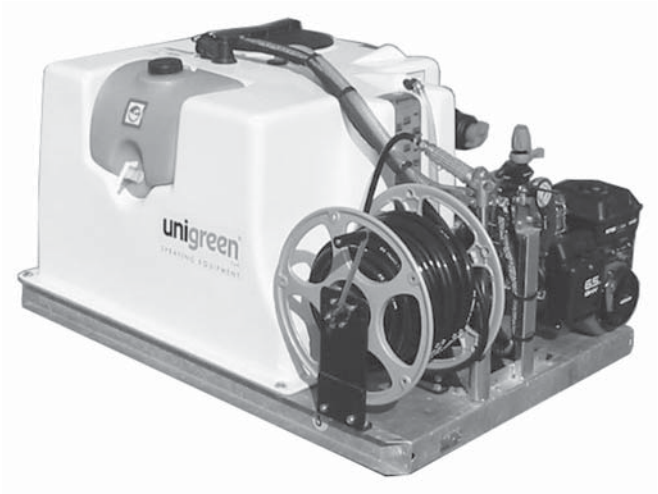
unigreen S.p.A.
CROP PROTECTION

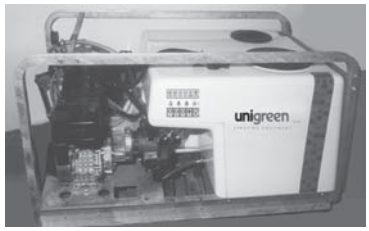
GB



USE AND MAINTENANCE MANUAL

UMP - MASTER

serie MASTER 20/40/50/55



Read this manual carefully before use

05/2005

the green world partner

Summary
Sommario

Thank you for having chosen UNIGREEN.
The product you purchased has been designed and built with the greatest attention to the safety of the operator and the environment, nevertheless there are still some residual risks due to the nature of the product used.
For this reason we recommend reading all of this manual to avoid making mistakes in the first period of use and to get the most out of the working life of the sprayer in time, doing the programmed maintenance at regular intervals.

1 USING AND KEEPING THE USE AND MAINTENANCE MANUAL

The manual is an integral part of the machine and should be kept in a safe place where it can be reached easily for consultation.

1.1 COMPOSITION OF THE MANUAL

This manual consists of various parts to make it easier to consult by subject and to avoid repetitions; the following are part of the manual:

a) pump handbook
b) pressure regulator handbook (manual or electric)
c) spraying computer handbook (if fitted)
d) optional accessories handbooks (marker, premix, cardan shaft, etc.)

UNIGREEN reserves the right to make changes to the manual without prior warning and the normal printing cycles may vary slightly.

1.2 GUARANTEE

The enclosed card indicates the conditions of the UNIGREEN guarantee. The UNIGREEN guarantee covers the repair or replacement of parts considered manufacturing flaws, according to the unquestionable judgement of UNIGREEN, only after the authorised agent for that zone has verified the fault.
Ambit of the guarantee
The guarantee doesn't cover cases of normal wear, negligent use, poor maintenance and/or improper use.
The following materials subject to normal wear are not covered by the guarantee: gaskets and seals, diaphragms, seal rings, tubes and pipes, nozzles, pressure gauges, oil, tyres, friction material of the clutches.
Evident cases of negligence include: work speed over that indicated in the spraying tables in the handbook (or too high for the conditions of the terrain), use of herbicide booms without an auto-levelling system or with the auto-levelling system blocked, power-takeoff speed over 540 rpm.
Mounted sprayers: activation of the three-point elevator with cardan shaft engaged and power-takeoff operational.
And anything else indicated in the present Use and Maintenance Manual.
Maintenance:
The guarantee is void if the maintenance indicated in the tables in this manual isn't respected, regarding the period and deadline of the interventions, washing the machine and the circuit at the end of the treatment.
Improper use:
The use the UNIGREEN machines are designed for is indicated in this manual, any other use is forbidden and makes the guarantee void.

1.3 PRODUCT RESPONSIBILITY

UNIGREEN spa is not responsible if:

a) During the working life of the machine the normal maintenance operations aren't performed and documented as indicated in this handbook, in the enclosed handbooks of the pumps-motors-regulators-etc. and in any case as is customary for the normal maintenance of mechanical machinery.
b) The machine is equipped with non original accessories or components or parts that aren't acknowledged by UNIGREEN as their own.
c) The machine is equipped with original accessories or components that are unsuitable in the measurements, weight or version for the same.
Please consult the page of available and recommended fittings.
d) Not following the instructions in the manual whether totally or partially.
e) Modifications made to the machine that haven't been authorised by UNIGREEN.

Composite handbook, consult the specific files on the various components

1.4 WARNING SIGNS IN THE MANUAL AND ON THE MACHINE

Below you will find all of the pictograms on the machine, in order to illustrate the warnings, the prohibitions and the correct method of use.
The operations that require particular attention are shown in the images beside the text.

Key to the symbols

1- Read the Use and Maintenance manual
2- Stop the machine and read the manual before every intervention
3- Don't lubricate while running
4- Don't drink
5- Don't dispose of residue liquids in the environment
6- No smoking
7- Danger, risk or injury, don't get near the machine until the moving machine members have stopped
8- Danger of crushing, don't get your hands near the moving mechanical machine members
9- Danger, risk or injury caused by fluids under pressure
10- Don't climb on the machine during work or transfers
11- Don't climb on the tank
12- Don't enter in the tank
13- Wearing earmuffs is obligatory
14- Wearing a face mask is obligatory
15- Wearing safety footwear is obligatory
16- Wearing protective gloves is obligatory
17- Wearing protective overalls is obligatory
18- Use a working pressure under that indicated in red on the manometer.

19- Don't get your hands near the moving cardan shaft
20- Make sure power-takeoff of the tractor turns in the right direction and runs at the right speed.

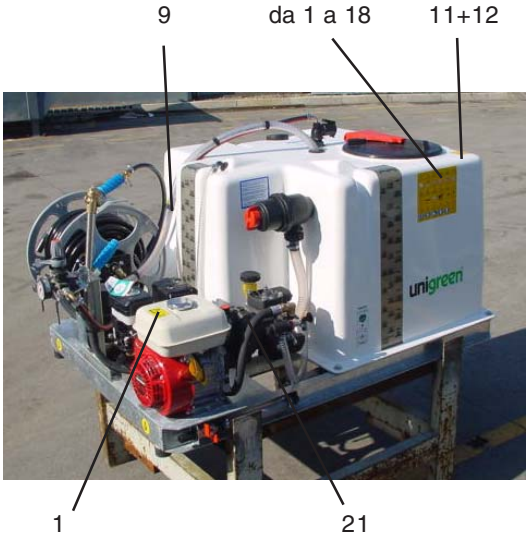
21- Danger of surfaces at high temperatures (internal combustion engine)

2 SAFETY REGULATIONS AND RESIDUAL RISKS

In relation to safety, the following terms will be used:
Dangerous zones: any zone inside and/or near the machine where the presence of a person exposed constitutes a risk for the safety and health of the same person.
Person exposed: any person who has their body or any part of their body in a dangerous zone.
Before starting the machine, the operator must check for any visible faults in the safety devices and the machine itself.
Never start the machine until you have told anyone in the range of action of the machine to move away and they have done so.
The protective devices must not be removed or disabled when the machine is running.
It is obligatory to keep all the plates with danger and safety signs in perfect conditions. If they get damaged or deteriorate, replace them in good time.
Replace parts believed to be faulty with others indicated by UNIGREEN.
NEVER try makeshift or hazardous solutions.
Don't wear clothes, jewellery, accessories, or anything else that can get caught in the moving machine members.
Pay the greatest attention to all the warning and danger signs on the machine.
Don't use the machine for any other purpose other than that indicated in the manual.
The machine has been designed and built with the appropriate devices to guarantee the safety of the user.
In any case there are some residual risks associated with the improper use of the machine by the operator; for this purpose danger signs and symbols and prohibitions are applied near some parts of the machine (see previous pictograms).

