MICRON

Handy

Instruction Manual

Publication Part Number: 9117

Revision: 1.1

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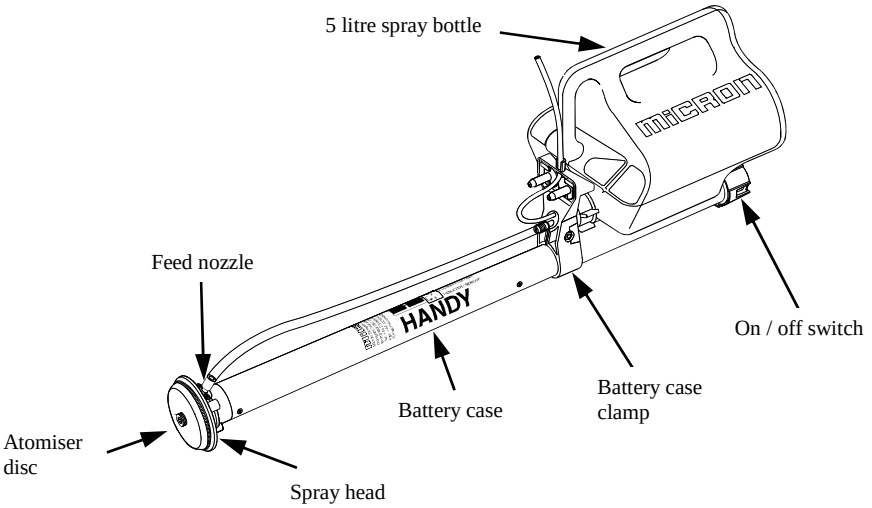
DESCRIPTION

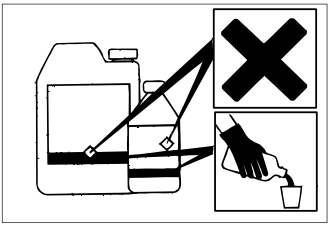
The HANDY is a lightweight hand-held, spinning disc, Controlled Droplet Application (CDA) sprayer, designed for the application of herbicides at low volumes (10 to 30 litres/hectare). It is powered by four torch (D-cell/R20) batteries, which give over 40 hours spraying. Liquid is fed by gravity through colour coded feed nozzles. An electrically governed motor spins the atomiser disc at a constant 2000 rpm to produce uniform spray droplets of around 250 micron; large enough to minimise any risk of spray drift. The ergonomic design of the HANDY, with the carrying handle and bottle being an integral part of the machine allows for closed chemical transfer and improved operator safety. The weight of the machine ready to spray is 6.2 kg.



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 HANDY in potentially explosive atmospheres or spray flammable liquid through it.
The HANDY can be used with most conventional herbicides, as well as specific CDA formulations (only available in some countries).

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 product 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 HANDY 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 HANDY is:

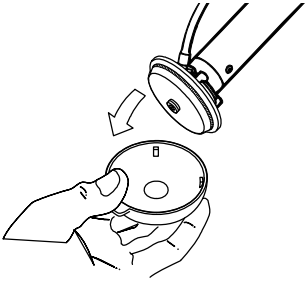
- rubber gloves
- boots/shoes and long trousers
- eye protection
- long sleeved shirt

Note:

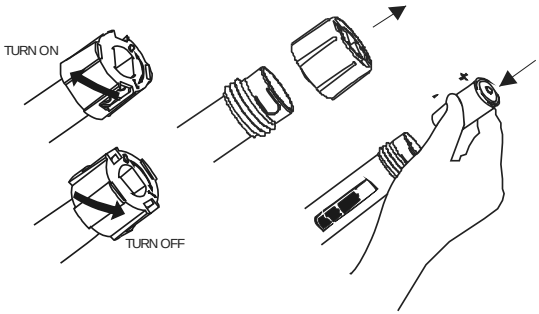
a) Acoustic information: the sound pressure level at the operator's ear does not exceed 70 dB(A).

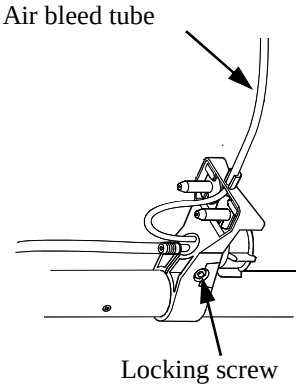
b) Vibration: the weighted RMS acceleration value at the hands when using this machine does not exceed 2.5 m/sec².

