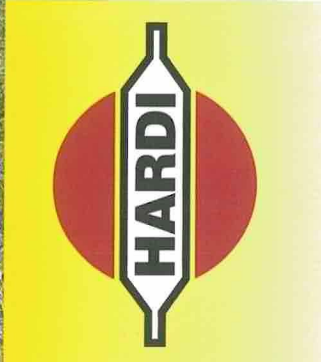


ZENIT



■ **Compact and Efficient**



HARDI technology for protection of your crops



Model	Capacity (gallon)	Pump (diaphragm)	Treatment system	Air kit
ZENIT	105	321	pneumatic	AG 820
	155	321		P 540



1 Calibration of forward speed

Half fill the spray tank with water. Mark out 300 ft - note time to drive the distance.

Example

If it takes 24 seconds to drive 300 ft then the spraying speed is 8.5 MPH.

Driving speed formula

$$\frac{\text{Distance driven (ft)} \times 0.68}{\text{Time (sec.)}} = \text{MPH}$$

2 Calculation of nozzle size and pressure

After determining your forward speed and choosing your application rate according to the recommendations on the chemical container, the total nozzle capacity can be calculated on the following formula (based on driving in each row):

$$\frac{\text{Row spacing (ft)} \times \text{GPA} \times \text{MPH}}{495} = \text{total GPM}$$

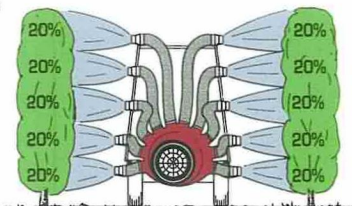
Example Row spacing: 18 ft
Application rate: 40 GPA
Forward speed: 3 MPH

$$\frac{18 \text{ ft} \times 40 \text{ GPA} \times 3 \text{ MPH}}{495} = 4.36 \text{ GPM}$$

The total nozzle capacity is 4.36 GPM. This amount has to be divided between all the nozzles on the mistblower. Two examples are described in the following:

a Nozzle calibration when equal output from each nozzle is desired.

From the drawing you can see that, because the foliage to be sprayed is evenly distributed, the output



from each of the 10 nozzles is the same. This is calculated as follows:

$$\frac{\text{Total GPM}}{\text{Number of nozzles}} = \text{capacity of single nozzle in GPM}$$

Example

$$\frac{4.36 \text{ GPM}}{10 \text{ nozzles}} = 0.44 \text{ GPM}$$

In the 1299 nozzle chart you will find the nozzle closest to the desired output at a suitable pressure - Red nozzle at 110 PSI has a capacity of 0.45 GPM.

We recommend that you double-check the nozzle output with a measuring jug (with clean water in the sprayer). You can do this by disconnecting the blower and directing the water into the jug, using a hose. If exactly 0.44 GPM is desired, the pressure can be adjusted with the pressure adjustment formula:

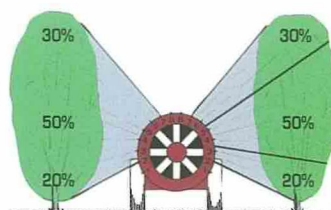
$$\left(\frac{\text{New output (GPM)}}{\text{Known output (GPM)}} \right)^2 \times \text{Known pressure (PSI)} = \text{New pressure (PSI)}$$

Example

$$\left(\frac{0.44 \text{ GPM}}{0.45 \text{ GPM}} \right)^2 \times 110 \text{ PSI} = 105 \text{ PSI}$$

b Nozzle calibration when nozzle output must be adapted to the crop

The drawing shows 8 nozzles pointing to each side. We can use the same example as in a), with a row spacing of 18 ft, forward speed of 3 MPH and desired application rate of 40 GPA.



