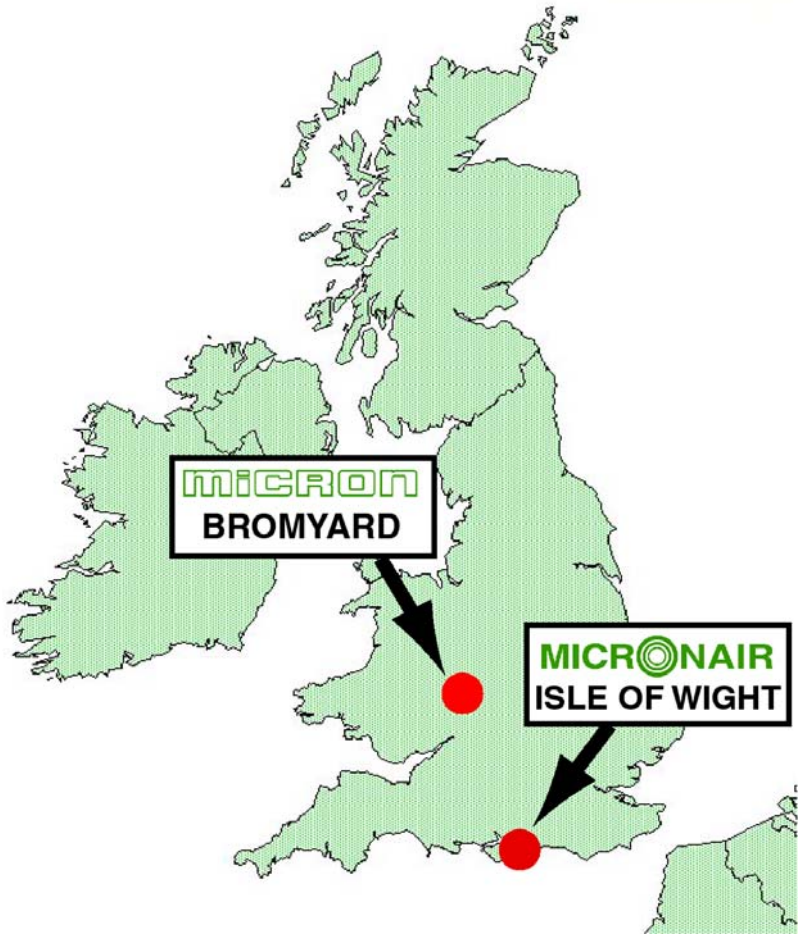
SPRAY EQUIPMENT FOR ENVIRONMENTAL HEALTH

MICRONAIR

Micron Sprayers Limited

- UK based and owned
- Pioneer of CDA using rotary atomisers
- 50 employees
- Sales to over 90 countries
- Micronair Division on Isle of Wight



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ULTRA LOW VOLUME (ULV) SPRAYING

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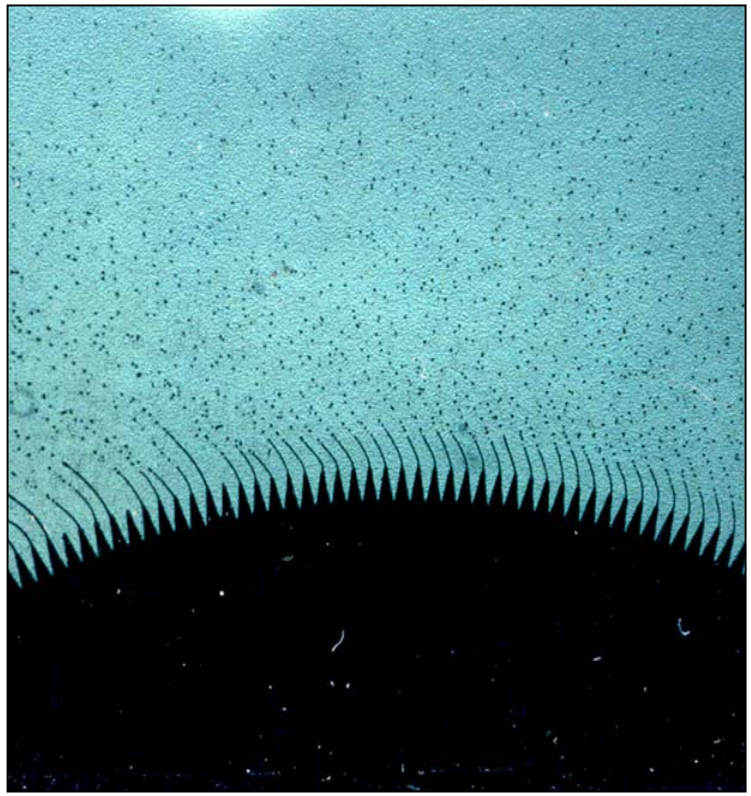
Production of Spray Droplets

Flat fan pressure nozzle



Rotary atomiser

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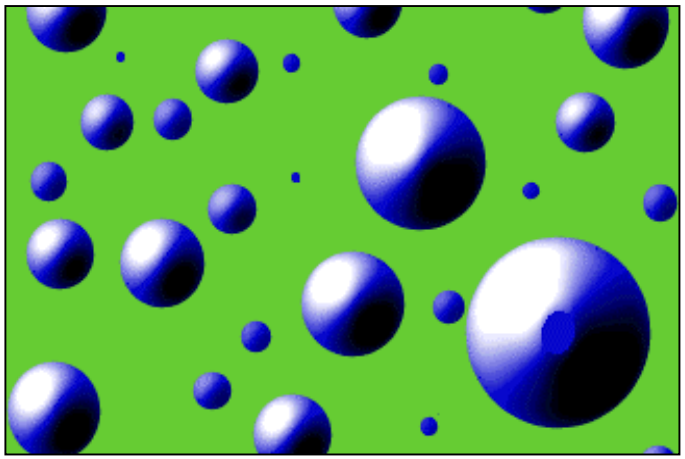
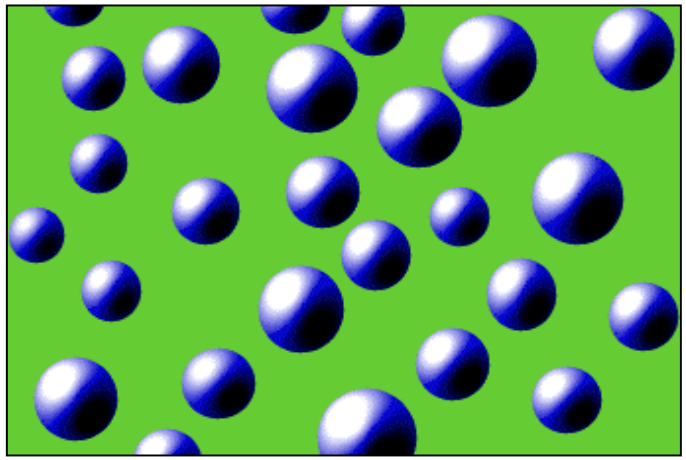
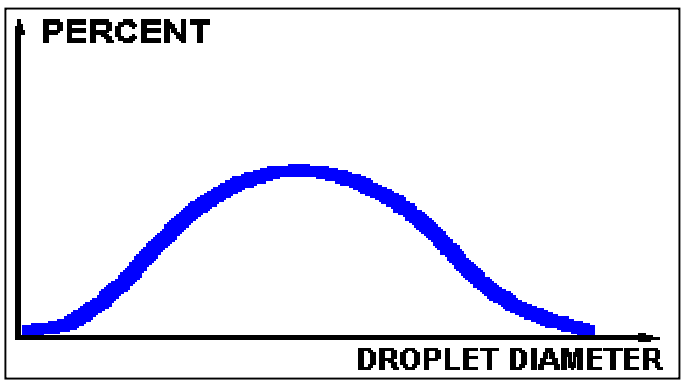
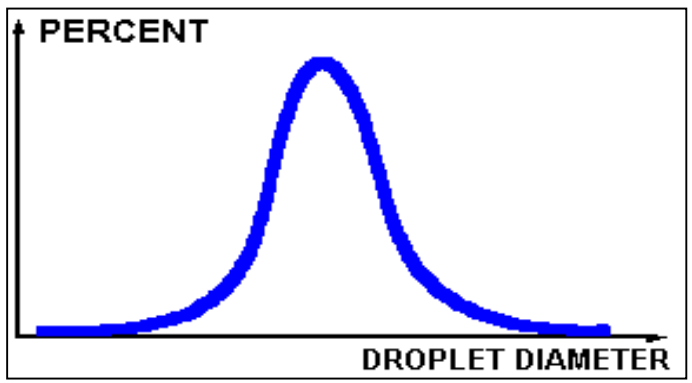
Comparison of Spray Droplets









