

OPERATING INSTRUCTIONS



VARIMANT - ONE Flex VARIMANT - TWO Flex

**ULV- Applicator for weed control
in areas of specialised cultivation such as nurseries, orchards and
vineyards, ornamental plant and vegetable gardens, as well as
agricultural, forestry, communal and non-cultivated lands.**

**The unit has been developed for the *undiluted*
application of ROUNDUP® products (Glyphosate).**

Important:

Before application, carefully read the usage instructions for the unit and the plant protective agent!
Observe safety instructions!

For questions regarding plant protective agents, consult the manufacturer!

Observe the requirements and regional regulations for the use of herbicides and, if necessary,
obtain approval from the responsible authorities (e.g. environmental conservation agency)!

Application is to be performed only by a competent user.

Remarks about usage of the unit:

Settings: This system is not suitable for the application of water.
Use herbicides for testing the spray action and calibration of the
flow rate.



Keep the applicator and pesticides out of the reach of children.

Noise emission from the unit equates to less than 70 dB(A).

Manufacturer:

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VARIMANT – ONE / -TWO

For the undiluted application of Roundup® products (Glyphosate)

Intended usage:

Weed control in areas of specialised cultivation such as nurseries, orchards and vineyards, ornamental plant and vegetable gardens, as well as agricultural, forestry, communal and non-cultivated lands.

Before application, carefully read the usage instructions for the applicator unit and pesticides.

Observe safety instructions.

For questions regarding pesticides, consult the manufacturer!

Observe the requirements and regional regulations for the use of herbicides. Permission is required from the responsible authorities (e.g. environmental conservation agency) for the application of herbicides on surfaces used for non-agricultural, forestry or gardening purposes ("non-cultivated lands"). Application is not permitted on sealed surfaces (e.g. pavement surfaces) with connection to sewage water systems from which the danger of run-off exists! Application is to be carried out only by a competent user.

Noise emission from the unit equates to less than 70 dB (A).

Protective measures

Observe the remarks in the pesticide usage instructions regarding user safety and wear recommended body protection. Wear protective gloves when filling the chemical substance.

Do not eat, smoke or drink while working with pesticides.

Avoid chemical spillage without fail. Thoroughly clean hands and face after completion of work.

Thoroughly clean and dry the unit immediately following its usage. Never use the mouth to blow out nozzles or other small parts!



Keep pesticide applicators and chemical substances away from children.

Assembly and preparation for initial application

Unit assembly is described for the individual models. Assembly of the spray hoods according to the draft on page 5. and connect all plugs. Please connect the hoses not until the output volume is checked. To check the spray width place underlay (cardboard or paper) on the ground and select a output quantity.

General remarks regarding applicator unit function and deployment

Pesticides: This applicator unit was originally designed for the undiluted application of Roundup products (Glyphosate). Practical experience has shown, however, that other herbicides can also be deployed in conjunction with this technology. Considering the many products on the market with their differing formulations, it is not possible to provide a complete list with application rate recommendations. Specifications for adjusting the unit listed on following pages relate to the usage of Roundup UltraMax (Glyphosate 450 gr/ltr). In general, all products with a comparable viscosity are suitable. If it is intended to use a product other than Roundup UltraMax, its application should be first tested over a small area on a trial basis. Usage instructions for the chosen herbicide should be observed in every case, along with local requirements.

