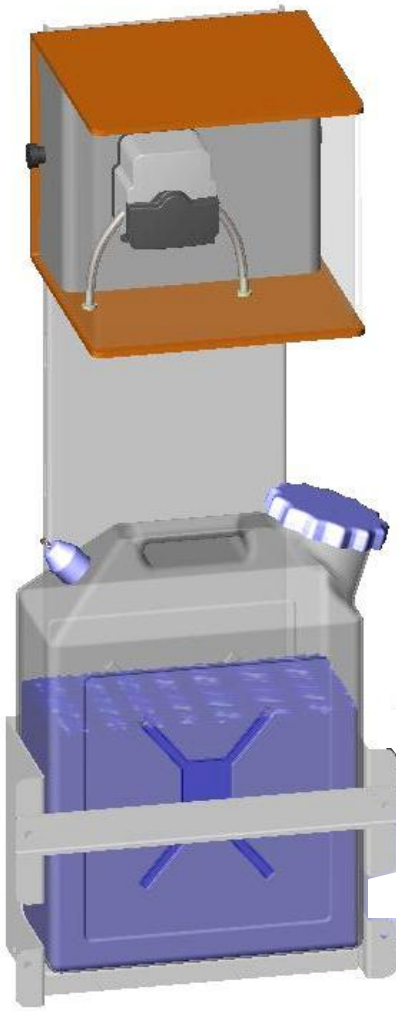
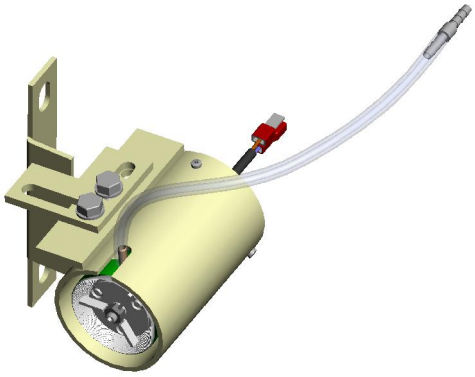
INSTRUCTION MANUAL FOR MAFEX SILAGE





Manufacturer:

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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 4-250 ml/min, depending on hose
- Concentrate of bacteria is applied as atomised spray
- Maximum duration of application guaranteed by using 2 x 10 l container for exchange or extra tank with 30 l
- Simple, exact control of volume flow rate
- Flow control (optional)

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 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.

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

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 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!

Differing mounting kits are required for the various brands of forage harvesterss. The assembly instructions required for your specific shredder can be found in separately provided instructions.

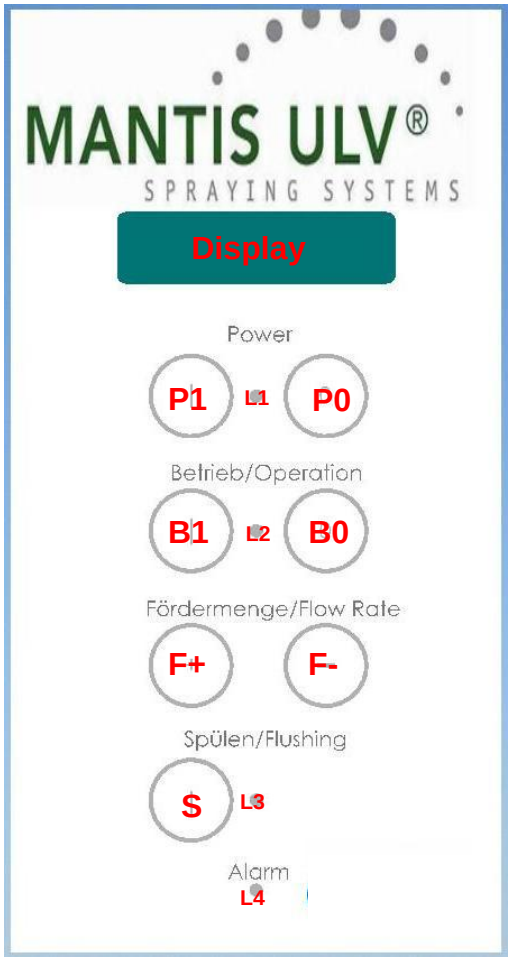
<u>It is recommended that the rotary nozzle be installed near the suction area of the throw accelerator air intake opening!</u>

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.