In this case nozzles 1 and 8 are shut off
2 and 3 apply 20% = 0.44 GPM (each nozzle applies 0.22 GPM)
4 and 5 apply 50% = 1.09 GPM (each nozzle applies 0.54 GPM)
6 and 7 apply 30% = 0.65 GPM (each nozzle applies 0.33 GPM)

Chosen from the flow table, giving the following combination at 110 PSI:

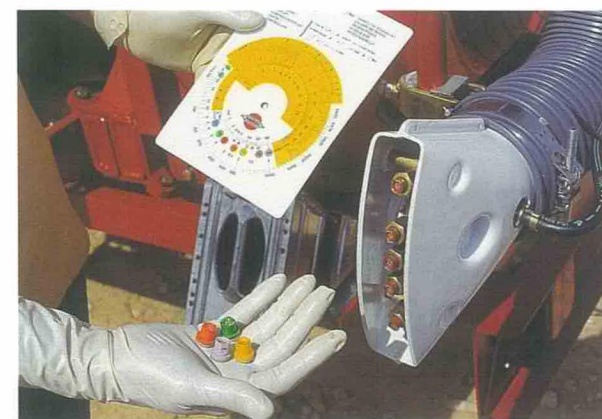
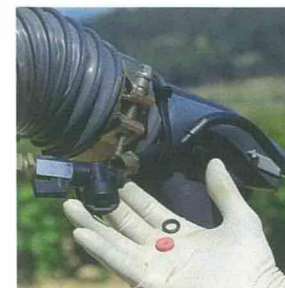
Nozzle 2 and 3: 1299-14 orange (0.24 GPM)

Nozzle 4 and 5: 1299-18 green (0.58 GPM)

Nozzle 6 and 7: 1299-12 yellow (0.32 GPM)

These do not correspond exactly with the desired, as the total capacity would be 4.56 GPM instead of 4.36 GPM. The correct pressure can be calculated with the pressure correction formula at 101 PSI.

$$\left(\frac{4.36 \text{ GPM}}{4.56 \text{ GPM}} \right)^2 \times 110 \text{ PSI} = 101 \text{ PSI}$$



Use the HARDI® calibration disk (No: 285546) for easy nozzle selection and calibration.

AG820



Long fan housing with air vanes in the inlet canalising a uniform air stream to the blower. It provides an air volume of 23,500 CFM. Deflectors type V and DT for orchards and DV for vine can be fitted to the blower housing.

CANNON



The Cannon is designed for single side spraying. The spout can be rotated side to side by hydraulic controls. The Cannon is the perfect choice for spraying Christmas trees, vegetables, nursery stock and even livestock.

Deflector DV



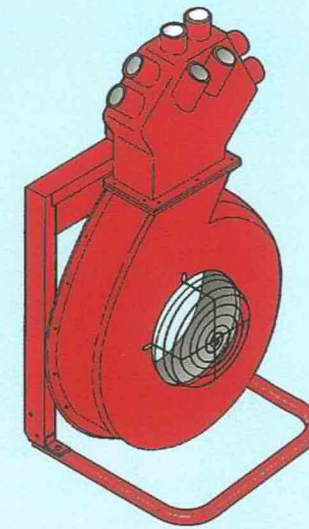
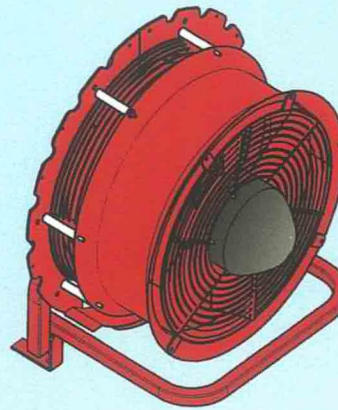
Made of stainless steel, can be fitted to all ZENIT sprayers with axial blower. For vine planted in head pruned or trellis formation.

B11 / SPV



Multi tube system adaptable to any ZENIT unit equipped with turbine. Fixed upright ideal for narrow rows. Valid with both pneumatic and hydro-pneumatic application systems.

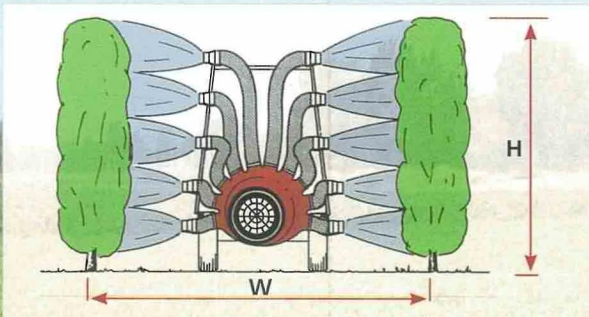
**HARDI has a solution
for your type of
plantation system**



