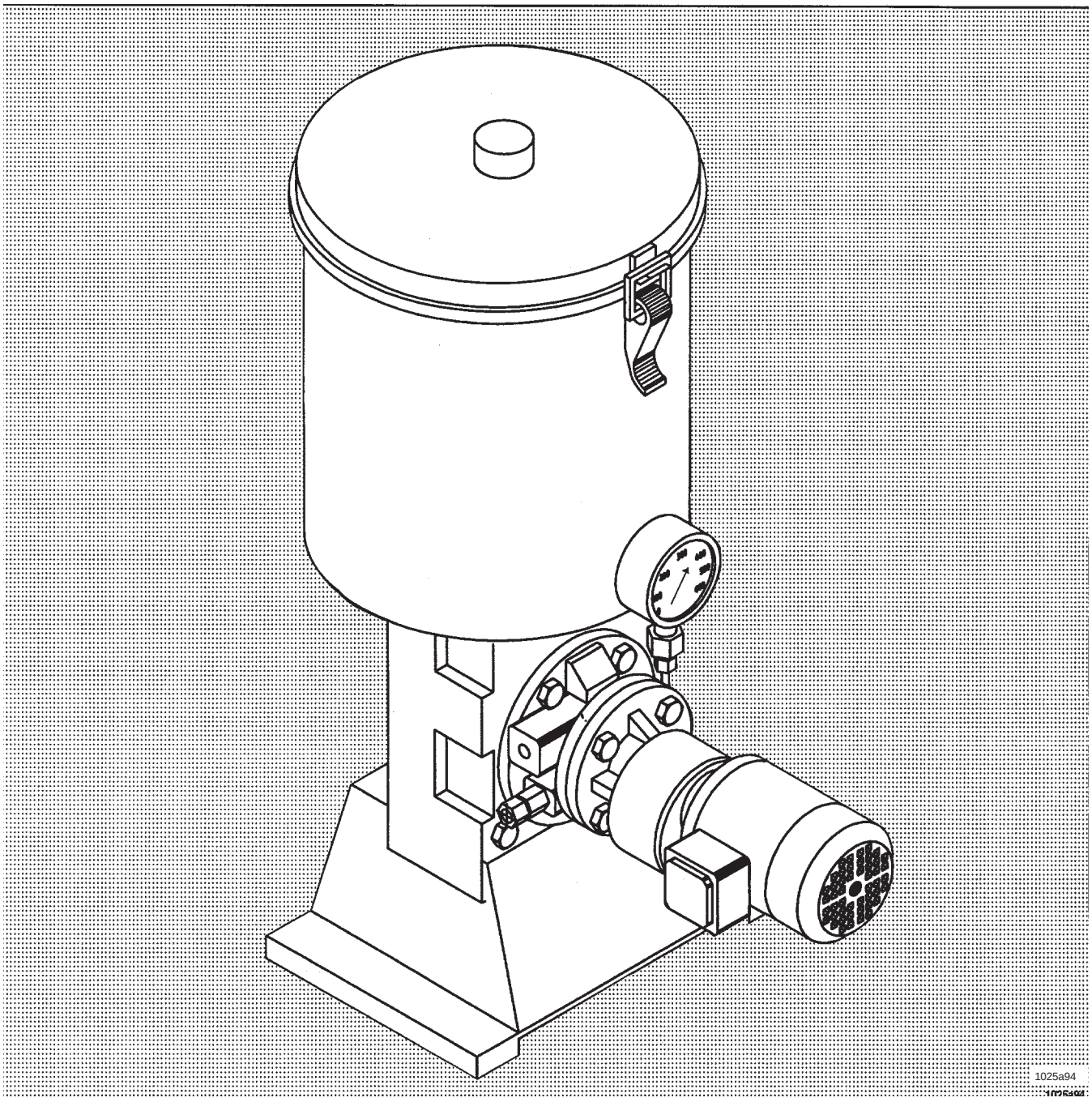
LINCOLN INDUSTRIAL®

1.1A-18001-A96

High-Pressure Central Lubrication Pumps for Grease Model ZPU08/14/24



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Preface of the Owner Manual

ThisOwner Manual is intended to familiarize the user with the pump/lubrication system and to enable him/her to use its various features.

The Operating Instructions contain important information for safe, correct and economic operation of the pump/lubrication system. Their observance will help avoid hazards, reduce repair costs and downtime, increase the reliability and prolong the service life of the pump/lubrication system.

These Operating Instructions must be completed to include the respective national regulations concerning the prevention of accidents and protection of the environment.

The Owner Manual must always be available on the site where the pump/lubrication system is in operation.

If persons who are charged with work with the pump/lubrication system do not have a good command of the english language, it is the user's responsibility to take the necessary action to make the Owner Manual, particularly the Safety Notes, understandable to these persons.

The Owner Manual must be read and used by all persons who are charged with work with the pump/lubrication system, e.g.

- **Operation**, including adjustment, troubleshooting during operation, elimination of production waste, maintenance, disposal of process materials
- **Maintenance** (inspection, repairs)
- **Transport**

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1 Safety Notes

The Operating Instructions include general instructions which must be followed when a pump/lubrication unit is installed, operated or serviced. Therefore, it is absolutely necessary for the fitter and the specialist/user to read the Operating Instructions before a unit is installed and commissioned. The Operating Instructions must always be available on the site where the machine/system is erected.

All general safety instructions contained in this main chapter on safety must be observed as well as all special safety instructions given in other main chapters.

Hazard markings in Operating Instructions
The notes referring to safety contained in the Operating Instructions whose failure to observe them may result in personal injury are marked by the following symbol

Safety symbol acc. to DIN 4844-W9


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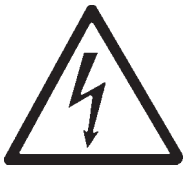
The symbol

Safety symbol acc. to DIN 4844-W8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warns of an electrical hazard.

If ignoring the safety notes might result in machine damages and malfunction, the word

CAUTION

is added.

Warnings directly fixed to the machine must always be observed and must be kept in completely legible condition.

Staff Qualification and Training
The staff responsible for operation, maintenance, inspection and installation must be adequately qualified for these jobs. The user must properly regulate the field of responsibility and supervision of the personnel. If the personnel is not in command of the necessary expertise, they must receive the appropriate training and instructions.
If necessary, this can be done by the manufacturer/supplier on behalf of the machine user. Furthermore, the user must ensure that the contents of the Operating Instructions are fully understood by the personnel.

Hazards resulting from failure to observe the safety notes
Failure to heed the safety warnings may result in damage to equipment and the environment and/or personal injury.
Failure to observe the safety notes may result in the loss of all claim for damage.
As an example, in the following we list some dangers which may result from failure to observe the warnings:

- failure of machine/system to fulfill important functions
- failure of specified methods for maintenance and repair
- personal injury due to electrical, mechanical and chemical influences
- danger to the environment due to leakage of harmful materials

Safety-Conscious Working
The safety notes given in the Operating Instructions, the prevailing national regulations for the prevention of accidents and any internal working and shop regulations and accident prevention measures of the user must be observed.

Safety Instructions for the User/Operator
- If warm or cold machine parts may involve hazards, the customer must protect them against accidental contact.
- Do not remove protection devices for moving parts while the machine is in operation
- Leakages of harmful materials must be disposed of so as not to jeopardize neither persons nor the environment. The requirements of the law must be satisfied.
- Danger caused by electrical current must be excluded (for details refer to the applicable specifications of VDE and the local power supply companies).

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Safety Notes

Safety Instructions for Maintenance, Inspection and Installation Services
The user must make sure that all maintenance, inspection and installation work is executed by authorized and qualified experts who have throroughly read the Operating Instructions. On no account may work be done on the machine while the machine is in operation. Follow all instructions for shutting down the machine as described in the Operating Instructions. Decontaminate pumps and pump units delivering harmful materials.
Reassemble all safety and protection devices immediately after completion of the cleaning procedure.
Dispose of material harmful to the environment in accordance with the applicable official regulations.
Before putting the pump/lubrication unit into operation, ensure that all points given in the chapter „Commissioning“ are fulfilled.

Unauthorized Modification and Spare Parts Production
Alteration and modifications of the machine are only allowed if approved by the manufacturer. Original spare parts and accessories authorized by the manufacturer ensure safe operation. If other parts are used, the manufacturer may be released from liability for the resulting consequences.

Inadmissible Operating Modes
The operational safety of the supplied product is only granted if the product is operated according to the instructions given in chapter 1 - General - of the Operating Instructions. The max. ratings listed in the Technical Data sheet must never be exceeded. Commissioning of the product (pump/pump unit) within the European Union is forbidden until it has been decided that the machine in question meets the requirements of the EU guidelines.

