HERON ELECTRIC COMPANY LTD

EC8 EC16 MEC128

Environmental Controller

User Manual

MEC-128 User3.odt

1. Getting to Know Your Controller

The TC6 and EC16 are single zone controllers. The EC16 has 16 outputs and the TC6 is limited to 6 outputs.

The MEC-128 can control ventilation, heating and screens across multiple greenhouses or zones. The MEC128 can control up to 8 zones with a total of when fully configured..

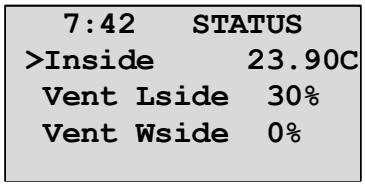
This manual describes first how to set up your controller in its simplest format, controlling vents and heating for one zone.

This manual then describes how to set the controller's configuration options to achieve far more sophisticated monitoring and control of vents and heaters.

It is assumed that appropriate sensors have been installed to initiate the control of vents and heaters.

Status Page

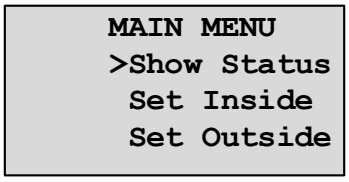
When you switch on the power the **Status Page** will be displayed.



The information shown on the **Status Page** will depend on how your controller has been set up. In the example above the current inside temperature and the percentage opening of the leeside and wind side vents are displayed.

Main Menu

To access the controller's **Main Menu**, press the **MENU** button.



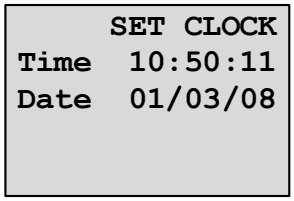
The items listed on the **Main Menu** will vary depending on the options set when the controller is configured.

- To scroll through the items on any menu displayed by the controller press the up and down arrows.
- To select any menu item press the **OK/SELECT** button.
- To return to the previous **Menu** at any time press the **MENU** button.
- To display the **Status Page** select the "**Show Status**" option on the **Main Menu**.

2. Resetting the Clock and Date

Select "**Set Clock**" from the **Main Menu**.

The following screen will be displayed.



Use the **Left** and **Right** arrow keys to move the cursor over the time fields and change the time of day.

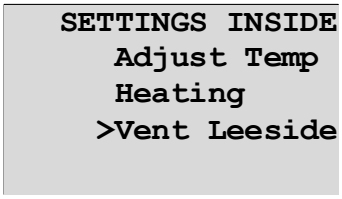
Press **Arrow Down** to move cursor over the date fields. The date is in the format DD/MM/YYY.

Press the **MENU** button to return to the **Main Menu.**

3. Temperature Settings for Vents

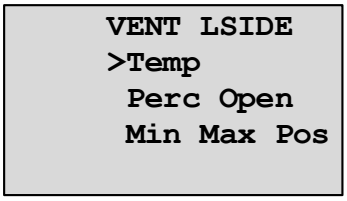
For both the leeside and wind side vents you need to enter the temperatures when the vents should be fully closed and fully open.

Select "**Set Inside**" from the **Main Menu.**

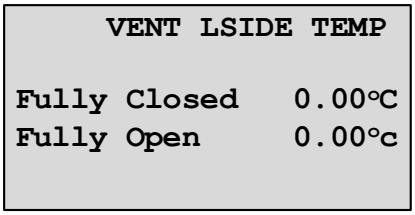


Select "**Vent Leeside**" from the **Settings Inside Menu**.

The following screen will be displayed.



Select "**Temp**" from the **Vent Leeside Menu**. The following screen will be displayed.



Enter temperature thresholds for when the vents must be fully closed or fully open.

If the temperature reading falls below the specified fully closed temperature, then the vents will close fully.

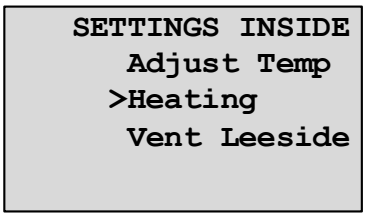
If the temperature reading goes above the specified fully open temperature, then the vents will open fully.

