

Operating instructions  
**Pump BS-B**

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## 1. General

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 a 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

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)

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### 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\_X\_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**

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- Discharge pressure up to max. 400 bar
- High reliability due to forced control
- Compact and rugged design
- Lubricant grease, liquid grease
- Geared motors
- Surface signal grey RAL 7004
- Discharge: 7,14 and 22 litres/h, depends on driving speed

## A. PUMP TYPE BSB

## B. NUMBER OF OUTLETS

1 outlet

## C. REVISION

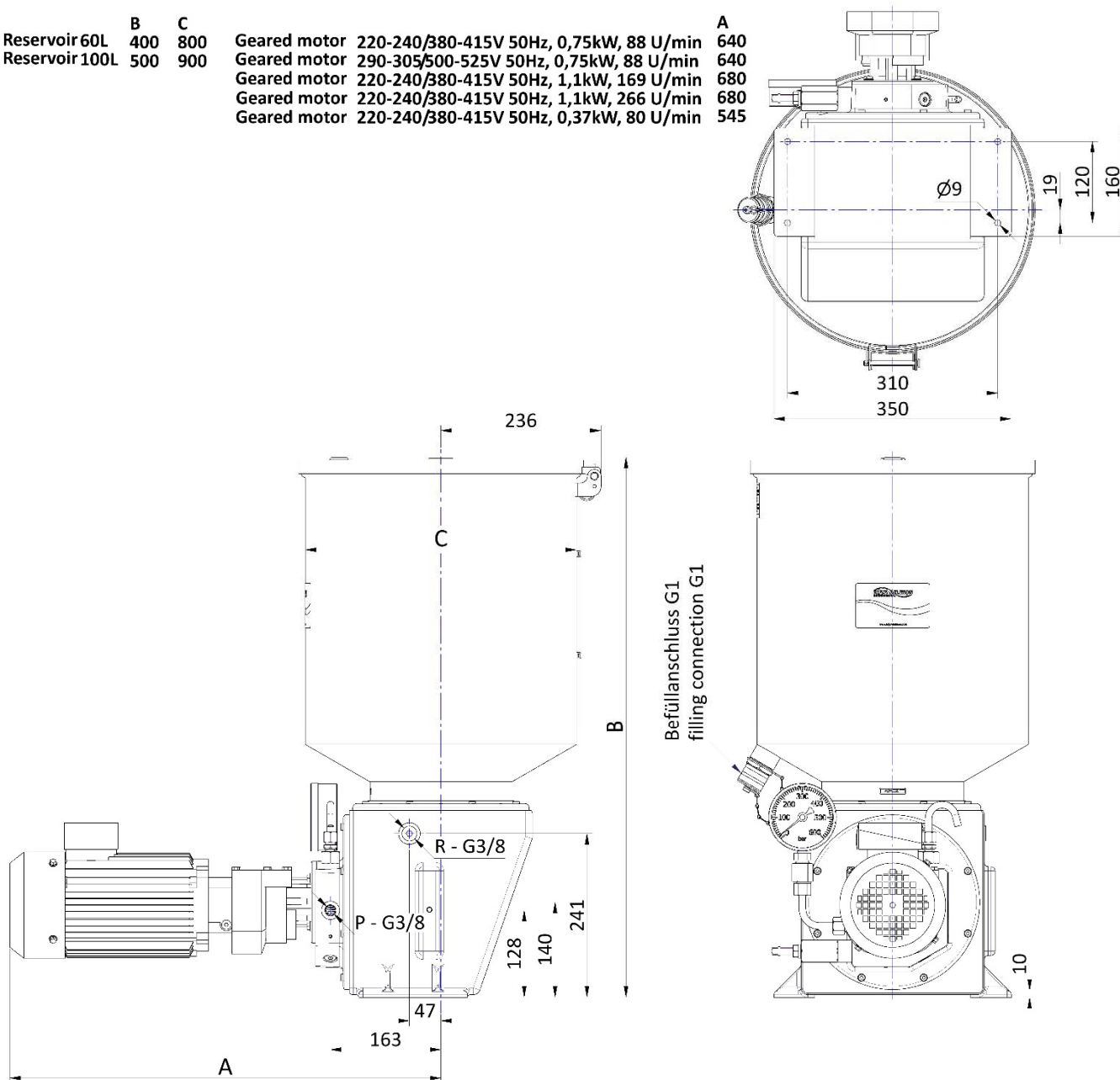
Status A

## D. KINDS OF DRIVE

Flange-mounted geared motor 220 - 240 / 380 - 415 / 50 Hz, 0.75 kw, 88 min<sup>-1</sup>; dimension A = 640 mm  
 Flange-mounted geared motor 290 - 305 / 500 - 525 / 50 Hz, 0.75 kw, 88 min<sup>-1</sup>; dimension A = 640 mm  
 Flange-mounted geared motor 220 - 240 / 380 - 415 / 50 Hz, 1.5 kw, 151 min<sup>-1</sup>; dimension A = 680 mm  
