

**INDEX**

	<b>Page</b>
1. General .....	2
2. Safety .....	2 – 4
A. Pump type .....	5
B. Number of outlets .....	5
C. Inspection .....	5
D. Kinds of drive .....	6
E. Position of drive .....	6
F. Reservoir .....	7
G. Accessories .....	8
3. Design .....	9
4. Principle of operation .....	10 – 11
5. Specification .....	11
6. Pump installation .....	12
7. Start-up .....	13
8. Maintenance .....	14 – 15
9. Fault finding .....	16
10. Lubricants .....	16
11. Plates .....	17



## 1. General

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Prior to start up, we recommend to read these operating instructions carefully as we do not assume any liability for damages and operating troubles which result from the nonobservance of these operating instructions!

Any use beyond the applications described in these operating instructions is considered to be not in accordance with the product's intended purposes. The manufacturer is not to be held responsible for any damages resulting from this: the user alone bears the corresponding risk.

As to figures and indications in these operating instructions we reserve the right to make technical changes which might become necessary for improvements.

The copyright on these operating instructions is kept reserved to the company DELIMON. These operating instructions are intended for the erecting, the operating and supervising personnel. They contain regulations and drawings of technical nature which must not – completely or partially - be distributed nor used nor communicated to others without authorization for competition purposes.

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## 2. Safety

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These operating instructions contain fundamental instructions which are to be observed during erection, operation and maintenance. Therefore it is absolutely necessary for the fitter and the competent qualified staff/user to read these operating instructions before installation and start-up. The operating instructions must be available at all times at the place of use of the machine/system.

Not only the general safety instructions stated under this main point "safety" are to be observed, but also the other specific safety instructions stated under the other main points.

### 2.1 Identification of safety warnings in the operating instructions

The safety warnings contained in these operating instructions which, if not observed, may cause dangers to people, are specially marked with general danger symbols



safety sign according to DIN 4844, warning about a danger spot ,

in case of warning about electric voltage with



safety sign according to DIN 4844, warning about dangerous electric voltage.

In case of safety instructions which, if not observed, may cause damage to the machine and its function, the word

**ATTENTION**

is inserted.

Instructions that are directly attached to the machine, as for example

- rotational direction arrow
- identifications for fluid connections

must be observed at all events and maintained in a fully legible condition.

- Note: There is an increased skid risk in case of spilled/leaked out lubricants. They are to be removed at once properly.



Safety sign according to DIN 4844, warning about skid risk.

## 2. Safety (continuation)

### 2.2 Personnel qualification and training

The operating, maintaining, inspecting and erecting personnel must have the appropriate qualification for such work. Area of responsibility, competence and supervision of the personnel have to be regulated by the user. If the personnel do not have the necessary knowledge, they have to be trained and given instructions. This can be effected, if necessary, by the manufacturer/supplier on behalf of the user of the machine. Furthermore, the user has to make sure that the contents of the operating instructions are fully understood by the personnel.

### 2.3 Dangers in case of nonobservance of the safety instructions

The nonobservance of the safety instructions may result in hazards to persons, to the environment and to the machine. The nonobservance of the safety instructions may lead to the loss of any claims for damages. In detail, the nonobservance may for instance lead to the following hazards:

- Failure of important functions of the machine/system
- Failure of prescribed methods for maintenance and repair
- Hazard to persons by electrical, mechanical and chemical influences
- Hazard to the environment by the leakage of dangerous substances

### 2.4 Safety conscious working

The safety instructions stated in these operating instructions, the existing national regulations as to the accident prevention as well as possible internal working, operating and safety rules of the user are to be observed.

### 2.5 Safety instructions for the user/operator

- If hot or cold machine parts lead to dangers, these parts have to be protected against touch.
- Protection against touch for moving parts (e. g. coupling) must not be removed when the machine is in operation.
- Leakages (e. g. from the shaft seal) of hazardous goods to be delivered (e. g. explosive, toxic, hot) are to be removed in such a way that there is no danger to persons and environment. Legal rules are to be observed.
- Hazards caused by electrical power are to be excluded (for details please refer for instance to the rules of the VDE and the local power supply companies).

### 2.6 Safety instructions for maintenance, inspection and installation work

The user has to take care that all the maintenance, inspection and installation work is executed by authorized and qualified skilled personnel who have informed themselves adequately by thoroughly studying the operating instructions.

Basically, work on the machine is only to be carried out during shut-down. It is obligatory to observe the shut-down procedure described in the operating instructions.

Pumps or pump aggregates that deliver media being hazardous to health have to be decontaminated. Immediately after completion of the work, all safety and protective equipments have to be reinstalled and/or reactivated.

- Advice: When working with compressed air, do wear glasses.



(DIN 4844 – Use breathing mask)

- Advice: Observe EC-Safety Data Sheet for materials of consumption and additives used and use personal protective equipment.