Press the **MENU** button to return to the **Vent Leeside Menu.**

4. Temperature Settings for Heating

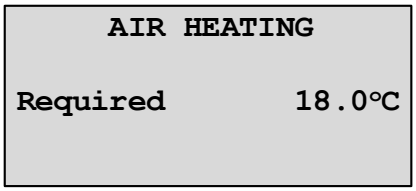
To control the operation of the glasshouse heaters you need to define the required glasshouse temperature.

Select "**Set Inside**" from the **Main Menu**.



Select "**Heating**" from the **Settings Inside Menu**.

The following screen will be displayed.



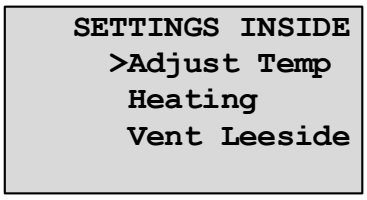
Enter required glasshouse temperature.

Press the **MENU** button to return to the "**Set Inside**" menu.

5. Adjust All Temperatures

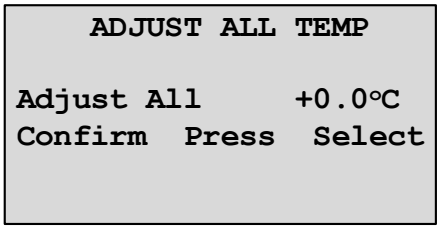
This option allows you to increase for a specified zone the required glasshouse temperature; the leeside and wind side vents fully open and closed temperatures, in one operation.

Select "**Set Inside**" from the **Main Menu**.



Select "**Adjust Temp**" from the **Settings Inside Menu**.

The following screen will be displayed.



Enter the required increase in temperature. Press the **OK/SELECT** button.

Press the **OK/SELECT** button again to confirm you want to make the change.

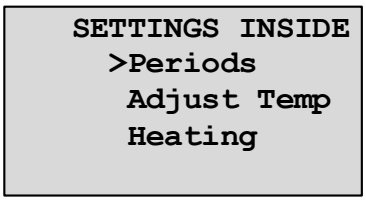
After a few seconds the display will automatically revert to the **Settings Inside Menu**.

6. Setting Temperatures With Multiple Time Periods

If your controller is set to use Multiple Periods then you need to set temperatures for each period. You also need to set the period start times. (The number of Periods that each zone uses is set under Zone Options as described in the installation manual).

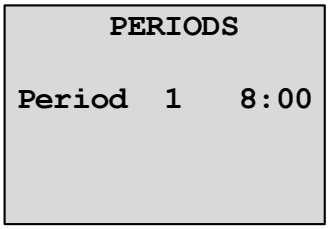
Setting Periods Start Times

Select "**Set Inside**" from the **Main Menu**.



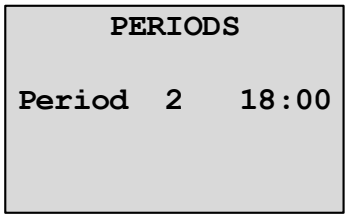
Select "**Periods**" from the **Settings Inside Menu**.

The following screen will be displayed.



Now enter the time of day as per the 24-hour clock when the first period should start.

Press the **Arrow Down** to scroll to the start time for the next period to set this.

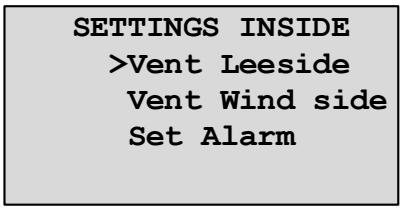


In the example above, the day has been split into two time periods. Period 1 will apply from 8:00hrs in the morning until 18:00hrs in the evening. Period 2 will apply from 18:00hrs in the evening until 8:00hrs the following morning.

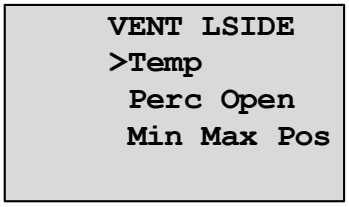
The temperature thresholds to control the heaters and the vents for each period must now be entered.