 Flange-mounted geared motor 220 - 240 / 380 - 415 / 50 Hz, 1.5 kw, 238 min<sup>-1</sup>; dimension A = 680 mm

	B	C
Reservoir 60L	400	800
Reservoir 100L	500	900

Geared motor	220-240/380-415V 50Hz, 0,75kW, 88 U/min	640
Geared motor	290-305/500-525V 50Hz, 0,75kW, 88 U/min	640
Geared motor	220-240/380-415V 50Hz, 1,1kW, 169 U/min	680
Geared motor	220-240/380-415V 50Hz, 1,1kW, 266 U/min	680
Geared motor	220-240/380-415V 50Hz, 0,37kW, 80 U/min	545



## E. POSITION OF DRIVE

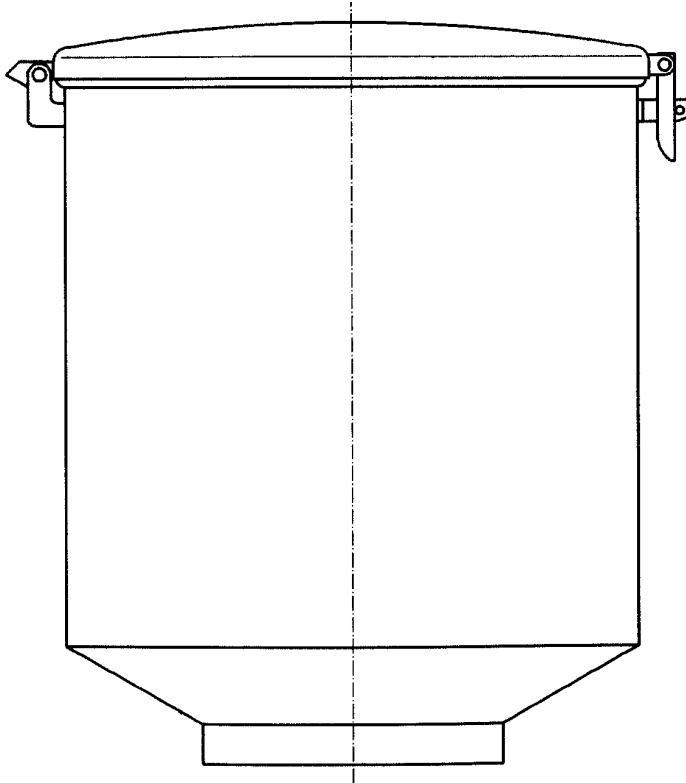
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without

## F. RESERVOIR

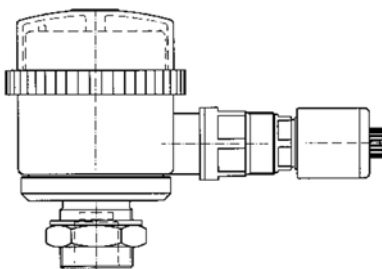
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60 and 100 litres



## G. ACCESSORIES

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Level switch

A level switch is available for the indication of the filling level in the reservoir. As sensor serves an ultrasonic sensor. As soon as the min. or max. level allowed has been obtained, a signal is released. With the help of a signal lamp at the reservoir, this signal can be used for the visual warning or for the control of an automatic filling facility. In case of receiving the order, we will attach particular operating instructions to the level switch with the following code: BA\_20XX\_X\_GB\_76951\_6011