(DIN 4844 – Use breathing mask)

Before recommissioning, observe the points stated in section “initial start-up”.

### 2.7 Unauthorized conversion and manufacture of spare parts

Conversion or modifications to the machine are only permitted when agreed with the manufacturer. Original spare parts and accessories authorized by the manufacturer serve to ensure safety. The use of other parts may render the liability for consequential losses null and void.

## **2. Safety** (continuation)

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### **2.8 Unacceptable modes of operation**

The operational reliability of the machine supplied is only guaranteed if the machine is used in accordance with its intended purposes as per section 1 - General - of the operating instructions. The limiting values specified in the data sheet must on no account be exceeded.

### **2.9 Guidelines & standards**

1., 2. and 3. guideline (see data sheet: R&N\_2009\_1\_GB)

### **3.0 Notes on environmental protection and waste disposal**

In correct operation with lubricants, the components are subject to the special requirements set by environmental legislation.

The general requirements for lubricants are specified in the respective safety data sheets.

Used lubricants are hazardous forms of waste and therefore require special supervision in the sense of § 41 paragraph 1 sentence 1 and paragraph 3 no. 1 of KrW-/AbfG (Closed-Loop Waste Management Act).

Used oils must be handled in compliance with AltölV (Waste Oil Ordinance).

The devices or components contaminated with lubricant must be disposed of by a certified waste management company.

Records of proper waste management must be filed in conformance to NachwV (Ordinance on Waste Recovery and Disposal Records).

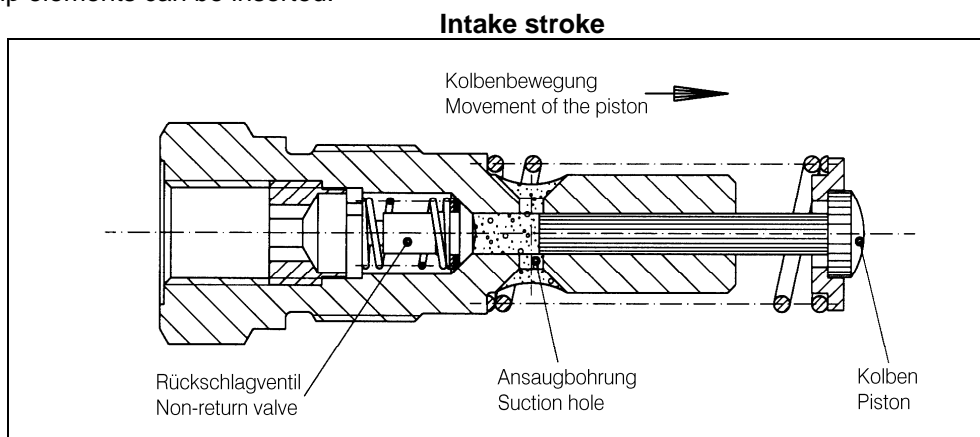
## GENERAL PRODUCT CHARACTERISTICS

- Multi-line pump
- D.C voltage drive
- Output volume: at choice
- Lubricant: oil, grease, liquid grease

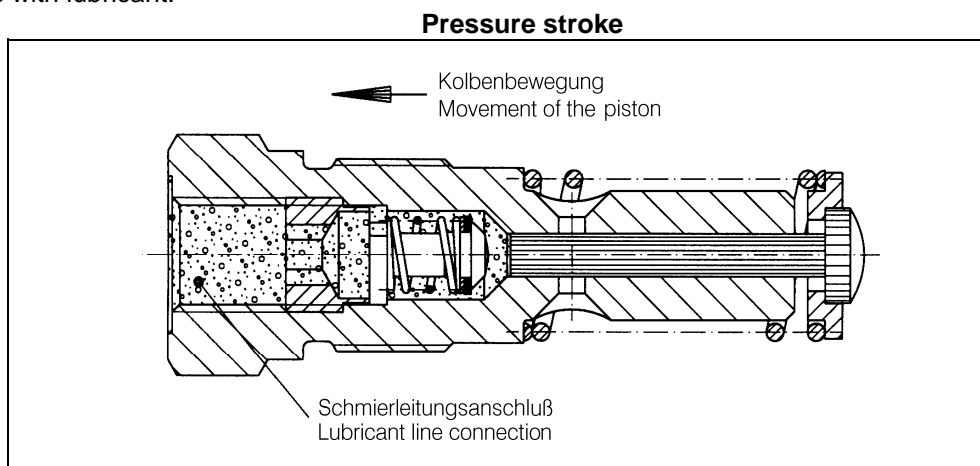
## A. PUMP TYPE AUTOLUB-E

## B. NUMBER OF OUTLETS

1 – 3 pump elements can be inserted.



According to the eccentric position, the piston is pushed to the right by springiness so that a diminished pressure is created in the space between the non-return valve and the piston. In the course of the next intake stroke, the piston unblocks the suction holes. Now the space between the non-return valve and the piston fills with lubricant.



