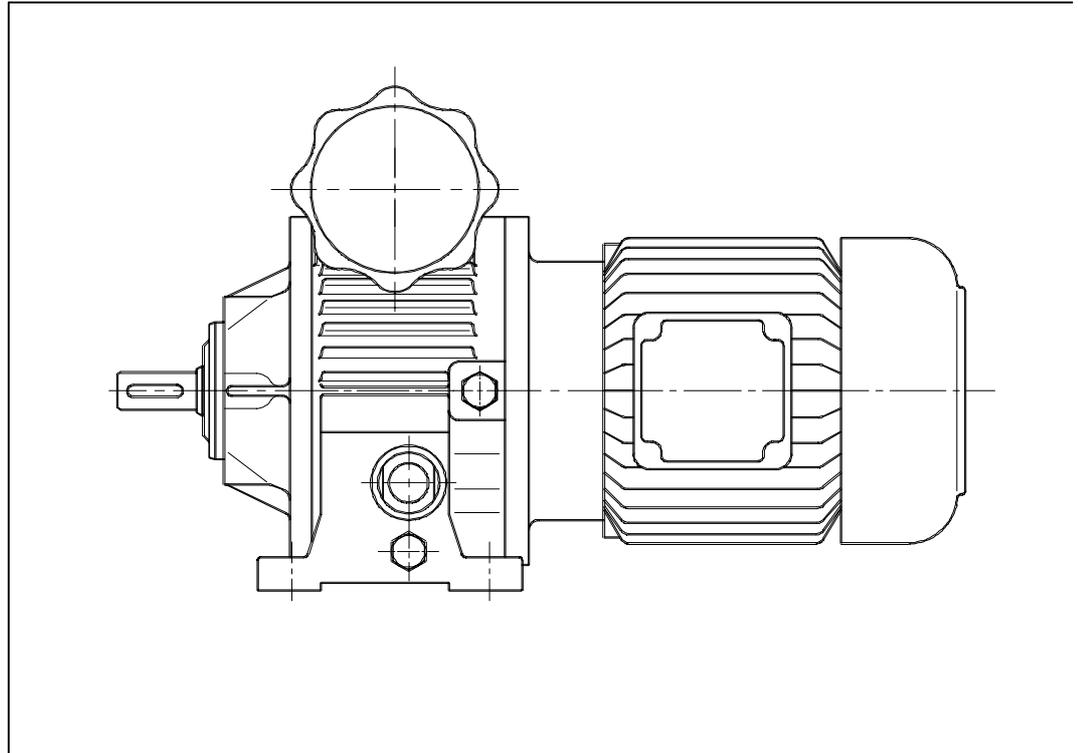


BA 11.5032
411 716 EN

Lenze

Operating Instructions



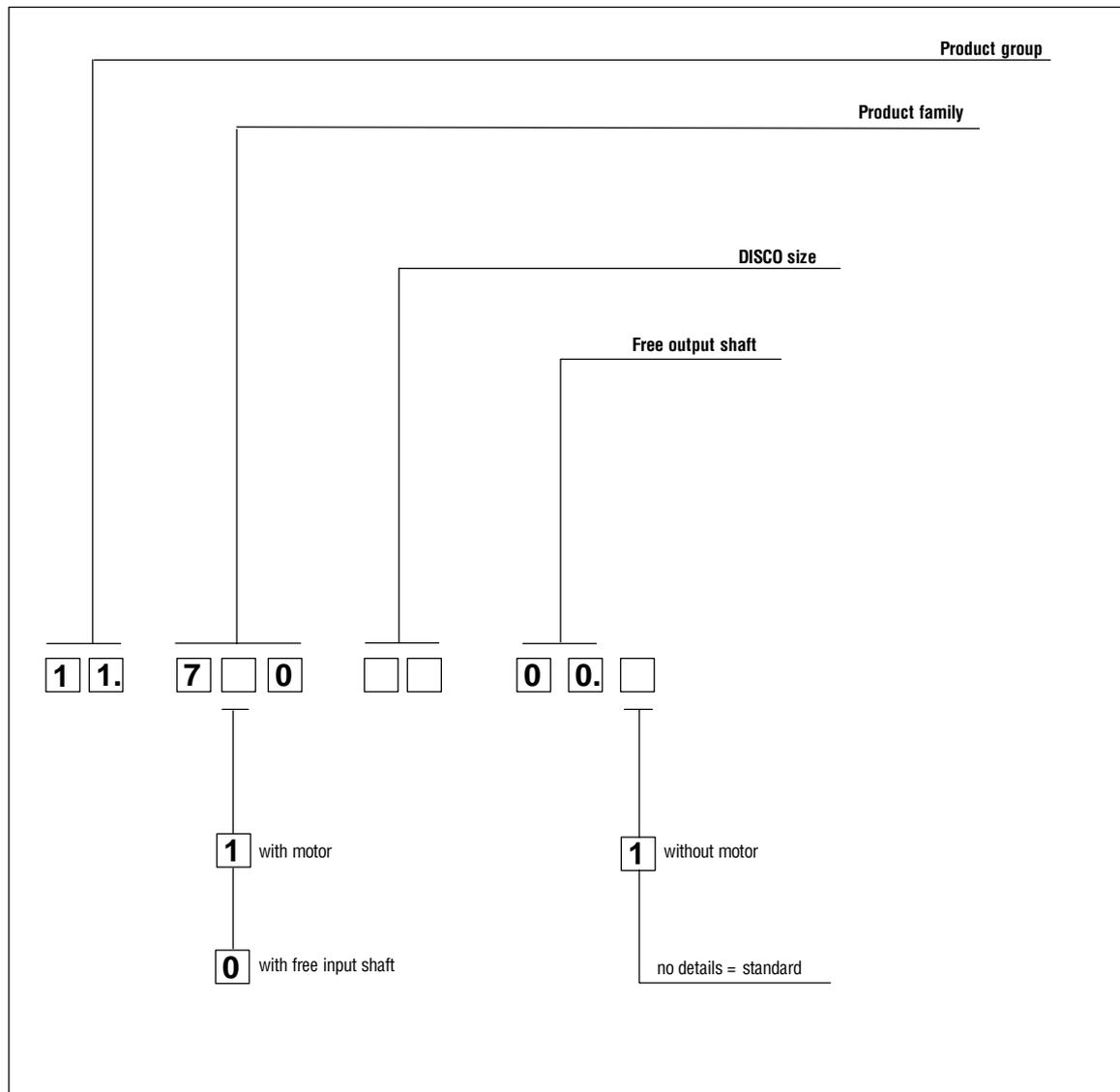
G□□ motion

***DISCO variable speed
drive***



Product code

Disco variable-speed drive without supplementary gearbox



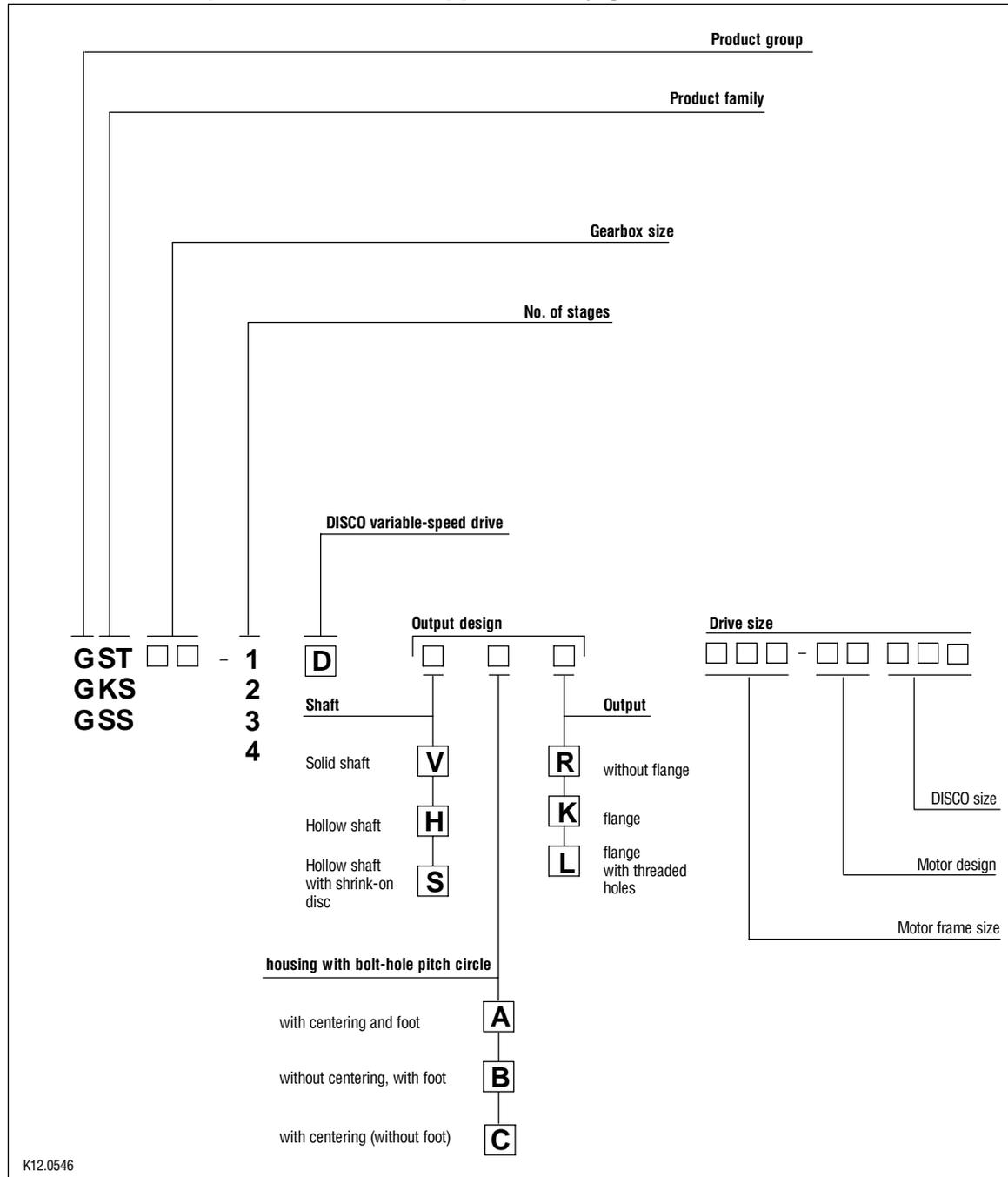
BA 11.5032

Author: Lenze GmbH & Co KG, Drives Division

1st edition: 09/99

Product code

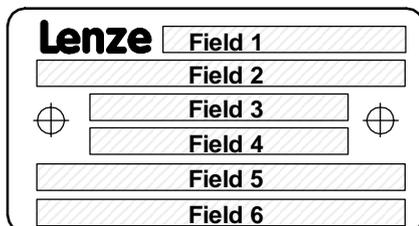
Disco variable-speed drives with supplementary gearbox



GST - helical gearbox
 GKS - bevel gearbox
 GSS - helical-worm gearbox

Nameplate for DISCO variable-speed drives with supplementary gearbox

Layout

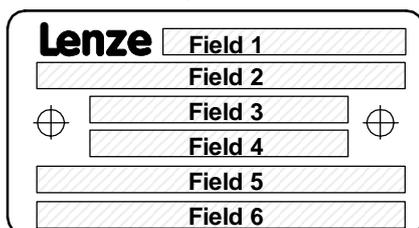


Assembly

Field	Contents	Example
1	Assembly plant	
2	Type Drive size Layout of system components Mounting position	
3	Torque M_2 in Nm	
4	Speed n_2 in rpm (frequency in Hz)	
5	Transmission ratio Lubrication type for supplementary gearbox Manufacturing week and year	
6	Order number Type number	

Nameplate for DISCO variable-speed drives without supplementary gearbox

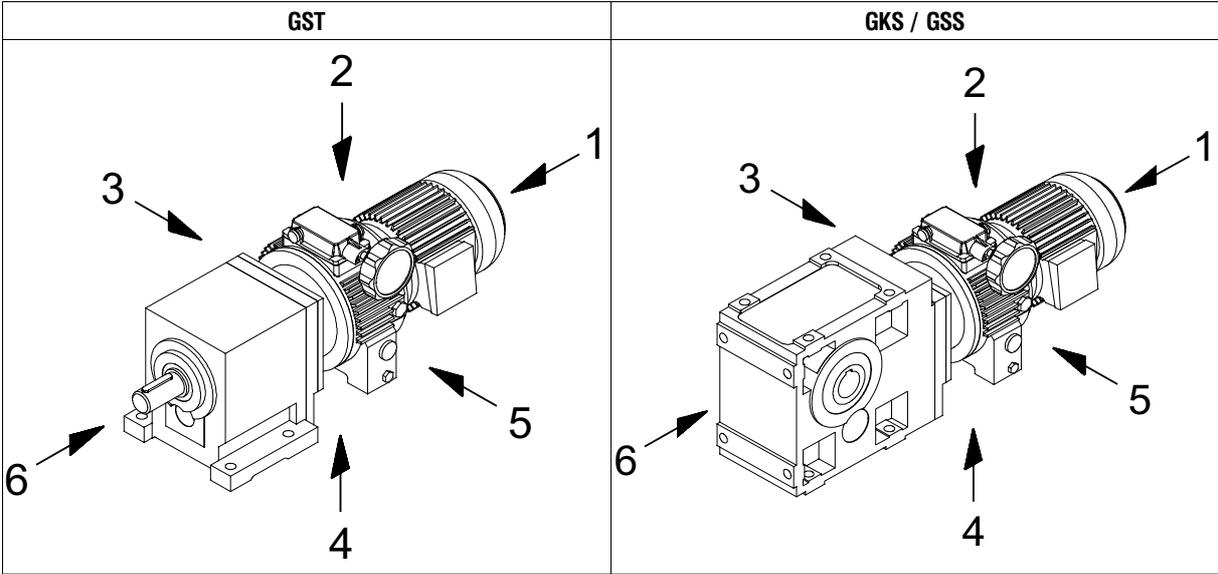
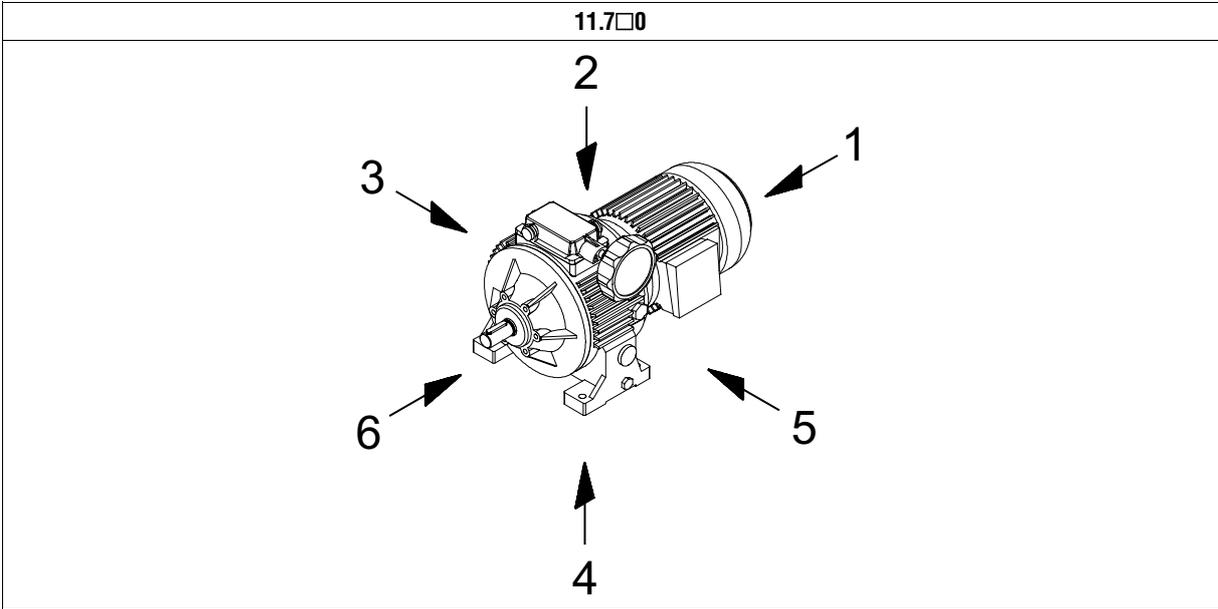
Layout

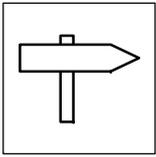


Assembly

Field	Contents	Example
1	Assembly plant	
2	Type Drive size Layout of system components Mounting position	
3	Torque M_2 in Nm	
4	Speed n_2 in rpm (frequency in Hz)	
5	Manufacturing week and year	
6	Order number Type number	

Layout of the system components



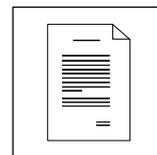


Contents

1	Preface and general information	7
1.1	About these Operating Instructions ...	7
1.1.1	Terminology used	7
1.2	Items supplied	7
