MOTOR-DRIVEN GEAR PUMP Series 340

User and Maintenance Manual

Original text translation

Warranty information

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CE

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1. INTRODUCTION

This manual refers to ***Motor-driven Gear Pump, Series 340.***
You can find additional copies and newer revisions of this document from our website http://www.dropsa.com. Alternatively contact one of our sales offices.
This User and Maintenance Manual contains important information on health and safety issues for the personnel. It is recommended to attentively read this manual and carefully keep it in good condition so that it is always available to personnel requiring to consult it.

2. GENERAL DESCRIPTION

This *Motor-driven Gear Pump* has been designed to be used in mineral oil lubrication systems. The *340 Series* is particularly suitable for feeding lubrication systems.
Three basic versions of *motor-driven gear pump* are available:

- With built-in non-return valve. Equipped with non-volumetric injectors or dosing valves, for single line lubrication systems. Working pressure is < 20 bar (290 psi) in continuous or intermittent service - ***System 01***;
- With built-in non-return valve, for feeding progressive dosing units. Working pressures are < 30 bar (435 psi) in continuous service and < 70 bar (1015 psi) in intermittent service - ***System 26***;
- With built-in release valve, for feeding volumetric dosing valves in intermittent service lubrication systems. Working pressure is < 70 bar (1015 psi) in intermittent service - ***System 04-06***.

3. PRODUCT - MACHINE IDENTIFICATION

Pump identification yellow label is located on the frontal side of the pump and contains pump serial number, input voltage and details of its operating parameters.

4. TECHNICAL CHARACTERISTICS

4.1 GEAR-PUMP

<table>
<tr><th colspan="3">MOTOR</th><th>Three-phase</th><th>Single- phase</th></tr>
<tr><td colspan="3">Revolutions per minute</td><td colspan="2">1500</td></tr>
<tr><td rowspan="5">By-pass calibration</td><td rowspan="3">Max Pressure on Intermittent Service*</td><td>LINE 01</td><td colspan="2">5 bar
(73.5 psi)</td></tr>
<tr><td>LINE 26</td><td>70 bar
(1015 psi)</td><td rowspan="2">40 bar
(588 psi)</td></tr>
<tr><td>LINE 04-06</td><td>50 bar
(735 psi)</td></tr>
<tr><td rowspan="3">Max Pressure on Continuous Service</td><td>LINE 01</td><td colspan="2">5 bar</td></tr>
<tr><td>LINE 26</td><td rowspan="2">30 bar
(435 psi)</td><td rowspan="2">20 bar
(290 psi)</td></tr>
<tr><td>LINE 04-06</td></tr>
<tr><td colspan="3" rowspan="2">Flow rate</td><td colspan="2">350 cc/min (21.35 cu.in./min)</td></tr>
<tr><td colspan="2">500 cc/min (30.51 cu.in./min)</td></tr>
<tr><td colspan="3">Storage Temperature</td><td colspan="2">-20°C ÷ +50°C (-4°F ÷ +122°F)</td></tr>
<tr><td colspan="3">Working Temperature</td><td colspan="2">+5°C ÷ +40°C (+41°F ÷ +104°F)</td></tr>
<tr><td colspan="3">Operating Humidity</td><td colspan="2">90% relative humidity</td></tr>
<tr><td colspan="3">Continuous sound pressure level</td><td colspan="2"><70 dB(A)</td></tr>
<tr><td colspan="3">Oil Viscosity**</td><td colspan="2">15 ÷ 1000 cSt
(73.31 ÷ 4628 SUS)</td></tr>
</table>

****With intermittent service at 50%, to obtain the maximum pump performance, a maximum time of 5 minutes must not be exceeded followed by a subsequent pause time of 5 minutes.***
****** Should it be necessary to utilise a different product, prior authorisation must be obtained from Dropsa S.p.A.***

4.2 ELECTRIC MOTOR

Motor	Three phase	Single phase
Description	Special 220/380V, 240/415V,225/440V	220V (on request 110V)
Frequency	50-60 Hz	
Size	56	
Power absorption	90W approx.	
Protection grade	IP 55	
Insulation Class	F	
Continuous Service	S1	
Intermittent service (25%)	S3	-

WARNING: **Operate the pump only with the voltage indicated on the product label and within the specific operating parameters.**

