PRM

Multi-output pump for oil

Operation and Maintenance Manual

Translation of original instructions

CONTENTS

C2295IE - WK 14/19

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Dropsa products can be purchased at Dropsa branches and authorised distributors.
Go to www.dropsa.com or write to sales@dropsa.com

1. INTRODUCTION

This operation and maintenance manual refers to the **PRM** pump and contains important information for the health and safety protection of the personnel who use this equipment.
The most recent version can be obtained by requesting it from the Sales Technical Office or online at http://www.dropsa.com.

This manual must be read carefully and kept so that it is always available to the operators who want to consult it.

2. GENERAL DESCRIPTION

Centralised lubrication systems are designed for automatic lubrication of critical points of friction. Such systems greatly reduce the maintenance costs of the machinery on which they are installed, eliminating downtime for lubrication operations and extending the life of the lubricated components. Furthermore, lubrication systems also allow for all the points that require lubrication to be reached, especially those that are difficult for an operator to reach.
The pump can be used to supply installations with direct-point lubrication systems (multi-line).

2.1. DIRECT-POINT LUBRICATION IN *(MULTI-LINE)*

The PRM pump directly lubricates friction points without needing to use other flow-rate dosing devices. This allows you to have a product for inexpensive lubrication that is versatile and easy to use.
The PRM pump was developed to supply lubrication systems at a single point in agricultural machinery, in installations and in various types of machinery, for use with grease.
It is designed to power up to 12 outputs, allowing you to supply several independent lines.
The number of outputs to be used must be specified when ordering.

2.2. FEATURES AND BENEFITS

- The PRM is a piston pump driven by a camshaft system, designed to be operated with a maximum of 6 pistons on 12 outputs, allowing several independent lines to be supplied. The number of outputs to be used must be specified when ordering.
- The tank containing lubricant can be placed above or below the pump itself, up to 0.5 metres.
- The PRM can run without lubrication up to 100 hours, limiting the risk of seizing in the event of failure to refill the tank.
- The pumps are available with various reduction ratios, allowing greater flexibility of use depending on the type of application.
- The regulation of the flow rate of the single piston can be easily implemented rapidly.
- The outputs can be excluded following a procedure explained later in this manual.
- The PRM is reversible, meaning that it can operate independently of the direction of rotation of the mechanical drive.
- The great strength of the pump, it can be used in harsh environments.

NOTE: The maximum limit of operating the pump without lubricant depends on the environmental conditions and usage at hand.

3. PRODUCT IDENTIFICATION

Pump identification numbers, or part numbers and work orders, as well as the designation of the manufacturer are stamped on the base of the pump.

4. TECHNICAL CHARACTERISTICS

GENERAL TECHNICAL SPECIFICATIONS		
Pumping system	Type	*6 cam-driven pistons*
Delivery	cm^3/rotation [in^3/rev]	*0.015 ÷ 0.06* *0.0009 ÷ 0.0037*
Pump speed (downstream from the base of reduction)	RPM	*Max. 45*
Operating pressure	bar [psi]	*Max. 10 [145]*
Number of outputs	No.	*Max. 12*
Delivery connection (outlet)	Type	*Push-in Ø4mm [Ø0.157in]*
Suction connection (input)	Type	*Push-in Ø8mm [Ø0.315in]*
Operating temperature	°C [°F]	*0 ÷ +70 [+41 ÷ +104]*
Storage temperature	°C [°F]	*-15 ÷ +90 [+5 ÷ +194]*
Net weight	Kg [lb]	*2.5 [5.5]*
Relative humidity	%	*90*
Permitted lubricants	cSt	*15 ÷ 1000*
Noise level	dB	*<70*
Reduction ratios	Type	*2.2:1* *8:1* *8.75:1* *25:1* *50:1*

ATTENTION: Do not start the pump without first making sure that the top of the pump is protected by an appropriate cap.

