

FrostBoss™ C49

FrostBoss™ A24



Quiet, Reliable & Efficient

ENGINES

CAT C6.6 ACERT Diesel Engine

The CAT C6.6 utilises proven Caterpillar ACERT technology, the engine features an advanced common rail fuel system controlled by an Electronic Control Module (ECM) to manage injection timing, rpm, turbo wastegate, and all other engine functions including engine protection.

These features combined with the intercooler provide improved fuel consumption while delivering a strict Tier 3/Stage IIIA emissions compliant engine.

The ECM also provides human interface for control, diagnostics and operational history. Supported worldwide by the Caterpillar dealer network.

Perkins 1006 6T

The Perkins 1006 6T is an inline 6 cylinder and 6 litre capacity engine that is water-cooled and turbo-charged and is based on the well proven 1000 series engine range that covers industrial, agricultural, vehicle and construction applications.

With the use of the highest quality components throughout the engine such as deep skirted cylinder block, carbide honed dry liners, gear driven water pump, Vitron crankshaft seals and integral plate type oil cooler a long and trouble free life can be expected.

Perkins advanced combustion technology known as "Quadram" direct injection combustion system combined with high specification fuel injection equipment provides the 1006 6T with excellent performance, very economical fuel economy, low noise and rapid startability.

Common Engine features

- Rubber isolation mounts
- External air intake for maximum power with cold air
- Centrifugal clutch with torsional isolation coupling
- Quiet muffler with stainless steel exhaust flapper

CONTROLLERS

Manual

- Simple operator controls with a manual key start
- Engine shut down protection on low oil pressure and high temperature



Frostboss Auto Start/Stop

- Intelligent controller to auto start and stop by operator set ambient temperature set points, wireless temperature sensor. (no temp probe cable)
- Anemometer shut down in winds above 10kph, automatically re-arms the machine when winds drop below 8kph
- Engine protection shut down for over rev, low oil pressure, high temperature and low fuel level
- LCD screen display for engine faults and operating status
- Diagnostics for fault finding (AT only)
- Solar panel and heavy duty voltage regulator for prolonged battery life
- Simple single switch operator controls
- Anemometer/warning light spar



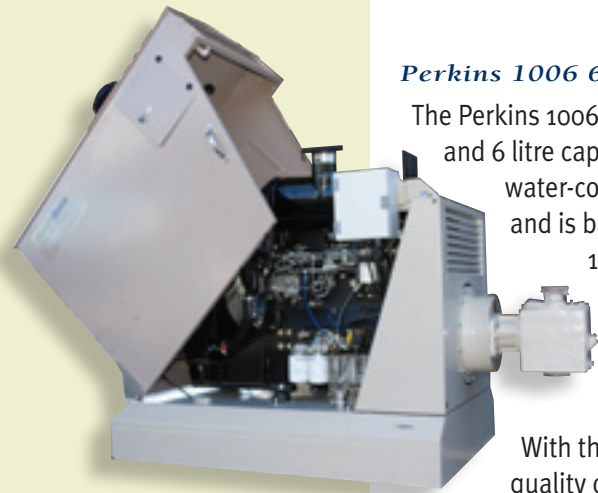
Wireless temperature receiver is attached to the spar and mounted 6.5 m up the tower.

WIND MACHINE UPGRADES

We have an upgrade package for most brands of frostfans.

We can upgrade your existing frostfan with a new C49 blade system, the most efficient blade in the market.

This saves fuel and is noise compliant. Ask us for more information.



CABINETS



- Designed and built in heavy gauge durable powder coated steel
- Fully enclosed and lockable making them pest and rodent proof
- Louvres for noise attenuation
- Lifting cabinet top for easy access for maintenance and servicing
- 500 litres integral fuel tank (*secure when cabinet locked*)
- Fittings are manufactured in stainless steel for durability
- Self contained engine assembly, simple removal for ancillary use

Optional

- Semi enclosed galvanized lockable cabinet
- Wide side doors for easy access for maintenance and service
- Stand alone fuel tank with fork pockets and quick release fuel hose couplings for easy removal
- Self contained engine assembly, simple removal for ancillary use



BLADES

Frostboss C49 ~ 4 Blade

- CNC machined taper locked hub (*no welding*)
- The C49 composite blade is an advance technology composite structure comprising 7 different materials
- Manufactured utilising the latest Resin Transfer Molding (RTM) technology enabling an uncompromised aerodynamic design to be engineered for low operating engine speeds of 1700 to 1800 rpm

