

PUMP SERIES DRAGON

User and Maintenance Manual

Original instructions

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Manual drawn up in accordance with
EC Directive 06/42

C2000IE– WK 06/14

Dropsa products can be purchased from Dropsa branches and authorized distributors, visit
www.dropsa.com/contact or contact us sales@dropsa.com

1. INTRODUCTION

This manual provides instructions for the use and maintenance of the **Dragone pump**, which is designed for use in lubrication systems using mineral oil or fluid grease.

The manual should be kept in a safe place in which it is protected from damage and does not deteriorate over time; it should be easily available to any staff member who wishes to consult it.

For other copies of the manual, updates or clarifications, please contact the technical office of Dropsa SpA.

The Dragone pump may only be operated by qualified personnel who have basic hydraulic and electrical skills.

The manufacturer reserves the right to update the product and/or manual without necessarily revising the preceding versions. It is however possible to request the latest version in use from the Dropsa SpA technical office.

The overall condition of the pump, and of any accessories attached to it, should be checked immediately after receiving it. In the event of a complaint, immediately contact the commercial office of Dropsa SpA.

DROPSA S.p.A. is absolved from any responsibility for damage to persons or things in the event that the instructions outlined in this manual are not followed.

Any modifications to the components of the system or any usage of the system (and its parts) differing from its intended use without written permission from DROPSA S.p.A. will absolve the company from any responsibility for damage to persons and/or things and will also absolve the company from any guarantee obligations.

The importer and the instructions for ordering the model desired are reported in Chapter 4.

2. GENERAL DESCRIPTION

This series of pumps is particularly suited for feeding lubrication systems. There are three basic versions:

motor-driven gear pumps:

- For lubrication systems with injectors and for circulation systems with operating pressure < 20 bar (290 psi) – system 01
- With a built-in release valve, for lubrication systems equipped with “direct response” feeding devices with operating pressure < 50 bar (750 psi) – system 33V
- For progressive lubrication systems and for circulation systems controlled by progressive feeding devices with operating pressure < 70 bar (1015 psi) – system 26

Pressure maximum:

- with intermittent running is 70 bar (1015 psi) with a three-phase motor, 40 bar (580 psi) with a single-phase motor
- with continuous running is 30 bar (435 psi) with single-phase or three-phase motor.

The operating temperature is + 5 °C ÷ + 40 °C.

The system may only be used with mineral lubricating oil that has a viscosity of 15 ÷ 1000 cSt or NGLI 000 grease (at operating temperature); in the event that a different product is to be used, authorisation must first be received from Dropsa S.p.A.

3. PRODUCT IDENTIFICATION

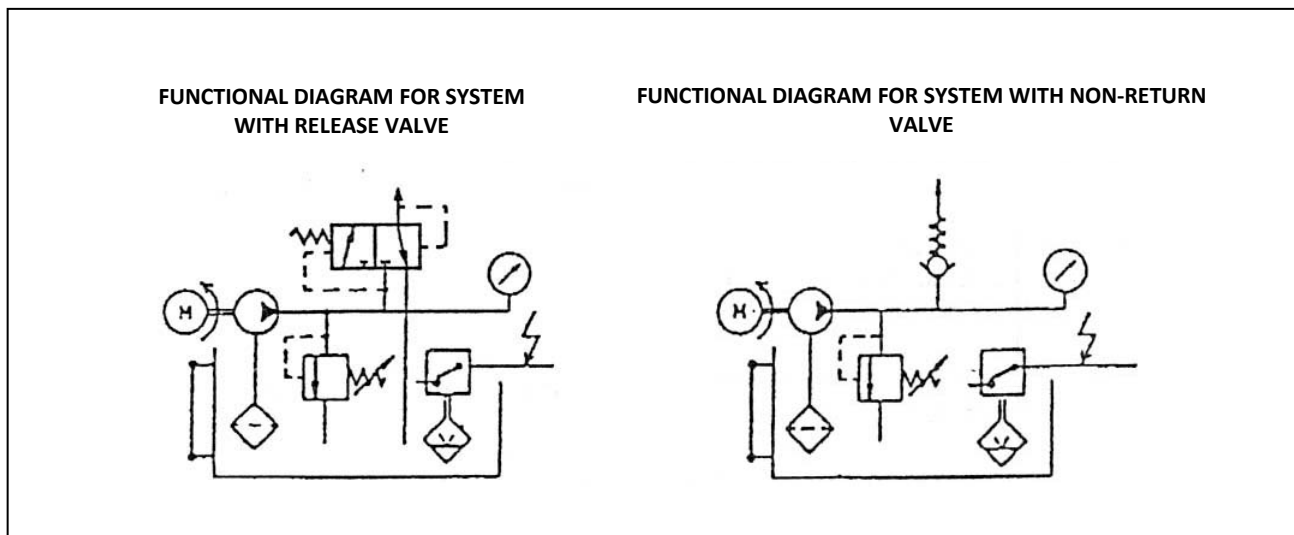
Machine identification yellow label is located on the front side of the reservoir and contains product serial number, input voltage and details of the operating parameters.