1.3	Legal conditions	7
2	Safety information	8
2.1	Persons responsible for the safety	8
2.2	General safety information	8
2.3	Safety and commissioning instructions for Lenze low - voltage machinery	9
2.4	Layout of the safety information	10
3	Technical data	11
3.1	Product features	11
3.2	Transport weights	11
3.3	Operating conditions	12
3.3.1	Temperatures	12
3.3.2	Surrounding media	12
4	Installation	13
4.1	Storage	13
4.2	Installation	13
4.3	Electrical connection	13
4.3.1	Main motor connection	13
4.3.2	Electrical adjuster	14
5	Commissioning and operation	15
5.1	Before switching on	15
5.2	During operation	15
6	Maintenance	16
6.1	Maintenance intervals	17
6.2	Maintenance services	17
6.2.1	Replace lubricant	17
6.3	Repair	17
6.4	Spare parts	18
6.4.1	DISCO variable-speed drive, Size 02	18
6.4.2	DISCO variable-speed drive, Size 03	19
6.4.3	DISCO variable-speed drives, Sizes 04-07	20
6.4.4	DISCO variable-speed drive, Size 08/18	21
6.4.5	Speed adjustment mechanisms, Sizes 02 - 07	22
6.4.6	Speed adjustment mechanism, Size 08/18	23
7	Troubleshooting and fault elimination	24

Manufacturer's Certification

Service addresses



1 Preface and general information

1.1 About these Operating Instructions ...

- These Operating Instructions provide information about safety-relevant working on and with DISCO variable-speed drives. They contain safety information which must be observed.
- All personnel working on and with the DISCO variable-speed drive must have these Operating Instructions available and observe the information and notes relevant for them.
- The Operating Instructions must always be in a complete and perfectly readable state.