2.1 INTENDED USE

The sprayer in this series is built for agricultural use. The materials used are resistant to normal chemical products used in agricultural spraying (or herbicides) at the time of construction.
Any other use is not allowed and the manufacturer is not responsible for any damage caused by aggressive, dense or sticky chemicals.
THE USE OF THE MACHINE BY PERSONS UNDER 18 YEARS OF AGE IS STRICTLY FORBIDDEN
The use of liquid fertilizers in suspension is not allowed, while the use of the same in a solution is possible if requested when the machine is ordered from



INDICATIVE POSITION OF THE WARNING SIGNS ON THE SPRAYERS
NB: the position may vary on the basis of the characteristics of the model.

Unigreen and in any case changing some of the parts described in the handbooks of the regulator, such as the manometer (stainless steel), the nozzles (large diameter ceramic) and eliminating the fine mesh filters to prevent blockages.

2.2 PROHIBITED USE

Using the machine with the following products is strictly forbidden:

= Paints of any kind and type
= Solvents or thinners for paints of any kind and type
= Combustibles or lubricants of any kind and type
= LPG or gas of any kind and type
= Flammable liquids of any kind and type
= Liquid foodstuffs, whether for animals or humans
= Liquids containing granules or consistent solids
= Mixtures of various incompatible chemical products
= Liquid fertilizer or manure in suspension with lumps and/or that is particularly dense
= Liquids with a temperature of over 40°C
= Any products that aren't suitable for the specific use of the machine.

2.3 USING CHEMICAL PRODUCTS

All pesticides or herbicides can be dangerous to humans and the environment if used erroneously or inadvertently.
Therefore we recommend that only suitably trained persons should use these products (license) and in any case only after having carefully read the instructions on the container.

2.3.1 REGULATIONS FOR THE USE OF CHEMICAL PRODUCTS

Some recommendations for avoiding damage and accidents:

= Keep the machine in a suitable, protected place with no access for children or strangers
= Handle the products with care, wearing rubber acid-proof gloves, goggles-face masks or filtering helmets, overalls made of water-repellent fabrics or TIVEK and boots made of rubber or similar materials.
= If chemical products or mixtures of product come into contact with the eyes or are swallowed consult a doctor immediately, taking the label of the product with you.
= Wash all clothes that come into contact with the chemical, whether diluted or undiluted, thoroughly before using them again.
= Don't smoke, drink or eat when preparing or spraying the mix or near or in the fields treated.
= **DON'T ENTER THE TANK:** the residues of a chemical product can cause poisoning and suffocation.
= When spraying, respect safe distances from residential areas, water courses, roads, sports centres and public parks or paths.
= Thoroughly wash the containers of plant protection products using the relevant accessories, rinsing several times with clean water. The liquids used for washing can be used for treatment.
= Collect the washed containers and send them to the relevant collection centres. Never dispose of them in the environment and don't use them again for any other purpose. It is good practice to knock a hole in the bottom of the tins so they can't be used again.
= When you have finished spraying, wash the sprayer thoroughly, diluting the residues with a quantity of water at least 10 times that of the residues, spraying the resulting mix over the treated field.

2.4 RECOMMENDATIONS

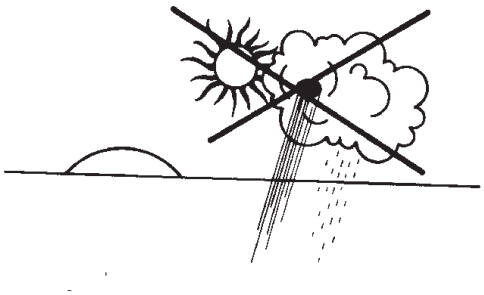
a) Refer to the present handbook for the use and maintenance of the frame, tank, auto-levelling systems, elevators, mechanical and hydraulic herbicide booms, spray booms and hose reels.
Refer to the enclosed handbooks for the use and maintenance of the pump and pressure regulator and any accessories or motors.
b) Please contact the agent in your zone, the nearest authorised workshop or UNIGREEN S.p.A. directly for any repairs the user feels they aren't capable of performing alone. (see point 10.4)
c) Due to the complexity of the equipment and the variety of technologies used (mechanical, hydraulic, oil-pressure and electrotechnical) operators must not dismantle or modify the equipment. All of the relevant operations must be performed by specialised personnel, authorised by UNIGREEN S.p.A.

2.4.1 TAKING PRECAUTIONS AGAINST FIRE HAZARDS

Don't use naked flames or heat sources near the machines.
The sprayers are made with many materials that derive from petroleum: tanks, tubes, pipes and hoses, wheels and plastic parts; furthermore the presence of oils of various nature and residues of chemical products make them potentially flammable.

2.5 MACHINES DESIGNED TO BE USED ONLY WITH CLEAN WATER

There are versions of the machines designed only to be used with a hose reel for washing with cold clean water.
These machines cannot be used with chemical products as they don't have some of the devices or accessories that are needed to use these products safely. These machines are identified by the word "washing" on the CE plate.



2.7 WEATHER CONDITIONS

We recommend spraying in the early hours of the morning or late in the afternoon, avoiding the hottest time of day.
Never do any spraying if it's raining or rain is forecast.
Don't spray in strong wind or in any case, in winds above 3/5 m/second.
If you have to spray in windy conditions, use relatively low pressures to obtain quite large drops that are less sensitive to drifting (being heavier the wind has less effect). There are also special anti-drift nozzles available from UNIGREEN S.p.A.; for information, please contact our offices.

2.8 ROAD CIRCULATION

The admissible capacity of the vehicle (pickup or truck) or the trailer upon which the equipment is positioned should be checked.
The equipment is supplied for application to the floor. In the case of fixed rigging the vehicle needs to be registered.
You need to check the correct couplings with your area dealer.

3 CHARACTERISTICS AND SPECIFICATIONS

3.1 MACHINE IDENTIFICATION

This handbook is valid for UMP-MASTER sprayers to be used for:
a) treatments with hand lances with or without a hose reel
b) hand lances for washing with or without a hose reel
The UNIGREEN S.p.A. sprayers are identified by the CE plate (FIG. 1) bearing one of the marks indicated in the tables of the allowed fittings (TABLE N° 10 , page 19).

FIG. 1

3.2 TABLES OF FITTINGS ALLOWED

Table N° 10 let you identify the version of your machine indicating the basic equipment and all the possible fittings available (optional).
You can also find the other fittings allowed or other versions to meet your requirements in the future.
THE FITTING DEFINED IN TABLE N° 10 (PAGES 19) SHOULD BE CONSIDERED BINDING FOR THE VALIDITY OF THE DECLARATION OF CONFORMITY.
Other fittings or setups of basic components and optionals should be considered unsafe and therefore are not covered by the guarantee and aren't UNIGREEN's responsibility.
The same goes for fittings realised with components or accessories that aren't original UNIGREEN parts.
UNIGREEN accessories can easily be identified by the label with the yellow background "ORIGINAL UNIGREEN ACCESSORY"

3.3 NOISE LEVEL OF THE MACHINE

Use earmuffs to protect your ears when using the machine, the multi-purpose Units produce a maximum level of sound pressure inferior to 89 dB (A) and a level of power inferior to 107Db (A).
Readings taken in accordance with the following standards:
Machines Directive 98/37/CE (Ex. Dir.89/392 CE).
Legislative Decree D.Lgs. n°292 of the 4th of September 2002 concerning the environmental acoustic emission of machines and equipment for use outdoors.
Legislative Decree D.Lgs. 277/91 on the subject of the protection of workers against the risks deriving from exposure to chemical, physical and biological agents.

