

# **INSTRUCTION MANUAL**

**for MANKAR-L**

**Herbicide Sprayer for undiluted ROUNDUP®**

Manufacturer:

**Mantis ULV-Sprühgeräte GmbH**  
D-21502 Geesthacht, Vierlander Straße 11 a  
Telefon: 04152 / 8459-0, Fax: 04152 / 8459-11

## USER SAFETY RECOMMENDATIONS

- Always observe the safety recommendations for user protection in the "directions for use" of the chemical and wear the recommended personal protective equipment.
  - Do not eat, smoke or drink when working with pesticides.
  - Dispose of excess pesticide mix and rinse in accordance with label instructions.
  - Always keep pesticides and applicators out of the reach of children.
  - After use, thoroughly clean the applicator.
- Exchange the chemical in the tank for tap water and turn the wheel for approx. 2 minutes.**

## SET-UP AND OPERATION OF THE APPLICATOR

### BATTERY USE AND CARE

**Use the charger in dry conditions only. Protect against moisture.**

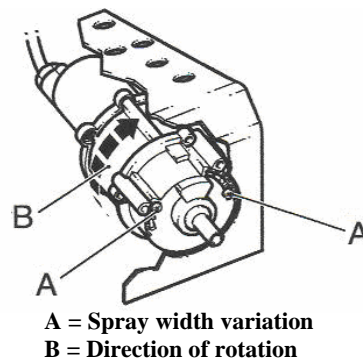
**Always start the day with a fully charged battery.**

Connect charger plug to powerpack socket correctly before connecting charger to 110 V (US) or 230 V (GB) outlet. **Operate the switch on powerpack.** The charging starts and indicator on charger will light. Battery is fully charged in 16 hours. When the battery is charged, the charger will switch to trickle charge automatically. After charging, remove charger plug from 110 V (US) or 230 V (GB) outlet, then remove plug from battery socket. Never disconnect by pulling on the wires. Store powerpack in fully charged condition. Failure to do so reduces the service life of the battery.

### **For charging switch on powerpack.**

**Recharge the battery immediately after use, at least as many hours as the sprayer has been operated.**

**Off season storage: Charge continuously**



**A = Spray width variation  
B = Direction of rotation**

Total spraying time of fully charged battery:

MANKAR-P	approx. 15 hours
MANKAR-110 P	approx. 8 hours
MANKAR-110 GP	approx. 8 hours

Battery containing mercury, cadmium or lead as electrochemical substances are subject to special waste disposal.

The atomiser is powered by the rechargeable battery. The fluid metering is handled by a metering pump. The droplets are formed by the centrifugal force of the atomiser and discharged downwards through an adjustable segment. Flow rate can be affected by temperature fluctuations, therefore the flow rate specified in the calibration table has to be checked and adjusted as required. Check the atomiser daily to be sure it is clean and operating smoothly. The spray hood should pass closely over the top of the area to be treated. During operation, some of the chemical will collect in the atomiser and will trickle out for approx. 30 sec. after closing the valve on top of the chemical tank. Be sure to close valve about one minute before end of treatment and allow atomiser to continue running. Switch off the atomiser at the end of the treatment.

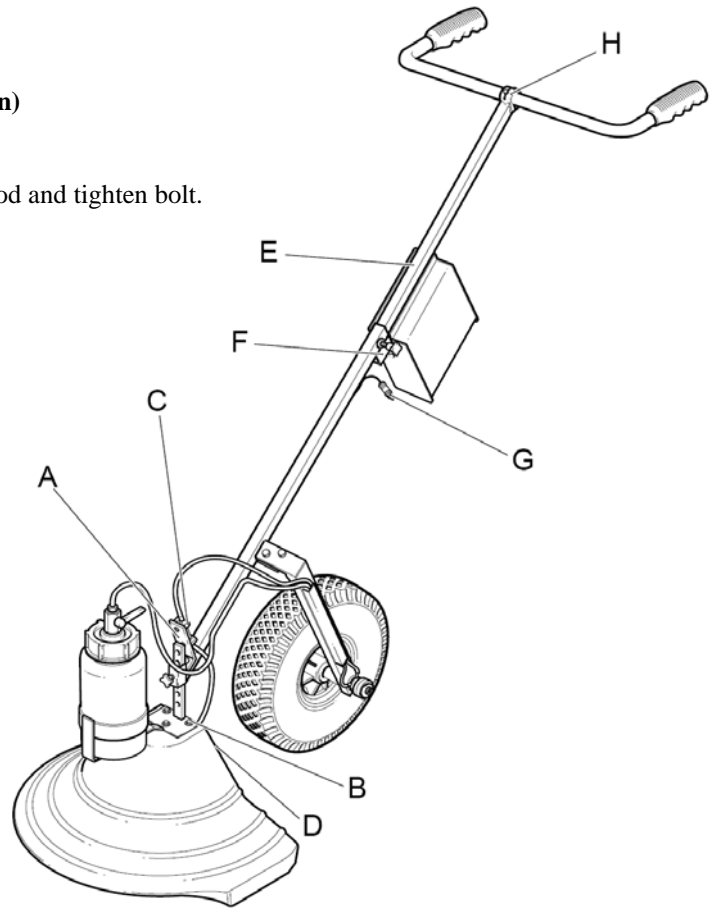
### **CAUTION**

**Before lifting the spray hood, be sure to close valve and switch off atomiser.**

Set the Spray band of the atomiser by adjusting the spray limiters (see drawing). The spray band should be set so that the droplets are discharged across the entire compartment width. Fill tank and open the valve. Find a clean dry surface, preferably a concrete base, or place a cardboard panel under the spray hood and check the coverage on the panel. Adjust as required and recheck. Be sure you understand all the functions of the applicator before starting treatment.

**MANKAR-P assembly instructions (Refer to illustration)**

- A. Bolt bracket for flow control to base unit.
- B. Connect spray hood to base unit, set height of spray hood and tighten bolt.
- C. Connect hose to flow control valve.
- D. Connect electrical plug connectors.
- E. Insert handle extension into top channel on base unit.
- F. Insert power pack into bottom channel on base unit.
- G. Plug electrical connector into power pack socket.
- H. Adjust handle and tighten bolts.



**MANKAR-P packing list**

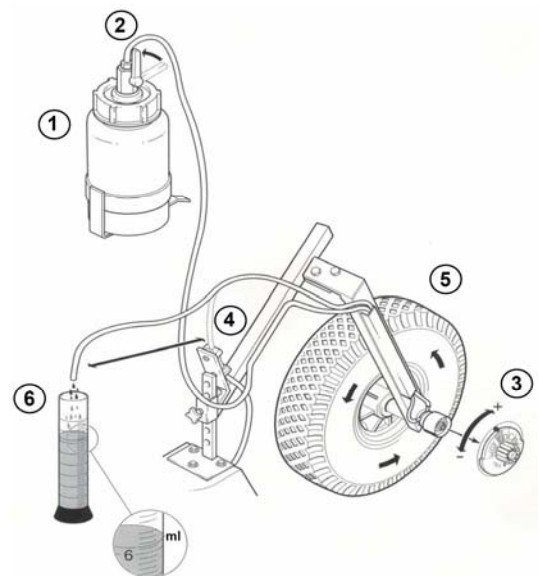
- 1 Base unit with handle
- 1 Wheel assembly with pump and tyre (400 x 100 mm)
- 1 Segmental atomiser
- 1 Spray Hood
- 1 Plastic tank (1 liter bottle)
- 1 Powerpack 6 Volts DC - 7,2 Amp hour
- 1 Battery charger (230 Volts AC / 6 Volts DC)  
(or 110 Volts AC / 6 Volts DC)

**MANKAR-P Calibration Instruction**

Application Rate for Undiluted Roundup	Metering Knob Position	Desired Flow Rate for 50 Wheel Rotations
2,1 qt./Ha. = 2 ltr / Ha.	E	0,2130 oz Approx. 6,3 ml
3,2 qt./Ha. = 3 ltr / Ha.	H	0,3211 oz Approx. 9,5 ml
28,0 oz/Acre = 2 ltr / Ha.	E	0,2130 oz Approx. 6,3 ml
41,0 oz/Acre = 3 ltr / Ha.	H	0,3211 oz Approx. 9,5 ml

