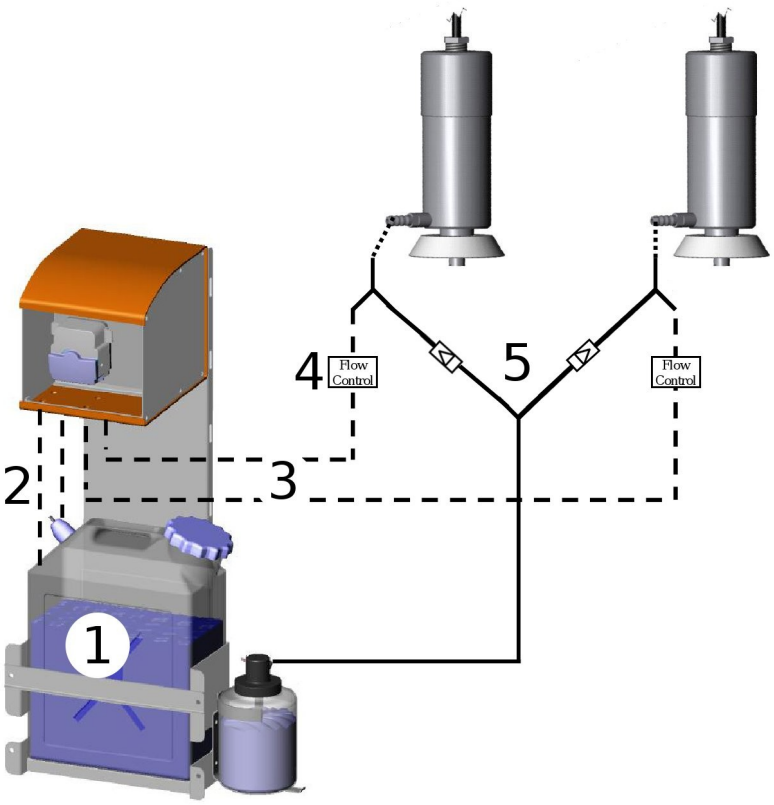
Installation tips for MAFEX Ultra-Low Volume Applicator



1) Tank – The storage tank for the products you are applying should be located no more than 1 meter lower than the pumping system. If it is lower, please be sure to check the system to make sure the output is matching the volume shown on the controller screen. Also, if the product you are using does settle over time, be sure to either use a tank with agitation or periodically shake the container to maintain suspension.

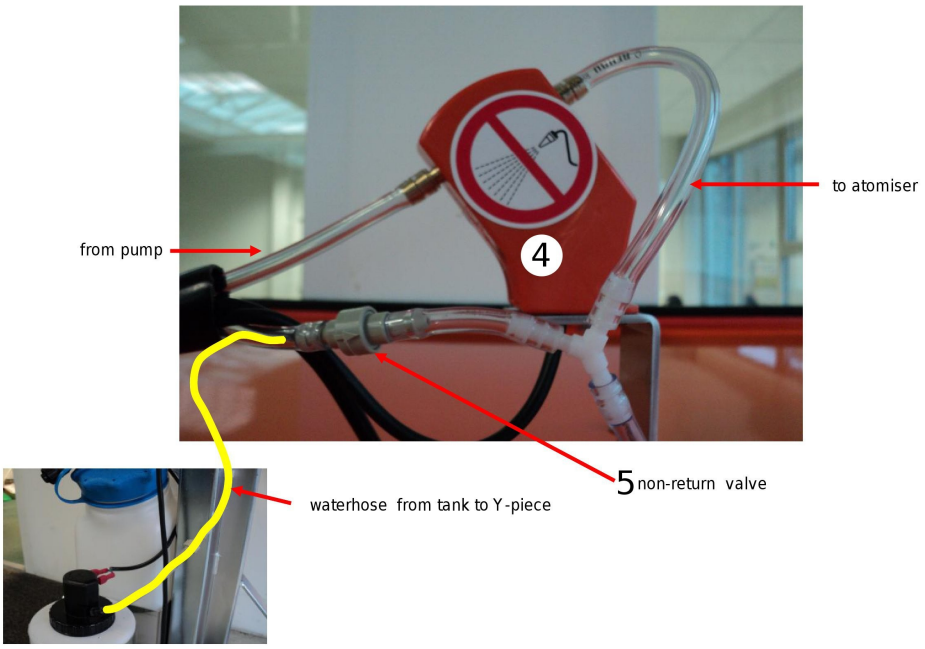
2) Suction hoses – If you are using the (largest size) 8mm pump hoses, please be sure to use suction hoses of comparable inside diameter (the thick braided hose that is supplied, not the clear small hose used on the output side). Also, if you are using multiple pump heads make sure they have their own suction hoses, not a Y-connector pulling from a single common suction hose.

