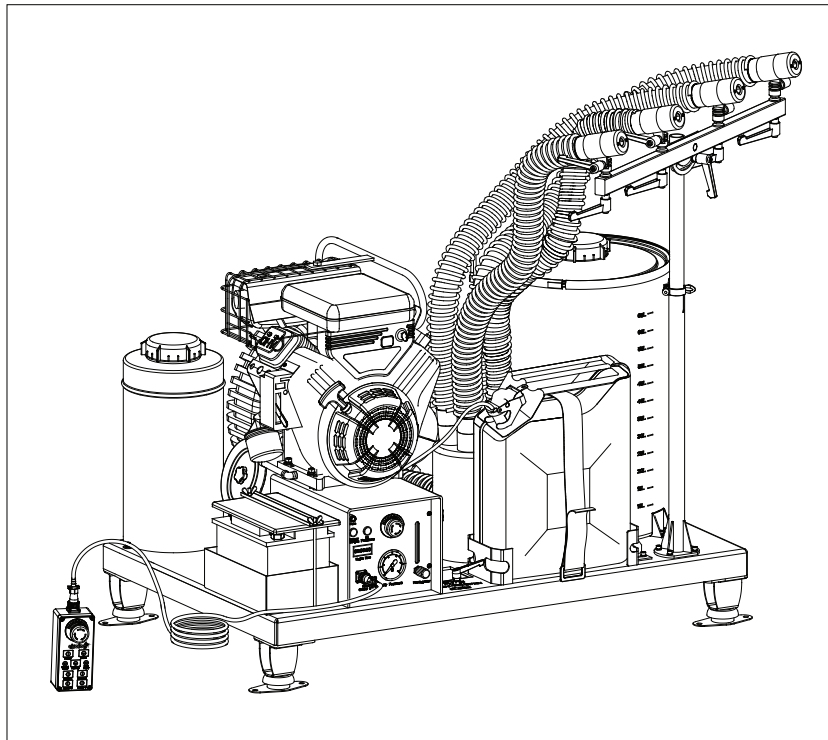


ULV Cold Fogging Machine Vehicle-mounted model UM-4

Original Instruction



Manufactured by:

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1. General information

Thank you for purchasing AIROFOG quality product. We wish you all the success on the application and believe you will be fully satisfied with its performance.

These instructions expatiate all the information necessary for the use of the application by means of explosion drawings, start-up, operation, maintenance, cleaning, trouble-shooting and etc. as well as all safety precautions to be taken throughout the lifetime of the machine.

Airofog ULV cold fogging machine model UM-4 is in CE conformity in scope of

- * 2006/42/EC Machinery directive
- * 2009/127/EC Machinery directive for pesticide application
- * 2004/108/EC Electromagnetic compatibility
- * 2000/14/EC amended by 2005/88/EC Noise emission...for use outdoors
- * 2002/44/EC The minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration)
- * 2009/251/EC Dimethylfumarate (DMFu)
- * EN ISO 4254-1:2013 Agricultural machinery - safety - part 1: general requirements
- * EN ISO 4254-6:2009+AC:2010 Agricultural machinery - safety - part 6: sprayers and liquid fertilizer distributors

All data and information concerning in this instruction manual are based on and given to the best of our experience and knowledge so far. This manual might change to meet our technical improvement without notice along with the continuous technological development.

Please feel free to contact us for updated information.

1.1 Machine data

machine name: ULV cold fogging machine (ULV aerosol generator)
machine model: UM-4
machine serial no.:
year of construction:
engine model:
engine serial no.:



EC Declaration of Conformity

We: **Airofog Machinery Co., Ltd.**

1st Floor, Blk. 3, No. 67 Lane 1768, Li Yue Road, Minhang District
Shanghai 201114, P. R. China

Do hereby declare that:

ULV Cold Fogging Machine (Aerosol Generator)

Model:

UM-4

(serial no. 29200403)

Are in conformity with the following directives and/or standards:

- * 2006/42/EC Machinery directive
- * 2009/127/EC Machinery directive for pesticide application
- * 2004/108/EC Electromagnetic compatibility
- * 2000/14/EC amended by 2005/88/EC Noise emission...for use outdoors
- * 2002/44/EC the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration)
- * 2009/251/EC Dimethylfumarate (DMFu)
- * EN ISO 4254-1:2013 Agricultural machinery - safety - part 1: general requirements
- * EN ISO 4254-6:2009+AC:2010 Agricultural machinery - safety - part 6: sprayers and liquid fertilizer distributors

Notes:

This declaration becomes invalid if technical or operational modifications are introduced without the manufacturer's consent.