To clean then the complete system including the atomiser after work the container has to be replaced by a container filled with fresh water. 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

1. Open the XSILAGE INOCULANTX container an fill it up to XX with water. Close the container and shake the mixture thoroughly. Fill the dissolution through the funnel with filter into the 10l tank.
   To mix the XSILAGE INOCULANTX products use the special XSILAGE INOCULANTX mixing tank. Fill the content of one container into mixing tank which is filled water up to the filling mark. Close the tank and shake it for approx. 15 sec.
   Now, fill the dissolution through the funnel with filter into the tank.
2. Repeat the procedure, until the required concentration is reached.
3. After filling the XSILAGE INOCULANTX -preparation into the tank fill it up with water to the required quantity (10l or 30l).
4. Close the tank and shake it for a short time to ensure the mixing.
5. Repeat the whole procedure fort he second tank.

Now put the tank into the mounting frame and fix it.

Reverse pumping of the preparation

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

Tipp:
Mixed preparations can be stored in the refrigerator up to one week during longer interruptions of work. (Don’t deep-freeze!)

Silage inoculant dosing

For an optimal inoculation of the harvested crops, please use the recommended dosing quantity.

The concentration of the mixed product is decisive for the preparation volume to apply in ml per tons silage.

For XSILAGE INOCULANTX (products which have to be applied with **1g/t**) the following formula has to be used:

$$\frac{P}{I \cdot K} = D$$

P = Volume to mix in ml (1l=1000ml)
I = Content of the container in g/container
K = required output quantity ml/t
D = Number of container to add

Example:
The 10l tank shall be mixed with XSILAGE INOCULANTX (50g container). The output quantity should be 25ml/t:

$$\frac{10000\,ml}{50\,\frac{g}{container} \cdot 25\,\frac{ml}{t}} = 8\ \ container$$

8 container of XSILAGE INOCULANTX have to be liquidated in 10l water.

For products which were applied with **2g/t** (e.g. XSILAGE INOCULANTX) the factor two has to added to the formula.

$$2\,\frac{P}{I \cdot K} = D$$

Please note the dosing tables on the following pages!

Mixing example:

Area to chaff: 10 ha grass

Harvest: 10t/ha

Working width swather: 12 m

Driving speed: 7 km/h

Silage inoculant: XSILAGE INOCULANTX (1 container for 50 t)

Tank: 10 Liter

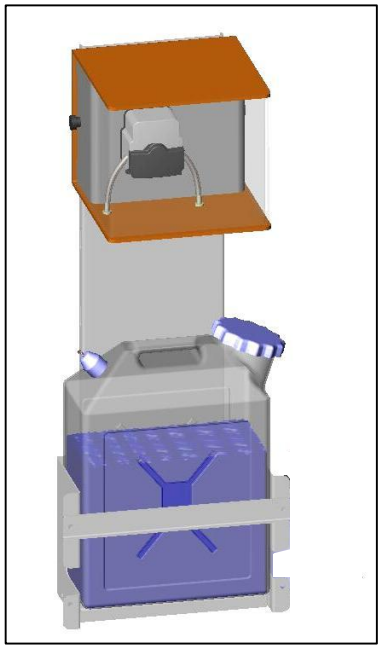
Dosage: 25 ml/t

A total quantity of 100 t should be inoculated. There for 2 container of “Bonsilage Plus Flüssig” must be liquidated in 2,5 liter water.

