2.1EN-18003-D11

Multiline Pump Model 205

501 7p07

2.1EN-18003-D11

Table of Contents

Preface

The Owner`s Manual

- is itended to familiarize the user with the pump/lubrication system and to be enable him to use it adequately
- must always be available on the site where the pump/lubrication system is in operation
- must be read and used by all persons who are charged with working 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) and/or
  - Transport
- Persons who **do not have a good command of the English language** must be informed by the user of the pump/lubrication system on the **contents of the Owner's Manual, particularly the Safety Instructions, before they carry out the work**.

The Operating Instructions

- contain important information for the 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.
- must be supplemented by the respective national regulations concerning the prevention of accidents and protection of the environment.

General

- This Owner's Manual only refers to the high-pressure multiline pumps of the 205 series.
- It is intended for the personnel charged with the installation, operation and maintenance of the pump.
- If you require more information than given in this Owner's Manual, please contact: LINCOLN GmbH

This User Manual was compiled on behalf of
- the manufacturer
Lincoln GmbH
Heinrich-Hertz-Str. 2-8
D-69190 Walldorf

- by
EdiDoc GmbH
Erzberger Str. 8
D-68753 Waghäusel

Phone: +49 (6227) 33-0
Fax: +49 (6227) 33-259
E-Mail: Lincoln@lincolnindustrial.de

Safety Instructions

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

Safety symbol acc. to DIN 4844-W9

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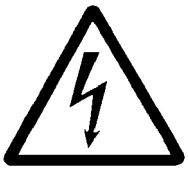
- The notes referring to safety contained in the Operating Instructions whose failure to observe them may result in personal injury are marked by the symbol above.



Safety symbol acc. to DIN 4844-W8

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- This symbol warns of an electrical current.
- If ignoring the safety note 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 Instructions

- 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 claims 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

- Observe:
  - the safety instructions given in the Operating Instructions,
  - the prevailing national regulations for the prevention of accidents
  - any working and shop regulations and accident prevention measures of the user
- When handling lubricants and other chemical substances, observe the safety prescriptions valid for the product.

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Safety Instructions, continuation

Safety Instructions for the User/Operator

- If warm or cold machine parts present 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).

Safety Instructions for Maintenance, Inspection and Installation Work

- The user must make sure that all maintenance, inspection and installation work is executed by authorized and qualified experts who have thoroughly read the Operating Instructions.
- On no account may work be done on the machine while the machine is in operation. Follow all notes 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 products is only granted if the product is operated according to the instructions given in the chapter “Appropriate use“ of the Owner’s Manual. The maximum ratings listed in the Technical Data must never be exceeded.
- The commissioning of the product (pump/pump unit) is forbidden within the EU until it has been stated that the machine concerned on which the product will be mounted is in conformity with the EU guidelines.

Appropriate Use

- The pump model 205 is exclusively designed for use in centralized lubrication systems for dispensing lubricants.
- The maximum ratings mentioned in the Technical Data, particularly the maximum operating pressure of 350 bar, must not be exceeded.
- The multiline pump model 205 is a central lubrication pump with 1 to 5 pump elements and thus 1 to 5 outlets. The high pump operating pressure of 350 bar allows the pump to be used as a multiline pump for the direct supply of lubrication points and also as a central lubrication pump in large-sized progressive systems.
- The great diversity of pump models allows the 205 multiline pump to be used for a wide range of applications, e.g.
  - machines in the beverage industry
  - machines in the conveying technology (cranes, drives for conveyors, conveyor worms)
  - machines in the construction industry
  - eccentric presses, forging machines n
- Any other use is not in accordance with the instructions and will result in the loss of claims for guarantee and liability.

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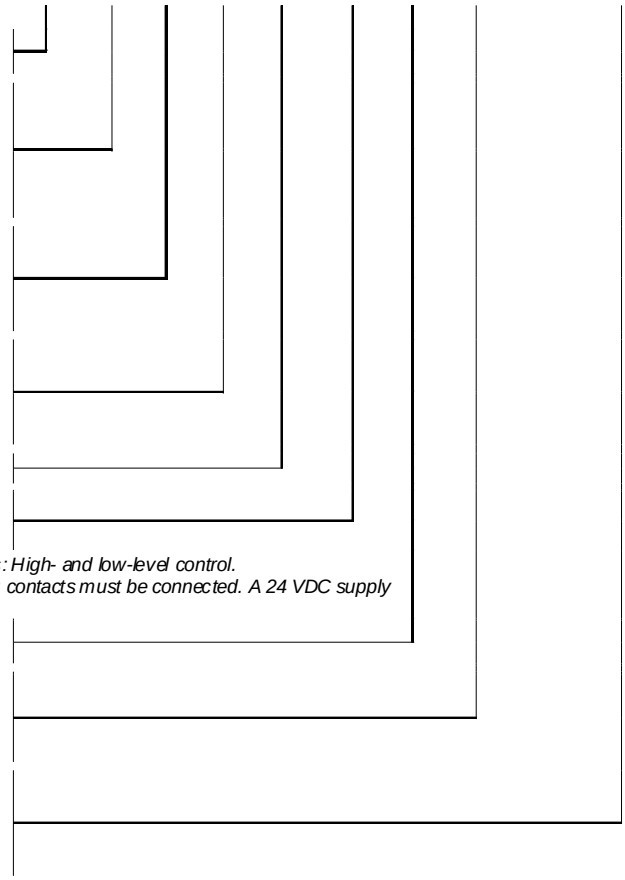
Identification Code

The complete pump unit is defined by a type code on the nameplate.

Code examples:

P205	-	M	070	-	4	XY	N	-	5	K6 - 380-420 / 440-480
P205	-	M	070	-	5	X	B	-	1	K7 - 380-420 / 440-480
P205	-	F	280	-	4	XY	BU	-	1	K7
P205	-	M	700	-	8	XY	BU	-	2	K6 - 380-420 / 440-480



P205
Basic type (housing assembly)
Housing assembly for all pump models

Drive assembly
M = Three-phase flanged motor
The motor designation with extension e. g. for voltages, frequencies, explosion-proof design is added to the type code
F = Free shaft end

Gear ratio i
280 = i = 280 : 1
700 = i = 700 : 1
070 = i = 70 : 1

Reservoir assembly
4 = 4 l plastic reservoir
5 = 5 l sheet metal reservoir
8 = 8 l plastic reservoir

XY = Reservoir for grease and oil

N = Reservoir without level control
BU = Reservoir with level control

Note: The ultrasonic sensor is equipped with 2 switching points: High- and low-level control. If only one low level control is desired, the corresponding contacts must be connected. A 24 VDC supply voltage is required for the sensor.

Pump element assembly
1 bis 5 = Number of the pump elements

K5 = piston diameter 5 mm
K6 = piston diameter 6 mm
K7 = piston diameter 7 mm
KR = Pump element adjustable, piston diameter 7 mm

Extensions for the motor designation, e. g.
380-420, 440-480 = Standard multi-range motor for network rated voltages 380-420 V/50 Hz and 440-480 V/60 Hz
000 = pump without motor, however with connecting flange

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Mode of Operation

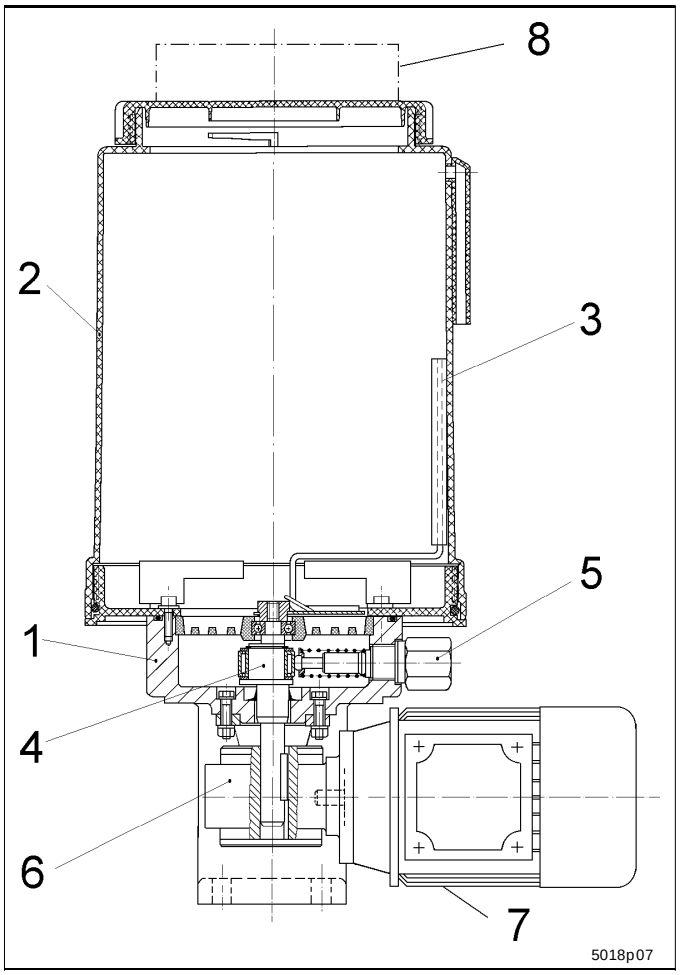

Fig. 1-1 Sectional drawing of the pump 205

1 - Housing
2 - Lubricant reservoir
3 - Stirring paddle with scraper
4 - Eccentric shaft
5 - Pump element
6 - Worm gear
7 - Drive motor
8 - Level control

- The pump essentially consists of the main components shown in Fig. 1-1.
- The worm gear 6 reduces the speed of the driver motor to the speed of the eccentric shaft.
- The eccentric shaft 4 causes the piston lodged in the pump element 5 to move to and from, with the result that the lubricant is sucked and dispensed to the outlet via a check valve.
- The eccentric shaft simultaneously drives the stirring paddle 3. The rotating movement of the stirring paddle makes sure that the lubricant is homogenized and directed into the suction boreholes of the pump element.

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Mode of Operation, continuation

