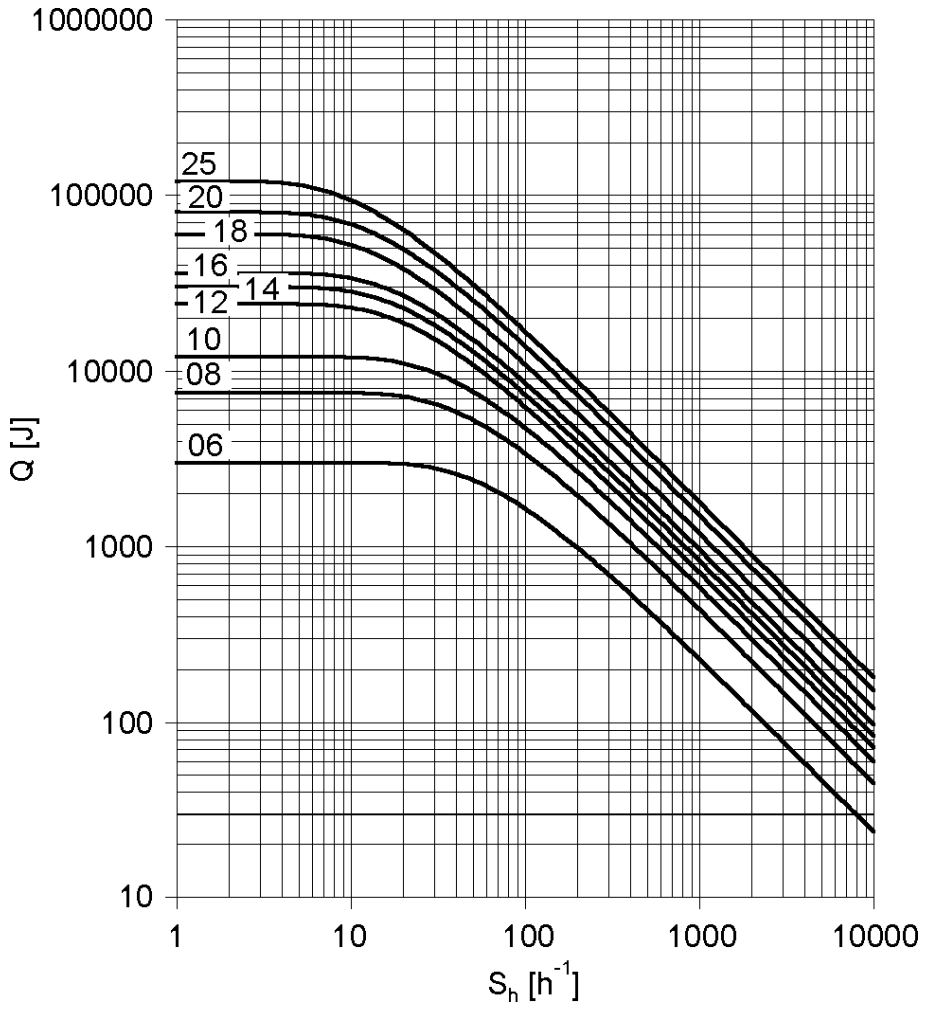
- Supply voltage / brake coil voltage ratio
  up to the overexcitation time = 1.11
  From the overexcitation time = 2.22
- Supply voltages
  AC 230 V
  AC 400 V

During the switching operation the bridge/half-wave rectifier functions as a bridge rectifier for the overexcitation time $t_{ü}$ 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 $t_{ü}$ 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 brake

Permissible friction energy



Q =Switching energy per switching cycle
S_h =Operating frequency
Brake size = 06 to 25

Spring-applied brake

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											
	$S_{hü}$	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia											
	J	[kgcm²]	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 %.

Spring-applied brake

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											
	$t_{ü}$	[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.

Spring-applied brake

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											
	$S_{hü}$	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia											
	J	[kgcm²]	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 %.

Spring-applied brake

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.