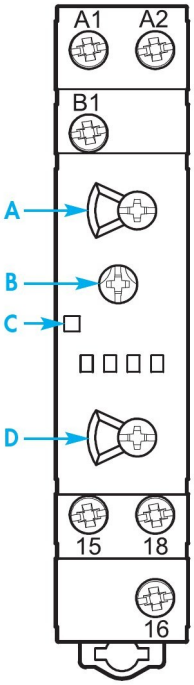
3) Output hoses – The atomizer should be placed no more than 3 meters higher and 10 meters away from the pump box. Once the atomizers and the pump box have been installed, shorten the output hoses to eliminate any extra loops and length. The shorter the hoses, and the more uniform the incline, the better.

4) (optional) Flow Sensor – The flow sensor should be installed on the output hose, just before the Y-connector that joins the output hose with the flush hose. The input of the flow sensor should be lower than the output, to eliminate the chance of trapping air bubbles inside the sensor.

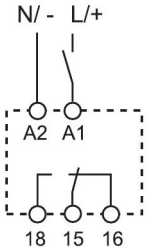
5) Check valve – also known as one-way valve or non-return valve – This should be placed on the flush hose, just before the Y-connector that joins the output hose with the flush hose. Make sure the arrow is pointing towards the atomizer.

6) If you are getting air bubbles in the line, make sure to clamp the connections to ensure a good seal. If bubbles persist, check hose for damage (eg. Cuts) and replace hose if necessary.





Relay

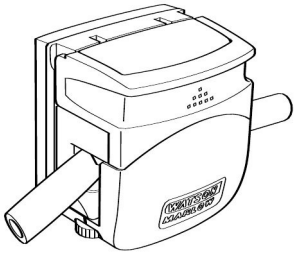


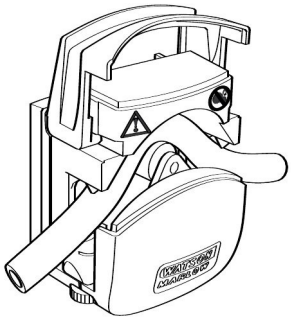
Generally, you will use only one setting with this relay, although it has many options and is very flexible. Mostly, we connect to a power supply from the table, so that when the table stops the Mafex pump also stops. There is a blue and brown wire coming out the side of your pump box, Blue is positive (wired to terminal A1 on the relay) and Brown is negative (terminal A2).

To use the relay, make sure the pump wires are wired into terminal 15 and 18. Now, the pump will not run without power from the table. Note the relay accepts 12-240 V, AC or DC. Make sure the relay is set to AI (D on the left photo), the time scale is set to "2s" (A), and the time setting (B) is set as low as possible. These settings should be set for you already by default. If the light marked (C) turns on, it is receiving power from your signal source.

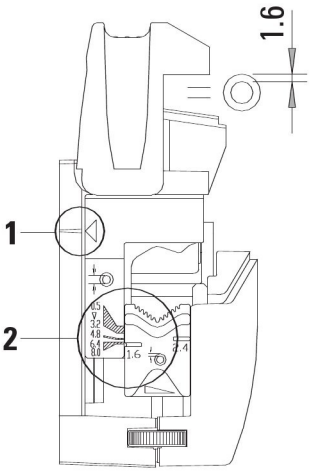
To bypass the relay and ignore any incoming signal, wire the pump to 15 and 16. This is how the machine should have been delivered.

Pumps





The hose should be centered in the pump head, and should not have any kinks or folds in it. If it is kinked it is probably too long, so cut a piece off to make it fit properly.



The pumps accept a number of hose bores for different pump volumes. The MAFEX systems use 4 sizes all with the 1.6 mm wall thickness. Looking at the picture on the right, to set the size make sure the top flap is all the way open and the arrow meets the line at (1). Then, line up the 1.6 (wall thickness) with the bore of the hose you are using, which is either 1.6, 3.2, 4.8, or 8.0 mm. You can adjust this by the dial at the bottom.