1.1.1 Terminology used

Drive system

In the following text, the term "drive system" is used for drive systems with DISCO variable-speed drives and other Lenze drive components.

1.2 Items supplied

- The drive systems are individually configured on the modular principle. The list of all items supplied can be obtained from the accompanying documents.
- After receipt of the delivery, check immediately whether the items delivered match the accompanying documents. Lenze does not accept any liability for deficiencies claimed at a later date. Claim
 - visible transport damage immediately to the forwarder.
 - visible deficiencies/incompleteness immediately to your Lenze representative.

1.3 Legal conditions

Labelling	Nameplate		Manufacturer
	Lenze motors are clearly identified by the information on the nameplate.		Lenze GmbH & Co KG Postfach 101352 D-31763 Hameln, Germany
Application as directed	Lenze drive systems <ul style="list-style-type: none"> • are only intended for use in machines and systems. • are only to be used for the ordered and acknowledged purposes. • are only to be operated under the conditions that are described in these Operating Instructions. • must not be used outside the given power limits. Any other use shall be deemed inappropriate!		
Liability	<ul style="list-style-type: none"> • The information, data, and notes in these Operating Instructions met the state of the art at the time of printing. Claims referring to drive systems that have already been supplied cannot be derived from the information, illustrations and descriptions herein. • Lenze does not accept any liability for damage and operating interference caused by: <ul style="list-style-type: none"> – inappropriate use. – unauthorized modifications to the drive system – operating faults. – disregarding the Operating Instructions. 		
Warranty	<ul style="list-style-type: none"> • Warranty conditions: see Sales and Delivery Conditions of Lenze GmbH & Co KG. • Warranty claims must be made to Lenze immediately after detecting the deficiency or fault. • The warranty is void in all cases where liability claims cannot be made. 		
Disposal	Material	recycle	dispose
	Metal	•	-
	Plastic	•	-
	Pcb assemblies	-	•
	Lubricants	-	•



2 Safety information

2.1 Persons responsible for the safety

Operators

- An operator is any natural or legal person who uses the drive system or on whose behalf the drive system is used.
- The operator or the safety personnel must ensure
 - that all relevant regulations, instructions, notes and laws will be observed,
 - that only qualified personnel works on and with the variable-speed drives,
 - that the Operating Instructions are always available,
 - that unqualified personnel is not allowed to work on and with the variable-speed drives.

Qualified personnel

Qualified personnel are persons who, because of their training, experience and knowledge of all applicable standards and regulations as well as of all operating circumstances, have been entitled by the person responsible for the system to work on and with the system and to see and avoid all possible dangers. (Definition for qualified personnel to IEC 364)

2.2 General safety information

- These safety notes do not claim to be complete. If any questions or problems should arise, please contact your Lenze agency.
- The drive systems met the state of the technology at the time of delivery and are generally safe to operate.
- Drive systems can generate hazards for persons, the drives themselves, and other property of the user, if
 - unqualified personnel works on and with the drive system,
 - the drive system is used inappropriately.
- The drive systems must be planned in such a way that, when properly installed and operating without error in applications as directed, they fulfil their function and do not create any hazards for personnel. This also applies to the interaction of the drive system with the reset of the system or plant.
- Take additional measure to limit the consequences of faulty operation, which might endanger persons or cause damage to property.
 - electrical or non-electrical protection devices (inhibit or mechanical lock)
 - system-wide measures.
- Operate the drive system only when it is in perfect working order.
- Do not make any modifications, changes or retrofitting to the drive system (see chapter 1.3 liability and warranty).



2.3 Safety and commissioning instructions for Lenze low - voltage machinery

1. General

Low-voltage machines have dangerous, live and rotating parts as well as possibly hot surfaces. All operations involving transport, connection, commissioning and maintenance are to be carried out by skilled, responsible technical personnel (observe EN 50110-1/ VDE 0105-100; IEC 60364). Improper handling can cause severe injury or damage.

If synchronous machines are rotating, voltages will be induced on the open terminals.

2. Application as directed

These low-voltage machines are intended for industrial and commercial installations. They comply with the harmonized standards of the series EN 60034 (VDE 0530). Their use in hazardous areas is prohibited, unless they are expressly intended for such use (follow additional instructions).

The enclosures \leq IP23 cannot be used outdoors, unless additional protective measures are implemented. Air-cooled designs are rated for ambient temperatures between $-15\text{ }^{\circ}\text{C}$ and $-10\text{ }^{\circ}\text{C}$ and $+40\text{ }^{\circ}\text{C}$ and altitudes \leq 1000 m a.m.s.l., from $-20\text{ }^{\circ}\text{C}$ to $+40\text{ }^{\circ}\text{C}$ without brake or with spring-operated brake, with separate ventilation or self ventilation, from $-15\text{ }^{\circ}\text{C}$ to $+40\text{ }^{\circ}\text{C}$ with permanent magnet brake and from $-10\text{ }^{\circ}\text{C}$ to $+40\text{ }^{\circ}\text{C}$ with separate fan. Check the data on the nameplate, and if it is different, it must be observed. The conditions on site must correspond to all the nameplate data.

Low-voltage machines are components for the installation into machines, as defined in the Machinery Directive 98/37/EC. Commissioning is prohibited until the conformity of the end product with this Directive has been established (follow a.o. EN 60204-1).

The integrated brakes cannot be used as safety brakes. It cannot be ruled out, that factors which cannot be influenced, such as oil ingress because of a defective A-side shaft seal, may cause a reduction in torque.

3. Transport, storage

The forwarder must be informed directly after receipt of the goods about all damage or deficiencies; if necessary, commissioning must be stopped. Tighten screwed-in ring bolts before transport. They are designed for the weight of the low-voltage machine, do not apply extra loads. If necessary, use suitable and adequately dimensioned means of transport (e.g. rope guides).

Remove the shipping brace before commissioning. Reuse it for further transportation. For storage of low-voltage machines ensure a dry, dust free and low vibration ($v_{\text{rms}} \leq 0.2\text{ mm/s}$) environment must be assured (static load damage to bearings). Measure the insulation resistance before commissioning. If the values are \leq 1 kW per volt of rated voltage, dry the winding.

4. Installation

Ensure an even surface, solid foot or flange mounting, and exact alignment if a direct clutch is connected. Avoid resonances with the rotational frequency and double mains frequency, which may be caused by the assembly. Turn the rotor by hand, listen for unusual grinding noises. Check the direction of rotation when the clutch is inactive (observe section 5).

Use only the appropriate tools to mount or remove belt pulleys and clutches (warm up!) and provide protective covering). Avoid impermissible belt tensions.

The machines are half-key balanced. The clutch must also be half-key balanced. The visible projecting part of the key must be removed.

If required, provide pipe connections. Mounting positions with the shaft end on top must be protected with a cover that avoids the ingress of foreign particles into the fan. Free circulation of the cooling air must be ensured. The exhaust air - also the exhaust air of other machines in the vicinity - must not be immediately recirculated.

5. Electrical connection

All operations must only be carried out by qualified and skilled personnel when the low-voltage machine is at standstill, disconnected, and protected against an unintentional restart. This also applies to auxiliary circuits (e.g. brake, encoder, separate fan).

Check that the supply is disconnected!

If the tolerances in EN 60034-1; IEC 34 (VDE 0530-1) - voltage $\pm 5\%$, frequency $\pm 2\%$, waveform, symmetry - are exceeded, more heat will be generated and the electromagnetic compatibility will be affected.

Observe the nameplate data, operating notes, and the connection diagram in the terminal box.

The connection must ensure a continuous and safe electrical connection (no loose wire ends); use the appropriate cable terminals. The connection to the PE conductor must be safe. The plug-in connector must be tightened up to the stop.

The clearances between bare, live parts and earth must not be less than: 8 mm at $V_N \leq 550\text{ V}$, 10 mm at $V_N \leq 725\text{ V}$, 14 mm at $V_N \leq 1000\text{ V}$.

The terminal box must be clean and dry, free from foreign particles, dirt and moisture. All unused cable entries and the box itself must be sealed against dust and water. For the trial run without output elements, secure the key. Check the correct functioning of the brake before commissioning low-voltage machines with brakes.



Safety information

6. Operation

Vibration severities $v_{rms} \leq 3.5 \text{ mm/s}$ ($P_N \leq 15 \text{ kW}$) or 4.5 mm/s ($P_N \text{ rated} > 15 \text{ kW}$) are acceptable when the clutch is activated. If deviations from normal operation occur, e.g. increased temperature, noise, vibration, find the cause and, if necessary, contact the manufacturer. If in doubt, switch off the machine.

If the drive is exposed to dirt, clean the air paths regularly.

Do not switch-off the protection devices, not even for trial runs.

Integrated temperature sensors do not provide full protection. If necessary, limit the maximum current. Apply the function block to switch off after a few seconds of operation at $I > I_N$, especially if there is a danger of a blockage.

