BIJUR DELIMON INTERNATIONAL

Manual Instructions

Piston pump TB-D
pneumatic

BA_2017_1_GB_TBD_P

ZERTIFIZIERT ISO 9001 CERTIFIED

Index

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!

1.1 Intended Use

The below described pump is designed for use in centralized lubrication systems or to supply downstream lubrication systems. 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 responsilbe 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.

Company address, spare parts and service address

DELIMON GmbH
Arminstraße 15
D-40277 Düsseldorf
Phone: 0211 7774-0
Fax: 0211 7774-210

Branch office
Am Bockwald 4
D-08344 Grünhain-Beierfeld
Email: 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 product 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.

2.2 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. Safety

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 product. The non-observance 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 product/system/machine
- Failure of prescribed methods for maintenance and repair
- Harzard 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 preventation 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 product or 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 electrial 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.

2.7 Unauthorized conversion and manufacture of spare parts

Conversion or modifications to the product 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 consequencial losses null and void.

2.8 Unacceptable modes of operation

The operational reliability of the product supplied is only guaranteed if the product 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_20XX_X_GB)

2.10 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).

3. Application

The pneumatically operated piston pump TB-D has been developed for use in progressive, single-line and multi-line systems.

Progressive system: The pump supplies the total delivery quantity of 4.50 cm^3 to the progressive distributor via outlet X.

Multi-line system: The pump has 9 separate outlets (1-9). Each outlet supplies 0.5 cm^3 to the lubrication point one after the other. If a higher metered volume is required at a lubrication point, then the outlets can be connected to one another externally.

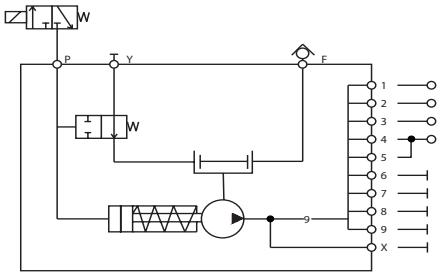
Single-line system: If a pump is used in a single-line system with volumetric piston distributors, systems with a maximum total metered volume of 1.5 cm^3 can be supplied. The delivery volume of 4.5 cm^3 is supplied to the distributors via outlet X. Discharge is performed via connection Y.

4. Function

The delivery piston in the pump is actuated by the impact of compressed air. As the first step, the intake borehole to the tank is closed, and the delivery quantity supplied at the individual outlets 1-9 or the shared outlet X. If the air pressure line is depressurised, the piston moves back to the starting position by spring pressure, and the dosing chamber fills up for the new lubrication cycle. For use in a single-line system, the relief borehole Y is opened and the pressure in the main line drops. The fill level in the tank can be monitored using an optional float switch (oil) or level switch (grease).

5. System description

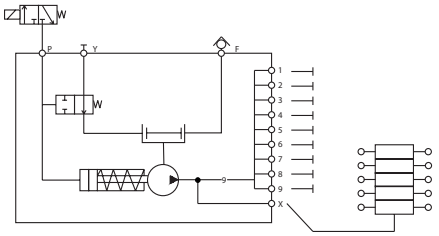
Multi-line system:



With one lubrication cycle, each of the 9 outlets delivers 0.5 cm^3 of lubricant one after the other, starting with 1. Figure 1 shows a system with 5 pump outlets. 2 outlets have been combined externally. As a result, 3 lubrication points receive 0.5 cm^3 of lubricant and 1 lubrication point receives 1.0 cm^3 of lubricant.

The number of outlets must be specified when ordering. The number of outlets can only be changed retroactively via the manufacturer.

Progressive system:



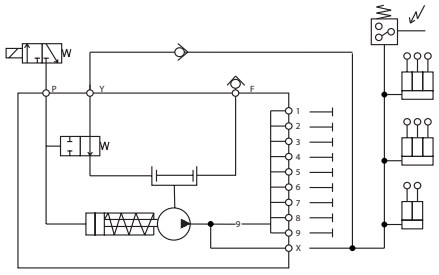
Outlets 1-9 are connected in this system. The main line is connected at outlet X. Outlet X supplies the progressive distributors with 4.5 cm^3 of lubricant per pump stroke. The system can be monitored via a monitoring switch on the progressive distributor.

