



OPERATING AND MAINTENANCE MANUAL

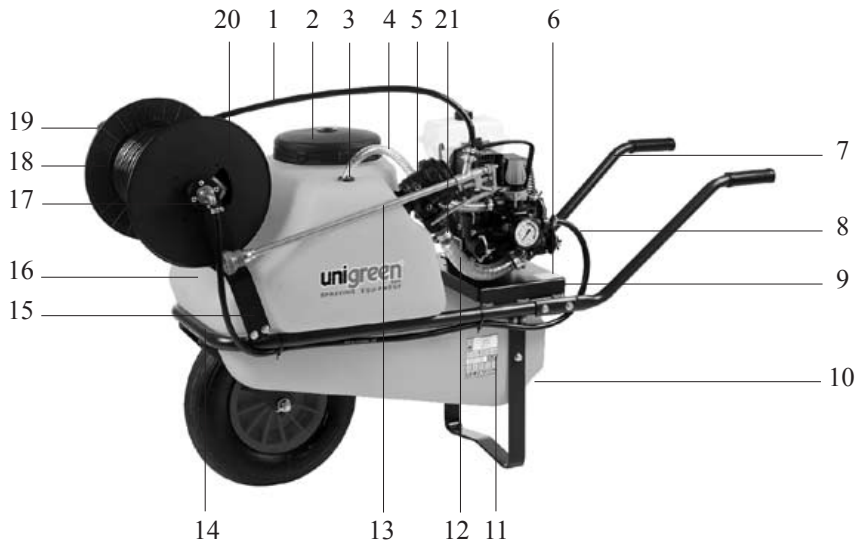
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TROLLEYS AND BARROWS

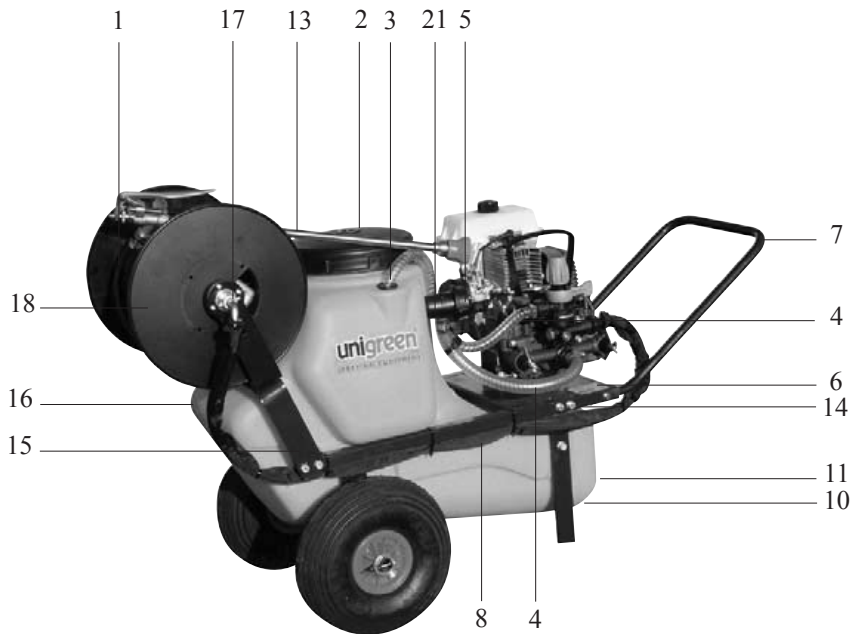


Please read this instruction booklet
carefully before use.

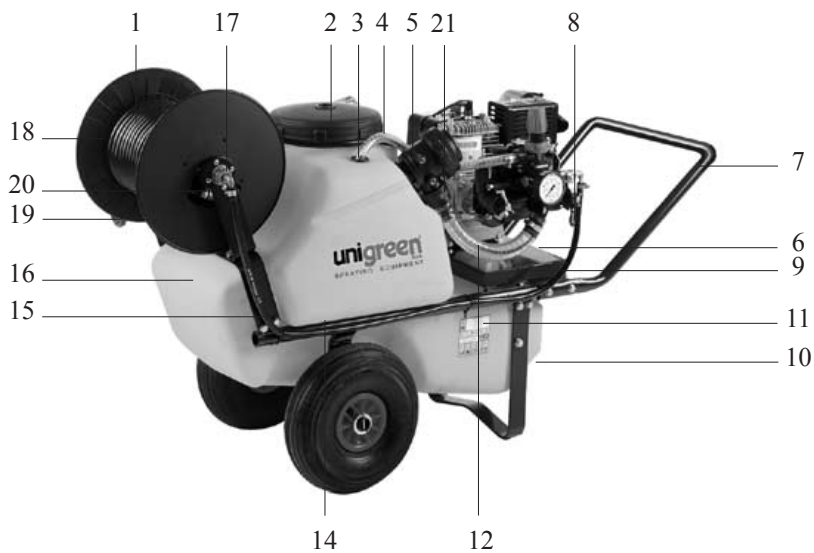
ALLOWED EQUIPMENTS			CR 125P	CR 125P	CR 80 2R	CR 75 1R	CR 70 1R	CR 50P
COMET PUMPS	Pump	MC 20	X		X	X	X	X
	" "	MP 30		X				
	" "	MP 40		X				
	" "	APS 31		X				
ANNOVI REV. PUMPS	Pump	AR 252	X		X	X	X	X
	" "	AR 30		X				
COMBUSTION MOTORS	Oleo Mac	550	X		X	X	X	X
	CM	46	X		X	X	X	X
	B. & S.	6,5 HP		X				
	Honda GX120	4 HP		X				
	Tecumsen	5 HP		X				
	Honda GC160	5 HP		X				
	Honda GX160	5,5 HP		X				
	Robin	2 HP	X		X	X		
B. & S.	3,5 HP	X				X	X	
ELECTIC MOTOTRS	Monofase	220 V	X		X	X	X	X
	Trifase	380 V	X	X			X	X
HOSE-REELS	AVT.	20	X	X	X	X	X	X
	" "	40	X	X	X	X		
	" "	50		X				
SPRAYGUNS	Lever Spraygun		X	X	X	X	X	X
	"Mitra" Spraygun		X	X				
WEED-KILLING BOOMS	3 mt Weed-killing boom		X	X				
NOZZLES	Standard Nozzle		X	X				
	Antidrip Unijet Nozzle		X	X				
NOZZLE TIPS	Fan	KEMATAL	X	X				
	" "	CERAMIC	X	X				
	" "	BRASS	X	X				
	" "	Stainless-Steel	X	X				
	Cone	CERAMIC	X	X				
LAWNMOWER	Tow-hook kit		X	X				
WEIGHT IN Kg	Net Weight (full optionals)		55	80	45	45	30	30
	Total Weight (full optionals)		180	205	125	120	100	80



