BIJUR DELIMON INTERNATIONAL

Operating instructions

Pump BF-E

INDEX

1. General

Before installing and operating this equipment, we highly recommend that you become thoroughly familiar with these instructions. DELIMON does not accept liability, expressed or implied, for any direct or inconsequential injuries to personnel or damage to equipment, including process interruption, arising from the misuse or misapplication of its products. Application and / or modification of product beyond its intended purpose is strictly prohibited.

DELIMON reserves the right to make modifications, changes and/or amendments to both products and to these instructions as may become necessary to assure ongoing technical clarity.

Contact Information: For assistance with product, replacement parts, service or training.

DELIMON GmbH
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 instructions provide basic guidance which must be followed during installation, operation and maintenance. It is assumed that personnel performing required tasks are skilled in the areas of electrical and mechanical millwright trades plus all local and federal safety requirements. These instructions should be kept near the point of use and made available for reference at all times.

2.1 Identification of safety warnings in the operating instructions

To minimize risk to people working with this equipment, safety warnings included within these instructions must be observed. Potential safety issues are identified through use of the following general danger symbols:

Safety Sign, per DIN 4844, provides warning of potential general danger.

Safety Sign, per DIN 4844, provides warning of potential electrical danger.

ATTENTION

Caution designation utilized to signify that damage to machinery and function may result if guidance is not properly followed.

Instructions affixed directly to machines and equipment must always be observed and maintained to ensure that they are fully legible. Examples of such instructions would be:

- Rotational direction arrows for shafts and couplings.
- Identification of fluid connections, direction of flow and substance contained in pipes.

Important Note: There is always increased risk of slipping or falling whenever spilled or leaking lubricants are present. In all cases, they should be properly removed and disposed of.

Safety Sign, per DIN 4844, provides warning of an increased risk of slipping and falling due to the presence of water, oil, grease or other foreign substances on pavements, floors and walkways.

2. Safety (continuation)

2.2 Personnel qualification and training

Personnel performing work required to install, operate, maintain or inspect this equipment must be adequately trained and qualified. In this regard, determination of competency, understanding and supervision levels required for individual assignment is left to the purchaser of the equipment. However, should assistance with on-site training be desired, please contact your local DELIMON office for assistance.

2.3 Dangers in case of nonobservance of the safety instructions

Failure to properly follow all safety instructions may result in hazard to personnel, the environment or to machinery and equipment. Failure to follow these instructions may also additionally void warranties and nullify claims for damages. Examples of such instances follow:

- Failure of machinery or operating systems to function properly
- Failure to observe proper methods of maintenance and repair
- Unnecessary creation of hazards to personnel by means of electrical shock, mechanical injury or exposure to potentially hazardous chemicals
- Unnecessary creation of environmental hazards through chemical leaks

2.4 Safety conscious working

All Safety Instructions resulting from National, Local or User mandated regulations, as well as those contained within this instruction, must be observed at all times.

2.5 Safety instructions for the user/operator

- Users should always take care that only authorized and skilled personnel are allowed to perform installation, maintenance and inspection work.
- Installation, maintenance and inspection of lubrication systems should only be performed while machinery and equipment being serviced is in “Shut-Down Mode”.
- Protective covers and guards, provided to ensure that contact with moving parts is eliminated during machine operation, (e.g. couplings, pulleys, gears, etc.), must be replaced following maintenance and repair.
- Use “Common Sense”! When hot or cold machine parts can lead to potential dangers, those parts must be handled in such manner so as to avoid human touch; i.e. shielding is required.
- Leaks from shaft seals, reservoirs, piping or fittings should be repaired so as to not cause potentially hazardous materials from escaping to the work area. In instances where such leaks have occurred, all local and National rules and regulations for their recovery and disposition must be followed.
- All potential hazards resulting from exposure to electrical sources must be eliminated. Please refer to VDE and local power company rules and regulations for guidance.
- Before restarting system and equipment, refer to instruction in Section 7; Start-Up Procedure.