Air kit

Blower type	AG820 axial	P540 turbine
Air volume (CFM)	23,500	6,475
Diameter (inch)	32"	21"
Fan material	Aluminium and synthetic polymer	steel
Gear box speeds	2 + neutral	2 + neutral
Min. power consumption (HP)	30	27
Adjustable fan blades	✓	-
Centrifugal clutch	✓	✓
Liquid system	Hydropneumatic	Pneumatic hydropneumatic
Deflectors / Booms	V/DT/DV	B11/CANNON

✓ = standard



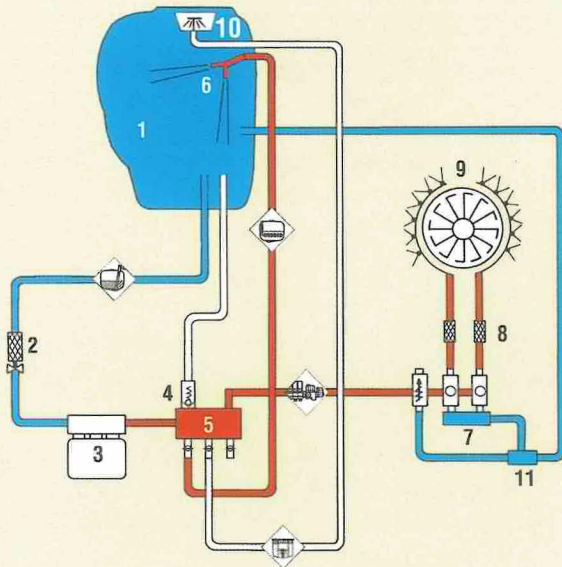
Working conditions

	AG 820			P540	
	Std./V	DT	DV	B11	CANNON
H Max. height, (feet)	13	16	7	8	N/A
W Max. row width, (feet)	16	19	13	11	N/A
Rows treated	1	1	1 - 2	1	

Function diagram

Diagram with option

- | | |
|------------------------------|---------------------|
| 1. Main tank | 7. Control unit |
| 2. Suction filter with valve | 8. In-Line filters |
| 3. Pump | 9. Spray arcs |
| 4. Safety valve | 10. Powder mixer |
| 5. Pressure manifold | 11. Return manifold |
| 6. Agitation | |



Nozzles



1099
Ceramic disc



1299
Ceramic hollow cone nozzle

See our web-site
www.hardi-nozzles.com

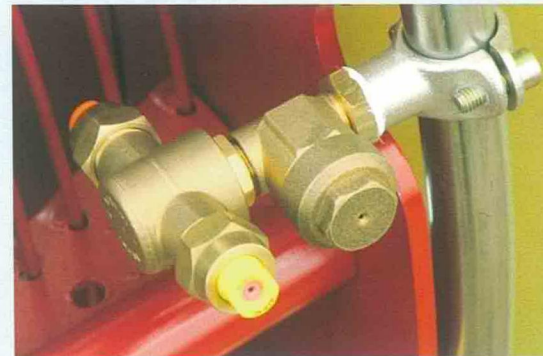
Nozzle holders

HARDI sprayers are fitted with brass nozzle holders and can be closed individually, or aimed to the canopy. All nozzle holders are fitted with a non-drip valve, that stops the liquid flow through the nozzles when closing the sectors and the pressure goes down below 30 psi.

ZENIT mistblowers incorporate single nozzle holders as standard. Double nozzle holders can be fitted as an optional.



Simple nozzle holder



Double nozzle holder: fixed/fixe

Spouts for vine

ZENIT line can be equipped with hydro-pneumatic or pneumatic system.

Hydro-pneumatic system: The droplets are formed when the liquid passes through the nozzles (working pressure: 60 to 220 psi).

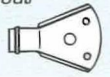
Pneumatic system: The droplets are formed when the spray liquid is torn off by a very high-speed air stream (working pressure: 15 to 60 psi).



