

User Operating and Maintenance Manual

Original Instructions





Manual drawn up in accordance with EC Directive 06/42

C2150IE WK 29/23

www.dropsa.com

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1. INTRODUCTION

This user and maintenance manual relates to the **Dragon X**. Using this pump means that oils and greases can be distributed within lubrication systems even at high pressures of up to 70 bar (1015 psi).

The latest version may be obtained from the Technical-Commercial Office, or by consulting our web site http://www.dropsa.com.

The pump subject of this manual must be used by qualified personnel with basic hydraulic and electrical knowledge.

This user and maintenance manual contains important information about protecting the health and safety of the personnel who intend to use this apparatus. You must read and look after it carefully, making sure that it is available at all times for the operators who intend to consult it.

2. GENERAL DESCRIPTION

The **DRAGON X** pump is particularly suggested due to its compact form and versatility when used with press lubrication systems, machine tools, reducers, guides, chains, etc.

- The **DRAGON X** pump has a built-in release valve* and can be used in the following types of systems:
 - Lubrication systems with injectors and circulation systems with operating pressures <20 bar (290 psi) system 01
 - Lubrication systems that have "direct response" measuring devices with operating pressures < 50 bar (735 psi) system 33V.
 - Progressive lubrication systems and circulation systems controlled by progressive measuring devices with operating
 pressures < 70 bar (1015 psi) system 26. A non-return valve is available for this version.

* 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.

3. PRODUCT IDENTIFICATION

There is a yellow label on the front of the pump tank that displays the product code and its basic characteristics.

| PRODUCT IDENTIFICATION TEST CERTIFICATE | | | | |
|--|-------------------------------|--|--|--|
| PART NUMBER 3905000 | | | | |
| VAR | | | | |
| PACK QUANTI | ΓY | | | |
| 39050 | (Electric Gear Pump) | | | |
| FLOW | 350 cc/min | | | |
| VOLT | 230-400V 50Hz | | | |
| PRESSURE | 70 bar Max | | | |
| TANK | 3 It Max | | | |
| OIL | MIN 32 cSt | | | |
| GREASE | MAX NLGI 000 | | | |
| | | | | |
| WO: IT | 0001 | | | |
| | CE Dropsa SpA. Milan Italy | | | |
| | | | | |
| | Year: 2016 | | | |
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| Сканер штрих-ко | да 🔳 станута | | | |
| www.DropsA.com | | | | |



4. TECHNICAL CHARACTERISTICS

| GENERAL CHARACTERISTICS | | | |
|--|---|--|--|
| Empty weight 6.2 Kg | | | |
| ELECTRICAL CHARACTERISTICS | | | |
| Motor power supply | Δ/Y 230/400 240/415 V - 50 Hz Δ/Y 260/440 280/480 V - 60 Hz 110 V 50 Hz single phase 4p 230 V 50 Hz single phase 4p 24 V CC 2800 rpm ⁽¹⁾ | | |
| Rated motor power | 0.09 Kw@50Hz – 0.11 Kw@60Hz | | |
| Degree of motor protection | IP 55 | | |
| Minimum level | Optical (oil and fluid grease versions) / With floating switch (only oil version) | | |
| Optical power supply level | 8÷28 V DC inversion protected | | |
| Optical level output signal | Type NPN/PNP short-circuit protected, off in the case of minimum level. Max 1.7A | | |
| Optical LED signal | Active when tank is not empty | | |
| Level connector (optical- floating switch) | DIN 43650 | | |
| Float Level output signal | Clean contact 50V max voltage, 40 W max power. SPDT Contact. | | |
| Pressure switch | Contact closed in the case of max calibration pressure alarm (3-18-30 bar) | | |
| Pressure switch output signal | Voltage free contact max voltage 42V, max. power 100 W | | |
| HYDRAU | ILIC CHARACTERISTICS | | |
| Pumping system | Gear pump | | |
| Flow rates (1500 rpm) | 350 cc/min - 500 cc/min (three-phase/single-phase versions) 600 cc/min | | |
| | 70 bar -three-phase motor (with intermittent service max 5 min with pause ratio 1:1) | | |
| Maximum operating pressures | - 40 bar (single-phase motor) | | |
| | - max 30 bar with continuous service | | |
| Outlet connection | G1/8" BSP | | |
| Tank capacity | 3L/6L | | |
| Filter | Degree of filtering 1000 µ | | |
| By-pass | Adjustable 0 ÷70 bar – precalibrated 40bar (35bar for single-phase motors) | | |
| Temperature of use | + 5 ÷ + 70 °C | | |
| Operating humidity | 90 % rel. humidity | | |
| Permitted lubricants * | Mineral lubricating oil 32 cSt; grease max NLGI000 | | |
| Storage temperature | -20 ÷ +65 °C | | |
| Continuous sound pressure level | < 70 dB(A) | | |

