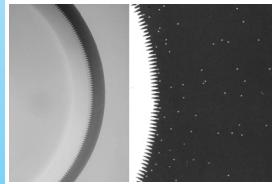


MICRON HERBI-4 CDA



Instruction Manual

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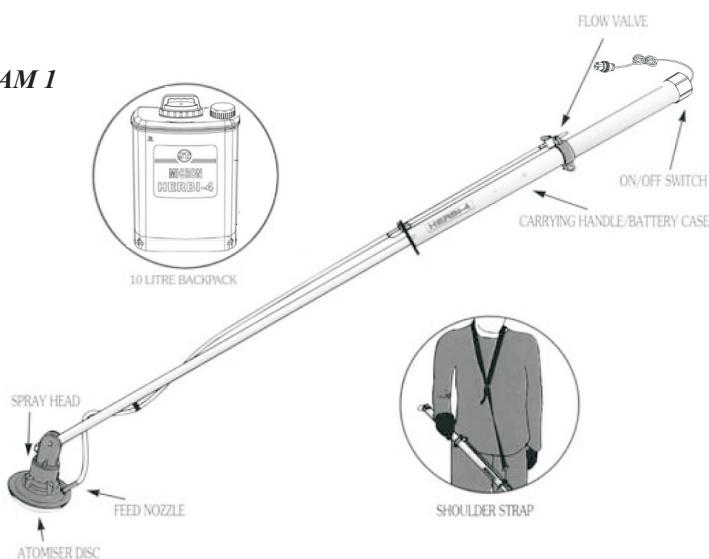
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DESCRIPTION

The HERBI-4 is a simple robust hand-held spinning disc Controlled Droplet Application (CDA) sprayer powered by 6 volt 3 Ah LSA battery, with one set of good quality battery giving over 20 hours spraying time. It is designed to apply herbicides in a 1.2m wide band at low volumes (10 to 30 litres/hectare). A governed electric motor spins the atomiser disc at a constant 2,000 rpm to produce uniform spray droplets of around 250 micron; large enough to minimise any risk of spray drift. Liquid is fed by gravity through colour coded feed nozzles. The HERBI-4 can apply herbicides to borders, pathways, ditches and larger areas by making a series of consecutive spray passes. The weight of the machine ready to spray, with the *ST 10 litre backpack*.

DIAGRAM 1



Specially designed ST backpacks and a shoulder strap are available for use with the HERBI-4.

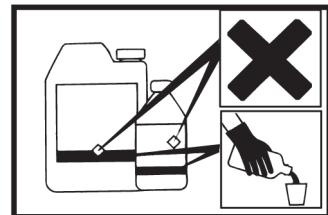
SAFETY

Using agrochemicals is a hazardous process. Operators should comply with all relevant legislation and/or regulations governing the use of agrochemicals and should use appropriate personal protective equipment (see 'OPERATOR PROTECTION'). **Never** use the HERBI-4 in potentially explosive atmospheres or spray flammable liquid through it.

The HERBI-4 can be used with most conventional herbicides, as well as specific CDA formulations (only available in some countries) to provide a closed transfer system to improve operator safety.

Always read the product label carefully to discover:-

- approved applications
- maximum dose rates
- maximum number of treatments
- operator protection required
- necessary environmental protection measures



N.B. 'Dose rate' refers to the amount of chemical applied per hectare.

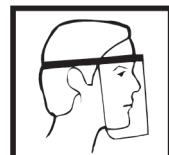
Never eat, drink, or smoke when working with agrochemicals. After using agrochemicals or handling equipment wash your hands thoroughly. Keep people (especially children) and animals out of areas being sprayed.

Always store agrochemicals safely to protect people and animals, and to safeguard the environment (take special care to avoid water pollution). See 'SPRAYING' sections for guidelines on safe use of the HERBI-4 in operation.

