

## ***Multiline Pump Model 215***



Subject to change without notice

## TABLE OF CONTENTS

	Page		Page
Safety Instructions .....	3	Putting into operation when fluid lubricants are dispensed .....	10
Appropriate use .....	4	Adjustment of the pump elements .....	10
Description .....	5	Maintenance and repair .....	11
Identification-chart .....	5	Troubleshooting .....	14
General .....	6	Component parts of pump 215 .....	15
Operation .....	6	Annex : Dimensioned drawings .....	20
Operation of the low level control for grease reservoir "...XYBU" .....	7	Data sheets for motors .....	25
Technical data .....	7	Data sheets for ultra-sonic sensor .....	27
Erection and installation .....	8	Declaration of manufacturer .....	29
Erection of the pump .....	8		
Electric Connection .....	8		
Operating Instructions .....	9		
Putting into operation .....	9		
Putting into operation when grease is dispensed .....	9		

## Preface to the Owner`s Manual

### • The Owner`s Manual

- is intended 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.

## 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-V9

- 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

- This symbol warns of an electrical current.

**CAUTION**

- 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

## 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.
- Dispose of leakages of harmful materials so as to jeopardize neither persons nor the environment. The requirements of the law must be satisfied.
- Exclude danger caused by electrical current (for details refer to the applicable specifications of VDE and the local power supply companies).

## Safety Instructions of 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 instructions for shutting down the machine as described in the Operating Instructions.
- Reassemble all safety and protection devices immediately after completion of the cleaning procedure.
  - Decontaminate pumps and pump units delivering harmful materials.
  - 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 "Putting into Operation" 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 the chapter "Appropriate use". The maximum ratings listed in the Technical Data 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 on which the product will be installed meets the requirements of the EU guidelines.

## Appropriate Use

- The **pump model 215 is exclusively designed** for use in **centralized lubrication systems** for dispensing lubricants.
- On request, softeners for PVC and rubber can also be dispensed if they are mentioned on a special registration list.
- The maximum ratings mentioned in the Technical Data, particularly the maximum operating pressure of 350 bar, must not be exceeded.
- The multiline pump model 215 is a central lubrication pump with 1 to 15 pump elements and thus 1 to 15 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, but also as a central lubrication pump in large-sized progressive systems.
- The great diversity of pump models allows the 215 multiline pump to be used for a wide range of applications, e.g.
  - machines in the steel industry (eccentric presses, forging machines)
  - machines in the conveying technology (cranes, drives for conveyors, conveyor worms)
  - machines in the construction industry (stone crushers), rubber and plastic mixers and rolling mills.
- **Any other use is not in accordance with the instructions and will result in the loss of claims for guarantee and liability.**

## Description

### Identification chart

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

Examples of types codes:

**Examples:**

P215 - M 490 - 010 XYBU -5 K6 - 380-420, 440-480,500  
P215 - F 100 - 030 XY N- 12K7  
P215 - P 007 - 010 XYN - 7 K6  
P215 - M 049 - 010 XYBU -8 K6 - 000

**Basic type (housing assembly):**

P215 : 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  
P : Oscillating drive  
490: Gear ratio  $i = 490 : 1$   
100:  $i = 100 : 1$   
049:  $i = 49 : 1$   
007:  $i = 7 : 1$  (only for 'F' and 'P')

**Reservoir assembly :**

004: 4l plastic reservoir  
008: 8l plastic reservoir  
010: 10 l sheet metal reservoir  
030: 30l sheet metal reservoir

XY: Reservoir for grease and oil  
N : Reservoir without level control  
BU: Reservoir with low and high level control (ultrasonic sensor)

*Note: The ultrasonic sensor is equipped with 2 switching points. 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 to 15 : Number of the pump elements  
K 6 oder K 7 : piston diameter (mm)

Extensions for the motor designation, e. g.:

380-420, 440-480: multi-range motor for network rated voltages  
380-420 V/50 Hz and 440-480 V/60 Hz in the case of a star connection  
500 : single-range motor for network rated voltages 500 V, 50 Hz  
000 : pump without motor, however with connecting flange

## General

- This Owner's Manual only refers to the high-pressure multiline pumps of the 215 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  
 Postfach 1263  
 D - 69183 Walldorf  
 Phone 06227/330  
 FAX 06227/33259  
 e-mail:  
 Lincoln@lincolnindustrial.de

## Applications

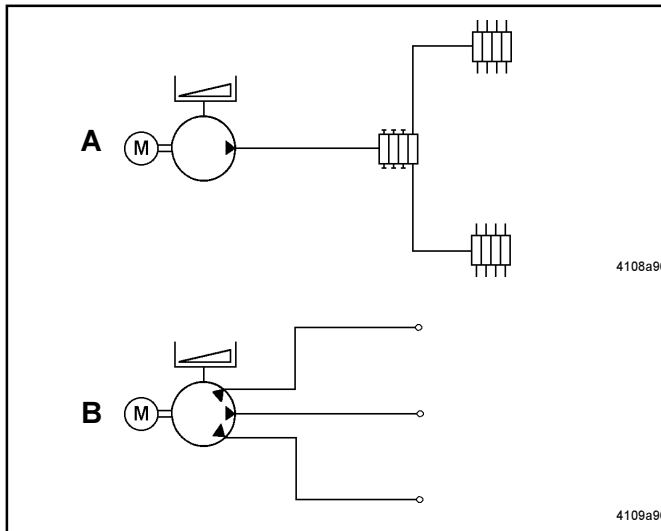


Fig. 1 - Sample Applications of multiline pump 215

- Pump model 215 used as a central lubrication pump for the supply of large-sized progressive systems (Refer to A, Fig. 1).
- Pump model 215 used as a multiline pump for the direct supply of individual lubrication points (Refer to B, Fig. 1)

## Operation

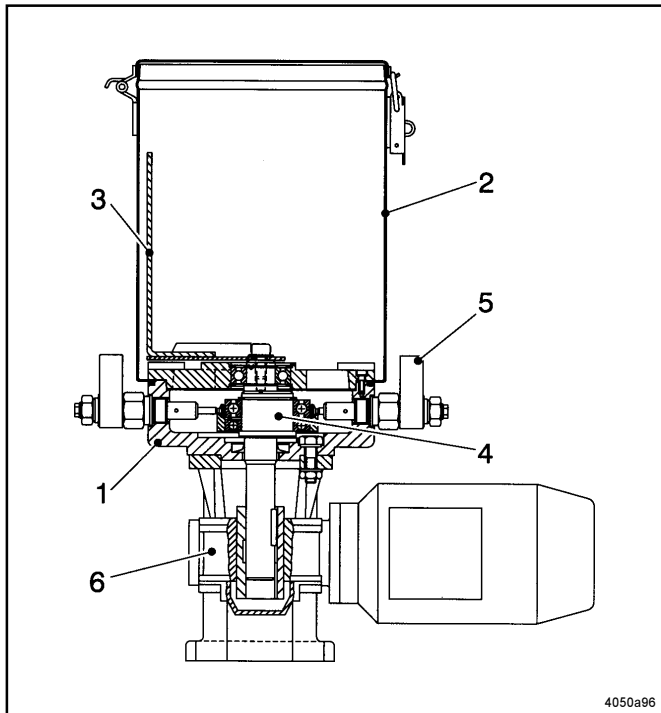


Bild 2: Sectional drawing of pump model 215

- |                                  |                     |
|----------------------------------|---------------------|
| 1 - Housing                      | 4 - Eccentric shaft |
| 2 - Lubricant reservoir          | 5 - Pump element    |
| 3 - Stirring paddle with scraper | 6 - Worm gear motor |

- The pump essentially consists of the components shown in Fig. 2.
- The worm gear (6, Fig. 2) reduces the speed of the drive motor down to the speed of the eccentric shaft.
- The eccentric shaft (4) causes the piston lodged in the pump element (5) to move to and fro, 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.

## Operation of the low level control for grease reservoirs "...XYBU"

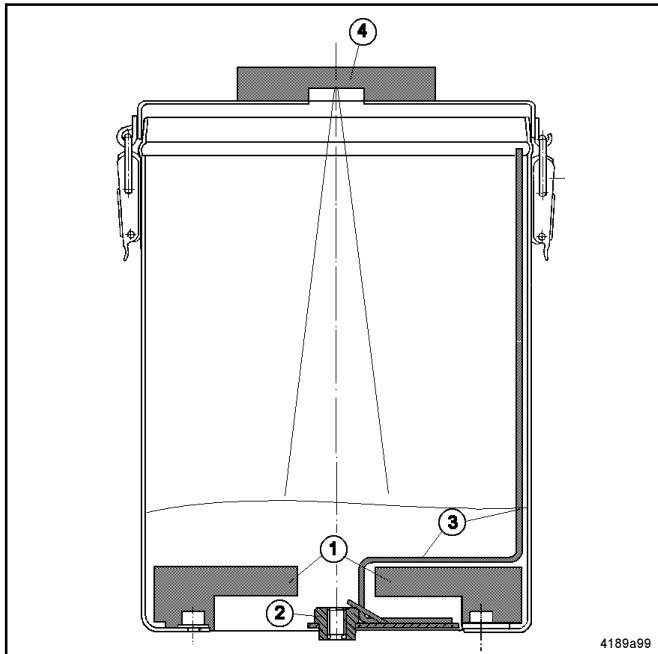


Fig. 3 - Operation of the low level control (grease reservoirs "...XYBU")

- 1 - Fixed paddle  
2 - Stirring paddle  
3 - Scraper  
4 - Ultrasonic sensor

### ATTENTION

Observe the direction of rotation of the pump drive (clockwise)

- The „empty“ signal (as well as the „full“ signal) are obtained via an ultrasonic sensor (4) installed in the middle of the reservoir lid.
- Two fixed paddles (1) are arranged 144° opposite the reservoir bottom. Thus, they form an obstruction to the grease pushed forward by the stirring paddle.
- The stirring paddle (2) turns below these fixed paddles, thus smoothing the grease level and producing a useful echo for the ultrasonic sensor.
- The low level signal takes place, as soon as the grease has dropped to a minimum.