Pressure nozzle

Rotary atomiser

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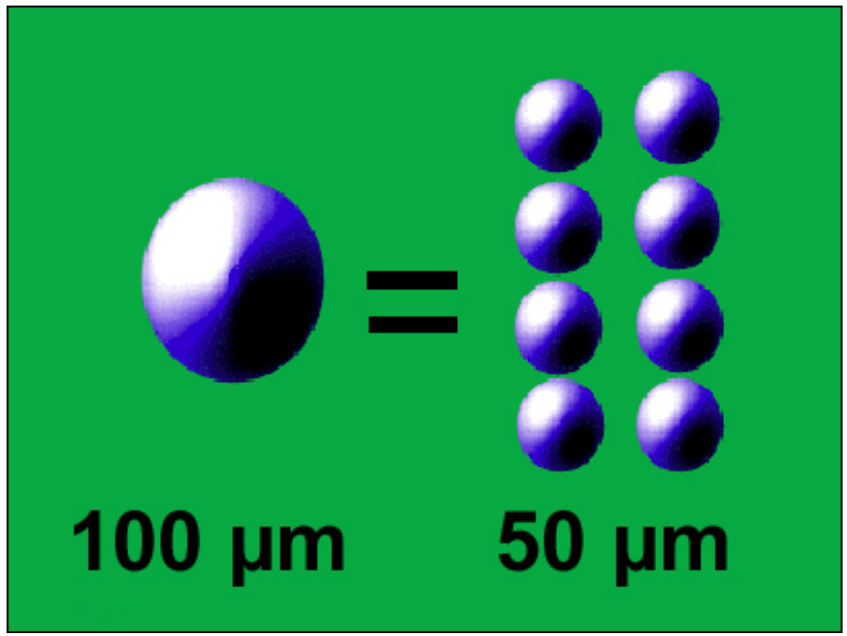
Droplet Size & Number

- The volume of a spray droplet is proportional to the cube of its diameter
- Halving the diameter produces 8x the number of droplets from the same amount of spray liquid
- Large droplets will settle quickly



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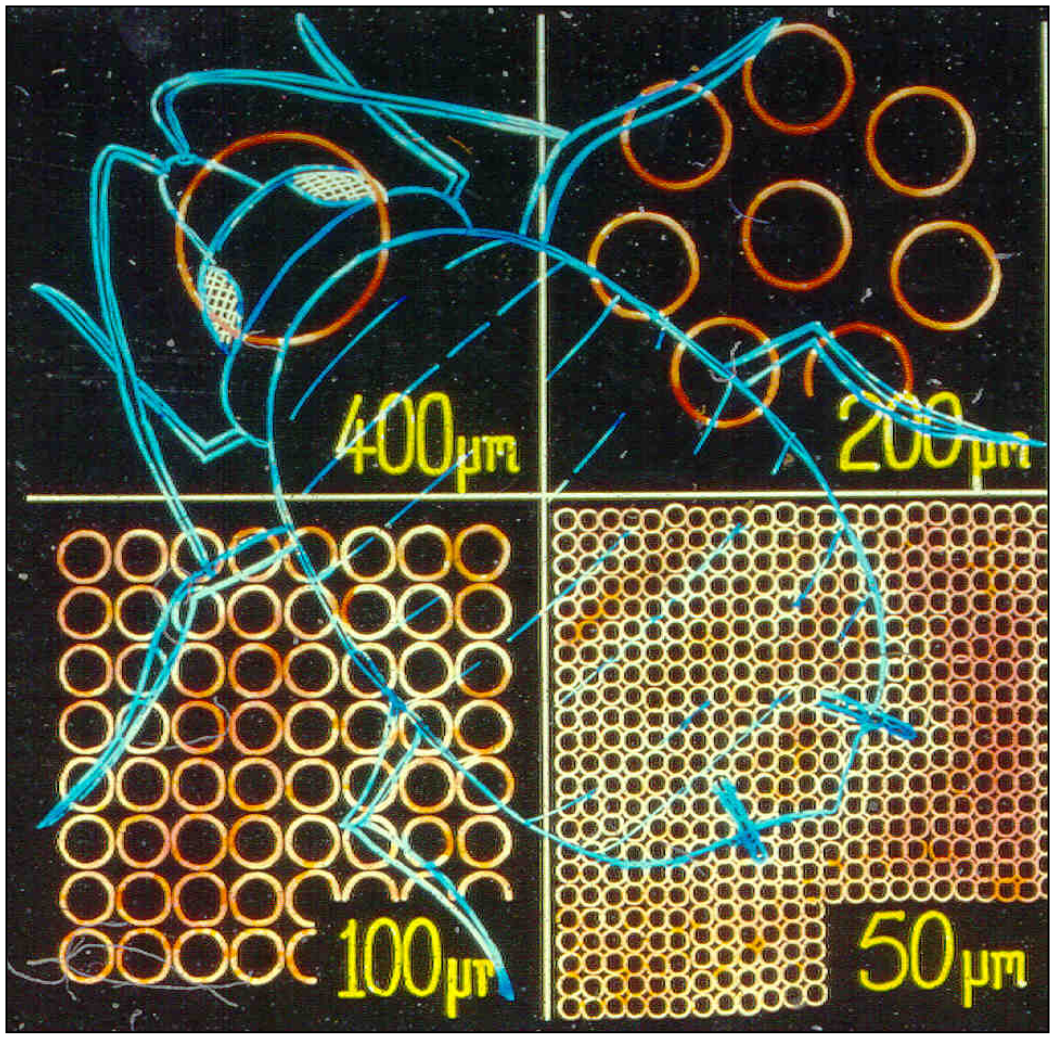
Number of Droplets on Target

1

8



64

512

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EQUIPMENT

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ULV Sprayers for Environmental Health

AU8000

- Rotary gauze atomiser on knapsack mistblower
- Robust construction - designed for continuous use

Micron Micronex

- Rotary disc atomiser on knapsack mistblower
- Low-cost sprayer for private or occasional use

AU8115 Series

- Vehicle mounted sprayers using rotary gauze atomiser with air assistance

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Micronair AU8000 Sprayer

- 77 cc (3.6 kw) engine
- Uses 2-stroke gasoline
- 20 m^3/min blower
- 125 m/sec air velocity
- 17 l liquid tank
- Optional pump
- Micronair AU8000 sprayhead

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Micronair AU8000 Sprayer

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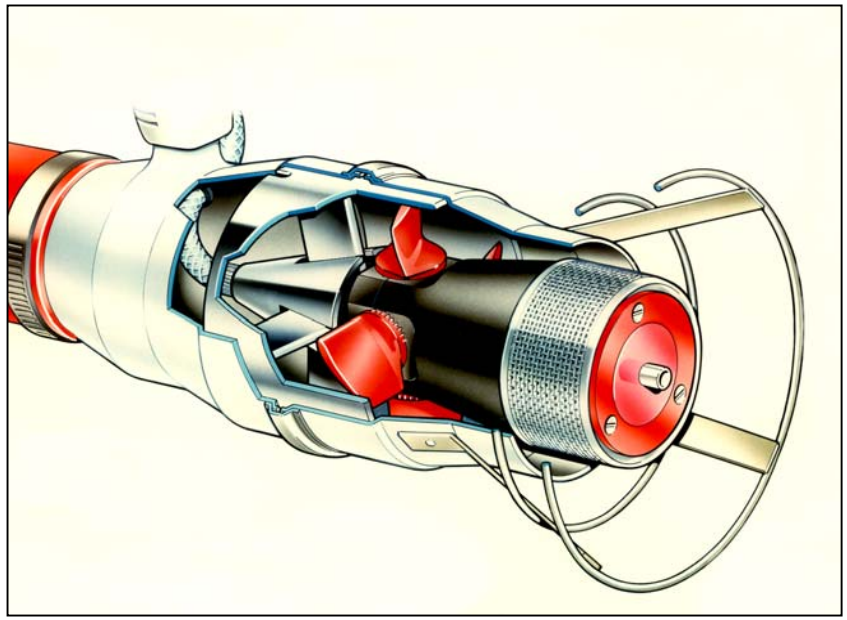
AU8000 Sprayhead

