

Operating instructions
Pump BM-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 a technical nature which must not – completely or partially - be distributed nor used nor communicated to others without authorization for competition purposes.

Company address, spare parts and service address

DELIMON

Arminstraße 15

D-40277 Düsseldorf

Phone : +49 211 77 74-0

Fax : +49 211 77 74-210

Branch office

Am Bockwald 4

D-08344 Grünhain-Beierfeld

E-mail : kontakt@bijurdelimon.com

www.bijurdelimon.com

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)

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)

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

- Discharge pressure up to max. 400 bar
- High reliability due to forced control
- Compact and rugged design
- Lubricant: oil, grease, liquid grease
- Geared motors
- Surface signal grey RAL 7004
- Discharge: 2 and 4 litres/h, depends on driving speed

A. PUMP TYPE BMB

B. NUMBER OF OUTLETS

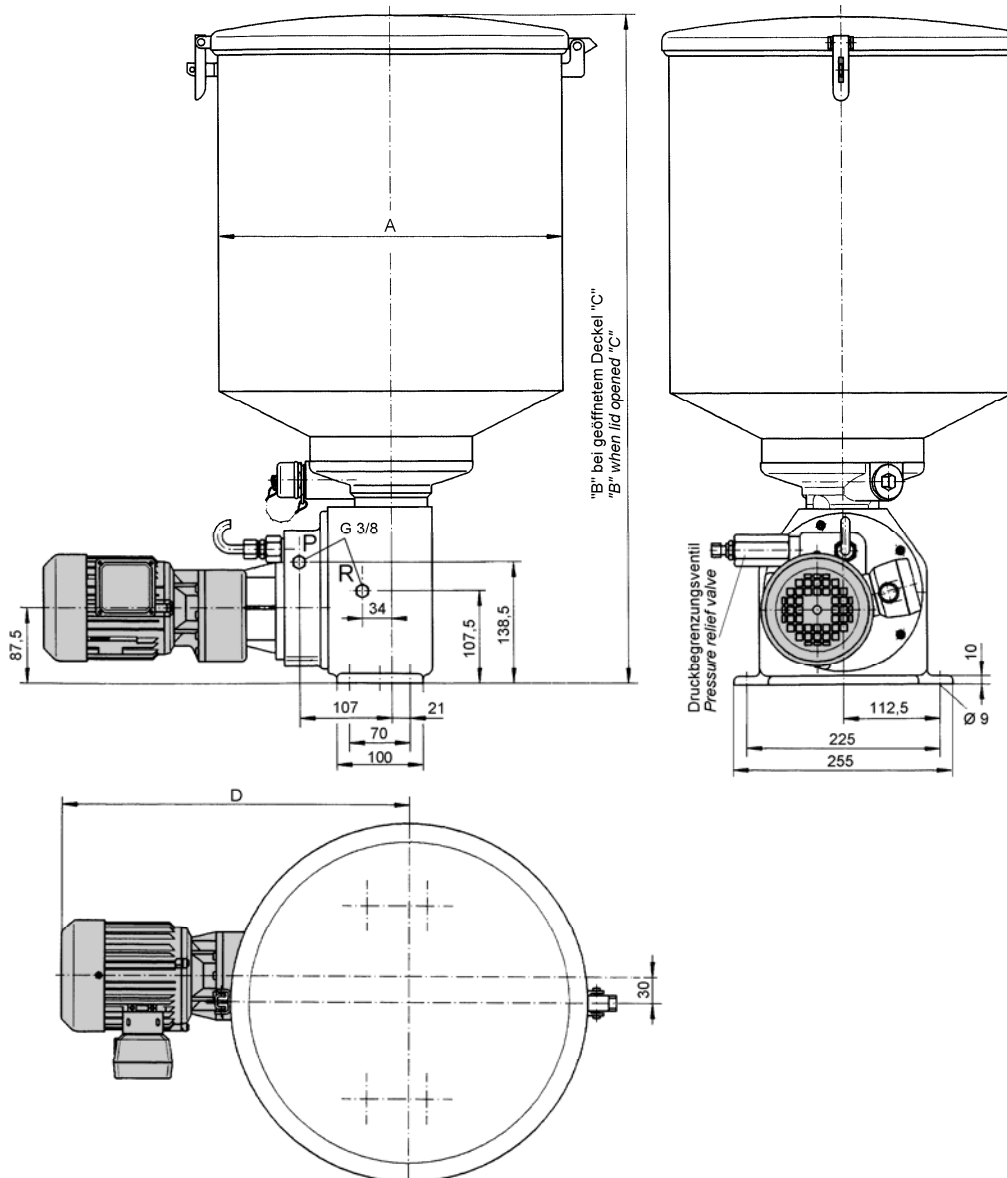
1 outlet

C. REVISION

Status A

D. KINDS OF DRIVE

Flange-mounted geared motor 220 - 240 / 380 - 415 / 50 Hz, 0.18 kw, 63 min⁻¹
 Flange-mounted geared motor 220 - 240 / 380 - 415 / 50 Hz, 0.37 kw, 63 min⁻¹