Person responsible for keeping the technical file:

Name, Surname: Mr. Bernhard, BETTE
Address: Gladenbacher Weg 13, Biebertal, Germany 35444

Person responsible for making this declaration:

Name: Mr. Choke Hua, PHUA

Signature:

Title of Signature: Managing Director
Date / Place of Issue: 04-06-2018 / Shanghai 201114, China



2. Usage

Airofog vehicle-mounted ULV cold fogging machine (ULV aerosol generator), hereinafter referred to as “fogger”, uses pre-mixed solutions or chemicals mixed with carrier. As all components exposed to solution are made from corrosion-resistant materials like stainless steel, Teflon, polyethylene and etc., all approved chemicals that do not attack such materials can be used.

The selection of chemical preparation and carrier is subject to legally binding regulations and the manufacturer’s guidelines.

Insecticide must only be sprayed while the vehicle is moving within the treatment area. When in stationary position, direct the fog along passageway or cover the plants in the fog affected area.

The fogger suits for following purposes and applications:

- vector and insect control
- pest control
- public health
- plant protection with pesticides and fungicides.
- stock protection
- Hygiene and disinfection
- deodorization

2.1 Health and safety precautions

Airofog fogger UM-4 is fully tested and provided with safety devices. However, failure can be caused due to misuse or service errors. Please read carefully the provided instruction manual and highly pay attention to safety regulations before you use. Only trained and qualified personnel who are fully knowledgeable of the use of such machines are authorised to do the operation and maintenance.

We guarantee correct manufacturing and function if the fogger is in proper use accordingly to instructions. Arbitrary modifications and alterations are not allowed. The guarantee is invalidated if damage occurs due to improper use/repair/maintenance, incorrect transport or handling, the use of non-recommended parts/products or acceptance of damaged/broken machines by any reason.



Warning is highlighted in this manual as: **identified important notes**.

1. Application of insecticides should follow recommendations of the manufacturers. Adhere to all relevant handling precautions and regulations especially when mixing and using toxic substances, operators must wear protective clothing, gloves, eye protector and masks.
2. Ensure the fogger is calibrated correctly for the insecticide being applied.
3. Always keep first aid and washing facilities available, personnel should be aware of usage.
4. Wear suitable clothing, gloves and eye protection to protect skin and eye from exposure to chemicals.
5. Residues of insecticide must be stored or disposed safely, keep it out of reach of personnel or any target where contamination could give adverse effect.
6. Personnel with heart pacemakers must consult their doctors before operation due the fogger is started by using electronic ignition coil.
7. Wear ear protection during operation as the fogger produces a sound level of 95dBA.
8. During operation the doors and windows of the vehicle cab should be kept closed, personnel in the cab should not wear hearing protection.

2.2 Handling, operation and application

Following recommendations are for guidance only and do not exclude any statutory requirement.

- Ensure this Instruction Manual is kept with fogger at all times.
- To move or lift up the fogger, forklift must be used. When putting the forks underneath the fogger's chassis, stability should be attentioned.
- For stationary use, ensure the fogger is mounted evenly and horizontally without tilt.
- When the fogger is used on the moving vehicles, it must be secured to the bed of vehicle by M10 bolts, nuts and washers. All the 4 buffer feet have to be bolted.
- If installing the fogger on a light-weight vehicle or trailer, it must be positioned such the weight of machine does not affect the stability or road worthiness of the vehicle.
- After mounted on the vehicle, the fogger has to be checked again all its safety features (directive 2006/42/EC) before it can be operated.
- Never fogging while the vehicle is travelling downwind (i.e. wind blowing from behind).
- Use the fogger only for the purpose it was designed for.
- The operator should be aware of all protection and safety measures before operation.
- Observe local safety regulations for use of gasoline-driven equipment and strictly follow the engine Operator's Manual attached to this instruction manual.
- Observe local safety regulations for use of equipment on vehicle.
- Follow the safety regulations for lead-acid batteries.
- Before operation, ensure the fogger is correctly assembled in good condition with no visible damage or leaks at joints, tubes and hose. Make sure all protective devices are fitted properly.
- Stop running immediately if the fogger is not operated perfectly.
- During operation, never leave the fogger unattended.
- Do not ever run the blower without air filter.
- Not to touch hot parts due to danger of burning, e.g. engine, motor, exhaust, spray nozzles.
- Not to touch moving parts, e.g. the pullys and V-belt drive.
- Do not fog directly against walls or other fixed objects.
- Keep person or animal away from the front or vicinity of spray nozzles or exhaust outlet.