If the pump is not going to be used for a long period of time, please open the top flap to release tension on the hose. This will greatly prolong hose life. In general the hose should be good for one season, although in practice you may want to change the hose more regularly to ensure optimal performance.

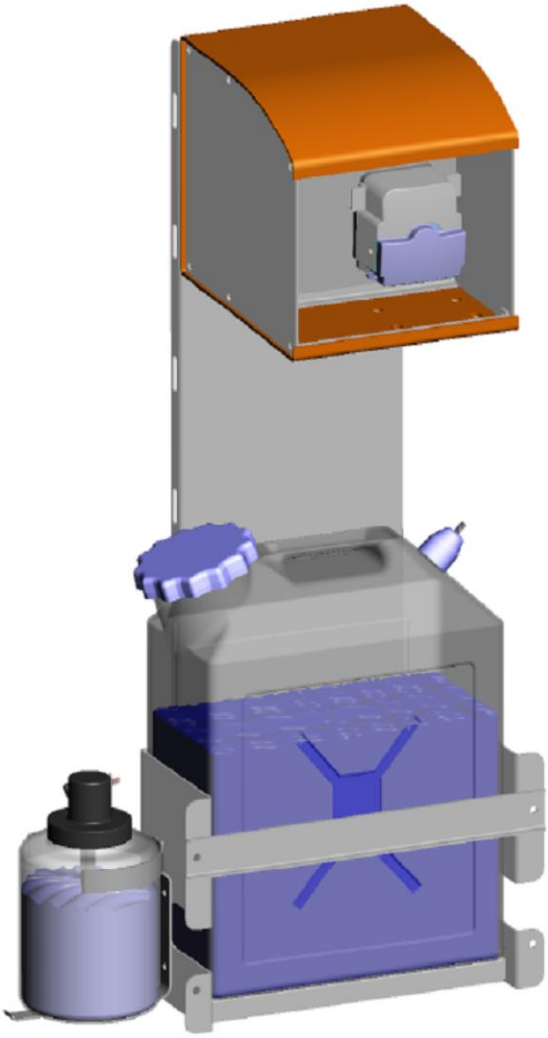
Maintenance

It is important to clean the system after use. Even if you shut down for 1 hour, take a few seconds to hit the flush button to rinse the atomizer (bottom left button on your controller). When you shut down for the day, take the suction hose out of your product tank and set it in a pail of water, then pump the water to thoroughly rinse out the system for 2 or 3 minutes. This will keep hoses and atomizers from gumming up with product.

Before rinsing out the system, you can reverse the pump to empty all the product in the hoses back into the tank by holding the "F-" button on the bottom right.

To reset the total volume displayed on the screen, press the "F+" button. Note that for this to work the system must be on, but not pumping.

INSTRUCTION MANUAL FOR MAFEX POTATO



Manufacturer:

Mantis ULV-Sprühgeräte GmbH
Germany 21502 Geesthacht, Vierlander Str. 11 a
Telephone +49(0)4152-8459-0, FAX +49(0)4152-8459-11
Web: www.mantis-ulv.eu Email: mantis@mantis-ulv.eu

For safety reasons:

Keep the electric circuit zero potential
for assembly. Prevent unintentional resetting

Important!

Periodic cleaning of the device is essential for a failure-free operation

- Check water-level in flushing tank periodically and refill it if necessary
- Religiously cleaning of the ULV dosing system after each use according to description on page 12.

Attention!

Never clean components of the ULV dosing device with a high-pressure cleaner or a sharp water jet.
The electronic components could be destroyed.

<u>These operating instructions must be carefully and thoroughly read prior to installation or initial commissioning.</u>

This unit:

- Was designed for the application of liquids against storage disease and germination inhibiting.
- Was designed for a supply voltage of 11 V to 19 V with compensation for natural fluctuations in the supply voltage of ±5 %.