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2 Description

2.1 General

This Owner Manual only refers to high-pressure central lubrication pumps of the series ZPU 08/14/24. It is intended for the personnel charged with the erection, operation and maintenance of the pumps.
If you require more information than given in this Owner Manual, please contact the following company:

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Abt. Zentraler Kundendienst
Postfach 1263
D-69183 Walldorf
Tel +49 (6227) 33-0
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2.2 Appropriate Use

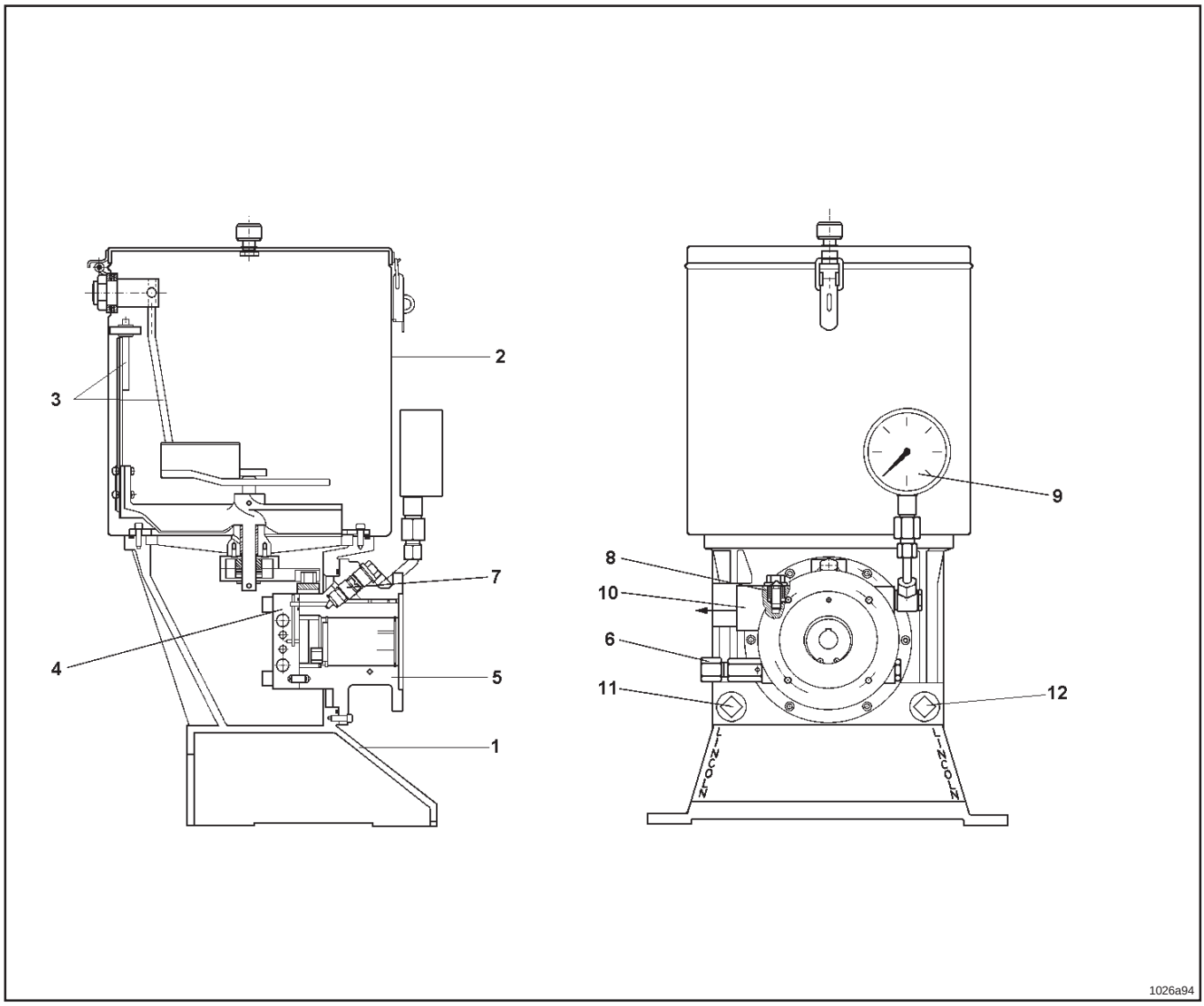
The pumps model ZPU08/14/24 are designed for use in centralized lubrication systems only. Take care that the maximum ratings mentioned in the Technical Data, particularly the max. operating pressure of 400 bar, are not exceeded. Any other use is not in accordance with the instructions and will result in the loss of claims for guarantee and liability.
The pump is mainly used as a feed pump for two-line lubrication systems. If an electro-hydraulic pressure switch is fitted, the pump can also be used as a lubricator for the lubrication unit „Cobra“

2.3 Technical Data

Model	ZPU08	ZPU14	ZPU24
Lubricant Output:	8 dm^3h^{-1}	14 dm^3h^{-1}	24 dm^3h^{-1}
Drive speed:	60 rpm (1500 rpm with worm gear speed reducer)	100 rpm	180 rpm
Operating pressure	p max = 400 bar		
Connection thread	pressure line 3/4" BSPm. relief line 3/4” BSPm. filling line 3/4“ BSPm.		
Direction of rotation of the drive	optional		
Reservoir capacity	40 or 100 dm^3		
Lubricant filter	filter area 5.1 cm^2 grade of filtration 280 µm		
Suitable lubricants	grease up to NLGI grade 3 acc. to DIN 51818		
Safety valve	fixed setting to 410 bar, tamper-proof		
Drive motor	refer to Motor Data Sheet		
Sound level	< 70 dB (A)		
Operating temperature:	-20°C - +80°C		

Note: In the case of 60 Hz motors the speed and thus the lubricant output may be less then the theoretical value calculated.
With stiff greases and at low temperatures the effective output may be less then the theoretical value calculated.

2.4 Structure



The pumps ZPU 08/14/24 consist of the following parts:

Item	Designation
1	pump housing
2	lubricant reservoir
3	stirring paddle with scraper and fixed paddle
4	high-pressure pump element
5	bearing flange with drive
6	safety valve

Item	Designation
7	check valve
8	lubricant filter
9	pressure gauge
10	pressure line connection
11	relief line connection
12	filling connection

The detailed structure of the pump and its equipment can be found in the following model designation chart.

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Model Designation

The complete pump unit is defined by a model designation (mentioned on the nameplate).

Examples of model designations:

ZPU08	**F**	**40**	**XL**	**000**	
ZPU08	**G**	**40**	**XN**	**380-415/ 420-480**	**C**
ZPU14	**G**	**100**	**XB**	**500**	
ZPU24	**S**	**40**	**XV**	**380-415/ 420-480**	

Lubricant output:

08 = 8 dm^3h^{-1}
14 = 14 dm^3h^{-1}
24 = 24 dm^3h^{-1}

Type of drive:

F = with free shaft end
G = with flanged gear motor construction IMB5
S = with worm gear and 3-phase motor, construction IMV1
SF = with worm gear and free shaft end, suitable for 3-phase motor construction IMB3

S and SF only available for model 08

Reservoir capacity

40 = 40 dm^3
100 = 100 dm^3

Reservoir design

XN = grease reservoir, standard design
XV = grease reservoir with high-level control
XVD = grease with high-level control and cover interlock switch
XL = grease reservoir with low level control
XB = grease reservoir with high and low level control

Supply voltage of the motors

380-415/
420-480 = standard multi-range motor for 380-415/420-480V 50 Hz und 420-480V 60 Hz
500 = 500 V, 50 Hz
000 = unit without motor

other voltages on request

C = version as feed pump for COBRA

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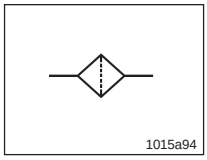
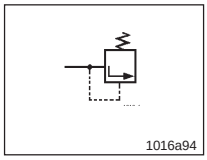
Description

The pump is equipped with the following units:

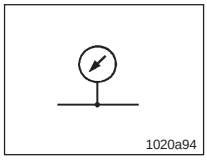
1. Lubricant filter, item 8, page 6
Cleans the lubricant and prevents impurities from entering the pump reservoir



2. Safety valve, item 6
Protects the pump against too high backpressure. The safety valve is set to a pressure of 410 bar and is tamper-proof.