Pump element

Suction phase

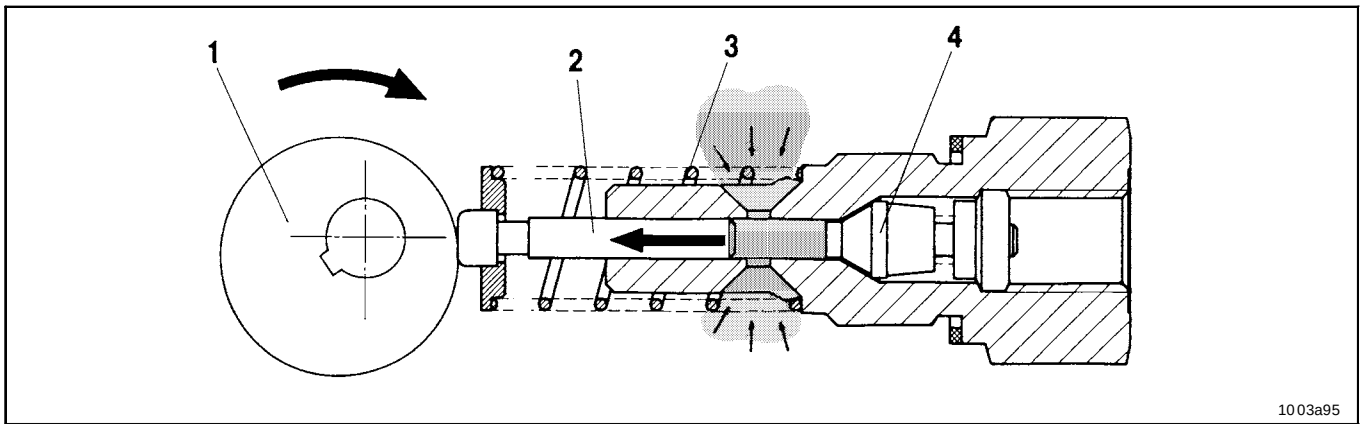

Fig. 1-2 The pump element sucks in lubricant

1 - Eccentric 2 - Piston 3 - Spring 4 - Check valve

Dispensation phase

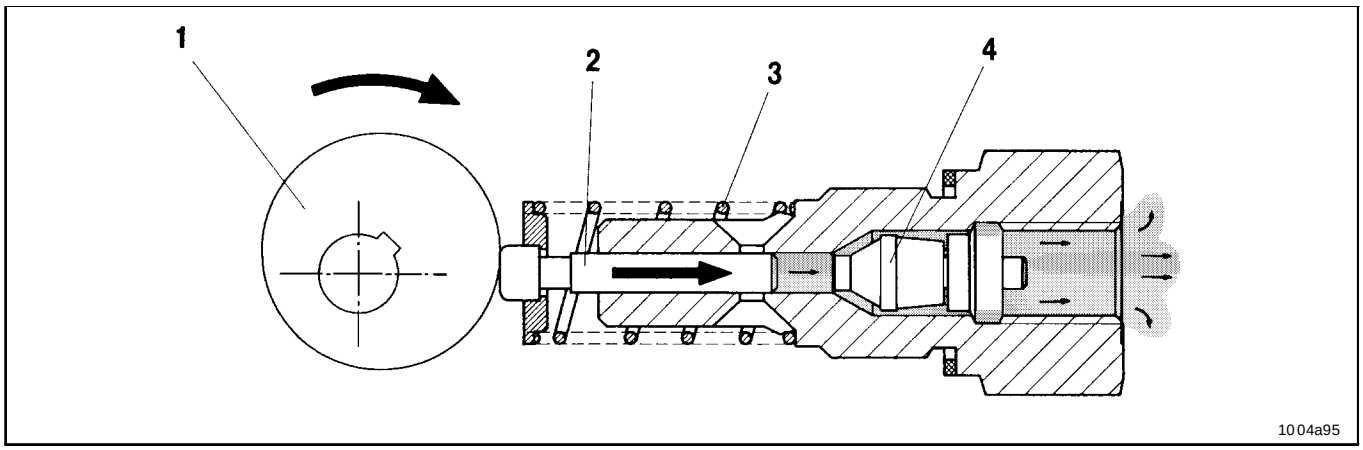

Fig. 1-3 The pump element dispenses lubricant

1 - Eccentric 2 - Piston 3 - Spring 4 - Check valve

Pump element with adjustable lubricant output

Fig. 1-4 Adjustable pumpelement

- The mode of operation (suction and supply phase) is the same as that of the pump elements with an invariable lubricant output.
- The lubricant outputs are adjustable from 0.04 to 0.18 ccm/stroke, or 0.7 to 3 ccm/min.
- The pump elements are factory-adjusted to the maximum lubricant output; the adjusting dimensions “S” should be 29 ± 0.1 mm (see fig. 2-1).

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Mode of Operation, continuation

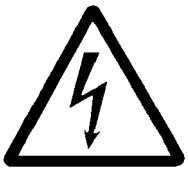
Erection of the pump

Requirements on the installation site:

- protected from dust and dirt
- safe against atmospheric influences (note the type of protection 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 installation site

- Depending on the pump design, it may be necessary to connect the drive. The direction of rotation of the pump and thus that of the driving shaft is clockwise.
- In the case of pumps with a free shaft end or an oscillating drive take care that the max. admissible speed of the drive or number of strokes is adhered to (see Technical Data).

Electric connection



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CAUTION!

All electrical works should be carried out only by qualified personnel.

Electric connection of the drive motor:

- Terminal wiring diagram under the cover of the terminal box
- Fuse protection in accordance with the national regulations in force; rated current consumption: see motor data sheet in annex
- For special motors, please see the technical data on the motor type plate
- Protect the drive motor against overcurrent/overload. Observe local regulations.

Electric connection of the level controls:

- Refer to the respective terminal diagrams in the annex and to the electrical wiring diagram

Operating Instructions

Commissioning

- Before commissioning the pump fill the reservoir with lubricant.

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ATTENTION!

- When filling the reservoir pay attention that no dirt or foreign particles enter the reservoir.
- Always refill the reservoir in time.
- Avoid contamination in the pump area.

- Do not touch internal parts of the reservoir while the pump is in operation. Risk of injury due to the stirring paddle.
- All system components which are connected downstream of the pump and on which the hydraulic pump pressure has an influence (e.g. progressive plunger metering devices, tube lines, tube fittings, hoses) must be designed for maximum system pressure.
- *Mount supply lines professionally. Screw components together firmly.*
- Protect each pump element against overpressure by means of an adequate safety valve (max. opening pressure: 350 bar).

... when grease is dispensed

Pumps with low speed of the stirring paddle (< 10 rotations)

- In the case of pumps with a slow drive (speed of the stirring paddle up to approx. 10 rpm) fill in so much oil for the first operation that the pump elements are entirely covered by oil.
  Then fill in the grease to be dispensed by the pump.

➲ Switch the pump on.

➲ Retighten the pump element if the pump is equipped with the maximum number of pump elements. Wait until the grease emerges from all the outlet ports.

➲ Adjust the desired outputs at the adjustable pump elements.

➲ Switch the pump off.

➲ Connect the tube lines which are filled with grease to the outlet ports.

- The system is ready for operation.
- The lubricant output of adjustable pump elements can be changed any time (see „Adjustments of the pump element"). To do so, the outlet tube fitting has to be removed.

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Operating Instructions, continuation

Pumps with speed of stirring paddle > 10 rpm

- ➲ Unscrew any closure plug or pump element from the housing.
- ➲ Switch the pump on.
- · The pump elements remain adjusted to zero delivery until grease leaks from the threaded hole in the housing. The time required for this ranges from 5 minutes for very fast running pumps to 5 hours for extremely slow running pumps. The ambient temperature and grease consistency have a significant impact on the time required.
- ➲ Retighten the pump element if the pump is equipped with the maximum number of pump elements. Wait until the grease emerges from all the outlet ports.
- ➲ Adjust the desired outputs on the pump elements.
- ➲ Switch the pump off.
- ➲ Screw the closure plug in again.
- ➲ Connect the tube lines which are filled with grease to the outlet ports.
- · The system is ready for operation.
- · The lubricant output of adjustable pump elements can be changed any time (see „Adjustments of the pump element“). To do so, the outlet tube fitting has to be removed.

Commissioning when fluid lubricants are dispensed

- ➲ Switch the pump on.
- ➲ As soon as the lubricant emerges from the outlet ports switch the pump off and connect the lubricant feed lines.
- · The system is ready for operation.

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Operating Instructions, continuation

Adjustment of the lubricant output

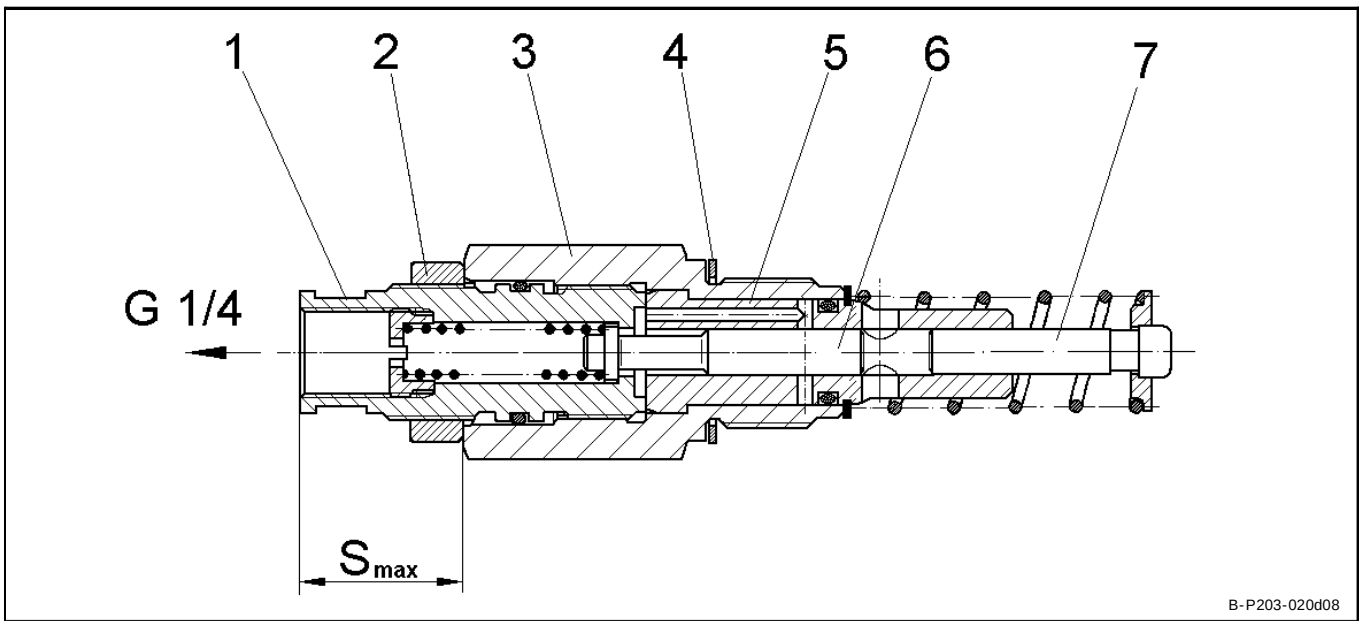

Fig. 2-1 Sectional view: adjustable element

1 - Adjusting spindle SW 16 (width over flats)
2 - counternut SW 24
3 - pump element body SW 27
4 - gasket
5 - pump cylinder
6 - control piston
7 - delivery piston
S_{max} - max. adjusting measure of the adjusting spindle

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IMPORTANT

Before adjusting the output volume exactly, determine the maximum adjusting measure "S_{max}".

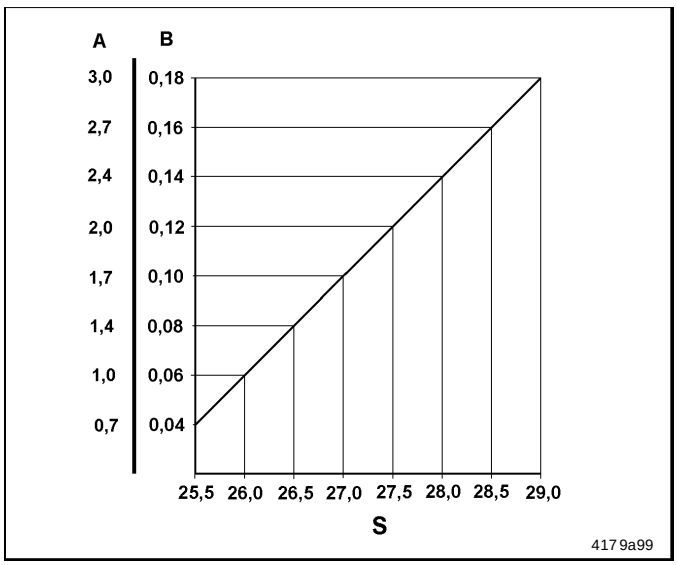

Fig. 2-2 Lubrication output diagram

A - Lubrication output cm^3/min
B - Lubrication output cm^3/stroke
S - Adjusting measure in mm (without deviation)

Determine deviation for maximum adjusting measure "S_{max}":

- Loosen counternut 2 (fig. 2-1).
- Unscrew adjusting spindle 1 out of pump element body 3.
- Screw counternut 2 completely onto the adjusting spindle 1.
- Determine and note down maximum adjusting measure "S_{max}". Deviation = S_{max} – 29 mm

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IMPORTANT

The determined deviation must be considered for each adjusting measure:
max. adj. measure "S_{max}", e.g. ..... 29.5 mm
- deviation ..... + 0.5 mm
required output volume, e.g. 0.14 ccm/stroke
- adjusting measure "S" (fig. 2-1) ..... 28 mm
$S_{0,14}$ = S + deviation
Adj. measure "$S_{0,14}$" .... 28 + 0,5 = 28,5 mm

Adjustment of the lubrication output:

- Remove pressure relief valve from pump element KR.
- Determine adjusting measure S (including deviation) for the required output volume by means of the output diagram (fig. 2-2).
- Loosen counter nut 3 (fig. 2-1) while holding in position pump element body 2.
- Adapt adjusting measure S at the adjusting spindle 1.
  - Increase "S" ..... increase output
  - Reduce "S" ..... reduce output
- Fix pump element body 3 and secure position of adjusting spindle with counternut 2.

Subject to modifications

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Maintenance and Repair

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ATTENTION!

Before undertaking any repair on the pump observe the following instructions.

