

Operating instructions Distributor ZV-F

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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.

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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

- Dual-line manifold block with flange plate
- Grease and oil
- up to 8 outlets
- Metered volume: 1.5 / 3.0 cm³
- Material: maching steel

A. DISTRIBUTOR TYPE ZVF



B. NUMBER OF OUTLETS

1 - 8 outlets are possible.





C. REVISION

Stage A

D. METERED VOLUME

Metered volume 1.5 / 3.0 cm³

Where no future adjustment of metered lubricant volume is desired, the travel of the piston stroke is set using a metering screw. That ensures that the piston always displaces the same quantity of lubricant with every stroke. When an adjusting device is requested, instead of using a metering screw, the length of stroke, and thus metering quantity, can be infinitely changed. However, the minimum volume which can be established should never be reduced below 1/4 of the maximum delivery volume of the distributor.

E. METERING



Metering screw 1/1 for 1 and 2 outlets Metering screw 1/1 for 3 and 4 outlets Metering screw 1/1 for 5 and 6 outlets Metering screw 1/1 for 7 and 8 outlets



Adjusting device with motion indicator for 1 and 2 outlets Adjusting device with motion indicator for 3 and 4 outlets Adjusting device with motion indicator for 5 and 6 outlets Adjusting device with motion indicator for 7 and 8 outlets

F. FLANGE PLATE



Example for distributor with 6 outlets



3. Application

ZV-F distributors are utilized in grease or oil dual-line centralized lubrication systems. Their function is to meter lubricant and feed it to various lubrication points regardless of back pressure.

4. Design

ZV-F distributors are 'block type' metering devices and can be configured to deliver varying amounts of lubricant. Each block incorporates four G 3/8 threaded holes, two on each opposing face, to facilitate main line connection. Two to eight G ¼ threaded ports are provided for connecting to friction point lines, depending on block configuration. This type of distributor functions hydraulically, and is thus 'spring-free'.



with adjusting device and motion indicator



To double outlet delivery rate: (Optional) Block outlet on top or bottom with G $\frac{1}{4}$ threaded plug (5) and 14 x 20 seal (4). Then, remove M 6 x 8 Allen screw (3). (All distributors similar).





with adjusting device and electr. control





4. **Design** (continuation)

Distributor configurations

- Supplied with metering screws for 1/1, 1/2, 1/3 or 1/4 of the maximum metered distributor volume. Note: 1/3 is available for 3.0 cm³ distributor only.
- Supplied with adjusting device for infinitely variable output from nearly zero to the maximum output
 rate. Devices include motion indicator pins which provide visual indication of piston motion during the
 lubricating cycle, or to indicate the piston's travel position.
- Supplied with adjusting device and terminal switch, which produces a signal when the piston has
 reached its terminal (final travel) position. Signals generated can be sent to an indicator lamp or to
 cycle (pulse) monitoring systems. Note: Available with 1.5 cm³ distributor only.

Distributor with odd number of outlets

When 1, 3, 5, or 7 lubrication points are connected to a distributor, the Allen screw located between the two facing outlets is removed by the manufacturer, and the unused outlet is sealed with a G $\frac{1}{4}$ threaded plug. As a result, the lubrication point connected to the block receives lubricant metered by both piston strokes; i.e. twice the volume.

If additional outlets are not used, be sure to modify the block accordingly, as described above.

5. Principle of operation

ZV-F distributors incorporate one metering piston (7) and one control piston (8) for every two lubrication points serviced. During system operation, only one of the two points being serviced by the block will receive lubrication during any given cycle, depending on which main line, Line I or Line II, is pressurized. When the pressurization / depressurization cycle of Line I and Line II is reversed, the other friction point will receive lubricant. For this reason, an operating cycle always consists of two independent pressure

Stroke no. 1



During the pause between strokes, both pistons (7 and 8) are located at their bottom terminal positions. When Line I is pressurized, and Line II depressurized, control piston (8) begins moving. Then, metering piston (7) begins to travel and dispense lubricant due to hydraulic pressure exerted on it from lubricant passing through cross-holes, which is generated as control piston (8) continues its movement. Lubricant displaced ahead of the control piston (8) is pushed into main Line II.



5. Principle of operation (continuation)



During the second lubrication stroke, Line II is pressurized and Line I depressurized. This enables the control piston (8), then the metering piston (7), to begin travelling in the reverse direction to deliver lubricant through the bottom outlet. Pressure seen at the lubrication point equals pump outlet pressure, minus pressure drop across the distributor and main feed line.

To ensure proper distributor operation, and proper control piston (8) function, the pressure differential between the two main lines must be at least 50 bar.

6. Specification

Operating pressure max.:	400 bar
Actuating pressure min.:	10 bar
Metering volume:	1.5 or 3.0 cm ³
Actuating volume:	0.3 cm ³
Number or outlets:	1 to 8
Operating temperature :	- 20° C to + 80° C
Suitable lubricants : Grease lubricants on mineral oil basis Oil lubricants: Synthetic lubricants	up to NLGI-class 3 DIN 51818 ISO VG 68 to 1500 (DIN 51519) as service viscosity 190 mm²/s at request

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<u>Never</u> exert a pressure in excess of 400 bar on the distributors as this results in personnel being exposed to extreme danger!



7. Installation

ZV-F distributors may be installed in any position, regardless of radial orientation. However, access consideration should be given to future maintenance and servicing needs.

To ensure ease of line removal in the future, it is best to install tubing with a 90° angle at the distributors; or to use banjo fittings.

Two threaded plugs (10) are inserted into each distributor to close off unused main line connections. The plugs may be used on the right-hand or left-hand side of the block, depending upon need. They may also be removed whenever the distributors are installed in series.

Whenever high levels of dirt contamination are generated within the installation site, it is recommended that the distributors be installed with the adjustment device facing down. This helps to prevent accumulation of contaminant on the adjustment device.

When mounting distributors without terminal switches, use M 6 x 50 cross-recessed screws per DIN 7984.

To ensure proper circulation of grease through all of the main lines, a distributor must be installed behind the terminal switch. This helps to avoid operating function failure due to grease-hardening, grease-aging, or oil-separating from the grease, and the saponification which often results.

8. Start-up

Output delivery rates are not adjustable on distributors fitted with metering screws (9). Delivery can only be changed by changing to a different metering screw.

Delivery rates can be changed on distributors equipped with adjusting devices having motion indicators. Ouput rates can be changed to suit requirements via the Allen screw (12).

On distributors having electric switches, output delivery rates can be adjusted by turning the Allen screw (12). However, the limit switch (19) and the switching pin (21) must first be removed.

One turn = app. 0.12 cm³. <u>Do Not</u> reduce the output rate below 1/4 of maximum output.

Subsequent connecting of two facing outlets

Future removal of one lubrication point requires that the set screw between the two outlets be removed. A threaded plug must then be inserted into one of the outlets.

9. Maintenance

With the exception of control pistons (8), metering pistons (7) and housings (6), all distributor components are replaceable and can be ordered; or factory replaced. Pistons (7 & 8) require factory replacement.

Work areas should always be kept clean during installation and maintenance activity as contamination entering into the distributors can lead to system malfunction and damage,

10. Plates

Type plate 26 x 52mm (75511-1311)