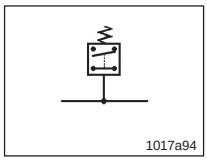


3. Pressure gauge, item 9
Allows visual monitoring of the operating pressure



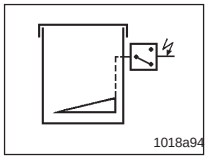
Options:

4. Electro-hydraulic pressure switch
Switches the pump drive motor OFF at a preset pressure (160 to 400 bar)

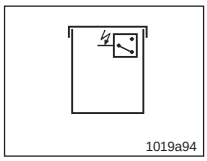


5. Low level control for 40 dm³ reservoirs
Via the pivoted paddle and magnetic switch

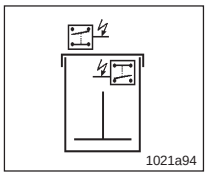
Note: Not to be used with greases NLGI grade 3



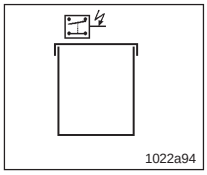
6. High level control for 40 dm³ reservoirs
Via diaphragm and magnetic switch



7. Low and high level control for 100 dm³ grease reservoirs
Via follower plate and limit switches



8. Cover interlock switch (overflow safety element)
Only for 40 dm³ reservoirs
Monitors any inadvertent opening of the cover



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2.5 Electrical Equipment

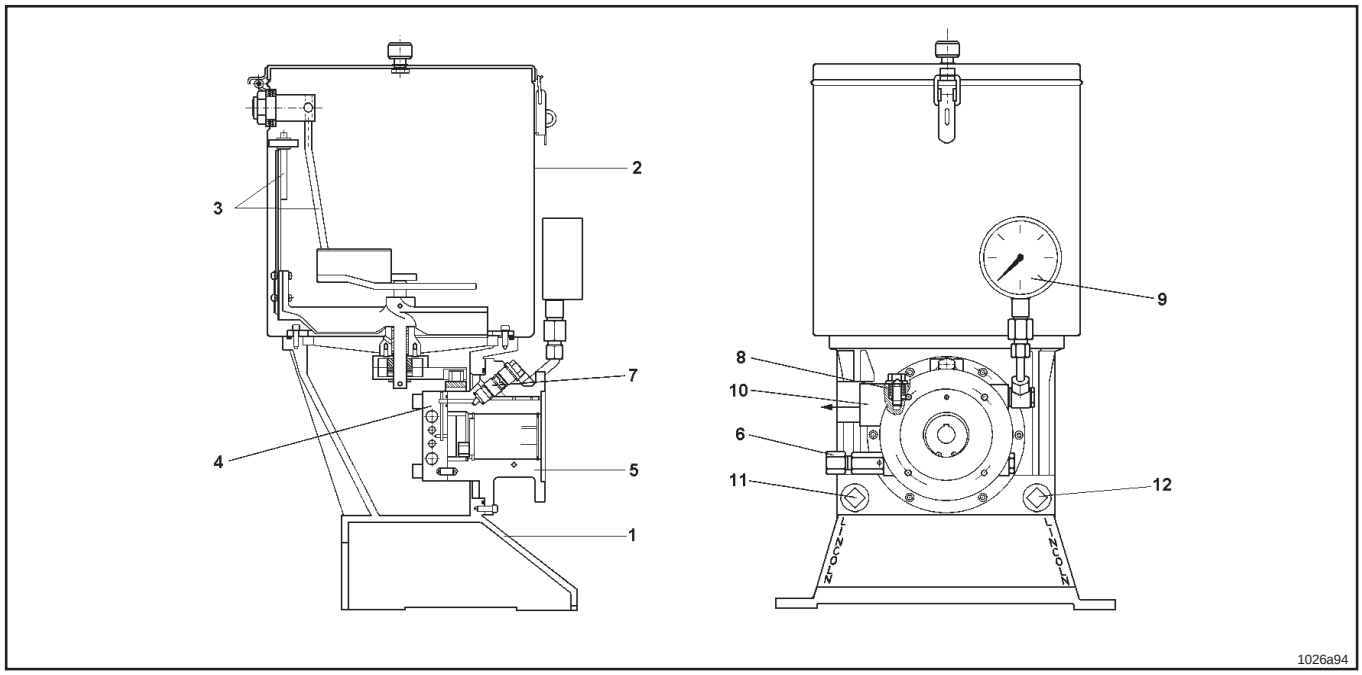
Flanged gear motor	for technical data refer to enclosed Data Sheet

Accessories (depends on the pump equipment)

Pressure switch (position switch)	refer to enclosed data sheets
Low level control (via pivoted paddle)	-„-
High level control (via diaphragm and magnetic switch)	-„-
Low and high level control via follower piston (for 100 dm³ reservoirs)	-„-
Cover interlock switch	-„-

2.6 Mode of Operation

The lubricant is filled by hand into the reservoir (connection, item 12) via the opened cover or by means of a filling pump.
A stirring paddle with scraper and a fixed paddle (item 3) are installed in the reservoir. The grease is homogenized and purged of air by the rotation of the stirring paddle. The fixed paddle prevents the grease from flowing in the direction of rotation of the stirring paddle. When an electrical low level control is installed, the fixed paddle is pivoted in a needle bearing.
The pump element (item 4) operates as a piston pump with 2 pistons operating in opposite direction which suck in lubricant alternately and then feed it through the outlet hole to the pressure line. The outlet channels of the high-pressure pistons are controlled by a floating piston.
The pump element is driven by a hollow shaft with eccentric pin and roller, by which the rotary movement of the driving shaft is converted into the oscillating movement of the pump pistons. With this kind of drive, the direction of rotation of the pump shaft can be selected and changed as desired.
The lubricant supplied by the pump element is fed via a check valve (item 7) and a lubricant filter (item 8) to the pressure line connection (item 10).
A safety valve (item 6) and a pressure gauge (item 9) are also connected with the pressure line connection.



Description of Operation of High-Pressure Pump Element for Pumps ZPU08, ZPU14, ZPU24

The pump element operates as a piston pump with two pistons operating in opposite direction which suck in lubricant alternately and feed it through the outlet hole to the pressure line. The outlet channels of the high-pressure pistons are controlled by a floating piston.

The pump element is driven by a hollow shaft with eccentric pin and roller, by which the rotary movement of the driving shaft is converted into the oscillating movement of the pump pistons

Legend:

1, 2 = delivery piston
3 = floating piston
I = suction hole for delivery piston 1
II = suction hole for delivery piston 2
III = outlet hole (pressure line connection)

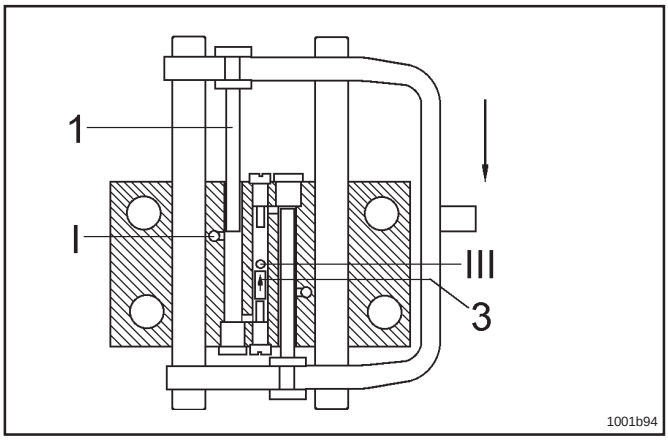
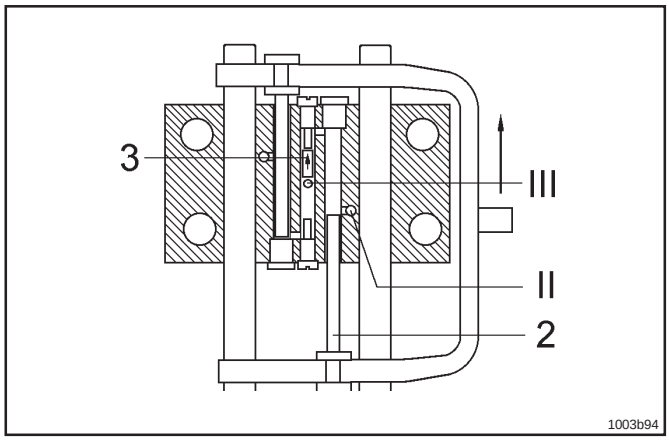


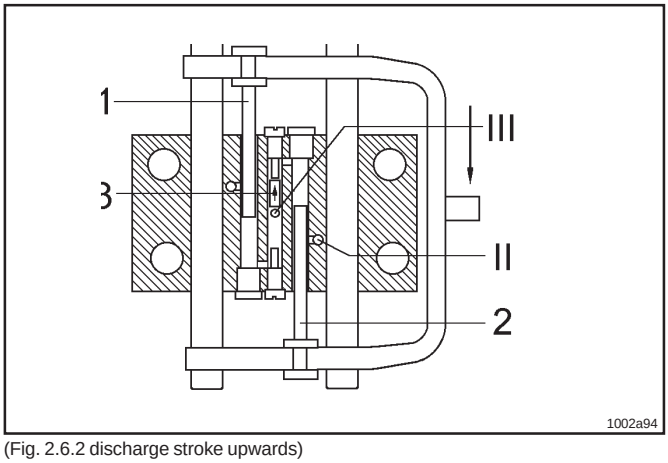
Fig. 2.6.1 Upper final position)

