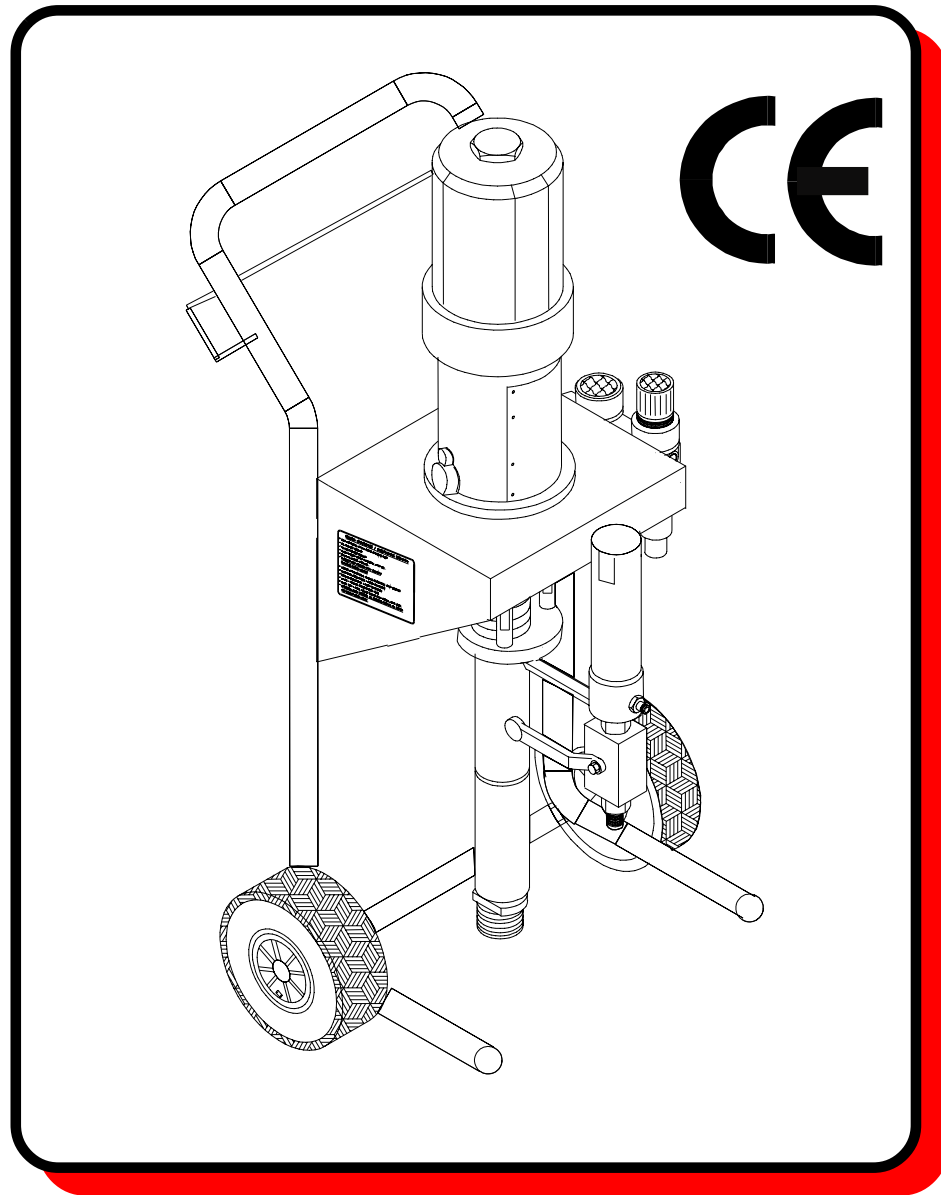




USE AND MAINTENANCE MANUAL



Pneumatic Airless Painting System
WITH HIGH PRESSURE AIR OPERATED PUMP:
K301 MODEL

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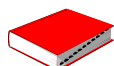
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WARRANTY
PUMP ASSEMBLING DRAWINGS
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USE AND MAINTENANCE MANUAL



HOW TO USE THE MANUAL

The following manual is a document that accompanies the machine throughout its lifetime. It is, therefore, an integral part of the machine. Carefully read the following warnings and procedures before engaging IN ANY ACTIVITY with this machine, including handling and unloading it from its transportation mean. For easier references, this instruction manual has been divided into the following sections:

Section I

Transportation, packaging, handling, and inspection of the purchased product.

Section II

This section describes the machine, its field of application (the work it can perform) and it lists its technical features. This information is similar to that of a publicity leaflet.

Section III

Machine installation

Section IV

Description of the instructions needed to use the machine.

Section V

Routine and extraordinary maintenance

Section VI

Dismantling

SYMBOLS USED

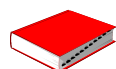
Those operations which might be dangerous if not performed correctly are indicated with the following symbol:



Those operations which, in order to avoid risks, must be performed by trained and authorized personnel are indicated by the following symbol:



All personnel in charge of using the machine must be thoroughly trained; all the above information must be thoroughly understood and applied.