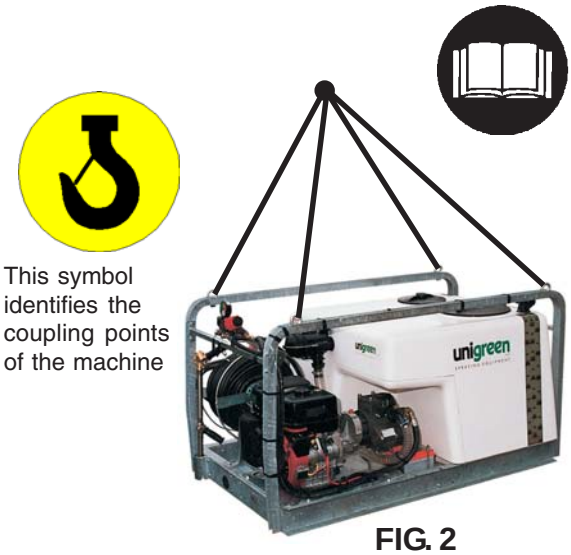
3.3 STANDARDS OF REFERENCE:

- MACHINES DIRECTIVE 98/37/CEE (Ex. Dir.89/392 CE).
- Directive 86/188/CEE: risks deriving from exposure to noise (implemented in Italy by Legislative Decree D.L 277/1991)
- DPR 547/1955: Regulations for the prevention of accidents and hygiene at work.
- Legislative Decree D.Lgs. n°292 of the 4th of September 2002 concerning the environmental acoustic emission of machines and equipment for use outdoors.
-UNI EN 292-1/Nov.1992: Machinery safety – Terminology, basic methodology
-UNI EN 292-2/Nov.1992: Machinery safety - Specifications and technical principles.
-UNI EN 294/July 1993: Machinery safety, safe distances to avoid reaching hazardous areas with upper limbs.
-UNI EN 349/June 1994: Machinery safety, minimum spaces to prevent crushing of body parts
-UNI EN 907/Nov.1998: Agricultural and forestry machinery - Sprayers and spreaders of liquid fertilizers - Safety.
-EN 954-1/Dec. 1992: Safety of machinery: Basic concepts, general principles for design.
-UNI EN 982/July 1997: Machinery safety. Safety requisites relevant to systems and their components for hydraulic and pneumatic transmissions. Hydraulics.
-UNI EN 1553 Agricultural machinery - self-propelled, tractor mounted, half-trailed and towed machines. Common safety requisites
-ISO 11684/1995: Pictograms - general principles.

4 USER'S INSTRUCTIONS

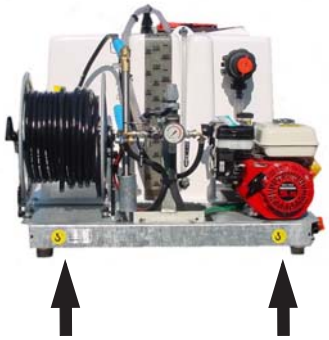
4.1 TRANSPORTING AND MOVING THE MACHINE

If the machine has to be lifted, use suitable slinging and tackle, crane or bridge crane, with capacity suitable for the use. The dry weight of the machine at the maximum level of fitting and with all the accessories allowed is stamped on the nameplate; use slings and lifting gear with a adequate load-bearing capacity.
Don't stand the sprayer on soft ground or steep slopes.
Never lift or move the sprayers by hand if there is liquid in the tank. The machine will weigh more and the movement of the liquid can change the centre of gravity causing uncontrolled movements.
It is opportune to apply the slinging as in FIG.2 for the MASTER 55 model or those equipped with eyebolts. It is necessary to use forklift trucks or transpallets with an adequate capacity for other models. The forks should be placed as indicated in the specific pictograms.
Don't pass or stand under the machine when it is being lifted.



This symbol identifies the coupling points of the machine

FIG. 2



4.2 DESCRIPTION OF THE MACHINE

The UMP and MASTER machines are made to be mounted on the floor of the pickup vehicle. Some models can be equipped with wheels and handlebar for towing by hand or by small tractors.
The frame is in hot galvanised steel, the cisterns are in easy-to-empty organic glass reinforced with glass fibre. Versions are available with the cistern in galvanised or stainless steel.
The pumps are generally membrane and in some cases piston and are coaxially mounted with an electric or internal combustion engine reducer.
They are equipped with an external suction filter that allows easy inspection.
All the machines are equipped with a hose nozzle for watering and/or washing with a length of tubing.

4.2.1 HAND WASHING TANKS

The sprayers are supplied with an auxiliary hand-washing tank with clean water and a hand tap.
This tank must always be supplied with water and the inside must be clean so you can wash any parts of the body that come into contact with the chemical product used.
Never drink the liquid inside.

4.3 PRELIMINARY CHECKS

When you receive the machine, check that it is complete and no parts are missing.
If there are any damaged parts, inform your local reseller or UNIGREEN directly in good time.
When the machine is delivered, make sure you ask:

a) that the machine is delivered with all of its parts fitted and that the fitting meets the requisites in table N° 10 (page 19). (This procedure is necessary because for reasons of space during transportation the machine is often delivered partially dismantled).

b) that it is tested in your presence in particular checking:

= that the suction filter and the inside of the tank are clean and free of work residues.

= that the connections are made correctly following the basic layout (FIG. N° 9, page 16).

= that the hose clips and all the unions and connections are tightened properly.

= that all of the protective covers are fitted solidly to the machine, in particular the protective cover of the power-takeoff of the pump.

4.4 APPLICATIONS

The UMP and MASTER machines are made to be mounted on the floors of vans or similar vehicles. They can also be mounted on automobile type trolleys or pickup vehicles with sufficient capacity. Always made sure before mounting that the capacity of the trolley or the vehicle is sufficient. A tow-hook wheel kit NOT approved for circulation on the road and suitable for small movements within private areas is supplied on request.

4.5 MOTORS

4.5.1 ELECTRIC MOTORS

The electric motors of the motor-pumps correspond to the regulations in force envisaged by the low-tension regulation and are guaranteed by the specific plate of the constructor. The 20 Volt single-phase version is usually supplied with plug and switch while the 380 Volt three-phase version is usually supplied with a terminal board and the plug must be installed by an authorised and competent installer. The plant to which the motor-pump is applied must correspond to the regulations in force and be served by an automatic differential lifesaver switch. Never, for whatever reason, direct the spray of the nozzle towards the motor. Consult the specific use manual attached.

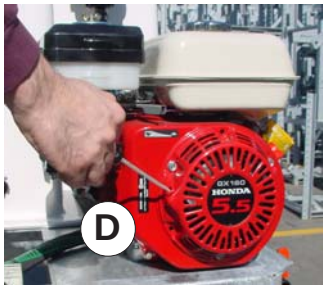
4.5.2 INTERNAL COMBUSTION ENGINES (TWO STROKE-PETROL-DIESEL)

Use the motor keeping scrupulously to the use and maintenance booklet and in case of need apply to the producer's assistance network.
Nevertheless, we list summarily a number of instructions to observe:

Petrol mixture motors (two stroke): respect the percentage of oil present in the petrol and avoid the motor losing revs if the liquid contained in the cistern unexpectedly finishes.

