



VENTRA PRO™

Installation & Operation Manual

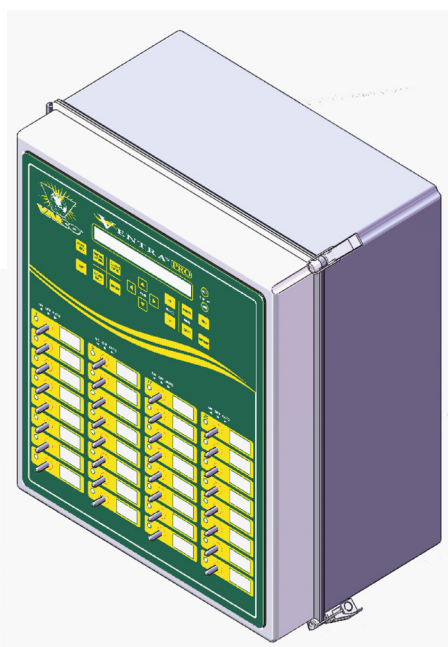
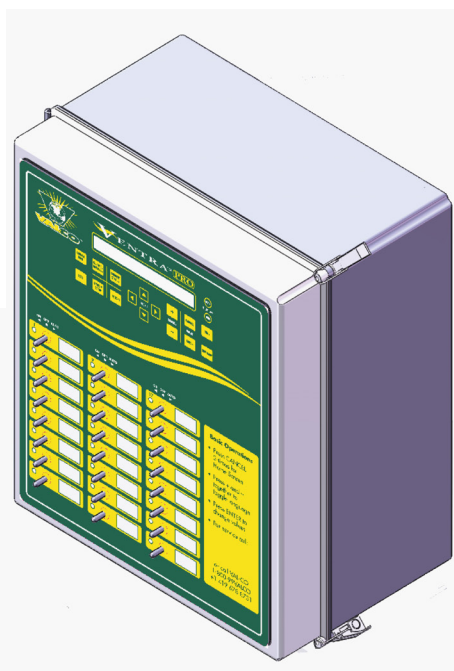
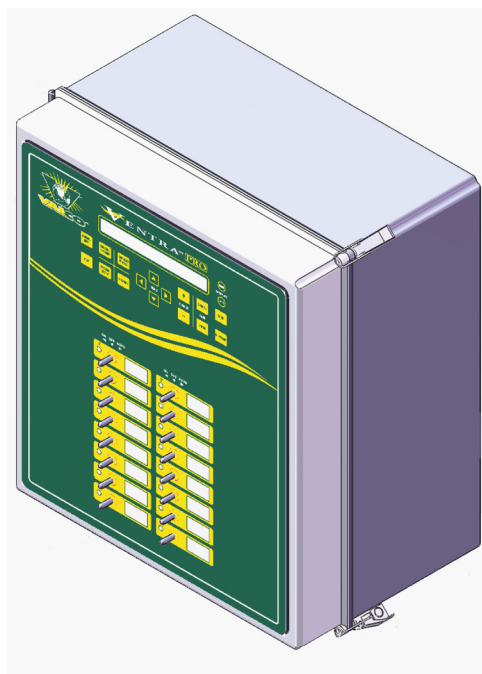




Table of Contents

Table of Contents.....	2-9
Warranty.....	10-12
Introduction.....	13-15
General Information.....	13
About the Manual.....	14
<i>Informational and Warning Symbols.....</i>	<i>14</i>
<i>Application Specific Symbols.....</i>	<i>15</i>
<i>Hot Key Symbols.....</i>	<i>15</i>
<i>Toggle Switches – Hot Key Symbols.....</i>	<i>15</i>
Before You Start!.....	16-23
Planning.....	16
Component Description.....	17
<i>Controller.....</i>	<i>17</i>
<i>Variable Speed (VS) Configurations.....</i>	<i>17</i>
<i>Control Specifications.....</i>	<i>17</i>
Circuit Protection.....	18
<i>Circuit Breakers.....</i>	<i>18</i>
<i>Power Surges.....</i>	<i>18</i>
<i>Conduit and Connections.....</i>	<i>18</i>
Essential Background Information.....	19
<i>Zones.....</i>	<i>19</i>
<i>Effective Environmental Temperature (EET).....</i>	<i>19</i>
<i>Ventilation Modes.....</i>	<i>20-21</i>
Sensors.....	22
Devices.....	23
Control Hardware and Installation.....	25-43
Verify Parts List.....	25
Mounting the control.....	25
Memory Card Location.....	26
Prepare Enclosure for Wiring.....	26
Powering the control.....	27
Sensor Installation – Input Terminals.....	28-29
<i>Sensor Wire.....</i>	<i>28</i>
<i>Sensor Wire Spacing.....</i>	<i>28</i>
<i>Sensor Placement.....</i>	<i>28</i>
<i>Splicing.....</i>	<i>28</i>
<i>Terminal Connectors.....</i>	<i>29</i>
Analog Inputs.....	30-33
<i>Temperature Sensors.....</i>	<i>30</i>
<i>Humidity Sensor.....</i>	<i>31</i>
<i>Feed Sensor.....</i>	<i>32</i>
<i>Static Pressure Sensor.....</i>	<i>33</i>
<i>Position Sensor.....</i>	<i>33</i>
Digital Inputs.....	34-35
<i>Digital Alarm.....</i>	<i>34</i>
<i>Water Flow Meter.....</i>	<i>35</i>



Output Relays – (What you need to know!)	36-41
<i>Output Channel Load Specification</i>	36
<i>Fuse Replacement</i>	36
<i>Channel Interlocking</i>	37
<i>Testing Interlocks</i>	37
<i>Output Relay Wiring (220 Volt Wiring Example)</i>	38
<i>Output Relay Wiring (120 Volt Wiring Example)</i>	39
<i>Backup Systems</i>	40
<i>Alarm Information</i>	40
<i>Alarm Relay Output Wiring</i>	40-41
Communication Station	41
Expansion Stations	41
The Control's Display, Keys and Navigation	42-48
The Display Area	42
Controller Switches and Hot-Keys	42
<i>Channel Output Toggle Switches</i>	42
Key Pad Descriptions	43
Menus and Navigation	44-45
Changing Values in the Submenus	46-47
Editing Timers	48
Using Hot-Keys for Quick Navigation	48
PowerUpSequence	49
Control Sequence Completed	49
GlobalParameter–InitialSetup	50
Global Parameter Setup	50
<i>Hogs or Birds</i>	50
<i>Length/Weight Measurements</i>	50
<i>Temperature Measurement</i>	50
<i>Language Selection</i>	50
CriticalUserInformation	51
Daily Usage	51
Survival Mode	51
Software and Security Setup	52-53
<i>Opening Screen</i>	52
<i>Revision – Date/Time</i>	52
<i>Control Center Serial Number</i>	52
<i>Entering the Password</i>	54
<i>Editing the Password</i>	53
<i>Security Levels</i>	53
<i>Compile Options</i>	53
Current Environmental Conditions Menu	54-56
<i>Average Actual Temperature</i>	54
<i>Average Actual – Effective Temp</i>	54
<i>Sensor Temperatures</i>	54
<i>Outside Temperature</i>	54
<i>AirSpeed</i>	55
<i>Relative Humidity</i>	55



Static Pressure.....	55
Ventilation Mode.....	56
Animal Stress Index.....	56
Control Equipment Status Menus (Hot-Key).....	57-59
Brooders/Furnaces/Heaters.....	57
Fans.....	57
Curtains, Ridge Vents and Inlets.....	58
Equipment Timers.....	58
Digital Alarm Group.....	59
Whisker Switch Group.....	59
Water Use.....	59
Current Animal (Hog/Bird) Information Menu (Hot Key).....	59
Weight Gain Progress.....	59
Head Count Information.....	60
Changing Current Animal Information.....	60
History Menu (Hot-Key).....	61-64
Scroll to History by Date.....	61
Scroll Submenus within a Date.....	63
Historical Environmental Conditions Stored.....	62
Daily High and Low Temperatures.....	62
Static Pressure.....	63
Purge Cycles.....	63
Mortality Change.....	63
Stress Index.....	63
On Times.....	63
Opening Sizes.....	64
Water Use.....	64
System Restart.....	64
Temperature Control Settings Men.....	65
Temperature Setpoint.....	65
Controlling Building Temperature: Actual or Effective.....	65
House Control Mode.....	66
Interlocking.....	67
Tunnel Settings.....	69
Temperature Ramping.....	69
Floor Type.....	70
Curtain Temperature Inhibit.....	70
Minimum Venting and Purging.....	70-74
Introduction.....	71
Building Purge Setting Menu.....	71
Natural Ventilation.....	71
Conditions for Purging.....	71
Purge Time On and Delay Time.....	72
Humidity Purge Setpoint.....	72
Humidity Purge On Time and Delay Time.....	72
High and Low Temperature Inhibit.....	72
Heat Zone before Purging.....	72



Minimum Vent and Purge Settings Menu.....	73-75
<i>Power Ventilation</i>	73
<i>Minimum Ventilation Timer</i>	73
<i>Minimum Vent Ramping</i>	73
<i>Humidity Purge Setpoint</i>	73
<i>Humidity Purge On Time and Delay Time</i>	74
<i>High and Low Temperature Inhibit</i>	75
<i>Heat Zone before Purging</i>	75
Static Pressure Setting Menu.....	76
<i>Natural Setpoint, Open and Close</i>	76
<i>Tunnel Setpoint, Open and Close</i>	76
<i>Static Pressure Ramping</i>	76
Sound Alarm When....Menu.....	77-80
<i>Alarm Relay Operation</i>	77
<i>Fixed High Temperature Alarm</i>	77
<i>High/Low Temperature Alarm</i>	77
<i>Outside Temp Influence HI Alarm Temp</i>	77
<i>Feeder Alarm</i>	78
<i>Water Use Exceeds Alarm</i>	78
<i>Water Flow Drop Alarm</i>	78
<i>Static Pressure Alarms</i>	78-79
<i>Humidity Sensor Reading is Invalid Alarm</i>	80
Setting up the Control Software.....	81-89
System & Control Device Setup Menu.....	81
<i>Date and Time Setup</i>	81
<i>Power Up Load Delay Time</i>	81
<i>List Control Devices</i>	82-83
<i>Add a Control Device</i>	83
<i>Error Possibilities When Adding Devices</i>	84
<i>Change Control Device</i>	85
<i>Delete Control Device</i>	85
<i>Add Zone</i>	85
<i>Delete Zone</i>	86
<i>Zones</i>	86
Global Parameter Setup Menu (All submenus).....	87
<i>Setup Animal Type</i>	87
<i>Setup Units of Measure</i>	87
<i>Setup Temperature Measure</i>	87
<i>Setup Language</i>	87
<i>SD Card Free Space</i>	87
<i>Number of Switches on Front Panel</i>	88
<i>Start Up Options Password</i>	88
Viewing, Entering or Changing Equipment Operating Parameter	89
Setting up Input Devices.....	90-98
Air Sensor Setting.....	90
<i>Cable Length</i>	90
<i>Wire Gauge / Diameter</i>	90



Location.....	90
Use for Wind Speed	91
Cal Values.....	91
Outside Air Sensor Settings.....	91
Air Sensor Shared Device.....	91-92
Feeder Sensor Settings.....	93
Minimum Amps.....	93
Cal Value.....	93
Static Pressure Sensor Setting.....	93
ADC Cal 1 and ADC Cal 2.....	93
WC Cal 1 and WC Cal 2.....	93
Humidity Sensor Settings.....	94
Cal Value.....	94
Water Meter Sensor Settings.....	94
Cal Value (PPG / PPL).....	94
Digital alarm Sensor Settings.....	94
Trigger Alarm on Active Input.....	94
Input is Active When.....	94
Alarm Delay Time.....	94
Position Sensor Settings.....	95-97
Assign to a Device.....	95
Calibrate.....	96
Percent OUT of Position to Alarm.....	97
Whisker Switch.....	98
Assign to a Device.....	98
Validate Switch.....	98
Setting up Output Devices.....	99-128
Sensor Assignment.....	99
Curtains and Inlets	99-117
Introduction.....	99
Side Curtain Settings.....	100
Use Sensors.....	100
Opening and Closing Temp.....	100
Open This Distance and Pause.....	100
Close This Distance and Pause.....	101
Maximum Opening below Temperature.....	101
Static Pressure Pause Timer.....	101
Operating Mode.....	101
Natural Mode Operation.....	102
Proportional Control (Tunnel Modes Only).....	102
Tunnel Fan Groups On \ Opening Size.....	103
Tunnel Interlock to Fan.....	104
Response Mode.....	105
Calibration.....	105
Full Opening Size.....	105
Full Open Travel Time.....	105



<i>Purge Opening Size</i>	106
<i>Pre-Open Timer</i>	106
<i>Curtain Exercise Routine</i>	107
<i>Exercise Delay Days</i>	107
<i>Perform Exercise At</i>	107
<i>Exercise Aborted</i>	107
<i>Curtain Movements at Power Up</i>	107
Ridge Vent Settings	108-111
<i>Use Sensors</i>	108
<i>Opening and Closing Temp</i>	108
<i>Open This Distance and Pause</i>	108
<i>Close This Distance and Pause</i>	108
<i>Response Mode</i>	109
<i>Calibration</i>	109
<i>Full Opening Size</i>	109
<i>Full Open Travel Time</i>	109
<i>Full Close Travel Time</i>	109
<i>Purge Opening Size</i>	110
<i>Interlock Curtain Groups</i>	110
Chimney Damper Settings	110-111
<i>Proportional Control</i>	110
<i>Cool Fan Groups On \ Opening Size</i>	110
<i>Interlock to Fan</i>	111
<i>Calibration</i>	111
<i>Full Opening Size</i>	111
<i>Full Open Travel Time</i>	111
<i>Full Close Travel Time</i>	111
Sidewall, Tunnel & Ceiling Inlet Settings	112-117
<i>Static Pressure Pause Timer</i>	112
<i>Operating Mode</i>	112
<i>Proportional Control</i>	112
<i>Cool Fan Groups On \ Opening Size</i>	113
<i>Natural Interlock to Fan</i>	114
<i>Tunnel Fans Groups On \ Opening Size</i>	115
<i>Tunnel Interlock to Fan</i>	115
<i>Calibration</i>	116
<i>Full Opening Size</i>	116
<i>Full Open Travel Time</i>	116
<i>Full Close Travel Time</i>	116
<i>Purge Opening Size</i>	116
<i>Pre-Open Timer</i>	117
<i>Inlet Movements at Power Up</i>	117
Furnace, Heater & Brooder Settings	118
<i>Use Sensors</i>	118
<i>On and Off Temps</i>	118
<i>Interlock Curtain Groups</i>	118
<i>Use During Heat Purge</i>	118



CoolPad, Mister & Fogger Settings.....	119-121
Use Sensors.....	119
Time of Day to Enable / Disable.....	119
Humidity Disable / Re-Enable.....	119
Stress Index Disable.....	119
Full On and Off Temp.....	119
Cycle On Temp and On/Off Timers.....	120
Minimum On Temp.....	121
Stir, Sidewall, Tunnel, Pit and Ridge Fan Settings.....	122-126
Introduction.....	122
Operating Mode.....	122
Fan On and Off Temps.....	123
Fan On Power Setting.....	123
Power Ramp Starting Temp.....	123
Power Ramping Example.....	124
Fan Run Mode.....	124
Fan On and Off Timers.....	124
Timed Power Setting.....	125
Purge Mode Power Setting.....	125
Run While ENTRY/EXIT of Tunnel Mode.....	125
Use of Proportional Control.....	125
Curtain Open Size Inhibits Fans.....	126
Override Fans Off.....	126
Using certain curtains\inlets to determine if fan should run.....	126
Lights.....	127
Age, On Time and Off Time.....	127
Feeder Settings.....	127
Age, On Time and Off Time.....	128
Test Control Center Hardware.....	129
Test Alarm Relay.....	129
Test Outputs.....	129
Test Inputs.....	130
Test Output Status.....	130
Test Digital Input.....	130
Alarm History.....	131
Alarm History.....	131
Possible Alarm Conditions.....	132
Error Detail.....	133
Updating the Controller with NEW Version of Software.....	134-135
Introduction.....	134
Updating the Controller in Process - Display Screen Views.....	135
Updating of the controller when version DON'T MATCH.....	135
Updating the controller when version DO MATCH.....	135
Start Up Options.....	135-136



Parameter Set.....	137-139
Introduction.....	137
Copying Parameter Sets.....	137-139
Creating NEW Parameter Sets.....	139-140
Changing Parameter Sets.....	141
Editing an Existing Parameter Set.....	142
Password for Parameter Set Options.....	142
Resetting the Control to a “New State.....	143
<i>ADVANCED USERS.....</i>	<i>143</i>
 APPENDIX 1 – Progressive Heating and Cooling Example.....	144
APPENDIX 2 – Curtain and Inlet Behavior.....	145
APPENDIX 3 – Service Technician Features.....	146
APPENDIX 4 – Troubleshooting.....	147-153
APPENDIX 5 – Parts List.....	154-155
APPENDIX 6 – (MAIN & SUBMENUS) Menu Guide.....	156-163
APPENDIX 7 – Sensor Data Sheet.....	164
APPENDIX 8 – Parameter and Security Recording.....	165-183
APPENDIX 9 – Controller Info & Security Settings.....	184
APPENDIX 10 – Animal Information Min/Max Settings.....	184
APPENDIX 11 – Temperature Control Min/Max Settings.....	185
APPENDIX 12 – Purge and Minimum Vent Min/Max Settings.....	186
APPENDIX 13 – Static Pressure Min/Max Settings.....	187
APPENDIX 14 – Sound Alarm When.... Min/Max Settings.....	188
APPENDIX 15 – Sensor Min/Max Settings.....	189
APPENDIX 16 – System & Control Device Setup.....	190
APPENDIX 17 – Fan Min/Max Settings.....	190-192
APPENDIX 18 – Cool Pads, Fogger & Mister Min/Max Settings.....	193
APPENDIX 19 – Side Curtain Min/Max Settings.....	194-195
APPENDIX 20 – Ridge Vent Min/Max Settings.....	196
APPENDIX 21 – Inlets Min/Max Settings.....	197
APPENDIX 22 – Chimney Damper Min/Max Settings.....	198
APPENDIX 23 – Miscellaneous Device Min/Max Settings.....	198
APPENDIX 24 – Customer Service.....	199



Warranty

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VAL-CO™ MANUFACTURED PRODUCTS OTHER THAN EXTENDED WARRANTY PRODUCTS

Val Products, Inc. (Val Products) warrants to the original purchaser that Val Products' manufactured products (other than the products subject to an extended warranty set forth below) will be free of defects in material and workmanship for a period of one (1) year from and after the date of original purchase and when used in a usual and customary fashion. If Val Products is notified that such a defect exists within one year of the original purchase date and, upon inspection, agrees that the product is defective, Val Products will, at its option, (a) repair or replace (FOB Val Products' plant) the defective product, or (b) refund to the original purchaser the original purchase price paid for the defective product less any installation, shipping, or other charges associated with the original purchase. All defective products must be returned to a Val Products designated location for evaluation. Val Products' determination as to whether the product is defective is final. See the General Conditions and Limitations set forth below.

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2. Warranty will be void if all components of the product or system are not original equipment supplied by the manufacturer.
3. Products not manufactured by Val Products and supplied by outside manufacturers (such as, but not limited to, certain electrical motors, certain controls, gas valves, etc.) are warranted separately by the respective manufacturer and only to the extent of the manufacturer's warranty.
4. Warranty applies only to products used in applications as originally intended by Val Products – other applications in industry or commerce are not covered by the Warranty. Val Products' products are expressly not designed or authorized for use in any applications where intended to sustain or support human life or any other application where the failure of the product could result in personal injury or death.
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INTRODUCTION

General Information on the Control

The Ventra™ Pro's advanced microprocessor-based design has made it possible to regulate the environments of livestock facilities with greater precision than conventional thermostats and timers. It provides a consistent climate for your animals, resulting in better feed efficiency, better growth, and lower mortality. This is achieved by careful monitoring of temperature, air speed, humidity, static pressure, feed use and water use. These "inputs" are used to determine when to turn equipment on and off, when to open and close air inlets, when to turn on tunnel ventilation, and much more. Using the controller's keypad, you will input operating parameters for each device group, desired building temperature (which can be adjusted automatically over time), and conditional decisions such as at what humidity level should fogging/misting be disabled.



Warning!



AS WITH ANY SOPHISTICATED CONTROL SYSTEM, THIS CONTROLLER CANNOT BE GUARANTEED TO PERFORM WITHOUT INCIDENT FOREVER. THERE ARE MANY CONDITIONS SUCH AS LIGHTNING STRIKES, PROGRAMMING ERRORS, AND EQUIPMENT FAILURE THAT COULD RESULT IN THIS CONTROLLER FAILING TO PERFORM ITS INTENDED FUNCTION. YOU MUST BE AWARE OF THIS AND BE WILLING TO TAKE THE NECESSARY PRECAUTIONS TO PREVENT FINANCIAL LOSS.