USE AND MAINTENANCE MANUAL



INFORMATION LETTER

The following maintenance and instruction manual is an integral part of the machine and must always be available to the personnel in charge of using and maintaining it. The operator and the personnel in charge of handling the machine must have knowledge of the contents of the manual. The descriptions and illustrations in the manual are not to be considered as binding. Although the main features of the machine described in this manual are not subject to change, **Ningbo Dino-power Machinery Co** reserves the right to change those components, details and accessories it deems necessary to improve the machine or to meet manufacturing or commercial requirements, at any time and without updating this manual immediately.

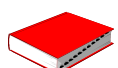


ALL RIGHTS ARE RESERVED. The reproduction of any part of this manual, in any given form, without prior written authorization from **Ningbo Dino-power Machinery Co**, is strictly forbidden. The content of this manual can be modified without prior notice. Great care has been taken in collecting and checking the documentation contained in this manual in order to make it as complete and comprehensible as possible. **Ningbo Dino-power Machinery Co.** machines are not designed to function in areas at risk of fires and/or explosions. For problems or information call **Ningbo Dino-power Machinery Co.** customer care technical service or your local dealer.



The machine original configuration must not be modified in any way.
On receiving the machine make sure that:

- ☐ The packaging is intact and undamaged.
- ☐ The supply corresponds to what has been ordered.
- ☐ In case of damage please call Ningbo Dino-power Machinery Co.



1.1 PACKAGING

To transport the machine in Italy and abroad, the unit is packaged in a cardboard box. All optional components (pipes, suction components, gravity tank) are placed with the machine, in the same cardboard box.

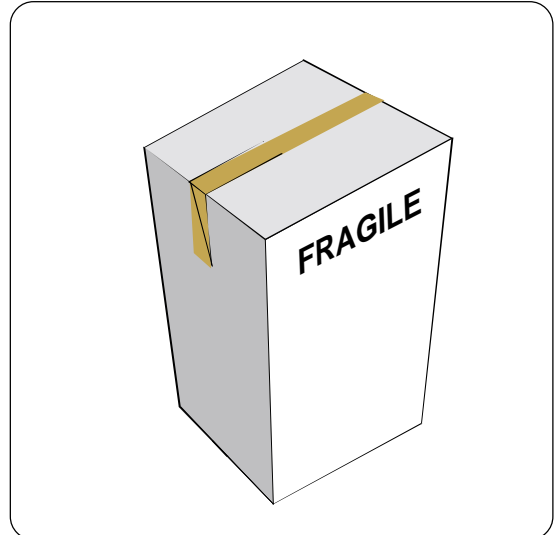
The box is fairly light and can be hand-lifted; this avoids any bumps which could damage the machine inside it.

WARNING

The machine plus the packaging weights ~27 Kg (~60 lb).

WARNING

Do not dispose of the packaging in the environment.



1.2 TRANSPORTATION

To transport the unit use a dolly. Do not transport more than one box at a time.

Warning: the packaging of a pump on a dolly is 1000 mm (39.37 in.) high and 700 mm (27.56 in.) wide.



1.3 STORAGE

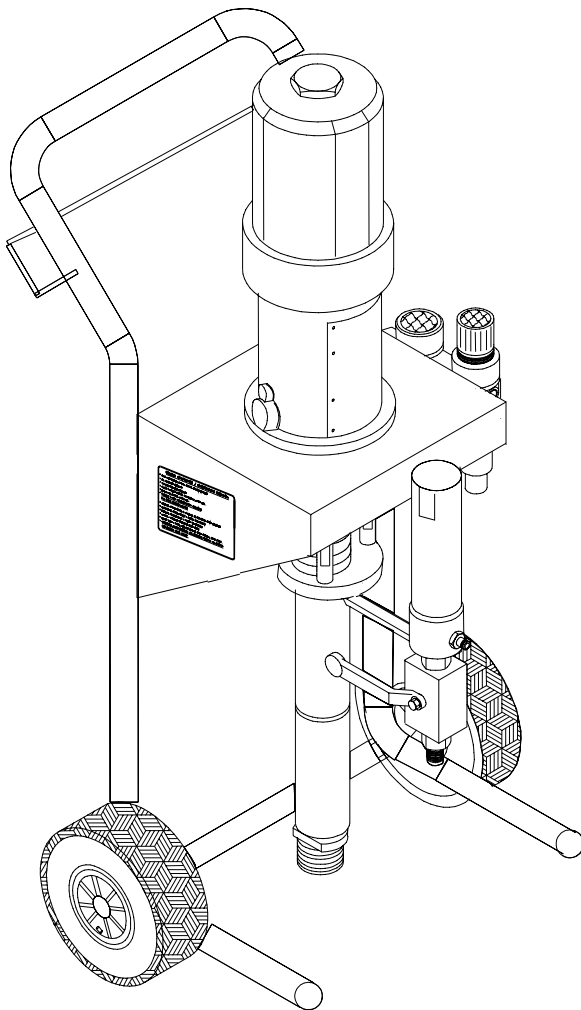
When transporting and storing the machine make sure the surrounding temperature remains included between -15 and 40 °C (5°F and 104°F). If transportation or storage operations last 24 hours or less do not exceed 50°C (122°F) otherwise the unit could be damaged.