Spring-applied brake

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												
	$S_{hü}$	[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	[kgcm²]	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

Spring-applied brake

Rated data with increased braking torque

► Activation via bridge/half-wave rectifier

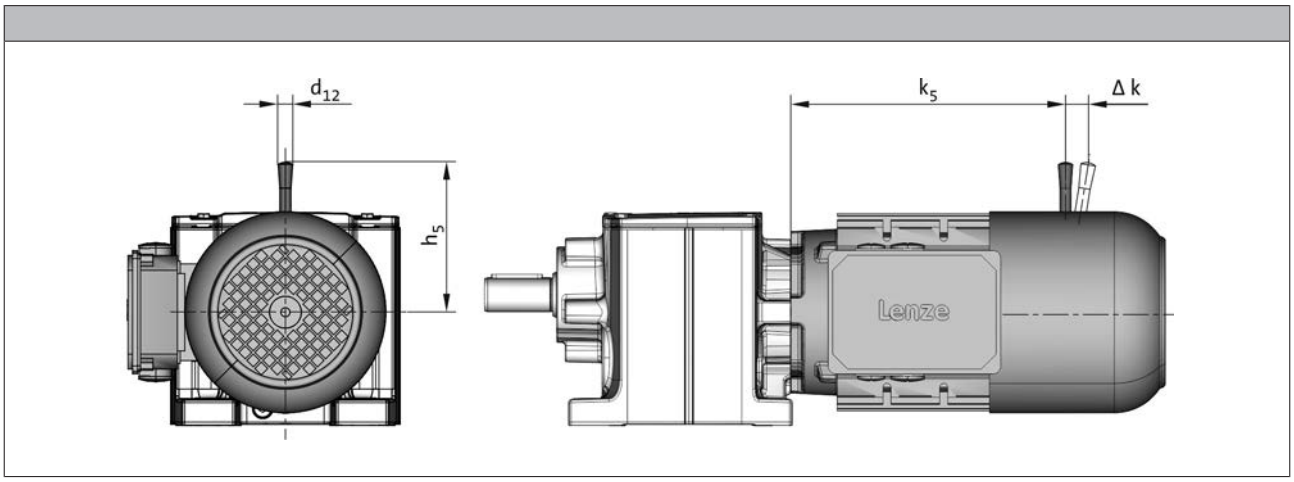
Design			Holding current reduction (cold brake)									
Size			10	12	14	16		18	20		25	
Friction energy												
	Q_{BW}	[MJ]	198	353	253	563	241	578	1596	580	2465	1409
Overexcitation time												
	$t_{ü}$	[ms]	300			1300						
Min. rest time												
	t	[ms]	900			3900						
Delay time												
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												
	$t_{ü}$	[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 brake

Manual release lever



Motor frame size			Size				
			Brake				
				k_5	Δ k	h_5	d_{12}
				[mm]	[mm]	[mm]	[mm]
	063-02 063-22		06	185	29	107	13.0
063-11 063-31	063-12 063-32 063-42		06	169	29	107	13.0
071-11 071-31	071-32 071-42	071-13 071-33	06 08	182 183	29 27	107 116	13.0 13.0
	080-32	080-13 080-33	06 08	208 219	29 27	107 116	13.0 13.0
	090-12 090-32		08 10	256 267	27 28	116 132	13.0 13.0
	100-12		10 12	290 292	28 37	132 161	13.0 13.0
	100-32		10 12	305 307	28 37	132 161	13.0 13.0
	112-22		12 14	309 313	37 41	161 195	13.0 24.0
	132-12 132-22		14 16	398 398	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)

Feedback

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		± 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

Feedback

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

Blower

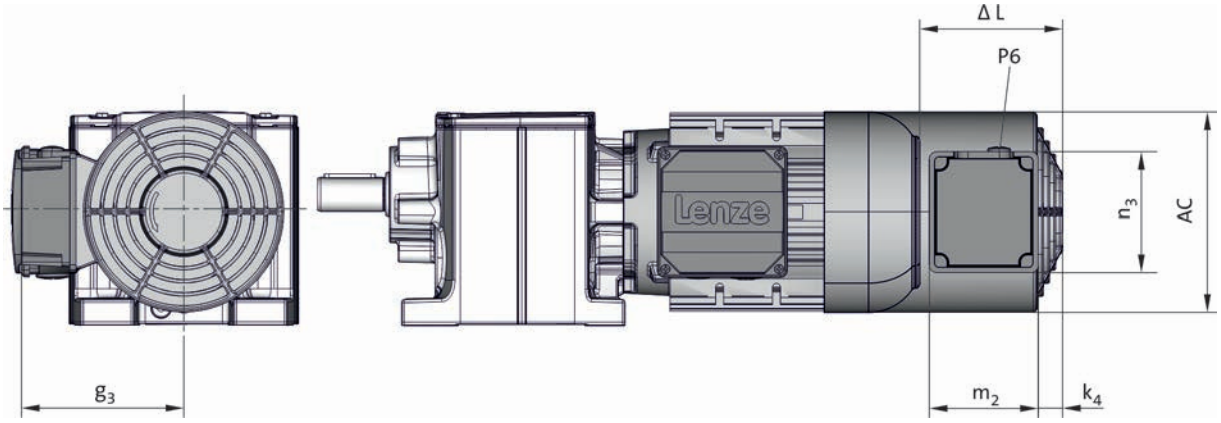
► The use of a blower enables operation below 20 Hz without torque derating.