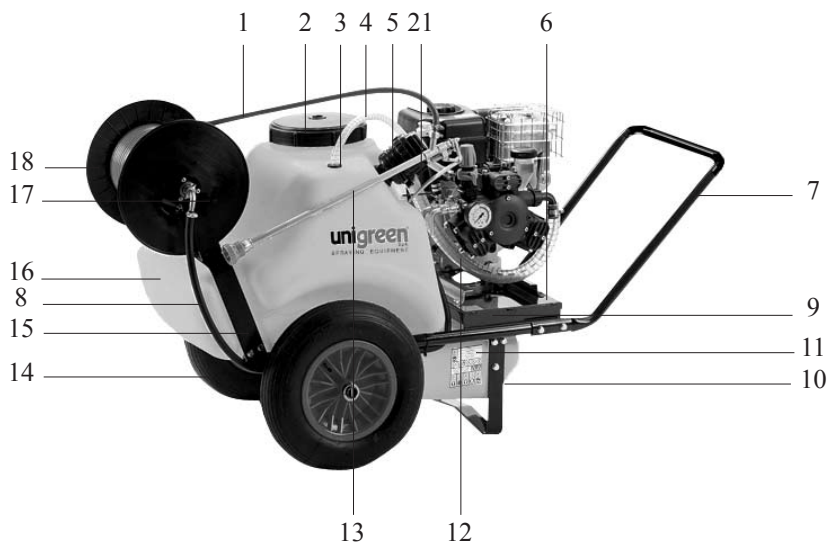
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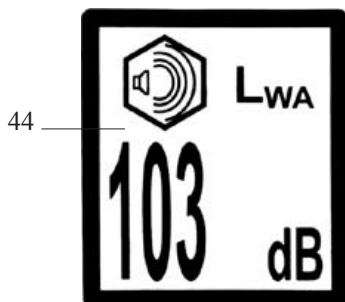
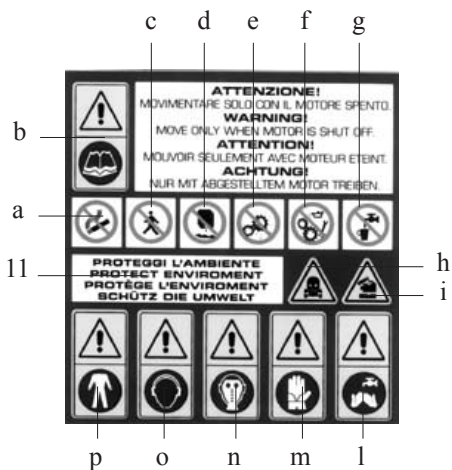
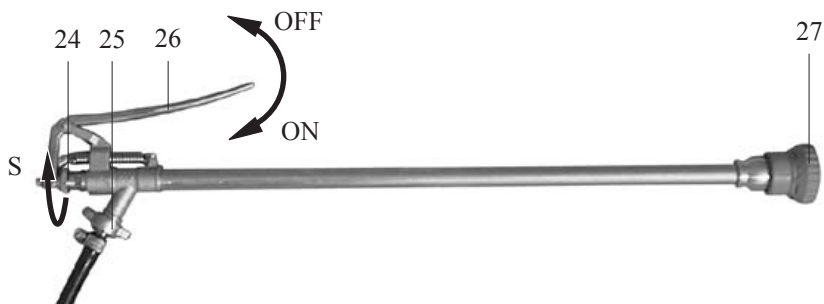
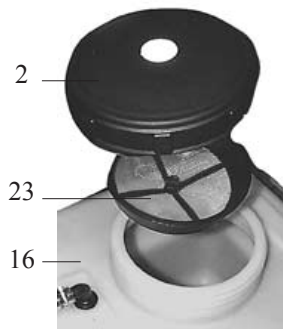
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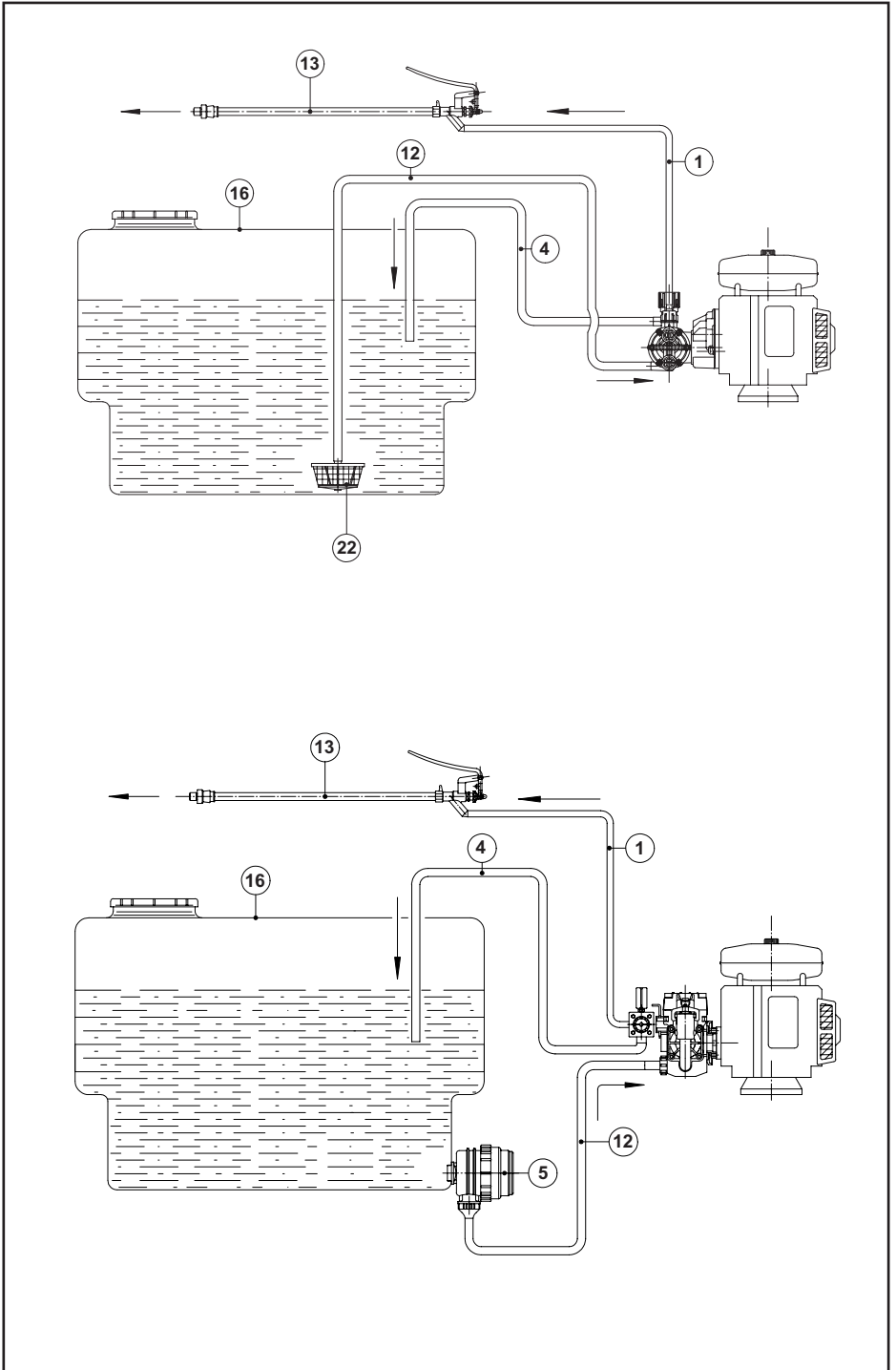


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INTRODUCTION

This manual is divided into two separate sections.