**Checking the Flow Rate**

- 1. Fill tank with chemical solution
- 2. Open tank shut-off valve
- 3. Set metering knob to suggested letter (A-H). Refer to table above
- 4. Remove hose from exit of flow control
- 5. Turn wheel until chemical emerges from the exit of the flow control
- 6. Collect fluid in the metric measuring cup for 50 wheel rotations
- 7. Check table and (if required) adjust metering knob to obtain the desired flow rate
- 8. Repeat steps 5 and 6

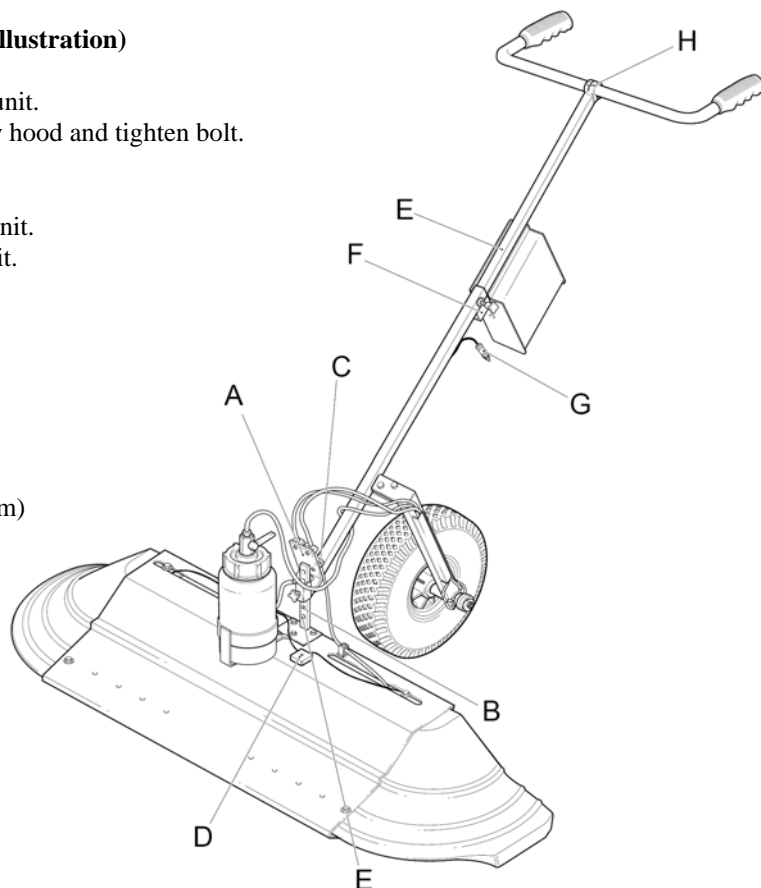


## MANKAR-110 P assembly instructions (Refer to illustration)

- A. Bolt bracket for dual flow control valves to base unit.
- B. Attach spray hood to base unit, set height of spray hood and tighten bolt.
- C. Connect hoses to flow controls.
- D. Connect electrical plug connectors.
- E. Insert handle extension into top channel on base unit.
- F. Insert power pack into bottom channel on base unit.
- G. Plug electrical connector into power pack socket.
- H. Adjust handle and tighten bolts.

## MANKAR-110 P packing list

- 1 Base unit with handle
- 1 Wheel assembly with pump and tyre (400 x 100 mm)
- 2 Segmental atomiser
- 1 Spray Hood adjustable 70 to 110 cm
- 1 Plastic tank (1 liter bottle)
- 1 Powerpack 6 Volts DC - 7,2 Amp hour
- 1 Battery charger (230 Volts AC / 6 Volts DC)  
(or 110 Volts AC / 6 Volts DC)



## MANKAR-110 P Calibration Instruction

Application for Settings in Table: 1.7 pints per acre undiluted Roundup

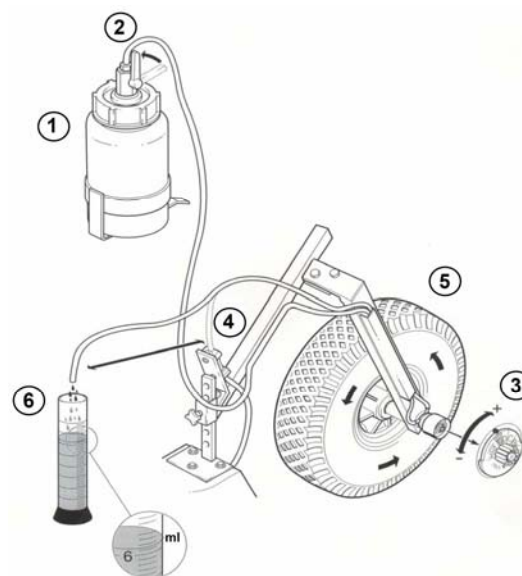
Spray Width inches      cm	Metering Knob Setting	Required yield <u>per atomiser</u> for 50 Wheel Rotations
28 in      70 cm	B	Approximately 0,15 oz. / 4,4 ml
36 in      90 cm	C	Approximately 0,19 oz. / 5,6 ml
44 in      110 cm	E	Approximately 0,23 oz. / 6,9 ml

## Calculation of different Application Rates

Factor X spray width in Inches = required flow rate <u>per atomiser</u> in ounces for 50 wheel rotations		
14 oz / 0,85 pints / acre	1 ltr. / hectare	Factor 0,0026
28 oz / 1,70 pints / acre	2 ltr. / hectare	Factor 0,0052
41 oz / 2,55 pints / acre	3 ltr. / hectare	Factor 0,0078

## Checking the Flow Rate

1. Fill tank with chemical solution
2. Open tank shut-off valve
3. Set metering knob to suggested letter (A-H). Refer to table above
4. Remove hose from exit of flow control
5. Turn wheel until chemical emerges from the exit of the flow control
6. Collect fluid in the metric measuring cup for 50 wheel rotations
7. Check table and (if required) adjust metering knob to obtain the desired flow rate
8. Repeat steps 5 and 6



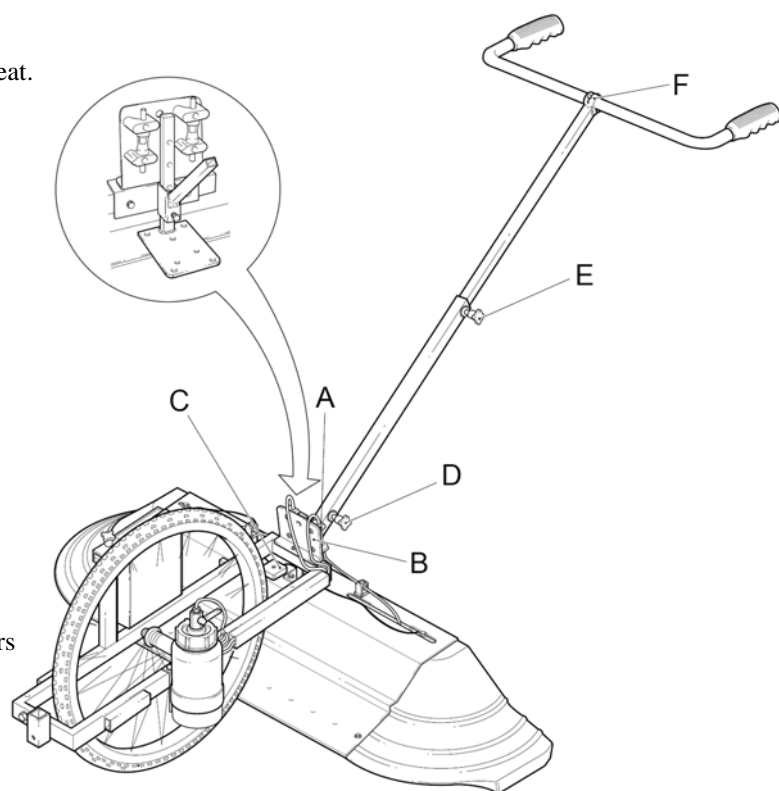
## MANKAR-110 GP assembly instructions (Refer to illustration)

- A. Bolt seat for spraying hood, rear, to the frame and bolt dual mounting bracket for flow controls to the seat. Attach spray hood into the seat, set height of spray hood and tighten bolt.
- B. Connect hoses to flow controls.
- C. Connect electrical plug connectors.
- D. Attach connection rod and bolt.
- E. Attach handlebar extension and bolt.
- F. Adjust handle and tighten bolts.