N.b. The specifications refer to the temperature of use of +20°C (+68°F)

 $^{\left(1\right) }$ revolutions with load less motor

* If a different product is used, please contact Dropsa S.p.A. to ensure it is suitable for use (see page 12)



4.1 HYDRAULIC SYSTEM



Fig. 1 Hydraulic diagram

Please note, pressure switch can be purchased separately (system 01/ 33V system). A check valve should be used in pump outlet, if used in progressive lubrication systems (System 26). Part numbers can be found in section: Accessories.

The only connection to make is to connect the pump to the point to lubricate or to the metering valves.



5. COMPONENTS



6. UNPACKING AND INSTALLATION

6.1 UNPACKING

Once the suitable location for installation has been identified, open the package and remove the pump. Check that it was not damaged during transport or storage. The packaging material does not require special disposal precautions as it is not in any way dangerous or polluting. Refer to the local regulations for disposal.

6.2 INSTALLATION

Pump assembly operations are not required.

Allow a sufficient amount of space for installation, leaving a minimum perimetric space of 100 mm (3,93 in.).

For wall-mounting, suitable space must be provided (see the installation diagram) to prevent abnormal positions or the possibility of impacts; fixing holes are provided on the plate (see Para. 12).

Then, the pump must be connected hydraulically to the machine. Make the connection to the control panel and fill the tank (making sure not to exceed the maximum visual level).

Empty the tank during the disassembly phase.

Disconnect the electric part from the hydraulic part.



6.3 MINIMUM LEVEL CONNECTION

The connection at the minimum level is done using connector 2 based on the following table:

| | VIP5 | Dropsa (Optional) | Connection | n pin when it is used Dropsa |
|--------------|--|-------------------|---|--|
| n°2 M3 Screw | Ter | minal streap M2 | VIP5 Contro | ol Device |
| | n° PIN | | Note: Set PIN 4 – M2 connection | |
| | | 10 | exclusively | on Out N or on Out P. |
| | | 5 | | |
| | 4 / NC | | Note: Set the NC level in VIP parameters | |
| | 4 / NC | | | |
| | | | | |
| | CONNECTION TABLE (version with optical level) | | (ve | CONNECTION TABLE rsion with floating switch) |
| | 1 | V+ (8÷28 Vdc) | 1 | COM |
| | 2 | V- (GND) | 2 | NC |
| | 3 | Out N | Z | |
| | 4 | Out P | 3 | NO |
| | | 1 | 4 | - |

6.4 OPTICAL LEVEL CALIBRATION

The level is tested and calibrated with oil by Dropsa, however is recommended before starting the pump to following the procedure below:

1) Fill the reservoir;

2) Open the front regulating hole;

3) Turn the level adjustment screw using a screwdriver (fig.1), until the green led on the level is off (see the image below);

4) Turn the screw in opposite way until the green led is on.

At the end of this procedure the level is correctly set. It is possible to re-do the calibration following the same procedure above.





7. OPERATING INSTRUCTIONS



7.1 STARTING THE PUMP

Before using the pump, a few preliminary checks must be performed:

- Check the integrity of the power supply cable and the unit prior to use.
- If there is damage to the power supply cable or the unit, do not start operations!
- Replace the damaged power supply cable with a new one.
- The unit may only be opened and repaired by specialized personnel.
- In order to prevent the danger of electrocution due to direct or indirect contact with live parts, the electric power supply line
 must be suitably protected by a specific differential magnetothermic switch with a triggering threshold of 0.03 Ampere and
 max triggering time of 1 second.