Petrol and diesel motors with electric starters: check the level of efficiency of the battery and carry out normal maintenance.

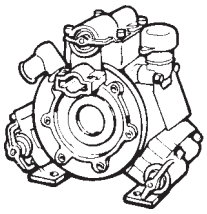
Before starting check that the command lever of the pressure adjustor (lever A page 10) is in the discharge position; starting is difficult in the pressure position and might not take place.



To start an internal combustion engine proceed as follows:

= Open the fuel supply, putting valve A onto the ON position
= Put air lever B onto the closed position
= Select ON on the main switch of the motor (C)
= Pull start handle D or press the START switch (motors with electric starter)
= Gradually re-open the air (lever B) and adjust the speed.

ATTENTION: normally the parts that heat up (silencer, heads, etc) are protected. However pay maximum attention to avoiding contact.



4.6 PUMP

When using the pump scrupulously observe the instructions in the enclosed handbook supplied by the manufacturer.
The pump can be identified by the ratings plate on the same; the main data on the pressure and delivery are easy to find on this plate.
Normally the pumps mustn't exceed 550 RPM; a higher speed won't improve performance but there is a risk of compromising the life and safety of the pump.
There is a safety valve on the pump, calibrated to prevent overpressure. Don't tamper with this valve for any reason and don't block or obstruct the pipes connected to it in any way.

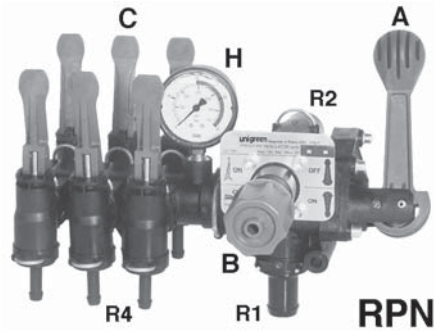
4.7 SUCTION FILTER

FIG. 3

The sprayer is fitted with a suction filter with filter cartridges that have roughly a 50-gauge mesh, which is equivalent to a hole of 0.4 at 0.35 mm.
An efficient filter lets the sprayer work properly.
You should periodically check that the filter cartridge is clean, this check should be done more often if there are impurities in the liquid.
To inspect the filter cartridge wear rubber acid-proof gloves as the liquid in the filter can come into contact with your hands when you open the filter.
Don't perform this operation with the pump running as the depression produced blocks the cover preventing the removal.
Before removing the cover of the filter, make sure that the same is isolated from the tubing by unscrewing the relevant rear valve (FIG. N° 3).
After washing the cartridge, reassemble the cover making sure you connect the same to the circuit again, using the valves described above in the opposite order.
WARNING!: Don't disperse the washing residues in the environment!!

4.8 PRESSURE REGULATOR

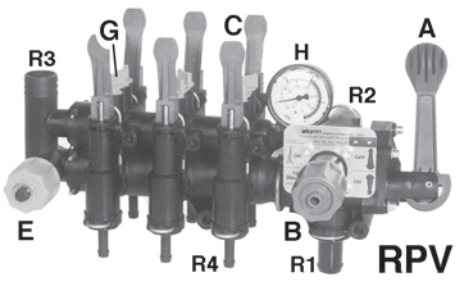
To use the pressure regulator, follow the instructions in the enclosed handbook scrupulously. The pressure regulator controls all of the most important spraying functions, the thorough knowledge of its functions makes work easier and more precise.
The working pressure and the maximum pressure of the sprayer are determined by the pressure regulator which also protects the circuit from overpressure in any work conditions. (In serious but very rare cases, if the connecting pipes get blocked the pressure relief valve lets the pressure off)
In some setups there may be a pump that can reach a pressure of 50 bar controlled by a regulator designed for 20 bar. In this case the maximum pressure that can be reached is 20 bar.
The regulators can be manual, mounted on the sprayer or at a distance to make the controls easier to use; or electrical with a control panel in the cabin.
There are also regulator versions with mechanical remote controls with a cable. If the tractor has a waterproof cabin the use of electrical controls is obligatory.



4.8.1 COMPONENTS OF THE PRESSURE REGULATOR

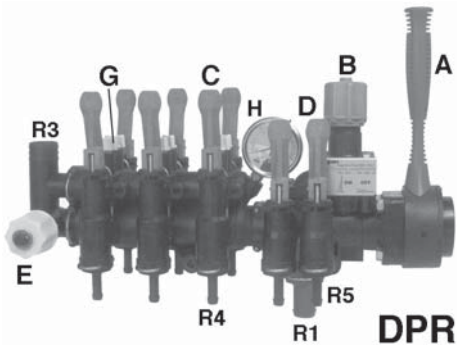
Below you will find the indications for the main models fitted on Unigreen products.

A main ON-OFF command: "open" lets the fluid flow into the circuit in use; "closed" empties the tank.
B maximum pressure valve: adjusted by hand with the relevant knob (drains the excess liquid when the set pressure is reached).
C boom section tap: opens the corresponding boom or drains to the compensation regulator (G).
D auxiliary tap: can be used for various accessories (it is always manual).
E volumetric pressure valve (proportional):
(when present) it regulates the spraying pressure. The valve automatically compensates variations in speed (within the scope of the same gear ratio), keeping the quantity of liquid supplied per surface unit (litres/hectare) unchanged.
F self-cleaning filter: filters the delivery liquid.
G compensation regulators: suitably regulated, these make it possible to keep the pressure constant when one or more sections of jets is closed, they don't influence treatments with the boom fully open.
H manometer: indicates the working pressure.



Connections:
R1 supply union
R2 drain union
R3 volumetric drain union
R4 boom section delivery union

R5 auxiliary delivery union



4.8.2 GENERAL INSTRUCTIONS

When using the pressure regulator, scrupulously observe the instructions in the enclosed handbook, below you will find generic indications for the major models fitted by Unigreen.

All the regulation and adjustment tests must be carried out with clean water.

Pressure regulators without a volumetric valve (GCP3-way - RPN - RVA)

Adjusting the maximum pressure valve

= put main control **A** in the drain position ("OFF").

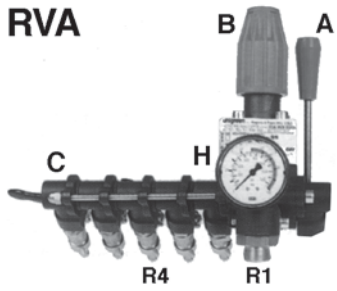
= loosen the hand wheel of maximum pressure valve **B** completely (anticlockwise).

= start the pump by activating the power-takeoff of the tractor at 540rpm

= open main control **A** (position "ON"), the manometer will be activated

= open all of the section valves **C** (position "ON")

= adjust maximum pressure valve **B** to the working value (in any case less than the safe maximum pressure the system can reach).



Pressure regulators with a volumetric valve (RPN-DPR-ERGO-REMO)

Adjusting the maximum pressure valve

= put main control **A** in the drain position ("OFF").

= loosen the hand wheel of maximum pressure valve **B** completely (anticlockwise).

= open volumetric valve **E** completely.

= start the pump by activating the power-takeoff of the tractor at 540rpm

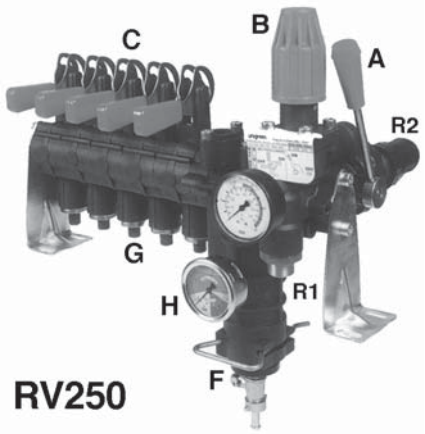
= open main control **A** (position "ON"), the manometer will be activated

= open the drain tap on filter **F** slightly (only ERGO and REMO)..