## Technical Data

Number of outlets : .....1 to 15

*Note : If the pump is equipped with the maximum number of pump elements (i. e. 15) a filling connection cannot be fitted.*

Threaded connection.....G1/4" i  
Filling connection (accessory):  
(part-no. 304-17571-1).....G1/4" i  
or  
(part-no. 304-17574-1).....G 1/2"i  
Maximum operating pressure .....350 bar  
(protection required by means of an adequate overpressure valve)

Suitable lubricants :  
Lubricating grease up to NLGI-grade 2  
NLGI -grade 3 on request  
Mineral oils with a viscosity of 20 mm²/s

Lubricant output per piston stroke :  
for pump element with piston - Ø 6 mm:.....0.16 cm³  
for pump element with piston - Ø 7 mm:.....0.23 cm³  
Adjusting range : .....25 % bis 100 %

Reservoir sizes : .....4, 8, 10 oder 30 l  
deliverable on request : .....low level control or high level control

Kinds of drives:

- with worm gearmotors
- with worm gears and flange for three-phase a. c. motor- with worm gear and free shaft end
- with oscillating drive (only for i = 7 : 1)

Ratios:..... 490 : 1, 100 : 1, 49 : 1; 7 : 1

*Note : in the case of 60Hz motors the lubricant output is increased by 20 %*

Rated speed of drive :  
Drives M 490 and M100:.....1370 rpm at 50 Hz  
(see identification chart)  
Drive M049:.....1334 rpm at 50 Hz  
Min. speed of the stirring paddle.....2.5 rpm  
(lower speeds on request, depending on the lubricant and  
temperature)  
Max. speed of the stirring paddle :.....35 rpm  
(for fluid media)

*Note : in the case of lubricating grease of NLGI - grades 1 - 3,  
the speed of the eccentric shaft must not exceed 20 rpm*

Weight of the pump:.....19 kg (with motor drive and 10 l  
reservoir, without lubricant)  
Weight of the pump element : .....0.6 kg  
Sound level : .....≤ 70 dB (A)

## 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 and oil (reservoir "XYBU") see page 28

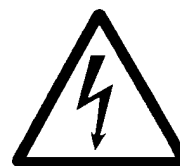
## Erection and Installation

### Erection of pump

#### *Requirements on the installation site :*

- protect 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



- All electric 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

#### *Electric connection of the level controls:*

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

## Owner's Manual

### Commissioning

- Before putting the pump into operation fill the reservoir with lubricant via the reservoir lid or via a vacant pump element outlet.
- For filling via a vacant element, there are two possible filling connectors (see Technical Data). Remove an existing outlet closure plug (item 2, page 16) and screw in the filling connector.

**Important:** Pumps with an **integrated follower plate** (reservoir XLF and XBF) for low level or low and high level control are **not to be filled via the reservoir lid**. Filling must occur by means of a **vacant pump element outlet**.

*Note: In some cases all pump element outlets may be occupied (with pump elements). In this case the above mentioned filling procedure is not possible. For this situation a filling hole, through the reservoir, between the follower plate and the housing (item 1, page 16) must be drilled and fitted with an appropriate connector. Take care that no particles enter the reservoir during the drilling.*

#### CAUTION

- 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.
- Before the pump is put into operation for the first time take care that all pump elements are adjusted on the zero output.



- Do not touch internal parts of the reservoir while the pump is in operation or connected to electrical source
- 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 device, tube lines, tube fittings, hoses) must be designed for maximum system pressure.
- Protect each pump element against overpressure by means of an adequate safety valve (max. opening pressure : 350 bar)

### Putting the pump into operation when grease is dispensed

#### *Pumps with low speed of the stirring < 10 rotations*

- In the case of pumps with a slow drive (speed of the stirring paddle up to approx. 10 rpm) and in the case of all pumps which are operated by an oscillating drive fill so much oil for the first operation that the pump elements are entirely covered by oil. Then fill the grease which will be dispensed by the pump.
- \* Switch the pump on.
- \* Adjust the pump elements to the maximum output and wait until the grease emerges from all outlet ports.
- \* Adjust the required lubricant output at the 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 each pump element can be altered at any time, even while the pump is in operation.

#### *Pumps with speed of the stirring paddle > 10 rpm*

- \* Unscrew any closure plug from the housing.
- \* Switch the pump on.
- The pump elements remain adjusted on the zero output until the grease emerges from the threaded hole in the housing. The time required for it varies between five minutes, in the case of pumps running very quickly, and five hours, in the case of pumps which operate extremely slowly. The ambient temperature and the consistency of the grease have a great influence on this time.
- \* Adjust the pump elements to the maximum output and wait until the grease emerges from all the outlet ports.
- \* Adjust the required lubricant output at 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 each pump element can be altered at any time, even while the pump is in operation (refer to "Adjustment of the pump elements").

### Putting the pump into operation when fluid lubricants are dispensed

- \* Switch the pump on with the pump elements adjusted to the zero output.
- \* After 5 minutes of pump operation adjust all the pump elements to the maximum output. As soon as the lubricant emerges from the outlet ports switch the pump off and connect the lubricant feed lines.
- \* Adjust the pump elements to the required lubricant output.
- The system is ready for operation.
- The lubricant output of each pump element can be altered at any time, even while the pump is in operation (refer to "Adjustment of the pump elements").

### Adjustment of the pump elements

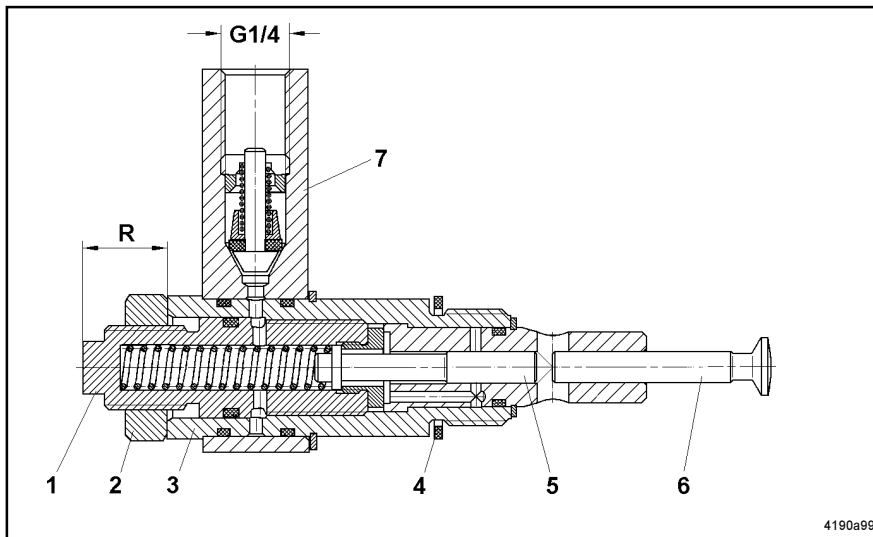


Fig. 4 - Sectional drawing of the pump element

- |                             |                     |
|-----------------------------|---------------------|
| 1 - Adjusting spindle SW 10 | 4 - Gasket          |
| 2 - Counter nut (SW22)      | 5 - Control piston  |
| 3 - Pump body               | 6 - Delivery piston |

7 - Outlet port with check valve

- \* Loosen counter nut 2 (Fig. 4) and, using a second key, simultaneously keep threaded sleeve 3 from turning.
- \* Turn adjusting spindle 1 with a wrench SW10:  
 clockwise = lower output  
 counter-clockwise = greater output

- The "R" dimension shown in Fig. 4 indicates the approximate lubricant output range:

R = 22.5 mm =	maximum output
R = 21.0 mm =	approx. $\frac{3}{4}$ output
R = 19.5 mm =	approx. $\frac{1}{2}$ output
R = 18.0 mm =	approx. $\frac{1}{4}$ output

- \* After the adjustment of the output, tighten counter nut 2 (Fig. 3). **Tightening torque: max. 12 Nm.**

## Maintenance and Repair



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.
- Loosen the pressure connection fittings on the pump element 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 subject to a natural wear which depends on the operating time and operating pressure and must therefore be replaced.

### 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.

**Attention:** The delivery pistons cannot be changed!  
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 clearance of only few micrometers.

## Assembly

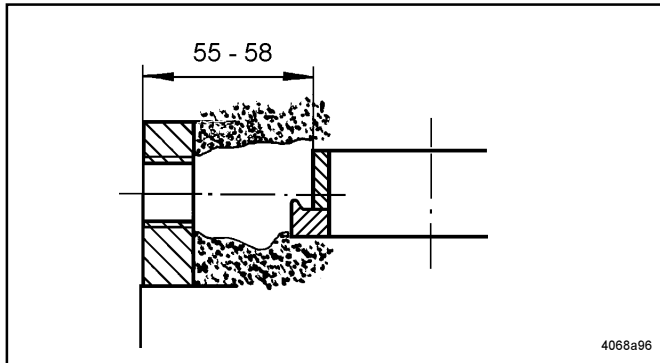


Fig. 5 - Digging a hole in the grease

- \* Unscrew closure plug
- \* Once the pump is filled with grease, dig a whole in the grease with a suitable object up to the eccentric ring (Fig.4).
- \* Check whether the pump element is equipped with a gasket (see item. 4, Fig. 4).