Adjustment of spray hood  
Loosen screws on top of metal hood and unscrew bolts on front side

## MANKAR - 110 GP packing list

- 1 Base unit with handle
- 1 Frame with pump and tyre 580 mm
- 1 Spray hood (adjustable 70 to 110 cm) with 2 atomisers
- 1 Powerpack 6 Volts DC - 7,2 Amp hour
- 1 Plastic tank (1 liter bottle)
- 1 Battery charger 230 Volts AC / 6 Volts DC or 110 Volts AC / 6 Volts DC



## MANKAR-110 GP Calibration Instruction

### Application for Settings in Table: 1.7 pints per acre undiluted Roundup

Spray Width		Metering Knob Setting	Required yield <u>per atomiser</u> for 50 Wheel Rotations
inches	cm		
28 in	70 cm	B	Approximately 0,24 oz. / 7,0 ml
36 in	90 cm	D	Approximately 0,30 oz. / 8,8 ml
44 in	110 cm	F	Approximately 0,37 oz. / 11,0 ml

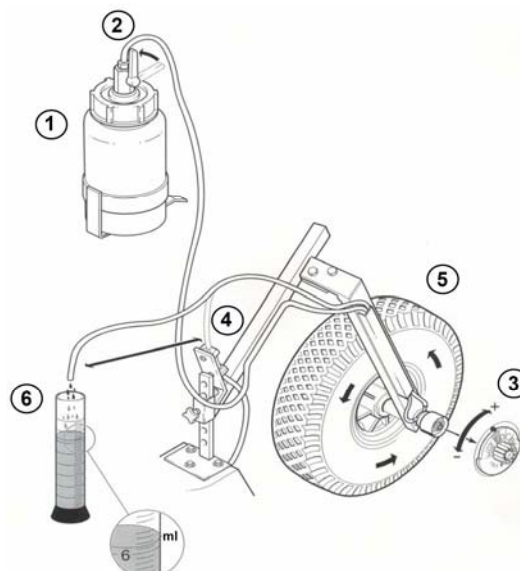
## Calculation of different Application Rates

Factor X spray width in Inches = required flow rate per atomiser in ounces for 50 wheel rotations

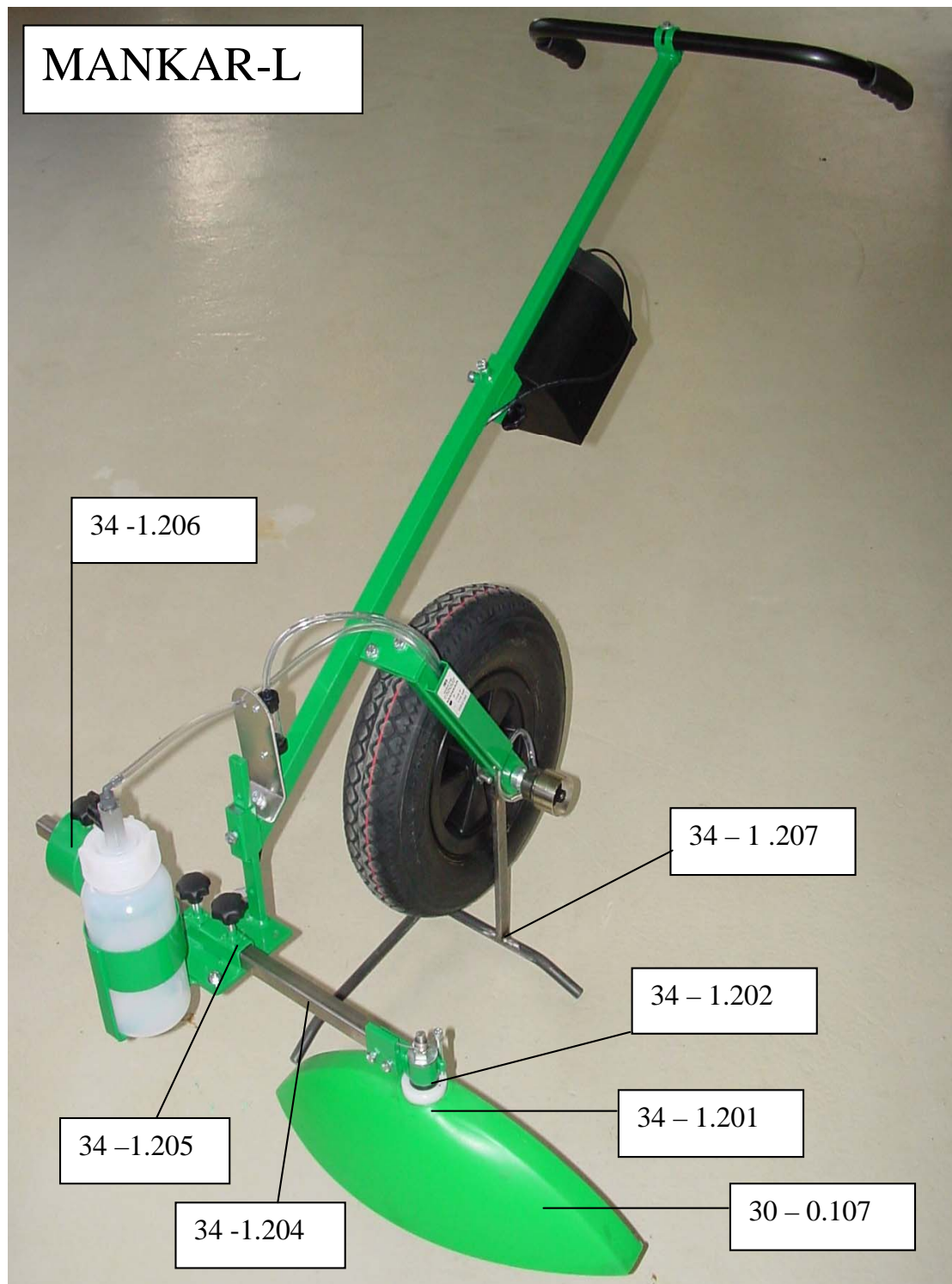
14 oz / 0,85 pints / acre	1 ltr. / hectare	Factor 0,0043
28 oz / 1,70 pints / acre	2 ltr. / hectare	Factor 0,0086
41 oz / 2,55 pints / acre	3 ltr. / hectare	Factor 0,0130

## Checking the Flow Rate

1. Fill tank with chemical solution
2. Open tank shut-off valve
3. Set metering knob to suggested letter (A-H). Refer to table above
4. Remove hose from exit of flow control
5. Turn wheel until chemical emerges from the exit of the flow control
6. Collect fluid in the metric measuring cup for 50 wheel rotations
7. Check table and (if required) adjust metering knob to obtain the desired flow rate
8. Repeat steps 5 and 6