Setting Period Temperatures for Venting

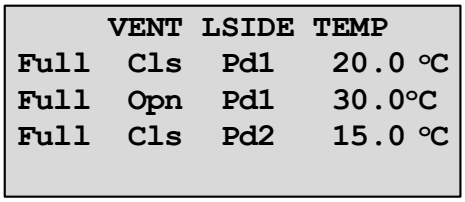
Select "**Set Inside**" from the **Main Menu**. .



Select "**Vent Leeside**" from the **Settings Inside Menu**. The following screen will be displayed.



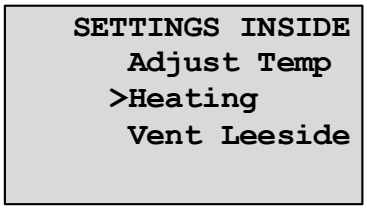
Select "**Temp**" from the **Vent Leeside Menu**.



Enter the fully open and fully closed temperatures for each period.

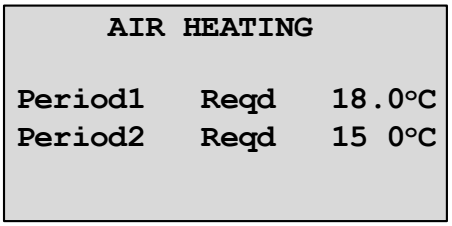
Setting Period Temperatures for Heating

Select "**Set Inside**" from the **Main Menu**.



Select "**Heating**" from the **Settings Inside Menu**.

The following screen will be displayed.



Enter the required temperature for each period.

7. Additional User Vent Settings

This section describes additional vent settings. The section describes how to configure:-

- Vent opening
- Vent synchronization
- Climatic control of the vents.
- Humidity control with vents

Note: The following steps should be repeated for both the leeside and wind side vents.

Adjusting Minimum and Maximum Vent Positions

By default you controller has been set with **10 vent positions**, set up as follows:-

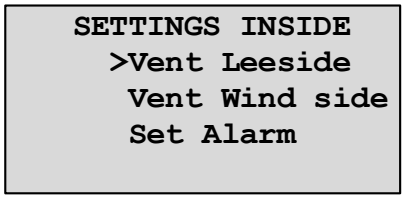
position 1 is set at 10% open, position 2 is set at 20% open etc.

For each vent you can set the minimum position the vent will travel to and the maximum position it will travel to. For example, you can set a vent to always operate between 20% and 90% of its maximum travel by setting the vents minimum position and maximum position. Referring to the table above, 20% equates to Position 2 and 90% equates to Position 9. Therefore, you would enter the Minimum Position=2 and the Maximum Position=9.

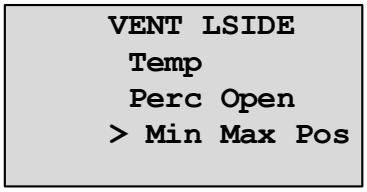
Note: if you need to adjust the percentage opening of each position please refer to the next section.

To change the vent minimum and maximum position proceeds as follows:-

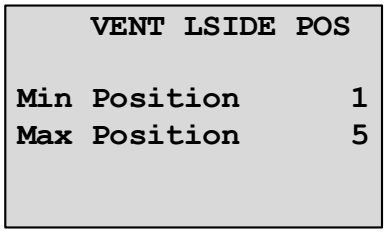
Select "**Vent Leeside** " from the **Settings Inside Menu.**



Select "**Min Max Pos**" from the **Vent Leeside Menu**.



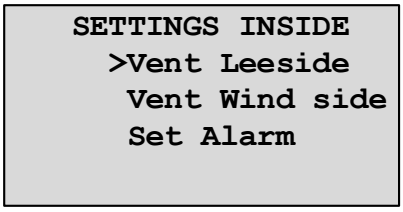
The following screen will be displayed.