- AU8000 atomiser
- Air driven
- Adjustable fan blades control droplet size
- Handle with on/off valve & flow control
- Flow 0.02 - 1.20 l/min



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AU8000 Sprayhead Specification

Weight	**1.5 Kg**
Length	**300 mm**
Diameter (guard)	**150 mm**
Air inlet tube dia	**65 mm**
Power source	**Air from mistblower**
Atomiser speed*	**10,000 – 12,000 RPM**
Flow rate	**0.02 – 1.20 litres/minute**

Performance varies according to mistblower used

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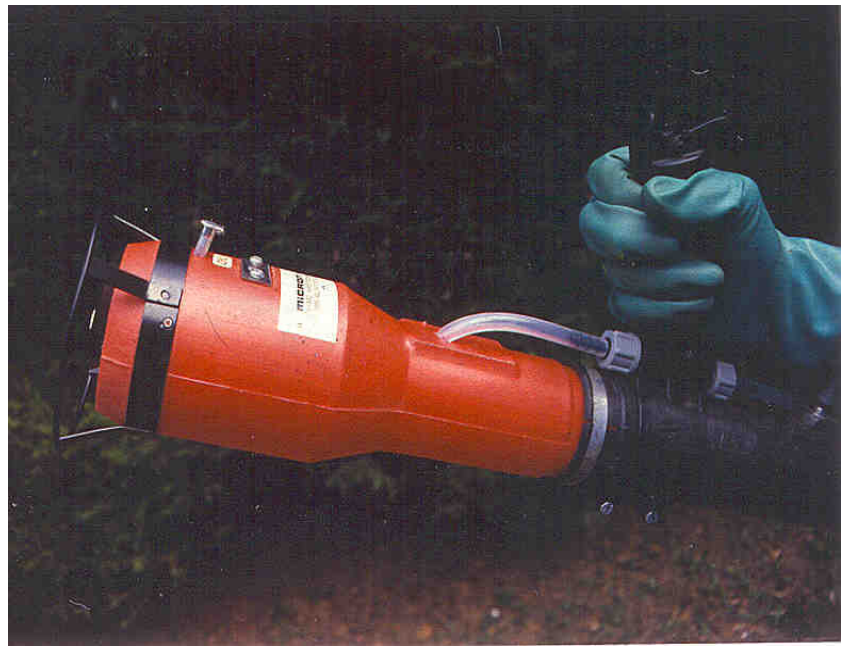
Micron Micronex

- X-1 disc atomiser
- Air driven
- Fixed pitch fan blades
- Handle with on/off valve & flow control
- Flow 0.02 – 0.15 l/min



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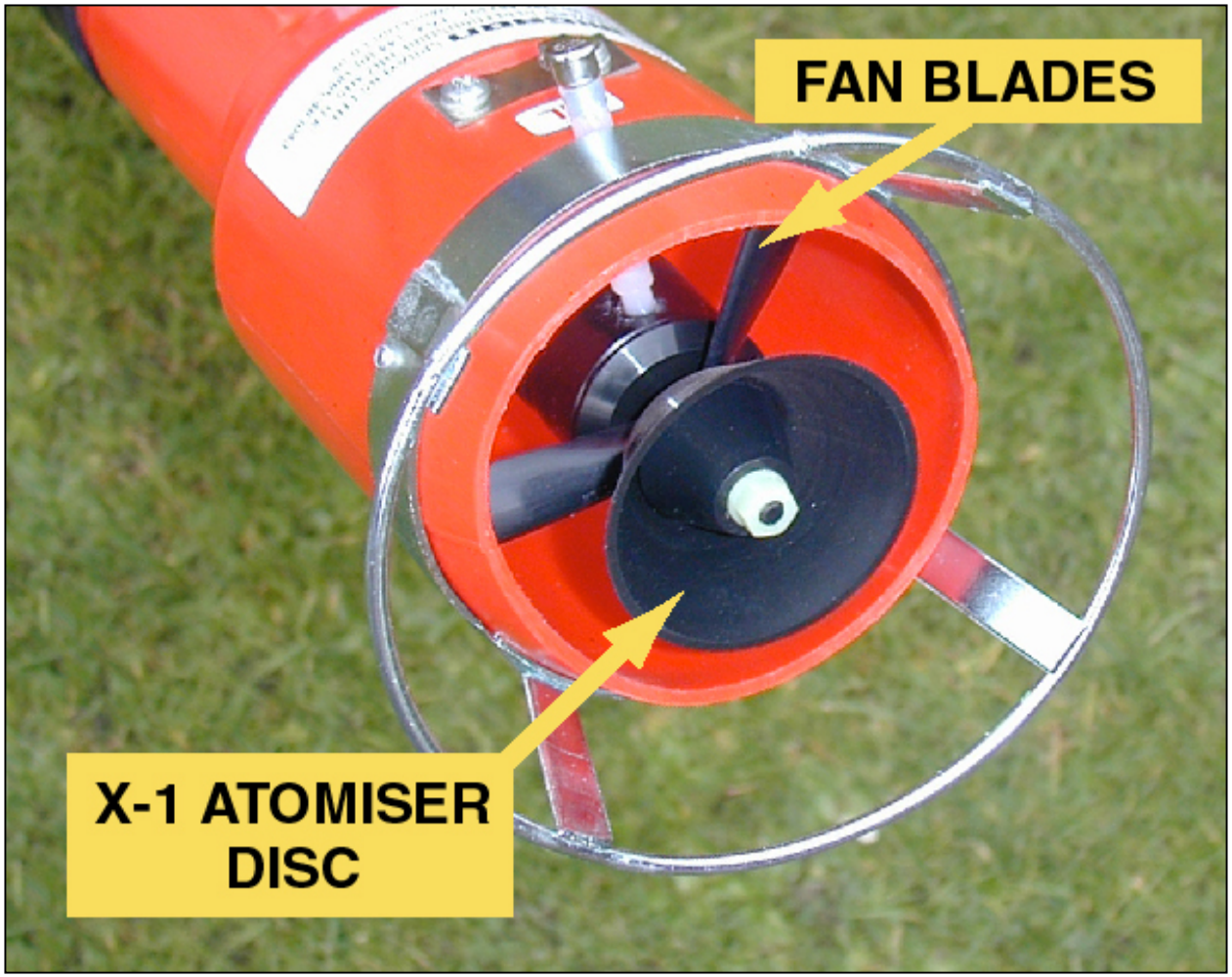
Micron Micronex Sprayhead



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Micronex Specification

Weight	**0.5 Kg**
Length	**350 mm**
Diameter (guard)	**140 mm**
Air inlet tube dia	**60 – 68 mm**
Power source	**Air from mistblower**
Disc speed*	**10,000 – 15,000 RPM**
Flow rate	**0.02 – 0.15 litre/min**

**Performance varies according to mistblower used*

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Micronair AU8115M Sprayer

- 11 HP 4-stroke engine
- Uses normal gasoline
- Blower drives AU8115 sprayhead
- 100 l liquid tank
- 10 l flushing tank
- Electric pump
- Flow 0.02 - 3.5 l/min
- Controls in cab