Hydro-pneumatic spout with 5 nozzles



Hydro-pneumatic spout with 3 nozzles



Pneumatic cannon



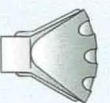
Pneumatic spouts with 2 atomizers



Pneumatic spouts with 3 atomizers



Pneumatic spouts with 4 atomizers



HARDI Liquid Circuit



BK/2 Manual Control Unit

The BK/2 control features a simple solution for controlling the spray functions. The operating unit features a main on/off valve, 2 on/off control valves for left and right section control, manual pressure regulation and Hardi-matic mechanical rate control.



HC/2 Manual control unit

The Zenit can be equipped with 2 hydraulic valves for left and right on/off control. Two hydraulic outlets are required. This simple and reliable solution eliminates the need for cables and wires in the cab.

Filters

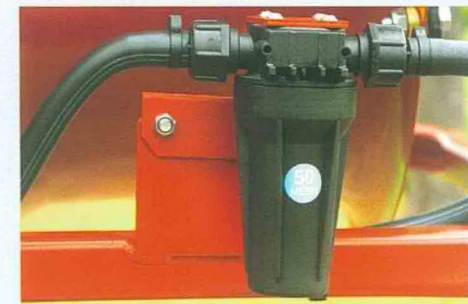
HARDI mistblowers can be equipped with a Triplet filter system including: filter basket in filling hole, suction filter before the liquid is absorbed by the pump action, In-Line pressure filters for each spray sector.



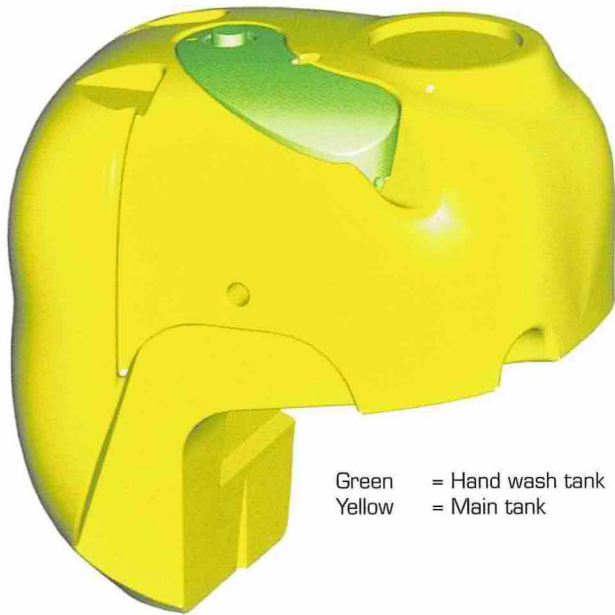
Filter basket



Suction filter



In-Line pressure filters for HLC system



Green = Hand wash tank
Yellow = Main tank

Tank

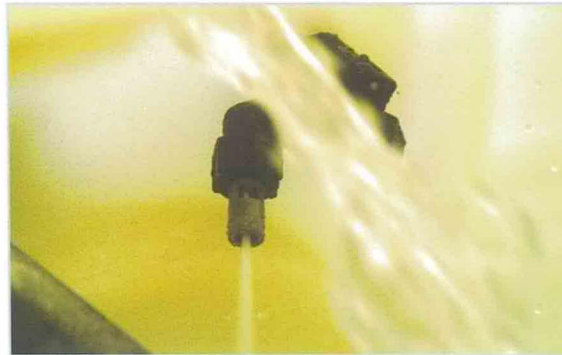
The Zenit tanks are made of rotational molded polyethylene. The smooth round design optimizes the performance of the agitation system as well as easing the tasks of filling and cleaning, always keeping the operators safety at its utmost.

Features:

- Capacities: 105 and 155 gallon.
- UV-resistant.
- Good stability as the over-all design ensures a low centre of gravity.
- A 4 gallon clean water tank is integrated in the main tank (see picture).
- Tank contents indicators situated in the front and on the side of the tank.
- Large drain valve in the sump of the tank allows for full drainage of the tank.
- Powerful agitation system (see picture).
- Powder mixer placed in the main filling strainer (optional).
- Exterior compact design, smooth and rounded tank shape without projections (lids, hoses,...) to avoid tree and fruit damages.
- Tank warranty - 5 years under normal working conditions.



Hand washing tank



Agitation

Air kits

The Zenit air kits of the Hardi mistblower have been designed in close collaboration with specialists in aerodynamics, improving air distribution while reducing noise and power consumption.