2.6 Safety instructions for maintenance, inspection and installation work

Before installing or servicing lubrication equipment and machinery, management should insure that only persons who are fully trained, skilled and authorized to perform such work are assigned to such tasks.
Major installation or modification work should only be performed during shut-downs. It is also imperative that shut-down procedures recommended by equipment manufacturers be followed. Pumps, lubricators and distribution systems which deliver potentially hazardous materials to the environment must be thoroughly cleaned. All safety devices and protective equipment, disabled or removed during cleaning, must be immediately reinstalled and reactivated prior to machine use.

Safety Sign, per DIN 4844, Use Safety Glasses or Goggles.
Advice: Whenever working with compressed air, wear safety glasses

Safety Sign, per DIN 4844, Use Breathing Mask.
Advice: Observe EC-Safety Data Sheet for materials of consumption and additives used and use personal protective equipment.

2. Safety (continuation)

2.7 Unauthorized conversion and manufacture of spare parts

The modification and/or manufacturing of parts for use as spare or replacement parts in DELIMON lubrication equipment, without the written consent and approval of DELIMON Engineering, is strictly prohibited. Any such modification and/or manufacture of component parts shall immediately render any and all warranties as null and void.

2.8 Unacceptable modes of operation

The operational integrity and reliability of all equipment supplied is warranted only when said equipment is utilized in strict accordance with parameters established in Section 1; Introduction. Maximum operating parameters outlined in Engineering Data Sheets must never 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

During proper operation, various component parts of lubricating systems are subject to special requirements as set forth by Environmental Legislation.
General requirements for handling lubricants are specified in their respective safety data sheets.
Used lubricants are hazardous forms of waste and therefore require special handling and supervision with regard to § 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).
Any devices or components which become contaminated with lubricant must be disposed of by a certified waste management company. Additionally, records indicating proper conformance to waste management practice and law must be filed according to NachwV (Ordinance on Waste Recovery and Disposal Records).

GENERAL PRODUCT CHARACTERISTICS

- Electrically driven drum pump
- Discharge max. 100 cm^3/min (3000 r.p.m.)
- Discharge pressure max. 320 bar
- Lubricant grease
- Surface: signal grey RAL 7004

A. PUMP TYPE BFE

B. NUMBER OF OUTLETS

1 outlet

C. REVISION

Stage A

D. KINDS OF DRIVE

Motor 230/400V / 260/460V (1500/1800 r.p.m) 50/60 Hz, 0.25 kW
Motor 230/400V / 260/460V (3000/3600 r.p.m.) 50/60 Hz, 0.55 kW