# MANKAR-L

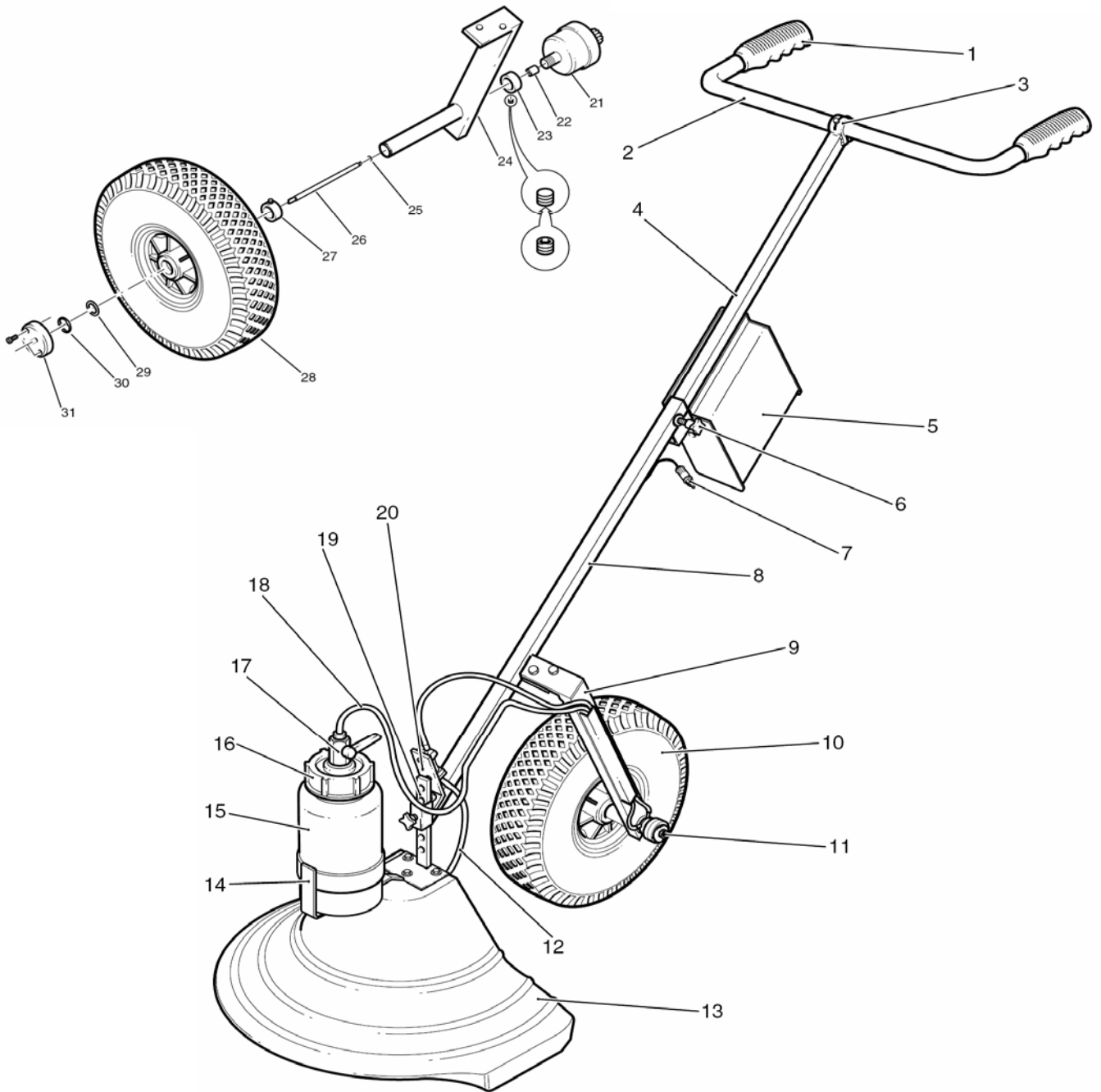


**Item Part No. Description**

**34-1.000 MANKAR-L**

1	34-1.206	Counterweight MANKAR-L
2	34-1.205	Bracket for MANKAR-L
3	34-1.204	Extension arm MANKAR-L
4	34-1.207	Parking stand MANKAR
5	34-1.202	Spring MANKAR-L
6	34-1.201	Distance ring
7	30-0.107	Sprayhood, green, 45 cm width without atomiser
8	32-2.300	SEGMENTAL-ATOMISER 2004 for MANKAR
9	34-1.135	Sprayhood height adjustment with tank holder

