

# PWM PowderMaster

## Forage Additive Applicator



# User Guide

## Standard Volume

50g - 2000g per minute

### Supplied:

In-cab speed control box  
Granular applicator  
Mounting brackets  
10m Cable  
Tubing

### Before turning the control box on:

Always make sure the 12 volt supply and the applicator are connected to the correct side of the control box and that the RED terminal is connected to plus (+) and the BLACK terminal is connected to negative (-) and that the bare wires of the cables do not touch the case of the control box

**! NEVER** leave unused additive in the hopper it could solidify and stop the rotor turning causing damage to the motor and control box.

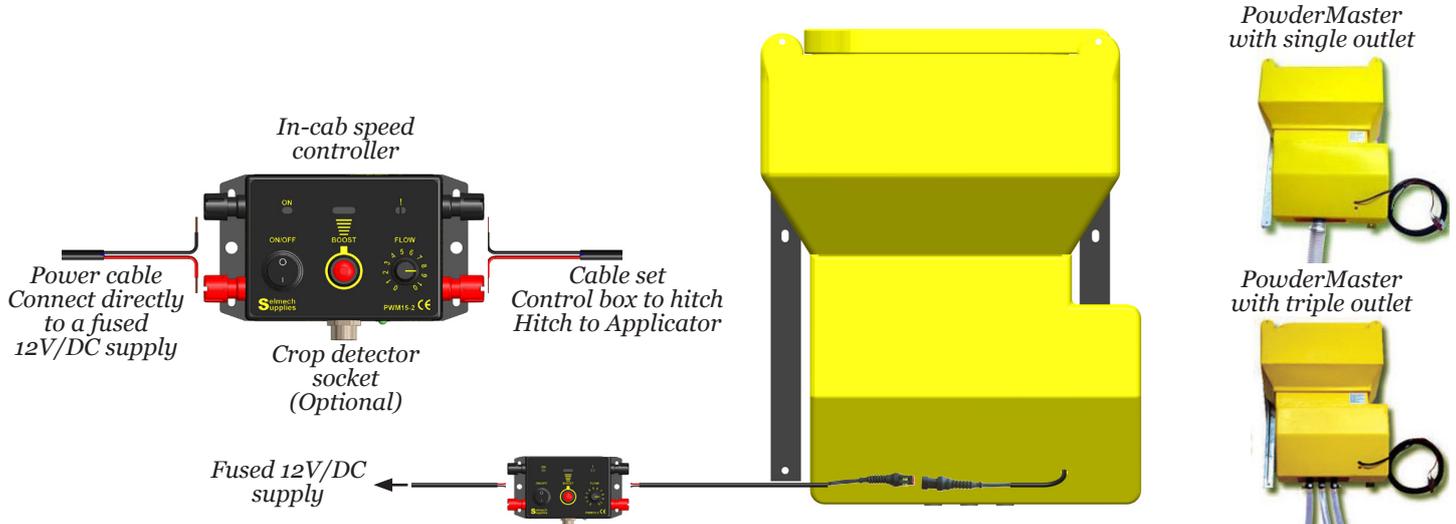
**Any damage caused by failure to follow the above instructions could void the warranty**

# Setting up the PowderMaster

The PowderMaster applicator has a rotor delivery system used to apply granular or powder preservative to treat home grown forage lifted with a self propelled or trailed forage harvester, forage wagon or baler. Depending on the machine it is being installed on the additive is gravity fed down flexible hose via a single 40mm diameter outlet or three 25mm diameter outlets. Where gravity feeding is not possible an optional blower attachment is available. The in-cab speed controller is used to adjust the speed of the rotor to regulate the output. It has the option to attach a thru beam crop detector to automatically turn the motor on and off.

The hopper, manufactured from high density plastic to avoid problems associated with condensation, is available with 50kg or 80kg capacity.

