



Geared servo motors

g500-H / m850 helical geared servo motor

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About this document

Document description

This document addresses to all persons who want to carry out any configurations with the products described.

The data and information compiled in this document serve to support you in the dimensioning and selection processes and in carrying out the electrical and mechanical installation. You will receive information regarding product extensions and accessories.

- The document includes safety instructions which must be observed.
- All persons working on and with the drives must have the documentation at hand during work and observe the information and notes relevant for it.
- The documentation must always be complete and in a perfectly readable state.

Further documents



Information and tools with regard to the Lenze products can be found on the Internet:

www.Lenze.com → Downloads

About this document

Notations and conventions



Notations and conventions

Conventions are used in this document to distinguish between different types of information.

Numeric notation		
Decimal separator	Point	Generally shown as a decimal point. Example: 1 234.56
Warnings		
UL Warnings	UL	Are used in English and French.
UR warnings	UR	
Text		
Engineering Tools	" "	Software Example: "Engineer", "EASY Starter"
Icons		
Page reference		Reference to another page with additional information. Example:  16 = see page 16
Documentation reference		Reference to other documentation with additional information. Example:  EDKxxx = see documentation EDKxxx

Layout of the safety instructions

DANGER!

Indicates an extremely hazardous situation. Failure to comply with this instruction will result in severe irreparable injury and even death.

WARNING!

Indicates an extremely hazardous situation. Failure to comply with this instruction may result in severe irreparable injury and even death.

CAUTION!

Indicates a hazardous situation. Failure to comply with this instruction may result in slight to medium injury.

NOTICE

Indicates a material hazard. Failure to comply with this instruction may result in material damage.



Product information

Product description

When used in combination with servo motors, our helical gearboxes form a compact, powerful and dynamic 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 are characterized by high permissible radial forces, closely stepped ratios and a low backlash. They are available in a 2-, 3- and 4-stage design with an output torque of up to 3000 Nm and a ratio of up to $i = 3529$.

Designs

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

Synchronous servo motor m850 as basis for geared motor

In a power range of 2.0 to 9.2 kW, Lenze offers servo motors with an easily scalable modular design.

The drives are designed for the open-loop or closed-loop controlled servo inverter operation. Medium dynamics and easy controllability via a favourable mass inertia ratio of the load to the motor characterise these motors.

Customer benefit

- Easy controllability by an advantageous ratio of the mass inertia of the load and that of the motor
- High overload capacity of the motors
- Easy assembly and easy servicing thanks to connectors with bayonet catch and rotatable connector boxes
- Reduced cabling thanks to one-cable technology in connection with digital absolute value encoders
- High efficiency
- Space-saving thanks to compact direct attachment to Lenze gearboxes
- Can be used universally for a wide range of machine tasks due to the market-oriented modular system



m850-S120/L3960 synchronous servo motor - g500-H450 helical gearbox



m850-S120/L3960 synchronous servo motor- g500-H450 helical gearbox with One Cable Technology (OCT) in connection with a digital absolute value encoder

Product information

Identification of the products



Identification of the products

Gearbox product name

Gearbox type	Product series		Type	Rated torque Nm	Gearbox
Helical gearbox	g500	-	H	45	g500-H45
				100	g500-H100
				140	g500-H140
				210	g500-H210
				320	g500-H320
				450	g500-H450
				600	g500-H600
				850	g500-H850
				1500	g500-H1500
				3000	g500-H3000

Product name: m850 synchronous servo motor

Product range		Version	Flange height		Overall length	Rated speed	Motor
			mm			rpm	
m850	-	S (synchronous)	120	supply	S (short)	3960	m850-S120/S3960
					M (medium)	3960	m850-S120/M3960
					L (long)	3960	m850-S120/L3960
			140		S (short)	3240	m850-S140/S3240
					M (medium)	3240	m850-S140/M3240
					L (long)	3240	m850-S140/L3240
			190		S (short)	3000	m850-S190/S3000
					M (medium)	3000	m850-S190/M3000
					L (long)	2520	m850-S190/L2520



Features

The following figure provides an overview of the elements and connections on the product. Their position, size and appearance may vary.

Ventilation

(depending on the mounting position)

Oil filler plug

(depending on the mounting position)

Remove oil control plug

(depending on the mounting position)

Temperature monitoring

Motor connection

Cooling

Feedback

Spring-applied brake

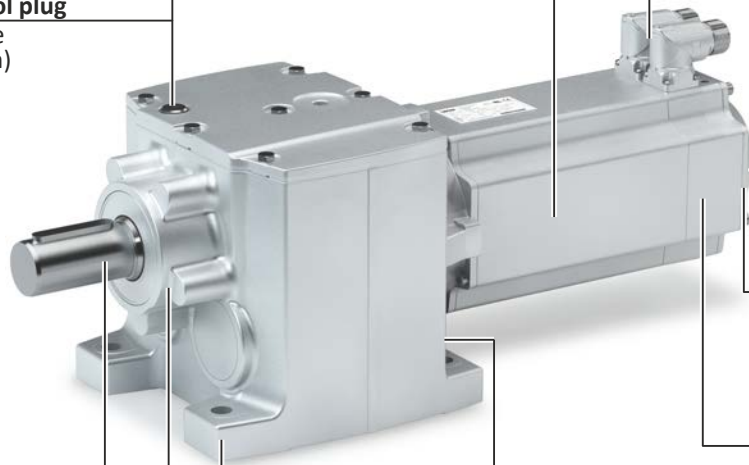
Oil drain plug

(depending on the mounting position)

Output shaft

Output flange

Housing type



Product information

The modular system



The modular system



Values printed in bold are standard designs. Values that are not printed in bold are potential extensions, some of them including a surcharge.

Geared motors up to 450 Nm

Gearbox		g500-H100	g500-H140	g500-H210	g500-H320	g500-H450
Min. motor assignment		m850-S120	m850-S120	m850-S120	m850-S120	m850-S120
Max. motor assignment		m850-S120	m850-S120	m850-S140	m850-S140	m850-S190
Technical data						
Max. output torque	Nm	100	140	210	320	450
Min. drive torque	Nm	4.8	4.8	4.8	4.8	4.8
Max. drive torque	Nm	7.4	9.0	14.0	17.4	35.0
Mounting position						
Standard		M1, M2, M3, M4, M5, M6 (ABCDEF)				
Combined		M1/5/6 (AEF)				
Color		Primed Painted in RAL colors				
Surface and corrosion protection		OKS-G Different types of OKS				
Output shaft						
Solid shaft with featherkey	mm	20 x 40	25 x 50	25 x 50	30 x 60	30 x 60 35 x 70
Solid shaft without keyway	mm	20 x 40	25 x 50	25 x 50	30 x 60	35 x 70
Shaft material		Steel Stainless steel				
Shaft sealing ring material		NBR FKM (Viton)				
Output shaft bearing		Normal Reinforced				
Gearbox version		With foot (VBR) With foot and centering (VAR) With foot and output flange (VAK) With centering (VCR) With output flange (VCK) With output flange (VCP)				
Output flange	mm	120/140/160	120/140/160	120/140 160/200	160/200	160/200/250
Lubricant		Synthetic oil Food-compatible oil				
Ventilation		Without			Vent valve	
Cooling		Self-ventilated				
Motor connection		Connector ICN hybrid connector for One Cable Technology (OCT)				
Spring-applied holding brake		Without With				
Feedback						
Without functional safety		Resolver Absolute value encoder Digital absolute value encoder for One Cable Technology (OCT)				
With functional safety		Resolver Absolute value encoder Digital absolute value encoder for One Cable Technology (OCT)				
Temperature monitoring		PT1000 temperature sensor				



Product information

The modular system

Geared motors 600 Nm to 3000 Nm

Gearbox		g500-H600		g500-H850	g500-H1500	g500-H3000
Min. motor assignment		m850-S120		m850-S120	m850-S120	m850-S120
Max. motor assignment		m850-S190		m850-S190	m850-S190	m850-S190
Technical data						
Max. output torque	Nm	600	850	1500	3000	
Min. drive torque	Nm	4.8	4.8	4.8	4.8	
Max. drive torque	Nm	35.0	35.0	35.0	35.0	
Mounting position						
Standard		M1, M2, M3, M4, M5, M6 (ABCDEF)				
Combined						
Color		Primed Painted in RAL colors				
Surface and corrosion protection		OKS-G Different types of OKS				
Output shaft						
Solid shaft with featherkey	mm	35 x 70 40 x 80	40 x 80	50 x 100	60 x 120	
Solid shaft without keyway	mm	35 x 70	40 x 80	50 x 100	60 x 120	
Shaft material		Steel Stainless steel				
Shaft sealing ring material		NBR FKM (Viton)				
Output shaft bearing		Normal Reinforced				
Gearbox version		With foot (VBR) With foot and centering (VAR) With foot and output flange (VAK) With centering (VCR) With output flange (VCK)				
Output flange	mm	200/250	250/300	250/300/350	300/350/450	
Lubricant		Synthetic oil Food-compatible oil				
Ventilation		Vent valve Oil compensation reservoir				
Cooling		Self-ventilated				
Motor connection		Connector ICN hybrid connector for One Cable Technology (OCT)				
Spring-applied holding brake		Without With				
Feedback						
Without functional safety		Resolver Absolute value encoder Digital absolute value encoder for One Cable Technology (OCT)				
With functional safety		Resolver Absolute value encoder Digital absolute value encoder for One Cable Technology (OCT)				
Temperature monitoring		PT1000 temperature sensor				

Product information

The modular system
Designs



Designs

Gearbox designs

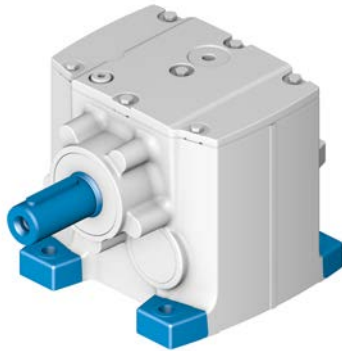


Observe the available gearbox designs!

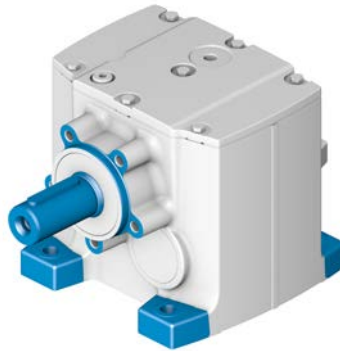
► [The modular system](#)  10

The VCP design (reinforced flange) is suitable for absorbing high radial and axial forces  49 .

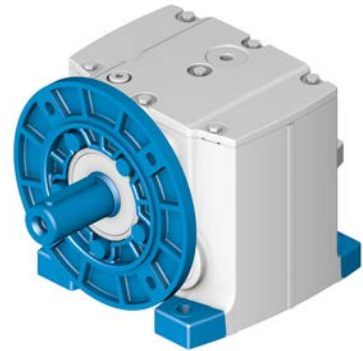
Solid shaft, with foot



Without centring (VBR)

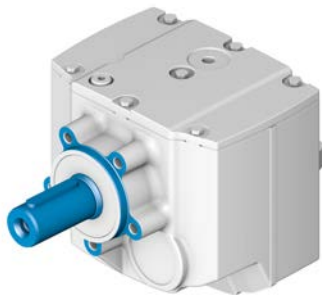


With centring (VAR)



Flange with through holes (VAK)

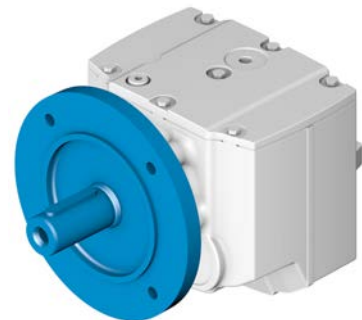
Solid shaft, without foot



With centering (VCR)



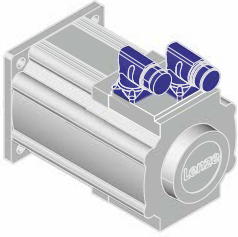
Flange with through holes (VCK)



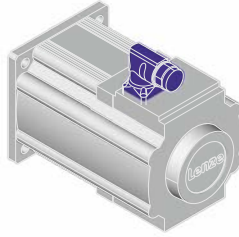
Reinforced flange with through holes (VCP)



Models at the output Motor connection

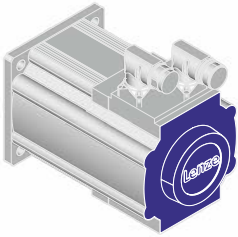


ICN connector

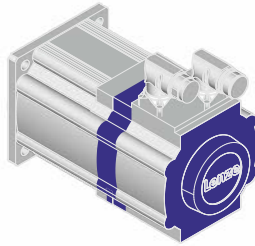


ICN hybrid connector for One Cable
Technology (OCT)

Cooling: Self-ventilated



Feedback



Feedback and brake

Product information

The modular system
Mounting positions

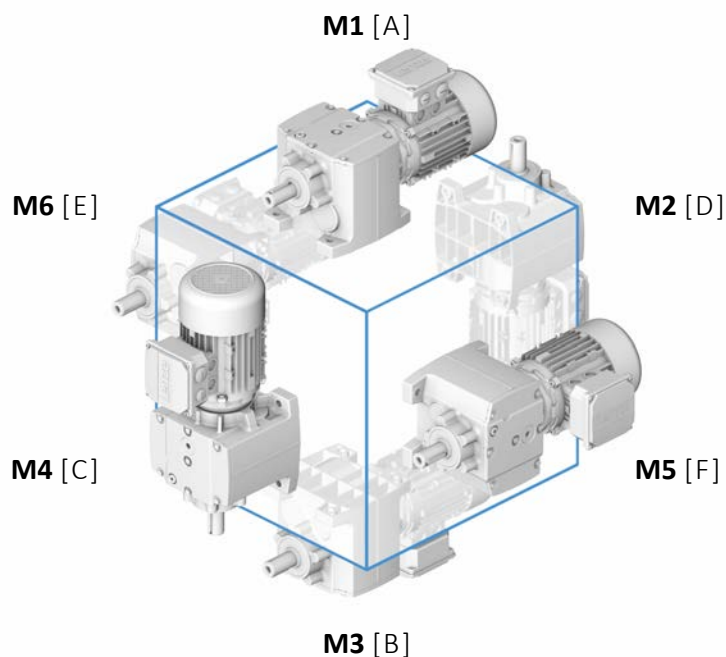


Mounting positions

Details of the mounting position are needed to ensure the corresponding lubricant amount, position of the ventilation, oil checks and oil drain plug on the gearbox.

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

- g500-H100 ... H450 in mounting position M1/5/6 (AEF)

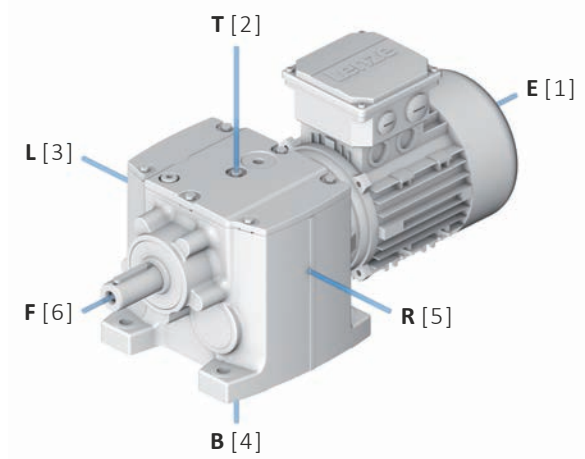


Defined positions on the geared motor

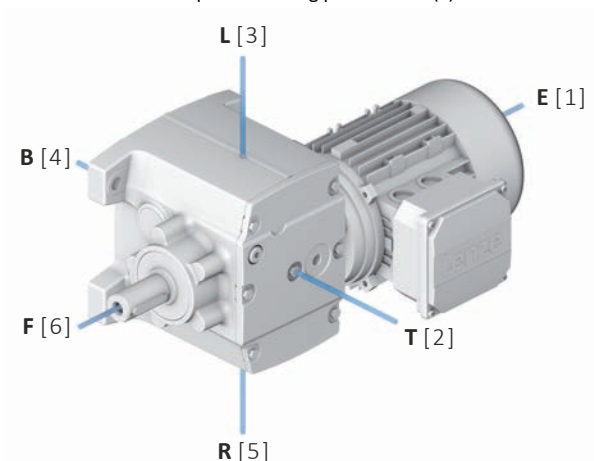
All of the defined positions refer to the areas on the geared motor in mounting position **M1 (A)**.

Position of the built-on accessories with T, L, R, B, F, E (Top, Left, Right, Bottom, Front and End)

If the geared motor is rotated into a different mounting position M2 ... M6 (B...F), the defined positions on the geared motor are retained.



Example: Mounting position M5 (F)

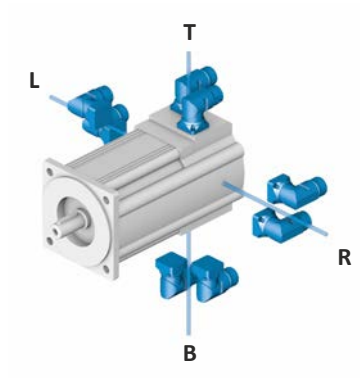




Product information

The modular system
Mounting positions

Position of the ICN connectors





Information on project planning

Safety instructions

Basic safety instructions

Disregarding the following basic safety instructions and safety information may lead to severe personal injury and damage to property!

- Only use the product as directed.
- Never commission the product in the event of visible damage.
- Never modify the product technically.
- Never commission the product before assembly has been completed.
- Never operate the product without the required covers.
- Connect/disconnect all pluggable connections only in deenergized condition!
- Only remove the product from the installation in the deenergized state.
- The product can – depending on their degree of protection – have live, movable or rotating parts during or after operation. Surfaces can be hot.
- Observe all specifications of the corresponding documentation supplied. This is the condition for safe and trouble-free operation and the achievement of the specified product features.
- The procedural notes and circuit details given in the associated documentation are suggestions and their transferability to the respective application has to be checked. The manufacturer of the product does not take responsibility for the suitability of the process and circuit proposals.
- All work with and on the product may only be carried out by qualified personnel. IEC 60364 and CENELEC HD 384 define the qualifications of these persons:
 - They are familiar with installing, mounting, commissioning, and operating the product.
 - They have the corresponding qualifications for their work.
 - They know and can apply all regulations for the prevention of accidents, directives, and laws applicable at the place of use.

Application as directed

- The product is a professional equipment intended for use by trades, specific professions or industry and not for sale to the general public. IEC 60050 [IEV 161-05-05]
- To prevent personal injury and damage to property, higher-level safety and protection systems must be used!
- All transport locks must be removed.
- Mounted eye bolts on the motor are not suitable for transporting geared motors.
- The product may only be operated under the specified operating conditions and in the specified mounting positions.
- The product may only be operated on the inverter.
- Built-in brakes must not be used as safety brakes.
- The product must not be operated in private areas, in potentially explosive atmospheres and in areas with harmful gases, oils, acids and radiation.



Residual hazards

Even if notes given are taken into consideration and protective measures are implemented, the occurrence of residual risks cannot be fully prevented.

The user must take the residual hazards mentioned into consideration in the risk assessment for his/her machine/system.

If the above is disregarded, this can lead to severe injuries to persons and damage to property!

Product

Observe the warning labels on the product!



Dangerous electrical voltage:

Before working on the product, make sure there is no voltage applied to the power terminals!
After mains disconnection, the power terminals will still carry the hazardous electrical voltage for the time given next to the symbol!



High leakage current:

Carry out fixed installation and PE connection in compliance with:
EN 61800-5-1 / EN 60204-1



Hot surface:

Use personal protective equipment or wait until the device has cooled down!

Protection of persons

- The power terminals may carry voltage in the switched-off state or when the motor is stopped.
 - Before working, check whether all power terminals are deenergized.
- Voltages may occur on the drive components (e.g. capacitive, caused by inverter supply).
 - Careful earthing in the marked positions of the components must be carried out.
- There is a risk of burns from hot surfaces.
 - Provide protection against accidental contact.
 - Use personal protective equipment or wait until the device has cooled down.
 - Prevent contact with flammable substances.
- There is a risk of injury due to rotating parts.
 - Before working on the drive system, ensure that the motor is at a standstill.
- There is a risk of accidental start-up or electric shock.

Motor protection

- Installed temperature sensors are no full protection for the machine.
 - If necessary, limit the maximum current. Parameterize the inverter so that it will be switched off after some seconds of operation with $I > I_{rated}$, especially if there is a risk of blocking.
 - Integrated overload protection does not prevent overloading under all conditions.
- The fuses are no motor protection.
 - Use a current-dependent motor protection switch.
 - Use the built-in temperature sensors.

Information on project planning

General information
Residual hazards



Gearbox protection

- Excessive vibration accelerations and resonances will damage the gearbox.
 - Do not operate the gearbox at vibration accelerations $> 2 \text{ g}$ (20 m/s^2) of the machine.
 - Do not operate the gearbox in the resonance range of the machine.
- Excessive torques will damage the gearboxes.
 - Do not exceed the output torques specified on the nameplate.
- Excessive input speeds lead to increased temperatures.
 - Do not exceed the input speeds specified on the nameplate.
- Avoid excessive lateral forces on the gearbox shaft.
 - Align the shafts of the gearbox and driven machine exactly with each other.
- Machine elements can be damaged by a lack of lubricant.
 - Mount the gearbox only in the mounting position indicated on the nameplate.
 - When changing the lubricant, use the lubricant type and quantity specified on the nameplate.

General information

Thermal power limit

The thermal power limit, defined by the heat balance, limits the permissible continuous gearbox power. It 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 spectrum.
- the ambient conditions: temperature, air circulation, input or dissipation of heat via shafts and the foundations.

NOTICE

A thermal check with the Drive Solution Designer (DSD) or contacting your Lenze representative is required if

- ▶ the input speed $n_1 > 1500 \text{ rpm}$ is fallen below in case of the gearbox ratios given in the following.
- ▶ the drive speeds mentioned in the following will be exceeded as a function of the mounting position. For a short period of time up to 5 min, 30 % higher speeds are permissible.
- ▶ the ambient temperature is predominantly above $+30 \text{ }^\circ\text{C}$.

Gearboxes	Ratio i
g500-H850 ... H3000	≤ 50

Motor	Mounting position M1	Mounting position M3, M5, M6	Mounting position M2, M4
m850-S120	4000 rpm	3500 rpm	3000 rpm
m850-S140/S190	3000 rpm	2600 rpm	1500 rpm

Possible ways of extending the application area

- Shaft sealing ring made of FKM material/Viton (option)
- Reducing the lubricant amount (after consultation with Lenze)
- Cooling the geared motor by air convection on the machine/system



Drive dimensioning

In order to carry out an accurate drive dimensioning process, you can use our configuring software, the »Drive Solution Designer«.

With the »Drive Solution Designer«, you can design the drive both quickly and to a high quality. The software contains profound and proven expertise with regard to drive applications and mechatronic drive components.

Please get in touch with your Lenze representative.

NOTICE

The dimensioning is suitable for the operating modes S1, S2, S3 and S6

The following 3 elements are taken into consideration in the dimensioning process :

Drive function

On the basis of the values required for the process that are specified, a drive is selected, for which all operating points are within the speed-torque characteristic curve of the motor.

As a result, a motor with a suitable speed with an inverter with a sufficient maximum current is selected. Further limits (maximum speed, installation height...) are specified in tables.

Mechanical strength

On the basis of the forces and torques which build, a drive is selected that has a sufficient mechanic strength (endurance strength for the periodically occurring torques and fatigue strength for the sporadically occurring torques).

Thermal dimensioning

For the inverter, the thermal dimensioning process is carried out on the basis of the continuous inverter current or on the basis of the continuous torque from the motor-inverter combination, which can be reached.

The motor is thermally dimensioned on the basis of the mean speed and the effective torque.

The thermal dimensioning of the gearbox is based on the medium speed and the permanent torque of the motor/gearbox combination. The thermal limit speed is to be understood as a recommendation.

The mean speed of the drive should not exceed the values specified.



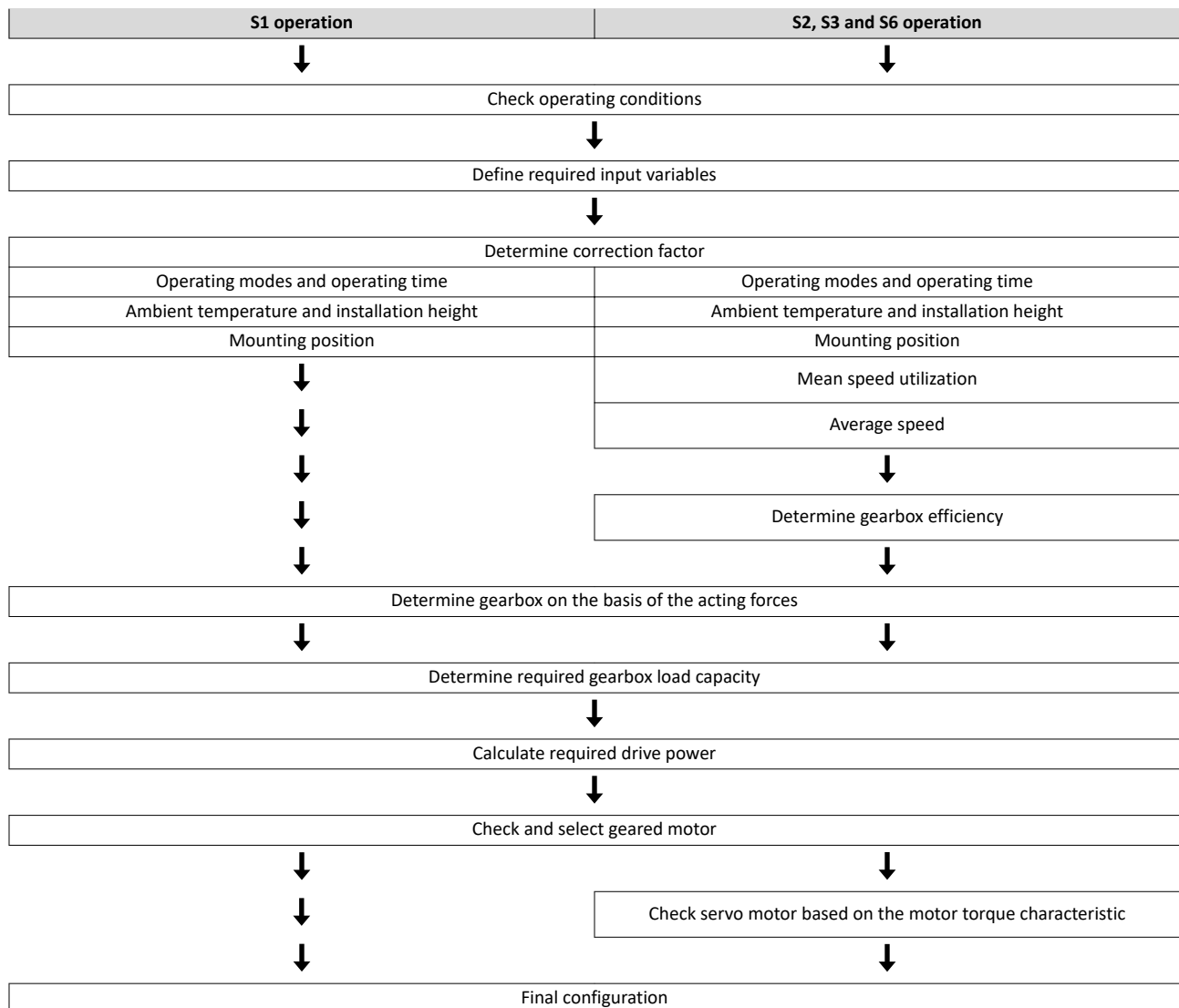
If dimensioning processes are complex or reach limit loads, please refer to your Lenze branch office

Information on project planning

Drive dimensioning



Workflow



Check operating conditions

Check
Approvals Conformities Supply voltage Degree of protection Ambient temperature Surface protection

► Standards and operating conditions [📖 37](#)

► Surface and corrosion protection [📖 26](#)



Define required input variables

Necessary input variables	Note	Symbol	Unit
Operating time/day		BD	h
Mean speed utilization of the geared motor	Relating to the load speed n_L		%
Ambient temperature		T_V	°C
Site altitude Amsl		H	m
Radial force		F_{rad}	rated
Axial force		F_{ax}	rated
Transmission element at the output	Gear wheels, sprockets ...		
Effective diameter of the transmission element		d_w	mm
Load torque	Only with S1, S2, S3, and S6 operating modes	M_L	Nm
Load speed	Only with S1, S2, S3, and S6 operating modes	n_L	rpm
Short-time maximum torque	Emergency off, quick stop, occasional high starting duty	$M_{L,max}$	Nm
Runtime with maximum torque		t_L	%

Determine correction factor

Operating modes S1, S2, S3, S6, and operating time							
Operating mode S1		Operating mode S2		Operating mode S3		Operating mode S6	
ED	k_L	ED	k_L	ED	k_L	ED	k_L
%		min		%		%	
100	1.0	10	1.4 - 1.5	15	1.4 - 1.5	15	1.5 - 1.6
		30	1.15 - 1.2	25	1.3 - 1.4	25	1.4 - 1.5
		60	1.07 - 1.1	40	1.15 - 1.2	40	1.3 - 1.4
		90	1.0 - 1.05	60	1.05 - 1.1	60	1.15 - 1.2

► Operating modes of the motor [133](#)

Ambient temperature and installation height		
Ambient temperature	Installation height amsl	
	≤ 1000 m	≤ 2000 m
	Correction factor	
T_U	k_H	k_H
≤ 20 °C	1.10	1.04
30 °C	1.05	1.00
40 °C	1.00	0.95
50 °C	0.80	0.76
60 °C	0.60	0.57

Mounting position						
Gearboxes	Mounting position					
	M1	M2	M3	M4	M5	M6
	Correction factor					
	k_E	k_E	k_E	k_E	k_E	k_E
g500-H	1.00	0.70	0.80	0.80	1.00	1.00
g500-S	1.00	0.70	0.80	0.85	0.80	0.90
g500-B	1.00	0.70	0.80	0.80	0.80	0.80

► Selection tables [54](#)

Information on project planning

Drive dimensioning



Mean speed utilisation					
Daily operating time	Mean speed utilisation relating to the load speed n_L				
	100 %	80 %	60 %	50 %	25 %
	Correction factor				
	k_N	k_N	k_N	k_N	k_N
1.0 h	1.29	1.33	1.38	1.42	1.55
2.0 h	1.15	1.20	1.25	1.29	1.42
3.0 h	1.08	1.12	1.17	1.21	1.34
4.0 h	1.02	1.06	1.12	1.15	1.29
5.5 h	0.96	1.00	1.06	1.09	1.22
8.0 h	0.89	0.93	0.99	1.02	1.15
12.0 h	0.81	0.85	0.91	0.94	1.08
16.0 h	0.76	0.80	0.85	0.89	1.02
22.0 h	0.71	0.76	0.81	0.85	0.98
24.0 h	0.68	0.72	0.78	0.81	0.94

Mean speed					
Operating mode S2		Operating mode S3		Operating mode S6	
ED	k_M	ED	k_M	ED	k_M
min		%		%]	
10	0.16	15	0.15	15	1.00
30	0.50	25	0.25	25	
60	1.00	40	0.40	40	
90		60	0.60	60	

Gearbox efficiency

Gearboxes	Gearbox efficiency	
	η_{c1}	
g500-H		
2-stage	0.96	
3-stage	0.95	
4-stage	0.94	

Determine product on the basis of the forces

Transmission element			Gear wheels	Sprockets	Toothed belt pulleys (depending on the pretension)	Narrow V-belt (depending on the pretension)
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	F_{rad}	N	$F_{rad} = 2000 \times \frac{M_{L,max} \times f_z}{dw}$		$F_{rad} \leq f_w \times F_{rad,max}$	
Axial force	F_{ax}	N			$F_{ax} \leq F_{rad,max} \times 0.5$	

dw Effective diameter of transmission element in mm

f_w Additional load factor

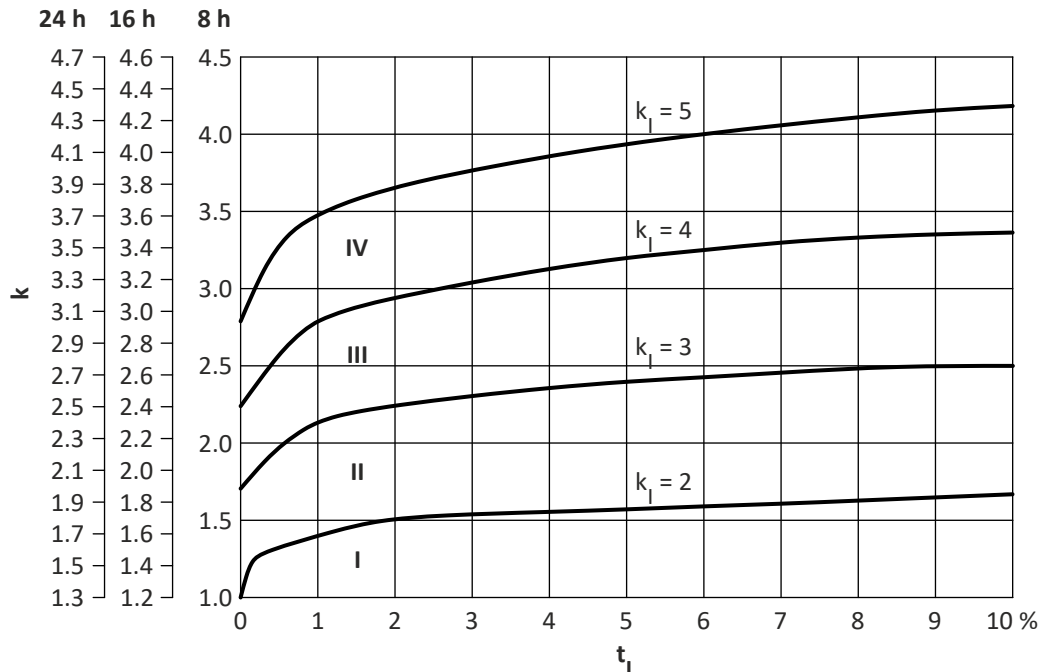
► [Radial forces and axial forces](#) 49



Determination of the required gearbox load capacity

Define the required load factor at runtime t_L		
Runtime $t_L \leq 10\%$	Take the load factor k from diagram into account	
Runtime $t_L > 10\%$	Take intensity k_I from calculation into account	
Calculate intensity		
no alternating load	$k_I = M_{L,max} / M_L$	$k_I =$
at alternating load	$k_I = M_{L,max} / M_L \times 1.4$	$k_I =$

Load factor k



Operating mode S1

Calculation of the required drive power			
	Calculation	Result	Unit
Output torque	$M_R \geq M_L / (k_L \times k_H)$	$M_R =$	Nm
Output speed	$n_R \geq n_L / k_E$	$n_R =$	rpm
Drive power	$P_R \geq M_R \times n_R / 9549$	$P_R =$	kW

Check geared servo motor and determine from the selection table			
	Check	Selection	Unit
Drive power	$P_1 \geq P_R$	$P_1 =$	kW
Output torque	$M_2 \geq M_L$	$M_2 =$	Nm
Output speed	$n_{2,th} \geq n_L$	$n_{2,th} =$	rpm
Load capacity of the geared motor	$c \geq k$ $c \geq k_I$	$c =$	
Short-time maximum torque			
no alternating load	$M_{2,max} \geq M_{L,max}$	$M_{2,max} =$	Nm
at alternating load	$M_{2,max} \times 1.5 \geq M_{L,max}$	$M_{2,max} =$	Nm
Ratio		$i =$	

► Selection tables 54

Information on project planning

Drive dimensioning



Order data			
	Ratio i	Geared motor	
Example	3.267	g500-H140	m850-S120/S3960
Example	3.661	g500-S130	m850-S120/S3960
Example	4.889	g500-B240	m850-S120/S3960

Operating modes S2, S3, and S6

Calculation of the required drive power			
	Calculation	Result	Unit
Output torque	$M_R \geq M_L / (k_L \times k_H)$	$M_R =$	Nm
Output speed	$n_R \geq (n_L \times k_M) / (k_E \times k_{rated})$	$n_R =$	rpm
Drive power	$P_R \geq M_R \times n_R / 9549$	$P_R =$	kW

Check geared servo motor and determine from the selection table			
	Check	Selection	Unit
Drive power	$P_1 \geq P_R$	$p_1 =$	kW
Output torque	$M_2 \geq M_L$	$M_2 =$	Nm
Output speed	$n_2 \geq n_L$	$n_2 =$	rpm
Load capacity of the geared motor	$c \geq k$ $c \geq k_I$	$c =$	
Short-time maximum torque			
no alternating load	$M_{2,max} \geq M_{L,max}$	$M_{2,max} =$	Nm
at alternating load	$M_{2,max} \times 1.5 \geq M_{L,max}$	$M_{2,max} =$	Nm
Ratio		$i =$	

► Selection tables [54](#)

Check servo motor based on the motor torque characteristic		
Gearbox efficiency	$\eta_G = \eta_{c1} - (c - 1) \times 0.01$	$\eta_G =$
All operating points (●)		$i \times n_L$
below the maximum torque characteristic of the servo motor/ inverter combination here, $M_{L,max}$ must be considered		$M_L / (i \times \eta_G)$
Thermally effective operating point (○)		$(i \times n_L \times k_M) / (k_E \times k_{rated})$
below the S1 torque characteristic of the servo motor		$M_L / (k_L \times k_H \times i \times \eta_G)$

► Torque characteristics [127](#)

Order data			
	Ratio i	Geared motor	
Example	3.267	g500-H140	m850-S120/S3960
Example	3.661	g500-S130	m850-S120/S3960
Example	4.889	g500-B240	m850-S120/S3960



Final configuration

	Screening
Connection dimensions	Output shaft Output flange/foot
Mounting position	Geared motor Connector/terminal box Driven shaft/output flange
Product extensions	Torque plate Shaft cover Connector/terminal box Brake Feedback Blower Temperature monitoring Second shaft end Handwheel Protection cover ...