- When fogging in an enclosed room, due to combustion engine and exhaust emissions, there is a general danger of producing explosive mixture. The fogger should run outside the room and remove only its spray nozzle from extension pole into the room then start fogging. The operator should keep an eye on the maximum output per volume. Appropriate warning signs should be given in a conspicuous place to prevent people from entering the room being treated. Ensure thorough ventilation of the room before it is allowed to be used again.
- Never fill up solution tank to the level where pressure line from blower is connected to the tank.
- When engine is running, solution tank is under pressure. Do not open tank cover or cap even when fogging is stopped.
- Solution tank must be emptied after every use.
- Wash out thoroughly the solution line system after use or before maintenance. This ensures a higher reliability of operation.
- The used insecticide and insecticide container must be stored or disposed in accordance with local regulations and statutory requirements.
- Contaminated residues, clothes and etc. must be disposed according to local safety regulations.
- Regularly check for leaks fuel lines, chemical tubes, seals and connectors. Replace if necessary.
- It is recommended to have the fogger maintained annually by qualified technician.
- Follow instruction of the engine Operator's Manual related to servicing and maintenance.
- Never modify the fogger.

2.3 Fire hazard

- Always obey the prevailing rules and regulations related to precautionary measures for fuel operated equipment.
- Always keep a fire extinguisher, which is approved suitable for burning fuel and chemicals, in the vehicle and in close proximity during mobile or stationary operation, repair and maintenance. If fire happens, smother flame with blanket and/or use a fire extinguisher as quickly as possible.
- Not to use flammable liquid as carrier.
- When filling with fuel, smoking is prohibited.
- Before filling with fuel, make sure the fogger is not hot and be careful not to spill. If spillage does occur, wipe it up immediately.
- Do not remove the fuel tank cover when the engine is running.
- Not to operate the engine if there is fuel spillage or in the danger of explosion. Relocate the fogger and avoid any form of spark until the fuel vapor is dissipated.
- Avoid fogging near naked flame, combustible material and heat source or where there is danger of dust explosion (e.g. grain mills).
- Not to leave the fogger in direct sunlight or in the vicinity of heat sources when it is not operated.
- Empty fuel tank if the fogger is not to be used for a long period.

2.4 Repair

- Only the trained and qualified personnel are authorized to repair the fogger.
- Only use original parts supplied by the manufacturer.
A high risk will be caused when using copied parts including possibility of injury to personnel.
- Repair of engine should be carried out in accordance with the engine Operator's Manual attached to this Instruction Manual.
- Smoking is forbidden during repair.
- Before starting a repair, disconnect active power supply, shut down the fogger and wait until it is cooled down completely.
- During repair/maintenance, avoid all forms of contact with the high-tension ignition components e.g. spark plugs and ignition coil.
- After repair/maintenance, reassemble all safety devices and ensure all parts are assembled correctly, all caps and seals are in clean and serviceable condition.
- After repair/maintenance, perform a functional test by fogging only water.
- It is recommended to have the fogger inspected and checked by a qualified and authorized specialist e.g. company service representative on a regular basis e.g. annually.

2.5 Guarantee

Airofog Machinery Co., Ltd. guarantees proper manufacturing for all AIROFOG products. We undertake to replace or repair, at the company's expenses, defective materials or components that fail under conditions of normal use within one year from the original date of purchase. Airofog does not responsible for any labour costs associated with the replacement of faulty components.

The guarantee is invalidated if damage occurs due to improper use/repair/maintenance, incorrect transport or handling, the use of non-recommended parts / products or acceptance of damaged / broken machines by any reason.