The eccentric pushes the piston to the left and closes the suction holes. In the course of the next pressure stroke of the piston, the lubricant pushes the non-return valve to the left, and the lubricant is pushed to the lubricant line connection.

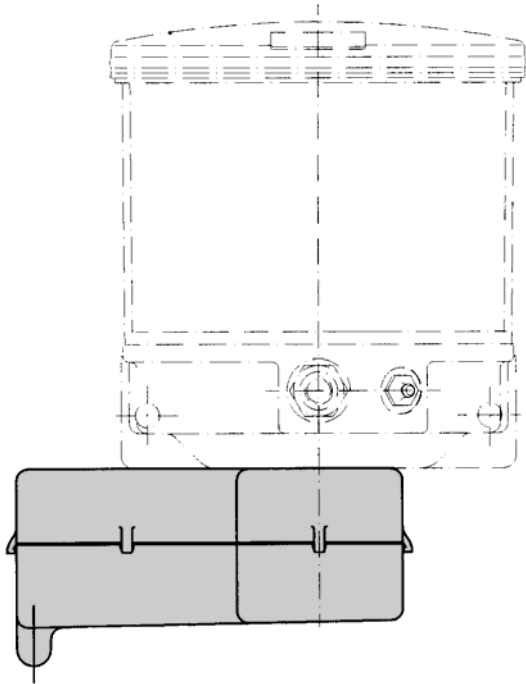
## C. INSPECTION

Stage A

**D. KINDS OF DRIVE**

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Drive with geared motor DC 24 V, rated speed 18 min<sup>-1</sup> (Item. 1)



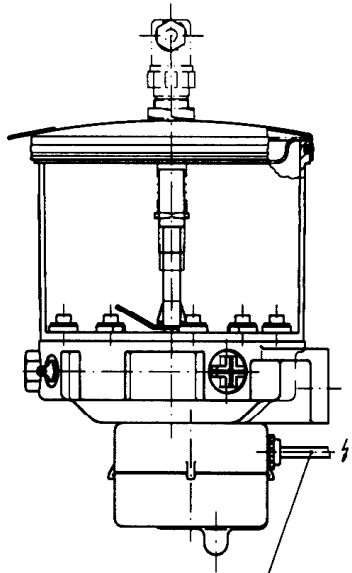
**E. POSITION OF DRIVE**

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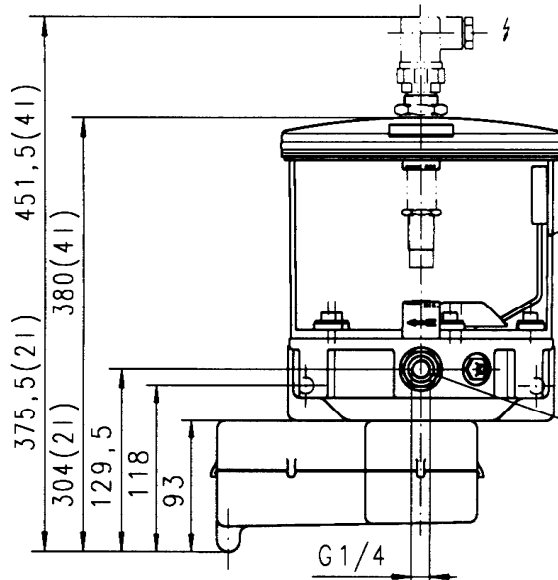
without