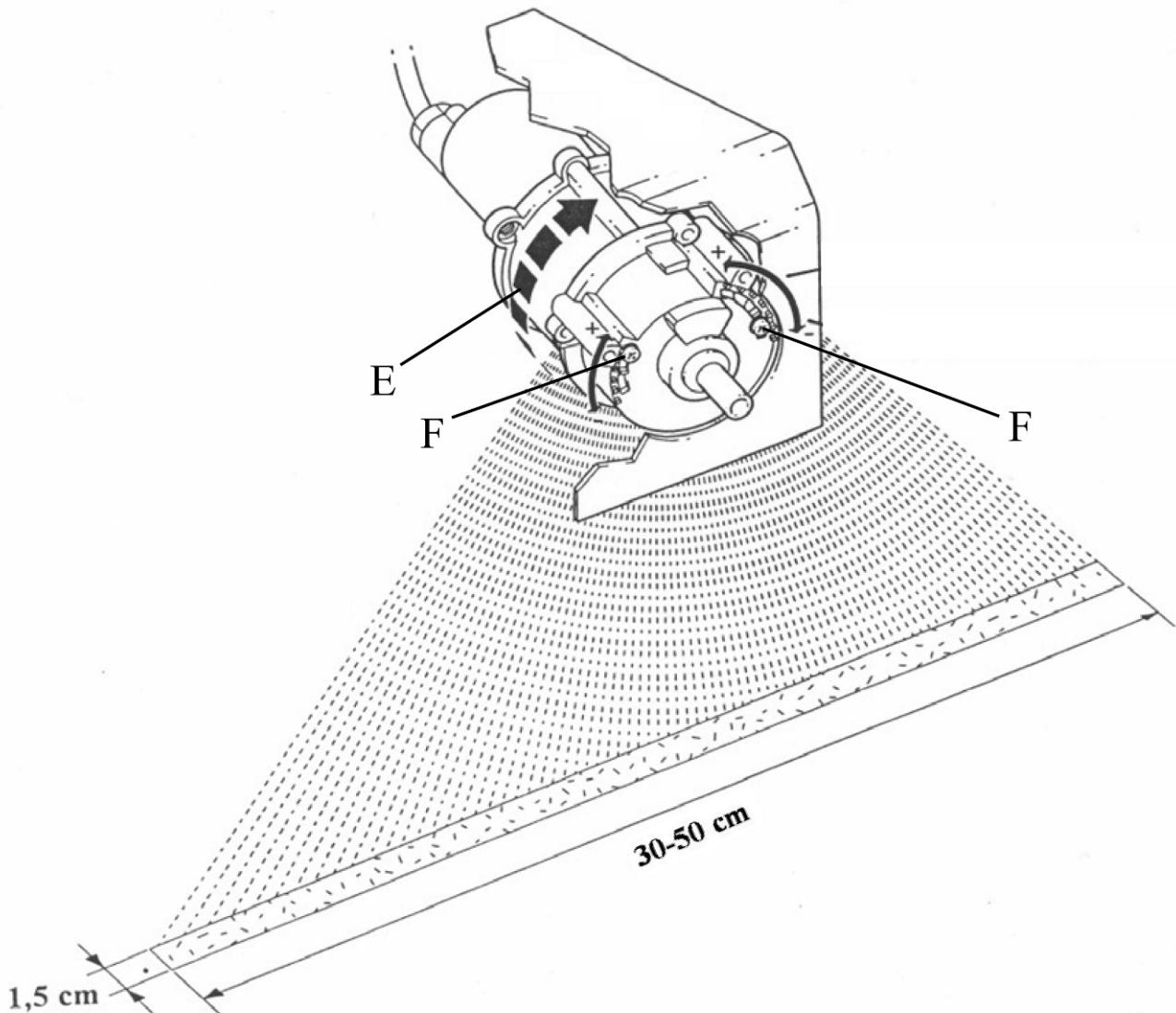
Applicator unit function: Rotating atomisers are driven by means of a rechargeable battery. Metering on all the units mentioned is path-dependent and takes place by means of a wheel driven pump. Droplets are formed by the centrifugal force of the rotating atomiser. The droplets are discharged downwards by the rotating atomiser through a continuously variable, adjustable segment. Residual chemical in the tank not intended for application is approx. 50 ml. This residual fluid can be refilled back into the original herbicide container.

Checking applicator unit function: Chemical solutions may flow quicker or slower due to temperature fluctuations, for which reason the flow rates in the Metering table should be checked and corrected as necessary. This system is not suitable for the application of water. Please use herbicides at all times for testing the spray process and calibrating the flow rate. Check the rotating atomiser on a daily basis for cleanliness and free turning motion. Check the output volume from time to time throughout the season.

Deployment of the applicator unit: Adjust the height of the spray hood in such a manner that it is as close to the ground as possible - if it is set too high, the risk of spray driftage exists. During operation, chemical fluid will collect in the rotating atomiser reservoir and will continue to drip for approx. 30 seconds after the shut-off valve has been closed if the unit is tilted. In order to avoid damage to cultivated plants due to dripping, we recommend closing the shut-off valve at the end of a row, for example, then folding the spray hood upwards and waiting approx. 30 seconds until the reservoir has emptied.

