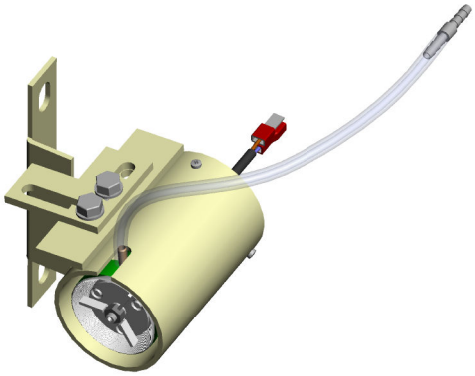
# INSTRUCTION MANUAL FOR MAFEX SILAGE
## North America





North American Distributor:

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## For safety reasons:

Keep the electric circuit of the chopper zero potential for assembly. To prevent unintentional resetting (Disconnect ground and remove the ignition key)!

**Voltage supply:**

- Is constructed for supply voltage of 11-19V, natural variations of +/- 5 % in supply voltage are compensated.

**Advantages of ULV dosing device:**

- Dosing of liquids without additional quantities of water
- For application of 2.5-220 ml/min (5 oz. - 3.5 gallons per hour), depending on hose
- Concentrate of bacteria is applied as atomised spray or droplets
- Maximum duration of application guaranteed by using a 10 gallon (38 litre) insulated container
- Simple, exact control of volume flow rate
- Flow sensor

## Important!

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

- Religiously cleaning of the ULV dosing system after each use according to description on page 5.

## 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.**

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

**This unit:**

- Was designed for a supply voltage of 11 V to 19 V with compensation for natural fluctuations in the supply voltage of ±5 %.
- Was designed for the application of liquid lactic acid bacteria preparations

**Advantages of the MAFEX SILAGE dosing unit:**

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

| Hose Type | Flow Rate | | | Tons per hour* |
|---|---|---|---|---|
| 1.6mm x 1.6mm | 150 – 1200 ml/h | 2.5-20 ml/min | 5-41 oz/h | 6 – 120 |
| 3.2mm x 1.6mm | 400 – 3300 ml/h | 7.0-55 ml/min | 14-112 oz/h | 16 - 330 |
| **4.8mm x 1.6mm** | **600 – 6850 ml/h** | **10-114 ml/min** | **20-232 oz/h (0.16-1.8 gph)** | **24 - 685** |
| 8.0mm x 1.6mm | 1200 – 13200 ml/h | 20-220 ml/min | 41-446 oz/h (0.3-3.5 gph) | 48 - 1320 |

**calculated between 10 to 25 ml/ton*

- Lactic acid bacteria concentrate is applied as spray mist or droplets
- Maximum application duration due to a 10 gallon (38 litre) insulated container
- 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!

For the optional atomizer, differing mounting kits are required for the various brands of forage harvesters. The assembly instructions required for your specific shredder can be found in separately provided instructions.

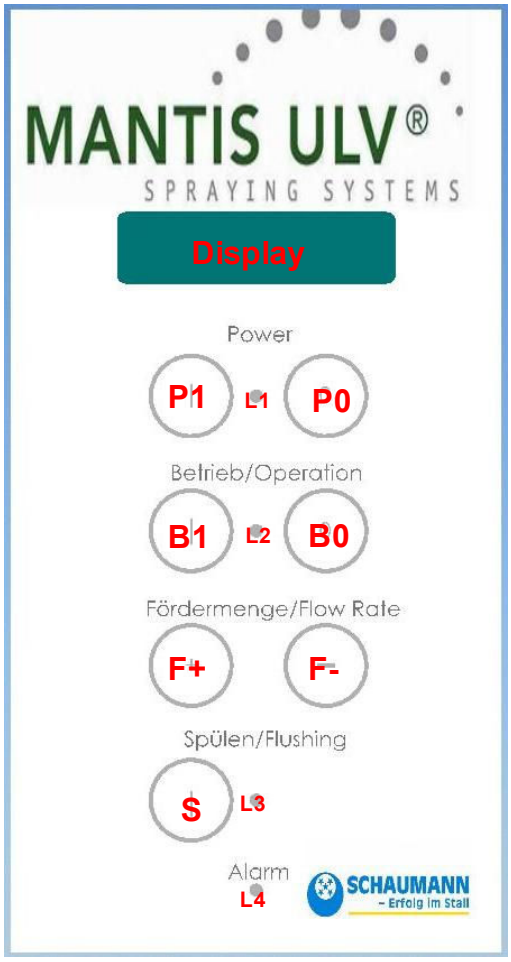
**It is recommended that the rotary nozzle be installed near the suction area of the throw accelerator air intake opening!**

# 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.

## *Assembly*

### Control unit:

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

**Pump unit:** The pump unit should be attached in such a manner that the concentrate tank can be easily removed.

Claas installation example with 10 litre uninsulated tank.