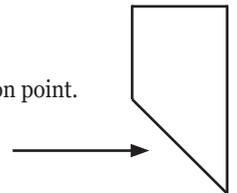
The PowderMaster should be powered by a fused 12 volt DC supply. It is important to ensure that all electrical connections are the correct polarity, clean and secure. Poor connections and long cables can reduce output and make it inconsistent.



## Mounting the PowderMaster

The additive is gravity fed down the hose. **DO NOT** kink or dress the hose up hill.

1. If gravity fed fit the PowderMaster onto the machine in a position so that the additive will be gravity fed to the application point.
2. Cut the delivery hose to the required length and push on to the hose tail/tails. **!Soften in hot water to help do this.**
3. Cut the ends of the hose at a 45 degree angle with the long side facing forward into the direction of travel.



## Application point

The application point will depend on your machine. For a forage harvester this can be behind the accelerator or over the feed rollers. Fitting to a forage wagon or baler the application should be delivered through a triple outlet either over the pick-up reel or transfer rotor.

## Connecting to the in-cab speed controller (control box)

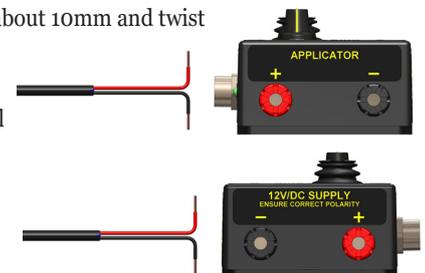
1. Mount the control box in an accessible location in the vehicle cab.
2. Using the cable supplied connect the Super Seal socket to the plug connector on the applicator. Work out the length of cable required to connect this to the control box and cut it at that point. **!Route it to avoid hot spots and pinch points.**



## When making connections to the control box:-

**!Make sure of correct polarity as damage to the control box and or applicator will occur if this is not correct, Make sure that the bare wires of the cable do not touch the case of the control box.**

3. At the cut end carefully strip the cable sleeve back 50mm to leave RED and BLACK tails. Strip the ends about 10mm and twist the bare ends.
4. Connect these bare ends RED + and BLACK - to the "APPLICATOR" terminals on the control box.
5. Cut the remaining cable to the length required to connect the "12V/DC SUPPLY" terminals of the control box to a fused 12-volt DC supply in the vehicle. **!Route it to avoid hot spots and pinch points.**
6. Repeat step 3 for this cable.
7. Connect the bare ends RED + and BLACK - from supply to the "12V/DC SUPPLY" side terminals of the control box.



**!Ensure correct polarity as damage to the control box and or applicator will occur if this is not correct.**

8. Connect to your fused 12 volt DC supply. If using a "D" plug check the polarity is correct in this RED + and BLACK -.

**!The connection to your supply should be secure and clean and the correct polarity.**

**DO NOT** connect the two negative terminals together. **DO NOT** connect the pump negative to the ground of the tractor as this will prevent the applicator operating correctly

## Finally

**Always ensure correct polarity before turning the control box on.**

# Operating the PowderMaster

## In-cab speed controller (control box) *If using a thru beam crop detector refer to the additional instructions.*

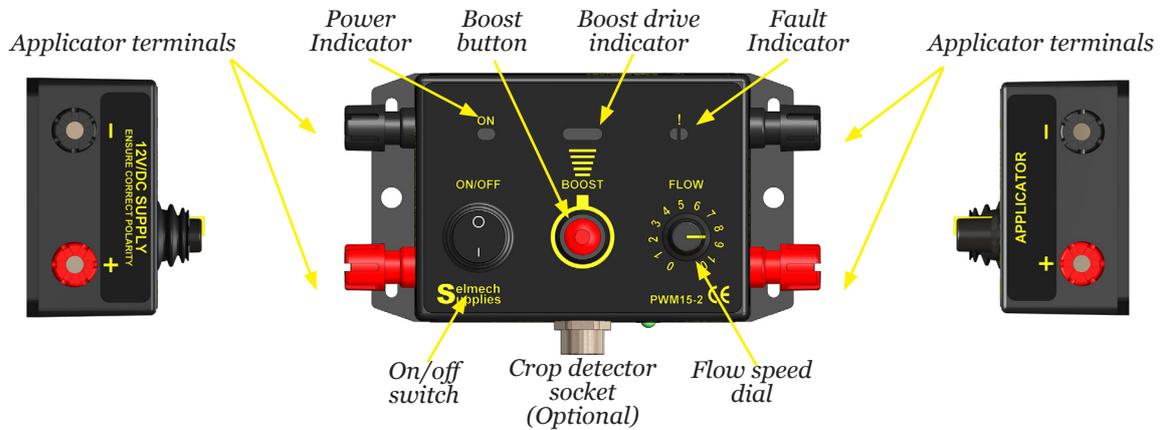
Use the flow speed dial to adjust and set the application rate. If there is extra heavy crop or an area of crop that has a higher moisture content the boost button can be pressed and released to run the motor at full speed for 10 seconds. The Boost indicator will illuminate when in this mode. To stop boost sooner press the button again. This can be repeated as often as required.