4. TECHNICAL CHARACTERISTICS

TECHNICAL CHARACTERISTICS	
Operating Voltage	220 Vac 50 Hz 220 ÷ 440 Vac 50 - 60 Hz
Power absorption	90 W
Output Signal	Contact minimum level: 220V 3A NO/NC
Working Temperature	+ 5 ÷ + 60 °C
Working Humidity	90 %
Mechanical Protection Grade	IP 55
Lubricant Viscosity	Mineral Oil 15-1000 cSt
Storage Temperature	-20 ÷ +65 °C
Sound Pressure Level	< 70 dB(A)

4.1 Hydraulic system

Connection between the gear pump and the valve body by means of nylon tubing, external \varnothing 4 mm.



4.2 Electric system

All the electrical components must be grounded. This applies both to the electrical components themselves and the control devices. To this end, ensure that the grounding wire is correctly connected. For safety reasons, the grounding conductor must be approx. 100 mm longer than the phase conductors. In the event of an accidental disconnection of the cable, the grounding terminal must be the last to detach itself.

In order to avoid the danger of fulguration due to direct or indirect contacts with the live parts, it is necessary that the electric power supply line be adequately protected by a special magnetothermal differential switch with a cut-off threshold of 0.03 Ampere and a maximum cut-off time of 1 second.

The cut-off power of the switch must be 10 kA and the rated current $I_n = 4$ A.



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

5. COMPONENTS

5.1 Gear pump

Two versions available: delivery 350 cm³/min and delivery 500 cm³/min, both at 1.500 RPM.

5.2 Electric motor

Standard motor, three-phase with 4 poles multi-voltage or single-phase, as specified.

Special three-phase motor with the following voltages: 220/380 V, 240/415 V and 255/440 V, frequency 50 - 60 Hz and power 90 W.

Single-phase motor: 220 V, 50 Hz and 90w – on request: 110 V 50/60 Hz

Size 56	IP degree of protection 55	class F insulation	Continuous running S1
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24 V dc motors are available on request.

5.3 Reservoir

There are available four versions:

- 3 liters oil proof Transparent plastic reservoir
- 3 liters alluminium reservoir with visual level
- 6 liters oil proof Transparent plastic reservoir
- 6 liters painted reservoir with visual level

5.4 Indicator of minimum level

Reversible float with contact normally closed at minimum level.

Maximum commutable power 50 W ÷ 50 VA;

maximum commutable voltage 220 ac – 150 V dc, maximum current 3A;

on request, a minimum level and lubricant reserve indicator is available code 1655571.

5.5 Inductive sensor type

For oil and light grease exclusively for 3 lt tanks; minimum voltage 30 V ac and maximum voltage 250 V ac; peak current: min. 15 mA, max. 300 mA.