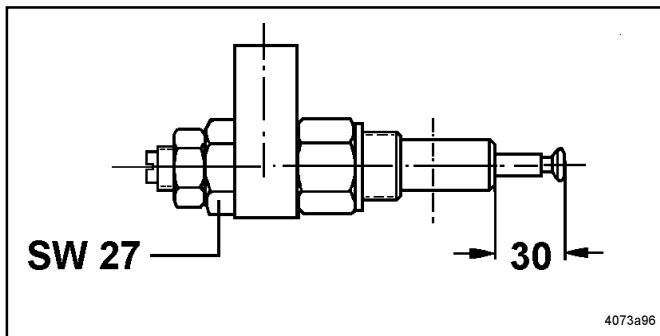


Fig. 6 - Removing the piston for the assembly of the pump elements

- Pull out the piston of the pump cylinder by about 30 mm.

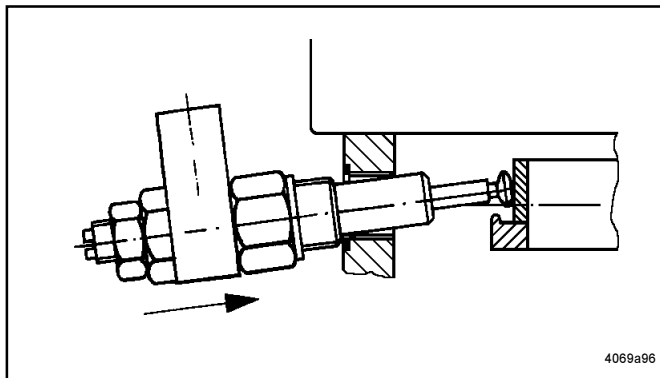


Fig. 7 - Inserting the pump element

- \* Insert the pump element (Fig. 7) in such a way that is slightly directed upward in order to prevent the delivery piston from falling down because it is not fixed within the pump cylinder.

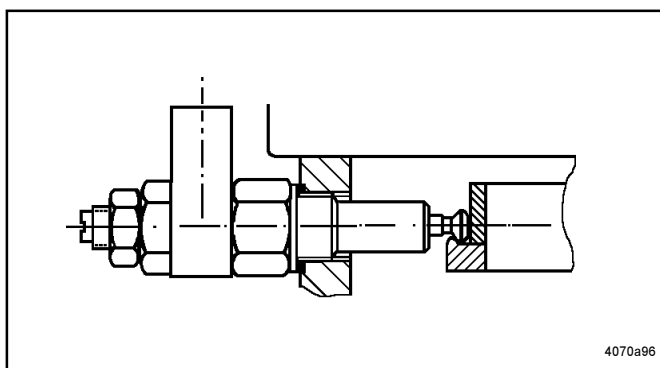


Fig. 8 - Pump element installed correctly

- \* Put the pump element in horizontal position and at the same time hang the head of the delivery position into the groove of the eccentric ring.

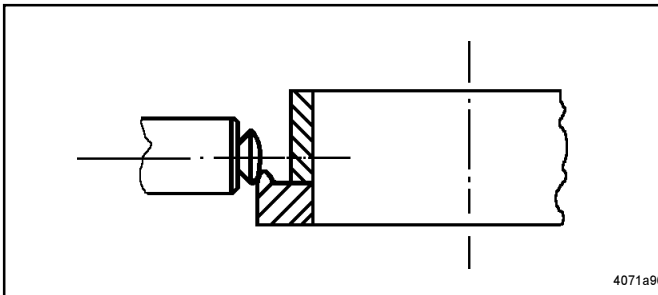


Fig. 9 - Incorrect assembly, lubricant output impossible

**Attention :** If the pump element is not installed correctly the lubricant cannot be dispensed and the pump may be damaged.

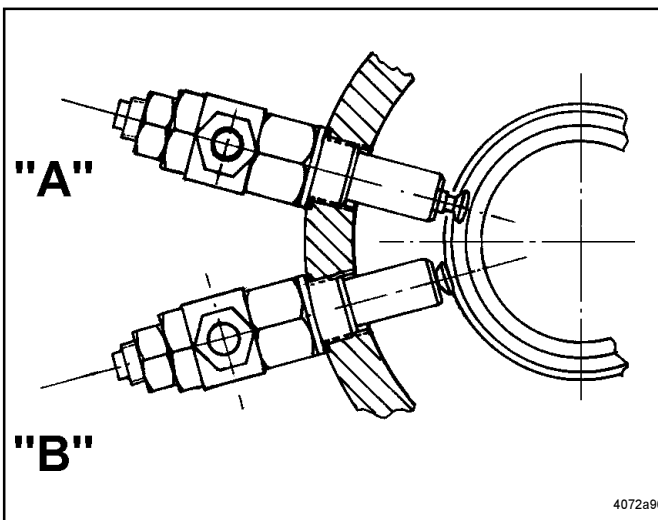


Fig. 8 - Correct and incorrect assembly

A - Correct assembly

B - Incorrect assembly

- First screw the pump element in by hand and then tighten it at the screwed plug 3 (Fig. 4) using a fork wrench SW27. Tightening torque: 30 - 35 Nm
- Pump elements which are installed must be set on the zero output adjusted in accordance with the instructions given in the chapter "Adjustment of the pump elements".
- If fluid lubricants are dispensed, fill them into the reservoir.
- Put the pump into operation as described on page 10.

## Dissassembly of pump elements

- \* Unscrew the tube line from the outlet port of the pump element.
- \* Apply the fork wrench at the screwed plug (3, Fig. 4) of the pump element and carefully unscrew the pump element.
- \* When disassembling or assembling (see Fig. 7) the pump element, direct it upwards in order to raise the delivery piston out of the groove of the eccentric ring.
- \* Remove the pump element from the housing by means of the delivery piston.
- \* Take care that the delivery piston does not stick in the grease.
- \* Screw in a closure plug or a new pump element.

## Maintenance of the ultrasonic sensor (reservoir "...XYBU")

- Take care that the surface of the sensor is clean.

## Troubleshooting

• Fault : The pump does not dispense the lubricant	
• Cause :	• Remedy :
• Reservoir empty	• Fill up the reservoir with lubricant and vent the pump, if necessary. <i>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.</i>
• Air bubbles in the lubricant	• Loosen the screwed 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.
• Pump piston worn	• Replace pump element.

• Fault : Blockage in the progressive system connected downstream of the pump	
• Cause:	• Remedy:
• Bearing, lines or progressive metering device clogged The fault can be identified as follows: a) grease leaking from the safety 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.

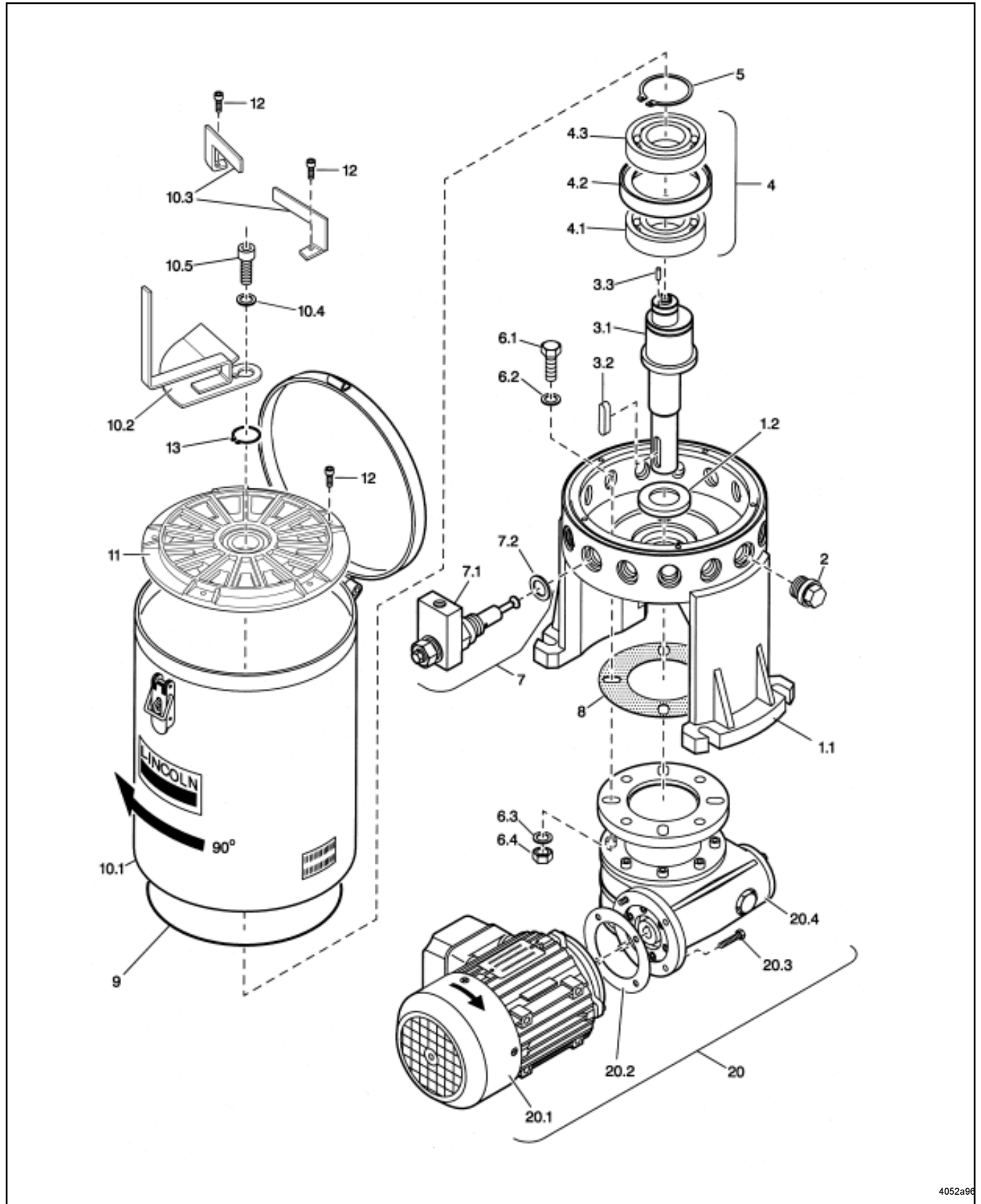
**IMPORTANT :** All the repairs which are beyond the knowledge of the user's personnel must be carried out by LINCOLN experts. For this, return the defective pump to the repair department of the Walldorf works or call for a specialist who will carry out the repair on site.