= close volumetric valve **E** completely. If the pressure rises over the maximum limit of the system, make sure maximum pressure valve **B** is open (see previous indications)

= open all of the section valves **C** (position "ON")

= adjust maximum pressure valve **B** to a value over that of the working pressure (generally 10-14 bar) and in any case lower than the safe maximum pressure that the system can reach.



Adjusting the volumetric pressure.

= with the volumetric pressure valve **E** adjust the pressure to the value the treatment will be done at (the pressure is indicated on the nozzles tables on the basis of the tractor speed and litres/hectare to spray)

Warning! The working pressure must be adjusted with the volumetric valve and not with the maximum pressure valve. In the case the working pressure is too near to the calibrated pressure of the maximum pressure valve, the proportional valve may not be able to compensate the speed variations correctly.

Adjusting the compensated returns

= close only one tap of section **C** (position "OFF").

= adjust the corresponding compensator **G** until you return to the pressure set previously (displayed on the manometer).

= open and close the tap of section **C** and check that the pressure remains constant.

= repeat the above operations for all the section taps.

If the types of nozzles aren't changed the regulations carried out will guarantee a constant spraying of the liquid also per treatments that are done at different working pressures.

NB: if the type of nozzle is changed then the calibrating will have to be done again.

4.9 DELIVERY FILTERS (ONLY EQUIPPED MODELS)

Particularly useful when using small (low volume) nozzles.

In a central position with a manometer after the filter that shows any blockages in the cartridge. On the RVA version there is also a manometer before the cartridge to make it easier to find the problem.

For cleaning the cartridge in the model RVA you should open the drain with the relevant lever (Fig. N° 4) for 2-3 minutes during the washing operations, as in the enclosed instructions.

You should clean the cartridge by hand periodically, on the basis of the product used. To clean, stop the pump. Wear rubber gloves and the other personal protective equipment when cleaning.

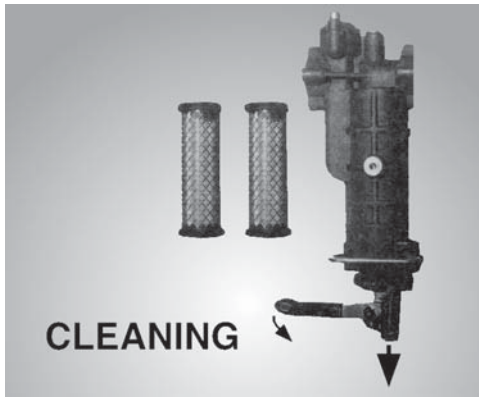
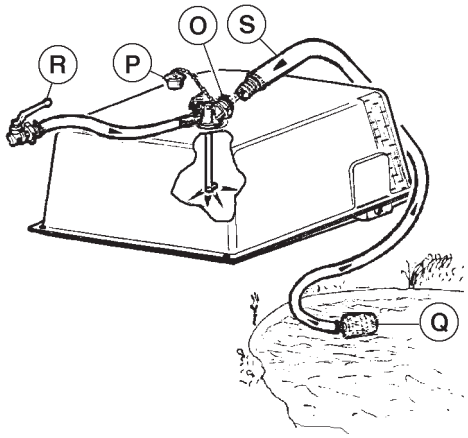


FIG. 4

4.10 FILLING THE TANK

The machines for defensive crop treatments, in consideration of the safety of persons, animals and the protection of the environment, must only be filled indirectly from open water courses and only by free-falling water from the waterworks.
The pipe used for filling must never come into contact with the liquid inside the tank and therefore the water must always fall over the upper edge of the filling inlet and through the filter installed on it.
The tank is fitted with a transparent graduated band that shows the exact quantity of liquid inside. This reading is precise if the tank is on flat ground; the actual total capacity coincides with the highest number. All the filling systems fitted by Unigreen on their production machines or on request are antipollution and stop the liquid overflowing out of the tank.

FIG. 6



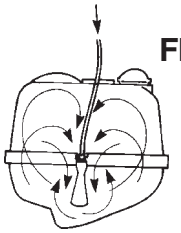
4.10.1 FILLING WITH THE ANTIPOLLUTION EJECTOR (FIG. 6)

If you are filling with an antipollution hydroejector (mounted as standard on some models) then you should proceed as follows:
= put roughly 20-30 L of water in the tank and start the pump.
= remove the cap of ejector **P** and insert filling pipe **S**.
= place the other end of the hose, on which you fitted filter **Q**, in the watering point.
= open the tap R that supplies the ejector (on pump or pressure regulator **)**.
= increase the pressure until it reaches a value which is sufficient to suck up the liquid.
= visually check the level of the liquid inside the tank and after filling disconnect pipe **S** from the ejector, close the tap R and replace the cap P.

4.11 TEST TREATMENT WITH CLEAN WATER

We recommend doing a test treatment with clean water to get to know the system and check the settings.

FIG. 7

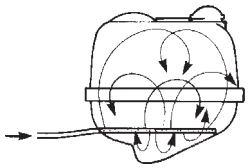


4.12 MIXING

The active principle can be mixed using the relevant stirrers before and during the treatment. Correct mixing and stirring is the basis of the correct distribution on the crops. We recommend some useful accessories such as the premixer for powders and liquids (see the following paragraph).

To mix the product in the tank proceed as follows:

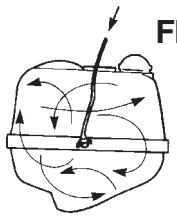
FIG. 8



a) high-pressure machines from 30 to 60 bar (FIG. N° 7): run the stirrer (or ejector) for roughly 10-15 minutes at the maximum pressure available

b) low pressure machines, max 20 bar
= with a drilled pipe on the drain, run the pump at roughly 540 RPM with the pressure regulator on drain for at least 10-15 minutes. (FIG. N° 8)
= with the stirrer on a delivery, run the pump supplying the stirrer (or ejector) at the maximum pressure available for at least 10-15 minutes. (FIG. N° 7)

FIG. 9



Some models with very small tanks aren't equipped with mixers, you should use the drain of the pressure regulator: run the pump at roughly 540 RPM with the pressure regulator in the drain position for at least 10-15 minutes. (FIG. N° 9).

4.12.1 MANUAL PREMIXING

Dilute the active principle by hand before introducing it into the tank, (you must wear suitable protective clothing such as rubber gloves, a mask or goggles, overalls, etc.).

WARNING: using the taps on the pump or in any case on the front of the machine puts the operator near the cardan shaft. Despite the presence of CE standard protective covers you should take great care.

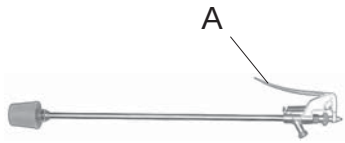
4.12.2 PREMIXER ON COVER (OPTIONAL):

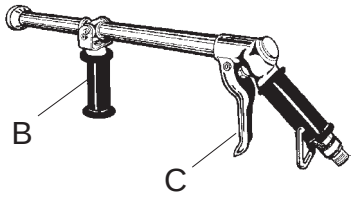
Open the cover and pour all of the chemical powder into the filter, close the cover and open the supply tap until all of the powder has dissolved.