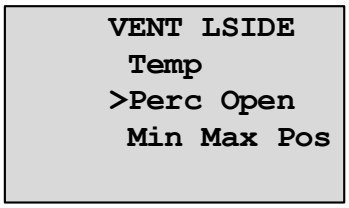
Adjusting Position Percentages

The default setting for your controller is for 10 vent positions, opening in increments of 10% as per the table above. You do not have to use all 10 positions. Vents can open in fewer stages or can open in non-linearly by adjusting the percentages. To change the percentages proceed as follows:-

Press the **MENU** button to return to the **Settings Inside Menu.**

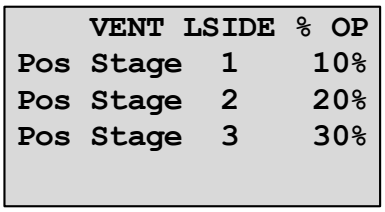


Select "**Vent Leeside**" from the **Settings Inside Menu**. The following screen will be displayed.:-



Select "**Perc Open**" from the **Vent Leeside Menu**.

The following screen will be displayed.



Press the arrow up and down keys to scroll through the 10 positions values and adjust then as required.

If, for example, you only require 5 possible positions then set the position stages as follows:-

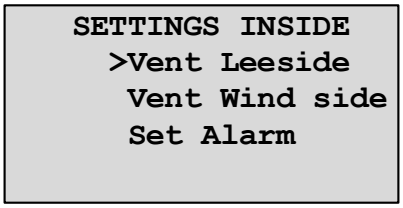
Vent Synchronization

A time of day can be specified when all vents should temporarily fully close. This enables the controller to synchronize and recalibrate the fully closed position across all vents.

If a vent remains in the minimum open position for a specified time, then it to can fully close temporarily to allow ongoing recalibration of the vent position during the day. A minimum position recalibration for a vent will not be initiated again until the vent has moved away from the minimum position and then returned to it.

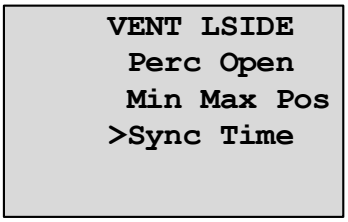
The following steps should be repeated for both the leeside and wind side vents.

Select "**Set Inside**" from the **Main Menu**. Enter the number of the zone you want to set up.



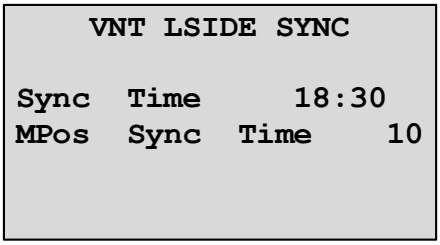
Select "**Vent Leeside**" from the **Settings Inside Menu**.

The following screen will be displayed.



Select "**Sync Time**" from the **Vent Leeside Menu**.

The following screen will be displayed.



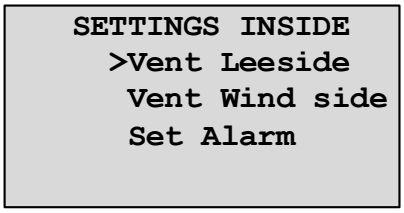
Position the flashing cursor over the "Sync Time" input field and enter the time of day when the vent should fully close and then return to their required position.

Position the flashing cursor over the “Minimum Position Sync Time “ input field and enter the number of minutes a vent needs to be in the minimum open position before it fully closes for recalibration.

Vent Climatic Control

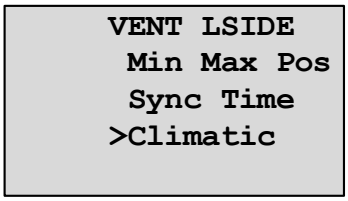
For each zone you can set how vents will be additionally controlled by the out side weather. You will need a Heron Weather Station or Heron Wind Speed senor connected to your controller. Also the Climatic Zone option will need to be set for each zone (see Installation Manual).

Select “**Set Inside**” from the **Main Menu**.



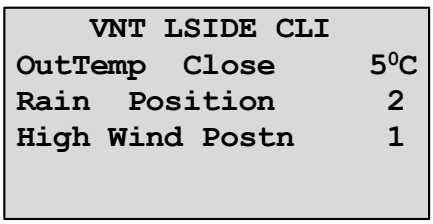
Select “**Vent Leeside**” from the **Settings Inside Menu**.