- Switch the drive motor or mechanical drive off and protect it from inadvertent restart. Risk of injury by the stirring paddle.
- Slowly loosen the pressure connection fittings on the pump elements in order to decrease the pressure in the pump and in the system.
- Risk of injury due to lubricant splashing under high pressure.
- Repairs may only be carried out by qualified, skilled personnel using original LINCOLN replacement parts.
- Provided that the pump dispenses only clean lubricant, it does not need any particular maintenance. Since the drive shaft and the pump elements are covered by the lubricant which is fed by the pump they are lubricated automatically.
- They are however subject to a natural wear which depends on the operating time and operating pressure and must therefore be replaced.

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IMPORTANT

For cleaning reservoirs made of plastic do not use polar organic solvents such as alcohol, methyl alcohol, acetone or similar.

Assembly and disassembly of pump elements

Preliminary works

- ➲ Switch the pump off and clean it on the outside.
- ➲ If the pump is filled with grease, the grease can remain in the pump. Fluid lubricants must be drained (unscrew the closure plug or the pump element).
- ➲ If the stirring paddle stays ahead of a pump element which must be disassembled, turn it until it is on the opposite side.

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ATTENTION!

The delivery pistons cannot be exchanged!

When assembling or disassembling several pump elements take care that each delivery piston remains in the pump cylinder. The delivery pistons are adjusted in the pump cylinder with a tolerance of only few micrometers.

Disassembly of pump elements

- ➲ Unscrew the tube line from the outlet port of the pump element.
- ➲ Apply the fork wrench at the threaded plug of the pump element 3 (Fig.2-1) and carefully unscrew the pump element.

Assembly of pump elements

- ➲ Unscrew the closure plug.
- ➲ Screw the pump element into the housing by hand and then tighten it using a fork wrench (SW 27). Tightening torque: 30 - 35 Nm.
- ➲ If fluid lubricants are dispensed, fill them into the reservoir.
- ➲ Put the pump into operation (see chapter „Operating Instructions“).

Maintenance of the ultrasonic sensor (Reservoir "...XYBU")

- ➲ Keep the sensor face absolutely clean.

Replacement of gears or drive motors

- ➲ Before assembling gears or drive motors apply a special paste (e.g. Klüber paste 46MR401) at the boreholes and shaft ends

Troubleshooting

Fault: The pump does not dispense the lubricant

Cause:	Remedy ... by operator personnel
· Reservoir empty	➲ Fill the reservoir with lubricant and vent the pump, if necessary.


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NOTE

Depending on the ambient temperature and/or the lubricant it may be that the pump elements need about 10 minutes to be fully operative.

Cause:	Remedy ... by serivce personnel
· Air bubbles in the lubricant	➲ Loosen the threaded outlet fitting at the pump element and let the pump operate until the lubricant emerges without air bubbles.
· Suction borehole of the pump element clogged	➲ Disassemble the pump element and check whether foreign particles are lodged in the suction borehole. Remove them, if there are any.
· Check valve defective or clogged	➲ Replace check valve.
· Delivery or control piston worn	➲ Replace pump element.
· Motor defective	➲ Replace motor.

Fault: Blockage in the progressive system connected downstream of the pump

Cause:	Remedy ... by service personnel
· Bearing, lines or progressive metering device clogged The fault can be identified as follows: a) grease leaking from the pressure relief valve b) the indicator pins fitted to the metering device pistons are not moving	➲ Find out the cause of the blockage and eliminate it. If the blockage is due to a progressive metering device, disconnect all connecting lines one after another until the pump resumes delivery. The blockage is located in the tube line of the fitting which was the last to be unscrewed


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IMPORTANT

All the repairs which are beyond the knowledge of the user's personnel must be carried out by LINCOLN experts.
For this, return the defective pump to the repair department of the Walldorf works or call for a specialist who will carry out the repair on site.

Service address:

LINCOLN GmbH
Abt. Zentraler Kundendienst
Postfach 1263
D-69183 Walldorf

Technical Data

Number of outlets ..... 1 to 5


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NOTE

If the pump is equipped with its maximum number of pump elements (i.e. 5) the thread hole G 1/4 of the filler fitting can be used as filling connection.

Threaded connection ..... G 1/4" i
Filling connection (accessory):
(part no. 304-17571-1) ..... G 1/4" i
or (part no. 304-17574-1) ..... G 1/2" i
max. operating pressure [1] ..... 350 bar

[1] protection required by means of an adequate overpressure valve:

Pressure relief valves with thread for all types of reservoirs:
SVEVT-350-G1/4AD6 ..... SN 624-28070-1
SVEVT-350-G1/4AD8 ..... SN 624-28714-1

Suitable lubricants:
- ..... Lubricating grease up to NLGI grade 2
- .....NLGI grade 3 on request
- ..... Mineral oils with a viscosity of min. 20 mm^2 / s


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IMPORTANT

When changing the type of grease or refilling different grease you have to check whether the greases are fully miscible.

Lubricant output per piston stroke:
for pump element K5 piston Ø 5 mm ..... 0.10 ccm
for pump element K6 piston - Ø 6 mm ..... 0.15 ccm
for pump element K7 piston - Ø 7 mm ..... 0.22 ccm
for pump element KR, adjustable ..... 0.04 – 0.18 ccm
Lubricant output during continuous operation ..... see table (depending on the ratio and drive speed)

Ratio	70:1	280:1	700:1
K5	115 ccm	29 ccm	11 ccm
K6	172 ccm	43 ccm	17 ccm
K7	253 ccm	63 ccm	25 ccm
KR	46-200 ccm	11.5-52 ccm	5-22 ccm


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NOTE

In the case of 60 Hz motors the lubricant output is increased by 20%.

The lubricant outputs listed above are valid for a lithium soap grease of NLGI grade 2 (basic oil viscosity mm²/s at 40°C) at room temperature. At lower temperatures (below 0°C), the lubricant output may decrease depending on the grease characteristics.

Output per hour
(with motor dirven pumps, speed 1340 rpm):
Reservoir sizes ..... 4, 5 or 8 dm^3


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NOTE

On request with electric level control.


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NOTE

Plastic reservoirs are not fully resistant to glycol and polyglycol oils and greases.

Kind of drive:
- with worm gear
- with worm gear and free shaft end
- with worm gear and flange for three-phase AC motor

Ratio 700:1 280:1 70:1

Rated speed of drive:
1340 rpm ..... 50 Hz
Min. speed of the stirring paddle ..... 2 rpm
(lower speeds on request, depending on the lubricant and temperature)
Max. speed of the stirring paddle ..... 35 rpm


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NOTE

In the case of lubricating grease of NLGI grades 1 - 3 the speed of the eccentric shaft must not exceed 20 rpm.

Sound level ..... < 70 dB(A)
Einsatztemperatur
- for pumps without Ultraschallsensor ..... –20 C bis + 80 C
- für Pumpen inkl. Ultraschallsensor ..... –20 C bis + 70 C
Gewichte:
Gehäuse ..... 2.66 kg
Getriebe 1-stufig (70:1) ..... 0.95 kg
Getriebe 2-stufig (280:1, 700:1) ..... 2.03 kg
Drehstrommotor ..... 3.02 kg
freies Wellenende ..... 0.61 kg
Behälter 4XYN ..... 1.45 kg
Behälter 5XYN ..... 2.19 kg
Behälter 8XYN ..... 1.72 kg
Ultraschallsensor ..... 0.20 kg
Pump element K5, K6, K7, KR ..... 0.15 kg

Electric equipment

Three-phase flanged motor:
Technical data on enclosed motor data sheet (see annex)
Accessories: (depending on the grade of equipment of the pump)
Sensor for low- and high-level control (ultrasonic sensor) for grease (reservoir "XYBU") see technical data sheet (see annex)

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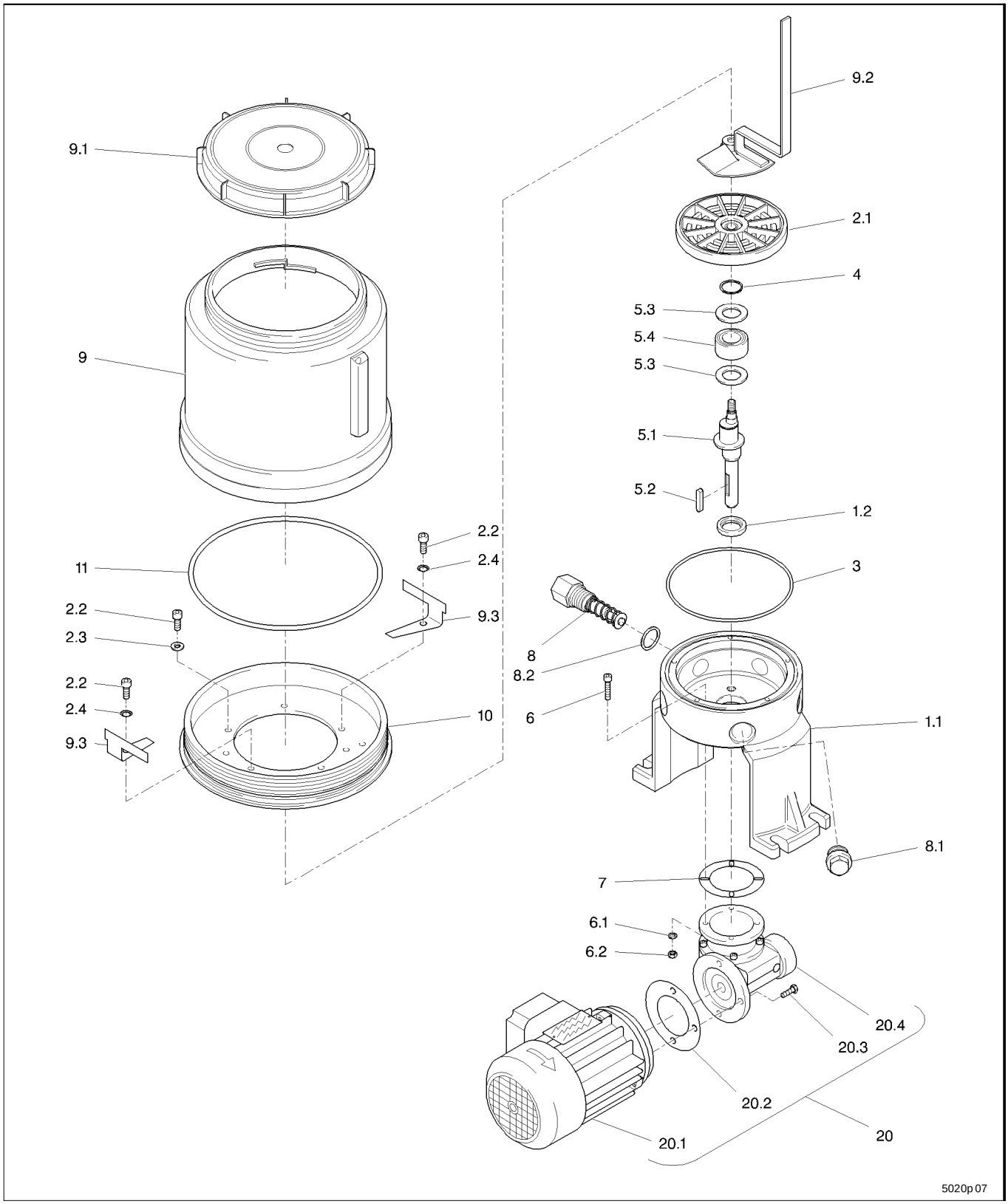
Component Parts of the Pump 205



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Component Parts of the Pump 205, continuation

Pos.	Designation	Qty.	Part no.
1.1	Housing	1	313-19694-1
1.2	Rotary shaft seal 20x32x7	1	220-13059-1
	Housing, assy.	1	555-32116-1
2.1	Intermediate bottom with grooved ball bearing	1	455-24460-1
2.2	Hexagon socket head screw M 6x16 C microencapsulated	5	201-13668-5
2.3	Washer A 6,4 C	3	209-13011-5
2.4	Washer A 6,4 C	2	209-13011-5
3	O-ring 137x3	1	219-13084-1
4	Retaining ring A 20x1,2	1	211-12164-5
5.1	Eccentric shaft	1	455-24458-1
5.2	Feather key A 5x5x28	1	214-12174-3
5.3	Axial bearing washer	2	250-14175-1
5.4	Needle bearing with inner ring 20x35x17	1	250-14006-8
6	Hexagon socket head screw M 5x30 C	4	201-12594-3
6.1	USIT ring 6,2x9,2x1,0	4	220-12238-7
6.2	Nut M5 C	4	207-14176-1
7	Sealing ring 40 x 70 x 0,5	1	306-19713-1
8	Pump element	1	
	with piston ∅ 5 mm		600-26875-2
	with piston ∅ 6 mm		600-26876-2
	with piston ∅ 7 mm		600-26877-2
	adjustable		655-28716-1
8.1	Closure plug M22 x 1,5 x 12		303-19285-1
8.2	Sealing ring ∅ 22,2 x ∅ 27 x 1,5		306-17813-1

