

## Delta Drive Operation

Delta Drive will run on SMA111 and all revisions of SMA106 board, and is supported by QNX and Linux based systems. The machine must be equipped with Pilot system and latest software (Update410 or later)

To enable the delta drive mode, go to the 'Fan Setup' function in the 'Setup' screen and turn on the 'Delta Drive' button. Only the standby fan speed setting can be changed, all other speeds are disabled and their settings will not have any effect when running profile in delta drive mode.



The algorithm is very simple.

1. At the start of the profile when machine is in warmup phase and actual temperature is well below setpoint, the fans will run at 100% speed.
2. Once machine warms up to a setpoint greater than 85 degrees, the speed will drop to 90% and remain there during first day of incubation. The 85 degree minimum is to keep fans at full speed during prewarm.
3. From day 1.00 to day 1.99 the fans will run at 70% speed.
4. At day 2.00 speed will drop to 50% and the machine will now measure the ambient temperature from the Platinum Egg sensors. A minimum of one sensor needs to be connected (two if P120), but if more than one sensor is present the highest ambient temperature will be used (typically the one placed lowest in the rack).
5. The machine will average several Platinum Egg ambient readings over the last two rack turns (2 hours if turning is set to 60 minutes) to eliminate the temperature swings seen by Platinum Eggs due to changes in air flow.
6. The highest Platinum Egg ambient temperature is compared to the machine temperature (i.e. probe mounted on ceiling) and if the difference is more than trigger point, the speed will be increased by 5. On Platinum P120 the fan speed has to be same for all fans, therefore will be increased by whichever zone

has the greater difference. On Platinum 2.0 the front and rear zones can operate at different speeds. The trigger point is as follows:

- Day 0.00 to 6.99 the trigger offset is 1.0 deg F
- Day 7.00 to 9.99 the trigger offset is 1.5 deg F
- Day 10.00 and onward the trigger offset is 2.0 deg F

7. The machine will wait at least 60 minutes before the speed can increase again, except if the temperature difference rises up rapidly where it will wait only 30 minutes.

8. The speed will only increase, it will never decrease during incubation cycle.

When machine operates in delta drive mode a thermometer icon is displayed beside the fan button.

When machine power is turned off and on, for the first minute fan speed will be controlled as per fixed speed setup. Once enough temperature samples have been collected from Platinum Egg, fan speed will be delta controlled again, starting at fan speed prior to power off. The first speed increase will not happen until at least two rack turn cycles have completed.

If the machine has a high temperature alarm or Platinum Egg communication alarm, the fans will run at full speed until problem is corrected.

If the machine is powered on with delta drive enabled but no Platinum Egg is plugged in, the machine will ignore the mode and use the normal fan speed profile programmed in the fan setup screen. This is the reason that the speeds are ghosted out in the setup screen, allowing the user to still see what settings will be used if machine can't operate in delta drive mode.