5.6 Suction filter

Degree of filtration: 260 micron

5.7 Block valve

Mounted inside the tank, composed of a by-pass valve that is easily calibrated from the outside; release valve* for systems equipped with “direct response” feeding devices (04 – 06 - 33).

* The release valve aims to discharge the line pressure when the pump is not in activity. This valve ensures 0.5÷1 bar (7.2÷14.5 PSI) seal on the supply line, in order to avoid the emptying pipes during the pause time of the pump, that is between a lubrication and the next one.



6. UNPACKING AND INSTALLING

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, however packing should be disposed of in accordance with regulations that may be in force in your area or state.

6.2 Installing the pump

In order to facilitate any maintenance intervention, to avoid unnatural posture for personnel during machine operation or the possibility of sustaining impacts, install the machine in a comfortable and easy-to-reach location. Allow sufficient space for the installation.

Do not install the unit in aggressive or explosive/inflammable environments or on vibrating surfaces.

7. OPERATING INSTRUCTIONS

7.1 Installing the pump

Damage to the power supply cable or the housing may result in contact with the high-voltage live elements and therefore the danger of death:

- Check that the power supply cable and the unit itself are undamaged before use.
- In the event that either the power supply cable or the unit itself is damaged, do not turn on the device!
- If the power supply cable is damaged, replace it with a new one.
- The unit may be opened and repaired only by specialised personnel.

- In order to avoid the danger of fulguration due to direct or indirect contacts with the live parts, it is necessary that the electric power supply line be adequately protected by a special magnetothermal differential switch with a cut-off threshold of 0.03 Ampere and a maximum cut-off time of 1 second.

The cut-off power of the switch must be 10 kA and the rated current $I_n = 4$ A.

- The connection of the manostat directly attached to the tank must be effectuated at 24 V ac/dc.
- The pump must not be used while submerged in fluids or in particularly aggressive or explosive/inflammable settings, unless specially preset by the supplier for such purposes.
- For correct fastening, check the dimensions of the axle bases reported in the illustrations.
- Use gloves and safety goggles, as stipulated in the safety chart for the lubricating oil.
- DO NOT use lubricants that may irritate the NBR gaskets; if in doubt, contact the Dropsa SpA technical office, which can provide you with a detailed chart of recommended oils.
- Do not ignore dangers to the health and maintain the regular hygiene standards.
- Attention! All the electrical components must be grounded. This applies both to the electrical components themselves and the control devices. To this end, ensure that the grounding wire is correctly connected. For safety reasons, the grounding conductor must be approx. 100 mm longer than the phase conductors. In the event of an accidental disconnection of the cable, the grounding terminal must be the last to detach itself.

Steps to be taken before starting up the device:

- Check that the pump is in good condition;
- Fill the tank with an appropriate lubricant (the min/max indications are on the tank);
- Check that the pump is at running temperature and that the tubes are free of air bubbles;
- Check that the electrical connection has been carried out correctly (CEI 64/8, IEC 364);
- Check the connection of the level (and, if present, the manostat) to the control board;
- With the pump activated, check the direction of rotation of the electric motor; if the motor turns the wrong way, it is necessary to invert the connection of the cables.

The minimum level condition is supplied, unless requested differently by the client, with the contact closed for the minimum level. Should the user require a contact that is normally open, it is necessary (with the tank open) to invert the operating direction of the float.

The pressure only can be modified. To change the set value it's needed turn clockwise (increase) or counterclockwise (decrease) the adjustment screw of the by-pass valve mounted on the fixing plate.

8. TROUBLESHOOTING

A diagnostics table is provided below that indicates the main anomalies, the probable causes and the possible solutions. If you were not able to solve the problem after consulting the diagnostics table, do not try to find the fault by disassembling machine parts but contact the Dropsa technical office and report the anomalies that have been discovered, with a detailed description.