Spray width

- Place an underlay (cardboard or paper) on the ground and prop up the unit on stands.
- Actuate the switch button on the powerpack while simultaneously turning the wheel and appraising the spray width obtained, initially at one location. The spray width must be set in such a manner that the droplets are discharged over the entire width of the spray hood. The optimal spray width under standard operating conditions is set by the manufacturer.
- Compensate for deviations is possible by loosening screw (F) and sliding the width adjustment on the atomiser (see drawing).
- Further details regarding operating width adjustment can be found on the respective pages for the individual applicator units.



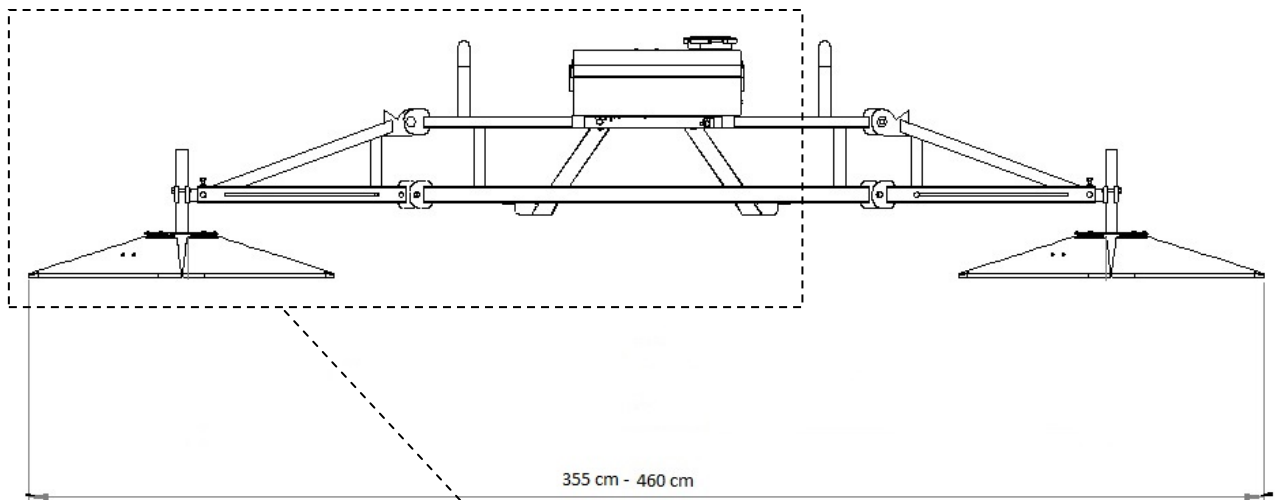
Do not clean the applicator unit with a high-pressure sprayer or with an intense water jet spray.

Cleaning during the season: During short work breaks (a few hours), herbicide can remain in the system as long as the shut-off valve remains closed. After work completion: before cleaning, refill the chemical solution into its original container. Open the shut-off and set the metering pump to maximum. Fill the chemical tank halfway with water, then with the unit positioned, switch the system on and let it run for 3 Minutes and allow the fluid to drain into a collector tank or, apply the cleaning fluid to the already treated surface. Remove any remaining water from the tank and let it run for approximately 2 Minutes again until the system is completely empty.

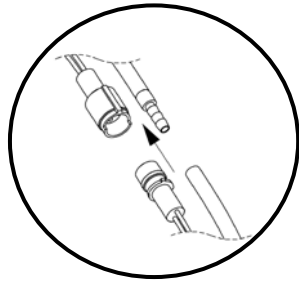


Cleaning at the end of the season: Rinse the unit with warm water as described above. Additionally: Unscrew filter and clean screen as necessary. The spray hood and the atomiser housing can be cleaned with a moist cloth. Remove the atomiser disc in order to avoid damage. With heavy contamination, the atomiser housing should be unscrewed to remove contaminants and plant parts. Connect the unit to the charging device (see below).