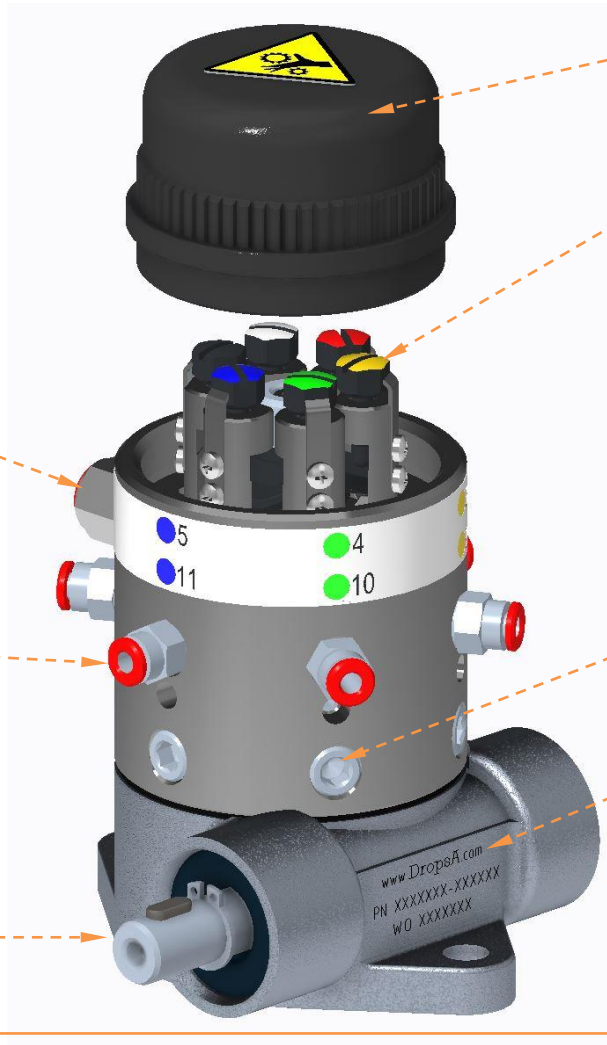
NOTE: The flow rate indicated refers to the following test conditions: 32 cSt oil and standard ambient conditions (temperature 20° C [68° F], pressure 1 bar [14.5 psi]). The flow rate is considered to be free; in the event of counter-pressure, it is subject to change.

NOTE: The viscosity of the lubricant indicated in table is considered to be aimed at the operating temperature. Before the use of lubricating fluids with different characteristics from those listed, please contact the Dropsa technical department.

5. COMPONENTS

In the following, the main components are indicated that make up the pump in the various versions, accessories and related options.

NOTE: The pump is equipped with Ø4 push-in straight fittings on the outputs and Ø8 push-in straight fittings on the input.



6. UNPACKING AND INSTALLATION

6.1. UNPACKING

Once you have identified the suitable place for installation, open the package and remove the pump, and check that it has not suffered any damages during transport and storage. The packing material does not require special disposal precautions as it is in no way dangerous or pollutant. For disposal, refer to local regulations.

6.2. INSTALLATION OF THE PUMP

- Place the pump and, after having connected to the drive shaft, attach it to the support using the appropriate holes Ø8.5 mm (0.335 in) with 2 suitable screws.
- Mount the pump in order to facilitate the connection with the lubricant reservoir.
- Leave at least 100 mm (3.94 in) as a perimeter distance with respect to other equipment or barriers to prevent access to the pump.
- Do not install the pump submerged in liquids and/or in aggressive environments.
- Do not install the pump in environments where there are explosive or flammable mixtures.
- Ensure that the pipes have been properly fastened and protected from any possible impact.

- Verify that the grease used is suitable for operating temperatures. If unsure then contact our Sales Technical Office for the correct choice of lubricant.

6.3. HYDRAULIC CONNECTIONS

The entry point of the lubricant is placed on the side opposite the drive shaft, with an Ø8mm push-in fitting.
All 12 outputs are equipped with Ø4mm push-in fittings and are fed in pairs from the piston positioned directly behind them.
For use in back pressure, it is necessary to use a check valve on the relevant output (Part Number 0092335).

ATTENTION: The pipeline must reach the point of lubrication along the shortest route possible.

7. OPERATING INSTRUCTIONS

7.1. MEASURES TO BE TAKEN PRIOR TO START-UP

- The unit may be put into operation by specialized personnel.
- Using the pump submerged in fluids or in a particularly aggressive or explosive/flammable environment is prohibited unless it has been prepared ahead of time by the supplier for this purpose.
- Use gloves and eye protection as required by the lubricant safety data sheet.
- DO NOT use lubricants that are aggressive to FPM gaskets. If you are unsure, contact the Dropsa S.p.A technical office for a detailed list of recommended lubricants.
- Never ignore health hazards and always follow sanitary regulations.
- Always use suitable piping for the operating pressure.
- Check the integrity of the pump.
- Check the oil level in the tank; in case of low level, refill.
- Ensure that the pump operates at operating temperature and that the pipelines are free of any air bubbles.
- Make sure that all outputs are used or, in the case of excluded/merged outputs, sealed with appropriate grub screws.