The engine (but not the fuel tank) is covered by Briggs & Stratton Corporation worldwide warranty, which is described in the warranty leaflet supplied with the engine. In the event of a warranty claim relating to the engine, the local B&S service center should be contacted directly with both series numbers of the engine and the fogger be always quoted.

3. Technical data

FEATURES	UM-4
Engine	
type: VANGUARD™ 18 Hp V-TWIN petrol engine starting systems: electric start or recoil power: 13.4kW (18 Hp) at 3600 min. preset speed: 3000 min. fuel tank capacity: 20 liter	
Blower	
type: side channel blower, anti-corrosive drive: 2 V-belt with centrifugal clutch pulley discharge rate: 9.5 m ³ /min. at 3500 min. air filter: paper star filter	
Solution system	
solution tank (nominal/actual volume): AISI 304, 65/75 liter with level sensor overpressure in solution tank: 0.25 bar, approx. flow rate variable max.: 60 l/h spray nozzle: 4 x nozzles, adjustable - horizontally 360°, vertically 180° nozzle bar: adjustable, between horizontal and vertical level spray on-off control: remote, individually	
Flushing tank	
capacity: AISI 304, 15 liter, with tank-empty sensor	
Control	
electrical power: 12 VDC / 36Ah battery (customer self-supplied)	
control box: <ul style="list-style-type: none"> emergency stop button solution flow rate control engine running-hour meter tank pressure gauge manometric switch flushing pump 4 x solenoid valve battery charging indicator engine oil pressure indicator light fuse 	
remote control: <ul style="list-style-type: none"> 5 m cable emergency stop button engine start button engine stop button 4 x fog solution ON/OFF button flushing button with tank-empty indicator control power indicator solution-empty indicator light 	
Chassis	
type: one-piece frame, zinc-galvanized with 4 shock absorbers	
Dimension	
length x width x height: 120 x 80 x 73 cm	
Net Weight	
	195 kg

* specifications subject to change without notice or obligation.

3.1 Standard accessories

- 1 x solution funnel with sieve
- 1 x petrol funnel with sieve
- 1 x instruction manual
- 1 x spark plug spanner
- 1 x allen key 5/16"
 - 3/8"
 - M6
 - M8
 - M10
- 2 x V-belt
- 1 x ear protector

3.2 Optional accessories

- long spray hose up to max. 10m length with solution line
- motor-driven mixing device for solution tank (i.e. when using wettable powders)

4. Working principles

A combustion engine drives the side channel blower by 2 x V-belts. The side channel blower is maintenance free and corrosion resistant. Compressed air operated from the side channel blower is well matched to the narrow-bore solution nozzle, bringing about the advantage of producing comparatively small air throughput at a high compression ratio.

The spray nozzle (atomizer) works in two stages: the first step is to break up the liquid at a high velocity. Then at the end of a short conical diffuser, compressed air enters again acting in an opposite direction and provides a better break up of the droplets. The stream of droplet is dispersed without touching the inner surface of the solution nozzle. Thus wettable powder suspensions can be applied without the danger of blocking nozzle.

Control of the throughput is done by a flow meter in which a regulating valve permits an infinitely variable output max. 60 l/h showing by a transparent tube with scale and a floating ball.