5. PUMP COMPONENTS

Pump unit consists of:

- a ***gear pump*** serving the lubrication circuit;
- an ***electric motor***;
- a ***reservoir*** (pump without reservoir are also available);
- a ***suction filter***, filtering degree → 260 micron;
- an easily accessible ***monobloc valve***, mounted external the reservoir and consisting of a by-pass valve which can be easily adjusted externally; a delivery fitting or connection both of G1/8 UNI-ISO 228/1 (1/8 BSP) with housing for double-cone and Ø6mm (Ø0.23 in.)pipe; a connection G1/8 UNI-ISO 228/1 (1/8 BSP) for the manometer; a non-return valve or a release valve for the functioning of systems with direct response dosing valves;
- a ***manometer*** for line pressure;
- a ***minimum level contact***: *Magnetic type* - reversible float with contact normally closed (NC) on minimum level. Maximum switching power 50W ÷ 50VA; maximum switching voltage 220VAC, maximum current 3A. On request a minimum level and lubricant reserve supply indicator are available: fitted with floats and two switches (minimum and zero).

It can also be fitted with the following accessories:

- ***Pressure switch***
  Three versions may be mounted depending on the lubrication system and high/low working pressures (*see table par. 11.5*).

- ***Control panel***
  This control panel (single- or three-phase), called "VIP", allows the monitoring of the different operating parameters: level and pressure switch alarms, working and pause cycles (refer to VIP controller *User and Maintenance Manual*).

- ***Dual level contact***
  Equipped with two floats which operate two contacts. The superior contact signals lubricant reserve supply while the inferior signals level zero. As a rule, the inferior contact is connected in a way which allows to use the same contact as machine stop-circuit.

6. UNPACKING AND INSTALLING THE PUMP

WARNING: **The unit must be used, opened and repaired only by qualified personnel.**

6.1 UNPACKING.

Once a suitable location has been found to install the unit, remove the pump from the packaging. Check the pump has not been damaged during transportation or storage. No particular disposal procedures are necessary as packaging materials are no dangerous for health or environment. However, packaging should be disposed of in accordance with regulations that may be in force in your area or state.