The “!” fault indicator warns of a power supply problem (refer to Fault Diagnosis).

Connect the control box directly to a fused 12-volt DC supply via the red and black terminals marked “12V/DC SUPPLY”.

Connect the applicator directly to the terminals marked “APPLICATOR”. **!Always ensure correct polarity before turning the control box on.**

**DO NOT connect the two negative terminals together. DO NOT connect the applicator negative to the ground of the tractor**



## Calculate your application rate (This guide can be used for forage harvesters, forage wagons and balers.)

It is important to know how much of your additive should be applied per tonne of forage (Application rate). Consult the supplier of your additive.

1. Work out how many tonnes per hour (t/hr) of forage is being treated. (example: - 120 t/hr)
2. Multiply that by the grams per tonne (g/t) of additive to be applied. (example: - 200 g/t x 120 t/hr = 24000 g/hr)
3. Divide that by 60 to give you the application rate in grams per minute (g/m). (example: - 24000 g/t / 60 = 400 g/m)
4. Refer to the calibration chart and use this figure to set the flow speed dial on the control box.

## For Your Figures

Tons of forage to be treated per hour	X	Additive application rate per tonne	=	Grams of additive per hour	/	Divide by 60 to convert to minutes	=	Grams of additive to be applied per minute
120		200 g/t		24000 g.hr		400 g/m		400 g/m

## Setting the application rate

The application rate will depend on the volumetric weight of your additive. The PowderMaster has a fluted rotor delivery system. This delivers a set volume for each flute so the weight of the additive in that flute determines the final output rate.

## What is Volumetric Weight?

**Volumetric weight (VW) is the weight in grams (g) of 1 litre (L) in volume of the additive.** Corn based additive is typically around 600g and a lime stone based additive 1500g.

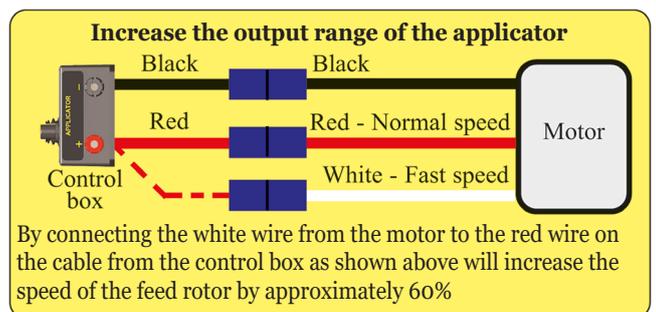
**The table below is used as a guide in grams per minute (g/m)**

Refer to the output guide below shown in grams per minute (g/m).

Set the control box flow speed dial to the number for your calculated application rate.

**We recommend you carry out your own calibration check** by using the guide to set the speed dial to the nearest setting that matches your target. Dispense additive into a bag/container for 1 minute and weigh it then adjust the speed dial up or down until you achieve your target application rate. Enter your results into the guide grid.