### Nozzle:

Please refer to the special supplement accompanying these operating instructions for application-specific instructions regarding nozzle installation on your chopper.
It is recommended that the rotary nozzle be installed near the suction area of the throw accelerator air intake opening!

Standard drip nozzle

Optional rotary atomizer

## 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.

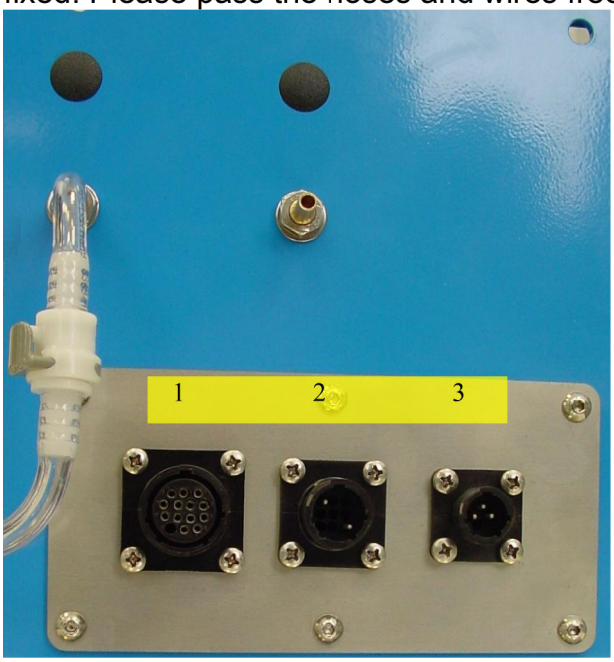
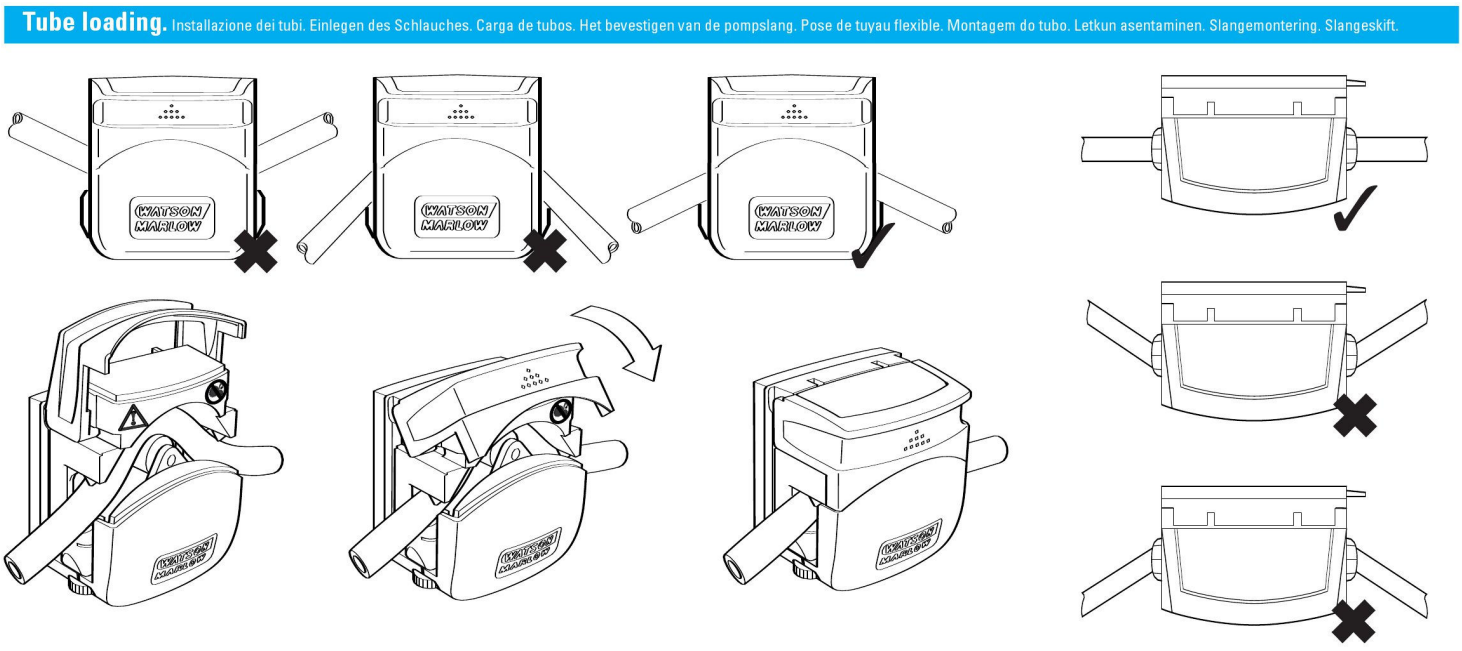