The piston begins to move downwards



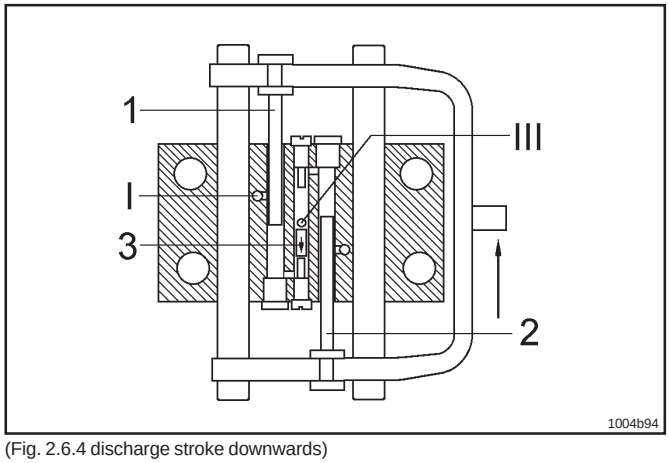
(Fig. 2.6.3 Lower final position)

The piston begins to move upwards



(Fig. 2.6.2 discharge stroke upwards)

Delivery piston 1 displaces floating piston 3 upwards, together with the lubricant stored from the preceding suction stroke.
Lubricant is delivered into the pressure line via the outlet hole which is opened now.
A vacuum is generated by delivery piston 2 with the result that lubricant is sucked in after hole II has been opened.



(Fig. 2.6.4 discharge stroke downwards)

Delivery piston 2 displaces the floating piston downwards, together with the lubricant stored from the preceding suction stroke.
The lubricant is fed into the pressure line.
Delivery piston 1 sucks in lubricant.

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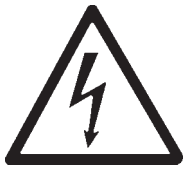
3 Installation Intructions

3.1 Erection of the Pump

Requirements on the place of installation
- protected from dust and dirt
- safe against atmospheric influences
- enough space for opening the pump cover and executing the maintenance work (space requirement acc. to the pump size)
- even, solid and vibration-free place of erection

3.2 Electrical Connection



All electrical work should be executed only by qualified personnel

Electrical connection of the drive motor:
- Terminal diagram in cover of terminal box
- Fuse protection in conformity with national regulations in force. Nominal current consumption mentioned in enclosed motor data sheet.

Electrical connection of pressure switch and level controls
- acc. to enclosed terminal diagrams and circuit diagrams

4 Operating Instructions

4.1 Commissioning

Filling the lubricant reservoir

The grease reservoir must be filled with clean lubricant via the filling connection or the opened cover.

When filling, take care that no
dirt or particles enter the reservoir
Refill the reservoir in due time.
Avoid dust in the pump area

CAUTION

Do not touch internal parts
(stirring paddle) of the grease reservoir while the pump is in operation
Risk of injury

Venting and Connection of the Tube Lines
Switch pump on (direction of rotation of the drive shaft is optional) and let it run until the lubricant emerges from the pressure line connection without air bubbles. Then, connect the tube lines to the pump.

All system components connected downstream of the pump (change-over valve, lubricant metering devices, tube lines, tube fittings, hoses) must be designed for the max. operating pressure of the system.

4.2 Maintenance and Repairs

The repair work should be executed only by qualified personnel using original spare parts.

Before executing any repair on the pump, take care of the following:

- **Switch drive motor off and secure it against inadvertent restart.**
  Risk of injury by the stirring paddle
- **Loosen pressure connection fitting of pump to decrease the pressure in the pump and system down to 0 (observe pressure gauge).**
  Risk of injury by lubricant splashing

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Under the condition that the pump only supplies clean lubricant, it does not need any particular maintenance. The pump element lies in the grease which is fed and is therefore lubricated automatically. It is subject to natural wear which depends on the operating time and adjusted pressure.

Maintenance work:

- Clean the lubricant filter (item 26 in spare parts list) every 100 operating hours. First, remove closure plug item 30. Unscrew filter insert and clean it. If it is very dirty, replace it.

- Replace the check valve (item 21 in spare parts list) when the filter is clogged. First, remove closure plug item 22

To ensure service life the gears of the flanged motors are filled with oil in the factory.

4.3 Adjustments (pressure switch)

The switching-off pressure of the electro-hydraulic pressure switch is set in the factory to 350 bar.
It can be readjusted to a lower or higher pressure, if necessary. In such a case, take care that the max. admissible pump pressure of 400 bar is not exceeded.
Refer to page 17 for the description of the pressure switch and its adjustment.

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4.4 Troubleshooting

Note: The following only describes faults of the pump. Faults of the electrical system or in the system are mentioned in the System Description.

• **Fault: pump does not supply the lubricant**	
• **Cause:**	• **Remedy:**
• Reservoir empty	• Refill reservoir with clean lubricant. Then, let pump run until the lubricant emerges from the pressure line connection without air bubbles.
• Filter clogged Note: this is indicated by short, strong deflections on the pressure gauge of the pump and grease leaking at the safety valve	• Check filter (item 8) and clean it. If it is damaged, replace it.
• Eccentric shaft or drive parts of the ratchet gear rocking plate and of the stirring paddle damaged or defective	• Replace parts
	• Remove pump element, clean it and check whether particles are lodged in it
• Suction boreholes of pump element clogged	
• **Fault: pump runs, but there is no pressure**	
• **Cause:**	• **Remedy:**
• Check valve (item 7) clogged or defective	• Replace check valve
• Pump element (item 4) damaged or defective	• Replace pump element
• Change-over valve or downstream system malfunctioning	• Refer to Faults of change-over valve and System Description

All repair work beyond the knowledge of the user's personnel must be undertaken by Lincoln qualified experts. For this, send the defective pump to the Repair Department of Lincoln or call a speciallist who will repair the pump on site.

Address of the Service Department:

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5 Spare Parts List

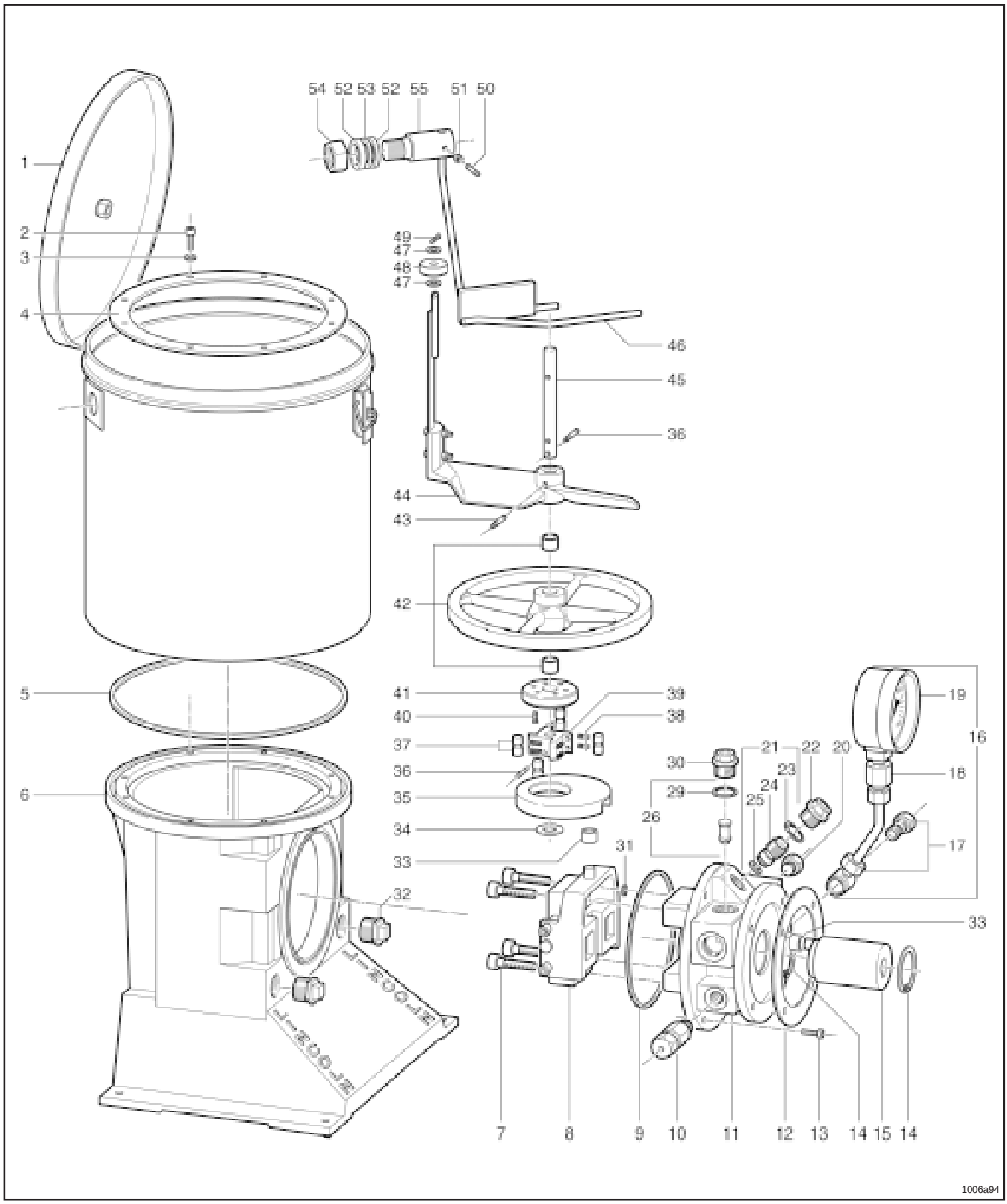

Fig 5.1: Central lubrication pump ZPU 08/14/24 without drive assemblies

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Spare Parts Drawing and Spare parts List