If the need arises to store the machine, make sure the humidity values in the storage area remain included between 30 and 80%.



2.1 IDENTIFICATION DATA

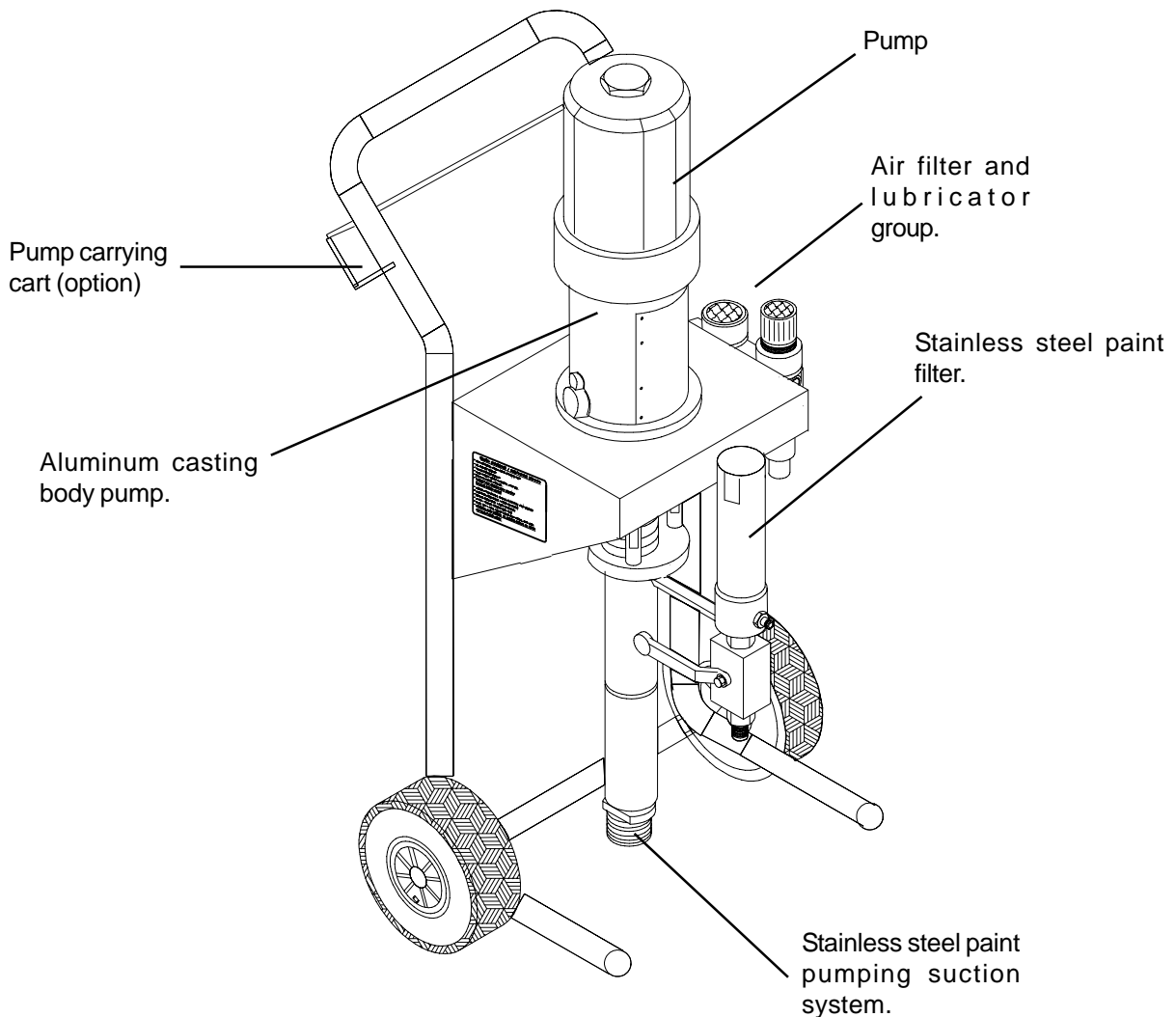
The manufacturer's identification plate is placed on the upper cover panel of the pump. The plate must not be removed at any time even if the machine should be sold again. Always refer to the serial number (reported on the plate) when contacting the manufacturer. A plate with some general recommendations is on the side of the cart of the pump; the warnings conveyed must be carefully observed by everyone dealing with the painting machine. The Company is not to be held responsible for damage to property or accidents to people which might occur if the above-mentioned warnings are not observed. In such a case, the operator is the only person responsible.



2.2 MACHINE DESCRIPTION

The machine described in this manual is a spray painting unit (K301 MODEL) which can spray virtually any kind of liquid material.

K301 main feature, a pneumatic piston pump group with high volume fluid delivery, makes it practical, versatile and easy to use. The airless spray application system reduces overspray and guarantees high transfer efficiency (over 80%) and perfect microatomization. This enables the user to save paint and to improve the finishing of all surfaces. Many optional components can be purchased separately from the pump group and can be used to personalize the machine (see drawing below).