Pos.	Designation	Qty.	Part no.
9	Reservoir, assy.	1	
	4XYN (4l plastic)		655-28734-1
	5XYN (5l metal sheet)		655-28735-1
	8XYN (8l plastic)		655-28736-1
9.1	Lid for 4l and 8l reservoirs	1	444-24234-1
9.2	Stirring paddle, assy.	1	
	for 4l and 8l reservoirs		555-32113-1
	for 5l reservoir		555-32117-1
9.3	Fixed paddle	2	455-24465-1
10	Adapter ring	1	455-24459-1
11	O ring 210x5	1	219-13730-9
20	Drive, assy.	1	
	Gear 70:1 a. motor 0,09 kW 380-415/420-480V, 50 Hz		245-13932-1
	Gear 70:1 a. motor 0,09 kW 290/500V, 50 Hz		245-13935-1
20.1	Three-phase a.c. flanged motor	1	
	0,09 kW, 1500 min-1 380-415/420-480V, 50 Hz		245-13504-5
	0,09 kW, 1500 min-1 290/500V, 50 Hz		245-13590-1
20.2	Packing 50,0 x 80,0 x 0,5	1	306-19714-1
20.3	Hexagon head screw M 5 x 16C	3	200-13017-9
20.4	Gear i = 70 : 1	1	246-14174-1
	Hydraulic lubrication nipple	1	251-14045-9
	Sonar-sensor 205U1-5BL-L190 EEX	1	664-36972-4
	- Ultrasonic sensor (standard)	1	237-12464-1
	- Locking	1	237-10254-1

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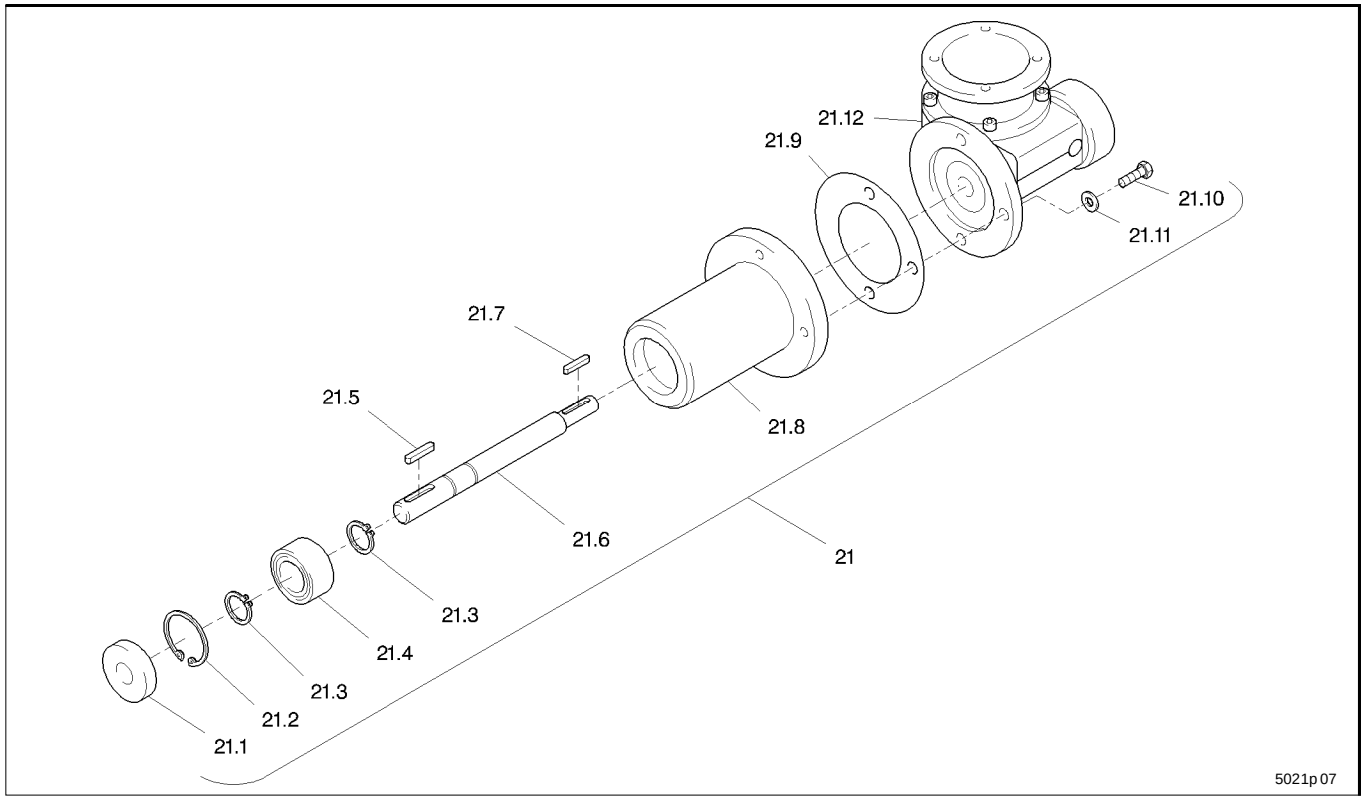
Component Parts of the Pump 205, continuation

Component Parts for Drive "Free Shaft End"



Pos.	Designation	Qty.	Part no.
21	Drive for free shaft end with		
	Gear 70 : 1 drive 205-F070	1	655-28733-1
	Gear 280 : 1 drive 205-F280	1	655-28740-1
	Gear 700 : 1 drive 205-F700	1	655-28732-1
21.1	Radial seal 12 x 32 x 7	1	220-13087-3
21.2	Retaining ring I 32 x 1,2	1	211-12448-3
21.3	Retaining ring A 12 x 1,0	2	211-12164-2
21.4	Angular ball bearing D 12/32x10	1	250-10683-6
21.5	Feather key A 4 x 4 x20	1	214-12173-6
21.6	Drive shaft	1	455-24462-1
21.7	Feather key A 3 x 3 x 20	1	214-12173-7
21.8	Bearing flange	1	455-24461-1

Pos.	Designation	Qty.	Part no.
21.9	Sealing ring 50,0 x 80,0 x 0,5	1	306-19714-1
21.10	Hexagon head screw M 5 x 16C	4	200-13017-9
21.12	Gear		
	- Reducing 70 : 1	1	246-14174-1
	- Reducing 280 : 1	1	246-14174-2
	- Reducing 700 : 1	1	246-14174-3

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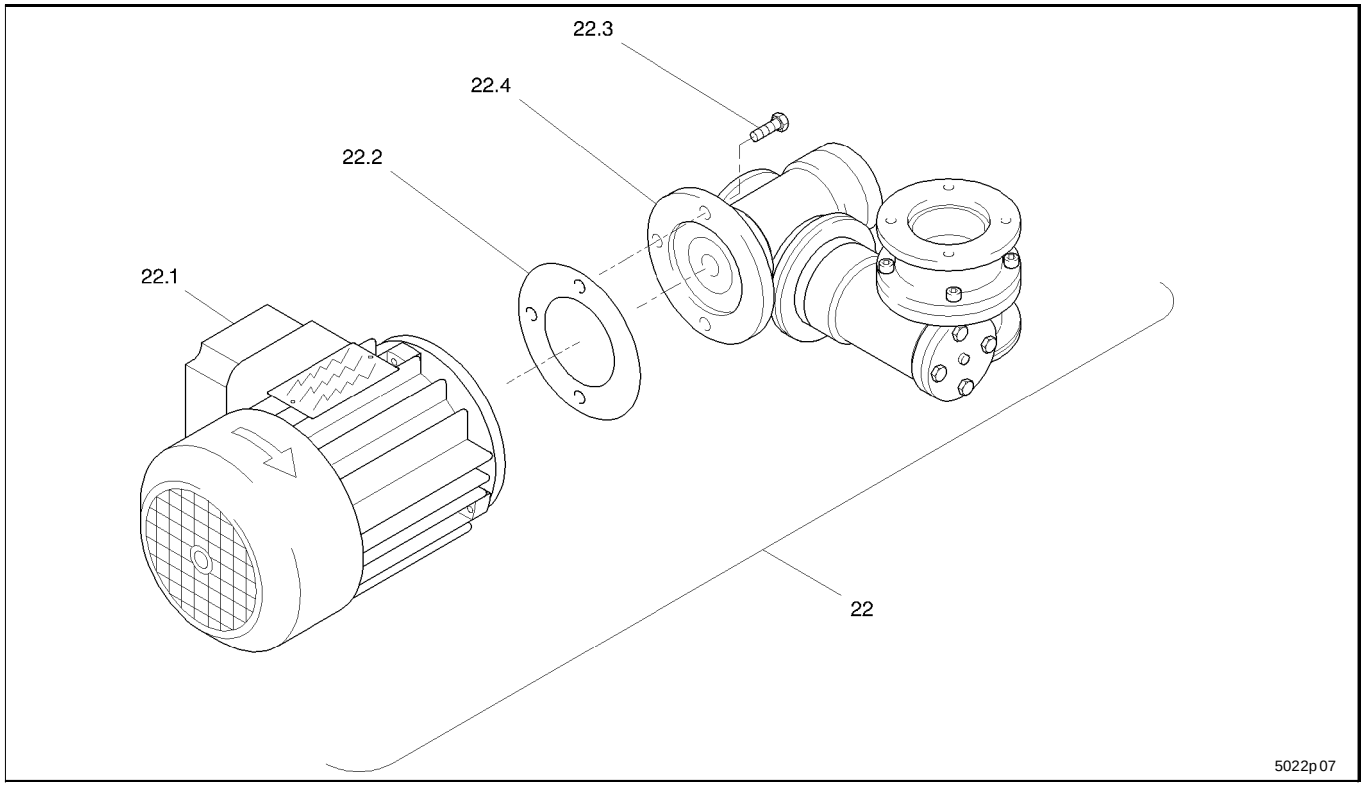
Component Parts of the Pump 205, continuation

Component Parts for Drive "Double Gear and Motor"



Pos.	Designation	Qty.	Part no.
22	Drive, assy.	1	
	Gear 280 :1, motor 0,09 kW		
	- 380-415, 50Hz/420-480V, 60Hz		245-13933-1
	- 290/500V, 60Hz		245-13936-1
	Gear 700 :1, motor 0,09 kW		
	- 380-415, 50 Hz/420-480V, 60Hz		245-13934-1
	- 290/500V, 50Hz		245-13937-1
22.1	Three-phase motor 0,09 kW	1	
	- 380-415, 50Hz/420-480V, 60Hz		245-13504-5
	- 290/500V, 50Hz		245-13510-2
22.2	Sealing ring 50,0 x 80,0 x 0,5	1	306-19714-1
22.3	Hexagon head screw M 5 x 16 C	3	200-13017-9
22.4	Gear	1	
	Reducing 280 : 1		246-14174-2
	Reducing 700 : 1		246-14174-3