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	8.00
	3	Δ	200	303		0.87	
		Y	346	525		0.50	

Blower

Dimensions, 4-pole motors



Built-on accessories					
	Without	Brake	Brake + Feedback	Feedback	

Size	Dimensions				
Motor					
	Δ L	Δ L	Δ L	Δ L	AC
	[mm]	[mm]	[mm]	[mm]	[mm]
063	128	170	170	128	123
071		165	165		138
080		183	183		156
090		181	181		176
100	109	170	170	109	194
112	102	183	183	183	218
132	115	202	202	202	257
160	149	179	237	224	309

Size	Dimensions				
Motor					
	k_4	g_3	m_2	n_3	P_6
	[mm]	[mm]	[mm]	[mm]	[mm]
063	12	115	95	105	1x M16x1.5
071		122			
080	13	132	96	106	
090	22	141	95	105	
100		150			
112		162			
132	32	182			
160	31	209	96	106	

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
					AC
	T	T_{min}	T_{max}	$I_{in,max}$	$U_{in,max}$
	-5 ... 5				
	[°C]	[°C]	[°C]	[A]	[V]
NC contact	150	90.0	135	2.50	250

PTC thermistor

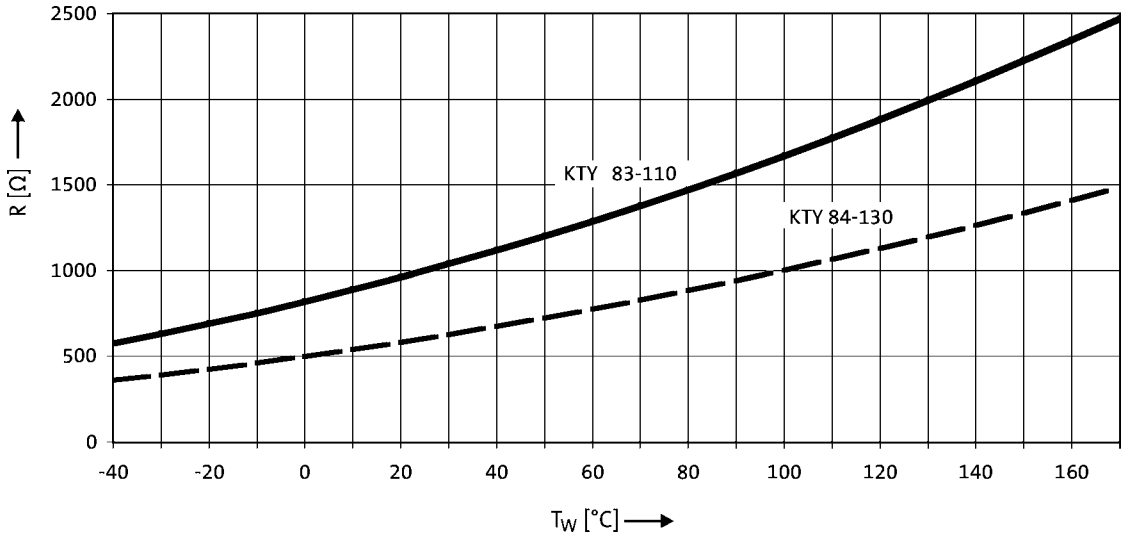
Function	Operating temperature	Rated resistance			Standard
		155 °C	-20 °C	140 °C	
	T	R_N	R_N	R_N	
	-5 ... 5				
	[°C]	[Ω]	[Ω]	[Ω]	
Sudden change in resistance	150	550	30.0	250	DIN 44080 DIN VDE 0660 Part 303

Temperature monitoring

KTY temperature sensor

	Function	Rated resistance			Max. input current	
		25 °C	150 °C	170 °C	25 °C	170 °C
		R_N	R_N	R_N	$I_{in,max}$	$I_{in,max}$
		[Ω]	[Ω]	[Ω]	[A]	[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