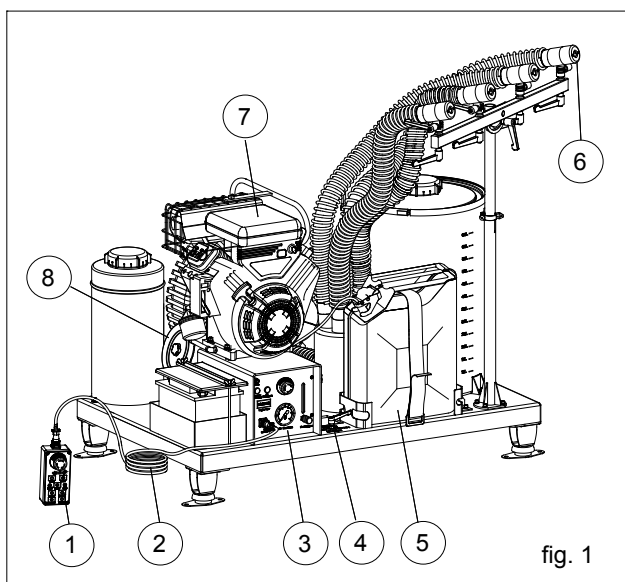


fig. 1

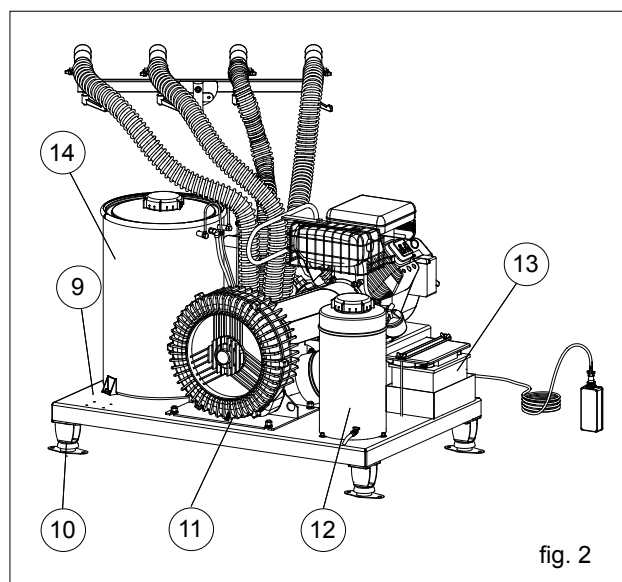


fig. 2

1. remote control
2. connecting cable
3. control box
4. solution valve
5. fuel tank
6. spray nozzle
7. engine

8. air filter
9. chassis
10. rubber buffer
11. side channel blower
12. cleaning/flushing tank
13. battery
14. solution tank

4.1 Remote control features

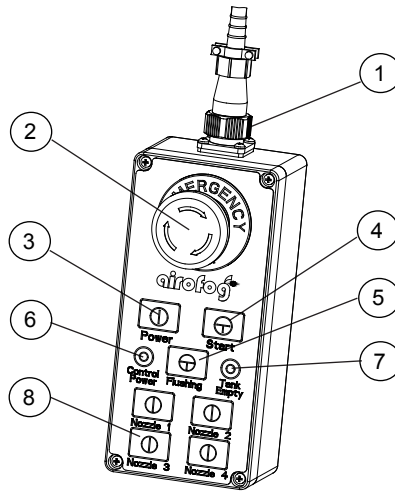


fig. 3

- | | |
|--------------------------|---|
| 1. connecting nut | 5. flushing button |
| 2. engine/emergency stop | 6. indicator light (circuit control power on) |
| 3. power on/off button | 7. indicator light (solution tank empty) |
| 4. engine start button | 8. push button (spray nozzle 1/2/3/4) |

4.2 Control box features

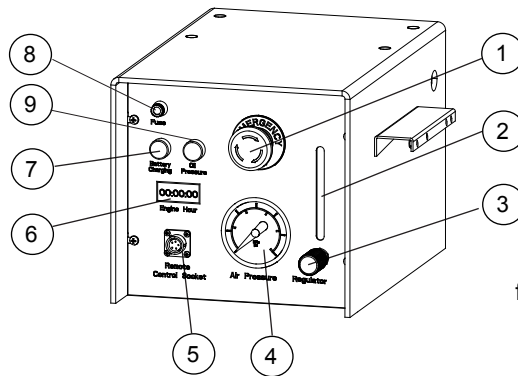


fig. 4

- | | |
|--------------------------|---|
| 1. engine/emergency stop | 6. engine running hour |
| 2. flow meter | 7. pilot light (battery charging) |
| 3. flow regulator knob | 8. fuse |
| 4. tank pressure | 9. indicator light (oil-pressure alarm) |
| 5. connecting socket | |

5. Application hints

All parts exposed to the chemical solution are made from corrosion-resistant materials (stainless steel, PE and etc.). Thus, all approved chemical solutions that don't attack these materials can be used without restrictions. No damaging influences of licensed pesticides are known.

Fogging mixture:

The chemical preparation is to be mixed with clean water as a carrier. Water temperature of 20-30°C supports the mixability with the chemical preparation and is of advantage to achieve a constant output and a homogeneous droplet spectrum.