Frostboss A24 ~ 2 Blade

- CNC machined pivoting hub (*no welding*)
- 2 extruded T6 alloy blades
- Blades pitched for maximum airflow at low operating speed (*2100 rpm*)
- Statically balanced for smooth running

Specifically the Frostboss C49 has:

- An optimised pitch from hub to tip
- Optimised blade area to improve inboard wind momentum
- Significantly thinner tips to reduce noise
- Optimal structural detailing for improved fatigue strength
- Statically balanced for smooth running



PERFORMANCE

During a radiation frost, wind machines are used to draw down the warmer inversion layer air above the orchard and blow it through the orchard. The wind machine fan needs to blow as much air as it can, to the greatest distance possible. This will give the most economical coverage for the wind machine.

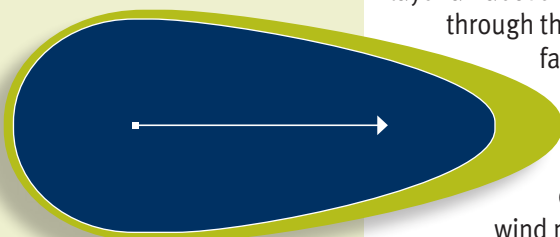
In order to reach the greatest distance, the fan needs to produce a strong, uniform wind. The distance the wind can penetrate into the orchard is proportional to the momentum of the wind. The momentum of the wind or the "wind momentum" is the product of the wind flow rate (*or the volume of air*) the wind speed and the air density.

The C49 has the blade area and pitch optimised from hub to tip creating a more uniform column of air that travels further before dispersing.

The coverage or effectiveness of a wind machine depends not only on the machines ability to move air but also the strength of the degree of inversion and the degree of frost that is being protected against.

In typical radiation frost conditions of a -2 to -3 degree frost with an inversion differential of 3-4 degrees and a 1-2 kph of drift the FrostBoss machines coverage footprint will be as shown in the diagram.

In situations of multiple machine placements and strong inversions coverage of up to 10 ha has been achieved.



■ 4 Blade
■ 2 Blade



NOISE

Noise resulting from the operation of a wind machine is derived from two primary sources, the fan and the engine.

Noise from the engine has been minimized by attenuating the engine enclosure and designing an effective muffler.

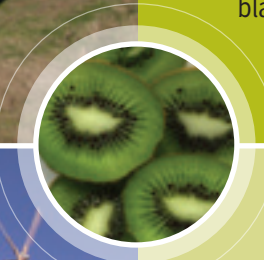
Noise from the fan results from the tip speed of the blades and the efficiency of the blade as it passes through the air.

Both the alloy 2 blade and the C49 blade are pitched to run as

slow as possible while operating at a fuel efficient point of the engine power curve.

The advantage of the C49 blade is that a more efficient blade shape has been created to increase the airflow while enabling the speed and noise of the fan to be reduced.

The result is that both the FrostBoss 2 and 4 blade machines produce a significantly lower noise profile than conventional 2 blade wind machines.



OPERATION

C49/A24 Auto Start/Stop machines

The premium machines start and stop automatically on operator selected preset temperatures. Additionally once the temperature conditions have been satisfied these machines have an anemometer to stop and start the machines based on a factory set wind range to ensure the machines do not run in the wind.

The machines can still be operated in manual mode if required. The machines can also be fitted with monitoring devices that can text the operator's cellphone

with a number of parameters for example temperatures, machines start, security etc.

This information is also sent to a website and displayed in graphical form.

Manual option

This requires the operator to start the machine on a key switch. We can provide frost alarms to wake the operator and each machine has an independent dual thermometer mounted on the tower displaying inversion and canopy temperatures.



INSTALLATION AND MAINTENANCE

In New Zealand we offer a complete siting and turnkey installation package, backed up by ongoing servicing.

The wind machines are guaranteed against defects in materials and workmanship for a period of 2 years from the date of installation when operated under normal

operating conditions provided annual maintenance has been carried out.

After the 2 year warranty period we still recommend annual servicing even on low hour machines as lack of use can cause a number of minor issues that can eventually cause unreliable operation.



1429 Omahu Road, Hastings, New Zealand
Ph: +64 6 879 8312, Fax: +64 6 879 7312
Email: info@nzfrostfans.com