PREPARING FOR SPRAYING - NEW SCREW SWITCH



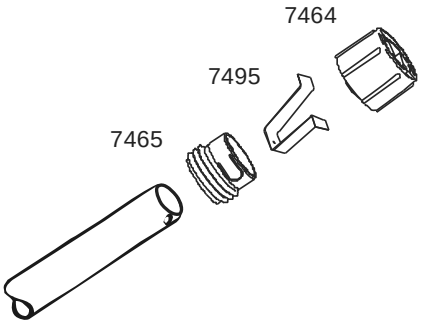
1. Remove the green protective cover from the atomiser disc.
2. Remove the switch end piece as shown on the label.
3. Insert four batteries (D-cell/R20) negative i.e. flat end first, and replace the switch end piece





4. Make sure that the locking screw on the battery case clamp is tight and that the air bleed tube is correctly positioned in the groove as shown.

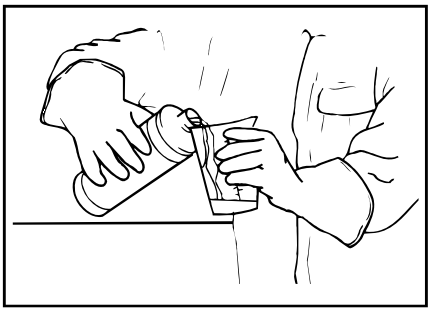
PARTS LIST AND DIAGRAM - NEW SCREW SWITCH



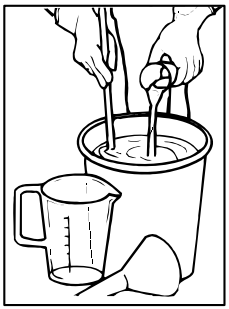
DESCRIPTION	PART NO.
SCREW SWITCH PLUG	7464
SCREW SWITCH SLEEVE	7465
CONNECTOR SCREW SWITCH	7495

MIXING, FILLING AND CALIBRATION

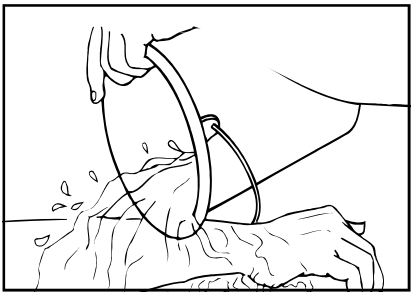
Mixing and filling is generally the most hazardous process in the spraying operation. **Always** follow the label instructions. **Always** use a funnel (preferably with a filter) when filling the bottle. **Only** mix enough spray for the area to be treated thereby avoiding the need for disposal of unused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



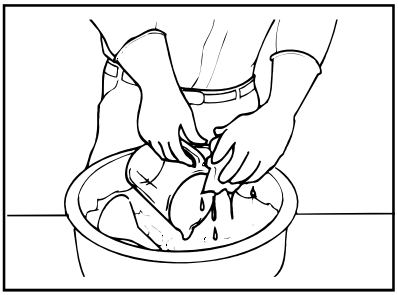
Always wear gloves when handling agrochemicals and equipment.



Always use the correct equipment when mixing and measuring.



Always wash off any skin contamination



Always clean all equipment after use.

With the HANDY herbicides are usually applied in around 20 litres total spray volume per hectare, with the exception of 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. Use the minimum dose rate recommended on the label for the intended treatment and add water to make up to the volume required for application with the HANDY.

For example, if the label recommends applying a minimum of 2 litres of product made up to 200 litres of water per hectare with a knapsack sprayer, use 2 litres of product made up to 20 litres for application with the HANDY, i.e. a spray mix concentration of 10%.

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

- specifically prohibits use of 'Reduced Volumes' i.e. increased concentrations;
- 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
- carries one of the following hazard ratings: 'very toxic', 'toxic' or 'corrosive' or carries the warning 'risk of serious damage to the eyes'

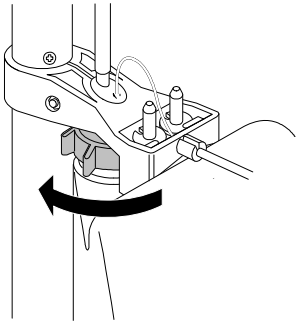
Micron do not generally recommend using spray mixes more than ten times the maximum concentration recommended for high volume application with knapsack sprayers. The safest product and lowest dose rate appropriate for the treatment should be used at all times.