Variation of resistance



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

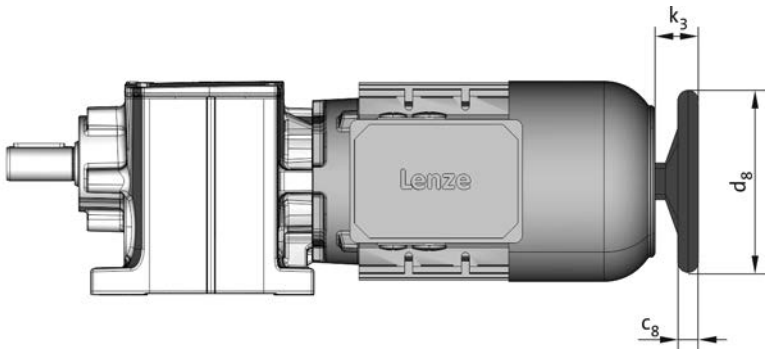
Handwheel

Design	Handwheel made from alloy, smooth wheel surface
Function	Manual operation: • Emergency operation • Setting-up operation for machines/systems
Note	The increased moment of inertia must be taken into account during project planning! For frequent switching operations, in particular if the direction of rotation changes: Please contact Lenze.

Size	Moment of inertia	Mass
Motor	Additional	Additional
	J	m
	[kgcm²]	[kg]
071	16.0	0.60
080	16.0	0.60
090	16.0	0.60
100	16.0	0.60
112	16.0	0.60
132	139	1.80

Handwheel

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



Size	Dimensions		
Motor			
	k_3	c_8	d_8
	[mm]	[mm]	[mm]
071	34.0	18.0	160
080	34.0	18.0	160
090	32.0	18.0	160
100	42.0	18.0	160
112	39.0	18.0	160
132	50.0	26.0	250