**F. RESERVOIR**

2 liters plastic  
4 liters plastic



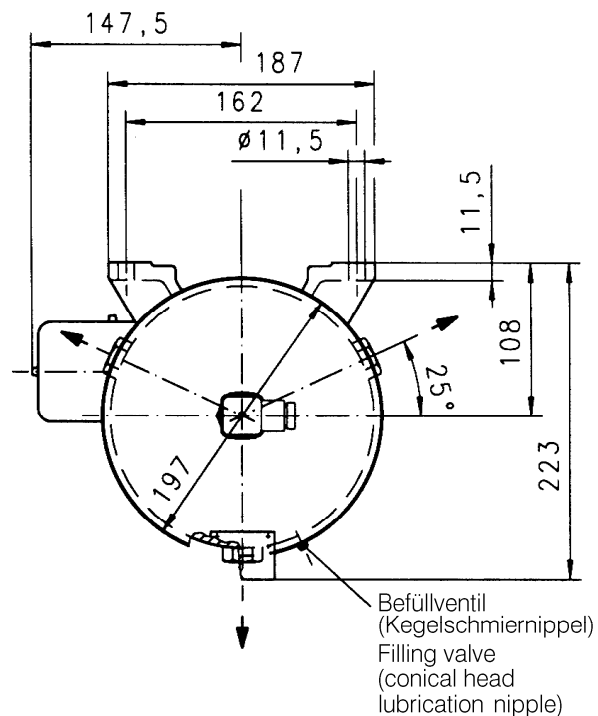
Elektroanschluß  
Electric connection



Behälter:  
transparenter Kunststoff  
Bowl:  
transparent plastic

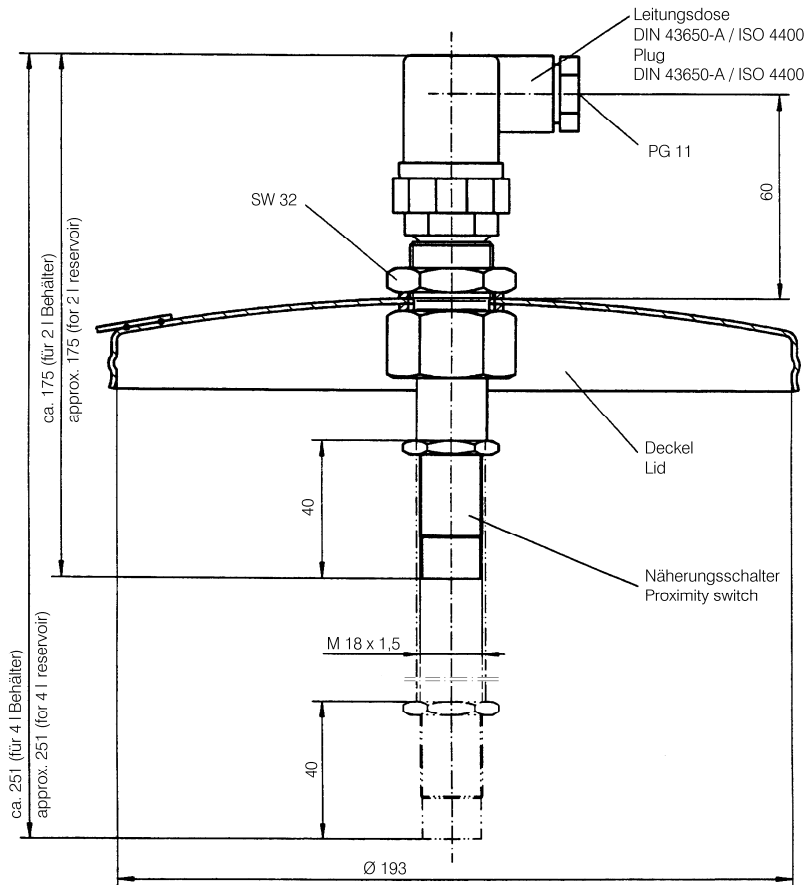
Pumpenelement  
Pump element

G1/4



Befüllventil  
(Kegelschmiernippel)  
Filling valve  
(conical head  
lubrication nipple)

## G. ACCESSOIRES



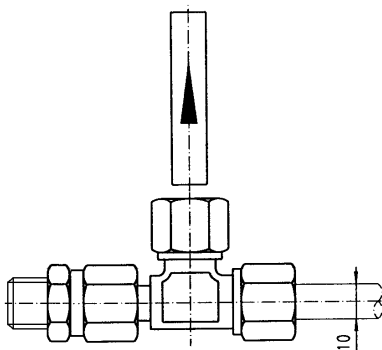
### Level switch for 2 and 4 litres plastic tank

The level switch for the pump Autolub-E with plastic tank consists of a proximity switch with housing, a mounted lid and a plug according to DIN 43650-A / ISO 4400.

If required, the level switch is mounted on the tank (item no. 8) instead of the lid (item no. 6). When the level switch is ordered, the technical data as well as the pin connections can be taken from an operating instruction (code BA\_2005\_1\_GB\_65121) which is supplied with the level switch. In case, this operating instruction will be part of the present operating instructions.

### Filling valve with coupler plug

The filling valve (item no. 2) consists of a coupler plug G ¼, a nipple G ¼ as well as a dust cap, and in case of need it is screwed in instead of the conical head lubrication nipple (item no. 2)