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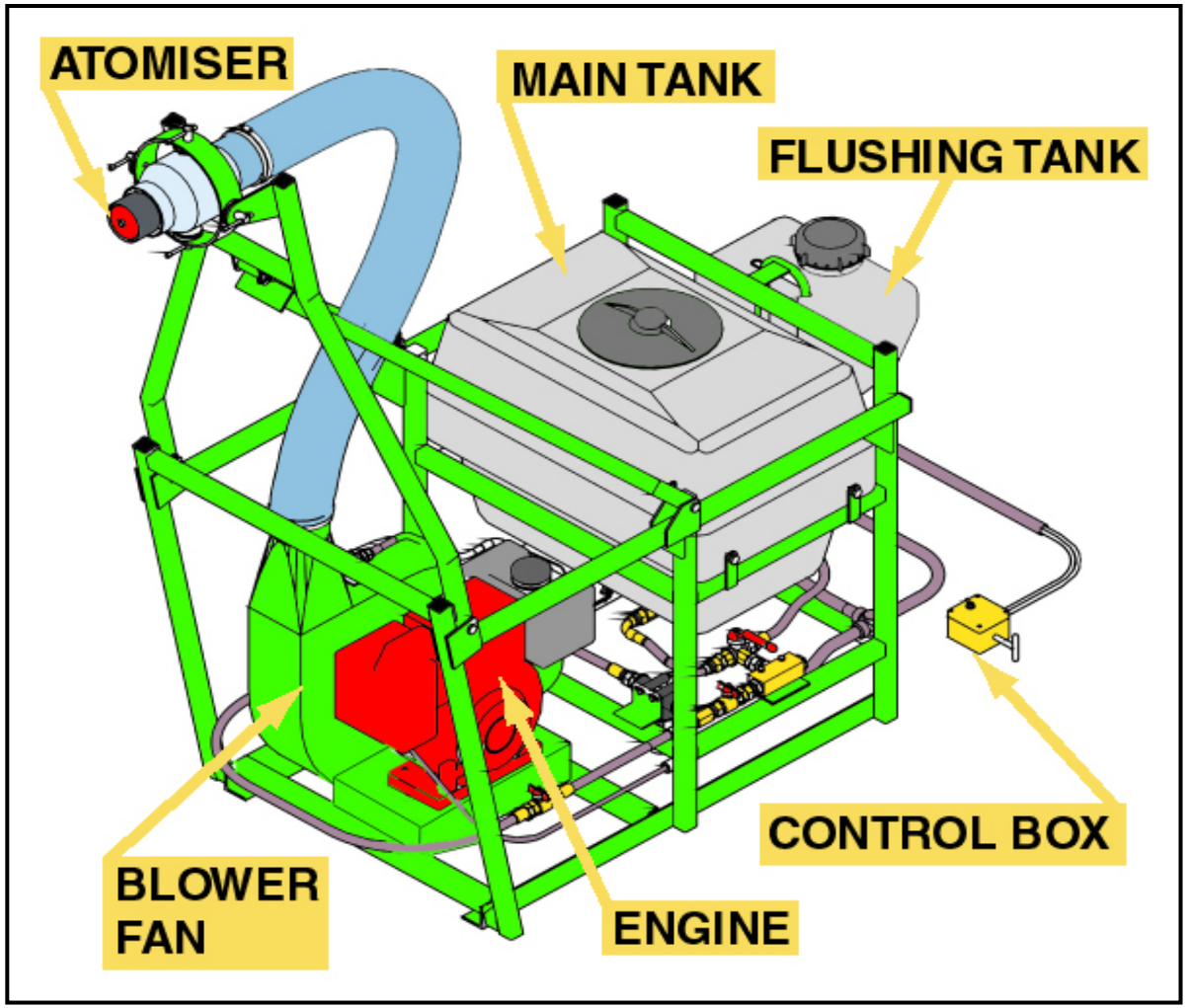
Micronair AU8115M Sprayer

MICRONAIR

Micronair AU8115M Sprayer



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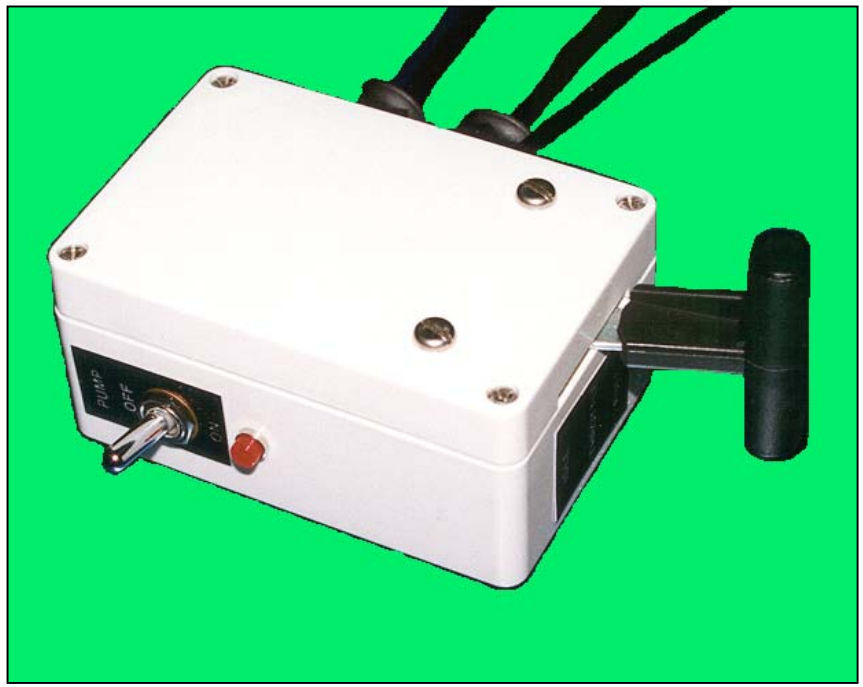
AU8115 Control Box

- Mounted in Cab
- Incorporates
  - Engine throttle
  - Pump switch
  - Pump indicator



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AU8115M Hand-held Option

- Operator walking behind vehicle
- Operator standing in vehicle

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AU8115M Specification

Weight	**130 Kg**
Dimensions	**140 cm L x 76 cm W x 85 cm H**
Height of atomiser	**1.8 m above bed of vehicle**
Power source	**11 HP 4-stroke gasoline engine**
Running time	**3 hours with full gasoline tank**
Pump	**Electric centrifugal (12 V)**
Tank capacity	**100 l main, 10 l flushing**
Flow rate	**0.02 – 3.50 litre/min**
Spray band width	**10 – 100 m (drift spraying)**

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AU811x Series Sprayers

AU8110 (Original Version)

- 60 l chemical tank
- Mechanically driven pump

AU8115 (Introduced 1997)

- 100 l chemical tank + 10 l flushing tank
- Electric pump

AU8115M (Introduced 2000)

- 100 l chemical tank + 10 l flushing tank
- Electric pump with magnetic drive
- PTFE (Teflon) lined pipework

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CALIBRATION

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Calibration Procedure

1. Calculate area covered per minute from:
   - Forward speed
   - Width covered
2. Establish volume application rate for product to be used from manufacturer's data sheet
3. Calculate required output from sprayer
4. Adjust sprayer for required output
5. Check actual output using product to be sprayed

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Area Covered Per Minute

1. Establish speed by walking or driving a measured distance in the spray area. Record the time and calculate speed in Km/hour
2. Assess the effective swath width (single pass) or track spacing (multiple overlapping passes) in metres
3. Calculate the coverage in hectares/minute:

$$\textbf{Ha/min} = \frac{\textbf{Speed (Km/hr) x Width (m)}}{\textbf{600}}$$

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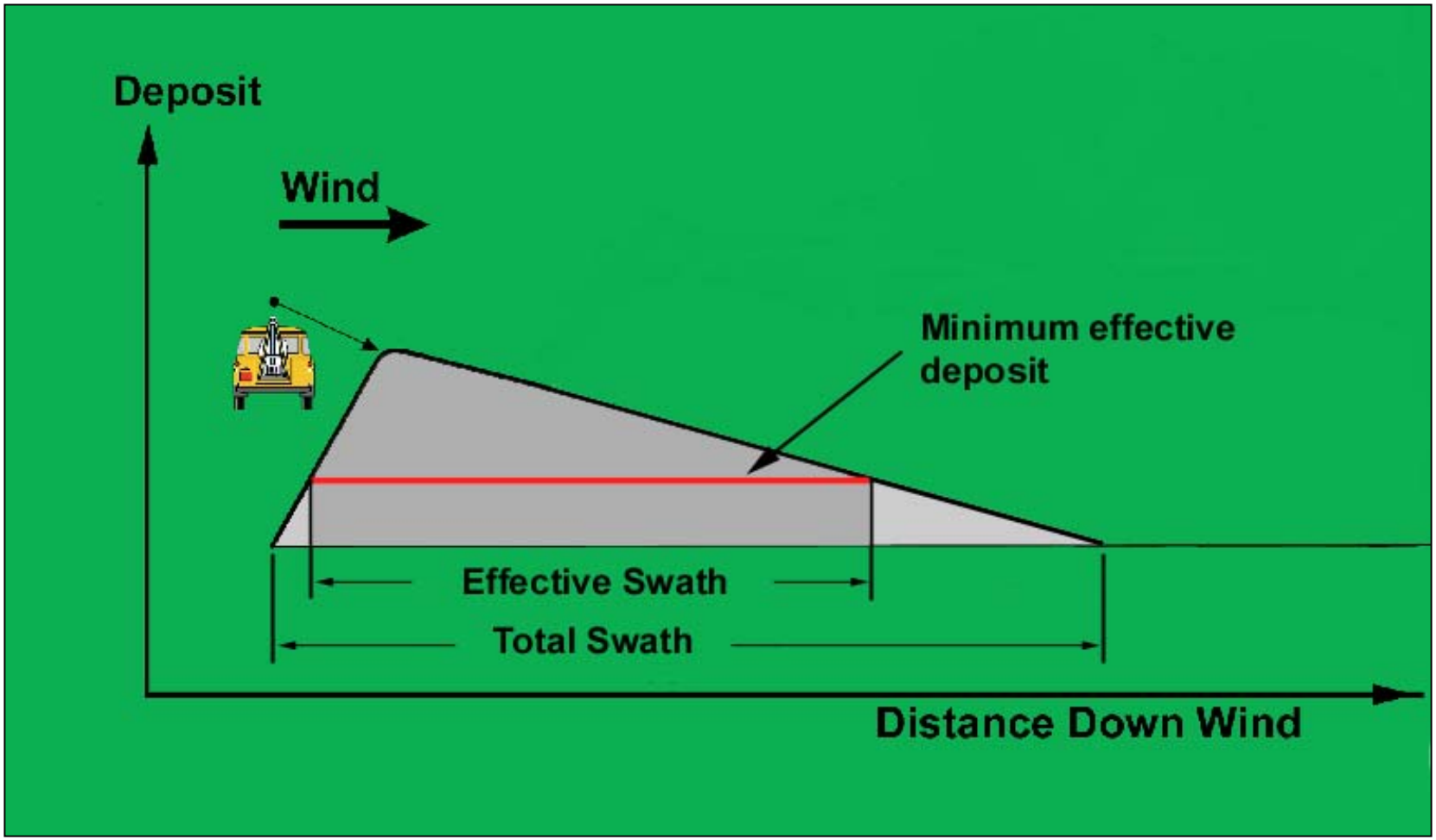
Single Swath Application



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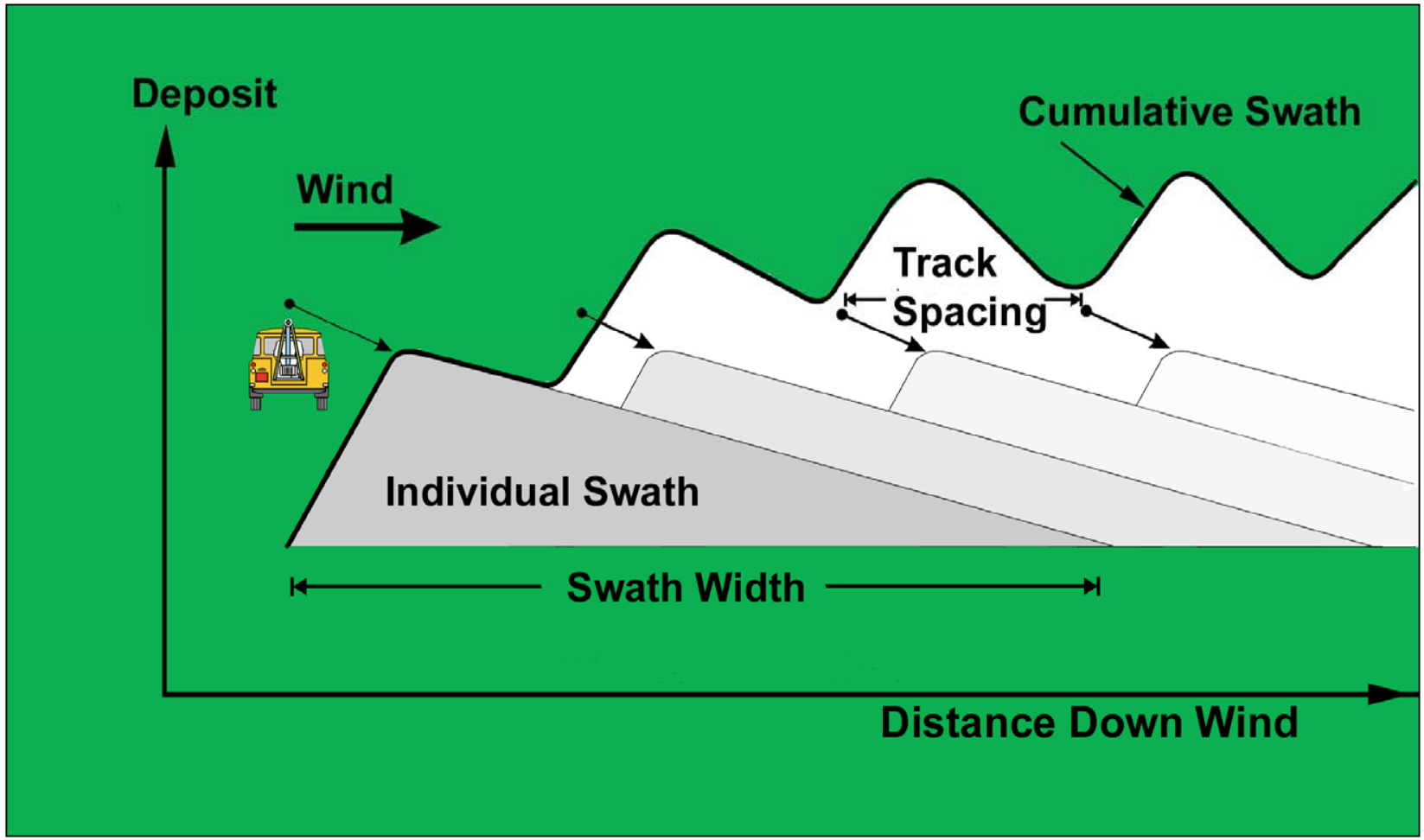
Incremental Drift Spraying



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Output from Sprayer

Calculate the output (flow) from the sprayer in litres/minute:

l/min = Rate (l/Ha) x Coverage (Ha/min)

The complete calibration formula is:

$$\text{l/min} = \frac{\text{Rate (l/Ha)} \times \text{Speed (Km/hr)} \times \text{Width (m)}}{600}$$

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Application Rate

- Refer to manufacturer's data sheet or product label for correct volume application rate
- If product is to be diluted, sprayer must be calibrated for total volume of mixed product to be applied

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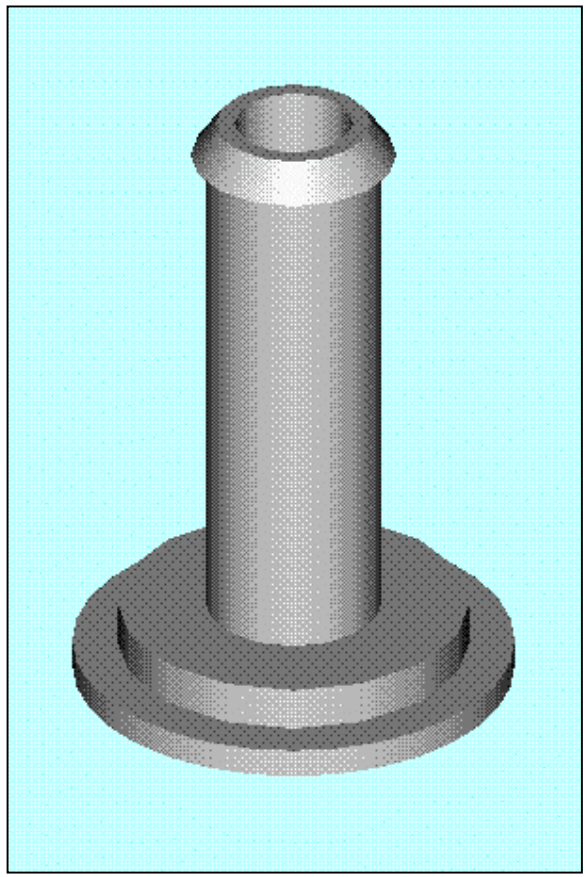
AU8000 Flow Restrictor