### Service address:

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

## Component Parts of Pumps Model 215

Component parts of pumps model P215 - M100 / M049 - 10XN / 10YN / 30XN / 30YN - ....



Subject to change without notice

Fig. 11 - Component parts of the pump model 215

Item	Designation	Qty.	Part- no.	Item	Designation	Qty.	Part-no.
1.1	Housing	1	313-19635-1	10.5	Hexagon socket head screw M 10 x 25C	1	201-12027-6
1.2	Rotary shaft seal 30 x 50 x 7	1	220-12231-4	11	Intermediate bottom assy. for plastic reservoir	1	460-24567-1
2	Closure plug M 22 x 1.5		303-19285-1		metal sheet reservoir	1	460-24568-1
3.1	Eccentric shaft	1	460-24302-1				
3.2	Feather key A 8 x 7 x 32	1	214-12176-3				
3.3	Dowel pin D 4 x 10	1	206-12498-3				
4.1	Grooved ball bearing D45/75x10	1	250-14064-3	12	Hexagon socket head screw M 5 x 20C	5	201-12016-8
4.2	Catch ring	1	460-24301-1	13	Retaining ring A25 x 1.2	1	211-12164-6
4.3	Grooved ball bearing D45/75x16	1	250-14064-4				
4	Catch ring assy.	1	560-36903-3				
5	Retaining ring A45 x 1.75	1	211-12164-9	20	Drive assy. with multirange motors 380 - 420/440-480 V		
6.1	Hexagon head screw M 10x35C	4	200-12008-6		Gear 100:1, 0.18/0.21 kW	1	245-13915-1
6.2	Sealing ring M 10	4	220-13653-7		Gear 49:1, 0.25/0.29 kW	1	245-13916-1
6.3	Washer A 10.5C	4	209-13077-2		Drive assy with motor 290/500 V		
6.4	Hexagon nut M 10C	4	207-12136-1		Gear 100:1, 0.18 kW	1	245-13921-1
7	Pump element with piston Dia. 6 mm	-	600-25046-3		Gear 49:1, 0.25 kW	1	245-13922-1
	Pump element with piston Dia. 7 mm	-	600-25047-3	20.1	Multi range motors 380-420/440-480 V		
7.1	Outlet port with check valve	-	560-32115-1		Three-phase a. c. flanged motor 0.18/0.21 kW for gear 100 : 1	1	245-13913-1
7.2	Sealing ring ø 22.2 x ø 27 x 1,5	-	306-17813-1		Three-phase a. c. flanged motor 0.25/0.29 kW for gear 49 : 1	1	245-13914-1
8	Sealing ring ø 70 x 126 x 0.5	1	306-19640-1		Motors 290/500 V		
9	O-ring 186 x 3.5	1	219-12226-8		Three-phase a. c. flanged motor 0.18 kW for gear 100 : 1	1	245-13919-1
10	10l - reservoir with cover	1	560-32012-1		Three-phase a. c. flanged motor 0.25 kW for gear 49 : 1	1	245-13920-1
-	30l - reservoir with cover	1	560-32010-1	20.2	Gasket 60 x 90 x 0,5	1	306-19415-1
-	4l - reservoir	1	444-24673-1	20.3	Hexagon head screw M 5 x 16C	4	200-13017-9
-	8l - reservoir	1	444-24674-1	20.4	Gear i = 100 : 1	1	246-14145-1
-	Cover for 4/8l - reservoir	1	444-24234-1		Gear i = 49 : 1	1	246-14145-2
10.2	Stirring paddle for 4/8/10l - reservoir	1	560-32128-1				
	Stirring paddle for 30 l reservoir	1	560-32129-1				
10.3	Fixed paddle	1	460-24566-1				
10.4	Washer A 10.5	1	209-13077-2				
	<b>Set of packings</b> consisting of item: 1.2, 6.2, 8, 9, 20.2	1	560-36919-2				
	<b>Repair kit for pump element</b> consisting of: 1 outlet port with check valve 2 O-ring 22 x 2 1 O-ring 15.3 x 24 1 gasket 22.7 x 27 x 1.5	1	560-36903-4				

## Component Parts for Drive "Free Shaft End"

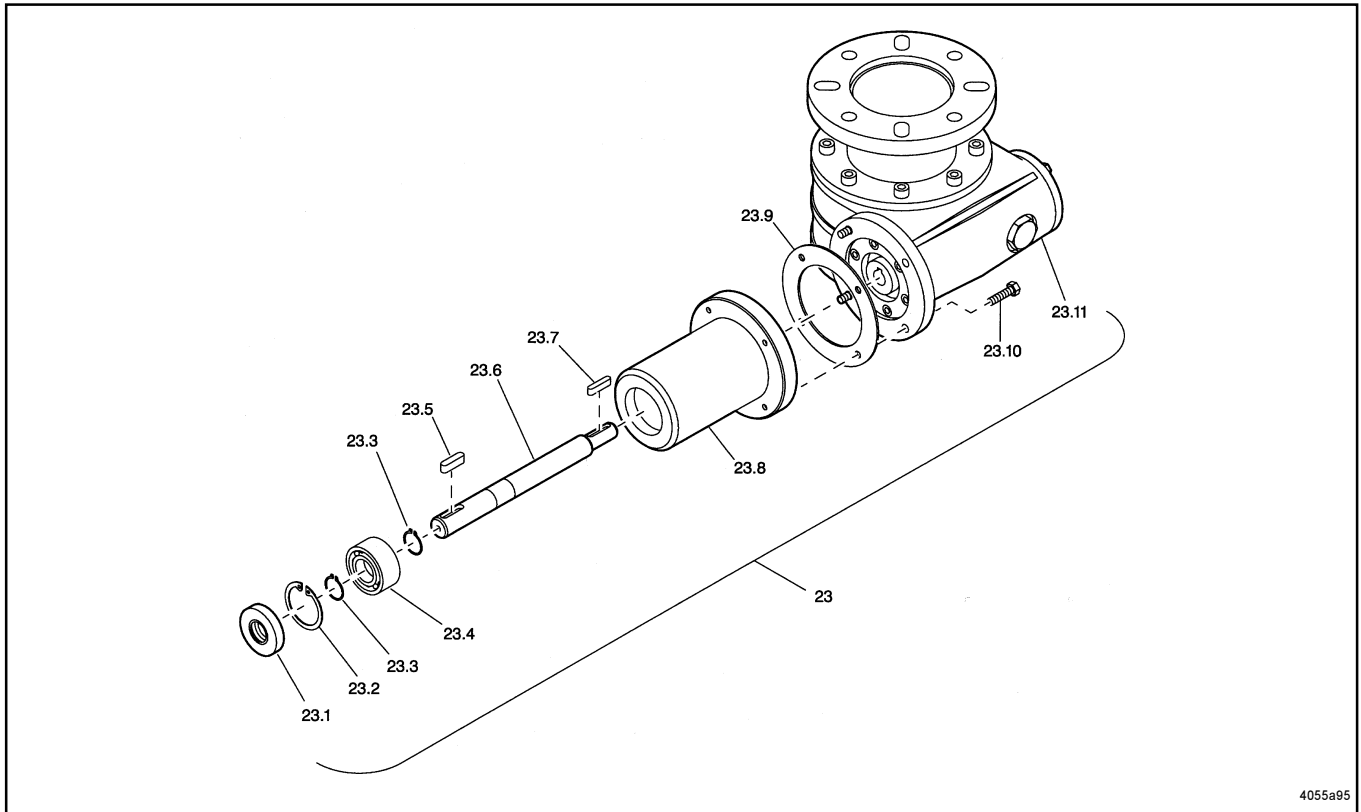


Fig. 13 - Component parts for drive "free shaft end"

Item	Designation	Qty	Part-no.
23	Drive for free shaft end with		
	Gear 7 : 1	1	660-28645-1
	Gear 49 : 1	1	660-28573-1
	Gear 100 : 1	1	660-28574-1
	Gear 490 : 1	1	660-28572-1
23.1	Radial seal $\varnothing 15 \times \varnothing 35 \times 7$	1	220-13087-2
23.2	Retaining ring J 35 x 1,5	1	211-12166-6
23.3	Retaining ring A 15 x 1,5	2	211-12164-4
23.4	Angular ball bearing D15/35 x 15.9	1	250-14003-1
23.5	Feather key A 5 x 5 x 20	1	214-12174-2
23.6	Drive shaft	1	460-24320-1
23.7	Feather key A 4 x 4 x 25	1	214-12173-5
23.8	Bearing flange	1	460-24319-1
23.9	Sealing ring 60 x 90 x 0.5	1	306-19415-1
23.10	Hexagon head screw M 5 x 16C	4	200-13017-9
23.11	Reducing gear 7 : 1	1	246-14145-4
	Reducing gear 49 : 1	1	246-14145-2
	Reducing gear 100:1	1	246-14145-1
	Reducing gear 490:1	1	246-14146-1
	<b>Set of packings</b>	1	560-36919-1
	consisting of item:		
	1.2, 6.2, 8, 9 from fig. 10		
	and 23.1, 23.9 from fig. 13		