Advantages of the MAFEX Potato/Fruit dosing unit:

- Liquid dosing without the use of additional amounts of water
- Differing application volumes according to hose variants:

Hose Ø	ml/min.	ml/h
3,2 mm	6,7 - 55	400 - 3300
4,8 mm	**10 - 114**	**600 - 6850**
8,0 mm	20 - 220	1200 - 13200

- Lactic acid bacteria concentrate is applied as spray mist
- Maximum application duration due to 2x10l interchangeable tanks or an extra 30 l tank
- Simple and precise regulation
- Flow control and nozzle monitoring
- Nozzle flushing function
- Active indication of the applied volume

Assembly/Installation

Install all components according to the installation instructions on the following pages.

Ensure the kink- and twist-free positioning of the hoses and cables during installation.

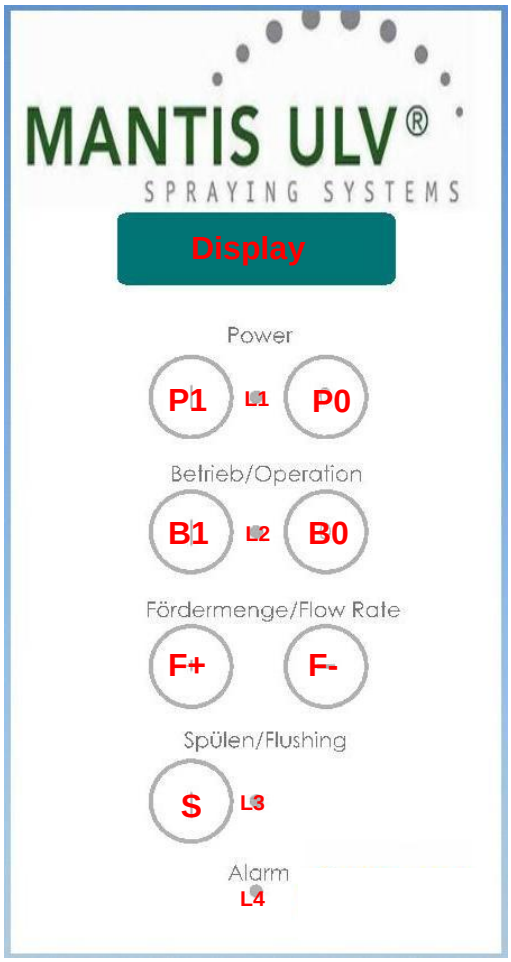
Perform a function and leak test prior to initial deployment!

Operation of ULV dosing device

Preparation

- Fill the container with pre mixed concentrate according to the manufacturer's instructions.
- Fill the container of the cleaning system with tap water.
- Define the required application rate (It depends on the concentration of your mixed liquid, example see next chapter)

Start-up



Switch-on the ULV dosing device by pushing button P1. Revision number is shown shortly and the connected components are initialised.

Before starting the system it is possible to delete the saved total output quantity by pressing the Flow Rate "+" button. By pressing the Flow Rate "-" button the mixture will be pumped reverse.

To start application push button B1. If the system is equipped with a flow control, mixture is pumped to the atomiser in maximum 90 seconds. After that the system switches automatically to operation mode.

Press button F+ or F- to adjust the desired application quantity. The current application quantity is shown in the display.

To stop application e.g. during breaks, press button B0.

Furthermore the atomiser should be cleaned with water during short breaks by pushing button S for approx. 3 seconds. LED L3 is glowing during flushing.

LED L4 is glowing if there is an error (e.g. no mixture in the container). Please have a look at the chapter on page 11 for troubleshooting.

Attention: Use only mixtures according to manufacturer's instructions!
Other, untested liquids with other viscosities, boils etc. might cause fatal errors.

Mix the concentrate

Chlorpropham - Liquids (300g/l Chlorpropham, EC-Formulation)						ml/t
Gro-Stop Basis (Certis/Spiess-Urania)			60ml/t in 140 ml water			200
Neonet Start (Belchim)			60ml/t in 140 ml water			200
Neo-Stop Starter (Stähler)			dto.			
Copper hydroxid - Liquids (460,6 g/l Copper Hydroxide, SC-Formul.)						
Cuprozin liquid (Spiess-Urania)			160ml/t in max 5% water			168
Imazilil-Liquids (100 g/l Imazilil, water soluble conc.)						
Fungazil 100 SL (Certis/Spiess-Urania)			150 ml/t in 150 ml water			300
Pencycuron - Liquids (Pencycuron 249,6 g/l, SC-Formulation)						
Monceren Flüssigbeize (Bayer)			600 ml/t			600