More information about the final configuration:

- ▶ [The modular system](#)  10
- ▶ [Product extensions](#)  107

Information on project planning

Final configuration

Surface and corrosion protection



Surface and corrosion protection

Depending on the ambient conditions, the surface and corrosion protection system (called OKS) offers tailor-made solutions for optimum protection.

Various surface coatings ensure that the motors operate reliably even at high air humidity, in outdoor installation or in the presence of atmospheric impurities. Any color from the "RAL Classic" collection can be chosen for the top coat.



The OKS-XL (extra Large) version requires a check by your responsible Lenze subsidiary.

Surface and corrosion protection	Applications	Product g500
OKS-G (primed)	Dependent on subsequent top coat applied	Standard
OKS-S (small)	- Standard applications - Internal installation in heated buildings - Air humidity up to 90%	Optional
OKS-M (medium)	- Internal installation in non-heated buildings - Covered, protected external installation - Air humidity up to 95 %	Optional
OKS-L (large)	- External installation - Air humidity above 95 % - Chemical industrial plants - Food industry	
OKS-XL (extra Large)	- External installation - Air humidity above 95 % - Chemical industrial plants - Food industry - Coastal areas with moderate salinity	

Surface and corrosion protection	Corrosivity category	Surface coating	Color	Coating thickness
	DIN EN ISO 12944-2	Design		
OKS-G (primed)		2K PUR priming coat	- Standard: RAL 7012 - Optional: RAL Classic	60 ... 90 µm
OKS-S (small)	Comparable to C1	2K-PUR top coat		80 ... 120 µm
OKS-M (medium)	Comparable to C2	2K PUR priming coat 2K-PUR top coat		110 ... 160 µm
OKS-L (large)	Comparable to C3			140 ... 200 µm
OKS-XL (extra large)	Comparable to C4	2K-EP priming coat (two times) 2K-PUR top coat		160 ... 240 µm



Lubricants

The following gearboxes are lubricated for life:

- g500-H45
- g500-H100
- g500-H140

Recommended lubricants:

Lubricant	CLP HC 220	CLP HC 320	CLP HC 46 NSF H1	CLP HC 220 NSF H1
Ambient temperature	-30 ... +40 °C	-20 ... +50 °C	-30 ... +10 °C	-20 ... +40 °C
Specification	Synthetic oil (polyalphaolefins basis)			
Changing interval				
Operating hours	25000	25000	16000	16000
Not later than after	4 years	4 years	3 Jahren	3 Jahren
At oil temperature	70 C°			
Fuchs	Renolin Unisyn XT 220	Renolin Unisyn XT 320		Cassida Fluid GL 220
Klüber	Klübersynth GEM4-220 N	Klübersynth GEM4-320 N	Klüberoil Summit HYSYN FG-46	Klüberoil 4 UH1-220 N
SHELL	Shell Omala S4 GXV 220	Shell Omala S4 GXV 320		

Lubricant amounts for stocking

All lubricant amounts are reference values for a change of lubricant. They serve stocking purposes, for example.

The exact values can be found on the nameplate.

Mounting position		M1 (A)	M2 (D)	M3 (B)	M4 (C)	M5 (F)	M6 (E)	M1-M6 (A-F)	M1, M5, M6 (AEF)
Gearbox									
g500-H45	I	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-
g500-H100	I	0.5	0.7	0.8	0.7	0.5	0.7	-	0.7
g500-H140	I	0.5	0.8	0.9	0.7	0.5	0.8	-	0.8
g500-H210	I	0.8	1.1	1.2	1.3	0.9	1.2	-	1.2
g500-H320	I	0.8	1.2	1.3	1.3	1.0	1.2	-	1.2
g500-H450	I	1.1	1.6	1.7	1.8	1.4	1.6	-	1.6
g500-H600	I	1.7	2.6	2.4	3.0	1.9	2.3	-	-
g500-H850	I	2.3	3.5	3.0	4.0	2.5	3.2	-	-
g500-H1500	I	4.6	7.0	6.0	7.7	5.0	6.0	-	-
g500-H3000	I	8.0	12.6	10.0	13.2	9.5	9.8	-	-
Pre-stage	I	0.4							

► Gearbox with pre-stage  105

Information on project planning

Final configuration
Ventilation



Ventilation



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

The gearbox g500-H210 can optionally be fitted with ventilation units.

From g500-H320 onwards, the gearboxes are supplied with ventilation units as standard.

Gearbox in combined mounting position

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

- g500-H100 ... H450 in mounting position M1/5/6 (AEF)



In these gearboxes, the lubricant amount has been optimised for the use in different mounting positions. If required, the breather elements are loosely enclosed and must be mounted before commissioning depending on the mounting position.

► [The modular system](#)  10

NOTICE

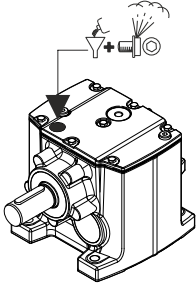
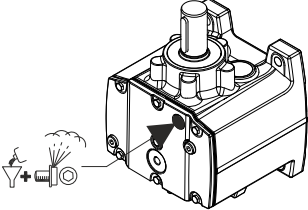
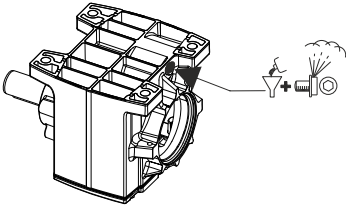
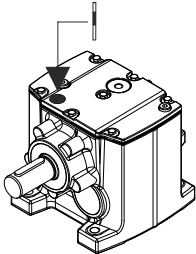
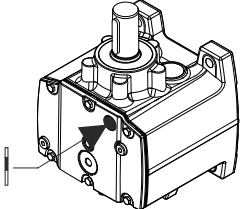
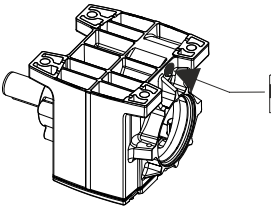
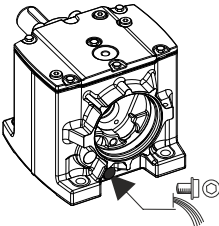
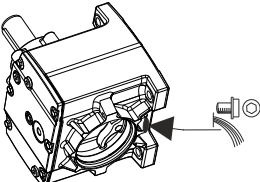
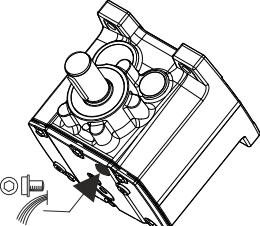
- For gearboxes with ventilation, a gap of at least 30 mm has to be observed to the machine wall on the corresponding gearbox side.



Information on project planning

Final configuration
Ventilation

g500-H210 ... H450

Mounting position M1 (A)	Mounting position M2 (D)	Mounting position M3 (B)
Filling and ventilation		
		
Control		
		
Drain		
		



Mounting position M4 (C)	Mounting position M5 (F)	Mounting position M6 (E)
Filling and ventilation		
Control		
Drain		

- ① g500-H210
- ② g500-H320
g500-H450



Information on project planning

Final configuration
Ventilation

g500-H600 ... H3000

Mounting position M1 (A)	Mounting position M2 (D)	Mounting position M3 (B)
Filling and ventilation		
Check		
Drain		

Information on project planning

Final configuration
Ventilation



Mounting position M4 (C)	Mounting position M5 (F)	Mounting position M6 (E)
Filling and ventilation		
Control		
Drain		

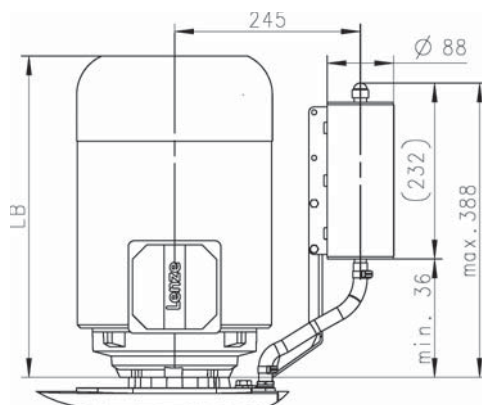
Gearbox with oil compensation reservoir for mounting position M4 (C)

In order to guarantee a reliable lubrication of the toothed parts in mounting position M4 (C) (motor is on the gearbox vertical from the top), a high filling level is required in the gearbox. As a result of the reduced volume of air in the gearbox, this may lead to oil escaping from the ventilation at higher input speeds. The oil compensation reservoir increases the expansion space for the lubricant.

The oil compensation reservoir can be ordered as a mounting set for fastening to the gearbox. If insufficient space is available, the oil compensation reservoir can also be mounted over the gearbox hose connection on nearby system parts.



Dimensions of the oil compensation reservoir



8800783-00

For the following gearboxes in mounting position M4 (C), which exceed the specified min. input speed, an oil expansion reservoir is required depending on the specified gear ratio:

g500-H1500		g500-H3000	
Gearbox ratio	Min. input speed	Gearbox ratio	Min. input speed
	rpm		rpm
3.743	2000	4.496	2000
4.758	2000	5.902	2000
5.400	2000	6.344	2000
6.245	2000	6.968	2000
6.864	2000	8.327	2000
7.592	2000	9.146	2000
9.010	2000	10.005	2000
10.267	2000	11.619	2000
11.356	2000	12.762	2000
12.362	3000	14.233	2000
13.673	3000	15.633	2000
15.156	3000	18.752	3000
16.763	3000	20.596	3000
20.533	3000	23.044	3000
22.711	3000	25.311	3000
24.933	3000	29.822	3000
27.578	3000	32.756	3000
32.267	4000	36.193	4000
35.689	4000	39.753	4000
39.160	4000	45.750	4000
43.313	4000	50.250	4000
49.500	4000		
54.750	4000		



Mechanical installation

Important notes

- Install the product according to the information in the chapter "Standards and operating conditions".
 - ▶ [Standards and operating conditions](#) 37
- The technical data and the data regarding the supply conditions can be found on the nameplate and in this documentation.
- Ambient media – especially chemically aggressive ones – may damage shaft sealing rings, lacquers and plastics.
- Lenze offers special surface and corrosion protection in this case.

Transport

- Ensure appropriate handling.
- Make sure that all component parts are securely mounted. Secure or remove loose component parts.
- Only use safely fixed transport aids (e.g., eye bolts or support plates).
- Do not damage any components during transport.
- Avoid electrostatic discharges on electronic components and contacts.
- Avoid impacts.
- Check the carrying capacity of the hoists and load handling devices. The weights can be found in the shipping documents.
- Secure the load against tipping and falling down.
- Standing beneath suspended loads is prohibited.

Installation

- The mounting surfaces must be plane, torsionally rigid and free from vibrations.
- The mounting areas must be suited to absorb the forces and torques generated during operation.
- Ensure an unhindered ventilation.
- For versions with a fan, keep a minimum distance of 10 % from the outside diameter of the fan cover in intake direction.



Electrical installation

Important notes

DANGER!

Risk of injury and risk of burns from dangerous voltage

Power terminals may also carry voltage in the switched-off state or when the motor is stopped and may cause life-threatening cardiac arrhythmia and serious burns.

- ▶ Disconnect the product from the mains.
- ▶ Check that the power terminals are deenergized before starting work.

- When working on energized products, comply with the applicable national accident prevention regulations.
- The electrical installation must be carried out according to the appropriate regulations (e.g. cable cross-sections, fuses, PE connection).
- The manufacturer of the system or machine is responsible for adherence to the limits required in connection with EMC legislation.

Operation on an external inverter

A max. pulse voltage amplitude of $U_{pk} = 1560 \text{ V}$ at the motor terminals must not be exceeded. Here, the minimum pulse rise time must be $t_R = 0.1 \text{ } \mu\text{s}$.

If it cannot be ruled out that the permissible voltage peaks will be exceeded or that the minimum pulse rise time will not be reached, the following measures must be initiated:

- Reduction of the DC-bus voltage (threshold for brake chopper voltage)
- Use of filters, chokes
- Use of special motor cables

Preparation



The notes for the electrical connection can be found in the enclosed mounting instructions.

EMC-compliant wiring



The EMC-compliant wiring is described in detail in the documentation of the Lenze inverters.

Technical data

Notes regarding the given data



Technical data

Notes regarding the given data

Catalog data

The power values, torques and speeds specified in the configuration are rounded values and apply to:

- Operating time per day = 8 hrs (100 % ED)
- Duty class up to 10 switching operations per hour
- Ambient temperature = 40 °C
- Site altitude ≤ 1000 m above mean sea level
- The selection tables indicate the mechanically permissible power levels and torques.
- The ratings apply to the operating mode S1 (acc. to EN 60034-1).

NOTICE

In case of other operating conditions, the achievable values can differ for those mentioned.

► In case of extreme operating conditions, please get in touch with your Lenze representative.



Standards and operating conditions

Conformities and approvals

More information and certificates of approval can be found under

[g500 + m850 helical geared motors](#)

Europe					
Country	Conformity/ approval	Law/standard	Description	Special feature	Product representation
European Union	CE	2006/42/EC	Machinery Directive	Only for safety-relevant components	CE mark
		2014/35/EU	Low-Voltage Directive		
		2014/30/EU	EMC Directive		
		2011/65/EU	RoHS		
				-	
Great Britain	UKCA	S.I. 2008/1597	The Supply of Machinery (Safety) Regulations 2008	Only for safety-relevant components	UKCA mark
		S.I. 2016/1091	The Electromagnetic Compatibility Regulations 2016	-	
		S.I. 2016/1101	The Electrical Equipment (Safety) Regulations 2016		
		S.I. 2012/3032	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012		

America					
Country	Conformity/ approval	Law/standard	Description	Special feature	Product representation
Canada	CSA	CSA 22.1 No. 100	CSA Standard for Motors and Generators	-	cULus mark
USA	UL	UL 1004-1	UL Standard for Rotating Electrical Machines		

Asia					
Country	Conformity/ approval	Law/standard	Description	Special feature	Product representation
China	-	GB 30253	Minimum allowable values of energy efficiency and energy efficiency grades for permanent magnet synchronous motors	-	CEL mark
		GB/T 26572	Requirements on concentration limits for certain restricted substances in electrical and electronic products		EFUP mark

Protection of persons and device protection

Degree of protection			
-	EN IEC 60529, EN IEC 60034-5	IP54 IP65	Information applies to the mounted and ready-for-use state
Temperature class			
-	EN IEC 60034-1	F (155 °C)	Insulation system
Permissible voltage			
-	IEC 60034-18-41	IVIC C	At 500 V
	IEC/TS 60034-25:2007	Limit curve A	Of the pulse voltage

Technical data

Standards and operating conditions
EMC data



EMC data

Noise emission		
-	EN IEC 60034-1	A final overall assessment of the drive system is indispensable
Noise immunity		
-	EN IEC 60034-1	A final overall assessment of the drive system is indispensable

Environmental conditions

Climate			
Storage	EN 60721-3-1:1997	1K3 (-20 ... +40 °C)	>3 months
		1K3 (-20 ... +60 °C)	<3 months
Transport	EN 60721-3-2:1997	2K3 (-20 ... +70 °C)	
Operation	EN 60721-3-3:1995 + A2:1997	3K3 (-10 ... +40 °C)	Operation, without brake
		3K3 (-15 ...+40 °C)	Operation without brake, forced ventilated
		3K3 (-20 ...+40 °C)	Operation without brake, self-ventilated
Site altitude			
0 ... 1000 m amsl	-	Without current derating	
1000 ... 2000 m. amsl		Reduce rated output current by 5 %/1000 m	
Air humidity			
-	-	Average relative humidity 85 %	Without condensation



Technical data

Data overview

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).

g500-H100, 2-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
M _{z, max}	i	z _g	z _t	
Nm				'
62.0	3.354	161	48	29
72.0	4.600	23	5	27
75.0	5.167	31	6	24
81.0	5.887	989	168	27
83.0	6.440	161	25	27
86.0	7.086	248	35	23
92.0	8.214	115	14	27
96.0	9.068	1333	147	23
99.0	10.063	161	16	27
100	11.360	284	25	22
100	12.653	620	49	23
100	14.490	710	49	22
100	15.500	31	2	23
100	17.750	71	4	22
100	22.314	781	35	22
100	28.738	1207	42	21

g500-H140, 2-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
M _{z, max}	i	z _g	z _t	
Nm				'
82.0	3.267	49	15	25
94.0	4.480	112	25	24
103	5.733	86	15	23
105	6.272	784	125	23
106	7.269	189	26	18
117	8.000	8	1	23
117	9.029	316	35	18
125	9.800	49	5	23
128	11.554	3397	294	18
132	12.640	316	25	18
136	13.957	4536	325	17
140	16.122	790	49	18
140	17.802	1620	91	17
140	19.750	79	4	18
140	21.808	567	26	17
140	24.829	869	35	18
140	31.976	1343	42	18



g500-H210, 2-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
M _{2, max}	i	z _g	z _t	
Nm				'
126	3.389	61	18	22
143	4.648	488	105	22
159	5.583	67	12	18
158	6.250	25	4	17
172	7.657	268	35	18
171	8.571	60	7	17
182	9.799	2881	294	18
189	10.720	268	25	18
186	12.000	12	1	17
201	13.673	670	49	17
200	15.306	750	49	17
210	16.750	67	4	17
210	18.750	75	4	16
210	21.802	2747	126	17
210	24.405	1025	42	16
210	27.119	1139	42	17
210	30.357	425	14	16
210	39.286	275	7	16
206	47.679	1335	28	16

g500-H320, 2-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
M _{2, max}	i	z _g	z _t	
Nm				'
165	3.389	61	18	20
189	4.648	488	105	20
227	6.083	73	12	16
218	6.910	539	78	15
249	8.343	292	35	16
238	9.477	616	65	15
265	10.677	3139	294	15
271	11.680	292	25	15
254	12.128	473	39	15
262	13.268	4312	325	15
294	14.898	730	49	15
281	16.923	220	13	14
313	18.250	73	4	15
299	20.731	539	26	14
320	23.754	2993	126	15
320	26.983	3157	117	14
320	29.548	1241	42	15
320	33.564	1309	39	14
251	38.238	803	21	15
218	46.407	6497	140	14



g500-H450, 2-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
M _{2, max}	i	z _g	z _t	'
Nm				
256	3.444	31	9	19
293	4.724	496	105	17
315	5.678	511	90	15
323	6.045	2666	441	17
334	6.613	496	75	17
354	7.787	584	75	14
370	8.800	44	5	13
384	9.965	3139	315	14
400	11.262	473	42	13
411	12.320	308	25	13
426	13.905	292	21	13
441	15.714	110	7	13
450	17.033	511	30	13
448	19.250	77	4	13
450	22.170	2993	135	13
450	25.056	451	18	13
450	27.578	1241	45	13
450	31.167	187	6	13
450	35.689	1606	45	13
450	40.333	121	3	12
322	43.313	6497	150	13
366	48.950	979	20	12
307	61.875	495	8	12

g500-H450, 3-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
M _{2, max}	i	z _g	z _t	
Nm				'
450	44.124	9928	225	14
450	49.867	748	15	13
450	56.469	53363	945	14
450	61.774	69496	1125	14
450	69.813	5236	75	13
450	78.794	4964	63	14
450	89.048	1870	21	13
450	96.522	8687	90	14
450	109.083	1309	12	13
450	137.133	2057	15	13
450	176.611	3179	18	13



g500-H600, 2-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
M _{2, max}	i	z _g	z _t	'
Nm				
240	3.267	49	15	17
297	4.480	112	25	15
339	5.733	86	15	15
404	6.456	581	90	13
435	7.250	29	4	13
487	8.853	664	75	12
510	9.943	348	35	12
537	11.330	3569	315	12
553	12.395	4648	375	12
578	13.920	348	25	12
600	15.810	332	21	12
600	17.755	870	49	12
600	19.367	581	30	12
600	21.750	87	4	11
600	25.207	3403	135	12
600	28.310	1189	42	11
600	31.356	1411	45	12
600	35.214	493	14	11
558	40.578	1826	45	11
600	45.571	319	7	11
456	49.247	7387	150	11
513	55.307	7743	140	11
371	62.250	249	4	11

g500-H600, 3-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
M _{2, max}	i	z _g	z _t	
Nm				'
600	31.197	49136	1575	13
600	35.037	8584	245	12
600	39.925	264106	6615	13
600	43.676	49136	1125	12
600	49.051	8584	175	12
600	55.710	24568	441	12
600	62.566	21460	343	12
600	68.244	3071	45	12
600	76.643	1073	14	12
600	88.826	251822	2835	12
600	99.757	43993	441	12
600	110.491	104414	945	12
600	124.088	18241	147	12
600	142.988	135124	945	12
600	173.536	273319	1575	12



g500-H600, 4-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
$M_{2, \max}$	i	z_g	z_t	
Nm				'
600	198.970	2014576	10125	13
600	223.457	351944	1575	12

g500-H850, 2-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
$M_{2, \max}$	i	z_g	z_t	
Nm				'
306	3.147	1734	551	15
378	4.362	663	152	15
429	5.368	102	19	14
551	5.946	1207	203	13
578	6.644	578	87	12
615	8.241	923	112	12
649	9.208	221	24	12
667	10.143	71	7	12
696	11.360	284	25	12
725	12.693	952	75	11
758	14.490	710	49	11
792	16.190	340	21	11
814	17.750	71	4	11
833	19.833	119	6	11
850	23.103	2911	126	11
850	25.815	697	27	11
850	28.315	4757	168	11
850	31.639	1139	36	11
850	37.190	781	21	11
850	41.556	374	9	11
850	45.136	6319	140	11
850	50.433	1513	30	11



g500-H850, 3-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
$M_{2, \max}$	i	z_g	z_t	
Nm				'
850	29.536	3692	125	12
850	33.003	12376	375	12
850	37.799	39689	1050	12
850	41.350	25844	625	12
850	46.204	86632	1875	12
850	52.743	1846	35	12
850	58.933	884	15	12
850	64.610	6461	100	12
850	72.193	10829	150	12
850	84.096	37843	450	12
850	93.966	63427	675	12
850	104.607	15691	150	12
850	116.884	26299	225	12
850	135.373	10153	75	12
850	151.262	34034	225	12
850	164.294	82147	500	12
850	183.577	137683	750	12
850	207.675	8307	40	12

g500-H850, 4-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
$M_{2, \max}$	i	z_g	z_t	
Nm				'
850	210.484	3551912	16875	12
850	234.319	439348	1875	12
850	261.821	1472744	5625	12
850	294.334	264901	900	12
850	328.881	443989	1350	12



g500-H1500, 2-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
M _{2, max}	i	z _g	z _t	'
Nm				
775	3.743	1647	440	14
924	4.758	2379	500	13
1098	6.245	2623	420	13
1157	6.864	858	125	10
1217	7.592	949	125	10
1320	9.010	946	105	10
1380	10.267	154	15	10
1400	11.356	511	45	9
1420	12.362	1298	105	10
1430	13.673	4307	315	9
1440	15.156	682	45	10
1450	16.763	2263	135	9
1500	20.533	308	15	10
1500	22.711	1022	45	9
1500	24.933	374	15	9
1500	27.578	1241	45	9
1484	32.267	484	15	9
1500	35.689	1606	45	9
1500	39.160	979	25	9
1500	43.313	6497	150	9
1250	49.500	99	2	9
1382	54.750	219	4	9

g500-H1500, 3-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
M _{z, max}	i	z _g	z _t	'
Nm				
1500	40.517	2431	60	10
1500	44.814	16133	360	10
1500	49.867	748	15	10
1500	55.851	20944	375	10
1500	61.774	69496	1125	10
1500	71.238	1496	21	10
1500	78.794	4964	63	10
1500	87.267	1309	15	10
1500	96.522	8687	90	10
1500	113.585	15334	135	10
1500	125.632	50881	405	10
1500	139.211	12529	90	10
1500	153.976	83147	540	10
1500	182.844	8228	45	10
1500	202.237	27302	135	10
1500	221.907	16643	75	10
1500	245.442	110449	450	10
1500	280.500	561	2	10
1500	310.250	1241	4	10



g500-H1500, 4-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
$M_{2, \max}$	i	z_g	z_t	
Nm				'
1500	203.537	29920	147	10
1500	225.125	99280	441	10
1500	254.431	858704	3375	10
1500	281.416	2849336	10125	10
1500	316.487	356048	1125	10
1500	350.054	1181432	3375	10
1500	397.548	53669	135	10
1500	446.497	84388	189	10
1500	494.511	22253	45	10
1500	572.324	2086121	3645	10

g500-H3000, 2-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
$M_{2, \max}$	i	z_g	z_t	
Nm				'
2300	10.005	3752	375	9
2400	11.619	244	21	9
2475	12.762	268	21	9
2530	14.233	427	30	8
2610	15.633	469	30	8
2750	18.752	5063	270	8
2815	20.596	5561	270	8
2900	23.044	1037	45	8
2965	25.311	1139	45	8
3000	29.822	1342	45	8
3000	32.756	1474	45	8
3000	36.193	5429	150	8
3000	39.753	5963	150	8
1765	45.750	183	4	8
1938	50.250	201	4	8



g500-H3000, 3-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
$M_{2, \max}$	i	z_g	z_t	
Nm				'
2830	47.186	44591	945	9
2910	51.828	48977	945	9
2950	53.770	7259	135	9
3000	59.059	7973	135	9
3000	64.744	61183	945	9
3000	71.112	67201	945	9
3000	79.375	32147	405	9
3000	87.183	35309	405	9
3000	107.541	14518	135	9
3000	118.119	15946	135	9
3000	130.585	17629	135	9
3000	143.430	19363	135	9
3000	168.993	22814	135	9
3000	185.615	25058	135	9
3000	205.096	92293	450	9
3000	225.269	101371	450	9
3000	259.250	1037	4	9
3000	284.750	1139	4	9

g500-H3000, 4-stage gearboxes

Max. output torque	Ratio	Number of teeth		Max. backlash
				Standard
$M_{2, \max}$	i	z_g	z_t	
Nm				'
2850	203.178	268804	1323	9
2650	226.604	61183	270	9
2950	248.893	67201	270	9
3000	292.511	987224	3375	9
3000	321.282	1084328	3375	9
3000	376.393	50813	135	9
3000	413.415	55811	135	9
3000	457.048	123403	270	9
3000	489.908	595238	1215	9
3000	538.095	653786	1215	9
3000	594.888	722789	1215	9
3000	653.402	793883	1215	9
3000	739.983	299693	405	9
3000	788.632	319396	405	9
3000	957.625	387838	405	9



Radial forces and axial forces

Permissible radial force

The calculation of the permissible radial force must take account of the additional load factor f_w .

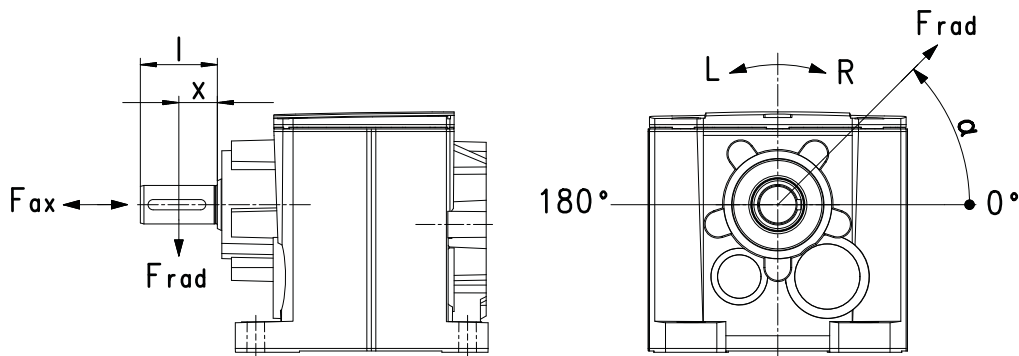
$$F_{\text{rad, perm}} = f_w \times F_{\text{rad, max}}$$

Permissible axial force

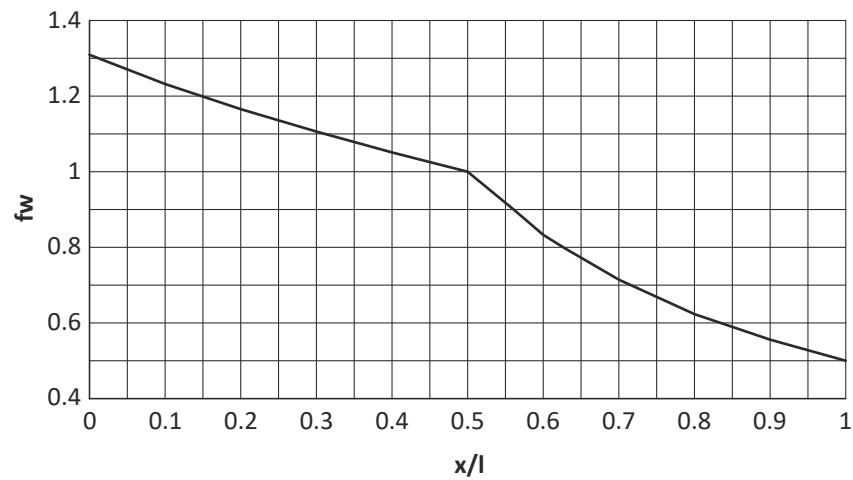
If there is no radial force, the maximum axial force is 50% of the value in the table $F_{\text{rad, max}}$

$$F_{\text{ax, zul}} = 0.5 \times F_{\text{rad, max}}$$

Application of forces



Additional load factor f_w on the drive shaft



Technical data

Radial forces and axial forces



The values given in the tables refer to the centre 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 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 get in touch with your Lenze representative

Max. radial force, gearbox with foot (VBR)

Getriebe	Output speed n_2 [rpm]									
	1000	630	400	250	160	100	63	40	25	16
	Max. radial force $F_{rad,max}$ [rated]									
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	1440	1800	2200	2500	3000	3300	3700	4100	4200
g500-H210	1100	1600	2000	2400	2800	3400	3900	4100	4400	4800
g500-H320	1760	2090	2480	3000	3520	4190	5000	5700	5700	5700
g500-H450	2440	2820	3340	4020	4660	5540	6500	7100	7100	7100
g500-H600	3820	4480	5250	6100	7260	8450	9500	9500	9500	9500
g500-H850	4700	5510	6430	7500	8860	10400	11500	11500	11500	11500
g500-H1500	6300	7440	8790	10300	12200	14500	17000	17000	17000	17000
g500-H3000	7510	8880	10100	12400	14600	17200	20000	20000	20000	20000

Reinforced bearings

Getriebe	Output speed n_2 [rpm]									
	1000	630	400	250	160	100	63	40	25	16
	Max. radial force $F_{rad,max}$ [rated]									
g500-H100	1000	1200	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	5100	5500	6000
g500-H320	2380	3250	4380	5600	6800	7100	7100	7100	7100	7100
g500-H450	4030	5100	6870	8650	8900	8900	8900	8900	8900	8900
g500-H600	7180	8710	9860	11300	12000	12000	12000	12000	12000	12000
g500-H850	9520	10500	11900	13300	15400	15600	15600	15600	15600	15600
g500-H1500	12600	14600	16500	19100	21000	21000	21000	21000	21000	21000
g500-H3000	16100	18000	20200	23600	25000	25000	25000	25000	25000	25000



Technical data

Radial forces and axial forces

Max. radial force, gearbox with/without foot with threaded pitch circle (V□R/V□K)

Getriebe	Output speed n_2 [rpm]									
	1000	630	400	250	160	100	63	40	25	16
	Max. radial force $F_{rad,max}$ [rated]									
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	1100	1600	2000	2400	2800	3000	3000	3000	3000	3000
g500-H320	1760	2090	2480	3000	3520	3600	3600	3600	3600	3600
g500-H450	2440	2820	3340	4020	4400	4400	4400	4400	4400	4400
g500-H600	3820	4480	5250	6100	7260	8450	8500	8500	8500	8500
g500-H850	4700	5510	6430	7500	8860	10000	10000	10000	10000	10000
g500-H1500	6300	7440	8790	10300	12200	14000	14000	14000	14000	14000
g500-H3000	7510	8880	10100	12400	14600	17000	17000	17000	17000	17000

Reinforced bearings

Getriebe	Output speed n_2 [rpm]									
	1000	630	400	250	160	100	63	40	25	16
	Max. radial force $F_{rad,max}$ [rated]									
g500-H100	1000	1200	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	2380	3250	3600	3600	3600	3600	3600	3600	3600	3600
g500-H450	4030	4400	4400	4400	4400	4400	4400	4400	4400	4400
g500-H600	7180	8500	8500	8500	8500	8500	8500	8500	8500	8500
g500-H850	9250	10000	10000	10000	10000	10000	10000	10000	10000	10000
g500-H1500	12600	14000	14000	14000	14000	14000	14000	14000	14000	14000
g500-H3000	16100	17000	17000	17000	17000	17000	17000	17000	17000	17000

Max. radial force, gearbox with reinforced flange (VCP)

Getriebe	Output speed n_2 [rpm]									
	1000	630	400	250	160	100	63	40	25	16
	Max. radial force $F_{rad,max}$ [rated]									
g500-H100	1900	2400	2900	3330	3650	3890	4060	4160	4240	4280
g500-H140	3000	3500	4000	5510	5950	6270	6480	6620	6710	6770
g500-H210	3400	4000	5000	6170	6670	7060	7330	7500	7620	7700
g500-H320	3900	4500	6000	7040	7690	8210	8570	8810	8970	9080
g500-H450	4300	5200	6400	7810	8550	9160	9590	9880	10100	10200

