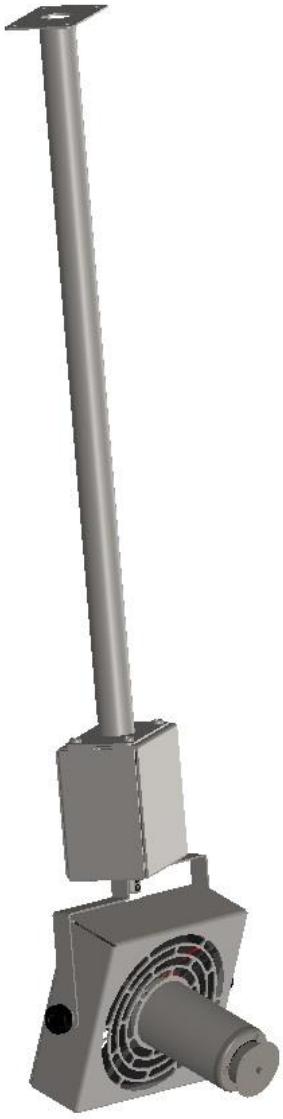
HIGH FLOW OSCILLATING DIFFUSER

NS3000, NS5000, NS10000 et NS15000



Sprai Technology

Centre Entrepreneurial – Bat. 503
91400 Orsay, FRANCE
33 (0)1 69 35 88 93

www.spraysas.com
www.ecoclimsprai.com
contact@spraysas.com

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1. Operation principle

The pump sucks the liquid from the tank to send it towards the disc through the pipes and the buffer tank. The liquid spreads on the spinning disc's lower surface and diffuses it all in fine droplets near its edge. The air stream created by the fan carries the droplets upwards, and diffuses them over the entire volume treated.

In order to increase the diffusion efficiency and cover a larger volume, the device oscillates around the attachment structure thrice a minute.

2. Description

The main components of the device are (figure 1) :

An attachment structure

50cm length, which has at its end a 85x50m plate with 4 4mm diameter holes placed at 65mm and 40mm from each other

An oscillation system

This system allows the diffuser to oscillate thrice a minute around its vertical axis with an amplitude of 150°. The oscillating system includes :

- An Stainless steel box
- A 24V stepper motor
- An attachment which allows the manual orientation of the sprayer.

A sprayer box

Which includes

- A thin, 42mm diameter stainless steel disc, spun by a brushless motor and fed liquid near its centre.

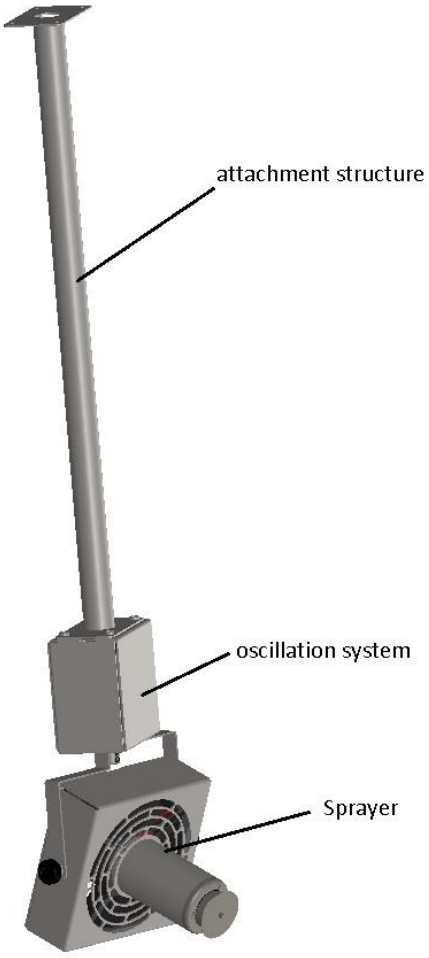


Figure 1

The disc must be protected when not in use. Any shock could distort it and damage the motor wheel bearings.

The disc should not be touched when it is spinning.

- A 24V brushless motor, rotation speed 40000 RPM.
- A motor box including liquid eccentric injector

- An optical sensor which detects the presence of liquid on the disc
- A 24V axial fan, flow rate 384 m³/h, noise level 62 Db, rotation speed 3600 RPM.

A control box (210 x 180 x 115mm)

Includes (figures 2 and 3) :

- A printed circuit board (power and controls)
- A 24V constant flow rate peristaltic pump with neopren tube. Max flowrate 15 l/h
- A 24VDC connector
- A power supply: input 230 VAC – outpout 24V – 5A.