Subject to change without notice

Component Parts for Oscillating Drive

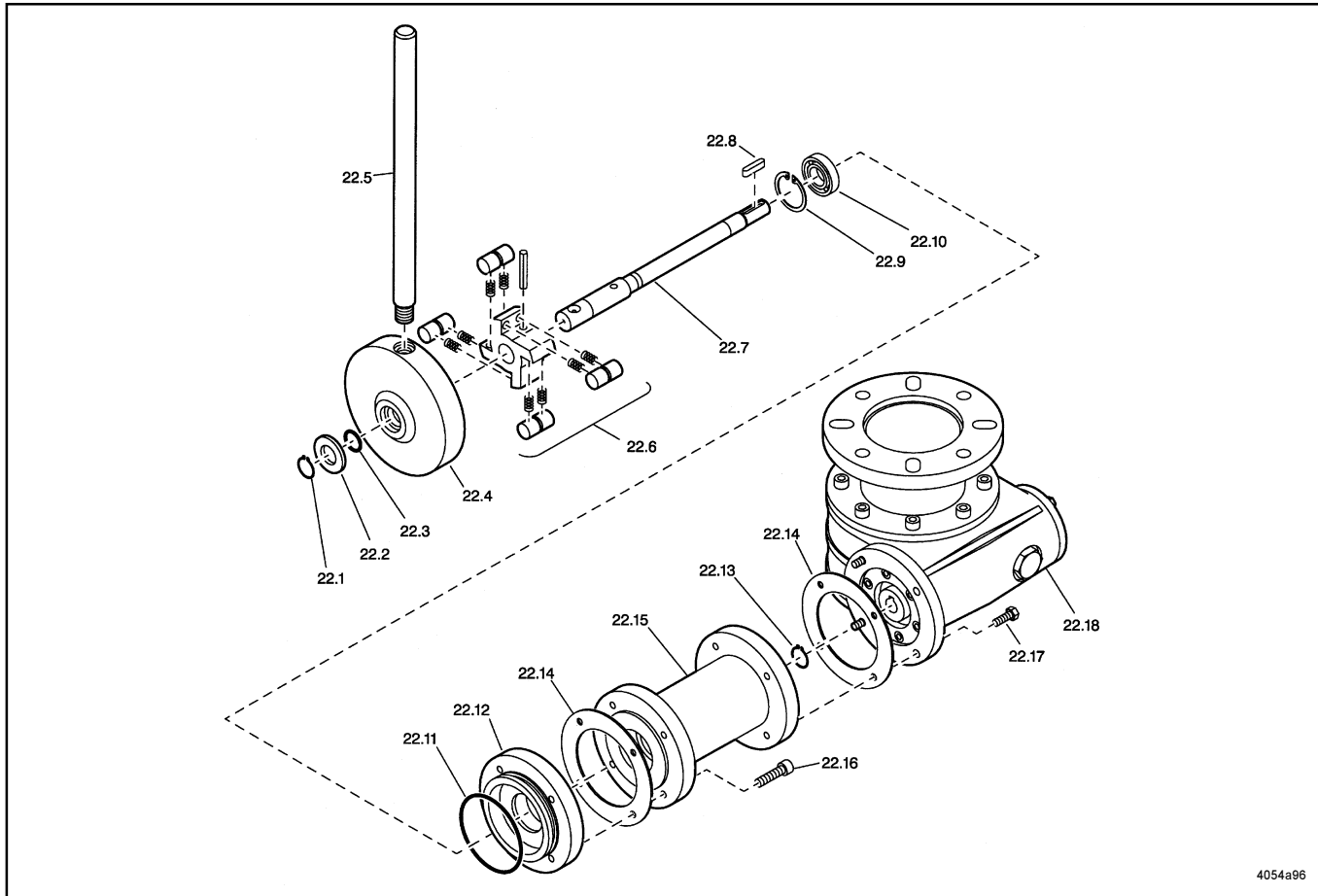


Fig. 14 - Component parts for oscillating drive

Item	Designation	Qty	Part-no.
22	Oscillating drive assy. 7 : 1	1	660-28575-1
22.1	Retaining ring A15 x 1.5	1	211-12164-4
22.2	Washer 15.1 x 28 x 3	1	318-19101-1
22.3	O-ring ø 15 x 3	1	219-13045-6
22.4	Ratchet gear housing	1	400-22817-2
22.5	Lever rod	1	402-20129-1
22.6	Ratchet wheel assy.	1	560-36903-2
22.7	Shaft	1	460-24321-1
22.8	Not applicable (part of gear)	1	214-12173-5
22.9	Retaining ring DIN 472 I 30	1	211-12165-2
22.10	Grooved ball bearing D12/30 x 8	1	250-14000-1
22.11	O-ring ø 59 x 3	1	219-13045-5
22.12	Brake ring	1	400-22819-2
22.13	Retaining ring A 12 x 1	1	211-12164-2
22.14	Sealing ring	2	306-19415-1
22.15	Bearing flange	1	460-24322-1
22.16	Hexagon head screw M 6 x 20C	4	200-13022-7
22.17	Hexagon head screw M 5 x 16C	4	200-13017-9
22.18	Gear 7:1	1	246-14145-4
	<b>Set of packings</b>	1	560-36919-3
	consisting of item:		
	1.2, 6.2, 8, 9 from fig. 10		
	and 22.11, 22.14 and 22.3 from fig. 14		

Component Parts for Double Drive M 490:1

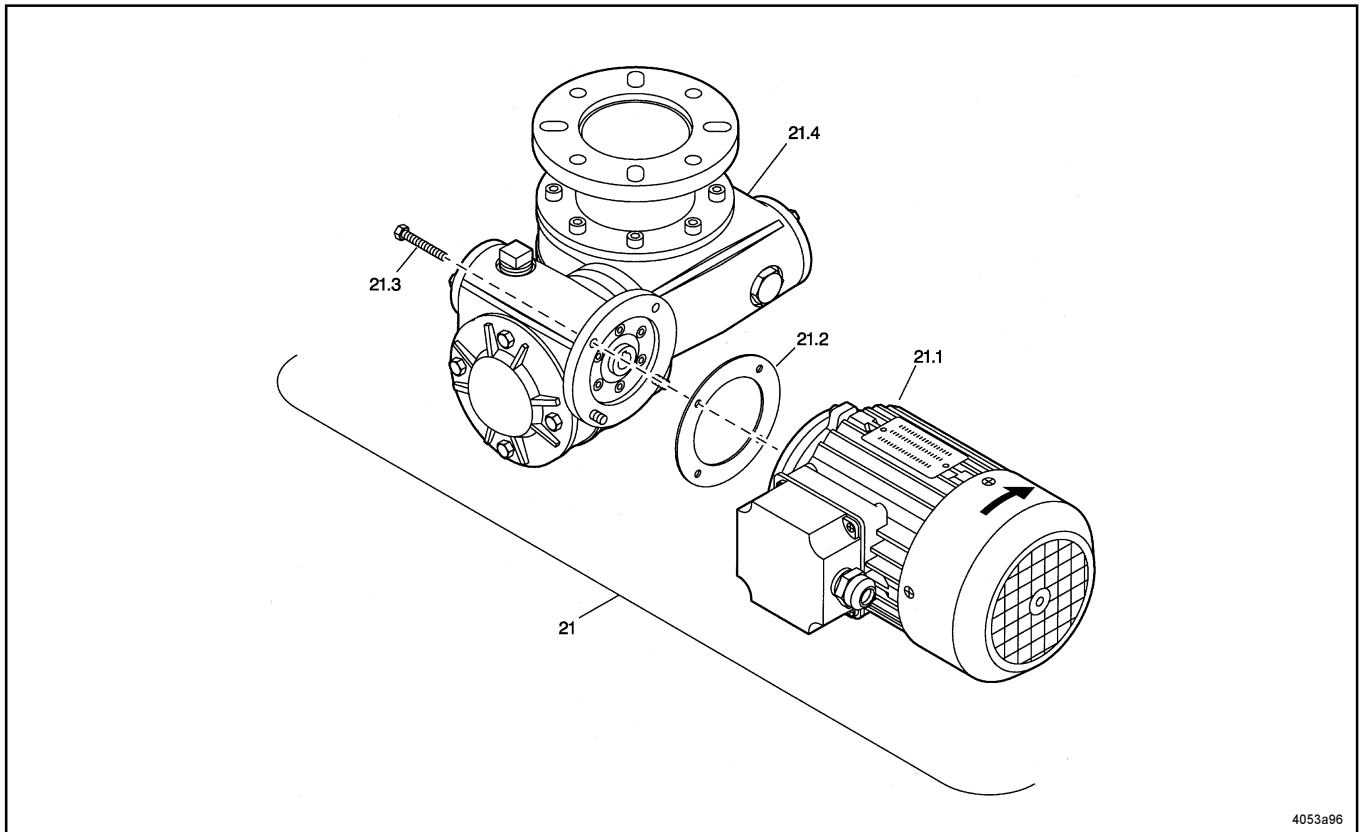


Fig. 15 - Component parts of double drive M 490 : 1

Item	Designation	Qty.	Part-no.
21	Drive,assy, Gear 490 : 1, motor 0.18/0.21 kW 380-420/440-480 V	1	245-13918-1
	Gear 490 : 1, motor 0.18/0.21 kW 290/500 V	1	245-13923-1
21.1	Three-phase a. c. motor 380-420/440-480V 0.18/0.21 KW, 1500 rpm	1	245-13913-1
	Three-phase a. c. motor 290/500 V 0.18 KW, 1500 rpm	1	245-13919-1
21.2	Sealing ring 60 x 90 x 0.5	1	306-19415-1
21.3	Hexagon head screw M 5 x16 C	4	200-13017-9
21.4	Gear i = 490 : 1	1	246-14146-1
	<b>Set of packings</b> consisting of item: 1.2, 6.2, 8, 9, 20.2 from fig. 10	1	560-36919-2

## Annex : Dimensioned Drawings

Pump: P215 - M100 / M049 - 10XN / 10YN / 30XN / 30YN - ....