OPERATOR PROTECTION

Always wear the protective clothing items listed on the product label for mixing and filling. The **minimum** protective clothing required for *spraying* with the HERBI-4 is:

- rubber gloves
- boots/shoes and long trousers
- eye protection
- long sleeved shirt



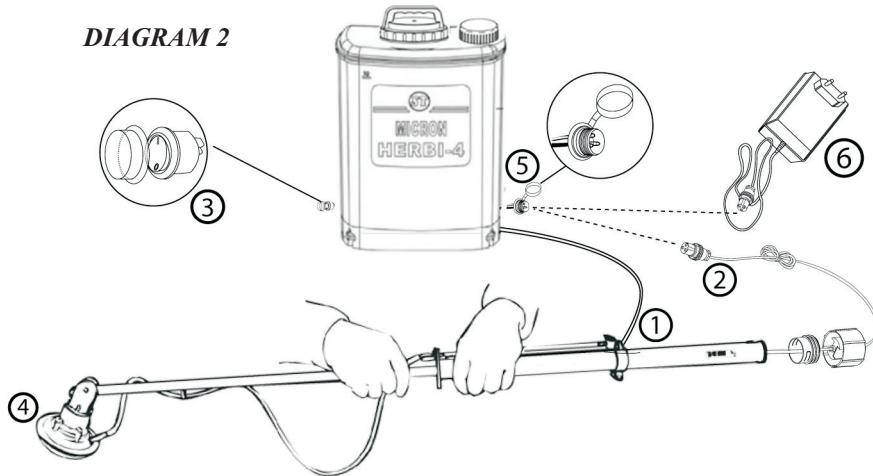
Note:

- a) Acoustic information: the sound pressure level at the operator's ear should not exceed 70 dB(A).
- b) Vibration: the weighted RMS acceleration value at the hands when using this machine should not exceed 2.5 m/sec.

PREPARING FOR SPRAYING

The sprayer is delivered in a collapsed form. To assemble ready for spraying:

DIAGRAM 2

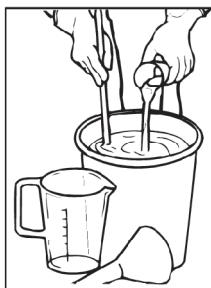
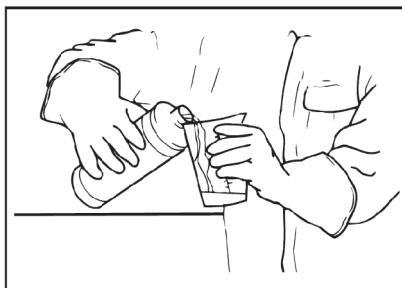


- 1) Extend the sprayer and securely connect the feed tube (1) to the flow valve.
- 2) Connect the male 3 pole connector (2) from the lance to the tank female 3 pole connector (5) and lock the both connector.
- 3) Remove the atomiser protective cover (4) and check by hand that the atomiser disc spins freely.
- 4) Turn on the switch (3).

N.B. Before spraying for the first time with the HERBI-4, the spray pattern produced should be checked using only water (see 'BEFORE SPRAYING').

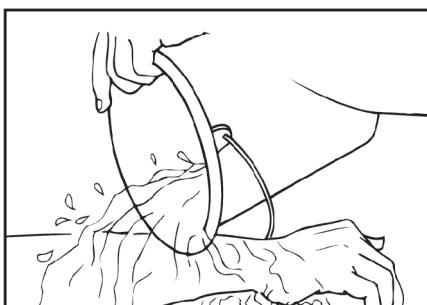
MIXING, FILLING AND CALIBRATION

Mixing and filling is generally the most hazardous process in the spraying operation. **Always** follow the label instructions. **Always** use a filter (fitted in the *ST backpacks*) and use a funnel if filling a container with a small neck. **Only** mix enough spray for the area to be treated thereby avoiding the need for disposal of unused spray mix.



Always wear gloves when handling agrochemicals and equipment.

Always use the correct equipment when mixing and measuring.



Always wash off any skin contamination.

Always clean all equipment after use.

With the HERBI-4 herbicides are usually applied in around 20 litres total spray volume per hectare, except for glyphosate which can be applied at volumes as low as 10 litres per hectare. These are lower volumes than recommended for high volume application with knapsack sprayers.