1.1A-18001-A96

Item	Designation	Qty.	Part Number
	without drive assemblies		
1	reservoir 40 dm³ with air filter	1	505-30851-1
2	Hexagon socket head scrM6x20C	8	201-12018-5
3	Tooth lock washer J6, 4Z	8	210-12161-3
4	Clamping ring	1	405-20315-1
5	O-ring Ø 265x4	1	219-12227-1
6	Housing	1	314-18594-1
7	Hexagon socket head screw M12x4S C	4	201-12028-4
8	Pump element with item 31	1	505-30405-3
9	O-ring Ø 155x4	1	219-12226-5
10	Safety valve SV-410-R3/8AZ	1	624-27092-1
11	Bearing flange	1	505-30853-1
12	Sealing ring 110x160x1	1	306-17856-1
13	Hexagon socket head screw M6x20 C	6	201-12018-5
14	Retaining ring J55x2	2	211-12165-6
15	Eccentric shaft	1	405-20316-2
16	Highpressure gauge assy.	1	505-30852-1
17	SWVE 10 - SG 3/8 AC	1	223-12285-5
18	MAV 10 - SG 1/2 C	1	223-13028-4
19	High pressure gaugeD1000-600bar	1	234-13101-2
20	Closure plug R318x10Z	2	303-17440-1
21	Check valve with gaskets	1	505-36089-1
22	Closure plug M20x1,5 C	1	203-12077-3
23	Sealing ring Cu 20x26x1,5	1	209-12158-4
24	Check valve without gasket	1	524-30812-1
25	O-ring Ø 10 x 3	1	219-13043-8
26	Filter assy. with gasket	1	528-30822-1
29	Sealing ring Cu 22x28x1,5	1	209-12464-8
30	Closure plug M22x1,5x16Z	1	303-19310-1
31	O-ring Cu Ø 9,3x2,4	1	219-13043-7
32	Flanged square head plug R 3/4 Z	2	203-12095-2
33	Roller	2	405-23544-1
34	Washer B15, 0C - 140 HV	1	209-13077-8
35	Ratchet gear rocking plate	1	405-23546-1
36	Roll pin 5x28	2	215-12187-3
37	Roller	8	405-24314-1
38	Compression spring 6,3x1x11	8	300-17203-1
39	Ratchet wheel	1	405-20307-1
40	Flat head screw M15x12 C	6	202-12402-2
41	Brake drum	1	405-20304-1
42	Stirrer support assy.	1	505-30410-1
43	Roll pin 5x36	1	215-12187-5
44	Stirring paddle with scraper (40 l reservoirs) with items 47, 48 and 49	1	505-30409-1
45	Stirrer shaft	1	405-20306-1
46	Fixed paddle (40 l reservoir)	1	405-20309-1
47	Washer A8, 4C	2	209-13077-1
48	Roller	1	406-20344-2
49	Cotter pin 3x16Z	1	215-12180-2
50	Set screw M6x25Z	1	204-12117-1
51	Hexagon nut M6C	1	207-12138-3
52	Washer D28	2	209-12526-7
53	Sealing ring 26,5x44x3	1	306-17817-1
54	Counternut G3/4	1	207-12143-6
55	Support	1	405-20313-1
56	Set of gaskets consisting of: items 5, 9, 12, 23, 25, 29 and 31		

Item	Designation	Qty.	Part Number
	Drive assemblies for central lubrication pump ZPU 08 (1)		
	Assembly for drive with gear motor		
1	Flanged gear motor 0.37 kW, 380-415V/50 Hz, 60 min^{-1} 420-480V/60 Hz, 72 min^{-1}	1	245-13575-1
	or		
	flanged gear motor 0.37 kW, 500 V 50 Hz, 60 rpm	1	245-13564-1
2	Tooth lock washer J8, 4Z	4	210-12161-8
3	Hexagon head screw 118x25 C	4	200-12007-5
	Assembly for rotating drive with free shaft end (2)		
2	Tooth lock washer J6, 4Z	4	210-12161-8
3	Hexagon head screw M8x25 C	4	200-12007-5
4	Internal retaining ring J42x1,5	1	211-12165-3
5	Grooved ball bearing D 20/42x8	1	250-14000-5
6	Flange	1	315-18643-1
7	Radial seal 20x40x7	1	220-12249-5
8	Feather key A 6x6x36	1	214-12175-2
9	Drive shaft	1	405-20317-1
10	Shaft retaining ring A 20x1,2	2	211-12164-5
11	Feather key A 5x5x32	1	211-12174-4
12	Washer D 16, 0C	1	209-12151-3
13	Roll pin 4x28	1	215-12186-2
	Assembly for drive with worm gear and three-phase AC motor (3)		
2	Tooth lock washer J6, 4Z	4	210-12161-8
3	Hexagon head screw M18x25 C	4	200-12007-5
14	Intermediate flange	1	315-18642-1
15	Sealing ring 43,5x69x0,5	1	306-17874-1
16	Tooth lock washer J6, 4Z	6	210-12161-3
17	Hexagon socket head screw M6x30 C	6	201-12476-9
18	Worm gear without flange	1	530-31313-1
19	Gasket 40x65x0,2	1	306-17844-1
20	Flanged housing	1	314-18602-1
21	Hexagon nut M8	4	207-12135-7
22	Tooth lock washer J8,4Z	4	210-12161-8
23	Gasket 110x160x1	4	310-17856-1
24	Radial seal 15x30x7	1	220-12249-2
25	Key A5x5x28	2	214-12174-3
26	Tooth lock washer J6,4Z	8	210-12161-3
27	Hexagon socket head screw M6x25C	6	201-12018-7
28	Coupling J24 D1=14, D2=15	1	252-14031-3
29	Hexagon head screw M8x30 C	4	200-12007-6
30	Three-phases AC motor, 0,37 kW, 1500 rpm, 220/380 V, 50 Hz or	1	245-13502-5
	Three-phases AC motor, 0,37 kW, 1500 rpm, 500 V, 50 Hz	1	245-13508-2

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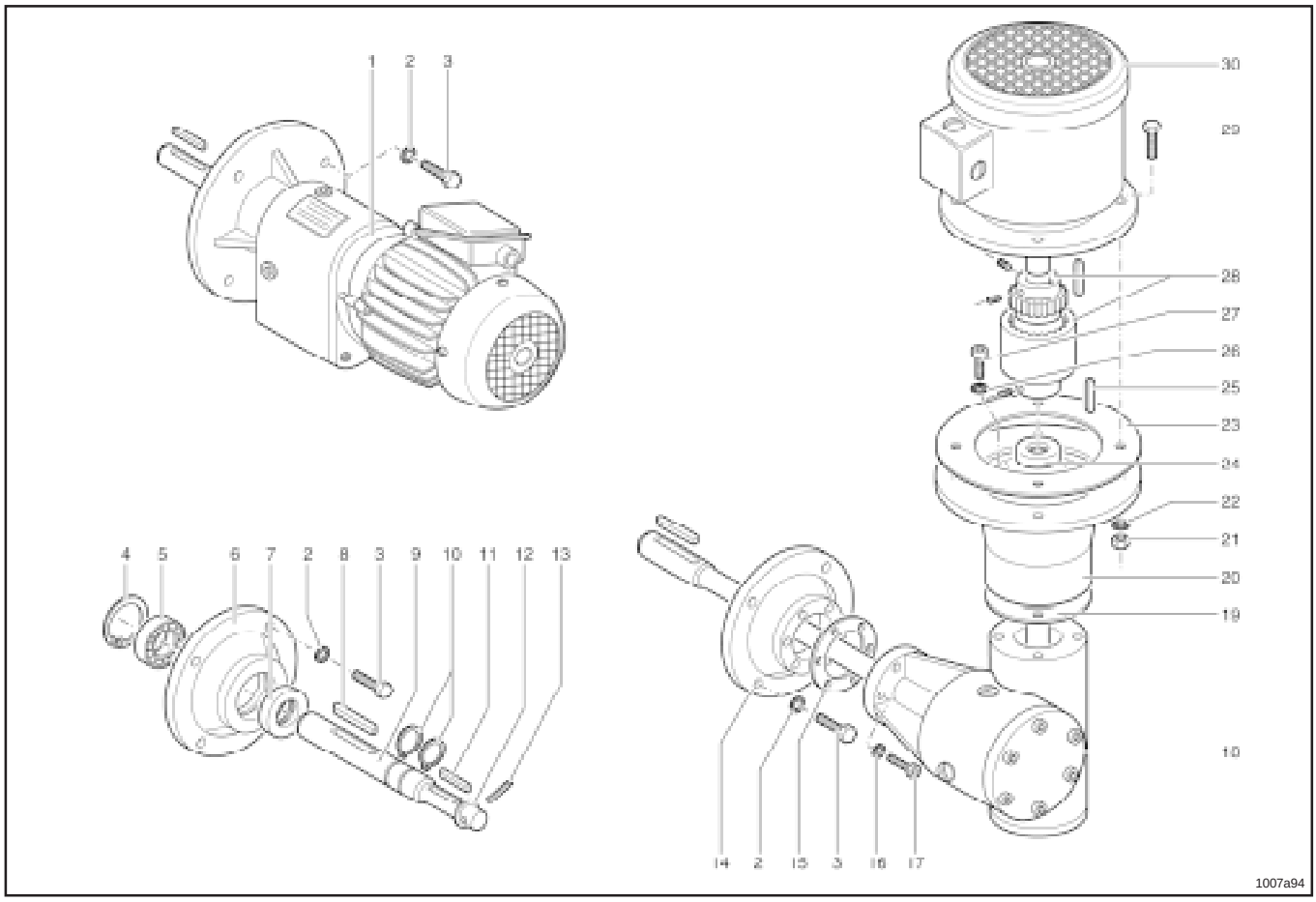
Spare Parts Drawing and Spareparts List