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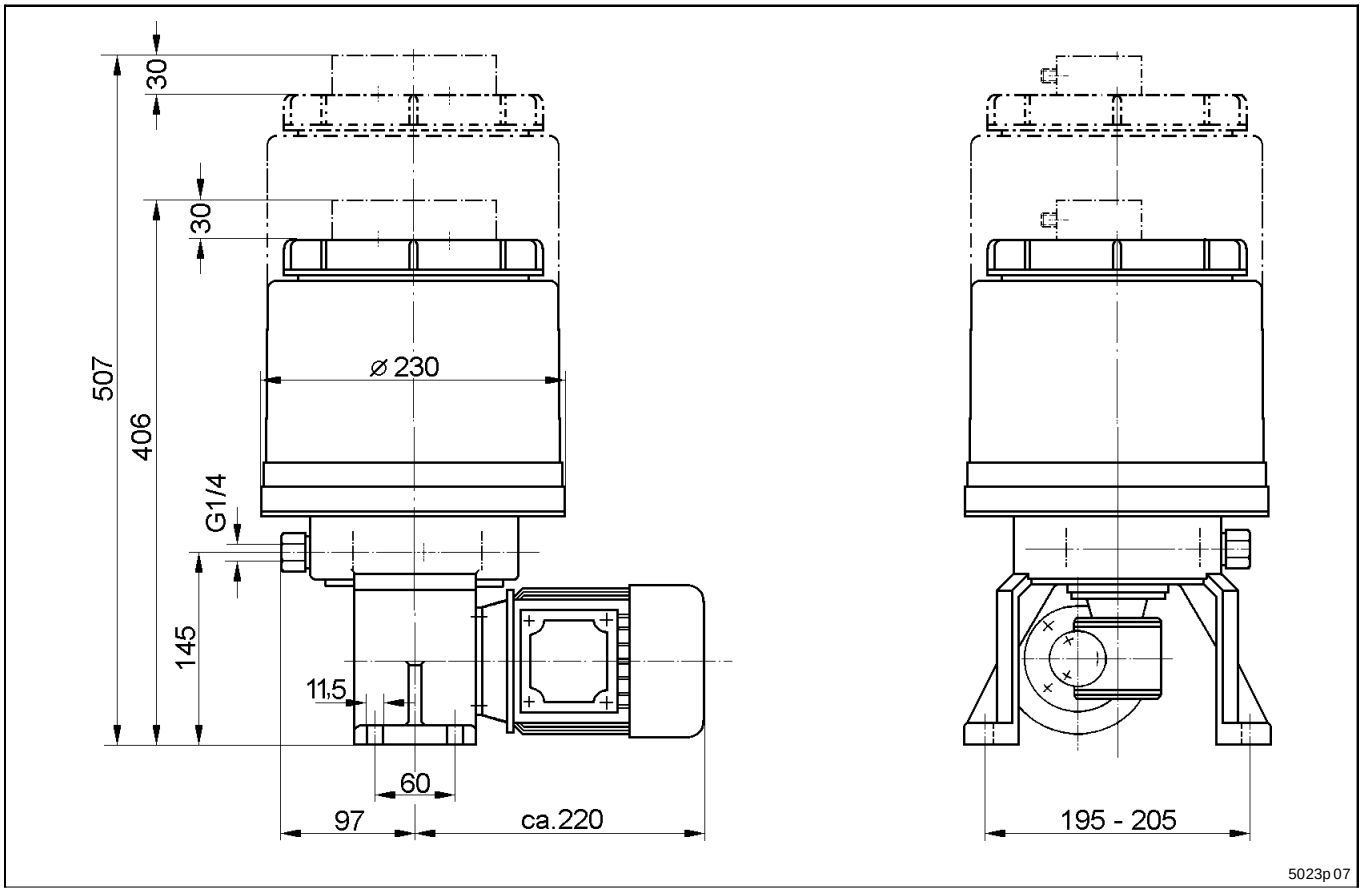
Annex: Dimensions

Dimensioned drawing for pump 205, single-stage gear, 4/8l plastic reservoir, motor drive



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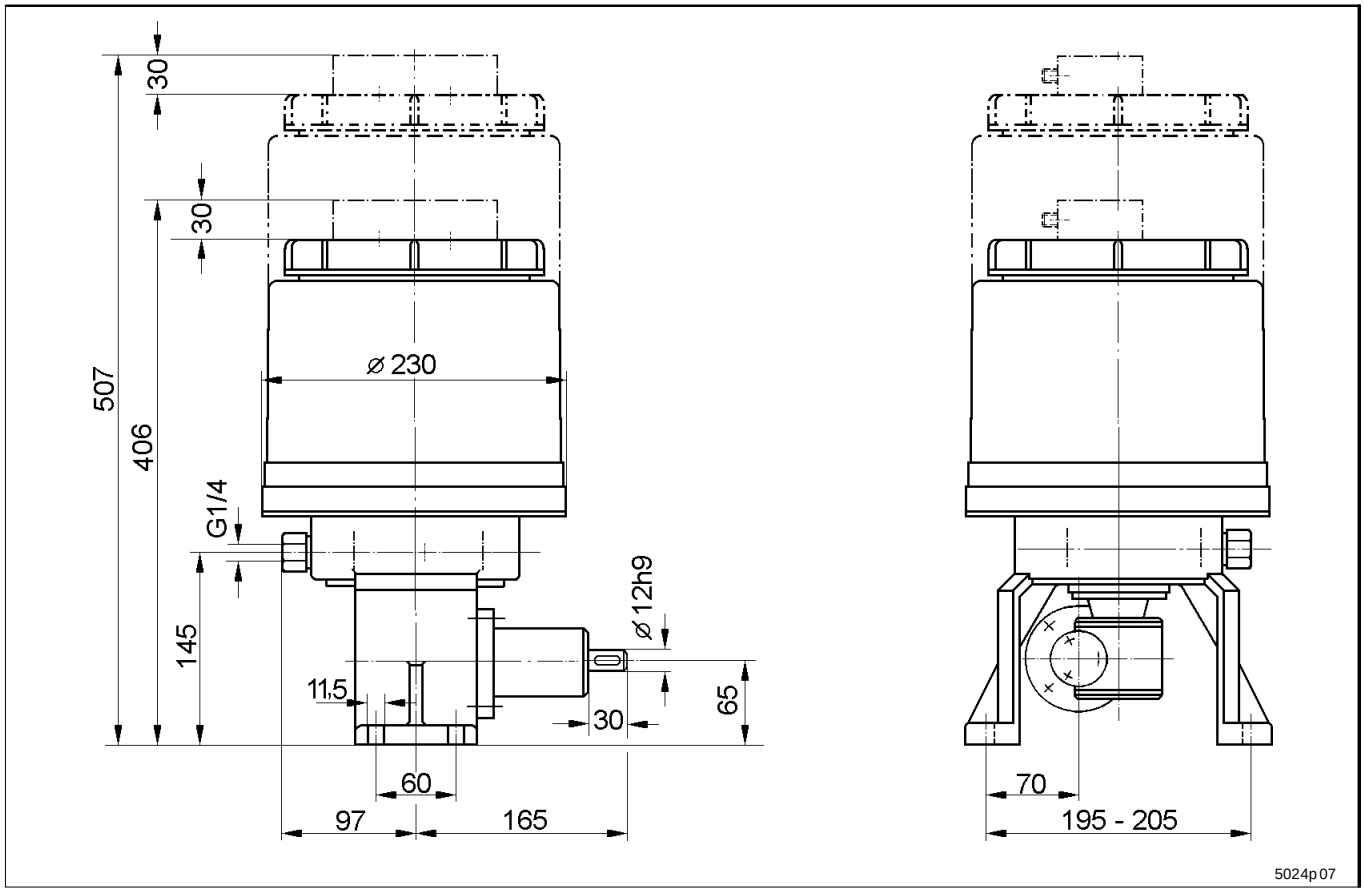
Annex: Dimensions, continuation

Dimensioned drawing for pump 205, single-stage gear, 4/8l plastic reservoir, free shaft end



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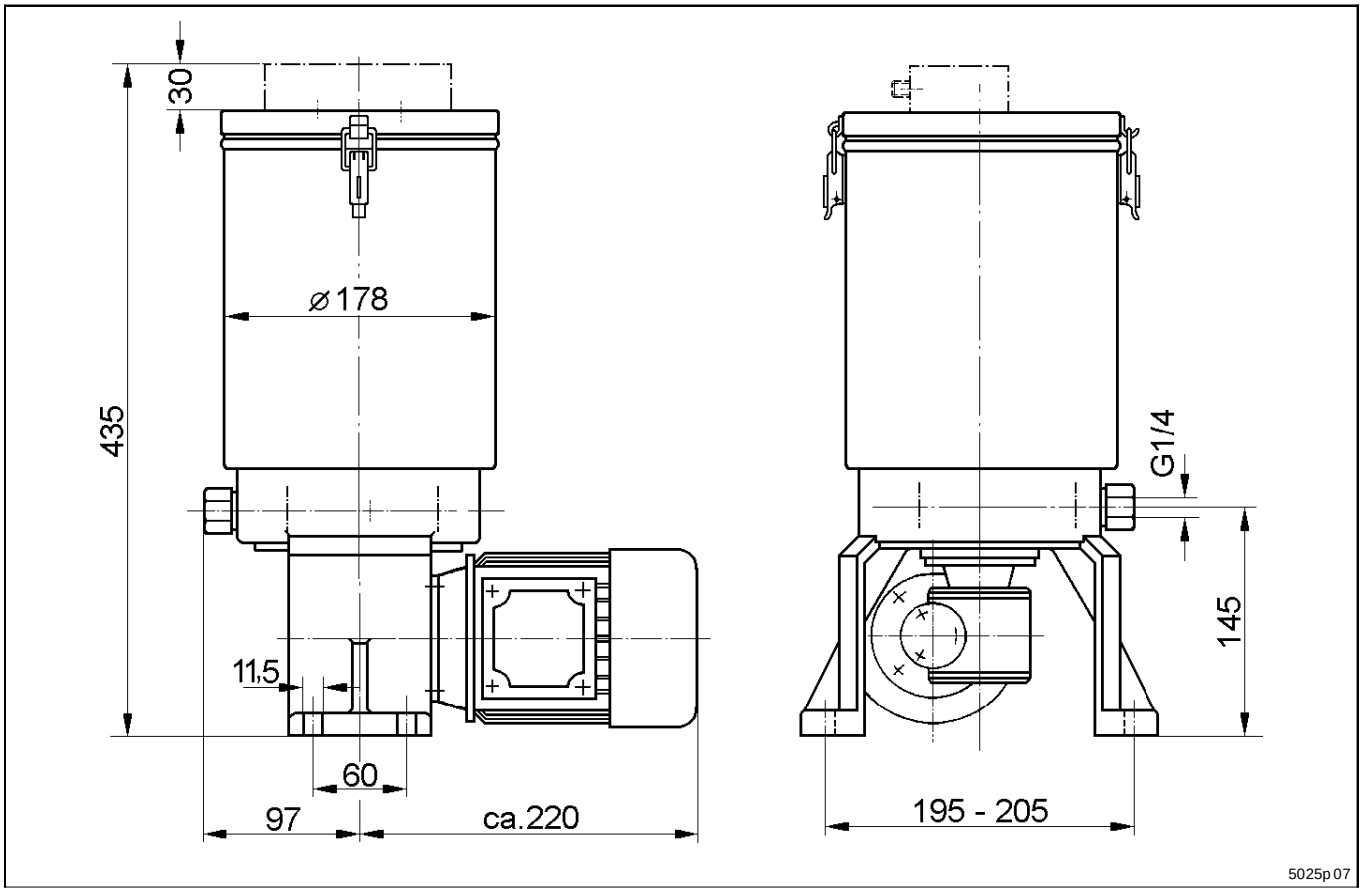
Annex: Dimensions, continuation

Dimensioned drawing for pump 205, single-stage gear, 5l sheet metal reservoir, motor drive