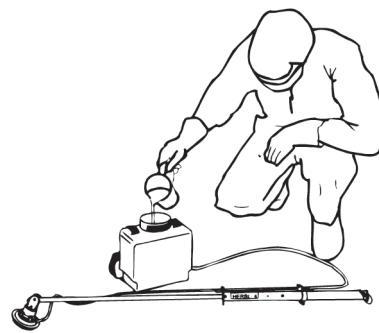
Do not use herbicide concentrations greater than the maximum recommended on the label (unless specific training or recommendations have been given) if the label:

- a) specifically prohibits use of 'Reduced Volumes' i.e. increased concentrations;
- b) has a statutory requirement for use of personal protective equipment when using the diluted product at high volumes (N.B. this will appear in the statutory box on the label);
or
- c) carries one of the following hazard ratings: 'very toxic', 'toxic' or 'corrosive' or carries the warning 'risk of serious damage to the eyes' e.g. paraquat (Gramoxone) which is classified as toxic should not therefore be used through the HERBI-4 at concentrations greater than recommended on the label. Micron do not generally recommend using spray mixes of more than ten times the maximum concentration recommended for high volume application with knapsack sprayers. The safest product and lowest dose rate appropriate for the treatment should be used at all times.

To prepare the spray mix first read the product label to determine the quantity of product to be applied per hectare e.g. 2 litres of glyphosate per hectare. Then determine the total spray volume to be applied per hectare with the Herbi-4 i.e. 10 or 20 litres per hectare. Calculate the ratio of product in water e.g. 2 litres glyphosate + 8 litres water = 10 litre mix = 1 : 4. Use this ratio to prepare the correct dose for the spray tank or bottle e.g. with a 5 litre backpack mix 1 litre glyphosate with 4 litre of water.



Measure out the exact amount of product.



Half fill the tank with clean water. Check for leaks. Add the measured product.

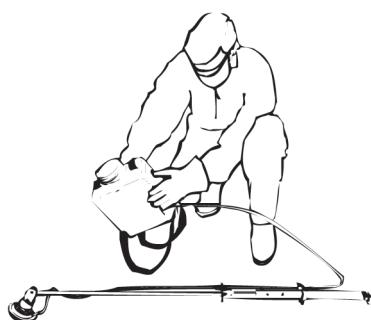
Never use leaking equipment. Take care to avoid spillage when filling or lifting the tank.



Fill the tank.



Wipe the tank with a dry cloth



Mix well by gently shaking the tank.



Place the tank on the operator's back.

Examples of mixing spray – for 1 hectare

a) glyphosate (360 g/l) 2 litres
add water: +8 litres

Total volume: 10 litres
i.e. 1 part glyphosate : 4 parts water

b) 2,4-D (500 g/l) 3 litres
add water: +17 litres

Total volume: 20 litres
i.e. 3 parts 2,4-D : 17 parts water

The table below indicates the relationship between total spray volume, flow rate and walking speed for the HERBI-4 as per the following formula:

Flow rate (ml/min) = 6 x total spray volume (l/ha) x walking speed (m/s) x band width (m)

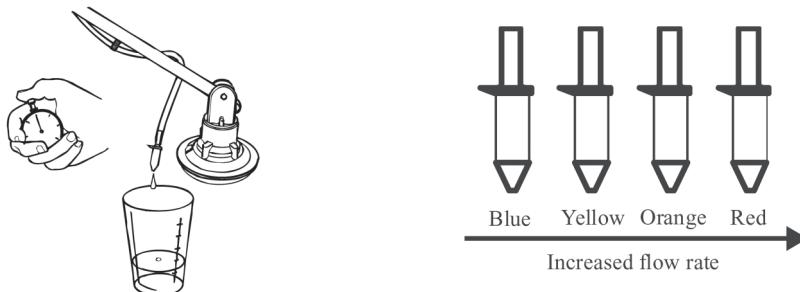
Total spray volume (l/ha)	Band width (m)	Feed nozzle	Flow rate (ml/min)	Walking speed (m/s)
10 (i.e. glyphosate)	1.2	Blue	72	1
20 (i.e. other herbicides)	1.2	Blue	72	0.5
		Yellow	144	1

Note: The flow rates in this table were measured with the spray head 65cm below the level of the liquid in the tank, using water only. The flow rate will vary with differences in this height and the viscosity of the spray mix (for very viscous spray mixes it may be necessary to use a larger feed nozzle).

CALIBRATION

Choose and fit the feed nozzle that is likely to be required. The actual flow rate should be checked holding the HERBI-4 in the spraying position. Remove the feed nozzle from the spray head by twisting and pulling out, then, once liquid has reached the feed nozzle, allow the liquid to flow into a suitable container for one minute and measure the volume dispensed. If the flow rate is not in the recommended flow rate range of 60 to 150 ml/min change the feed nozzle and repeat the above procedure.