Pressure gauge

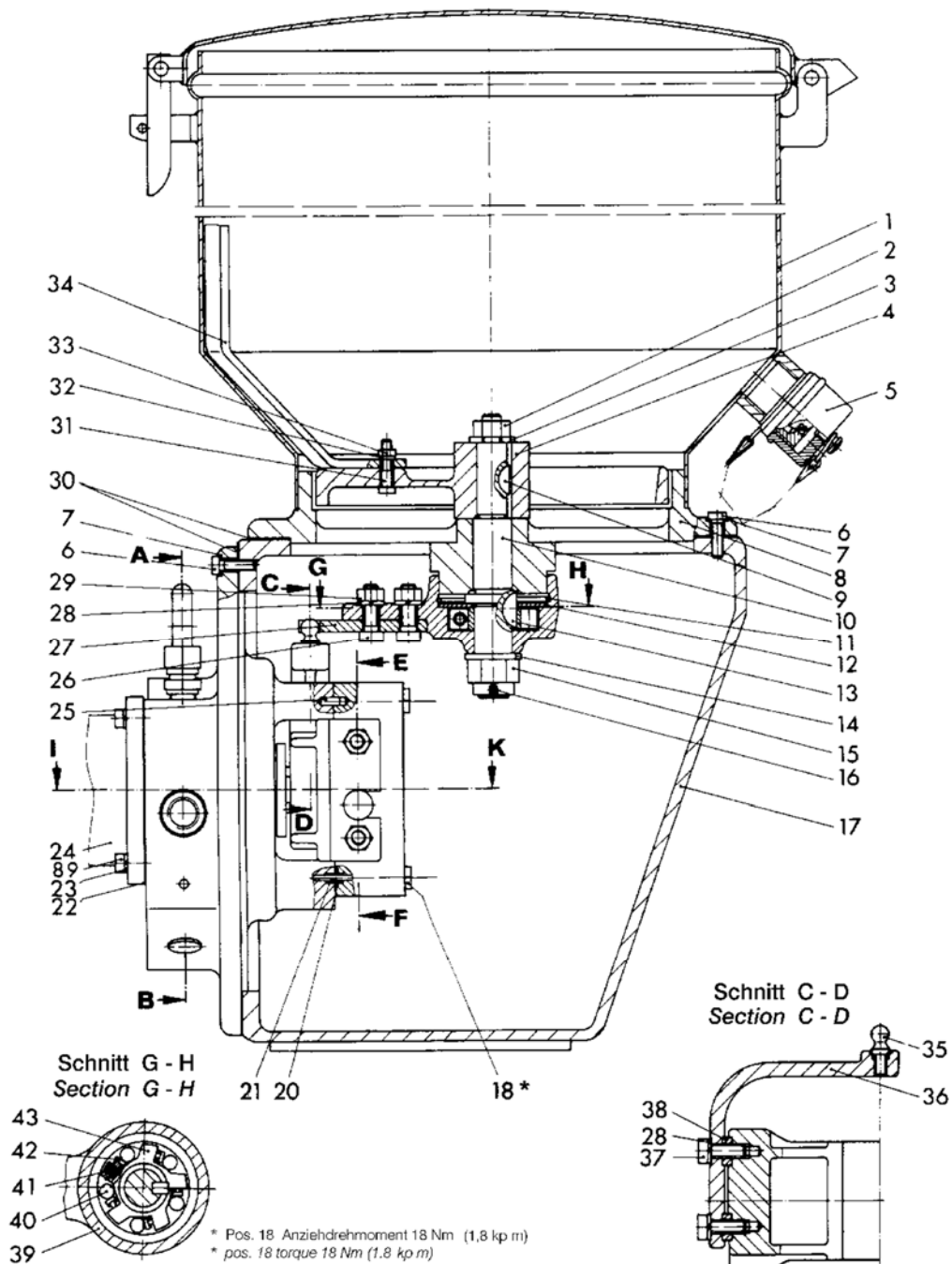
### 3. Application

The pump BS-B is used in cases where a lot of lubrication points shall centrally and reliably be supplied with lubricant. In connection with ZV-B distributors, the pump is predominantly used in dual-line lubrication systems. The pump BS-B is also suitable for filling and lubrication systems.