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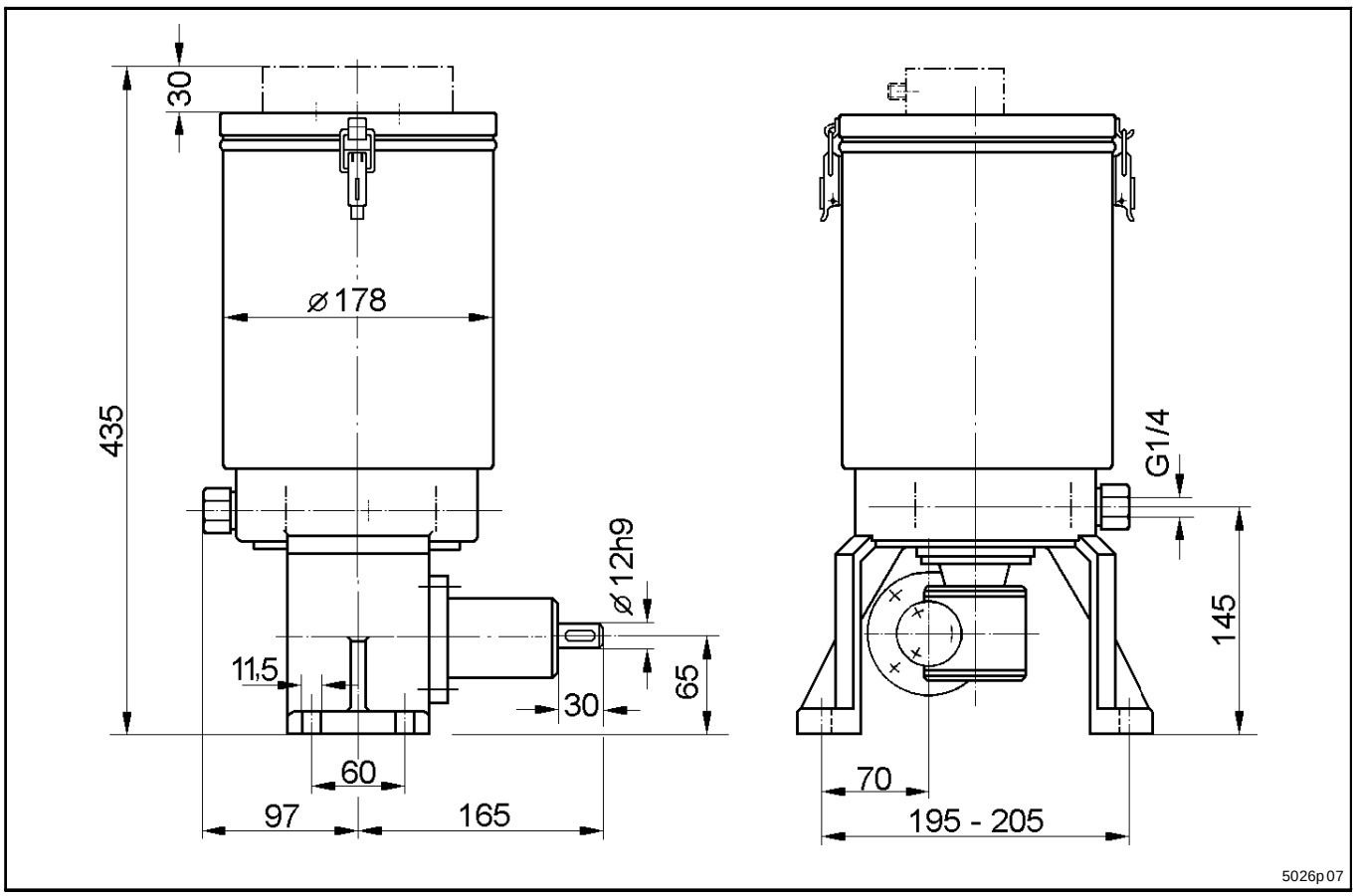
Annex: Dimensions, continuation

Dimensioned drawing for pump 205, single-stage gear, 5l sheet metal reservoir, free shaft end



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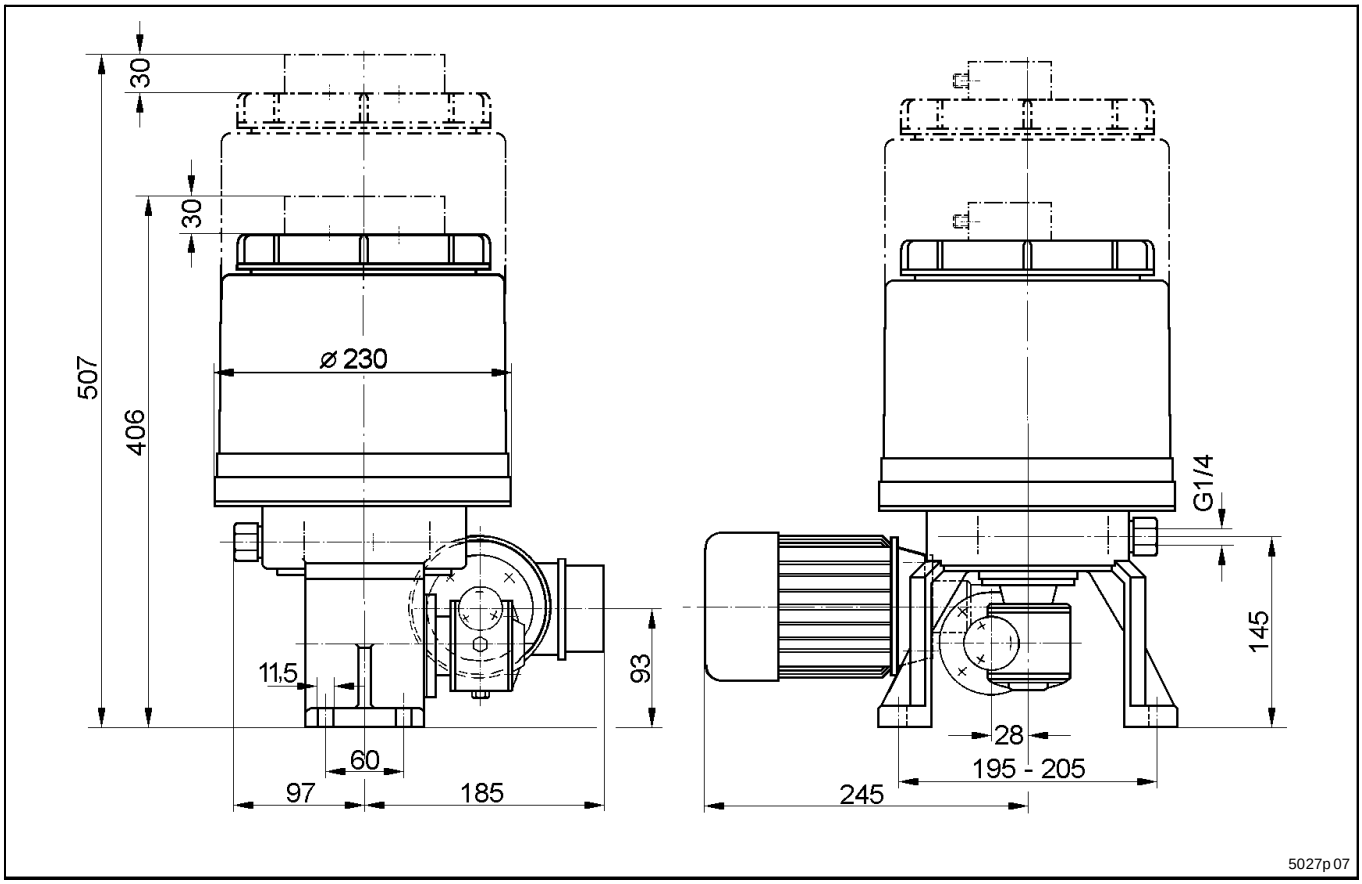
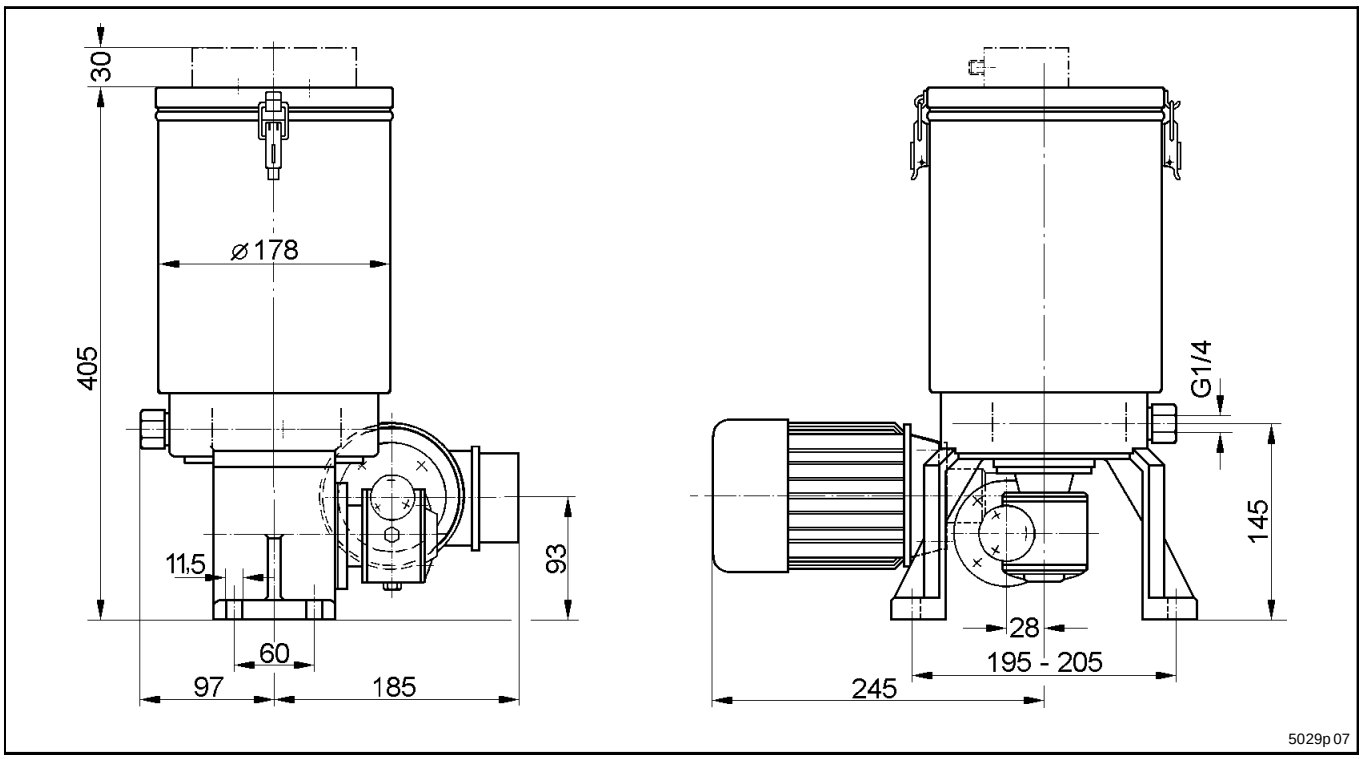
Annex: Dimensions, continuation

Dimensioned drawing for pump 205, two-stage gear, 4/8l plastic reservoir, motor drive



Dimensioned drawing for pump 205, two-stage gear, 5l sheet metal reservoir, motor drive