The cut-off power of the switch must be = 10 kV and the rated current= 4 A

- It is prohibited to use the pump if submersed in fluids or in a particularly aggressive or explosive/inflammable environment if not previously prepared for that purpose by the supplier.
- Use safety gloves or glasses as specified in the safety sheet for the lubricating oil
- DO NOT use aggressive lubricants with NBR gaskets. In the case of doubt, contact the Dropsa SpA technical office to receive a detailed card about the recommended oils.
- Do not ignore the hazards to health and comply with the health regulations.

ATTENTION: All components must be ground connected. This applies both to electric components as well as to control vices. For this purpose, make sure that the ground wire is directly connected. For safety reasons, the ground conductor ust be approx. 100 mm longer than the phase conductors. If the cable is accidentally disconnected, the ground terminal must be the last to be disconnected.

- Check the integrity of the pump
- Check that the pump is at the operating temperature and that there are no air bubbles in the pipes.
- Check that the electric connection was carried out correctly.
- Check the connection of the level and the pressure switch, if necessary, to the control panel.
- Once the pump has started, check the direction of rotation of the electric motor: if it rotates backward, reconnect it as shown in the wiring diagram provided with the motor.

7.2 INSTRUCTIONS FOR USE

- 1) Press the start button on the machine to which the pump is connected or start it;
- 2) Check that the pump starts;
- 3) To change the pressure value, turn the adjustment screw (see Chap. 5). Turn it clockwise to increase the pressure or counterclockwise to decrease it;
- 4) Check that the machine lubrication is suitable (if there are doubts about correct operation, the Dropsa SpA technical office can be contacted to request the inspection procedure).



8. TROUBLESHOOTING

A<u>TTENTION</u>: The machine may only be opened and repaired by authorised Dropsa personnel.

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.

| DIAGNOSTICS TABLE | | | | |
|---|--|---|--|--|
| PROBLEMS | PROBABLE CAUSES | ACTIONS | | |
| The pump does not deliver oil | It intakes air because the tank is empty The intake filter is dirty or clogged The internal fittings are loose or broken The motor rotates backward | Restore the level in the tank and bleed the air from the system Wash the filter with petroleum and blow with compressed air Carefully close all the fittings, making sure there are no leaks and replace the broken pipes. Correctly connect the motor, inverting the direction of rotation | | |
| The pump does not deliver oil at the required pressure | Pump deteriorated Pressure control valve decalibrated (therefore the oil returns immediately to the tank). Release valve damaged Adjustment valve incorrectly calibrated Presence of dirt in the by-pass valve | Replace the pump Tighten the adjustment screw until oil comes out of the delivery pipe Replace the by-pass valve Connect a pipe that is approx. 30 cm long to the pump outlet with a pressure gauge applied to the free end. Adjust the valve by turning the screw and reading the corresponding pressure value on the pressure gauge Remove the components and wash them with petroleum. Before reassembling the components, check the wear status of the O-ring. Replace the entire assembly if necessary | | |
| Line pressure not released | Control valve with irregular operation | • Disassemble and clean the by-pass valve, replace the valve if necessary | | |
| Emptying of the main system line during the pause time | Pump or system outlet fittings loosened Non-return or release valve dirty | Tighten the fittings Disassemble and clean the by-pass valve, replace the valve if necessary | | |
| Lubrication cycle not performed | Cycle control pressure switch calibration pressure not reached due to: Line pipe broken or loose fittings Pressure switch calibrated higher than the pump The pump does not deliver oil at the required pressure The pump does not deliver oil | Replace the pipe - fully tighten the fittings Correctly calibrate the pressure switch See the diagnostics table See the 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.
- Check if the filter is clean after every 2000 hours of operation.

The machine does not require any special equipment for any control and/or maintenance activity. It is recommended to use tools and personal protective devices suitable for use (gloves) and that are in good condition according to current regulations to prevent damage to people or machine parts.