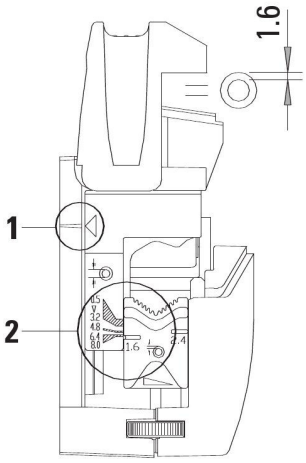

fig.: pump unit (buttom view)

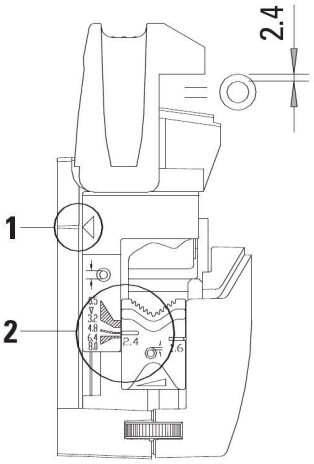
1) Connection control box
2) Connection optional atomiser
3) Connection flow control

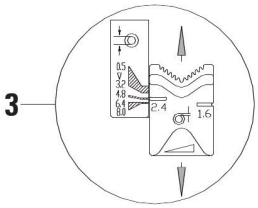
## Peristaltic pump

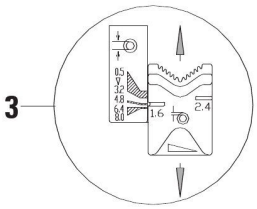


## Operation. Funzionamento. Drift. Betrieben. Funcionamiento. Bediening. Fonctionnement. Funcionamento. Käyttö. Betjening. Kørsel.



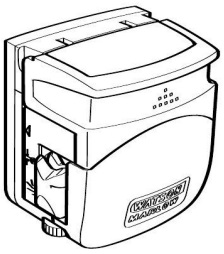



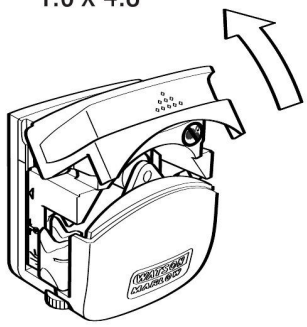

**1 Tube clamp setting.** Predisposizione del morsetto del tubo. Justera slangklämmen. Einstellung der Schlauchklemme. Fjar la abrazadera para tubos. Afstellen van slangklemmen. Réglage du serrage du tube. Predisposizione del morsetto de tubo. Putken kiinnikkeen asettaminen. Innstilling av slange klemme. Indstilling af slangeklemmer.

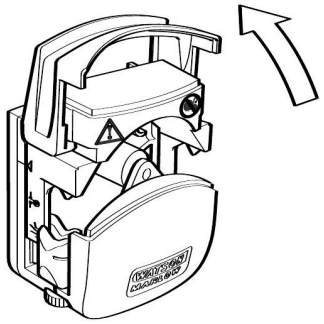
**2 Tube wall thickness.** Spessore delle pareti del tubo. Slangväggens grovlek. Wandstärke des Schlauchs. Grosor de la pared del tubo. Wanddikte pompslang. Epaisseur de la paroi du tube. Spessore delle pareti del tubo. Putken seinämän vahvuus. Veggtykkelse på slange. Vægtykkelse.