The Zenit mistblowers present a range of axial and turbine fans which provide a full adaptation to any kind of agricultural system.

The fan and turbines are made of steel and aluminum. They incorporate a centrifugal clutch (patented) that ensures minimum wear to the tractor and sprayer when engaging the unit.

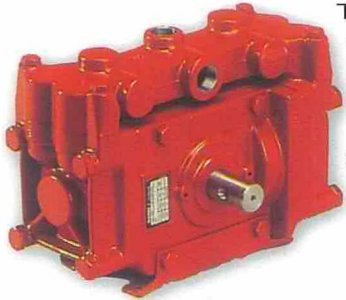
The axial fan is designed with synthetic fan wings of a state of the art composition of different materials, which create a strong and powerful wing, resistant to impact.



High quality components for your next sprayer

Hardi diaphragm pumps the heart of the sprayer

Designed for the application of plant protection products and can be used for distribution of liquid fertilizer.



The 321 pump has 2 diaphragms. Volume ranges from 6-17 Gal/min, and a maximum pressure of 367 PSI.

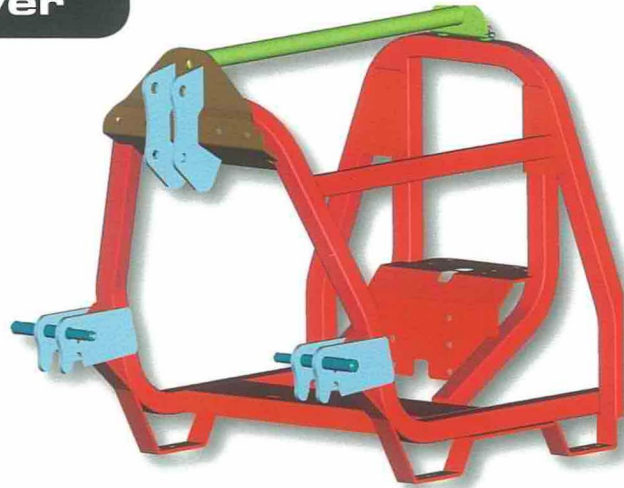
Features

- Self-priming.
- Able to run dry without damage.
- Grease lubricated crankcase.
- Chemical resistant diaphragms and valves.
- Able to rotate clockwise or anti-clockwise.
- Easy to service without special tools.

HLC

HARDI Liquid Circuit

- Diaphragm pumps
- Control units HC/2, BK/2
- HARDI pressure manifold
- HARDI In-Line Filters
- Designed for chemical and fertilizer applications



Frame

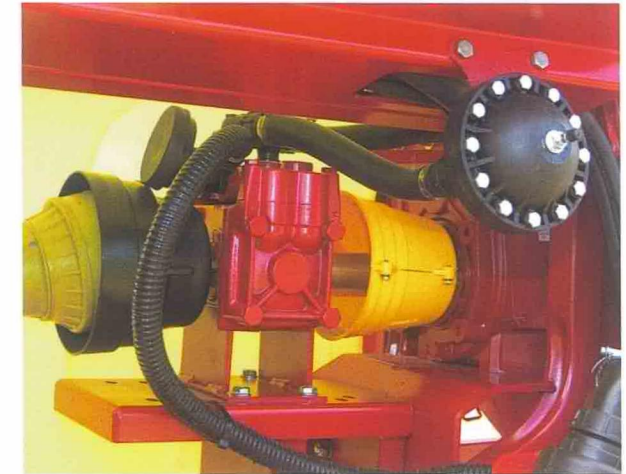
Three-dimensional structured chassis provides robust durability and resistance to vibration. Its compact and free-of-corners design prevents accumulation of dirt, making servicing and cleaning easy. It also helps prevent corrosion of the metal parts.

For further protection against corrosion, the manufacturing process of the metallic parts are steel shot blasted, then treated with synthetic primer and painted with a 2 component polyurethane paint.