With a progressive system, lubrication points can also be supplied with less than 0.5 cm^3 of lubricant. More customised distribution can be set up.

The following progressive distributors can be used with the TB-D:

- ZP-A
- PV-B
- PV-E
- M2500

Single-line system:



Outlets 1-9 are connected in this system. The main line is connected at outlet X. As a single-line system requires pressure relief in the main line, the main line must also be connected to the pump's Y connection. In order to prevent the main line from running dry during the relief phase, a non-return valve must be fitted upstream of connection Y. The maximum metered volume for all distributors must not exceed 1.5 cm^3. A main line tension loss of 3.0 cm^3 must be estimated. The main line must be limited to 5 m. If possible, the main line must be laid in a steel tube in order to keep the tension loss to a minimum.

The following single-line distributors can be used with the TB-D:

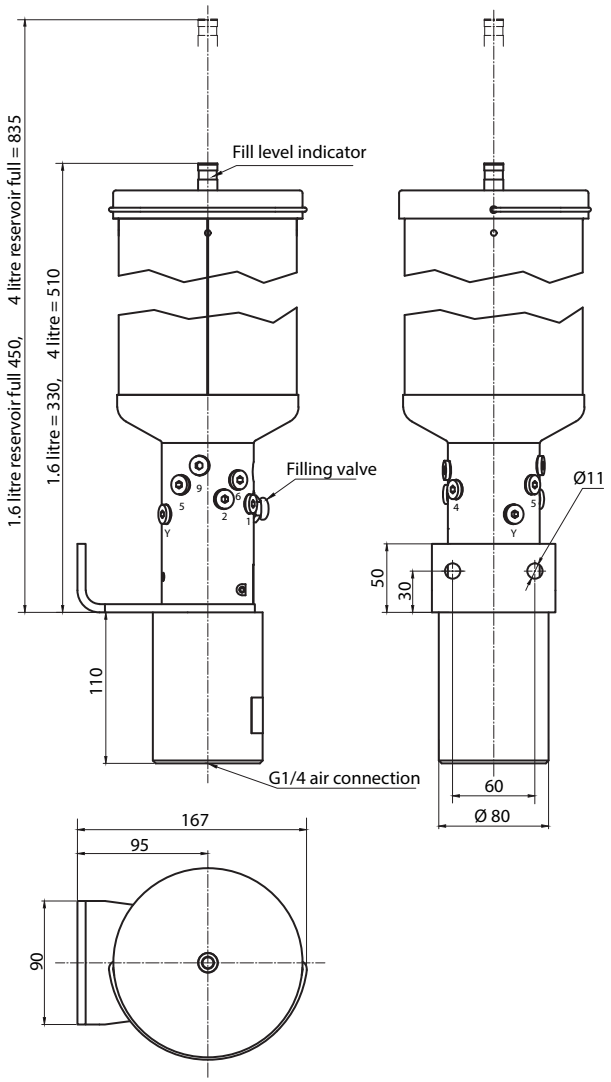
- ZE-C
- FL32
- FL33
- FL42
- FL43

6. Technical Data

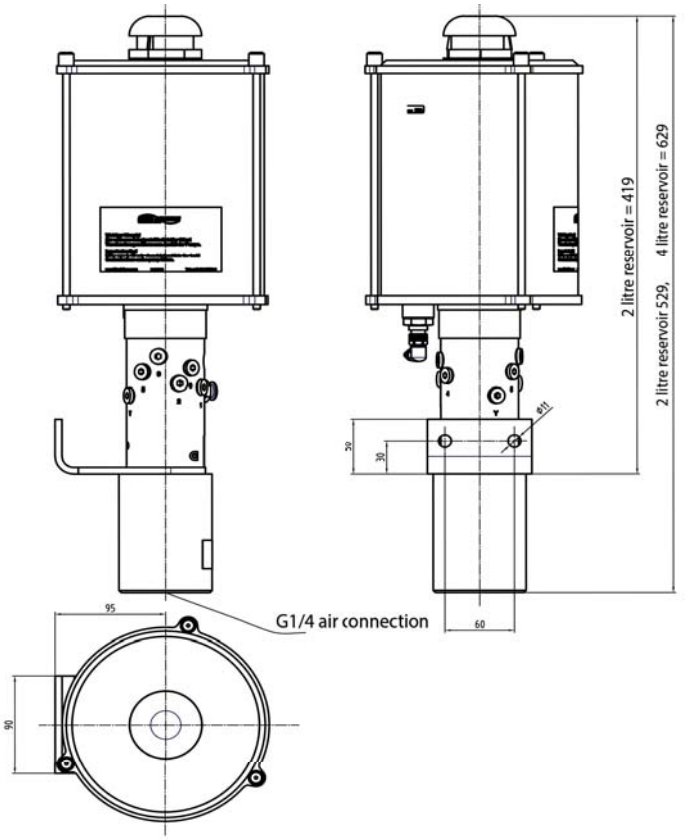
Pumping medium:	Oil viscosity range	20-1500 cSt at operating temperature
	Grease	NLGI class 000-2, DIN 51818
Operating temperature		- 20 °C to + 80 °C
Number of outlets	Optional	1, 2, 3, 4, 5, 6, 7, 8 or 9
Delivery quantity/stroke	Outlets 1-9	0.5 cm^3
	Outlet X	4.5 cm^3
Tank size	Metal	1.6 and 4.0 litres
	Plastic	2.0 and 4.0 litres
Air pressure	Min.	2 bar
	Max.	6.5 bar
ATTENTION! In single-line systems, the maximum permissible pressure for the distributors must be taken into account.		
Transmission ratio		16: 1
Thread	Output	M 10 x 1
	Inlet air	G 1/4
Filling	Grease	Flat-type lubricating nipple DIN 3404
	Oil	Filling spigot with screen on the lid
Material	Pneumatic cylinder	Painted steel
	Seals	NBR / FKM
	Pump body	Galvanized steel
	Tank - metal	Painted steel
	Tank - plastic	Acrylic glass XT colourless/UV resistant

7. Dimensions (mm)

Metal tank



Plastic tank



8. Operation

When pressure is applied to the pneumatic cylinder, the piston is raised, closing the intake borehole. The lubricant in the end cap is then displaced into the inside of the piston via the valve seat and ball. When the piston is moving upwards, its cross holes with ring grooves reach the outlet boreholes arranged at offset heights one by one, with these boreholes dispensing the lubricant. When the pneumatic cylinder is being discharged, the piston is brought into the starting position, whereby lubricant is drawn into the space between the end cap and piston again.