N.B. It is preferable to walk more slowly to achieve the required spray volume than to use higher flow rates.



Example: Required spray volume rate = 20 l/ha; Flow rate measured = 100 ml/min

$$\text{Walking speed (m/s)} = \frac{\text{Flow rate (ml/min)}}{6 \times 1.2 \times \text{total spray volume (l/ha)}} = \frac{100}{7.2 \times 20} = 0.7$$

i.e. 0.7 m/s or 42 metres in one minute (0.7m x 60s)

Mark out a distance of 42 metres and practice walking it in one minute.

BEFORE SPRAYING

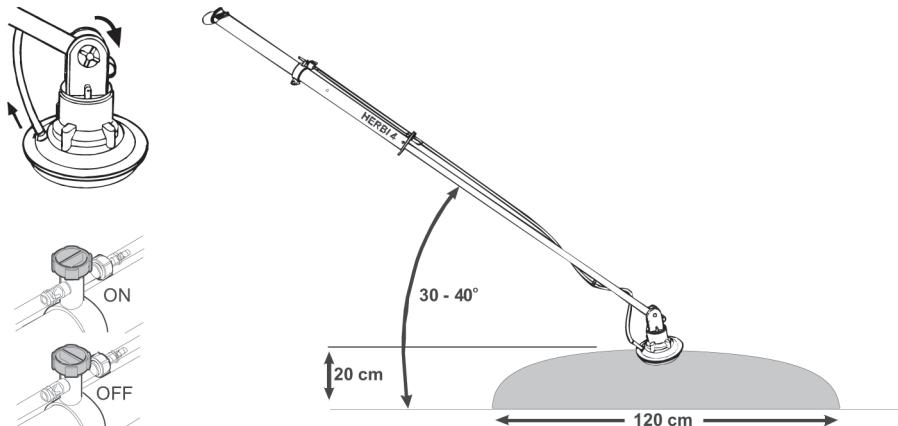
Check the wind speed and direction (below 5 kph) is safest. Take special care to avoid drift by keeping the spray head as low as possible. **Never** spray into the wind and avoid walking into the spray. **Always** keep the spray head at least 60cm from any part of the body to avoid direct contamination by the spray.

Before spraying for the first time use water **only** to check the spray pattern produced. Put some clean water in the tank and add a small amount of detergent. Check for leaks. Switch on the sprayer and then open the flow valve. Spray on one spot, preferably on clean dry concrete, for around 30 seconds with the spray head held about 20cm above the ground; a wet ring 1.2m wide should appear on the ground. Practice using the sprayer by walking along a few metres and then stopping spraying (see 'TO STOP SPRAYING').

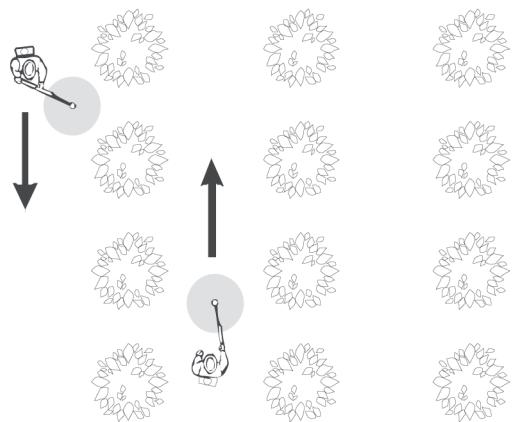
TO START SPRAYING

Hold the spray head about 20cm above the ground or weed foliage. Switch on the sprayer, check the atomiser disc starts spinning (**never** touch the atomiser disc when spinning or hold the spray head too close to the operator) and then open the flow valve. Start walking immediately the spray liquid reaches the feed nozzle. N.B. with the HERBI-4 Extra both flow valves must be opened.

The HERBI-4 is normally held at an angle of around 35° to 40° to the ground with the head inclined slightly away from the operator. **Do not** spray with the HERBI-4 held on the shoulder, since spray may contaminate the operator. N.B. the machine will not spray with the spray head above the level of liquid in the tank.