The first is for use by the end user and the **Skilled Technician**; the second is for use by the **Skilled Technician** alone.

Skilled Technician means a person, generally employed by the service centre, who has received appropriate training and is authorised to carry out special maintenance and repairs on the appliance (the term “appliance” is used to indicate both trolleys and barrows). Any work on electrical parts must be carried out by a **Skilled Technician** who is also a **Qualified Electrician**, i.e. a person with professional training who is authorised to check, install and repair electrical equipment correctly and according to the current regulations in the country where the appliance is installed.

CAUTION

• *The appliances are supplied in a kit and must be assembled; the motor-driven pump (operated by an electric motor or combustion engine) must be the type recommended by the Manufacturer. Other types of motor-driven pumps must not be used unless prior authorisation is granted by the Manufacturer.*

• *The kits must be assembled and the motor-driven pump must be installed by a **Skilled Technician** according to the instructions contained in part two of these instructions.*

The Declaration of Conformity contained at the end of this section in the instructions is only guaranteed if the above requisites are met.

PART ONE

1. GENERAL INFORMATION

Congratulations for choosing one of our products! We would like to remind you that we took the safety of the operator, the efficiency of its use and the protection of the environment into great consideration when designing and manufacturing this product.

In order to preserve its features over time, please read and follow these instructions carefully.

Particular attention must be awarded to the parts with the following symbol:

CAUTION

as they contain important instructions regarding safety when using the appliance.

The Manufacturer is not liable for damage caused by:

- failure to comply with these instructions and the instructions for the combustion engine, if any, used with the appliance;
- use of the appliance not included in the list in the “**DESIGNATED USE**” section;
- failure to comply with current safety regulations and regulations for the prevention of accidents in the workplace when using the appliance;
- tampering with the safety devices and devices limiting the maximum operating pressure
- incorrect installation
- failure to carry out the required maintenance;
- modifications or actions without prior authorisation by the Manufacturer;
- use of non-original or non-specific spare parts or accessories for this model of appliance;
- repairs which were not carried out by a **Skilled Technician**.

1.1 TERMS OF THE GUARANTEE

The guarantee is valid for a period of 24 months from the date on the sales document (receipt, invoice etc.) provided the guarantee certificate included with the appliance’s documents was sent

back to the Manufacturer within 10 days of the purchase date with all its parts filled in. The purchaser has sole right to the replacement of the parts that are deemed faulty by the Manufacturer, or by his authorised representative, as regards their material or manufacture. This does not imply any right to compensation for any type of direct or indirect damage. Any costs for labour, packing and transportation are at the purchaser's expense.

Should the product be sent to the Manufacturer for repairs under this guarantee, on arrival it must be complete with all its original parts and not be tampered with. Any request under this guarantee will be refused if this is not the case.

All replaced parts become the property of the Manufacturer.

Any faults or failures which occur during or after the period of the guarantee do not imply the right to suspend payment or to any further extension.

This guarantee does not cover the replacement of the appliance and automatically becomes void should the agreed terms of payment not be abided by.

The following are not covered by the guarantee:

- direct or indirect damage, of any type, caused by falls, incorrect use of the appliance and failure to observe regulations regarding safety, installation, operation and maintenance which are contained in these instructions and the instructions for the combustion engine, if any, used with the appliance;
- damages due to the inactivity of the appliance for repairs;
- any parts which are subject to wear during normal use;
- any parts which are deemed faulty due to negligence or carelessness during use;
- damage caused by the use of non-original spare parts or accessories or any not expressly authorised by the Manufacturer, and by repairs not carried out by a **Skilled Technician**
- damage caused by incorrect electrical power supply or the use of unsuitable fuel.

The guarantee becomes void should the appliance be tampered with, especially its safety and maximum pressure limiting devices, and the Manufacturer will no longer be held liable.

The Manufacturer reserves the right to make any modification at any time which it deems necessary to improve the product and is not liable to make these modifications to previously manufactured products, be they delivered or under delivery.

The conditions in this section exclude any previous explicit or implicit condition.

1.2 THE ADDRESS OF THE MANUFACTURER

The address of the Manufacturer of this appliance is given in the **Declaration of Conformity**, and at the end of this instruction manual.

1.3 USE AND CONSERVATION OF THESE OPERATING AND MAINTENANCE INSTRUCTIONS

CAUTION

- *These operating and maintenance instructions must be used in conjunction with those for the combustion engine, if any, which is used with the appliance. **The latter, which is taken as copied in full in this booklet, must always be kept with the appliance and read carefully in addition to these instructions.***

The operating and maintenance instructions are an integral part of the appliance and they must be kept in a safe place for future reference so that they may be readily consulted in case of need. The operating and maintenance instructions contain important information for the safety of the operator and of any people near him and for the protection of the environment.

In case of deterioration or loss, a new copy should be requested from the dealer or from an authorised service centre.

If the appliance is passed on to a third party, please make sure these operating and maintenance

instructions are also given to the new owner.

We take great care when drawing up our instructions. If you note any mistakes, please do inform the Manufacturer or an authorised service centre.

The Manufacturer reserves the right to modify, update and correct these instructions without notice.

It is illegal to copy these instructions, even partially, without prior authorisation by the Manufacturer in writing.

1.4 SYMBOLS

The symbol:



next to certain parts of the text, is to indicate that there is the firm possibility of injury to persons if the relative instructions and indications are not followed.

The symbol:



next to certain parts of the text, is to indicate that there is the possibility of damaging the appliance if the relative instructions are not followed.

2. FEATURES AND TECHNICAL SPECIFICATIONS

Barrows (one wheel) and trolleys (two wheels) are made up of a supporting tubular steel frame, a polyethylene tank, rubber hoses, a sprayer lance and a motor-driven pump with an electric motor or combustion engine. They may also be fitted with a hose reel (optional).