2.3 TECHNICAL FEATURES

The paint unit uses a pneumatic system which is fed by an air pressure of about 6 to 8 bar (85 to 115 psi), needed to move the paint pumping piston and to obtain a high airless atomizing pressure with any kind of fluid. The machine is equipped with high quality piston packings, stainless steel valves and hardened seats. **Ningbo Dino-power Machinery Co** carries out all the necessary tests on the paint unit before delivering it to its customers.

TECHNICAL FEATURES

FEAUTURE	K301
DELIVERY	6 lt/min. (1.5 gal)
PRESSURE RATIO	30:1
MAX FLUID PRESSURE	240 bar (3400 psi)
WORKING PRESSURE	8 bar (115 psi)
GRAVITY TANK	5 lt (1.25 gal.)
INLET FITTING	1/4"
PAINT OUTLET	3/8"
TIPS	from 0.007" to 0.026"
WEIGHT	30Kg (66 lb)

The above technical features are only exemplifying and can vary without prior notice.

2.4 STANDARD AND OPTIONAL COMPONENTS

The machine is delivered with the following standard components:

- 1 - PUMP GROUP
- 1 - Pin wrench
- 1 - Universal screw wrench
- 1 - Lubricator
- 1 - Use and maintenance manual



2.5 PAINTS, FLUIDS AND ADEQUATE PRODUCTS

The K301 paint units are designed to paint on large surfaces. It is possible to paint iron material in general, wood, plastics. The materials which can be used in the pump are: very thick paints, common paints, bases, glues.

The manufacturer must authorize the use of the unit with other products and successively the unit technical features must be changed in order to function properly with the new materials.

Ningbo Dino-power Machinery Co is relieved of all responsibility in case of accidents resulting from the use of the machine by unauthorized and unqualified personnel or by personnel using the machine differently than intended.

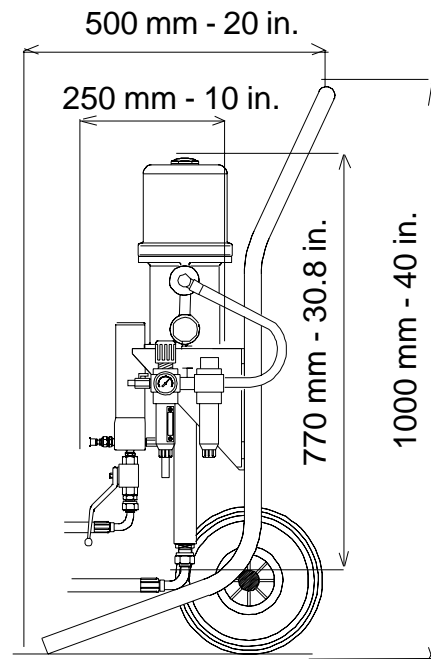
**DO NOT USE THE PAINTING SYSTEM WITH
FLAMMABLE OR HIGHLY TOXIC PRODUCTS
SUCH AS GASOLINE, HERBICIDE AND PESTICIDE**

2.6 CLOTHING

Wear protective gloves, goggles, masks and anti-noise headphones when using the machine. Observe the rulings of the laws in force .

2.7 DIMENSIONS

The unit has the following dimensions:



3.1 INSPECTION OF PURCHASED PRODUCT

Inspect the equipment before its use to check for damages caused by transportation or improper storage.

Make sure that all standard and optional components have been delivered.

3.2 INSTALLATION CONDITIONS

The machine does not require special installation procedures; just read the following warnings carefully.

WARNING

Do not place the machine near flammable products.