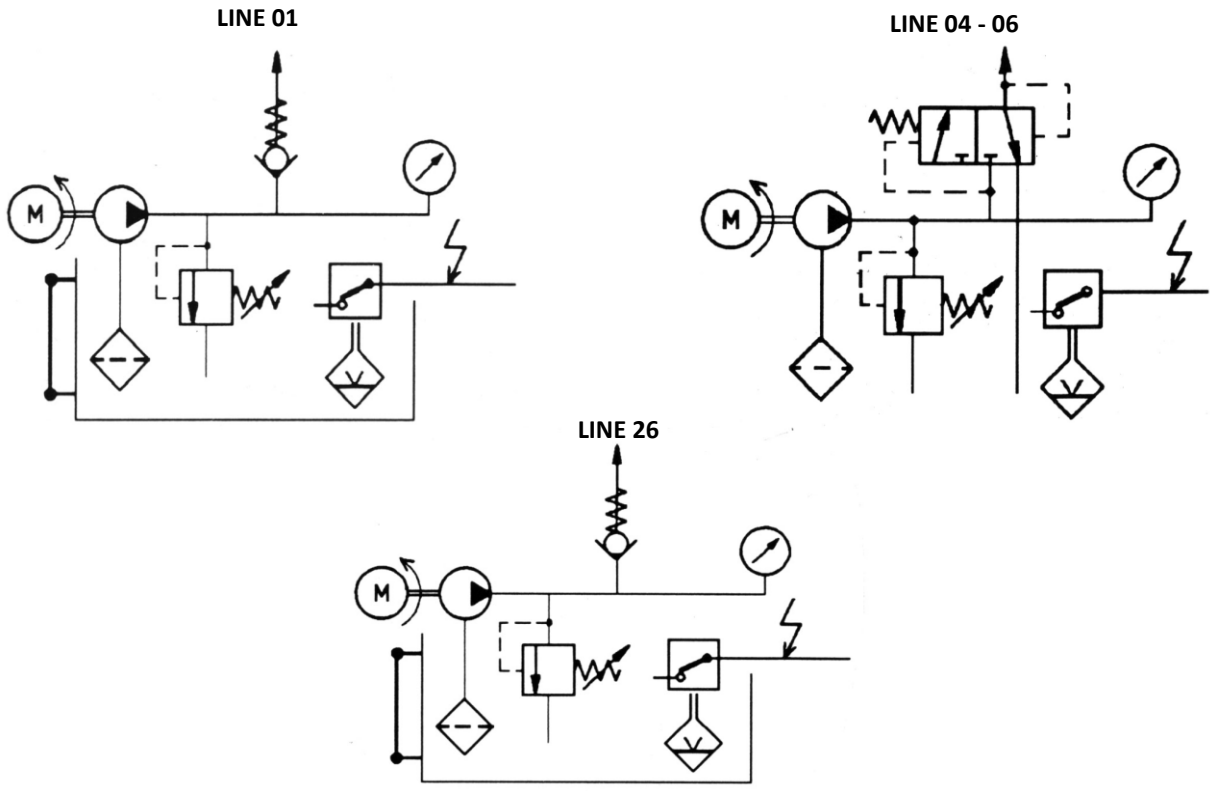
6.2 INSTALLING THE PUMP

- No pump assembly operations are envisaged.
- For wall mounting ensure adequate space (see dimensions diagram, *Ch. 12*) to avoid unnatural postures and possible impacts.
- Four fixing holes are provided with different characteristics depending on the pump version (For the correct fixing verify the distance between centres shown in the diagram *ch. 12*).
- First connect the pump hydraulically to the machine and then to the control panel.

6.3 HYDRAULIC FITTING

Gear pump is connected to valve block via ∅4mm (∅ 0.15 in.) nylon tubing.

HYDRAULIC CONNECTION DIAGRAM



6.4 PRESSURE ADJUSTMENT

Pressure is the only modifiable parameter. To adjust pressure, rotate the adjustment screw clockwise (to increase) or anticlockwise (to decrease).

WARNING: **At the end of the all connecting operations, make sure that pipes are safe from impacts and carefully fixed.**

7. PUMP OPERATIONS

7.1 PUMP START-UP

7.7.1 Prior to pump start-up

- Verify pump is undamaged.
- Check that electrical connections have been carefully carried out (CEI 64/8, IEC 364).
- Verify that pressure switch connection – mounted on reservoir - has been carried out at 24V.
- Verify that level and pressure switch connections to control panel have been correctly carried out.
- Refill the reservoir with compatible lubricant, (min/max lubricant indicator on reservoir).
- Check working temperature: MIN temperature +5°C (+41°F)

Unless otherwise specified by the customer, the minimum level indicator is supplied with the contact closed for minimum level. Should the user require to use a normally open contact, it will be necessary to open the reservoir and invert the operating direction of the float.

7.7.2 After pump start-up

- Switch ON the pump.
- Verify pump start-up.
- Check rotation direction of electric motor: if rotating in the wrong direction, invert the cable connections.
- Verify piping is air bubble- free.
- When using a VIP controller: verify the settings on the control panel.
- Verify machine correct operation.

If doubts exist as to machine correct functioning, please contact Eng. Dept. of Dropsa S.p.A. to request test procedures.

7.2 PRECAUTIONS TO BE TAKEN DURING CONNECTING PROCEDURE

- Prior to any operation, verify the voltage of the machine on the product label.
- In order to prevent dangers of electric shocks due to direct or indirect contact with the energized parts, electrical power supply line must be protected by a suitable magneto-thermal circuit breaker with an intervention threshold of 0.03 Ampere and 1 second minimum operating time. Circuit breaker power must be = 10 kV and nominal power In = 6 A.

8. TROUBLESHOOTING

WARNING: **This unit can be opened and repaired only by authorized Dropsa personnel.**

The following diagnostic table indicates the main anomalies which may be encountered, the probable causes and possible solutions.
If doubt exists or you cannot solve the problem, do not attempt to search for the trouble by disassembling parts of the machine but ***contact the Engineering Department of DROPSA S.p.A***.