To prepare the spray mix select the dose rate of product to be applied per hectare (from the product label) and mix in a suitable container. With liquid formulations, mixing can generally be carried out in the 5 litre spray bottle as shown below. Formulations which are harder to mix such as wettable powders or granules should be first mixed in a bucket and the spray mix then transferred to the spray bottle.

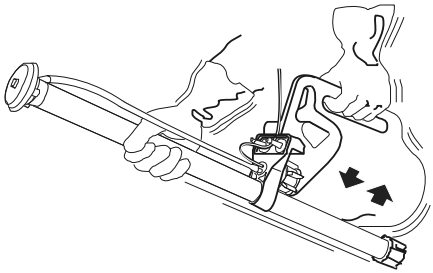
1. Half fill the spray bottle with water

2. Measure out the exact amount of product and add to the spray bottle

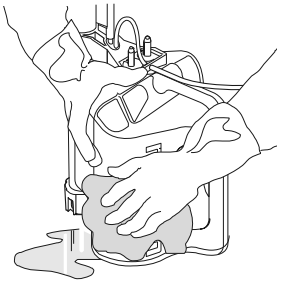
3. Fill with water up to the 5 litre mark.



4. Attach the spray bottle to the battery case clamp, making sure that the union nut is firmly tightened.



5. Shake the bottle to ensure thorough mixing - check for leaks.



6. Wipe the bottle with a dry cloth.

Never use leaking equipment. Take care to avoid the spillage of spray mix.

Examples of mixing spray - for 1 hectare

a) glyphosate:	2 litres
add water:	+8 litres
Total volume:	10 litres

i.e. 1 part glyphosate : 4 parts water

e.g. 1 litre of glyphosate + 4 litre of water in 5 litre spray bottle

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

e.g. 750 ml of 2,4-D + 4.25 litres of water in 5 litre spray bottle.

The formula below gives the relationship between swath width, flow rate, walking speed and total spray volume:

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

The table below gives examples of feed nozzle selection and walking speed to achieve desired total volume application rates.

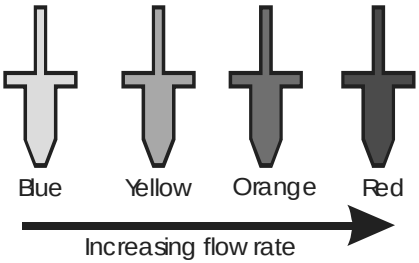
Total spray volume (l/ha)	Band width (m)	Feed nozzle	Flow rate (ml/min)	Walking speed (m/sec)
10 (i.e. glyphosate)	1	Blue	70	1.2
20 (i.e. other herbicides)	1	Orange	180	1.5

These values have been measured using water only. Actual flow rates will depend on the viscosity of the spray liquid used and the angle at which the operator holds the sprayer. Before spraying, therefore, the HANDY should be calibrated by the operator for the spray mix being used.

CALIBRATION

To calibrate the HANDY remove the atomiser disc (see 'AFTER SPRAYING') and collect and measure the volume of spray liquid dispensed in one minute with the sprayer held in the normal "head down" spraying position (see 'TO START SPRAYING'). As the balance of the machine and hence angle at which it is held will vary as the spray bottle empties, an average flow rate will be obtained if measured with the bottle half full.

It may be necessary to fit a different feed nozzle to obtain the desired flow rate. To change the nozzle, pull off the feed tube and remove the two screws which hold the nozzle in position. Alternative nozzles are located in slots in the battery case clamp. These are colour coded according to flow rate. Select the colour needed and screw into place.



Once the flow rate for a particular feed nozzle has been determined, walking speed should be adjusted to achieve the required spray volume.

Example: required spray volume rate = 20 l/ha Flow rate measured = 150 ml/min

$$\text{Walking speed (m/s)} = \frac{\text{Flow rate (ml/min)}}{6 \times 1 \times \text{total spray volume (l/ha)}} = \frac{150}{6 \times 20} = 1.25$$

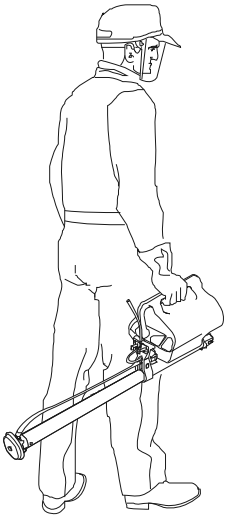
In general it is preferable to walk more slowly to achieve the required spray volume than to use higher flow rates.

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.