**For example:
VARIMANT-TWO 80 Flex**



VARIMANT – ONE 80 Flex
working width 175 - 230 cm



The shown unit just serves as sample and may differ from the actual unit

Assembly

1. Mount the spraying system on the vehicle.
2. Connect electrical plug 12 V-with the socket of the vehicle. Please check the vehicle polarity. If the plug is removed, blue lead is (+), brown lead (-).
3. Set ground clearance of the spray hood.
4. Connect control box with pump unit
5. Check spray width of the atomiser.
(see drawing page 3)
6. After checking the output, volume (workflow on the right) connect all hoses.

Metering table

Roundup UltraMax application rate at 20°C

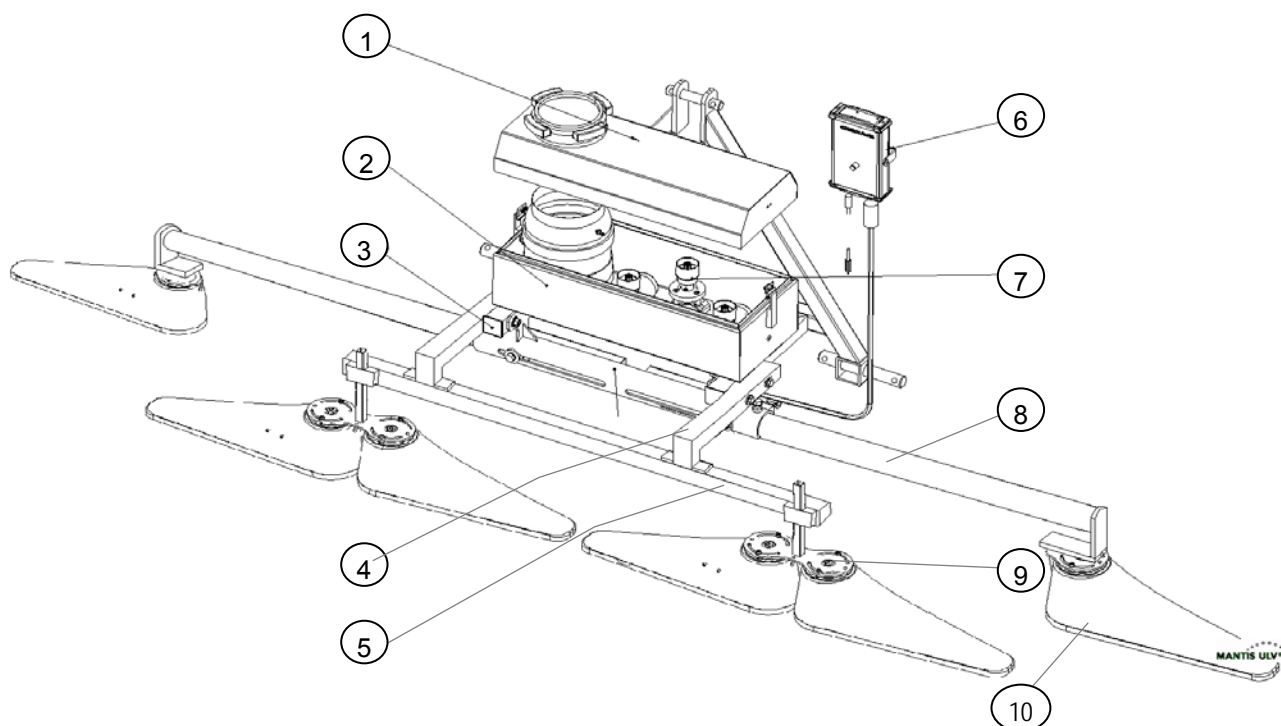
**Dosing pump Mankar -GP 3 Piston
Pump calibration -E-
for spray hood S-40 Flex**

| Speed 2 km/h | | Speed 4 km/h | | Speed 8 km/h | |
|--------------|-------------|--------------|-------------|--------------|-------------|
| L/ha | Output in % | L/ha | Output in % | L/ha | Output in % |
| 4,0 | 0 | 2,0 | 20 | 1,5 | 10 |
| 5,0 | 20-30 | 3,0 | 40-50 | 2,0 | 40-50 |
| 6,0 | 40-50 | 4,0 | 90 | 2,5 | 80 |