4.13 WASHING THE SPRAYER

Thoroughly wash the machine after each treatment pumping clean water through the circuit and clean the suction and delivery filters.
Dirty equipment is very dangerous for the people and environment.
Discharging the residues of washing in the environment without taking precautions is forbidden as this pollutes watercourses. Distribute the residues on the treated field.

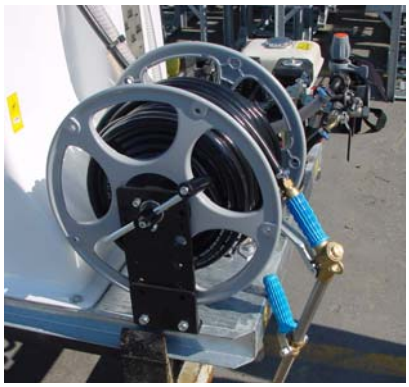
5 HAND LANCES





When using hand lances bear in mind the following notes:
= Don't direct the jet of liquid towards electric power lines or zones where there is electrical current, houses or where people might pass.
= Don't point the jet at people or animals.
The jet can cause serious injuries simply due to the mechanical force of the liquid under pressure.
= Never block the spraying lever of the lance in an open position because if the lance falls it will be uncontrollable.
= At the end of work after you have stopped the pump, make sure that any residual pressure in the pipes under pressure has been drained to avoid unexpected jets when putting the lance away.
There are various types of lances; with a lever, mitra spray gun and pistol grip. For further information please refer to the handbook in the package.
The lever lance is controlled by opening lever A which, depending on how much it's pressed, produces a conical spray or direct jet. The standard nozzle is Ø 1.5
The mitra spray gun can produce a direct jet or a conical spray and the type of spray is selected by pushing lever B forwards or backwards. Use lever C to open the jet. The standard nozzle is Ø 2.5
Replacement nozzles are available for all of the lances and the capacities are indicated in the tables N° 4 e N° 5 (5bis for Master 55).

6 HOSE REEL



Available in the following sizes 20-50-100 , with mechanical, electrical and hydraulic rotation.
To use the system, consult the enclosed handbook as there are significant differences between each.
After work it is important to block the winding roller to stop the hose unwinding while you are moving the sprayer.

Anti-unwinding blocking knob.

8 MAINTENANCE

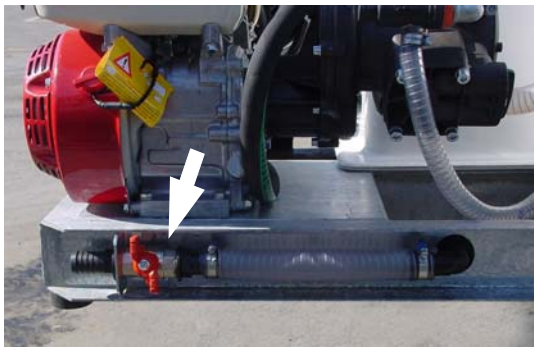
(to carry out with the internal combustion engine stopped or the plug detached for electric motors).
The maintenance of the sprayer is essential for maintaining a high level of safety. Also consult the single handbooks of the main components of the sprayer.
All of the maintenance operations and repairs must be carried out with the machine and cardan shaft stopped and the tank and circuit clean of any residues of chemical products.

8.1 PROGRAMMED MAINTENANCE

(TAB. N° 7, page 18)
We recommend using a table of programmed maintenance to follow in time to keep the sprayer in an efficient working condition.
For major and important maintenance jobs we recommend using the normal UNIGREEN assistance service available from your reseller, using original UNIGREEN spare parts.

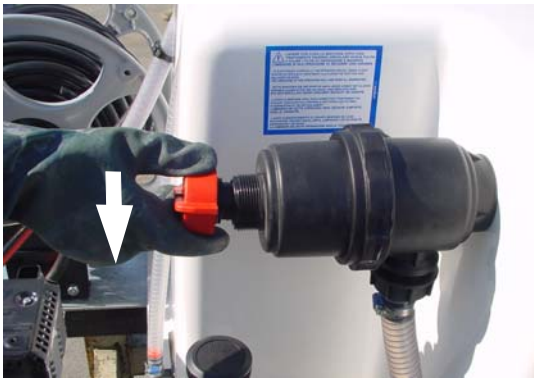
8.2 EMPTYING TANK

The MULTI-purpose unit is equipped with a tap for emptying the tank completely.
When cleaning the interior of the cistern, all the washing liquids can be conveyed toward the tap indicated to the side.
We advise connecting the supplied tube in order to avoid discharging the liquid directly onto the unit and its structure.


Rubinetto di svuotamento cisterna

8.3 ROUTINE MAINTENANCE

= After every treatment, wash the inside of the tank and the entire circuit as indicated in paragraph 4.13
= Periodically check that the suction and delivery filters are clean (see figure)
= Check the oil level in the volumetric compensator of the pump
= The use of chemical products that are particularly damaging for a nitrile rubber mix (ex.. herbicides and products for rice fields) can cause the diaphragm to break before time.
In these conditions check the state of the components more often.




Smontaggio Filtro di Aspirazione

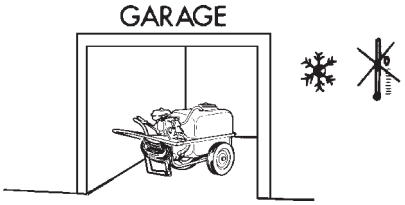
8.4 EXTRAORDINARY MAINTENANCE

At the end of a season of intense use, or every two years of normal use, it is a good idea to have a specialised service technician perform a general check on the machine.

8.5 REPAIRS

We recommend having the normal UNIGREEN assistance service available from our reseller perform any repairs or contact a specialised workshop. During all of the repairs, in particular when welding, the machine and the circuit must be clean of any residues of chemical product.
If the machine has to be lifted (for example to change a wheel) follow the instructions in point 4.1 of the present handbook.
Also make sure the machine is stopped, connected to the tractor, and use the relevant chocks to block the wheel still on the ground.
If you use a jack (manual or hydraulic) make sure you use a jack that is suitable for the frame so it can't slip and put it in the right position. The jack must be placed under the main frame of the machine near the wheel to change. Make sure the ground is compact: if necessary use wooden beams or other sufficiently resistant material to broaden the supporting base of the jack.

8.6 STORAGE IN A WAREHOUSE AND TRANSPORTATION



The sprayer must be kept in a closed place away from excessive humidity and protected from frost. Especially if electrical pressure regulators, electrical motors, a spraying computer or similar components are fitted.
Before storing the machine, after you have washed it, apply a light coat of oil.
If the temperature might drop to below zero, drain any residual liquid or add roughly 0.5 L of normal antifreeze for auto vehicles.
To transport the machine follow the instructions in point 4.1 of the present handbook.

8.7 PUTTING BACK INTO SERVICE AFTER WINTER LAYUP

Before using the machine again after a long period of inactivity you should perform some general checks, following the instructions in point 4.4 and drain any antifreeze.
Never start the shaft of the pump if you think there may by ice inside. To check this, make sure you can turn the shaft by hand without connecting it to the tractor.
After you have connected the machine to the tractor (see point 4.5) following the instructions in the present user's handbook and in the enclosures of the pump, pressure regulator and accessories.

