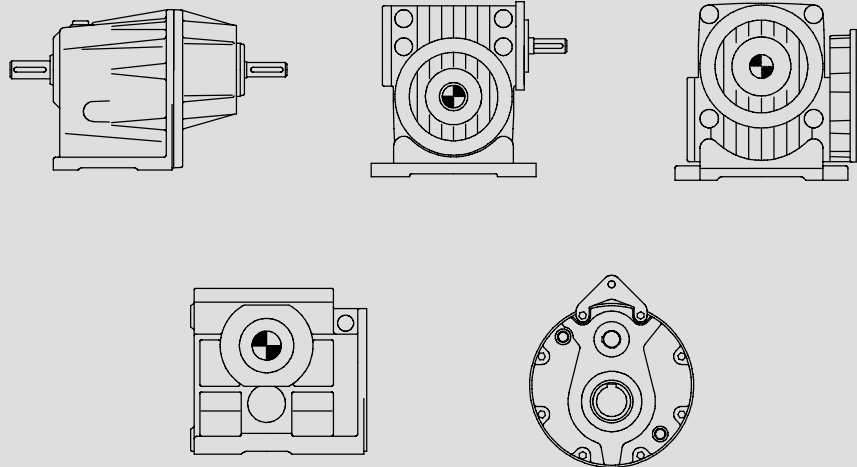


Operating Instructions

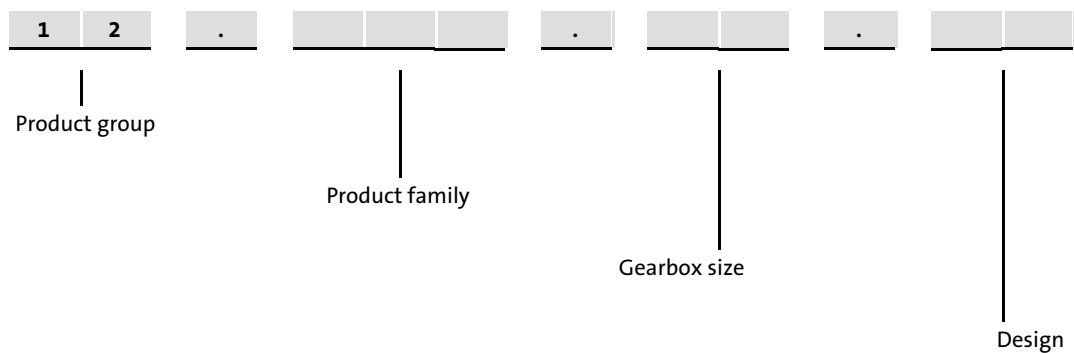
Gearbox



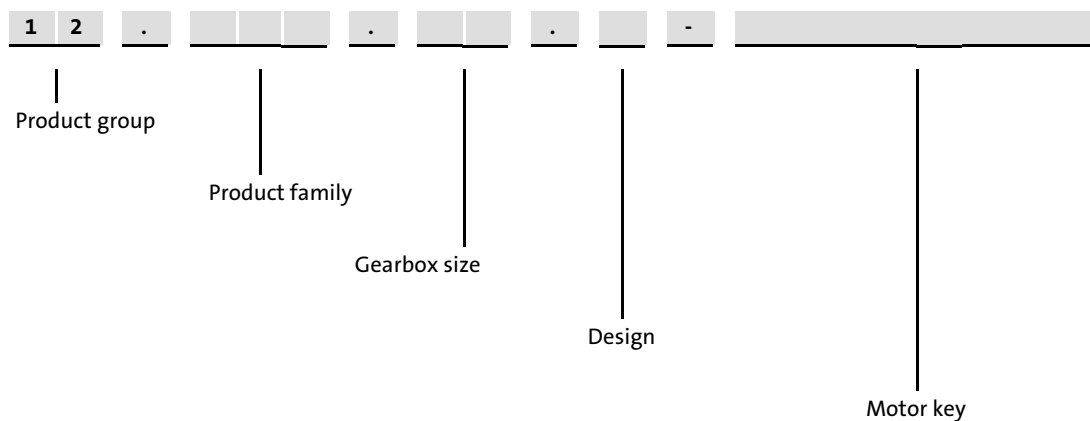
Type 12.□□□ / 52.□□□

Product key

Gearboxes



Geared motors



Nameplate

Gearboxes / geared motors

Field	Contents	Example
1	Assembly plant/country	Lenze EXTERTAL/Germany 12.623.12.1-71S/4-H-TH  i=132 CLP460  227 Nm 10/min (50Hz) GT/40001234 00566070 4-070-01-1156 0423
2	Product key	
3	Ratio Lubricant	
4	Torque M_2 in Nm Speed n_2 in 1/min (frequency in Hz)	
5	Order number ID number	
6	Customer requirements Year and week of manufacture	

Document history

Material number	Edition			Contents
391291	1.0	03/1996	TD09	First edition
450298	2.0	12/2001	TD09	Complete revision, new layout
	3.0	04/2003	TD09	Corrections in the lubricant quantity tables
	4.0	07/2004	TD09	Change in the lubricant table (lubricant type) in chapter "Maintenance intervals"
13035296	5.1	08/2004	TD09	Change: title page Change: nameplate Addition: list of lubricants (lubricant table)
13283213	6.0	12/2008	TD09	New edition due to reorganisation of the company

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1 Preface and general information

About these Operating Instructions

1 Preface and general information

1.1 About these Operating Instructions

- ▶ These Operating Instructions are intended for safety-relevant operations on and with the gearboxes 12.□□□ and 52.□□□. They contain safety instructions which must be observed.
- ▶ All persons working on and with the gearboxes 12.□□□ and 52.□□□ must have the Operating Instructions available and observe the information and notes relevant for them.
- ▶ The Operating Instructions must always be complete and perfectly readable.

1.2 Terminology used

Term	In the following text used for
Gearbox	Gearboxes of the product families 12.□□□ and 52.□□□
Drive system	Drive systems with gearboxes 12.□□□ and 52.□□□ and other Lenze drive components

1.3 Scope of supply

- ▶ The drive systems are combined individually according to a modular design. The scope of supply can be obtained from the pertinent papers.
- ▶ After receipt of the supply, check immediately whether it corresponds with the accompanying papers. Lenze does not grant any warranty for subsequent claims. Claim for
 - visible transport damages immediately to the forwarder.
 - visible deficiencies / incompleteness immediately to the responsible Lenze subsidiary / agency.