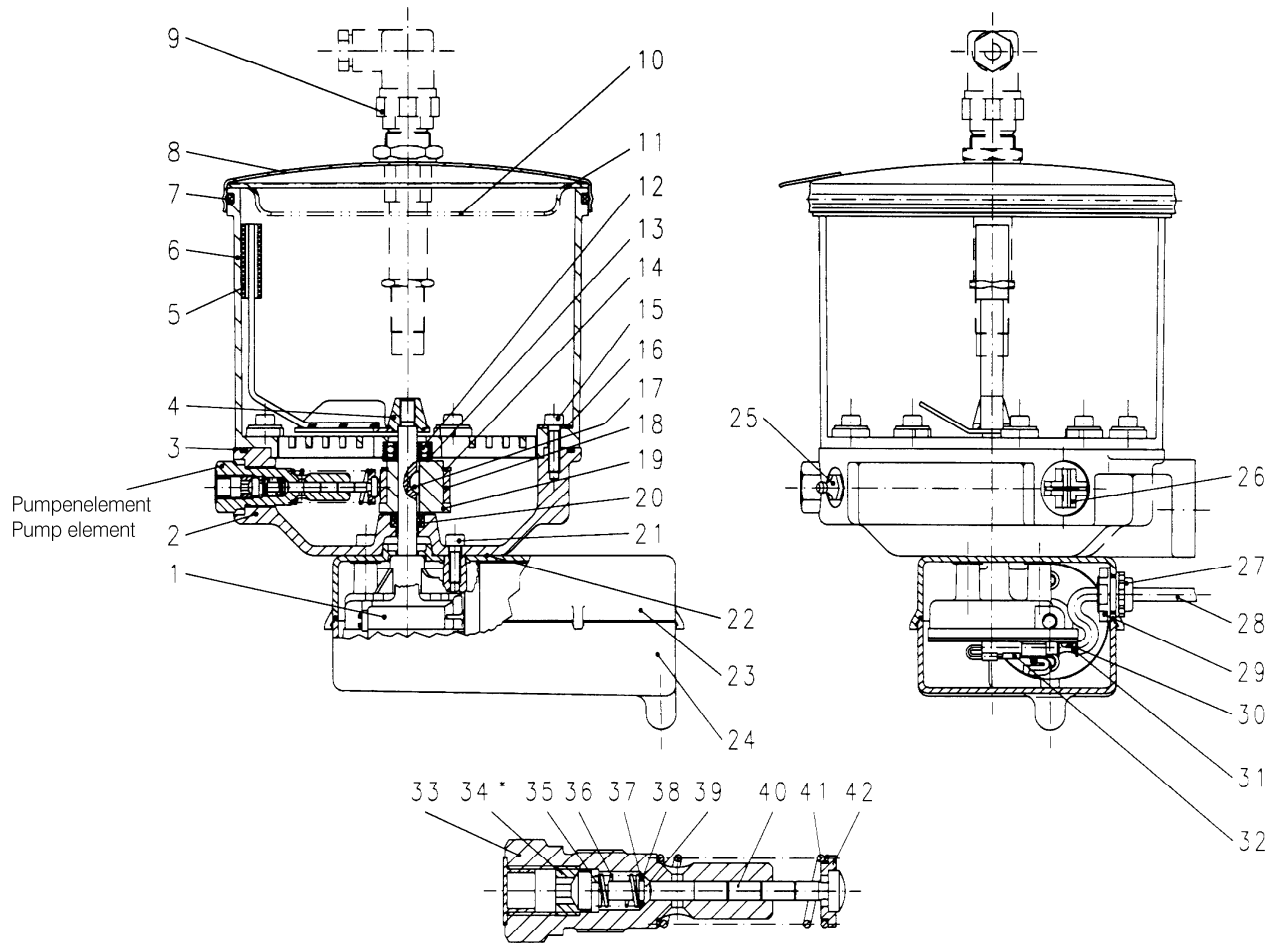


### Pressure control

In case of receiving the order, we will attach particular operating instructions to the pressure control: PB\_2005\_1\_GB\_38132.