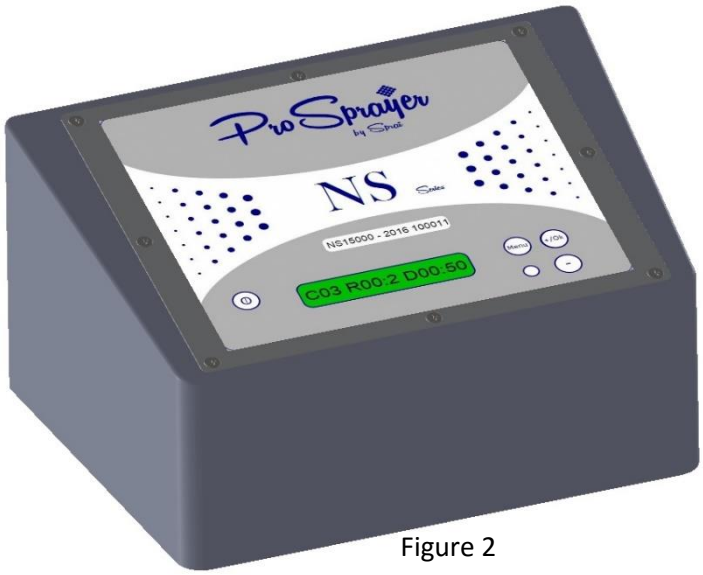


Figure 2

Figure 2

The diffuser is also equipped with:

- An electric connector, length 5m.
- a silicon tube, length 5m, internal diameter 4mm and external diameter 6mm

- Dimensions of diffuser : L=180mm ; W=160mm ; h= 750mm (250mm without attachment)
- Wight : 3 Kg
- The System is provided without a tank.

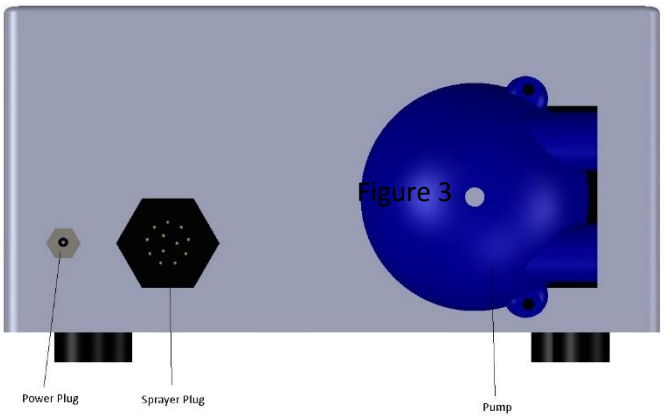


Figure 3

Figure3

3. Installation of the system

- ✓ Screw the attachment to the ceiling or the structure you have chosen
- ✓ Plug in the diffuser cable to the control box
- ✓ Plug in the silicon tube to the pump outlet
- ✓ Plug in the electrical cable 24V DC to the power plug on the control box
- ✓ Plug in the AC cable to the mains supply

Plug in the pump inlet to the tank containing the liquid to be sprayed Please make sure the tank is full and that the suction pipe is in place before operating the device.

✓ Your device is ready to use.

4. The control panel

The control panel is located on the front of the control box (figure 4). There are four buttons on the control panel:

- **On/OFF** switch
- **Menu**
- **+/Ok** : to increase the displayed value
- **-** :
  - to lower the displayed value
  - To know the program version and the total running duration of the machine (press < 1.5s)
  - To change the language Fr or En (press > 1.5 second).

Figure 4 : Control panel.

When pressing the ON/OFF button, the oscillation system goes to the starting point and waits for the diffusion order.

It is necessary to wait 30 seconds between two orders.

If the oscillation system presents an anomaly, put the system off and wait 10 seconds before restarting.

5. Programming the diffuser

The diffuser is designed to diffuse at a constant rate **continuously** or **sequentially**. It needs to be programmed with a number (**C)** of cycles, a delay (**R)** and duration (**D**) of diffusion of each period.

Diffusion time calculation:

The volumetric pump providing the diffusing has a constant flow rate set to 3000, 5000, 10000 or 15000 ml/hr. The exact flow rate is mentioned on the specifications sheet delivered with the diffuser.

Diffusion time is obtained by dividing the quantity of liquid to be diffused by the flow rate.