Before spraying for the first time use soap and water **only** to familiarise yourself with the sprayer and check the spray pattern produced. Put around a litre of water in the spray bottle and add a few drops of liquid detergent such as household washing up liquid. The detergent is important to reduce the surface tension in the liquid feed tube and helps ensure an even flow.

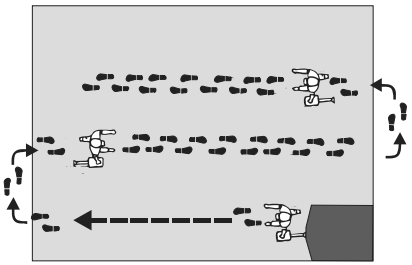
TO START SPRAYING



"Head Down" Position

To start spraying, first switch on the motor and check that the atomiser disc is spinning (never touch the disc when it is spinning). Then, holding the spray bottle by the handle, tilt it backwards into the "head down" spraying position so that the spray head is below the level of the bottle. This allows spray liquid to flow onto the atomiser disc.

The battery case should be at an angle of around 35° to the ground with the spray head about 20 cm above the ground or top of the weed canopy. Make sure that the spray head is far enough behind you so as to avoid contaminating the back of the legs. Look behind to ensure that the sprayer is not leaking around the union nut and to confirm that spray is being issued from the disc.

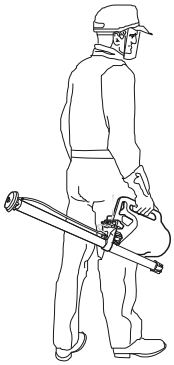


Start walking at the required speed. Occasionally glance behind to ensure that spray is being produced from the atomiser disc and the feed nozzle is not blocked.

At the end of the row do not interrupt the flow by turning the sprayer into the head up position, but continue application on the next row.

TO STOP SPRAYING

If there is any spray liquid left in the spray bottle, keep the motor running and slowly tilt the sprayer so that the head is above the level of the bottle and when no more spray liquid is emitted from the atomiser disc, switch off the sprayer. Do not raise the spray head above waist level with the disc still spinning as spray may continue to be emitted.



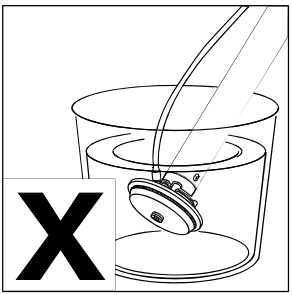
"Head Up" Position

AFTER SPRAYING

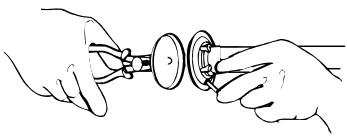
1. Dispose of any surplus spray mix according to the product approval. Store products safely, locked up and out of the reach of children.

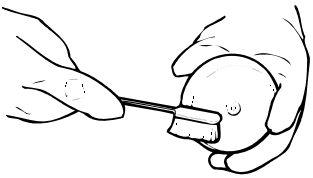
2. It is essential to clean the sprayer and bottle thoroughly using water and detergent after use. Never immerse the spray head in water or under a tap, since this will destroy the electric motor.

   A water and detergent mix should be put in the bottle, rinsed around, and then sprayed out onto the treated area or an area of waste ground. The sprayer and bottle should be wiped down externally using a cloth.

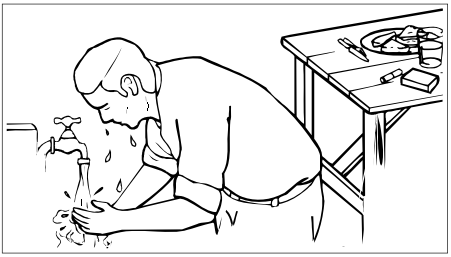


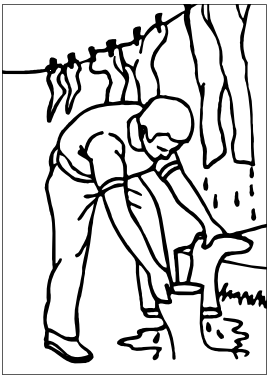
3. Periodically remove the atomiser disc with a pair of pliers and clean using a soft brush. When refitting the atomiser disc ensure that the two small lugs on the inside of the disc hole align with the slot in the white shaft which attaches to the motor.





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 for long periods, make sure that the batteries are removed to prevent leaking and that the sprayer is clean and dry. Both the sprayer and batteries should be stored in a dry place away from direct sunlight.