The following screen will be displayed.



Select “**Climatic**” from the **Vent Leeside Menu**.

The following screen will be displayed.



On this display you can set:-

- The outside temperature that the vent will close
- The Position the vent will move to when it rains
- The position the vent will move to in a High Wind

- The position the vent will move to in a Very High Wind

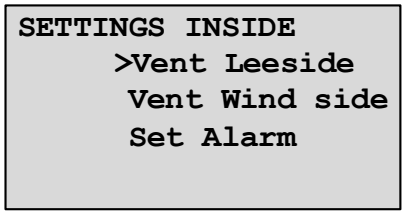
Setting the Wind Speed Thresholds for '**High Wind'** and '**Very High Wind'** are described in Section 9

Controlling Humidity With Vents

You can control humidity with the vents. Two humidity percentage thresholds can be specified to open the vents if the humidity rises too much. The humidity control option will need to be set, see Installation Manual.

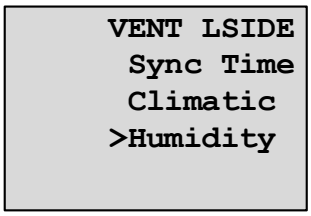
The following steps should be repeated for both the leeside and wind side vents.

Select "**Set Inside**" from the **Main Menu**.



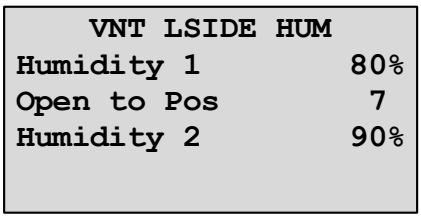
Select "**Vent Leeside**" from the **Settings Inside Menu**.

The following screen will be displayed.



Select "**Humidity**" from the **Vent Leeside Menu**.

The following screen will be displayed.

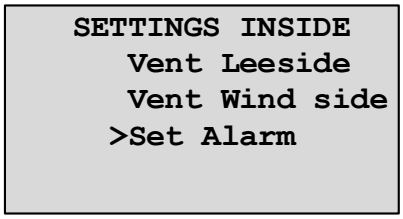


Enter the humidity percentage thresholds and their associated vent open position stage numbers.

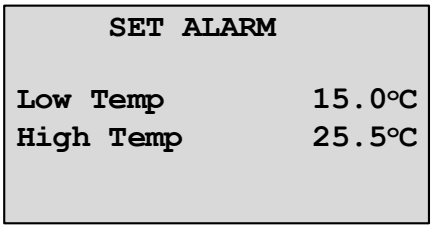
8. Alarms

Alarm thresholds for temperature can be set under **Set Alarm**.

Select "**Set Alarm**" from the **Settings Inside Menu**.



The following screen will be displayed.



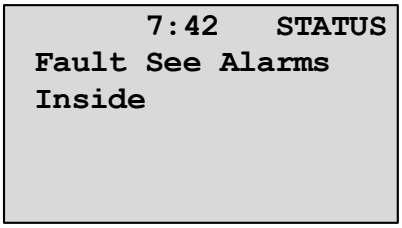
Enter the low temperature and high temperature thresholds, which will trigger an alarm.

If the temperature falls below or rises above the limit temperatures, the alarm output will be triggered.

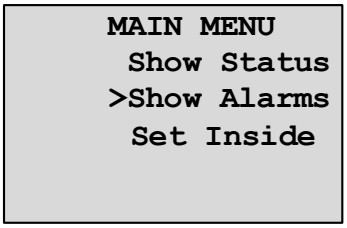
Press the **MENU** button to return to the **Settings Inside Menu.**

Displaying and Clearing Alarms

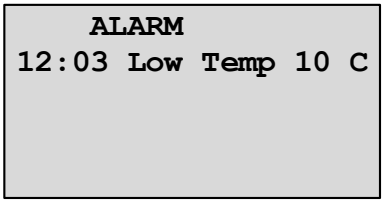
If an alarm condition occurs, it will be displayed on the Status page as shown below:-



To view and clear the Alarm go to the **"Show Alarms"** menu item which will appear in the **Main Menu**.



