



# The FrostGuard

## Frost Protection by Phase Transition Better Fruit Set - Better Fruit Quality

### Why Agrofrost ?

- Agrofrost is the biggest producer of frost protection machines in the world and our turnover increases year after year.
- During the last 50 years, Agrofrost has been the only company that introduced new effective solutions to fight frost.
- Agrofrost is the only company that continues to invest money in research for better solutions and better results.
- Agrofrost offers the biggest range of frost protection machines in the world, so we can always offer you the best solution: FrostGuards Revolution & Basic, Trailed and 3-points Frostbusters, Frost Alarms, Wind Machines, Burners for Wind Machines.



The Revolution R20

### How does it work? → Phase Transition !

The FrostGuard is a revolutionary system for frost protection. It has a powerful fan, powered by a propane engine, and a patented burner, also running on propane gas. The machine rotates and one rotation takes about 9 minutes. Once started, the FrostGuard works autonomously. You can also choose for the Auto Start System (Revolution only).

Instead of warming up the atmosphere, it uses phase transition to protect your orchards and vineyards. In a few words: by controlling the ice forming and by recuperating the energy that is liberated when vapor changes into ice, it provides an excellent protection with a minimum input of energy. Please visit our website and learn all about it: [www.agrofrost.eu](http://www.agrofrost.eu)

### Advantages

- Better fruit set and better fruit quality.
- The most flexible protection system on the market.
- Possibility to start up automatically (Revolution model only).
- Not a fix but mobile installation, so can be used anywhere.
- Very low maintenance costs.
- Ideal for smaller AND larger plots.
- Environmental friendly : burning of propane gas.
- No risk on diseases or loss of fertilizers as in case of the use of water

### Applications





The FrostGuard can be used to protect vineyards, any kind of fruit trees (apples, pears, peaches, avocados, apricots, nectarines, citrus, ...) and all kind of berries. It works also on some flowers like chrysanthemums.

## Two series of FrostGuard: the Revolution and the Basic

The FrostGuard Revolution was introduced on the market in 2016. It is smaller and lighter than the previous model and therefore from the introduction particularly popular.

End 2018, we decided to develop a new model. The goal was to make a more economic model and to reduce the production price as much as possible.

Let's have a look at the most important differences between the Revolution and the Basic.

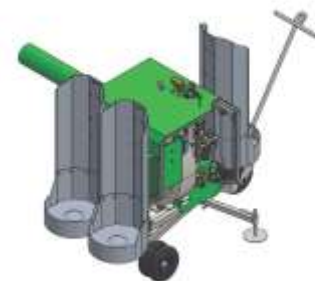
	<b>Revolution</b>	<b>Basic</b>
		
Engine	Briggs & Stratton, Vanguard 16 hp, twin cylinder with electrical starter	Greengear, mono-cylinder, 14 hp, with electrical starter
Bodywork	Completely closed, roof and doors insulated	Open structure
Auto Start System	Option	Not possible
Wheels	No	Yes, 3 wheels
Bottle holders	Possibility to mount 4 bottle holders	Possibility to mount 3 bottle holders
Transportable with gas bottles in holders	Yes	No

## The FrostGuard Basic

Although the Basic is an economic model, we have not cut back on safety and quality. Because of the lower weight and the 3 wheels, it can easily be put in place.



It can be setup in the field with 3 bottle holders mounted on the machine, it can be connected to a 500 kg tank or it can be connected to a container that holds 5 or 6 gas bottles. The Basic fits into this container which makes it easy to transport or store it.



## The Two Models of the Basic

Model	Basic B20	Basic B25
		
Outlet	20 cm from the ground	100 cm from the ground
Application	orchards, some vineyards, greenhouses	vineyards, lower crops like strawberries
Protected area	between 0,7 and 1 ha	approx. 1 ha
Air distribution	the machine rotates 360°	the machine rotates 360°
Dimensions	1350 x 800 x 1200 mm	1350 x 800 x 1200 mm
Weight	218 kg	218 kg
Gas consumption	10 kg/hour	10 kg/hour

## The FrostGuard Revolution

The FrostGuard Revolution is our top model. It's completely closed with doors on all sides. All doors and the roof are insulated, to prevent condensation and to reduce the noise.

The Revolution can be equipped with an Auto Start System: you only need to set the temperature at which the machine should start and done. It's available in 3 different versions.