 Flange-mounted geared motor 220 - 240 / 380 - 415 / 50 Hz, 0.37 kw, 125 min⁻¹
 Flange-mounted geared motor 500 - 525 / 50 Hz, 0.37 kw, 63 min⁻¹
 Flange-mounted geared motor 500 - 525 / 50 Hz, 0.37 kw, 125 min⁻¹
 Flange-mounted geared motor UL / 3/PE 115 V, / 60 Hz, 0.21 kw, 63 min⁻¹
 Flange-mounted geared motor UL / 3/PE 115 V, / 60 Hz, 0.37 kw, 63 min⁻¹
 Flange-mounted geared motor UL / 3/PE 115 V, / 60 Hz, 0.37 kw, 125 min⁻¹



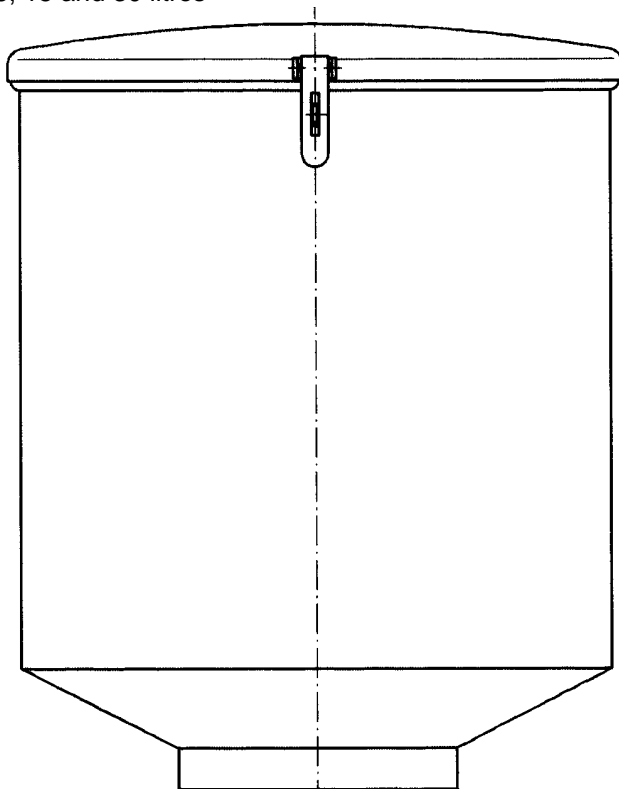
| Design | | Dimensions in mm | | | |
|-------------|--------------------------------|------------------|-----|------|-----|
| | | A | B | C | D |
| Reservoir | 8 litre | Ø 190 | 595 | 785 | |
| | 15 litre | Ø 240 | 630 | 870 | |
| | 30 litre | Ø 310 | 700 | 1010 | |
| Motor power | 0.18 kw, 63 min ⁻¹ | | | | 406 |
| | 0.37 kw, 63 min ⁻¹ | | | | 432 |
| | 0.37 kw, 125 min ⁻¹ | | | | 424 |

E. POSITION OF DRIVE

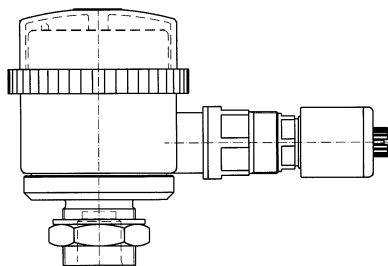
without

F. RESERVOIR

8, 15 and 30 litres



G. ACCESSORIES



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_2005_1_GB_76951_6011



Pressure gauge

3. Application

The pump BM-B, because of the constructional characteristics, may be used in single line-, dual line- progressive- and spray lubricating systems.