	CR 50	CR 75	CR 80	CR 125
ELECTRICAL CONNECTION	Voltage, frequency and power are given on the electric motor's label.			
FUEL	The fuel to be used is given in the instructions for the combustion engine			
PUMP OIL	AGIP SAE 20W/40 (AGIP Blasia S 150 only for MC16)			
REDUCER OIL (only for MP30, MP40, APS31 and APS 41)	AGIP SAE 80W/90			
HYDRAULIC SUPPLY Maximum inlet water temperature Minimum inlet water temperature	40° C (104° F) 5° C (41° F)			
Tank capacity	55 l 14.5 US gal	75 l 19.8 US gal	80 l 21.1 US gal	125 l 33.0 US gal
EFFICIENCY	Maximum pressure and flow rate are given on the pump's label.			
Maximum acoustic pressure level with electric motor Maximum acoustic pressure level with combustion engine	84 dB (A) 88 dB (A)			
Acoustic power level with electric motor Acoustic power level with combustion engine	101 dB(A) - guaranteed level is 103 dB(A) 106 dB(A) - guaranteed level is 108 dB(A)			
WEIGHT	Refer to data given on barrow/trolley's label			

- For appliances fitted with a combustion engine, the specifications given refer to atmospheric pressure of 1013 hPa at sea level with a room temperature of 16°C / 61°F.
- Features and technical specifications are approximate.
- The Manufacturer reserves the right to modify the appliance without notice

WARNING

- In order to supply full power, the combustion engine must be run in for at least 10 hours with a load that is 15-20% below the appliance's maximum efficiency.
- With the combustion engine, the maximum power that can be supplied decreases as the

altitude and the room temperature increase (the drop is approximately 3.5% for every 305m / 1000 ft above sea level and 1% for every 5.6°C/42°F above 16°C/61°F). Refer to the combustion engine's instructions for any precautionary steps to take if the appliance is to be used at high altitudes or at high room temperatures.

Refer to figures 1, 2, 3 and 4 located at the start of these operating and maintenance instructions for the following.

2.1 IDENTIFICATION OF PARTS

2.1.1 Trolley/Barrow parts

1	Delivery hose	15	Support for hose reel
2	Cover	16	Tank
3	Aperture for passage of by-pass hose	17	Central hose reel coupling
4	By-pass hose	18	Hose reel (optional)
5	Intake filter (external)	19	Hose reel handle
6	Identification label for barrow/trolley	20	Side hose reel coupling
7	Handle	21	Filter coupling
8	Connection hose	22	Intake filter (internal)
9	Base	23	Filling filter
10	Tank discharge cap	24	Spray angle adjustment/blocking
11	Warning label	25	Lance coupling
12	Intake hose	26	Lance lever
13	Lance	27	Nozzle
14	Frame		

2.1.2 Motor-driven pump parts

28	Filling cap for reducer oil	37	Pressure gauge
29	Pressure adjustment knob	38	Identification label for pump
30	By-pass/pressure lever	39	Identification label for motor-driven pump
31	Filling cap for pump oil	40	Coupling for delivery outlet
32	Volumetric oil compensator	41	Tap lever
33	Intake coupling	42	By-pass coupling
34	Hook	43	Pressure accumulator
35	Identification label for control unit	44	Label with guaranteed sound level
36	Inlet tap		

2.2 SAFETY DEVICES

Pressure limit/adjustment valve

This valve has been correctly set by the Manufacturer and enables adjustment of the operating pressure and the pumped fluid to return to the by-pass hose, thus preventing the creation of dangerous levels of pressure when the delivery outlet is closed or should pressure be set that is above permitted levels. A pressure limit/adjustment valve complete with interception/distribution devices for the pumped liquid (for example taps) is usually called a **pump control unit**. For simplicity's sake, these instructions use the term **control unit** to refer to both the pressure limit/adjustment valve and the pump control unit.

2.3 IDENTIFICATION LABEL AND WARNING LABELS

CAUTION

- If one or more identification labels or warning labels deteriorate during use, contact your dealer or an authorised service centre so they can be replaced.
- The identification label for the barrow/trolley (6) must be attached to the base (9) by the *Skilled Technician*

a) Identification label for the barrow/trolley

The identification label (6) gives the barrow/trolley's model name, its weight when empty, its tank capacity, and the year of manufacture. It is located on the base (9). For the appliance's serial number, refer to that of the motor-driven pump.

b) Identification label for the motor-driven pump

The identification label (39) gives the motor-driven pump's model name, its serial number and the year of manufacture. It is located on the base of the motor-driven pump or on the foot of the electric motor or on the casing of the electric motor's fan cover.

c) Identification label for the pump

The identification label (38) gives the pump's model name, its serial number, its maximum delivery rate (at 0 bar/0 psi) its delivery at maximum pressure, maximum pressure and maximum rotation speed. It is located on the front of the oil crankcase for pumps MC16 and MP30; on the top of the pressure accumulator for pumps MC20/20 and MC25; on a head (with adhesive label) for pumps APS31 and APS41; on a special label case fixed to a screw on one of the heads for pumps MP40.

d) Identification label for the control unit

The identification label (35) gives the control unit's model name, maximum pressure and maximum delivery rate. It is located on the lever (30) (only for MC20/20) or on the pressure gauge (37). This label is not found on the MC16 as this pump has an incorporated control unit.

e) Electric motor label

This identification label gives the name of the motor's Manufacturer, its model name and main specifications. It is located on the chassis of the electric motor. The specifications that are particularly important for installation are: voltage, frequency, and maximum consumption.

f) Warning label

The warning label (11) contains information regarding any further risks that may exist when using the appliance. It is located on the tank (16). The meaning of the symbols used is illustrated in the following table:

a	No smoking	h	Poisonous
b	Read instruction manual	i	Corrosive
c	Do not remain in range of the appliance	l	Wash hands after each use
d	Do not abandon waste in the environment	m	Wear gloves
e	Do not remove safety devices	n	Wear mask
f	Do not lubricate or clean when in use	o	Wear ear protection
g	Do not drink! Water not safe for drinking	p	Wear protective clothing

g) Guaranteed sound level label

This label (44) gives the maximum level of the guaranteed sound level for the appliance. It is located on the motor-driven pump.

2.4 STANDARD ACCESSORIES

Check that the product purchased is made up of the following parts:

- barrow/trolley with the chosen motor-driven pump;
- hose reel (if this optional has been chosen);
- lever lance with standard nozzle (1.5mm Ø);
- operating and maintenance instructions for combustion engine, if any.
- operating and maintenance instructions for barrow/trolley;
- guarantee certificate.

Please contact your dealer or authorised service centre if there are any problems with the above.

2.5 OPTIONAL ACCESSORIES

CAUTION

- *The operation of the appliance may be impaired if unsuitable optional accessories are used and may even make it dangerous. Only use the original optional accessories endorsed by the Manufacturer.*
- *Refer to the documents provided with the optional accessories for information regarding their general use, safety warnings, installation and maintenance.*

The standard accessories for the appliance can be integrated with the following range of accessories:

- hose reel (various models according to the type of appliance);
- weed killing bars (only for CR 125)
- “Multispray” spray lance;
- spray lance with knob;
- high pressure lance;
- various types of nozzle holder heads;
- various sizes of nozzles.

Please contact your dealer for further details.