- Fitted in outlet from valve in handle
- Hole inside tube restricts flow
- Supplied in 5 sizes:
  - 1 - lowest flow
  - 5 - highest flow



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Flow Through AU8000 Restrictor Tubes

Restrictor tube number	Flow (litres/minute)	
	With boost pump	Without boost pump
1	0.075	0.400
2	0.150	0.800
3	0.300	1.600
4	0.600	
5	1.200	

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Flow Restrictor Disc (Orifice Plate)

AU8000

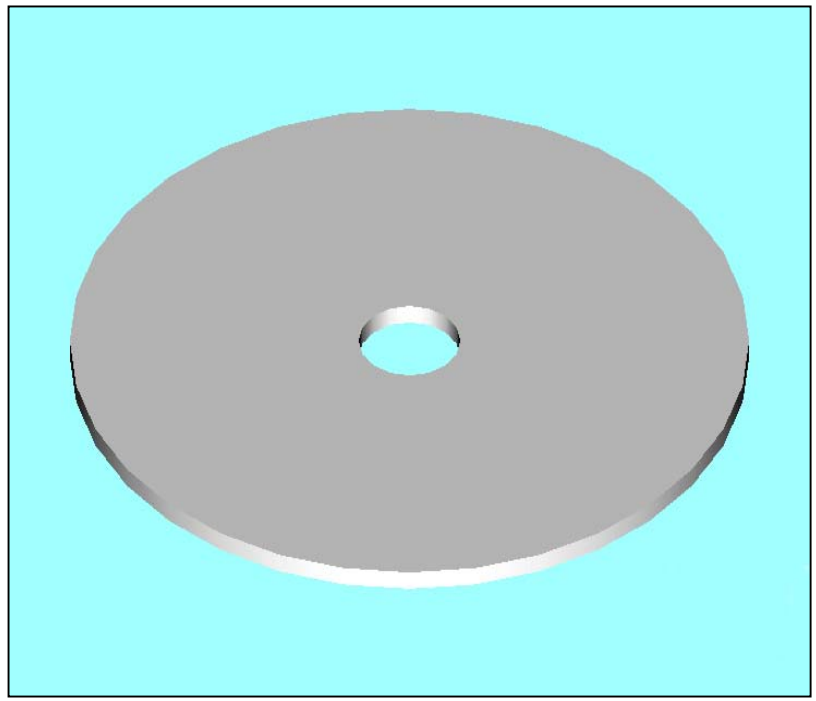
- Used for low flow rates
- Fitted under No 5 restrictor tube

Micronex

- Used for all flow rates

AU8115M

- Can be used instead of needle valve
- Fitted in output from needle valve
- Valve left fully open



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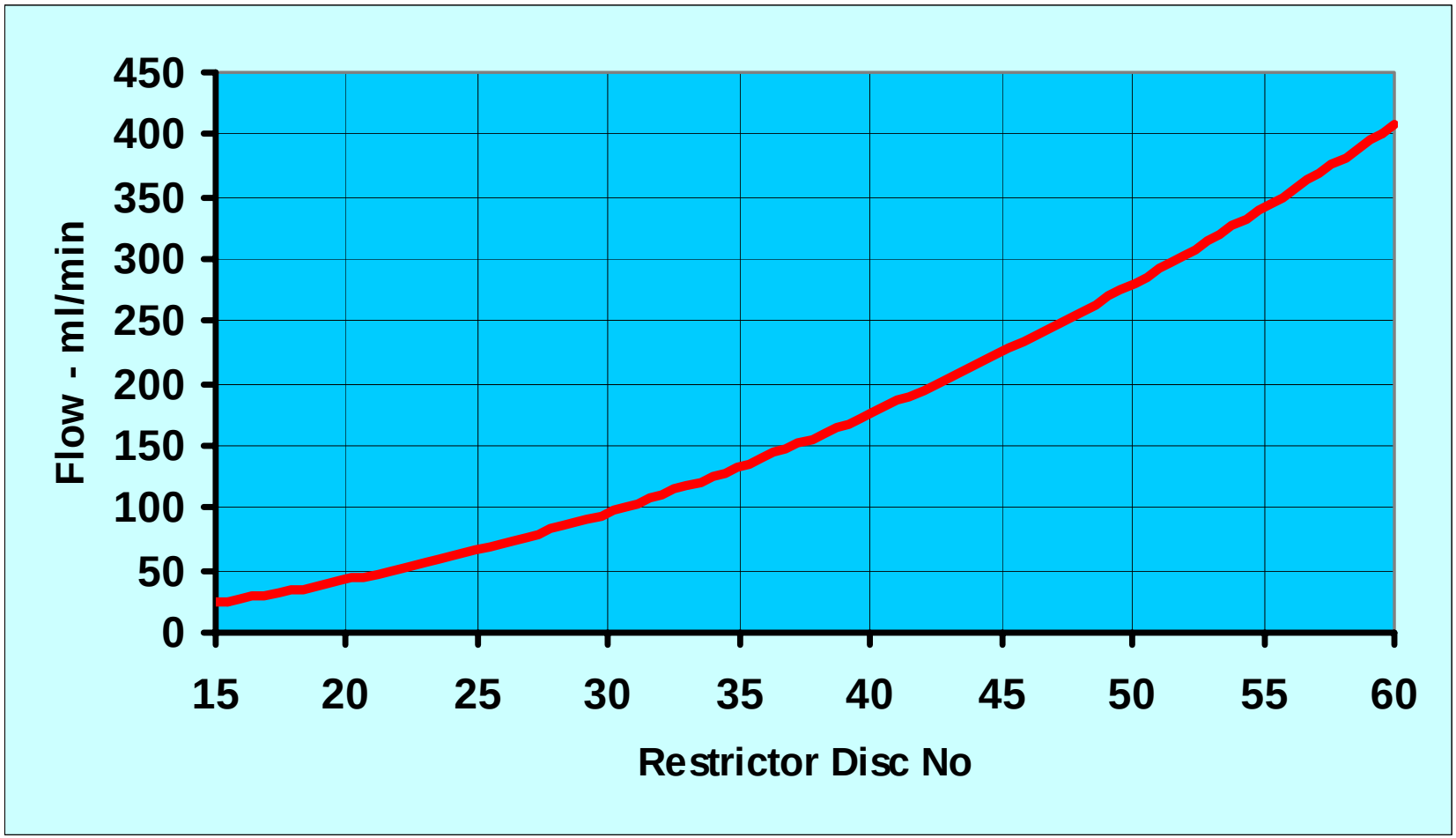
Flow Through Restrictor Discs



Data applicable to AU8000 & Micronex

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Micronex Flow Control

- Fixed restrictor orifice discs
- Fitted in outlet of valve handle
- Unscrew nut to change restrictor disc

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Flow Through Micronex Restrictor Discs

Restrictor disc number	Flow (l/min)
16	0.030
18	0.035
20	0.050
24	0.060
26	0.070
30	0.100
37	0.160

These flow rates are also applicable to AU8000

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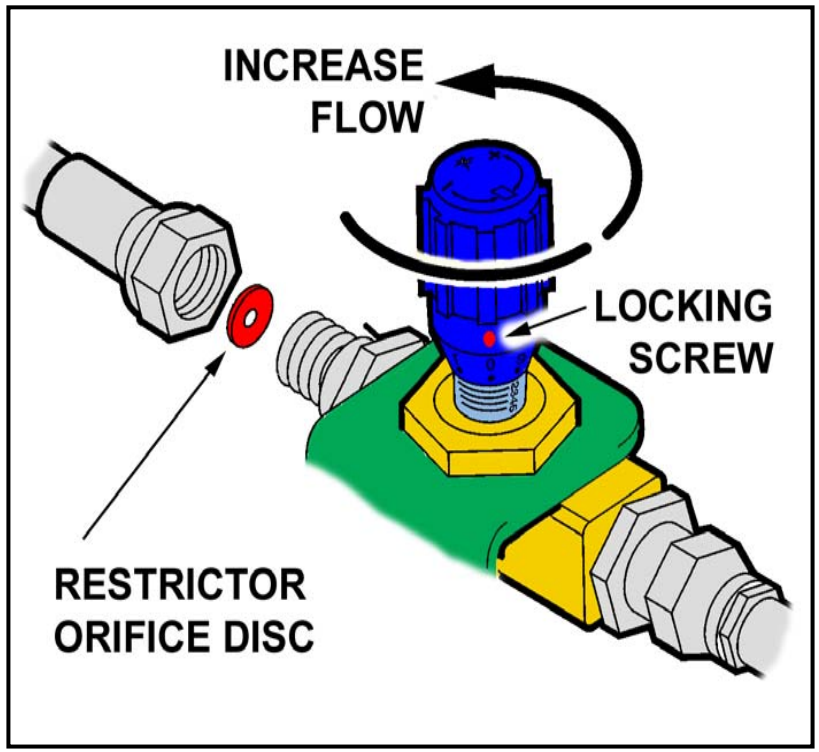
AU8115M Flow Control