1.4 Lenze drive systems

1.4.1 Labelling

Lenze drive systems are uniquely designated by the content of their nameplates.

Manufacturer
Lenze Drives GmbH
Postfach 10 13 52
D-31763 Hameln

Application as directed

- ▶ Lenze drive systems
 - are intended for use in machinery and plant,
 - must only be used for the purposes ordered and confirmed,
 - must only be operated under the ambient conditions prescribed in these Operating Instructions,
 - must not be operated beyond their corresponding power limits.

Any other use shall be deemed inappropriate!

1.5 Legal regulations

Liability

- ▶ The information, data, and notes in the Operating Instructions were state of the art at the time of printing. Claims referring to drive systems which have already been supplied cannot be derived from the information, illustrations, and descriptions.
- ▶ We do not accept any liability for damage and operating interference caused by:
 - inappropriate use,
 - unauthorised modifications to the drive system,
 - improper working on and with the drive system,
 - operating faults,
 - disregarding the Operating Instructions.

Warranty

- ▶ Conditions of warranty: see terms of sale and delivery of Lenze Drive Systems GmbH.
- ▶ Warranty claims must be made to Lenze immediately after detecting the deficiency or fault.
- ▶ The warranty is void where liability claims cannot be made.

2**Safety instructions****2.1****Personnel responsible for safety****Operator**

- ▶ An operator is any natural or legal person who uses the drive system or on behalf of whom the drive system is used.
- ▶ The operator or his safety officer must ensure
 - that all relevant regulations, instructions and legislation are observed.
 - that only qualified personnel work with and on the drive system.
 - that the personnel have the Operating Instructions available for all corresponding operations.
 - that non-qualified personnel are prohibited from working with and on the drive system.

Skilled personnel

Skilled personnel are persons who - because of their education, experience, instructions, and knowledge about corresponding standards and regulations, rules for the prevention of accidents, and operating conditions - are authorised by the person responsible for the safety of the plant to perform the required actions and who are able to recognise potential hazards.

(See IEC 364, definition of skilled personnel)

2.2**General safety information**

- ▶ This safety information does not claimed to be complete. In case of questions and problems, please contact your Lenze representative.
- ▶ At the time of delivery the drive system meets the state of the art and ensures safe basic operation.
- ▶ The drive system is a source of danger for persons, for the drive system itself, and for other material assets of the operator, if
 - unqualified personnel works with and on the drive system,
 - the drive system is used inappropriately.
- ▶ The drive systems must be designed such that they perform their functions after proper installation and with application as directed in fault-free operation and that they do not cause hazards for persons. This also applies for their interaction with the complete plant.
- ▶ Be sure to take appropriate measures in the case of drive system failure so that no material damage occurs.
- ▶ Operate the drive system only when it is in a proper state.
- ▶ Retrofittings, modifications, or redesigns of the drive system are basically prohibited. Lenze must be contacted in all cases.

2.3

Notes used

The following pictographs and signal words are used in this documentation to indicate dangers and important information:

Safety instructions

Structure of safety instructions:

	Danger! (characterises the type and severity of danger) Note (describes the danger and gives information about how to prevent dangerous situations)
---	--

Pictograph and signal word	Meaning
 Danger!	Danger of personal injury through dangerous electrical voltage. Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
 Danger!	Danger of personal injury through a general source of danger. Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
 Stop!	Danger of property damage. Reference to a possible danger that may result in property damage if the corresponding measures are not taken.

Application notes

Pictograph and signal word	Meaning
 Note!	Important note to ensure troublefree operation
 Tip!	Useful tip for simple handling
	Reference to another documentation

3 Technical data

- ▶ The most important technical data are indicated on the nameplate (for design and contents see page 2).
- ▶ Further technical data are listed in the product catalogues.

3.1 Product features

3.1.1 Design

Drive systems have a modular design.

They consist of:

- ▶ Reduction gearboxes
 - helical gearboxes,
 - worm gearboxes,
 - helical-worm gearboxes,
 - helical-bevel gearboxes,
 - shaft-mounted gearboxes
- ▶ Variable speed drives
- ▶ Motors

3.1.2 Mode of operation

- ▶ Torque and speed conversion

Product family	Input stage	1st stage	2nd stage	3rd stage
Helical gearbox	Helical	Helical	Helical	---
Worm gearbox	---	Worm	---	---
Helical-worm gearbox	Helical	Helical	Worm	---
Helical-bevel gearbox			Bevel	Helical
Shaft-mounted gearbox			Helical	

Tab. 1 Torque and speed conversion of the gearboxes

- ▶ The reaction torque must be supported by foot mounting, flange mounting, or torque plate.

3.2 Weights

Gearbox type	Weights [kg]: Helical gearboxes / helical-geared motors										Gearbox
	Geared motors										
	Motor frame size										
	071	080	090	100	112	132	160	180	200	225	
12.6□1.08	< 11	< 14	---	---	---	---	---	---	---	---	< 4.5
12.6□2.08	< 12	< 15	---	---	---	---	---	---	---	---	< 6
12.6□1.10	< 13	< 16	< 20	< 25	---	---	---	---	---	---	< 6.5
12.6□2.10	< 15	< 18	< 25	---	---	---	---	---	---	---	< 9
12.6□3.10	< 18	< 20	---	---	---	---	---	---	---	---	< 12
12.6□1.12	< 18	< 20	< 25	< 30	< 35	---	---	---	---	---	< 12
12.6□2.12	< 25	< 25	< 35	< 40	---	---	---	---	---	---	< 17
12.6□3.12	< 25	< 30	< 35	---	---	---	---	---	---	---	< 20
12.6□1.16	---	< 30	< 40	< 45	< 50	< 90	---	---	---	---	< 20
12.6□2.16	---	< 40	< 50	< 55	< 60	< 100	---	---	---	---	< 35
12.6□3.16	< 45	< 50	< 55	< 60	---	---	---	---	---	---	< 40
12.6□1.20	---	---	< 55	< 60	< 70	< 105	< 170	---	---	---	< 40
12.6□2.20	---	---	< 80	< 85	< 90	< 130	< 190	---	---	---	< 60
12.6□3.20	---	< 80	< 90	< 95	< 100	< 140	---	---	---	---	< 75
12.6□1.25	---	---	---	< 75	< 85	< 120	< 185	< 240	---	---	< 65
12.6□2.25	---	---	---	< 130	< 135	< 175	< 240	< 295	---	---	< 115
12.6□3.25	---	---	< 140	< 150	< 155	< 195	< 255	---	---	---	< 130
12.6□1.32	---	---	---	---	---	< 135	< 205	< 260	< 340	< 445	< 85
12.6□2.32	---	---	---	---	---	< 250	< 315	< 370	< 450	< 455	< 200
12.6□3.32	---	---	---	< 240	< 245	< 285	< 350	< 405	---	---	< 225