Scope of delivery

Included with the MAFEX-SYSTEM are:

1 x Control box 102396



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

1 x atomiser unit with specific bracket according to the chopper

- Claas 103329
- John Deere 103331
- New Holland FR bis 2013 103333
- New Holland FR ab 2013 103445
- Krone Big X 103334
- Fendt KATANA 103454

Optional (without figure):

- 30l tank 102609

Assembly

Control unit:

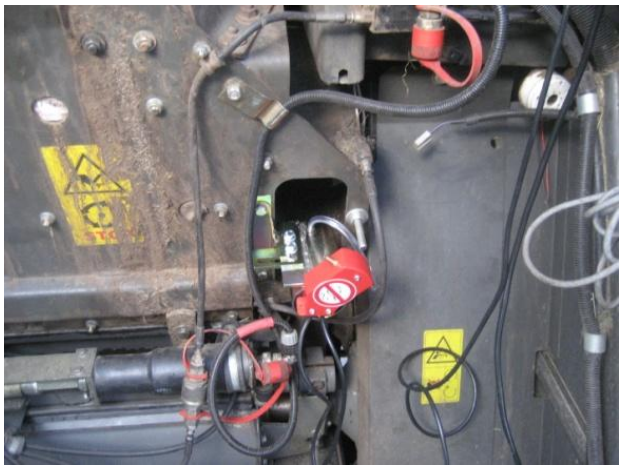
The control unit should be mounted with the prescribed bracket in a position highly visible during operation.

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

Claas installation example

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!



Claas installation example

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.

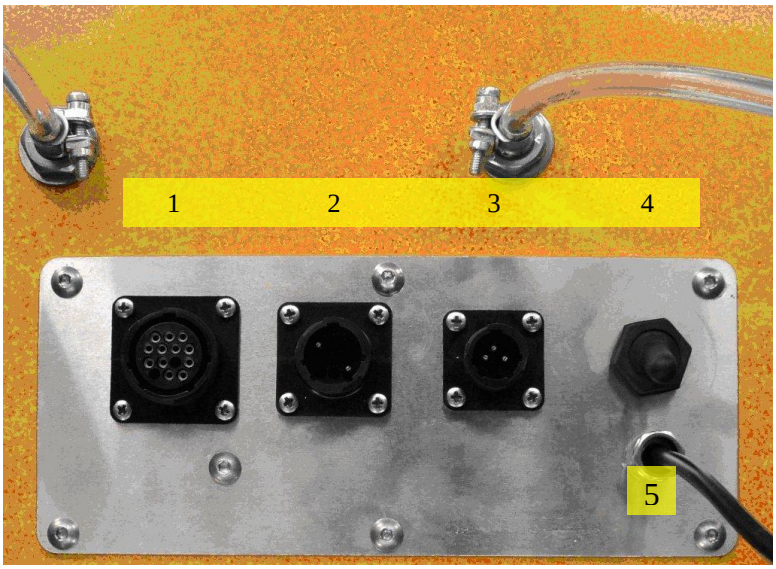
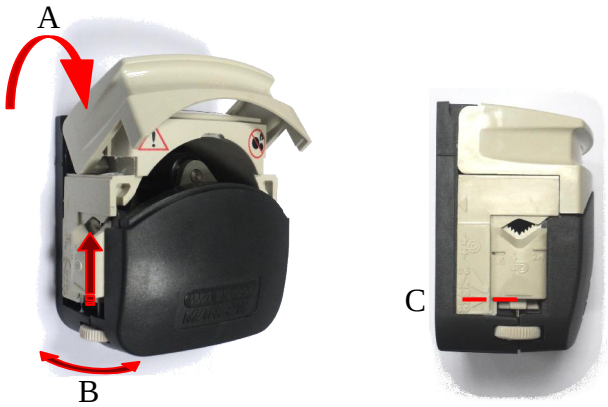


fig.: pump unit (bottom view)

1) Connection control box
2) Connection atomiser
3) Connection flow control
4) Selector switch for pickup signal
5) Cable for pickup signal

Peristaltic pump

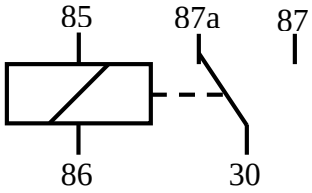
By turning the quick release fastener (A) the hose can be inserted/replaced. The hose has to be fixed by the hand wheel (B). The standard hose 4,8mm x 1,6mm for 600ml/h up to 6850ml/h has to be fixed in position (C).