3. DESIGNATED USE

CAUTION

- *This appliance is to be used exclusively for:*
 - *spraying and protection of plants in gardens, greenhouses, lawns and small cultivated areas;*
 - *distributing detergents and soluble paints that have been diluted in water;*
 - *spraying water not for human consumption.*
- *This appliance is not to be used for spraying:*
 - *water based solutions whose density and viscosity is greater than that of water;*
 - *chemical solutions if their compatibility with the materials that the appliance is made of, is not known;*
 - *seawater or water with a high salt content;*
 - *all fuels and lubricants;*
 - *inflammable liquids or liquid gas;*
 - *liquids meant for human consumption;*
 - *all solvents and diluents;*
 - *all non-soluble paints and varnishes;*
 - *liquids at a temperature above 40°C or below 5°C;*
 - *liquids containing granules or suspended solid matter.*

- *The appliance must not be used to wash people, animals, energized electrical appliances, delicate objects or the appliance itself.*
- *The accessories (standard and optional) used with the appliance must be those endorsed by the Manufacturer.*
- *The appliance is not suitable for use:*
 - *in situations where certain conditions may be found such as in corrosive or explosive atmospheres;*
 - *in a closed space if it is fitted with a combustion engine.*
- *Contact the Manufacturer's service centre before use on board vehicles, ships or airplanes, as there may be additional instructions for use.*

Any other use is considered improper.

The Manufacturer is not liable for any damage caused by improper or incorrect use.

4. OPERATION

4.1 PRELIMINARY PROCEDURES

CAUTION

- *Check that all the delivery outlets are closed or connected to closed applications (for example closed tap (36) or spray lance in its closed position).*
- *Check that all the hooks (34) located on the control unit have been inserted correctly. Particular attention must be paid to any control units that are secured to the pump by means of a hook.*
- *Check the grips that connect the hoses to their respective couplings are fastened down tightly.*
- *Make sure the appliance's moving parts are suitably protected and are not accessible to unauthorised personnel.*
- *Do not use the appliance if:*
 - *the power supply cable or other important parts, such as the high pressure delivery hose (1), the safety devices or the lance, are damaged;*
 - *it has been tipped over or has been bumped;*
 - *there are obvious leaks of oil.*
 - *there are obvious leaks of liquid.*

*In these circumstances, the appliance should be tested by a **Skilled Technician**.*

- *Under no circumstances should the inflation pressure of the pressure accumulator (43) (when present) exceed the maximum values shown in the table below.*
 - *Make sure the special maintenance checks are carried out by a **Skilled Technician**.*
- a) Check that the conditions of the plants or crops actually require treatment.
 - b) Follow the preliminary procedures indicated in the operating and maintenance instructions for combustion engine fitted with the appliance, if any. In particular, remember to refuel and to check the level of oil in the engine.
 - c) When the engine is off and the appliance has cooled down completely, check the level of the pump oil corresponds to the reference notch found on the volumetric compensator (32).
If it must be topped up, refer to the types of lubricants shown in the section on “**FEATURES AND TECHNICAL SPECIFICATIONS**”.
 - d) Check that the inflation of the pressure accumulator, if any, is correct using a normal compressed air gun with pressure gauge, such as those used to check the pressure of car tyres.
The inflation depends on the field of pressure where the appliance is to be used, as shown in the table below:

PUMP OPERATING PRESSURE		PRESSURE ACCUMULATOR INFLATION	
bar	psi	bar	psi
2-5	29-73	2	29
5-10	73-145	2-5	29-73
10-20	145-290	5-7	73-102
20-40	290-580	7	102

- e) Check the external intake filter (5) is clean (only for CR 75, CR 80 and CR 125).

WARNING

- *Make sure ice has not formed inside the pump, hoses and tank if the appliance is used in very low temperatures.*
- *The routine maintenance checks must be carried out, particularly those concerning the oil.*

4.1.1 Control and connection to mains electricity

CAUTION

- *A **Skilled Technician** must check that the electrical supply complies with the data indicated on the electric motor's identification label. It is especially important that the supply voltage does not differ more than $\pm 5\%$ from that indicated on the label.*
- *The connection to mains electricity must be carried out by a **Qualified Electrician** according to IEC 364 regulations or the equivalent standard in the country where the appliance is to be used. It is especially important that the current outlet where the appliance is connected is provided with an earth conductor, a suitable fuse, and it must be protected by a magneto-thermal differential circuit breaker, whose sensitivity is not in excess of 30 mA. It must be possible to insulate the appliance from the mains electricity with a universal switch with 3 mm minimum opening between its contacts.*
- *If the appliance is not to be connected permanently to the electric supply and the power cable is not provided with a plug, contact a **Qualified Electrician** for the installation of a plug according to the current regulations in the country where the appliance is to be used.*
- *If the appliance is to be connected permanently to the electric supply, it must be installed by a **Qualified Electrician** according to IEC 364 regulations or the equivalent standard in the country where the appliance is to be used. It is especially important that regulations are followed concerning its connection to earth, protection by a suitable fuse and magneto-thermal differential circuit breaker, whose sensitivity is not in excess of 30 mA, and the insulation of the appliance from the mains electricity with a universal switch with 3 mm minimum opening between its contacts.*

***Note:** to facilitate the reader, these operating and maintenance instructions always assume that the appliance is connected to the electrical supply with a plug.*

If the appliance is connected permanently to the electrical supply, it is presumed that:

- *when the universal circuit breaker is in the off position ('0' position) it is equivalent to the plug being disconnected from the current outlet.*
- *when the universal circuit breaker is in the on position ('1' position) it is equivalent to the plug being inserted in the current outlet.*
- *If the power supply cable is too short, an extension cord can be used provided it is no longer than 50 m /164 ft, the section of the wires is at least 1.5mm² and the plug and the socket are waterproof. Contact a **Qualified Electrician** to ensure all these requirements are met.*
- *The use of unsuitable extension cords can be dangerous.*
- *Do not use adaptors between the electric plug and the current outlet.*

WARNING

- For electric appliances with three-phase motors, particular attention must be paid to ensure the direction of rotation of the motor corresponds to that shown on the reducer. If this is not the case, contact a **Skilled Technician** who will be able to solve the problem by simply inverting a wire inside the power plug. **Failure to comply with the above will result in considerable damage to the appliance.**

4.1.2 Preparing chemicals for spraying

CAUTION

- *Keep products in a ventilated place with a door that can be locked. Products must be kept out of reach of children and unauthorised adults. Appropriate warning notices should be placed outside to inform of the danger.*
- *Read instructions and safety information provided on the chemical product's container carefully so that the most appropriate action may be taken to avoid endangering oneself or the environment. It is especially important that the maximum recommended concentrations are not exceeded, that only the amount of product needed for the treatment is prepared and that spillages onto soil and into water are avoided.*
- *Should chemicals come into contact with your eyes, wash immediately with water. Contact a doctor without delay and remember to take the product's container with you.*
- *Should chemicals be swallowed, do not provoke vomiting. Contact a doctor without delay and remember to take the product's container with you. Avoid inhaling the fumes that develop by using appropriate equipment for personal protection (a mask, for example). Drinking, eating and smoking are prohibited.*
- *Always wear suitable protective clothing and keep children, unauthorised adults and personnel without protection at a safe distance.*
- *Always wash your hands and face carefully after finishing work.*
- *All garments that have come into contact with chemicals must be washed thoroughly. Any item that may have been contaminated must be cleaned immediately.*
- *The containers used for chemicals must be disposed of according to current legislations in the country where the appliance is used.*

4.1.3 Filling the tank

CAUTION

- *Pay particular attention to the instructions contained in the section on “**Preparing chemicals for spraying**”.*
 - *Take care to avoid spilling the product onto the ground or into water when filling the tank.*
 - *Water must only be added to the tank using free-fall water pipes or indirectly (jugs, drums, etc). The hose used for filling must never come into contact with the liquid contained in the tank. Do not connect up to the mains supply of drinking water.*
 - *Do not over fill the tank; only fill with the amount of product needed for spraying.*
- a) Turn the cover (2) anti-clockwise and check that the aperture located in the middle is not blocked.
 - b) Check that the filling filter (23), the inside of the tank and the internal intake filter (22) (only CR 50) are clean.
 - c) Fill up with the product to be sprayed. We recommend a trial run with clean water before starting to spray with product for the first time in order to check the appliance is working correctly and to get used to operating it.
 - d) Close the cover (2) again, turning it clockwise but not forcing it.