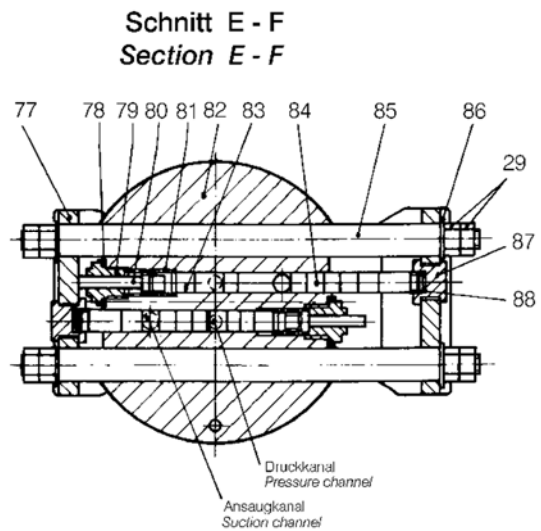
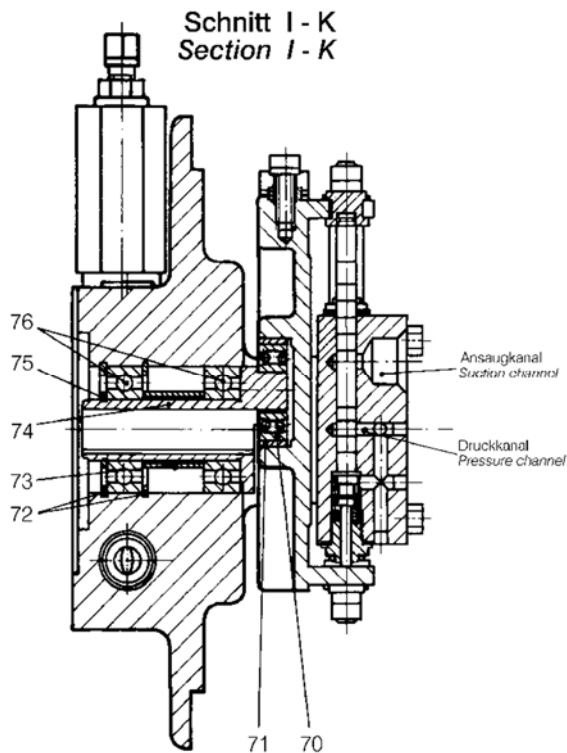
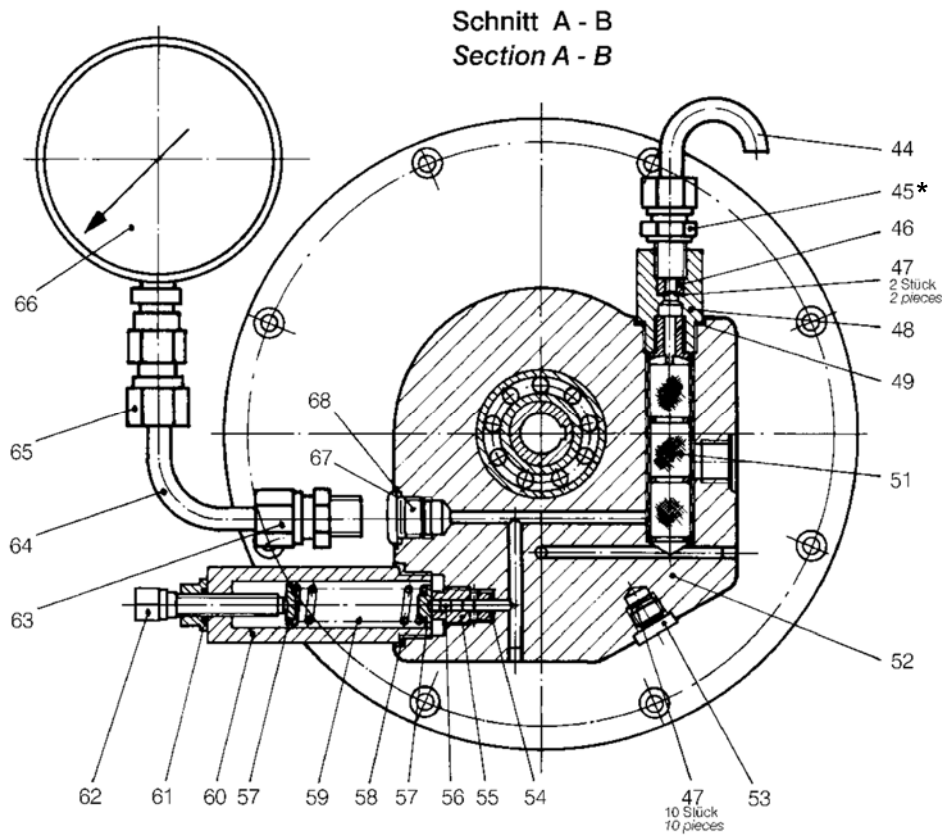
### 4. Design

The pump consists of the housing with the pump insert, and a lubricant reservoir mounted on top. An integral pressure relief valve is incorporated in the pump insert.