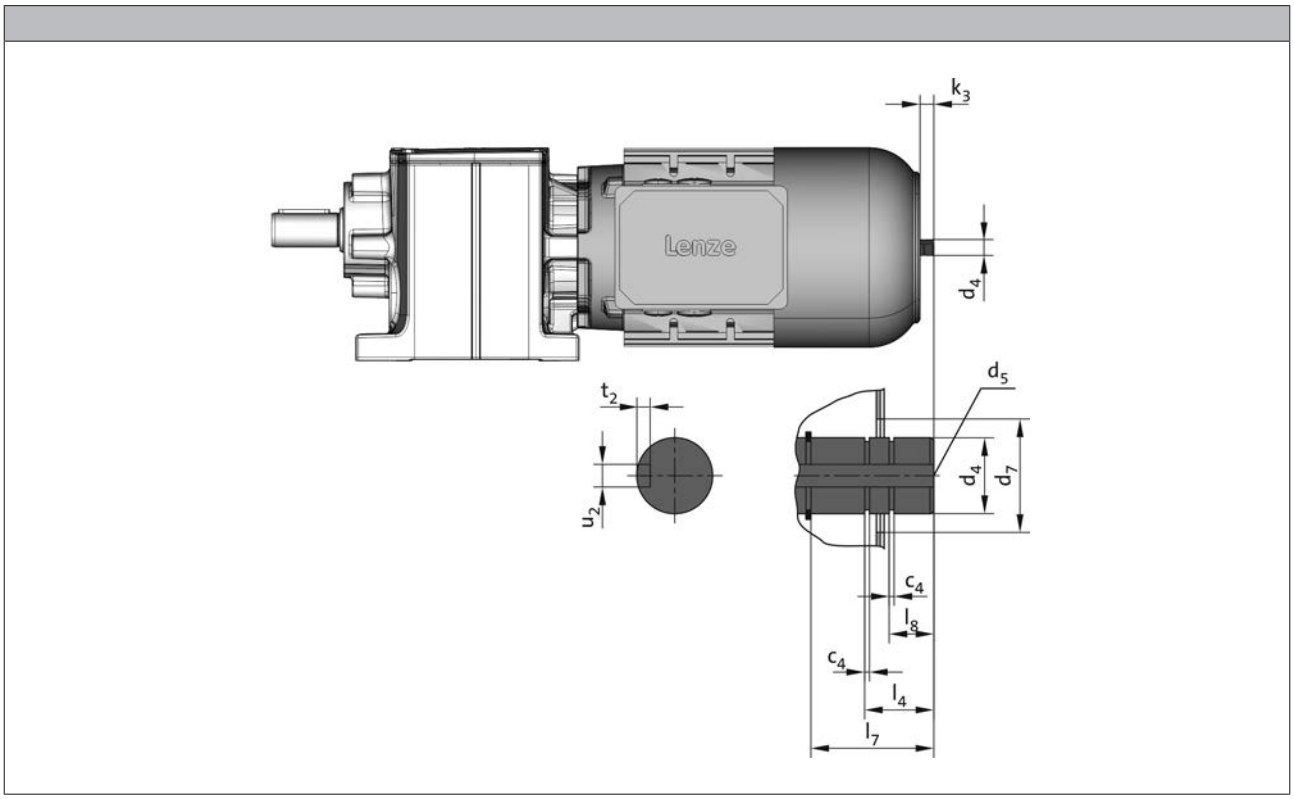
Centrifugal mass

Note	The increased moment of inertia must be taken into account during project planning! For frequent switching operations, in particular if the direction of rotation changes: Please contact Lenze.
Function	Increased motor centrifugal mass for smooth starting/braking
Design	Integral fan made from cast iron

	Moment of inertia	**Mass**
Motor frame size	Additional	Additional
	J	m
	[kgcm²]	[kg]
071	18.0	1.20
080	29.0	1.40
090-□1	83.0	2.80
090-□2	55.0	2.00
100	77.0	2.50
112	153	3.80
132	356	6.00

2nd shaft end

Dimensions, self-ventilated (2-pole)