### The Three Models of the Revolution

Model	Revolution R20	Revolution R25	Revolution R30
			
Outlet	fix, 20 cm from the ground	fix, 100 cm from the ground	rotating, above the machine
Application	orchards, some vineyards, greenhouses	lower crops like	vineyards, greenhouses, high crops like raspberries
Protected area	between 0,7 and 1 ha	approx. 1 ha	approx. 1 ha
Air distribution	the machine rotates 360°	the machine rotates 360°	the outlet rotates 360°
Dimensions	1200 x 775 x 1200 mm	1200 x 775 x 1200 mm	1200 x 775 x 1550 mm
Weight	325 kg	325 kg	325 kg
Gas consumption	10,5 kg/hour	10,5 kg/hour	10,5 kg/hour

### Safety and comfort features

- Acoustic and visual alarm if the temperature is too low or too high, so also when the machine runs out of gas.
- New pulse burner with ionization protection system: this makes it the safest burner in the agricultural business.
- Heat sensor that stops the gas supply if the burner goes out.
- The sound insulation in the machine prevents condensation and is fireproof.
- If the outlet is not mounted, the engine will not start (R20 and R25).
- Possibility to equip with an Auto Start System. This can also be mounted later as an option.
- Possibility to equip with wireless transmitter or SIM-card reader, for remote control.

### The different setup possibilities of the Revolution

The Revolution can be used in several ways:

- with a support for the gas bottles besides the machine. (1)
- equipped with 4 gas bottle holders. The advantage of this new system is that the machine can be displaced with the gas bottles mounted in the bottle holders. (2)
- **it's also possible to use a gas tank (approx. 500 kg per machine).** (3)
- for large areas, the ideal solution is to connect the FrostGuards with large propane storage tanks through an underground pipeline network.



The new Revolution R20



The old GC20 with a

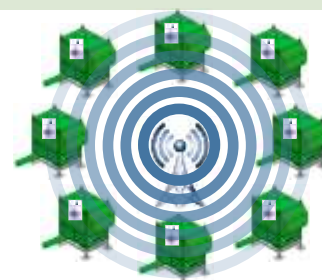


The old GC30 with a support besides the machine (1)

### Auto Start - Remote Control

If you choose for the Auto Start System, each machine is equipped with a temperature and humidity sensor. You can choose the wet temperature at which the Revolution has to start. A built-in clock will stop the machine at a chosen time in the morning.

The Revolution can also be equipped with a SIM-card reader or a wireless transmitter, connected to a remote station. This allows to start and stop the machine from a distance and to monitor all data on a computer or mobile phone.



## A few examples of the results of the FrostGuard

**Pears - Minimum Temperature : -3,5°C - Full flowering**

**Planting density of trees: 0,5 x 3,3 m - 6100 trees per hectare**

Results	Protected	Unprotected	Quality (class)	Protected	Unprotected
Number of fruits per tree	43	33	Class 0	55 %	19 %
Average weight / pear	220 g	170 g	Class 1	28 %	23 %
Yield per tree	9,46 kg	5,61 kg	Class 2	10 %	20 %
Yield per hectare	57.706 kg	34.221 kg	Class 3	5 %	18 %
Diameter > 70 mm	28 %	10 %	Class 4	2 %	20 %
Diameter 60-70 mm	63 %	52 %	% Pears	93 %	52 %
Diameter < 60 mm	9 %	38 %			

Financial result	Protected (57.706 kg)	kg/class	Price €/kg	Amount	Unprotected (34.421 kg)	kg/class	Price €/kg	Amount
Class 0	55 %	31.738	0.57	18.091 €	19 %	6.502	0.57	3.706 €
Class 1	28 %	16.158	0.43	6.948 €	23 %	7.781	0.43	3.384 €
Class 2	10 %	5.771	0.32	1.847 €	20 %	6.844	0.32	2.190 €
Class 3	5 %	2.885	0.22	635 €	18 %	6.160	0.22	1.355 €
Class 4	2 %	1.154	0.12	138 €	20 %	6.844	0.12	821 €
Total				27.659 €				11.457 €
Difference		16.202 €						



**Cherries - Minimum Temperature -4,7 °C**

**Full flowering - 2200 trees per hectare**

Results	Protected	Unprotected	Difference
Yield per tree	11,3 kg	2,7 kg	8,6 kg
Yield per hectare	24.860 kg	5.940 kg	18.920 kg
Quality	Excellent	Poor	

**Conclusion:**

higher yield, higher quality, higher profit, higher yield, higher quality,

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