In dual-line systems lubricant is being delivered under pressure by means of electric or pneumatic control valves into a main feed line and towards the metering blocks distributing it uniformly and precisely-metered to the points. Varying lubricant quantities can be coped with by selecting different blocks.



#### 4. Design (continuation)



- \* Pos. 45 Anziehdrehmoment 65 + 5 Nm
- \* pos. 45 torque 65 + 5 Nm



## 5. Principle of operation

### Reservoir with wedge plate assy. and scraper

A ratched mechanism (39-43) (section G-H) converts the oscillating motion of the rocker arm (77) (section E-F) into rotary motion of the feed worm (4) and the scraper (34) attached to it. Irrespective of the direction of drive of the motor the two parts always rotate clockwise causing the grease to be scraped off the wall of the reservoir (1) and forced into the housing (17), thus eliminating cavitation and ensuring positive priming of the pump unit.

### Pump insert

The pump insert is secured in the housing (17) by 8 cap screws. It comprises a flange (52) (section A-B) with an eccentric (74) (section I-K) running on a ball bearing, and the pump element (section I-K) bolted to the flange.

The eccentric (74) causes a reciprocating motion in the rocker arm (77). (section E-F). The two feeding pistons (84) are connected to the rocker arm. The double acting pump operates with two pairs of pistons simultaneously such that, as one pair of pistons is on the suction stroke, the other pair forces the lubricant to the outlet ports, through the pressure connection. Each of the two feed pistons fitted in the housing (82) comprises two control pistons (80, 83) in a common bore.

### Suction stroke

At the start of the suction stroke, the pistons (80, 83, 84) are moving together towards the suction channel until the spring-loaded control piston (83) is pressed against the stop thus reaching its final position. As the delivery plunger (84) continues to move, a vacuum is created between the feed plunger (84) and the control plunger (83). As soon as the feed plunger (84) uncovers the suction port, the vacuum, in conjunction with the slight overpressure of the lubricant in the pump housing (17), causes lubricant to be sucked into the cylinder. If the force of the spring (81) is not sufficient enough to enable to move the control piston (83) to the stop into the final position in the housing (82), the control piston (83) is bound to be positively controlled at the end of the stroke, by the rocker arm (77) and displaced into its final position mechanically, thanks to a second control plunger (80) being provided.

### Pressure stroke

Now the feed piston (84) moves towards the pressure connection closing the suction channel. The lubricant enclosed by the feed piston (84) and control piston (83) is moved axially, against the force of the spring (81). At the moment the annular groove in the control piston (83) is reaching the pressure channel, the axial movement of the control plunger stops. The lubricant is forced by the feed plunger (84) rotating in axial direction into the pressure channel. As soon as the two plungers (83, 84) make contact, the stroke of the feed plunger is terminated.

## 6. Specifications

Discharge pressure adjustable, max. :	400 bar
Discharge rate at :	
88 min <sup>-1</sup> :	circa 120 cm <sup>3</sup> /min ( 7 l/h )
151 min <sup>-1</sup> :	circa 235 cm <sup>3</sup> /min ( 14 l/h )
238 min <sup>-1</sup> :	circa 365 cm <sup>3</sup> /min ( 22 l/h )
Max. rpm :	with geared motor : 250 min <sup>-1</sup>
Rotational direction of drive :	right or left
Reservoir capacity :	60 or 100 l
Operating temperature according to design :	- 20 °C to + 80 °C
Compatible lubricants :	up to NLGI class 3, DIN 51818
Integral strainer :	strainer area 40 cm <sup>2</sup> , wire mesh size 0,4 x 0,18 DIN 4189
Integral pressure relief valve :	adjustable from 0 up to 450 bar, adjusted to 400 bar

## 7. Start-up

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### **Pump installation**

Install the pump vertically. Then connect the motor to the control panel (refer to wiring diagram). The motor may rotate in either directions, but with the view to the gearing of the transmission gear box, it is recommended that it should run clockwise.