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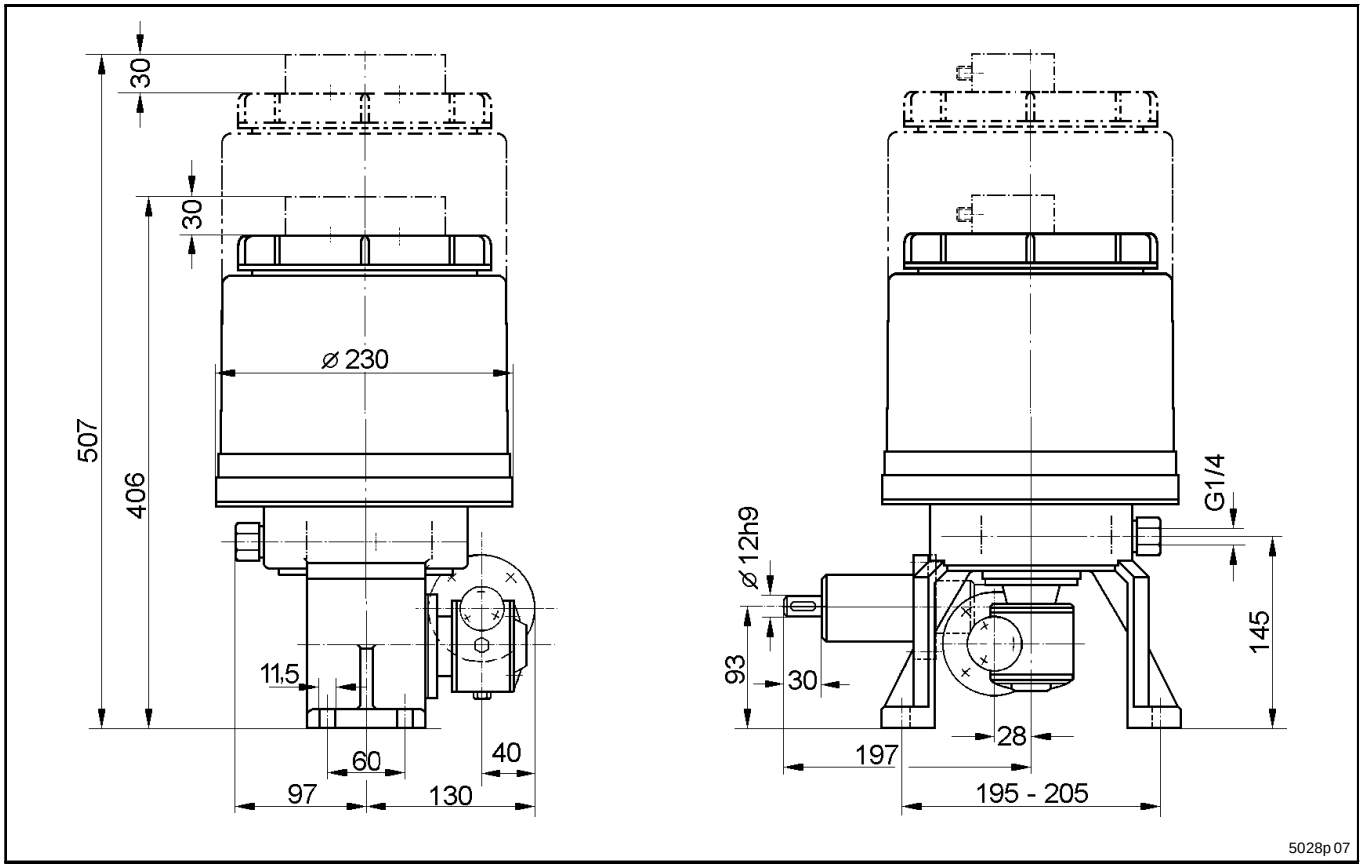
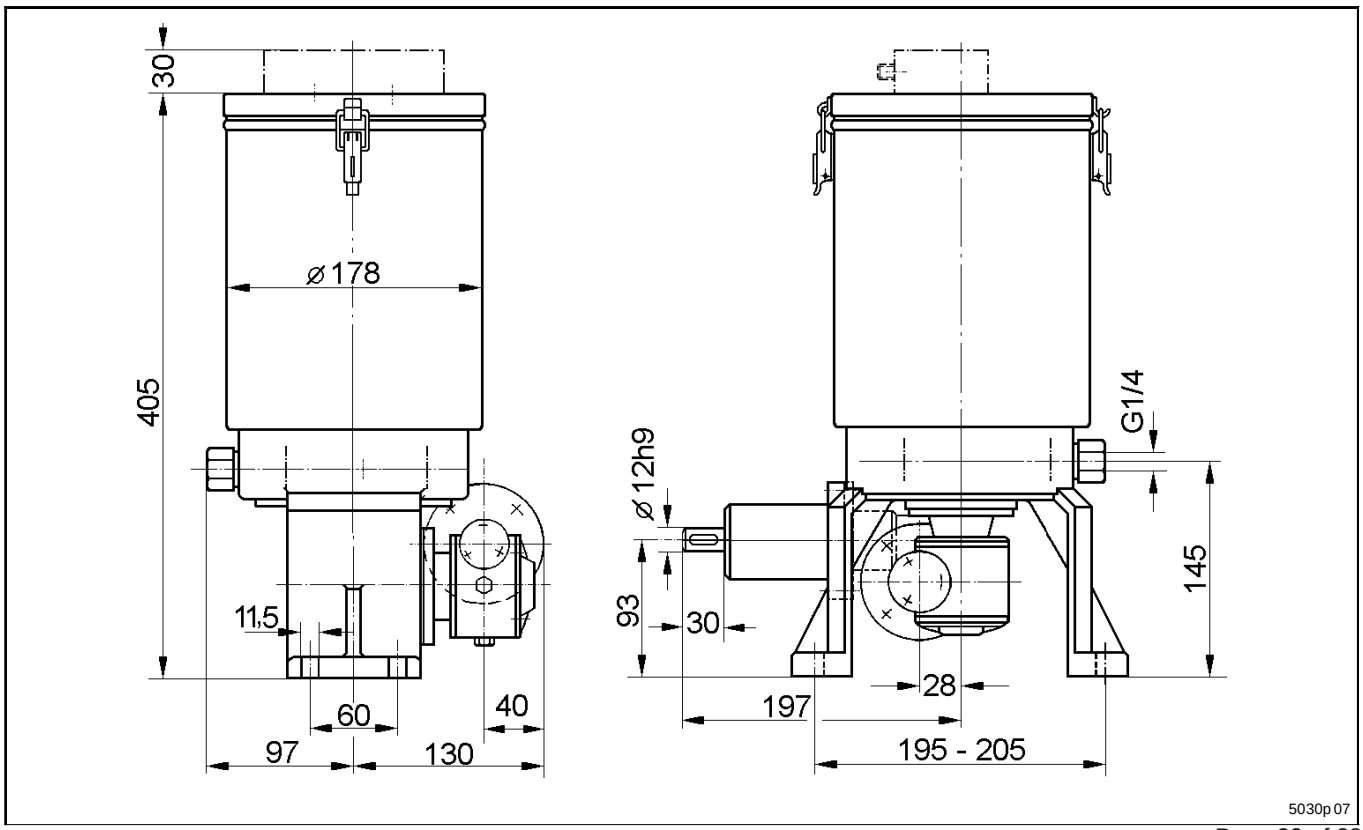
Annex: Dimensions, continuation

Dimensioned drawing for pump 205, two-stage gear, 4/8l plastic reservoir, free shaft end



Dimensioned drawing for pump 205, two-stage gear, 5l sheet metal reservoir, free shaft end



Data Sheet

Motor data sheet

Standard motors for pump model 205

		Multi rage motors		Single range motor	Units
Pump model		**205**		**205**	
Motor type		DIM 56B4		DIM 56B4	
Frequency	**f**	50	60	50	[Hz]
Nominal power	**P**	0.09	0.11	0,09	[kW]
Nominal speet	**n**	1340	1610	1340	[min^{-1}]
Rated troque	**M**	0.64	0.65	0.64	[Nm]
Nominal current	**I_N**	0.78 at 220-240 V	……..	0.62 at 290 V	[A]
		0.45 at 380-415 V	……..	……..	[A]
		……..	0.78 at 243-277 V	……..	[A]
		……..	0.45 at 420-480 V	0.36 at 500 V	[A]

Starting current ratio	**IA / IN**	2.6	2.6	2.9	[A]
Power factor	**cos φ**	0.67	0.67	0.62	
Efficiency	**η**	57	57	52	[%]
Frame size		56		56	
Type of construction		B 14/V18		B 14/V18	
Type of portection	**IP**	55		56	
Insulations class		F		F	
Weight		ca. 2.9		aporox. 2.9	[kg]
Flange		Ø 80		Ø 80	[mm]
Shaft end		Ø 9 x 20		Ø 9 x 20	[mm]

The multi range motors can be connected to the following networks:

- 220/380 V ± 5%, 50Hz
- 230/400 V ± 10%, 50Hz
- 240/415 V ± 5%, 50Hz
- 254/440 V ± 5%, 60Hz
- 265/460 V ± 5%, 60Hz

Other voltages and/or special designs available on request.

The single range motor can be connected to the following networks:
290/500 V ±10%, 50Hz

Motor without gear		part no. 245-13510-2
Motor with gear	70 : 1	part no. 245-13935-1
Motor with gear	280 : 1	part no. 245-13936-1
Motor with gear	700 : 1	part no. 245-13937-1

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Data Sheet, continuation

Data Sheet for Ultrasonic Sensor

Reservoir size:	**Part no.:**
4 L plastic reservoir	664-36939-1
5 L sheet metal reservoir	664-36939-2
8 L plastic reservoir	664-36939-3

Description of operation

This remote sensor is a solid state proximity type for 24 VDC which uses the echo delay-time method for distance sensing. It senses a sound-reflecting object which enters the sound cone from any direction. The objects to be sensed may be solid or liquid.

Installation

Figure I (dimensions in mm)
Any mounting position
Keep a free space around the sound cone of a distance “x“ (x = 60 mm) from reflecting objects (figure II)

Connection

By means of cable socket (figure III) part no. 237-13442-2

Pin		
1	L+	DC 20...30 V
2	S1	Switching output „high-level“(NO)
3	L-	Ground (GND)
4	S2	Switching output „low-level“(NC)

The connections are polarised, short-circuit proof and over-load-proof. In the case of electrical faults it is recommended to use shielded lines.

Operation

Switching range (figure IV)

a	Unusable blind zone
b	Sensing range
c	Overfill range
HV	Hysteresis „High level“
HL	Hysteresis „Low level“

The objects are sensed reliably in the set switching range within an opening angle of the sound cone of 5°. If the reflecting conditions are good, the objects can also be sensed outside of the sound cone. Keep the blind zone “a“ free from objects. These would lead to undefined switching states. Take care that the surface of the transducer is clean!

Display:

Reservoir empty	H2 is lit
Filling level 0K	H2 is not lit
Reservoir full	H1 is lit
Supply voltage	H3 is lit: green
Overfull signal	H3 is lit: red

Technical Data

Ambient temperature		-25...70° C
Sensing range		50...500mm [1)]
[1)] measured from the housing surface		
Sensing distance „High level“	S1	60mm*
Sensing distance „Low level“	S2	depends on the reservoir size
Hysteresis „High level“	HV	20mm
Hysteresis „Low level“	HL	70mm
Switching point fault		0.17% / K
Supply:		
Rated operational voltage	U_E	24 VDC
Operational voltage range	U_B	20...30 VDC
Admissible residual ripple		10%
Open-circuit power consumption		<60 mA
Switching output:		
Rated normal current	IE	<200 mA
Voltage drop	UD	<3 V
Spurious switch-on pulse		suppressed
Switching function	„High level“:	NO contact, switching on plus
	„Low level“:	NC contact, switching on plus

Typical values:

Availability delay	250 ms
Reflection area	10 x 10 mm2
Ultrasonic frequency	400 kHz
Switching frequency	8 Hz
Resolution	1 mm
Type of protection	IP 65

EX protection – relevant data:

Accordance with the 94/9/EC (ATEX) Directive is proved by compliance with the EN 50021, EN 50281-1-1 and EN 60947-5-2 standards.

Appropriate use
Use in explosive areas
Zone 2 following classification II 3G
(explosive gas atmosphere)
Zone 22 following classification II 3D
(explosive dust atmosphere)
Special conditions for safe operation:

- The area around the push-in fitting has to be protected against mechanical damage.
- The push-in fitting has to be secured by means of a locking mechanism (part no. 237-10254-1) to prevent a separation by hand.
- After unpacking protect the push-in fitting against serious concentrations of dust or water.

Installation and start-up

- The devices have been admitted for an ambient temperature of - 20°C to +70°C.
- The devices may be erected, connected and started up by authorized and qualified personnel only.
- Knowledge regarding the assignment of the classification to the respective allowed explosive areas is a prerequisite.
- The push-in fitting must never be connected or disconnected while voltage is applied.

Maintenance and trouble-shooting

- The devices do not require any maintenance.
- The devices may not be modified.
- Repairs on the devices are not possible.
- In the case of a replacement, observe the points described above.