TO PROTECT AGAINST LOSS RELATED TO THE FAILURE OR MALFUNCTION OF THIS CONTROLLER, THE FOLLOWING SAFEGUARDS ARE REQUIRED:

- 1. A MANUAL BACKUP SYSTEM MUST BE INSTALLED. THIS SYSTEM MUST TAKE OVER IN THE EVENT OF A CONTROL SYSTEM MALFUNCTION.**
- 2. AN ALARM SYSTEM MUST BE INSTALLED. THIS SYSTEM MUST PROVIDE A VISUAL INDICATION AND AUDIBLE WARNING OF ABNORMAL CONDITIONS.**
- 3. A WEEKLY TEST OF THE MANUAL BACKUP SYSTEM AND ALARM SYSTEM MUST BE PERFORMED. THIS TEST CONFIRMS THAT THESE SYSTEMS ARE FUNCTIONING PROPERLY.**
- 4. A DAILY CHECK OF THE CONTROL SYSTEM MUST BE PERFORMED. THIS CHECK CONFIRMS THAT THE SYSTEM IS OPERATING PROPERLY.**
- 5. NON-FUNCTIONAL ALARM OR BACKUP SYSTEM COMPONENTS MUST BE REPAIRED IMMEDIATELY.**

About the Manual - Symbols

Our concern is for your safety. The safety warnings are included in this manual as a guide to help and encourage the safe operation of your equipment. It is your responsibility to evaluate the hazards of each operation and implement the safest method of protecting yourself as owner and/or operator.

INFORMATIONAL AND WARNING SYMBOLS



= NOTE - take notice this may help you!



= IMPORTANT INFORMATION - be sure to read!



= WARNING - The safety alert symbol is always used on warning signs that involve your safety or has extra significance since it is describing the importance of a feature or explaining a step to which you should pay close attention to avoid problems.



= DANGER - imminent hazard, if ignored serious injury or death WILL occur.



= WARNING - probable hazard, if ignored serious injury or death COULD occur.



= CAUTION - potential hazard, if ignored minor or moderate injury MAY occur.



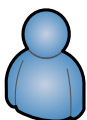
The above DANGER, WARNING OR CAUTION symbols may appear as shown to left.



= CHECK - the details of all requirements, processes or procedures of instructions listed.



= STOP - before you go further check the details of all requirements, processes or procedures of instructions listed.



= USER



APPLICATION SPECIFIC SYMBOLS



= The zones symbol appears next to information regarding zones.



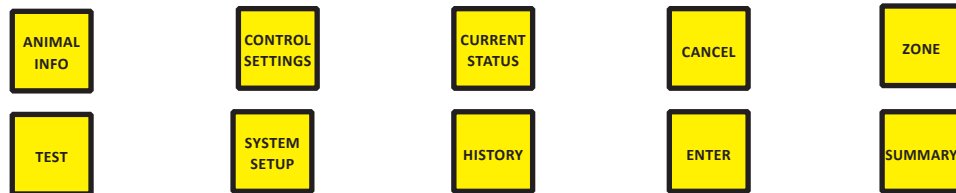
= The hog symbol appears next to text that applies ONLY to operating the hog controller software.



= The birds symbol appears next to text that applies ONLY to operating the bird controller software.

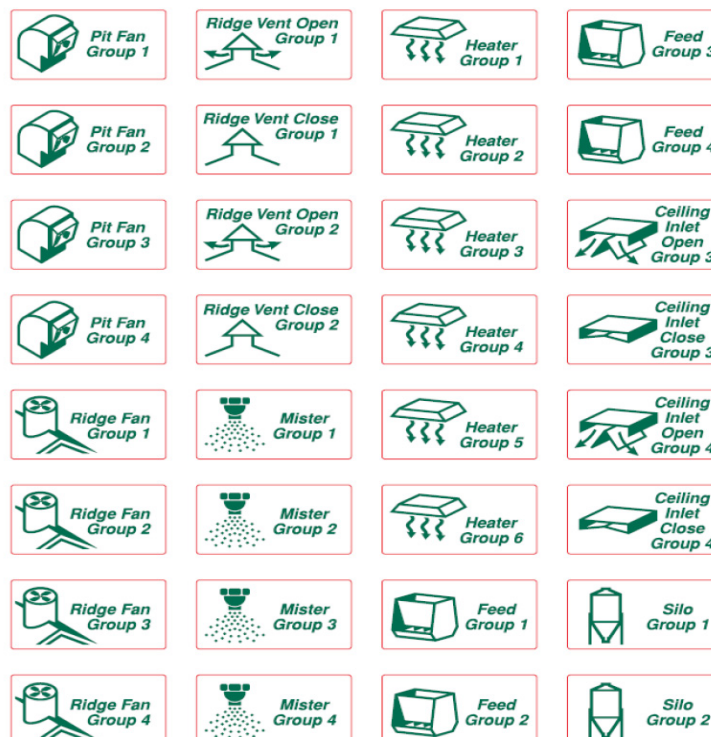
HOT-KEY SYMBOLS

Hot-Key technology™ are keys that provides direct access to Current Status (temperatures), History, Control Settings and System Setup, Animal Information, Zone, Summary and Test. The most commonly used being; the first four listed above. The Test Hot-Key brings directly to an input/output hardware testing screens. *These Hot-Keys are located below the Display Screen.*



TOGGLE SWITCHES HOT-KEY SYMBOLS

The Toggle Switch Hot-Key technology provides you with direct access to the specific device on each channel.



BEFORE YOU START!

WARNING



1. A **QUALIFIED ELECTRICIAN** or **Val-Co™** service should perform all wiring to ensure local and national codes are followed.
2. Disconnect all power before inspecting or servicing equipment.
3. Always use the proper wire size for wiring systems.



Planning



In order to set up a building to be operated by the controller you must:

- List the devices (fans, curtains, heaters, lights, misters, etc.) that are in the facility.
- Plan how each type of device will be grouped (turned on and off together).
- Determine optimum sensor locations.
- Determine which sensors will control each equipment group.
- Determine which controller output channel each equipment group will be connected to.
- Determine which controller input channel each sensor will be connected to.
- Determine the desired operational settings such as on/off temperature settings for each heating and cooling group, etc. Input these settings into the controller.
- After you have documented, and thoroughly understand the set up information, you can begin programming the controller. The System & Control Device Setup section of this manual describes the process of programming the controller



Component Description

Controller

The Ventra Pro is available in a 16, 24 or 32 channel controller. Variable speed stations can be added to provide control for variable speed devices. It is important that you understand the control's VS configuration if you are using variable speed devices, and the control specifications for each device requirement.

Variable Speed (VS) Configurations

1. 16 total channels, 2 of which are VS on channels 15, 16. Relay boards occupy banks 1 and 2 from the left in the enclosure.
2. 24 total channels, 2 of which are VS on channels 15, 16. Relay boards occupy banks 1, 2 and 3 from the left in the enclosure.
3. 32 total channels, 2 of which are VS on channels 15, 16. Relay boards occupy banks 1, 2, 3 and 4 from the left in the enclosure.
4. 32 total channels, 4 of which are VS on channels 15, 16, 31 and 32. Relay boards occupy banks 1, 2, 3 and 4 from the left in the enclosure.

Control Specifications

Fuses: Power Supply Input: 2.5 Amp 250VAC (5 x 20 mm) fast-acting interrupting type (Littelfuse 216 02.5 or equivalent)

Output Channel: 20 Amp 3AB ceramic body slow-acting type (Bussmann MDA-20 or equivalent 0.25 x 1.25")

Power Input: 120VAC / 240VAC 2.0A Maximum

Maximum torque on power input terminal screws is 8 inch-pounds.

Output:

Depending on the model, up to 32 Normally Open relay output channels and up to 4 variable speed channels.
120VAC, 1 HP / 240VAC, 1.5 HP maximum per circuit.

Alarm Output: 120VAC / 240VAC, 10A general purpose, NO/NC connection.

Sensor Inputs: 14 analog and 6 digital

Environmental: NEMA Enclosure type 4X

Dimensions: Width is approximately 16.75"

Depth is approximately 10.25 inches

Height is approximately 18.75 inches

Circuit Protection

Circuit Breakers

The controller should be wired to an independent circuit breaker. Ideally each equipment output channel should have its own breaker to insure that tripping one breaker will not affect other devices in the ventilation system.

Motors must have a thermal overload protection device or impedance protection. The overload should auto-reset for any essential equipment.

Power Surges

The Ventra Pro™ is protected against normal voltage surges, but lightning induced surges could damage the equipment. We recommend use of a Deadbolt™ surge suppressor to reduce damage from lightning and other types of power surges. **Lightning damage is not covered by the warranty.**

Conduit and Connections

High voltage wires should enter the control enclosure from the bottom so they can be easily connected to the relay terminals. Low voltage sensor wiring can be brought in from the bottom or side and connected to the input terminals near the top. Make sure there are no frayed wires because the control board may press against the wires when the controller's cover is closed.

To avoid electrical shorts or damage due to moisture, you should never run conduit openings through the top of the box. Conduit and hubs should be corrosion resistant plastic or fiberglass. Use only UL approved NEMA 4X rated conduit hubs. Connect hubs to conduit before connecting to the control enclosure. Use only liquid-tight strain-relief connectors to bring cables into the box.

Clearance Holes for Standard Conduit

Trade Size (inches)	Hole Size (inches)
1/2	0.875
3/4	1.125
1	1.375
1 1/4	1.750
1 1/2	2.000
2	2.500
2 1/2	3.000
3	3.625

Conduit Hole Sizes.eps

WARNING



1. A **QUALIFIED ELECTRICIAN** or **Val-Co™** service should perform all wiring to ensure local and national codes are followed.
2. Disconnect all power before inspecting or servicing equipment.
3. Always use the proper wire size for wiring systems.





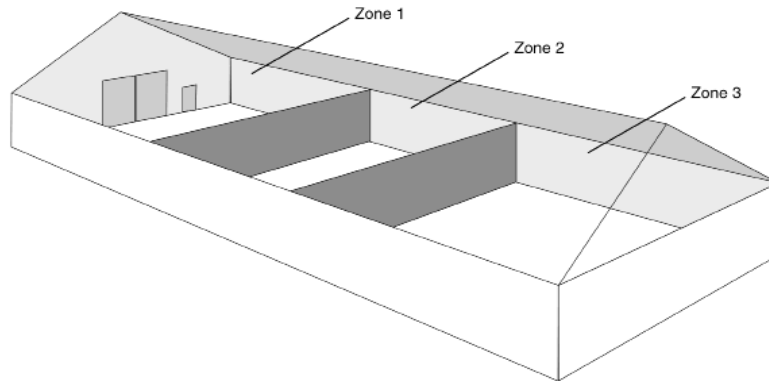
Essential Background Information

The following sections on Zones, Effective Environmental Temperature (EET) and Ventilation Modes are necessary for you to understand in order to set up the control and run your barn effectively.

Zones

This controller has a ZONE key and has multiple zone capability. This lets you specify different environmental conditions in individual rooms or areas. When two or more zones are set up, the controller can act like two or more separate controllers.

Zone Example



There are a few rules that pertain to multiple zones:

- Output channels cannot be assigned to more than one zone.
- Sensors cannot be assigned to more than one zone. Zoning isolates sensors in each zone. For example zone 1 can not read or average sensor readings from an inside temperature sensor in zone 2.



The exception here is the "Air Sensor Shared" device. This device is not assigned to a separate air probe but is assigned to a module/channel that has another "Air Sensor" assigned to it. The "shared" sensor can be assigned to a different zone than the one the actual air probe is installed in. This allows two zones to share the same physical air probe.

Effective Environmental Temperature (EET)

EET takes into account the effect that air movement has on "how" comfortable an animal feels (*requires an air temp/speed sensor such as Air Sensor Model 935*). This feature is based on the understanding that the higher the air movement is through a building, the cooler the animals feel. Since the animals feel cooler than what the actual temperature is, the fans and inlets are operated based on a lower temperature, than if the wind speed weren't present. This method keeps the animals from getting too chilled.

The controller uses three temperature settings to determine what temperature is used to operate the devices. These are:

- **Actual Temperature** - the actual temperature readings from the Air Sensors, with no wind speed adjustments.
- **Effective Temperature** - The temperature from the Air Sensors with the maximum cooling effect of the air movement taken into account. This will be lower than the Actual Temperature.
- **Working Temperature** - This is the temperature used to control the devices. This will be somewhere between the Actual Temperature and the Effective Temperature, depending on the "Temp Control" setting.

(EET continued on next page)

Essential Background Information - continued

The degree of effect the air movement has on the Actual Temperature, when figuring the Working Temperature, is controlled by the "Temp Control" setting under the Temperature Control Setting menus. If "Temp Control" is set to "Actual", air movement has no effect on the Working Temperature used to control the devices. The devices will operate based on the Actual Temperature. If "Temp Control" is set to "EET", the air movement will have the highest effect on the Working Temperature and the devices will operate based on the lower Effective Temperature. If "Temp Control" is set somewhere between "Actual" and "EET", the Working Temperature of the devices will be a percentage of the Effective and Actual Temperature.

If the air movement is high enough to create a larger Effective Temperature drop than the above limits, the controller will use a Working Temperature based on the limits to control the devices, and not the full cooling effect of the air movement. This prevents a building from getting too hot, due to high wind speeds, causing a very low Effective Temperature.

Humidity also plays a part in determining the Effective Temperature. The higher the Actual Temperature and /or humidity, the higher the air movement has to be to get the same cooling effect as lower temperature and/or humidity readings.

Ventilation Modes

You'll need to be familiar with several ventilation terms used in this manual.

Natural

Natural ventilation is simply opening a building to allow outside breezes to flow through. This is usually accomplished by lowering curtains. Natural ventilation is ideal when the temperature outside is close to the temperature the animals need. The air exchange rate depends greatly on outside winds.

Power Ventilation

Power ventilation uses sidewall fans in conjunction with curtains or other inlets for cooling. *This will increase the air exchange and bring more fresh outside air into the building.*



The controller menus combine natural and power ventilation into one mode called "natural" to differentiate this mode from tunnel mode.

(Ventilation Modes continue on the next page.)



Ventilation Modes - continued

Minimum Ventilation

Minimum ventilation is the process of bringing outside air into a building even when the indoor temperature and humidity do not require it. This helps keep ammonia, dust and carbon dioxide from accumulating.

Purge

Purging is the process of evacuating stale contaminated air and replacing it with fresh air. This is necessary when a building is closed up for a long time, as during cold weather. Purging is initiated when humidity reaches the level and length of time you set. Purging will not occur if curtains are open. Any combination of fans and air inlets can be set up to purge.

Tunnel

Tunnel mode uses air inlets or curtains located at one end of the building and tunnel fans at the other end to transform the building into a wind tunnel. This creates a wind chill effect for the animals. Tunnel mode is often used in warm climates where natural/power ventilation cannot adequately cool the animals.

Entering & Exiting Tunnel Mode

While entering and exiting tunnel mode, the tunnel curtains are moving to or from their tunnel positions. During this time, if all the tunnel fans are turned on, the curtains may not be able to move because of the suction generated by these fans. It is recommended that a limited number of fan groups be designated as ENTRY/EXIT fans to reduce this effect.

More detail on setting up ventilation modes will follow in the Temperature Control and Sidewall, Tunnel and Ceiling Inlet Setting menus.



If you experience problems, refer to the Troubleshooting Table in Appendix 4 on pages 147-153.



Sensors

Sensors throughout the building provide data on air temperature, humidity, feeder run times, static pressure, whisker switch and water usage and will be wired to either the analog or digital terminal inputs, as listed below.

Attach the following sensors to these inputs. Record the connection on the Sensor Data Sheet at the end of this manual.

ANALOG SENSORS <i>(Analog Terminal Inputs 1 to 14)</i>
• Air/Temp sensors
• Outside temperature sensor
• Humidity sensor (assign to one of the inputs 1, 2, 4, or 5)
• Feed sensor
• Static pressure sensor (assign to one of the inputs 1, 2, 4, or 5)
• Position sensor

DIGITAL SENSORS <i>(Digital Terminal Inputs 1 to 6)</i>
• Digital alarms
• Whisker switch
• Water Flow Meter



Devices

Devices throughout the building can be controlled by the Ventra Pro™ and will be wired to either Output Relays or a variable speed relay. *(VS configurations are listed on page 17.)*

DEVICES <i>(Output Relays or Variable Speed Relays)</i>
• All Fans
• All Heaters/Furnaces
• Side Curtains
• Feeders
• Chimneys
• Ridge Vents
• Ceiling Vents



Intentionally Left Blank



Control Hardware and Installation

Verify Parts List

It is important that you verify the parts listed in *Appendix 5 on page 154-155*.

Location

Begin by selecting a sheltered, vertical surface, and effective location for wiring and access. The control should be mounted in an area where there is at least **2 inches** of space surrounding it, clear from electrical items, with the wire routing holes facing down, *to protect the control from water or debris*.

Mounting the control

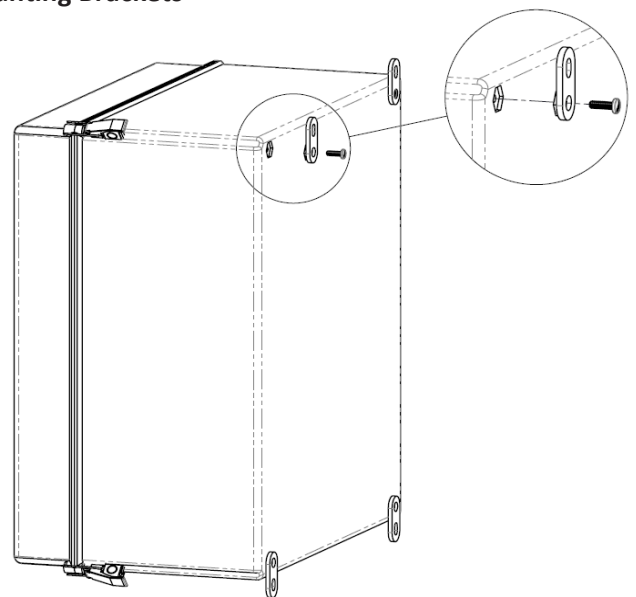
Mount the controller indoors where the temperature remains between 30 degrees Fahrenheit (- 1 degree Celsius) and 110 degrees Fahrenheit (43 degrees Celsius). **DO NOT** mount the controller in direct sunlight. Place the controller away from motors and relays/contactors that switch high current. It is **NOT RECOMMENDED** that you install the control in the same room where the animals live since the air tends to be corrosive to electronic circuits. A separate room or control office is a preferred location.

Mounting brackets for the Ventra Pro™ are enclosed with the unit.

Mounting Brackets

Before you drill holes into the enclosure mark their locations and make sure that you **DO NOT** drill into circuit boards and cables.

1. Attach the mounting clips with the 1/4-10 x 0.5" screws, *included in the hardware kit shipped with the control*.
2. Draw a level line on the wall where the control should be mounted.
3. Hold the control enclosure backside to the wall and align the top or bottom of the enclosure to the line drawn and use the mounting bracket holes to mark the wall where the holes should be drilled.
4. Drill pilot holes and use appropriate TEK screws to mount the control.



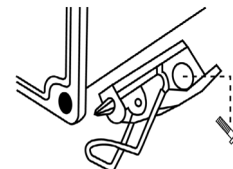
Warning:
Do not overtighten screws.



Unless absolutely necessary, do not remove the circuit boards. They are static sensitive and should always be handled with appropriate grounding and electrostatic precautions.



High Voltage Inside Enclosure!



Controllers are shipped with a bolt and nut to hold the quick release latch closed. You can remove the bolt and nut during the installation process. You must replace these after installation to protect against accidental exposure to the high voltage inside the enclosure.

Memory Card Location

The SD card stores the controller software, alarm detail and recorded history, as well as, the operating parameters the user inputs for the controller. The SD card is located in a socket on the upper right corner of the inside cover.

Your controller is shipped with the SD card **installed**. *You should NOT remove the SD card unless you are updating the controller with a different version of software, such as, a customer specific pre-loaded set of parameters which may not have come installed on your new control. Information on updating your control software can be found on page 134-135.*

Handling the SD Card

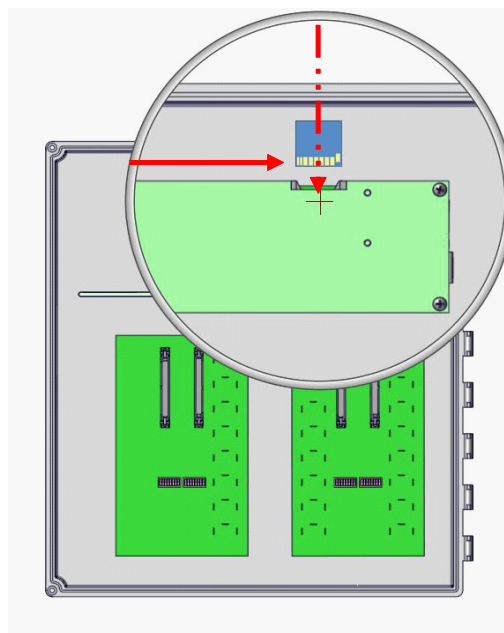


Always touch a ground before you touch the circuit boards. Never install or remove SD cards without turning off the power to the controller.

To install the SD card, match the key (in the card base to the slot in the socket on the control board, *as shown to the right*. Gently push the SD card into the slot until it snaps into place.

If you ever need to remove the SD card, push down gently, it will snap up and then you can remove it from the socket.