E. POSITION OF DRIVE

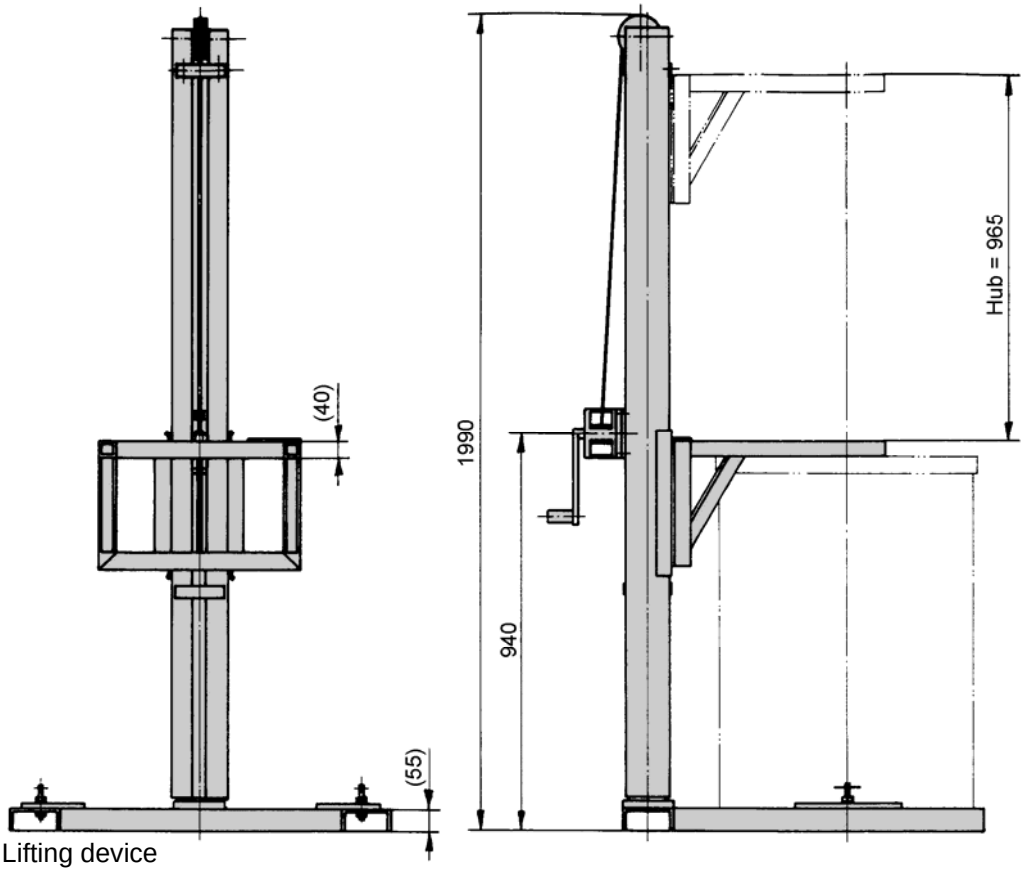
without

F. RESERVOIR /DRUM CAPACITY

200 liters

G. ACCESSORIES

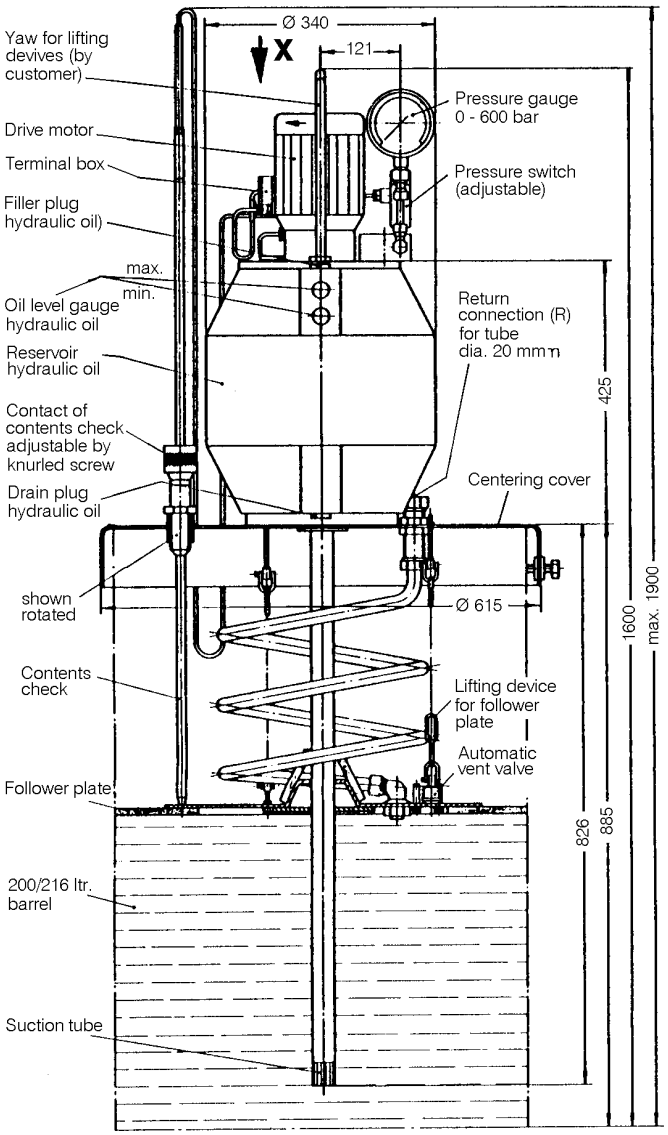
without
Contents control
Relief line
Contents control and relief line
Lifting device
Lifting device and contents control
Lifting device and relief line
Lifting device and contents control and relief line