To reduce the high evaporation rate of the fine aerosol droplets when water only is used as a carrier, special organic carriers like glycol, polyethyleneglycol, Nevocol or emulsifiable white oils should be added. A quantity of 5-10% of the total carrier quantity is sufficient to manifold the durability of the fine aerosol droplets. This is especially important when the relative air humidity is considerably below 90%.

The total mixture (=chemical preparation + water) should never be less than 1 liter per 1000m² for plant protection or per 1000 m³ for other space treatments. A quantity of water of e.g. 2-3 liter per 1000m² resp. 1000 m³ or even higher is of advantage, since more droplets of constant quality are formed and a better coverage is obtained.

In practice the following mixing ratios proved successful as a guide line:

powder formulations / water	1:15 to 1:25
liquid formulations / water	1:10 to 1:20



Observe applicable laws when selecting active solution and/or carriers.

The above are based on international application methods and experiences. Since correct application is beyond our control, we cannot be held responsible for ineffective treatment and damages caused by unsuitable chemical preparations or by incorrect application.

6. Before running

6.1 Check the power supply

- Power supply requires 12V vehicle battery, minimum power 36 Ah, maximum dimension W175 x L255 mm.
- The battery must be securely mounted and charged correctly.
- Connect the positive pole firstly then the negative pole (equipment ground).



Voltage of the battery needs to be minimum 9V.
When it is lower than 9V, the battery will not be charged from the engine.

6.2 Check the engine oil

Check the engine oil is sufficient. Not to start the engine if oil level is under the sign of minimum or above the sign of maximum (fig. 5).

Please refer to page 8-9 "Oil" of the engine Operator's Manual.

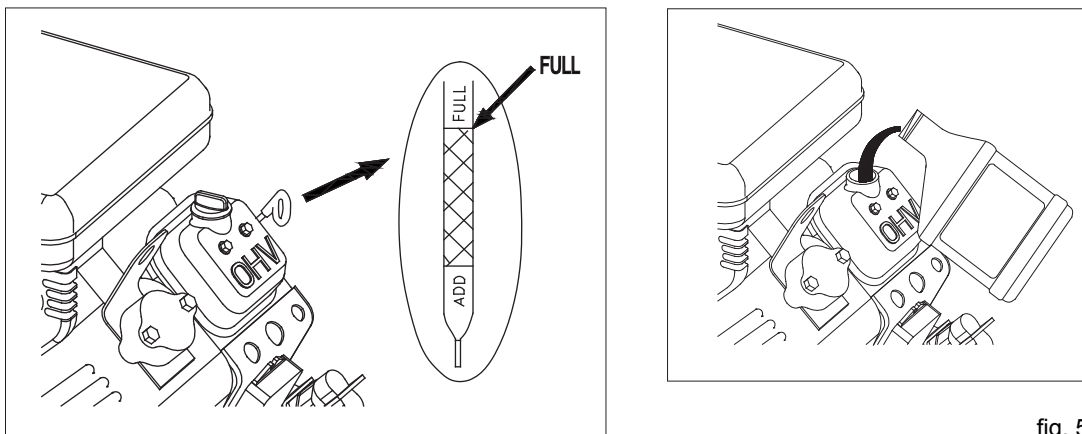


fig. 5

6.3 Fill the gasoline

Make sure of sufficient fuel amount, use only automotive gasoline.

Please refer to page 10 "Fuel" of the engine Operator's Manual.



Always use a funnel with strainer (fig. 6-1) when refilling gasoline to the fuel tank.
Never use an gasoline/oil mixture or dirty gasoline.
Avoid dust, water or dirt in the fuel tank.

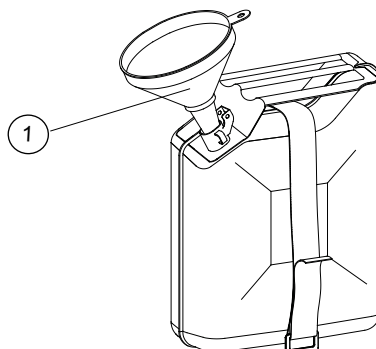


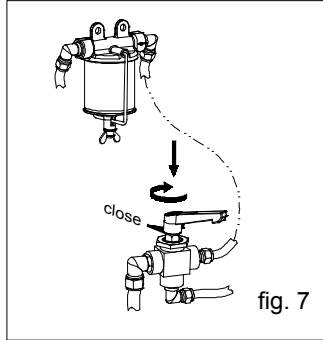
fig. 6

6.4 Fill the solution tank

When the fogger is installed on the vehicle/trailor, always stand on the bed of vehicle/trailor to fill the solution tank.