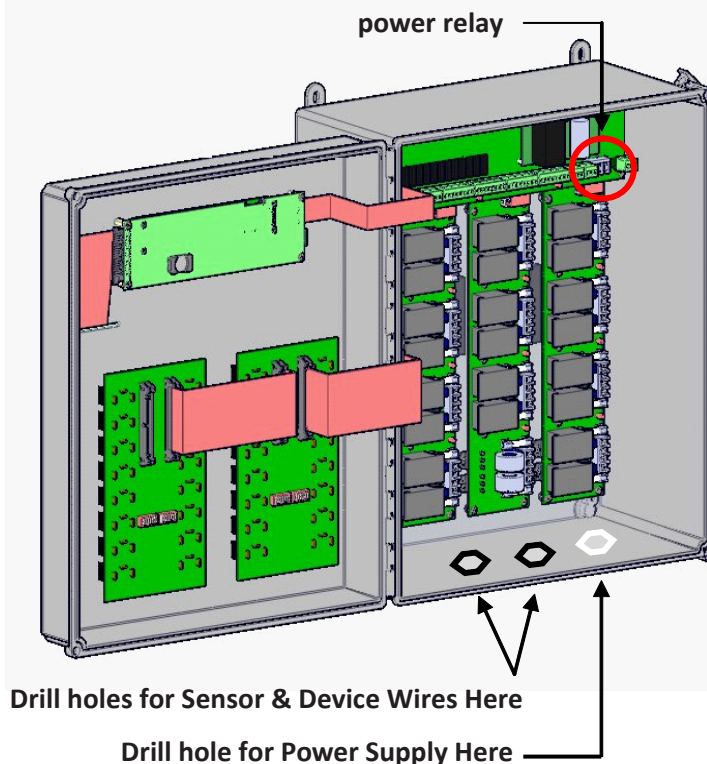
SD Card & Socket - Inside Cover



Prepare Enclosure for Wiring

The holes for wiring are NOT pre-drilled.

1. Determine and mark the location for each hole, *(the number and size of hole/holes needed will be determined by the number of devices and inputs to install)*. It is recommended that you place the hole/holes to the bottom side of the enclosure, as pictured to the right. It is also recommended that the hole used for the power supply be located in line with the power supply relay, located to the right corner of the enclosure, *(circled in picture to right)*.
2. Use a hole saw to drill hole/holes at the bottom of the enclosure for conduit or strain reliefs, taking care that you do not drill into any of the control's components.
3. Insert the conduit or stain reliefs from the outside bottom of the enclosure (through the hole/ holes) and be sure to use glue/caulking to seal against moisture or debris. Sealing the wiring is critical to protect against the harsh corrosive environment.



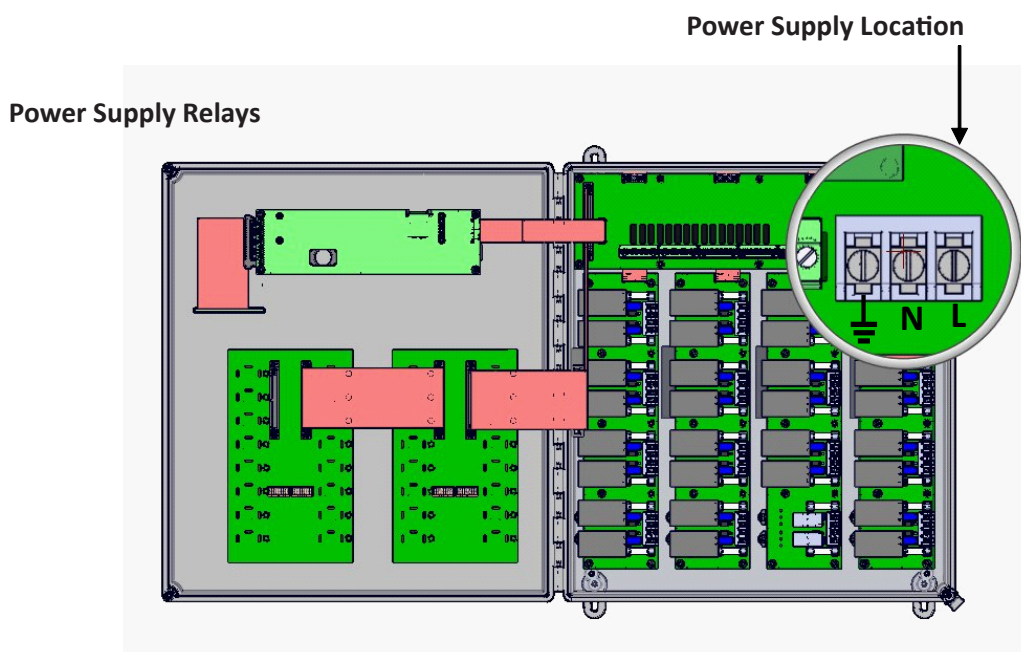


Powering the control

1. Locate the power supply at the top right corner inside the base of the enclosure *as shown below*.



Be sure that **ALL POWER IS DISCONNECTED BEFORE INSTALLING** or Servicing the control.



Ground

N

Neutral - spelled out on actual input board

L

Line - spelled out on actual input board

120 VAC Connections

Hot	L
Neutral	N
Ground	G

240 VAC Connections

Hot	L
Hot	N
Ground	G



It is beneficial to install an isolating switch to allow the power supply to be switched off during installation and service. The isolating switch must be bipolar.



- To ensure the Ventra Pro™ alarms on loss of power in either leg of 220V at your electrical service panel, we recommend wiring the control for 220V when it is available.
- A main power disconnect must be provided by the installer to allow the controller to be shut off.
- The maximum torque for the power input terminals is 8 inch-pounds.
- Use 18 to 14 gauge wire.



Warning: Do not tap power from the power supply for other devices. The extra power draw may cause the controller to malfunction.

Sensor Installation - Input Terminals

Sensor Wire (Recommendations)

Use **shielded 16 to 24 gauge** (or .5mm to 1.2mm for metric users) stranded wire, such as Carol® AWM style 2426, to connect sensors to input channels. Wire can be twisted pair or straight type. The shielding should be grounded to GND at the controller's terminal block.

Only 22 to 24 gauge wire will fit the Scotchlok® connectors supplied with the sensors.

Sensor Wire Spacing

If a sensor or communication cable runs parallel to power cables, allow a separation of at least 12" (30cm) to avoid interference.

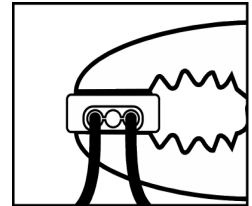


Do not run sensor or communication cables through conduit with power wires.

Sensors Placement

Suspend sensors from the ceiling to ensure free airflow. Sensors should hang close to the animals, but should be out of their reach. Leave enough wire so you can tie up several loops of slack to keep the sensor at the right height. If you must replace a bad sensor in the future, the extra length allows you enough wire to cut off the old sensor and still have plenty to splice to the new sensor.

As you install sensors, record wire length and gauge on the Sensor Data Sheet at the end of this manual on page 164. The person programming the controller will need these values.



3M Scotchlok® connectors are recommended for splicing (22-24 gauge wire only). Apply firm, even pressure to a button to ensure good contact. The button will be flush when properly sealed.

Splices

The splice between the wire and the sensor lead should be protected from the corrosive air in the building. The best splices can be made using the gel-filled 3M Scotchlok connectors enclosed with the sensors. These create low-resistance, corrosion-resistant connections. Wrap your splice well in electrical tape.

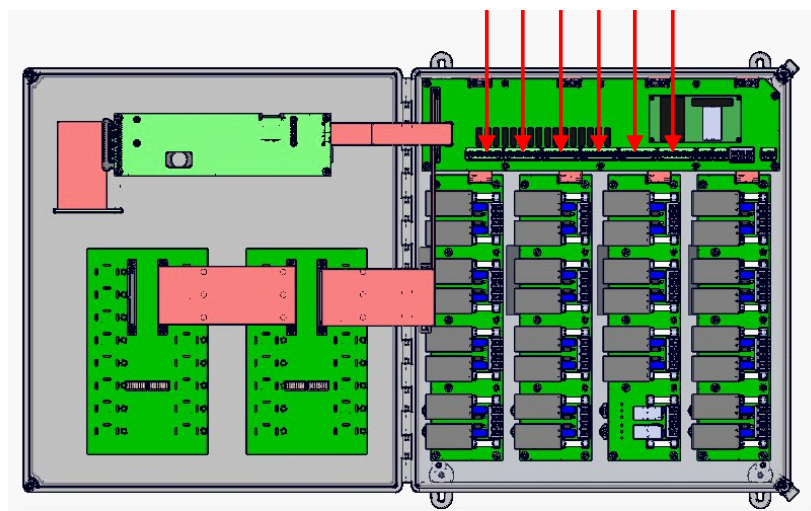
Replacement sensors can be connected by cutting the old sensor lead and making a new connection with a Scotchlok connector. It is not necessary to strip the insulation from the individual wires when using Scotchlok connectors.

Terminal Connectors

Make all sensor connections to the sensor terminals on the controller's input/output Interconnect board. There are 14 analog inputs (temperature, humidity, feed sensors and static pressure) and (6) six digital inputs (water meter, whisker switch and digital alarm).

(Input Terminals) Inside Control

Analog Input Terminals (4)
Digital Input Terminals (2)





Input Terminals - continued

All sensors must be connected to the inputs at the top of controller's input Interconnect board. There are six terminal strips for inputs. Four (4) strips are for analog inputs (1 through 14) and the other two (2) are for digital inputs (1 through 6).

Input numbers are labeled on the interconnection board and 1 is to the left for both analog and digital terminals.

Some analog input terminals, (1, 2, 4 and 5) have a 12V output that is required by certain sensors. All digital inputs have the 12V output available.

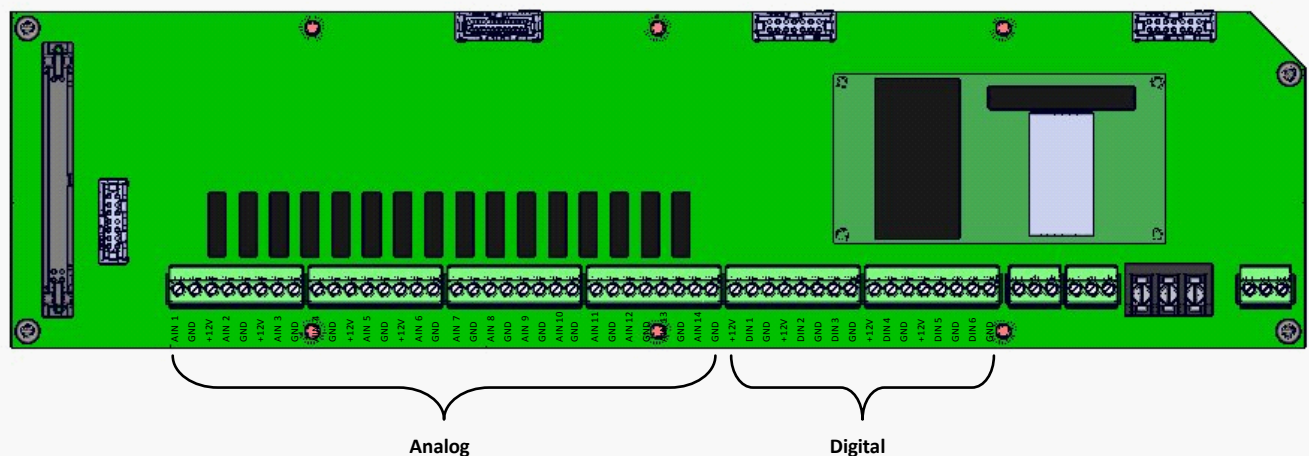
WARNING



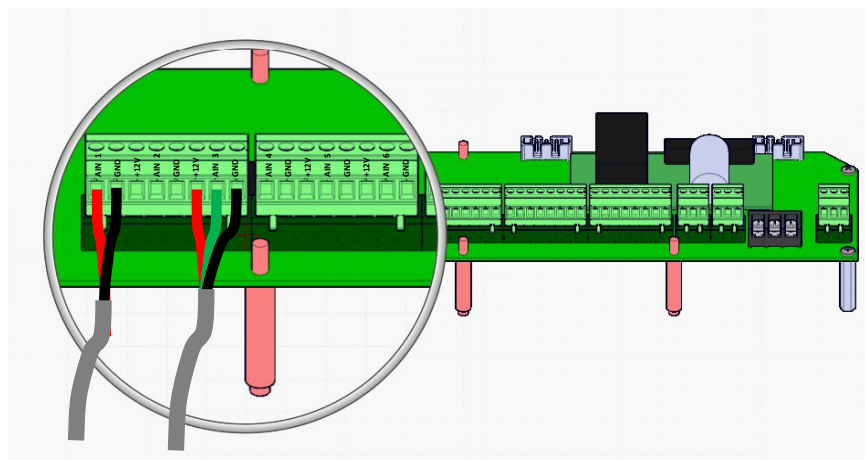
1. **A QUALIFIED ELECTRICIAN or Val-Co™ service** should perform all wiring to ensure local and national codes are followed.
2. **Disconnect all power before inspecting or servicing equipment.**
3. **Always use the proper wire size for wiring systems.**



Interconnect Board with Analog and Digital Input Terminals
(board shown NOT mounted in control)



Insert the wires into the underneath side of the terminals. More detail on installing the sensors are on the following pages 24-29.



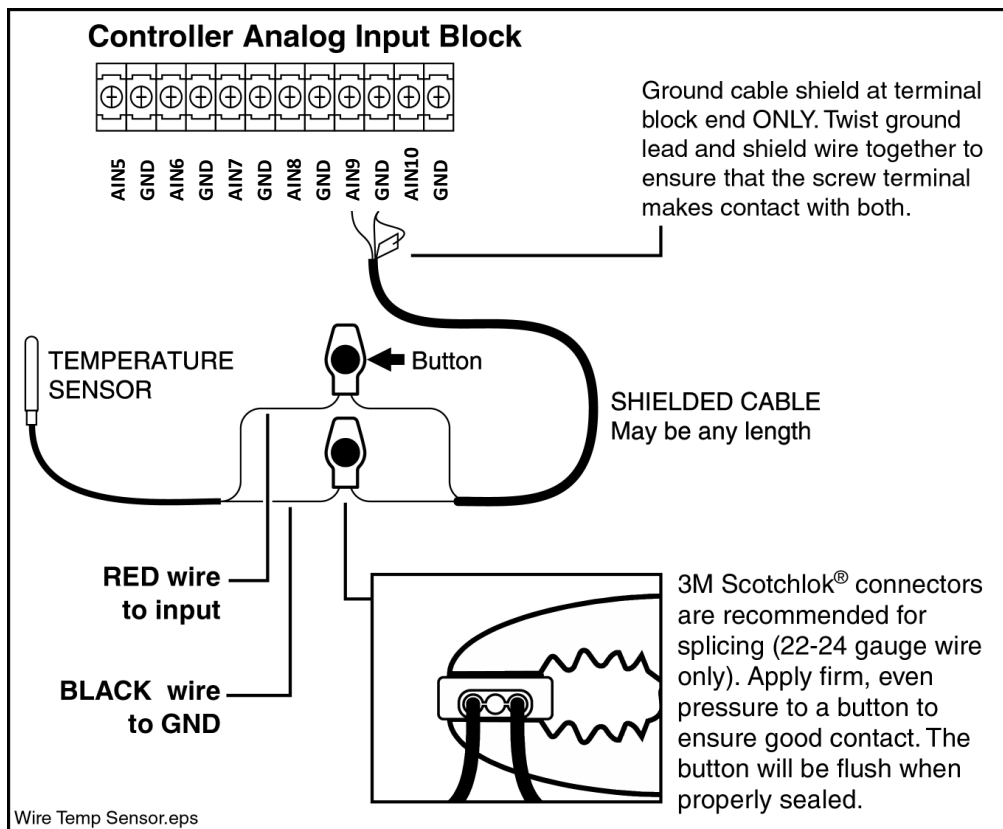
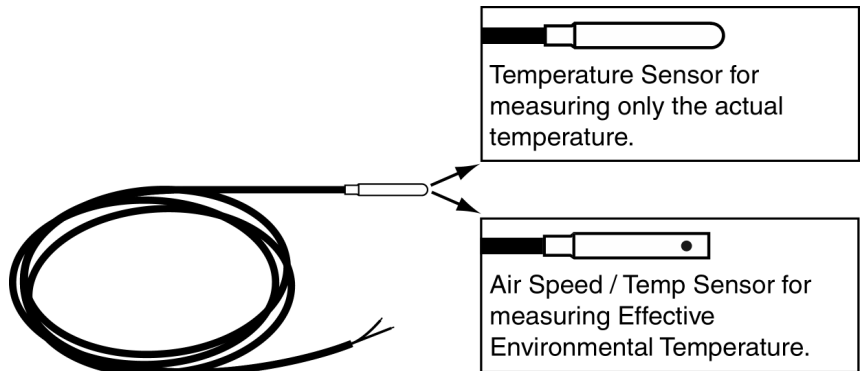
Analog Inputs

Temperature Sensors

Suspend sensors from the ceiling to ensure free airflow. Sensors should hang close to the animals, but should be out of their reach.

For best results, keep the sensors out of sunlight, away from moving machinery, heaters, power wiring, sprinklers, or lights. Center sensors between heating devices.

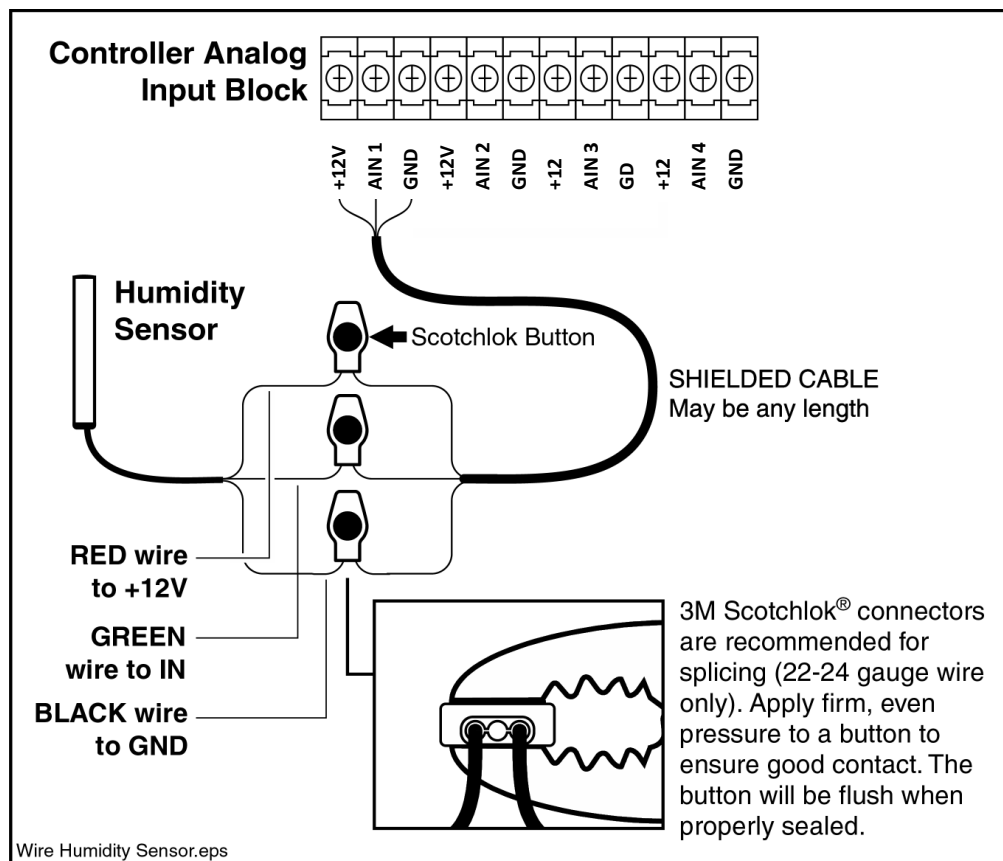
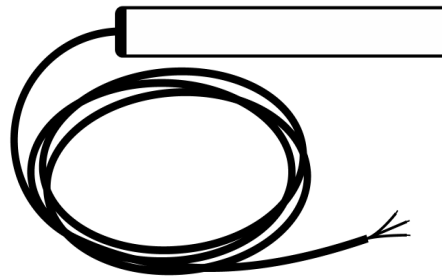
Connect sensors to the input/output board as shown below making sure to ground the shielding as well as the black wire.