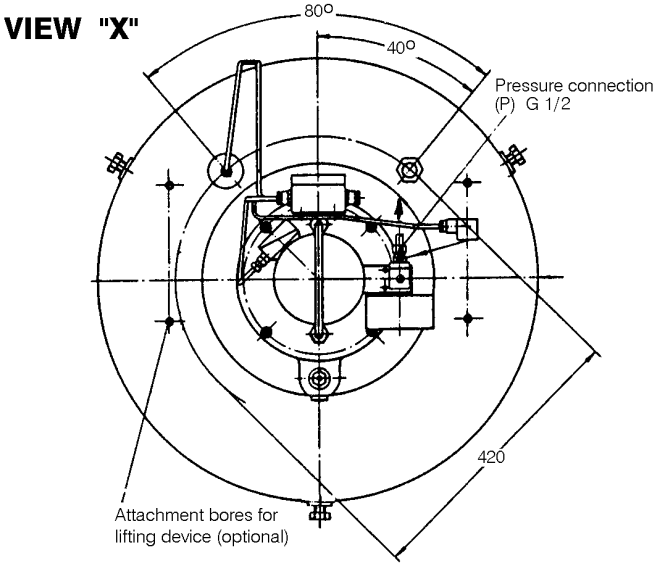


Lifting device

3. Design

The appliance comprises the following assembly groups:
Hydraulic aggregate with electric motor, grease pump with hydraulic motor, centering lid and follower plate with automatic aeration valve.

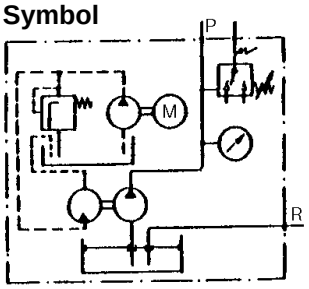




4. Principle of operation

Functional procedure:
The gear pump of the hydraulic assembly, driven by the electric motor, furnishes a continuous supply of oil to the hydraulic motor of the grease pump. When an oil pressure of 10 bar is obtained, because the maximum outlet pressure of 320 bar is achieved on the outlet side, excessive oil volume is released through a safety valve. The hydraulic motor, which incorporates a reciprocating action, transmits its directional movements to the delivery piston of the grease pump via a connecting rod. During upstroke of the delivery piston, grease is sucked in. Grease is then delivered to the pump outlet during the downward stroke. Lubricant discharge pressure is therefore generated based upon the internal ratio between grease pump and hydraulic motor, multiplied by the oil pressure generated by the hydraulic assembly. Outlet / discharge pressure can be adjusted between 100 and 400 bar by setting a pressure switch, provided for this purpose. When the preset pressure value is achieved, the electric motor is switched off to allow for system pressure drop; then switched on again automatically once the pressure drop and preset hysteresis of the pressure switch is achieved.

Symbol



5. Specifications

Lubricant pressure: ..... max. 320 bar
Pressure switch : ..... set to 320 bar, (adjustable from 100 to 400 bar)

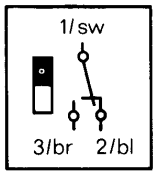
Output volume: optional, depending on driving speed at n = 1500 min^{-1} ..... 50 cm^3 (3,0 l/h)
at n = 3000 min^{-1} ..... 100 cm^3 (6,0 l/h)
Usable lubricants ..... grease up to NLGI class 2
..... (base oil viscosity max. 200 cSt based on mineral oil), DIN 51818
Oils and other media ..... on request
Transmission ratio P1 (lubricant) 45
P2 (hydraulics) 1
Hydraulic pressure ..... max. 10 bar
Hydraulic oil at room temperature ..... = 0 °C, H-L 22 DIN 51524 part 1
..... = 0 °C, H-L 10 DIN 51524 part 1
Oil filling ..... 24 l
Drive motor ..... 3-phase current according to DIN 42677, observe rotational direction
..... IMB 14-71-C 105; 0,25 kW x 1500 min^1
..... or IMB 14-71-C 105; 0,55 kW x 3000 min^1
Voltage ..... 230/400 V, 50 Hz / 260/460V, 60 Hz; other voltage, frequency and speed on request
Protective system ..... IP 44
Room temperature ..... - 20 °C to + 50 °C
Weight (without oil filling) ..... 42 kg
Application: . centering lid and follower plate according to DIN 6643/44 for rolling hoop lid drums 200/216 l
..... and/or rolling channel lid drums 200/216 l
The degree to which the drum is emptied depends on the lubricant to be delivered and the ambient temperature.

