2. Working principles

The Airofog ULV Aerosol Generator UE-1 is driven by a electric motor blower which is encapsulated, maintenance free and corrosion-resistant. This machine applies to both outdoor and indoor, especially extraordinary when applying acid based solution in an enclosed space as motor and blower will not be damaged. By programming control for self-running programme, it can be operated automatically, which helps lowering labor cost and reducing operator's exposure to chemicals.

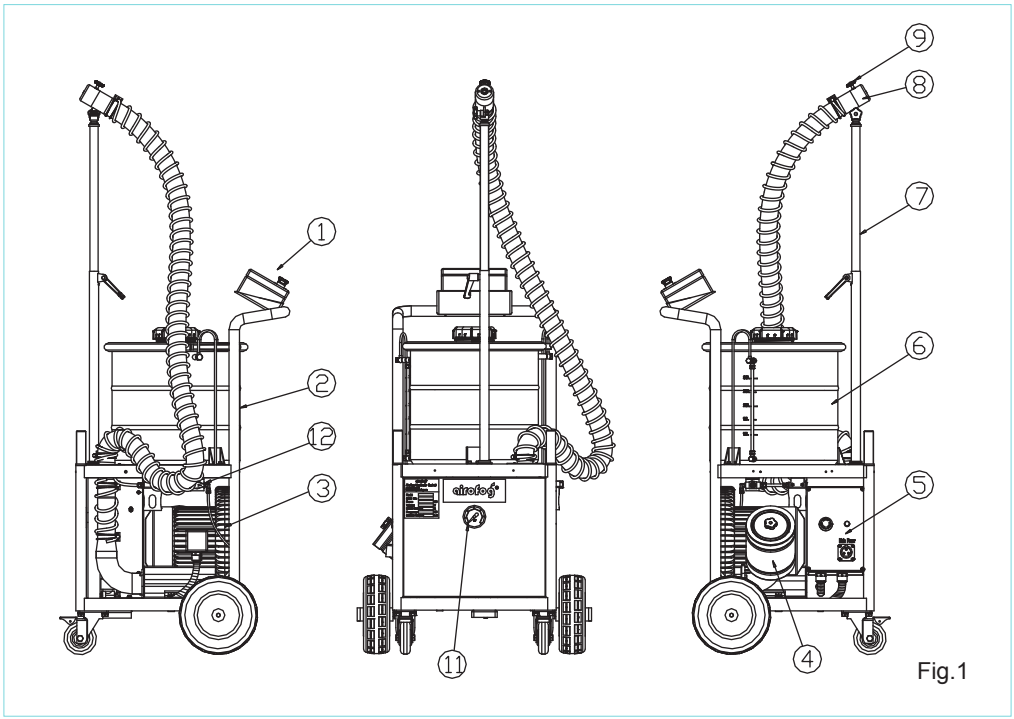

Fig.1

1. operator box
2. chassis
3. motor blower
4. air filter
5. power supply box
6. solution tank
7. telescopic pole
8. spray nozzle
9. flow regulator
10. type plate
11. solution tank pressure gauge
12. solution valve

The air compressor operates on the principle of the side channel blower and is matched to the solution nozzle well. It produces a comparatively small air throughput at a high compression ratio, which is advantageous considering the narrow nozzle bores.

The solution nozzle works in two stages.

The first step breaks up the liquid at a high velocity (about 180m/sec.). At the end of a short conical diffuser, compressed air enters again which is 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.

The control of the throughput is due to a needle flow regulator from 0 to max. appr. 24 l/h depending on the type and viscosity level of the liquid to be fogged.