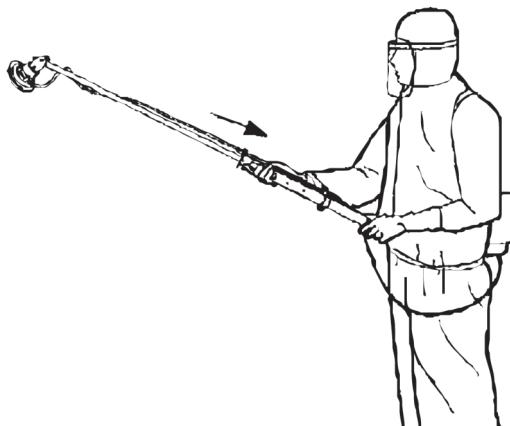


It is best to hold the HERBI-4 to the side or the rear so that the operator does not have to walk over the treated area.



TO STOP SPRAYING

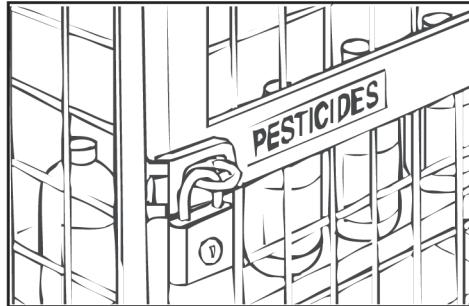
Close the flow valve and then switch off the sprayer. When the atomiser disc has stopped spinning raise the sprayer to an angle of 45° (see below). **Never** raise the spray head until the atomiser disc has stopped spinning. Then open the flow valve and drain any remaining liquid in the feed tube back into the tank (by raising the feed tube above the level of liquid in the tank). Then close the flow valve.



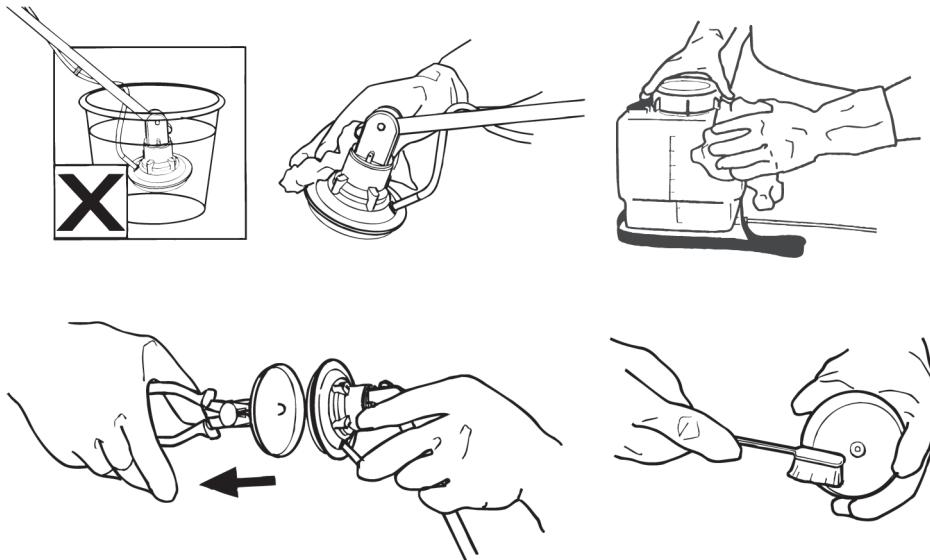
For ease of transport the tank can be disconnected (use the flow valve to isolate any liquid left in a backpack) and the sprayer collapsed (OFF the switch and disconnect the 3 pole connector).

AFTER SPRAYING

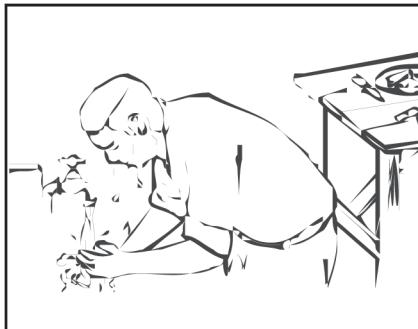
1. Dispose of any surplus spray mix according to the product approval. Store products safely, locked up and out of the reach of children.