Select "**Show Alarms**" and a page similar to the following will be displayed:-



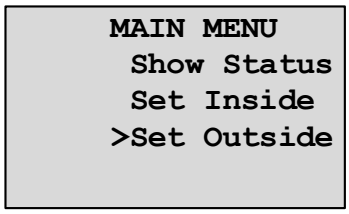
To clear the alarm, press the '**Clear Alm'** button.

Appendix 14 , provides more detailed information on alarm conditions.

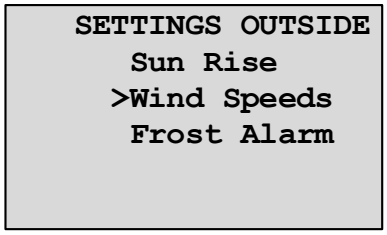
9. High Wind Thresholds

You can set two high wind thresholds which will close all vents in case of strong winds. You will need a Heron Wind Speed sensor connected to your controller.

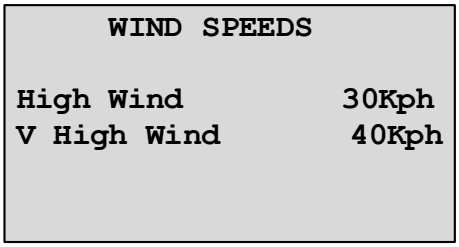
Select "**Set Outside**" from the **Main Menu**.



Select **"Wind Speeds"** from the **Settings Outside Menu**.



The following screen will be displayed.



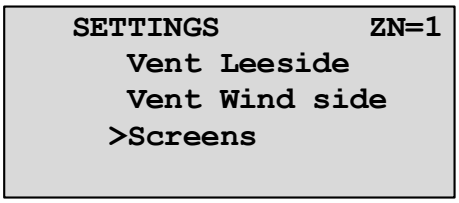
10. |Screening

The TC6, EC16 and MEC-128 controllers can be configured to control:-

- Thermal Screening
- Shading
- Gapping.

To display the **Screening Menu** the appropriate System Configuration options must be set up (see Installation Manual).

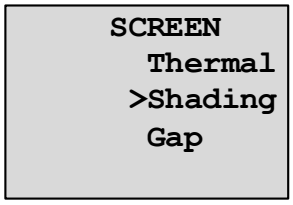
Select "**Set Inside"** from the **Main Menu**.



Scroll down the **Settings Menu** and select **"Screens".**

The following screen will be displayed.

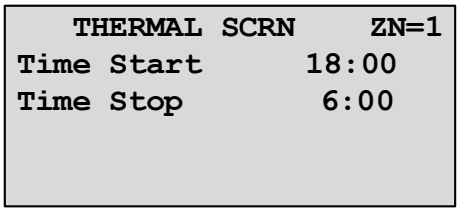
Note: In the display below it is assumed that screens have been defined for both thermal and shading use and the gapping option is set. Some menu items may not be displayed depending upon your configuration.



Thermal Screening

Select "**Thermal"** from the **Screen Menu.**

The following screen will be displayed.



The 'Time Start' is the time at which thermal screening will start, ie the time at which the screen will close. 'Time Stop' is the time at which thermal screening will end.

In the example above, the screen will close at 18:00 and open at 6:00.

If the Climatic control option is set (see Zone Options in the Installation Manual) then a third line is displayed giving you the facility to set the outside temperature at which the screen will close. This is shown below.

In the below example the screen will close if the outside temperature falls below 10 deg C.

```
 THERMAL SCRN    ZN=1
Time Start      18:00
Time Stop        6:00
OutTempClose    10 C
```

Shading

Select "**Shading"** from the **Screen Menu.**

The following screen will be displayed.

```
   SHADE SCREEN    ZN=1

Light Close      400Wm
Light Open       300Wm
```

Enter the light energy level threshold in Watts /m^2 which should trigger the closing of the screens.

Enter the light energy level threshold in Watts /m^2which should trigger the opening of the screens.

In the example above, the screens will close when light energy levels reach 400Wm^2. The screens will remain closed until the light energy levels fall to 300Wm^2.