Shaft seals and bearings have a limited service life.

Regrease the bearings using the relubrication facility while the low-voltage machine is running. Observe the saponification number. If the grease drain hole is sealed with a plug (IP54 drive end; IP23 drive end and non-drive end), remove the plug before commissioning. Seal the bore holes with grease. With continuous lubrication (2Z-bearing) replace the bearing after about 10,000 - 20,000 hours, at the latest after 3 - 4 years, or in accordance with the manufacturer's data.

2.4 Layout of the safety information

- All safety information given in these Operating Instructions has the same layout:



Signal word

Note

- The icon characterizes the type of danger.
- The signal word characterizes the severity of danger.
- The note text describes the danger and gives information on preventing dangerous situations.

Warning of danger to persons

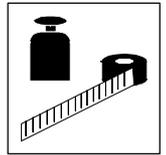
Icons used	Signal words
 Warning of hazardous electrical voltage	Danger! Warns of impending danger . Consequences if disregarded: Death or severe injury.
	Warning! Warns of potential, very hazardous situations . Possible consequences if disregarded: Death or severe injury.
 Warning of a general danger	Caution! Warns of potential, hazardous situations . Possible consequences if disregarded: Light or minor injury.

Warning of damage to material

Icons used	Signal words
	Stop! Warns of potential damage to material . Possible consequences if disregarded: Damage to the drive system/the controller or its environment .

Other notes

Icons used	Signal words
	Tip! Designates a general, useful note. If you observe it, handling of the drive system/controller will be made easier.



3 Technical data

- The most important technical data are provided on the nameplate (see Page 4 for layout and contents).
- Further technical data can be obtained from the product catalogs.

3.1 Product features

The DISCO variable-speed drive is a planetary drive, where all the functional parts run in an oil bath. The planets, located in the planet carrier, rotate around the driving inner sun. The speed and the transmission of force are transferred from the drive shaft to the inner sun. The flat, double-coned discs (the planets) are driven by the sun, simultaneously rolling along the outer rings, which are fixed in the housing. So the planets rotate not only about their own axes, but also around the sun. They thus move the planet carrier with them, which has a fixed connection with the output shaft. Rotating one of the three outer rings on the housing alters the speed setting through the adjustment spindle. This moves the planets to a different radius of rotation, depending on the size of the air gap between the outer rings. In this way, a continuous variation of output speed is achieved. Supplementary gearboxes, in the form of single or multi-stage helical spur, bevel or worm gearboxes, can be used to adapt the range of output speed to the requirements of the application.



Stop!

The DISCO must only be changed to a faster output speed while it is running! Otherwise, the DISCO could be damaged!
Changing to a slower speed is permitted while the DISCO is standing still.

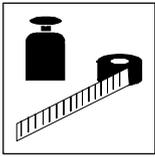
3.2 Transport weights

Disco variable-speed drives with GST helical gearbox

Gearbox size	Drive size							
	071-1□ 02	071-3□ 03	080-3□ 04	090-3□ 05	100-32 06	112-22 07	132-12 18	132-22 08
GST 04	< 18							
GST 05	< 25	< 32	< 43					
GST 06	< 36	< 40	< 51	< 67				
GST 07	< 56	< 64	< 75	< 83	< 120	< 130		
GST 09		< 99	< 110	< 127	< 150	< 161	223	230
GST 11			< 168	< 185	< 221	< 232	272	279
GST 14				< 296	< 333	< 343	406	413

Disco variable-speed drives with GKS bevel gearbox

Gearbox size	Drive size							
	071-1□ 02	071-3□ 03	080-3□ 04	090-3□ 05	100-32 06	112-22 07	132-12 18	132-22 08
GKS 04	< 28							
GKS 05	< 41	< 49	< 59					
GKS 06	< 64	< 69	< 79	< 96				
GKS 07	< 104	< 113	< 123	< 131	< 168	< 178		
GKS 09		< 191	< 202	< 218	< 242	< 252	< 315	< 322
GKS 11			< 329	< 346	< 382	< 392	< 433	< 440
GKS 14				< 574	< 607	< 621	< 684	< 709



Technical data

Disco variable-speed drives with GSS helical-worm gearbox

Gearbox size	Drive size					
	071-1□ 02	071-3□ 03	080-3□ 04	090-3□ 05	100-32 06	112-22 07
GSS 04	< 28					
GSS 05	< 41	< 48	< 59			
GSS 06	< 62	< 56	< 77	< 94		
GSS 07	< 101	< 109	< 120	< 128	< 165	< 175

DISCO variable-speed drive Type 11.700 / 710

DISCO Size	Type 11.710 with motor size											Type 11.700
	71-1□	71-3□	80-1□	80-3□	90-1□	90-3□	100-1□	100-3□	112-22	132-12	132-22	
02	< 10											< 5
03		< 19										< 13
04			< 27	< 28								< 21
05					< 42	< 45						< 35
06							< 74	< 78				< 58
07									< 89			< 58
18										< 151		< 88
08											< 158	< 85

Weight in [kg] with oil filling, for mounting position A (all values are approximate)

3.3 Operating conditions

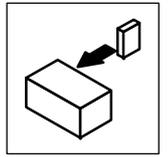
3.3.1 Temperatures

- DISCO variable-speed drives: permissible ambient temperature -15 to +40°C
- Supplementary gearboxes (see BA gearboxes)
- Motor (see temperature class for the motor)

The operating temperature is determined by the power dissipated, ambient temperature and cooling conditions!

3.3.2 Surrounding media

- DISCO variable-speed drives are protected against dust and sprayed water.
- Motors are protected according to their enclosure rating (see nameplate and/or operating instructions for the motor).
- Surrounding media - especially chemically corrosive ones - can attack shaft seal rings and paints (plastics in general). Abrasive media can endanger the shaft seal rings.



4 Installation

4.1 Storage

If you do not install the DISCO at once, please ensure that it is stored in proper conditions.

- Up to one year:
Without special measures, in dry dust-free enclosed rooms without direct sunlight.
 - Store ventilated gearboxes in such a manner that the ventilation screw is at the top.
 - Shafts and bare surfaces are delivered with rust protection.
- Longer than one year:
Please consult the factory.

4.2 Installation

Mount the drive systems on an even surface, free from distortion. If they are mounted on a baseplate, then the baseplate must also be mounted without distortion. If this is not done, then stresses appear in the gearbox housing and have a bad effect on the parallel alignment of the shafts and thus on the bearing and tooth alignment.

The output shaft of the drive system must be well aligned with the machine shaft that is to be driven. Small inaccuracies can be compensated by using an elastic coupling.

Couplings, gear wheels, sprockets etc. must be fixed by screwing to the shaft ends of the drive system. Driving them on can damage the ball bearings.

4.3 Electrical connection



Caution!

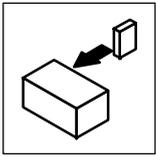
Always earth the drive!

If it is not possible to earth it via attached items (such as the motor) then the gearbox must be earthed!

4.3.1 Main motor connection

To connect up the motor correctly, you must follow:

- the notes in the terminal box of the motor.
- the notes in the operating instructions for the motor.
- the technical data on the motor nameplate.



Installation

4.3.2 Electrical adjuster



Stop!

The DISCO must only be changed to a faster output speed while it is running!
 Otherwise, the DISCO could be damaged!
 Changing to a slower speed is permitted while the DISCO is standing still.

1. Connect the electrical adjuster as shown in the wiring diagram (FIG. 1). Take care that the adjustment motor has the correct polarity!
2. It is vital that you make functional check, to avoid damage to the DISCO.

Functional check

(For position of adjustment motor and limit-switch boxes, see P. 5 “Layout of the system components”)

Adjustment motor in position 5 / limit-switch box in position 3	Adjustment motor in position 3 / limit-switch box in position 5
1. Switch on the DISCO	1. Switch on the DISCO
2. Increase the speed Left motion of the actuator in the limit-switch housing	2. Increase the speed Right motion of the actuator in the limit-switch housing
3. While the speed is being increased, use a screwdriver to actuate the limit-switch S4	3. While the speed is being increased, use a screwdriver to actuate the limit-switch S3
4. The adjustment motor and actuator must stop	4. The adjustment motor and actuator must stop
5. If the actuator and adjustment motor do not stop, reverse the polarity of the motor	5. If the actuator and adjustment motor do not stop, reverse the polarity of the motor