**3. Design**



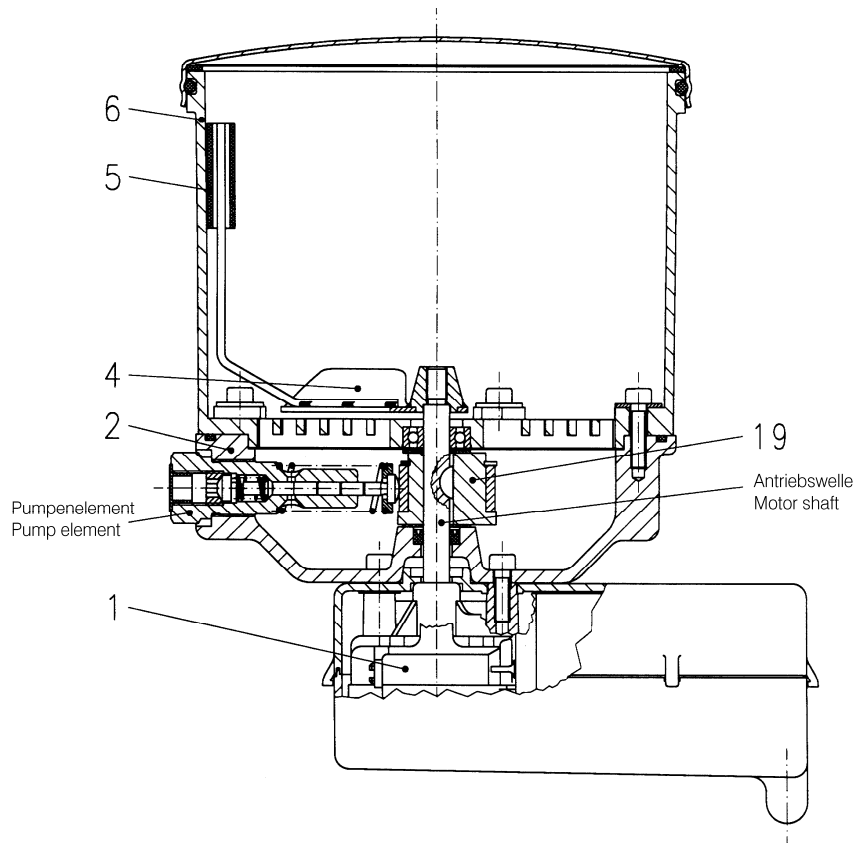
Pumpenelement  
Pump element

\* Pos. 34 Anziehdrehmoment 8 Nm  
\* item no. 34 Tightening torque 8 Nm

#### 4. Principle of operation

The drive shaft of the geared motor (item no. 1) drives the eccentric (item no. 19) and the agitator (item no. 4). The agitator (item no.4) is provided with the scraper (item no. 5), which clears the inner wall of the bowl (item no. 6) can be well recognized.

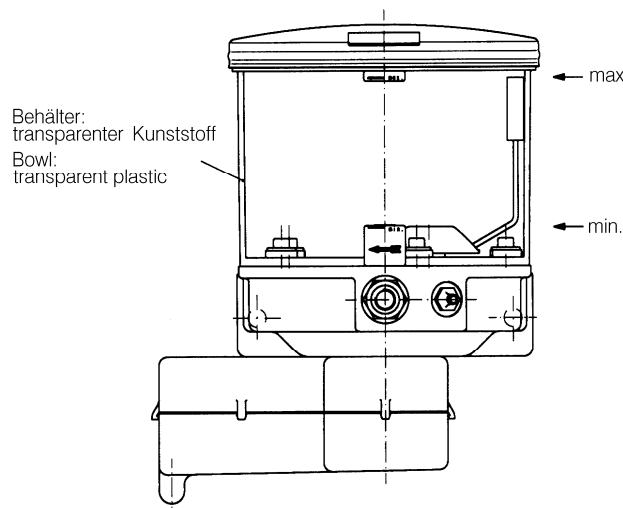
The eccentric (item no. 19) actuates up to 3 pump elements. The lubricant pressed into the housing (item no. 2) by the agitator (item no. 4) is sucked in by the pump elements and carried to the lubrication points or to the lubricant distributors via a connected lubricant line.



#### Change in delivery rate

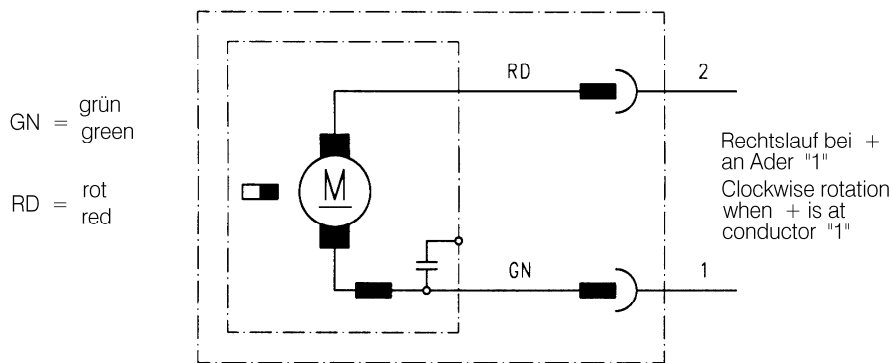
A change in the delivery rate can only be achieved by exchanging the pump elements as the delivery rate is determined by the diameter of the piston.

#### Level limitation



#### 4. Principle of operation (continuation)

##### Connection diagram / geared motor



#### 5. Specification

Discharge pressure :	.....max. 250 bar
Output volume per pump element :	..... at choice 0.1 (1.8); 0.15 (2.7) or 0.2 (3.6) cm <sup>3</sup> /stroke (cm <sup>3</sup> /min)
Number of pump elements :	..... 1 to 3 pieces
Operating temperature :	..... - 20° C up to + 80° C
Usable lubricants :	greases based on mineral oil NLGI-class 000 to 2 DIN 51818 (51825) mineral oils with viscosity over 68 mm <sup>2</sup> /s at operating temperature synthetic and biodegradable lubricants on request
Usable bowl capacity.....	2 or 4 Litre
Filling :	via filling valve (conical head lubrication nipple DIN 71412) filling valve with coupler or top cover of housing
Kinds of drive :	..... direct-current geared motor (noise-suppressed N with right-hand motion).
<b>24V version:</b>	
Nominal current at DC 24V .....	max. 1.8 A
Rated speed at DC 24V * .....	18 ± 3 min <sup>-1</sup>
Protective system :	..... IP 54
Electric connection :	10 m connecting lead, flexible, 2 pins, 1.5 mm <sup>2</sup> Conductor "1" = DC 12V / 24V (+) Conductor "2" = earth (-)
Installation position :	..... vertical

\* **Note:**

In case of voltage variations, the number of revolutions of the motor changes linearly to the voltage variation with equal load.