In the case of doubts and/or problems that cannot be solved, do not try to discover the reason by disassembling machine parts, but contact the DROPSA S.p.A technical office.

10. DISPOSAL

During machine maintenance, or if it is demolished, do not dispose of the polluting parts in an improper manner. Refer to the local regulations for their correct disposal. When demolishing the machine, the identification plate and all other documents must be destroyed.

11. ORDER INFORMATION

11.1 STANDARD VERSIONS

| ELECTRIC MOTOR | FLOW RATE | TANK CAPACITY | PART NUMBER (with optical level to use oil and fluid grease) | PART NUMBER (with float level to use only oil) |
|---|-----------|---------------|---|--|
| | 350 CC | 3 L | 3905000 | 3905040 |
| 230-400 V 50 Hz three-phase- 0.09 KW 4P | | 6 L | 3905001 | 3905041 |
| 265-460 V 60 Hz three-phase- 0.11 KW 4P | 500.00 | 3 L | 3905004 | 3905044 |
| | 500 CC | 6 L | 3905009 | 3905049 |
| 110 V 50 Hz single phase – 0,.9 KW 4P | 350 CC | 3 L | 3905007 | 3905047 |
| | | 6 L | 3905012 | 3905052 |
| | 500 CC | 3 L | 3905008 | 3905048 |
| | | 6 L | 3905013 | 3905053 |
| | 350 CC | 3 L | 3905005 | 3905045 |
| 230 V 50 Hz single phase – 0.09 KW 4P | | 6 L | 3905010 | 3905050 |
| | 500 CC | 3 L | 3905006 | 3905046 |
| | | 6 L | 3905011 | 3905051 |
| 24// 66 | 600.66 | 3 L | 3905002 | 3905042 |
| 247 ((| | 6 L | 3905003 | 3905043 |

N.B. The following specifications apply for all models:

Bypass calibration pressure 40 bar (35bar for single-phase motors); Pressure gauge 0 – 100 bar.



11.2 SPARE PARTS

| ITEM | DESCRIPTION | PART NUMBER |
|--------------------------|--|-------------|
| | Flow rate *350 CC | 3099186 |
| POMP | Flow rate *500 CC | 3099187 |
| | 230-400 V 50 Hz three-phase- 0.09 KW 4P 265-460 V 60 Hz three-phase- 0.11 KW 4P | 3301544 |
| MOTOR | 230 V 50 Hz single phase – 0.09 KW 4P | 3301545 |
| | 110 V 50 Hz single phase – 0.09 KW 4P | 3301546 |
| | 24V CC rpm | 3301283 |
| | For the 3L tank | 1639201 |
| OPTICAL SENSOR LEVEL | For the 6L tank | 1639202 |
| FLOATING LEVEL INDICATOR | For the 3L tank | 3133627 |
| | For the 6L tank | 3133628 |
| DISTRIBUTOR BLOCK | | 1525370 |
| | 3 L | 6770033 |
| TANK | 6 L | 6770006 |
| PRESSURE GAUGE | 0 -100 bar | 0020564 |

* Flowrate is referred to 1500 rpm

11.3 ACCESSORIES

| ITEM | DESCRIPTION | PART NUMBER |
|---------------------|-----------------------------|-------------|
| | Calibration pressure 3 Bar | 3291028 |
| PRESSURE SWITCH | Calibration pressure 18 Bar | 3291048 |
| | Calibration pressure 30 Bar | 3291022 |
| PRESSURE SWITCH CAP | | 3042098 |
| PRESSURE GAUGE | 0 -16 bar | 0020566 |
| NON-RETURN VALVE | | 0092335 |



12. DIMENSIONS

6L 24V pump





13. HANDLING AND TRANSPORTATION

Before shipping, the 39050.. pumps are carefully packed inside cardboard boxes. When transporting and storing the equipment, pay attention to the direction indicated on the boxes themselves.

Upon receipt, check that the package has not been damaged and store the equipment in a dry location. Manual handling must be done by at least two people.