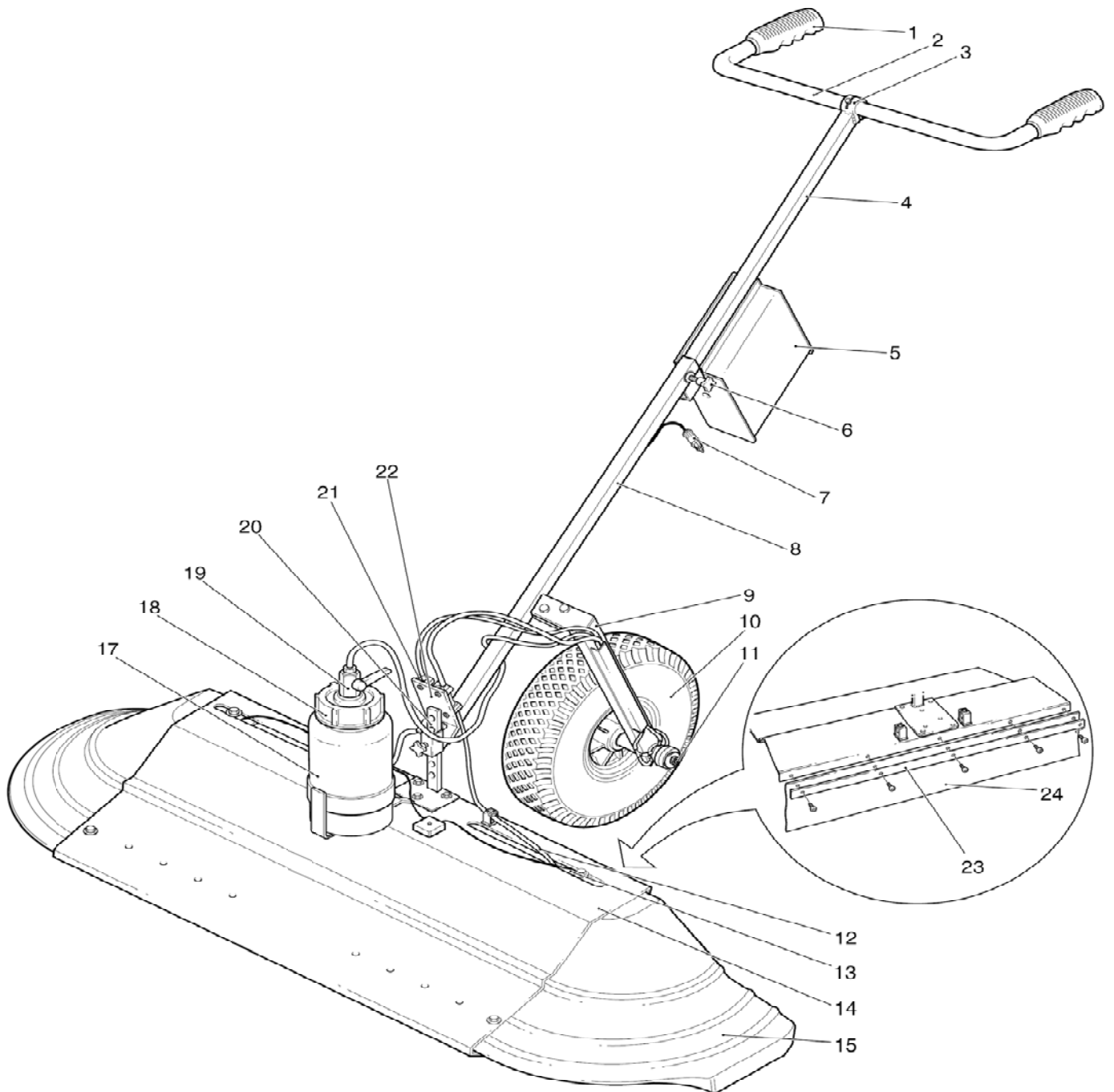
**Pump Drive for MANKAR-P and 110 P**



**Item Part No. Description**

**34-3.000 MANKAR-P**

Item	Part No.	Description	Item	Part No.	Description
1	34-1.004	Handle bar clip	18	-- -- --	Suction line 4 x 2 mm
2	34-1.016	Handle bar	19	34-1.135	Sprayhood height adjustment with tank holder
3	34-1.017	Handle clamp	20	34-1.092	Flow control complete for Mankar, without holder
4	34-1.086	Handle bar extension	21	34-3.100	Mafex-95 MS metering pump
5	34-1.600	Powerpack compl. 1 battery 6V-7 Ah	22	34-1.087	Screw socket
6	34-1.048	Star grip screw, 8 mm x 25	23	34-1.082	Socket for pump
7	34-1.079	Connecting cable complete	24	34-0.212	Pump support with axle
8	34-1.103	Toolbar MANKAR-P, 110 P	25	1-4.007	O-ring 4,47 x 1,78 mm
9	34-0.212	Pump support with axle	26	34-1.088	Cardan shaft
10	34-1.105	Pneumatic tyre, 400 x 100 mm	27	34-1.066	Set collar 20 mm
11	34-3.100	Mafex-95 MS metering pump	28	34-1.105	Pneumatic tyre, 400 x 100 mm
12	-- -- --	Pressure line 4 x 2 mm	29	34-1.522	Washer 28 x 1 mm
13	34-1.007	Spray hood, 50 cm	30	34-1.089	Seeger circlip ring
15	34-1.208	Kautex tank, 1 litre	31	34-1.061	Cardan shaft carrier
16	34-1.309	Cover, for 1 litre tank	--	34-1.334	Atomiser mounting bracket without illustration
17	34-1.085	Ball valve	--	32-2.300	SEGMENTAL-ATOMISER 2004 for MANKAR without illustration



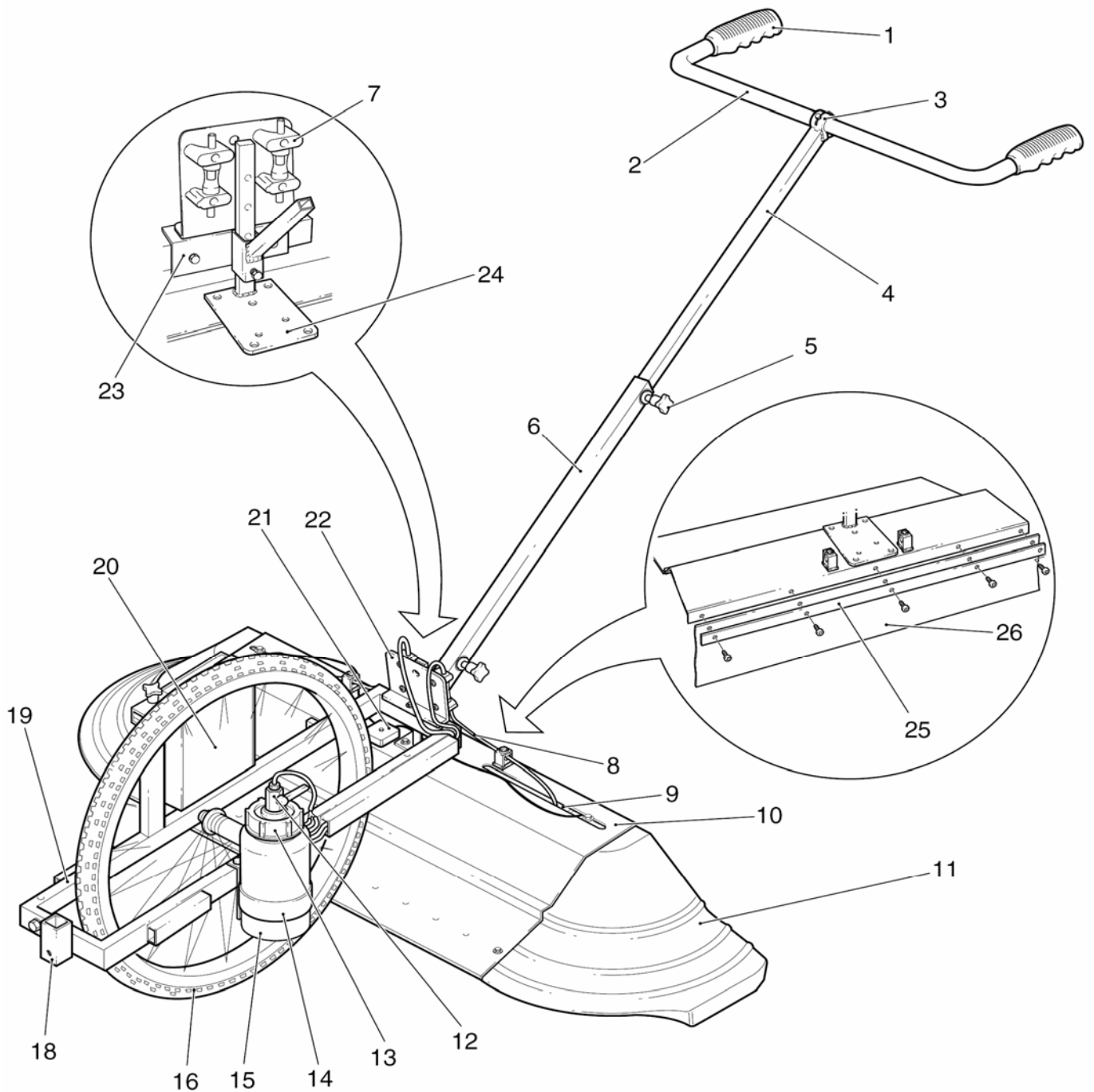
**Item Part No. Description**

**Item Part No. Description**

**34-6.000 MANKAR-110 P**

1	34-1.004	Handle bar clip	13	34-1.081	Cable
2	34-1.016	Handle bar	14	34-1.040	Metal hood, 600 mm width
3	34-1.017	Handle clamp	15	34-1.100	Spray hood, splitted 25 cm, left
4	34-1.086	Handle bar extension	17	34-1.208	Kautex tank, 1 litre
5	34-1.600	Powerpack compl. 1 battery 6V-7 Ah	18	34-1.309	Cover, for 1 litre tank
6	34-1.048	Star grip screw, 8 mm x 25	19	34-1.085	Ball valve
7	34-1.079	Connecting cable complete	20	34-1.135	Sprayhood height adjustment with tank holder
8	34-1.103	Toolbar MANKAR-P, 110 P	21	34-1.092	Flow control complete for Mankar, without holder
9	34-0.212	Pump support with axle	22	34-1.155	Dual mounting bracket for 2 flow controls
10	34-1.105	Pneumatic tyre, 400 x 100 mm	23	34-1.072	Fastener for rubber curtain
11	34-6.500	Metering pump MANKAR-95, 3 pistons	24	34-1.071	Rubber curtain for MANKAR-110 P + GP
12	- - - - -	Pressure line 4 x 2 mm			