Gearbox type	Weights [kg]: Worm gearboxes / worm-geared motors							Gearbox
	Geared motors							
	Motor frame size							
	063	071	080	090	100	112	132	
52.□□□.04	< 13	< 15	< 18	---	---	---	---	< 6.5
52.□□□.05	---	< 20	< 25	---	---	---	---	< 15
52.□□□.06	---	---	< 35	< 45	---	---	---	< 20
52.□□□.08	---	---	< 50	< 60	< 65	< 80	---	< 35
52.□□□.10	---	---	---	< 75	< 80	< 95	---	< 50
52.□□□.12	---	---	---	---	< 125	< 140	< 170	< 85

Gearbox type	Weights [kg]: Helical-worm gearboxes / helical-worm geared motors								Gearbox
	Geared motors								
	Motor frame size								
	063	071	080	090	100	112	132	160	
52.□□□.04		---	---	---	---	---	---	---	---
52.□□□.05	< 20	< 25	< 30	---	---	---	---	---	< 15
52.□□□.06	---	< 35	< 35	< 45	---	---	---	---	< 25
52.□□□.08	---	< 55	< 55	< 65	< 70	---	---	---	< 45
52.□□□.10	---	< 80	< 85	< 95	< 95	< 115	< 135	---	< 70
52.□□□.12	---	---	< 130	< 140	< 140	< 160	< 190	< 235	< 115

Gearbox type	Weights [kg]: Helical-bevel gearboxes / helical-bevel geared motors								Gearbox
	Geared motors								
	Motor frame size								
	071	080	090	100	112	132	160	180	
52.□□□.04	< 55	< 60	< 70	< 75	---	---	---	---	< 40
52.□□□.05	---	< 90	< 100	< 105	< 120	< 150	---	---	< 70
52.□□□.06	---	---	< 150	< 155	< 170	< 200	< 270	---	< 120
52.□□□.08	---	---	---	< 265	< 280	< 310	< 385	< 435	< 220

Type	Weights [kg]: Shaft-mounted gearboxes												
	Gearbox size												
	08	09	10	12	14	17	18	20	24	28	35	42	45
12.410	---	20	30	35	55	90	---	---	---	---	---	---	---
12.420	15	20	30	50	65	100	---	---	---	---	---	---	---
12.425	---	---	---	---	---	---	25	---	55	---	190	315	---
12.435	---	---	---	---	---	---	---	---	---	55	---	---	---
12.460	---	---	---	---	---	---	---	10	---	---	---	---	15

3.2.1 Operating conditions

Ambient conditions such as temperature range, etc. are determined by the lubricant specifications (see chapter 6.1) and the drive motor (📖 nameplate and Operating Instructions for the motor).

4 Mechanical installation



Danger!

Only transport the drive with transport equipment or hoists which are suitable for this load. Ensure a safe fixing. Avoid shocks!

4.1 Storage

If you do not install the gearbox immediately, ensure appropriate conditions of storage.

- ▶ Up to one year:
 - Without special measures in dry, dust-free rooms which are protected against sunlight.
 - Store the gearbox with ventilation such that the breather screw is located at the top.
 - Shafts and bright surfaces are delivered with protection against corrosion.
- ▶ More than one year:
 - Please contact Lenze.

4.2 Mounting

4.2.1 Preparation

Thoroughly remove anticorrosion agents from output shafts and flange faces.

4.2.2 General information about the assembly of drive systems

- ▶ Take safety measures prior to any operation:
 - Disconnect the machine from the mains, ensure standstill of the machine and avoid any machine movement.
 - Check the proper state of the drive system. Never install and set up damaged drive systems.
 - Check the combination of drive function and machine functions. Check the direction of rotation.
- ▶ The mounting surfaces must be even, without torsion, and free from vibration.
- ▶ Align the drive system on the mounting surfaces exactly with the machine shaft to be driven.
 - Ensure that the assembly is without torsion, to avoid additional load.
 - Compensate for minor misalignments by using suitable flexible couplings.
- ▶ Support the reaction torque appropriately.
- ▶ Fixings of accessories and attachments must be secured against loosening. We recommend that screw connections are glued.

**Stop!**

The lubricant fill quantity of the gearboxes is matched to the mounting position. The mounting position indicated on the nameplate must be observed to avoid damage to the gearbox.

4.2.3 Assembly of transmission elements on solid shafts

- ▶ Draw the transmission elements onto the output shaft only by using the centering thread.

**Stop!**

Shocks and blows to the shafts damage the roller bearings.

4.2.4 Mounting of motors on gearboxes with mounting flange

Helical gearboxes, helical-worm gearboxes, helical-bevel gearboxes

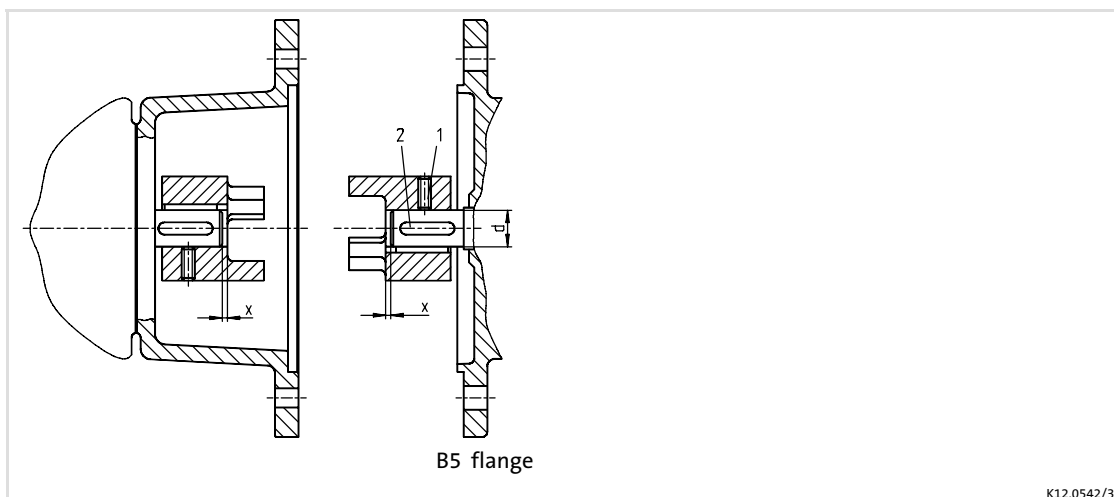


Fig. 1 Helical gearboxes, helical-worm gearboxes, helical-bevel gearboxes prepared for mounting on standard motors