2.1 Power supply and control panel

2.1.1 Power supply features:

1. Socket
2. Plug
3. Power indicating light
4. Emergency / Stop button

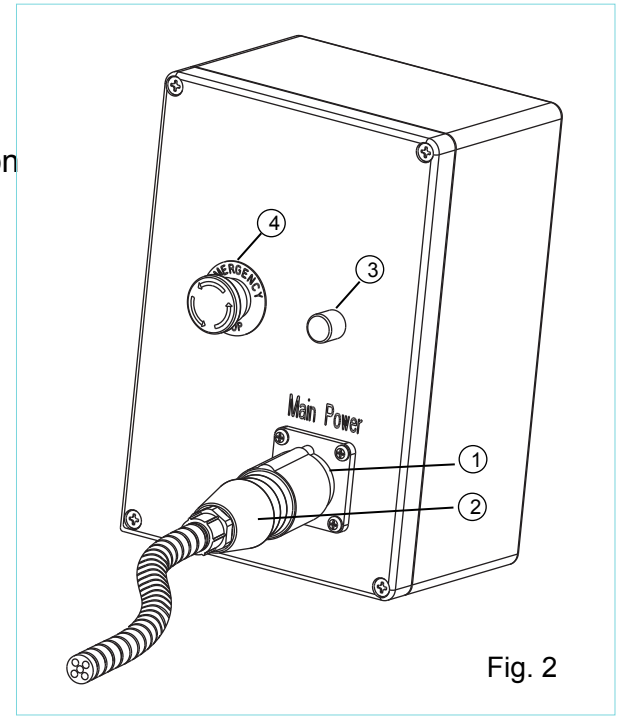

Fig. 2

2.1.2 Control panel features

1. Auto-mode button
2. Stand-by button
3. Spraying button
4. Post-blowing button
5. Selector (hour, min., sec.)
6. Time set
7. Selector
8. Manual/mode button
9. Time display
10. Accumulated running hour
11. Emergency/Stop button

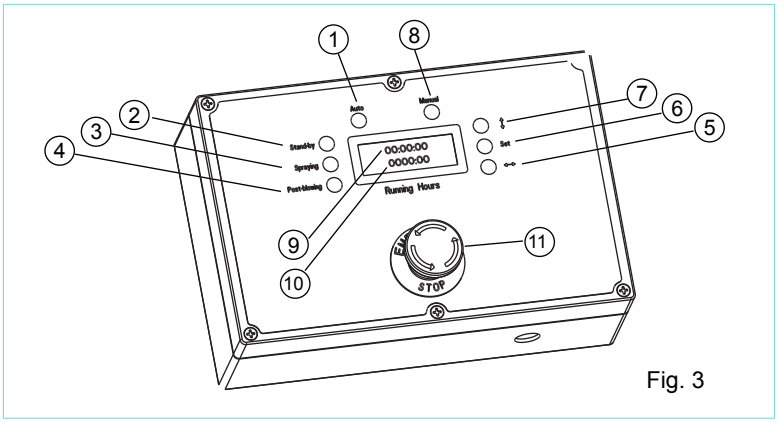

Fig. 3

3. Application hints

All parts exposed to the chemical solution are made from corrosion-resistant materials (stainless steel, brass, 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.

3.1 Fogging mixture

The chemical preparation is to be mixed with clean water as a carrier. A water temperature of 20-30^{0}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 1L per 1000m^2 for plant protection or per 1000 m^3 for other space treatments. A quantity of water of e.g. 2-3L per 1000m^2 resp. 1000 m^3 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.