Two options:

- Adjustable needle valve
- Fixed restrictor orifice disc in valve outlet

  Valve must be fully open if disc fitted



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Flow Through AU8115M Restrictor Discs

Restrictor disc number	Flow (l/min)
24	0.108
30	0.149
39	0.294
49	0.461
59	0.581
68	0.709
80	0.957
98	1.210

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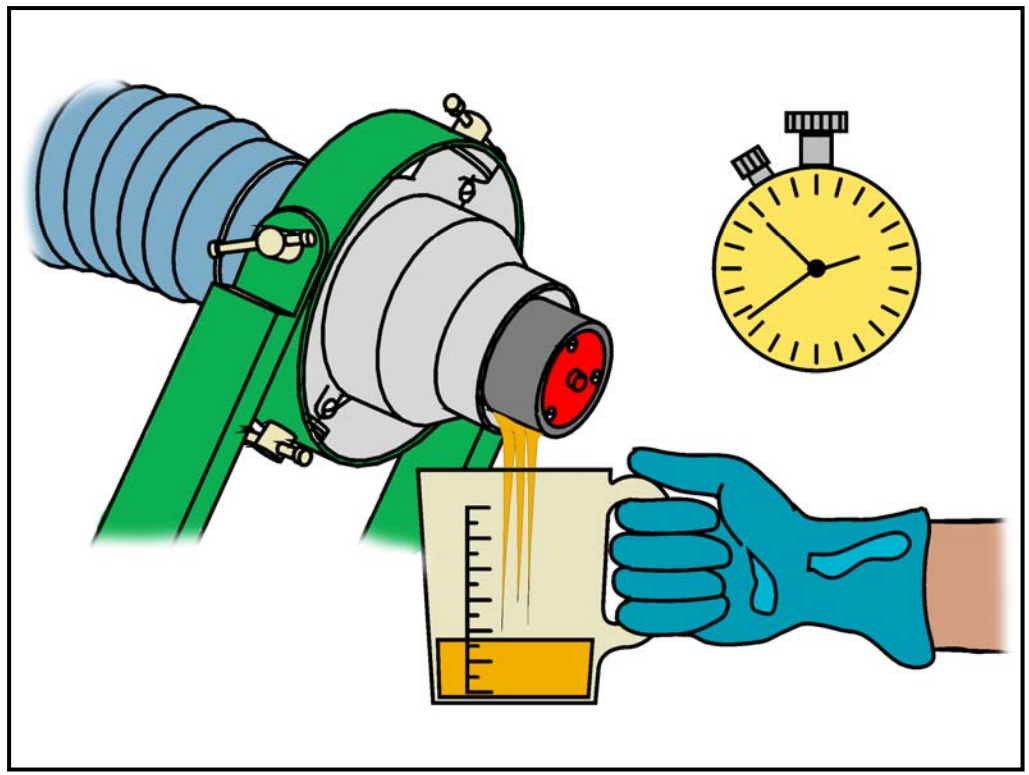
Calibration of AU8115 Sprayer

- Angle atomiser downwards
- Run vehicle engine to charge battery
- Use actual spray liquid
- Purge air from system
- Collect liquid for measured time



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OPERATION

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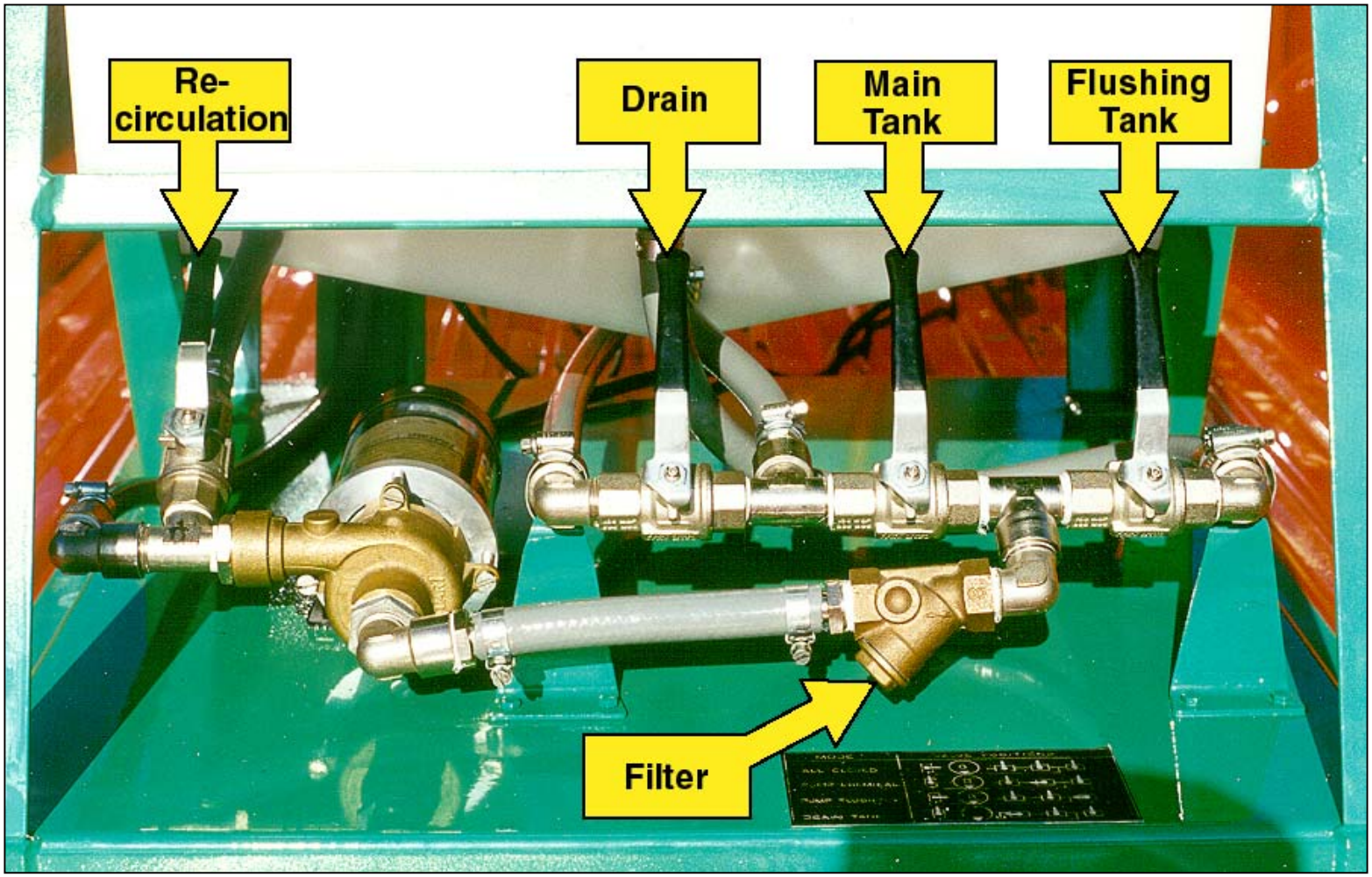
AU8115 Valves & Filter



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AU8115 Valve Positions

Valve	SPRAY	FLUSH	DRAIN
Main	OPEN	CLOSED	CLOSED
Flushing	CLOSED	OPEN	CLOSED
Recirculation	OPEN	CLOSED	CLOSED
Drain	CLOSED	CLOSED	OPEN