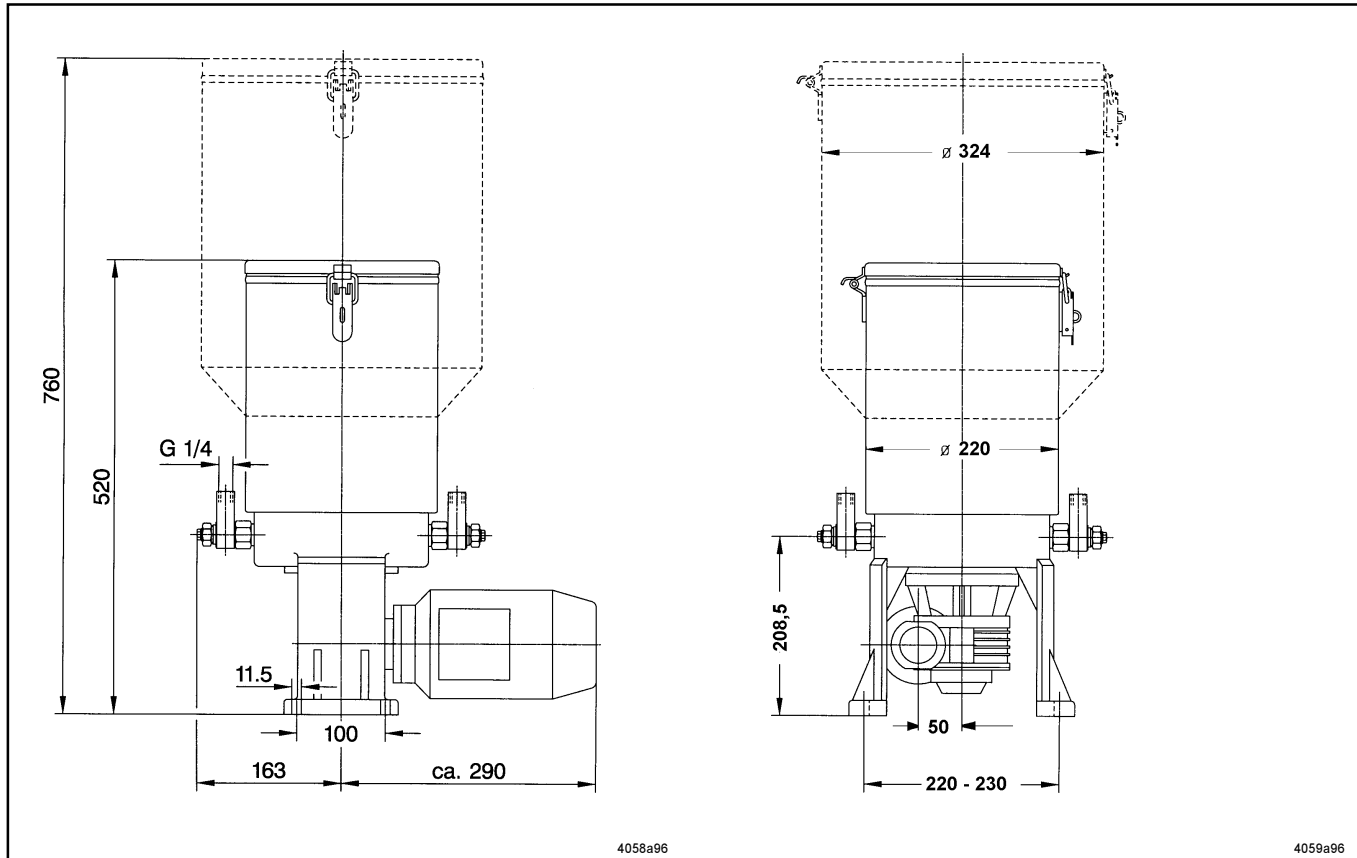


Fig. 16 - Dimensioned drawing for pump P215 - M100 / M049 - 10XN / 10YN / 30XN / 30YN - ....

**Pump with plastic reservoir : P215 - M100 / M049 - 4XN / 8XN**

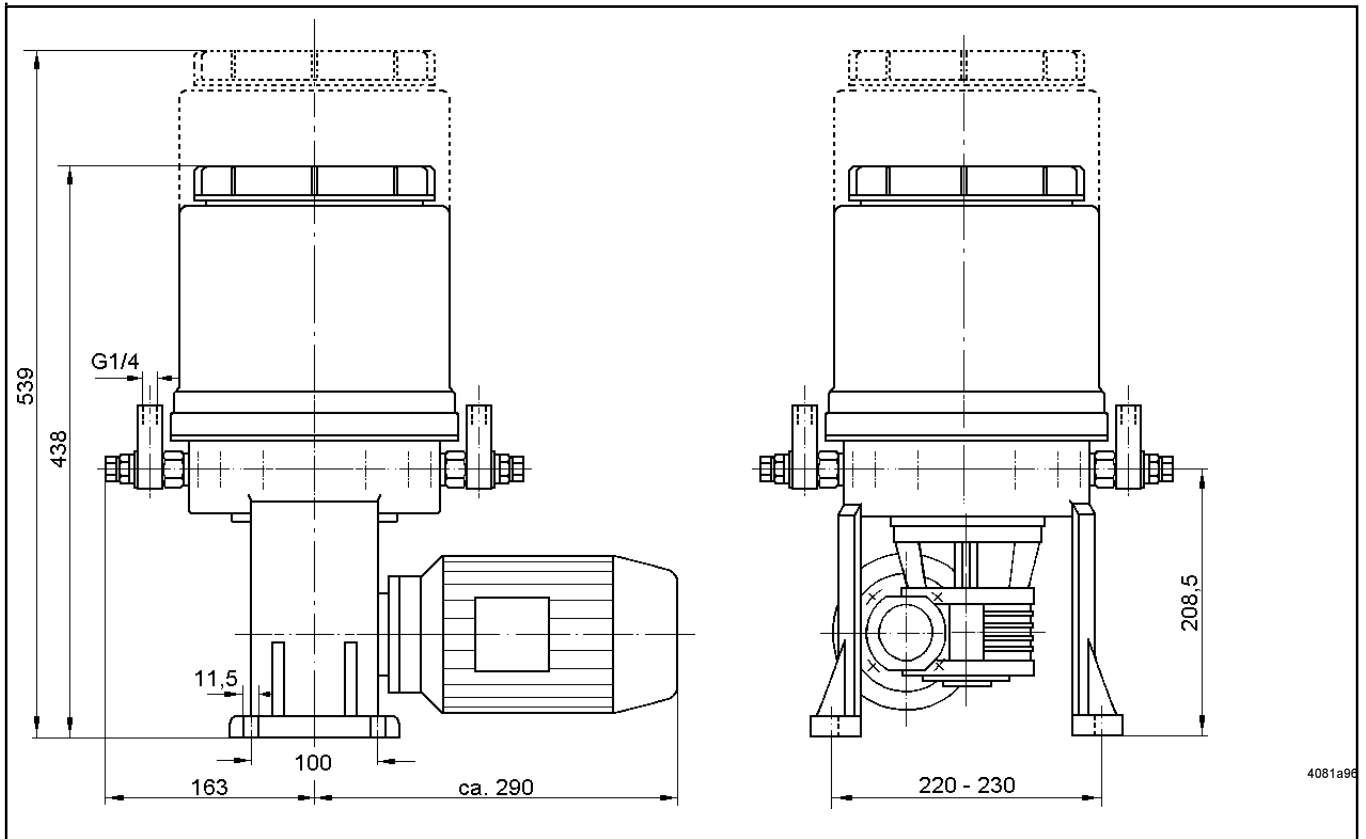


Fig. 17 - Dimensioned drawing with plastic reservoir for pump P215 - M100 / M049 - 4XN / 8XN .