- 1 Clamping screw
- 2 Motor key

1. Assemble motor key (2).
2. Push coupling hub onto the motor shaft, observe dimension x.
3. Secure coupling hub against axial movement using the clamping screw (1).
4. Lay spider into the coupling claw at the gearbox side.
5. Align claws of the motor-side coupling hub with its counterpart.
6. Slowly push motor, and bolt onto the gearbox flange.

Helical gearbox			Helical-bevel gearbox Type / size 12.5□3	Helical-worm gearbox Type / size 52.16□	Motor frame size	Motor shaft		Assembly dimensions x [mm]
Type / size 12.601	Type / size 12.602	Type / size 12.603				d [mm]	l [mm]	
08	08	10	---	05	063	11	23	0
					071	14	30	2.5
					080	19	40	7.5
10	10	12	---	06	071	14	30	0
					080	19	40	5
					090	24	50	0
12	12	16	15	08	080	19	40	5
					090	24	50	0
					100/112	28	60	0
16	16	20	19	10	090	24	50	0
					100/112	28	60	0
					100/112	28	60	0
20	20	25	24	12	132	38	80	0
					132	38	80	0
					160	42	110	3.5
25	25	32	30	---	180	48	110	0

Worm gearboxes

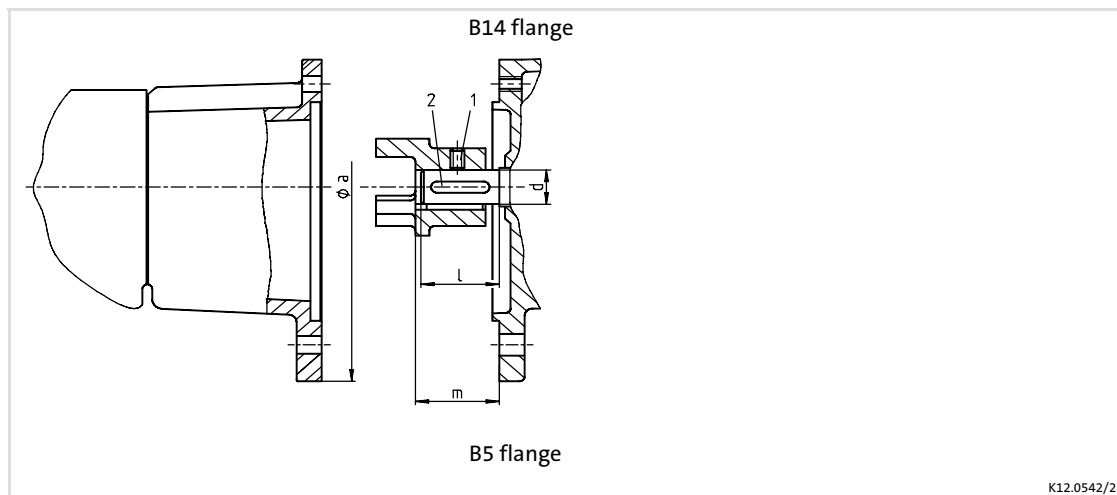


Fig. 2 Worm gearboxes prepared for mounting on standard motors, type 52.4□□ and 52.5□□

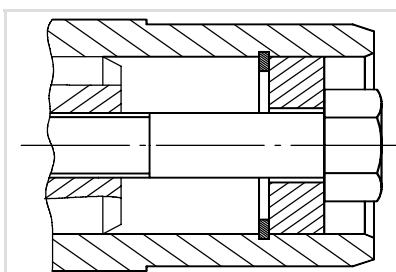
- 1 Clamping screw
2 Motor key

1. Assemble motor key (2).
2. Push coupling hub onto the motor shaft, observe dimension m .
3. Secure coupling hub against axial movement using the clamping screw (1).
4. Lay spider into the coupling claw at the gearbox side.
5. Align claws of the motor-side coupling hub with its counterpart.
6. Slowly push motor, and bolt onto the gearbox flange.

Motor frame size	Motor shaft		Flange dimensions	Assembly dimensions
	d [mm]	l [mm]	a [mm]	m [mm]
063	11	23	90	25
063	11	23	140	30
071	14	30	105/140/160	30
080	19	40	120/160/200	40

4.2.5 Mounting of gearboxes with hollow shaft with keyway

1. Draw the gearbox with hollow shaft onto the machine shaft to be driven:
 - Use a suitable assembly paste.
 - Take up forces only via the hollow shaft, and not via gearbox housing.
2. Secure the gearbox axially:
 - The hollow shaft is equipped with snap ring grooves for axial securing (fig. 3). Parts required for fixing the shaft are not included in the scope of supply.



K12.0525/1

Fig. 3 Hollow shaft with snap ring

4.2.6 Breather screw

- If your gearbox is equipped with a breather screw, the screw is marked by a label.



Stop!

Before the first set-up, remove the plug from the breather screw. Without ventilation, the seals may be damaged because of the rising pressure during operation.

5 **Electrical installation**



Danger!

Electrical connections must only be carried out by skilled personnel!

5.1 **Motor connection**

To correctly connect the motor, please observe:

- ▶ the notes in the terminal box of the motor
- ▶ the notes in the Operating Instructions of the motor
- ▶ the technical data on the motor nameplate.

6 Commissioning and operation



Stop!

The drive may only be commissioned by skilled personnel!