## 6. Pump installation

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### ATTENTION

Install the lubricant pump AUTOLUB-E in vertical position only!

Fix the lubricant pump AUTOLUB-E by means of 2 screws M 10, 2 hexagon nuts M 10 and 2 spring washers 10 on an even surface.

To guarantee a quick and safe assembly of the lubricant pump AUTOLUB-E, a drill template (75511-1611) is supplied to drill the fixing holes.

A central fixing device ensures optimal line lengths, consequently most unimportant losses in the lines.

A good access to the lubricant pump AUTOLUB-E is essential

- for a good visual level control
- for the lubricant filling via a conical head lubrication nipple according to DIN 71412 (item no. 25), the filling valve with coupler (item no. 25) or the removable top cover (item no. 8)
- for a problem-free dismantling and installation of the pump element.



- Consider pressure load capacity for piping material and olive screw joints.
- Do not use fittings!



The lubricant pump AUTOLUB-E is adapted to be used only for the max. feed pressure as stipulated in the technical specification. When the pressure limit is exceeded; there is the hazard inherent to lead to destruction of pump or pump elements. Care should be taken by installation the entire system adequately (pipework, components, pressure relief valve) in order to prevent that the max. admissible discharge pressure be exceeded.

### Electric connection

For the connection of the geared motor of the lubricant pump AUTOLUB-E to an electronic control unit, a 10 m long flexible connection lead with 2 conductors (1.5 mm<sup>2</sup>) is fixed in series.

Conductor "1" = DC 12V / 24V (+), conductor "2" = earth (-).



For the connection to an electronic control unit, it is essential that this is done by qualified staff only and that the voltage is eliminated (see "Specification" and "connection diagram/geared motor").

An electric control unit is to be installed by specialists only.

The local electric instructions must be observed (see "Safety").

### ATTENTION

It is absolutely essential that the agitator (item no. 4) turns clockwise. An arrow on the bowl (item no. 6) indicates the correct direction of rotation of the agitator (item no. 4). If the agitator (ite, no. 4) turns anticlockwise, the polarity of the geared motor (item no. 1) has to be checked according to the connection diagram/geared motor of these Operating Instructions.

## 7. Start-up

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### Filling

Fill bowl (item no. 6) of lubricant pump AUTOLUB-E with clean lubricant only, namely via the conical head lubrication nipple (item no. 25), the filling valve with coupling (item no. 25) or from the top by removing the lid (item no. 8). Air bubbles that might be enclosed in the grease will escape during operation of the lubricant pump. The lubricant pump deaerates automatically.

**ATTENTION**

While refilling the pump AUTOLUB-E make sure to protect it to avoid accidental starting.

In order to ensure that deaeration is effected rather quickly fill up the reservoir of the pump AUTOLUB-E from the top, during first commissioning and squeeze the grease into the suction chamber by using an adequate device such as a scraper or smoother. While doing this, take care to avoid air bubbles, then top up the reservoir with the required lubricant quantity.

The lubricant pump AUTOLUB-E must not run without lubricant!

Should the agitator inside the grease pump AUTOLUB-E become visible, proceed as described above. Always use clean lubricant and proceed with painstaking cleanliness to avoid any kind of contamination.

Dirt particles are the most frequent reasons for failures and damages.

Replenished reservoir always in time.

### Deaeration

Start the grease pump AUTOLUB-E and keep it running unconnected (for abt. 20 min) until lubricant with no air bubbles emerges.

### Connection of pipe lines

Before installing the pipes, clean them all throughly by tapping and blowing them through with compressed air and fill them with unpolluted lubricant by means of grease gun.

Then connect the pipe lines.



Check the pre-determined opening pressure of the pressure relief valves located downflow in the pipe lines. Observe max. operating pressure of lubricant pump AUTOLUB-E and that of the components of the system.

The pressure outlet ports of the pump elements must not be closed. In case of non-observance there is the risk of destroying both pump and pump elements.

## 8. Maintenance

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### ATTENTION

Should it once become necessary to exchange or dismount the geared motor (item no. 1), the cheese-head screws (item no. 21) must be replaced by new ones. These cheese head screws are provided with an adhesive which can be used twice only. (see point Assembly & disassembly / pump AUTOLUB-E).

The geared motor (item no. 1) can be only be supplied together with item nos. 23 and 24 (cap/upper part and cap/lower part).