Gapping

Select "**Gap"** from the **Screen Menu.**

The following screen will be displayed.

```
   GAP SCREEN
Temp 1          22.0 C
Temp 2          25.0 C
Humidity 1      70%
```

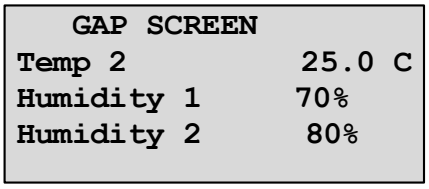
Gapping allows you to set the temperature and the humidity at which gapping will take place. There are two levels of 'Gapping', the second level will gap the screen to a greater extent.

Place the flashing cursor over "Temp 1" input field. Enter the lower temperature at which the first gapping will take place.

Place the flashing cursor over the "Temp 2" input field. Enter the upper temperature at which the second gapping will take place. In the example above, the screen will gap at 22 deg C and at 25 deg C.

Gapping on Humdity

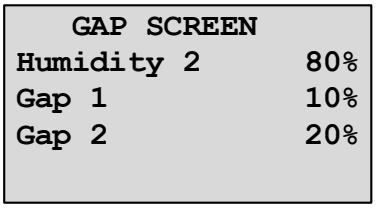
Place the flashing cursor over the “Humidity 1” input field. Enter the lower Humidity at which the gapping will take place. Now press ‘**Arrow Down’** to set the second Humidity level. In the example below the second level of gapping will take place at 70 and 80% Humidity.



Gap Percentage

The Percentage Gap for Gapping Levels 1 and 2 can also be set.

Press ‘**Arrow Down’** to scroll the screen down and the following screen will be displayed.

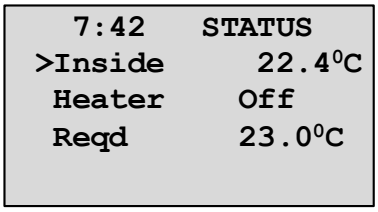


Place the flashing cursor over “Gap 2” input field. Enter the Gap percentage for level 1.

Place the flashing cursor over “Gap 2” input field. Enter the Gap percentage for level 1.

11. The Status Page

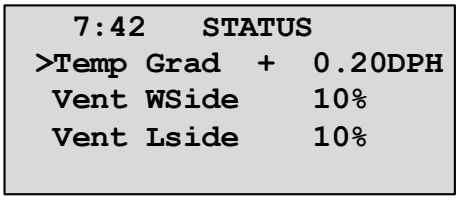
If your environmental controller is controlling the heating and ventilation in the greenhouse, then all the items detailed below will be displayed on the **Status Page**.



To scroll through the items displayed press the up and down arrows.

The **Status Page** will display:

- The current inside temperature.
- If the heater is currently switched on or off.
- The specified required glasshouse temperature.
- The temperature gradient in degrees / hour i.e. the rate at which the temperature is currently rising or falling.
- The percentage opening of the leeside and wind side vents.



12. Taking Care of Your Controller

GENERAL

Never - use sharp objects to press the buttons on your controller. Avoid pressing the buttons with your fingernails.

Always - ensure the lid screws are screwed down tightly to keep the inside of the controller dry and to reduce exposure to high humidity.

Always Keep powered up during the winter to prevent electronics becoming damp.

RAINING SENSOR (Weather Station Sensor)

Raining sensor detecting surface (grill shaped top) should be cleaned monthly to ensure reliable operation.

Use nylon scourer and water to clean surface.

After cleaning test sensor by wetting and drying surface. Check controller displays appropriate message ie raining or not raining. See “Show Status Zone 0” display.

OTHER SENSORS

All other sensors (Inside Temperature, Inside Humidity, Inside Pipe Temperature, Outside Temperature, Light Power, Wind Speed and Wind Direction Sensors) do not require maintenance. However correct operation should be checked occasionally.

13. Appendix A – Alarm Messages

Alarm	Description
Card Coms	Zone output module not connected to base unit or not powered.
Sensor1 Coms	Zone 0 weather station not connected to base unit or not powered.
Sensor2 Coms	Inside temperature sensor not connected to base unit or not powered.
Low Temperature	Low temperature inside zone.
High Temperature	High temperature inside zone.