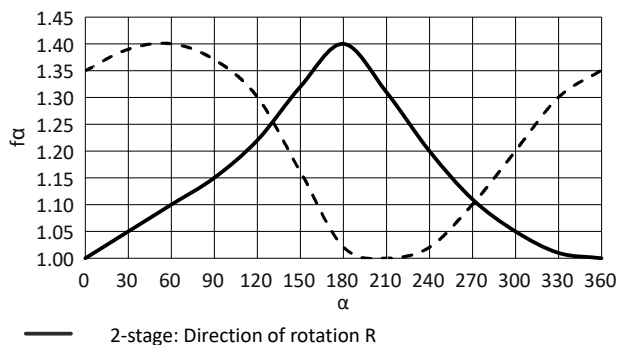
Technical data

Radial forces and axial forces

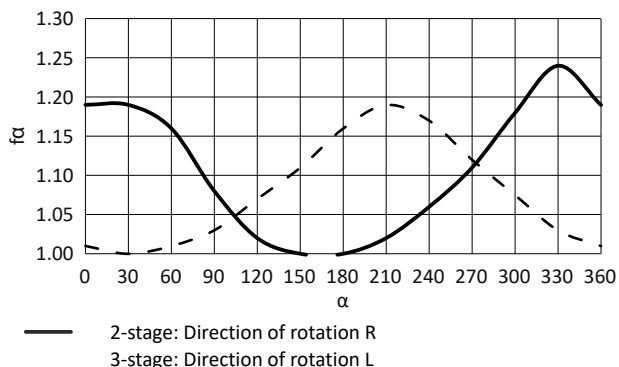


Effective direction factor f_α on the output shaft

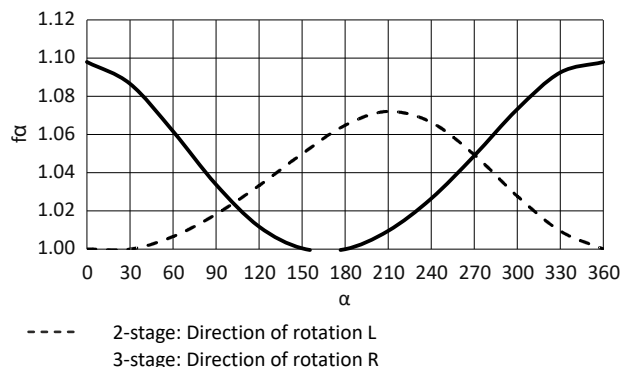
g500-H45



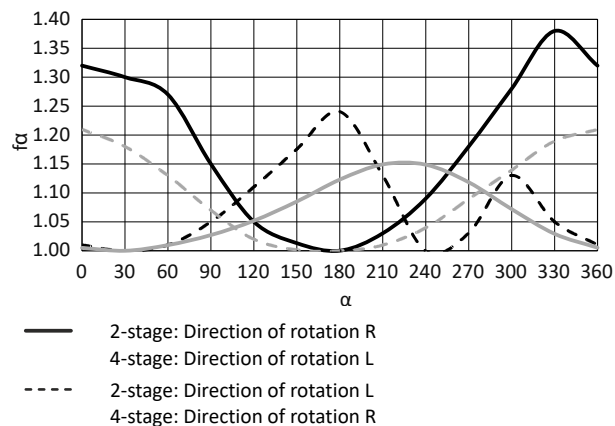
g500-H100



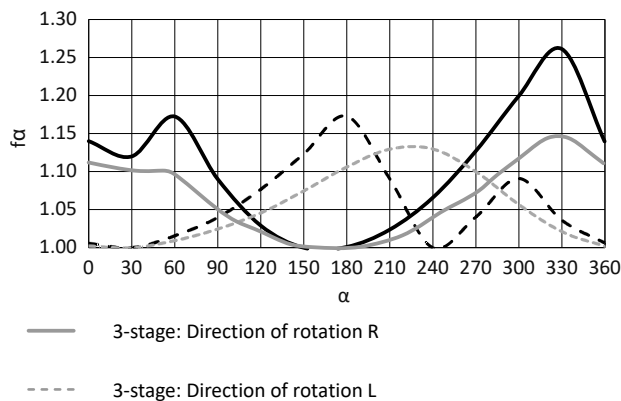
g500-H140



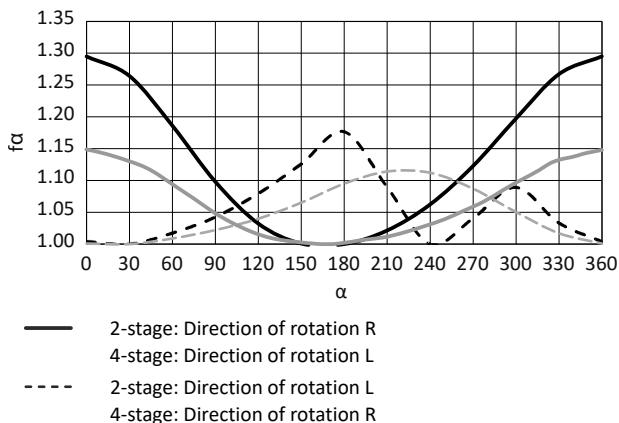
g500-H210



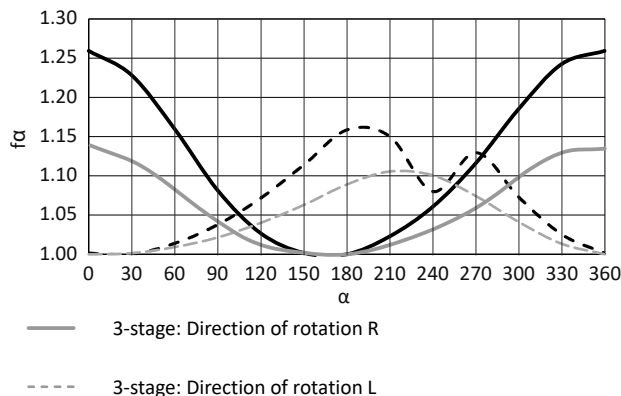
g500-H320



g500-H450



g500-H600

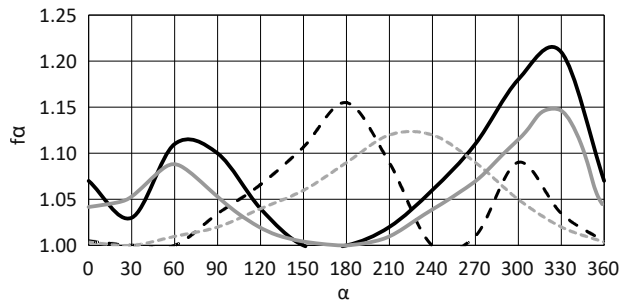




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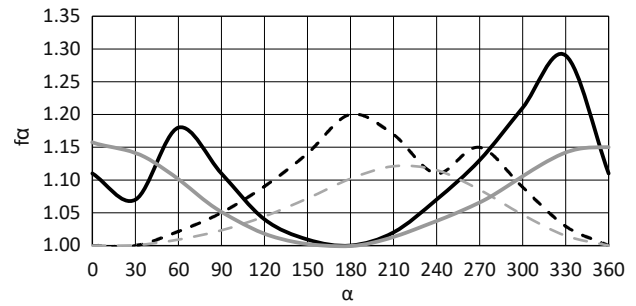
Radial forces and axial forces

g500-H850



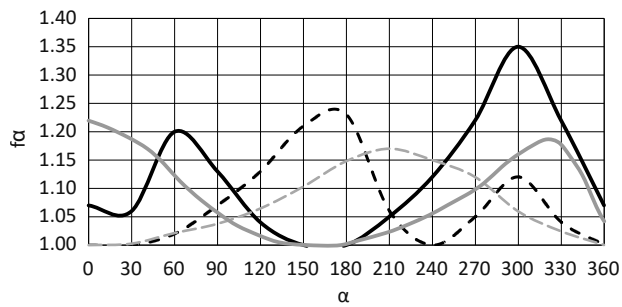
— 2-stage: Direction of rotation R
 — 4-stage: Direction of rotation L
 - - - 2-stage: Direction of rotation L
 - - - 4-stage: Direction of rotation R

g500-H1500



— 3-stage: Direction of rotation R
 — 3-stage: Direction of rotation L
 - - - 3-stage: Direction of rotation R
 - - - 3-stage: Direction of rotation L

g500-H3000



— 2-stage: Direction of rotation R
 — 4-stage: Direction of rotation L
 - - - 2-stage: Direction of rotation L
 - - - 4-stage: Direction of rotation R

— 3-stage: Direction of rotation R
 — 3-stage: Direction of rotation L
 - - - 3-stage: Direction of rotation R
 - - - 3-stage: Direction of rotation L



Selection tables

Notes on the selection tables

The selection tables represent the available combinations of gearbox, number of stages, ratio and motor for the mounting position M1. They only serve as a rough overview.

The following legend shows the layout of the selection tables:

Example

Inverter power supply 400 V, self-ventilated motors
2 kW

Explanation

Voltage of inverter mains connection, motor cooling type
Rated motor power

Inverter operation							Geared motor		Number of stages	
M_2	n_2	c	$M_{2,max}$	$n_{2,th}$	J	i	g500-	m850-	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
15.0	1212	3.9	46.0	1056	7.402	3.267	H140	120S40	2	11
16.0	1181	2.9	47.0	970	7.025	3.354	H100	120S40	2	10
16.0	1169	5.8	48.0	915	8.030	3.389	H210	120S40	2	13
21.0	884	3.3	63.0	828	7.036	4.480	H140	120S40	2	11

										Mass
										Number of gear stages
										Motor product name
										Gearbox product name
										Ratio
										Moment of inertia
										With feedback, without brake
										Max. permissible output speed in S1 operation
										Max. permissible acceleration torque
										Dependent on inverter
										Load capacity of the gearbox
										c is the ratio of permissible rated torque of the gearbox to the rated torque of the motor (converted to the driven shaft). c must always be higher than the application factor detected for the application k .
										$c = \frac{M_{2,zul}}{M_{1,N} \times i \times \eta_{Getr}} > k$
										Output speed
										Output torque



Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors

Inverter mains connection 400 V, Self-ventilated motors

2 kW

Inverter operation							Geared motor		Number of stages	
M ₂	n ₂	c	M _{2, max}	n _{2, th}	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
15.0	1212	3.9	46.0	1056	7.402	3.267	H140	120S40	2	11
16.0	1181	2.9	47.0	970	7.025	3.354	H100	120S40	2	10
16.0	1169	5.8	48.0	915	8.030	3.389	H210	120S40	2	13
21.0	884	3.3	63.0	828	7.036	4.480	H140	120S40	2	11
21.0	861	2.4	65.0	766	6.835	4.600	H100	120S40	2	10
22.0	852	4.8	65.0	754	7.477	4.648	H210	120S40	2	13
22.0	852	5.6	65.0	777	7.315	4.648	H320	120S40	2	14
27.0	691	2.8	81.0	691	6.859	5.733	H140	120S40	2	11
27.0	691	5.9	81.0	616	9.366	5.733	H600	120S40	2	29
27.0	673	2.1	81.0	673	6.736	5.887	H100	120S40	2	10
28.0	655	5.9	85.0	584	8.731	6.045	H450	120S40	2	18
28.0	651	5.8	86.0	510	8.155	6.083	H320	120S40	2	14
29.0	634	3.9	88.0	461	7.684	6.250	H210	120S40	2	13
29.0	631	2.6	88.0	631	6.809	6.272	H140	120S40	2	11
30.0	615	2.0	83.0	615	6.707	6.440	H100	120S40	2	10
31.0	599	5.6	93.0	546	8.476	6.613	H450	120S40	2	18
37.0	495	2.3	113	495	6.711	8.000	H140	120S40	2	11
38.0	482	1.7	92.0	482	6.648	8.214	H100	120S40	2	10
39.0	475	4.6	117	418	7.544	8.343	H320	120S40	2	14
40.0	462	3.1	121	376	7.293	8.571	H210	120S40	2	13
42.0	439	2.0	117	377	6.842	9.029	H140	120S40	2	11
46.0	404	2.0	125	404	6.655	9.800	H140	120S40	2	11
47.0	394	1.5	99.0	394	6.613	10.063	H100	120S40	2	10
50.0	371	3.9	150	345	7.223	10.677	H320	120S40	2	14
52.0	352	5.5	158	310	8.237	11.262	H450	120S40	2	18
53.0	350	5.9	159	312	8.569	11.330	H600	120S40	2	29
53.0	349	1.4	100	307	6.675	11.360	H100	120S40	2	10
54.0	343	1.7	128	323	6.740	11.554	H140	120S40	2	11
54.0	339	3.6	164	323	7.125	11.680	H320	120S40	2	14
56.0	330	2.4	169	292	6.997	12.000	H210	120S40	2	13
57.0	321	5.2	173	289	8.063	12.320	H450	120S40	2	18
58.0	320	5.6	174	291	8.341	12.395	H600	120S40	2	29
59.0	313	1.6	132	299	6.710	12.640	H140	120S40	2	11
67.0	273	1.1	100	253	6.629	14.490	H100	120S40	2	10
67.0	273	5.9	204	245	9.561	14.490	H850	120S40	2	38
69.0	266	3.1	210	266	6.944	14.898	H320	120S40	2	14
71.0	259	2.0	200	259	6.865	15.306	H210	120S40	2	13
73.0	252	4.4	221	241	7.669	15.714	H450	120S40	2	18
74.0	251	4.8	222	243	7.840	15.810	H600	120S40	2	29
75.0	246	1.4	140	246	6.650	16.122	H140	120S40	2	11
85.0	217	2.7	257	217	6.838	18.250	H320	120S40	2	14
87.0	211	1.7	210	211	6.785	18.750	H210	120S40	2	13
90.0	206	3.6	271	206	7.425	19.250	H450	120S40	2	18
90.0	205	4.1	272	205	7.538	19.367	H600	120S40	2	29
92.0	201	1.1	140	201	6.614	19.750	H140	120S40	2	11
108	171	4.1	325	171	8.153	23.103	H850	120S40	2	38
111	167	2.1	320	167	6.709	23.754	H320	120S40	2	14
114	162	1.3	210	162	6.679	24.405	H210	120S40	2	13
117	158	2.8	352	158	7.012	25.056	H450	120S40	2	18
117	157	3.3	355	157	7.079	25.207	H600	120S40	2	29

Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors



Inverter operation							Geared motor		Number of stages	
M ₂	n ₂	c	M _{2, max}	n _{2, th}	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
132	140	3.9	398	140	7.641	28.315	H850	120S40	2	38
138	134	1.9	320	134	6.652	29.548	H320	120S40	2	14
141	130	1.2	210	130	6.632	30.357	H210	120S40	2	13
143	127	3.0	432	127	7.608	31.197	H600	120S40	3	30
145	127	2.6	438	127	6.879	31.167	H450	120S40	2	18
146	126	3.1	441	126	6.923	31.356	H600	120S40	2	29
166	111	3.9	502	111	8.825	35.689	H1500	120S40	2	68
173	107	3.1	523	107	7.219	37.190	H850	120S40	2	38
173	105	3.6	524	105	8.432	37.799	H850	120S40	3	39
183	99.2	2.4	553	99.2	7.262	39.925	H600	120S40	3	30
188	98.2	2.2	450	98.2	6.738	40.333	H450	120S40	2	18
189	97.6	2.7	558	97.6	6.764	40.578	H600	120S40	2	29
190	95.8	3.2	573	95.8	8.226	41.350	H850	120S40	3	39
200	90.7	2.2	600	90.7	7.158	43.676	H600	120S40	3	30
202	91.4	3.6	609	91.4	8.211	43.313	H1500	120S40	2	68
210	87.7	2.8	635	87.7	7.031	45.136	H850	120S40	2	38
228	80.9	1.5	366	80.9	6.675	48.950	H450	120S40	2	18
229	80.4	1.8	456	80.4	6.693	49.247	H600	120S40	2	29
229	79.4	1.6	450	79.4	6.856	49.867	H450	120S40	3	18
242	75.1	2.9	731	75.1	7.769	52.743	H850	120S40	3	39
255	72.3	2.9	770	72.3	7.634	54.750	H1500	120S40	2	68
256	71.1	1.9	600	71.1	6.964	55.710	H600	120S40	3	30
296	61.3	2.4	850	61.3	7.492	64.610	H850	120S40	3	39
313	58.0	1.6	600	58.0	6.851	68.244	H600	120S40	3	30
320	56.7	1.2	450	56.7	6.717	69.813	H450	120S40	3	18
361	50.3	3.4	1092	50.3	9.283	78.794	H1500	120S40	3	70
386	47.1	2.0	850	47.1	7.051	84.096	H850	120S40	3	39
407	44.6	1.3	600	44.6	6.717	88.826	H600	120S40	3	30
408	44.5	1.0	450	44.5	6.655	89.048	H450	120S40	3	18
480	37.9	1.6	850	37.9	6.905	104.607	H850	120S40	3	39
507	35.8	1.1	600	35.8	6.657	110.491	H600	120S40	3	30
576	31.5	2.4	1500	31.5	8.172	125.632	H1500	120S40	3	70
621	29.3	1.3	850	29.3	6.753	135.373	H850	120S40	3	39
706	25.7	1.9	1500	25.7	7.568	153.976	H1500	120S40	3	70
754	24.1	1.0	850	24.1	6.686	164.294	H850	120S40	3	39
775	23.4	3.5	2342	23.4	8.761	168.993	H3000	120S40	3	115
928	19.6	1.5	1500	19.6	7.176	202.237	H1500	120S40	3	70
941	19.3	2.9	2842	19.3	8.167	205.096	H3000	120S40	3	115
1017	17.6	1.3	1500	17.6	7.222	225.125	H1500	120S40	4	73
1024	17.5	2.4	2650	17.5	7.552	226.604	H3000	120S40	4	118
1126	16.1	1.2	1500	16.1	7.003	245.442	H1500	120S40	3	70
1189	15.3	2.3	3000	15.3	7.607	259.250	H3000	120S40	3	115
1272	14.1	1.1	1500	14.1	6.866	281.416	H1500	120S40	4	73
1322	13.5	2.1	3000	13.5	7.719	292.511	H3000	120S40	4	118
1701	10.5	1.6	3000	10.5	7.170	376.393	H3000	120S40	4	118
2065	8.7	1.3	3000	8.7	7.081	457.048	H3000	120S40	4	118
2214	8.1	1.2	3000	8.1	6.906	489.908	H3000	120S40	4	118
2688	6.7	1.0	3000	6.7	6.853	594.888	H3000	120S40	4	118



Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors

2.9 kW

Inverter operation							Geared motor		Number of stages	
M ₂	n ₂	c	M _{2, max}	n _{2, th}	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
28.0	956	3.5	85.0	830	17.230	3.389	H210	140S32	2	16
28.0	956	4.6	85.0	875	16.925	3.389	H320	140S32	2	17
37.0	723	5.5	113	674	19.953	4.480	H600	140S32	2	32
38.0	697	2.9	117	684	16.677	4.648	H210	140S32	2	16
38.0	697	3.8	117	697	16.515	4.648	H320	140S32	2	17
39.0	686	5.5	119	639	18.913	4.724	H450	140S32	2	21
44.0	604	5.9	135	548	22.088	5.368	H850	140S32	2	41
47.0	565	4.7	145	565	18.566	5.733	H600	140S32	2	32
50.0	536	4.7	152	536	17.931	6.045	H450	140S32	2	21
50.0	533	3.5	153	463	17.355	6.083	H320	140S32	2	17
52.0	518	2.4	158	415	16.884	6.250	H210	140S32	2	16
53.0	502	5.9	163	409	20.144	6.456	H600	140S32	2	32
55.0	490	4.5	167	490	17.676	6.613	H450	140S32	2	21
69.0	388	2.8	210	379	16.744	8.343	H320	140S32	2	17
71.0	378	1.9	171	333	16.493	8.571	H210	140S32	2	16
73.0	368	3.9	222	321	18.104	8.800	H450	140S32	2	21
73.0	366	5.2	223	337	18.647	8.853	H600	140S32	2	32
84.0	319	5.9	256	290	20.829	10.143	H850	140S32	2	41
88.0	304	2.3	265	304	16.423	10.677	H320	140S32	2	17
93.0	288	3.3	284	281	17.437	11.262	H450	140S32	2	21
93.0	286	4.4	286	286	17.769	11.330	H600	140S32	2	32
94.0	285	5.5	287	265	19.923	11.360	H850	140S32	2	41
96.0	277	2.2	271	277	16.325	11.680	H320	140S32	2	17
99.0	270	1.5	186	244	16.197	12.000	H210	140S32	2	16
102	263	3.1	311	263	17.263	12.320	H450	140S32	2	21
102	261	4.2	313	261	17.541	12.395	H600	140S32	2	32
113	237	5.8	345	214	25.763	13.673	H1500	140S32	2	71
119	224	4.6	366	224	18.761	14.490	H850	140S32	2	41
123	218	1.9	294	218	16.144	14.898	H320	140S32	2	17
126	212	1.2	200	209	16.065	15.306	H210	140S32	2	16
130	206	2.6	396	206	16.869	15.714	H450	140S32	2	21
130	205	3.6	399	205	17.040	15.810	H600	140S32	2	32
146	183	4.0	448	183	18.087	17.750	H850	140S32	2	41
151	178	1.6	313	178	16.038	18.250	H320	140S32	2	17
155	173	1.1	210	173	15.985	18.750	H210	140S32	2	16
159	168	2.2	448	168	16.625	19.250	H450	140S32	2	21
160	167	2.9	489	167	16.738	19.367	H600	140S32	2	32
187	143	3.9	573	143	20.466	22.711	H1500	140S32	2	71
191	140	3.2	583	140	17.353	23.103	H850	140S32	2	41
207	129	1.7	450	129	16.212	25.056	H450	140S32	2	21
208	129	2.2	600	129	16.279	25.207	H600	140S32	2	32
227	118	3.8	696	118	19.327	27.578	H1500	140S32	2	71
234	114	3.1	714	114	16.841	28.315	H850	140S32	2	41
240	110	2.7	734	110	18.423	29.536	H850	140S32	3	42
246	109	3.8	752	109	23.004	29.822	H3000	140S32	2	113
253	104	1.8	600	104	16.808	31.197	H600	140S32	3	33
257	104	1.5	450	104	16.079	31.167	H450	140S32	2	21
259	103	2.0	600	103	16.123	31.356	H600	140S32	2	32
294	90.8	3.1	900	90.8	18.025	35.689	H1500	140S32	2	71
298	89.5	3.1	913	89.5	21.077	36.193	H3000	140S32	2	113
307	87.1	2.4	844	87.1	16.419	37.190	H850	140S32	2	41

Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors



Inverter operation							Geared motor		Number of stages	
M_2	n_2	c	$M_{2, \max}$	$n_{2, th}$	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
307	85.7	2.1	850	85.7	17.632	37.799	H850	140S32	3	42
324	81.2	1.4	600	81.2	16.462	39.925	H600	140S32	3	33
336	78.4	2.0	850	78.4	17.426	41.350	H850	140S32	3	42
355	74.2	1.3	600	74.2	16.358	43.676	H600	140S32	3	33
357	74.8	2.8	1034	74.8	17.411	43.313	H1500	140S32	2	71
372	71.8	2.2	850	71.8	16.231	45.136	H850	140S32	2	41
377	70.8	2.8	1092	70.8	19.243	45.750	H3000	140S32	2	113
428	61.4	1.7	850	61.4	16.969	52.743	H850	140S32	3	42
452	59.2	2.3	1068	59.2	16.834	54.750	H1500	140S32	2	71
453	58.2	1.2	600	58.2	16.164	55.710	H600	140S32	3	33
502	52.4	2.6	1500	52.4	19.857	61.774	H1500	140S32	3	73
525	50.1	1.4	850	50.1	16.692	64.610	H850	140S32	3	42
526	50.0	5.0	1609	50.0	25.327	64.744	H3000	140S32	3	118
640	41.1	2.1	1500	41.1	18.483	78.794	H1500	140S32	3	73
683	38.5	1.2	850	38.5	16.251	84.096	H850	140S32	3	42
784	33.6	1.9	1500	33.6	17.902	96.522	H1500	140S32	3	73
874	30.1	3.4	2672	30.1	20.308	107.541	H3000	140S32	3	118
1021	25.8	1.4	1500	25.8	17.372	125.632	H1500	140S32	3	73
1061	24.8	2.8	3000	24.8	19.219	130.585	H3000	140S32	3	118
1251	21.0	1.2	1500	21.0	16.768	153.976	H1500	140S32	3	73
1373	19.2	2.1	3000	19.2	17.961	168.993	H3000	140S32	3	118
1666	15.8	1.8	3000	15.8	17.367	205.096	H3000	140S32	3	118
1813	14.3	1.4	2650	14.3	16.752	226.604	H3000	140S32	4	121
2106	12.5	1.4	3000	12.5	16.807	259.250	H3000	140S32	3	118
2340	11.1	1.3	3000	11.1	16.919	292.511	H3000	140S32	4	121



Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors

3.1 kW

Inverter operation							Geared motor		Number of stages	
M ₂	n ₂	c	M _{2, max}	n _{2, th}	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
23.0	1212	2.5	82.0	971	13.302	3.267	H140	120M40	2	14
24.0	1181	1.9	62.0	871	12.925	3.354	H100	120M40	2	13
24.0	1169	3.8	95.0	842	13.930	3.389	H210	120M40	2	15
24.0	1169	4.2	95.0	860	13.625	3.389	H320	120M40	2	17
32.0	884	2.1	94.0	766	12.936	4.480	H140	120M40	2	14
33.0	861	1.6	72.0	661	12.735	4.600	H100	120M40	2	13
33.0	852	3.1	131	694	13.377	4.648	H210	120M40	2	15
33.0	852	4.0	131	728	13.215	4.648	H320	120M40	2	17
41.0	691	1.8	103	668	12.759	5.733	H140	120M40	2	14
41.0	691	4.1	161	576	15.266	5.733	H600	120M40	2	32
42.0	673	1.4	81.0	569	12.636	5.887	H100	120M40	2	13
43.0	655	4.1	170	546	14.631	6.045	H450	120M40	2	21
44.0	651	3.8	171	469	14.055	6.083	H320	120M40	2	17
45.0	634	2.6	158	421	13.584	6.250	H210	120M40	2	15
45.0	631	1.7	105	614	12.709	6.272	H140	120M40	2	14
46.0	615	1.3	83.0	529	12.607	6.440	H100	120M40	2	13
47.0	599	3.9	186	512	14.376	6.613	H450	120M40	2	21
57.0	495	1.5	117	495	12.611	8.000	H140	120M40	2	14
59.0	482	1.1	92.0	453	12.548	8.214	H100	120M40	2	13
60.0	475	3.0	235	385	13.444	8.343	H320	120M40	2	17
62.0	462	2.0	171	344	13.193	8.571	H210	120M40	2	15
65.0	439	1.3	117	310	12.742	9.029	H140	120M40	2	14
70.0	404	1.3	125	404	12.555	9.800	H140	120M40	2	14
77.0	371	2.5	265	319	13.123	10.677	H320	120M40	2	17
81.0	352	3.6	317	285	14.137	11.262	H450	120M40	2	21
81.0	350	4.1	319	291	14.469	11.330	H600	120M40	2	32
83.0	343	1.1	128	263	12.640	11.554	H140	120M40	2	14
84.0	339	2.3	271	299	13.025	11.680	H320	120M40	2	17
86.0	330	1.6	186	252	12.897	12.000	H210	120M40	2	15
88.0	321	3.4	347	266	13.963	12.320	H450	120M40	2	21
89.0	320	3.9	349	273	14.241	12.395	H600	120M40	2	32
91.0	313	1.1	132	248	12.610	12.640	H140	120M40	2	14
104	273	4.1	408	229	15.461	14.490	H850	120M40	2	41
107	266	2.0	294	266	12.844	14.898	H320	120M40	2	17
110	259	1.3	200	216	12.765	15.306	H210	120M40	2	15
113	252	2.8	441	224	13.569	15.714	H450	120M40	2	21
114	251	3.3	445	229	13.740	15.810	H600	120M40	2	32
131	217	1.7	313	217	12.738	18.250	H320	120M40	2	17
135	211	1.1	210	187	12.685	18.750	H210	120M40	2	15
138	206	2.4	448	206	13.325	19.250	H450	120M40	2	21
139	205	2.9	545	205	13.438	19.367	H600	120M40	2	32
166	171	2.9	650	171	14.053	23.103	H850	120M40	2	41
171	167	1.4	320	167	12.609	23.754	H320	120M40	2	17
180	158	1.8	450	158	12.912	25.056	H450	120M40	2	21
181	157	2.3	572	157	12.979	25.207	H600	120M40	2	32
203	140	2.8	684	140	13.541	28.315	H850	120M40	2	41
212	134	1.2	320	134	12.552	29.548	H320	120M40	2	17
221	127	2.0	600	122	13.508	31.197	H600	120M40	3	33
224	127	1.7	450	127	12.779	31.167	H450	120M40	2	21
225	126	2.2	593	126	12.823	31.356	H600	120M40	2	32
256	111	2.7	852	111	14.725	35.689	H1500	120M40	2	71

Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors



Inverter operation							Geared motor		Number of stages	
M_2	n_2	c	$M_{2, \max}$	$n_{2, th}$	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
267	107	2.2	704	107	13.119	37.190	H850	120M40	2	41
267	105	2.3	850	101	14.332	37.799	H850	120M40	3	42
282	99.2	1.5	600	93.3	13.162	39.925	H600	120M40	3	33
290	98.2	1.4	450	98.2	12.638	40.333	H450	120M40	2	21
291	97.6	1.8	558	97.6	12.664	40.578	H600	120M40	2	32
292	95.8	2.1	850	93.7	14.126	41.350	H850	120M40	3	42
309	90.7	1.4	600	85.8	13.058	43.676	H600	120M40	3	33
311	91.4	2.5	861	91.4	14.111	43.313	H1500	120M40	2	71
324	87.7	2.0	709	87.7	12.931	45.136	H850	120M40	2	41
353	79.4	1.1	450	67.0	12.756	49.867	H450	120M40	3	21
354	80.4	1.2	456	80.4	12.593	49.247	H600	120M40	2	32
373	75.1	1.9	850	75.1	13.669	52.743	H850	120M40	3	42
393	72.3	2.0	876	72.3	13.534	54.750	H1500	120M40	2	71
394	71.1	1.3	600	71.1	12.864	55.710	H600	120M40	3	33
457	61.3	1.5	850	61.3	13.392	64.610	H850	120M40	3	42
483	58.0	1.0	600	58.0	12.751	68.244	H600	120M40	3	33
557	50.3	2.2	1500	48.3	15.183	78.794	H1500	120M40	3	72
595	47.1	1.3	850	47.1	12.951	84.096	H850	120M40	3	42
740	37.9	1.1	850	37.9	12.805	104.607	H850	120M40	3	42
888	31.5	1.5	1500	31.5	14.072	125.632	H1500	120M40	3	72
1089	25.7	1.3	1500	25.7	13.468	153.976	H1500	120M40	3	72
1195	23.4	2.3	3000	23.4	14.661	168.993	H3000	120M40	3	117
1450	19.3	1.9	3000	19.3	14.067	205.096	H3000	120M40	3	117
1578	17.5	1.5	2650	17.5	13.452	226.604	H3000	120M40	4	120
1833	15.3	1.5	3000	15.3	13.507	259.250	H3000	120M40	3	117
2038	13.5	1.3	3000	13.5	13.619	292.511	H3000	120M40	4	120
2622	10.5	1.0	3000	10.5	13.070	376.393	H3000	120M40	4	120



Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors

3.7 kW

Inverter operation							Geared motor		Number of stages	
M ₂	n ₂	c	M _{2, max}	n _{2, th}	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
29.0	1212	5.1	139	785	25.100	3.267	H600	120L40	2	35
30.0	1169	3.1	126	809	19.730	3.389	H210	120L40	2	18
30.0	1169	4.0	145	854	19.425	3.389	H320	120L40	2	20
30.0	1150	5.1	147	745	23.143	3.444	H450	120L40	2	23
39.0	884	4.3	191	640	22.453	4.480	H600	120L40	2	35
41.0	852	2.6	143	667	19.177	4.648	H210	120L40	2	18
41.0	852	3.4	189	706	19.015	4.648	H320	120L40	2	20
41.0	838	4.3	202	607	21.413	4.724	H450	120L40	2	23
47.0	738	4.6	229	520	24.588	5.368	H850	120L40	2	43
50.0	691	3.6	245	560	21.066	5.733	H600	120L40	2	35
53.0	655	3.6	258	531	20.431	6.045	H450	120L40	2	23
53.0	651	3.1	227	451	19.855	6.083	H320	120L40	2	20
55.0	634	2.1	158	403	19.384	6.250	H210	120L40	2	18
56.0	613	5.1	276	397	22.644	6.456	H600	120L40	2	35
58.0	599	3.4	273	498	20.176	6.613	H450	120L40	2	23
73.0	475	2.5	249	370	19.244	8.343	H320	120L40	2	20
75.0	462	1.7	171	310	18.993	8.571	H210	120L40	2	18
77.0	450	3.5	370	313	20.604	8.800	H450	120L40	2	23
77.0	447	4.3	378	324	21.147	8.853	H600	120L40	2	35
89.0	390	4.6	433	275	23.329	10.143	H850	120L40	2	43
93.0	371	2.1	265	307	18.923	10.677	H320	120L40	2	20
98.0	352	2.9	400	274	19.937	11.262	H450	120L40	2	23
99.0	350	3.6	484	284	20.269	11.330	H600	120L40	2	35
99.0	349	4.2	485	252	22.423	11.360	H850	120L40	2	43
102	339	1.9	271	286	18.825	11.680	H320	120L40	2	20
105	330	1.3	186	231	18.697	12.000	H210	120L40	2	18
108	321	2.8	411	256	19.763	12.320	H450	120L40	2	23
108	320	3.4	511	266	20.041	12.395	H600	120L40	2	35
119	290	4.5	584	204	28.263	13.673	H1500	120L40	2	74
127	273	3.6	619	223	21.261	14.490	H850	120L40	2	43
130	266	1.6	294	246	18.644	14.898	H320	120L40	2	20
134	259	1.1	200	198	18.565	15.306	H210	120L40	2	18
137	252	2.3	441	216	19.369	15.714	H450	120L40	2	23
138	251	2.9	548	223	19.540	15.810	H600	120L40	2	35
155	223	3.1	656	193	20.587	17.750	H850	120L40	2	43
159	217	1.4	313	211	18.538	18.250	H320	120L40	2	20
168	206	1.9	448	199	19.125	19.250	H450	120L40	2	23
169	205	2.5	577	205	19.238	19.367	H600	120L40	2	35
198	174	3.0	833	150	22.966	22.711	H1500	120L40	2	74
202	171	2.5	686	171	19.853	23.103	H850	120L40	2	43
219	158	1.5	450	156	18.712	25.056	H450	120L40	2	23
220	157	2.0	600	157	18.779	25.207	H600	120L40	2	35
241	144	3.0	867	144	21.827	27.578	H1500	120L40	2	74
247	140	2.4	720	140	19.341	28.315	H850	120L40	2	43
254	134	2.4	850	112	20.923	29.536	H850	120L40	3	45
260	133	2.9	929	133	25.504	29.822	H3000	120L40	2	115
268	127	1.6	600	109	19.308	31.197	H600	120L40	3	35
272	127	1.4	450	127	18.579	31.167	H450	120L40	2	23
274	126	1.8	600	126	18.623	31.356	H600	120L40	2	35
312	111	2.4	900	111	20.525	35.689	H1500	120L40	2	74
316	109	2.5	941	109	23.577	36.193	H3000	120L40	2	115

Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors



Inverter operation							Geared motor		Number of stages	
M_2	n_2	c	$M_{2, \max}$	$n_{2, \text{th}}$	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
325	107	1.9	740	107	18.919	37.190	H850	120L40	2	43
325	105	1.9	850	95.0	20.132	37.799	H850	120L40	3	45
343	99.2	1.3	600	85.4	18.962	39.925	H600	120L40	3	35
356	95.8	1.7	850	85.8	19.926	41.350	H850	120L40	3	45
376	90.7	1.2	600	79.2	18.858	43.676	H600	120L40	3	35
378	91.4	2.2	912	91.4	19.911	43.313	H1500	120L40	2	74
394	87.7	1.7	749	87.7	18.731	45.136	H850	120L40	2	43
399	86.6	2.2	959	86.6	21.743	45.750	H3000	120L40	2	115
454	75.1	1.5	850	71.6	19.469	52.743	H850	120L40	3	45
478	72.3	1.8	930	72.3	19.334	54.750	H1500	120L40	2	74
479	71.1	1.0	600	69.4	18.664	55.710	H600	120L40	3	35
531	64.1	2.3	1500	53.0	22.357	61.774	H1500	120L40	3	75
556	61.3	1.3	850	61.3	19.192	64.610	H850	120L40	3	45
557	61.2	4.4	2722	55.7	27.827	64.744	H3000	120L40	3	120
678	50.3	1.8	1500	44.9	20.983	78.794	H1500	120L40	3	75
723	47.1	1.1	850	47.1	18.751	84.096	H850	120L40	3	45
830	41.0	1.7	1500	38.5	20.402	96.522	H1500	120L40	3	75
925	36.8	3.0	3000	36.8	22.808	107.541	H3000	120L40	3	120
1081	31.5	1.3	1500	31.5	19.872	125.632	H1500	120L40	3	75
1123	30.3	2.4	3000	30.3	21.719	130.585	H3000	120L40	3	120
1324	25.7	1.0	1500	25.7	19.268	153.976	H1500	120L40	3	75
1454	23.4	1.9	3000	23.4	20.461	168.993	H3000	120L40	3	120
1764	19.3	1.6	3000	19.3	19.867	205.096	H3000	120L40	3	120
1920	17.5	1.3	2650	17.5	19.252	226.604	H3000	120L40	4	123
2230	15.3	1.2	3000	15.3	19.307	259.250	H3000	120L40	3	120
2478	13.5	1.1	3000	13.5	19.419	292.511	H3000	120L40	4	123



Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors

4.8 kW

Inverter operation							Geared motor		Number of stages	
M ₂	n ₂	c	M _{2, max}	n _{2, th}	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
44.0	992	4.2	170	754	37.000	3.267	H600	140M32	2	37
46.0	956	2.1	126	746	31.630	3.389	H210	140M32	2	21
46.0	956	2.8	165	791	31.325	3.389	H320	140M32	2	22
47.0	941	4.2	179	717	35.043	3.444	H450	140M32	2	26
61.0	723	3.7	233	621	34.353	4.480	H600	140M32	2	37
63.0	697	1.8	143	591	31.077	4.648	H210	140M32	2	21
63.0	697	2.3	189	654	30.915	4.648	H320	140M32	2	22
64.0	686	3.5	245	585	33.313	4.724	H450	140M32	2	26
73.0	604	3.9	279	504	36.488	5.368	H850	140M32	2	46
78.0	565	3.1	298	543	32.966	5.733	H600	140M32	2	37
82.0	536	3.0	314	514	32.331	6.045	H450	140M32	2	26
83.0	533	2.1	227	416	31.755	6.083	H320	140M32	2	22
85.0	518	1.4	158	335	31.284	6.250	H210	140M32	2	21
88.0	502	3.6	335	369	34.544	6.456	H600	140M32	2	37
90.0	490	2.9	334	481	32.076	6.613	H450	140M32	2	26
113	388	1.7	249	324	31.144	8.343	H320	140M32	2	22
116	378	1.1	171	257	30.893	8.571	H210	140M32	2	21
120	368	2.4	370	289	32.504	8.800	H450	140M32	2	26
120	366	3.1	460	304	33.047	8.853	H600	140M32	2	37
138	319	3.7	526	264	35.229	10.143	H850	140M32	2	46
145	304	1.4	265	258	30.823	10.677	H320	140M32	2	22
153	288	2.0	400	253	31.837	11.262	H450	140M32	2	26
154	286	2.7	537	268	32.169	11.330	H600	140M32	2	37
154	285	3.5	590	242	34.323	11.360	H850	140M32	2	46
159	277	1.3	271	240	30.725	11.680	H320	140M32	2	22
167	263	1.9	411	234	31.663	12.320	H450	140M32	2	26
168	261	2.5	553	250	31.941	12.395	H600	140M32	2	37
186	237	3.9	710	197	40.163	13.673	H1500	140M32	2	76
197	224	3.0	752	215	33.161	14.490	H850	140M32	2	46
202	218	1.1	294	207	30.544	14.898	H320	140M32	2	22
213	206	1.6	441	188	31.269	15.714	H450	140M32	2	26
215	205	2.2	600	205	31.440	15.810	H600	140M32	2	37
241	183	2.6	814	183	32.487	17.750	H850	140M32	2	46
261	168	1.3	448	164	31.025	19.250	H450	140M32	2	26
263	167	1.8	600	167	31.138	19.367	H600	140M32	2	37
308	143	2.6	1036	143	34.866	22.711	H1500	140M32	2	76
314	140	2.1	850	140	31.753	23.103	H850	140M32	2	46
340	129	1.0	450	129	30.612	25.056	H450	140M32	2	26
342	129	1.4	600	129	30.679	25.207	H600	140M32	2	37
375	118	2.5	1078	118	33.727	27.578	H1500	140M32	2	76
385	114	1.9	850	114	31.241	28.315	H850	140M32	2	46
395	110	1.7	850	97.1	32.823	29.536	H850	140M32	3	47
405	109	2.5	1152	109	37.404	29.822	H3000	140M32	2	118
417	104	1.1	600	90.7	31.208	31.197	H600	140M32	3	38
426	103	1.2	600	103	30.523	31.356	H600	140M32	2	37
485	90.8	2.0	1115	90.8	32.425	35.689	H1500	140M32	2	76
492	89.5	2.1	1173	89.5	35.477	36.193	H3000	140M32	2	118
505	87.1	1.5	850	87.1	30.819	37.190	H850	140M32	2	46
506	85.7	1.3	850	77.0	32.032	37.799	H850	140M32	3	47
553	78.4	1.2	850	70.7	31.826	41.350	H850	140M32	3	47
588	74.8	1.9	1130	74.8	31.811	43.313	H1500	140M32	2	76

Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors



Inverter operation							Geared motor		Number of stages	
M_2	n_2	c	$M_{2, \max}$	$n_{2, \text{th}}$	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
613	71.8	1.4	850	71.8	30.631	45.136	H850	140M32	2	46
621	70.8	1.9	1203	70.8	33.643	45.750	H3000	140M32	2	118
706	61.4	1.1	850	61.1	31.369	52.743	H850	140M32	3	47
744	59.2	1.5	1153	59.2	31.234	54.750	H1500	140M32	2	76
827	52.4	1.6	1500	45.2	34.257	61.774	H1500	140M32	3	78
866	50.0	3.0	3000	50.0	39.727	64.744	H3000	140M32	3	123
1054	41.1	1.3	1500	36.5	32.883	78.794	H1500	140M32	3	78
1291	33.6	1.1	1500	32.3	32.302	96.522	H1500	140M32	3	78
1439	30.1	2.0	3000	30.1	34.708	107.541	H3000	140M32	3	123
1747	24.8	1.7	3000	24.8	33.619	130.585	H3000	140M32	3	123
2261	19.2	1.3	3000	19.2	32.361	168.993	H3000	140M32	3	123
2744	15.8	1.1	3000	15.8	31.767	205.096	H3000	140M32	3	123



Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors

5 kW

Inverter operation							Geared motor		Number of stages	
M ₂	n ₂	c	M _{2, max}	n _{2, th}	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
49.0	953	5.0	217	695	74.897	3.147	H850	190S30	2	51
51.0	918	3.8	225	738	67.700	3.267	H600	190S30	2	42
53.0	871	3.8	237	701	65.743	3.444	H450	190S30	2	31
68.0	688	4.4	300	563	69.586	4.362	H850	190S30	2	51
70.0	670	3.4	297	611	65.053	4.480	H600	190S30	2	42
73.0	635	3.2	293	572	64.013	4.724	H450	190S30	2	31
83.0	559	4.1	370	509	67.188	5.368	H850	190S30	2	51
89.0	523	3.0	339	523	63.666	5.733	H600	190S30	2	42
92.0	505	4.7	410	364	71.232	5.946	H850	190S30	2	51
94.0	496	2.7	323	496	63.031	6.045	H450	190S30	2	31
97.0	480	5.4	430	374	79.663	6.245	H1500	190S30	2	81
100	465	3.2	404	361	65.244	6.456	H600	190S30	2	42
103	454	2.6	334	454	62.776	6.613	H450	190S30	2	31
128	364	3.8	568	289	67.678	8.241	H850	190S30	2	51
137	341	2.2	370	282	63.204	8.800	H450	190S30	2	31
137	339	2.8	487	297	63.747	8.853	H600	190S30	2	42
157	296	3.4	667	258	65.929	10.143	H850	190S30	2	51
175	266	1.8	400	239	62.537	11.262	H450	190S30	2	31
176	265	2.4	537	261	62.869	11.330	H600	190S30	2	42
176	264	5.0	782	221	73.606	11.356	H1500	190S30	2	81
176	264	3.1	696	237	65.023	11.360	H850	190S30	2	51
180	258	5.4	800	201	91.115	11.619	H3000	190S30	2	123
191	244	1.7	411	220	62.363	12.320	H450	190S30	2	31
192	242	2.3	553	242	62.641	12.395	H600	190S30	2	42
212	219	4.4	942	202	70.863	13.673	H1500	190S30	2	81
225	207	2.7	758	207	63.861	14.490	H850	190S30	2	51
244	191	1.4	441	179	61.969	15.714	H450	190S30	2	31
245	190	1.9	600	190	62.140	15.810	H600	190S30	2	42
260	179	3.7	1155	174	68.634	16.763	H1500	190S30	2	81
276	169	2.3	814	169	63.187	17.750	H850	190S30	2	51
291	160	3.7	1292	155	76.000	18.752	H3000	190S30	2	123
299	156	1.2	448	156	61.725	19.250	H450	190S30	2	31
301	155	1.6	600	155	61.838	19.367	H600	190S30	2	42
353	132	2.9	1293	132	65.566	22.711	H1500	190S30	2	81
358	130	3.1	1386	130	72.150	23.044	H3000	190S30	2	123
359	130	1.9	850	130	62.453	23.103	H850	190S30	2	51
391	119	1.2	600	119	61.379	25.207	H600	190S30	2	42
428	109	2.8	1341	109	64.427	27.578	H1500	190S30	2	81
440	106	1.7	850	106	61.941	28.315	H850	190S30	2	51
452	102	1.5	850	91.5	63.523	29.536	H850	190S30	3	52
463	101	2.8	1435	101	68.104	29.822	H3000	190S30	2	123
554	84.1	2.3	1389	84.1	63.125	35.689	H1500	190S30	2	81
562	82.9	2.3	1454	82.9	66.177	36.193	H3000	190S30	2	123
578	79.4	1.2	850	72.9	62.732	37.799	H850	190S30	3	52
632	72.6	1.1	850	67.3	62.526	41.350	H850	190S30	3	52
672	69.3	2.1	1408	69.3	62.511	43.313	H1500	190S30	2	81
685	66.9	1.7	1500	54.9	67.204	44.814	H1500	190S30	3	83
710	65.6	2.1	1478	65.6	64.343	45.750	H3000	190S30	2	123
722	63.6	3.5	2830	58.8	76.542	47.186	H3000	190S30	3	128
822	55.8	3.2	2950	55.4	72.974	53.770	H3000	190S30	3	128
945	48.6	1.4	1500	42.7	64.957	61.774	H1500	190S30	3	83

Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors



Inverter operation							Geared motor		Number of stages	
M_2	n_2	c	$M_{2, \max}$	$n_{2, \text{th}}$	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
990	46.3	2.7	3000	46.3	70.427	64.744	H3000	190S30	3	128
1205	38.1	1.1	1500	34.7	63.583	78.794	H1500	190S30	3	83
1214	37.8	2.2	3000	37.8	68.344	79.375	H3000	190S30	3	128
1476	31.1	1.0	1500	30.9	63.002	96.522	H1500	190S30	3	83
1644	27.9	1.8	3000	27.9	65.408	107.541	H3000	190S30	3	128
1997	23.0	1.5	3000	23.0	64.319	130.585	H3000	190S30	3	128
2584	17.8	1.2	3000	17.8	63.061	168.993	H3000	190S30	3	128



Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors

5.9 kW

Inverter operation							Geared motor		Number of stages	
M ₂	n ₂	c	M _{2, max}	n _{2, th}	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
53.0	1030	4.5	244	678	58.697	3.147	H850	140L32	2	51
55.0	992	3.4	240	720	51.500	3.267	H600	140L32	2	42
57.0	956	2.2	165	755	45.825	3.389	H320	140L32	2	27
58.0	941	3.4	256	685	49.543	3.444	H450	140L32	2	31
74.0	743	3.8	339	544	53.386	4.362	H850	140L32	2	51
76.0	723	3.0	297	598	48.853	4.480	H600	140L32	2	42
78.0	697	1.9	189	612	45.415	4.648	H320	140L32	2	27
80.0	686	2.8	293	559	47.813	4.724	H450	140L32	2	31
91.0	604	3.3	388	486	50.988	5.368	H850	140L32	2	51
97.0	565	2.6	325	525	47.466	5.733	H600	140L32	2	42
100	545	4.3	462	355	55.032	5.946	H850	140L32	2	51
102	536	2.5	323	491	46.831	6.045	H450	140L32	2	31
103	533	1.7	227	378	46.255	6.083	H320	140L32	2	27
105	519	4.1	485	353	63.463	6.245	H1500	140L32	2	81
109	502	2.9	404	352	49.044	6.456	H600	140L32	2	42
112	490	2.3	334	460	46.576	6.613	H450	140L32	2	31
139	393	3.4	615	282	51.478	8.241	H850	140L32	2	51
141	388	1.4	249	288	45.644	8.343	H320	140L32	2	27
149	368	1.9	370	273	47.004	8.800	H450	140L32	2	31
149	366	2.5	487	290	47.547	8.853	H600	140L32	2	42
171	319	3.0	667	252	49.729	10.143	H850	140L32	2	51
180	304	1.1	265	235	45.323	10.677	H320	140L32	2	27
190	288	1.6	400	224	46.337	11.262	H450	140L32	2	31
191	286	2.2	537	255	46.669	11.330	H600	140L32	2	42
192	285	3.7	881	208	57.406	11.356	H1500	140L32	2	81
192	285	2.8	696	231	48.823	11.360	H850	140L32	2	51
196	279	4.1	902	190	74.915	11.619	H3000	140L32	2	123
197	277	1.1	271	221	45.225	11.680	H320	140L32	2	27
208	263	1.5	411	207	46.163	12.320	H450	140L32	2	31
209	261	2.1	553	239	46.441	12.395	H600	140L32	2	42
231	237	3.3	979	190	54.663	13.673	H1500	140L32	2	81
245	224	2.4	758	206	47.661	14.490	H850	140L32	2	51
265	206	1.3	441	171	45.769	15.714	H450	140L32	2	31
267	205	1.7	600	195	45.940	15.810	H600	140L32	2	42
283	193	2.8	1031	164	52.434	16.763	H1500	140L32	2	81
300	183	2.1	814	179	46.987	17.750	H850	140L32	2	51
317	173	2.8	1141	147	59.800	18.752	H3000	140L32	2	123
325	168	1.1	448	148	45.525	19.250	H450	140L32	2	31
327	167	1.4	600	167	45.638	19.367	H600	140L32	2	42
383	143	2.2	1093	141	49.366	22.711	H1500	140L32	2	81
389	141	2.3	1169	134	55.950	23.044	H3000	140L32	2	123
390	140	1.7	850	140	46.253	23.103	H850	140L32	2	51
426	129	1.1	600	129	45.179	25.207	H600	140L32	2	42
466	118	2.2	1137	118	48.227	27.578	H1500	140L32	2	81
478	114	1.6	850	114	45.741	28.315	H850	140L32	2	51
491	110	1.3	850	86.5	47.323	29.536	H850	140L32	3	52
503	109	2.1	1215	109	51.904	29.822	H3000	140L32	2	123
602	90.8	1.7	1181	90.8	46.925	35.689	H1500	140L32	2	81
611	89.5	1.8	1240	89.5	49.977	36.193	H3000	140L32	2	123
629	85.7	1.1	850	69.2	46.532	37.799	H850	140L32	3	52
731	74.8	1.6	1198	74.8	46.311	43.313	H1500	140L32	2	81

Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors



Inverter operation							Geared motor		Number of stages	
M_2	n_2	c	$M_{2, \max}$	$n_{2, \text{th}}$	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
745	72.3	1.6	1500	51.6	51.004	44.814	H1500	140L32	3	83
772	70.8	1.6	1265	70.8	48.143	45.750	H3000	140L32	2	123
785	68.7	3.2	2830	57.4	60.342	47.186	H3000	140L32	3	128
894	60.3	2.9	2950	54.1	56.774	53.770	H3000	140L32	3	128
1027	52.4	1.3	1500	40.4	48.757	61.774	H1500	140L32	3	83
1077	50.0	2.5	3000	48.9	54.227	64.744	H3000	140L32	3	128
1310	41.1	1.0	1500	33.0	47.383	78.794	H1500	140L32	3	83
1320	40.8	2.0	3000	40.8	52.144	79.375	H3000	140L32	3	128
1788	30.1	1.6	3000	30.1	49.208	107.541	H3000	140L32	3	128
2171	24.8	1.4	3000	24.8	48.119	130.585	H3000	140L32	3	128
2810	19.2	1.0	3000	19.2	46.861	168.993	H3000	140L32	3	128



Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors

7.5 kW

Inverter operation							Geared motor		Number of stages	
M ₂	n ₂	c	M _{2, max}	n _{2, th}	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
73.0	953	3.3	306	634	131.097	3.147	H850	190M30	2	60
76.0	918	2.5	240	674	123.900	3.267	H600	190M30	2	51
80.0	871	2.5	256	641	121.943	3.444	H450	190M30	2	40
102	688	3.0	378	515	125.786	4.362	H850	190M30	2	60
104	670	2.3	297	560	121.253	4.480	H600	190M30	2	51
110	635	2.1	293	523	120.213	4.724	H450	190M30	2	40
125	559	2.7	429	466	123.388	5.368	H850	190M30	2	60
134	523	2.0	339	496	119.866	5.733	H600	190M30	2	51
138	505	3.2	551	332	127.432	5.946	H850	190M30	2	60
141	496	1.8	323	447	119.231	6.045	H450	190M30	2	40
145	480	4.0	727	351	135.863	6.245	H1500	190M30	2	90
150	465	2.1	404	329	121.444	6.456	H600	190M30	2	51
154	454	1.7	334	411	118.976	6.613	H450	190M30	2	40
192	364	2.5	615	264	123.878	8.241	H850	190M30	2	60
205	341	1.4	370	231	119.404	8.800	H450	190M30	2	40
206	339	1.9	487	267	119.947	8.853	H600	190M30	2	51
236	296	2.2	667	235	122.129	10.143	H850	190M30	2	60
262	266	1.2	400	192	118.737	11.262	H450	190M30	2	40
264	265	1.6	537	222	119.069	11.330	H600	190M30	2	51
264	264	3.7	1219	207	129.806	11.356	H1500	190M30	2	90
265	264	2.1	696	217	121.223	11.360	H850	190M30	2	60
271	258	3.9	1341	189	147.315	11.619	H3000	190M30	2	132
287	244	1.1	411	179	118.563	12.320	H450	190M30	2	40
289	242	1.5	553	205	118.841	12.395	H600	190M30	2	51
318	219	3.2	1287	189	127.063	13.673	H1500	190M30	2	90
337	207	1.8	758	186	120.061	14.490	H850	190M30	2	60
368	190	1.3	600	170	118.340	15.810	H600	190M30	2	51
390	179	2.8	1358	163	124.834	16.763	H1500	190M30	2	90
413	169	1.6	814	157	119.387	17.750	H850	190M30	2	60
437	160	2.7	1494	146	132.200	18.752	H3000	190M30	2	132
451	155	1.1	600	147	118.038	19.367	H600	190M30	2	51
529	132	2.2	1434	132	121.766	22.711	H1500	190M30	2	90
537	130	2.3	1538	130	128.350	23.044	H3000	190M30	2	132
538	130	1.3	850	130	118.653	23.103	H850	190M30	2	60
642	109	2.1	1485	109	120.627	27.578	H1500	190M30	2	90
659	106	1.2	850	106	118.141	28.315	H850	190M30	2	60
677	102	1.0	850	75.1	119.723	29.536	H850	190M30	3	61
694	101	2.1	1591	101	124.304	29.822	H3000	190M30	2	132
831	84.1	1.6	1500	84.1	119.325	35.689	H1500	190M30	2	90
843	82.9	1.7	1615	82.9	122.377	36.193	H3000	190M30	2	132
1009	69.3	1.5	1500	69.3	118.711	43.313	H1500	190M30	2	90
1028	66.9	1.2	1500	44.1	123.404	44.814	H1500	190M30	3	92
1065	65.6	1.5	1642	65.6	120.543	45.750	H3000	190M30	2	132
1082	63.6	2.4	2830	53.6	132.742	47.186	H3000	190M30	3	137
1233	55.8	2.2	2950	50.4	129.174	53.770	H3000	190M30	3	137
1485	46.3	1.8	3000	44.3	126.627	64.744	H3000	190M30	3	137
1821	37.8	1.5	3000	35.8	124.544	79.375	H3000	190M30	3	137
2467	27.9	1.2	3000	27.9	121.608	107.541	H3000	190M30	3	137
2995	23.0	1.0	3000	23.0	120.519	130.585	H3000	190M30	3	137

Technical data

Selection tables

Inverter mains connection 400 V, Self-ventilated motors



9.2 kW

Inverter operation							Geared motor		Number of stages	
M ₂	n ₂	c	M _{2, max}	n _{2, th}	J	i	g500-	m850	z	m
Nm	rpm		Nm	rpm	kgcm ²					kg
107	801	2.4	306	586	207.097	3.147	H850	190L25	2	72
111	771	1.8	240	608	199.900	3.267	H600	190L25	2	64
117	732	1.8	256	581	197.943	3.444	H450	190L25	2	52
148	578	2.2	378	478	201.786	4.362	H850	190L25	2	72
152	563	1.6	297	489	197.253	4.480	H600	190L25	2	64
160	534	1.5	293	447	196.213	4.724	H450	190L25	2	52
162	530	3.7	716	399	220.688	4.758	H1500	190L25	2	103
182	469	2.0	429	433	199.388	5.368	H850	190L25	2	72
195	440	1.5	339	416	195.866	5.733	H600	190L25	2	64
202	424	2.3	551	307	203.432	5.946	H850	190L25	2	72
205	417	1.3	323	374	195.231	6.045	H450	190L25	2	52
212	404	3.1	793	333	211.863	6.245	H1500	190L25	2	103
219	390	1.6	404	281	197.444	6.456	H600	190L25	2	64
225	381	1.3	334	348	194.976	6.613	H450	190L25	2	52
258	332	3.7	1143	250	216.724	7.592	H1500	190L25	2	103
280	306	1.9	615	239	199.878	8.241	H850	190L25	2	72
299	286	1.0	370	198	195.404	8.800	H450	190L25	2	52
301	285	1.4	487	224	195.947	8.853	H600	190L25	2	64
344	249	1.6	667	203	198.129	10.143	H850	190L25	2	72
385	222	1.2	537	188	195.069	11.330	H600	190L25	2	64
386	222	2.9	1319	197	205.806	11.356	H1500	190L25	2	103
386	222	1.5	696	184	197.223	11.360	H850	190L25	2	72
395	217	3.1	1454	179	223.315	11.619	H3000	190L25	2	144
421	203	1.1	553	175	194.841	12.395	H600	190L25	2	64
464	184	2.5	1392	179	203.063	13.673	H1500	190L25	2	103
483	177	2.7	1530	160	216.535	14.233	H3000	190L25	2	144
492	174	1.3	758	156	196.061	14.490	H850	190L25	2	72
569	150	2.1	1450	146	200.834	16.763	H1500	190L25	2	103
603	142	1.1	814	135	195.387	17.750	H850	190L25	2	72
637	134	2.1	1617	131	208.200	18.752	H3000	190L25	2	144
771	111	1.6	1500	108	197.766	22.711	H1500	190L25	2	103
783	109	1.8	1661	106	204.350	23.044	H3000	190L25	2	144
936	91.4	1.5	1500	88.8	196.627	27.578	H1500	190L25	2	103
1013	84.5	1.6	1733	82.1	200.304	29.822	H3000	190L25	2	144
1229	69.6	1.4	1756	67.7	198.377	36.193	H3000	190L25	2	144
1578	53.4	1.7	2830	47.3	208.742	47.186	H3000	190L25	3	149
1799	46.9	1.6	2950	43.1	205.174	53.770	H3000	190L25	3	149
2166	38.9	1.3	3000	36.9	202.627	64.744	H3000	190L25	3	149
2655	31.7	1.1	3000	30.8	200.544	79.375	H3000	190L25	3	149



Dimensions

Notes on the basic dimensions

Gearbox	Without pre-stage	With pre-stage
g500-H45	2-stage	-
g500-H100 ... g500-H140	2-stage	3-stage
g500-H210 ... g500-H3000	2-/3-stage	4-stage

The ratio range of gearboxes with pre-stage is extended via an additional housing with gear stage between the gearbox and motor.

The basic dimensions are shown without pre-stage and are valid up to the following deviating dimensions for gearbox with pre-stage valid:

- Total length "L"
- Center distance "a" (gearbox output shaft – motor shaft)

Deviating dimensions: ▶ [Gearbox with pre-stage](#) [105](#)

Example

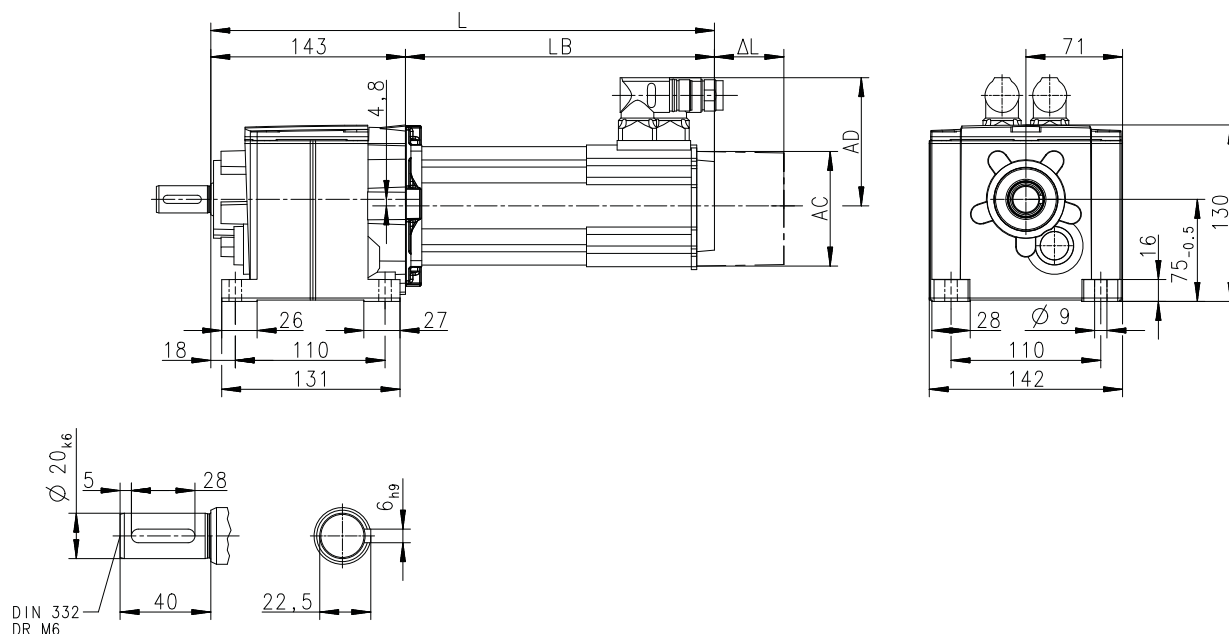
g500-H100

Gearbox version: Solid shaft with foot (VBR)

Explanation

Gearbox

▶ [Designs](#) [12](#)



Motor	m850-		
	S120/S3960	S120/M3960	S120/L3960
Table content			
Total length	L	Total length of the drive without brake	
Motor length	LB	Motor length without brake	
Length of motor options	Δ L	Additional length (with brake)	
Motor diameter	AC	Motor diameter	
Motor/connection distance	AD	Distance from motor center to connector end	



The dimensions shown in the dimensional drawings for the solid shafts with featherkey (V□□) also apply for solid shafts without a keyway (G□□).

Please observe the available output shaft designs!

▶ [The modular system](#) [10](#)

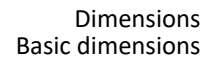
Technical data

Dimensions



If the mounting area (foot support) towards the motor is longer than the gearbox foot, some motors collide with the mounting area!

For an accurate check of the geometrical data, Lenze recommends the use of the »Product Finder« at **www.Lenze.com**.



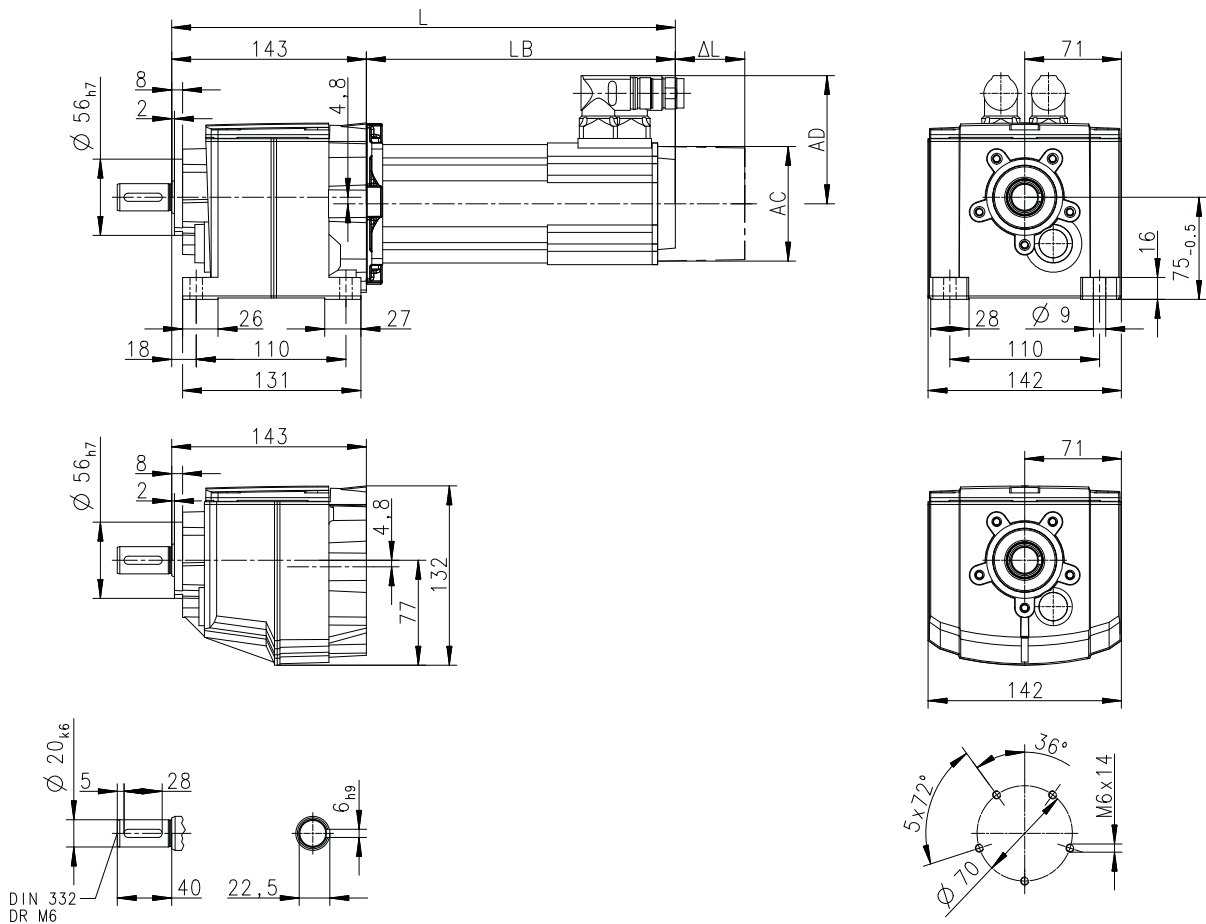
Technical data

Dimensions
Basic dimensions



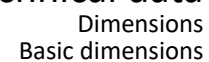
g500-H100, 2-stage

Gearbox version: Solid shaft with foot/centering (VAR/VCR)



8800090-00

Motor			m850-	
			S120/S3960	S120/M3960
Total length	L	mm	325	363
Motor length	LB		182	220
Length of motor options	Δ L	mm	46	
Motor diameter	AC	mm	121	
Motor/connection distance	AD	mm	102	



Gearbox version: Solid shaft and foot/flange (VAK/VCK)

8800089-03

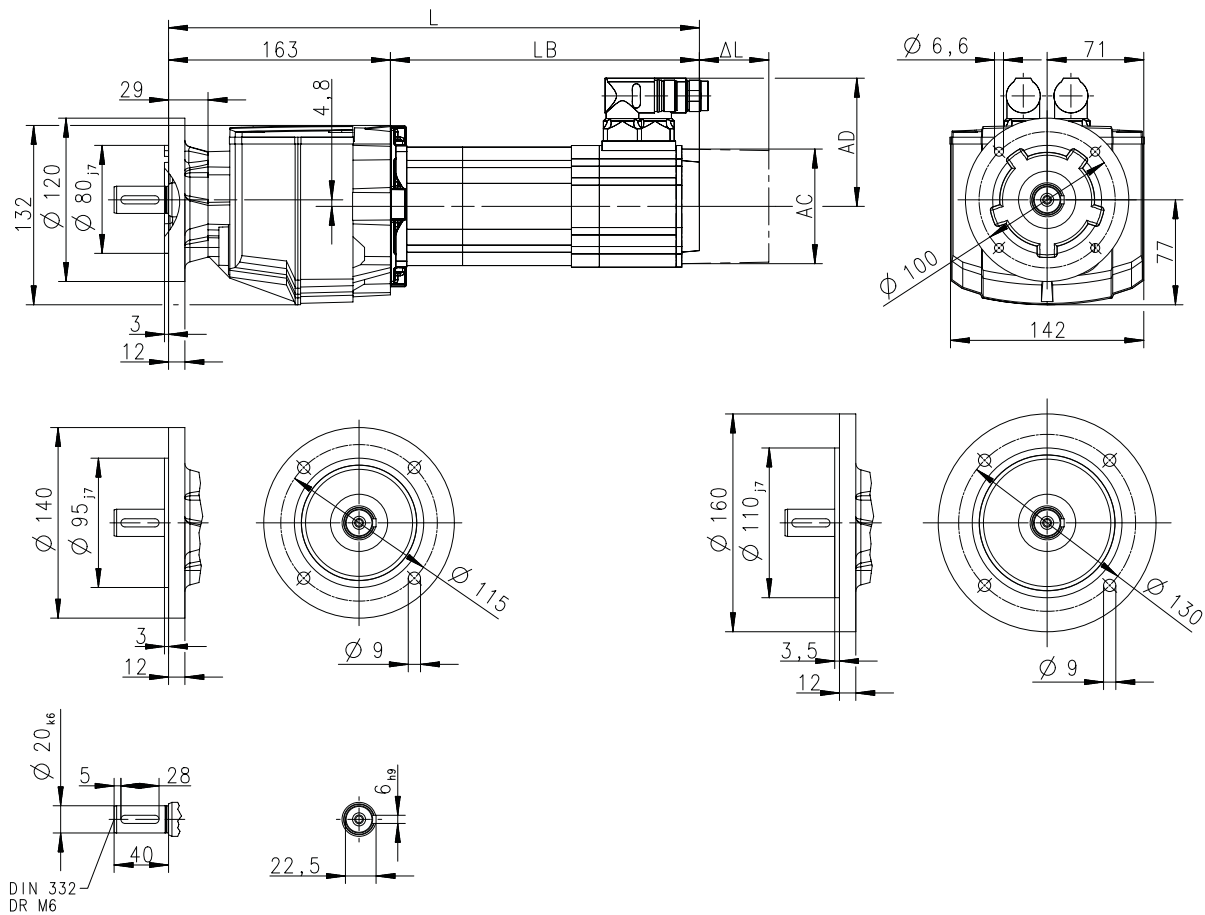
Technical data

Dimensions
Basic dimensions



g500-H100, 2-stage

Gearbox version: Solid shaft and flange (VCP)



8800317-00

Motor			m850-	
			S120/S3960	S120/M3960
Total length	L	mm	345	383
Motor length	LB		182	220
Length of motor options	ΔL	mm	46	
Motor diameter	AC	mm	121	
Motor/connection distance	AD	mm	102	