1.1A-18001-A96



Item	Designation	Qty.	Part Number
	Drive assemblies for central lubrication pump ZPU 14		
	Assembly for drive with gear motor (1)		
1	Flanged gear motor 0.55 kW, 380-415V 50 Hz, 100 rpm 420-480V 60 Hz, 120 rpm	1	245-13575-2
	or		
	Flanged gear motor 0.55 kW, 500 V 50 Hz,100 rpm	1	245-13564-2
2-13	same as ZPU 08		

Item	Designation	Qty	Part Number
	Drive assemblies for central lubrication pump ZPU 24 (1)		
	Assembly for drive with gear motor		
1	Flanged gear motor 1,15 kW, 380-415V 50 Hz, 180 rpm 420-480V 60 Hz, 216 rpm	1	245-13575-3
	or		
	Flanged gear motor 1,15 kW 500 V, 50 Hz	1	245-13564-3

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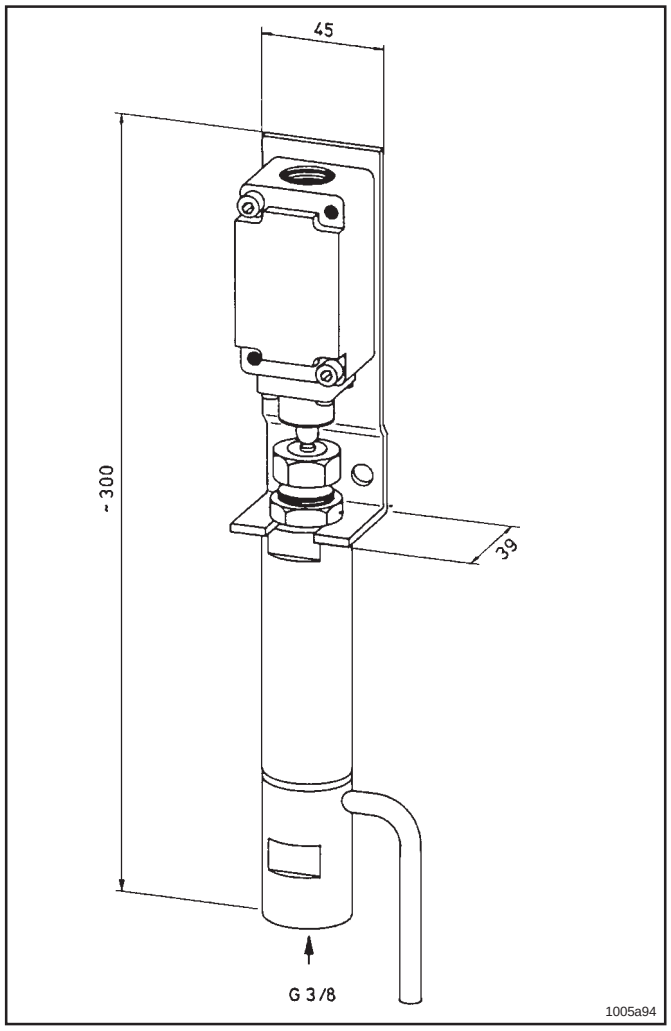
6 Appendix

6.1 Pressure Switch



Adjustment of pressure switch:

Before adjusting the pressure switch, switch off electrical supply to lubrication pump.

After loosening counter nut SW 27, re-adjust the spring tension.

On turning set screw SW 24 clockwise, the compression spring is tensed and the switching pressure is increased. Inverse procedure will result in a pressure decrease.

Scope of delivery:
As illustrated, please indicate the piston diameter when ordering

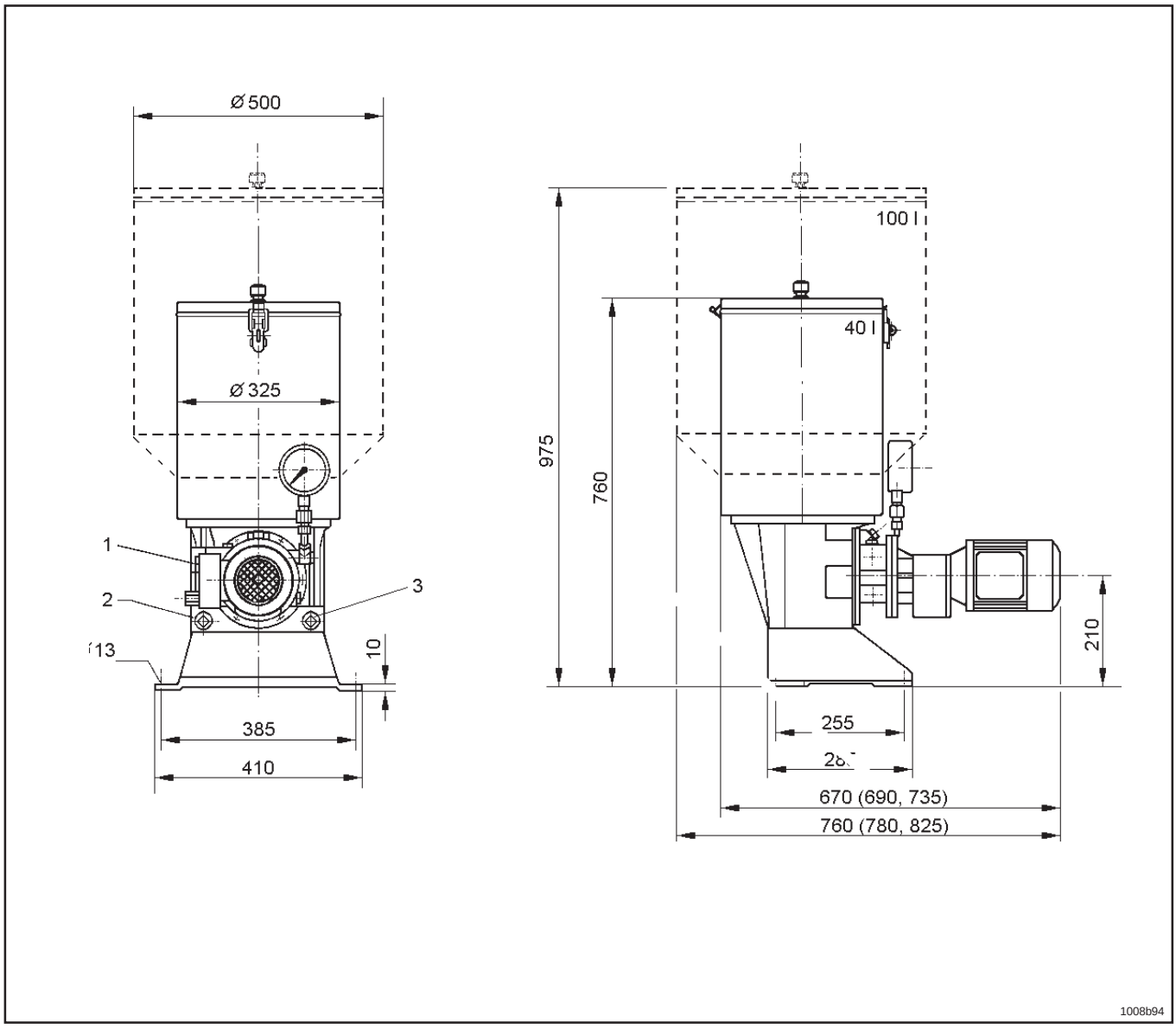
To be supplied by customer:
Wiring of limit switch to switch cabinet by means of oil-resistant cable 3 x 1.5 mm²