Before filling solution tank, make sure that:

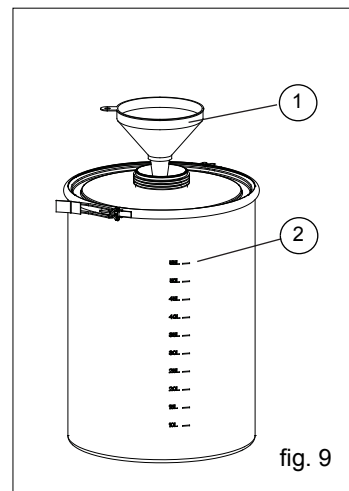
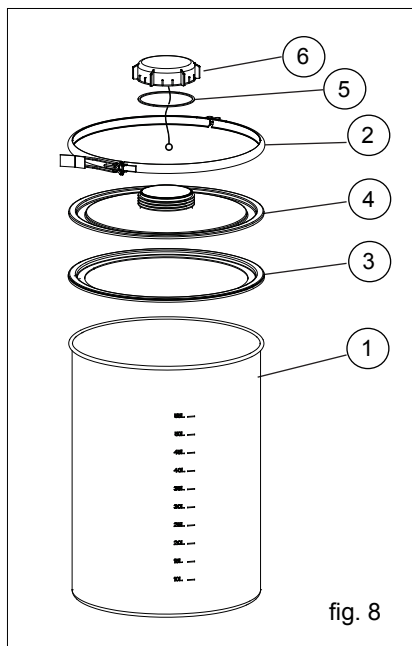
- Solution valve is closed. Push down the lever and turn it till the pointer pointing to the "CLOSE" position (fig. 7).



- Check if cover (fig. 8-4) is tightened well on the solution tank (fig. 8-1) by clamping ring (fig. 8-2). But before tightening, make sure the sealing ring (fig. 8-3) is in the correct position within the cover (fig. 8-4).

- Fill solution tank. Always use solution funnel (fig. 9-1) with strainer.
- Only fill the required solution amount for application.
- Place tank cap (fig. 8-6) with seal (fig. 8-5) in proper position then close them on tank cover tightly.

Never fill up solution tank over the max. level (fig. 9-2).



6.5 Fill the cleaning tank (flushing tank)

A separated 15 liter cleaning tank (water tank) is provided for operators.

It is suggested to keep clean water only, in case the operator is contacted with chemicals, he can wash with the clean water immediately.

Water or suitable cleaning agents can also be applied for flushing work after completion of pesticide application to flush the solution tank, solution pipe system and nozzles.

- Should use the funnel with strainer (fig.10-1) when filling the cleaning tank.
- From time to time cleaning the flushing tank to prevent the build-up of algae.

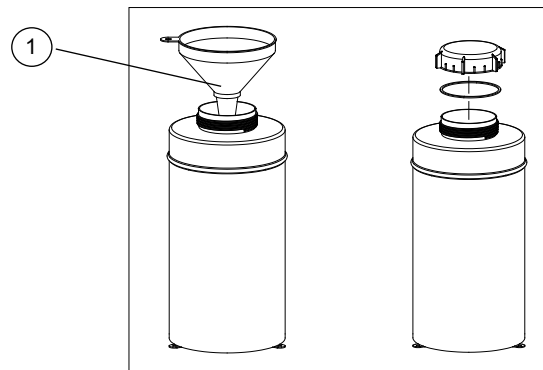


fig. 10



After the cleaning tank is filled, when the remote control power is on, the flushing light will be automatically on; on the contrary, the flushing light is be off.

6.6 Adjust the spray nozzle

6.6.1 Position of the extension base

The extension base (fig.11-1) can be placed on either left or right side of the chassis.