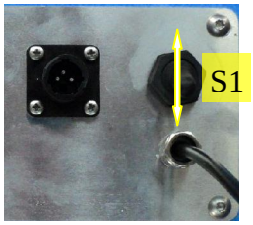


If the hose locking device is set on a too small diameter the pump performance will be reduced and the output is too low. In this case the total pump output “T-Vol” shown in the display will deviate from the actual capacity

Function & connection of the pickup-signal

The pick up control wire of all common choppers can be connected with the relay of the pump unit. This relay is an NO/NC type. To choose whether the circuit should be “Normally Open” or “Normally Closed” use the selector switch S1





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.

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.

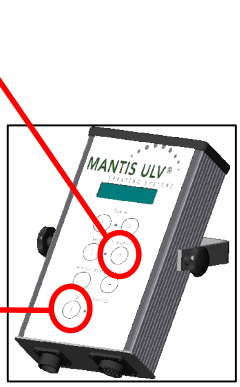
THIS FUNCTION DOES NOT REPLACE THE REGULAR INSPECTION OF THE NOZZLE ATOMISER DISC!

Cleaning

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

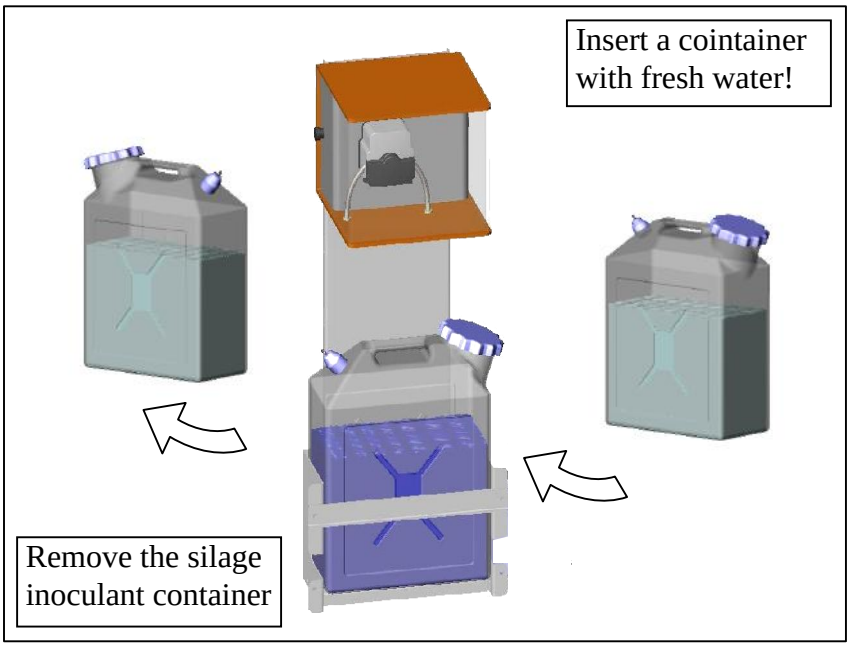
How to clean the atomiser on the job (in short brakes):

1. Stop the dosing process by pressing the operation„0“ button.
2. Remove the silage inoculant container clean it and fill it with fresh water
3. Press the „Flushing“ button to start the flushing process
4. Press the “Flushing” button and the system starts flushing for 90 seconds. If nessesary this procedure can be done several times.