2. It is **essential** to clean the sprayer and tank thoroughly using water and detergent after use. **Never** immerse the spray head in water or under a tap, since this will destroy the electric motor. A water and detergent mix should be put in the tank, swilled around, and then sprayed out onto the treated area of waste ground. The sprayer and tank should be wiped down externally using a cloth. Periodically remove the atomiser disc with a pair of pliers and clean with a soft brush.

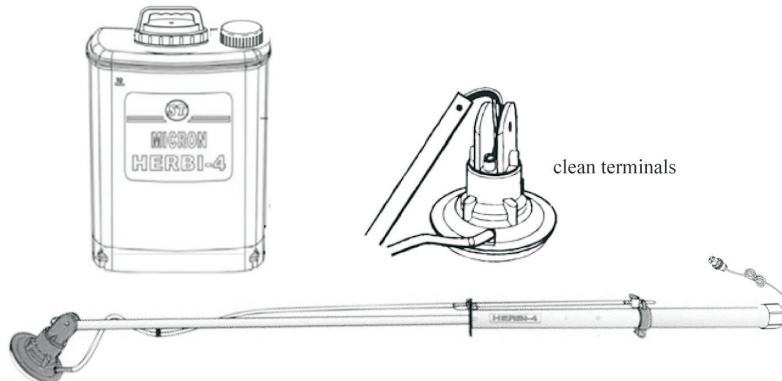


3. After working with agrochemicals, or handling spraying equipment, **always** thoroughly wash hands and exposed skin. All protective clothing should be washed separately from other clothing and stored. Contaminated gloves should be washed inside and out.



STORAGE

Before storing the HERBI-4, clean all the electrical contacts with wire brush or similar. The machine should be stored in a dry cool place.



RECHARGING AND MAINTAINING THE BATTERY (DIAGRAM 2)

- Connect the battery charger male ⑥ 3-pole connector to the tank female 3-pole connector ⑤ and lock the both connectors.
- The tank's switch ③ should be in **ON** position.
- Connect the battery charger plug to the main electric power and switch on. The Red static 'in charging' and the red blinking 'done charging' indicator will glow. The battery will need to recharge for 8 hours.
- After done with charging, remove the battery charger ⑥ from the main electric power and disconnect the 3-pole connector.

TROUBLESHOOTING

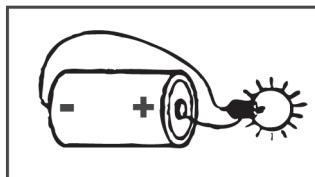
A) Atomiser disc spins but does not spray or sprays irregularly. Check:

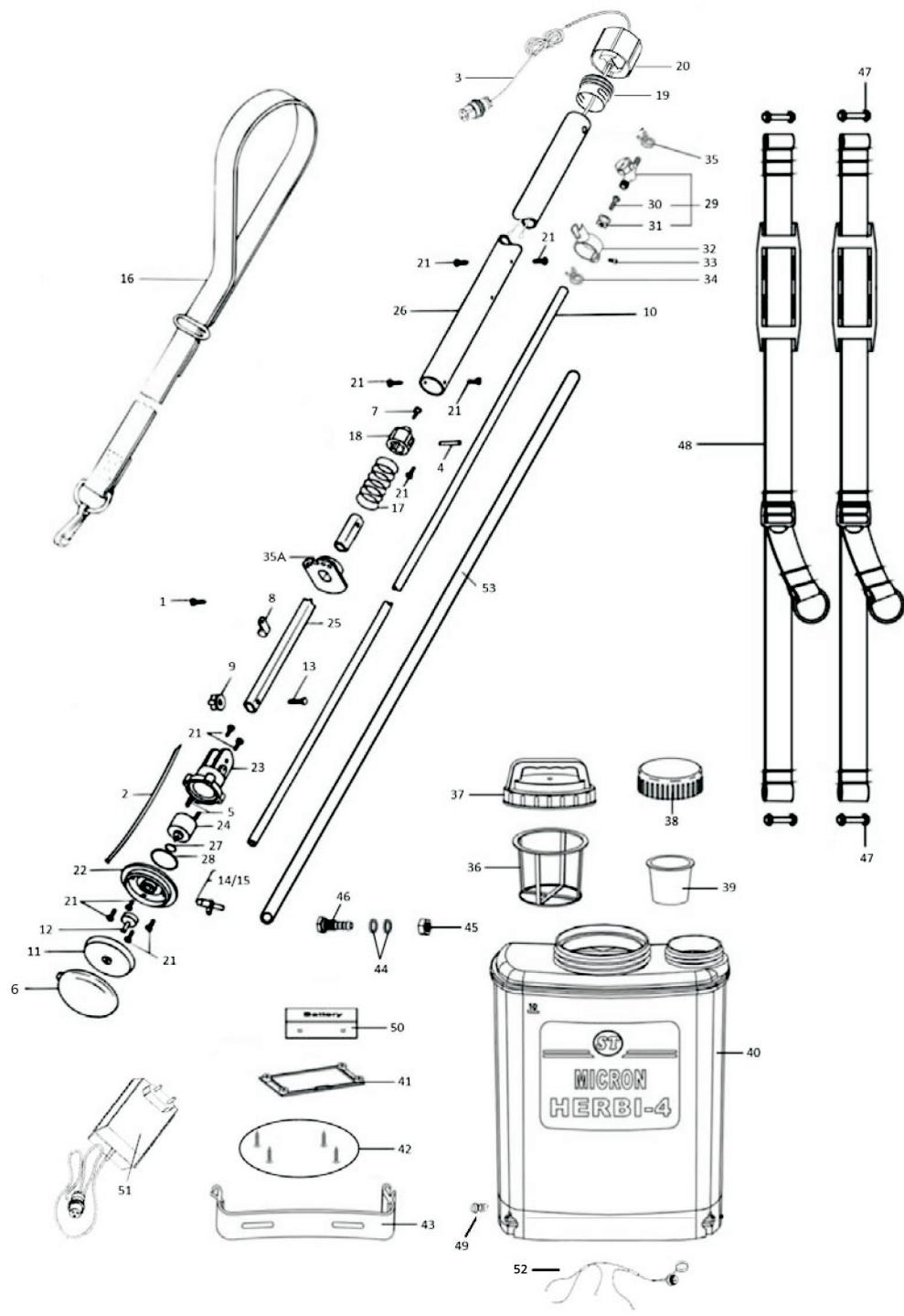
- The feed nozzle. If the feed nozzle is blocked remove and soak in soapy water. **Never** blow through the nozzle with your mouth. Check that the feed nozzle gives a flow rate within the operating range.
- The atomiser is clean and undamaged. Clean or replace.
- The flow valve for blockage. Rinse through with soapy water.

B) Atomiser disc fails to spin or spins unevenly. Check:

- Charging was done correctly.
Switch (3) should be in ON position when charging, 3 pole connector is connected properly.
- The condition of the batteries. Replace if necessary.
- That electrical terminals and contact points are clean and that electrical wires are not broken or corroded.
- If the atomiser disc is rubbing on the motor base plate or the motor shaft is bent. Replace the disc or motor if necessary.
- The motor for corrosion or obvious signs of wear. Replace if necessary.

N.B. Battery condition can be checked with a torch (or a torch lightbulb and electrical wire).