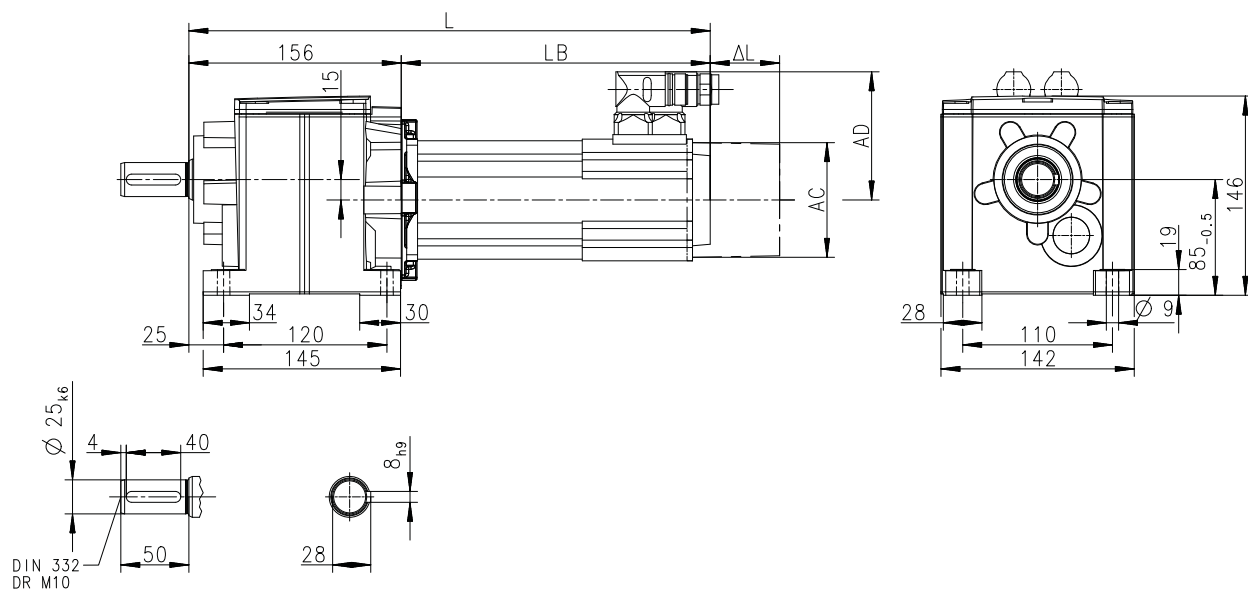


Technical data

Dimensions
Basic dimensions

g500-H140, 2-stage

Gearbox version: Solid shaft with foot (VBR)



8800100-00

Motor			m850-	
			S120/S3960	S120/M3960
Total length	L	mm	338	376
Motor length	LB		182	220
Length of motor options	ΔL	mm	46	
Motor diameter	AC	mm	121	
Motor/connection distance	AD	mm	102	

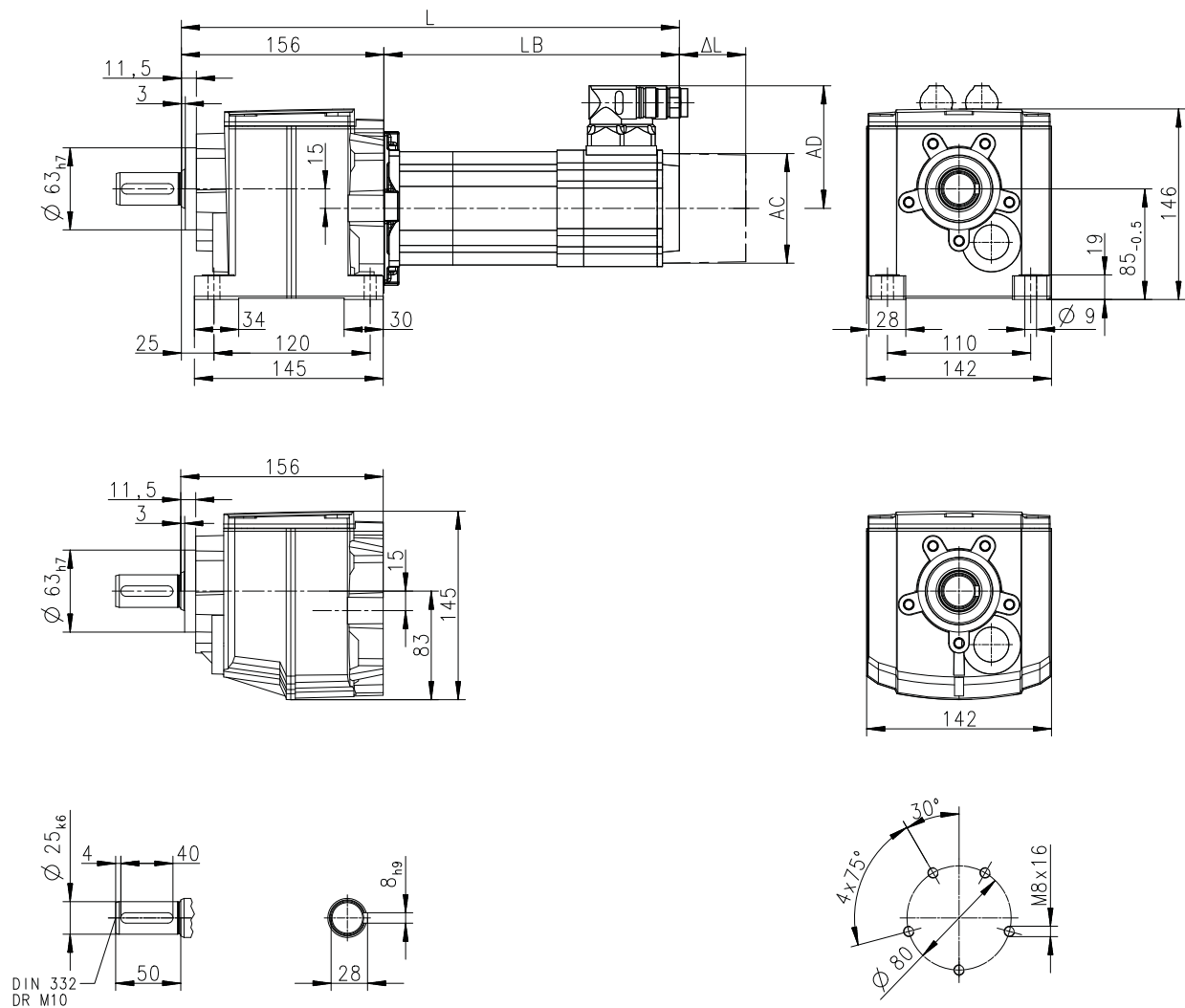
Technical data

Dimensions
Basic dimensions



g500-H140, 2-stage

Gearbox version: Solid shaft with foot/centering (VAR/VCR)



8800102-01

Motor			m850-	
			S120/S3960	S120/M3960
Total length	L	mm	338	376
Motor length	LB		182	220
Length of motor options	Δ L	mm	46	
Motor diameter	AC	mm	121	
Motor/connection distance	AD	mm	102	

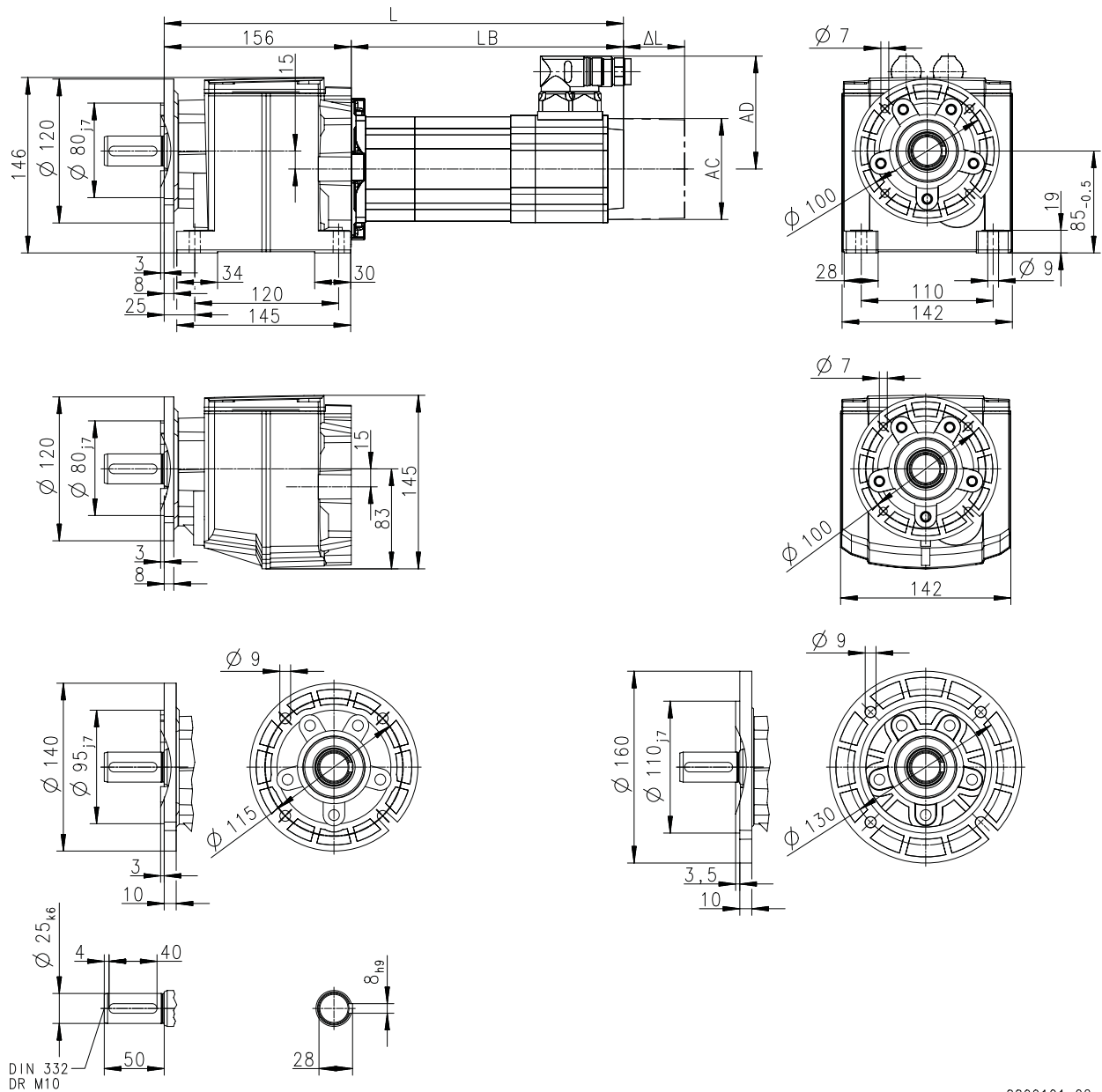


Technical data

Dimensions
Basic dimensions

g500-H140, 2-stage

Gearbox version: Solid shaft and foot/flange (VAK/VCK)



8800101-02

Motor			m850-	
			S120/S3960	S120/M3960
Total length	L	mm	338	376
Motor length	LB		182	220
Length of motor options	Δ L	mm	46	
Motor diameter	AC	mm	121	
Motor/connection distance	AD	mm	102	

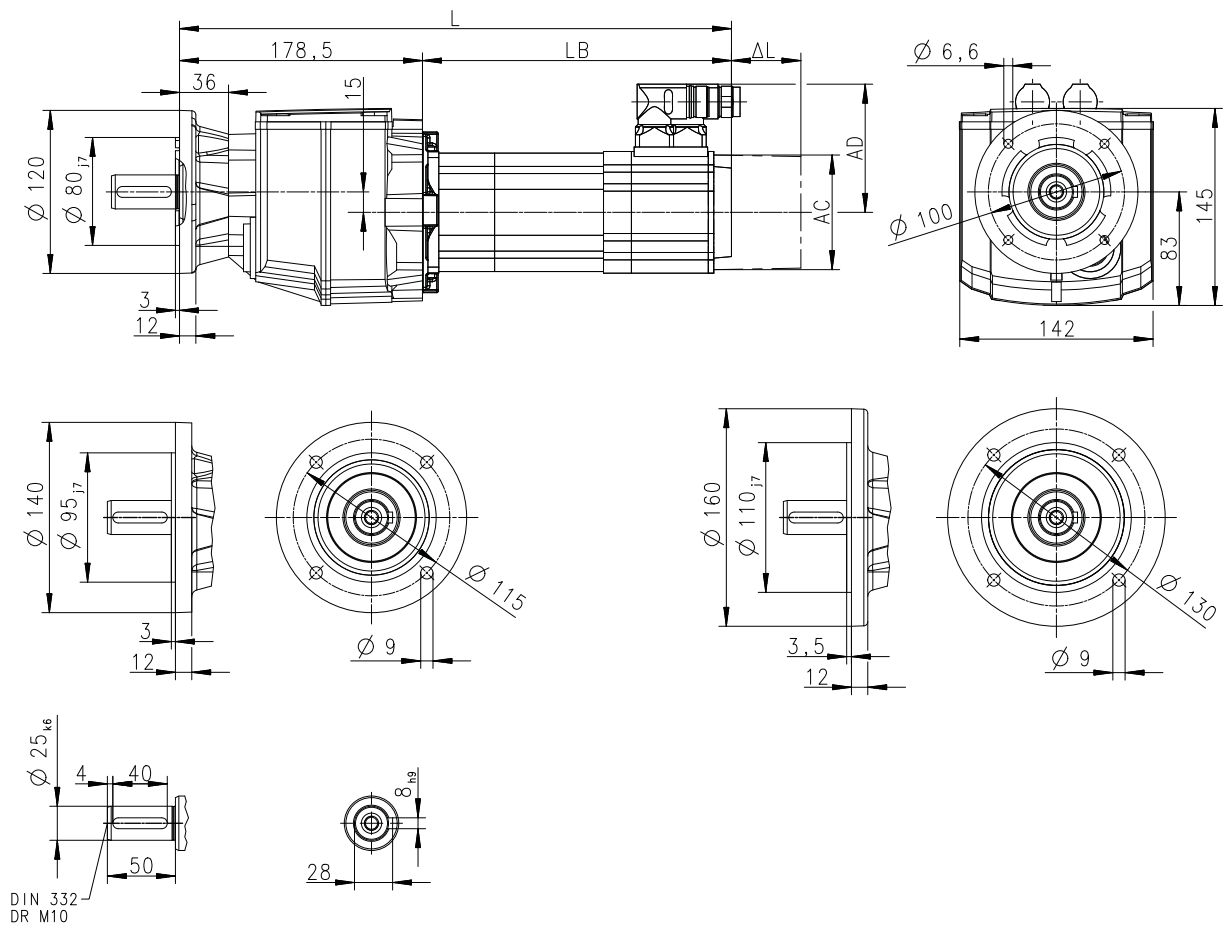
Technical data

Dimensions
Basic dimensions



g500-H140, 2-stage

Gearbox version: Solid shaft and flange (VCP)



8800318-01

Motor			m850-	
			S120/S3960	S120/M3960
Total length	L	mm	360	398
Motor length	LB		182	220
Length of motor options	Δ L	mm	46	
Motor diameter	AC	mm	121	
Motor/connection distance	AD	mm	102	

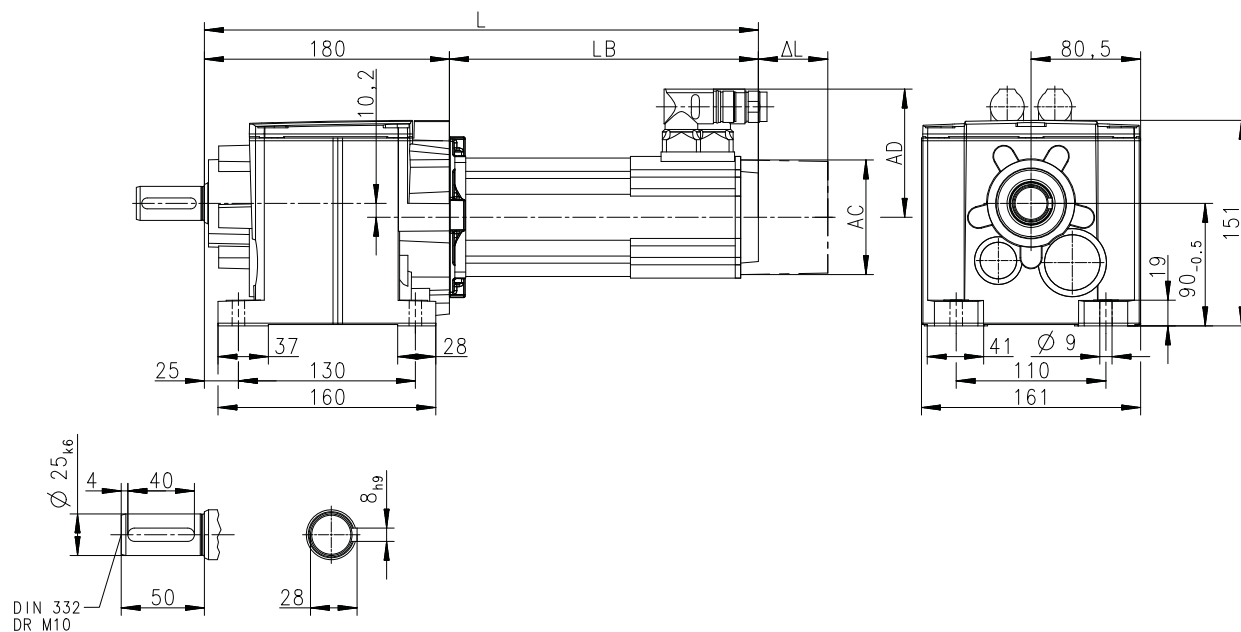


Technical data

Dimensions
Basic dimensions

g500-H210, 2-/3-stage

Gearbox version: Solid shaft with foot (VBR)



8800112-00

Motor			m850-				
			S120/S3960	S120/M3960	S120/L3960	S140/S3240	S140/M3240
Total length	L	mm	362	400	438	364	404
Motor length	LB		182	220	258	184	224
Length of motor options	ΔL	mm	46			53	
Motor diameter	AC	mm	121			142	
Motor/connection distance	AD	mm	102			114	

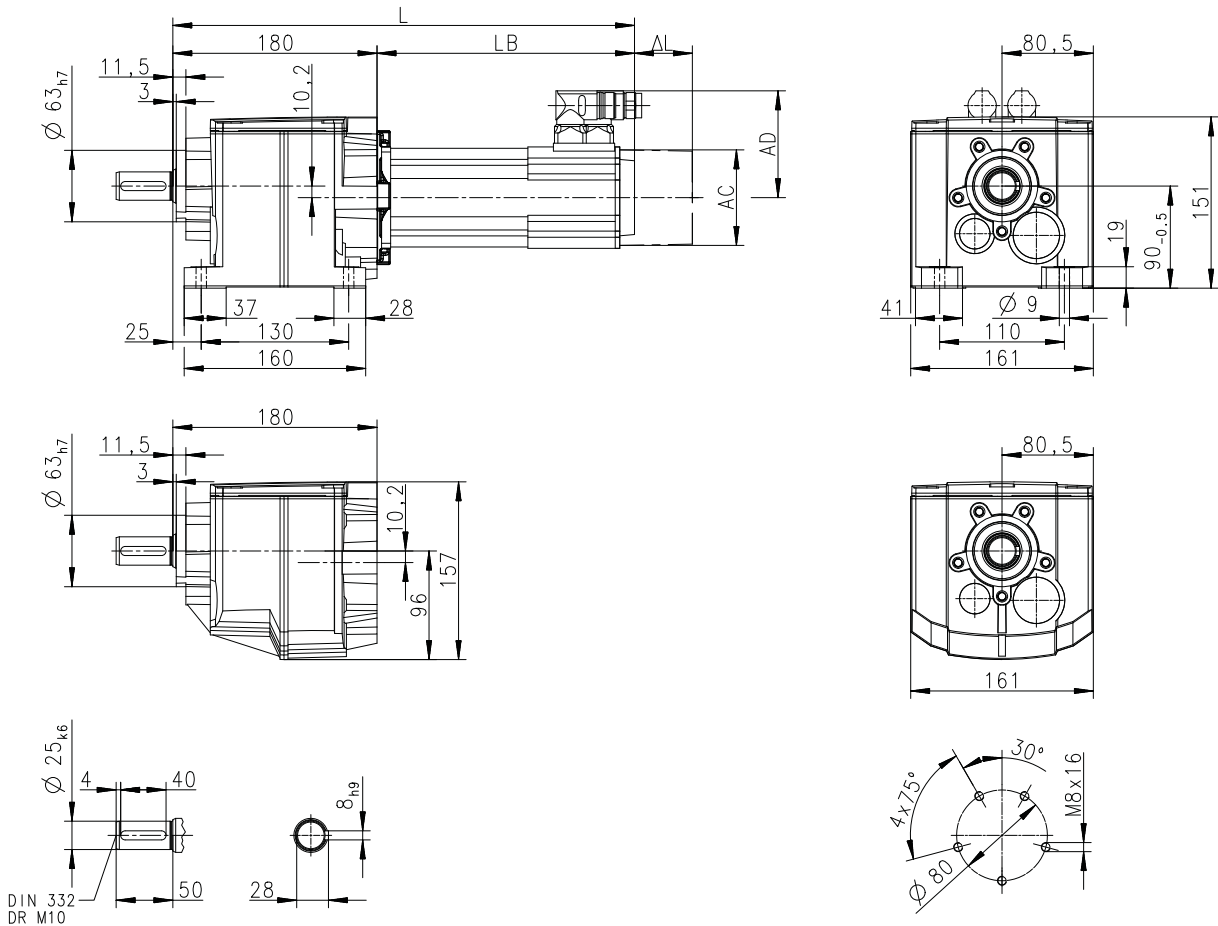
Technical data

Dimensions
Basic dimensions



g500-H210, 2-/3-stage

Gearbox version: Solid shaft with foot/centering (VAR/VCR)



8800114-00

Motor			m850-				
			S120/S3960	S120/M3960	S120/L3960	S140/S3240	S140/M3240
Total length	L	mm	362	400	438	364	404
Motor length	LB		182	220	258	184	224
Length of motor options	Δ L	mm	46			53	
Motor diameter	AC	mm	121			142	
Motor/connection distance	AD	mm	102			114	



g500-H210, 2-/3-stage

8800113-02

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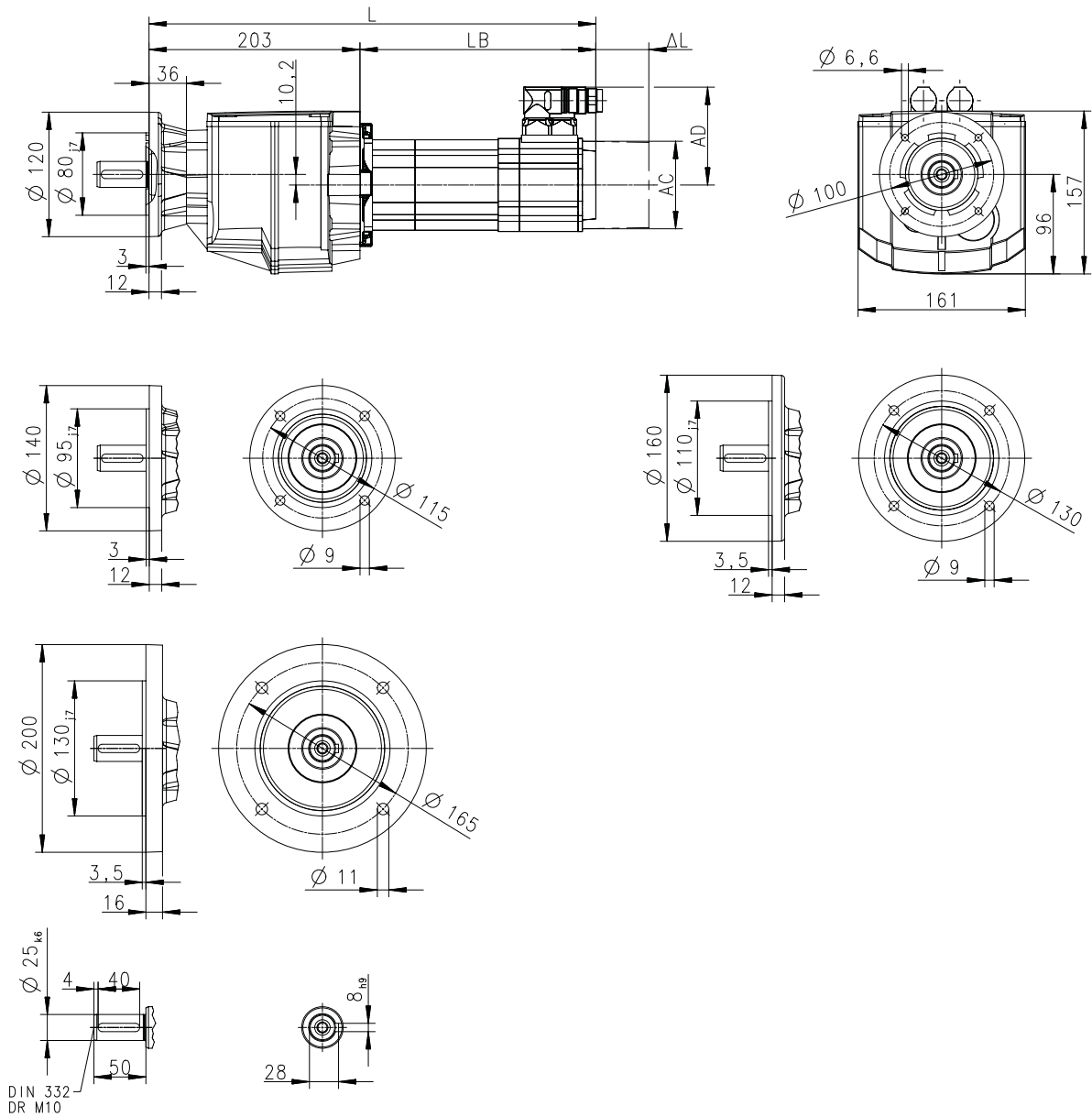
Technical data

Dimensions
Basic dimensions



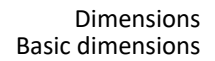
g500-H210, 2-/3-stage

Gearbox version: Solid shaft and flange (VCP)

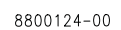


8800319-01

Motor			m850-				
			S120/S3960	S120/M3960	S120/L3960	S140/S3240	S140/M3240
Total length	L	mm	385	423	461	387	427
Motor length	LB		182	220	258	184	224
Length of motor options	Δ L	mm	46			53	
Motor diameter	AC	mm	121			142	
Motor/connection distance	AD	mm	102			114	



Gearbox version: Solid shaft with foot (VBR)

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Technical data

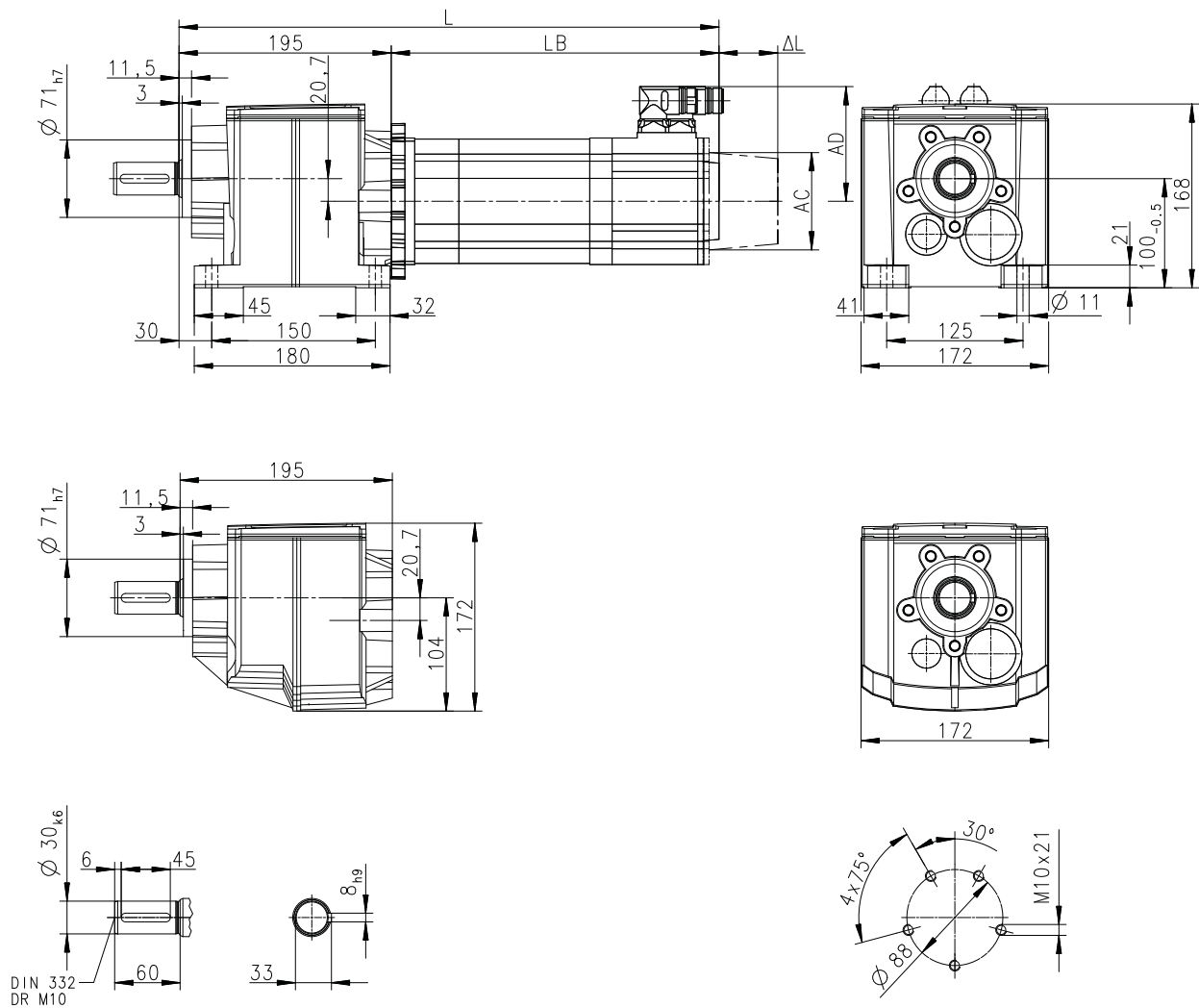
Dimensions

Basic dimensions



g500-H320, 2-/3-stage

Gearbox version: Solid shaft with foot/centering (VAR/VCR)



8800126-01

Motor			m850-					
			S120/S3960	S120/M3960	S120/L3960	S140/S3240	S140/M3240	S140/L3240
Total length	L	mm	377	415	453	379	419	459
Motor length	LB		182	220	258	184	224	264
Length of motor options	ΔL	mm	46			53		
Motor diameter	AC	mm	121			142		
Motor/connection distance	AD	mm	102			114	114	135



g500-H320, 2-/3-stage

Technical drawing of a 100mm diameter ball valve, showing dimensions in mm.