DIAGNOSTIC TABLE		
PROBLEMS	PROBABLE CAUSES	ACTION TO TAKE
<p>The pump does not deliver oil in sufficient quantities or does not deliver at all</p>	<ul style="list-style-type: none"> • It is sucking in air because the tank is empty • The suction filter is dirty or blocked • The internal connections are loose • The pump has deteriorated • The valve adjusting the pressure is loose and so the oil is returning immediately into the tank before flowing through the delivery valve • Release valve damaged • Calibration of the pressure-adjusting valve incorrect 	<ul style="list-style-type: none"> • Restore the correct level in the tank and purge the air from the system • Wash the filter with petrol and blow with compressed air • Carefully close all the connections, ensuring that there is no leakage • Replace the pump • Tighten the adjusting screw until no oil comes out from the delivery
<p>The pump does not deliver oil at the preset pressure</p>	<ul style="list-style-type: none"> • There is dirt below the valve 	<ul style="list-style-type: none"> • Replace the valve • Connect a tube of about 30 cm in length to the outlet of the pump, with a pressure gauge at the free end. Adjust the valve by turning the screw and reading the corresponding pressure value on the pressure gauge. • Remove the elastic sealing ring of the valve unit, extract the valve unit and wash it with benzene or petrol. Before reassembling the valve unit, check the condition of wear of the O rings. If necessary, replace the valve unit • Remove the elastic sealing ring of the valve unit, extract the valve unit and wash it with benzene or petrol. Before reassembling the valve unit, check the condition of wear of the O rings. If necessary, replace the valve unit
<p>The pressure in the line does not release</p>	<ul style="list-style-type: none"> • The adjusting valve is malfunctioning 	<ul style="list-style-type: none"> • Remove the elastic sealing ring of the valve unit, extract the valve unit and wash it with benzene or petrol. Before reassembling the valve unit, check the condition of wear of the O rings. If necessary, replace the valve unit
<p>The lubrication cycle is not carried out</p>	<p>Calibration pressure of the cycle-controlling manostat not reached because of:</p> <ul style="list-style-type: none"> • Tubing of the line broken or connections loose • Manostat calibration set higher than that of the pump • The pump does not deliver oil at the preset pressure • The pump does not deliver oil 	<ul style="list-style-type: none"> • Replace the tubing – tighten the connections fully • Calibrate the manostat correctly • See diagnostics table • See diagnostics table

9. MAINTENANCE PROCEDURE

The pump was designed and built in order to minimize maintenance requirements.

To simplify maintenance, it is recommended to install it in an easy to reach position.

Periodically check the pipe joints to detect any leaks. Furthermore, always keep the pump clean to be able to quickly detect any leaks or defects.

If necessary, replace the refilling filter code 3130180

It is necessary to periodically check as follows:

INSPECTION / MAINTENANCE OPERATION	WORK CYCLES
Condition of lubrication	1000
Cleansing of the loading filter and of the suction filter	2000
Cleansing of the tank bottom if there are deposits	4000

The machine does not require special equipment for any inspection and/or maintenance activity. It is however recommended that the equipment used be suitable and in good condition (DPR 547/55) so as to avoid damage to people or parts of the machine.



WARNING: Prior to any maintenance, be sure that the power and the hydraulic supplies are off and there is no residual pressure in the main/branch pipe.

In the case of persistent problems and/or doubts, do not disassemble parts of the machine to trace the origin, instead contact the technical office of DROPSA S.p.A.