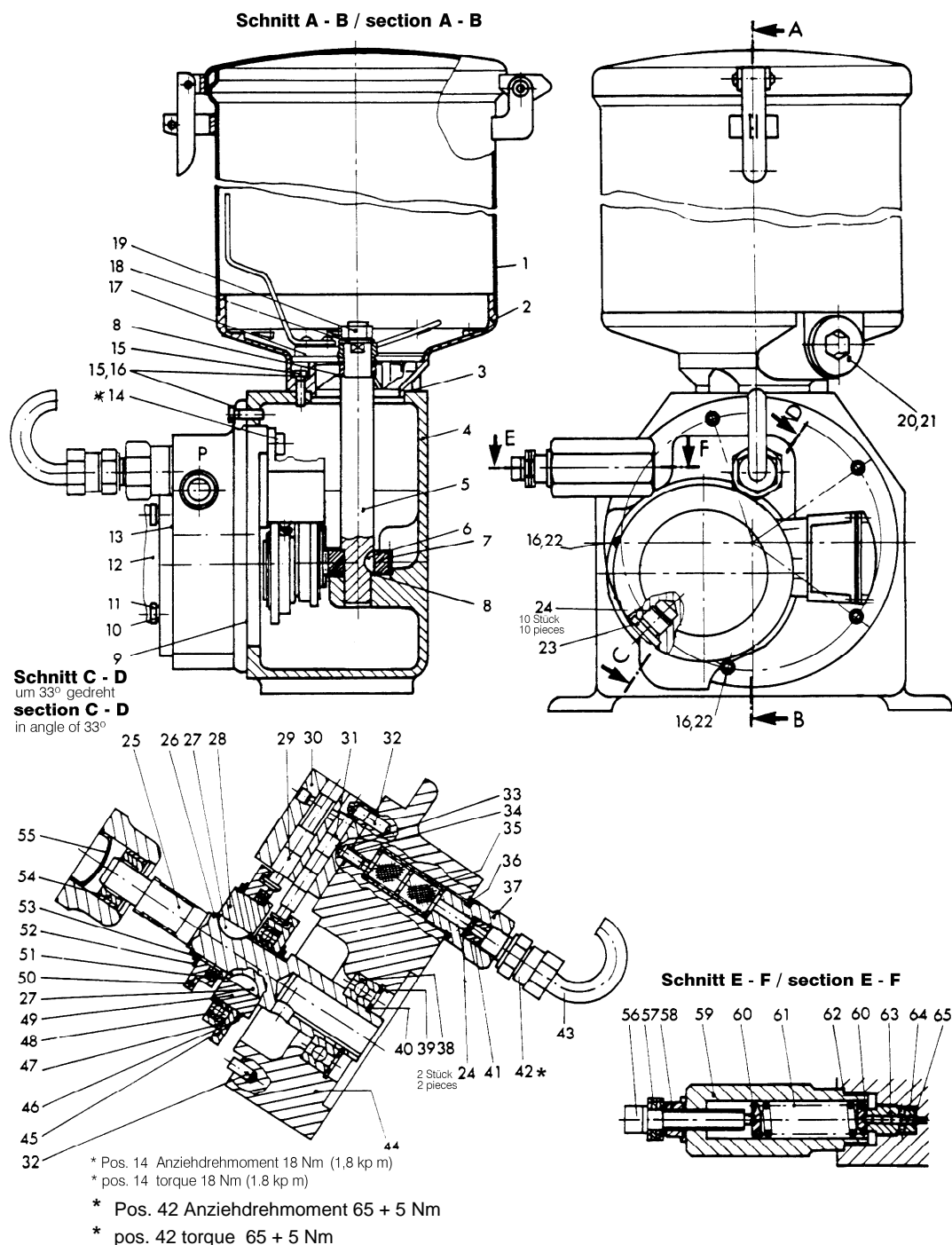
Regardless of the number of lubrication points, the pump BM-B can be effectively adapted to meet any requirements. It can also be used for refilling and mobile greasing systems.

4. Design

The pump consists of a housing together with the pump insert and the lubricant reservoir mounted on top. The pump insert has an integral pressure relief valve.

The delivery and control plungers of the pump element are driven by eccentric cams to which they are rigidly connected. As a result there of, they are positively controlled.

The required delivery pressure can be adjusted by means of an integrated pressure relief valve. It prevents damages to the pump in the event of an inadmissibly high counter-pressure situations. The pump BM-B need not be vented.



5. Principle of operation

Reservoir with wedge plate assy. and scraper

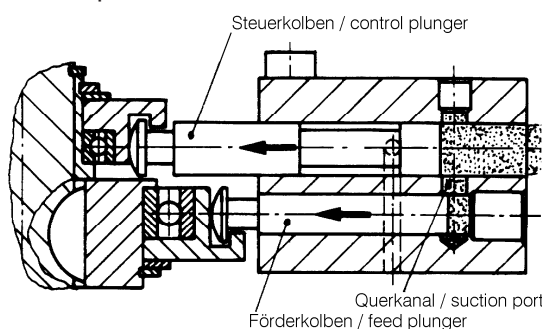
The wedge plate assy (17) is driven by the worm wheel (7, 25) and drive shaft. The grease is thus scraped off the wall of the reservoir and squeezed into the housing (4).