4.2 SPRAYING

CAUTION

- Pay particular attention to the instructions contained in the section on **“Preparing chemicals for spraying”**.
- While you are spraying, avoid spraying the product on buildings, houses, public or private land, gardens, roads, public or private courses of water and areas used by people or animals. Spraying in close proximity of these areas must be carried out when it is not windy.
- Before starting up the appliance, read these instructions carefully as well as those for the combustion engine, if any, which is used with the appliance. It is particularly important that you have understood how the appliance works regarding the intercepting of liquids.
- The appliance must be used with due care and attention. It is your responsibility to make sure that any infrequent users have read these instructions and those for the combustion engine, if any, which is used with the appliance, and are acquainted with the operation of the appliance. This appliance must not be used by children or by unauthorised personnel
- Comply with the safety warnings in the operating and maintenance instructions of the combustion engine, if any, used with the appliance.
- Comply with the safety warnings in the operating and maintenance instructions of any optional accessories to be used
- It is especially important to pay great attention when the appliance is used in areas where there are moving vehicles as these can crush or damage the power supply cable, the delivery hose, the spray gun etc.
- During operation, never leave the appliance unattended and make sure it is out of reach of children and animals. Pay particular attention when using it in kindergartens, nursing homes and old people's homes, as unsupervised children, elderly people and disabled people may be present in such places.
- Before using the appliance, make sure it is in a dry place and that it is in a flat and stable position in order to avoid accidents and prevent it from falling over.
- Before moving the appliance, follow the instructions in the **“Switching off”** section.
- Use personal protective clothing, which guarantees adequate protection against noise (for example headphones).
- Before operating the appliance, put on clothing which guarantees adequate protection against the possibility of incorrect manoeuvres of the jet of pressurised liquid and the chemicals used. Do not operate the appliance near people, unless they are also wearing protective clothing, or animals.
- High-pressure jets of water can be dangerous if they are not used properly. Do not point the jet in the direction of people, animals, and energized electrical appliances or towards the appliance itself.
- Do not point the jet towards oneself or other people in order to clean off clothing or footwear.
- Do not point the high-pressure jet towards materials containing asbestos or other harmful substances
- Hold the spray gun firmly during use because the operator is subjected to the backlash of the high-pressure jet when the control lever is operated to spray the product.
- Do not use the appliance in the rain.
- Pay particular attention to the instructions in the **“Controls and connection to mains electricity”** section.

- Follow the instructions in the “**Switching off**” section:
 - when the appliance is not in use;
 - before leaving the appliance unattended, even for a short time;
 - before topping up the chemicals;
 - after use;
 - Do not remove the plug from the power outlet by pulling on the power supply cable.
 - Keep the power supply cable, any extension cords, the plugs and the outlets dry. Do not touch them with wet hands.
 - Should the power supply cable be damaged, contact a **Qualified Electrician** for its replacement.
 - Do not cover the appliance during operation and do not put it where there is inadequate ventilation.
 - When the appliance is used in enclosed spaces, make sure that there is adequate ventilation. The appliance must not be used in enclosed spaces if it is operated with a combustion engine.
 - Do not get close to moving parts on the appliance, even if there are suitable devices for protection.
 - Do not remove the protective devices from moving parts.
 - Do not tamper with hoses containing pressurised liquids.
 - Do not carry out maintenance on the appliance when it is operating.
 - Follow the instructions in the “**DESIGNATED USE**” section;
 - Do not alter the appliance’s installation conditions: it is especially important not to alter its assembly and hydraulic connections.
 - Do not operate any taps mounted on the appliance unless they are connected to a utility that prevents the pumped liquid being released by accident.
 - Do not neutralise or tamper with the safety controls and devices and the pressure limit/adjustment valve.
 - Operating pressure must never exceed the maximum amount specified for the appliance (also refer to the “**FEATURES AND TECHNICAL SPECIFICATIONS**” section).
- a) Unroll the delivery hose (1) completely.
 - b) Check that the adjuster (24) for the lance (13) is turned completely towards “S” so that the lever (26) can be put in the “OFF” position. Put the tap lever (41), if any, in the “OFF” position.
 - c) Check that there is no pressure in the delivery hose as follows:
 - turn the knob (29) on the adjustment valve anti-clockwise as far as it will go; this is only necessary for MC16 as it does not have lever (30).
 - operate lever (30) and put it into the “BY-PASS” position.
 - d) Start up the appliance so it can prime. If the appliance is fitted with an electric motor, operate both the universal circuit breaker on the socket that the appliance is connected to, and the switch on the electric motor, if any, by putting them both in position “1” (please remember to take into account the recommendations regarding three-phase motors in the “**Controls and connection to mains electricity**” section). For appliances fitted with a combustion engine, follow the instructions for the start up of the same in its operating and maintenance instructions.
 - e) Bring the appliance up to pressure as follows:
 - operate lever (30) putting it in position “PRESS”.
 - turn the knob (29) until the required pressure is reached (turn clockwise to increase pressure, anticlockwise to decrease). The level of pressure is shown on the pressure gauge (37) (if any).
 - f) Put the tap lever (41), if any, in the “ON” position

- g) Operate the lever (26) on the lance (13) to achieve the required spraying angle (from an empty cone to a needle-point jet). The adjuster (24) can be used to fix the preferred position for spraying. We recommend this is done while spraying with the lance into the tank to avoid wasting chemicals.
- h) The flow rate of the sprayed liquid depends on the operating pressure, the nozzle (27) used (the 1.5 mm Ø nozzle is supplied as standard with the appliance) and the adjustment of the spray angle. Refer to the table below for information on which nozzle to use for a job (note that the maximum flow is indicated, i.e. corresponding to a needle-point spray angle).

		Pressure (bar)					
Nozzle Ø (mm)	5	10	15	20	30	40	
1.0	1.0	1.5	1.8	2.1	2.5	2.9	
1.2	1.4	1.9	2.4	2.8	3.4	3.9	
1.5	2.0	2.8	3.4	3.9	4.8	5.6	
1.8	2.2	3.2	3.9	4.5	5.5	6.3	
2.0	2.6	3.7	4.5	5.2	6.4	7.4	
		Flow rate (l/min)					

WARNING

- Follow step c) each time the tank is emptied of liquid to ensure the appliance will prime quickly.
- We recommend checking the pump oil level after the first few hours of operation and to top it up if necessary as indicated in the “**PRELIMINARY PROCEDURES**” section.