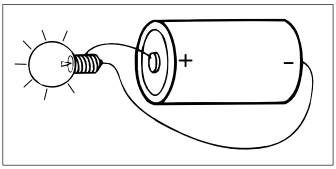
Troubleshooting

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

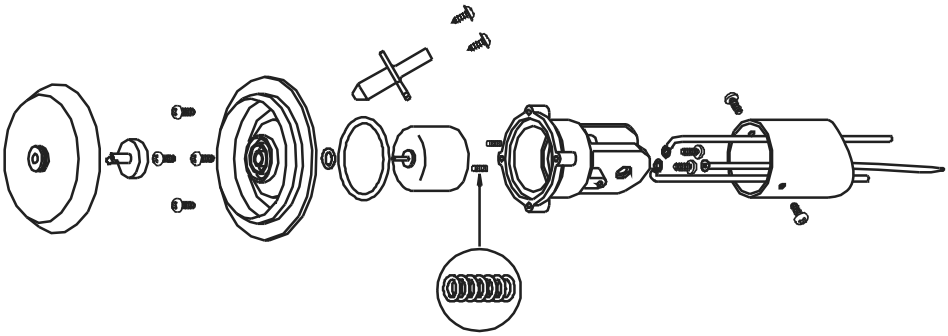
- the feed nozzle. If the feed nozzle is blocked remove and soak in soapy water. Never blow through the nozzle with your mouth.
- that the feed nozzle gives a flow rate within the operating range.
- that the air bleed tube is not blocked and correctly positioned (see 'PREPARING FOR SPRAYING')
- the atomiser disc is clean and undamaged. Clean or replace.

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

- that the batteries are fitted correctly.
- the condition of the batteries. Replace if necessary. Battery condition can be checked using a torch or torch bulb and electrical wire as shown.

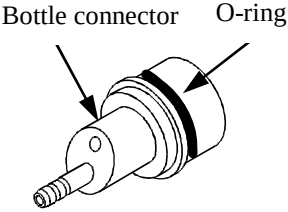


- that electrical terminals and contact points are clean and that electrical wires are not broken or corroded.
- if the atomiser disc is rubbing on the motor front plate or the motor shaft is bent. Replace the disc or motor if necessary.
- the motor for corrosion or obvious signs of wear. Replace if necessary.