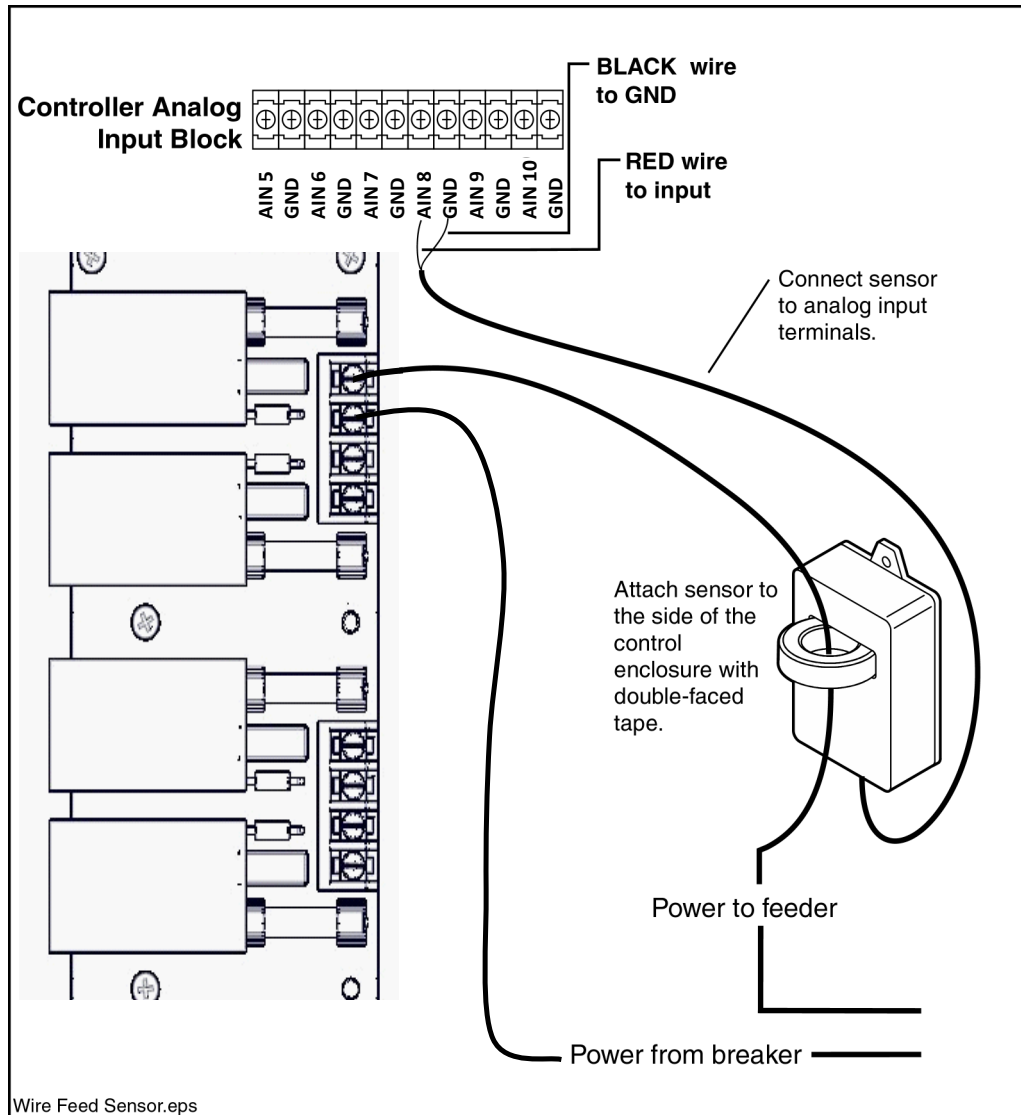
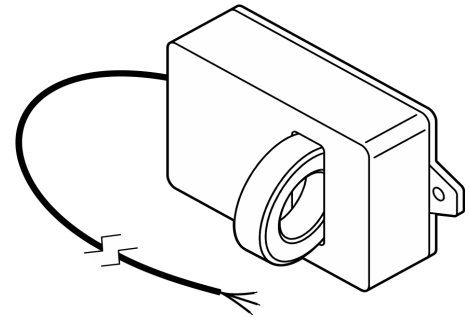
Humidity Sensor

Follow the same procedure as the temperature sensors.
Position the humidity sensor in the center of the building.
The humidity sensor is a three-wire device and must be connected to one of the three-connection inputs, labeled 1 through 4 on the input board .



Feed Sensor

Feed sensors should be mounted inside the controller enclosure with the feeder power wire running through the sensor loop. If a single sensor monitors multiple feeder circuits, run the wires from all feeder groups the same direction through the sensor loop.

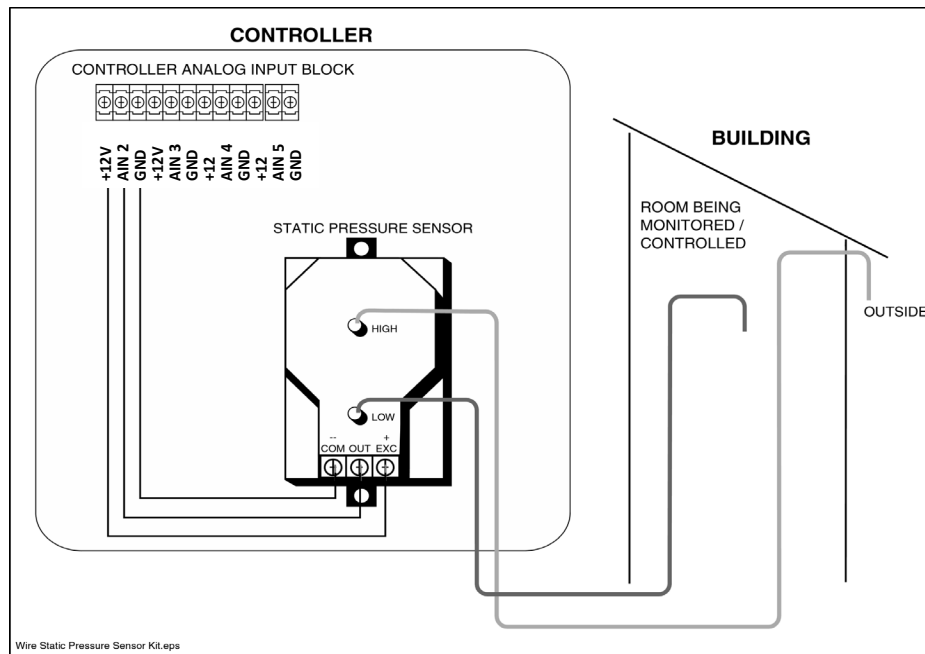


The best use for a single feed sensor is monitoring your silo auger motor. This provides a clear indication of all feed entering the building and it provides an alarm when the feed silo is empty.



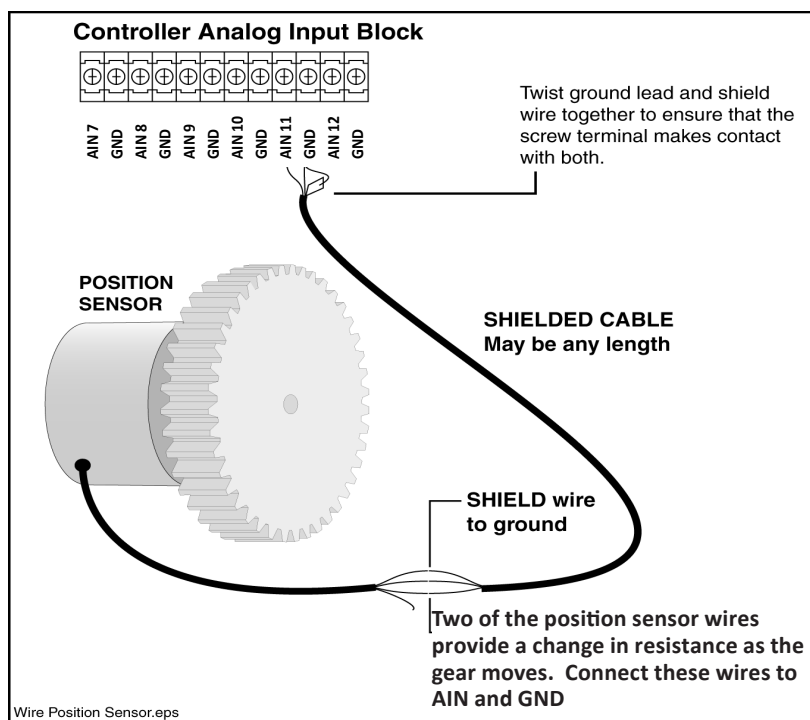
Static Pressure Sensor

Connect the static pressure sensor to the +12, AIN and GND input terminals for one of the analog inputs.



Position Sensor

A position sensor allows the controller to determine the current opening size of a curtain, ridge vent, chimney damper or inlet. If the position sensor has more than two leads, find two that provide a smooth change in resistance as the sensor is turned. You may need an Ohmmeter to measure this.



Digital Inputs

Digital Alarm

Digital alarms provide warnings of almost any emergency condition you need to be informed about. Any no-voltage circuit that can be switched will provide an alarm to the controller.

The controller has (6) six digital inputs (numbered DIN1 through DIN6 on the input board) which can be connected to digital alarms, whisker switch or water meters.

The term “digital” refers to two possible states for a circuit: open and closed. You can set up each digital alarm input to sense for an open or a closed circuit. The circuit must be a simple switch with no voltage applied.

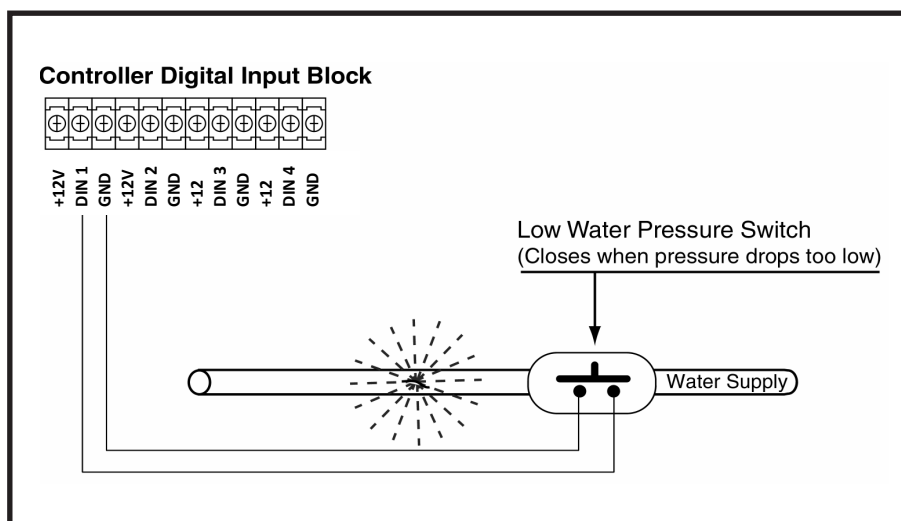


WARNING!

Attaching circuits with voltage to the controller’s digital inputs will damage the controller.



- Attach a low water pressure switch to detect water line breaks or empty water tanks. This can be especially important where evaporative cooling or fogging is used.
- Attach a gas pressure switch to detect an interruption in gas.
- If you are running three-phase power, you can set up a switch to detect the loss of a phase.
- Attach a level switch to indicate when your feeder bin is empty.
- If your curtain drop has an output switch or the capability to have a switch/relay added, you can alarm when the curtain drops.
- You can hook up a door switch to alarm when people enter your building, or when the door remains open.

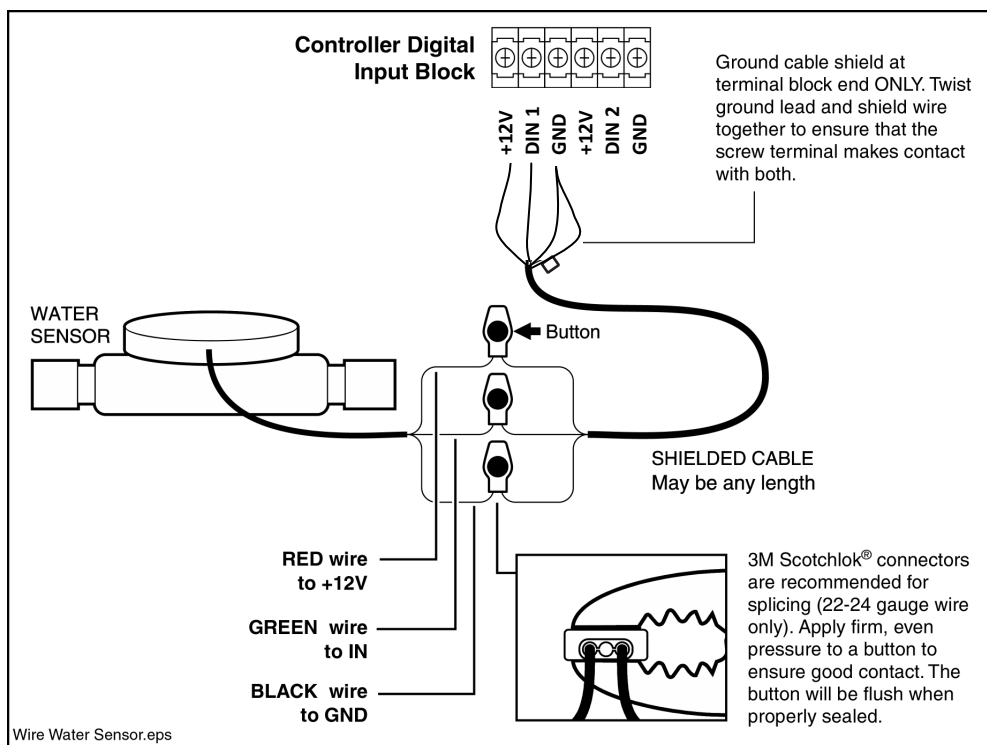
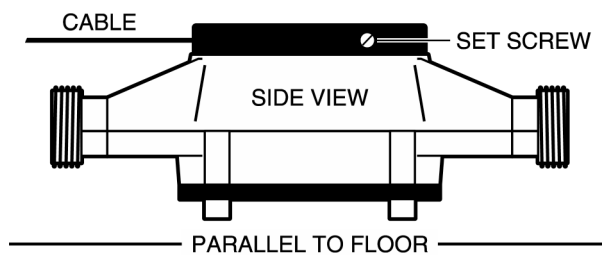
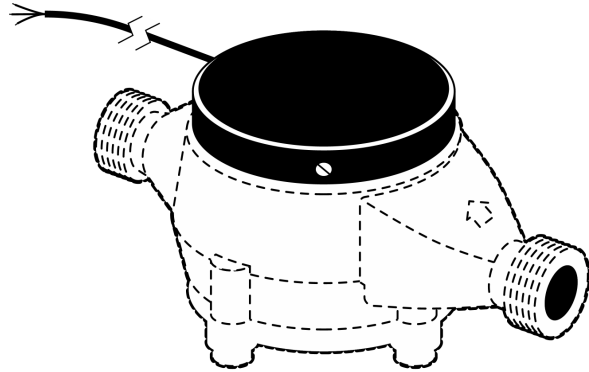


The controller allows you to set up the digital alarm in several ways. For example, you can alarm when the circuit becomes open or becomes closed and you can delay an alarm to avoid false alarms.



Water Flow Meter

The electronic water meter sensor is made to fit on the Badger™ flow meter RCDL 25 (or a compatible unit) as shown below. Any other orientation may cause inaccurate readings and early failure. The water meter hooks up to the controller's digital inputs. If you use another meter with two electrical connections, wire through DIN and GND and verify that the control is reading the signal. Improper connections or incompatible sensors may ground out the input/output board and cause noticeable controller malfunction until the wiring is corrected.



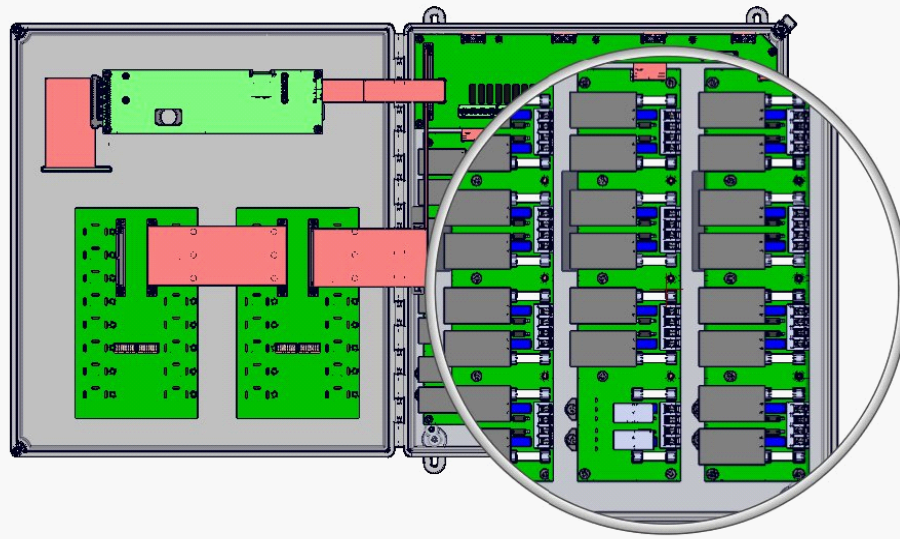
Output Relays - What you NEED to know!

Output Channel Load Specifications

Check the load on each channel. Light groups and tunnel fan groups will likely be your highest amperage circuits. The relays are rated at 1HP at 120VAC and 1½ HP at 240VAC. They will sustain a 200 percent startup surge for up to three seconds.

Use a contactor or divide equipment into several groups as necessary to avoid overloading a relay.

Output Relays - Inside Base of enclosure



Fuse Replacement

The fuse on the power supply is a 2.0 Amp 250VAC (5 x 20mm) fast-acting interrupting type (Littelfuse 0216002 or equivalent).

Each output relay has a 20 Amp 3AB ceramic body slow-acting fuse (Bussmann® MDA-20 or equivalent 0.25 x 1.25"). Electrical load should be no more than 1HP at 120VAC and 1½HP at 240V.



WARNING!

When replacing Relays, they must be carefully **ALIGNED** and **FULLY SEATED**!



The Val-Co™ Ventra Pro Controller has “Plug-in” RELAYS for easy and cost effective replacement.



Output Relays - What you NEED to know! - continued

Channel Interlocking

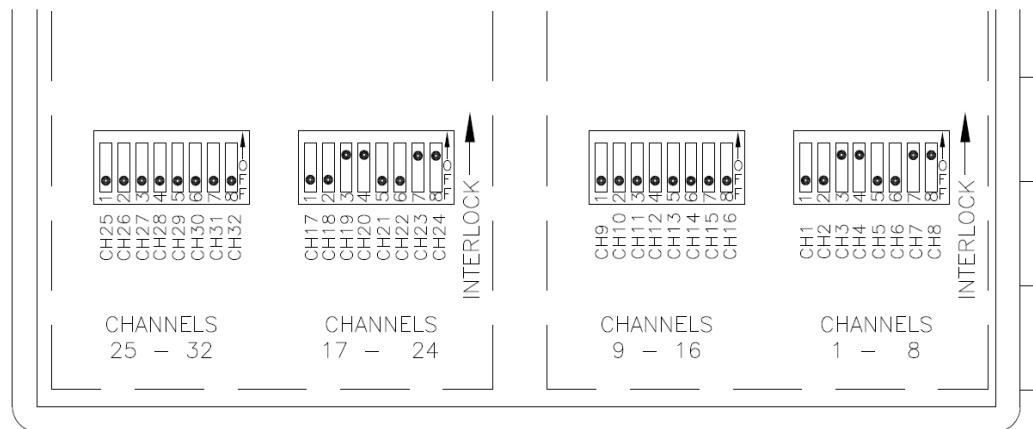
Devices that require an open and close channel such as curtain machines, inlets and chimney dampers, should be interlocked.

This prevents sending open and close signals simultaneously to curtain or inlet machines, which could damage equipment.

In the event two interlocked channels are switched on, the first channel on has priority.

For inlet devices installed on these channels, set the appropriate switches OFF. For example, if Curtain Group #1 is on channels 1 and 2, then interlock (move to OFF) switches 1 and 2.

An odd-numbered channel can be interlocked with the next even-numbered channel (1 & 2, 3 & 4, and so on). Interlocking must always be done in pairs.



Testing Interlocks

Equipment Groups

Verify that all interlocks are properly set for open/close devices.

Manually switch each equipment group ON and OFF with the front panel toggle switches. Verify the connection of the proper devices to each channel. Run each device long enough to confirm that it is fully functional and properly adjusted.

Backup Systems

Test the backup equipment override thermostats and curtain drops. Make sure these devices operate the way they are expected to before depending on them to protect animals.

Alarms

Turn off the electricity to the controller. This will cause an alarm and allow you to verify that each alarm device is operational.

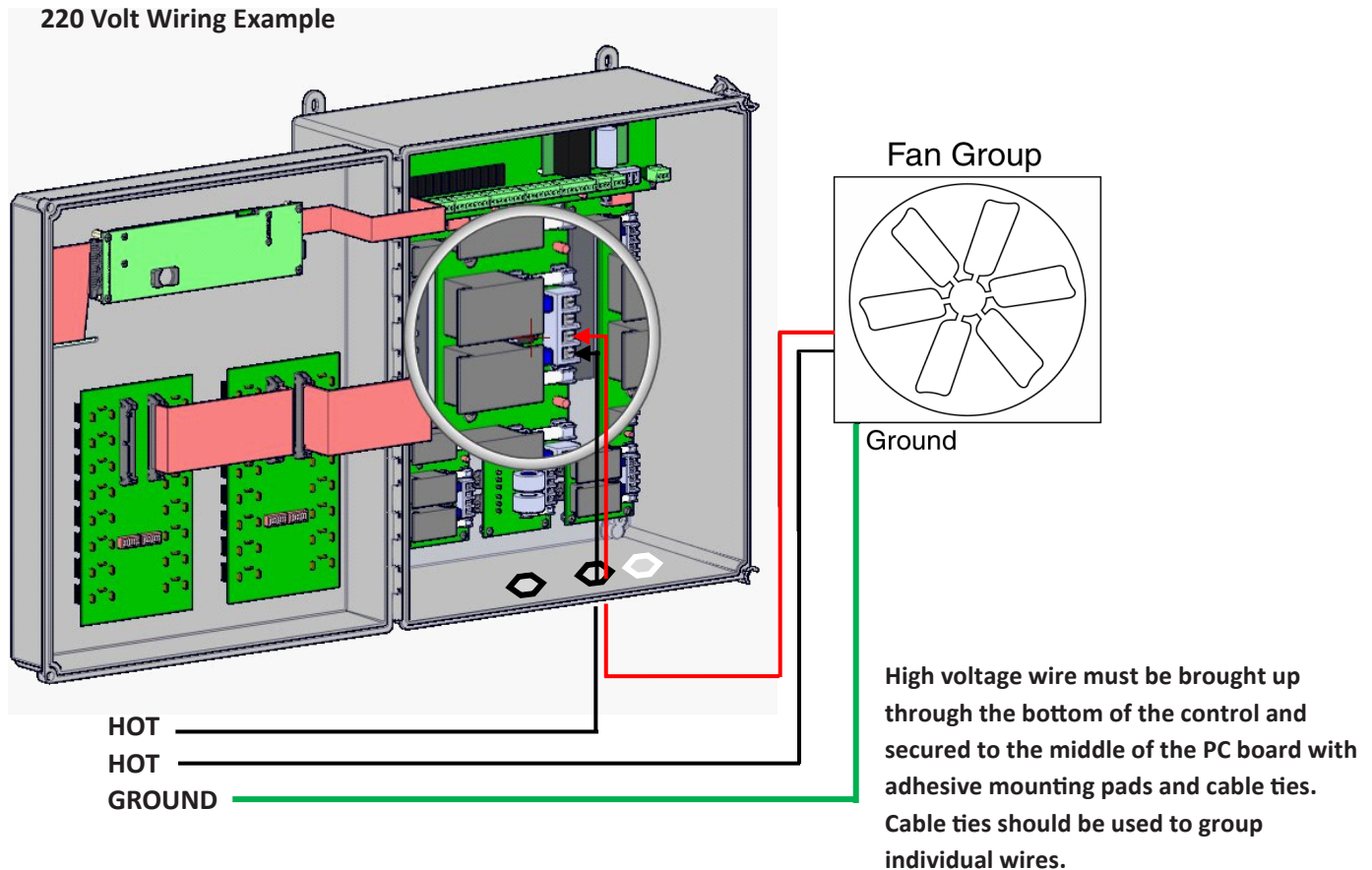
Clear any ACTIVE ALARM by pushing **ENTER** while the alarm is on the screen.