ANOMALY	PROBABLE CAUSE	SOLUTION
Pump does not deliver oil. **Pump delivers oil incorrectly**	• Pump is drawing off air because the reservoir is empty • Suction filter dirty or fouled • Internal connections are loose • Wear of the pump • Pressure adjusting valve loosening: before flowing down through the delivery valve, oil flows back immediately to the reservoir	• Refill the reservoir and discharge air from the system • Wash the filter with petrol and blow compressed air through it • Tighten all connections ensuring there are no leakages • Replace the pump • Tighten the adjusting screw until oil flows out from the delivery valve
Pump delivers oil at an improper pressure	• Release valve damaged • Wrong calibration of the adjusting valve	• Replace the valve • Pump outlet must be connected to a hose - approximately 300 mm (11.81 in.) long - with a manometer connected to the free end. Adjust pressure by turning the screw and reading the corresponding pressure value on the manometer
Pressure in line not released	• Presence of dirt under the valve • Adjusting valve is faulty	• Disassemble and clean the valve. Replace it, if necessary • Disassemble and overhaul the valve. Replace it, if necessary

9. MAINTENANCE PROCEDURE

Motor-Driven Gear Pump, Series 340 does not require any special tool for checking or maintenance tasks. However, it is recommended the use only of appropriate and in good conditions tooling, protective devices (gloves, glasses) and clothing (according to current regulation) to avoid injury to persons or damage to machine parts.
For an easy maintenance, it is advised to assemble the machine in a comfortable and reachable location.
Prior to any maintenance intervention:

- Verify that power supply and hydraulic feeding are disconnected.
- Empty the reservoir.

***WARNING*: To avoid contact with mineral lubricant, use suitable personal protective clothing and devices.**

Periodical checks:

INSPECTION	WORK CYCLE
Lubrication status	1000
Oil level	2000
Cleanliness of refilling and suction filters	4000
Deposits on the bottom of the reservoir	6000

10. DISPOSAL

During maintenance or disposal of the machine care should be taken to properly dispose of environmentally sensitive items. Refer to local regulations in force in your area.
When disposing of this unit, it is important to ensure that the identification label and all the other relative documents are also destroyed.

11. ORDERING INFORMATION

11.1 RESERVOIR CHARACTERISTICS AND DIMENSIONS

Material	Capacity		Dimensions lxdxh		Weight	
	lt	gals	mm	in.	Kg	lb
Transparent Nylon	2.7	0.59	240x138x166	9.44x5.43x6.53	0.4	0.88
Aluminium	3	0.66	240x138x171.5	9.44x5.43x6.75	1.4	3.08
Steel	6	1.32	327x184x255	12.87x7.24x10.03	4.6	10.14
	11	2.42	327x184x400	12.87x7.24x15.74	8	17.63
	15	3.3	327x184x509	12.87x7.24x20.03	9	19.84

11.2 LINE 01

ASSEMBLY							
FLOW RATE at 1500 rpm	MOTOR	RESERVOIR					
		None	2.7 lt (0.594 gals)	3 lt (0.66 gals)	6 lt (1.32gals)	11 lt (2.42 gals)	15 lt (3.3 gals)
			Transparent Nylon	Aluminium	Steel		
350 cc/min (21.35 cu.in./min)	Three-phase 220/380 V 50Hz 3301374	3404023	3404031	3404032	3404034	3404048	3404049
500 cc/min (30.51 cu.in./min)		3404022	3404030	3404033	3404035	3404042	3404043
350 cc/min (21.35 cu.in./min)	Single-phase 110 V 50Hz 3301375	3404026	3404055	3404051	3404056	3404053	3404054
500 cc/min (30.51 cu.in./min)		3404046	3404039	3404040	3404041	3404044	3404045

11.3 LINE 04-06

ASSEMBLY							
FLOW RATE at 1500 rpm	MOTOR	RESERVOIR					
		None	2.7 lt (0.594 gals)	3 lt (0.66 gals)	6 lt (1.32gals)	11 lt (2.42 gals)	15 lt (3.3 gals)
			Transparent Nylon	Aluminium	Steel		
350 cc/min (21.35 cu.in./min)	Three-phase 220/380 V 50Hz 3301374	3405098	3405200	3405204	3405206	3405294	3405295
500 cc/min (30.51 cu.in./min)		3405100	3405201	3405205	3405207	3405243	3405244
350 cc/min (21.35 cu.in./min)	Single-phase 110V 50Hz 3301375	3405123	3405240	3405324	3405325	3405296	3405297
500 cc/min (30.51 cu.in./min)		3405124	3405298	3405241	3405242	3405245	3405246