10. DISPOSAL

During maintenance or disposal of the machine care should be taken to properly dispose of environmentally sensitive items such as oils or other lubricants. 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

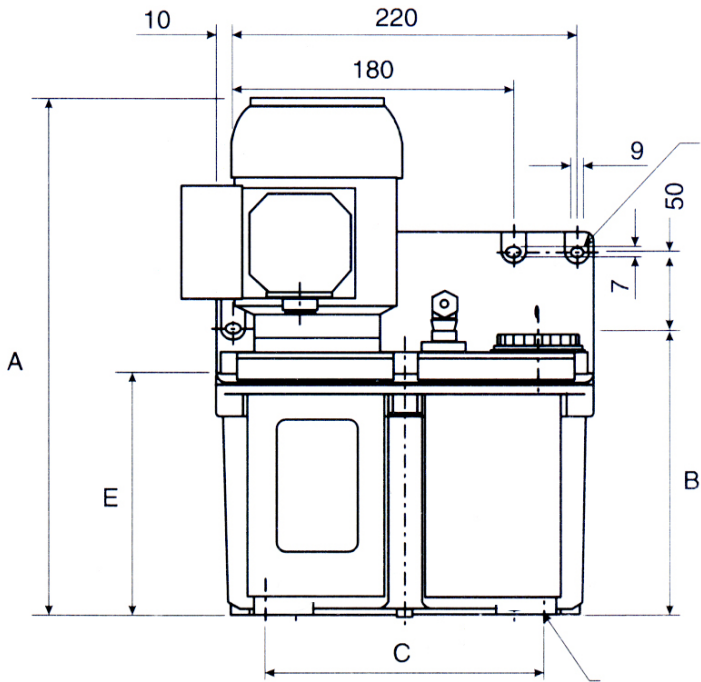
11.1 Standard Versions:

MOTOR	FLOW RATE	TANK	SYSTEM 01	SYSTEM 33V	SYSTEM 26
THREE-PHASE MULTI-VOLTAGE	350	3	3901050	3902050	3903050
		6	3901052	3902052	3903052
	500	3	3901054	3902054	3903054
		6	3901056	3902056	3903056
MOTOR	FLOW RATE	TANK	SYSTEM 01	SYSTEM 33V	SYSTEM 26
MONOFASE	350	3	3901070	3902070	3903070
		6	3901072	3902072	3903072
	500	3	3901074	3902074	3903074
		6	3901076	3902076	3903076

11.2 Accessories

PART NO.	DESCRIPTION	
20566	Pressure gauge (0 ÷ 25 bar)	Depending on the lubrication system, two versions may be assembled: 0 ÷ 25 bar for uses with low pressures, 0 ÷ 100 bar for higher pressures.
20564	Pressure gauge (0 ÷ 100 bar)	
3291028	Pressure switch (low pressure)	Depending on the lubrication system, two versions may be assembled: 10 ÷ 20 bar for uses with low pressures, 20 ÷ 50 bar for higher pressures.
3291022	Pressure switch (high pressure)	
1639142	Control panel (mono-phase 110Vac)	It is also possible, as an accessory to the pump, to have a control panel entitled "VIP5", which allows the various operating parameters to be controlled: manostat and level alarms, as well as the operating and pause cycle.
1639140	Control panel (mono-phase 230Vac)	
1639152	Control panel (three-phase)	
3085230	Revolving terminal	
		Provisions must be taken for this when the pressure gauge and manostat are installed.