Example:

Quantity of liquid to be diffused :	**7500mL**
Flowrate :	**15000ml/hr.**
Diffusion time : d = 7500 / 15000 =	**0.5 hour (30 minutes)**

Diffuser programming

When switched on, the diffuser displays: **Start**

After parameter initialization, the diffuser displays: **Prosprayer NS15000**

And indicates the program parameters: **C01 R0:01 D00:01**

C05	R1:15	D05 :10
Number of cycles	*Delay*	*Duration of each cycle*

C indicates the number of cycles (adjustable from 1 to 99) **R** indicates the programed delay (hours and minutes), **D** indicates the diffusion duration of each cycle (minutes and seconds).

- Programing the right **C, R** and **D**
  - Press Menu. The number for **C** starts flashing.
  - Press **+/Ok** or **—** to obtain the required value (between 1 and 99).
  - Press **Menu** to set the next value. The number for **R0:01** starts flashing indicating the delay in hours.
  - Press **+/Ok** or **—** to obtain the required value (between 1 and 9).
  - Press **Menu** to set the next value. The number for **R0:01** starts flashing indicating the delay in ten of minutes.
  - Press **+/Ok** or **—** to obtain the required value (between 1 and 5).
  - Press **Menu** to set the next value. The number for **R0:01** starts flashing indicating the delay in minutes.
  - Press **+/Ok** or **—** to obtain the required value (between 1 and 9).
  - Press **Menu** to set the next value. The number for **D00:01** starts flashing indicating the spray duration in tens of minutes.
  - Press **+/Ok** or **—** to obtain the required value (between 1 and 5).
  - Press **Menu** to set the next value. The number for **D00:01** starts flashing indicating the spray duration in minutes.

- Press +/**Ok** or — to obtain the required value (between 1 and 9).
- Press **Menu** to set the next value. The number for D00:01 starts flashing indicating the spray duration in tens of seconds.
- Press +/**Ok** or — to obtain the required value (between 1 and 5).
- Press **Menu** to set the next value. The number for D00:01 starts flashing indicating the spray duration in seconds.
- Press +/**Ok** or — to obtain the required value (between 1 and 9).
- Once the last value has been set, press **Menu** to save. Set values will be stored even when the diffuser is switched off.

C05 R1:15 D05 :10

This message indicates that there are 5 cycles each having a spray duration of 5mn and 10s. Each cycle begins 1 hour and 15 minute after the preceding cycle has finished. The total duration of use is 6h.40mn.50s.

- Press **Menu** to go back to the main display screen.

6. Diffusing process

Press the Ok button to begin the diffusing process, the diffuser displays the following message:

Priming

- The fan starts first, followed by the rotating disk and the oscillation system.
- The pump starts after. diffusion Time begins to be calculated when liquid reaches the disk
- During diffusion, the diffuser indicates the time remaining before the end of spraying.

For example :

20 :49

At the end of each cycle, the pump stops first, followed by the fan, the rotating disk and the oscillation system.

At the end, the pump rotation inverses and empties the hydraulic circuit:

Empty

At the end of a diffusing cycle, the display indicates:

Pulverizing OK

Emergency stop

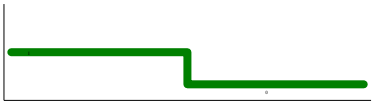
If the cycle needs to be stopped for any reason, press the Increase/OK button. Pressing the same button will take the device back to the main page, to resume normal cycle.

If there is an anomaly, the diffuser will stop and indicates the amount of time the diffusing lasted:

Worked 05 :00

Control by LED

The diffuser is equipped with a LED which indicates the status of the system



Green flashing light (1s) indicates that diffuser is in **starting** phase

Green fast flashing light indicates that diffusion has successfully completed.
Panel indicates "**Pulverizing OK**"

Green permanent light indicates that diffuser is in **diffusion** phase.

Red fast flashing light indicates that diffusion has finished but a fault has occurred.

7. Operating default

When a default has occurred during diffusion, the LED flashes red and two messages appear alternately:
The first message indicates the origin of default:

No liquid	Indicates that the liquid does not reach the diffuser, check if the liquid remains in the tank
Error#001	Indicates a fan anomaly
Error#002	Indicates a pump anomaly
Error#003	Indicates a motor anomaly

The second message indicates the diffusion time

10 : 50

A simple press of the OK button clears these messages.
It is advisable to start a new spray cycle and if the problem persists, contact the maintenance department.

Cleaning the diffuser

Do not clean the diffuser with tap water.