5. Specifications (continuation)

Electrical data of the contents control

Kind of contact: ..... 1 change-over switch
Switching capacity: ..... ON 60 VA
Switching current: ..... ON 0,24 A
Voltage max.: ..... 250 V AC
Basic adjustment of contact making with a drum capacity of approx.. ..... 10 l
Adjusting range: ..... 0 – 20 drum capacity
Protective system: ..... IP 65

Circuit symbol: Change-over switch, figure: reservoir level > min.



6. Start-up

- At start-up, fill reservoir of the hydraulic assembly with 24 litters of hydraulic oil.
- Adjust pressure switch according to the lubrication system application / design requirements.
  Dual-line systems with ZV – distributors: 320 bar (standard).
  Progressive systems with ZP-A and E4 distributors 160 bar. ZP-B distributors: 320 bar.
  Single-line systems with ZE-C distributors: 160 bar.

Adjustment of the pressure switch is performed as follows:

- Remove protective cap and loosen lock nut.
- Loosen adjusting screw by turning it counter-clockwise until you cannot feel the spring tension.
- Close lubricant outlet and activate electric motor.
- While operating pump, turn adjusting screw clockwise until the desired pressure is indicated on the system pressure gauge.

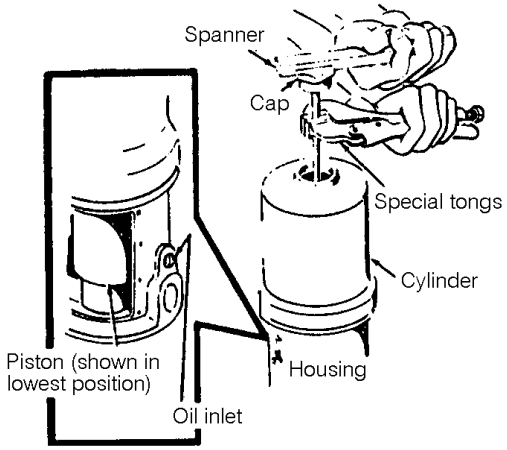
Maintenance of the hydraulic motor

- For ease of handling, remove all hoses from pump before starting.
- Clamp hydraulic motor housing in a vice and carefully move hydraulic piston to topmost position.
- Unscrew cap from cylinder. Affix vice grips to piston rod and pull upward.
- Unscrew cap from rod. Loosen the screws that connect the cylinder with the housing.
- Carefully remove cylinder, taking care not to tilt it, so as to prevent bore from being damaged.
- Push bow in lowest position, but do not put your fingers into the mechanism.
- Remove locking wires from external valves, remove upper lock nut and unscrew valve stem. Remove rubber valve.
- Carefully check all disassembled parts for damage.
- Push rollers downward and inward using vice grip, pliers or suitable object to lift them out of grooves.
- Check spring clip and valve traverse (movement) while in installed position.
- Remove the entire piston rod valve mechanism from bow and traverse.
- Loosen clamps from cylinder if they are to be replaced.
- Clean all parts in solvent and dry carefully.
- Check all parts for damage and wear and replace if necessary.