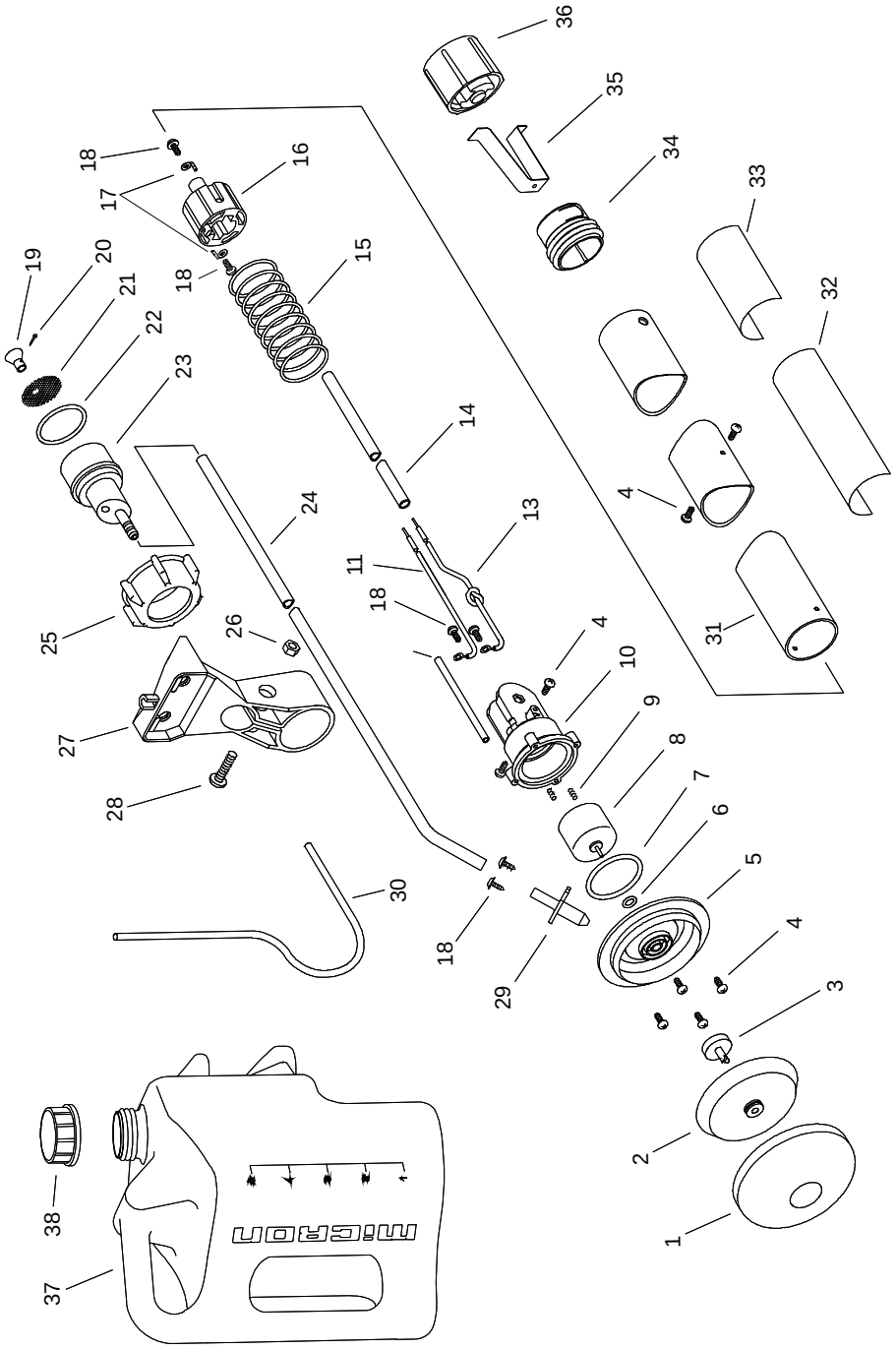


c) Leakage occurs at the bottle connection. Check:

- that the O-ring (part number 5148) around the bottle connector (part number 5752) is in place and in good condition. Replace if necessary.



HANDY PARTS DRAWING



HANDY PARTS LIST

NO	DESCRIPTION	PART NO.	QTY
1	ATOMISER PROTECTIVE COVER, GREEN	4462/GREEN	1
2	ATOMISER DISC	5021	1
3	SLINGER / DUMMY SHAFT	5022	1
4	SCREW No. 6 x 3/8” POZI PAN HD, TYPE B S/S	5399	11
5	FRONT PLATE	5424	1
6	O’RING NITRILE	7289	1
7	O’RING BS365-30, NITRILE	5455	1
8	MOTOR HERBI	5442	1
9	SPRING 9/32” LONG	4457	2
10	MOTOR HOUSING	6125	1
11	WIRE 1MM SQ, RED 0.59M LONG	4368/59	1
12	AIR VENT TUBE, 0.2M LONG	3512/20	1
13	WIRE 1MM SQ, BLACK 0.56M LONG	4134/56	1
14	TUBE 5MM x 8MM PVC, 0.51M LONG	4993/20	1
15	SPRING, BATTERY CASE S/S	5363	1
16	CENTRE CONNECTOR	5375	1
17	TERMINAL RING	5575	4
18	SCREW No.6 x 3/8” S/S FLANGED HD, TYPE AB	4646	4
19	AIR BLEED DEFLECTOR	5063	1
20	PIN 1MM x 10MM LONG, BRASS	5463	1
21	FILTER, 40 MESH	4428	1
22	O’RING BS125, VITON	5148	1
23	BOTTLE CONNECTOR	5752	1
24	TUBE 6MM x 9MM, PVC, 0.2M LONG	4309/20	1
25	UNION NUT	5753	1
26	NUT M6, PLAIN STEEL	3691	1
27	BATTERY CASE CLAMP	6126	1
28	SCREW M6 x 25MM, SLOTTED PAN HD A2 S/S	5787	1
29	NOZZLE, ORANGE	4766	1
	NOZZLE, BLUE	4338	1
	NOZZLE, YELLOW	3405	1
30	TUBE, 3/16” O/D, NYLON, 0.45M LONG	3374/45	1
31	BATTERY CASE, ALUMINIUM, 0.75M LONG	5377	1
32	LABEL HANDY	8426	1
33	LABEL, BATTERY ON/OFF	8621	1
34	SWITCH SLEEVE	7465	1
35	CONNECTOR, SWITCH, PRESSED	7495	1
36	SWITCH PLUG	7464	1
37	BOTTLE, 5 LITRE	6167	1
38	CAP, 40MM	6177	1

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