Failure to clear an alarm will prevent the alarm relay from resetting.

Output Relay Wiring

Bring the wire from an output channel through a strain relief or conduit on the bottom of the of the controller and up between the banks of relays to the proper relay. The control wire should run from the circuit breaker to the Ventra Pro™ relay and then out to the device or device contactor.

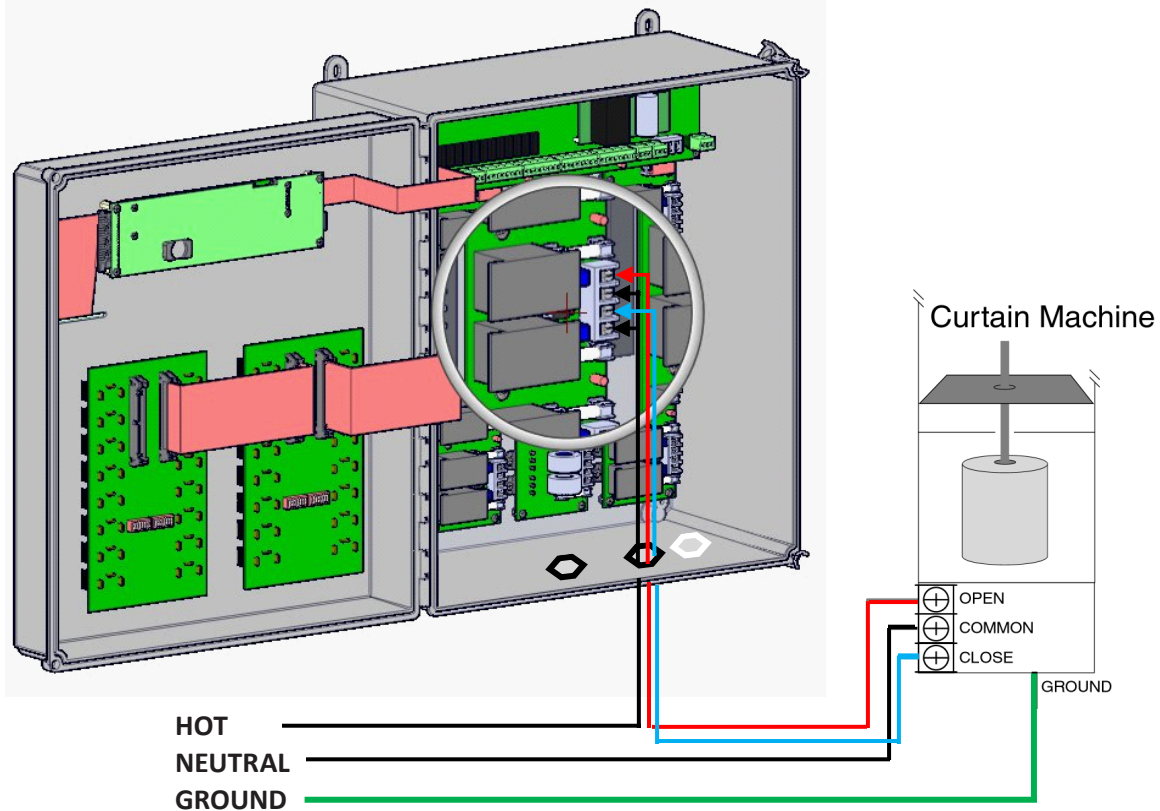
We recommend dedicating a separate circuit breaker for each channel. That way, if there is a problem with one of the device groups, it won't disable your entire ventilation system.





Output Relay Wiring - continued

120 Volt Wiring Example



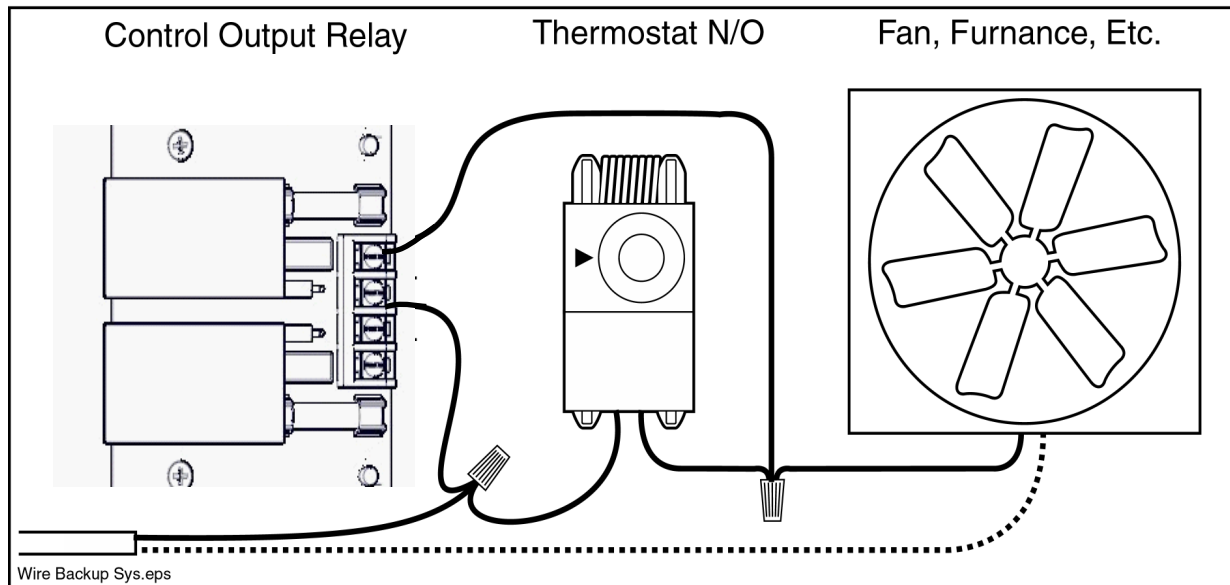
High voltage wire must be brought through the bottom of the control and secured to the middle of the PC board with adhesive mounting pads and cable ties. . Cable ties should be used to group individual wires.



Output Relay Wiring - continued

Backup Systems

Setting backup devices that allow heat and ventilation in case of a power failure or other type of failure is essential for the safety of the animals.



Alarm Information

Note: Always test alarm operation.

The Ventra Pro™ will alarm on:

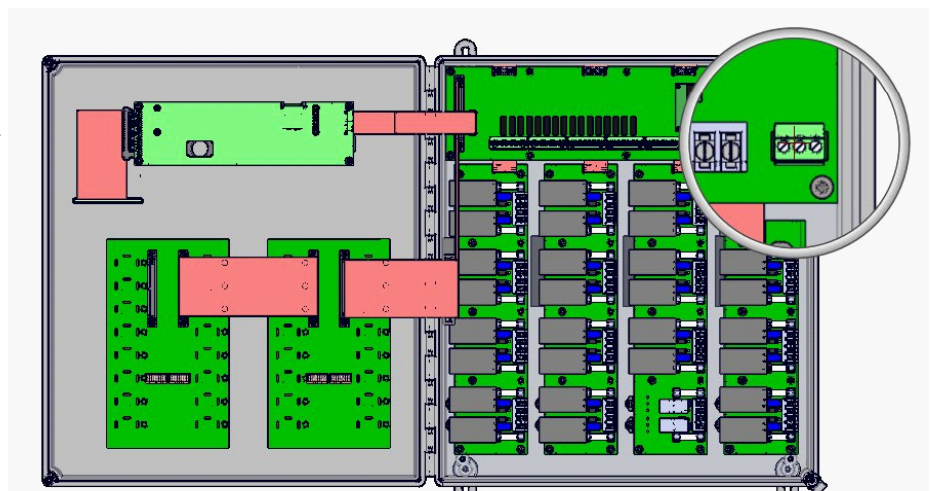
- High/low temperature
- Power outage
- Feeder over/under run time (with optional feed motor sensor)
- Over/under consumption of water (with optional water meter sensor)
- Static pressure (with optional static pressure sensor)
- Digital alarm input
- Communication errors and certain memory errors

The alarm connection may be wired to whatever device is necessary to provide a warning of alarm conditions, usually an auto dialer or siren.

Backup alarm devices must be installed in case of controller failure.

Alarm Relay Output Wiring

The alarm relay is on the input board. Located toward the top right corner of the enclosure.



Continued on next page.

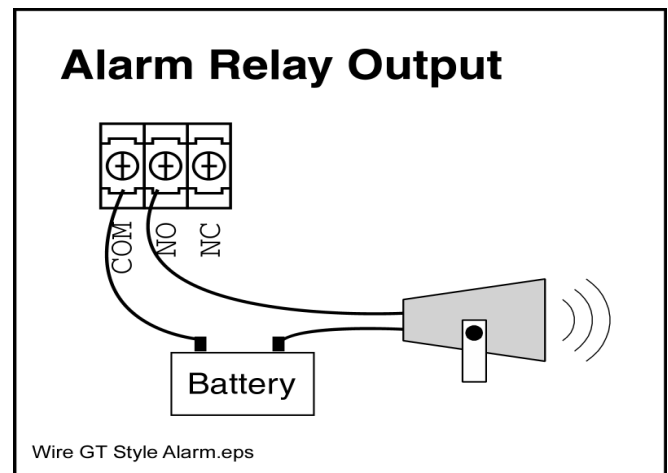


Output Relay Wiring - continued

The normally open (NO) dry-contact (no voltage) connection has continuity during an alarm condition and could be used to turn on a device such as a siren, strobe light or auto dialer. The normally closed (NC) connection will have continuity when there is no alarm.

Multiple Ventra Pro™ controllers can be wired in series for a normally open alarm or in parallel for a normally closed connection.

Specifications: The alarm relay is SPDT rated 120/240VAC 10A. Alarm devices should be fused externally.



Communications Station

You can attach a communications station to the Ventra Pro™ to enable remote access from a computer. This access gives you many of the same capabilities as using the controller's keypad. Refer to the manual that came with your communications station for wiring instructions.

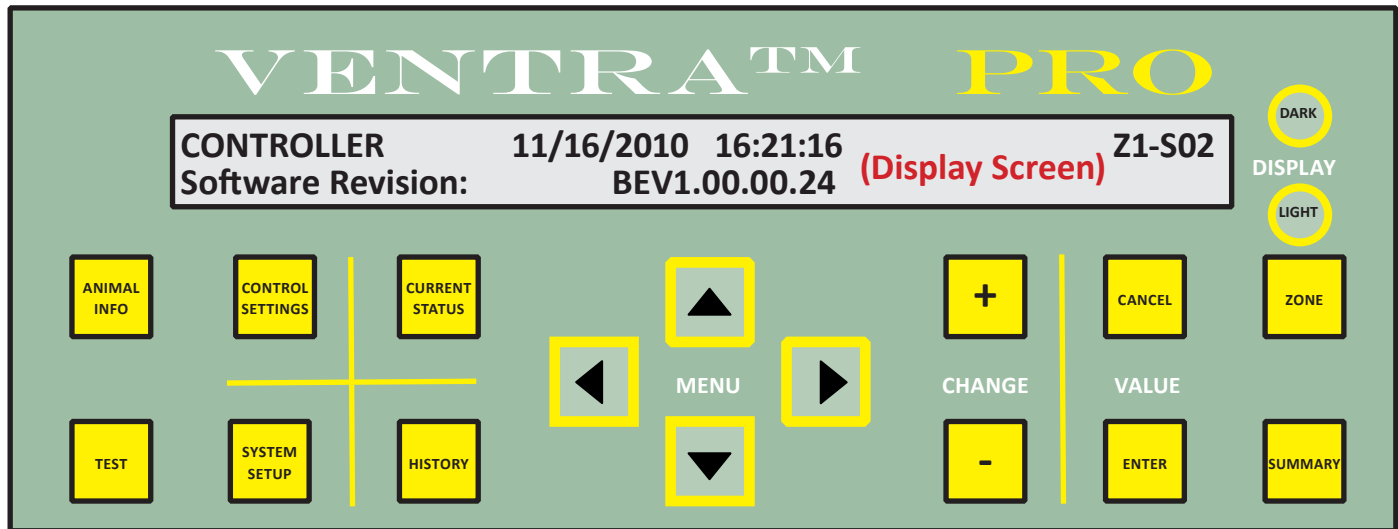
Up to 16 Ventra Pro™ controllers can be wired to the same communications station.

Expansion Stations

You can attach a variable speed expansion station (2VS) to Ventra Pro™ 16, 24 and 32 Channel models. Refer to the installation manual that came with your expansion station for wiring instructions.

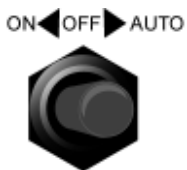
The Control's Display, Keys and Navigation

The Display Area



Controller Switches and Hot-Keys

Channel Output Toggle Switches



- Each equipment group is assigned to an output channel. Some devices with independent open and close circuits, such as curtains, require two output channels. In those cases, the two output channels should be interlocked. *Refer to the Channel Interlocking section in this manual for more information on page 31.*
- The three-position toggle switches allow you to manually control devices connected to each output channel. The status light next to a channel illuminates when that channel is on.

On/Off

Set the switch to ON or OFF to override the controller. You can use this switch to test an equipment group, turn off equipment, or override the controller for any reason. **The controller will not let you turn on a channel if it is interlocked to a channel that is already on.**

Auto

Set the toggle switch to AUTO to allow the controller to manage the environment. Before selecting AUTO, input your settings in the Device/Equipment Settings menu. Make certain the settings in this menu are properly configured.

Hot - Keys







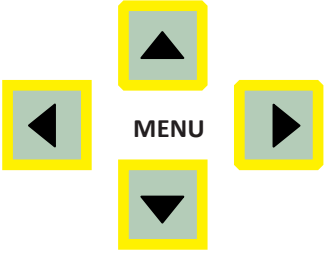








HotKey technology™ provides direct access to current temperatures, history, control settings, system setup, *(the 4 most commonly used menu selections)*, animal information and input/output tests. *Each output channel's label uses HotKey technology. Pressing a HotKey takes you directly to the display for that channel's settings.*



Navigation to all menus can be done using the arrow keys on the keypad if you chose not to use Hot-Keys. (examples on next page)



Key Pad Descriptions

	Hot-Key for accessing control parameter setup such as the temperature setpoint. You can edit these values.
	Hot-Key for accessing the current environmental conditions including temperature and humidity. These values can be viewed.
	Hot-Key for accessing system & control device setup. You can enter the date and time in this menus and add or edit input/output devices.
	Hot-Key for accessing hourly historical data of equipment run times and environmental conditions such as average temperature.
	Hot-Key for accessing animal information such as current animal age and weight.
	Hot-Key for accessing test menus of the various input/output relays, including the alarm output relay.
 MENU	Used for navigation. Press the UP or DOWN arrow to move vertically through menu screens. Press the LEFT or RIGHT arrow to move to the top screen of an adjacent menu category.
 CHANGE 	When you need to change a value or group number in a menu item, press the PLUS and/or MINUS keys.
 VALUE 	Press CANCEL to cancel a current menu and move back to the current main menu. Pressing CANCEL twice will always return you to the starting menu "CONTROLLER". Press ENTER to edit a menu item's value and to confirm changes.
 	Selects the zone to be viewed or modified. Pressing ZONE cycles between all zones. Press SUMMARY to view the summary of history records for that day.
 DISPLAY 	Use this to change the contrast of the 80 - character display. If the display is blank when you turn the unit on, press and hold the DARK button to increase the contrast to the desired level.

Menus and Navigation

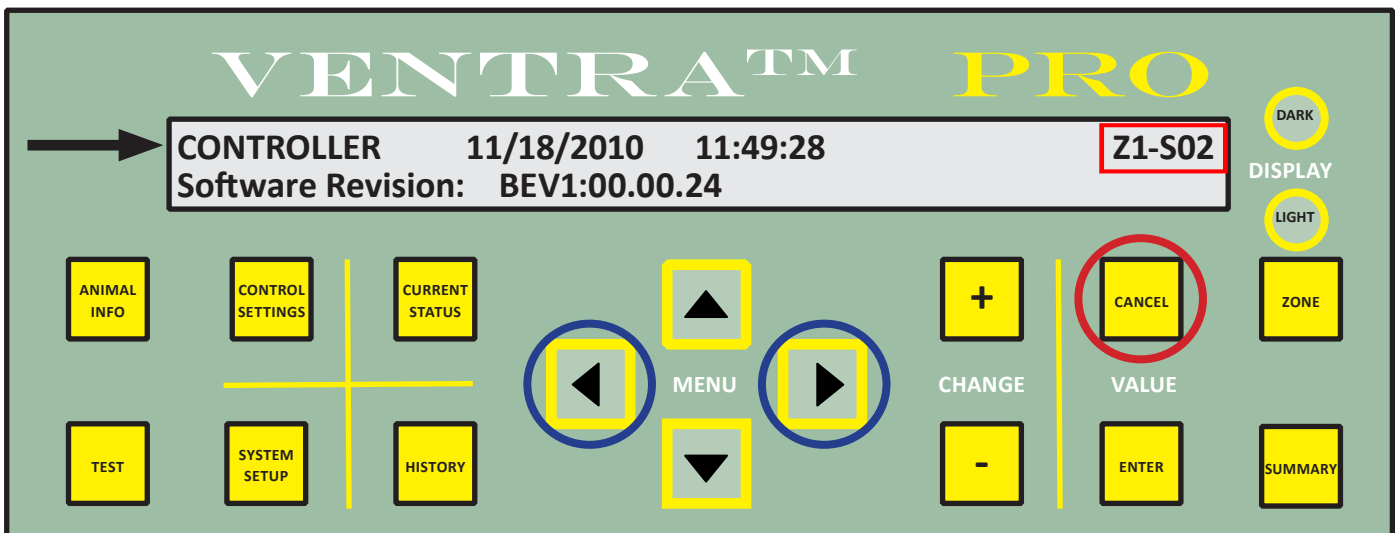
The following pages describe how to find the menus on the controller. The navigation keys allow you to **scroll** through the major menu categories using the **RIGHT** and **LEFT** arrow keys.

Begin by pressing the **CANCEL** key (2) two times. This will take you to the major menu categories, starting with the menu CONTROLLER software version screen. *Now you can use the RIGHT or LEFT arrow keys to scroll the major menu category selections.*

Other ways to bring up the major menu categories are by pressing the Hot- Keys **CURRENT STATUS, CONTROL SETTINGS, HISTORY, SYSTEM SETUP, ANIMAL INFO** or **TEST**. All these will bring you to major menu categories and allow you to scroll until you find the menu of choice. (You can scroll back & forth through the major menu categories by using either the **RIGHT** or **LEFT** keys.)

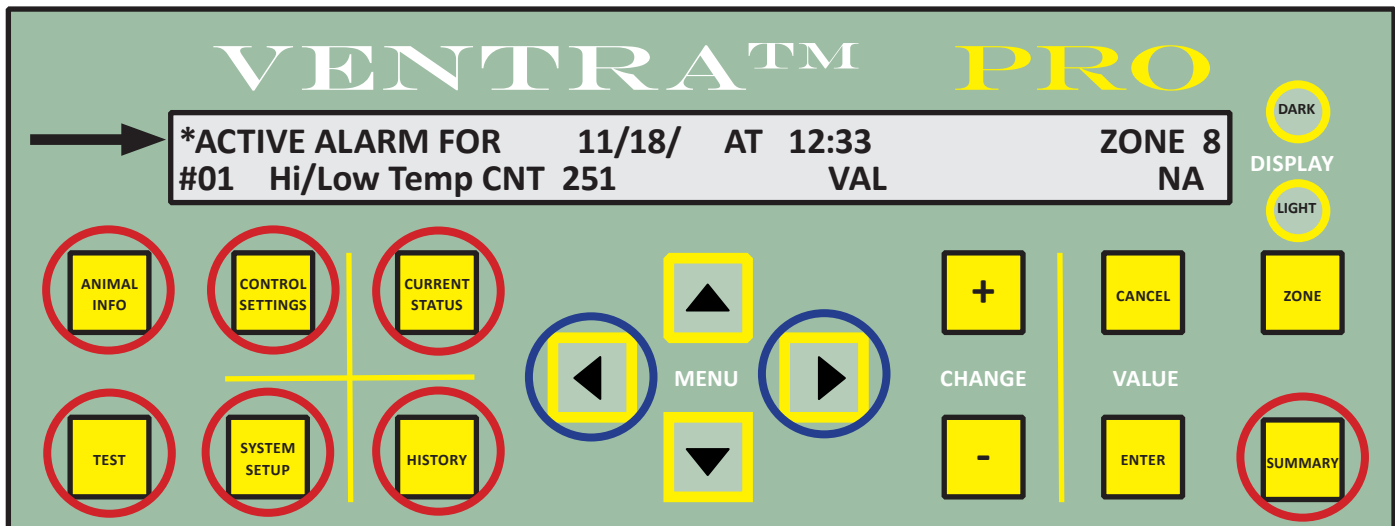
The **Z1-S02** shown in the example below on the top right corner means Zone 1 and Parameter Set #2

Press **CANCEL KEY** as circled (in red) boldly (2 times). To scroll press the **RIGHT** or **LEFT** keys circled (in blue) lightly.