Should the agitator (item no. 4) be exchanged or disassembled, the safety adhesive of Messrs. Locite no. 243, has to be used (see point Assembly & disassembly / pump AUTOLUB-E) for the re-installation

### Replacing or refitting of pump element



- Disconnect motor and level switch by qualified staff, and/or protect pump against unintended switching on.
- Loosen lubricant line carefully from pump element. Unscrew pump element by using a wrench (wrench size across flats 24), but do not remove entirely from reservoir.
- To prevent the piston of pump element from getting clung in the lubricant, rotate the element (by spinning movements) in order to create a cavitation. When removing the element take care that the piston is showing diagonally, to the top.

### ATTENTION

- Refill the suction or piston channels of new pump element of those which have been repaired with grease.
- Push element into the housing bore with pistons showing diagonally to the top, then screwing it into the pump and tightened it firmly with a torque of 35 to 40 Nm.
- Motor and level switch have to be connected to the mains by qualified staff only, and the protection against accidental switching-on to be removed.



Pay attention to correct rotary direction of the agitator, sense of rotation = right-hand/clockwise.

### ATTENTION

- Deaerate pump (see Start-up)

### Assembly & disassembly / pump element

- Pull piston (item no. 40) out of the housing (item no. 33).
- Unscrew screw (item no. 34) by means of a wrench (wrench size across flats 6).
- Remove non-return valve.
- Clean parts in naphtha or petroleum ether.
- Check parts of damages.
- Replace damaged parts.
- Assemble pump element in reverse order.

### ATTENTION

- Tighten screw (item no. 34) with a torque 8 Nm.

## 8. Maintenance (continuation)

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### Assembly & disassembly of pump AUTOLUB-E



- Disconnect motor by qualified staff.
- Remove pump from the machine and/or from the system.
- Dismantle pump elements.
- Pull off top cover (item no. 8) from the bowl (item no. 6).

#### ATTENTION

- Screw off agitator (item no. 4). Attention - lefthanded thread!
- Remove screws (item no. 15) and take off bowl (item no. 6).
- Remove eccentric (item no. 19) and woodruff key (item no. 17).
- Remove screws (item no. 21) and take geared motor (item no. 1) with protection caps (item no. 23 + 24) off the housing (item no. 2).
- Clean parts in naphtha or petroleum ether (this does not apply to the geared motor (item no. 1) with its protection caps (item no. 23 + 24)).
- Check parts for damages.
- Replace all seals by new ones.
- Assemble lubricant pump AUTOLUB-E in reverse order.

#### ATTENTION

- For mounting the geared motor (item no. 1) with the protection caps (item no. 23 and 24) to the housing, use new screws (item no. 21) only. The screws (item no. 21) are provided with an adhesive which allows two uses only.
- For the installation of the agitator (item no. 4) onto the shaft of the geared motor (item no. 1), observe the following points:
  1. Clean thread on the shaft of the geared motor (item no. 1) and the thread in the hub of the agitator (item no. 4) from all remnants of grease and adhesive with the help of a suitable detergent.
  2. Wet thread on the shaft of the geared motor (item no. 1) or thread in the hub of the agitator (item no. 4) with adhesive no. 243 of the company Locite.
  3. Screw agitator (item no. 4) onto the shaft of the geared motor (item no. 1).
- Install pump element.
- Mount pump to the machine and/or into the system.



- Connect motor to current supply by qualified staff.



- Pay attention to correct rotational sense of the agitator; sense of rotation = right-hand/clockwise.
- Pumpe entlüften (siehe Abschnitt Inbetriebnahme).



- Dispose of old oil and grease remnants according to rule.

## 9. Fault finding

Failure	Possible reasons	Repair
Pump does not deliver lubricant	filling level is lower than min. value (reservoir empty) Electric connection of geared motor has been polarized in the wrong way.	Fill up lubricant and deaerate as described under Start-up. Check pin connection.
Pump does not run	Voltage incorrect Voltage supply is interrupted. Lubrication point is blocked	Check voltage Check voltage at the battery. To find out which lubrication points and/or which lubrication point group is blocked, loosen pipe connections at pump elements one after the other. When the blocked bundle has been loosened, the pump must start running again. Localize the lubrication points concerned by loosening the connection lines. The failure may have been caused by dirt accumulation in the lubrication point, blocked up lubrication points or squeezed lubricant lines.
Pump element does not deliver lubricant	Pump element is defective	By loosening the pipe connections at the pump elements you will find the pump element which does not deliver lubricant after the pump has been switched on. Dirt accumulation within the piston or heavy mechanical damages to the pump element are possible reasons for the failure. If removal and purification of the pump element do not result in an improvement, the pump element has to be replaced by a new one. <b>ATTENTION</b> When assembling the cleaned pump element, the screw (item no. 34) must be tightened with a torque of 8 Nm only.

## 10. Lubricants

**Recommended lubricants :**  
grease Gearmaster LX00 (Lubritech)  
or something comparable

## 11. Plates

Name plate 110 x 60 mm (75511-1531)



Type plate 110 x 60 mm (75511-1321)