SV Control box setting	3	4	5	6	7	8	9	10
Corn based - output in g/m	130	200	270	350	430	500	580	620
Limestone based - output in g/m	320	490	680	880	1070	1250	1440	1550
Your calibration figures								
Your calibration figures								



The calibration guide assumes that the electrical supply is adequate. Poor connections and long cables can reduce the drive voltage to the motor.

**Monitor the flow** - Make adjustments if necessary

**! NEVER leave unused additive in the hopper it could solidify and stop the rotor turning causing damage to the motor and control box.**

## Safety

1. Read and follow any warnings or guidance supplied with the additive.
2. Wear protective clothing when handling additive or applicator being used with additive.
3. Switch off and disconnect the applicator before filling with additive, putting your hand in the hopper or carrying out maintenance.
4. Do not contaminate skin, clothing, ponds or waterways with additive.
5. Do not allow the tubing to become kinked or blocked.
6. Never use a higher rated fuse than the one fitted.
7. Make sure all electrical connections are clean, secure and of the correct polarity before turning on the control box.
8. This applicator **SHOULD ONLY** be used for dispensing additive recommended by the suppliers.

## Maintenance

1. Always remove any unused additive.
2. Store empty in a clean dry place.

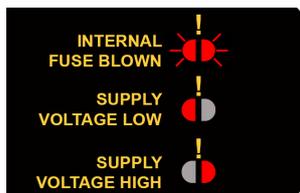
## Internal fuse



15 AMP fuse Mini Blade type

## Fault Diagnosis

The control box fault indicator will alert you if there is a problem with the supply or if the internal fuse is blown.



If the internal fuse has blown check for reasons why this may have happened before replacing and turning the control box on. **! Never use a higher rated fuse than 15 Amps.**

If the supply voltage is low check your supply and all connections. **! This could be caused by inadequate cable or poor connections.**

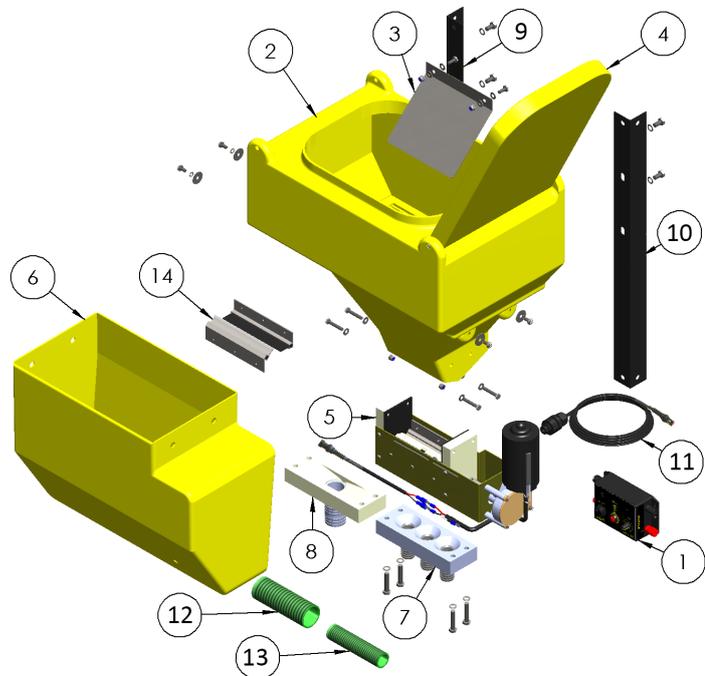
If the supply voltage is high. **! This could be caused by faulty tractor regulator or unregulated power supply.**

Fault	Diagnosis	Remedy
Motor will not run	Fuse blown	Check the internal control box fuse and for reasons why it has blown before replacing.
	Supply Low voltage indicator illuminated	Check supply and wiring connections
	Wires incorrectly connected or damaged	Check the wiring is connected correctly
	Seized or damaged motor	Contact your agent or Selmech Supplies
Motor runs but poor or no output	Motor leads incorrectly connected causing the Motor to run backwards	Connect leads correctly. This could have damaged the in cab speed controller and/or the motor.
	Hopper empty	Refill hopper
	Tubing kinked or split	Check tubing/remove kink and re-route tubing
Incorrect application rate	Incorrect calibration setting	Refer to calibration chart
	Volumetric weight not compatible with calibration chart	Calculate volumetric weight and adjust settings accordingly
Additive coming out when turned off	Brush strips clogged or worn no longer effective	Replace brush strips