MICRON HERBI-4 SPRAYER PARTS Listing

ITEM	PARTS NO.	DESCRIPTION
1.	STMC-021-10000	SCREW NO. 6 X 1/4" S/T (B)
2.	STMC-021-10001	AIR VENT TUBE - 0.15M
3.	STMC-021-10002A (NEW)	ELECTRIC WIRE BLACK / RED (3-POLE CONNECTOR)
4.	STMC-021-10005	SPRING HOLDER PIN
5.	STMC-021-10006	SPRING 9/32" TERMINAL CONNECTING
6.	STMC-021-10007	ATOMISER PROTECTIVE COVER (GREEN)
7.	STMC-021-10008	SCREW NO 6 X 3/8" S/STEEL
8.	STMC-021-10009	TUBE CLIP
9.	STMC-021-10010	WING NUT
10.	STMC-021-10011	PVC TUBE 6MM X 9MM - 1.21M
11.	STMC-021-10012	ATOMISER DISC
12.	STMC-021-10013	SLINGER DUMMY SHAFT
13.	STMC-021-10014	SCREW M5 X 25MM
14.	STMC-021-10015	FEED NOZZLE BLUE
15.	STMC-021-10016	FEED NOZZLE YELLOW
16.	STMC-021-10053	NECK STRAP
17.	STMC-021-10017	SPRING BATTERY CASE
18.	STMC-021-10018	CENTRE CONNECTOR
19.	STMC-021-10060	SCREW SWITCH PLUG
20.	STMC-021-10061	SCREW SWITCH SLEEVE
21.	STMC-021-10023	SCREW NO 6 X 3/8" S/T POZI PANHEAD (B)
22.	STMC-021-10026	FRONT PLATE
23.	STMC-021-10027	MOTOR HOUSING C/W AIR BLEED TUBE
24.	STMC-021-10028	MOTOR HERBI - 4
25.	STMC-021-10029	EXTENSION TUBE 1.15M
26.	STMC-021-10030	BATTERY CASE
27.	STMC-021-10032	O - RING (BS 611)
28.	STMC-021-10033	O - RING (BS 365-30)
29.	STMC-021-10034	INLINE SYPHONE TAP (NEW MODEL)
30.	STMC-021-10035	INLINE SYPHONE TAP CONNECTOR
31.	STMC-021-10036	JOINT NUT
32.	STMC-021-10037	SYPHONE TAP HOLDER
33.	STMC-021-10038	SCREW
34.	STMC-021-10039	HOSE CLIP
35.	STMC-021-10040	HOSE CLIP
35A.	STMC-022-10039	BATTERY CASE END CAP
<u>TANK (NEW MODEL)</u>		
36.	STMC-021-10054	NYLON 80 MESH FILLING STRAINER
37.	STTK-011-10008	FILLING CAP COMPLETE
38.	STMC-021-10041	SPARE CUP COVER
39.	STMC-021-10042	SPARE CUP
40.	STMC-021-10043	10 LITER TANK
41.	STTK-012-10016	BATTERY BOTTOM COVER
42.	STMC-021-10044	BATTERY COVER BOTTOM SCREW
43.	STTK-012-10006	STAND GUARD
44.	STTK-012-10019	OUTLET WASHER
45.	STMC-021-10045	OUTLET VALVE
46.	STMC-021-10046	OUTLET VALVE NUT
47.	STTK-011-10003	STRAPS STOPPER
48.	STTK-011-10002	SHOULDER STRAP
<u>BATTERY CONVERSION KIT</u>		
49.	STMC-021-10048 A (NEW)	SWITCH C/W SWITCH COVER
50.	STMC-021-10050	6V 3AH LEAD SEALED BATTERY
51.	STMC-021-10051A (NEW)	6V BATTERY CHARGER
52.	STMC-021-10052 A (NEW)	WIRE HARNESS FROM BATTERY(3-POLE CONNECTOR)
53.	STMC-021-10057	PVC TUBE

MICRON HERBI-4 PERIODIC INSPECTION CHECK LIST

ITEM	PARTS NO	DESCRIPTION	4 MONTHS	8 MONTHS	12 MONTHS
1	STMC-021-10002A (NEW)	Electric Wire Black / Red (3-Pole Connector)			0
2	STMC-021-10006	Spring 9/32" Terminal Connecting		0	0
3	STMC-021-10011	Pvc Tube 6mm X 9mm - 1.21M			0
4	STMC-021-10012	Atomiser Disc	0	0	0
5	STMC-021-10013	Slinger Dummy Shaft	0	0	0
6	STMC-021-10016	Feed Nozzle Yellow		0	
7	STMC-021-10053	Neck Strap			0
8	STMC-021-10028	Motor Herbi - 4	0	0	0
9	STMC-021-10032	O - Ring (BS 611)	0	0	0
10	STMC-021-10033	O - Ring (BS 365-30)	0	0	0
11	STMC-021-10034	Inline Syphone Tap (New Model)		0	
12	STTK-011-10002	Shoulder Strap			0
13	STMC-021-10057	Pvc Tube		0	
14	STTK-012-10016	Battery Bottom Cover			0
15	STMC-021-10044	Battery Cover Bottom Screw			0
16	STMC-021-10048A (NEW)	Switch c/w Switch Cover		0	
17	STMC-021-10050	6v 3ah Lead Sealed Battery	0	0	0
18	STMC-021-10025A (NEW)	Wire Harness Battery(3-Pole Connector)		0	

0 - Complusory change for continuous use at indicated intervals.

The rest change when necessary.

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