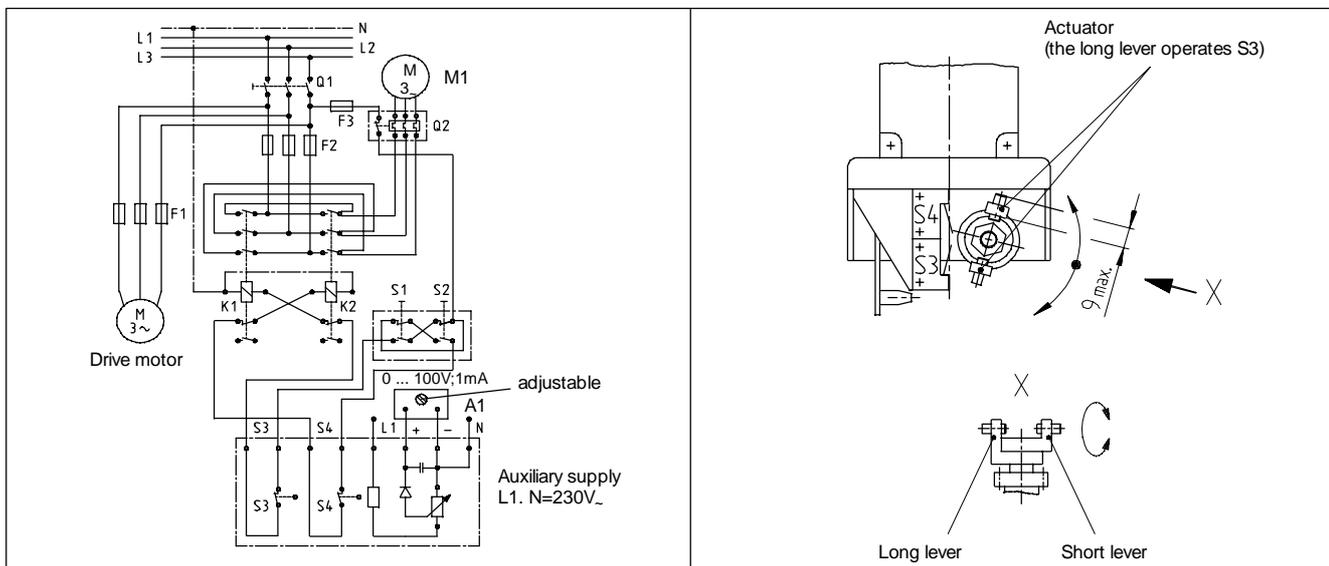
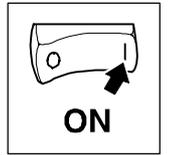


FIG. 1 Circuit diagram for adjuster with potentiometric display device

- A1 = Display unit 0 ... 100V =/ 1000 Ω/V (Option)
- F1, F2, F3 = Fuses*
- K1, K2 = Reversing contactors*
- M1 = Adjustment motor
- Q1 = Main switch*
- Q2 = Motor cut-out*
- S1, S2 = Pushbutton switches*
- S3, S4 = Limit-switches

* not included in delivery



5 Commissioning and operation



Stop!

Commissioning must only be carried out by properly qualified persons!

5.1 Before switching on

Check:

- Is the mechanical mounting correct?
 - Are the electrical connections o.k.?
 - Are rotating components and surfaces that can reach high temperatures protected against contact?
 - With DISCO variable-speed drives
Is the ventilation assured?
-



Tip!

Supplementary gearboxes should have separate ventilation % BA gearboxes!

5.2 During operation



Stop!

During running-in, raised temperatures may occur over a period of 2 - 8 hours.

- Carry out checks regularly during operation. Please observe in particular:
 - unusual noises or temperatures
 - Leakage
 - loose fixing elements
 - the condition of the electrical cables.
- If faults occur, please work through the table in Chapter 7. If the fault cannot be eliminated, please contact the Lenze Service.



Maintenance

6 Maintenance

DISCO gearboxes are supplied with an oil filling.



Tip!

- The lubrication instructions for supplementary gearboxes can be found in the operating instructions for gearboxes.
- We recommend that the oil level is checked regularly!
- If an oil is used that is not include in the table, we recommend that the lubricating oil has the following technical data:
 - Viscosity: 32mm²/s ±10% at 40°C
 - Flash point: ~ 210°C
 - Pour point: ~ -30°C
 - FZG-Test A8.3/90: damage resistance level ≥10
 - Air separation capability: 5min. at 50°C
 - Foam volume with air intake at 25/95/25°C: 230/10/290 ml

Oil filling quantity for DISCO gearboxes

DISCO Size	Mounting positions				
	horizontal spindle housing			vertical output shaft	
	above	side	below	below	above
02	0.4	0.3	0.4	0.4	0.4
03	0.4	0.5	0.8	0.6	0.6
04	0.5	0.5	1.0	1.0	1.0
05	0.7	1.0	2.0	2.0	1.5
06/07	1.5	2.0	3.0	3.5	2.5
08	2.5	4.0	3.5	6.0	5.0
09	3.0	6.0	4.5	9.5	7.0
10/11	6.0	10.0	4.5	14.0	11.0

Tab. 1 Oil quantities - guidelines

- - Oil sight glass
- ^K - Oil check screw
- ▼ - Oil filling screw
- - Oil drainage
- ⊗ - Ventilation



Manufacturer	Oil types
Lenze GmbH & Co KG	DISCO Lebensdauer-Ö (lifetime-oil)
AGIP	OSO 32 / BLASIA 32
ARAL	Degol BG 32
BP	Energol HL-XP 32 / Energol HLP-HM 32
CASTROL	Hyspin AWS 32 / Hyspin SP 32
DEA	Astron HLP 32 / Pentran 32
ESSO	TORQUE FLUID N 45
FUCHS	RENOLIN MR 10 VG 32 / RENOFLUID TF 1500
KLÜBER	LAMORA HLP 32
MOBIL	DTE 24 / Mobilfluid 125
Shell	Shell Tegula Öl 32
SRS	Wiolan HF 32
Texaco	Rando Oil HD A-32

Tab. 2 Recommended types of oil DISCO variable-speed drives

6.1 Maintenance intervals

- The mechanical power transmission system is maintenance-free.
- No oil-change when DISCO lifetime-oil is used.
If other oils are used, an oil-change is necessary after every 2000 hours of operation.
- Shaft seal-rings:
 - The operating life depends on the conditions of use.
 - Replace leaking shaft seals, to prevent further damage.



Stop!

With drive systems: observe the maintenance intervals for the other drive components!

6.2 Maintenance services

6.2.1 Replace lubricant

- The DISCO variable-speed drive should be warm.
- Secure the drive system and machinery against unintended movement or power-on.



Stop!

Supplementary gearboxes have separate lubrication: see the operating instructions for gearboxes!

6. Drain off the lubricant through the drainage hole (FIG. Tab. 1).
7. Fit the drainage screw with a fresh seal.
8. Fill up the lubricant through the filling hole.
9. Replace the filling screw.
10. Dispose of the waste oil according to the applicable regulations.

6.3 Repair

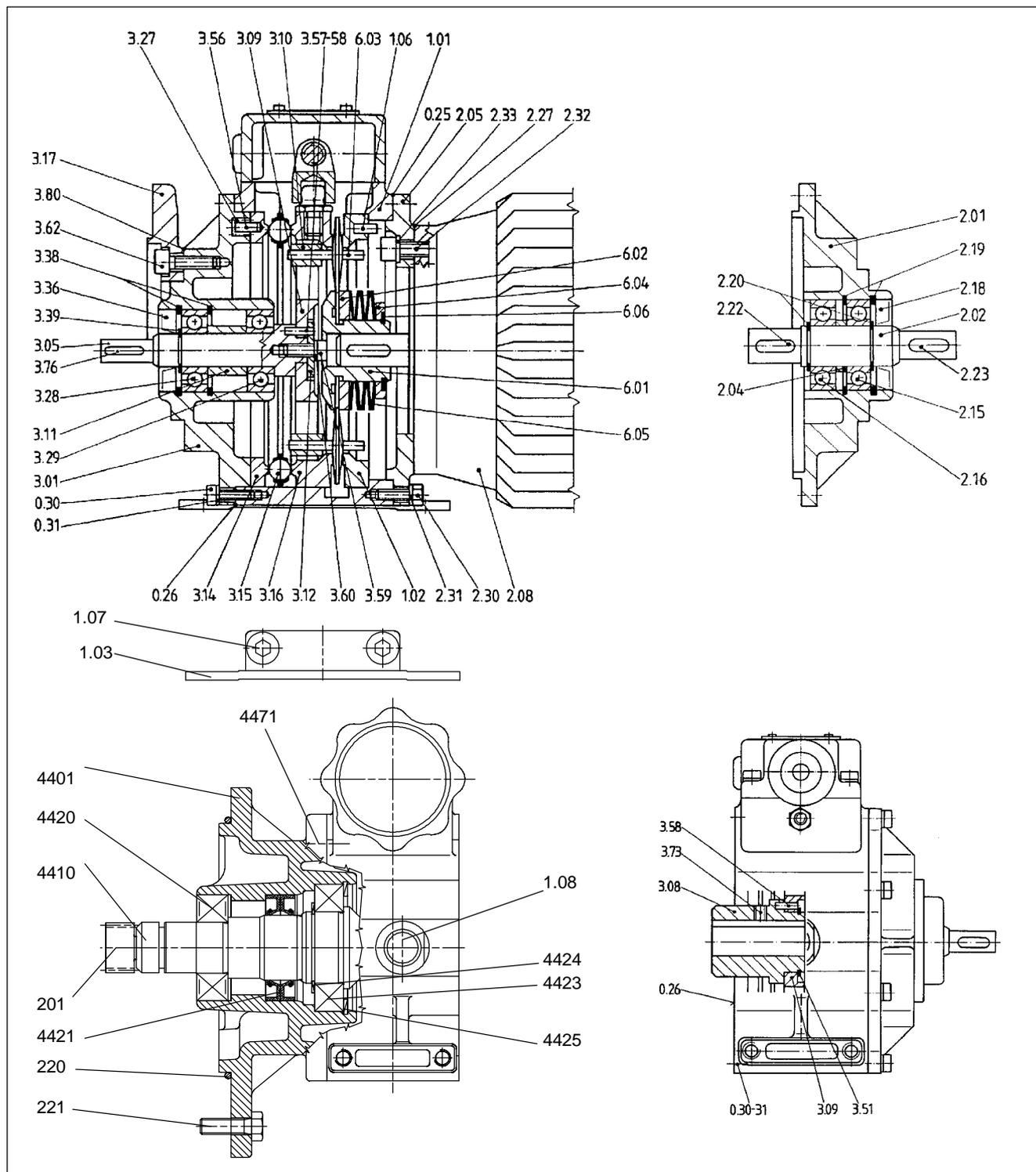
We recommend that all repairs are carried out by Lenze Service.