5. SWITCHING OFF

CAUTION

- *Always check that there are no moving parts on the appliance and there is no pressurised liquid in the hoses after the following instructions for switching off have been completed.*
 - *When switching off the appliance and leaving it to cool down, take care that:*
 - *the appliance is not left unattended in the presence of unsupervised children, elderly or disabled people.*
 - *the appliance is in a stable position and not at risk of falling over.*
 - *the appliance is not in contact with inflammable materials, or in their immediate vicinity.*
- a) Eliminate the delivery pressure as instructed in point c) in the “Spraying” section.
- b) If the appliance is fitted with an electric motor, operate both the switch on the electric motor, if any, and the universal circuit breaker on the socket that the appliance is connected to, by putting them both in position “0” and remove the plug from the power outlet. For appliances fitted with a combustion engine, follow the instructions for switching off the same in the engine’s operating and maintenance instructions and then disconnect the spark plug.
- c) Put the lance lever (26) in position “ON” so that any residual pressure is discharged.

6. CLEANING, STORAGE AND MAINTENANCE

CAUTION

- *Pay particular attention to the instructions contained in the section on “**Preparing chemicals for spraying**”.*
- *Only start cleaning and maintenance once the instructions in the ‘**Switching off**’ section have been completed, i.e. **when there are no moving parts on the appliance, there is no pressurised liquid in the hoses and the appliance has cooled down completely.** It is particularly important to always disconnect the electricity supply (or disconnect the spark plug if the appliance is fitted with a combustion engine).*
- *Cleaning and maintenance must only be carried out if the appliance is on a flat surface and in a stable position.*
- *Protective clothing must always be worn during cleaning and when emptying the tank.*
- *Liquids that have been emptied out of the tank, or used to rinse it, must be put in suitable containers and reused for the next spraying or disposed of at authorised refuse tips in accordance with the current regulations in the country where the appliance is used.*
- *Never wash the appliance near water, wells, springs and ditches.*
- *Do not use diluents or solvents to clean the appliance.*
- *To safeguard the safety of the appliance, only use the original spare parts supplied by the Manufacturer or those endorsed by him*
- *The high-pressure hoses, couplings and the spray lances are important for safety: only use those endorsed by the Manufacturer.*

6.1 CLEANING AND STORAGE

- Follow the instructions in the “**Switching off**” section.
- Empty the tank completely by unscrewing the discharge cap (10).
- Clean and rinse the interior of the tank.
- Screw the discharge cap (10) on again, tighten it, and fill the tank with clean water.
- Check that the adjuster (24) on the lance (13) is turned completely towards “S” so that the lever (26) can be put in the “OFF” position. Put the tap lever (41), if any, in the “OFF” position.
- Eliminate the delivery pressure, as instructed in point c) in the “**Spraying**” section.
- Operate the appliance so that it can prime, as instructed in point d) in the “**Spraying**” section.
- Put the tap lever (41), if any, in the “ON” position.
- Operate the lever (26), spraying inside the tank to complete the pump’s cleaning cycle.
- Repeat from a) to d) without adding water to the tank.
- Wind the delivery hose up taking care not to bend it.
- Wind the electric power cord up carefully.
- For appliances fitted with a combustion engine, follow the instructions for the cleaning and storage of the same in the engine’s operating and maintenance instructions.
- Store the appliance in a clean and dry place making sure that the power supply cable and the delivery hose are not damaged.

WARNING

- *Never store the appliance with sprayed liquid inside it.*
- *The appliance is not frost proof.*
- *In order to prevent the formation of ice inside the appliance in cold areas, we recommend taking up a motor vehicle grade anti freeze (diluted for the minimum temperatures that the appliance will be exposed to) and then emptying it out completely.*

CAUTION

- *Dispose of anti-freeze correctly; do not dump in the environment.*

6.2 ROUTINE MAINTENANCE

Follow the instructions in the “**Switching off**” section and in the table below.

For appliances fitted with a combustion engine, remember to follow the instructions for routine maintenance in the engine’s operating and maintenance instructions, especially as regards controlling the engine oil, the air filter and the spark plug.

INTERVAL FOR MAINTENANCE	ACTION
Each time used	<p>Check level and status of pump oil</p> <p>Check the intake filter, filling filter, and nozzle and clean, if necessary. Do not use hard or sharp objects to clean the nozzle.</p> <p>Check the supply cable, high-pressure hose and spray lance, that the grips and couplings are secure and that any hooks (34) on the control unit are inserted correctly.</p> <p>Should any of these parts appear to be damaged, do not use the appliance and contact a Skilled Technician.</p>
Every 50 hours	<p>Oil or lubricate rotating or sliding parts that are easily accessible for the operator.</p> <p>Check the inflation pressure of the pressure accumulator (if any) and tyres.</p> <p>Check the intake circuit.</p> <p>Check the motor-driven pump is securely fastened to the appliance’s structure.</p> <p>Should the motor-driven pump appear not to be secure, do not use the appliance and contact a Skilled Technician.</p>

WARNING

- During use, the appliance should not be too noisy and large amounts of liquid or oil should not drip from underneath it.
In this event, a **Skilled Technician** should test the appliance.

6.2.1 Diaphragm rupture

The rupture of one or more diaphragms can result in the mechanical parts of the pump being damaged by the liquids being pumped.

The following are symptoms of possible diaphragm rupture:

- oil takes on a whitish appearance (symptom of water in the oil)
- excessive consumption of oil
- sudden lack of oil in the volumetric compensator (32).

WARNING

- To avoid the negative consequences of this malfunction, stop operation of the appliance immediately and contact a **Skilled Technician** without delay (within 24 hours) who will take the necessary action.
If it is not possible to contact a **Skilled Technician** within the above time in case of

diaphragm rupture, we recommend you drain the pump crankcase of the mixed oil and pumped liquid and then fill it with oil or diesel to prevent the formation of rust.

- *The following are frequently the causes of diaphragm rupture:*
 - *bottlenecks in the intake circuit (inadequate hose section, very dirty filter, very dense liquid being pumped, etc)*
 - *the use of very aggressive chemicals*

6.3 SPECIAL MAINTENANCE

CAUTION

- *Only **Skilled Technicians** are authorised to carry out special maintenance.*
- *Dispose of waste oil correctly; do not dump it in the environment*

Follow the instructions in the table below for special maintenance.

For appliances fitted with a combustion engine, remember to follow the instructions for special maintenance in the engine's operating and maintenance instructions

INTERVAL FOR MAINTENANCE	ACTION
Every 300 hours	Check the intake, delivery and adjustment valves (*) Change the oil (**)
Every 500 hours	Change the reducer oil (***)
At the end of every season or once a year	Check diaphragms and replace if necessary (****) Check the motor-driven pump screws are tight

(*) Check more frequently if liquids are used with suspended abrasive particles.