11.4 LINE 26

ASSEMBLY							
FLOW RATE at 1500 rpm	MOTOR	RESERVOIR					
		None	2.7 lt (0.594 gals)	3 lt (0.66 gals)	6 lt (1.32gals)	11 lt (2.42 gals)	15 lt (3.3 gals)
			Transparent Nylon	Aluminium	Steel		
350 cc/min (21.35 cu.in./min)	Three-phase 220/380V 50Hz 3301374	3405099	3405202	3405230	3405291	3405292	3405293
500 cc/min (30.51 cu.in./min)		3405101	3405203	3405231	3405232	3405251	3405252
350 cc/min (21.35 cu.in./min)	Single-phase 110V 50Hz 3301375	3405121	3405235	3405299	3405300	3405301	3405302
500 cc/min (30.51 cu.in./min)		3405122	3405303	3405236	3405237	3405253	3405254

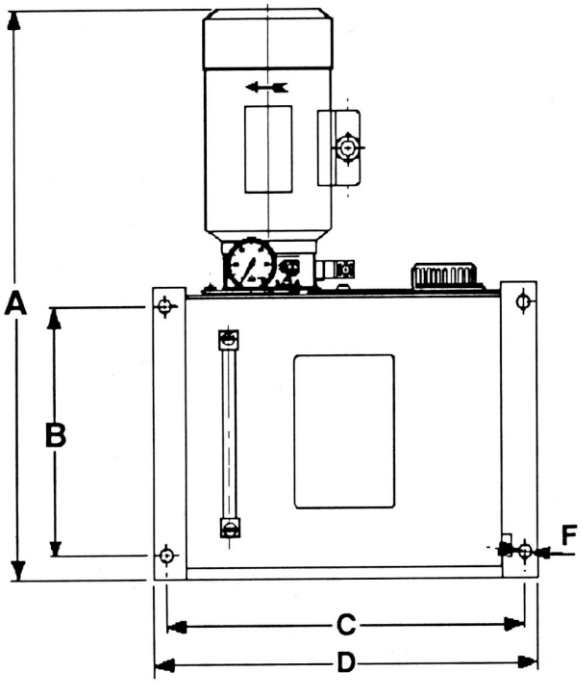
11.5 ACCESSORIES AND SPARE PARTS

PART DESCRIPTION			PART N°		
			LINE 01	LINE 04-06	LINE 26
Gaskets kit			3132000	3132001	
Manometer			20621	20620	
Suction Filter			3130052		
Dual level contact			1655571		
Reservoir visual level kit		3 lt (0.66 gals)	3289101		
		6 lt (1.32 gals)	1524435		
		11 lt (2.42 gals)	3289006		
		15 lt (3.3 gals)	3289008		
Gear pump		350 cc (21.35 cu.in.) /1500 rpm	3099129		
		500 cc (30.51 cu.in.) / 1500 rpm	3099130		
Electric motor		3-phase continuous service 220/380 V 50Hz - 90W 4 pole	3301374		
		Single-phase 110 V-50Hz - 90W	3301375		
Plastic control panel		Single-phase	1639077		
		Three-phase	1639087		
Metal sheet control panel		Single-phase	1639081		
		Three-phase	1639089		
Pressure switch	1-10 bar (14.7 ÷147 psi)	NO	3291028		
		NC	3291031		
	10-20 bar (147÷294 psi)	NO	3291034		
		NC	3291035		
	20-50 bar	NO	3291022		

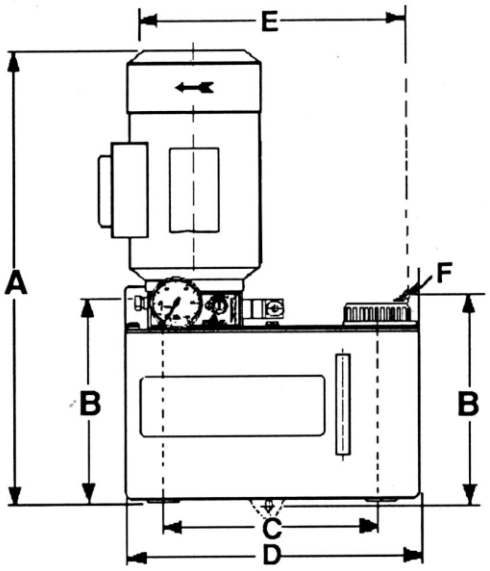
	(294 ÷735 psi)	NC	3291021

12. DIMENSIONS

Allow sufficient space for the installation, leaving minimum 100 mm (3.93 in.) around the machine in order to facilitate any maintenance intervention.