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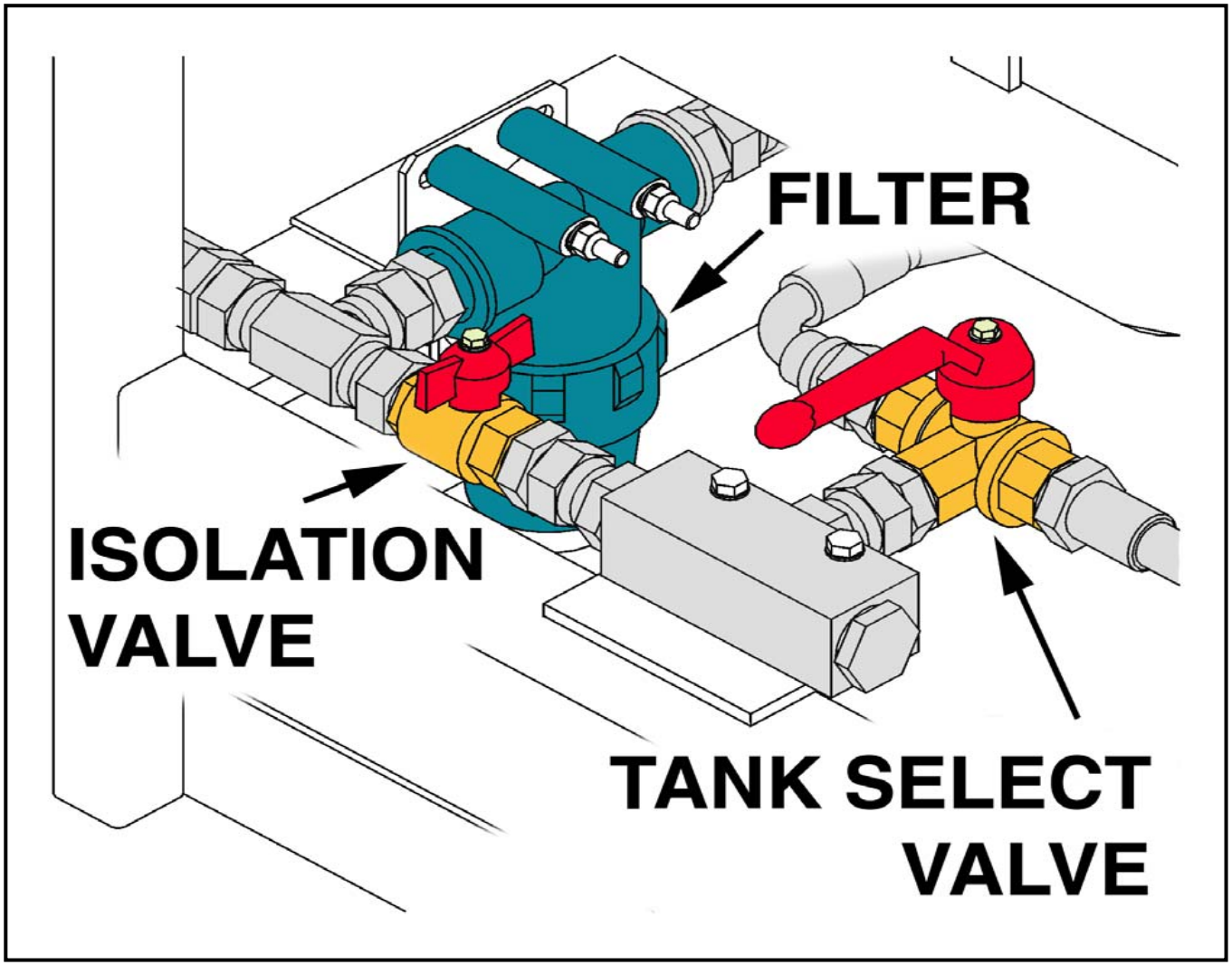
AU8115M Valves & Filter



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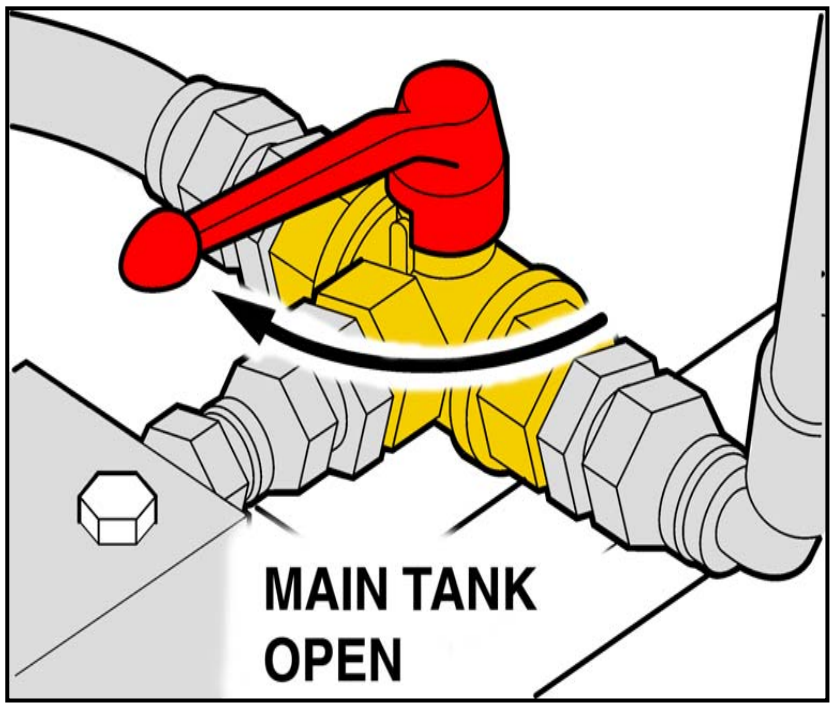
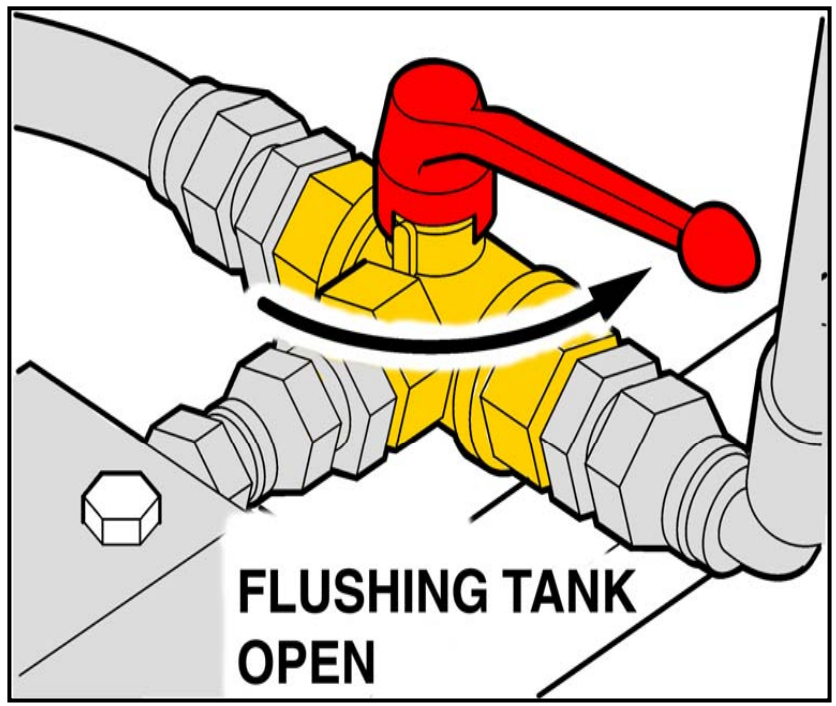
AU8115M Tank Select Valve



Normal operation



Flushing out sprayer

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Operator Safety

- AU8000, AU8115 and Micronex sprayers produce an airstream to carry spray to target
- Operator must always walk or drive along upwind edge of sprayed area, thus minimising contamination
- Each spray swath should be upwind of the previous swath, so operator never walks or drives through sprayed area
- Recommended protective clothing must always be worn by spraying and loading personnel

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SPRAY EQUIPMENT FOR ENVIRONMENTAL HEALTH

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