(**) Oil must also be changed when diaphragms are replaced.

(***) Not necessary for MC16; for MC 20/20 and MC25, change when pump oil is changed

(****) We recommend replacing diaphragms regardless of their condition if particularly aggressive chemicals are used

WARNING

- The data in the table is approximate. Maintenance may be required more frequently in cause of particularly heavy use.

7. MOVING AND TRANSPORTATION

CAUTION

- *Follow the instructions in the “**Switching off**” section before moving or transporting the appliance.*
- *When the appliance has to be transported, remember to anchor it firmly to the means of transport (using cables or other systems, as appropriate) and to empty the tank.*
- *Hold the handle (7) firmly to avoid losing your grip if knocks and bumps are caused by uneven ground. It is important to bear this in mind if the tank is full and the ground is wet.*
- *Only move the appliance by means of the grips on the handle (7).*
- *Do not move the appliance if it is on a slope in excess of 2% or if the ground is very wet.*

8. DISMANTLING AND DISPOSAL

Only trained personnel are allowed to dismantle the appliance in accordance with the current regulations in the country where it is installed.

CAUTION

- *Before disposing of the appliance, make sure it is no longer possible to operate it, by cutting the power supply cable for example. Make sure all its parts are now inoffensive, as they could prove to dangerous to children playing.*

9. PROBLEMS, CAUSES AND SOLUTIONS

CAUTION

- *Before taking any steps, follow the instructions in the “Switching off” section. If it is not possible to restore correct operation of the appliance using the information in the table below, contact a **Skilled Technician**.*

PROBLEM	CAUSE	SOLUTION
The combustion engine does not start or does not work properly during operation.	Refer to the operating and maintenance instructions for the combustion engine.	Refer to the operating and maintenance instructions for the combustion engine.
When the switch is pressed, the electric motor does not start or stops during use.	A safety device has cut in on the system where the appliance is connected (fuse, differential circuit breaker, etc). The plug on the power cord is not inserted correctly.	Reset the protection device. If it cuts in again, do not use the appliance and contact a Skilled Technician. Take the plug out of the socket and insert it correctly.
If switch is turned, the electric motor hums but does not start up.	The electrical system and / or extension cord are not suitable.	Follow instructions in the “Controls and connection to mains electricity” section.
The pump does not prime.	Air intake. Adjustment valve positioned under pressure.	Check the intake circuit is intact. Set pressure to zero with the knob (29) (MC 16 only) or by putting the pump in bypass with the lever (30).
The pump does not reach maximum pressure.	The pressure adjustment knob (29) is not screwed down sufficiently. The lever (30) is in BY-PASS position. Bottlenecks in intake circuit. The nozzle is worn or is too big.	Turn the knob clockwise until the required pressure is reached. Put the lever (30) in PRESS position. Check the intake circuit (above all if the intake filter is clean). Replace the nozzle (refer to instructions in the “Spraying” section).
Pressure and flow are irregular (bubbles).	Air intake	Check the intake circuit is intact.
Excessive vibration in delivery circuit.	Pressure accumulator not correctly inflated.	Restore correct inflation (refer to instructions in the “Preliminary procedures” section).
Excessive noise associated with drop in the oil level.	Bottlenecks in intake circuit.	Check intake circuit (above all if the intake filter is clean).
Excessive consumption of oil and/or oil is whitish colour (presence of water in oil)	Rupture of one or more diaphragms.	Refer to instructions in the “Diaphragm Rupture” section.

PART TWO

(only for use by **Skilled Technicians**)

CAUTION

- *This part of the manual is only for use by Skilled Technicians and is not meant to be used by the end user of the appliance.*

1. REMOVING THE APPLIANCE FROM ITS PACKING MATERIALS

CAUTION

- *Protective gloves and glasses must be worn when removing the appliance from the packing materials to prevent injury to the hands and eyes.*
- *The packing materials (plastic bags, staples etc.) must not be left in reach of children, as they are potentially dangerous.*
- *The packing materials must be disposed of according to current regulations in the country where the appliance is installed.*

In particular, plastic bags and packaging must never be abandoned, as they are harmful to the environment.

- *After removing the appliance from the packing materials, check that no parts are missing and check that the identification and warning labels are present and are legible. The identification label (6) for the trolley/barrow is enclosed with these instructions: it must be attached to the base (9) by the **Skilled Technician**.*
- *In case of doubt, contact the Manufacturer's Service Centre.*
- *This operating and maintenance manual, the instruction manual for the combustion engine fitted with the appliance, if any, and the guarantee certificate must always accompany the appliance and made available to the end user.*

2. ASSEMBLY

CAUTION

- *The appliance must be assembled according to the instructions in this manual and the general rules of good mechanics. The **Skilled Technician** can contact the Manufacturer's Service Centre for any further information.*
- *Always check that couplings and hose grips are secured tightly.*

Refer to figures 1, 2, 3, and 4 and the hydraulic diagrams in figure 5.

- a) Put the motor-driven pump on the base (9) and secure it using the four screws supplied.
- b) For appliances fitted with an electric motor, follow the instructions in the “**Controls and connection to mains electricity**” section, and remember to take the comments regarding three phase motors into account.
- c) Mount the handle (7) and secure it using the appropriate screws.
- d) Use the appropriate grips supplied and connect one end of the intake hose (12) to the filter coupling (21) and the other end to the intake coupling (33) on the pump.
- e) Use the appropriate grip supplied and connect one end of the by-pass hose (4) to the by-pass coupling (42) on the pump and insert the other end into the tank through the hole (3).
- f) Use the appropriate grips supplied and connect one end of the delivery hose (1) to the lance coupling (25) and the other end to the delivery coupling (40) on the pump (refer to the following paragraph if the hose reel is fitted).

- g) Check the inflation pressure of the pressure accumulator and the tyres.
- h) Check the level of the pump oil and reducer oil.
- i) For appliances fitted with combustion engine, fill the crankcase with oil as the engines are supplied without oil.
- j) Carry out a test with clean water before giving the appliance to the end-user.

2.1 MOUNTING THE HOSE REEL (OPTIONAL)

- a) Pre-assemble the hose reel using the specific assembly instructions provided.
- b) Secure the hose reel support (15) onto the structure (14) using the screws supplied.
- c) Secure the hose reel (18) onto the support (15) using the screws supplied.
- d) Use the appropriate grips supplied and connect one end of the high-pressure connection hose (8) to the central hose reel coupling (17) and the other end to the delivery coupling (40) on the pump.
- e) Use the appropriate grip supplied and connect one end of the delivery hose (1) to the side hose reel coupling (20).
- f) Use the handle (19) to wind up all the delivery hose on the hose reel.
- g) Use the appropriate grip supplied and connect the free end of the delivery hose (1) to the lance coupling (25).

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PART TWO

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UNIGREEN® S.p.A.
via Rinaldi, 105 - 42100 REGGIO EMILIA - ITALY
Tel. (0039) 0522 369811
Fax. (0039) 0522 369898
e-mail info@unigreen-spa.com
internet www.unigreen-spa.com
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