6.1 Before switching on

Check:

- ▶ Does the drive appear undamaged?
- ▶ Is the mechanical fixing o.k.?
- ▶ Has the electrical connection been carried out properly?
- ▶ Are all rotating parts and surfaces that may become hot protected against contact?
- ▶ If the oil level of the drive has been increased due to storage purposes (see chapter 4.1), it must be reduced again to the height permissible for the intended mounting position.
- ▶ For gearboxes with breathing:
 - Has the transport locking device been removed?

6.2 During operation

During operation, check the drive periodically and take special care of:

- ▶ Deviations from normal operation such as
 - abnormal noises, stronger vibrations, or increased temperatures
 - leakages,
 - loose fixing elements,
 - the condition of the electrical cables.
- ▶ If any interference should occur, you have to stop the drive and go through the steps for troubleshooting and fault elimination (chapter 8). If the interference cannot be eliminated, please contact the Lenze Service.

7

Maintenance

7.1

Maintenance intervals

- ▶ The mechanical power transmission system is free of maintenance.
- ▶ Shaft seals and roller bearings:
 - The service life depends on the operating conditions.
 - Replace seals in case of leakage to avoid consequential damage.
- ▶ Lubricants are subject to natural aging and must be replaced at regular intervals:
 - The type of lubricant is indicated on the nameplate. If not indicated, please see "List of lubricants" (Tab. 2).
 - Only use similar lubricants when changing the lubricant.
 - For maintenance intervals: see Tab. 2 "List of lubricants".

**Stop!**

Also observe the maintenance intervals for the other drive components!

Gearbox type	Lubricant				Change intervals
	Type	Specification	Ambient temperature	Note	
Helical gearboxes, helical-bevel gearboxes, shaft-mounted gearboxes	CLP 460	Oil on mineral basis with additives	0 °C ... + 40 °C		16,000 operating hours - no longer than three years (oil temperature 70...80 °C)
Worm gearboxes, helical-worm gearboxes	CLP-PG 460 CLP-PG 220	Oil on synthetic basis (polyglycol)	-20 °C ... + 40 °C	Do not mix with mineral oils	25,000 operating hours - no longer than three years (oil temperature 70...100 °C)
All gearbox types	CLP-HC 220 (H1)	Food-compatible oil on synthetic basis	-20 °C ... + 40 °C	Approval to USDA H1	16,000 operating hours - no longer than three years (oil temperature 70...80 °C)
All gearbox types	CLP-E 320	Biodegradable diester oil on synthetic basis	-20 °C ... + 40 °C	Water pollution class 0	16,000 operating hours - no longer than three years (oil temperature 70...80 °C)

Tab. 2 List of lubricants

7.2 Maintenance operations

7.2.1 Replacing the lubricant

- ▶ Gearbox should be warm.
- ▶ Secure drive system and machine from inadvertent movement and mains connection.



Stop!

The input stage is separately greased - completely drain all gearbox parts!

1. Drain lubricant through orifice.
2. Insert oil drain plug with new seal.
3. Fill up lubricant through filler.
4. Insert filling screw.
5. Dispose of waste oil according to the applicable regulations.

7.2.2 Lubricant quantity

Single-stage helical gearboxes / geared motors

Gearbox type	Lubricant quantity [l]: Single-stage helical gearboxes / geared motors	
	Design B3, B3/B11, B3/B5, B5, B6, B7, B8, B10, B14	V1, V1/V5, V3, V5, V6, V3/V6, V10, V14, V18, V19
12.6□1.08	0.12	0.12
12.6□1.10	0.22	0.22
12.6□1.12	0.40	0.40
12.6□1.16	0.80	0.80
12.6□1.20	1.60	1.60
12.6□1.25	3.50	3.50
12.6□1.32	7.50	7.50