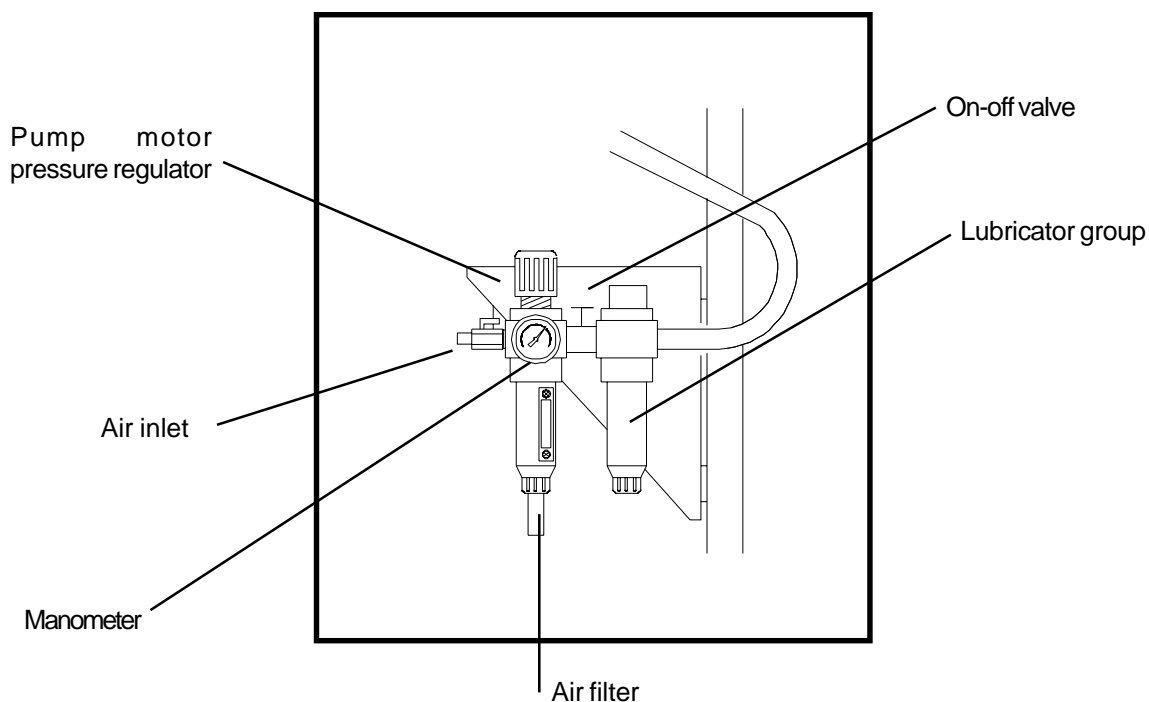
WARNING

The paint can must be placed near the machine.

3.3 CONNECTION TO THE PNEUMATIC NETWORK

The unit is equipped with a condensate filter with regulator. Make sure the working pressure does not exceed 8 bar (115 psi) max.

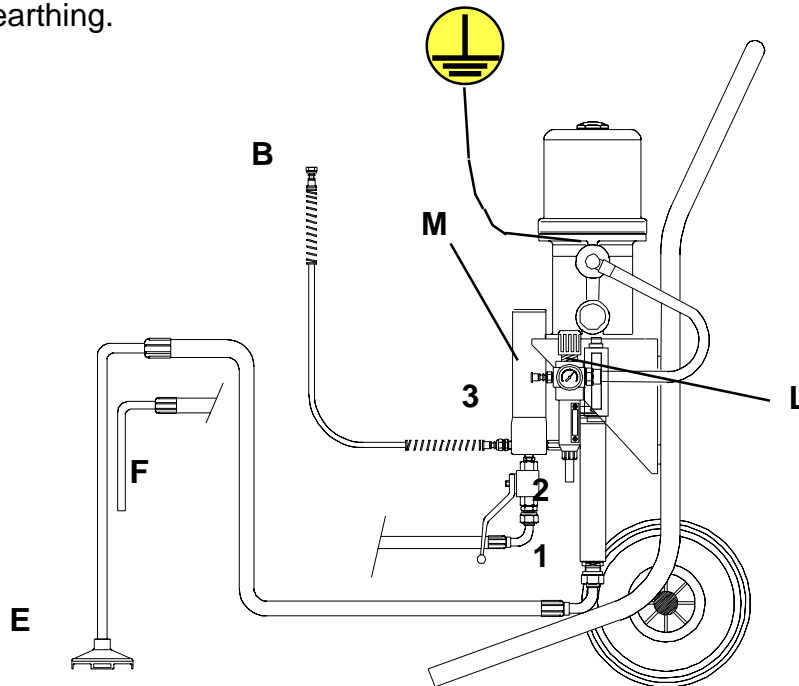
Use dry compressed air to obtain improved painting results.



3.4 HOSE CONNECTION

The unit is delivered disassembled. To assemble the hoses proceed as follows (using the drawing below):

- Screw the hose with the suction filter (**E**) or the 1.25 gal. tank to the unit connection (**1**).
- Screw the return hose (**F**) to the unit connection (**2**).
- Connect the compressed air line to the air inlet (**M**) of the pressure regulator (**L**).
- Connect the gun paint hose (**B**) to the unit connection (**3**).
- Connect the earthing.



WARNING

Always use high pressure hoses and, before using them, make sure they are in perfect working conditions, that is without holes, bends or splits.

WARNING

IT IS RECOMMENDED TO USE CERTIFIED, TESTED GUNS UP TO 300 bar/4300 psi BECAUSE OF THE PUMP HIGH PRESSURE (UP TO 240 bar/3400psi).

3.5 EQUIPMENT AND CONDITIONS NEEDED TO WORK

Painting operations **MUST** be carried out in an appropriate cabin equipped with a filtering system. Do not use the unit if the filtering system is not activated. Always wear protection gloves, goggles, breathing filters with active carbon and adequate clothing for the protection of the entire body. Ground all the unit components because static currents could create sparks and explosions. All the machine standard hoses are made of antistatic material.



4.1 INTRODUCTION












This section explains how to use the painting unit and illustrates those safety rulings which must be observed for its safe functioning. Read this section carefully.

4.2 SAFETY RULINGS TO FOLLOW DURING USE

TO USE the painting unit **STRICTLY OBSERVE** the following precautions and safety criteria.

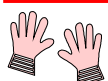
Ningbo Dino-power Machinery Co declines every responsibility whatsoever in case the user does not observe said precautions and safety criteria; furthermore, it is not responsible for any kind of negligence when using the equipment.