Pessure range	Pressure reducer Piston and cylinder DIA	Compression spring Wire DIA	Part Num.
*160 - 400 bar	6 mm	4.0 mm	623-25461-2
** 75 - 170 bar	10 mm	4.0 mm	623-25456-2

* included in pressure switch with 40 l, part no. 623-37243-1or pressure switch kit 100 l part no. 623-37242-1
** Pressure switch for ZPU with COBRA-Systems
Connection thread 3/8" BSP
Limit switch: 1 NC contact, 1 NO contact
Technical data: refer to data sheet 93A-10001-A95

6.2 Dimensioned Drawing

ZPU08 G - with flanged gear motor 0.37 kW, 60 rpm
ZPU14 G - with flanged gear motor 0.55 kW, 100 rpm
ZPU24 G - with flanged gear motor 1.10 kW, 180 rpm



Item	Designation
1	pressure line connection 3/4" BSP
2	return line connection G 3/4“ BSP
3	filling line connection 3/4“ BSP

dimensions for ZPU14 and ZPU24 in parentheses

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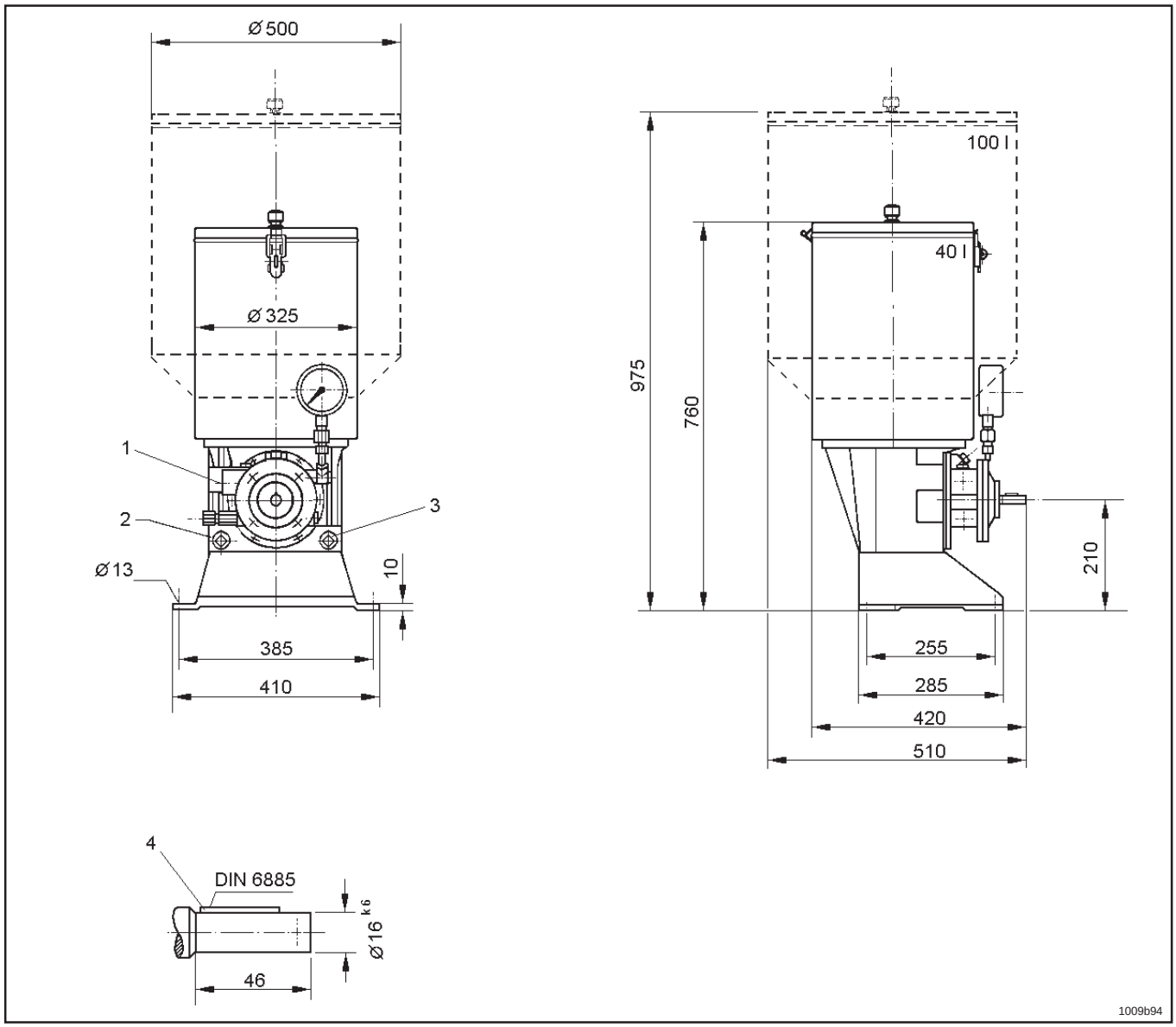
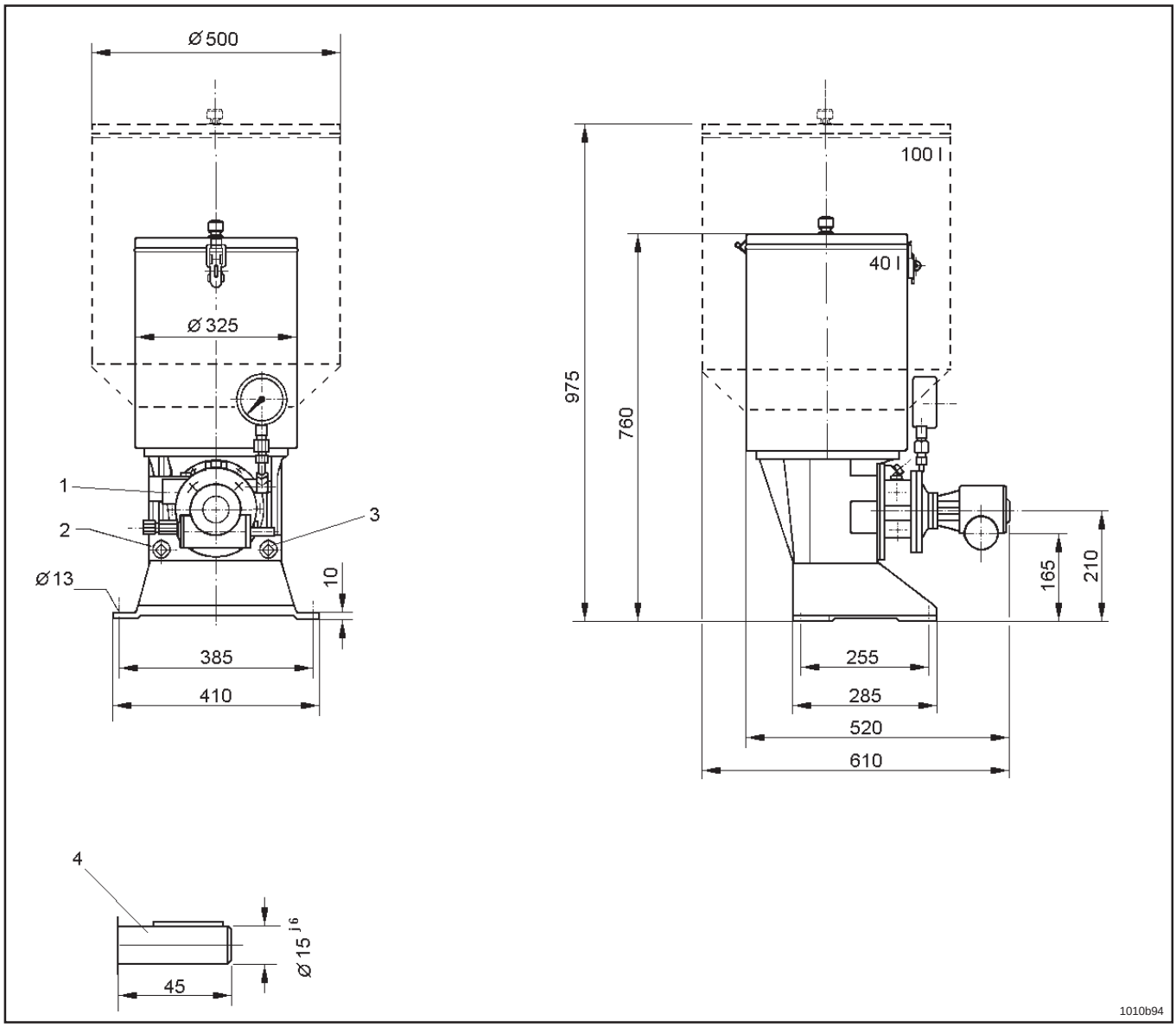
ZPU08F - with free shaft end, suitable for a drive speed of 60 rpm
ZPU14F - with free shaft end, suitable for a drive speed of 100 rpm
ZPU24F - with free shaft end, suitable for a drive speed of 180 rpm