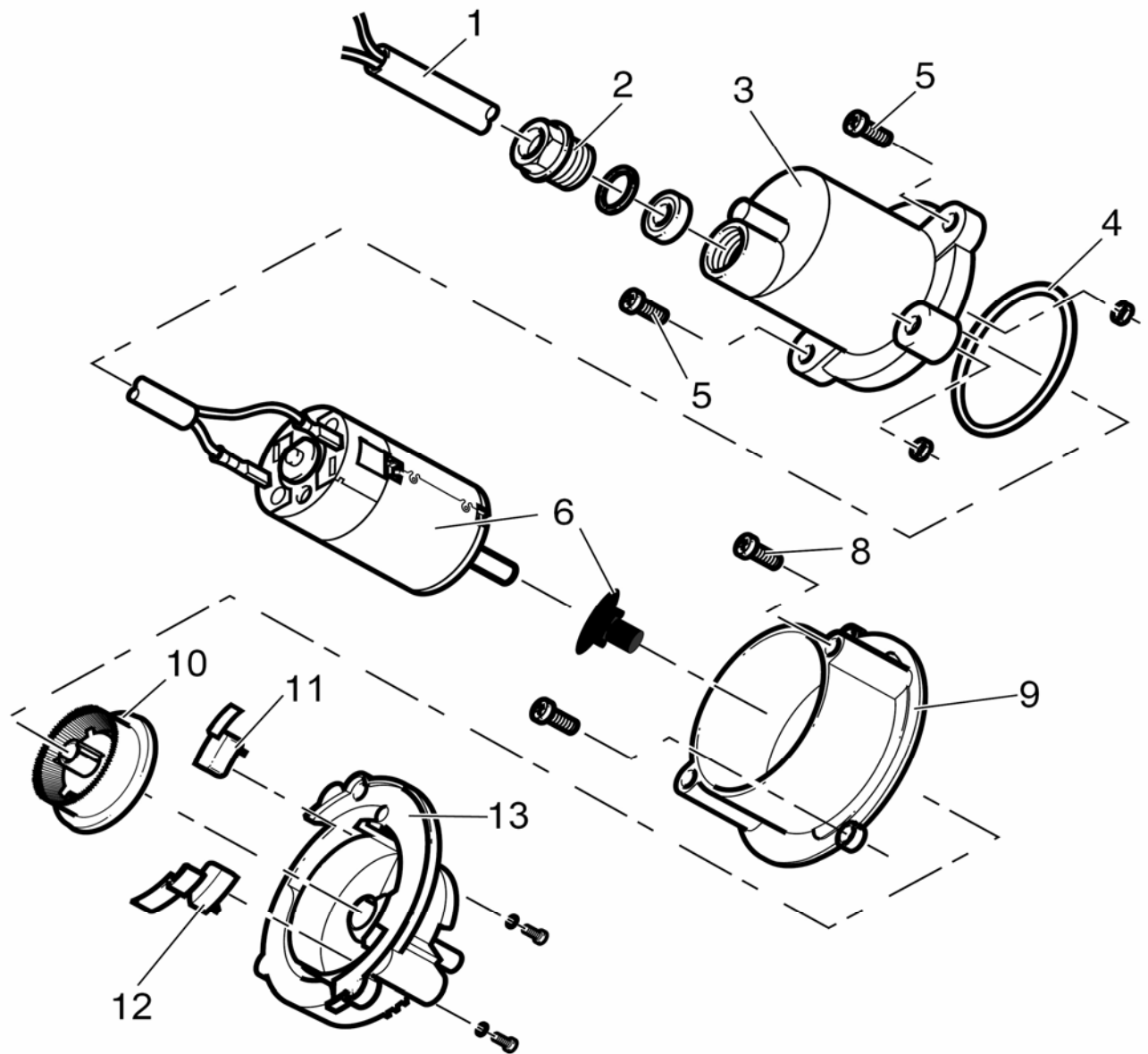


**Item Part No. Description**

**Item Part No. Description**

**34-7.000 MANKAR-110 GP**

1	34-1.004	Handle bar clip	15	34-1.208	Kautex tank, 1 litre
2	34-1.016	Handle bar	16	34-1.090	Pneumatic tyre, 560 mm
3	34-1.017	Handle clamp	non ill.	34-1.091	Counter weight, GP (not illustrated)
4	34-1.186	Handle bar extension GP	18	- - - - -	Seat for hood, front
5	34-1.048	Star grip screw, 8 mm x 25	19	34-9.057	Frame compl. with wheel axle
6	34-1.203	Connection rod	20	34-1.600	Powerpack compl. 1 battery 6V-7 Ah
7	34-1.092	Flow control complete for Mankar, without holder	21	34-1.070	Pull relieve
8	- - - - -	Pressure line 4 x 2 mm	22	34-1.155	Dual mounting bracket for 2 flow controls
9	34-1.081	Cable	non ill.	34-7.100	MANKAR GP metering pump
10	34-1.040	Metal hood, 600 mm width	23	34-9.059	Seat for hood, rear
11	34-1.100	Spray hood, splitted 25 cm, left	24	34-1.035	Spray hood height adjustment
12	34-1.085	Ball valve	25	34-1.072	Fastener for rubber curtain
13	34-1.309	Cover, for 1 litre tank	26	34-1.071	Rubber curtain for MANKAR-110 P + GP
14	34-1.046	Tank holder			