WARNING

-  Always wear protective gloves, masks, breathing filters with activated carbon and adequate clothing for the protection of the entire body.
-  The unit is employed with paints and thinners which are highly inflammable, therefore, use the machine in well ventilated areas and avoid any action which might start a fire (eg. smoking, high temperature slags or shavings, sparks or electric elements). In order to avoid the creation of sparks due to static charges, ground the unit.
-  CHECK the chemical compatibility of the products on their technical safety charts. Further information on the materials which make up the unit are available, on request, at **Ningbo Dino-power Machinery Co**.
-  The use of products which contain organic solvents might cause intoxication because of the created toxic vapours.
-  DO NOT USE the unit with food or medicines.
-  DO NOT EXCEED the indicated maximum working pressure (see section 2.3).
-  BEFORE starting on any dismantling, cleaning, maintenance or assembly operation DISCHARGE the pressure in the hoses (see section 5).
-  It is MANDATORY to use the unit inside a painting cabin equipped with a filtering system.
-  The user must wear shoes with leather or antistatic soles.
-  Never aim the gun at anything other than the surface you intend to spray.
-  The unit must be used by one operator only.

IMPORTANT

DO NOT USE the unit with **HALOGENATED HYDROCARBON** thinners (eg. Ethylchloride, Trichloride, etc.) which might explode when coming into contact with aluminum or galvanized parts.



USE AND MAINTENANCE MANUAL



4.3 NORMAL USE

To correctly carry out all painting operations the user must:



never mix different kinds of paints.



when changing color clean the spray booth, the pump and all dirty components.



never recycle the paint in the filters because it is contaminated.



clean the surfaces for a better outcome of the paint job.



dry all surfaces. Make sure they are not oxidized, stained by grease, oil or other residue.



observe the instructions given by paint manufacturers to obtain weather resistant and mechanical resistant coatings.

BEGINNING OF THE WORK SESSION

- Fill the oil bowl (pos. 40) halfway with synthetic machine oil.
- Mix the paint by following the instructions given by the manufacturer.
- Immerse the suction hose into the fluid or fill the 1.25 gal. tank and open the return ball valve.
- Any flexible hose used to siphon fluid from drums or containers, must be cut diagonally at the ends in order to avoid its sticking to the bottom. They must also be strengthened by a rigid spiral.
- Open the air inlet and set the pressure, then pull the gun trigger.
- Start painting.

END OF THE WORK SESSION

- Close the air inlet.
- Remove the suction hose.
- Close the paint return ball valve very slowly.
- Discharge the fluid in the hoses by pulling the trigger of the gun.
- Clean the entire unit very accurately (see section 6).

4.4 DANGEROUS AND IMPROPER USES

Using the unit in a different way than indicated by the manufacturer (Section 2.5) could damage the equipment and endanger the operator. The unit is not designed to use dangerous, explosive and/or toxic material. To use materials which differ from the ones indicated by **Ningbo Dino-power Machinery Co**, the operator must ask the permission of the manufacturer.

4.5 EMERGENCY SITUATIONS



FIRE: Use dry powder extinguishers. They must be found near the equipment as prescribed by LAW (Ruling 626/94 company safety) **DO NOT USE WATER.** Personnell must be trained so as to know how to face such accidents.



5.1 ROUTINE AND PREVENTIVE MAINTENANCE

An adequate maintenance lengthens the equipment life expectancy and keeps it in excellent and efficient working conditions. It also assures lasting safety standards throughout the years. It is highly recommended that skilled personnel should carry out maintenance operations.



Personnel should be equipped with the individual safety measures commonly used in such cases and should observe the safety rulings described in the following chapter


5.2 SAFETY RULINGS DURING MAINTENANCE

When carrying out maintenance operations on the machine be sure to:

- ❑ Disconnect the pneumatic feeding power when removing parts of the unit or when replacing any component.
- ❑ Do not wear rings, watches, chains, bracelets etc. during maintenance operations.
- ❑ Always wear individual protection devices (protection gloves, goggles and shoes) ❑

Use only original spare parts.

- ❑ Do not use free flames, pointed elements or pins.

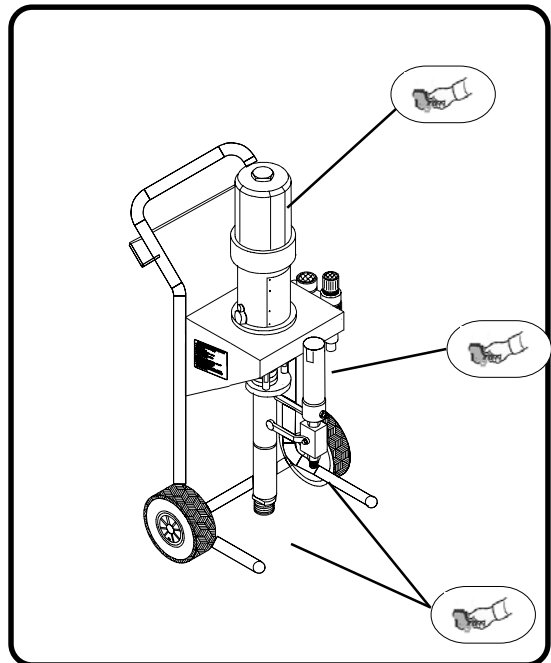
- ❑ Do not smoke 

5.3 CLEANING OPERATIONS

Clean the exterior of the unit at the end of each workday or at the end of each work session. This preserves the unit in good working conditions. The picture on the side illustrates the parts which must be kept clean:

- ❑ The hoses.
- ❑ The pump body.