Dimensions:

- Overall length: L
- Ball diameter: $\varnothing 100$
- Handle diameter: $\varnothing 160$
- Mounting flange diameter: $\varnothing 130$
- Mounting flange thickness: 20.7
- Mounting flange outer diameter: $\varnothing 168$
- Mounting flange inner diameter: $\varnothing 110_{-0.7}^{+0.7}$
- Mounting flange hole diameter: $\varnothing 9$
- Mounting flange hole spacing: 125
- Mounting flange hole diameter: $\varnothing 11$
- Mounting flange hole diameter: $\varnothing 130$
- Mounting flange hole diameter: $\varnothing 165$
- Mounting flange hole diameter: $\varnothing 200$
- Mounting flange hole diameter: $\varnothing 30_{+0.6}^{-0.6}$
- Mounting flange hole diameter: $\varnothing 33$
- Mounting flange hole diameter: $\varnothing 45$
- Mounting flange hole diameter: $\varnothing 60$
- Mounting flange hole diameter: $\varnothing 8_{+0.5}^{-0.5}$
- Mounting flange hole diameter: $\varnothing 11.5$
- Mounting flange hole diameter: $\varnothing 130_{-0.7}^{+0.7}$
- Mounting flange hole diameter: $\varnothing 160$
- Mounting flange hole diameter: $\varnothing 172$
- Mounting flange hole diameter: $\varnothing 195$
- Mounting flange hole diameter: $\varnothing 200$
- Mounting flange hole diameter: $\varnothing 210$
- Mounting flange hole diameter: $\varnothing 220$
- Mounting flange hole diameter: $\varnothing 230$
- Mounting flange hole diameter: $\varnothing 240$
- Mounting flange hole diameter: $\varnothing 250$
- Mounting flange hole diameter: $\varnothing 260$
- Mounting flange hole diameter: $\varnothing 270$
- Mounting flange hole diameter: $\varnothing 280$
- Mounting flange hole diameter: $\varnothing 290$
- Mounting flange hole diameter: $\varnothing 300$
- Mounting flange hole diameter: $\varnothing 310$
- Mounting flange hole diameter: $\varnothing 320$
- Mounting flange hole diameter: $\varnothing 330$
- Mounting flange hole diameter: $\varnothing 340$
- Mounting flange hole diameter: $\varnothing 350$
- Mounting flange hole diameter: $\varnothing 360$
- Mounting flange hole diameter: $\varnothing 370$
- Mounting flange hole diameter: $\varnothing 380$
- Mounting flange hole diameter: $\varnothing 390$
- Mounting flange hole diameter: $\varnothing 400$
- Mounting flange hole diameter: $\varnothing 410$
- Mounting flange hole diameter: $\varnothing 420$
- Mounting flange hole diameter: $\varnothing 430$
- Mounting flange hole diameter: $\varnothing 440$
- Mounting flange hole diameter: $\varnothing 450$
- Mounting flange hole diameter: $\varnothing 460$
- Mounting flange hole diameter: $\varnothing 470$
- Mounting flange hole diameter: $\varnothing 480$
- Mounting flange hole diameter: $\varnothing 490$
- Mounting flange hole diameter: $\varnothing 500$

Standards:

- DIN 332
- DR M10

Part Number: 8800125-01

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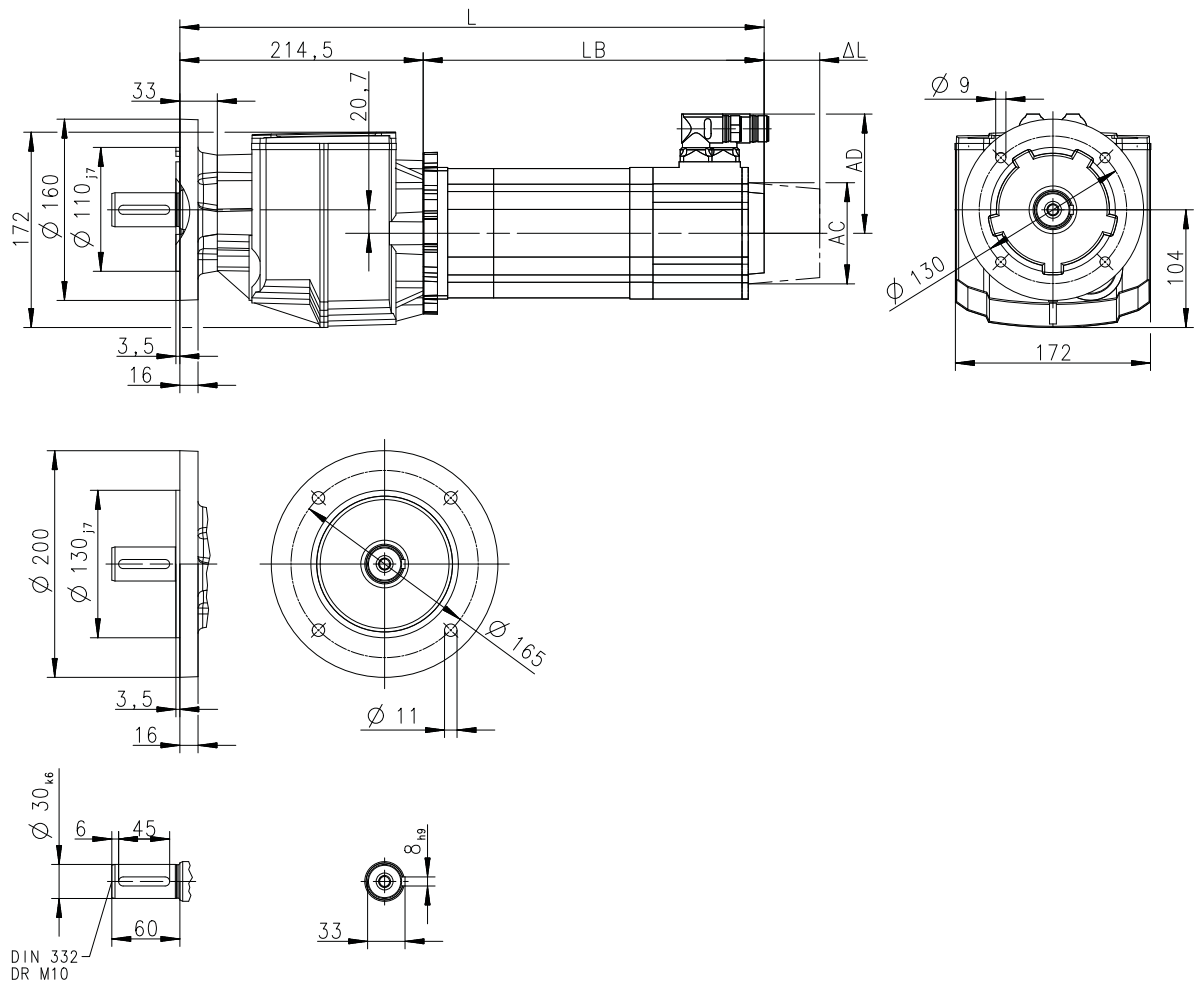
Technical data

Dimensions
Basic dimensions



g500-H320, 2-/3-stage

Gearbox version: Solid shaft and flange (VCP)



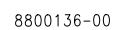
8800320-00

Motor			m850-					
			S120/S3960	S120/M3960	S120/L3960	S140/S3240	S140/M3240	S140/L3240
Total length	L	mm	396	434	472	399	439	479
Motor length	LB		182	220	258	184	224	264
Length of motor options	ΔL	mm	46			53		
Motor diameter	AC	mm	121			142		
Motor/connection distance	AD	mm	102			114	114	135



Basic dimensions

Gearbox version: Solid shaft with foot (VBR)

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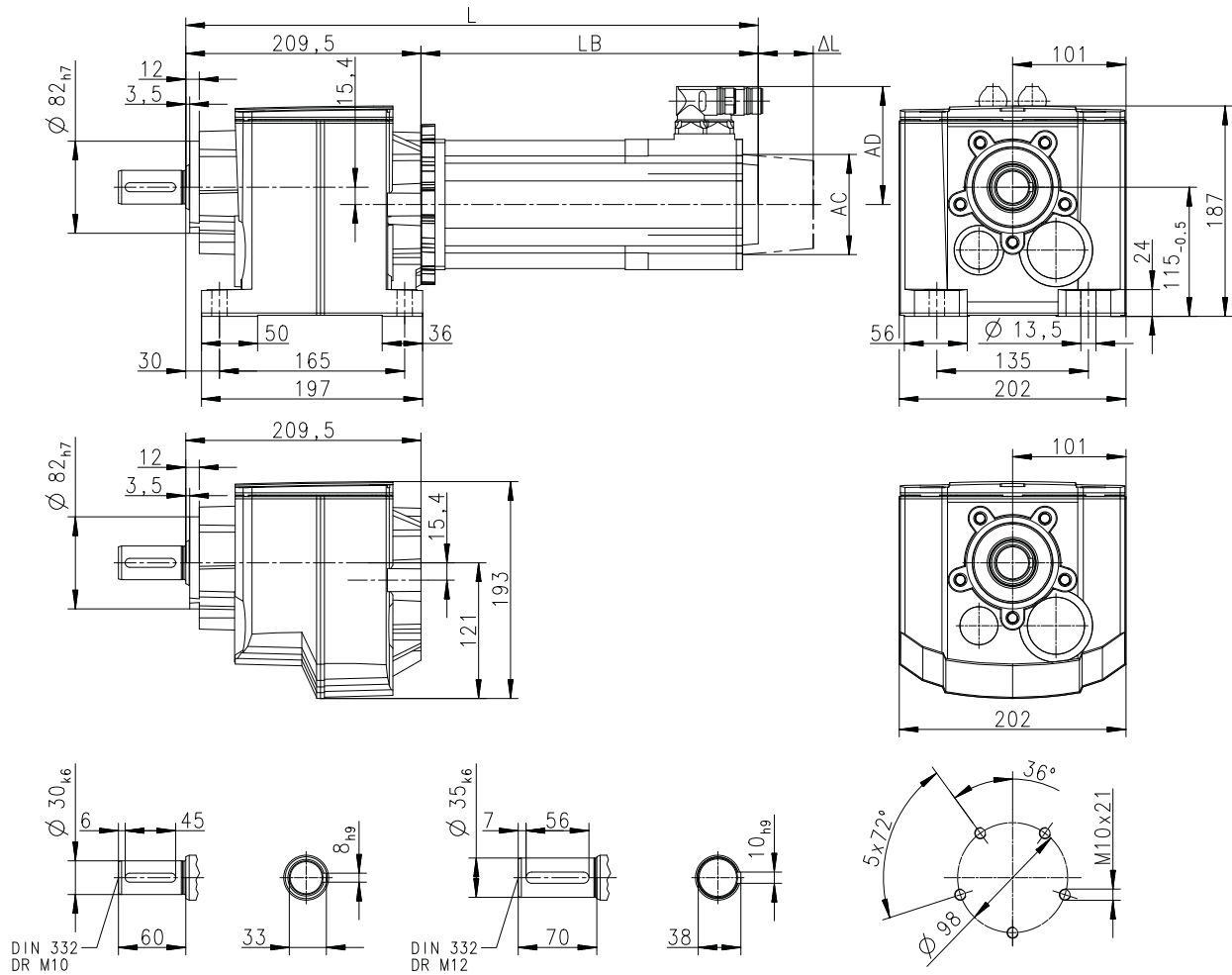
Technical data

Dimensions
Basic dimensions



g500-H450, 2-/3-stage

Gearbox version: Solid shaft with foot/centering (VAR/VCR)



8800138-00

Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	391	429	467	394	434	474	435	483	547
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	ΔL	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158

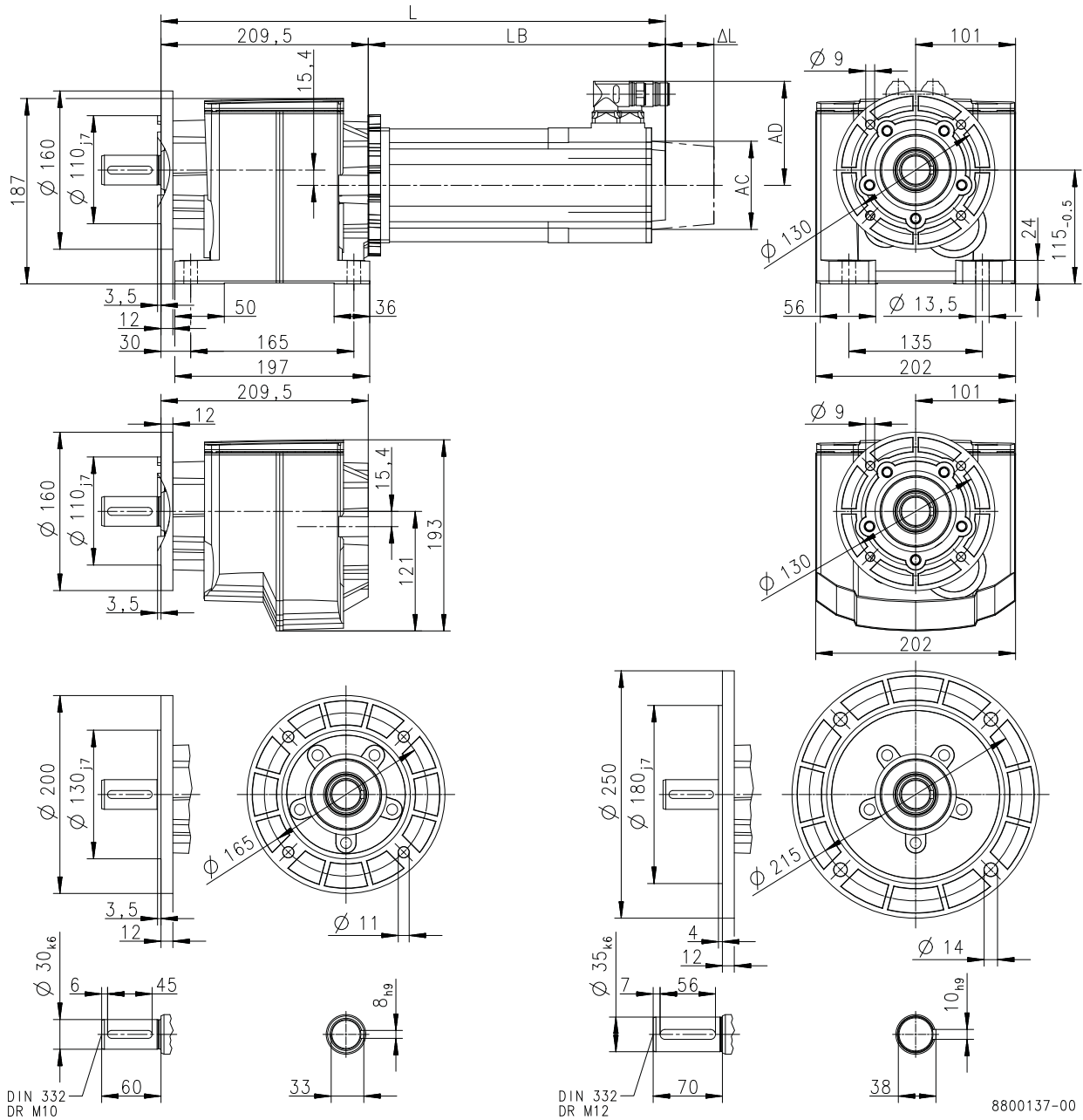


Technical data

Dimensions
Basic dimensions

g500-H450, 2-/3-stage

Gearbox version: Solid shaft and foot/flange (VAK/VCK)



Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	391	429	467	394	434	474	435	483	547
Motor length	LB	mm	182	220	258	184	224	264	225	273	337
Length of motor options	ΔL	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158

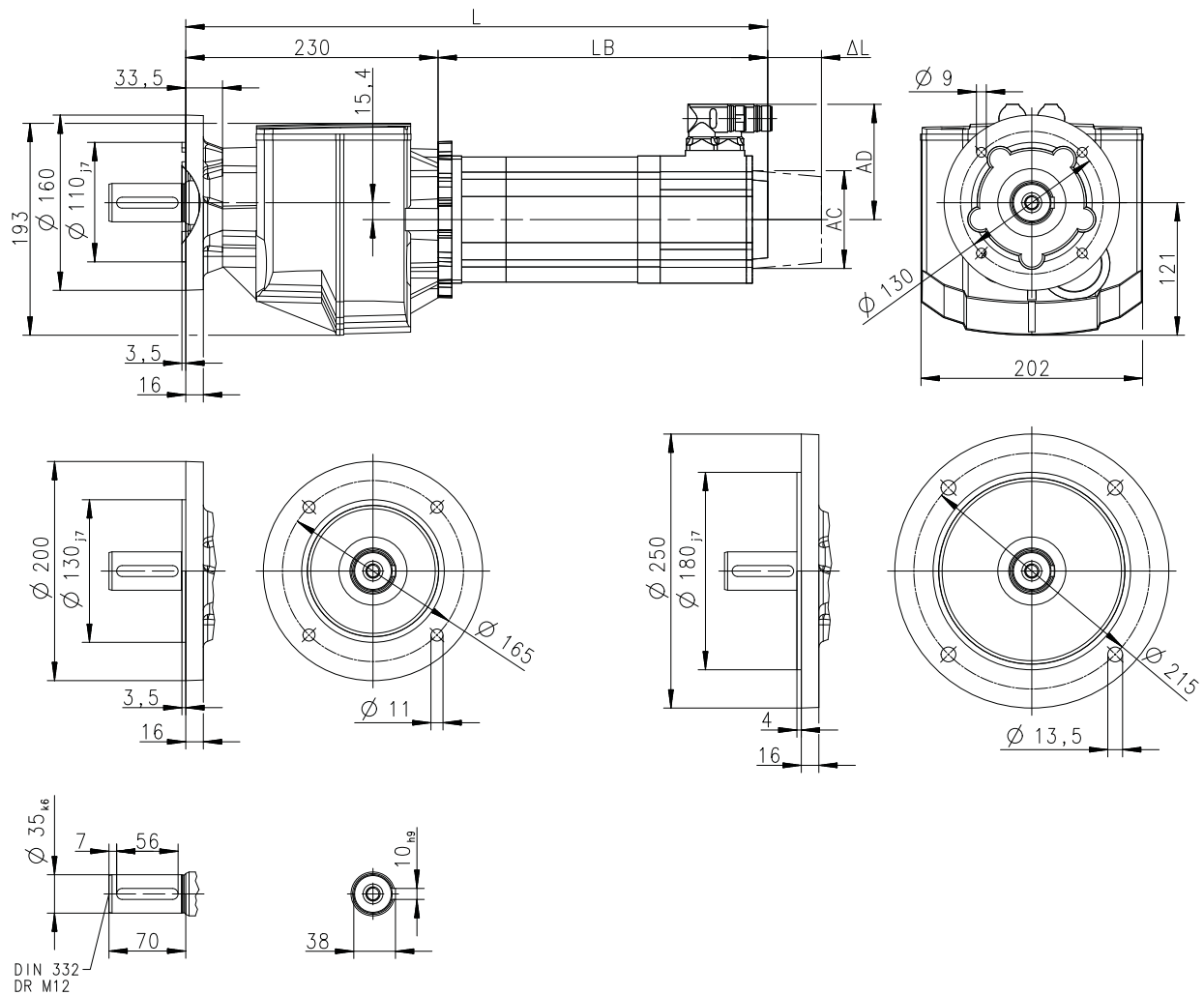
Technical data

Dimensions
Basic dimensions



g500-H450, 2-/3-stage

Gearbox version: Solid shaft and flange (VCP)



8800321-00

Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	412	450	488	414	454	494	455	503	567
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	ΔL	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158

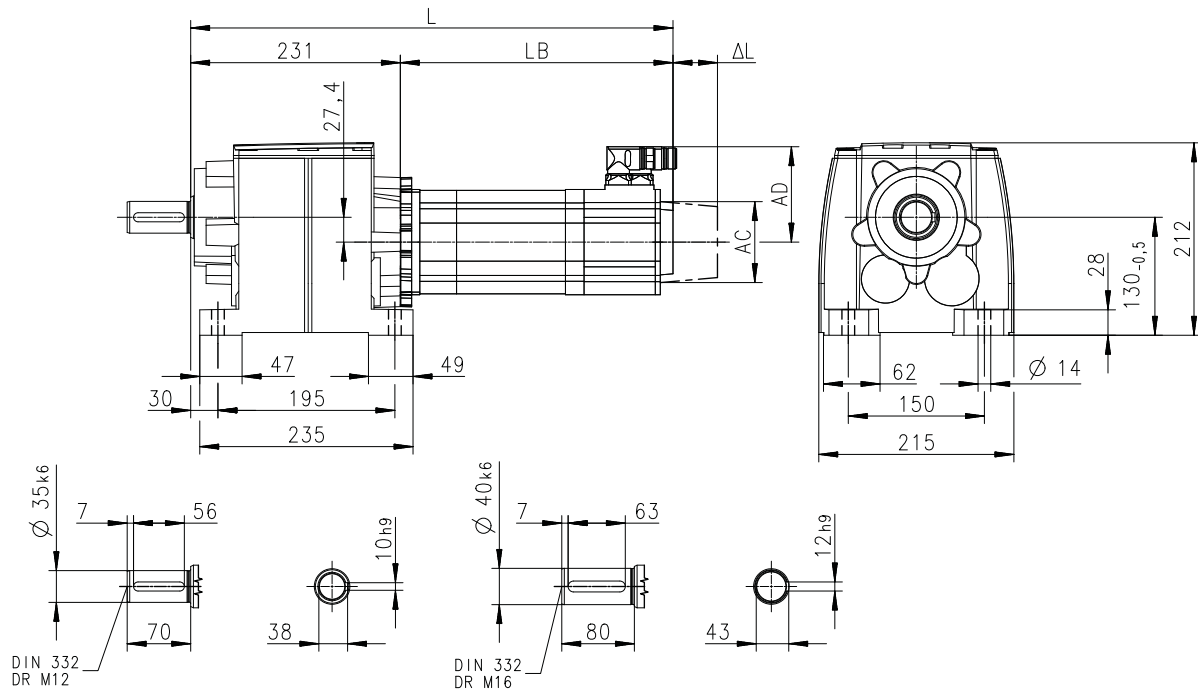


Technical data

Dimensions
Basic dimensions

g500-H600, 2-/3-stage

Gearbox version: Solid shaft with foot (VBR)



8800540-00

Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	413	451	489	415	455	495	456	504	568
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	ΔL	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158

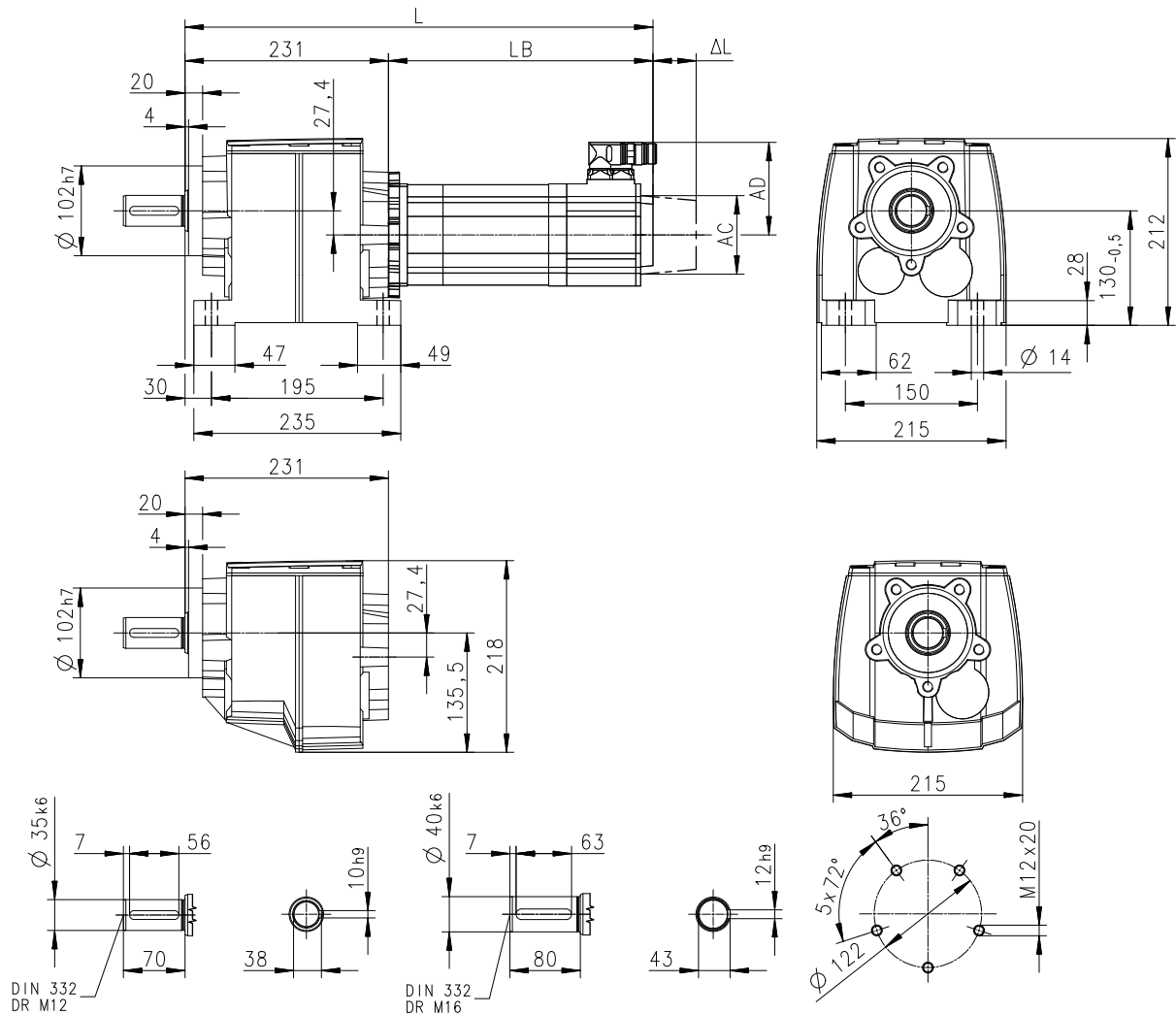
Technical data

Dimensions
Basic dimensions



g500-H600, 2-/3-stage

Gearbox version: Solid shaft with foot/centering (VAR/VCR)



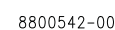
8800541-00

Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	413	451	489	415	455	495	456	504	568
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	Δ L	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158



Basic dimensions

Gearbox version: Solid shaft and foot/flange (VAK/VCK)

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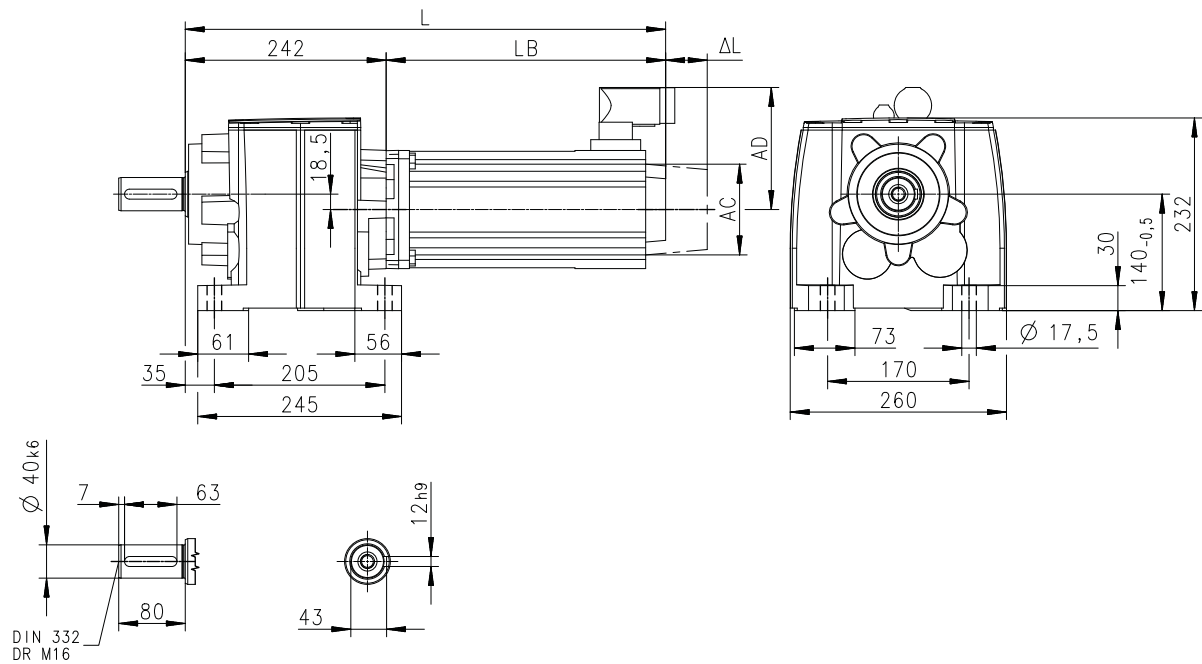
Technical data

Dimensions
Basic dimensions



g500-H850, 2-/3-stage

Gearbox version: Solid shaft with foot (VBR)



8800543-00

Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	424	462	500	426	466	506	467	515	579
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	Δ L	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158

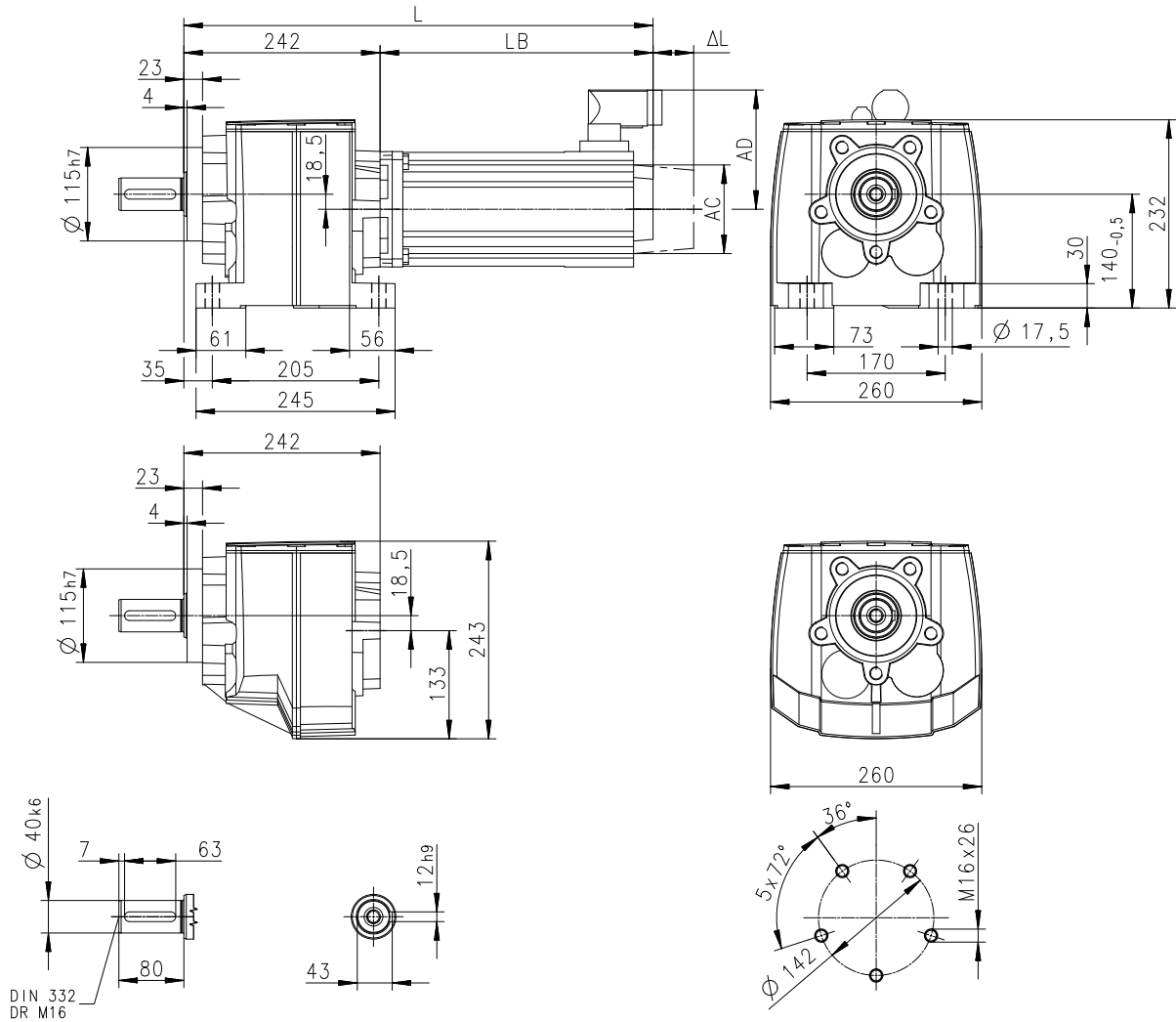


Technical data

Dimensions
Basic dimensions

g500-H850, 2-/3-stage

Gearbox version: Solid shaft with foot/centering (VAR/VCR)

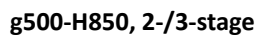


8800544-00

Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	424	462	500	426	466	506	467	515	579
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	Δ L	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158

Dimensions

Basic dimensions



Motor			m850-								
			\$120/ \$3960	\$120/ M3960	\$120/ L3960	\$140/ \$3240	\$140/ M3240	\$140/ L3240	\$190/ \$3000	\$190/ M3000	\$190/ L2520
Total length	L	mm	424	462	500	426	466	506	467	515	579
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	Δ L	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158

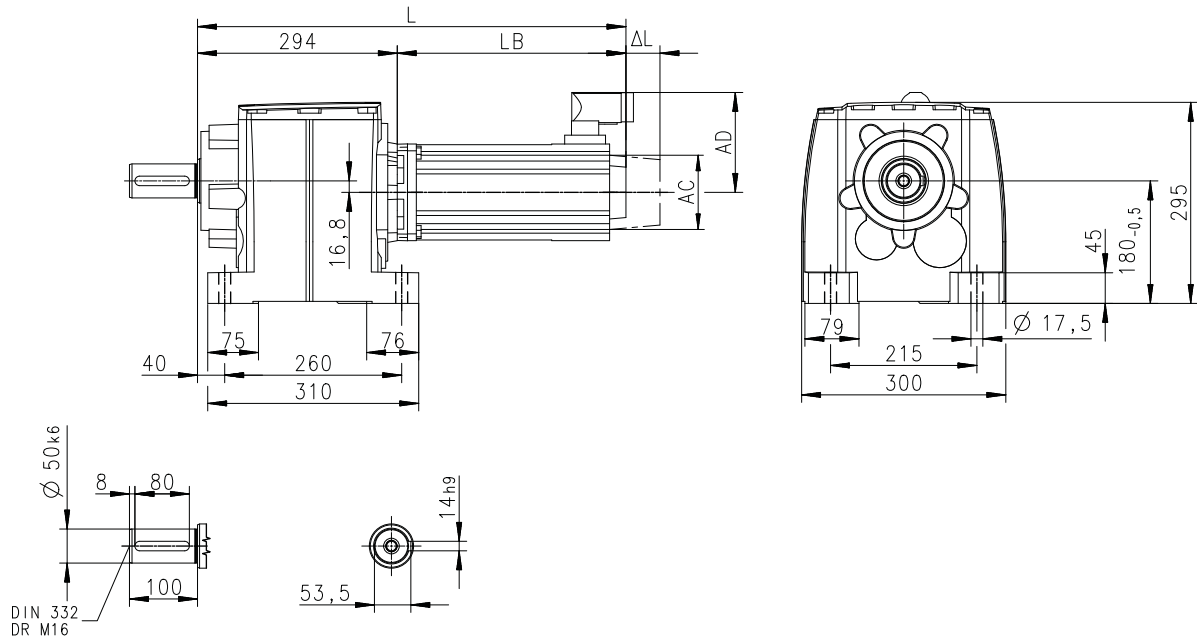


Technical data

Dimensions
Basic dimensions

g500-H1500, 2-/3-stage

Gearbox version: Solid shaft with foot (VBR)



8800546-00

Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	476	514	552	478	518	558	519	567	631
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	ΔL	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158

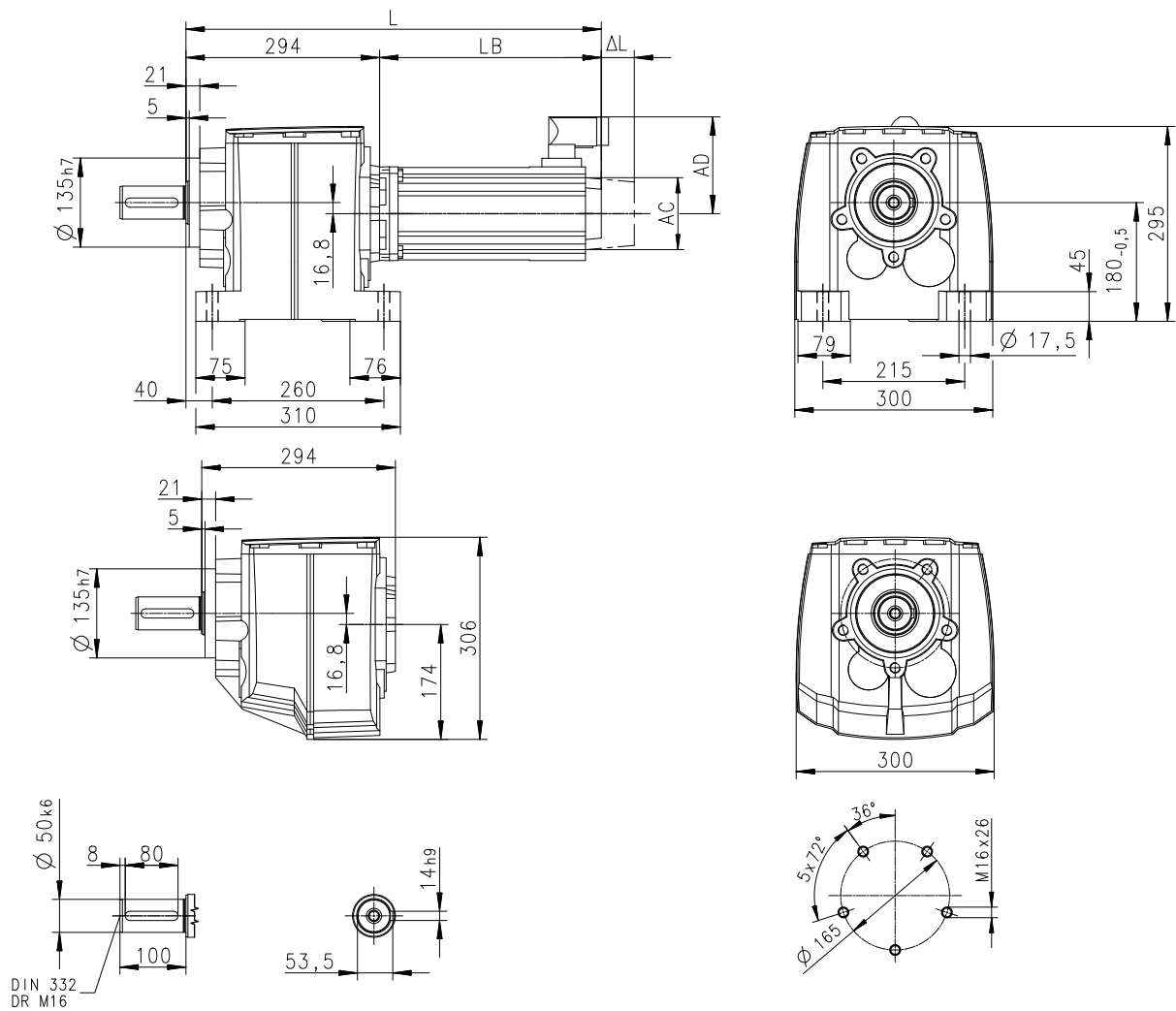
Technical data

Dimensions
Basic dimensions



g500-H1500, 2-/3-stage

Gearbox version: Solid shaft with foot/centering (VAR/VCR)



8800547-00

Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	476	514	552	478	518	558	519	567	631
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	ΔL	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158

