

High-Pressure Multiline Pump model 105



Owner Manual Operating Instructions and Service Parts Lists



Preface / Table of Contents

2.1A-18002-A95

Preface to the Owners Manual

the pump/lubrication system is in operation.

This User Manual is intended to familiarize the user with the pump/lubrication system and to enable him 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 User Manual must always be available on the site where

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 User Manual, particularly the Operating Instructions, understandable to these persons.

The User 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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Safety Notes

1 Safety Notes

The Operating Instructions include general instructions which must be followed when a pump/pump 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

The symbol

Safety symbol acc. to DIN 4844-W8

warns of an electrical hazard.

If ignoring the safety notes might result in machine damages

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 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).



and malfunction, the word



Safety Notes

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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/pump 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 its 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 guide-lines.



Description

2 Description

2.1 General

This User Manual only refers to the high-pressure multiline pumps of the series 105. It is intented for the personnel charged with the erection, operation and maintenance of the pump.

If you require more information than given in this User Manual, please contact

LINCOLN GMBH Abt. Zentraler Kundendienst Postfach 1263 D-69183 Walldorf Tel. 06227 330 Fax 06227 33259

2.2 Appropriate Use

The multiline pump model 105 is designed for use in centralized lubrication systems only. Take care that the maximum ratings mentioned in the Technical Data sheet, particularly the max. operating pressure of 300 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 multiline pump model 105 is a central lubrication pump with 1 to 5 pump elements, i.e. with 1 to 5 outlets. The high operating pressure of 300 bar allows to use the pump as a multiline pump and also as a central lubrication pump in large-sized progressive systems.

The diversity of models allows a wide range of use of pump 105:

e.g for machines in the beverage industry for machines for materials handling (cranes, drive for conveyors, conveyor worms) for machines in the construction industry eccentric presses, forging machines Any other use is not in accordance with the instructions and will result in the loss of claims for guarantee and liability. Drive motor <l

2.3 Technical Data

Э	Technical Data		
- e	Number of outlets:	1 to 5	
-	Threaded connection:	1/4" BSPF	
	Max. operating pressure:	300 bar	
	Deliverable lubricants:	greases up to	NLGI grade 3
	mineral oils having a viscosity of r	nin. 20 mm²s⁻¹	I
	Lubricant output at continuous operation:	5 - 210 cm³/h	1
	(see also chart on page 16+17)		
-	Lubricant output/piston stroke:		
i y II	for pump element piston DIA 5 mr for pump element piston DIA 6 mr for pump element piston DIA 7 mr	n: n: n:	0.11 cm ³ 0.16 cm ³ 0.23 cm ³
= 1]	Available reservoir sizes: (level controls optional)	3, 5 or 10	dm³
b	Kinds of drive:	with free sha	ft end
C		with worm g shaft end	gear and free
		with worm g phase flange	ear and three- d motor
-	Drive motor		
d	Nominal output Syncronous speed Protection class Insulation class other versions on request	0,09 kW 1500 rpm IP 54 F	

Sound level < 70 dB(A)

Output of motor driven pumps model 105-SM

model designation	ratio	C	output (cm³/h and outlet) piston dia				
		5	6	7			
105-SM 100	100:1	80	125	175			
105-SM 200	200:1	40	60	85			
105-SM 400	400:1	20	30	45			
105-SM 1600	1600:1	5	8	10			

Nominal speed n=1330 min -1



Description

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2.4 Structure



The pump consists of the following main components:

item	description
	accomption

- 1 housing
- 2 lubricant reservoir
- 3 stirring paddle with scraper
- 4 eccentric shaft
- 5 pump element
- 6 worm gear

The detailed pump structure and pump equipment are shown on the following model designation. The detailed model designation is mentioned on the namepla-

te.

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Description

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Model Designation

The complete pump unit is defined by a model designation.

Examples	of model desig	nations:		105 105 105	- - -	SM SF F	800 1600 40	-	3 X L 3 X N 5 X B	- :	4 K7 3 K7 4 K7	-	000
						SM	1600	-	5 Y B	- :		-	400
105 = bas	sic pump model fo	or grease or oil, w	ith 1 to 5 outlets										
Kind of dr F = with SF = with SM = with rpm)	ive: a free shaft end a worm gear and a worm gear and	free shaft end I three-phase flan	ged motor (1500										
Total ratio	o of the pump ge	ears											
Model	Total ratio	Pump ratio	Gear ratio										
10 40 100 200 400 1600	10 40 200 400 1600	10 40 10 10 10 40	- 10 20 40 40										
Reservoir 5 = 5 no 3 = 3 no	designs ominal capacity o ominal capacity o	f the sheet metal f the sheet metal	reservoir										
X = greas Y = oil res	se reservoir		ŀ										
N = stand L = reserv B = reserv	dard design voir with low leve voir with high and	l control d low level control	s										
Pump ele 1 to 5 = 1	ements number of pump	elements	F										
K7, K6, K	5 = piston diamet	ter 7, 6 or 5	ŀ										
Motor vol 000 = pur 400 = 230 500 = 500	I tages mp unit without n)/400V, 50 Hz I V, 50 Hz	notor	-										