4. Preparation of the machine

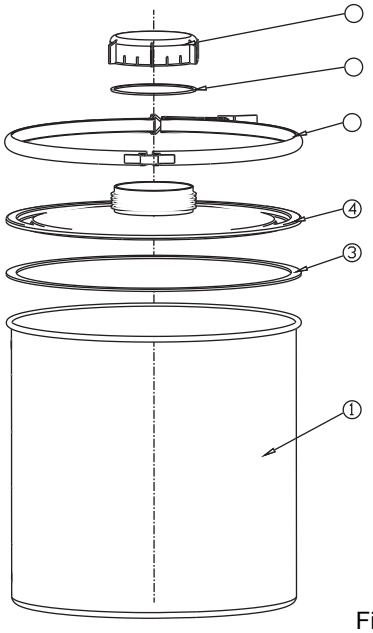

Fig. 4

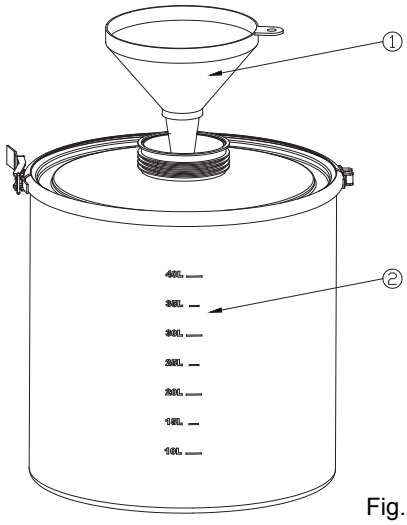

Fig. 5

4.1 Filling the solution tank

⚠ Before filling solution tank, make sure that:

- solution tap is closed, lever points in vertical direction (fig. 1-12).
- check if cover (fig. 4-4) on the solution tank (fig. 4-1) is tightened and the clamping ring (fig. 4-2) is in the correct position together with the sealing ring (fig. 4-3).

- Fill solution tank. Always use solution funnel (fig. 5-1) with strainer.
- Only fill the required solution amount for application.
- Place tank cap (fig. 4-6) with seal (fig. 4-5) in proper position then close them on tank cover tightly.

⚠ Never fill up solution tank over the max. level (30L) (fig. 5-2).

4.2 Setting the output quantity

The machine is fitted with needle flow regulator which dosing max. 300ml/min. As the output varies according to different chemicals and physical property of formulations as well as the height of the nozzle, we advice you to do your own metering of the output under prevailing conditions.

Regulator turn	water (appr. ml/min)
1/4	30
1/2	80
3/4	130
1	180
1.1/4	230
1.1/2	280
1.3/4	300
2	310

Since a fine mist is difficult to see, it is usually better to calculate by fogging time and flow volume than to rely on visible indications.

An optimum distribution rate is 50ml of substance per minute approximately.
To establish the application time, firstly determine the total quantity of substance to be used in accordance with the formula as below:

(m^3 of area to be treated) x (ml of substance required for $1m^3$) = ml of substance

$$\frac{\text{ml of substance}}{\text{distribution in ml per minute}} = \text{distribution time in minutes}$$

4.3 Adjustment of the spray nozzle

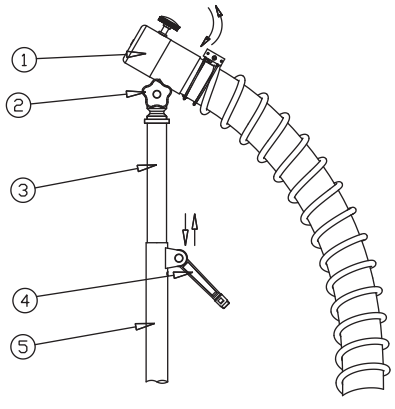

Fig. 6

- The angle can be set by adjusting knob nut (fig. 6-2).
  A light upwards inclination of the spray nozzle (fig. 6-1) is advantageous.

- Adjust spray nozzle to required height by pulling in and out the extension pole (fig. 6-3) from the extension base (fig. 6-5) by loosen and tighten locking lever firstly (fig. 6-4).