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Data Sheet, continuation

Data sheet for Ultrasonic Sensor, continuation

Installation

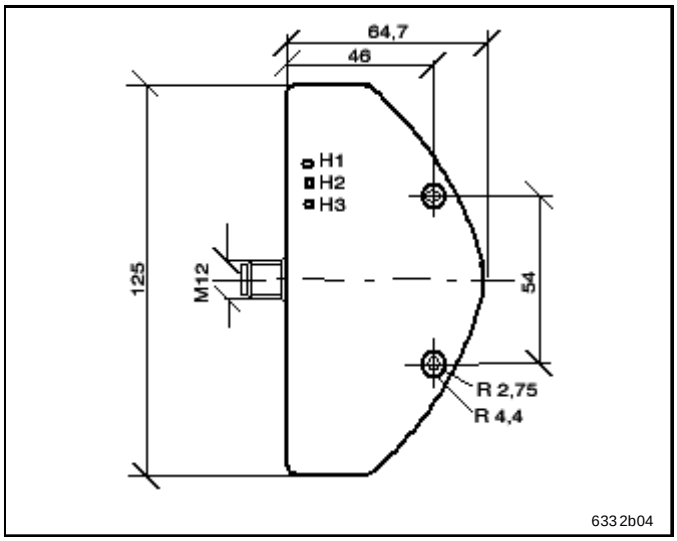


Fig. I Height 30 mm

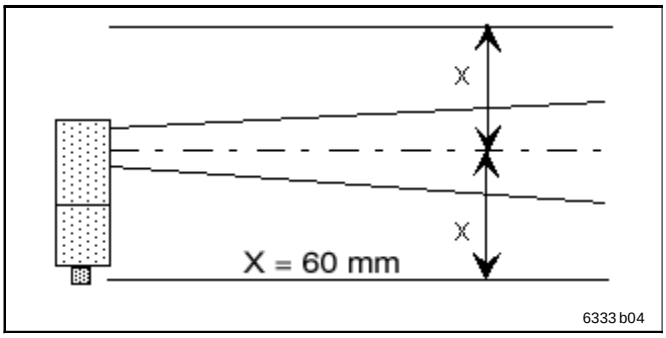


Fig. II

Connection

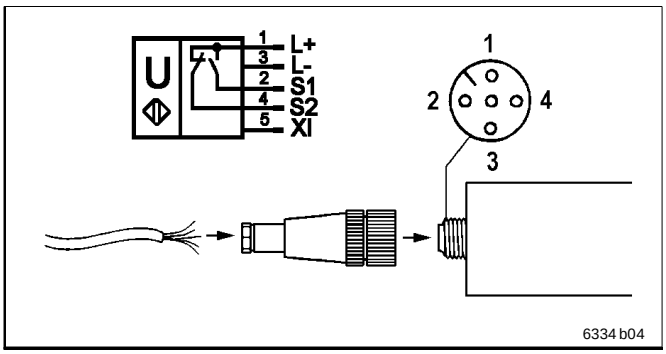
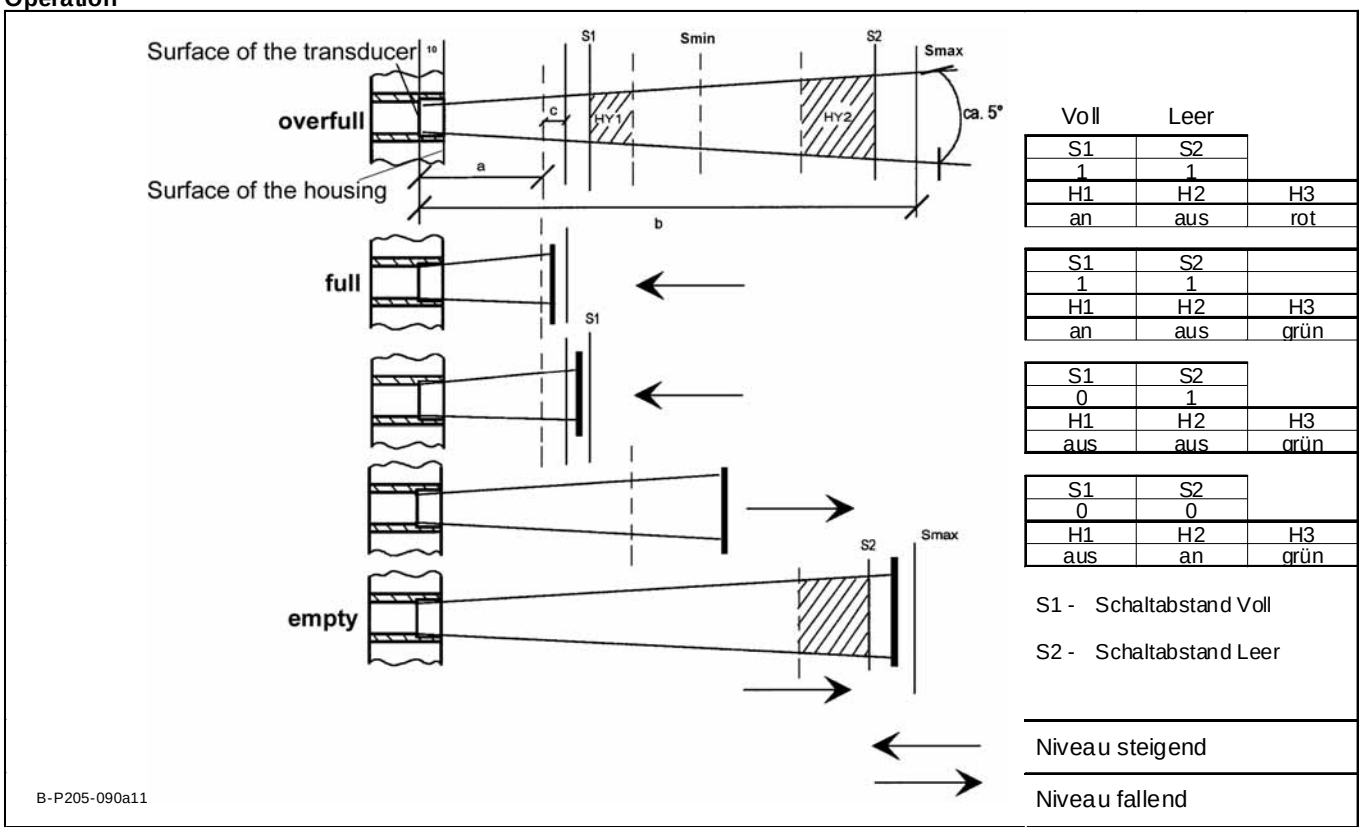


Fig. III

Operation



Voll	Leer	
S1	S2	
1	1	
H1	H2	H3
an	aus	rot

S1	S2	
1	1	
H1	H2	H3
an	aus	grün

S1	S2	
0	1	
H1	H2	H3
aus	aus	grün

S1	S2	
0	0	
H1	H2	H3
aus	an	grün

S1 - Schaltabstand Voll

S2 - Schaltabstand Leer

Niveau steigend

Niveau fallend

Fig. IV

Subject to modifications

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2.1EN-18003-D11

Original Language

D	GB	F	E	I
EG-Konformitätserklärung	**EC Declaration of conformity**	**Déclaration CE de conformité**	**Declaración CE de conformidad**	**Dichiarazione CE di conformità**
Hiermit erklären wir, dass die Bauart von	*Herewith we declare that the model of*	*Par la présente, nous déclarons que le produit ci-dessous*	*Por la presente, declaramos que el modelo suministrado*	*Si dichiara che il prodotto da noi fornito*

Multiline Pump 205

in der von uns gelieferten Ausführung den Bestimmungen allen einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen entspricht, einschließlich deren zum Zeitpunkt der Erklärung geltenden Änderungen. *Angewendete harmonisierte Normen, insbesondere:*	*in the version supplied by us corresponds to the provisions of all pertinent fundamental health and safety requirements, including all modifications of this directive valid at the time of the declaration.* *Applied harmonized standards in particular:*	*dans la version dans laquelle nous le livrons est conforme aux réglementations régissant toutes les exigences fondamentales de sécurité et celles relatives à la santé, y compris les amendements en vigueur au moment de la présente déclaration.* *Normes harmonisées, notamment :*	*en la versión suministrada corresponde a las disposiciónes de los requisitos pertinentes y fundamentales de salud y seguridad en su redacción vigente en el momento de instalación.* *Normas armonizadas utilizadas, particularmente:*	*nella versione da noi fornita è conforme a tutti i requisiti basilari prescritti in termini di sicurezza e di salute, incluse le modifiche vigenti al momento della dichiarazione.* *Norme armonizzate applicate in particolare:*
Maschinenrichtlinie 2006/42/EG	**Machinery Directive 2006/42/EC**	**Directive machines 2006/42/CE**	**Directiva de máquinas 2006/42/CE**	**Direttiva Macchine 2006/42/CE**
DIN EN ISO 12100 – Teil 1 & 2	**– Part 1 & 2**	**– Parties 1 & 2**	**– Parte 1 & 2**	**– Parte 1 e 2**
Sicherheit von Maschinen	**Safety of machinery**	**Sécurité de machines**	**Seguridad de máquinas**	**Sicurezza delle macchine**
Grundbegriffe, allgemeine Gestaltungsleitsätze	*Basic terms, general design guidelines*	*Notions fondamentales, directives générales d'élaboration*	*Términos básicos, axiomas generales de diseño*	*Concetti basilari, principi guida generali*
		DIN EN 908		
Pumpen und Pumpengeräte für Flüssigkeiten	**Pumps and pump units for liquids**	**Pompes et groupes de pompes pour liquides**	**Bombas y equipos de bombas para líquidos**	**Pompe e dispositivi di pompaggio per liquidi**
Allgemeine sicherungstechnische Anforderungen	*General safety requirements*	*Exigences en matière de sécurité technique*	*Prescripciones generales referente a la seguridad*	*Requisiti generali di sicurezza tecnica*
EMV-Richtlinien 2009/19/EG	**EMC directives 2009/19/EC**	**Réglementations CEM 2009/19/CE**	**Directivas CEM 2009/19/CE**	**Direttive EMC 2009/19/CE**
Kraftfahrzeug	*Automotive*	*véhicules automobile*	*vehículo*	*autoveicolo*
2004/108/EG	**2004/108/EC**	**2004/108/CE**	**2004/108/CE**	**2004/108/CE**
		DIN EN 61000-...		
Fachgrundnormen: *- Störaussendung*	*Generic emission standards:* *- Emitted interference*	*Normes fondamentales :* *- Emission de parasites*	*Normas especiales fundam.:* *- Emisión de interferencias*	*Norme specifiche fondam.:* *- Emissione di interferenze*
... Teil 6-4 [a]	**... Part 6-4** [a]	**... Partie 6-4** [a]	**... Parte 6-4** [a]	**... Parte 6-4** [a]
... Teil 6-3 [b]	**... Part 6-3** [b]	**... Partie 6-3** [b]	**... Parte 6-3** [b]	**... Parte 6-3** [b]
- Störfestigkeit	*- Noise immunity*	*- Résistance aux brouillages*	*- Resistencia a interferencias*	*- Resistenza alle interferenze*
... Teil 6-2 [a]	**... Part 6-2** [a]	**... Partie 6-2** [a]	**... Parte 6-2** [a]	**... Parte 6-2** [a]
... Teil 6-1 [b]	**... Part 6-1** [b]	**... Partie 6-1** [b]	**... Parte 6-1** [b]	**... Parte 6-1** [b]
[a] für Industriebereiche	[a] for industrial environment	[a] pour domaine industriel	[a] para áreas industriales	[a] per settore industriale
[b] für Wohnbereich, Geschäfts- und Gewerbebereiche sowie Kleinbetriebe	[b] for residential, commercial and light industry	[b] pour domaines de l'habitation, des magasins et de l'artisanat ainsi que des petites entreprises	[b] para áreas residenciales, comerciales e industriales tanto como pequeñas empresas	[b] per il settore residenziale, commerciale, industriale e per le piccole imprese
Dokumentations-bevollmächtigter	**Documentation agent**	**Responsable du Service de documentation**	**Encargado/a de la documentación**	**Responsabile della documentazione**

Wolfgang Studer • Heinrich-Hertz-Str. 2-8 • 69190 Walldorf

Walldorf, Nov 30, 2009, Dr.-Ing. Z. Paluncic
Director Research & Development

Lincoln GmbH
Heinrich-Hertz-Str. 2-8
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Whatever service is required – selecting a lubricating system, customised system installation or the supply of top quality products – you will always be best advised by the staff of the Lincoln offices, representatives and contract dealers.

Systems dealers

Our systems dealers have the most extensive specialised knowledge in our industry. They plan your installations to suit your specifications with exactly the combination of Lincoln components that you need. They then build the installations at your operation with experienced technicians or work closely with your personnel to ensure that everything goes smoothly.
All dealers have the complete range of pumps, distributers, monitoring devices and accessories in stock and meet our exacting demands with their specialised knowledge about products, installations and service. Whenever and wherever you need our experts, from St. Louis to Singapore, Walldorf and worldwide, Lincoln's first-class systems dealers are at your service.

Find out where the nearest Lincoln distribution and service office to you is located:

Americas:	**Lincoln Industrial**	One Lincoln Way St. Louis, MO 63120-1578 USA	Phone: (+1) 314 679 4200 Fax: (+1) 800 424 5359 Home: www.lincolnindustrial.com
Europe/Africa/Asia:	**Lincoln GmbH**	Heinrich-Hertz Straße 2-8 69190 Walldorf Germany	Phone: (+49) 6227 33-0 Fax: (+49) 6227 33-259 E-Mail: lincoln@lincolnindustrial.de
Asia/Australia/Pacific:	**Lincoln Industrial Corporation**	3 Tampines Central 1 # 04-05 Abacus Plaza Singapore 529540	Phone: (+65) 6588-0188 Fax: (+65) 6588-3438 E-Mail: sales@lincolnindustrial.com.sg

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