Reservoir capacity: 6 – 11 – 15 lt (1.32 – 2.42 – 3.3 gals)
Depth: 184 mm (7.24 in.)



Reservoir capacity: 2.7 – 3 lt (0.59 –0.66 gals)
Depth: 138 mm (5.43 in.)

Reservoir capacity		A		B		C		D		F - Diameter-	
lt	gals	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
-	-	~ 300	~ 11.81	-	-	-	-	-	-	-	-
2.7	0.59	394	15.51	-	-	175	6.88	240	9.44	6.5	0.25
3	0.66	378	14.88	-	-	220	8.66				
6	1.32	482	18.97	205	8.07	305	12	327	12.87	11	0.43
11	2.42	630	24.80	365	14.37						
15	3.3	740	29.13	470	18.5						

13. HANDLING AND TRASPORTATION

Prior to shipping, pumps are accurately packed and dispatched in cardboard containers. During transportation and storage always maintain the pump the right way up as indicated on the box.
No particular precautions are required except as noted on the package itself.
On receipt, check that packaging has not been damaged and store the pump in a dry place.
For the low weight of the pump, handling can be effected by only one person: *lift the unit maintaining the right way up indicated on the box.*

***WARNING*: Pump components shall withstand a temperature range of –20 °C ÷ + 50 °C (-4°F ÷ +122°F). Anyway, in order to prevent damage, pump must be started-up at a working temperature of +5 °C (+41°F) at least.**

14. PRECAUTIONS

It is necessary to read carefully about the instructions and the risks involved when using lubrication pumps. The user must know pump operation through this manual.

Damage to power supply cable and unit housing could result in contact with high voltage live parts and hence be a danger to life:

- In order to prevent dangers of electric shock due to direct or indirect contact with live parts it is necessary that the electrical power supply line is adequately protected by a suitable differential magneto-thermal circuit breaker with an intervention threshold of 0.03 Ampere and a max. operating time of 1 second.

  The breaking capacity of the circuit breaker must be ≤ 10 kA and the nominal current In = 6 A.

- Carefully check the integrity of power supply cable and pump before use. In the event of damages, DO NOT put the system into service! Replace the damaged power supply cable with a new one.

  ✓ The pump MUST NOT be pump submerged into fluids or used in aggressive or explosive/inflammable environments, if not preventively provided for this purpose by the manufacturer
  ✓ Use gloves and safety glasses as required in the lubrication oil safety chart.
  ✓ DO NOT use aggressive lubricants with NBR gaskets and seals; In case of doubts, please contact the Eng. Dept. of Dropsa SpA, who will provide a chart with the details of recommended oils.
  ✓ DO NOT ignore dangers to health and observe all hygiene standards.

***WARNING*: All electric components and control devices must be grounded. Verify the ground cable is correctly connected. For safety reasons, ground cable must be approx. 100 mm (3.93 in.) longer than the phase cables. In the event of accidental detachment of the cable, ground terminal must be the last to be removed.**

15. OPERATING HAZARDS

Verification of compliance with essential safety requirements and *Machine Directive dispositions* has been carried out filling in checking lists provided and contained in the *technical file*.

Dropsa used three kinds of checking list:

- The list of hazards (according to the EN 414 as it refers to EN 292).
- Enforcement of the essential safety requirements (*Machine Directive* – annex 1, part 1).
- Electric safety requirements (EN 60204-1).

The following is a list of dangers which have not been fully eliminated but which are considered acceptable:

- During assembly/maintenance oil squirts and contact with oil are possible -> See the requirements for the use of suitable personal protective clothing.
- Use of incompatible lubricant -> lubricant characteristics are shown on the pump and in the *User and Maintenance Manual* ***(in case of doubt contact the Eng. Dept. of Dropsa SpA)***.

INADMISSIBLE FLUIDS	
Fluid	**Danger**
Lubricants containing abrasive components	Premature wear of pump
Lubricants containing silicon	Pump failure
Petrol – solvents - flammable liquids	Fire – explosion - seal damage
Corrosive products	Pump damage - danger to persons
Water	Pump oxidization
Food Products	Contamination of product