## Warranty

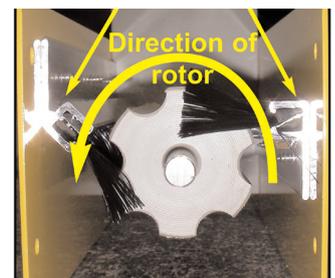
Provided installation is carried according to these instructions a warranty of 1 year from date of delivery applies. This covers faulty parts/manufacture only and does not cover wear and tear through normal use or mechanical or chemical damage that has occurred to parts through misuse or unauthorised attempts to repair the unit. In the case of faulty manufacture, claims are limited to repair of the unit and its return to the customer.

## Parts Diagram



No.	Part No.	Description	QTY
1	SS83	PWM12-2 Controller	1
2	SSX174	50kg or 80kg Hopper (Option)	1
3	SSX255	Baffle Plate	1
4	SSX174	Hopper Lid Part of Hopper	1
5	SSX159	Feed Unit With Motor	1
6	SSX175	Feed Assembly Cover	1
7	SSX263	Triple Hose Block (Option)	1
8	SSX240	Single Hose Block (Option)	1
9	SSX256	Mounting Rail 1 of a pair	1
10	SSX256	Mounting Rail 1 of a pair	1
11	SSX22	10M Cable	1
12	SSX60	40mm Tube (Option)	2M
13	SSX80	25mm Tube (Option)	3M
14	SSX70	Brush Strip Set	1