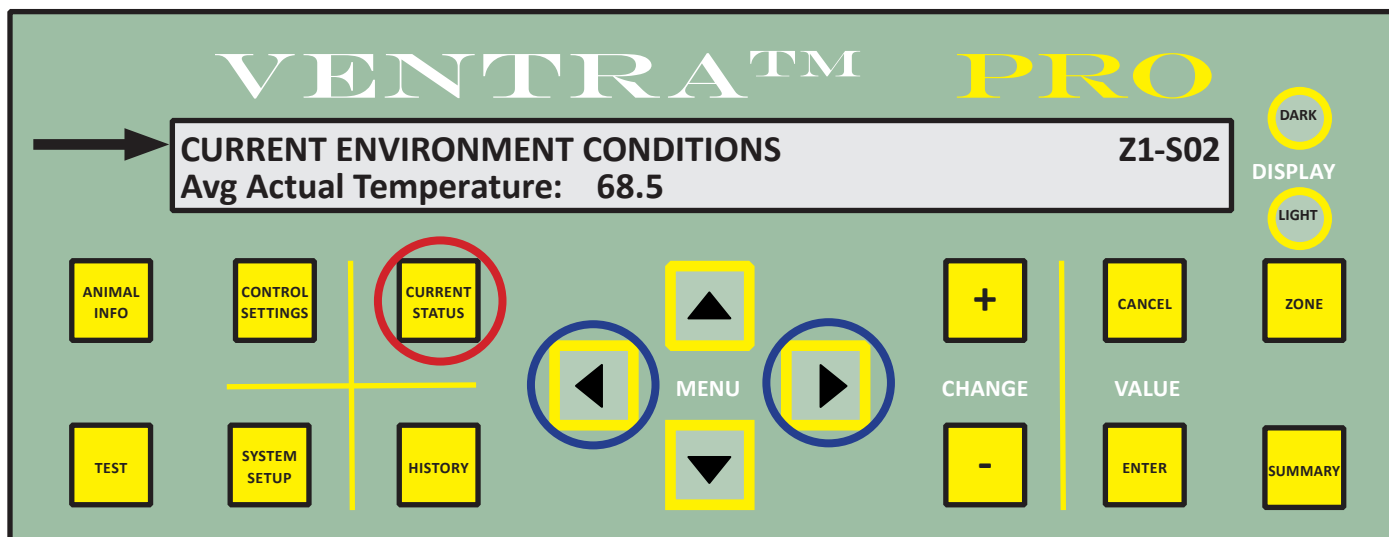
(refer to Appendix 6 page 156-163 - MENU GUIDE for a complete list of menus and submenus.)

Press **HOT-KEY** as circled (in red) boldly (1 time). To scroll press the **RIGHT** or **LEFT** keys circled (in blue) lightly.

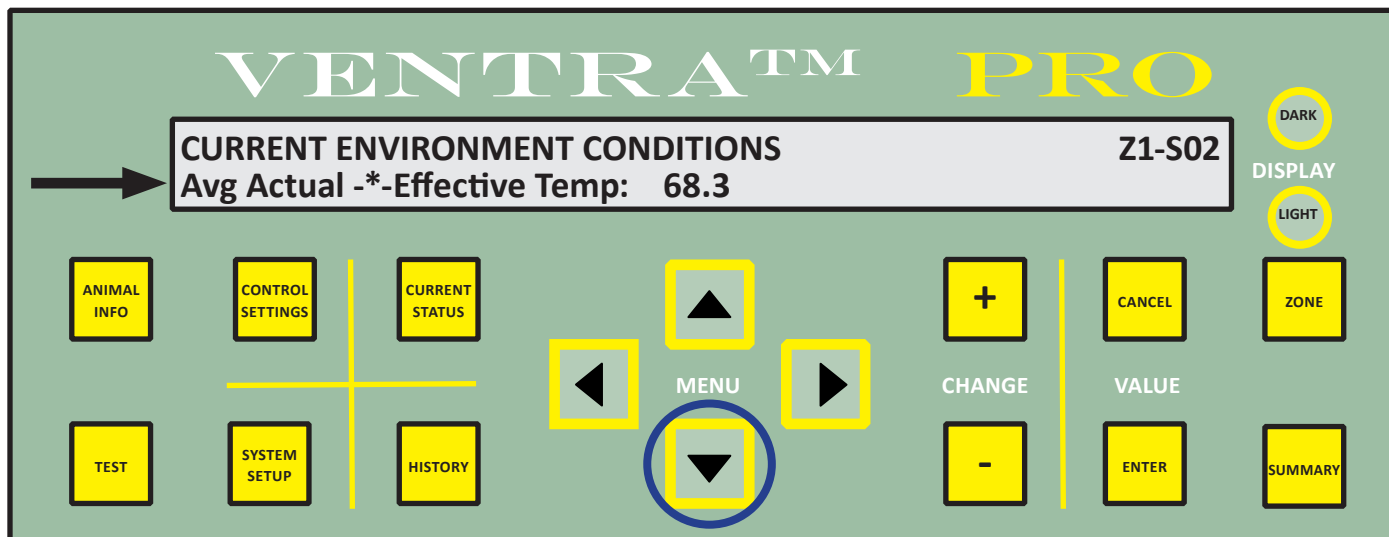




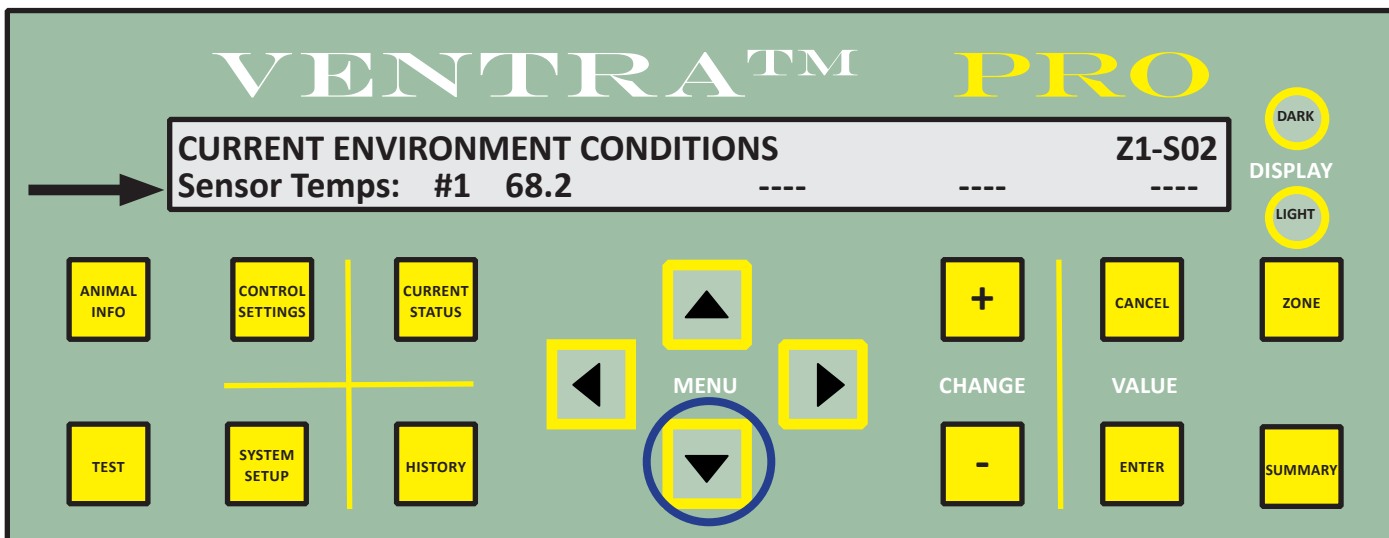
Examples using Hot-Keys: "CURRENT STATUS" Key, Use RIGHT and LEFT arrow keys to scroll to this menus.



Press UP or DOWN arrows to scroll through submenus within the same major menu category as shown below.



Example showing another submenu change within the same major menu category. (change with scrolling.)



Changing Values in the Submenus

The previous 2 pages exemplified how to navigate to the major menu categories and to most submenus. However; the “major” menu (DEVICE / EQUIPMENT SETTINGS) requires that you press **ENTER** to get to the menu/submenu screens for the “DEVICE / EQUIPMENT SETTING” menus. *(The menu of the “DEVICE / EQUIPMENT SETTINGS” is shown below because the process is slightly different due to the need to get to another level of menus before you can scroll through the submenus. When you get to the submenus to change values they are changed in the same manner).*

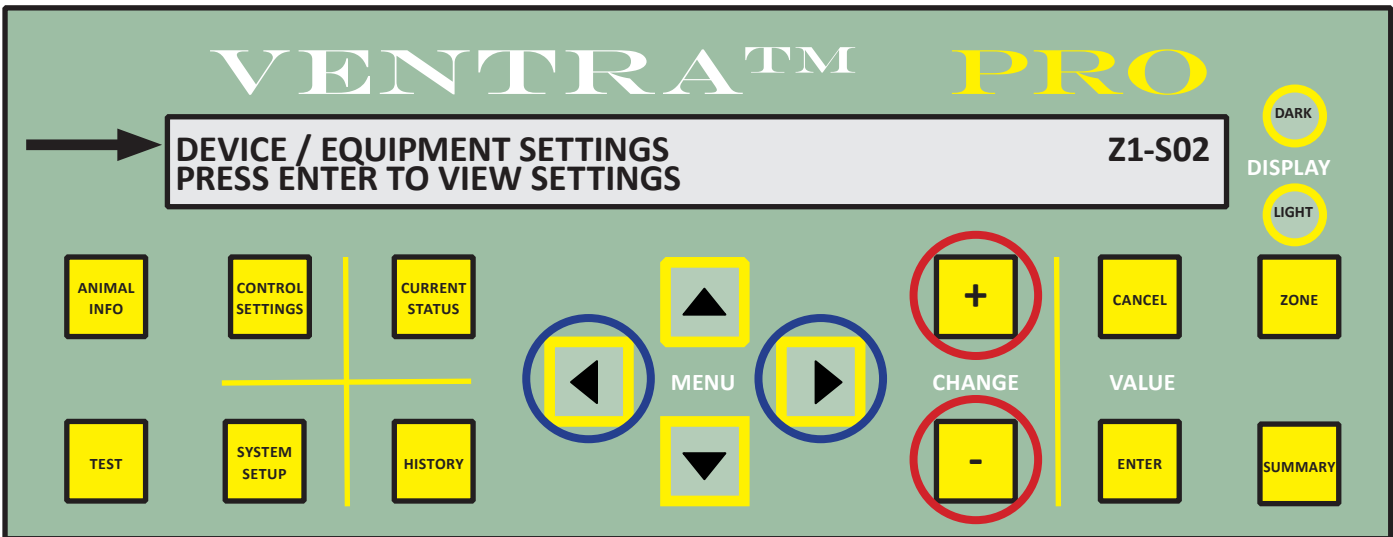


Three Basic Steps -

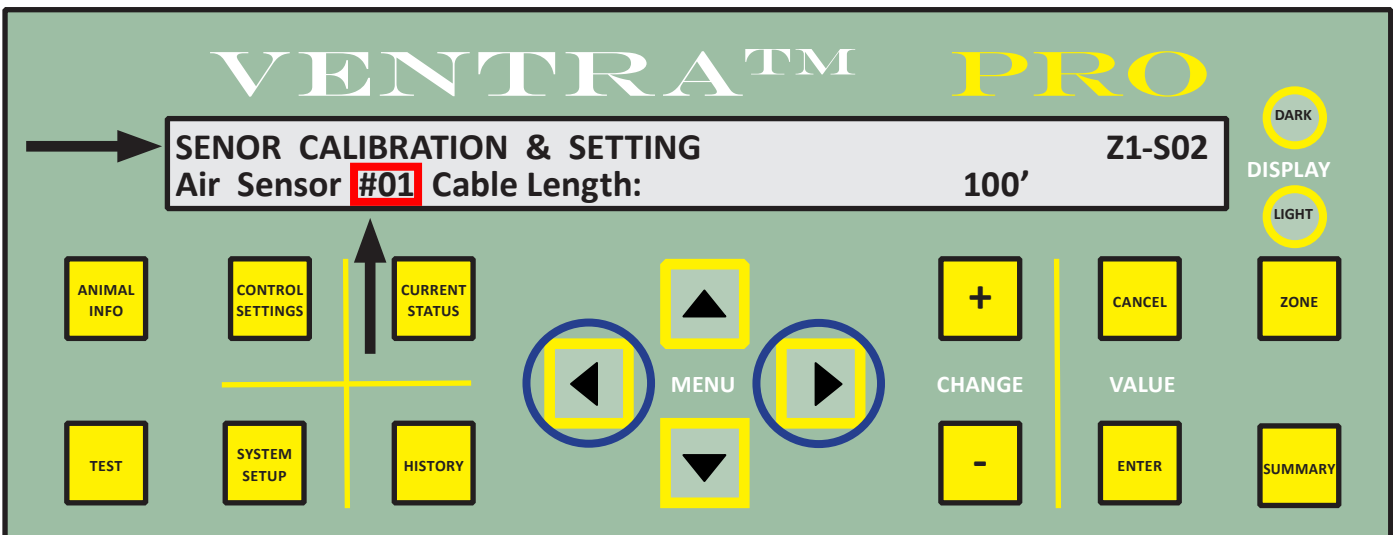
1. Press **ENTER**.
2. Press the **PLUS** or **MINUS** key to change the first digit.
3. Press the **RIGHT** arrow key to move to the next digit.

Only values in submenus can be changed.

STEP #1 - At the DEVICE / EQUIPMENT SETTINGS major menu press **ENTER**.

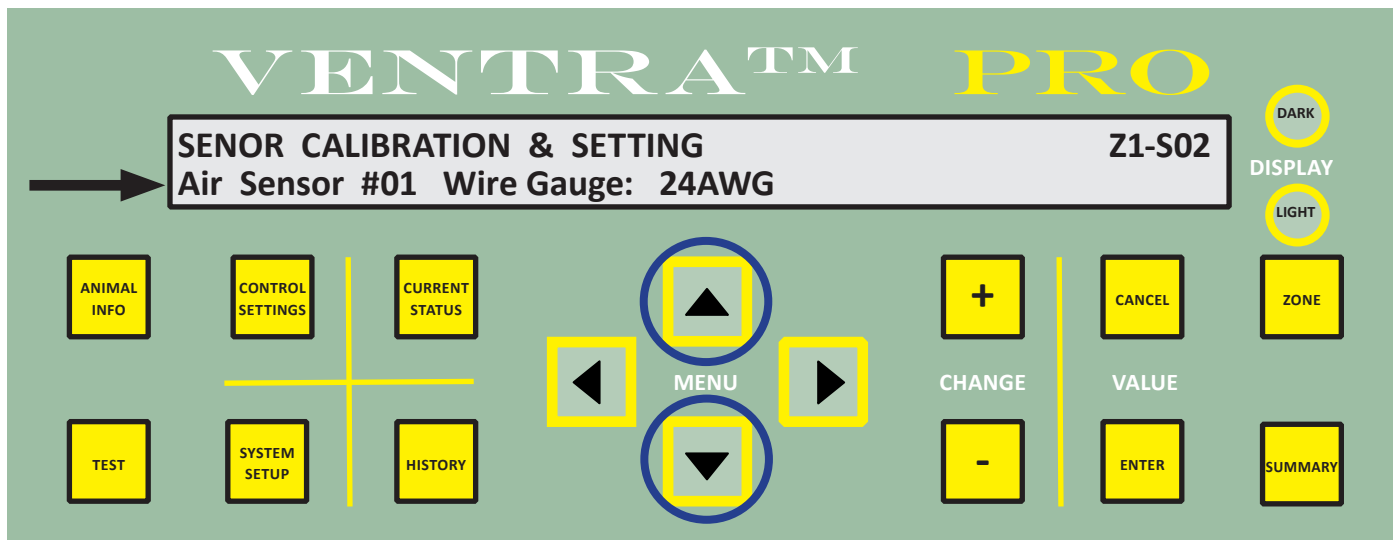


STEP #2 - Now use the **RIGHT** and **LEFT** arrows to get to the next level of the “DEVICE / EQUIPMENT SETTING” menus. These menus will take you to the submenus with values that can be changed when setting up devices. In some instances, you will need to press the **PLUS** or **MINUS** keys to move between similarly named/numbered devices *as shown in the bolded red box below*. Changing values are on the next page.

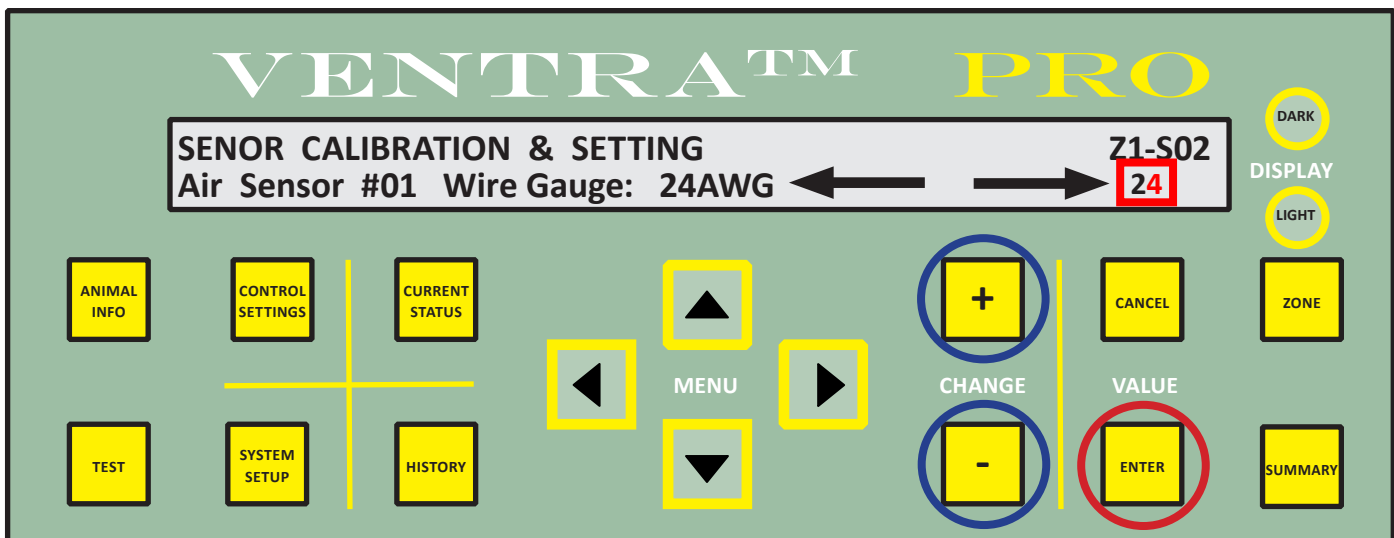




STEP #3 - Use the **UP** or **DOWN** arrow keys to scroll to the submenu desired.



STEP #4 - To **CHANGE** the value in the reading “24AWG” press **ENTER** which will bring up a current value (boxed and bolded in red) to the far right bottom of the display screen. The right digit will be FLASHING (as shown, bolded in red). To change this value, press and hold the **PLUS** or **MINUS** key as shown with the circles below, (in blue). The numbers will either go up or down depending on which key you have pressed. When you get to the desired setting, press **ENTER**. (This setting is now setup.)



Remember

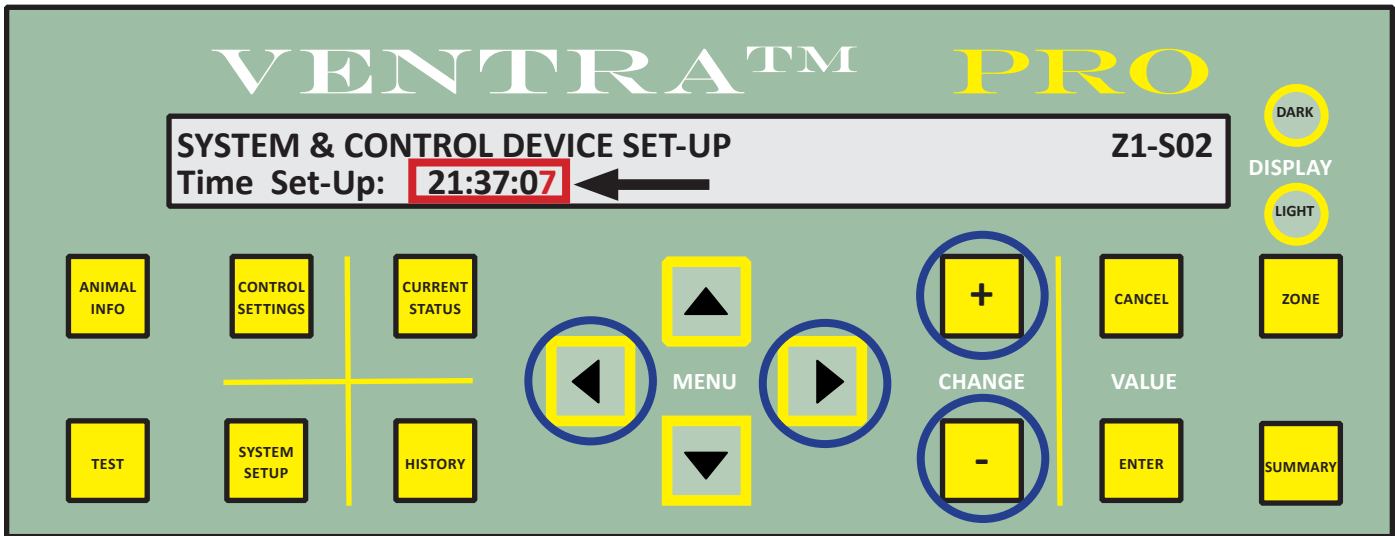


- that you can always move back/forth or up/down using these keys for quicker access to a submenu instead of moving through all the submenus. (you can backup.)
- You can hold down the **PLUS** or **MINUS** keys to rapidly increase or decrease a value.