Pump insert

The pump insert is secured in the housing (4) by 5 screws (14, 22). It basically comprises a flange (44) with drive shaft (25) and the pump element with is fastened on top of the flange. Both control- (29) and feed plunger (31) of pump element are driven via an eccentric (28, 50, 51 and 47, 48, 49) running in ball bearings. The plungers are positively controlled in the eccentrics thus seizing (as usually occurring with spring-loaded plungers or with hydraulic pressure load) is prevented.

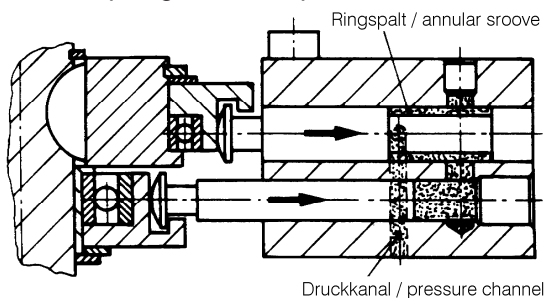
Suction stroke

At the start of the suction stroke, both control- and feed plunger are moved to the left whereby the feed plunger uncovers the suction port. The vacuum in conjunction with the slight overpressure of lubricant occurring inside the housing (4), causes the lubricant to be sucked via the control plunger bore and the suction port.



Pressure stroke

Now both the control- and feed plunger are moved to the right. This uncovers a connection via the annular groove of the control plunger between suction port and pressure channel so that the lubricant is forced by the feed plunger into the pressure channel.



6. Specifications

| | |
|--|---|
| Discharge pressure adjustable, max. : | 400 bar |
| Discharge rate at : | 63 min ⁻¹ : 34 cm ³ /min (2,0 l/h) |
| | 125 min ⁻¹ : 67 cm ³ /min (4,0 l/h) |
| Max. rpm : | with motor : 125 min ⁻¹ |
| Rotational direction of drive : | left |
| Reservoir capacity : | 8, 15 or 30 l |
| Operating temperature according to design : | - 20 °C to + 80 °C |
| Compatible lubricants : | up to NLGI class 3, DIN 51818 |
| Mineral oils : | ISO VG 68 to 1500, DIN 51519 |
| Integral strainer : | strainer area 19 cm ² , wire mesh size 0.4 x 0.18 DIN 4189 |
| Integral pressure relief valve : | adjustable from 0 to 450 bar, adjusted to 400 bar |
| When using the hydraulic 4/2-way valve SAK, the set pressure may not exceed 350 bar. | |

7. Start-up

Pump installation

Install the pump vertically. Then connect the motor to the control panel (refer to wiring diagram). Wire motor so as to ensure that fan runs anti-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. The reservoir should only be re-charged via the filler plug provided, preferably 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 most important, otherwise there is a risk of air finding its ways into the pump and main lines. To ensure trouble-free functioning the pump itself should be bled by operating it for a period without back pressure. As soon as the lubricant is discharged free of air bubbles from pressure connection (P), the feed lines can be connected. Run the pump then and continue to bleed all main lines, then connect pre-filled pipework to the metering elements.

Connecting the pressure and relief lines

The pressure outlet port at the flange (44) has a pipe connection of 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 (and/or 3/2-way valves). On the housing (4) there is the pressure relief port of 3/4" 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.

8. Maintenance

Strainer

The strainer (35) 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 (35) and will be removed when disassembling.

ATTENTION

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

Pressure relief valve

The integral pressure relief valve (56 to 65) protects the pumping element from damage. The pressure can be set according to system requirements from 0 to 400 bar. Turning the square spindle (56) clockwise the pressure is increased, and turning it anti-clockwise it is decreased. The relief valve is set by manufacturer's to a pressure of 400 bar.

ATTENTION

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

Burst discs

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

Two burst discs (24) are located in the stud (37) below the bush (41) which will rupture in the event of failure, or excessive pressure beyond 500 bar building up in the pressure channel in flange (44), e.g. if the relief valve (56 to 65) is clogged. When these discs burst, the lubricant issues out of the tube (43). In this case, first remedy the cause of failure and replace two new burst discs. Under the plug (23) in the flange (44) there are ten spare discs. When replacing new bursting discs take care that the curved face shows towards the bushing (41). If incorrectly fitted, the burst pressure is apt to be increased to such an extent causing in 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 to - 45 °C) is recommended. The quantity to be recharged is 0.1 litre.



Do not mix lubricants with others; Clean gear thoroughly with petrol or spirit before recharging with oil.

9. Plates

Name plate



Type plate

|  | | | |
|---|--|--|--|
| 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 | |