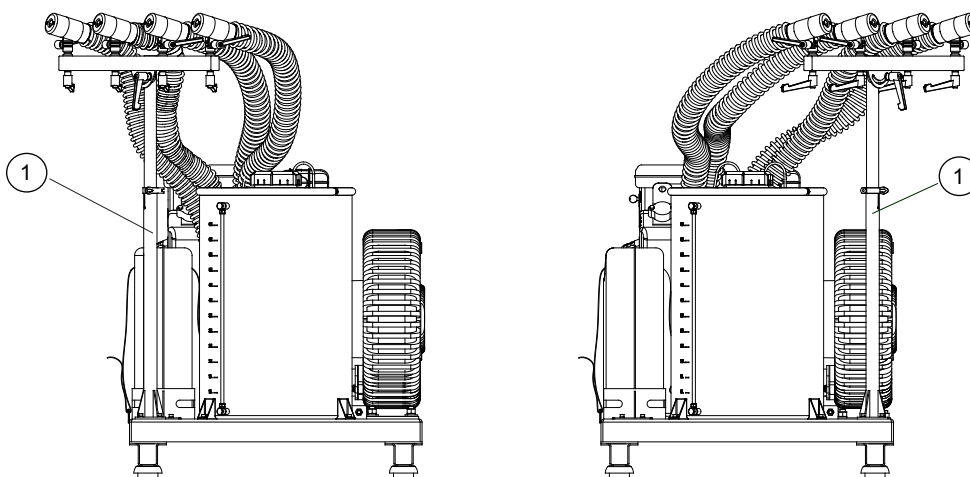


fig. 11

6.6.2 Position of the spray nozzles

- Nozzle bar (fig.12-4) can be easily adjusted to any angle between horizontal and vertical level by just loosening the locking lever (fig.12-3).
- By loosening the locking clamp (fig.12-6), the extension pole (fig.12-5) can be pulled up or down / left or right out of the extension base (fig.12-7), thereby both height and direction of the 4 spray nozzles can be adjusted simultaneously.
- Individual nozzle can be adjusted its angle (upward / downward) by turning locking lever (fig. 12-1) and be adjusted its direction (rightward / leftward) by turning locking lever (fig. 12-2).



After adjustment, make sure the air hose (fig.12-8) not to contact any hot part of the fogger (i.e. engine exhaust, blower and etc.)

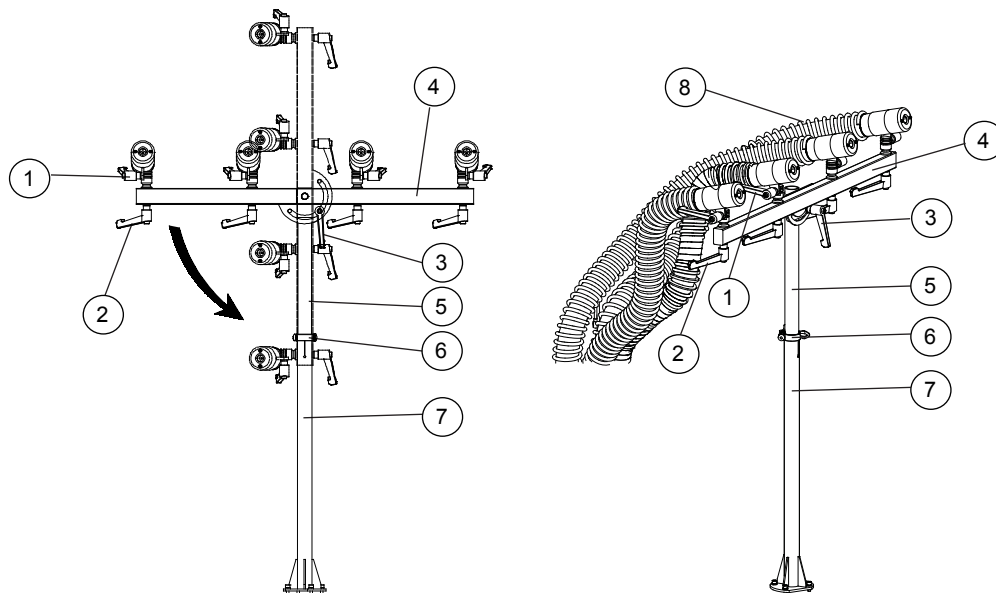


fig. 12