**Pump P215 - F100 / F049 - 10XN / 10YN / 30XN / 30YN - ....  
with free Shaft**

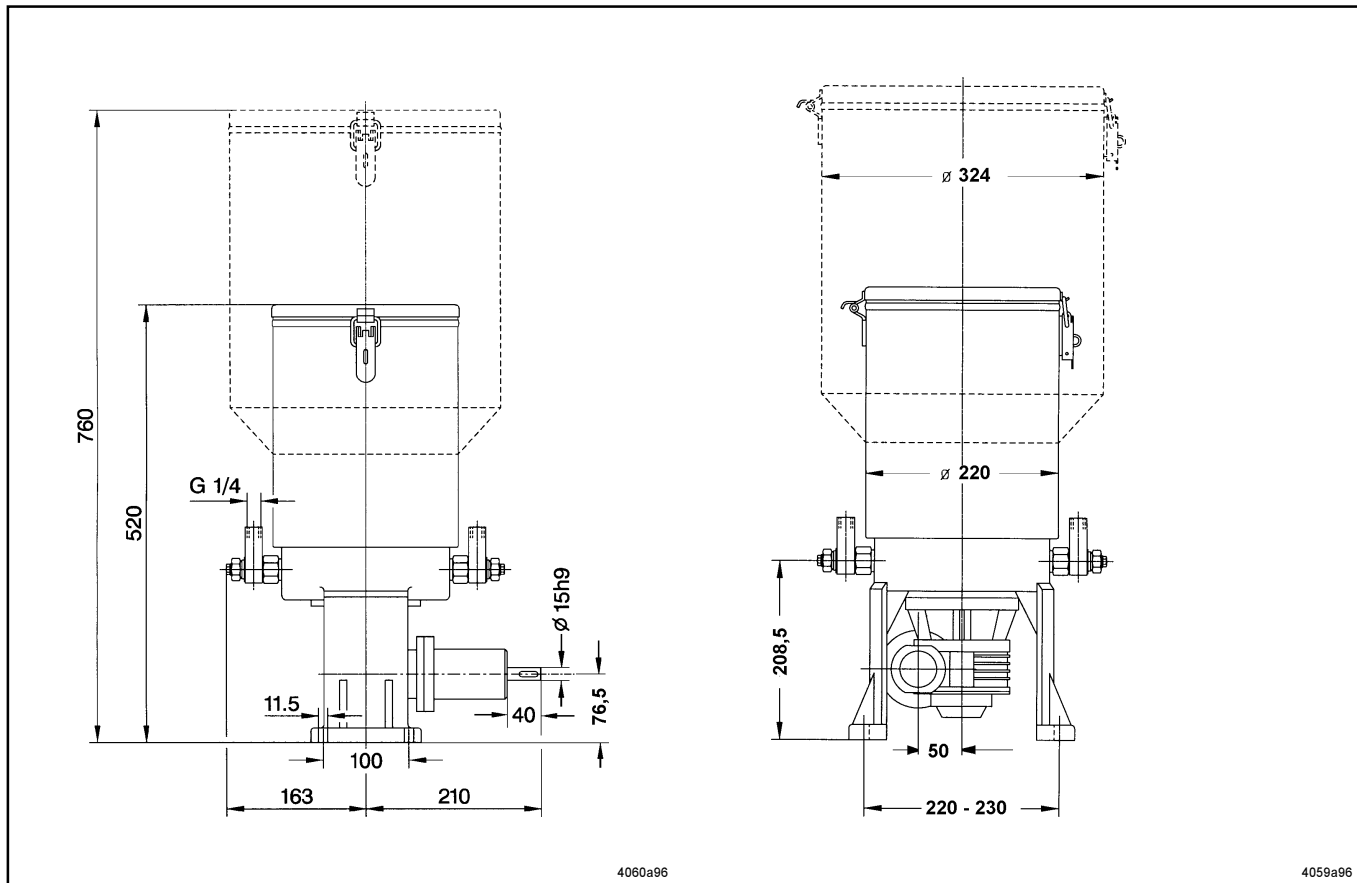


Fig. 18 - Dimensioned drawing for pump P215 - F100 / F049 - 10XN / 10YN / 30XN / 30YN - ....  
with free shaft end

**Pump P215 -P007- 10XN / 10YN / 30XN / 30YN - ....  
with Oscillating Drive**

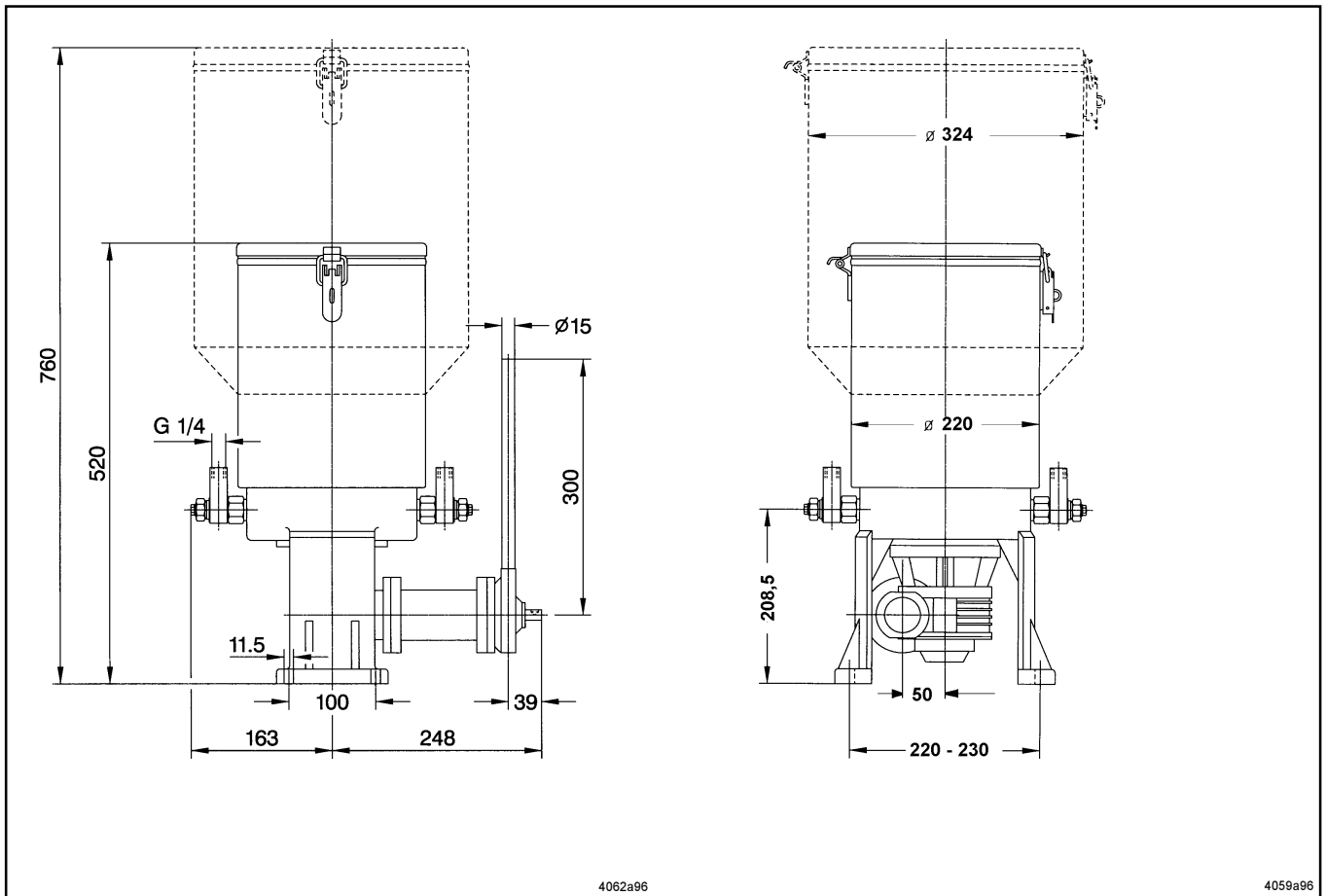


Fig. 19 - Dimensioned drawing for pump P215 -P007- 10XN / 10YN / 30XN / 30YN - ....  
with oscillating drive

**Pump P215 - M 490- 10XN / 10YN / 30XN / 30YN - ....  
with Double Gear and Motor**

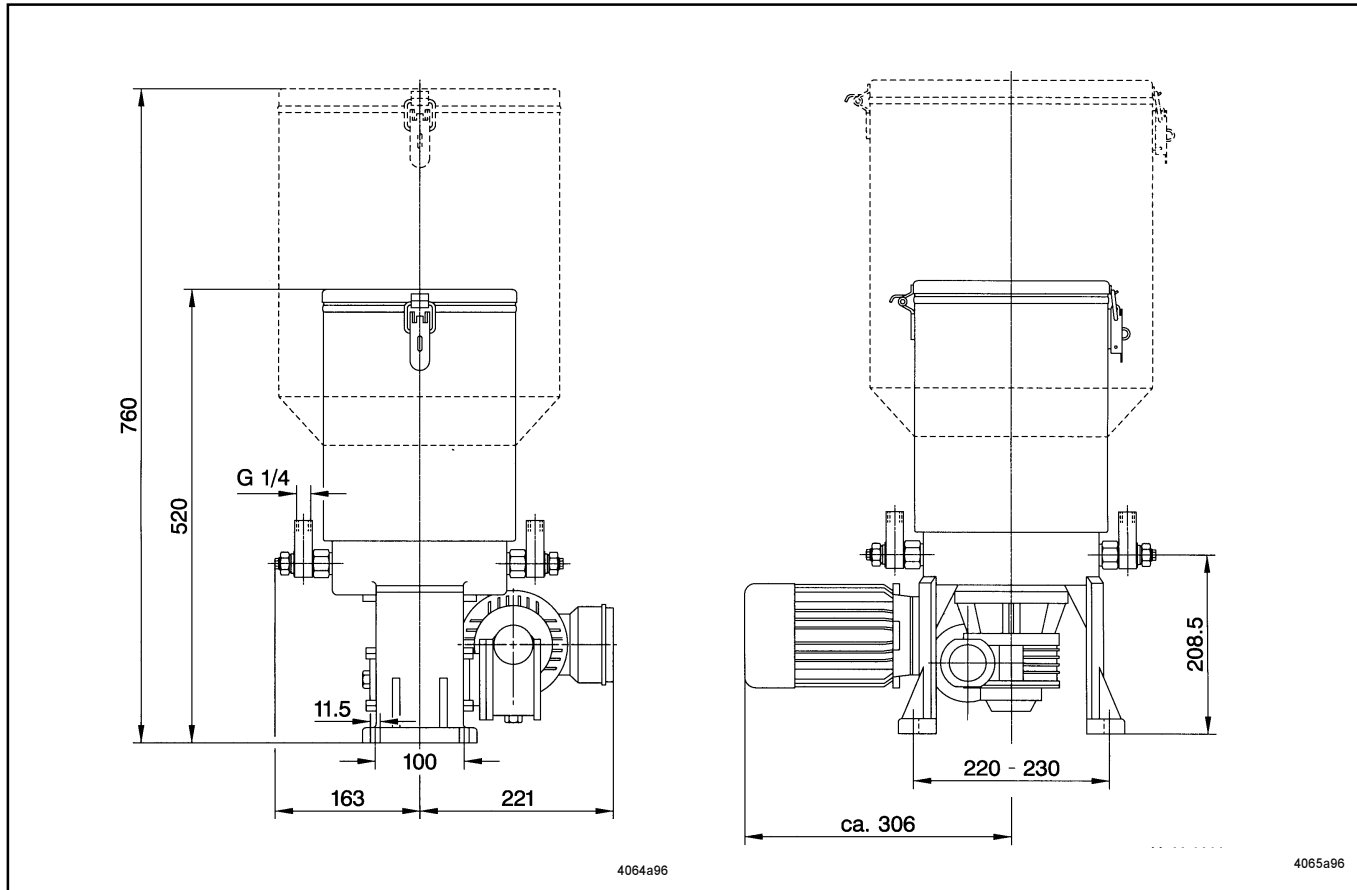


Fig. 20 - Dimensioned drawing for pump P215 - M490 - 10XN / 10YN / 30XN / 30YN - ....  
with double gear and motor