Maintenance

6.4 Spare parts

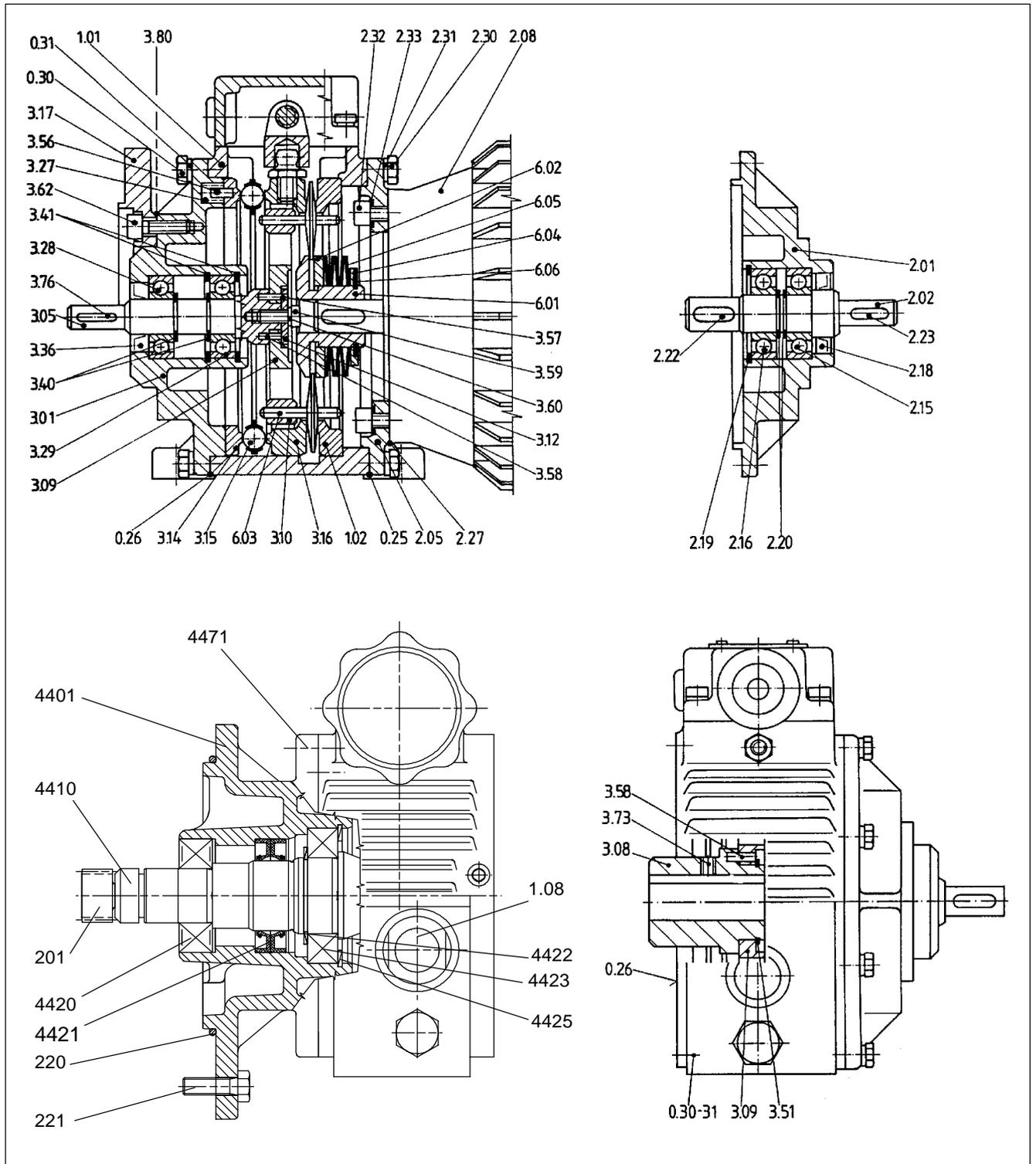
6.4.1 DISCO variable-speed drive, Size 02