No responsibility is taken for the correctness of the details provided

Mixing example:

If there are 20 tons of potatoes which should stored in 60 min and should be treated with an application rate of 200ml per ton you need the following pump capacity:

$$\frac{20\,t}{60\,\min} * \frac{200\,ml}{1t} = 67\frac{ml}{\min} = 4020\frac{ml}{h}$$

System check

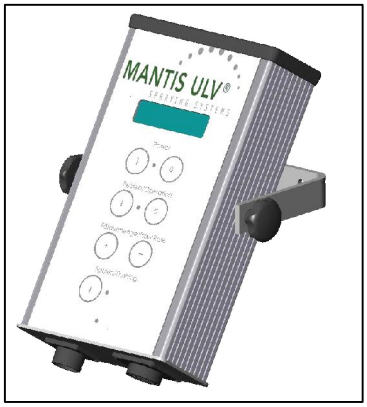
Set the chemical solution volume according to your calculations and run the system for 15 minutes.
Collect the chemical solution for one minute into a measuring cup.
If the desired volume is not reached, please check the seat and adjustment of the hose
After one hour work the nominal value should be compared with the volume which was pumped out of the container.

Reverse pumping of the preparation

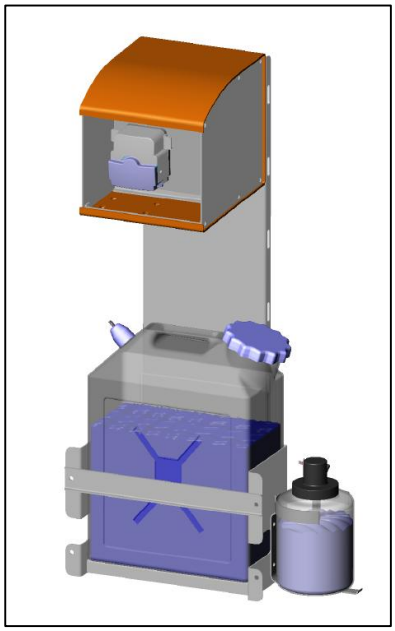
Keep the F- button pressed, until all fluid from atomiser to the tank is pumped reverse.

Scope of delivery

Included with the MAFEX-SYSTEM are:



1 x Control box 102595



1 x Pump unit with power supply	102597
1 x Flushing pump with tank	100988
1 x 10l tank	102564
1 x mounting frame for MAFEX	102628

Optional (without figure):

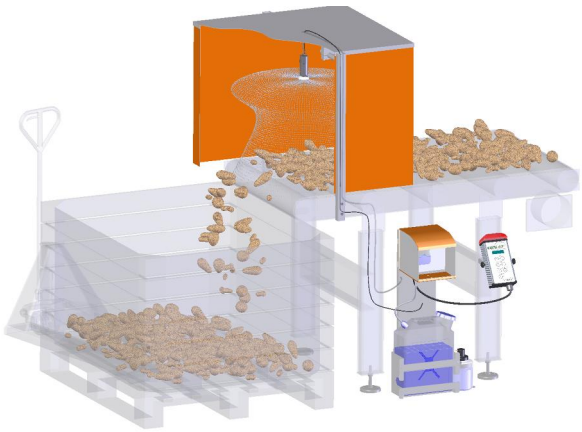
- Flow control device MAFEX-Potato/1 102658
- Flow control device MAFEX-Potato/2 102659
- Flow control device MAFEX-Potato/3 102669
- Flow control device MAFEX-Potato/4 102670
- Horn with flashlight 101684
- Automatic pump switch-off 102629
- 30l tank 102609

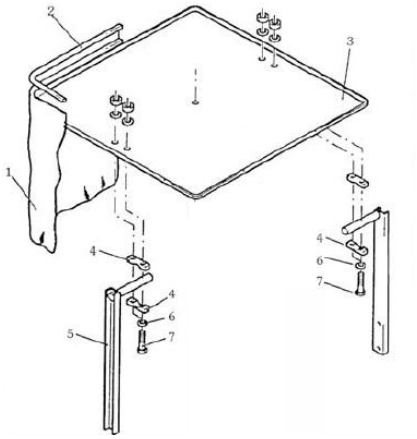
Assembly

Control unit:
The control unit should be mounted with the prescribed bracket in a position highly visible during operation.