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440 = 440 V, 60 Hz Other voltages on request



Description

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2.5 **Electrical Equipment**

Flanged gear motor	technical data on enclosed data sheet
Accessories (depend on the pump equipment)	
Low level control and/or high level control for grease (via follower plate and contact pin)	_"_
Low level control and/or high level control for oil (via floating switch)	- " -

2.6 Mode of Operation

The worm gear and a gear reducer, if any, reduce the speed of the eccentric shaft down to the desired output.

The eccentric shaft causes the piston lodged in the pump element to be moved back and forward, which results in the lubricant being sucked in and supplied to the outlet via a check valve.

The eccentric shaft simultaneously drives the stirring paddle. The lubricant is homogenized by the rotating motion of the stirring paddle and it is dispensed to the suction boreholes of the pump element.







Fig. 2.6.2: Delivery phase



3 Erection and Assembly

3.1 Pump Erection

Requirements on the place of installation

- protected from dust and dirt
- safe against atmospheric influences (note the protection type of the electric motor)
- enough space for opening the reservoir cover and executing the maintenance work (the required space depends on the pump size)
- · even, solid and vibration-free place of erection

Depending on the pump design, it may be necessary to connect the drive. The sense of rotation of the pump and thus that of the driving shaft is optional.

In the case of pumps with free shaft end, take care that the max. admissible drive speed of the drive shaft mentioned on the nameplate is not exceeded.

3.2 Electrical Connection

All electrical work should be undertaken only by qualified personnel.



Electrical connection of the drive motor

- · Terminal diagram under the cover of the terminal box
- Fuse protection in conformity with the national regulations in force; rated current consumption mentioned on enclosed motor data sheet

Electrical connection of the level controls

• acc. to enclosed terminal diagram/circuit diagram

4 Operating Instructions

4.1 Commissioning

Before putting the pump into operation, fill the reservoir with lubricant

- When filling the lubricant, take care that no impurities or other particles enter the reservoir
- · Always refill the reservoir in due time
- · Avoid dust/dirt in the pump area

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



CAUTION

Operation with oil

Before filling the oil, remove the lubrication fitting on the pump housing and replace it by a closure plug.

Only use mineral oils having a viscosity of min. 20 mm²/s.

Operation with grease

The pump model 105 is suitable for the delivery of greases including NLGI grade 3 (depending on the ambient temperature).

The first pump filling must be made via the lubrication fitting on the pump housing. Further filling may be made from the top. It is however recommended to fill the reservoir from below via the lubrication fitting.

Venting and connection of the tube lines

Switch on pump and let it run until the lubricant emerges from the pump outlets without air bubbles. Then connect the tube lines which must have been filled with grease before to the pump elements.

If the lubricant has not been refilled in due time, it is necessary to vent the pump as follows:

- · Disconnect tube line from pump outlet
- · Fill pump via lubrication fitting on pump housing
- Switch pump on until lubricant emerges from all pump outlets
- · Reconnect tube line

All system components on which the pump hydraulic pressure acts (e.g. progressive metering devices, tube lines, tube fittings, hoses) must be designed for the maximum system pressure.



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Operating Instructions

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4.2 Maintenance and Repairs

The repairs should be executed only by qualified personnel using original spare parts. Before undertaking any repair on the pump, follow the following instructions:

- Switch drive motor or mechanical drive off and protect it from inadvertent restart.
- Risk of injury by the stirring paddle • Loosen the pressure connection fit-
- Loosen the pressure connection fittings on the pump element in order to decrease the pressure in the pump and system.



Risk of injury due to lubricant splashing under high pressure

Under the condition that the pump only delivers clean lubricant, it does not need any particular maintenance. Since the drive shaft and pump elements lie in the lubricant which is fed by the pump they are lubricated automatically.

They are subject to a natural wear which depends on the operating time and operating pressure and must therefore be replaced. Installation of pump elements

- Switch pump off to remove the pump elements. They can only be removed and replaced when the pump is out of operation
- Clean the pump outside to avoid dust entering the pump.
- If grease is still in the pump reservoir, it can remain in the reservoir. In the case of oil pumps, let the oil flow.

When screwing in the pump elements, take care that the scraper of the stirring paddle is in front of the pump element to be installed. Before installing the pump element, replace the old gasket by a new one.