### **Filling the reservoir and pipe lines**

Efficient operation demands the use of only clean lubricant! Contamination of the lubricant can lead to operation trouble and damage. To shorten the time of the initial start-up it is advisable to fill the grease using a barrel pump or a press via the R-outlet. Containers should only be re-charged via the filler plug provided, preferably by use of a filling pump or grease gun, or from the works bulk supply system. The container must always be kept closed and care taken in ensuring that the lubricant is kept free from dirt and other contamination. Recharging of the container at the correct time is most important, otherwise there is a risk of air finding its ways into the pump and main lines. In contrast to other pumps, no oil is required to be charged for initial start-up. To ensure trouble-free functioning the pump itself should be de-aerated by running it for a period without back pressure. As soon as the lubricant is discharged free of air from pressure connection (P), the feed lines can be connected. Run the pump then and continue to bleed all main lines, then make the connection to the metering elements.

### **Connecting the pressure and relief lines**

The pressure outlet port at the flange (52) (section A-B) has a pipe connection of G 3/8" BSP female thread. When using the pump in a dual-line system, this branch is used to connect the 4/2-way reversing valve (or 3/2-way valve respectively). On the pump housing (17) there is the pressure relief port of G 3/8" BSP to connect the 4/2-way valve. In filling or greasing systems without a change-over valve, this port should be shut by a plug.



**WARNING!** Make sure to fill tube (44) (section A-B) correctly otherwise, and in the event of failing to provide it at all, there is a danger to life and limb to everybody involved.

## 8. Maintenance

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### **Strainer**

The strainer (51) (section A-B) should retain any contamination, which, by carelessness, has been allowed to get into the lubricant. Therefore, check and clean with petrol or spirit the strainer at regular intervals. Any dirt therefore is retained inside the strainer (51). When disassembling the impurities are removed.

#### **ATTENTION**

A blinding filter due to pollution is leading to the bursting of the strainer.

### **Pressure relief valve**

The integral pressure relief valve (54-62) (section A-B) is adjustable from 0 up to 400 bar. Turning the square spindle (62) clockwise the pressure is increased, and turning it anti-clockwise it is decreased. The pressure relief valve is set by the manufacturer's to a pressure of 400 bar.

#### **ATTENTION**

The pressure rating adjusted at relief valve must not be higher than max. admissible operating pressure of the elements installed downflow.

### **Bursting discs**

The respond of the burst plates protects the components of the system (e. g. pipes, fittings etc.) for overpressure.

Two burstings discs (47) are fitted in the stud (48) (section A-B) below the bush (46) which will rupture in the event of failure, or excessive pressure beyond 500 bar building up in the pressure channel in flange (52), e.g. if the relief valve (54-62) is clogged. When these discs burst, the lubricant issues out of the tube (44). In this case, first remedy the cause of failure and replace two new burst discs. Under the plug (53) in the flange (52) there are ten spare discs. When replacing new bursting discs take care that the curved face shows towards the bushing (46). If incorrectly fitted, the burst pressure is apt to be increased to such an extent causing the pump drive to be damaged.

## 8. Maintenance (continuation)

### Geared motor or gear

When being delivered, the geared motor or the gear is ready for operation and filled with oil ARAL Degol MB 680, which is suitable for an ambient temperature range from - 10° C to - 20° C. Refilling is not necessary, filling in excess is apt to heat the pump which is inadmissible. First oil change is recommended to take place at the end of 10,000 service hours. For a temperature range of -10° C, we recommend - among other things - the oil type Degol BMB 220 of Aral. If the oil type recommended by us is not available, the following oil types can be used for a temperature range of up to -20° C:

Aral : Degol BG 220  
 BP : Energol GR-xP 220  
 Calypsol : Biesen Öl MSR 114  
 Esso : Spartan EP 220  
 Mobil : Mobilgear 630  
 Shell : Omala 220  
 Texaco : Meropa 220

For temperatures below - 20 °C ARAL Degol BMB 46 (suitable down - 45 °C) is recommended. The quantity to be recharge is 0.2 litre for 0.75 or 1.5 kW power ratings respectively.

## 9. Plates

### Name plate



### Type plate

BIJUR DELIMON INTERNATIONAL			
Artikel-Nr. Code no.			
Fabrik-Nr. Serial no.		Betriebsdruck max. Operating pressure	
Baujahr Year of manufacture		Fördervolumen Feed volume	
Übersetzung Ratio			
www.bijurdelimon.com		Tel: +49 211 7774 0	