Operating instructions

Distributor PVB

BA_2016_1_GB_PVB
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 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 4044, warning about a danger spot, in case of warning about electric voltage with

⚠️ safety sign according to DIN 4044, 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 4044, warning about skid risk.
2. SAFETY

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. 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.

2.8 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

- Progressive distributor / modular design
- Grease and Oil
- up to 20 outlets for pipe 6 mm
- Metered volume 0.17 cm³
- Material: Steel or stainless steel

A. DISTRIBUTOR TYPE PVB

PVB

B. NUMBER OF MAXIMUM OUTLETS

<table>
<thead>
<tr>
<th>Number of outlets</th>
<th>6 outlets</th>
<th>8 outlets</th>
<th>10 outlets</th>
<th>12 outlets</th>
<th>14 outlets</th>
<th>16 outlets</th>
<th>18 outlets</th>
<th>20 outlets</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
<td>135</td>
<td>150</td>
<td>165</td>
</tr>
</tbody>
</table>

C. REVISION

Status A

D. MONITORING

with non-return valve, without motion indicator, without electrical monitoring
with non-return valve, with motion indicator, without electrical monitoring
with non-return valve, with motion indicator, with electronic limit switch
E. CODING OF THE OUTLETS

- **AA**: both outlets open
- **AB**: outlets connected; outlet with odd marking open; outlet with even marking closed
- **BA**: outlets connected; outlet with even marking open; outlet with odd marking closed
- **AC**: outlet with odd marking open; outlet with even marking closed and routed to the next pair of outlets
- **CA**: outlet with even marking open; outlet with odd marking closed and routed to the next pair of outlets
- **CC**: both outlets closed and routed to the next pair of outlets
- **BC**: outlets connected; both outlets closed and routed to the even divider side to the next pair of outlets
- **CB**: outlets connected; both outlets closed and routed to the odd divider side to the next pair of outlets

F. ACCESSORIES

- **without**
  - Inlet screw joint GE 06 LR CF
  - Inlet screw joint GE 10 LR 1/8 CF
3. APPLICATION

Distributors of the above mentioned design are used in progressive centralized lubrication systems. Their field of application is the total loss lubrication for the media oil, liquid grease and grease as well as the oil recirculation lubrication in small and medium-sized machinery. They can be used for machine tools, processing machines, all kinds of presses, plastics and paper processing machines, textile machines, printing machines, wrapping machines and machines of the food and luxury food processing industry.

Further possibilities of use are at open cast appliances in the construction of heavy machinery and in the field of commercial vehicles, among other things also in connection with dual-line systems.

Every use beyond this field of application is considered to be not in accordance with the product’s intended purposes, and the manufacturer is not to be held responsible for any damages resulting from it. The corresponding risk is taken by the user only.

4. DESIGN

General

The progressive distributors are piston distributors in block assembly which meter the lubricant, which they receive via the main line, in partial quantities and allocate it forcibly to the individual lubrication line connections. Here, the pistons have the metering and control function of the lubricant flow. Due to the forcibly bound mode of working of the progressive distributor, a safe operational monitoring of a “progressive lubrication system” is possible with little expenditure only. The distributor works as long as it receives lubricant under sufficient pressure.

Progressive distributor

The progressive distributors PVB consist of the manifold block, in which are arranged the pistons and the functional connection and control bores, the plugs for the determination of the pistons’ lodgment, the screwin threads for the main and lubrication line connections and the bores for the fixation of the progressive distributor. The metered volume started for each lubrication point connection is constant and equal.

It is however possible to collet lubrication point connections in the manifold block according to the requirement in order to increase the metered quantity of lubricant at given connections. This is possible for the connections on the right or left side of a distributor.

In addition to this, it is possible to lead individual or fused lubricant volumes within one metering assembly group to the respective opposite side. For both collection kinds of metered volumes of individual outlets, it is essential to observe certain conditions.
4. DESIGN (continuation)

Control facilities

If required, the progressive distributors can be provided with a visual control facility or a monitoring switch the encapsulated proximity switch of which triggers a pulse. This control facility is always fixed on the right side to the connection having the greatest distance to the inlet (connection C2 to F2). Control facilities are used as visual or electric variant. The visual control facilities consists of the indicator screw fittings and the indicator pin, which is firmly connected with the piston and makes the stroke motion visible. Regarding the electrical control facility, a proximity switch with switching state indication (LED) is actuated by the control pin of the visual control facility.