Lift the equipment according to the direction shown on the cardboard package. the machine components can support storage temperatures between 10 to + 65 °C; however, to prevent damage, the machine must only be started up after the machine has reached a temperature of +5 °C.

14. PRECAUTIONS

The warnings about the risks involved in using a pump for lubricants must be read. The operator must understand its operation and clearly understand the hazards connected to pumping pressurized grease.

Therefore we recommend the following:

- Check the chemical compatibility of the material with which the pump is built with the fluid to be pumped (see chap. 4). An incorrect selection could cause, in addition to damaging the pumps and pipes, serious risks for people (spillage of irritating products that are harmful to health) and for the environment.
- Never exceed the maximum operating pressure permitted for the pump and the components connected to it. In the case of doubt, refer to the data specified on the machine plate.
- Only use original spare parts.
- If components must be replaced with others, make sure they are suitable for operating at the pump's maximum operating
 pressure.

<u>^TTENTION</u>!

ever try to stop or deviate any leaks with your hands or other body parts.

Note: Personnel must use protective devices, garments and tools in compliance with current standards with regard to the location and the use of the pump both during work as well as during maintenance operations.

A<u>TTENTION</u>: The warnings about the risks involved in using a pump for lubricants must be read. The user must nderstand its operation using the user and maintenance manual.

Electric current

Do not carry out any work on the machine before disconnecting it from the electrical power supply and making sure that no one can reconnect it during the operation. All the installed equipment (electric and electronic), tanks and basic structures must be connected to the ground line.

Inflammability

The lubricant used in the lubrication circuits is normally not an inflammable liquid. It is however necessary to adopt all the possible measures to prevent that it comes into contact with very hot parts or open flames.

Pressure

Before each operation, make sure there is no residual pressure in every branch of the lubrication circuit that could cause oil to spray when disassembling fittings or components.

After long periods of inactivity, check the seal of all the parts subject to pressure.

Do not subject the fittings, pipes and pressurized parts to violent impacts.

Damaged flexible pipes or fittings are DANGEROUS and must be replaced.

Only original spare parts should be used.

Noise

Under normal operating conditions, noise emission **does not exceed 70 dB "A"** at a distance of 1 metre (39.3 inches) from the pump.



NOTE: The pump was designed to operate with lubricants with a maximum rating NLGI 000. ⁽¹⁾ Se lubricants that are compatible with NBR gaskets. Iny internal residual lubricant used for assembly and testing purposes is 32 cSt oil

(1) The use of the pump with grease with a consistency NLGI000 must be assessed on a case by case basis given the extreme difference in the sliding properties of the compound, which depends both on the viscosity of the base oil as well as the soaps and additives that are used.

The use of the pump with grease with a consistency NLGI000 must be assessed on a case by case basis given the extreme difference in the sliding properties of the compound, which depends both on the viscosity of the base oil as well as the soaps and additives that are used. *

A comparison table is provided between the classification of NLGI lubricants (National Lubricating Grease Institute) and the ASTM classification (American Society for Testing and Materials) for greases for the values that concern the pump.

| GREASES | | |
|---------|-----------|--|
| NLGI | ASTM | |
| 000 | 445 – 475 | |

For further information about the technical specifications and the safety measures to adopt, refer to the product safety sheet (Directive 93/112/EEC) relative to the type of lubricant selected and supplied by the manufacturer.

15. OPERATING HAZARDS

Compliance with the essential safety requirements and the provisions specified in the machine directive was checked by filling out prepared check lists that are contained in the technical file. Two types of lists were used:

- 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:

- Electrocution: 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.

| FLUIDS THAT ARE NOT PERMITTED | | | |
|---|--|--|--|
| FLUIDS | RISKS | | |
| Lubricants with abrasive additives | wear of the components inside the pump | | |
| Lubricants with silicone additives | Pump seizure | | |
| Petrol – solvents – inflammable liquids | Fire – explosion – damage to the gaskets | | |
| Corrosive products | Pump corrosion - damage to people | | |
| Water | Pump oxidation | | |
| Food substances | They would be contaminated | | |

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





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