## Brush strips



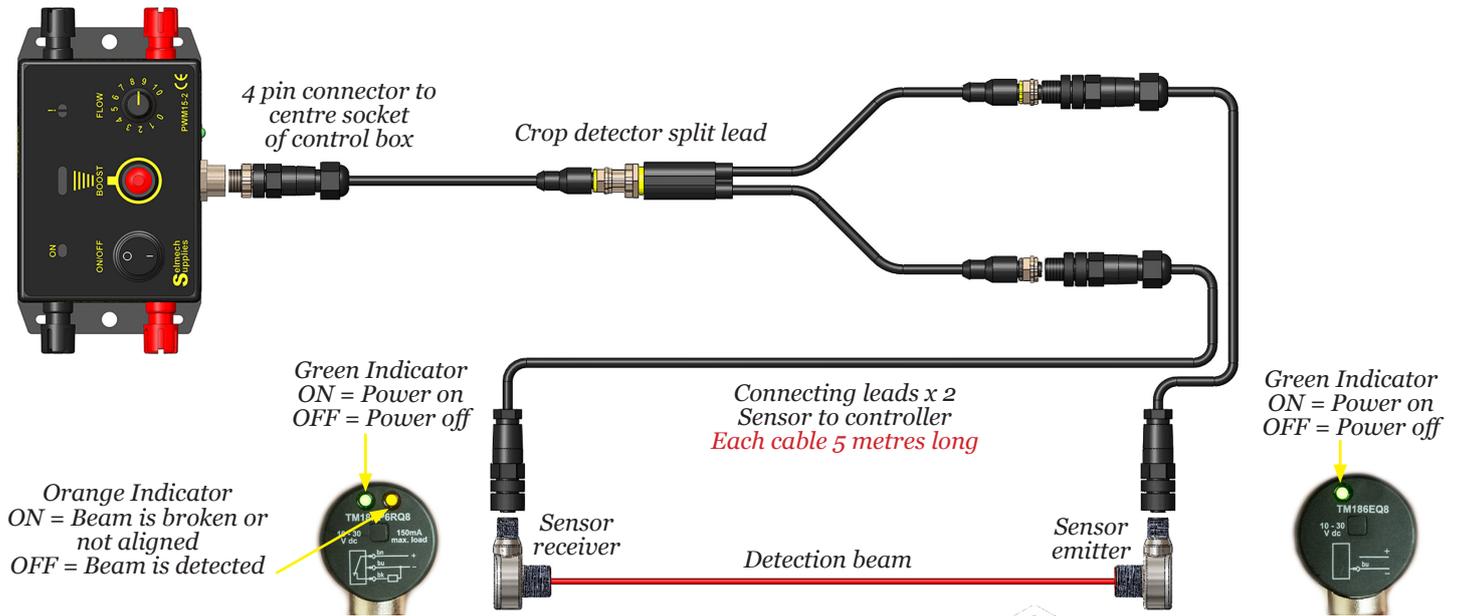
# The thru beam crop detector option

The thru beam detector kit is designed to be used in conjunction with a Selmech Supplies in cab speed controller that is fitted with a 4 pin socket between the supply and applicator connectors.

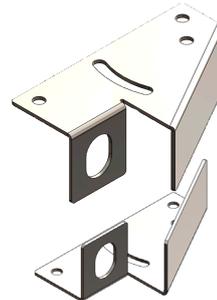
When connected it will automatically turn the applicator on when crop is detected by breaking the beam at the point of pick-up. When there is no crop (beam not broken) the applicator will be turned off.

There is an LED lamp, that displays green, or red this will show if there is crop or no crop. If there is no crop detector kit plugged in the lamp will not be illuminated and the control box will work normally.

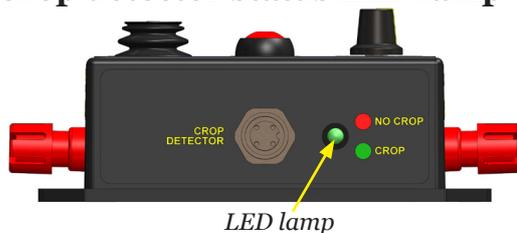
## Crop Detector connections



The mounting position of the sensors will vary depending on the make and model of the baler. In some cases an adaptor bracket may need to be fabricated by the end user.



## Crop detector status LED lamp



When the LED lamp is RED - NO CROP is being detected and the applicator will not dispense additive.

When the LED lamp is GREEN - CROP is being detected and the applicator will dispense additive.

If no crop detector kit is plugged the LED lamp will not be illuminated and the control box will work normally.

If crop is present but the LED lamp is RED check all connections and for any damage to cables or the sensors.

## Powdermaster Blower Attachment Option

The Powdermaster blower attachment is supplied as a kit that can be easily fitted to the Powdermaster. This is particularly valuable where gravity feed is not possible or difficult to accommodate.

A wiring loom is included that enables the electrical connections to be made via a switching control circuit to synchronise the operation of the blower with the Powdermaster.