To determine the maximum operating pressure, it is necessary to know the pressure drop of the pipeline connected to the pumping elements, depending on the length, temperature and type of lubricant.
Depending on these variables to achieve a proper supply to the delivery point, it is always necessary to ensure that the pipeline pressure loss plus the pressure required at the lubrication point does not exceed the maximum pressure supplied for pump delivery.

ATTENTION: To avoid any malfunction and void the warranty, we recommend using a lubricant free of impurities.

7.2. ADJUSTING THE FLOW RATE DISPENSED

The flow rate dispensed by the pair of outputs, supplied by a single piston can be adjusted independently with respect to the others.
For the adjustment of the flow rate, proceed as follows:

- Make sure that the pump is stopped and secured
- Make sure that there is no residual pressure in the delivery pipeline.
- Remove by unscrewing the cap of the pump
- Identify the outputs for which you want to change the flow rate
- Move the regulation screw all the way down or in the maximum flow-rate position (0.06cm^3/rotation [*0.0037in^3/rev]*)
- Unscrew the adjusting screw to obtain the desired flow rate, taking into consideration that one screw rotation or 6 clicks of the holding spring corresponds to a reduction in flow rate equal to 0.01cm ^{3}/rotation [*0.0006in^3/rev]*
- Screw the cap onto the pump

ATTENTION: Make sure, when adjusting the flow rate, to never go below the flow-rate minimum limit, or 0.015cm^3/rotation [*0.0009in^3/rev].*

ATTENTION: The flow rate values relating to individual outputs and their adjustments are intended to be doubled in the event merged inputs are requested at the time of making your order.

7.3. OUTPUT EXCLUSION

When necessary, you can turn off the flow of lubricant from specific pairs of outputs. This procedure can only be applied on pairs of outputs supplied by the same piston and it is not possible to exclude an output by leaving out the other functioning one.

To exclude the outputs, proceed as follows:

- Make sure that the pump is stopped and secured
- Make sure that there is no residual pressure in the delivery pipeline.
- Remove by unscrewing the cap of the pump
- Identify the outputs that you want to exclude and the relevant piston
- Unscrew and remove the piston adjusting screw
- Close the exits with the appropriate grub screws (part number 3232098)
- Screw the cap onto the pump

7.4. USE

- Start the transmission connected to the pump shaft
- Ensure that the pump starts.
- Ensure the adequate lubrication of the machine (if there are doubts on correct operation, you can contact the Dropsa S.p.A. Technical Office and ask for the testing procedure).

7.5. HOW TO USE

The pump is driven mechanically by an input shaft on the outside and connected to the pump by means of special joints. The speed of rotation of the pump, and consequently the flow rate will depend on the rotational speed of the crankshaft and the transmission ratio of the pump.

For the operation of the lubrication system, refer to the machine's management and control instructions where the pump is installed.

8. PROBLEMS AND SOLUTIONS

Below is a troubleshooting table where the main faults, probable causes and possible solutions to be carried out immediately are indicated (contact Dropsa).

In the event of doubts and/or irresolvable problems, do not search for the fault disassembling parts of the pump, but rather contact the Dropsa Technical Office.

TROUBLESHOOTING TABLE		
FAULT	**CAUSE**	**REMEDIAL ACTION TO BE TAKEN**
The pump works but lubrication does not arrive at the lubrication points.	Lines disconnected.	Check the condition of the lines and the relative connections to the fittings. Replace worn lines.
	Excessive pressure in the pipes	Check the pressure drop on the lubrication system; use of check valves on the outputs (part number 0092335).
The lubricant is distributed to the lubrication points in irregular doses.	Use with backpressure on the outputs without check valve	Use of check valves on the outputs (part number 0092335).
The pump does not dispense lubricant.	The reservoir is empty.	Fill the reservoir with clean lubricant;
	The tap of the tank is shut off.	Open the tap to allow for proper pump supply.
	Use of unsuitable lubricant.	Empty the reservoir and refill it with a suitable lubricant again.
	Suction of blocked pump	Dissemble the pumping element and re-clean the suction pipes.