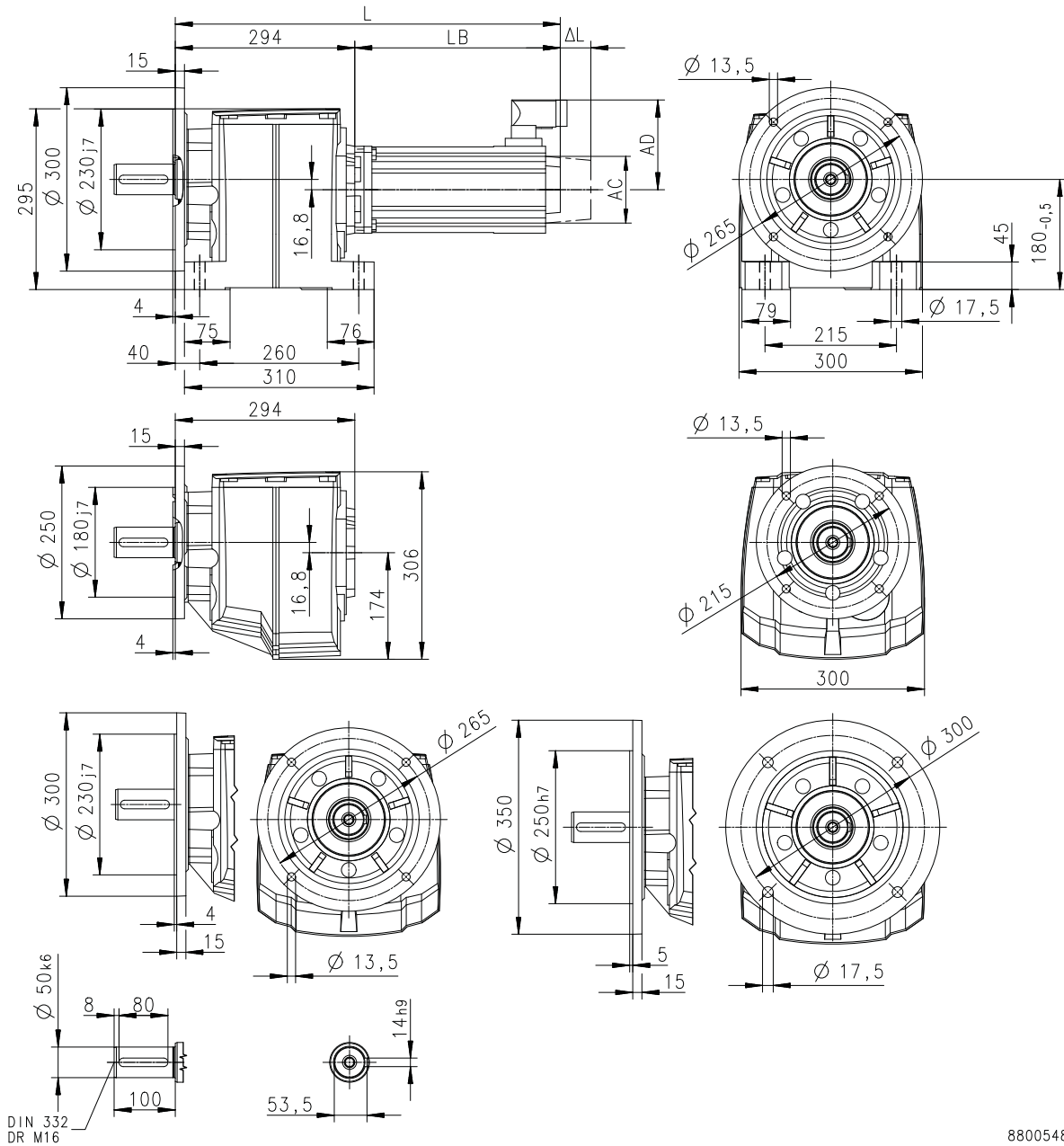


Technical data

Dimensions
Basic dimensions

g500-H1500, 2-/3-stage

Gearbox version: Solid shaft and foot/flange (VAK/VCK)



8800548-00

Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	476	514	552	478	518	558	519	567	631
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	Δ L	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158

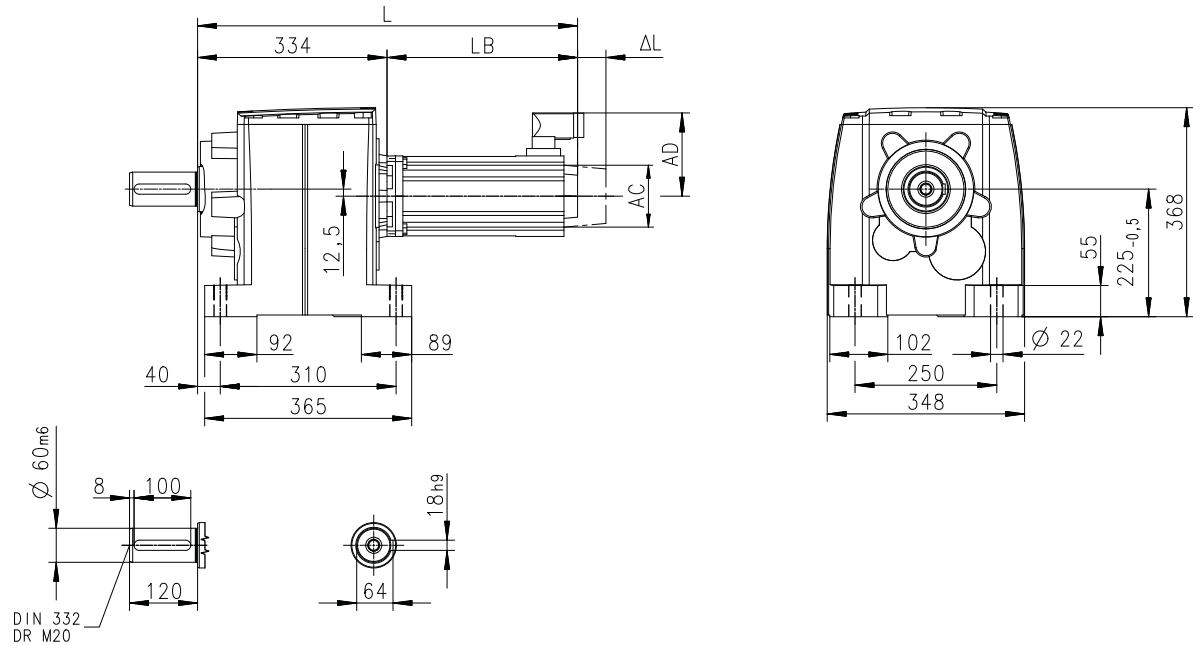
Technical data

Dimensions
Basic dimensions



g500-H3000, 2-/3-stage

Gearbox version: Solid shaft with foot (VBR)



8800549-00

Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	516	554	592	518	558	598	559	607	671
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	Δ L	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158

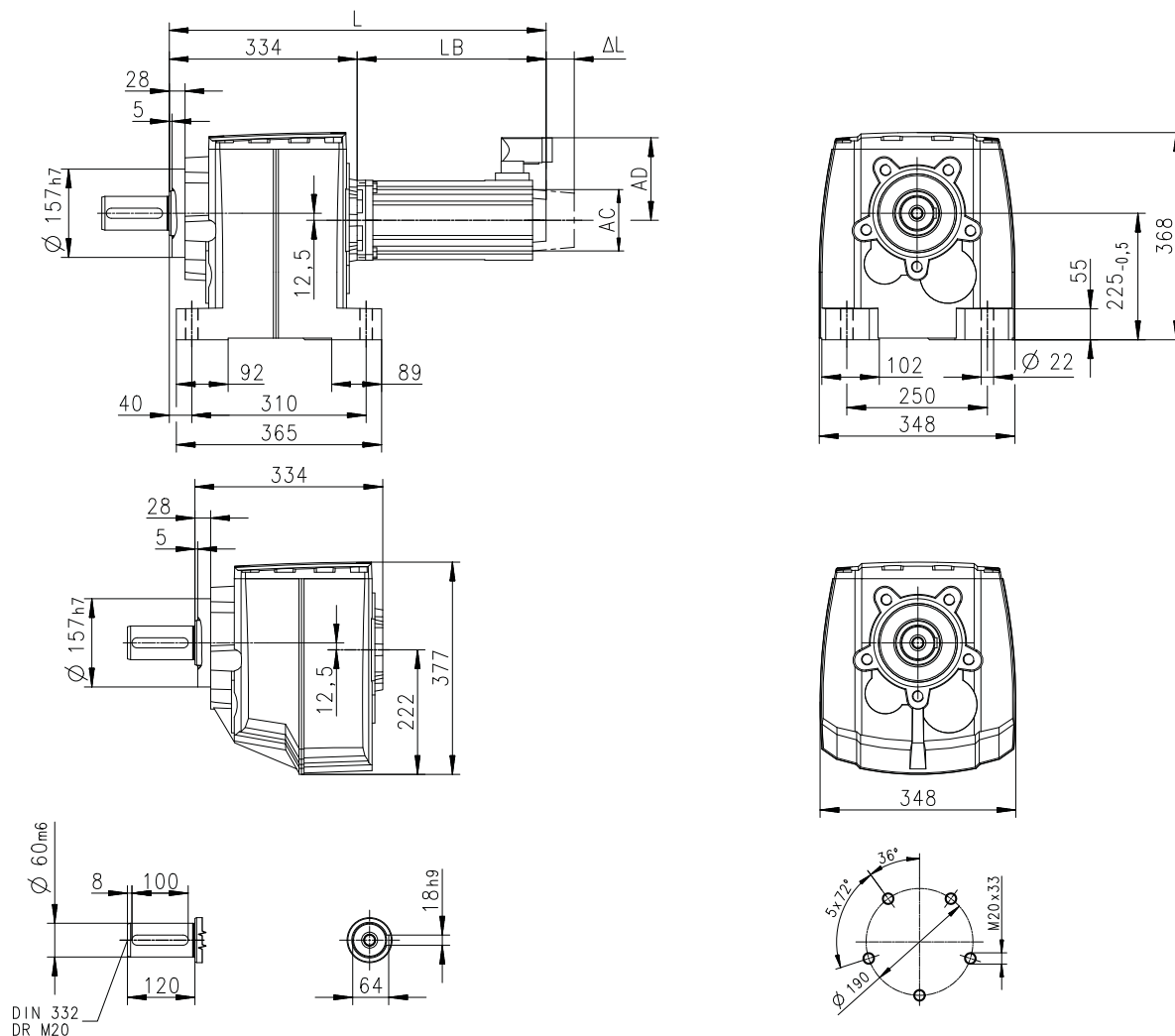


Technical data

Dimensions
Basic dimensions

g500-H3000, 2-/3-stage

Gearbox version: Solid shaft with foot/centering (VAR/VCR)



8800550-00

Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	516	554	592	518	558	598	559	607	671
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	Δ L	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158

Technical data

Dimensions
Basic dimensions

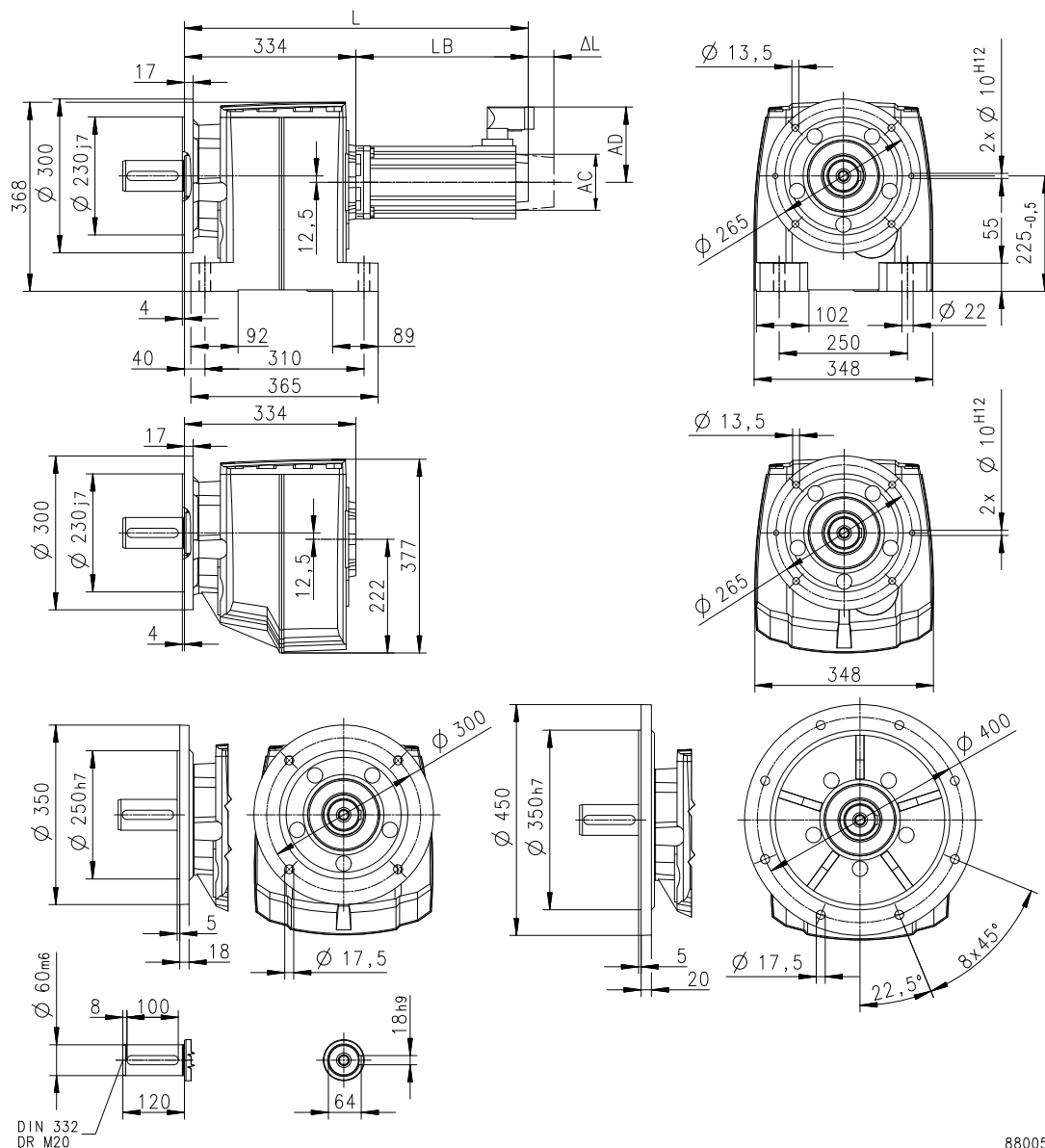


g500-H3000, 2-/3-stage

Gearbox version: Solid shaft and foot/flange (VAK/VCK)

NOTICE

► Additionally secure the $\varnothing 300$ output flange with two spiral pins.



8800551-02

Motor			m850-								
			S120/ S3960	S120/ M3960	S120/ L3960	S140/ S3240	S140/ M3240	S140/ L3240	S190/ S3000	S190/ M3000	S190/ L2520
Total length	L	mm	516	554	592	518	558	598	559	607	671
Motor length	LB		182	220	258	184	224	264	225	273	337
Length of motor options	ΔL	mm	46			53			68		
Motor diameter	AC	mm	121			142			190		
Motor/connection distance	AD	mm	102			114	114	135	137	158	158



Technical data

Dimensions
Gearbox with pre-stage

Gearbox with pre-stage

g500-H100 ... H140, 3-stage

g500-H210 ... H3000, 4-stage

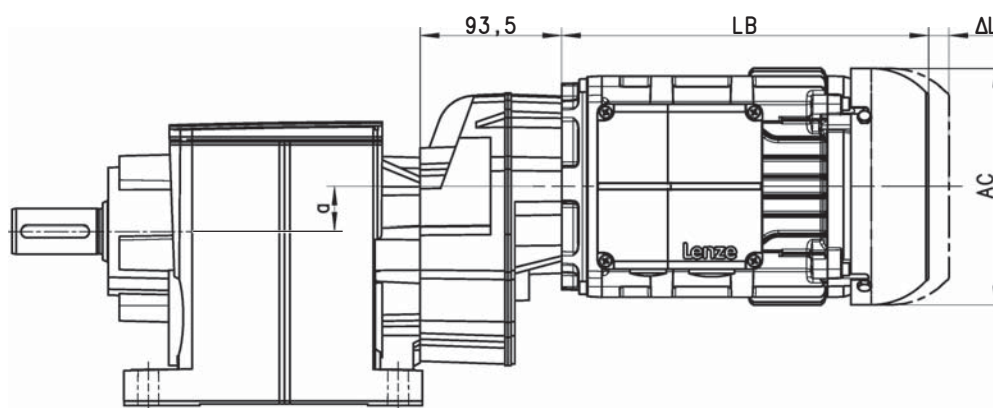


The geared motor dimensions can be found in the basic dimensions, except the total length "L" and the center distance "a".

► [Basic dimensions](#) 73

The total length "L" in the basic dimensions is extended by the 93.5 mm of the pre-stage.

Observe the altered center distance "a" between the gearbox and motor shaft.



8801279-00

Gearboxes			g500-H100	g500-H140	g500-H210	g500-H320	g500-H450	g500-H600	g500-H850	g500-H1500	g500-H3000
			3-stage		4-stage						
Center distance	a	mm	40.2	30	34.8	24.3	29.6	17.6	26.5	28.2	32.5

Additional lengths

Motors

Motor			m850-		
			S120/S3960 S120/M3960 S120/L3960	S140/S3240 S140/M3240 S140/L3240	S190/S3000 S190/M3000 S190/L2520
Spring-applied holding brake	Δ L	mm	46	53	68

Technical data

Weights
Basic weights



Weights

Basic weights



The basic weights are listed in the selection tables.

Weights with lubricant for mounting position M1, all data approximate values.
The exact values can be found in the delivery documents

► [Selection tables](#)  54

Observe ► [Additional weights](#)  106!

Additional weights

Gearbox

Gearbox			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
Flange (VCP)	m	kg		2.0	3.9	3.9	4.1	6.1

Gearbox			g500-H600	g500-H850	g500-H1500	g500-H3000
Foot	m	kg	2.0	2.8	4.3	5.8
Flange	m	kg	4.3	7.6	8.3	20
Flange (VCP)	m	kg				

Motors

Motor			m850-		
			S120/S3960 S120/M3960 S120/L3960	S140/S3240 S140/M3240 S140/L3240	S190/S3000 S190/M3000 S190/L2520
Spring-applied holding brake	m	kg	2.0	3.0	6.7



Product extensions

Motor connection
Connection via ICN connector

Product extensions

Motor connection

Connection via ICN connector

The electrical connection to the servo motors as a standard is established via ICN connectors.

The connection is made via two plug connectors, one for power and brake and one for feedback and temperature monitoring. Alternatively, Lenze offers One Cable Technology (OCT).

The connectors can be rotated by 270 ° and are provided with a bayonet catch. Since the catch of the connector is also compatible with conventional box nuts, existing mating connectors with a screw plug can continue to be used without any problems.



In order to provide for a quick and error-free connection of Lenze motors to Lenze inverters, we recommend using prefabricated Lenze system cables.

Product extensions

Motor connection
Connection via ICN connector



One Cable Technology (OCT)

With the aid of the open motor feedback protocol HIPERFACE DSL® and the digital absolute value encoders, the motor supports the future-oriented One Cable Technology (OCT).

Advantages

- All necessary wiring is done in only one connector.
- The use of hybrid cables allows for combined servo and feedback cables.
- This intelligently minimizes connecting cables, cable variants, and connection costs.
- The motor temperature is transmitted digitally together with the encoder signal. An additional connection for a motor temperature sensor is not required.
- Speed-dependent safety functions can be implemented by using the safety-rated absolute value encoder.



Pre-assembled hybrid cables for single-cable technology (OCT) can be found at the end of this chapter.

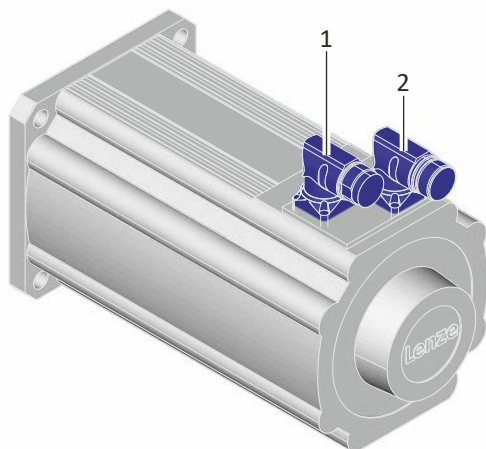


Product extensions

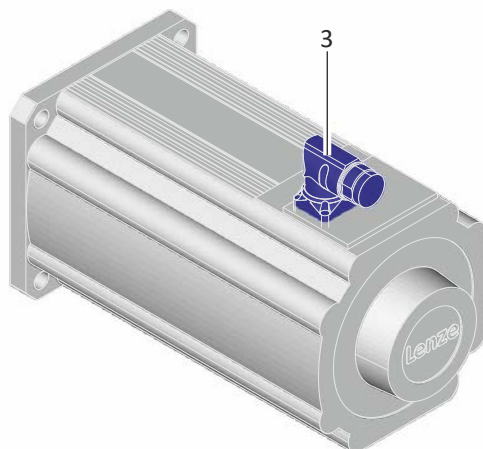
Motor connection
Connection via ICN connector

Position of the connections

Standard connection



One Cable Technology (OCT)



Position	Meaning	Position	Meaning
1	ICN-M23 connector, 6-pole ICN-M40 connector, 8-pole • Power connection • Brake connection • PE connection	3	For One Cable Technology (OCT) ICN-M23 connector, hybrid ICN-M40 connector, hybrid • Power connection • Brake connection • PE connection • Connection of digital absolute value encoder • Connection of temperature monitoring
2	ICN-M23 connector • Feedback connection • Connection of temperature monitoring		

Motor/ICN connector assignment

Standard connection: Power and brake

One Cable Technology (OCT): Power connection, brake, feedback and temperature monitoring

Motor	Connector	Motor	Connector	Motor	Connector
m850-S120/S3960	ICN-M23	m850-S140/S3240	ICN-M23	m850-S190/S3000	ICN-M23
m850-S120/M3960	ICN-M23	m850-S140/M3240	ICN-M23	m850-S190/M3000	ICN-M40
m850-S120/L3960	ICN-M23	m850-S140/L3240	ICN-M40	m850-S190/L2520	ICN-M40

Product extensions

Motor connection
Connection via ICN connector

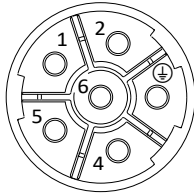


Standard connection

Connection of power and brake

ICN-M23 connector assignment

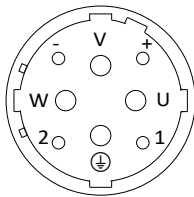
6-pole



ICN M23 6-pole		
Contact	Name	Meaning
PE	PE	PE conductor
1	BD1	DC +/-AC brake
2	BD2	DC -/AC brake
4	U	Power phase U
5	V	Power phase V
6	W	Power phase W

ICN-M40 connector assignment

8-pole



ICN M40 8-pole		
Contact	Name	Meaning
+	BD1	Holding brake +
-	BD2	Holding brake -
PE	PE	PE conductor
U	U	Power phase U
V	V	Power phase V
W	W	Power phase W
1		Not assigned
2		Not assigned



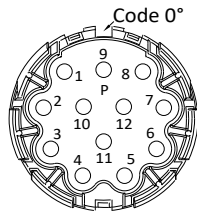
Product extensions

Motor connection
Connection via ICN connector

Feedback and temperature monitoring connection

ICN-M23 connector assignment

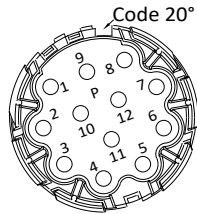
Resolver



ICN M23 for resolvers		
Contact	Name	Meaning
1	+Ref	Transformer windings
2	-Ref	Transformer windings
3	+VCC ETS	Supply: Electronic nameplate (Only for motors and inverters that support this function)
4	+COS	Cosine stator windings
5	-COS	Cosine stator windings
6	+SIN	Sine stator windings
7	-SIN	Sine stator windings
8		Not assigned
9		Not assigned
10	Schirm	Encoder housing shield
11	+	Temperature monitoring: PT1000
12	-	Temperature monitoring: PT1000

ICN-M23 connector assignment

Incremental and SinCos absolute value encoder Hiperface©



ICN M23 for incremental and SinCos absolute value encoder Hiperface		
Contact	Name	Meaning
1	B	Track B / +SIN
2	A ⁻	Track A inverse /-COS
3	A	Track A / + COS
4	+UB	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	Schirm	Encoder housing shield
11	+	Temperature monitoring: PT1000
12	-	Temperature monitoring: PT1000

Product extensions

Motor connection
Connection via ICN connector



Motor/connector assignment

NOTICE

When making your selection, the motor data and permissible currents of the cables according to the system cable system manual must be observed.

Power terminal connectors

Motor code		m850-				
		S120/S3960	S120/M3960	S120/L3960	S140/S3240	S140/M3240
Plug		ICN-M23 6-pole				
Motor cable	mm ²	1.0/1.5/2.5				
Screw plug						
Order code		EWS0001				
Coding in the system cable type code		M01				
Bayonet lock						
Order code		EWS1001				
Coding in the system cable type code		M04				

Motor code		m850-				
		S140/L3240		S190/S3000	S190/M3000	S190/L2520
Plug		ICN-M40 8-pole		ICN-M23 6-pole	ICN-M40 8-pole	
Motor cable	mm ²	2.5/4.0	6.0/10/16	1.0/1.5/2.5	6.0/10/16	
Screw plug						
Order code		EWS0012	EWS0013	EWS0001	EWS0013	
Coding in the system cable type code		M02	M03	M01	M03	
Bayonet lock						
Order code		EWS1012	EWS1013	EWS1001	EWS1013	
Coding in the system cable type code		M05	M06	M04	M06	

Feedback connectors

Feedback	Resolver	SinCos absolute value Hiperface
Plug	ICN-M23	ICN-M23
Screw plug		
Order code	EWS0006	EWS0010
Coding in the system cable type code	F01	F02
Bayonet lock		
Order code	EWS1006	EWS1010
Coding in the system cable type code	F05	F06



Product extensions

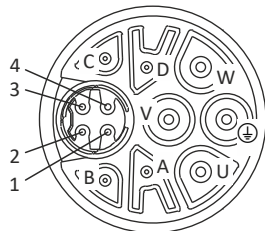
Motor connection
Connection via ICN connector

One Cable Technology (OCT)

Connection of power, brake, feedback and temperature monitoring

ICN-M23 connector assignment, hybrid

For One Cable Technology (OCT) with digital absolute value encoder



ICN M23 Hybrid for One Cable Technology (OCT) with digital absolute value encoder

Contact	Name	Meaning
U	U	Power phase U
V	V	Power phase V
W	W	Power phase W
PE	PE	PE
A	BD1	Holding brake +
B	BD2	Holding brake -
C	+	Optional temperature monitoring: PTC +
D	-	Optional temperature monitoring: PTC -
1		Not assigned
2	+	VCC/data +
3	-	GND/data -
4		Not assigned

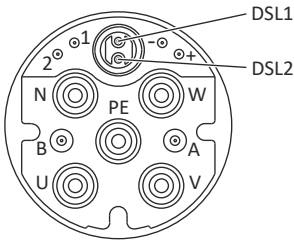
Product extensions

Motor connection
Connection via ICN connector



ICN-M40 connector assignment, hybrid

For One Cable Technology (OCT) with digital absolute value encoder



ICN M40 Hybrid for One Cable Technology (OCT) with digital absolute value encoder		
Contact	Name	Meaning
U	U	Power phase U
V	V	Power phase V
W	W	Power phase W
A	BD1	Holding brake +
B	BD2	Holding brake -
PE	PE	PE
N		Not assigned
DSL1	+	VCC/data +
DSL2	-	GND/data -
+		Not assigned
-		Not assigned
1	+	Optional temperature monitoring: PTC +
2	-	Optional temperature monitoring: PTC -



Product extensions

Motor connection
Connection via ICN connector

Hybrid cables for One Cable Technology (OCT)

Connector with bayonet lock	ICN-M23 Hybrid
Order code for hybrid cable 1.5 mm ²	
Cable length 2.0 m	EYP0080A0020M11A00
Cable length 3.5 m	EYP0080A0035M11A00
Cable length 5.0 m	EYP0080A0050M11A00
Cable length 7.5 m	EYP0080A0075M11A00
Cable length 10 m	EYP0080A0100M11A00
Cable length 15 m	EYP0080A0150M11A00
Cable length 20 m	EYP0080A0200M11A00
Cable length 50 m	EYP0080A0500M11A00
Cable length 100 m	EYP0080A1000M11A00
Order code for hybrid cable 2.5 mm ²	
Cable length 2.0 m	EYP0081A0020M11A00
Cable length 3.5 m	EYP0081A0035M11A00
Cable length 5.0 m	EYP0081A0050M11A00
Cable length 7.5 m	EYP0081A0075M11A00
Cable length 10 m	EYP0081A0100M11A00
Cable length 15 m	EYP0081A0150M11A00
Cable length 20 m	EYP0081A0200M11A00
Connector with bayonet lock	ICN-M40 Hybrid
Order code for hybrid cable 4.0 mm ²	
Cable length 2.0 m	EYP0085A0020M12A00
Cable length 3.5 m	EYP0085A0035M12A00
Cable length 5.0 m	EYP0085A0050M12A00
Cable length 7.5 m	EYP0085A0075M12A00
Cable length 10 m	EYP0085A0100M12A00
Cable length 15 m	EYP0085A0150M12A00
Cable length 20 m	EYP0085A0200M12A00
Cable length 50 m	EYP0085A0500M12A00
Cable length 100 m	EYP0085A1000M12A00
Order code for hybrid cable 6.0 mm ²	
Cable length 2.0 m	EYP0086A0020M12A00
Cable length 3.5 m	EYP0086A0035M12A00
Cable length 5.0 m	EYP0086A0050M12A00
Cable length 7.5 m	EYP0086A0075M12A00
Cable length 10 m	EYP0086A0100M12A00
Cable length 15 m	EYP0086A0150M12A00
Cable length 20 m	EYP0086A0200M12A00
Cable length 50 m	EYP0086A0500M12A00
Cable length 100 m	EYP0086A1000M12A00



Brakes

⚠ CAUTION!

They may not be used as safety elements (particularly with hoist axes) without additional measures being implemented.

The brakes used are not fail-safe brakes in the sense that prospective disruptive factors, e.g. oil ingress, can lead to a reduction in torque!

- ▶ The brakes must only be used as holding brakes for holding the axes at a standstill or in the deenergised state.
- ▶ The brake must not be used as a service brake.

⚠ CAUTION!

If no suitable voltage (incorrect value, incorrect polarity) is applied to the brake, the brake will be applied and can be overheated and destroyed by the motor continuing to rotate.

Motor supply cables

If long motor supply cables are used, pay attention to the ohmic voltage drop along the cable and compensate for it with a higher voltage at the input end of the cable.

The following applies to Lenze system cables:

$U[V] = U_B[V] + 0.08 \frac{[V]}{[A] \times [m]} \times I_{Lg}[m] \times I_B[A]$	U	V	Resulting supply voltage
	U _B	V	Rated voltage of the brake
	I _{Lg}	m	Cable length
	I _B	A	Rated current of the brake

NOTICE

- ▶ The brakes become active when the supply voltage has been switched off (closed-circuit principle).
- ▶ When using the brakes purely as holding brakes, virtually no wear occurs on the friction surfaces.
- ▶ The friction surfaces must always be free from oil and grease because even small amounts of grease or oil will considerably reduce the braking torque.

NOTICE

In case of travel axes, the compliance of the permissible ratio of mass inertia load/brake motor (J_L/J_{MB}) ensures that the permissible maximum switching energy of the brake will not be exceeded and at least the values given for the emergency stop functions from the given speed (see rated data) are applied.

For hoist axes, the load torque resulting from the weight acts additionally. In this case, the specifications for (J_L/J_{MB}) do not apply.



To simplify matters, the friction energy per switching cycle can be calculated using the formula below and must not exceed the limit value for emergency stops, which depends on the switching rate:

$Q = \frac{1}{2} \times J_{\text{ges}} \times \left(2\pi \times \frac{\Delta n}{60} \right)^2 \times \frac{M_N}{M_N - M_L}$	Q	J	Friction energy
	J_{total}	kgm ²	Total mass inertia (motor + load)
	Δn	rpm	Differential speed
	M_N	Nm	Rated torque of the brake
	M_L	nM	Load torque



The shortest operating times of the brakes are achieved by DC switching of the voltage and an external suppressor circuit (varistor or spark suppressor).

Without suppressor circuit, the operating times may increase. A varistor/ spark suppressor limits the breaking voltage peaks. It must be ensured that the power limit of the suppressor circuit is not exceeded. This limit depends on the brake current, brake voltage, disengagement time and the switching operations per time unit.

Furthermore the suppressor circuit is necessary for interference suppression and for increasing the service life of the relay contacts (external, is not integrated into the motor).



It is not possible to readjust the brake.

Product extensions

Brakes
Spring-applied brakes



Spring-applied brakes

Rated data

NOTICE

Engagement and disengagement times apply to rated voltage ($\pm 0\%$) and suppressor circuit of the brakes with a varistor with DC switching. Without a suppressor circuit, the times may be longer.

The currents are the maximum values when the brake is cold (value used for dimensioning the current supply). The values for a motor at operating temperature are considerably lower.

Requirements with regard to the DC 24 V brake: smoothed DC voltage, ripple $\leq 1\%$.

Maximum switching energy for each emergency stop with $n = 3000$ rpm for a maximum of 3-6 emergency stops per hour.

Motor			m850-S120/ S3960	m850-S120/ M3960	m850-S120/ L3960	m850-S140/ S3240	m850-S140/ M3240	m850-S140/ L3240
Supply voltage range	V _{in}	V	21.6 ... 26.4					
Supply voltage	V _{rated}	V	24					
Bemessungsdrehmoment								
At 20 °C	M _{rated}	Nm	20			34		
At 120 °C	M _{rated}	Nm	18			32		
Rated current	I _{rated}	A	1.2			1.4		
Engagement time t1	t ₁	ms	30			50		
Disengagement time t2	t ₂	ms	110			150		
Friction energy	Q _E	kJ	3.1					
Weight	m	kg	2.0			3.0		
Massenträgheitsmoment								
Brake	J	kgcm ²	0.75			2.01		
Brake motor	J _{MB}	kgcm ²	7.5	13.3	19.2	18.1	32.5	46.9
Load/brake motor ratio	J _L /J _{MB}		74	47	32	34	19	13

Motor			m850-S190/S3000	m850-S190/M3000	m850-S190/L2520
Supply voltage range	V _{in}	V	21.6 ... 26.4		
Supply voltage	V _{rated}	V	24		
Bemessungsdrehmoment					
At 20 °C	M _{rated}	Nm	102		
At 120 °C	M _{rated}	Nm	100		
Rated current	I _{rated}	A	2.1		
Engagement time t1	t ₁	ms	40		
Disengagement time t2	t ₂	ms	230		
Friction energy	Q _E	kJ	5.7		
Weight	m	kg	6.70		
Massenträgheitsmoment					
Brake	J	kgcm ²	10.42		
Brake motor	J _{MB}	kgcm ²	72.6	128.9	204.3
Load/brake motor ratio	J _L /J _{MB}		15	8	5



Feedback

For speed control with a servo inverter, the servo motor can be equipped with the following feedback systems:

Inverter	Feedback without functional safety		
	Resolver	Absolute value encoder	Digital absolute value encoder for OCT
i950 servo inverter	RS0	AM128-8V-H	AM20-8V-D
i700 servo inverter	RS0	AM128-8V-H	-
8400 TopLine inverter drives	RS0	AM128-8V-H	-
9400 HighLine servo drives	RS0	AM128-8V-H	-

Inverter	Feedback with functional safety		
	Resolver	Absolute value encoder	Digital absolute value encoder for OCT
i950 servo inverter	RV03	AM128-8V-K2	AM20-8V-D2
9400 HighLine servo drives	RV03	AM128-8V-K2	-

Feedbacks in the environment of functional safety

Motors can perform speed-dependent safety functions for safe speed and/or safe relative position monitoring in a drive system by Lenze inverters or Controllers. In case of inverters, these functions are implemented by integrable safety modules and in case of Controllers by the additionally required Safety Controller.

When planning systems/installations of this kind, always observe the following:

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

You can find the limit values in the corresponding feedback data of the individual motor ranges.

Speed-dependent safety functions

Examples of speed-dependent safety functions:

- Safe stop 1 (SS1)
- Safe operational stop (SOS)
- Safely limited speed (SLS)
- Safe maximum speed (SMS)
- Safe direction (SDI)
- Operation mode selector (OMS) with confirmation (ES)
- Safe speed monitor (SSM)
- Safely limited increment (SLI)

Product extensions

Feedback
Resolver



Resolver

The stator-supplied, 2-pole resolver with two stator windings shifted by 90 degrees and a rotor winding with a transformer winding can record both the speed and the rotor position, just like a single-turn absolute value encoder. The rotor position can be determined within one mechanical motor revolution after a voltage failure.