Control box

Important!



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.

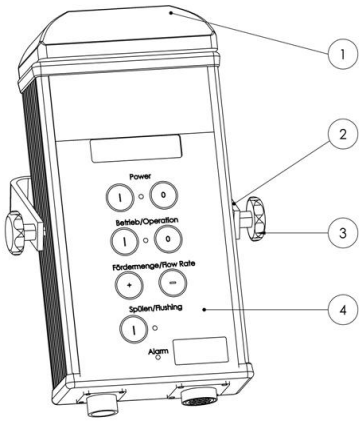
Malfunctions

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

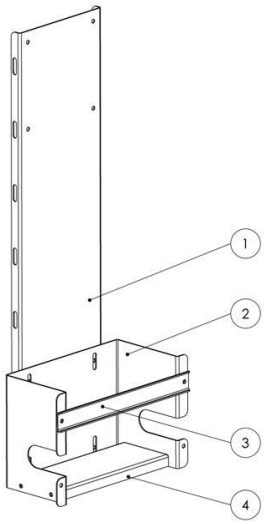
1. Check the suction lance for clogging and the connection hose for proper seating.
2. Remove the hose from the flow controller and clean the sensor with water.
3. Dismantle the front side of the nozzle and remove the nozzle atomiser disc from the motor shaft. Thoroughly clean all components with a brush.

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

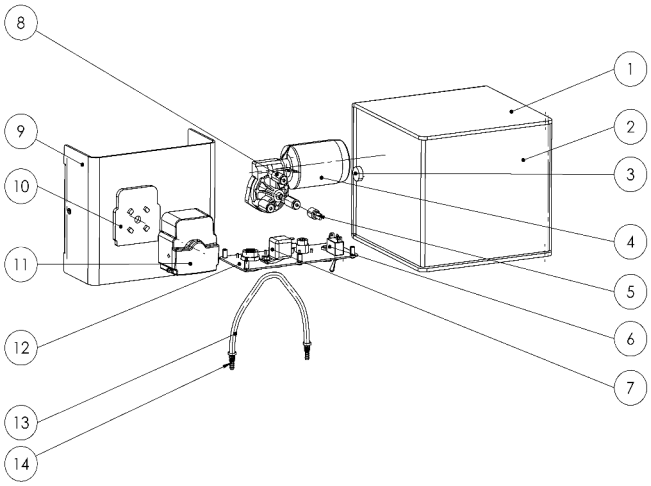
Spare parts



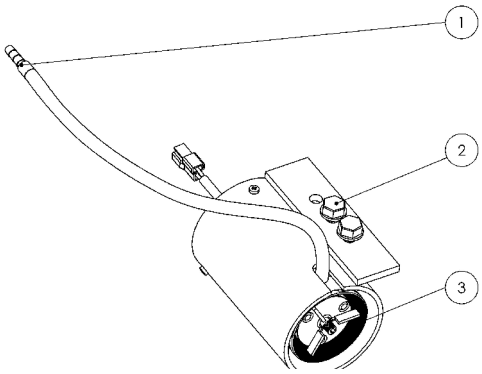
Part	Art.No.	Description
	102396	Control box, MAFEX 2010
1	102747	Alarm siren with flash light, red ,12V
2	103125	bracket for controll box MAFEX 2010
3	100861	Star-shaped clamp screw
4	102434	membrane keyboard, MANTIS Logo



Part	Art.No.	Description
	102628	mounting frame for MAFEX
1	103119	bracket for pump unit, Mafex 2010
2	103120	bracket for 10l tank, Mafex 2010
3	103122	lock bar for mounting frame, Mafex 2010
4	103121	baseplate for mounting frame, MAFEX 2010
5		Screw set for mounting frame MAFEX 2010