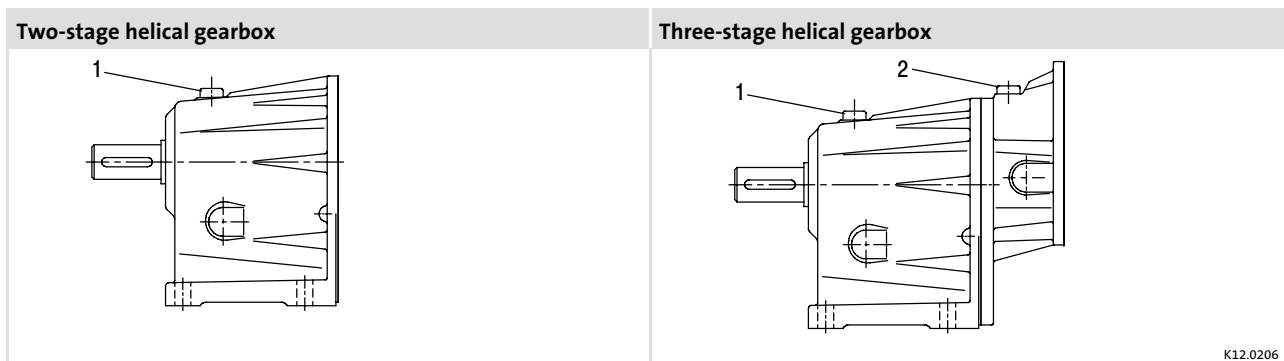
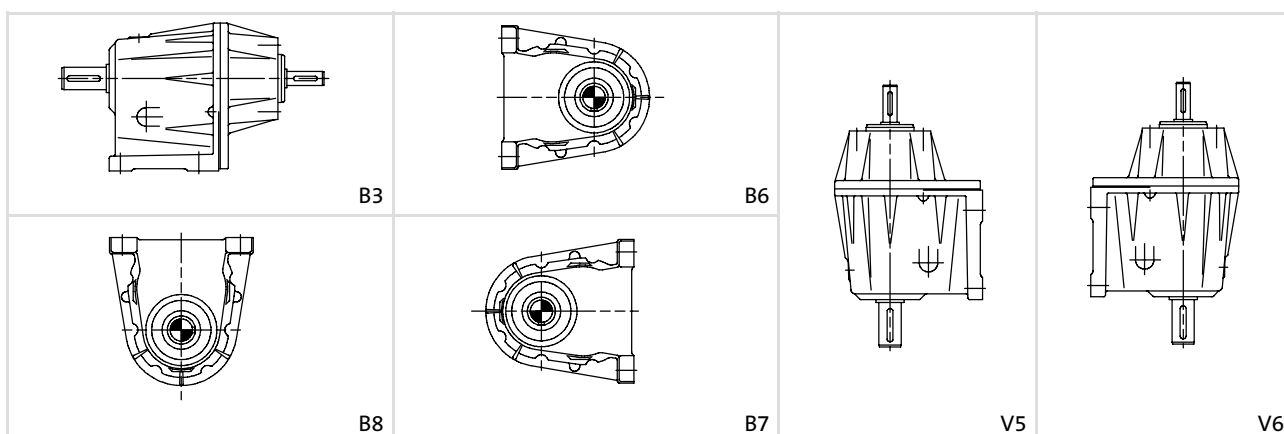
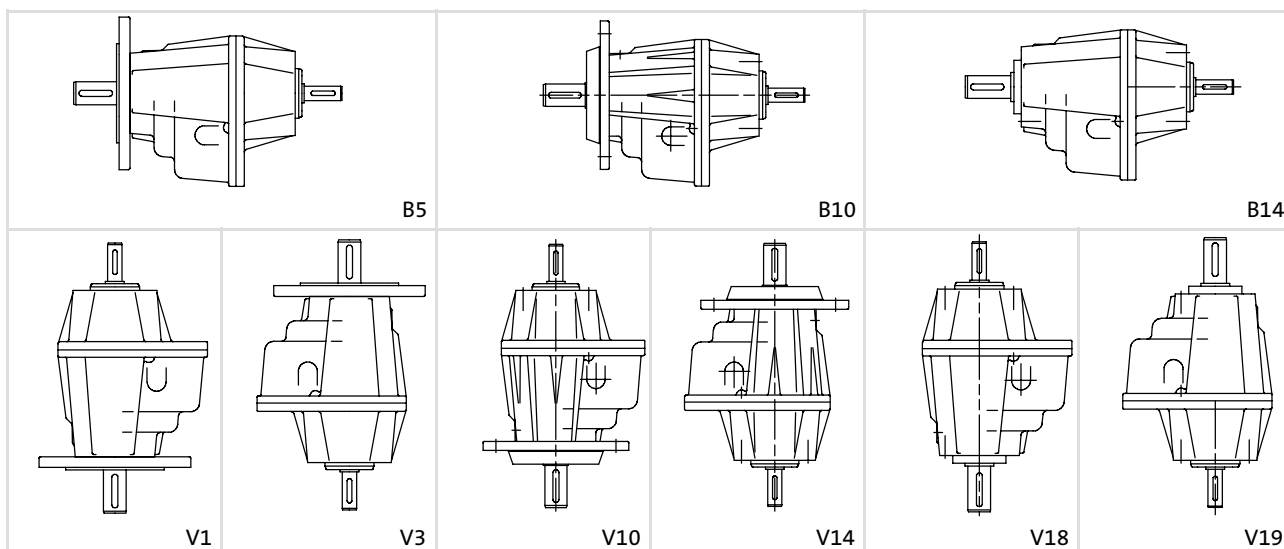
Two-stage and three-stage helical gearboxes / geared motors

Fig. 4

Helical gearbox

- 1 Basic gearbox
- 2 Pre-stage unit

Foot design**Flange design**

Foot/flange design

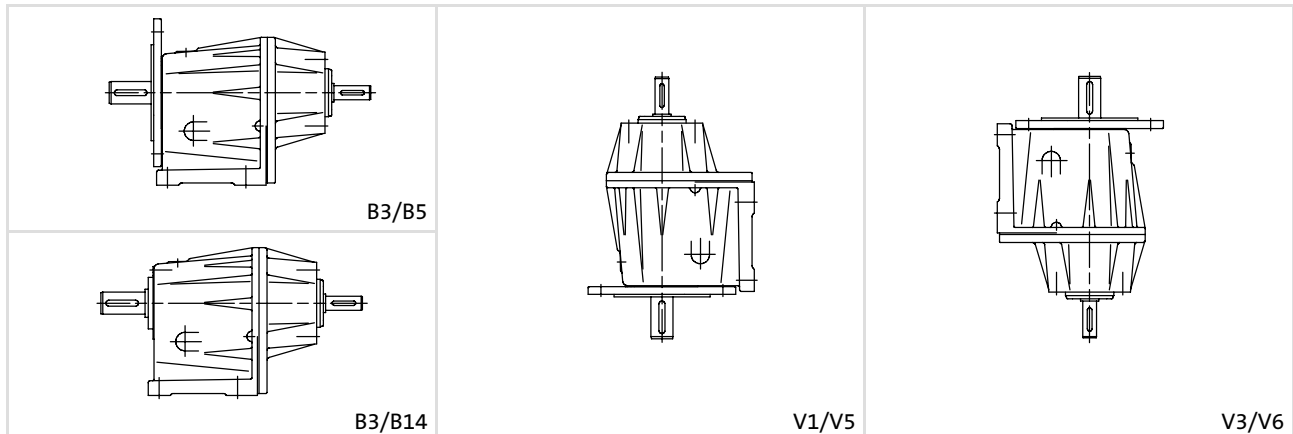


Fig. 5 Helical gearbox designs (K12.0146)