9. DISPOSAL

Do not dispose of polluting components in the environment during pump maintenance or in case of demolition; refer to local regulations for correct disposal. Upon demolition of the pump, the identification label and any other document must be destroyed.

10. HANDLING AND TRANSPORT

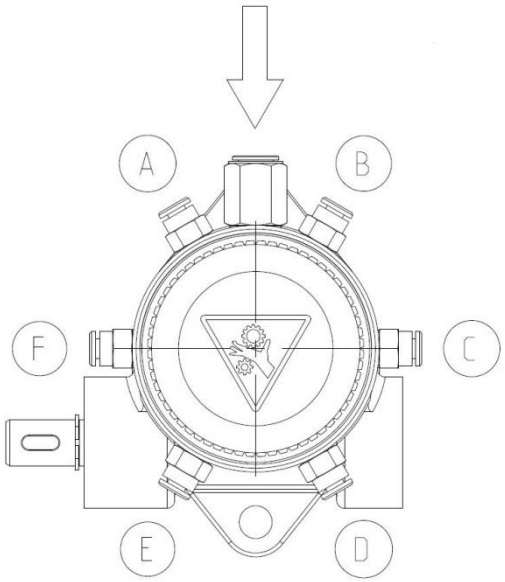
Before shipment, the pumps are carefully packed inside a cardboard box. During transport and storage of the equipment, pay attention to the direction indicated on the box. Upon receipt, check that the packaging is not damaged and store the pump in a dry place.

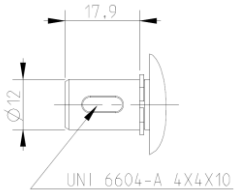
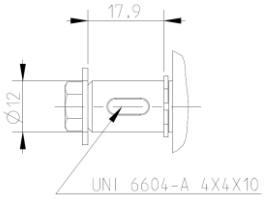
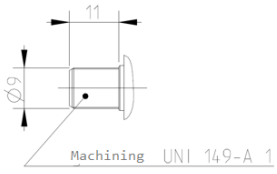
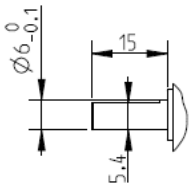
11. ORDER INFORMATION

STANDARD PUMP			
PART NUMBER	**DESCRIPTION**	**REDUCTION RATIO**	**SHAFT TYPE**
0146200-000000	PUMP PRM12B2,2S	2.2:1	A
0146201-000000	PUMP PRM12B25S	25:1	B
0146202-000000	PUMP PRM12B50S	50:1	B
0146203-000000	PUMP PRM12B8S - REDUCED	8:1	C
0146204-000000	PUMP PRM12B8,75S - FLANGED	8.75:1	FLANGE
0146205-000000	PUMP PRM12B16,66S - REDUCED	16,66:1	D

CODING FOR MERGING OUTPUTS						
	OUTPUT					
	G	H	I	L	M	N
01462_ _-						
DON'T MERGE=	0					
MERGE=	1					

Input
Push-in Ø8



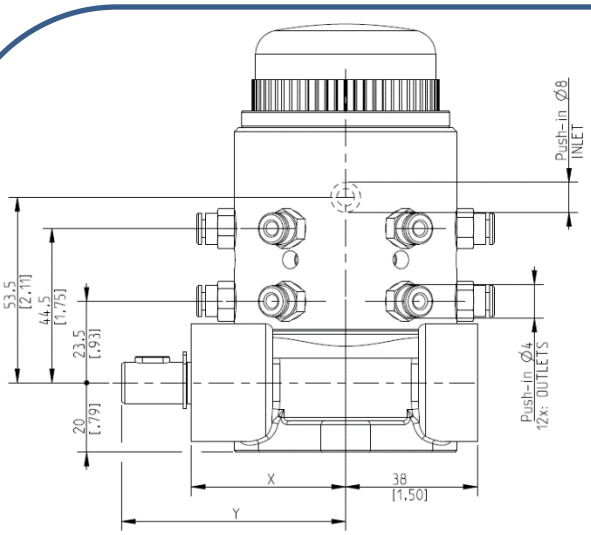
SHAFT IN DETAIL	
DESIGNATION	**DETAIL**
I	
II	
III	
IV	