**3 Set for tube bore size.** Predisposto per le dimensioni del diametro del tubo. Ställ in för olika slangstorlekar. Satz för Gröfle der Schlauchbohrung. Fjar para el tamaño di-metro interior del tubo. Ingesteld voor slangdoorlaten. Régler le diamÊtre interne du tube. Predisposto per le dimensioni del diametro del tubo. Asetus putken halkaisijan koolle. Innstilt størrelse på slange diameter. Instilling af slangediameter

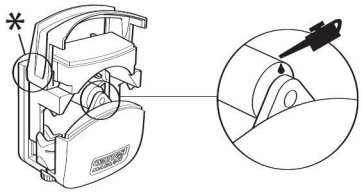
**Opening the pumphead.**
Apertura della testa della pompa.
Öppna pumphuvudet.
Öffnen des Pumpenkopfs.
Abrir el cabezal.
Openen van pompkop.
Ouverture de la tête de pompe.
Apetura della testa della pompa.
Pumpun pään avaaminen.
Åpning av pumpehode.
Åbning af pumpehovedet.







## Pumphead maintenance



**If the pumphead is regularly wet or washed, lightly lubricate the rollers with Shell Omala 220 gear/bearing oil or similar. * Grease the lever.**

Se la testa della pompa è regolarmente bagnata o lavata, lubrificare leggermente i rulli con olio per ingranaggi/cuscinetti Shell Omala 220 o simile. * Lubrificare la leva.

Om pumphuvudet ofta blir vätt eller tvättas regelbundet ska rullarna smörjas lätt med Shell Omala 220 eller liknande lagerolja. * Smør løftestangen.

Wenn der Pumpenkopf regelmäßig naß ist oder gewaschen wird, sind die Rollen mit Shell Omala 220 Getriebe/Lageröl oder einem gleichwertigen Öl leicht zu schmieren. * Schmieren Sie den Hebele.

Si el cabezal de la bomba se moja o lava con regularidad, engrase ligeramente los rodillos con el lubricante Shell Omala 220 para engranajes y cojinentes o con un producto similar. * Engrase la palanca.

Als de pompkop regelmatig nat wordt, moeten de rollers licht worden gesmeerd met Shell Omala 220 lagerolie of iets dergelijks. * Vet de hefboom in.

Si la tête de la pompe est régulièrement mouillée ou lavée, lubrifier légèrement les rouleaux avec de l'huile à engrenages/à roulements Shell Omala 220 ou équivalent. * Graissez le levier.

Se la testa della pompa è regolarmente bagnata o lavata, lubrificare leggermente i rulli con olio per ingrannaggi/cuscinetti Shell Omala 220 o simile. * Lubrifique a alavanca.

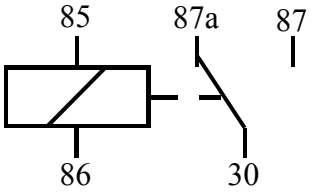
Jos pumpun pää on säännöllisesti märkä tai pesty, voitele kevyesti rullia Shell Omala 220 rasvalla/ laakeriöljyllä rai vastaavalla. * Voitele vipu.

Hvis pumpehodet er regelmesssig vätt eller har blitt vasket, smør rullene ved ä bruke litt tannhjul/ lager-olje av typen Shell Omala 220 eller liknende. * Smør spaken.

Hvis pumpehovedet ofte vaskes eller bliver vädt, bør rullerne smøres let, med Shell Omala 220 gear- og leje-olie eller lignende. * Smørj spaken.

## Function & connection of the pickup-signal

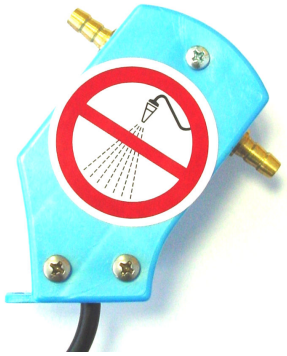
The control wire of the pickup-signal of the chopper has to be connected with the relais. This relay is an NO/NC type and can be used for all common choppers




The pins 85 and 86 have to be connected with 12V+ and – of the pickup-signal. The connection of the dosing pump is pin 30 and 87 or 87a depending on the chopper type

## Flow control

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.

## Optional rotary atomizer monitoring function & connection

The atomizer monitoring function is integrated into the controller. The monitoring function ensures the proper operation of the atomizer motor. Permanent current monitoring checks whether the atomizer is connected to the system or if it is operating in the overload range. An alarm will be triggered if the atomizer 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*

Cleaning of the system after use at the end of the day is essential.

How to clean the system:

1. Stop the dosing process by pressing the operation„0“ button.
2. Disconnect the intake hose from the insulated tank and set the hose in a pail of water.
3. Press the „Flushing“ button to start the flushing process.
4. Press and hold the Flushing button at least 15 seconds.


For a religious cleaning of the system after use at the end of the day the 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 shredder pick-up switch does not provide the correct signal | Swap the connections from 87 to 87a or vice versa. |
| 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 24 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)