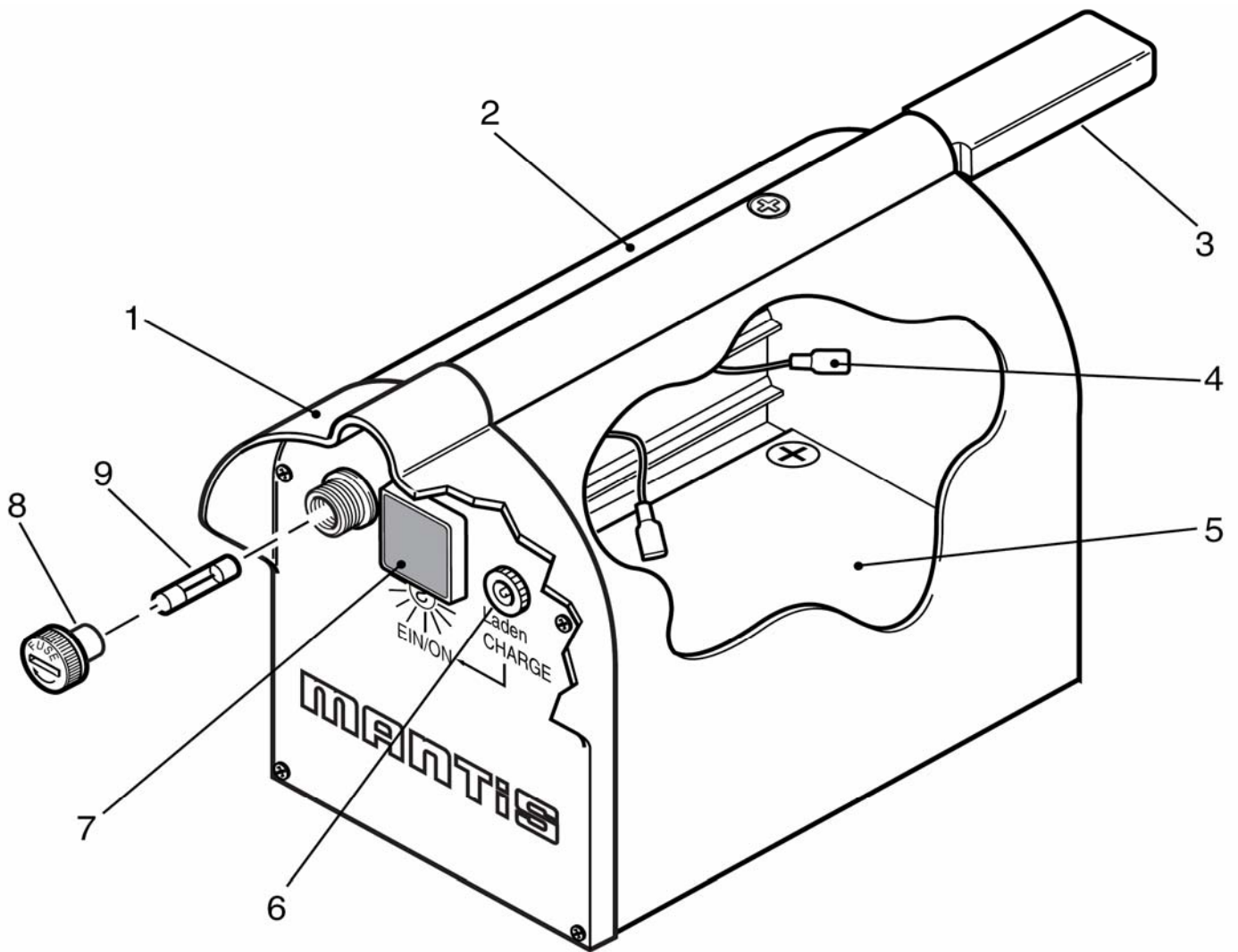
**Item Part No. Bezeichnung**

**Description**

**32-2.300 Segment-Rotationsdüse 2004, für MANKAR**

**SEGMENTAL-ATOMISER 2004 for MANKAR**

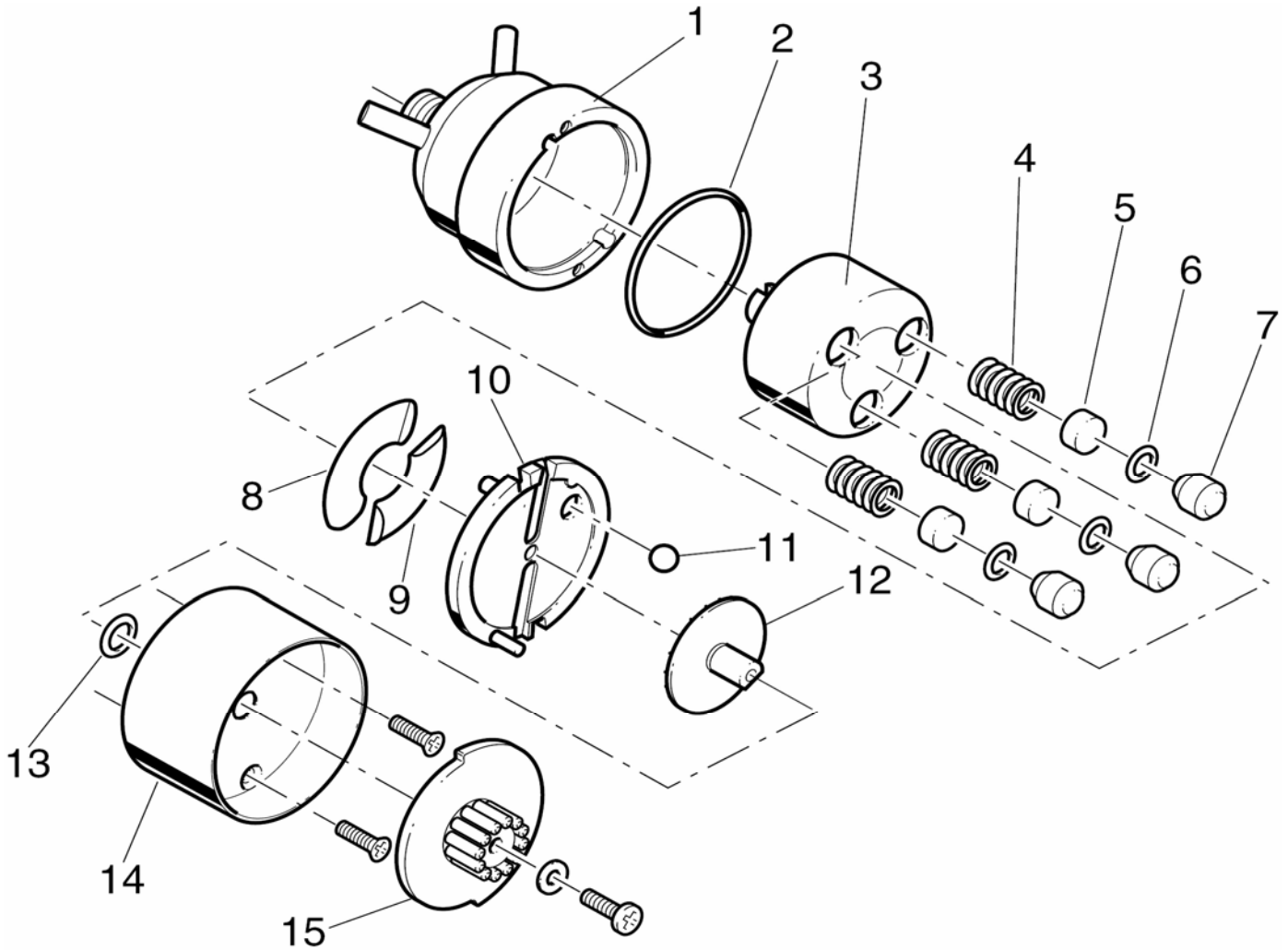
Item	Part No.	Bezeichnung	Description
1	34-1.081	Düsenkabel f. Segmentdüse, außer Mini / Plus	Cable
2	1-3.101	PG 7 Kabelverschraubung, MX-Düse	Screw fitting PG 7
3	34-2.101	Motor-Gehäuse für Segmentdüse	Motor housing
4	34-2.007	Paradichtung 30 x 40 x 3 mm Herbizid Segment-Rotationsdüse	Para-Sealing
5	- - - - -	Schraube M 4 x 10	Screw M 4 x 10
6	34-0.330	Motor mit div. Anbauteilen für Segmentdüsen ab 1996	Motor subassembly for atomiser since 1996
8	- - - - -	Schraube M 3 x 10	Screw M 3 x 10
9	34-2.102	Düsen-Vordergehäuse 2004	Atomiser housing, front 2004
10	34-2.003	Rotationsscheibe f. Segment-Düse 2000	Atomiser disc
11	34-2.004	Breitenverstellung, rechts für Segmentdüse	Spray limiter, right
12	34-2.006	Breitenverstellung, links für Segmentdüse	Spray limiter, left
13	34-2.105	Düsen-Rückgehäuse 2004	Atomiser housing, rear 2004



**Item Part No. Description**

**34-1.600 Powerpack compl. 1 battery 6V-7 Ah**

1	34-1.624	Powerpack-cover, ABS
2	34-1.603	Powerpack case, ABS
3	34-1.602	Powerpack mounting bar
4	34-1.604	Battery connection cables (internal)
5	34-1.505	Storage battery 6V - 7Ah
6	40-0.012	Socket, d=2,1 mm
7	34-1.606	Switch with control light
8	34-1.043	Fuse housing complete
9	4-1.055	Fuse T3.15 Amp