With single-line and progressive systems, the entire delivery quantity of the pump is taken from outlet X. With single-line systems, the discharge lubricant is fed back into the tank through connection Y.

The minimum pulse time depends on the lubricant, the air pressure, the number of outlets and the cross-section and length of the lines. It should be worked out through trial and error.

9. Installation and commissioning

The pump must be attached to a flat, vertical surface. The connecting pipes must be carefully cleaned prior to installation, and filled with clean lubricant.

At initial commissioning, the tank must be filled with oil up to around 1 cm above the pump body, and then with grease. Filling with oil is recommended in order to prevent air pockets in the pump system. After filling, undo the vent screw and put the pump into operation. As soon as the lubricant is emerging from the borehole without any air bubbles, connect the pipes and screw the vent screw back on.

10. Maintenance

Filling the lubricant tank

The tank should be filled up when around 80% of the contents have been used.

With visual fill level monitoring and a metal tank, the TB-D_P pumps have one follower piston. The minimum grease level is indicated by the top yellow ring on the protruding contents display; the bottom yellow ring indicates the maximum grease level.

11. Changing the outlet numbers

The pump is supplied with the required number of outlets, but this can be changed at the place of use.
The outlets are marked with numbers 1 to 8. Each pump body has an end cap with a size that corresponds to the outlet number, and that limits the stroke volume of the delivery piston to the total number of active outlets. The individual caps are marked on the front with the outlet number for which they are intended. To change the number of outlets, the cap will need to be replaced using a socket wrench SW 22.

Closing outlets
If fewer outlets are required than the number on the pump, the unnecessary outlet boreholes are closed using screw plugs. This closure must not be performed arbitrarily, but in sequence, starting from the outlet with the highest number. The end caps must also be replaced as described above.G
Example:
If only 5 outlets are required on a pump with 8 outlets, then outlets 8, 7 and 6 must be closed.