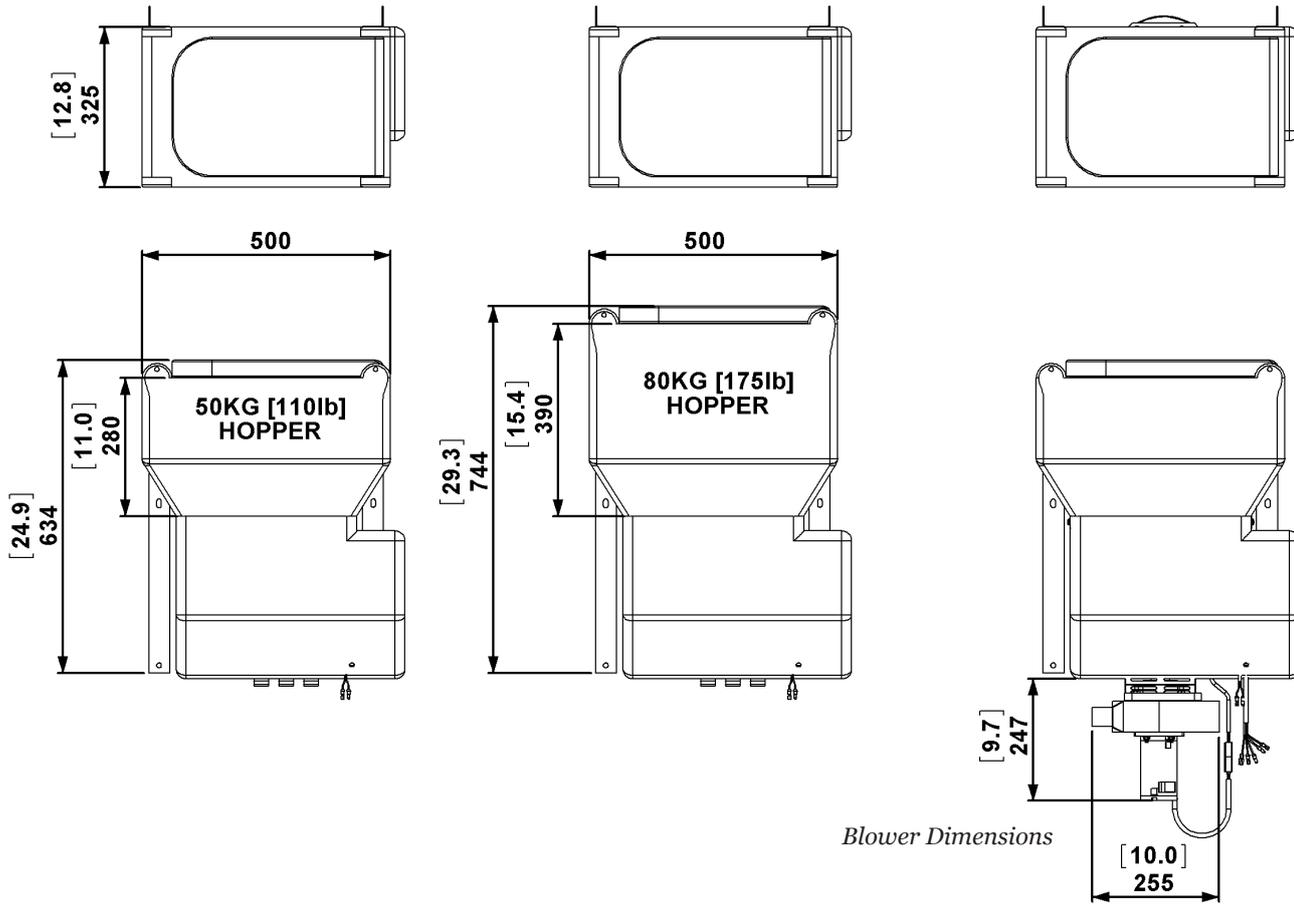
The blower assembly can be mounting so that the pipe outlet is facing in a left or right direction. It can be fitted to both 50kg or 80kg Powdermaster, with either digital and non digital controller.

Below are some images showing how the Powdermaster with blower attachment has been mounted on some machines.



# Technical Details

## Powdermaster Overall Dimensions



TECHNICAL DATA	POWDERMASTER	BLOWER
Supply Voltage	12V/DC (10.6V DC to 16.4V/DC)	12V/DC (10.6V DC to 16.4V/DC)
Current consumption	2.8A	11.5A
Fuse rating	5A	15A
Output signal to motor	PWM approx 1.4 KHz	
Capacity of the hopper	50 kg or 80kg (110lb or 175lb)	<i>The fan power supply is independent of the applicator. The fan does not draw power from the applicator.</i>
Output range	Standard Volume - 50g to 2000g (1.8oz - 70oz) per minute	
	High Volume - 400g to 3000g (14oz - 105oz) per minute	<i>Output will depend on the volumetric weight of additive.</i>
	Low Volume - 20g to 150g (0.70oz - 5.30oz) per minute	

## Photos of mounted Powdermasters



# Wiring Diagrams

**PWM POWDERMASTER WIRING DIAGRAM**