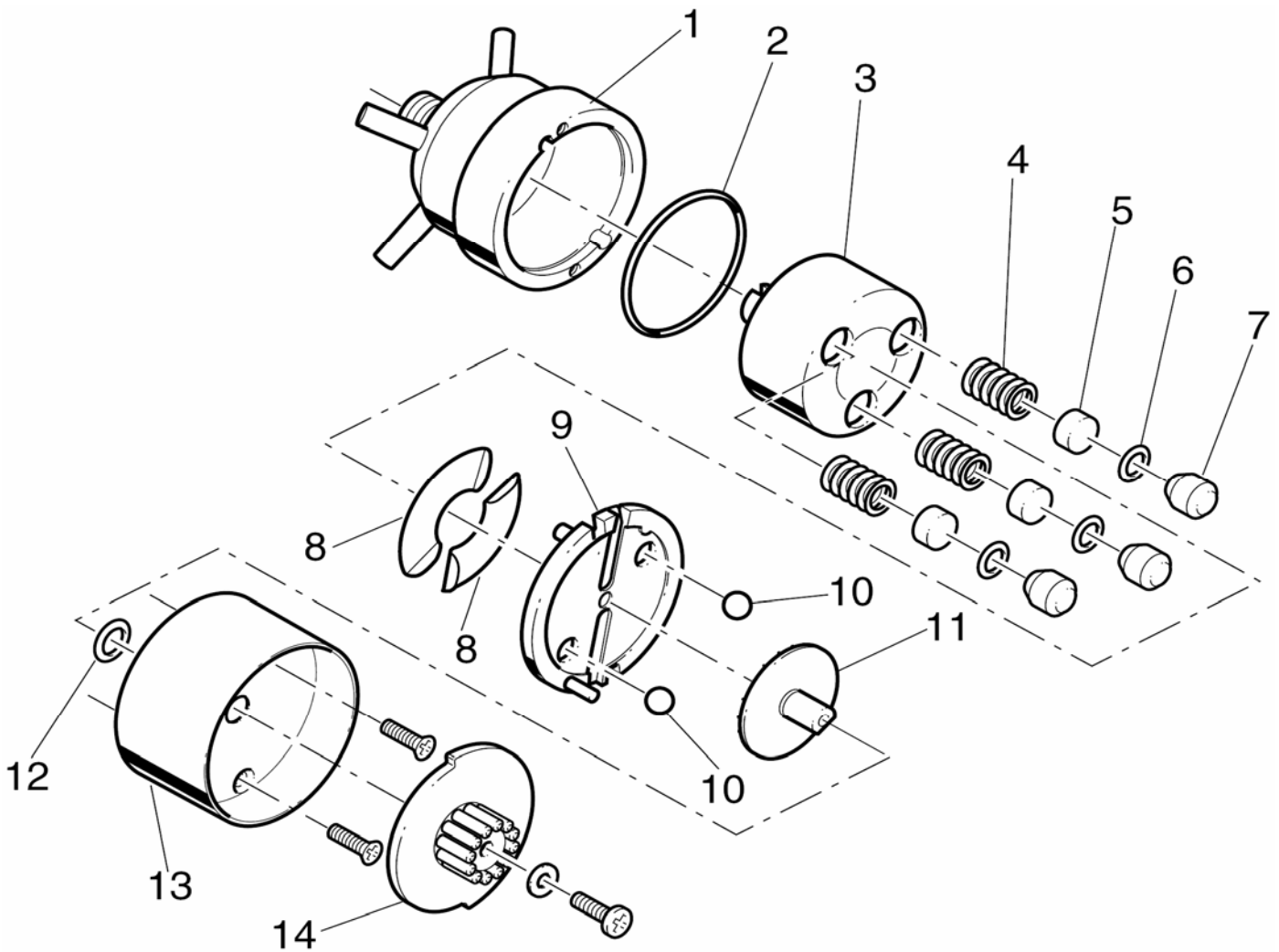
## For MANKAR-P

**Item Part No. Description**

**Item Part No. Description**

### 34-3.100 Mafex-95 MS metering pump

1	34-3.101	Pump housing	9	34-7.103	Wobble plate, Mankar-95
2	34-3.106	O-ring 41 x 1,78 mm	10	34-3.103	Pressure plate, Mafex-95
3	1-4.004	Rotor, 3 cylinder	11	34-7.105	Ball, 6 mm, stainless
4	34-7.102	Spring, bronze	12	34-3.104	Selector, Mafex-95
5	1-4.006	Piston	13	34-3.107	O-ring 7,65 x 1,78 mm
6	1-4.007	O-ring 4,47 x 1,78 mm	14	34-7.107	Pump cover
7	1-4.008	Distance piece	15	34-3.105	Metering adjustment knob, Mafex-95
8	34-3.102	Wobble plate, Mafex-95			



<u>Item</u>	<u>Part No.</u>	<u>Description</u>
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For MANKAR-110 P	34-6.500	Metering pump MANKAR-95, 3 pistons
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For MANKAR-110 GP	34-7.100	MANKAR GP metering pump
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1	34-7.101	Pump housing
2	34-3.106	O-ring 41 x 1,78 mm
3	1-4.004	Rotor, 3 cylinder
4	34-7.102	Spring, bronze
5	1-4.006	Piston
6	1-4.007	O-ring 4,47 x 1,78 mm
7	1-4.008	Distance piece
8	34-7.103	Wobble plate, Mankar-95
9	34-7.104	Pressure plate, Mankar-95
10	34-7.105	Ball, 6 mm, stainless
11	34-7.106	Selector, Mankar-95
12	34-3.107	O-ring 7,65 x 1,78 mm
13	34-7.107	Pump cover
14	34-6.501	Metering adjustment knob, Mankar-95

The parts of MANKAR-110 GP pump are similar, except part 11, which is 34-7.206 Selector GP

## **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 twelve 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 borne 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 be 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.

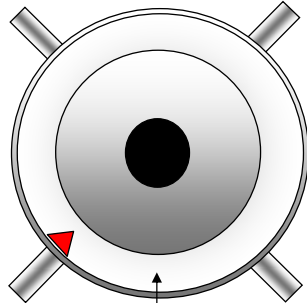
Since manufacturer have no influence on installation and handling of apparatus, the company will not assume any responsibility for lack of success or for damages caused by the apparatus itself or by its use.

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

**Dosierpumpe MAFEX 95 MS**  
**Metering pump MAFEX 95 MS**  
**Pompe doseuse MAFEX 95 MS**

**Druckseite**  
**Pressure sleeve**  
**Pression**

**Saugseite**  
**Sucking sleeve**  
**Aspiration**

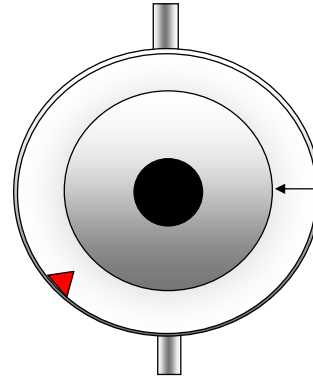


**Saugseite**  
**Sucking sleeve**  
**Aspiration**

**DOSIERKNOPF**  
**Metering adjustment knob**  
**Réglage de débit**

**Druckseite**  
**Pressure sleeve**  
**Pression**

**Druckseite / Pressure sleeve / Pression**

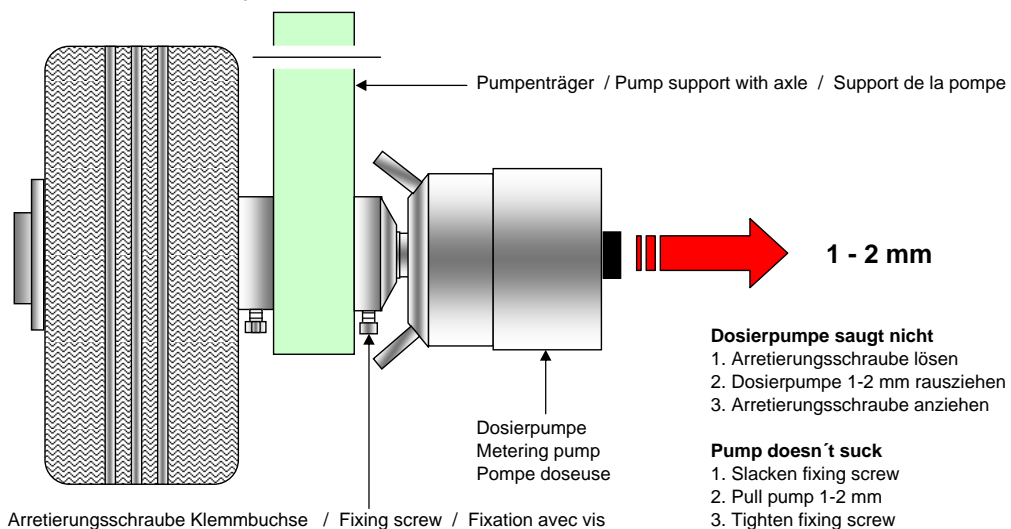


**DOSIERKNOPF**  
**METERING**  
**ADJUSTMENT KNOB**  
**RÉGLAGE DE DÉBIT**

**Saugseite**  
**Sucking sleeve**  
**Aspiration**

**Dosierpumpe saugt nicht**  
**Metering pump doesn't suck**  
**La pompe doseuse n'aspire pas**

**Pumpeneinheit Mankar/Flexomant**  
**Pump subassembly Mankar/Flexomant**  
**Pompe sur roue Mankar/Flexomant**



**Dosierpumpe saugt nicht**  
 1. Arretierungsschraube lösen  
 2. Dosierpumpe 1-2 mm rausziehen  
 3. Arretierungsschraube anziehen

**Pump doesn't suck**  
 1. Slacken fixing screw  
 2. Pull pump 1-2 mm  
 3. Tighten fixing screw

**La pompe doseuse n'aspire pas**  
 1. desserrer la vis de fixation  
 2. tirer la pompe 1 à 2 mm (libre jeu du cardan)  
 3. serrer la vis de fixation