- Cleaning the external casing: the casing should be cleaned regularly with a damp cloth.
- Cleaning the hydraulic system: it should be rinsed **after each use:**
  - Replace the product container by a second container containing water (or solvent).
  - Check that the suction tube is still in place.
  - Program the diffuser for a 5 minute diffusing period.

Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
No liquid gets to the disc	• The tank is empty • The suction tube does not reach the liquid • The pump does not work • A pipe is clogged up • The buffer tank is clogged up	• Fill up the tank • Replace the tube correctly • Send diffuser back • Send diffuser back • Send diffuser back
The disc does not rotate	• Motor failure • PCB failure	• Send diffuser back
The fan does not work	• Motor failure • PCB failure	• Send diffuser back
The diffuser is abnormally noisy	• Fan noise • Diffusing system noise • Pump noise	• Send diffuser back
The diffusion is not good enough	• Fan problem • Wrong spinning speed • Wrong liquid	• Send diffuser back • Use an appropriate liquid
The oscillation system presents an anomaly	•	• Put the system off, wait 10 seconds before to restart

8. Maintenance

On site maintenance

Disc replacement can easily be carried out on site.

Please do not use force on the motor, otherwise the bearings will be damaged. Do not remove the power supply cover.

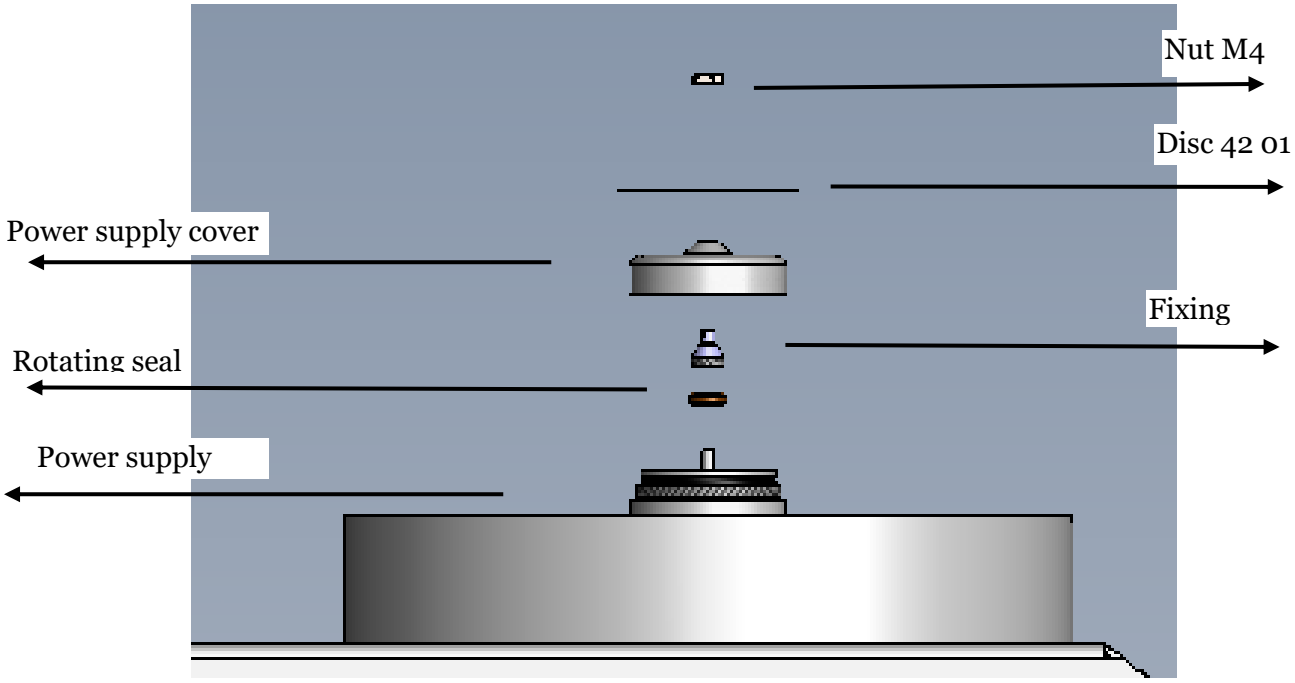


Figure 5 : Disc replacement

1. Unscrew the M4 nut.
2. Remove the disc.
3. Replace the new disc in position.
4. Tighten the M4 nut.

Preventive care

The diffuser you are using has undergone thorough controls before delivery. It is advisable to schedule a preventive maintenance visit at the manufacturer **every 200 hours** of use. This visit will include:

- Disc removal
- Seals replacement
- Pipes check and replacement if necessary