Pipe connections

ATTENTION

For the connection of the lubrication point lines, special union pieces with nonreturn valve (similar to union piece DIN 2353 - CLL 6 - St) for pipe diameter 6 mm are used, which simultaneously have a sealing function inside the progressive distributor. These union pieces cannot be replaced by normal olive union pieces. The nonreturn valves integrated in the outlet union pieces ensure that the distributor works with reliability even in case of little lubricant volumes and higher counterpressure involved in connection with flexible pipework material.

Dimensions (mm)
5. PRINCIPLE OF OPERATION

When lubricant is supplied to the main line connection of the progressive distributor, piston "A" (for instance) is moved in direction of outlet A1 up to the limit stop, and the lubricant in front of the limit stop is metered to outlet F2. The delivery of lubricant is continued, and piston "B" is moved in direction of outlet B1 up to limit stop, and the lubricant in front of the limit stop is carried to outlet A1. In the continued succession, piston "C" is moved in direction of outlet C1 up to the limit stop, and the lubricant in front of the limit stop is metered to outlet B1 etc.

When all pistons are adjacent to the left limit stops, piston "A" is moved in direction of outlet A2 up to the limit stop, and the lubricant in front of the limit stop is metered to outlet F1. In the sequel of the lubricant supply, the piston "B" and "C" are moved to the right limit stops, piston "B" metering the lubricant to outlet A2, and piston "C" metering the lubricant to outlet B2 etc.

The supply of lubricant to the outlets is effected in the same order as described, until the pistons "A" to "F" have been moved into the respective limit stop side. The functioning of the progressive distributors requires at least 3 metering groups (piston pairings).

An unlimited increase of the number of outlets is theoretically possible.

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**Fusion of outlets**

If it is necessary to fuse individual lubrication point connections in order to increase the lubricant volume delivered for a given lubrication line connection, it is essential to observe the order of the metering of lubricant.

**ATTENTION**

It is basic rule that the two outlets having the greatest distance to the lubricant inlet must not be closed.

**Fusion of two opposite outlets**

- Remove the headless pin, which normally has the task to seal the opposite lubrication line connections, from the connection bore.
- Close the outlet of one side with a plug being capable of receiving a clamping ring and a clamping ring.

**Fusion of several outlets of one side**

- Remove the connecting union piece with clamping ring at the outlets to be fused.
- Close the connections concerned with plug M 10 x 1/6 using seal rings DIN 7603 – A 10 x 13.5 – Cu.
6. INSTALLATION

The progressive distributors are delivered according to the indications made and normally supplied completely with the connecting union pieces for the lubrication point lines.

The progressive distributor is fixed via the two fixing holes Ø 6.4, preferably by means of hexagon head cap screws M 6 x 45 and spring washers DIN 127 – B 6, which protect the screw joint from automatic loosening.

These fixing elements and the union pieces for the connection of the main line are not part of the extent of supply and have to be specified on the order. The final pipe connection at the distributor must not be effected before the lubricant comes without air bubbles out of the pipe having been detached from the distributor. This fact can be recognized by a constant air bubble-free delivery of lubricant.

7. SPECIFICATION

<table>
<thead>
<tr>
<th>Working pressure max.:</th>
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<tbody>
<tr>
<td>layout with motion indicator : 160 bar</td>
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<tr>
<td>layout without motion indicator : 300 bar</td>
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<tr>
<td>Metered volume per piston stroke and outlet : 0.17 cm³</td>
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<tr>
<td>Response pressure : &gt; 10 bar</td>
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<tr>
<td>Temperature range : -20°C up to +120°C</td>
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<tr>
<td>Volume flow for oil and grease : min. 0.5 cm³/min; max. 1000 cm³/min</td>
</tr>
<tr>
<td>Differential pressure between 2 outlets : max. 70 bar</td>
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</tbody>
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Compatible lubricants on mineral oil basis
- Grease lubricants up to NLGI class 2 DIN 51818
- Oil ISO VG 68 to 1500 (DIN 51519) at 20°C ambient temperature
- Synthetic lubricants on request

<table>
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<tbody>
<tr>
<td>Inlet : female thread: G 1/8</td>
</tr>
<tr>
<td>Outlet : Ø 6 mm</td>
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Electrical values of the control facility
- Voltage : 10...30 V DC |
- Switching current max. : 200 mA |
- Make of contact : N/C PNP |
- Protective system : IP 65 |
- Temperature range : -20° up to + 70°C |

8. PLATES

Type plate

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