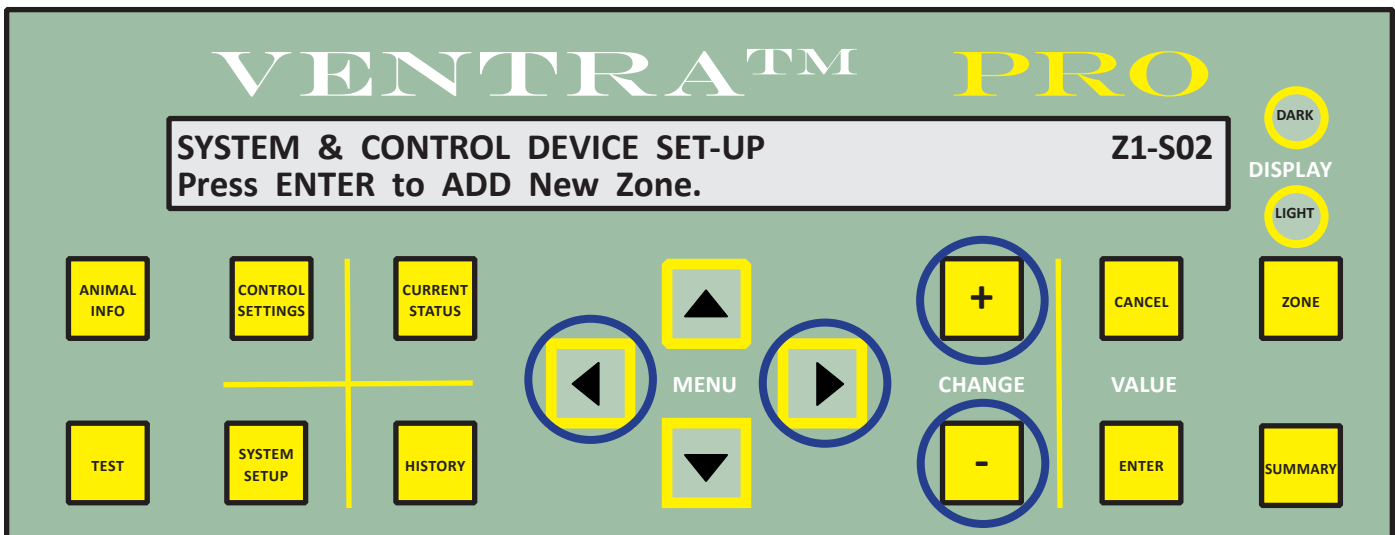
Editing Timers - You can scroll through the submenus of any major menu and determine which device timer you would like to set-up or change. Once you have chosen the timer you want to set-up or change press the **ENTER** key. This will cause the far right digit to FLASH. Use the **PLUS** or **MINUS** keys to increase or decrease the value. Use the **RIGHT** or **LEFT** arrow keys to switch between hours, minutes and seconds.



You can hold down the **PLUS** or **MINUS** keys to rapidly increase or decrease a value.



Using HOT-KEYS for QUICK NAVIGATION (Example): Setting up Zones - You have learned to scroll to major menus but you may also press one of the four major menu *HOT-KEYS* to get right to a major menu. The **SYSTEM SETUP** hot-key will bring you to the SYSTEM & CONTROL DEVICE SET-UP menu. Use the **UP** or **DOWN** arrow keys to scroll to the submenu. "Press **ENTER** to ADD New Zone." Press **ENTER**, the next screen will display Next available unused Zone number being 1-9. Press **ENTER** to accept this Zone number. Deleting a zone is detailed on page 86.



From here out we will only use the display screen area to show examples of menus.



Power Up Sequence



Check all connections before switching on your controller.

When the controller is powered on, you will see the following sequence of operations. These operations are automatic and you should not press any keys at this time. This will take approximately 30 seconds.

Checking Real Time Clock
Correct operation clears message

Start-Up Procedure 036 11:47
Setup SD CARD operations



Press ENTER if you want to load and use a different parameter set than what you will be setting up as you continue through the "Setting Up the Control" instructions. *More detail on parameter sets can be found on page 137-142.*

Start-Up Procedure Options
Press ENTER to change. *This screen will only display for approximately 2 seconds*

Start-Up Procedure 036 *(this number may be different)* 11:47
Power Reset Slave Modules (5 seconds)

Control Sequence Completed

When the controller has finished going through the sequence of operations *shown above* the following GLOBAL PARAMETERS SETUP display screen will appear. Instructions for setting up the GLOBAL PARAMETERS SETUP submenus are on the next page.

GLOBAL PARAMETERS SETUP
Animal Type: Birds

Global Parameters - (Initial Setup)

The controller software is designed for hog or bird applications, Metric or American measurement units and Fahrenheit or Celsius temperatures. When setting up the controller, or a new parameter set, for the first time and the start up procedure is complete the display screen will open with GLOBAL PARAMETERS SETUP with submenus; Animal Type; (Hog or Bird applications), Units of Measure; (Metric or American measurement units), Temperature Measure; (Fahrenheit or Celsius temperatures) and Display Language; (English or Spanish). Below are display screen examples/instructions.

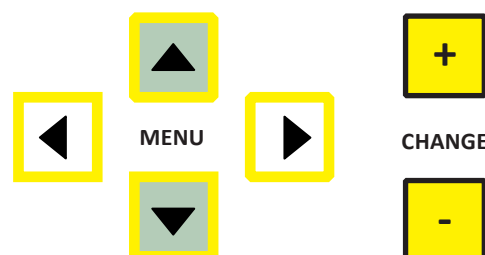
Global Parameters



The Global parameter preferences cannot be changed once you start installing devices (fans, inlets, etc.) To change the preferences, uninstall all of the devices to reset the controller for Global Parameter selections listed below or follow the steps on page 143 to reset your controller to a “New - Factory Fresh State” which will remove the devices, alarms and history. The exception to this rule is the “Display Language” submenu. You can change language preference anytime.

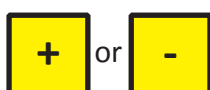


Press the **DOWN** or **UP** arrow key to navigate to menu items within a menu group. Press **PLUS** or **MINUS** key to change selection then to confirm selection by pressing **ENTER** and go to the next screen.



Hogs or Birds

Select whether the controller will be used in a hog or bird application by pressing the **PLUS** or **MINUS** key.



GLOBAL PARAMETERS SETUP
Animal Type: Birds

Length / Weight / Measurement

Select the preferred unit of measurement.



GLOBAL PARAMETERS SETUP
Units of Measure: Inch/Pound/Gallon

Temperature Measurement

Select the preferred temperature measurement.



GLOBAL PARAMETERS SETUP
Temperature Measure: Fahrenheit

Language Selection

Select the English or Spanish language.



GLOBAL PARAMETERS SETUP
Display Language: English

A Copyright screen, shown below, will flash quickly after the GLOBAL PARAMETERS SETUP screens have been setup.

COPYRIGHT (C) 1995 – 2010
Valco Companies, inc ALL Rights Reserved



Critical User Information



If this is your first time setting up the Ventra Pro™ control, you should review the information on the following pages, 51-86, before you start the setup of the devices and parameters so that you will have a clear understanding on the function of the controller and it's menus. This knowledge will help you with establishing the settings; Go to "Setting up the Control Software" section

Daily Usage



You should review a few parameters on a daily basis.

- **Alarms** - Check the controller display to make sure there are no active alarms. If there are active alarms, you must clear them (press the **ENTER** key) to turn off the alarm relay. Go to the Alarm History menu to find information on alarms and errors. As the animals grow, adjust the water usage and feeder run time ON/OFF alarm settings as necessary.
- **Current Environmental Conditions** - Observe that the animals appear comfortable. Check the temperature and humidity. You should also check these in the History menu to see what the conditions were during the previous night/day.
- **Setpoint** - Verify the temperature setpoint (Temperature Control Setting menu) is correct. If you are not using the temperature setpoint ramping feature, adjust the setpoint manually as the animals grow and their temperature requirements change.
- **Equipment Status** - Check the water use and feeder run times. You should also check the status of other equipment.
- **Backup Thermostats** - Adjust and test backup thermostats regularly to match changes in the setpoint temperature. Improperly adjusted thermostats may start devices when you don't want them to or they will not provide effective backup when needed.



If an active alarm condition is detected and no keys have been pressed for 60 seconds or more, the Alarm History menu is automatically displayed.

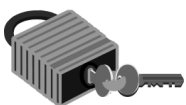
Survival Mode

In the rare event that all temperature sensors in a zone fail, or an entire input/output board fails, the controller follows a set of operating rules and activates attached alarm devices.



- The last valid temperature reading continues to be used.
- Curtains and inlets stay in their current position.
- If the current ventilation mode is Entering Tunnel, the controller will continue into Tunnel mode.
- Purge cycles will continue.
- Furnaces and Heaters are turned off.
- Brooders continue to run based on the last valid temperature reading.
- Other devices run based on timed settings and/or last valid temperature.

Software & Security



Opening Screen

The opening screen displays the controller's date, time, and software revision number. If the controller goes without power for a week or longer, or if you recently changed the controller's memory card, verify the time and date. The time and date are set under the System and Control Device Set-Up menu.



CONTROLLER (Date) (Time) Software Revision Number: BEV1.00.0024
--

Revision – Date/Time

This screen displays the software's revision date and time.



CONTROLLER	1/20/2010	2:19:34	Z1-S02
Revision Date/Time:	(Date)	(Time)	

Control Center Serial Number

This is a unique identifier which the user will enter in order to use Link, allowing to access the controller from a remote PC. It is recommended that you change this number and record the new number for future reference. *The procedure is the same as Entering a Password.*



CONTROLLER	1/20/2010	2:19:34	Z1-S02
Control Center Serial Number:	99999999		

Entering the Password

Ventra Pro™ controllers are shipped without a password, so there are few restrictions on what can be viewed or edited. You can use the EDIT PASSWORD menu (described later) to create a password.



CONTROLLER	1/20/2010	2:19:34	Z1-S02
Enter Password: 0000	Security Level:		

1. Press **ENTER**.



2. Press the **PLUS** or **MINUS** key to change the first digit to match your password.



3. Press the **RIGHT** arrow key to move to the next digit.



4. Repeat steps 2 and 3 until the password is correct.

5. When the cursor is under the last digit, press **ENTER** and your security level will appear. Wait for a few seconds for the controller to accept the password.

Security remains at the level entered for one hour after the last key is pressed. To reset the security level to 0 after you are finished, enter a password of 0000 and press **ENTER**.



Editing the Password

Up to 10 different passwords can be set up. Password codes and security levels may be changed or deleted at any time.



CONTROLLER	1/20/2010	2:19:34	Z1-S02
Edit Password: #0000 Security Level: 0			



You must have level 5 or higher security access to edit passwords.

1. At the Edit Password menu, choose the password you want to edit using the **PLUS** or **MINUS** keys.
2. Press **ENTER**.
3. Change the password digits using the **PLUS** or **MINUS** keys. Press the **RIGHT** arrow key to move to the next digit.



To DELETE a password, change it to 0000. Be sure there is a level 5 or higher password left, or no password, or you will be locked out of the controller.

4. Repeat step 3 until the password is correct.
5. When the cursor is under the last digit, press **ENTER** to confirm the password.
6. Use the **PLUS** and **MINUS** keys to select a security level for this password.
7. Press **ENTER** to confirm the password and security level.

Security Levels

- | | |
|-------|---|
| 0 | This is the most secure level. Level 0 users cannot change parameters or settings. |
| 1 | User can change the Animal Information. |
| 2 | User can change the Setpoint Temperature and the Ramping Offset (if the zone is ramping) and Time and Date. |
| 3 | User can change the feeder timers and light timers. |
| 4 | User can change all parameters except for adding, deleting and changing control devices and passwords. |
| 5 – 7 | User is allowed to make any changes. Level 5 is required to view Error Detail menus. |
| 9 | Service code for technician or a user single-day code available from manufacturer. |

Compile Options

This menu item provides a quick look at the controller's configuration. It is useful for troubleshooting over the phone with a service technician. It is not important to know what the code shown after Compile Options signifies.



CONTROLLER	1/20/2010	2:19:34	Z1-S02
Compile Options: EBCYNNYNBF			

This menu item will only appear for users with a password security level of 5 or when no passwords and security levels have been set up.

Current Environmental Conditions Menu



Average Actual Temperature

This is an average of all indoor air sensors. If the controller detects erroneous sensor readings it does not use them to calculate the average temperature. Sensor readings outside the temperature range of 30 degrees to 130 degrees Fahrenheit or -1.1 to 54.4 degrees Celsius are ignored.



CURRENT ENVIRONMENT CONDITIONS				Z1-S02
Avg Actual Temperature: 74.0				

Average Actual - Effective Temp

This reading is based on the actual/effective mix set in the Temperature Control Settings menu. Effective temperature takes into account the effect that air speed has on how comfortable an animal feels. If there is no air sensor, "Avg Actual - * Effective Temp: N/A" is displayed. (requires an air temp/speed sensor such as Air Sensor Model 935).



CURRENT ENVIRONMENT CONDITIONS				Z1-S02
Avg Actual - * Effective Temp: 71.0				

If you use the Effective Environmental Temperature feature, you must:



- Enter Animal Age
- Enter Animal Weight
- Enter Projected Age
- Enter Projected Weight
- Use Air Speed/Temp Sensors
- Clean Sensors Week

Sensor Temperatures

The controller displays current temperatures for 1-12 indoor sensors (this may require up to (3) screens to display). Press the **DOWN** arrow key to view additional sensor temperatures. The sensor number shown on the screen is the first sensor in the listing (if the number is #1, the temperatures are for sensors one, two, three and four). A series of dashes indicates a sensor is not installed. N/A indicates a sensor with an invalid reading (the reading is too high, too low, or there is no reading).



CURRENT ENVIRONMENT CONDITIONS				Z1-S02
Sensor Temps: #1	*68.5	74.2	71.2	----



Also, if there is an "*" in front of the sensor reading, there is a problem with the reading and the sensor is not being used to control devices or to calculate the avg. temperature. If the sensor is not being used (has a * next to it), there should be an active alarm associated with it.

Outside Temperature

This is the reading from the outside temperature sensor. Outside temperatures from - 60 degrees to 130 degrees Fahrenheit or - 51.1 degrees to 54.4 degrees Celsius are considered valid.



CURRENT ENVIRONMENT CONDITIONS				Z1-S02
Outside Temp: 70.0				



Current Environmental Conditions Menu- continued

Air Speed

Because air speed is measured using a resistive thermal sensor, high accuracy should not be expected. The objective is to determine the overall effect air speed has on the animal's comfort level. The air speed shown is averaged over several minutes. Multiple readings are listed the same as the sensor temperatures. OFF indicates the air speed capability for a sensor has been turned off (refer to the Air Sensor Settings section later in this document) and a series of dashes indicates the sensor is not installed. N/A is displayed for any sensor with an invalid reading. This menu item requires an air temp/speed sensor such as Air Sensor Model 935 and an EET-capable controller.



CURRENT ENVIRONMENT CONDITIONS

Z1-S02

Avg Air MPH: #1 1.5 1.9 OFF ----



6.9 MPH is the fastest air speed reported.

Relative Humidity

This menu item is displayed only if there is at least one relative humidity sensor installed. A total of 3 humidity sensors per zone can be installed. The average reading of the installed sensors will be used during the operation of the controller. Humidity can be difficult to accurately measure, especially in a confinement building environment where the air is generally contaminated. Factory fresh sensors are typically accurate to plus or minus 5 percent. Long-term accuracy depends greatly on the level of impurities in the air.



CURRENT ENVIRONMENT CONDITIONS

Z1-S02

Relative Humidity: 45 46 44 avg: 45%

Static Pressure

This menu item is displayed only if there is a static pressure sensor installed. The Ramping OFF status indicates the temperature is beyond the low or high end of the ramp table or that you have not set a ramp table. ON indicates the static pressure setpoint is adjusted based on the ramp table. Refer to the Temperature Control Settings section for static pressure ramping information.



CURRENT ENVIRONMENT CONDITIONS

Z1-S02

Static Press: 0.040" water (Ramping OFF)

Current Environmental Conditions - continued on next page

Current Environmental Conditions Menu - continued

Ventilation Mode

Devices operate differently in different modes, so knowing the ventilation mode helps you understand what the controller is doing. Seven possible modes can be displayed:

- **Natural Temp** – The building is currently using devices designated as natural (natural, power, or minimum ventilation). All tunnel-only and purge-only devices should be off or closed.
- **Entering Purge** – The building is transitioning into purge mode. Non-purge curtains, inlets and fans are closing or turning off. Purge curtains and inlets are opening to the specified purge opening size.
- **Purging** – All non-purge devices are off or closed and purge devices are running or open to the specified purge opening size. The building remains in this mode for the duration specified under the Building Purge Setting menu.
- **Exiting Purge** – The building is transitioning out of purge mode. All devices designated as purge are closing or turned off.
- **Entering Tunnel** – The building is transitioning into tunnel mode. Non-tunnel inlets, curtains and fans are closing or turning off.
- **Tunnel** – The building is in tunnel cooling mode. All devices designated as natural only are off or closed. Only devices designated as tunnel are enabled.
- **Exiting Tunnel** – The building is transitioning from tunnel mode back to natural. All devices designated as tunnel are closing or turning off and natural devices are enabled.



CURRENT ENVIRONMENT CONDITIONS
Ventilation Mode: Tunnel

Z1-S02

Animal Stress Index



The Animal Stress Index provides an indication of your animals' comfort level. It takes into account the combined effects of air temperature, air speed, floor type, animal weight and animal age. The four responses are:

- Not Stressed
- Alert
- Danger
- Emergency



CURRENT ENVIRONMENT CONDITIONS
Animal Stress Index: Not Stressed

Z1-S02



If "Today's Age", "Today's Weight", "Finish Age" and "Finish Weight" is set to zero's, the stress index will not be displayed. *This is only available for hogs.*



Control Equipment Status Menu (Hot-Key)



Use **RIGHT** arrow key to scroll to this menu.

The Control Equipment Status menu shows the status of the ventilation equipment in the building. The screens are automatically updated as the status changes. Use the **UP** and **DOWN** arrow keys to scroll through the available menu items in this category. Use the **PLUS** and **MINUS** keys to scroll through the device group numbers within each menu item (device type).



Menu items for devices and equipment not installed are not shown.

Any device that has an ON/OFF status menu, may also have (SW ON) or (SW OFF) on the menu when the output channel's toggle switch is in a position that contradicts the expected on/off status.

Brooders / Furnaces / Heaters

The current ON/OFF status of an individual furnace group is shown (brooder and heater are similar).



CONTROL EQUIPMENT STATUS
Furnace Group #1: OFF

Z1-S02

Fans

Fixed speed fan groups can only be OFF or ON. Variable speed fan groups can be OFF or ON at power settings that range from 1 (minimum) to 60 (full on).



Variable speed fans require a controller model with variable speed channels or the ability to communicate with a variable speed expansion station.



CONTROL EQUIPMENT STATUS
Sidewall Fan Group #1: OFF

Z1-S02



CONTROL EQUIPMENT STATUS
Tunnel Fan Group #2: OFF

Z1-S02



CONTROL EQUIPMENT STATUS
Vari-Side Fan Group #3: OFF

Z1-S02



CONTROL EQUIPMENT STATUS
Vari-Side Fan Group #1: ON at 22 of 60

Z1-S02

In House Fog, Cool Pads and Misters

In house fog, cool pad and mister operation is controlled using temperature and one of four variable duty cycle timers. The example below shows house fog Group number two (#2) is currently controlled by Duty Cycle timer four (4).






CONTROL EQUIPMENT STATUS
In House Fog Group #2, Duty Cycle 4: ON

Z1-S02

Control Equipment Status Menus (Hot-Key) - continued



Curtains, Ridge Vents and Inlets

Device motor run times (or position sensors if installed) are used to calculate the current opening size of curtains and inlets.


	CONTROL EQUIPMENT STATUS Z1-S02 Side Curtain #1 Open: 17"
	CONTROL EQUIPMENT STATUS Z1-S02 Sidewall Inlet #2 Open: 2"
	CONTROL EQUIPMENT STATUS Z1-S02 Tunnel Inlet #2 Open: 0"

Equipment Timers

The ON/OFF status menu items for the various timers used to control lights and feeders is shown below.

	CONTROL EQUIPMENT STATUS Z1-S02 Lights Group #1: OFF
	CONTROL EQUIPMENT STATUS Z1-S02 Feeder Group #1: ON

The 24-hour feeder run times are in **hrs:min** format. The times are taken from the three most recent 24-hour periods in the historical data (excluding the current hour). The most recent 24-hour total is displayed as the left-most data. *The screen will display "Searching History Record for Data" for a few seconds while retrieving the information.*


	CONTROL EQUIPMENT STATUS Z1-S02 24Hr. Feeder#1 Run: 12:30, 9:00, 11:22
--	--



Feeder run times are determined by monitoring feed sensors. If there are no installed feeders (output channels) then the controller monitors the feed sensors all the time. If there is a feeder installed, the controller only monitors the corresponding feed sensor when the feeder channel is ON. Feed Sensor #1 is related to Feeder #1. Be sure each feeder sensor has the same group number of any feeders it monitors.