Attention!
Pump unit and power supply should not be mounted in a dusty humid surrounding area

Pump unit:
The pump unit should be mounted next to the canopy
Make sure that the concentrate tank can be easily removed.





Assemblyl example for controll- and pump unit

Atomiser:

Assemblyl example for atomiser

Cable and hose connections

After installation of the control box, pump unit and atomiser the cable and hose connections have to be fixed. Please pass the hoses and wires free of twists.

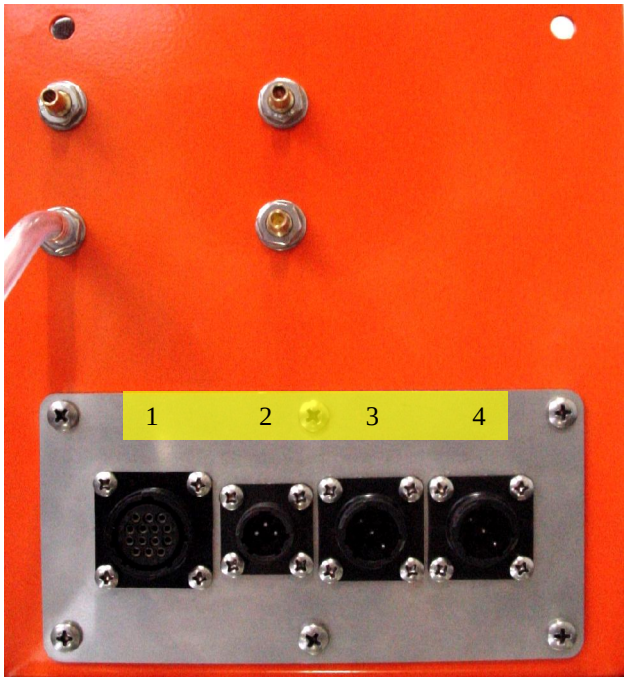


fig.: pump unit (buttom view)

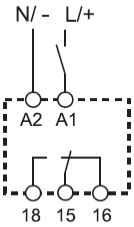
1) Connection control box
2) Connection flow control
3) Connection atomiser
4) Connection atomiser

Peristaltic pump

By turning the quick release fastener (A) the hose can be inserted/replaced. The hose has to be fixed by the hand wheel (B). The standard hose 4,8mm x 1,6mm for 600ml/h up to 6850ml/h has to be fixed in position (C).

Function & connection of the AGA (optional)

The control wire of the conveyor belt has to be connected with the relay. This relay is an NO/NC type. Please make sure that pump is connected right.



The pins A1 and A2 have to be connected with the 230V control wire.

<u>For your personal safety make sure that the pump box is earthed when you are working with voltage over 60 V DC or 25 V AC to earthed.</u>

Flow control (optional)

The flow control unit should be installed next to the atomiser.

For testing the flow control some salt should be added to the water to raise conductibility of the fluid.

Nozzle monitoring function & connection

The nozzle monitoring function is integrated into the controller. The monitoring function ensures the proper operation of the nozzle motor. Permanent current monitoring checks whether the nozzle is connected to the system or if it is operating in the overload range. An alarm will be triggered if the nozzle is not connected to the system, due to cable breakage or silage clogging, for example.

THIS FUNCTION DOES NOT REPLACE THE REGULAR INSPECTION OF THE NOZZLE ATOMISER DISC!

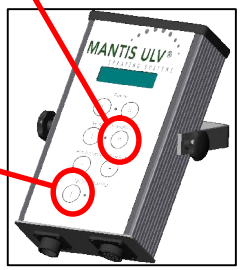
Cleaning

A religiously cleaning of the system after use at the end of the day is essential.

How to clean the atomiser on the job (in short brakes):

1. Stop the dosing process by pressing the operation„0“ button.
2. Check filling level of the flushing tank
3. Press the „Flushing“ button to start the flushing process
4. Press and hold the Flushing button at least 3 seconds.

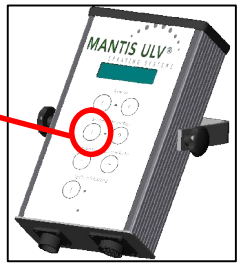
Flushing pump, tank



Control box

For a religiously cleaning of the system after use at the end of the day the 10l/30l tank has to be cleaned and filled with fresh water.