CAUTION

Screw the pump element into the housing by hand and tighten it by means of a wrench SW 27. Tightening torsion is 30 to 35 Nm



- 1 housing
- 2 pumpelement
- 3 closure plug
- 4 gasket

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Operating Instructions

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4.3 Troubleshooting

Fault: pump does not supply	
• Cause:	Remedy:
Reservoire empty	• Refill reservoir with lubricant and vent pump, if necessary. Note: according to the ambient temperature and/or the sort of lubricant, it may be that the pump elements need about 10 min.to be fully operative.
Air bubbles in the lubricant	 Disconnect the outlet tube fittings from the pump element and let the pump run until the lubricant emerges without air bubbles.
Suction hole of pump element clogged	• Remove pump element and check whether foreign particles are in the pump element. Remove them, if any.
Check valve defective or clogged	Replace check valve
Pump piston worn	Replace pump element
Fault: blockage of downstream progressive system	
• Cause:	• Remedy:
 Bearing, lines or progressive metering device clogged The fault is indicated by: grease leaking from the safety valve 	 Find out which is the cause of the blockage and rectify. In the case of a progressive metering device, disconnect all connection lines one after the other until the pump supplies the lubricant. The blockage will be found in the tube line of

- · grease leaking from the safety valve
- non-moving indicator pins on the metering device pistons ٠
- 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 specialsit who will repair the pump on site.

Address of the Service Department:

LINCOLN GmbH Service Department Postfach 1263 D-69183 Walldorf Tel.: 06227 330 Fax: 06227 33259

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the connection fitting which has been disconnected last



Spare Parts Drawing and Spare Parts List

5 Spare Parts Drawing

pump housing



Item Designation Qty. Part Number Item Designation Qty. Part Number 313-19031-1 400-22760-1 housing 1 4 shaft DIA 10 x 98 1 1 closure plug M 22x1,5 KF 0 - 4 303-19285-1 4.1 key A 3 x 3 x 25 214-12173-2 1.1 1 1.2 sealing washer 22,2 x 27 x 1,5 1 - 5 306-17813-1 4.2 needle bearing without 1 250-14006-4 grooved ball bearing 9 x 24 x 7 1.3 1 250-14009-6 inner ring 22 x 35 x 16 grooved ball bearing 20 x 32 x 7 eccentric DIA 26 x 44 1 400-22762-1 1.4 1 250-14009-6 4.3 1.5 radial seal 20 x 32 x7 220-13059-1 4.4 washer 22,5 x 35 x 0,5 2 209-12428-2 1 internal retaining ring J 32 x 1,2 1.6 1 211-12448-3 4.5 external retaining ring A 22 x 1,2 1 211-12472-5 1.7 closure plug 1/4 " BSP 303-17526-2 4.6 external retaining ring A 10 x 1 211-12164-1 1 3 251-14045-9 4.7 1.8 filler fitting 1/4 " BSP key A 3x 3 x 10 214-12173-3 1 1 1.9 pump element 105 K5 1-5 600-26875-2 4.8 grooved ball bearing 10 x 26 x 8 250-14009-7 1 pump element 105 K6 1 - 5 600-26876-2 5 bearing ring DIA 120 x 13 313-19085-1 1 pump element 105 K7 1-5 600-26877-2 5.1 grooved ball bearing 10 x 26 x 8 1 250-14009-7 2 o-ring 137 x 3 1 219-13084-1 5.2 internal retaining ring J 26 x 1,2 1 211-12448-2 3 worm wheel ratio = 10 : 1 or 309-19076-1 6 worm shaft ratio = 10 - 1 or 1 1 309-19075-1 worm wheel ratio = 40 : 1 worm shaft ratio = 40 : 1 1 309-19071-1 309-19073-1 1 external retaining ring A 20 x 1,2 1 6.1 211-12164-5

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reservoir

Item	Designation	Qty.	Part Number
7	stirring paddle assembly 3XN or	1	500-30681-2
	stirring paddle assembly 5XN	1	500-30682-2
8	fixed paddle for 3XN and 5XN	1	400-22983-1
9	reservoir 3XN with lid or	1	500-30641-2
	reservoir 5XN with lid	1	500-30642-2
9.1	hexagon socket head screw	5	201-12019-9
	M 6x 16		
9.2	washer A 6,4 C	5	209-13649-1
10	air filter	1	253-14050-1
10.1	hexagon nut M 12 x 1,5	1	207-12138-5
10.2	copperwasher 12 x 16 x 1,5	1	209-12464-9
10.3	tooth lockwasher A 12,5	1	210-12162-7