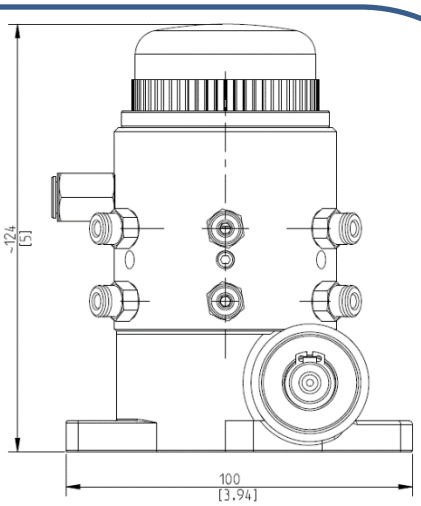
Example of a PRM with a Type-C shaft , 8:1 reduction ratio and merged outputs in position B, C and D; the reference string will be: *0146203-011100*

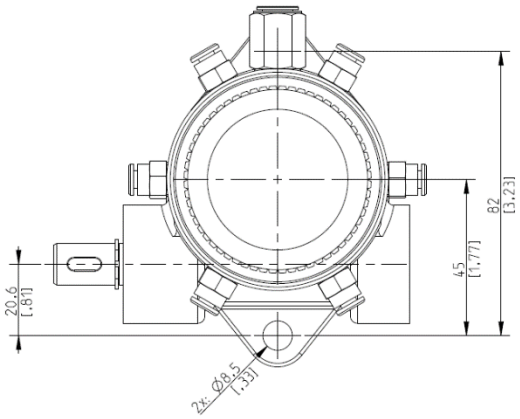
OPTIONAL KITS and ACCESSORIES	
PART NUMBER	**DESCRIPTION**
0092335	Check valve
3232098	Grub screws to close the outputs
0911096	Push-in fitting, 90°, adjustable, G1/8" Ø4
3084672	Push-in fitting, 90°, adjustable, G1/8" Ø8
0146180	Elastic coupling for shaft type C
3200182	Flexible coupling for shaft type D

SPARE PARTS	
PART NUMBER	**DESCRIPTION**
3084577	Push-in straight fitting G1/8" Ø4
3084676	Push-in straight fitting G1/8" Ø8
0146176	Grease type
0146173	Adjustment screw
0146172	Holding spring
0146174	Pump-base gasket