Opening outlets
When increasing the original number of outlets, the corresponding number of screw plugs must be removed in such a way that the numerical sequence of the open outlets is not interrupted. The end caps must then be replaced.
Example:
If a pump has 5 outlets, then outlet boreholes 6 and 7 are opened in order to increase this number to 7 outlets.

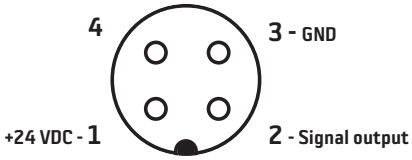
12. Accessories to be ordered separately

Figure	Designation	Item no.
	3/2-way valve for air 24V	38152M029
	GE screw connection GE 06 LL, M 6 x 1 keg CF	734421203
	GE screw connection GE 06 LL, M 8 x 1 keg CF	734421143
	GE screw connection GE 06 LL, M 10 x 1 CF	734421164
	GE screw connection GE 06 LR, R 1/8 keg CF	734420734
	GE screw connection GE 06 LR, R 1/4 keg CF	73442V251
	WE screw connection GE 06 LL, M 6 x 1 CF	734451193
	WE screw connection GE 06 LL, M 8 x 1 CF	734451163
	WE screw connection GE 06 LL, M 10 x 1 CF	734431293
	WE screw connection GE 06 LR, R 1/8 CF	734431214
	WE screw connection GE 06 LR, R 1/4 CF	734431823
	S screw connection WH 06 L, M 10 x 1 CF	734427023
	S screw connection WH 06 LL, R 1/8 CF	734427023
	High-pressure hose DN 04 - 2KT	733121273
	Screw sleeve NW 4 for DN 04 - 2KT	733913443
	Pipe bracket, straight, long, 6 mm	733913513
	Pipe bracket, straight, short, 6 mm	73391S039
	Pipe bracket, 90°, long, 6 mm	733912513
	Pipe bracket, 90°, short, 6 mm	733912831
	Plastic pipe 6 x 1 for air supply	731002183

Cable socket with cable

Designation	2 m cable	5 m cable	10 m cable
M 12 x 1 - straight	M124S02U34	M124S05U34	M124S10U34
M 12 x 1 - 90° angled	M124A02U34	M124A05U34	M124A10U34

Device plug M 12x1 4-pin (A-code)



13. How to order

Code						
TBP		A	01	0		00

Pump type

TB-D pneumatically operated	TBP

Number of outlets

1 outlet (0.5 cm³)	01
2 outlets	02
3 outlets	03
4 outlets	04
5 outlets	05
6 outlets	06
7 outlets	07
8 outlets	08
9 outlets	09
1 outlet X (4.5 cm³)	10

Revision

Status	A

Mode of operation

Pneumatic	01

Drive position

without	0

Outlet coding

1.6 litre / oil / grease / with follower piston / metal reservoir with visual fill level monitoring	A
4.0 litre / oil / grease / with follower piston / metal reservoir with visual fill level monitoring	B
2.0 litre / oil / plastic reservoir without fill level monitoring	E
2.0 litre / oil / plastic reservoir with electric fill level monitoring	F
4.0 litre / oil / plastic reservoir without fill level monitoring	G
4.0 litre / oil / plastic reservoir with electric fill level monitoring	H
2.0 litre / grease / with follower piston / plastic reservoir without fill level monitoring	I
2.0 litre / grease / with follower piston / plastic reservoir with electric fill level monitoring	J
4.0 litre / grease / with follower piston / plastic reservoir without fill level monitoring	K
4.0 litre / grease / with follower piston / plastic reservoir with electric fill level monitoring	L
2.0 litre / semi-fluid grease / plastic reservoir without fill level monitoring	M
2.0 litre / semi-fluid grease / plastic reservoir with electric fill level monitoring	N
4.0 litre / semi-fluid grease / plastic reservoir without fill level monitoring	P
4.0 litre / semi-fluid grease / plastic reservoir with electric fill level monitoring	Q

Accessories

without	00

TBP 10 A 01 0 H 00 - Pneumatic piston pump TBD, 1 outlet X (4.5 cm³), 4 litre tank, pumping medium oil, electric fill level monitoring.

14. Plates (examples)

Company sign

Name plate