Fig. 5.2: reservoir

worm gear speed reducer

Item	Designation	Qty.	Part Number	Item	Designation	Qty.	Part Number
11. 11.1	housing cover 1313-19040-1	1	313-19041-1	11.13 11.14	internal retaining ring J 35 x 1,5 sleeve bearing DIA 10/16 x 10	1 2	211-12166-6 250-14004-9
11.2	closure plug M 10 x 1	3	303-17499-2	11.15	radial seal 10 x 22 x 7	1	220-12231-3
11.3	copperwasher 10 x 14 x 1	3	209-12158-2	12	worm wheel ratio = 10 : 1 or	1	309-19099-1
11.4	hexagon socket head screw	3	201-12546-4		worm wheel ratio = 20 : 1 or	1	309-19038-1
	M 5 x 16				worm wheel ratio = 40 : 1	1	309-19070-1
11.5	washer A 5,3	3	209-13077-3	12.1	shaft DIA 10 x 124	1	430-22763-1
11.6	o-ring 46 x 3	1	219-13045-3	12.2	key A 3 x 3 x 14	1	214-12173-4
11.7	hexagon screw M 6 x 25 C	4	200-13022-1	12.3	center-grooved pin 3 x 20	1	400-22854-1
11.8	tooth lock washer A 6,4	4	210-13649-1	12.4	shim ring 10 x 16 x 0,2	4	209-13047-2
11.9	hexagon nut M 6	4	207-12135-5	13	worm shaft ratio = 10 : 1 or	1	309-19098-1
11.10	grooved ball bearing 10 x 26 x 8	1	250-14009-7		worm shaft ratio = 20 - 1 or	1	309-19039-1
11.11	grooved ball bearing 17 x 35 x8	1	250-14009-8		worm shaft ratio = 40 : 1	1	309-19072-1
11.12	radial seal 17 x 35 x 7	1	220-12229-6	13.1	external retaining ring A 17 x 1	1	211-12472-8



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Spare Parts Drawing and Spare Parts List

drive with 3-phase flanged AC motor (not shown)

Item	Designation	Qty.	Part Number
14	3-phase flanged AC motor 220/380 V 50 Hz, 0.09 kW, 1500 rpm or	1	245-13504-5
	3-phase flanged AC motor 500 V 50 Hz, 0,09 kW, 1500 rpm	1	245-13510-2
14.1	hexagon head screw M 6 x 16	4	200-12019-9
14.2	tooth lock washer A 5,3	4	210-12162-9

bearing flange 105-F





bearing flange 105-SF

16bearing flange 80 x 32116.1grooved ball bearing 12 x 28 x 22	400-22858-1 250-14064-1 211-12166-9
16.2 internal retaining ring J 28 x 1,2 4 16.3 shaft DI A 12 x 82 1 16.4 key A 3 x 3 x 10 1 16.5 key A 4 x 4 x 25 1 16.6 external retaining ring A 12 x 1 2 16.7 hexagon head screw M 6 x 25 4 16.8 tooth lock washer J 6,4 4 16.9 hexagon nut M 6 4 kit of seals 105-F 1 1 kit of seals 105-SM/SF 1	400-22865-1 214-12173-3 214-12173-5 211-12164-2 200-13022-1 210-12161-3 207-12135-5 500-36864-3 500-36864-1



Fig. 5.5: bearing flange 105-SF, drive: free shaft end (only in connection with worm gear speed reducer)

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Appendix

6 Appendix

6.1 Dimensional Drawings





Fig. 6.1.1: Drive with free shaft end

Fig. 6.1.3 Drive with worm gear and three-phase flanged motor



Fig. 6.1.2: Drive with worm gear and free shaft end

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Appendix

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6.2 Lubricant Output Diagram



Fig. 6.2.1: Lubricant output per putlet of multiline pumps 105-F and 105-SF

For accurate data see following diagramm

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Appendix

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6.3 Motor data sheet

Manufacturer	Halter		
Model	DI 56 B4		
Nominal output Nominal speed Nominal torque Nominal current	P = n = M = I _N =	0.09 kW 1330 min 0.6 Nm 0.7 A 0.66 A 0.4 A 0.38 A 0.37 A 0.35 A 0.33 A 0.30 A	-1 at 220 V at 230 V at 380 V at 400 V at 415 V at 440 V at 460 V at 500 V
Starting current/ Nominal current Frequency Power factor Efficiency Frame size Construction Protection class IP Insulation class Weight Flange	$I_A/I_N = f = \cos \varphi = \eta =$	2.9 50 Hz 0.6 57 % 56 B14/V18 54 B 3.5 kg Ø 80	

7 Declaration by the manufacturer as defined by machinery directive 89/392/EEC Annex II B

Herewith we declare that the supplied model of

Pump Typ 105...

is intended to be incorporated into machinery covered by this directive and must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the directive.

Applied harmonized standards in particular

EN 292 T1/T2 prEN 809 EN 563

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