Component designation: see fold-out page



6.4.2 DISCO variable-speed drive, Size 03

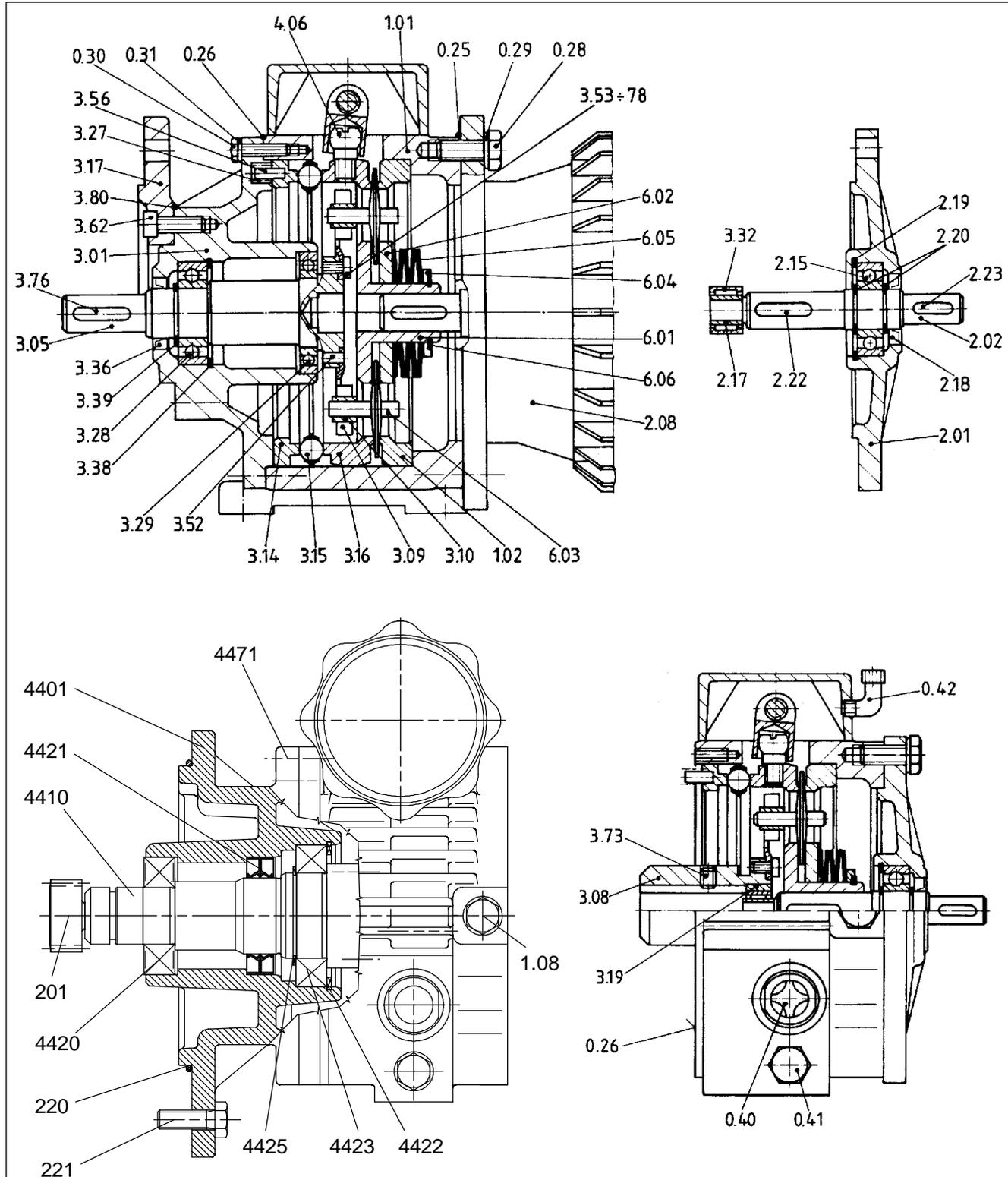


Component designation: see fold-out page



Maintenance

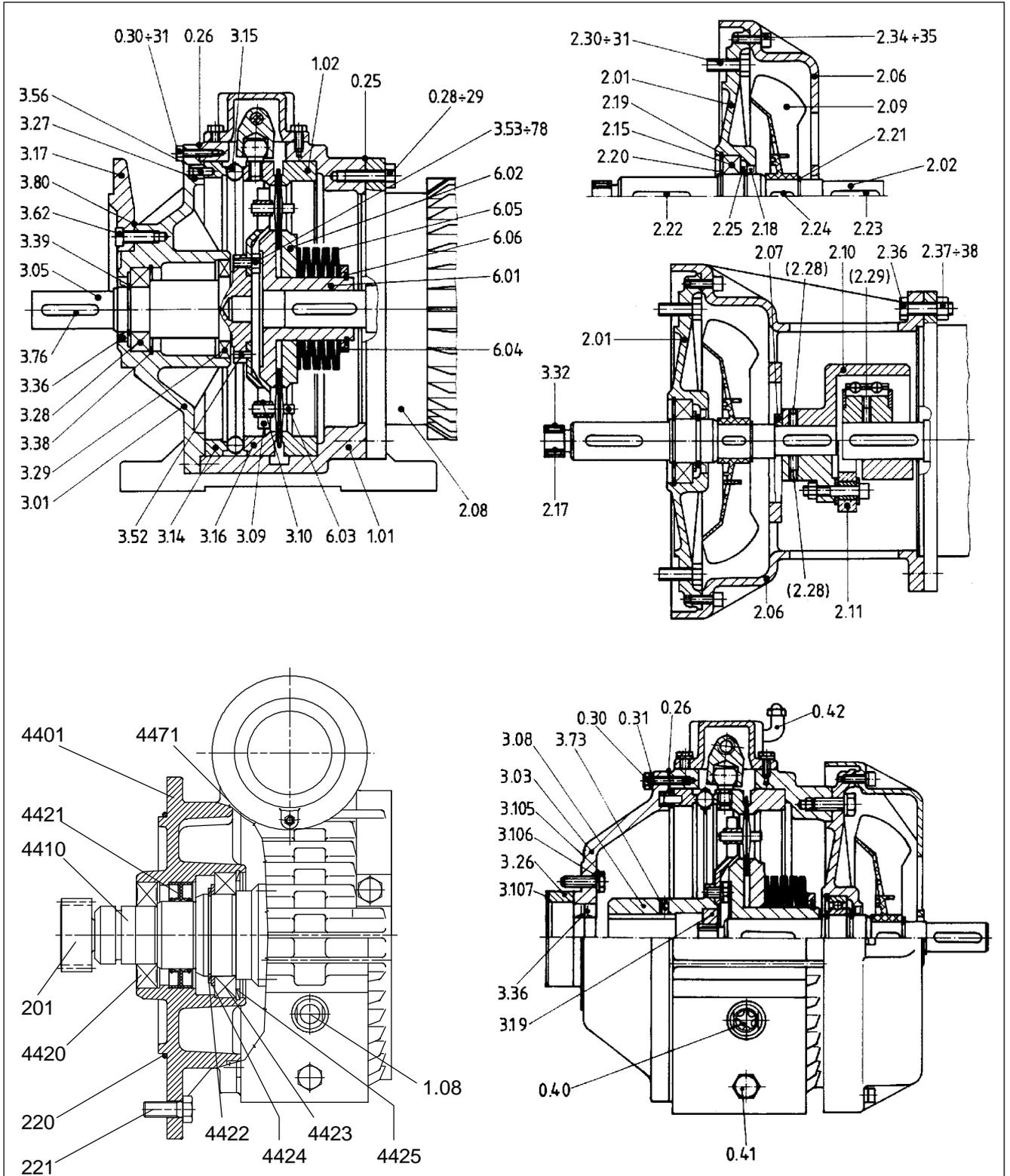
6.4.3 DISCO variable-speed drives, Sizes 04-07



Component designation: see fold-out page



6.4.4 DISCO variable-speed drive, Size 08/18

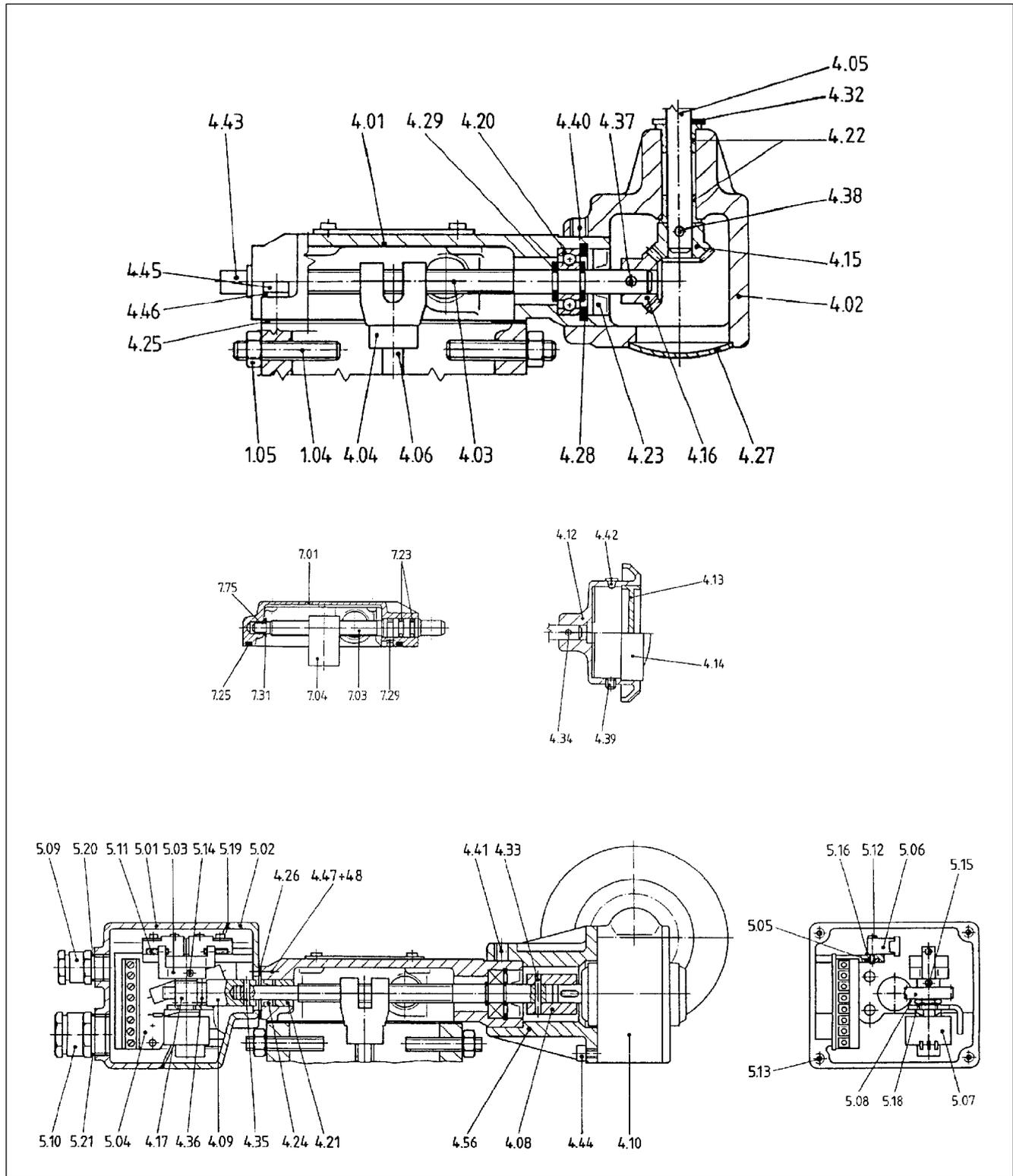


Component designation: see fold-out page



Maintenance

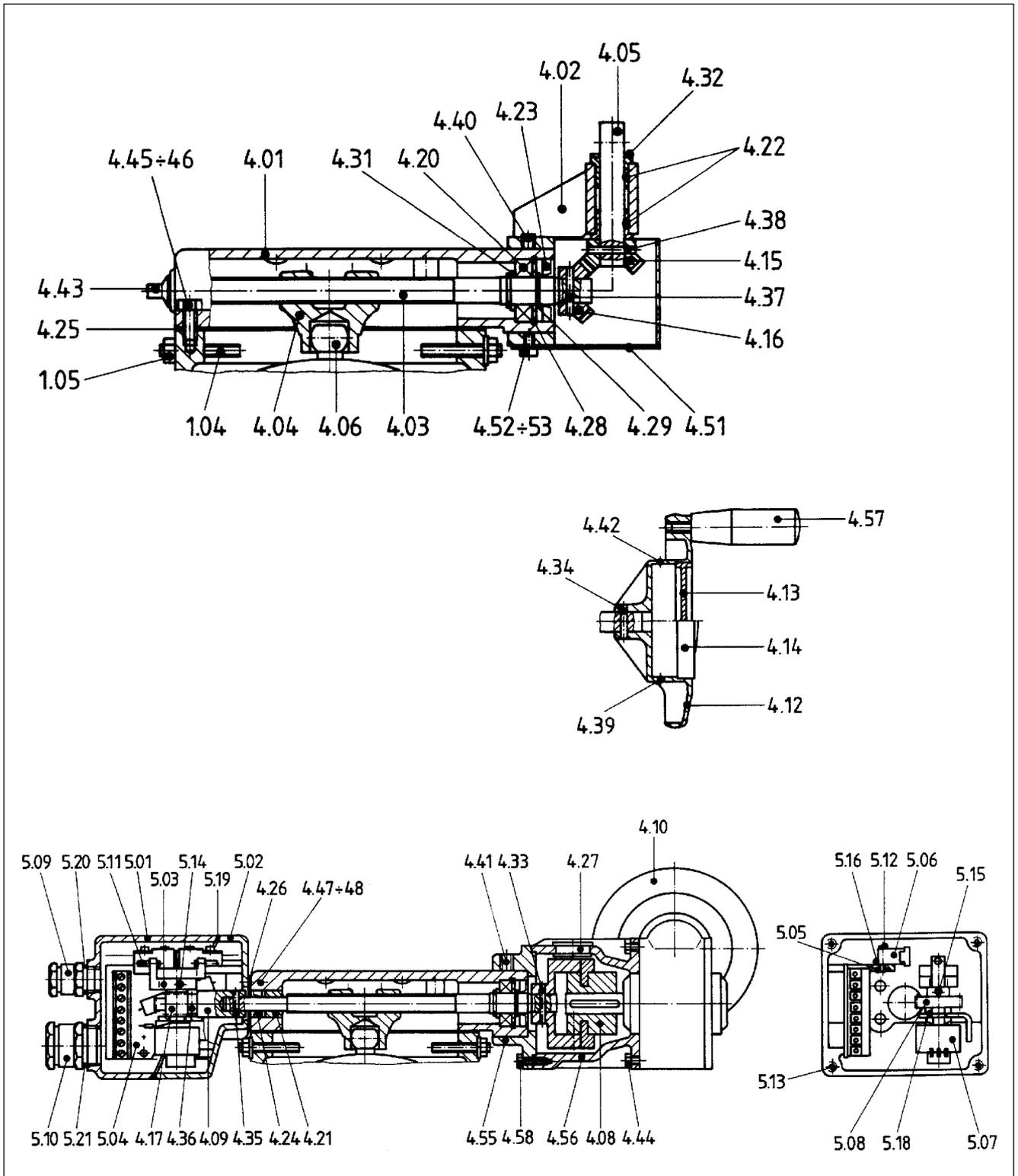
6.4.5 Speed adjustment mechanisms, Sizes 02 - 07