Lubricant quantity [l]: Two-stage and three-stage helical gearboxes / geared motors						
Gearbox type	Design					
	B3, B6, B7, B8, B3/B5, B3/B14	B5, B10, B14	V1, V10, V18	V3, V14, V19	V5, V1/V5	V6, V3/V6
12.602.08□.1/12.602.08□.4	0.2	0.2	0.2	0.2	0.2	0.2
12.602.08□.5/12.622.08	0.2	0.2	0.2	0.2	0.2	0.2
12.602.10□.1/12.602.10□.4	0.5	0.5	0.5	0.5	0.5	0.5
12.602.10□.5/12.622.10	0.5	0.5	0.5	0.5	0.5	0.5
12.603.10. (basic gearbox)	0.5	0.5	0.5	0.5	0.5	0.5
12.603.10. (pre-stage)	0.2	0.2	0.2	0.2	0.2	0.2
12.602.12□.1/12.602.12□.4	0.9	0.8	0.8	0.8	0.9	0.9
12.602.12□.5/12.622.12	0.9	0.8	0.8	0.6	0.9	0.6
12.603.12. (basic gearbox)	0.9	0.8	0.8	0.6	0.9	0.6
12.603.12. (pre-stage)	0.2	0.2	0.2	0.2	0.2	0.2
12.602.16□.1/12.602.16□.4	1.3	1.3	1.8	2.0	1.8	2.0
12.602.16□.5/12.622.16	1.3	1.3	1.8	1.5	1.8	1.5
12.603.16. (basic gearbox)	1.3	1.3	1.8	1.5	1.8	1.5
12.603.16. (pre-stage)	0.5	0.5	0.5	0.5	0.5	0.5
12.602.20□.1/12.602.20□.4	2.4	2.4	3.0	4.4	3.0	4.4
12.602.20□.5/12.622.20	2.4	2.4	3.0	3.2	3.0	3.2
12.603.20. (basic gearbox)	2.4	2.4	3.0	3.2	3.0	3.2
12.603.20. (pre-stage)	0.6	0.6	0.8	0.6	0.8	0.6
12.602.25□.1/12.602.25□.4	4.5	4.5	8.0	7.0	8.0	7.0
12.602.25□.5/12.622.25	4.5	4.5	8.0	5.5	8.0	5.5
12.603.25. (basic gearbox)	4.5	4.5	8.0	5.5	8.0	5.5
12.603.25. (pre-stage)	1.5	1.5	1.8	1.5	1.8	1.5
12.602.32□.1/12.602.32□.4	10.0	10.0	14.0	12.0	14.0	12.0
12.602.32□.5/12.622.32	10.0	10.0	14.0	9.0	14.0	9.0
12.603.32. (basic gearbox)	10.0	10.0	14.0	9.0	14.0	9.0
12.603.32. (pre-stage)	2.5	2.5	3.0	2.5	3.0	2.5

Worm gearboxes

Gearbox type	Lubricant quantity [l]: Worm gearboxes		
	Foot	Design Flange	Hollow-shaft
52.□□□.04	0.28	0.28	0.25
52.□□□.05	0.5	0.5	0.45
52.□□□.06	1.0	1.1	1.0
52.□□□.08	2.0	2.2	1.8
52.□□□.10	2.5	2.9	2.35
52.□□□.12	5.5	6.0	5.0

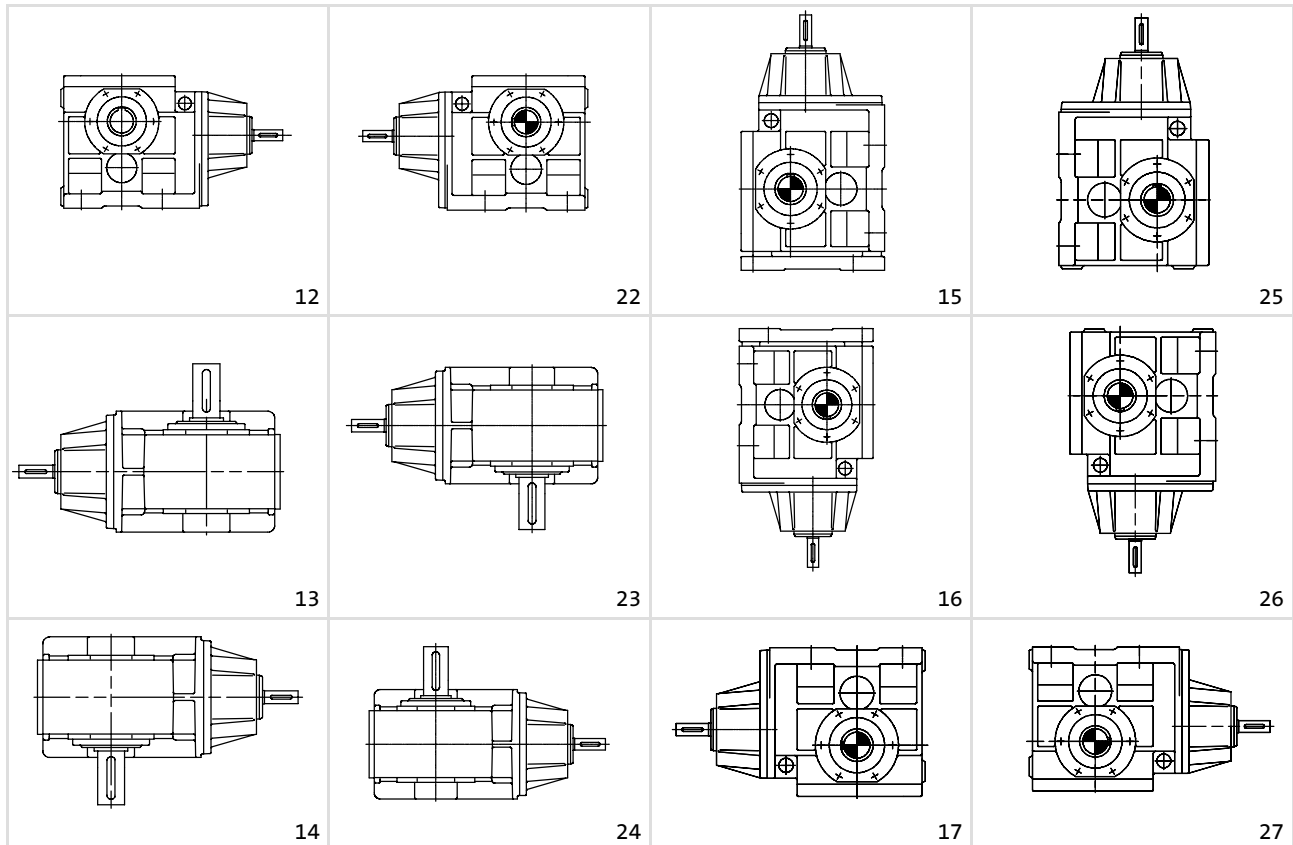
Helical-worm gearboxes

Gearbox type	Lubricant quantity [l]: Basic gearboxes		
	Foot	Design Flange	Hollow-shaft
52.□□□.05	0.5	0.5	0.45
52.□□□.06	1.0	1.1	1.0
52.□□□.08	2.0	2.2	1.8
52.□□□.10	2.5	2.9	2.35
52.□□□.12	5.5	6.0	5.0

Gearbox type	Lubricant quantity [l]: Pre-stage, free input-shaft design	
	Mounting positions	
	Vertical input shaft, below	Other mounting positions
52.1□□.05	0.10	0.16
52.1□□.06	0.18	0.27
52.1□□.08	0.30	0.45
52.1□□.10	0.60	1.00
52.1□□.12	1.00	2.00