Use a soft cloth previously soaked in thinner or detergent solution to clean the above-mentioned components.



5.4 ROUTINE MAINTENANCE

The routine maintenance of the K301 unit is simple and does not require special operations because the mechanical parts of the unit do not need to be lubricated. During working operations, the friction of the rod on the packings may cause the product to leak into the bowl (when the equipment is new it happens after about 30/40 operating hours). These leaks may be small at the beginning, but if neglected, they can damage the pumping rod beyond repair. The leak is caused by the adjustment of the packing. It is important to immediately carry out the regulation of the packing with the pin wrench supplied with the equipment.

REGULATING THE PACKINGS

The regulation of the packing must be carried out when the pumping rod is moving and when no product is being used. Open the return ball valve (see page 10-pos. 2), adjust the air inlet to 2 bar (30psi) (the rod begins to move) and rotate the bowl clockwise with the supplied pin wrench. For small leaks it is enough to lightly preload the packings. (AVOID LOCKING THE ROD THROUGH AN EXCESSIVE ROTATION OF THE BOWL)

PRESSURE DISCHARGE OPERATION

When stopping the system to carry out operations on the unit or when stopping it at the end of the working day the high pressure inside the unit must be completely discharged. It is necessary to release the pressure both from the paint circuit and the air circuit. An accidental activation of the system in both circuits can cause serious damages to the operator or to anyone in the system working area because when the air supply to the pump is shut off the motor can carry out another cycle and a fluid jet can come out at the same pressure used while working. A manual shut off valve is mounted on the cart (between the lubricator and the motor pump). When it is activated, the air to the motor pump is automatically shut off. (WARNING: THE PRODUCT IN THE FLEXIBLE TUBE IS STILL UNDER PRESSURE).

PROCEED AS FOLLOWS:

- 1 Lock the trigger of the spray gun by rotating the throttle of the safety trigger lock and shut off the inlet ball valve of the pump.
- 2 Disassemble the splash guard from the spray gun and remove the safety trigger lock (**during this phase be careful not to operate the spray gun trigger unintentionally. Always aim the gun at the ground**).
- 3 Take a metal bucket, make sure it is firmly fixed on the ground and keep the spray gun pressed tightly against the walls of the bucket. Pull the trigger to discharge the product.

After discharging the fluid, connect the air supply *keeping the main ball valve closed* and take the shut off valve sliding lever back to closing position by pulling the lever upwards.



5.5 CLEANING THE UNIT WHEN CHANGING COLOR OR AT THE END OF A WORK SESSION

Clean the paint circuit of the unit daily or at the end of each working session so that remaining material particles will not dry out on its walls, thus guaranteeing long term efficiency. Cleaning operations must be carried out on the entire unit, spray gun and hoses included. The entire operations are carried out without dismantling any component.

- 1 Lift the suction and return hoses from the can and allow them to drain.
- 2 Carry out the DEPRESSURIZATION PROCEDURE.
- 3 Put the hoses in a can containing clean thinner. Open the air supply (adjusted to 2 bar-30 psi) and the return ball valve and let the thinner circulate for a few minutes inside the pump.
- 4 Close the return ball valve
- 5 Release the safety trigger lock and discharge the paint residue left in the high pressure hose and in the gun into the can of thinner. (Repeat the procedure until clean thinner is sprayed from the gun).
- 6 Shut the air supply off, open the return ball valve very carefully and discharge the washing thinner into the can. The return ball valve must remain open until the equipment is used again.
- 7 Clean the line filter, and especially the filter mesh and the spray gun, by dismantling and washing it.
- 8 Carefully clean the inside of the spray gun head where the product flows.

5.6 FILTER REPLACEMENT

After about 100 working hours the return paint filter must be cleaned or replaced. The life expectancy of the filter only depends on the type of paint used. To replace the filter, unscrew the cylinder (1) then remove the filter (2) (see picture on the side).

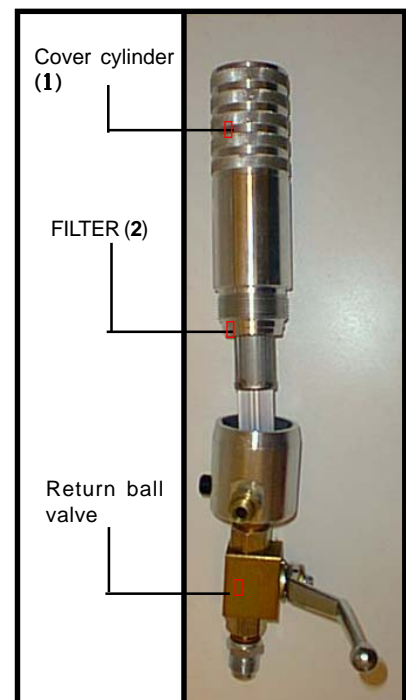
Replace or clean the filter then mount everything back on.