5. Starting of the machine and functions

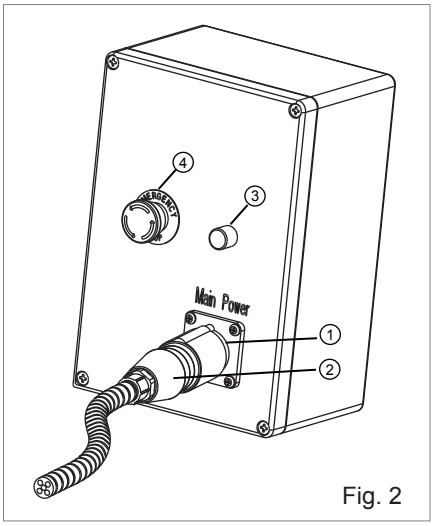

Fig. 2

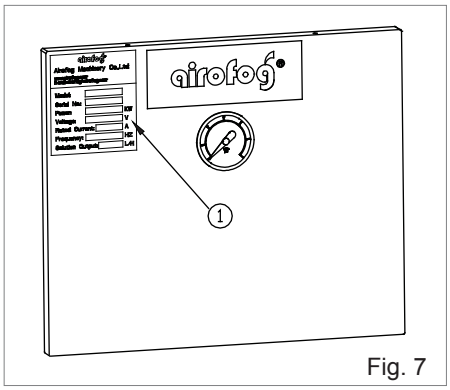

Fig. 7

Power supply:
Before connecting the plug (fig. 2-2) to the socket (fig. 2-1) of the power supply, check whether the voltage of the machine (see type plate fig. 7-1) corresponds to the local mains voltage. Connect the plug of the machine only to sockets with ground connection. Note that the yellow / green lead is the ground connection. Only extension cords which are suitable for the use in greenhouses or being moisture-proof should be used (diameter at least 2.5mm^2). When using a cable drum, take care that most of the cable is wind off to avoid overheating in the cable drum eventually causing a voltage drop.

Function of control panel:
Please refer to the detailed steps in section 9 “ Setting of Timer ”.

<u>Before starting the machine, make sure that:</u>
- Aim the nozzle in the required direction;
- Open the solution tap, turn the solution tag in horizontal direction pointing to the solution filter.

The machine is now ready for operation.

- Press the Auto button (fig. 3-1).

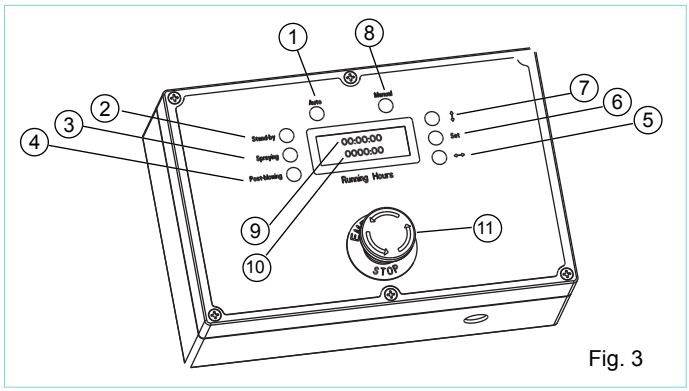

Fig. 3

⚠ If you do not wear protective clothing, you should leave the room immediately after the machine starts running.

The application process now runs automatically in the modes.

(A) Starting the blower
The blower starts automatically after the programmed time on “Stand-by”.

(B) Spraying
Spraying will start in the same time when the blower starts.
Duration of spraying depends on the programmed time on “Spraying”.

(C) Post-blowing
Automatically blowing after completion of spraying for an optimal air circulation and distribution of droplet.
Duration of post-blowing depends on the programmed time on “Post-blowing”.

(D) Stopping
Machine stops automatically after completion of post-blowing.

⚠ Please note:
The solution tank is under pressure (approx. 0.2 bar). Therefore, do not open the cover or tank cap when tank is under pressure.

5.1 Fogging in enclosed spaces

When fogging in rooms, stables, halls etc., there is a general danger of producing an explosive mixture, if operator does not watch the maximum ouput per volume.

The dosage of combustible parts of the total fog mixture is not allowed to exceed the following maximal rates per 1000m^3 in the below chart:

a) Fog additives

Diesel or Kerosene	3.0 L/1000m^3
Glycerine	2.5 L/1000m^3
Ekomist	2.0 L/1000m^3
Erthylenglycole	2.0 L/1000m^3
Diethylenglycole	2.0 L/1000m^3
VK 2 – Special	2.0 L/1000m^3
VK 1	1.5 L/1000m^3
Nevolin/Nevocol	1.5 L/1000m^3

b) Fuel, white oils:

Vegetable oil	2.5 L/1000m^3
Diesel/heating oil	2.0 L/1000m^3
Petroleum	2.0 L/1000m^3
Petropal	2.0 L/1000m^3
Shell Risella 15	1.5 L/1000m^3

These rates are more than enough to the limits of inflammability. Meanwhile they are much higher than what usually dosed in the limited spaces which is 1L per 1000m^3 by oil based formulations.