Checking the output volume

1. Place an underlay (e.g. cardboard or paper) on the ground and prop up the unit on stands.
2. Fill the chemical tank with herbicide –undiluted.
3. Open the pump box and set the chemical solution volume according to the output table.
4. Set quantity of chemical according to the application table
5. Volume calibration: Collect the chemical solution in a metric measuring cup for one minute. If the desired volume is not reached, set a larger or a smaller volume with pump metering adjustment knob.
6. Perform volume calibration again.
7. Reconnect the hose
8. The unit is now ready for deployment

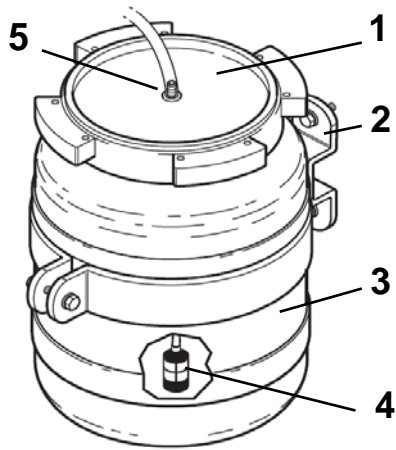
VARIMANT- ONE / - TWO Flex



The shown unit just serves as sample and may differ from the actual unit

Item Part No. Description

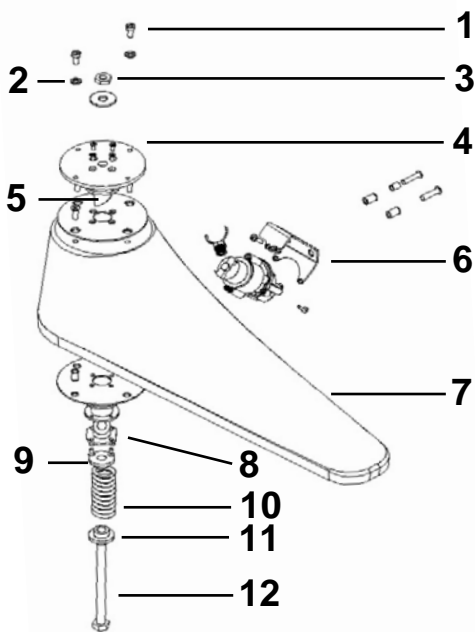
| | | |
|----|--------|--|
| 1 | 102975 | Housing cover for UNIMA-CITY |
| 2 | 102976 | Housing for UNIMA-CITY |
| 3 | 103184 | Mounting frame for UNIMA-CITY housing |
| 4 | 103185 | Mounting frame for addition extension arm |
| 5 | 103186 | Addition extension arm 120 cm |
| 6 | 102216 | Control box with 1 switch, without converter for VARIMANT |
| 7 | 100527 | Metering pump MANKAR-3, capacity 5 - 12 ml/min for MANKAR-110 GP |
| 8 | 103187 | Extension arm VARIMANT 100 cm |
| 9 | 104702 | Height adjustment TWO Mankar-Roll |
| 10 | 104855 | Spray hood 55 cm Mankar-Roll without atomiser |
| | 104840 | Spray hood 40 cm Mankar-Roll without atomiser |
| | 104824 | Spray hood 25 cm, left Mankar-Roll without atomiser |
| | 104825 | Spray hood 25 cm, right Mankar-Roll without atomiser |



Item Part No. Description

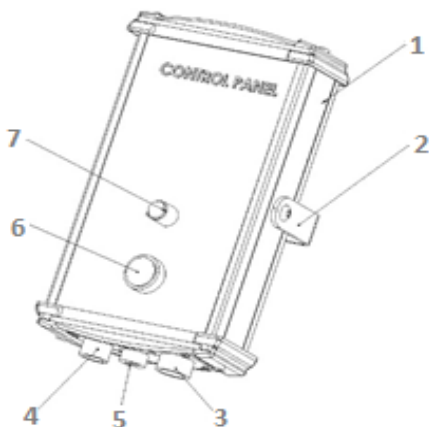
100589 Tank 6L, tank holder, lid and filter complete for VARIMANT

| | | |
|---|--------|---|
| 1 | 100625 | Tank lid for 6L tank |
| 2 | 100623 | Tank bracket for 6 litre tank |
| 3 | 100624 | Tank, capacity 6 litre |
| 4 | 100281 | Filter MINI-MANTRA |
| 5 | 100085 | Hose grommet 6 mm MS for pump sets MAFEX / MANKAR |



