

Greenhouse Controller Operation Guide

Read all the instructions before installing and powering the controller

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Greenhouse
Control v1.17
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Initializing...
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1. Profiling Mode : The first time the controller is powered up the current version of software will display for a few seconds (v1.xx). The next screen will display Initializing for about 1 minute while the controller measures the internal pressure of the inflation chamber. The damper is set to a known value and the system will wait until the pressure stabilizes. This process will take several hours to complete based on the size of the greenhouse inflation

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LOW      0.00
PRESSURE
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```
PROFILING  1
S1000  P.15 T.05
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Once stabilized, if the pressure is less than 0.10 the display will show Low Pressure and the controller will then open the damper all the way. The system will continue to monitor pressure until it reaches 0.10, at which time the Profiling process will begin. The profiling process will set different damper openings (S1xxx) to achieve the predetermined pressures. These servo values are stored in a table and used to set the damper opening for different pressures. The damper opening will be profiled from 0.05 to 0.50 in increments of 0.05. If the pressure cannot be achieved, the table value for that pressure will be set to the maximum value. During the profile the display will show the current target pressure (Tx.xx), the current actual pressure (Px.xx), and the current damper opening (Sxxxx). Each change in the damper opening will require the pressure to stabilize before a reading is recorded. The total number of measurements is determined by the SCALE setting. The current reading number is shown on the right side of the top line of the display. Once it has completed Profiling it will switch to Auto Mode.

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HUMIDITY  →
  87
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P 0.15  WIND→
T 0.15  2
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IN  TEMP F  OUT→
101  89  78
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2. Auto Operation : Auto Mode is the default mode of operation. This compares the inlet blower temperature and internal greenhouse temperatures to calculate the film surface temperature of the air chamber. It will maintain a lower pressure in the chamber during high temperature and a higher pressure during lower temperatures. By controlling the pressure it will prevent damage to the film due to stretching caused by excessive pressure during elevated temperatures. The controller will monitor the pressure fluctuations caused by the wind hitting the air chamber. Pressure in the air chamber that is too low during high winds and gusts will cause flapping or rippling that may cause damage to the film. The controller will increase the pressure in the air chamber stiffening the surface to resist the effect of the wind. The target pressure is based on the film temperature and the Wind Gain setting. The controller sets a lower max pressure during high temperatures and a higher max pressure during lower temperatures. An Arrow will be displayed in the top right corner of the HUMIDITY, PRESSURE and TEMP screens when Auto mode is enabled.

A green rectangular screen displaying the text "MENU:" in a monospaced font.A green rectangular screen displaying the text "Current Mode:" on the first line and "MANUAL" on the second line in a monospaced font.A green rectangular screen displaying the text "Current Mode:" on the first line and "AUTO" on the second line in a monospaced font.

3. Menu Mode : Access the Menu by holding down the Start/Stop Button for 5 seconds. The display will cycle between screens until MENU: is displayed. Release the button and the Current Mode screen will be displayed. There are two options for this screen, use the Arrow Buttons to toggle between the MANUAL and AUTO displays. Press the Start/Stop button to move to next menu screen.

A green rectangular screen displaying the text "Learn Mode:" on the first line and "ENABLED" on the second line in a monospaced font.A green rectangular screen displaying the text "Learn Mode:" on the first line and "DISABLED" on the second line in a monospaced font.


4. Learn Mode : The Learn Mode is set to ENABLED as the default setting. This will allow the controller to learn the profile characteristics of the blower, servo/damper and greenhouse chamber inflation/deflation rates. The goal is to find the range of pressure from low to high that the blower is capable of due to the leaks in the air chamber. It will start by lowering the pressure by closing the damper. It will then bring it back up by opening the damper in small increments until it has reached the max pressure. The controller will then use this profile to maintain the pressure either in Auto or Manual Mode. If the Mode is set to Disabled the controller will use a generic pre-programmed profile into the unit and will not allow the unit to run in full Profile Mode.

A green rectangular screen displaying the text "Wind Gain" on the first line and "1.0" on the second line in a monospaced font.

5. Wind Gain : This is a sensitivity setting ranging from 0 to 10 (low to high) affecting the max pressure the unit will reach during a wind event while running in Auto Mode. A lower gain will decrease the pressure while a higher gain will increase the pressure.

A green rectangular screen displaying the text "Max Pressure :" on the first line and "0.50" on the second line in a monospaced font.

6. Max Pressure : The default pressure is set to .50 which is the maximum pressure recommended by most greenhouse manufacturers to prevent damage to the plastic film. You may lower it if needed based on plastic thickness or as a preventive measure.

A green rectangular screen displaying the text "DAMPER" on the first line, "1024" on the second line, "100%" on the third line, and "P0.50" on the fourth line in a monospaced font.

7. Damper : The UP and DOWN Arrows manually control the DAMPER opening from 100% fully open (1024) to 0% fully closed (2022). The P0.xx is the current reading of the Air Chamber.



8. Scale : This setting is based on the size of the greenhouse: 1 being a small Greenhouse and 10 an extremely large Greenhouse. Most greenhouses will operate in the 3 to 6 range. This allows the user to optimize the response time with relation to the Greenhouse size. A larger number provides more time for the pressures to stabilize before the controller makes adjustments while a smaller number is more responsive.



9. Reset Default : Setting to YES will reset all parameters back to factory defaults, except for profile data.



10. Clear Profile : By setting this to Yes you will reset all the profile information stored in the unit and cause it to go back and run a new profile on the unit as discussed in learn mode. Learn Mode must be set to ENABLE for this feature to work.



11. Manual Operation : This mode uses the adjustable target setting to maintain the pressure in the air chamber without considering the temperature or wind gusts. The display will cycle through the Humidity, Pressure and Temperature screen every 4 seconds.

Humidity Display shows the humidity reading from the sensor mounted in the bottom of the Controller Enclosure. It is measuring the Humidity level in the greenhouse or the area where the Controller is mounted.

Pressure Display shows the actual pressure from the inlet attached to the air chamber of the greenhouse via the .25 Dia. tubing provided and the controller. The reading on the lower left (Ax.xx) is the actual reading in the chamber measured in inches of water. The numeric reading on the right (T x.xx) is the target pressure desired in the air chamber.

Temperature Display shows the air temperature (IN) of the greenhouse where the Controller is mounted and (OUT) is the inlet air filling the chamber. The middle reading is the calculated outside film temperature.

NOTE : If power is lost, the damper will close to slow the deflation of the greenhouse. If the inflation motor is running with the controller unplugged, the pressure can still be controlled by physically moving the damper. The servo will not be damaged by directly adjusting the damper. Once power is restored to the controller, it will again take control.