12. DIMENSIONS

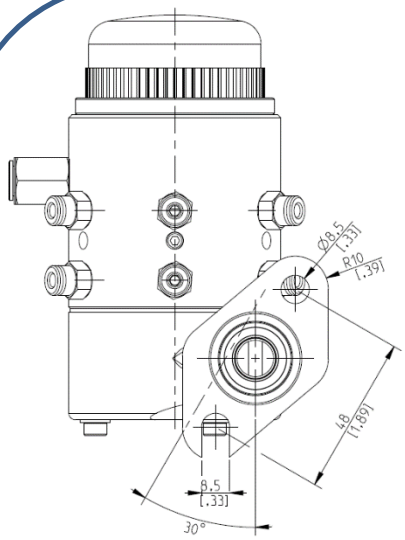


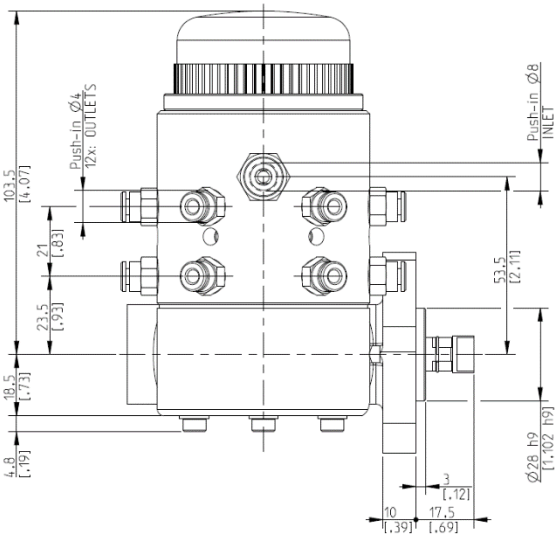


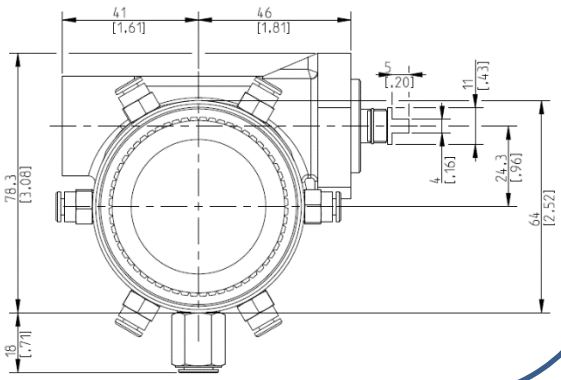


Part number	"X"	"Y"
0146200-000000	44.5	64.8
0146201-000000	44.5	69.7
0146202-000000	44.5	69.7
0146203-000000	36.6	48.8
0146205-000000	36,6	52,8

Dimensions in: *mm [in]*







13. MAINTENANCE PROCEDURES

The pump does not require special tools for any check and/or maintenance operations. In any case, it is recommended to use suitable equipment and personal protective equipment (gloves, protection goggles, etc.) that in good condition in accordance with applicable regulations to avoid injury or damage to parts of the pump.
The unit has been designed and built in such a way that it requires a minimum level of required maintenance. Nevertheless, it is recommended to always keep the body of the equipment clean and periodically check the tube joints in order to be able to readily detect any leaks.

ATTENTION: Before any maintenance or cleaning operation, make sure that the mechanical drive is disconnected and the tank supply tap is shut off.

13.SCHEDULED MAINTENANCE

The following table lists the periodic inspections, the frequency and the intervention that the maintenance will have to carry out in order to ensure the efficiency of the system over time.

CHECK	FREQUENCY INTERVAL	INTERVENTION
Line attachment	After the first 500 hours of operation Every 1500 hours of operation	Check the joint fittings. Check the fastening to the parts of the machine.
Reservoir level	As required	Restore the lubricant level in the reservoir.

14. PRECAUTIONS FOR USE

- **Operating Type**
  You should not attempt any work on the machine before having disconnected the mechanical drive and making sure that nobody can reconnect it during the intervention.
- **Flammability**
  The lubricant generally used in the lubrication circuits is not inflammable fluid. However, it is imperative to take all necessary steps to prevent it from coming into contact with very hot parts or naked flames.
- **VALVE**
  Before any operation, check for the absence of any residual pressure in all branches of the lubricant circuit, that could cause spurts of oil in the event that fittings or components are disassembled.
- **Noise**
  The equipment does not emit noise exceeding 70 dB (A).

ATTENTION: The warnings on risks using a lubricant pump implies must be carefully read. The user must be familiar with operation through the Operation and Maintenance Manual.

14.1. LUBRICANTS

For information on the technical characteristics and the safety measures to adopt, see the Product Safety Data Sheet (Directive 93/112/EEC) related to the type of lubricant selected and supplied by the manufacturer.

NOTE: The pump is designed to work with lubricants 15 ÷ 1000 cSt. Use FPM gasket compatible lubricants. The lubricant used for assembling and testing possibly remaining inside is mineral oil 32 cSt.

15.CONTRAINDICATIONS OF USE

The hazards that have not been entirely eliminated, but that have been deemed acceptable, are listed below:

- During the maintenance phase, low pressure spurts of lubricant are possible. (For this reason, maintenance operations must be carried out using suitable PPE).
- Presence of moving mechanical parts. →Make sure that the cap is present and screwed on firmly before starting the pump.
- Contact with lubricant during maintenance or filling the reservoir. → Protection from direct or indirect contact with the lubricant must be ensured by the user of the machine. (See the DPI regulation on proper use according to regulations in force).
- Use of unsuitable lubricant. →The characteristics of the lubricant are indicated both on the pump and in this Operation and maintenance manual (in the event of any doubt, contact the Dropsa S.p.A. Technical Office).

PROHIBITED FLUIDS	
FLUIDS	***HAZARDS***
Lubricants with abrasive additives	*High wear of the contaminated parts*
Lubricants with silicon additives	*Seizing of the pump*
Petrol – solvents – flammable liquids	*Fire – explosion – damage to the gaskets*
Corrosive products	*Corrosion of the pump – damage to personnel*
Water	*Oxidation of the pump*
Food substances	*Contamination of the same*