Item Part No. Description

| | | |
|----|--------|--|
| 1 | 103467 | Filister head screw M 6 x 12 mm VA with Allen head |
| 2 | 101868 | Washer M6, Ø6.4 mm, 3D VA |
| 3 | 103428 | Nut, pressed, M10, hexagonal, VA |
| 4 | 104740 | Rotary disc, spray hood Mankar-Roll |
| 5 | 104311 | Mounting bush, rotary-joint Mankar-Roll |
| 6 | 104810 | Atomiser bracket, spray hood Mankar-Roll |
| 7 | 104855 | Spray hood 55 cm Mankar-Roll without atomiser |
| | 104840 | Spray hood 40 cm Mankar-Roll without atomiser |
| | 104824 | Spray hood 25 cm, left Mankar-Roll without atomiser |
| | 104825 | Spray hood 25 cm, right Mankar-Roll without atomiser |
| 8 | 104313 | Intermediate bush, rotary-joint Mankar-Roll |
| 9 | 104315 | Spring retainer for pressure spring Mankar-Roll |
| 10 | 104314 | Pressure spring, rotary-joint Mankar-Roll |
| 11 | 104315 | Spring retainer for pressure spring Mankar-Roll |
| 12 | 104316 | Bolt, Allen key 10 x 130 mm, VA Mankar-Roll |

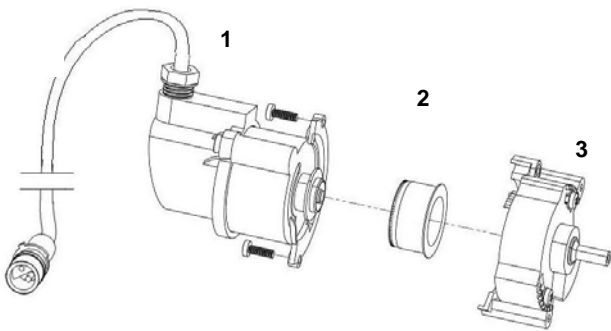


Item Part No. Description

104962 Control box VARIMANT, UNIMA, ONE, TWO

104963 Control box, MAFEX 2010

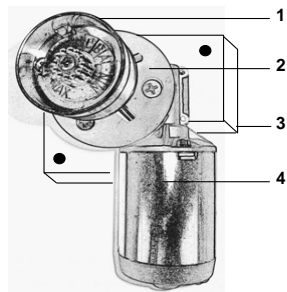
| | | |
|---|--------|---|
| 1 | 103479 | Aluminum housing |
| 2 | 104959 | Bracket for control box MAFEX 2010 |
| 3 | 102731 | Socket (AMP) 9-pol |
| 4 | 102732 | Socket (AMP) 4-pol |
| 5 | 100365 | Fuse holder complete MINI-MANTRA / MANKAR / FLEXOMANT / |
| 6 | 102974 | Pressure switch, green light, (round) for MANTRA and MANKAR |
| 7 | 104960 | Control knob für control box |
| 8 | 103831 | Cover (AMP) for aluminum housing |



Item Part No. Description

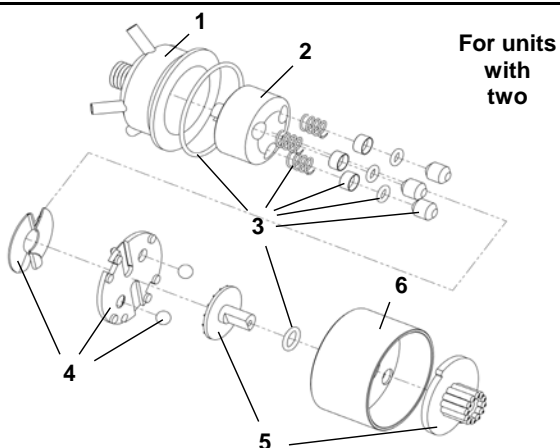
103947 Atomiser for MANKAR, One-S, Two-S, Flex

| | | |
|---|--------|---|
| 1 | 103946 | Motor-Modul for atomizer MANKAR, One-S, Two-S |
| 2 | 100478 | Atomiser disc for segment atomiser |
| 3 | 101996 | Segment-module for segmental atomiser incl. width adjustments |