8.8 DEMOLITION AND DISPOSAL

When the sprayer will be put out of service you should wash it with great care to remove any residues of chemical product, follow the instructions in point 4.13 of the present handbook.
Most of the materials used in the construction of the sprayer can be recycled; all the metals (steel, aluminium, brass) can be consigned to a normal scrap yard.
All of the remaining parts, whether made of plastic (nylon, nylon + fibreglass, moplen, etc...) see pressure regulator and parts of the pump, fibreglass or polyethylene (tank), nitrile rubber mix and fabric or plasticized PVC (various pipes and hoses) can be consigned to a controlled 1st class dump.
For information contact the normal waste disposal and rubbish collection service in your area.
The disposal of the waste that derives from the demolition of the machine should be done in full respect of the environment, without polluting the ground or water courses.
In any case respect the relevant local legislation in force.
Remember that refuse is understood to mean any substance or object that the possessor disposes of or has decided to dispose of or is obliged to dispose of (legislative decree D.L.vo n.22 of the 5th of February 1997).

UMP with MOTORPUMPE

FIG. 9

A: MUTORPUMPE
B: SUCTION FILTER
C: EJECTOR
D: FLOATING FILTER

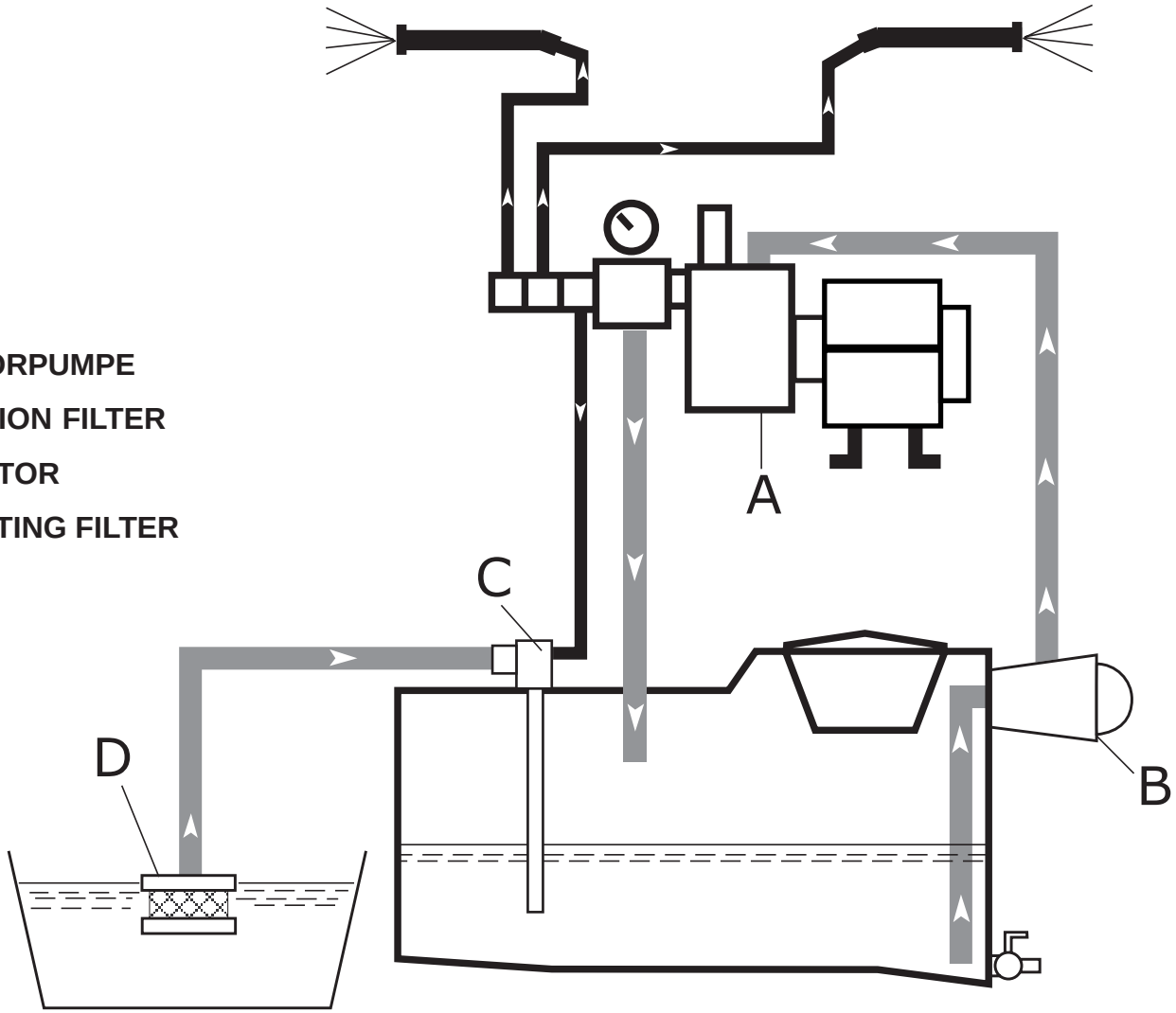


TABLE 4-5 TABLES OF DELIVERY OF NOZZLES FOR HAND LANCES

TABLE OF DELIVERY IN LITRES / MIN. OF THE CONICAL NOZZLES FOR LEVER LANCE

note: standard Ø1,5 nozzle

NOZZLE DIAMETER			Ø 1,0	Ø 1,2	Ø 1,5	Ø 1,75	Ø 2,0	Ø 2,2	Ø 2,5
PRESSURE (BAR)		JET	CAPACITY (Lt / min)						
	**5**	cone	1,16	1,40	1,90	2,25	2,65	2,90	3,50
		direct jet	1,40	1,70	2,50	3,95	4,7	6,00	7,70
	8	cone	1,40	1,80	2,60	2,80	3,40	3,65	4,45
		direct jet	1,70	2,20	3,40	4,85	6,00	7,60	9,80
	10	cone	1,50	1,96	2,90	3,10	3,90	4,10	5,00
		direct jet	1,90	2,40	3,75	5,40	6,95	8,55	11,0
	12	cone	1,60	2,20	3,20	3,40	4,30	4,50	5,50
		direct jet	2,00	2,70	4,20	5,95	7,70	9,40	12,1
	15	cone	1,88	2,40	3,40	3,80	4,50	5,00	6,10
		direct jet	2,30	3,00	4,50	6,65	8,30	10,4	13,4
	30	cone	2,60	3,40	4,80	5,40	6,30	7,10	8,70
		direct jet	3,20	4,20	6,40	9,40	11,7	14,7	19,1
	50	cone	3,40	4,40	6,20	6,80	8,10	9,20	11,2
TAB. 4		direct jet	4,10	5,40	8,30	11,8	15,1	19,1	24,6

TABLE OF DELIVERY IN LITRES / MIN. OF THE CONICAL NOZZLES FOR "MITRA" SPRAY GUN

note: standard Ø2,5 nozzle

NOZZLE DIAMETER			Ø 1,0	Ø 1,2	Ø 1,5	Ø 1,8	Ø 2,0	Ø 2,3	Ø 2,5	Ø 3,0
PRESSURE (BAR)		JET	CAPACITY (Lt / min)							
	**15**	cone	2,45	3,60	4,60	5,90	6,90	8,10	9,20	11,5
		direct jet	2,50	3,80	5,10	7,30	8,80	10,8	13,0	18,4
	25	cone	3,00	4,25	5,70	7,20	8,10	10,2	11,4	14,4
		direct jet	3,10	4,60	6,50	9,30	11,7	14,1	16,4	24,1
	35	cone	3,40	4,70	6,60	8,50	10,2	12,9	14,0	18,0
		direct jet	3,50	5,40	7,40	10,8	13,4	16,8	19,1	28,2
	40	cone	3,55	5,20	6,90	9,20	10,9	13,7	14,5	18,8
		direct jet	3,65	5,90	7,80	11,7	14,3	17,9	21,0	30,1
	45	cone	3,75	5,35	7,30	9,70	11,7	14,3	15,4	19,6
		direct jet	3,85	6,10	8,20	12,2	15,2	18,8	22,0	31,5
	50	cone	4,00	5,60	7,70	10,5	12,5	14,9	16,4	20,9
TAB. 5		direct jet	4,10	6,30	8,60	12,7	15,8	19,7	23,0	33,0