Item	Designation
1	pressure line connection 3/4“ BSP
2	return line connection G 3/4“ BSP
3	filling line connection 3/4“ BSP
4	drive shaft dimensions

dimensions for ZPU14 and ZPU24 in parentheses

ZPU08 SF - with flanged worm gear i = 20 : 1
and free shaft end (max. drive speed 1500 rpm)



Item	Designation
1	pressure line connection 3/4" BSP
2	return line connection G 3/4“ BSP
3	filling line connection 3/4“ BSP
4	drive shaft dimensions

dimensions for ZPU14 and ZPU24 in parentheses

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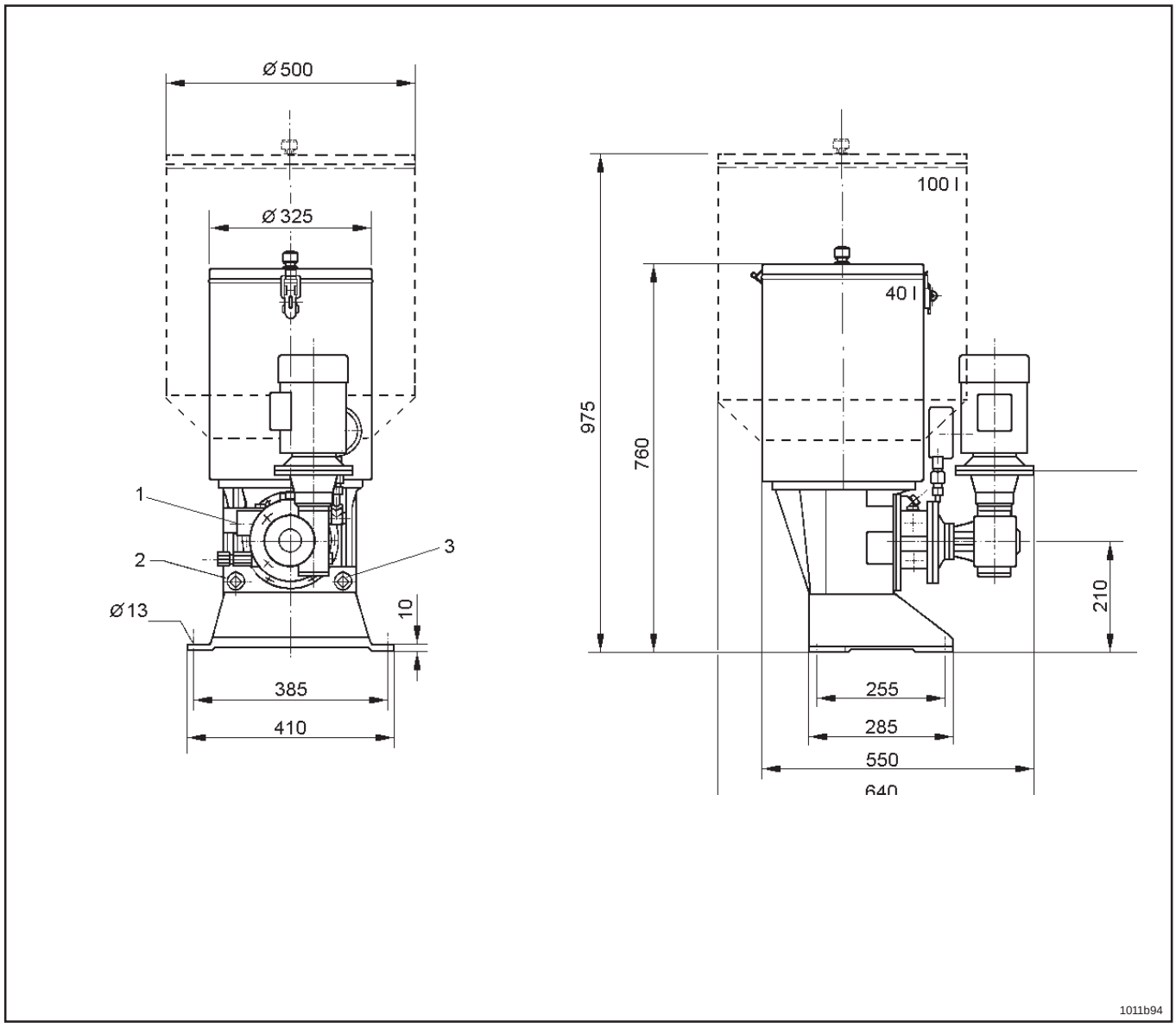
ZPU08 S - with flanged worm gear i = 20 : 1
and flanged three-phase motor (0.37 kW - 1500 rpm)



Item	Designation
1	pressure line connection 3/4" BSP
2	return line connection G 3/4“ BSP
3	filling line connection 3/4“ BSP

dimensions for ZPU14 and ZPU24 in parentheses

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6.3 Motor Data Sheet

Standard Multi-Range Three-Phase AC Asynchronus Gear Motors

Pump model		**ZPU08**		**ZPU 14**		**ZPU 24**		**Units**
Motor manufacturer		ABM		ABM		ABM		
Motor type		G80F/D71B-4		G80F/D80B-4		G90F/D90SA-4		
Part-No.		245-13575-1		245-13575-2		245-13575-3		
Frequency	f	50	60	50	60	50	60	[Hz]
Nominal power	P	0.37	0.37	0.55	0.55	1.1	1.1	[kW]
Nominal speed	n1/n2	1370/60	1690/73	1400/100	1700/118	1370/180	1700/216	[min $^{-1}$]
Rated torque	M	59	48	53	45	58	49	[Nm]
Nominal current	I_N	1.80	----------	2.6	----------	4.7	----------	[A] at 220-240 V
		1.05	----------	1.5	----------	2.7	----------	[A] at 380-415 V
		----------	1.55	----------	2.25	----------	4.2	[A] at 243-277 V
		----------	0.90	----------	1.3	----------	2.4	[A] at 420-480 V
Starting current/ ratio	I_A/I_N	3.9	4.7	4.0	4.9	4.1	4.6	[A]
Power factor	cos φ	0.73	0.73	0.80	0.80	0.85	0.82	
Efficiency	η	0.72	0.74	0.69	0.70	0.73	0.76	[%]
Frame size		71		80		90S		
Type of construction		B5 A1/160		B5 A1/160		B5 A1/160		
Type of protection	IP	55		55		55		
Insulation class		F		F		F		
Weight		ca. 11		ca. 12		ca. 17		[kg]
Flange		∅160		∅160		∅160		[mm]
Shaft end		∅20X50		∅20X50		∅20X50		[mm]

The motors can be connected to the following networks:
220/380 V ± 5%, 50Hz
230/400 V ± 5% and ± 10%, 50Hz
240/415 V ± 5%, 50Hz
265/460 V ± 5%, 60Hz
254/440 V ± 5%, 60Hz
Other voltages available on request.

Motor Data Sheet

Three-Phase AC Asynchronus Gear Motors 290/500 V (50Hz)

Pump model		**ZPU 08**	**ZPU 14**	**ZPU 24**	**Units**
Motor manufacturer		ABM	ABM	ABM	
Motor type		G80F/D71B-4	G80F/D80B-4	G90F/D90SA-4	
Part No.		245-13564-1	245-13564-2	245-13564-3	
Frequency	f	50	50	50	[Hz]
Nominal power	P	0.37	0.55	1.1	[kW]
Nominal speed	n1/n2	1370/60	1400/100	1370/180	[min $^{-1}$]
Rated torque	M	59	53	58	[Nm]
Nominal current	I_N	1.45 0.85	2.0 1.15	3.65 2.1	[A] at 290 V [A] at 500V
Starting current/ ratio	I_A/I_N	3.9	4.1	4.2	[A]
Power factor	cos φ	0.73	0.80	0.81	
Efficiency	η	0.72	0.69	0.73	[%]
Frame size		71	80	90S	
Type of construction		B5 A1/160	B5 A1/160	B5 A1/160	
Type of protection	IP	55	55	55	
Insulation class		F	F	F	
Weight		ca. 11	ca. 12	ca. 17	[kg]
Flange		∅160	∅160	∅160	[mm]
Shaft end		∅20X50	∅20X50	20X50	[mm]

The motors can be connected to the following network:
290/500 V ± 10%, 50Hz

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