1. Now restart the system for three minutes. If the flow Control gives an alarm message in these three minutes Please restart the system.



Winter storage

For the storage in wintertime please make sure that there is no water left in the system (hoses, tank, pump, and atomizer). Don’t use any anti-freezing agent. Store the system in dry conditions above the freezing temperature.

Malfunctions

If malfunctions occur due to neglect of the cleaning requirements, constituting improper usage, proceed as follows:

1. Check the suction lance for clogging and the connection hose for proper seating.
2. Remove the hose from the flow controller and clean the sensor with water.
3. Dismantle the front side of the nozzle and remove the nozzle atomiser disc from the motor shaft. Thoroughly clean all components with a brush.

Fault	Possible cause	Remedial action
The display does not indicate a value	Voltage is below 11.5V or no supply voltage applied	Check the plug connections as well as the voltage
The display depicts „Flow sensor error“	Preparation is no longer conveyed due to a defective hose or an empty tank	Check the hoses as well as the tank fill charge
The dosing pump does not turn	No supply voltage applied	Check the control line plug connections (grey cable)
	The relay does not provide the correct signal	Swap the connections from 3 and 4 to 1 and 2.
The flush pump is not functioning	No supply voltage applied	Check the plug connections as well as the voltage
The display indicates „Nozzle alarm“	No supply voltage applied or current draw too high	Check the plug connections, check whether deposits are clogging the nozzle/nozzle atomiser disc
	The nozzle is defective	The nozzle must be replaced
The selected pump capacity does not correspond to the application volume	The pump hose is defective or not properly installed, or the system has a leak	Check all hose connections

GUARANTEE

The manufacturer guarantees that in accordance with the present state of technology the article of purchase is free from defects as regards raw materials and construction. Guarantee is valid for all machines and apparatus for 12 months. The period of guarantee begins from the date of purchase by the user.

The manufacturer will decide to repair or replace faulty parts or issue a credit note.
Parts damaged due to normal wear and tear will not be replaced under guarantee. Carriage costs are bourne by the manufacturer for faulty goods.
Unresolved claims do not entitle purchaser to withhold payments or set them against non-approved claims. Parts not manufactured by manufacturer are guaranteed by the original manufacturer under their terms. Warranty claims must be submitted in writing within 4 weeks of the damage being seen.
Repairs will carried out with original manufacturer spare parts by an approved dealer.

Acknowledgement of a claim by manufacturer is binding only when a written notice is issued. Unless the manufacturer cannot make a repair, there is no right to cancellation of orders or to mitigation. Compensation for direct or indirect damage will not be given.

Guarantee terminates if the article of purchase is altered by manipulation of third parties or by installing spare parts of extraneous origin and if the ascertained damage is directly caused thereby. Guarantee also terminates if orderer does not observe the operating instructions.
Guarantee does neither apply to natural wear, to damage caused during storage or by corrosion, nor to damage caused by negligent or improper handling. Guarantee does not apply to used machines or apparatus.

The operation instruction published by the manufacturer has been carefully prepared and is based on extensive tests.
Since manufacturer have no influence on installation and handling of apparatus, the company will not assume any responsibility for lack of success or for damages caused by the apparatus itself or by its use.

EG-Declaration of conformity
Council Directive 2006/42/EG

Mantis ULV-Sprühgeräte GmbH, Vierlander Straße 11 a, 21502 Geesthacht declares under our sole responsibility that the following products are in conformity with the provisions of the following Council Directive: 2006/42/EG

Typ	MANKAR-P, MANKAR-110-P, MANKAR-110-GP, MANKAR-L, MANKAR-110 SELECT EL
Typ	MANTRA, MINI-MANTRA / PLUS, MICRO-MANTRA, MICRO-VASO
Typ	FLEXOMANT-1W, FLEXOMANT-2W, FLEXOMANT-3W, FLEXOMANT-4W, FLEXOMANT-PLUS, VARIMANT-1, VARIMANT-2, VARIMANT-4 PLUS, VARIMANT-WINNER-TOP, VARIMANT-WINNER-UNO
Typ	MAFEX
Typ	ROFA

André Verder
Managing Director

Geesthacht January 2009

(Place and date of signature) (Name, title and signature)