TABLE OF DELIVERY IN LITRES / MIN. OF THE CONICAL NOZZLES FOR "SUPERGETTO" SPRAY GUN

note: standard Ø4,5 nozzle

NOZZLE DIAMETER			Ø 3,5	Ø 4,0	Ø 4,5	Ø 5,0	Ø 5,5	Ø 6,0	Ø 7,0
PRESSURE (BAR)		JET	CAPACITY (Lt / min)						
	**15**	cone	24,0	29,0	33,7	40,3	43,8	47,3	47,3
		direct jet	24,8	30,2	36,2	41,8	47,3	52,0	55,8
	25	cone	31,0	37,5	43,5	52,0	56,5	61,0	61,0
		direct jet	32,0	39,0	47,0	54,0	61,0	67,0	72,0
	35	cone	36,7	44,4	51,5	61,5	67,0	72,2	72,2
		direct jet	37,9	46,1	55,6	64,0	72,2	79,3	85,2
	40	cone	39,2	47,4	55,0	65,8	71,5	77,2	77,2
		direct jet	40,5	49,3	59,5	68,3	77,2	84,7	91,1
	45	cone	41,6	50,3	58,4	69,8	75,8	81,8	81,8
		direct jet	43,0	52,3	63,1	72,5	81,8	90,0	96,6
	50	cone	43,8	53,0	61,5	73,5	80,0	86,3	86,3
TAB. 5bis		direct jet	45,3	55,2	66,5	76,4	86,3	94,8	102,0

TABLE 7 TABLE OF PROGRAMMED MAINTENANCE

OPERATION	8 h	50 h	300 h	END OF SEASON
Check the level and state of the oil	0			
Check the accumulator pressure		0		
Check the suction (hoses, pipes, unions)		0		
Check and clean the suction and delivery filters	0			
Check the pump fixing feet and screws in general		0		
Check the diaphragm and the oil and change if necessary			X (1)	X (2)
Check the suction/delivery valves			X	X
Check the pump screws and bolts are tight				X
Check and clean the nozzles and the non-drip diaphragm	0			
Check the wear of the nozzles			0	
Check the hydraulic oil level		0		
Check any failures or cracking of the welds, especially on herbicide booms				0
Grease the articulated joints and the wheel hubs		0		
Check the tyre pressure		0		

NOTE: 0 Operation to be carried out by the operator
X Operation to be carried out by a specialised technician or in an authorised workshop
(1) First oil change
(2) Change at the same time a changing the diaphragm

TABLE 8 PROBLEMS, CAUSES AND SOLUTIONS

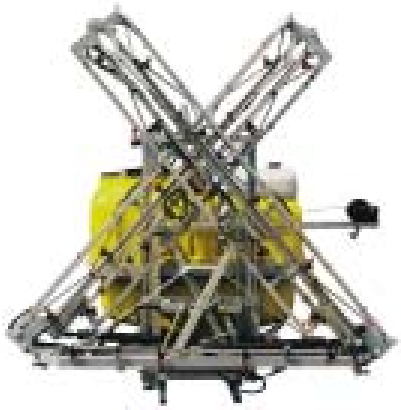
PROBLEMS	CAUSES	SOLUTIONS
The pump won't charge	Air suction	Check the suction system
	Adjustment valve closed (Command group isn't at zero pressure)	Position the lever correctly
	Valves and/or valve seats suction and delivery worn or dirty	Replace or clean (*)
The pump doesn't reach the set pressure	Valve and/or valve seat adjustment worn	Replace (*)
	Valves and/or valve seats suction and delivery worn or dirty	Replace or clean (*)
	Insufficient rpm	Bring speed up to correct rpm always in the field of 350 ÷ 550 rpm.
	The nozzles used are worn or have holes that are too big	Replace
	Suction blocked	Clean the cartridge of the filter or remove the blockage
Irregular pressure (with impulses)	Valves and/or valve seats suction and delivery worn or dirty	Replace or clean (*)
	Air suction	Check the suction system
Excessive vibrations at delivery	Pressure accumulator discharged or incorrect air pressure	Bring the air pressure back up to the right value (see pump handbook) (*)
Noisiness and the level of the oil has dropped	Blocked suction	Check the suction system
Water in the oil	Breakage of one or more diaphragms	Replace (*) If the replacement isn't done immediately, drain the water out of the pump and introduce clean oil without water (also used) or diesel to stop rust attacking the internalparts
No liquid comes out of the nozzles	Delivery filter dirty Non-drip filters dirty Nozzles blocked	Clean

NOTE: (*) Only specialised technician

TAB.10 ALLOWED FITTINGS

2005 TYPE OF MACHINE **TAB. 10** FITTING Capacity (lt)		Mobile Unit Sprayer with Fiberglass Tank							
		MASTER 20 200	MASTER 40 400	MASTER 40 400	MASTER 50 500	MASTER 50 500	MASTER 55 500	MASTER 55 500	MASTER 55 500
PUMPS	PUMP MP40	X	X		X				
COMET	" " APS 31	X	X		X				
	" " APS 41	X	X		X		X		
	" " APS 51			X		X		X	
	" " P48	X	X		X				
PUMPS	PUMP AR 50			X		X		X	
ANNOVI	" " AR 503			X		X		X	
REVERBERI	" " AR 813								X
CLEANING	AXD 3020 G		X		X		X		
PUMPS	ZWD 3530 G			X		X		X	
4-STROKE	B & S 6,5 HP	X	X		X		X		
ENGINES	B & S 9 HP			X		X		X	
	B & S 16 HP								X
	HONDA GC160 5 HP	X	X		X				
	HONDA GX160 5,5 HP	X	X		X		X		
ELECTRIC	Battery 12V	X	X	X	X	X	X	X	X
START									
HOSE REEL	20 Mt	X	X	X	X	X	X	X	X
	40 Mt	X	X	X	X	X	X	X	X
	50 Mt	X	X	X	X	X	X	X	X
SPRAY GUN	LEVER	X	X	X	X	X	X	X	X
	MITRA	X	X	X	X	X	X	X	X
	SUPERGETTO			X		X		X	X
BOOMS	GREEN 2 mt	X	X	X	X	X	X	X	X
	Herbicide boom 3 mt	X	X	X	X	X	X	X	X
NOZZLES	Unijet Antidrip	X	X	X	X	X	X	X	X
NOZZLES TIPS	FAN NOZZLE TIP ISO	X	X	X	X	X	X	X	X
	CONE NOZZLE TIP ATR	X	X	X	X	X	X	X	X
	CONE NOZZLE TIP ISO	X	X	X	X	X	X	X	X
	ANTIDRIFT NOZZLE TIP	X	X	X	X	X	X	X	X
TOWING	WHEELS KIT AND TOWBAR	X	X	X	X	X	X	X	X
WEIGHT	EMPTY MAX FITINGS	155	175	180	165	175	175	200	220
in Kg	FULL MAX FITINGS	370	630	640	700	710	740	770	790

Table of standard riggings supplied by UNIGREEN, special riggings must be agreed with the constructor.
Multi-purpose Mobile Units with a higher capacity (800 - 1000 - 2000 litres) and cistern in organic glass or steel (galvanised or stainless) are available on request. For information apply to the administration office.



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UNACOMA MEMBER

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