Feedback type			Resolver	
Feedback			RS0	RV03
Speed-dependent safety functions			No	Yes
Design			Mounting	
Resolution - angle		'	0.8	0.8
Min. accuracy		'	-10	-10
Max. accuracy		'	10	10
Absolute positioning			1 revolution	1 revolution
Max. speed	$n_{\max}$	rpm	8000	8000
Max. DC input voltage	$V_{\text{in,max}}$	V	10	10
Max. input frequency	$f_{\text{in,max}}$	kHz	4	4
Ratio stator/rotor			0.3	0.3
Min ratio tolerance		%	-5	-5
Max ratio tolerance		%	5	5
Rotor impedance	Z_{ro}	Ω	51+j90	51+j90
Stator impedance	Z_{so}	Ω	102+j150	102+j150
Impedance	Z_{rs}	Ω	44+j76	44+j76
Min. insulation resistance at DC 500 V	R_{min}	M Ω	10	10
Number of pole pairs			1	1
Max. angle error Min		'	-10	-10
Max. angle error Max		'	10	10

Speed-dependent safety functions

Feedback			RV03
Max. permissible angular acceleration	α	rad/s ²	19000
Functional safety			
IEC 61508			SIL3
EN 13849-1			Up to Performance Level e



Product extensions

Feedback
Absolute value encoder

Absolute value encoder

Absolute value encoders can detect the speed, the rotor position, and the machine position with a very high resolution. They are used for the positioning of dynamic applications and do not require homing.



With the aid of the open feedback protocol HIPERFACE DSL® and in connection with the digital absolute value encoder AM20-8V-D, the motor supports the future-oriented One Cable Technology (OCT).

Feedback type			Digital absolute value encoder		SinCos absolute value encoder	
Feedback			AM20-8V-D	AM20-8V-D2	AM128-8V-H	AM128-8V-K2
Speed-dependent safety functions			No	Yes	No	Yes
Design			Mounting	Mounting	Mounting	Mounting
Encoder type			Multi-turn	Multi-turn	Multi-turn	Multi-turn
Resolution		bit	20	20	-	-
Pulses			-	-	128	128
Output signals			Digital	Digital	SinCos 1 Vss	SinCos 1 Vss
Interfaces			Hiperface	Hiperface	Hiperface	Hiperface
Absolute revolution			4096	4096	4096	4096
Resolution - angle			0.02	0.02	0.4	0.4
Min. accuracy		'	-	-	-1.3	-1.3
Max. accuracy		'	-	-	1.3	1.3
Fehlergrenze Positionswert						
System accuracy			1.7	1.7	-	-
Integral nonlinearity			1	1	-	-
Min. DC input voltage	$V_{in,min}$	V	-	-	7	7
Max. DC input voltage	$V_{in,max}$	V	-	-	12	12
Max. current consumption	I_{max}	A	0.15	0.15	0.06	0.06
Limit frequency	f_{max}	kHz	-	-	200	200

Speed-dependent safety functions

Feedback			AM20-8V-D2	AM128-8V-K2
Max. permissible angular acceleration	α	rad/s ²	240000	240000
Functional safety				
IEC 61508			SIL2	
EN 13849-1			Up to Performance Level d	

Product extensions

Temperature monitoring
Thermal detectors PT1000



Temperature monitoring

Thermal detectors PT1000

The thermal detector used continuously monitors the motor temperature. The temperature information is transferred to the inverter using the system cable of the feedback system. **This is not a full motor protection!**

This makes it possible to determine the motor temperature in the permissible operating range with great accuracy.

The thermal sensors used continuously monitor the motor temperature. The temperature information is transferred to the inverter using the system cable of the feedback system. **This is not a full motor protection!**

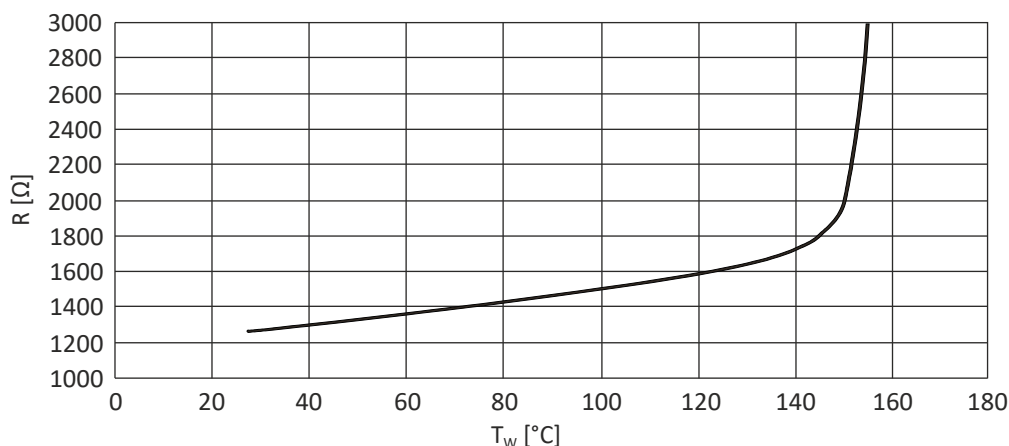
The motors are monitored via three thermal sensors connected in series (1x PT1000 + 2x PTC 150 °C). This makes it possible to determine the motor temperature in the permissible operating range and at the same time execute the overtemperature response configured in the inverter in one of the winding strands.



The three thermal sensors connected in series are identified on the nameplate by the short designation "PT1k+2PTC".



When supplying the thermal sensors with a measurement current of 1 mA, the connection between the temperature and the resistance measured applies.



R Resistance
 T_w Winding temperature



Product codes

Gearbox product code

Example		G	50	A	H	045	M	V	C	R	2	C	1A
Product type	Gearboxes	G											
Product family			50										
Generation				A B									
Gearbox type	Helical gearbox				H								
Output torque	45 Nm					045							
	100 Nm					110							
	140 Nm					114							
	210 Nm					121							
	320 Nm					132							
	450 Nm					145							
	600 Nm					160							
	850 Nm					185							
	1500 Nm					215							
	3000 Nm					230							
	5000 Nm					250							
	8000 Nm					280							
	14000 Nm					314							
Type of construction	Geared motor						M						
	Gearboxes						N						
Shaft type	Solid shaft with featherkey							V					
	Solid shaft without featherkey							G					
Housing type	Foot mounting + centering								A				
	Foot mounting								B				
	With centering								C				
Flange mounting	Without flange									R			
	Flange with through holes									K			
	Reinforced flange with through holes									P			
Number of stages	2-stage										2		
	3-stage										3		
	4-stage										4		
Motor mounting	Integrated motor											C	
	IEC adapter with jaw coupling											N T	
	IEC adapter with plug-in hollow shaft											H	
	NEMA adapter with jaw coupling											A	
	NEMA adapter with plug-in hollow shaft											B	
	Servomotor adapter with plug-in hollow shaft											S	
	Servomotor adapter with jaw coupling											E D G	
Drive size													1A ... □H 08 ... 82

Product codes



Product code of m850 synchronous servo motor

Example		M	8	5	A	S	120	S	25	5	S	0	R	C	C	0
Meaning	Variant	Product code														
Portfolio segment		M														
Product family	8		8													
Product level	5			5												
Product generation	1				A											
Product type	Synchronous servo motor					S										
Flange height	120						120									
	140						140									
	190						190									
Motor length	Short							S								
	Medium							M								
	Long							L								
Speed	25 x 100 rpm								25							
	30 x 100 rpm								30							
	32 x 100 rpm								32							
	40 x 100 rpm								40							
Degree of protection	IP5x									5						
	IP6x									6						
Cooling	No cooling										S					
Brake attachment	No brake											0				
	Spring-applied brake											F				
	Permanent magnet brake											P				
Encoder mounting	Resolver												R			
	Absolute value encoder												A			
	Digital absolute value encoder												D			
	Hiperface DSL®															
Product approval	CE													C		
	CE; cULus													L		
Manufacturer	Lenze														C	
Internal key																0



Motor data

Rated data

Inverter mains connection 400 V, Self-ventilated motors

Motor data

Rated data

Inverter mains connection 400 V, Self-ventilated motors

Motor			m850-S120/ S3960	m850-S120/ M3960	m850-S120/ L3960	m850-S140/ S3240	m850-S140/ M3240	m850-S140/ L3240
Standstill torque	M_0	Nm	6.50	11.0	15.0	11.0	21.0	28.0
Rated torque	M_{rated}	Nm	4.80	7.40	9.00	8.50	14.0	17.4
Max. torque	M_{max}	Nm	14.5	29.0	44.0	26.0	53.5	80.0
Rated speed	n_{rated}	rpm	3960	3960	3960	3240	3240	3240
Max. speed	n_{max}	rpm	6000	6000	6000	6000	6000	6000
Rated power	P_{rated}	kW	2	3.1	3.7	2.9	4.8	5.9
Standstill current	I_0	A	5.50	8.80	12.1	7.40	14.0	18.0
Rated current	I_{rated}	A	4.30	6.40	7.80	6.30	10.0	12.2
Max. current	I_{max}	A	15.0	28.0	42.0	23.0	45.5	66.0
Rated voltage	V_{rated}	V	330	330	320	340	330	330
Rated frequency	f_{rated}	Hz	330	330	330	270	270	270
Moment of inertia	J	kgcm ²	6.50	12.4	18.2	15.7	30.1	44.6
Efficiency	η		0.902	0.914	0.914	0.879	0.915	0.926
Torque constant	$K_{t_{0\ 150}}$ °C	Nm/A	1.18	1.25	1.24	1.49	1.50	1.56
Voltage constant	$K_{E_{LL\ 150}}$ °C	V/ (1000/ min)	68.99	73.1	72.93	86.81	88.36	90.67
Stator terminal resistance	$R_{UV\ 20}$ °C	Ω	2.24	1.02	0.63	1.436	0.562	0.366
Stator terminal resistance	$R_{UV\ 150}$ °C	Ω	3.376	1.537	0.949	2.164	0.847	0.552
Stator inductance	L	mH	11.5	6.73	4.58	9.90	5.22	3.76
Weight	m	kg	6.5	9.25	12.0	9.50	14.5	19.5

Motor data

Rated data

Inverter mains connection 400 V, Self-ventilated motors



Motor			m850-S190/S3000	m850-S190/M3000	m850-S190/L2520
Standstill torque	M_0	Nm	27.0	46.0	67.0
Rated torque	M_{rated}	Nm	16.0	24.0	35.0
Max. torque	M_{max}	Nm	71.0	120	200
Rated speed	n_{rated}	rpm	3000	3000	2520
Max. speed	n_{max}	rpm	4500	4500	4500
Rated power	P_{rated}	kW	5	7.5	9.2
Standstill current	I_0	A	16.0	26.8	30.8
Rated current	I_{rated}	A	10.3	15.4	17.7
Max. current	I_{max}	A	64.0	87.0	112
Rated voltage	V_{rated}	V	340	330	345
Rated frequency	f_{rated}	Hz	250	250	210
Moment of inertia	J	kgcm ²	60.8	117	193
Efficiency	η		0.905	0.919	0.929
Torque constant	$K_{t_{0\ 150}}^{\circ C}$	Nm/A	1.69	1.72	2.18
Voltage constant	$K_{E_{LL\ 150}}^{\circ C}$	V/(1000/min)	99.24	101.13	124.86
Stator terminal resistance	$R_{UV\ 20}^{\circ C}$	Ω	0.452	0.196	0.16
Stator terminal resistance	$R_{UV\ 150}^{\circ C}$	Ω	0.681	0.295	0.241
Stator inductance	L	mH	5.46	2.90	2.76
Weight	m	kg	19.8	28.5	41.0



Torque characteristics



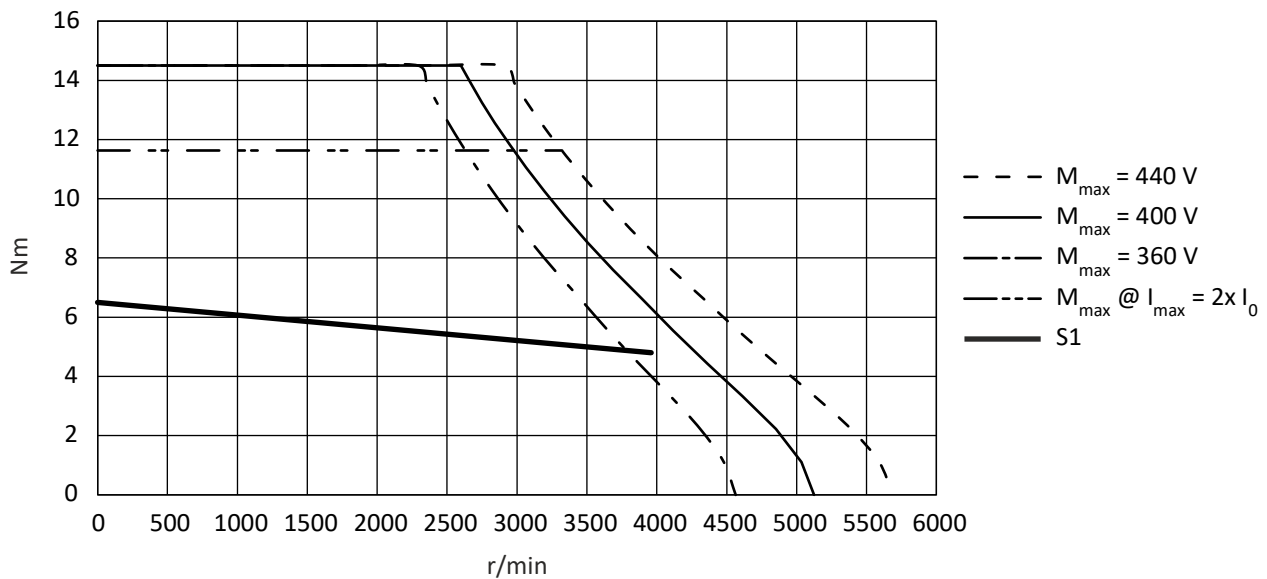
The torque/speed characteristic for your motor/inverter combination can be found on the Internet:

<http://www.lenze.com> → Product Finder → M-n characteristics

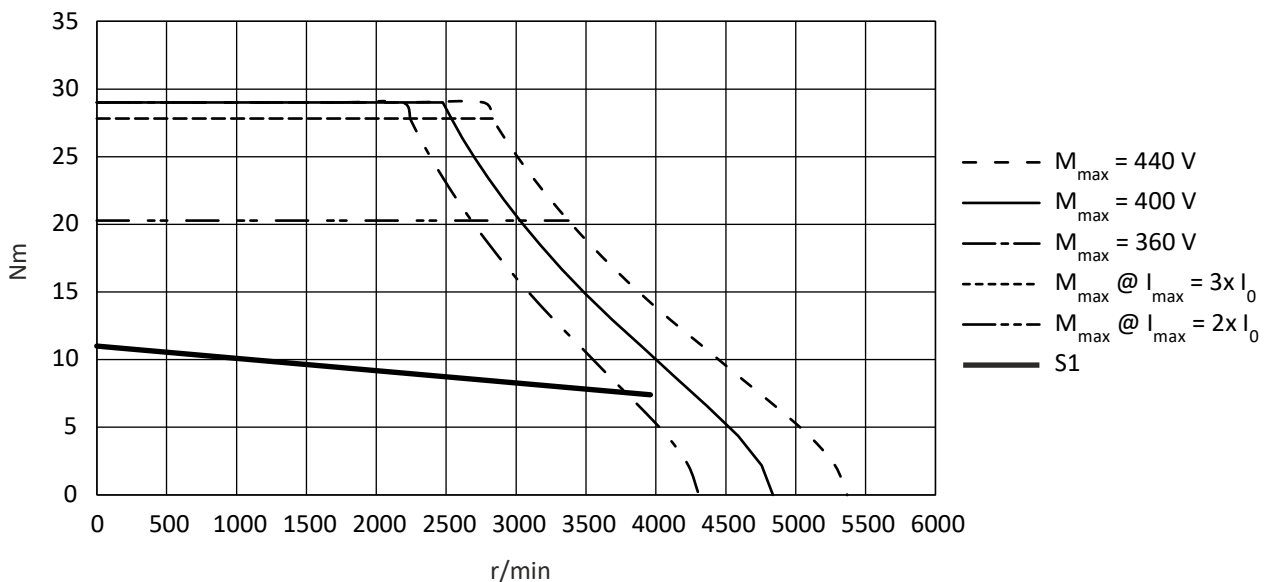


The following data apply to a mains voltage 3 x 400 V of the inverter.

m850-S120/S3960

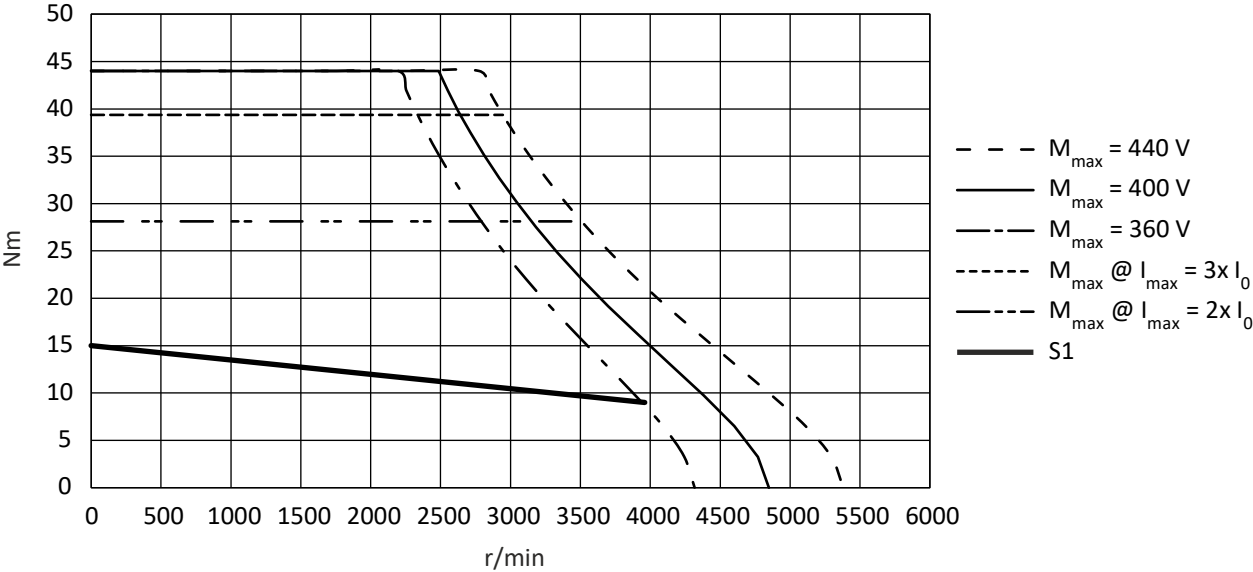


m850-S120/M3960

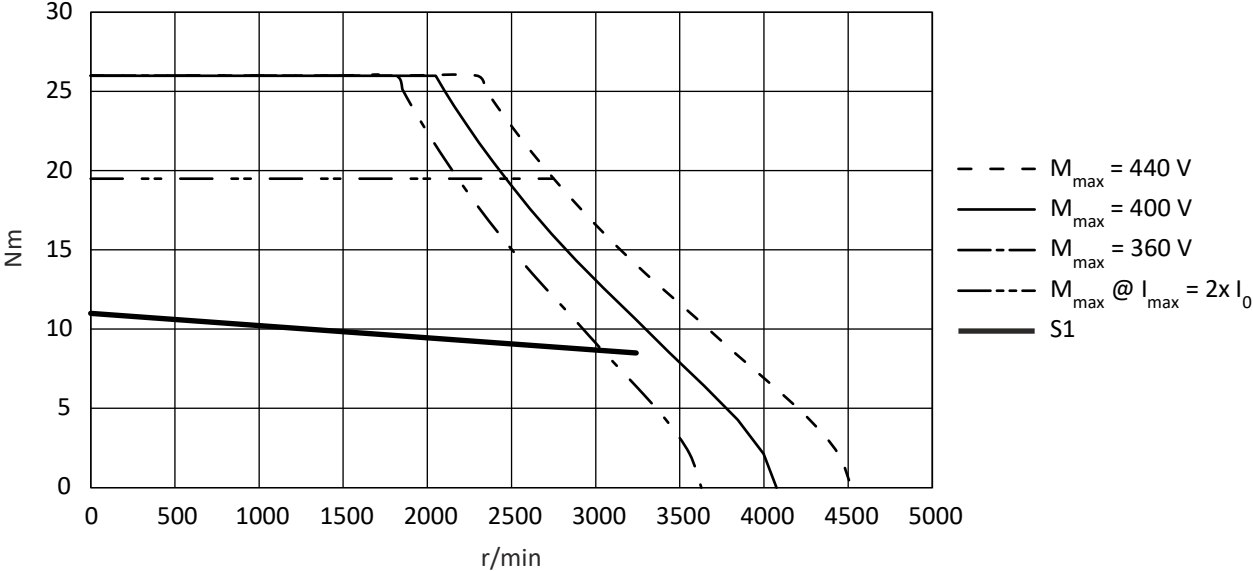




m850-S120/L3960



m850-S140/S3240

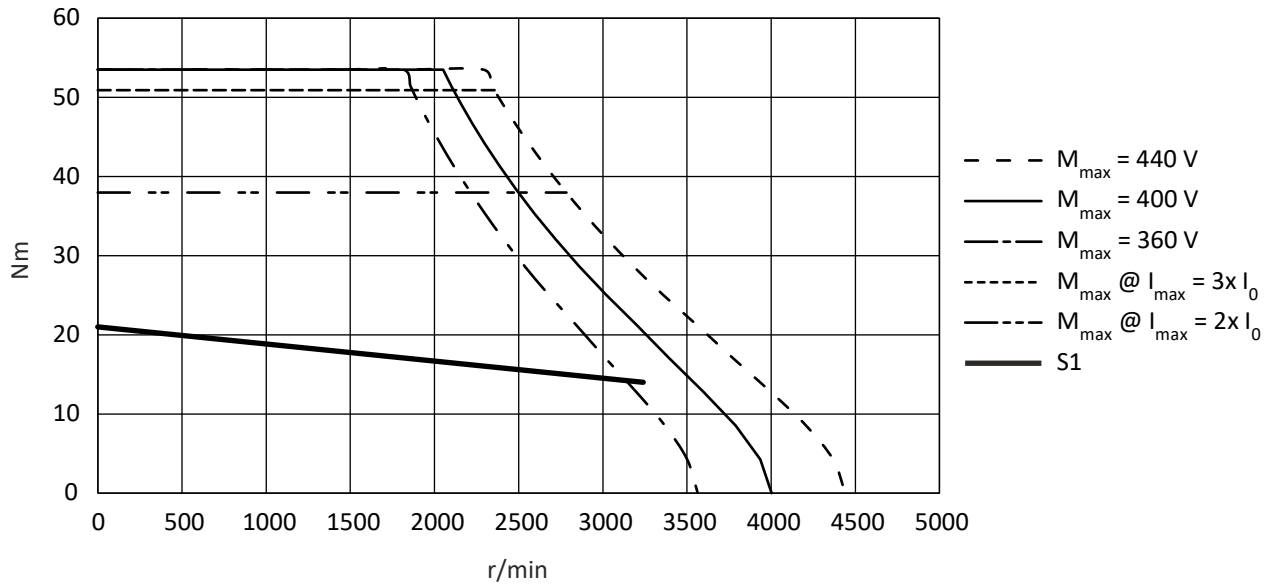




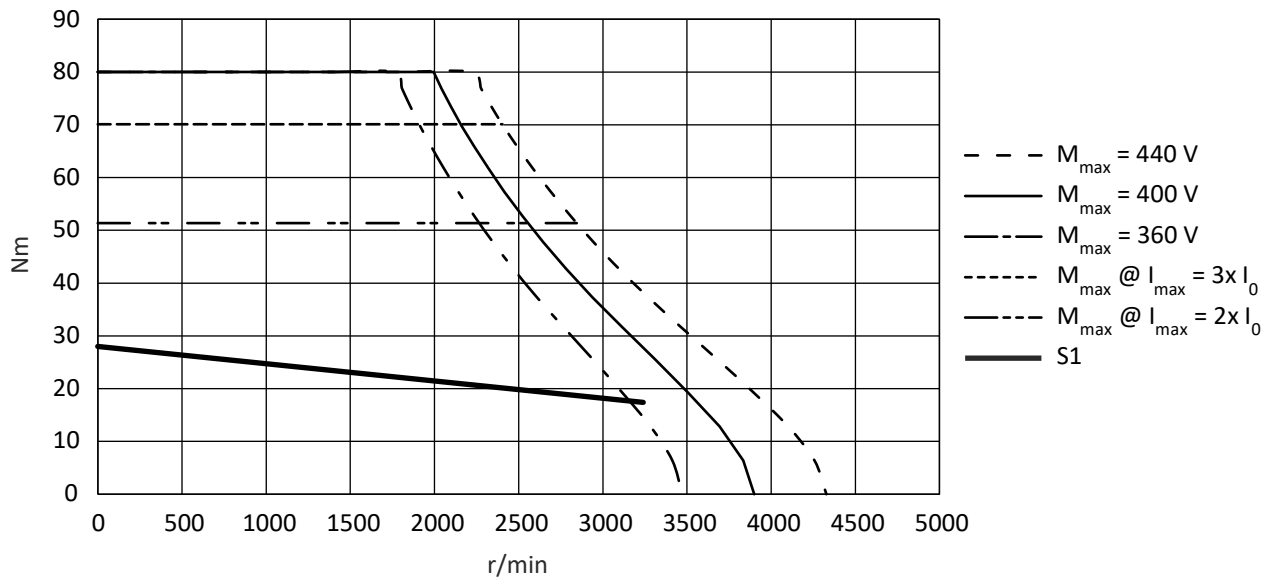
Motor data

Torque characteristics

m850-S140/M3240



m850-S140/L3240

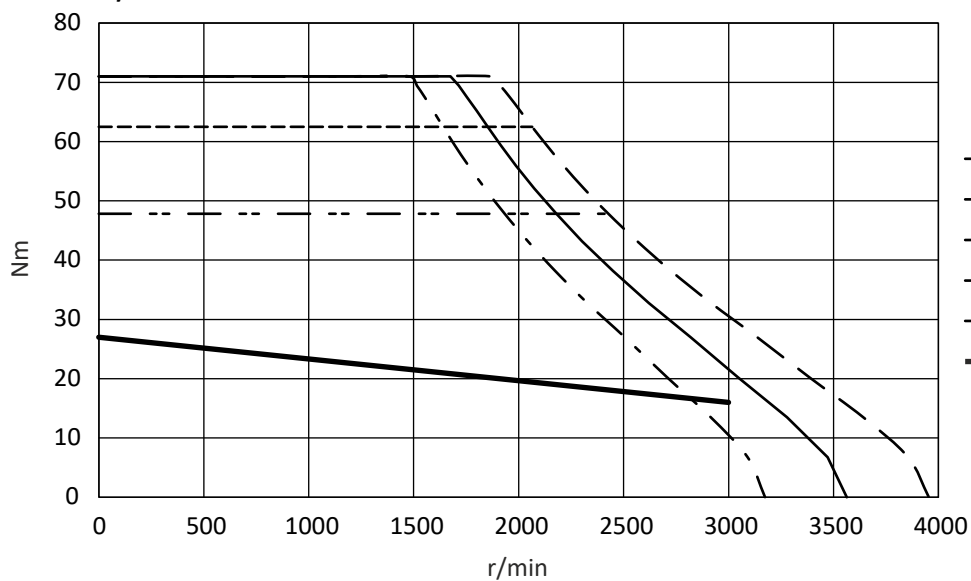


Motor data

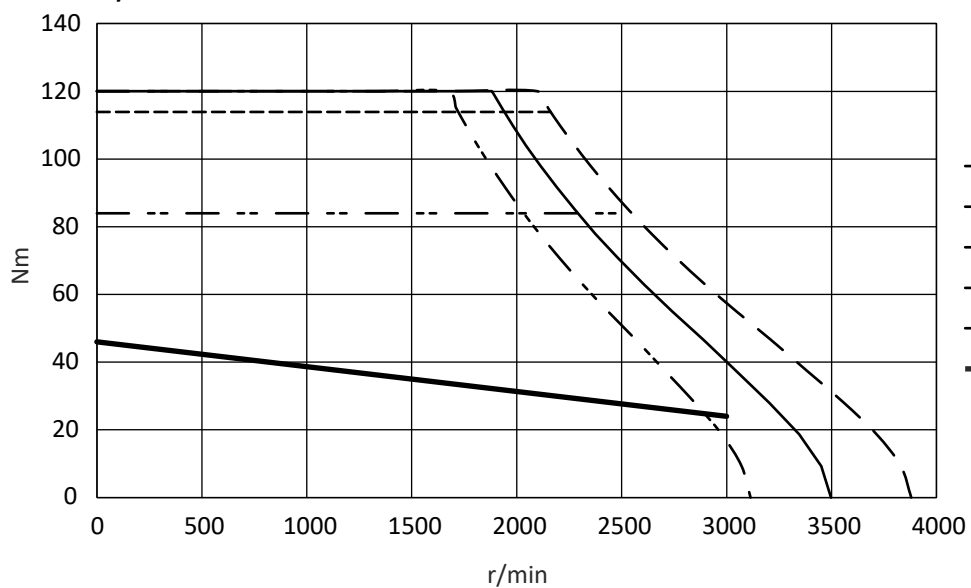
Torque characteristics



m850-S190/S3000



m850-S190/M3000

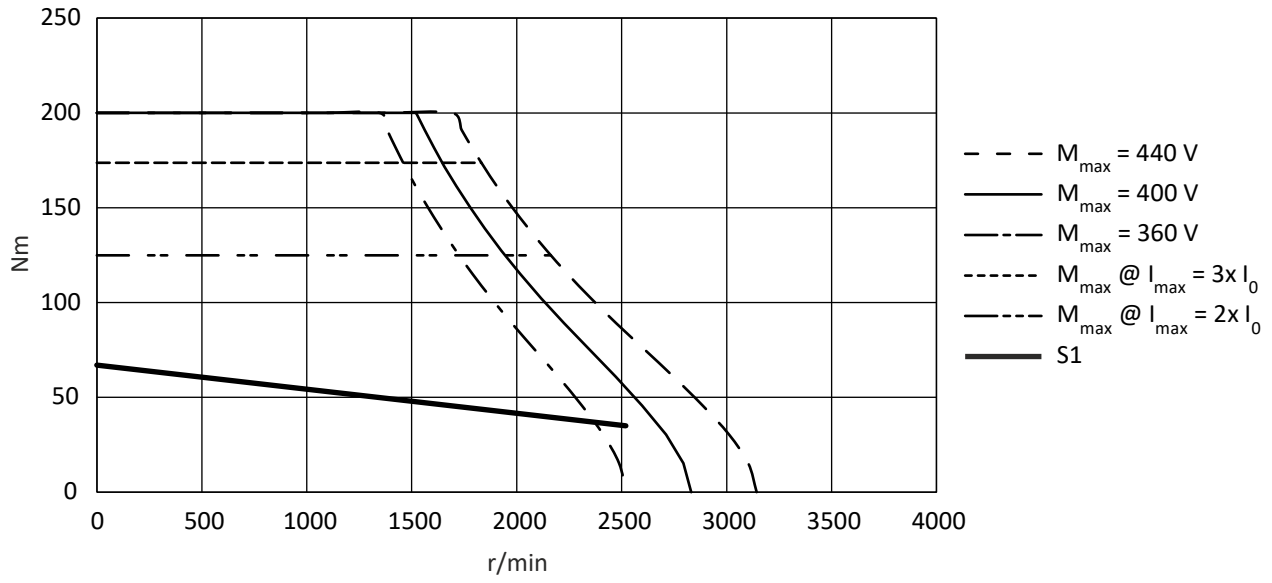




Motor data

Torque characteristics

m850-S190/L2520





Environmental notes and recycling

Lenze has been certified to the worldwide environmental management standard for many years (DIN EN ISO 14001). As part of our environmental policy and the associated climate responsibility, please note the following information on hazardous ingredients and the recycling of Lenze products and their packaging:



Lenze products are partly subject to the EU Directive on the restriction of certain hazardous substances in electrical and electronic equipment 2011/65/EU: RoHS Directive [UKCA: S.I. 2012/3032 - The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012] . This is documented accordingly in the EU declaration of conformity and with the CE mark.



The crossed-out wheeled bin symbol is located on the equipment. This information indicates that used electrical and electronic products must not be disposed of with normal household waste.

The EU Directive 2012/19/EU: Directive on waste electrical and electronic equipment (WEEE) [UKCA: S.I. 2013/3113 - The Waste Electrical and Electronic Equipment Regulations 2013] , which has been transposed into national law by the respective EU member states, applies to the disposal of equipment. As a customer, you have the option of disposing of the electrical and electronic equipment that you have purchased from us and that is subject to WEEE via the Lenze branch in your country.

Lenze addresses in Europe: <https://www.lenze.com/en-de/company/global-presence>

Some Lenze products contain batteries/rechargeable batteries in accordance with EU Directive 2006/66/EC: Battery Directive [UKCA: S.I. 2009/890 - The Waste Batteries and Accumulators Regulations 2009] . Any batteries/rechargeable batteries included are designed to last the life of the product and do not need to be replaced or otherwise removed by the end user.



Lenze products are usually sold with cardboard or plastic packaging. This packaging complies with EU Directive 94/62/EC: Directive on packaging and packaging waste [UKCA: S.I. 1997/648 - The Producer Responsibility Obligations (Packaging Waste) Regulations 1997] . The required disposal route is indicated by material-specific labels with the "recycling triangle". Example: "21 - other cardboard"

REACH

Lenze products are subject to REGULATION (EC) No 1907/2006: REACH Regulation [UKCA: S.I. 2008/2852 - The REACH Enforcement Regulations 2008] . When used as intended, exposure of substances to humans, animals and the environment is excluded.

Lenze products are industrial electrical and electronic products and are disposed of professionally. Both the mechanical and electrical components such as electric motors, gearboxes or inverters contain valuable raw materials that can be recycled and reused. Proper recycling and thus maintaining the highest possible level of recyclability is therefore important and sensible from an economic and ecological point of view.

- Coordinate professional disposal with your waste disposal company.
- Separate mechanical and electrical components, packaging, hazardous waste (e.g. gear oils) and batteries/rechargeable batteries wherever possible.
- Dispose of the separated waste in an environmentally sound and proper manner (no household waste or municipal bulky waste).

What?	Material	Disposal instructions
Pallets	Wood	Return to manufacturers, freight forwarders or reusable materials collection system
Packaging material	Paper, cardboard, pasteboard, plastics	Collect and dispose of separately
Products		
Electronic devices	Metal, plastics, circuit boards, heatsinks	As electronic waste give to professional disposer for recycling
Gearbox	Oil	Drain oil and dispose of separately
	Casting, steel, aluminium	Dispose as metal scrap
Motors	Casting, copper, rotors, magnets, potting compound	As engine scrap give to professional disposer for recycling
Dry-cell batteries/rechargeable batteries		As used batteries give to professional disposer for recycling



Further information on Lenze's environmental and climate responsibility and on the topic of energy efficiency can be found on the Internet:

www.Lenze.com → search word: "Sustainability"



Appendix

Good to know

Operating modes of the motor

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.

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

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.

Appendix

Good to know
Enclosures



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.

P Power
t Time
 t_L Idle time
 θ Temperature

P_v Power loss
 t_B Load period
 t_S Cycle duration

Enclosures

The protection class indicates the suitability of a product for specific ambient conditions with regard to humidity as well as the protection against contact and the ingress of foreign particles. The protection classes are classified in the EN 60034-5/ EN IEC 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 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 the like.	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 or the like.	3	Protection against spraying water, up to 60° from vertical.
4	Protection against granular foreign particles, $d > 1$ mm, keeping away tools, wire or 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).

Lenze SE
Postfach 101352 · 31763 Hameln
Hans-Lenze-Straße 1 · 31855 Aerzen
GERMANY
Hannover HRB 204803
Phone +49 5154 82-0
Fax +49 5154 82-2800
sales.de@lenze.com
www.Lenze.com