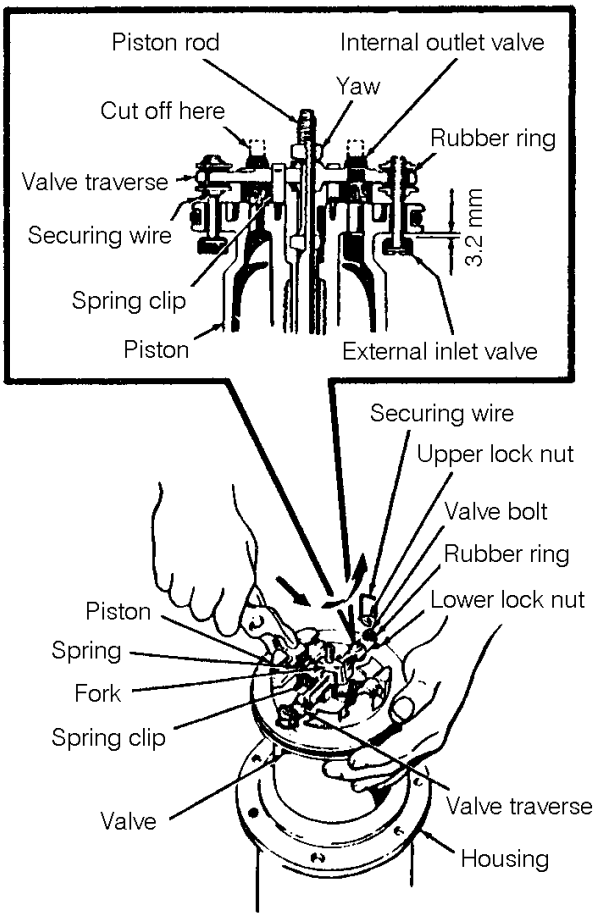
6. Start-up (continuation)

Note

- When replacing the (four) rubber valves, it is recommended that the (two) rubber rings be replaced as well.
- Apply a light grease film to all parts before installing them.
- Install internal valves and rubber O-rings of the external valves. Remove (cut off) pegs from the internal valves.



- Hold mechanism with valve travel in the lower position in such a way that the internal valves align with the outlet holes of the piston.
- Check to ensure that the piston rod moves freely.
- Mount external valves onto the valve stems. Push valve stems downwards through the bores of the housing and screw on lower lock nuts. Push stems through the rubber rings and install upper lock nut.



6. Start-up (continuation)

Before inserting the locking wire, adjust the clearance of the external valves as follows:

- Check clearance between inlet valve and valve seat to be 3.2 mm, screw stems into the upper lock nuts until valve clearance is correct.
- Tighten lower and upper lock nut without changing the adjustment. Align bores of lock nuts, insert locking wire and bend over the ends.
- Move mechanism upwards and downwards to check function.
- Reassemble all parts of the hydraulic motor in reverse order.

ATTENTION

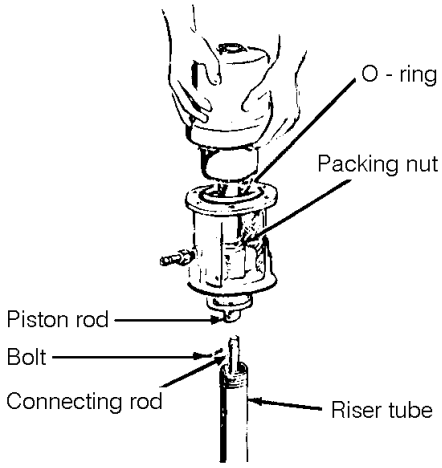
When installing the cylinder, do not tilt it as the bore may easily be damaged.

7. Maintenance

- Clamp housing in a vice.
- Loosen shovel pipe, piston and support
- Loosen shovel pipe, piston and holder.
- Screw ascending pipe off the housing and pull it carefully over the seals to avoid damages.
- Check inner surfaces of the ascending pipe for damages as this may result in pressure variations during the up-stroke.
- Clean all parts and check them, replace damaged parts if necessary.
- Grease all parts and reassemble them.

Replacement of the packing at the hydraulic motor

- Clamp housing in a vice.
- Screw ascending pipe of the housing and draw it from the housing to such an extent that the stud can be removed.
- Remove stud and screw connecting piston rod off the piston.
- Loosen the six fixing screws from the housing towards the cylinder.
- Pull cylinder and piston carefully out of the housing. Check O-ring in the housing and replace it if necessary.
- Loosen packing nut by means of a special wrench or a 6 mm round steel bar. Remove bearing, sealing, disk and packing from the housing, clean and check all these parts, if necessary, replace them.
- If the packings are replaced, also renew the sealings and the bearing.
- Reassemble the parts in reverse order.
- Screw packing nut and sealing tape into the pump case.
- Grease seals, piston rod and piston. Carefully reinstall piston and cylinder.
- Assemble housing and cylinder by means of six screws.
- Assemble remaining parts in reverse order – as described for the assembly.



8. Plates

Name plate

Type plate