## Data Sheets

### Motor Data Sheet

*Standard-Motors for Pump Model 215/Three-Phase a. c. Asynchronous Motors*

Pump model		215 - M 100 - M 490		215 - M 049		Units
Motor manufacturer		Halter		Halter		
Motor type		DIC 63 B 4		DIC 63 L4		
Frequency	f	50	60	50	60	[Hz]
Nominal power	P	0.18	0.21	0,25	0,29	[kW]
Nominal speed	n	1370	1640	1334	1600	[min <sup>-1</sup> ]
Rated torque	M	1.26	1.23	1.79	1.73	[Nm]
Nominal current	I <sub>N</sub>	1.38	-----	2.07	-----	[A] at 220-240 V
		0.80	-----	1.20	-----	[A] at 380-420 V
		-----	1.38	-----	2.07	[A] at 380-275 V
		-----	0.80	-----	1.20	[A] at 440-480 V
Starting current/ ratio	I <sub>A</sub> /I <sub>N</sub>	3	3	3.6	3.6	[A]
Power factor	cos φ	0.67	0.67	0.77	0.77	
Efficiency	η	61	61	65	65	[%]
Frame size		63		63		
Type of construction		B 14		B 14		
Type of protection	IP	55		55		
Insulation class		F		F		
Weight		4.4		5.0		[kg]
Flange		ø 90		ø 90		[mm]
Shaft end		ø 11x23		ø 11x23		[mm]

The 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  
480 V ± 5%, 60Hz

Other voltages and/or special designs as well as other manufacturers available on request

*Standard-Motors for Pump Model 215/Three-Phase a. c. Asynchronous Motors 290/500 V*

Pump model		215 - M 100 - M 490	215 - M 049	Units
Motor manufacturer		Halter	Halter	
Motor type		DIM 63 B 4	DIM 63 L4	
Frequency	f	50	50	[Hz]
Nominal power	P	0.18	0.25	[kW]
Nominal speed	n	1370	1336	[min <sup>-1</sup> ]
Rated torque	M	1.25	1.79	[Nm]
Nominal current	I <sub>N</sub>	1.11	1.66	[A] at 290 V
		0.64	0.96	[A] at 500 V
Starting current/ ratio	I <sub>A</sub> /I <sub>N</sub>	2.5	2.6	[A]
Power factor	cos φ	0.7	0.7	
Efficiency	η	47	43	[%]
Frame size		63	63	
Type of construction		B 14	B 14	
Type of protection	IP	55	55	
Insulation class		F	F	
Weight		4,4	5,0	[kg]
Flange		ø 90	ø 90	[mm]
Shaft end		ø 11x23	ø 11x23	[mm]

The motors can be connected to the following networks :

290/500 V ± 10%, 50Hz

Other voltages and/or special designs as well as other manufacturers available on request

**CAUTION**

For motors exposed to strong temperature changes, especially when operated in humid environments, we recommend providing condensate bores or installing an auxiliary heating system for stationary periods.

## Data Sheet for Ultrasonic Sensor

### 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 I).

### Connection

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

Pin		
1	L+	DC 20 ... 30 V
2	S	Switching output "High level" (NO)
3	L-	Ground (GND)
4	S2	Switching input "Low level" (NC)

The connections are polarized, 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 the sound of 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 O.K.	H2 is non lit
Reservoir full	H1 is lit
Supply voltage	H3 is lit: green
Overfill signal H3 is lit:	red

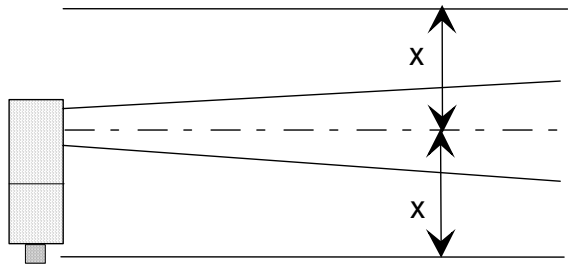
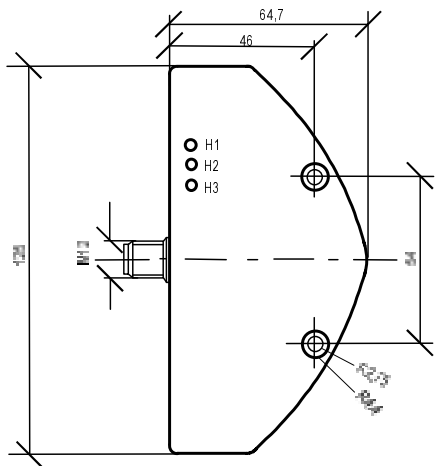
### Technical data

Ambient temperature:	-25...70°C
Sensing range:	50...500 mm*
Sensing distance „High level“	S1: 60 mm*
Sensing distance „Low level“	S2: depends on the reservoir size
Hysteresis „High level“	HV: 20 mm
Hysteresis „Low level“	HL: 50 mm
Switching point fault :	0.17% / K
* measured on the housing surface	
Supply	
Rated operational voltage:	U <sub>E</sub> 24 V DC
Operating voltage range:	U <sub>B</sub> 20...30VDC
Admissible residual ripple:	10%
Open-circuit power consumption:	<60 mA
Switching output:	
Rated normal current:	I <sub>E</sub> <200 mA
Voltage drop:	U <sub>D</sub> <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 mm <sup>2</sup>
Ultrasonic frequency:	400 kHz
Switching frequency :	8 Hz
Resolution:	1 mm
Protection:	IP 65

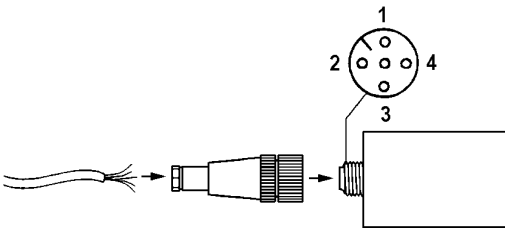
### Part-Numbers:

Ultrasonic-Sensor adjusted for reservoir sizes:

4 L	Part-No.: 664-36939-6
8 L	664-36939-7
10 L	664-36939-4
30 L	664-36939-5

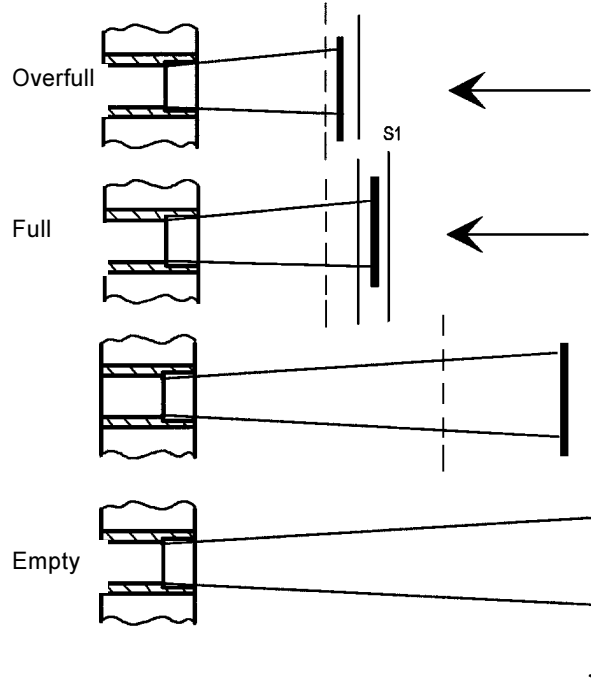
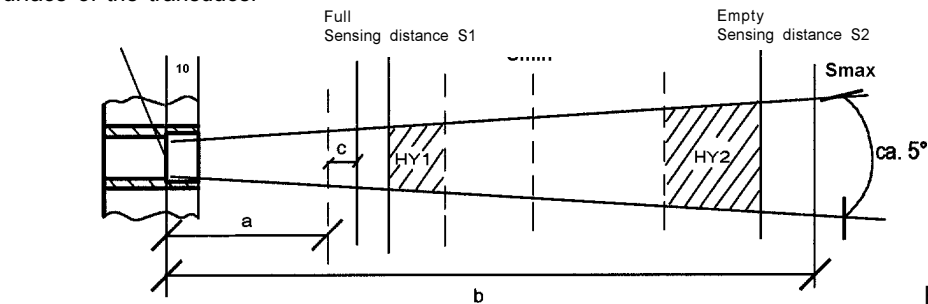


III



Surface of the housing

Surface of the transducer



Full	Empty	
S1	S2	
1	1	
H1	H2	H3
on	off	red

S1	S2	
1	1	
H1	H2	H3
on	off	green

S1	S2	
0	1	
H1	H2	H3
off	off	green

S1	S2	
0	0	
H1	H2	H3
off	on	green

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

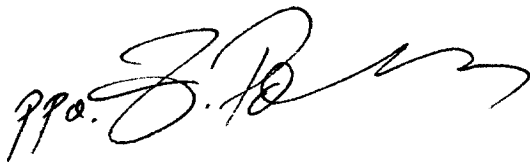
Herewith we declare that the supplied model of

**Multiline Pump Model 215**

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**

A handwritten signature in black ink, appearing to read 'ppa. Z. Paluncic', with a stylized flourish at the end.

*Walldorf, 25.11.1996 , ppa. Z.Paluncic*