Gearbox type	Lubricant quantity [l]: Directly mounted on motor, with hollow shaft at input side	
	All mounting positions	
52.□ 2 □.05	0.08	
52.□ 2 □.06	0.14	
52.□ 2 □.08	0.24	
52.□ 2 □.10	0.35	
52.□ 2 □.12	0.70	

Helical-bevel gearboxes / geared motors



Tab. 3 Design of helical-bevel gearboxes / geared motors (K12.0420)

Gearbox type	Lubricant quantity [l]: Helical-bevel gearboxes / geared motors				
	Design				
	12, 22	17, 27	13, 14, 23, 24	15, 25	16, 26
12.503.15□.1 12.503.15□.4	1.5	2.2	2	3.15	1.7
12.503.15□.5 12.522.15□	1.5	2.2	2	3.15	1.7
12.503.19□.1 12.503.19□.4	2.8	3.7	3.5	5.2	2.8
12.503.19□.5 12.522.19□	2.8	3.7	3.5	4.8	2.8
12.503.24□.1 12.503.24□.4	4	5.5	6.5	9	4.8
12.503.24□.5 12.522.24□	4	5.5	6.5	8	4.8
12.503.30□.1 12.503.30□.4	7	13	13	16.5	11
12.503.30□.5 12.522.30□	7	13	13	15	11

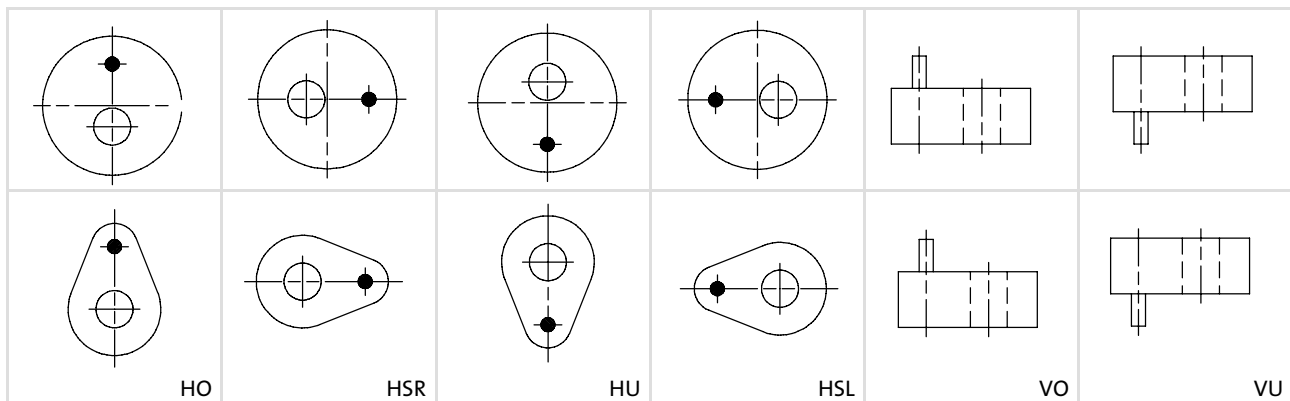
Shaft-mounted gearboxes

Fig. 6 Mounting positions of shaft-mounted gearboxes (K12.0250)

Gearbox type	Lubricant quantity [l]: Shaft-mounted gearboxes					
	Mounting positions					
	HO	HSR	HU	HSL	VO	VU
12.410.09.□□	0.5	0.7	0.5	0.7	0.9	1.0
12.410.10.□□	0.6	1.0	0.6	1.0	1.5	1.5
12.410.12.□□	0.8	1.5	0.6	1.5	2.2	2.2
12.410.14.□□	1.4	2.4	1.0	2.4	3.5	3.8
12.410.17.□□	2.2	4.0	1.6	4.0	5.5	6.0
12.420.08.□□	0.8	0.8	0.8	0.6	1.2	1.2
12.420.09.□□	1.2	1.2	0.9	1.7	1.8	1.8
12.420.10.□□	1.8	1.9	1.4	1.0	2.8	2.8
12.420.12.□□	2.8	2.8	2.2	1.6	3.8	4.7
12.420.14.□□	4.5	4.5	3.5	2.8	6.0	7.0
12.420.17.□□	6.5	6.5	5.0	4.0	8.0	10.0
12.425.18.□□	1.8	0.8	0.9	0.8	1.8	1.8
12.425.24.□□	3.2	2.0	2.0	2.0	5.0	4.0
12.425.35.□□	10.0	6.0	5.0	6.0	10.0	9.0
12.425.42.□□	21.0	12.0	8.0	12.0	23.0	23.0
12.435.28.□□	3.6	1.6	2.0	1.6	2.0	2.0

7.2.3 Repair

Lenze recommends that repairs are carried out by the Lenze Service.

8 Troubleshooting and fault elimination

If any malfunctions should occur during operation of the drive system, please check the possible causes using the following table. If the fault cannot be eliminated by one of the listed measures, please contact the Lenze Service.

Fault	Possible cause	Remedy
Drive is at standstill	Voltage supply interrupted	Check connection
	Wrong electrical connection	Check if nameplate matches voltage supply
	Excessive load	Reduce load Check drive - machine combination
Motor running, gearbox at standstill	Fixing elements are missing or defective	Check attachment
	Gearbox is defective	Contact Lenze Service
Unusual noise	Overload	Reduce load Check drive - machine combination
	Damage in the gearbox or motor	Contact Lenze Service
Excessive temperature	Overload	Reduce load Check drive - machine combination
	Insufficient heat dissipation	Improve cooling air supply Clean gearbox / motor
	Insufficient lubricant	Refill lubricant as specified
Loose fixing elements	Vibrations	Avoid vibrations

Protect the environment! Valuable materials can be recycled.

What?		Where?
Transport material	Pallets	Return to the manufacturer or forwarder
	Packaging material	Cardboard box to waste paper Plastics to plastics recycling or residual waste Reuse or dispose of wood wool
Lubricants	Oil, grease	Dispose according to current regulations
Components	Housing: Cast iron, aluminium Bearings, shafts, gear wheels: Steel Seals: Hazardous waste	Separate different types of material and dispose





Notes





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