Item Part No. Description

| | | |
|--------|--------|---|
| 1 | 100522 | Metering pump MANKAR-3, capacity 5 - 10 ml/min |
| 2 | 103317 | Mounting flange for electric dosing pump MAFEX/MANKAR |
| 3 | 103318 | Mounting plate for electric dosing pump MAFEX/MANKAR |
| 4 | 100177 | Pump motor 12 V with Hall-Sensor |
| no pic | 100667 | Converter 12V to 6V |



Item Part No. Description

100527 Metering pump MANKAR-3, capacity 5 - 12 ml/min for MANKAR-110 GP

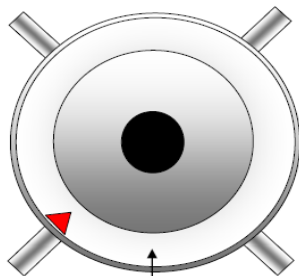
| | | |
|---|--------|---|
| 1 | 100528 | Pump housing for two-channel pump Metering pump MANKAR |
| 2 | 102209 | Rotor-3, chromed brass for piston pump MAFEX/MANKAR |
| 3 | 102373 | Sealing set for metering pump MANKAR-3/MAFEX-3 |
| 4 | 101626 | Repair set, metering pump MANKAR, pressure plate/wobble plate |
| 5 | 102429 | Repair set, metering pump MANKAR, metering adustment knop/ selectordisc |
| 6 | 100534 | Cover for piston pump MAFEX/MANKAR |

**Dosierpumpe MANKAR
Metering pump MANKAR
Pompe doseuse MANKAR**

**Dosierpumpe MAFEX
Metering pump MAFEX
Pompe doseuse MAFEX**

**Druckseite
Pressure sleeve
Pression**

**Saugseite
Sucking sleeve
Aspiration**

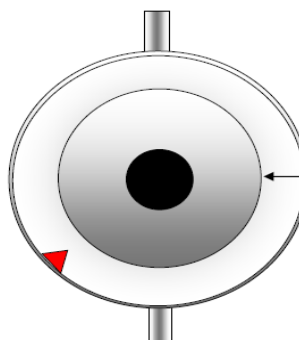


**Saugseite
Sucking sleeve
Aspiration**

**DOSIERKNOPF
Metering adjustment knob
Réglage de débit**

**Druckseite
Pressure sleeve
Pression**

Druckseite / Pressure sleeve / Pression



**DOSIERKNOPF
METERING
ADJUSTMENT KNOB
RÉGLAGE DE DÉBIT**

**Saugseite
Sucking sleeve
Aspiration**

Fault remedy

| Fault | Cause | Remedy |
|------------------------------------|---|--|
| Atomiser disc not Turning | Atomiser contaminated | Thoroughly clean atomiser, remove plant parts if needed |
| | No electrical contact | Check cable or connector contact |
| | Battery defective Atomiser motor defective | Install new battery Install new motor Connect the brown cable to Plus (+). |
| Atomiser spray one-sided | Rotation disc turning in the wrong direction | Connect cable correctly! Selectively plug the brown cable onto the contact pin on the switch/valve unit Connect the blue cable via the round pin plug. |
| Atomiser spray too wide | Width adjustment improperly set | Loosen the screw F (see page 4) and correct the width setting to the left or to the right, respectively |
| Atomiser drips | Pump incorrectly set | Check setting, see table |
| | Atomiser disc defective / contaminated | Replace / clean disc |
| | Atomiser spray discharge contaminated | Clean |
| Atomiser foams | Residual water in system | Completely empty container, hose, segmental atomiser. |
| Chemical not flowing evenly | Filter contaminated | Unscrew filter, clean screen. |
| Air in hose line | Hose connection / Filter leaking | Slightly shorten the hose and set onto a hose nipple. Re-tighten the screw on the filter. |

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 **VARIMANT**

Hiske Weissmann
Managing Director



Geesthacht January 2020

(Place and date of signature)

(Name, title and signature)