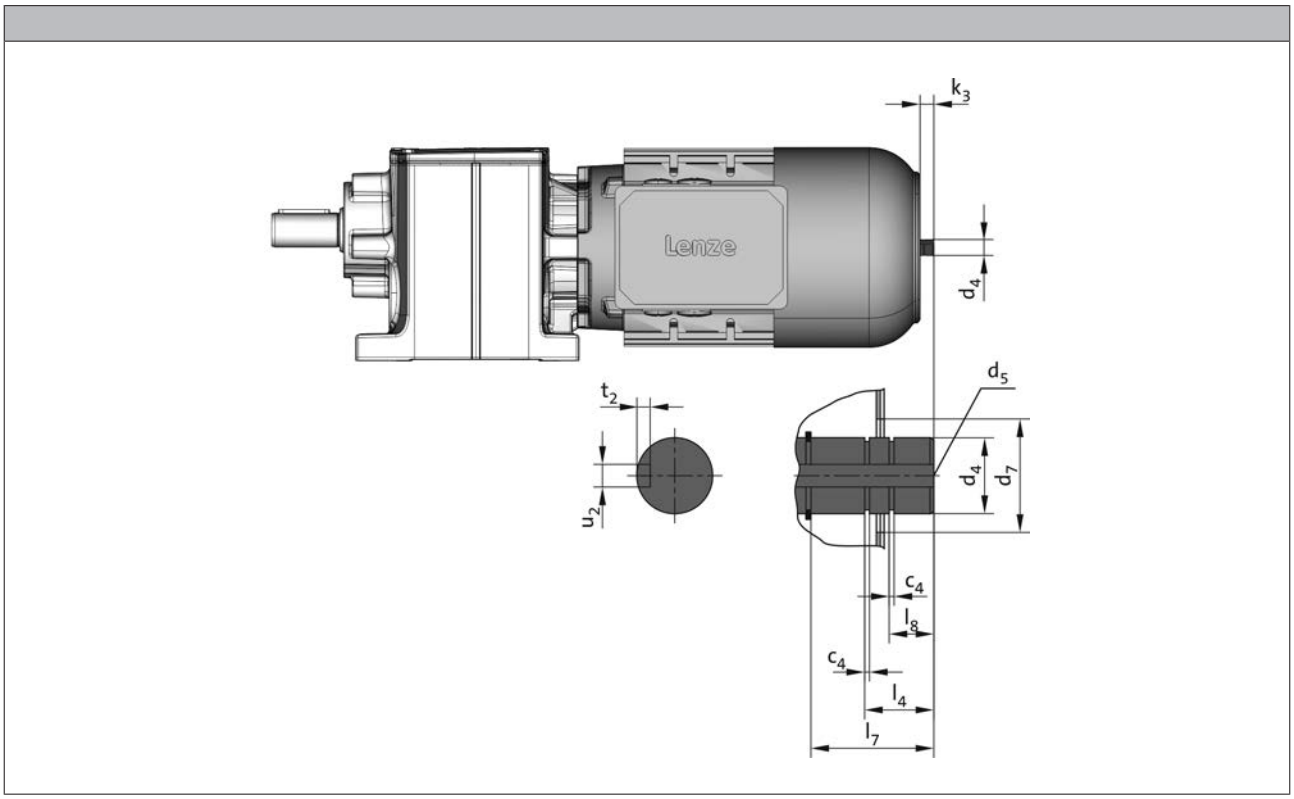


Size	Dimensions										
Motor											
	k_3	c_4	d_4	d_4	d_5	d_7 [1)]	l_4	l_7	l_8	u_2	t_2
			h6	j6							
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	11.0	1.10	14.0		M5	34.0		19.0	3.00	5.00	3.00
080	9.00	1.30	19.0		M6	34.0		19.0	4.50	6.00	3.20
090	9.00	1.30		20.0	M6	34.0		19.5	5.50	6.00	3.50
100	18.5	1.30		25.0	M10	34.0	17.0	32.5	10.5	8.00	4.00
112	16.0	1.30		25.0	M10	34.0	17.0	28.5	7.00	8.00	4.00
132	24.5	1.60		30.0	M10	48.0	24.5	42.0	8.50	8.00	4.00

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

2nd shaft end

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

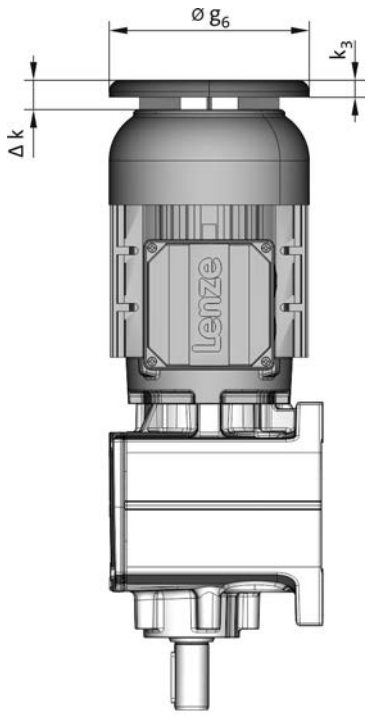


Size	Dimensions										
Motor											
	k_3	c_4	d_4	d_4	d_5	d_7 [1)]	l_4	l_7	l_8	u_2	t_2
			h6	j6							
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	11.0	1.10	14.0		M5	34.0		19.0	3.00	5.00	3.00
080	9.00	1.10	14.0		M5	34.0		19.0	4.50	5.00	3.00
090	9.00	1.10	14.0		M5	34.0		19.0	5.00	5.00	3.00
100	18.5	1.30		20.0	M6	34.0	17.0	32.5	10.5	6.00	3.50
112	16.0	1.30		20.0	M6	34.0	17.0	28.5	7.00	6.00	3.50
132	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.

Protection cover

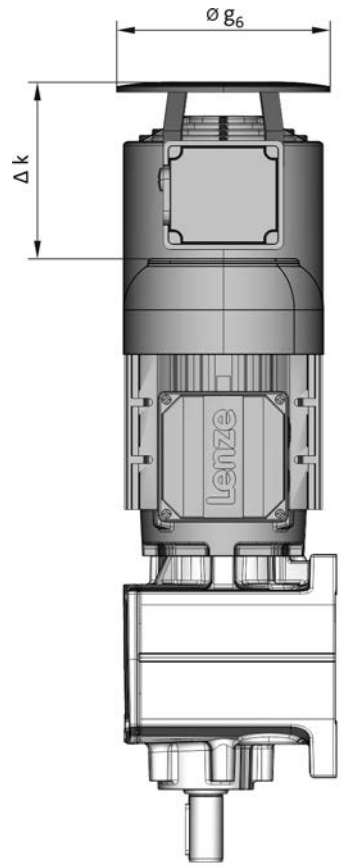
Dimensions, self-ventilated



Size	Dimensions		
Motor			
	Δ k	k_3	g_6
	[mm]	[mm]	[mm]
063	26	11.0	123
071	26	12.0	138
080	26	16.0	156
090	26	15.0	176
100	31	17.0	194
112	31	18.0	218
132	31	20.0	257
160	37	25.0	310

Protection cover

Dimensions, forced ventilated (4/6-pole)



Built-on accessories					
	Without	Brake	Brake + Feedback	Feedback	

Size	Dimensions				
Motor					
	Δ k	Δ k	Δ k	Δ k	g_6
	[mm]	[mm]	[mm]	[mm]	[mm]
063	169	209	209	169	133
071	165	202	202	165	150
080	168	224	224	168	170
090	157	210	210	157	188
100	137	198	198	137	210
112	135	216	216	216	249
132	140	226	226	226	300
160	155	267	267	267	338

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