12. DIMENSIONS

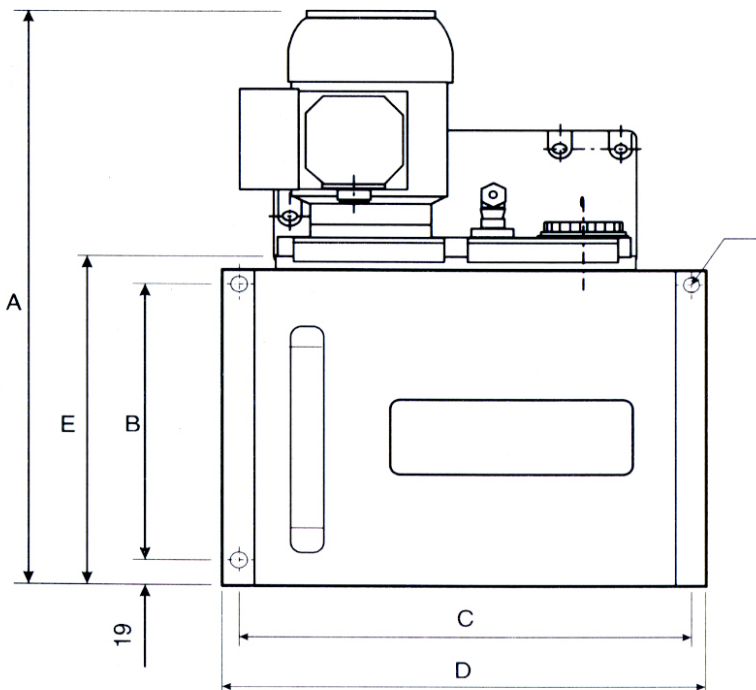


RESERVOIR CAPACITY 3 LITRE POLYTHENE

	mm	inches
A	337,5	13.28
B	187	7.36
C	177,8x101,5	7.0x3.96
D	240	9.45
E	160,5	7.00

RESERVOIR CAPACITY 3 LITRE ALUMINIUM

	mm	inches
A	330	12.99
B	179	7.05
C	177,8x101,5	7.0x3.96
D	240	9.45
E	152,5	6.0



RESERVOIR CAPACITY 6 LITRE POLYTHENE

	mm	inches
A	430,5	16.9
B	280	11
C	177,8x101,5	7.0x3.96
D	240	9.45
E	253,5	9.9

RESERVOIR CAPACITY 6 LITRE STEEL

	mm	inches
A	421	16.5
B	205	8.0
C	305	12.0
D	327	12.8
E	243,5	9.5

13. HANDLING AND TRANSPORTATION

Prior to shipping, the equipment is carefully packed in cardboard package.

During transportation and storage, always maintain the pump the right way up as indicated on the box. On receipt check that package has not been damaged. Then, storage the machine in a dry location.

No particular precautions are required except as noted on the package itself.

Handling must be effected by at least two persons.

- ! Lift the unit with taking account of the right way up indicated on the cardboard carton
- ! The machine components can withstand temperatures, during storage, from -20 to +50°C; however, in order to avoid damage, starting of the machine should occur at a minimum temperature of -5°C.

14. PRECAUTION



WARNING: It is necessary to carefully read about the instructions and the risks involved in the use of lubrication machines. The operator must know the machine functioning through the User and Maintenance Manual.

Power supply

Any type of intervention must not be carried out before unplugging the machine from power supply. Make sure that no one can start it up again during the intervention.

All the installed electric and electronic equipment, reservoirs and basic components must be grounded.

Flammability

The lubricant generally used in lubrication systems is not normally flammable. However, it is advised to avoid contact with extremely hot substances or naked flames.

Pressure

Prior to any intervention, check the absence of residual pressure in any branch of the lubricant circuit as it may cause oil sprays when disassembling components or fittings.

Noise

Pump does not produce excessive noise, less than 70 dB(A) .

15. OPERATING HAZARDS

The verification of conformity with the essential safety requirements and regulations of the Machine Directive is effected by means of the compilation of a check list which has been pre-prepared and is contained in the *technical file*.

The lists which are utilised are of three types:

- Risk assessment (UNI EN ISO 14121-1)
- Compliance with the essential safety requirements (Machine Directive –EC 06/42).

The risks that were not completely eliminated, but considered acceptable, are specified below:

- Electrocutation: this can only occur in the case of serious user incompetence.
- Use of unsuitable lubricant: the types of fluids that are not compatible with correct pump operation are listed below. *
- Contact with harmful fluids.

Fluid	Danger
Lubricants with abrasive additives	High wear rate of contacted parts
Lubricants with silicone based additives	Seizure of the pump
Petrol – solvents – inflammable liquids	Fire – explosion – damage to seals
Corrosive products	Corrosion of the pump– injury to persons
Water	Oxidation of the pump
Food substances	Contamination of the substances themselves

* For more detailed information regarding product compatibility with particular fluids, contact the Dropsa S.p.A. technical office