WARNING

Before opening, discharge the pressure in it by opening the return ball valve.

5.7 PACKINGS

After about 30/40 working hours (when the unit is new) check the rod packings for leaks, (the leaks are caused by the adjustment of the packing). The adjustment must be carried out with the supplied pin wrench, when the pumping rod is activated and when no paint is being used. Open the return ball valve, set the working pressure to 2 bar-30 psi (make sure the rod starts to move) and turn the packing holding bowl clockwise. For light leaks (usually after about 50/80 working hours) just apply a light pressure to the packing holding bowl. Make sure not to lock the rod.



5.8 TROUBLESHOOTING

This chapter describes how to solve the most common problems which could affect the unit.

The problem is indicated by the following symbol: (■)

The probable cause is indicated by the following symbol: (□)

The probable solution is indicated by the following symbol: (▢)

■ THE SPRAY NOZZLE IS CLOGGED.

■ THE SPRAY GUN FILTER OR THE LINE FILTER ARE CLOGGED.

■ THE COLOR PUMP IS CLOGGED.

■ THE AIR LEAKS CONTINUALLY.

▢ Clean the nozzle as described in the manual.

▢ Clean everything accurately and use well filtered materials.

▢ Dismantle the color pump and clean it accurately.

▢ If you can't solve the problem call the AUTHORIZED REPAIR CENTER.

■ LOWERING OF THE WORKING PRESSURE WHEN SPRAYING

▢ Foreign particles in the suction valve.

▢ The filters are partially clogged.

▢ The packings are worn.

▢ The viscosity of the fluid is incompatible with the filters or nozzles used.

▢ Too large or worn nozzle.

▢ Dismantle the seat of the valve and clean it with a paintbrush and clean thinner.

▢ Dismantle and accurately clean all the filters of the unit.

▢ Replace the packings .

▢ Thin the material by observing the technical features described on the packaging.

▢ Increase the air pressure in the pump motor.

▢ Replace the filter or the spray nozzle with a smaller one.

■ THE COLOR PUMP WORKS IRREGULARLY, THE SPRAYING FAN IS REDUCED.

▢ The spraying pressure is too low.

▢ The fluid used is too viscous.

▢ Sticky valves.

▢ The valves, packings and piston are worn.

▢ Increase the working pressure of the pump and try using a smaller nozzle.

▢ Thin the material by following the manufacturer instructions.

▢ Accurately clean the inside of the color pump, the seats and the ball of the valves (use a paintbrush + clean thinner). Soak the color pump completely into the thinner to dissolve all the left residue a paintbrush can't reach.

▢ Replace the components.

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□ THE PUMP WORKS BUT IT DOES NOT SIPHON THE FLUID.

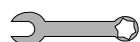
- The product is exhausted or is too thick to be siphoned
- The ball of the suction valve is sticky.
- The bushing of the suction system is not mounted accurately (air in the fluid circuit)
- The filter of the suction hose is clogged
- Add fluid or thin the product according to the manufacturer's instruction. Release the air from the machine.
- Dismantle and clean the ball and the valve accurately.
- Tighten the bushing accurately and release the air from the machine.
- Dismantle and clean the filter accurately.

□ THE PUMP FUNCTIONS EVEN WHEN THE GUN IS CLOSED

- The valves, the piston and the packings are worn.
- Replace the components

□ THE MOTOR OF THE COLOR PUMP FREEZES

- The motor stroke frequencies are high and the pump functions in a wrong environment.
- Too much condensate in the color pump motor.
- Use a smaller nozzle and check the paragraph on the *correct environmental conditions*.
- Filter the working air by mounting a condensate separator + lubricator.





5.9 MAINTENANCE TABLE

The following is a CHECK - LIST of the required maintenance operations.

OPERATIONS	FREQUENCY				CONDITIONS
	Daily	Weekly*	Monthly*	6 mths.	
Cleaning the unit Check hose integrity. Check ball valves. Check condensate level	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				This operation must be carried out when the unit is turned off and not working.
Check the clogging of the paint filter Check the clogging of the air filter. Check the tightening of the screws. Check pneumatic connections.		<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>		This operation must be carried out when the unit is turned off and not working.
Check the rod packings Check the wear of the rod				<input type="checkbox"/> <input type="checkbox"/>	This operation must be carried out when the unit is turned off

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6.1 STORING THE EQUIPMENT

If the need arises to store the equipment for a certain amount of time observe the following instructions:

- Disconnect the unit from the compressed air line
- Thoroughly clean the unit from paint residue.
- Insert thinner in the hoses.
- Cover the unit with a waterproof sheet.
- Keep the unit in a dry environment. To preserve all mechanical components the room temperature must range between 15°C and 40°C (59°F and 104°F).

6.2 DISMANTLING

Whenever the need arises to dismantle the paint unit, it is mandatory to observe a few fundamental rules for the safeguarding of the environment.

Protective coverings, flexible pipes, plastic or non-metal material should be dismantled and disposed of separately.

The machine DOES NOT CONTAIN POLLUTING OILS but residue paints must be disposed of at authorized waste disposal sites.