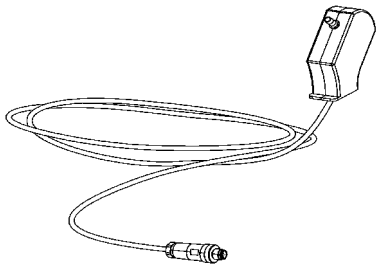


Part	Art.No.	Description
	103498	Pump unit MAFEX Silage 2013
1	103489	Housing, pump unit, MAFEX 2013
2	103491	Window, housing for pump unit, MAFEX
3	100233	Knurled screw M 5 x 10 mm
4	100177	Pump motor 12 V with Hall-Sensor
5	102876	Coupling for motor, WM, hose pump
6	103495	Toggle Switch for MAFEX AGA/Pick-Up
7	102610	Relay 12V, NC / NO
8	102807	Distance piece for motor, MAFEX 2010 pump unit
9	103490	Mounting plate for pump, pump unit, MAFEX
10	102932	Mounting plate for hose pump
11	102873	Peristaltic Pump Head, 3-rollers pump head
12	103493	Connector plate for pump housing, Silage
13	102805	Hose, MAFEX, 3,2 mm, 10-60 ml/min. for WM.
13	102806	Hose, MAFEX, 4,8 mm, 20-130 ml/min. for WM.
13	102818	Hose, MAFEX, 8,0 mm, 20-220 ml/min. for WM
14	102930	Hose lead-through 6,5mm-6,5mm
14	102870	Hose lead-through 9,0mm-6,5mm
14	102860	Hose lead-through 9,0mm-9,0mm
15		Screw set for pump housing MAFEX 2013

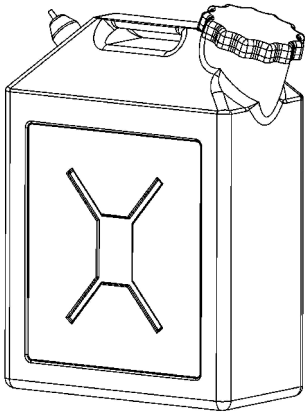


Part	Art.Nr.	Match code
	102483	Silage-Atomiser unit

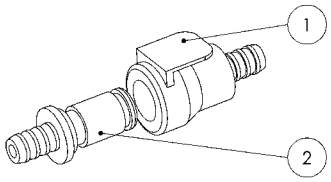
1	100361	Connector 5 mm diameter for plastic tubes
2	102291	Hexagon screw M 8 x 20 mm stainless steel
3	100132	Atomiser disc for MAFEX / ROFA



Part	Art.Nr.	Match code
	103176	Flow Control-MAFEX/1



Part	Art.Nr.	Match code
	102564	Tank, capacity 10 litre for MAFEX 2010
	102608	Behälter 31L
	102810	Tank, capacity 31 L (Tank with bracket)
	102817	Intake fitting



Part	Art.Nr.	Match code
	102838	quick release coupler 6mm, compl.

1	102740	quick release coupler 6mm
2	102739	quick release coupler-plug 6mm

	102949	quick release coupler 9mm, compl..

1	102947	quick release coupler 9mm
2	102948	quick release coupler-plug 9mm

Part	Art.Nr.	Match code
ohne Abb.	102772	atomizer cable with AMP-plug 5m
ohne Abb.	100774	Control lead, 5 m, 2-plug (AMP) 14-pol.
ohne Abb.	102847	Control lead, 10 m, 2-plug (AMP) 14-pol.
ohne Abb.	102763	cable, power supply for control box with RG90 plug
ohne Abb.	102622	Hose kit, 4,8 mm with connector, WM
ohne Abb.	102623	Hose kit, 8 mm with connector, WM
ohne Abb.	102603	Hose, 4,8mm for peristaltic pump head, sold per meter
ohne Abb.	102604	Hose, 8mm for peristaltic pump head, sold per meter
ohne Abb.	100885	Hose PVC, 4 x 2 mm, , sold per meter

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)