Component designation: see fold-out page



6.4.6 Speed adjustment mechanism, Size 08/18



Component designation: see fold-out page

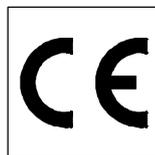


Troubleshooting and fault elimination

7 Troubleshooting and fault elimination

If faults occur while operating the drive system, please use the following table to check the possible causes: If the fault cannot be eliminated by one of the methods listed here, please contact the Lenze Service.

Fault	possible reason	Remedy
Antrieb does not start	Voltage supply interrupted	Check electrical connection
	faulty electrical connection	Check that supply voltage matches nameplate data
	excessive load	reduce load Check drive-machine assignment
Motor runs, gearbox does not	Coupling components are missing or defective	Check mounting
	Gearbox is faulty	Inform Lenze Service
unusual running noise	overload	reduce load Check drive-machine assignment
	Damage to gearbox or motor	Inform Lenze Service
excessive temperature	overload	reduce load Check drive-machine assignment
	inadequate heat transfer	improve cooling air flow clean gearbox/motor
	lubrication deficiency	top up lubricant according to instructions
loose fixing elements	vibration	avoid vibration



Lenze

Gearboxes

Lenze GmbH & Co KG
Postfach 10 13 52
D-31763 Hameln

Site: Bösingfeld
Breslauer Straße 3
D-32699 Extertal
Telephone (05154) 82-0
Telefax (05154) 82-15 75

Manufacturer's Certification

We herewith certify that the below listed products are intended for assembly into a machine or for assembly with other elements to form a machine. Commissioning of the machine is prohibited before it is proven that it corresponds to the EC regulation 98/37/EC.

Product:

Low-profile gearboxes and geared motors

Helical gearboxes and geared motors

Helical bevel gearboxes and geared motors

Bevel gearboxes and geared motors

Helical worm gearboxes and geared motors

Variable speed belt drives and geared motors

Variable speed drives with/without gearbox

Shaft-mounted gearboxes

Worm gearboxes and geared motors

Type:

GFL

GST, 12.6□□

GKS, 12.5□□

GKR

GSS, 52.1□□

11.1□□, 11.2□□, 11.4□□

11.7□□

12.4□□

52.3□□, 52.4□□, 52.5□□

Applied standards and regulations:

EN 292 part 1

EN 292 part 2

Hameln, April 15, 1999

(i.A. Zimmer)
Head of R&D dept. gearboxes



Pos. No. Name

Pos.	Name	Pos.	Name	Pos.	Name
0.25	Gasket	3.17	Flange	4.44	Hexagon head bolt
0.26	Gasket	3.19	Bush		Allen screw
0.28	Hexagon head bolt	3.26	Bush	4.45	Hexagon head screw
0.29	Locking washer (for Sizes 02-03)	3.27	Compression spring		Allen screw
0.29	Spring washer (for Sizes 04-07)	3.28	Grooved ball bearing	4.46	Spring washer
0.30	Allen screw	3.29	Grooved ball bearing	4.47	Allen screw
0.31	Spring washer	3.32	Groove ball bearing	4.48	Shakeproof washer
0.40	Oil sight glass	3.36	Shaft seal	4.51	Cowl
0.41	Locking screw	3.38	Circlip	4.52	Allen screw
0.42	Angled breather pipe	3.39	Circlip	4.53	Spring washer
1.01.	Housing	3.40	Circlip	4.55	Hub
1.02	Pressure ring	3.41	Circlip	4.56	Bell housing
1.03	Foot	3.51	Circlip	4.57	Handle
1.04	Set screw	3.52	Dowel pin	4.58	Hexagon head bolt
1.05	Seal-Lock hex. nut	3.53	Hexagon head bolt	5.00	Limit-switch assembly
1.06	Dowel pin	3.56	Dowel pin	5.01	Housing
1.07	Allen screw	3.57	Dowel pin	5.02	Housing
1.08	Oil sight glass	3.58	Dowel pin	5.03	Actuator
2.01	Lid	3.59	Allen screw	5.04	Board assembly
2.02	Shaft	3.60	Spring washer	5.05	Plate
2.04	Housing	3.62	Allen screw	5.06	Microswitch
2.05	Flange	3.73	Set screw	5.07	Rheostat
2.06	Fan cover	3.76	Fitted key	5.08	Worm wheel
2.07	Bush	3.78	Circlip	5.09	Bolt fixing
2.08	Three-phase AC motor	3.80	Gasket	5.10	Bolt fixing
2.09	Fan	4.00	Spindle housing assembly	5.11	Set screw
2.10	Starting coupling	4.01	Spindle housing	5.12	Allen screw
2.11	Elastic coupling	4.02	Housing	5.13	Screw
2.15	Grooved ball bearing	4.03	Spindle	5.14	Set screw
2.16	Grooved ball bearing	4.04	Guide piece	5.15	Set screw
2.17	Inner ring	4.05	Shaft	5.16	Adapter
2.18	Shaft seal	4.06	Ball-end bolt	5.18	Shakeproof washer
2.19	Circlip	4.08	Bush	5.19	Gasket
2.20	Circlip	4.09	Adapter	5.20	O-ring
2.21	Circlip	4.10	Small worm-gear motor	5.21	O-ring
2.22	Fitted key	4.12	Handwheel	6.00	Innner sun assembly
2.23	Fitted key	4.13	Rotation-direction indicator	6.01	Inner sun left
2.24	Fitted key	4.14	Setting indicator	6.02	Inner sun right
2.25	Shim washer	4.15	Bevel gear	6.03	Planet
2.27	Gasket	4.16	Bevel gear	6.04	Pressure disk
2.28	Set screw	4.17	Worm	6.05	Plate spring
2.29	Set screw	4.20	Grooved ball bearing	6.06	Circlip
2.30	Hexagon head bolt	4.21	Bush	7.00	Spindle housing assembly
2.31	Locking washer (for Sizes 02-03)	4.22	Flanged bush	7.01	Spindle housing
2.31	Spring washer (for Sizes 04-07)	4.23	Shaft seal	7.03	Spindle
2.32	Allen screw	4.24	Shaft seal	7.04	Guide piece
2.33	Seal ring	4.25	Gasket	7.23	O-ring
2.34	Allen screw	4.26	Gasket	7.25	Gasket
2.35	Spring washer	4.27	Sealing ring	7.29	Keeper plate
2.36	Hexagon head bolt	4.28	Circlip	7.31	Shim washer
2.37	Hex. nut	4.29	Locking ring	7.75	Flanged bush
2.38	Spring washer	4.31	Shim washer		
3.01	Lid	4.32	Seeger ring	201	Pinion
3.03	Flange	4.33	Dowel pin	220	O-ring
3.05	Shaft	4.34	Dowel pin	221	Hexagon head bolt
3.08	Hub	4.35	Dowel pin	4401	Flange
3.09	Planet carrier	4.36	Dowel pin	4410	Shaft
3.10	Slide ring	4.37	Dowel pin	4420	Grooved ball bearing
3.11	Bush	4.38	Dowel pin	4421	Shaft seal
3.12	Washer	4.39	Set screw	4422	Circlip
3.14	Coupling ring	4.40	Set screw	4423	Grooved ball bearing
3.15	Ball race	4.41	Set screw	4424	Adapter disk
3.16	Coupling pressure ring	4.42	Conical plug	4425	Circlip
		4.43	Protective cap	4471	Hexagon head bolt