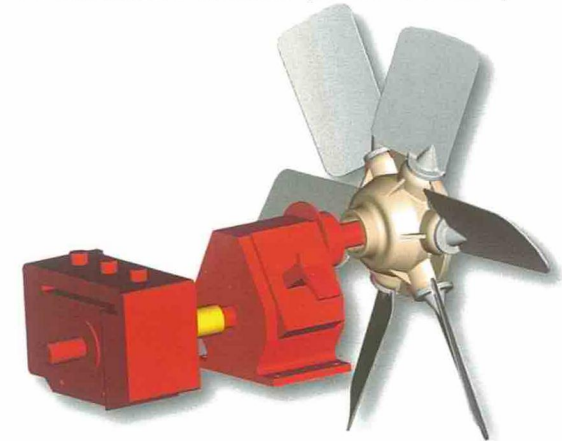
As standard the chassis incorporates a three-point hitch and can adapt a quick hitch as optional.

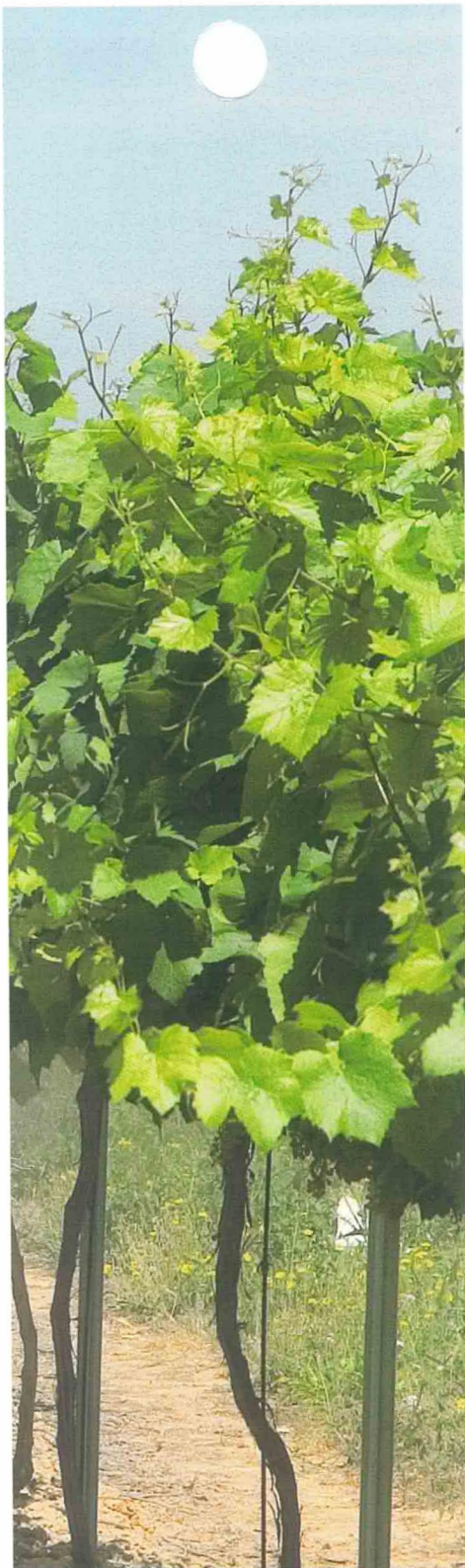
Power transmission

The power transmission from the tractor to the fan or the turbine goes directly through the 2-speed and neutral gear box



The transmission system, completely protected, meets the most strict safety regulations and generates the highest air volume with the lowest tractor power consumption.





Two tank capacities

Hardi Zenit is available in 105 Gallon and 155 gallon tank capacities.

Two air kits available

The Hardi Zenit offers an axle or turbine fan to provide optimum air generation to meet your specific crop and working conditions.

Higher application performance and efficiency

The quality and volume of airflow improve the overall performance of the equipment. Higher forward speeds are obtainable while maintaining a superior penetration and efficiency of application.

Solid and stable

Chassis and tank design provide a low center of gravity and optimum agitation, allowing for treatments in very narrow and steep working conditions.

Reliable and simple

The design of Hardi mistblowers reflects the grower's continuous demand for sturdiness and easy operation.

Minimizing operating costs for the farmer

Zenit is also designed to facilitate easy access to any part of the machine for servicing. The power transfer system and the air kit design secure the maximum air volume with minimal power consumption.

Environmental care

Hardi equipment is designed to minimize drift for minimal environmental impact.



Axial fan with V defectors



Cannon spout with turbine fan.