Press the **PLUS** or **MINUS** keys to change the feeder group number.

Run time is totaled for each feeder (days, hours, minutes and seconds). If more than one feeder sensor installed, press the **PLUS** and **MINUS** keys to scroll through the feeder group numbers. Press **ENTER** while viewing the total to reset it to zero. Press the **LEFT** arrow key to confirm the reset action.

	CONTROL EQUIPMENT STATUS Z1-S02 Feeder #9 Total Run Time: 10 10:46:50
--	---



All Current Equipment Status screens require the pressing of the **PLUS** or **MINUS** keys to change the group number, if more than one of the device type is installed. *Example: two sidewall fans require a press of the **PLUS** key to see sidewall fan #2, when viewing sidewall #1.*



Control Equipment Status Menu (Hot-Key) - continued

Digital Alarm Group

This menu item displays the current status of the digital alarm sensors. On indicates that the device is currently open. How you have the digital alarm set up will determine if an alarm is activated when the device is open (On) or closed (Off). Press the **PLUS** or **MINUS** keys to change sensor numbers if you have more than one installed.



CONTROL EQUIPMENT STATUS
Digital Alarm Group #1: OFF

Z1-S02

Whisker Switch Group

This menu item displays the current status of the whisker switch sensors. OFF indicates that the sensor circuit is open and the inlet/curtain is closing. ON indicates a closed circuit and the inlet/curtain is opening. Press the **PLUS** or **MINUS** keys to change sensor numbers if you have more than one installed.



CONTROL EQUIPMENT STATUS
Whisker Switch Group #1: OFF

Z1-S02

Water Use

The amount of water used in the three most recent 24-hour periods for Water Meter #1 (excluding the current hour) is shown in the menu below. Press the **PLUS** or **MINUS** keys to change the water meter group number.



CONTROL EQUIPMENT STATUS
24Hr. Water#1 Used: 5000, 3125, 3094

Z1-S02

The Total Gallons Used for each water meter is displayed. If more than one water meter sensor is installed, press the **PLUS** or **MINUS** keys to scroll through the water meter group numbers. Press **ENTER** while viewing the total to reset it to zero. Press the **LEFT** arrow key to confirm the reset action.



CONTROL EQUIPMENT STATUS
Water #1 Total Gallons Used: 123456

Z1-S02

Current Animal (Hog/Bird) Information Menus (Hot Key)



Weight Gain Progress

The controller tracks animal age and weight. However, you must input the initial age and weight at the start of a production cycle. Each day at midnight, the age is incremented by one and a new weight is calculated. You must input the projected finishing age and weight for this calculation to work properly. The temperature ramping feature uses the animal age value. Some stress index calculations (if the controller supports stress index) use the age and weight values.



CURRENT (HOG/BIRD) INFORMATION
Today's Age: 35 Days Weight 2.0

Z1-S02






CURRENT (HOG/BIRD) INFORMATION
Finish Age: 90 Days Weight 6.0

Z1-S02

Current Animal (Hog/Bird) Information Menu - continued

Head Count Information

The head count numbers are for your record keeping.

	CURRENT (HOG/BIRD) INFORMATION Beginning Head Count: 10000	Z1-S02
	CURRENT (HOG/BIRD) INFORMATION Total Mortality Head Count: 10	Z1-S02
	CURRENT (HOG/BIRD) INFORMATION Total Sold Head Count: 0	Z1-S02



- **Warning: Setting the Beginning Head Count to 0 or the Temp control to Off, in affect, shuts down the controller.**
- **It also disables most alarms.**







Changing Current Animal Information - To change any of the Head Count information, you enter the increase or decrease in the count and the controller will update the actual count. Only the hourly change in the Mortality Head count is saved in the history record for each hour. *(The number to be increased or decreased will flash.)*

			CURRENT (HOG/BIRD) INFORMATION Beginning Head Count: 00000	+10 =	Z1-S02 10010
--	---	---	---	-------	-----------------



Reminder:

- Press the **ENTER** key once you have reached the correct number to accept it.
- If you need to change the number (increase or decrease) for any reason, at any time, you simply use the **PLUS** or **MINUS** key to make the change.

			CURRENT (HOG/BIRD) INFORMATION Total Mortality Head Count: 10	+2=	Z1-S02 12
			CURRENT (HOG/BIRD) INFORMATION Total Sold Head Count: 450	+5=	Z1-S02 445



History Menu (Hot Key)



The controller tracks operating conditions and equipment status. This information is totaled or averaged for each one-hour period and then saved to memory and can be retrieved. Press the **UP** or **DOWN** arrow keys to scroll through the stored item list for a given hour. *Scroll to the date you want first, and then scroll to the submenu item, or you can scroll to the submenu item first, and then scroll to the date.* The “Searching History Record for Data” message will display each time the four keys are pressed. This message may appear for a split second or for many seconds (10, 20, or more) depending on what screen and/or date/time is being changed.



*Each zone has its own history record. The user has to press the **ZONE** key to view the history of a different zone. When the **ZONE** key is pressed, the "Z1" in the "Z1-S02" right upper corner of the display will change to show which zone is being viewed. The zone numbers will scroll in order as you press the **ZONE** key.*

Scroll to History by Date

- Press the **HISTORY** Hot-Key to open the “HISTORY FOR” screen.
- Then press and hold the **PLUS** or **MINUS** keys to scroll to the desired date.
- The date as shown (in red) below will change as you are clocking up or down with the **UP** or **MINUS** key.



HISTORY FOR	11/20/2010 (Date)	AT 13:00	(Clock)	Z1-S02
Temperature Control: *-----				

Scroll Submenus within a Date

- Press **HISTORY** Hot-Key to open the “HISTORY FOR” screen.
- Press the **UP** or **DOWN** arrow keys to move forward or backward through the history data.
- Then press and hold the **PLUS** or **MINUS** keys to scroll to the desired date.
- *Note that the dates and times are all the same below and only the submenu has changed.*



HISTORY FOR	11/20/2010 (Date)	AT 13:00	(Clock)	Z1-S02
Temperature Control: *-----				



HISTORY FOR	11/20/2010	AT 13:00		Z1-S02
High / Low Temps (actual):		65.4 / 64.7		



HISTORY FOR	11/20/2010	AT 13:00		Z1-S02
Set Point Temperature:		70.0		



History storage capacity is influenced by the number of devices that are installed. This history record fills quicker when more devices are being read. When the memory storage is almost full, the history and alarm records are deleted by oldest dates to make room for the new history. The SD card can hold many years of history records, but the Ventra Pro™ will only display the history records for the current year and the previous year (12 to 24 months, depending on the time of year).









The optional Link Software package is a great way to download history data from the controller and display it on a PC in table or chart format.



History Menu (Hot Key) - continued







Historical Environmental Conditions Stored

These menu items display the measured environmental conditions including temperature, air speed and humidity. The setpoint temperature is recorded once per hour. The average temperature calculation uses actual, effective, or a percentage of effective temperature depending on the Temperature Control Mode. With the Temperature Control Mode set to OFF, actual temperature is used. The number of purges initiated during each hour is also recorded.

		HISTORY FOR 11/20/2010 AT 13:00 Z1-S02 Temperature Control: ----*----
		HISTORY FOR 11/20/2010 AT 13:00 Z1-S02 House Control Mode: Growout 2
		HISTORY FOR 11/20/2010 AT 13:00 Z1-S02 Setpoint Temperature: 71.0
		HISTORY FOR 11/20/2010 AT 13:00 Z1-S02 Zone Avg Temperature: 70.8
		HISTORY FOR 11/20/2010 AT 13:00 Z1-S02 High/Low Temps (actual): 72.6/ 67.3
		HISTORY FOR 11/20/2010 AT 13:00 Z1-S02 Searching History Record for Data Flashes 10+ sec. when displaying new day

Daily High and Low Temperatures

The daily high and low temperature (for a 24-hour period - full day) is displayed with the hour of the day that each temperature was recorded. The high and low temperatures displayed are shown for the date shown in the top line of the display. To change to a different day, press the **PLUS** or **MINUS** key until the date desired is displayed on the top line.

	HISTORY FOR 11/20/2010 AT 13:00 Z1-S02 Low 64.7 @ 09:00 High 67.8 @ 06:00
	HISTORY FOR 11/20/2010 AT 13:00 Z1-S02 Avg Air Speed (MPH): 2.1
	HISTORY FOR 11/20/2010 Z1-S02 Avg Outside Temp: 67.2
	HISTORY FOR 11/20/2010 AT 13:00 Z1-S02 Purge Cycles Humidity: 46%
	HISTORY FOR 11/20/2010 AT 13:00 Z1-S02 Sidewall Inlet #1 Avg Open: 0"
	HISTORY FOR 11/20/2010 AT 13:00 Z1-S02 System Restart Incidents: 0



History Menu (Hot Key) - continued

Static Pressure

When a static pressure sensor is installed, static pressure information is stored. Refer to the Static Pressure Setting section, page 76, for more information.



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
Static Pressure Setpoint: 0.050				



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
High/Low Static Pressure: 0.060/ 0.040				

Purge Cycles

The controller records the number of purge cycles each hour.



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
Purge Cycles (Humidity/Timed) 0/ 2				

Mortality Change

The controller records the mortality change each hour. Say you add 5 dead and then subtract 2 the hourly total will display 3.



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
Mortality changed this hour by: +3				

Stress Index

The animal stress index provides an indication of your animals' comfort level. It takes into account the combined effects of air temperature, air speed, floor type, animal age and animal weight. These menu items are displayed only when there is information to report (stress minutes is greater than zero).



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
Minutes at "ALERT" Stress Index: 23				



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
Minutes at "DANGER" Stress Index: 17				



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
Minutes at "EMERGENCY" Stress Index: 8				

On Times

The controller saves historical information for all devices except lights. The listed times are in minutes and seconds for a given hour.



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
Sidewall Fan Grp #1 ON Time: 30:00				

Your controller has the ability to record actual on time as well as the time a device should have been on. The time listed next to C is the time a device should have operated according to the controller's settings. The time listed next to A is the actual time a device operated. If the C and A times are different, the channel switch was probably not on Auto during the time period.



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
Sidewall Fan #1 C-30:00 A-30:00				

History Menu (Hot Key) - continued

Opening Sizes

The controller saves historical opening size information for curtains, inlets, ridge vents and chimney dampers. The number of inches open is a running average for the hour.



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
Sidewall Inlet #1 Avg Open: 11"				

The time listed next to O is the time spent opening and the time listed next to C is the time spent closing. These are actual times rather than the times expected according to the controller's settings.



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
Sidewall Inlet #1		Actual O-21:00 C-21:00		

Water Use

The amount of water consumed is often used as an indicator of animal health.



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
Water Meter #1 Gallons Used: 120				

System Restart

Every time the controller performs a power-up restart, the System Restart incident counter for that hour is incremented by one. A restart may occur as a result of a power loss, system reset, or watchdog reset. This is a troubleshooting aid.



HISTORY FOR	11/20/2010	AT	13:00	Z1-S02
System Restart Incidents: 1				



Temperature Control Settings Menu



The controller makes many decisions based on temperature. The Temperature Control Settings menu allows you to input preferences for temperature-related decisions. Be sure to complete these menu items before setting up specific devices (fans, heaters, etc.). The information entered here, especially temperature setpoint, impacts most installed devices.

Temperature Setpoint

This is your target building temperature. The controller calculates the on and off temperatures for devices based on the current temperature setpoint. **Changing the Setpoint will cause the following values to change: Temperature Control Settings, Purge and Minimum Vent Settings, Sound Alarm When settings, Fixed Fans – Stir, Sidewall, Tunnel, Ridge, Pit, Variable Fans - Stir, Side, Tunnel, Ridge, Pit, Heater Settings – Brooder, Furnace, Heater, Mister Settings – In House Fogger, Cool Pad Low/High, Mister, Curtain Inlets, Ridge Vent.**

Set the Temp Setpoint manually or have the temperature ramping feature automatically adjust it every day at midnight. If the animal age is within the age settings in the temperature setpoint ramp table (explained later), ramping is ON. When ramping is ON, the setpoint may NOT be manually adjusted. Temperature settings for control devices (fans, heaters, etc.) automatically track along with temperature setpoint changes.



TEMPERATURE CONTROL SETTING

Z1-S02

Temp Setpoint: 71.0

(Ramping ON)



You should determine what your temperature setpoint will be before inputting or editing individual temperature settings for control devices.

Controlling Building Temperature: Actual or Effective

Actual or effective temperature, or a blend of the two, can be used to control the building environment. This is called the working temperature. The controller uses the **working** temperature to determine when to turn devices on and off. The Temp Control can also be set to OFF. **See NOTE below on what happens when “Temp Control” is set to OFF. Effective** takes into account the effect that air speed has on how comfortable the animal feels. **Actual** uses the actual air temperature only.

Model 935

When setting the temperature control, use the **PLUS** or **MINUS** keys to move the asterisk (*) right or left, or to select the OFF mode (the asterisk is replaced by the word OFF). Moving the asterisk to the right increases the amount of effective temperature used to calculate the working temperature. If you are not using an air speed/temp sensor such as Air Sensor Model 935, move the asterisk fully toward Actual.



TEMPERATURE CONTROL SETTING

Z1-S02

Temp Control: Actual *----- Eff.



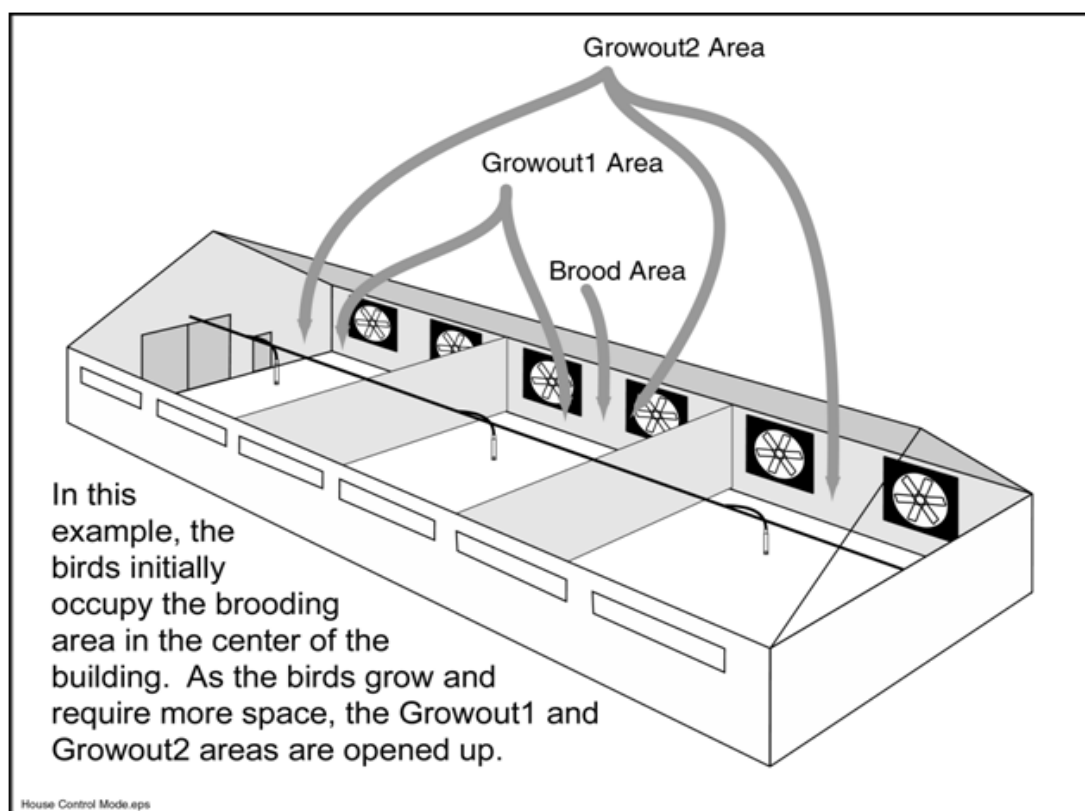
The OFF mode causes the controller to turn off all temperature controlled output devices and disable the normal alarms. Changing Temp Control to OFF also sets the Beginning Head Count (Current Animal Information menu) to zero in addition; turns off all output channels, so no fans inlets, etc. will work. The controller still continues to read inputs and store history. This mode is designed to conserve energy costs when the building is empty.

Temperature Control Settings Menu - continued

House Control Mode



This determines which sensors are used for calculating the working temperature. The working temperature is used to determine when devices should be turned on or off. Most producers designate a section of their building for Brood. All of the air sensors in that area of the building are then Brood sensors. Refer to the Air Sensor Settings section for information about specifying the location of an air sensor. The rest of the building can be one or two more sections; Growout 1 and Growout 2.



- When the House Control Mode is Brood, only sensors in the Brood area are used by the controller.
- When you move from Brood to Growout 1, or from Growout 1 to Growout 2, **remember to change the House Control Mode menu item** (see the Temperature Control Settings menu).



TEMPERATURE CONTROL SETTING
House Control Mode: Brood

Brood

Z1-S02

Press **PLUS** or **MINUS** key to change Brood to Growout 1 or Growout 2.



TEMPERATURE CONTROL SETTING
House Control Mode: Growout 1

Growout 1

Z1-S02



TEMPERATURE CONTROL SETTING
House Control Mode: Growout 1

Growout 2

Z1-S02



Temperature Control Settings Menu - continued

Interlocking

You can interlock devices together so that the operation of one device affects the operation of another device. These menu items only appear when the related devices are installed.

To enable interlocking, set Ridge to Curtains and/or Heater to Curtains to **INTERLOCK**.



TEMPERATURE CONTROL SETTING
Ridge to Curtains: NO INTERLOCK

Z1-S02



TEMPERATURE CONTROL SETTING
Heater to Curtains: NO INTERLOCK

Z1-S02

When interlocking is enabled, a menu is added to the Ridge and Heater/Brooder/Furnace menus that allow you to specify the curtain groups to interlock with the device.

Interlocking ridge vents to curtains can enhance air quality in the building while maintaining good temperature control. When ridge vents are interlocked, their open or close settings are ignored. All ridge vents open the same number of inches as the interlocked curtain having the largest opening size. For example, the maximum curtain opening size is 48 inches and the maximum ridge opening size is 10 inches. As the curtains open the ridge will also open, tracking the curtain in that zone that is open the most. As soon as any curtain in the group is 10 inches open, all ridges in that zone will be fully open (this example assumes that ALL curtain groups are interlocked).

When interlocking is enabled for a heater (or furnace or brooder), and the controller detects that the heater's ON temperature has been reached, the heater will not turn on if the interlocked curtains are open more than about one inch or centimeter. Set the Heater to Curtain interlock to Zone Interlock to use curtains/ridge vents in the current zone only or to All Zone Interlock to keep the heater from turning on if any curtain in any zone is open. The word "Curtains" in the Interlock menu items also includes ridge vents. Only the word Curtain appears due to the limited display size.

Refer to the **Ridge Vent Settings** and the **Furnace, Heater and Brooder Settings** sections for more information.

Temperature Control Settings Menu - continued

Tunnel Settings

You can set up the temperatures for entering and exiting tunnel mode. Tunnel mode takes over when the working temperature reaches the tunnel entry temperature. For example, you may be running sidewall fans to keep the building temperature below 80 degrees. But on a hot day, this might not be enough to keep the temperature below 80 degrees, so tunnel mode begins at 83 degrees to create a wind chill effect for the animals.

The controller follows these steps when tunnel mode starts:

- Cool fans stop. Only the fans designated for tunnel mode run.
- Purge and minimum ventilation times are overridden and cease to function until the building returns to natural mode.
- Natural inlets and curtains close completely. Tunnel inlets and curtains then open.
- If you stage the tunnel fans on at different temperatures (set each fan's ON Temp setting), inlets will open wider proportionally to the number of fan groups running.

The following menu items appear only when a tunnel fan is installed.



TEMPERATURE CONTROL SETTING
ENTER Tunnel Temperature: 83.0

Z1-S02



EXIT Tunnel Temperature: 80.0

Input the minimum time the building must remain in tunnel mode. This prevents the ventilation system from going out of tunnel mode too quickly. However, the controller overrides the minimum time if the working temperature drops to the setpoint. Don't set the minimum time too long since it is possible the temperature could fall to the EXIT Tunnel Temperature and turn off the fans before the minimum time expires leaving you with no ventilation.

TEMPERATURE CONTROL SETTING
Remain in Tunnel Time: 0:05:00

Z1-S02

You can prevent the controller from entering Tunnel mode if the outside temperature is too low. Set the Enable Tunnel Entry, Outside Temp value to the temperature where the outside temperature has to be above to allow tunnel mode. An Outside Temperature Sensor has to be installed for this menu to appear.

TEMPERATURE CONTROL SETTING
Enable Tunnel Entry, Outside Temp: 55

Z1-S02



Refer to Appendix 1, page 144 for information on staging tunnel groups.



Temperature Control Settings Menu- continued

Temperature Ramping

You can automatically adjust the building temperature to the animals' needs by creating a ramp table with appropriate temperature values and ages. The animal age used here is the same animal age used within the Current Animal Information menu.



TEMPERATURE CONTROL SETTING
Today's Age: 5 Days

Z1-S02



TEMPERATURE CONTROL SETTING
Ramp Point #1 Age: 10 Temp 80.0

Z1-S02

A ramp point is an age at which you want the building (or zone) to be at a specific temperature. Set a series of ramp points, up to 12, to adjust temperature over a growing cycle. Press the **PLUS** or **MINUS** keys when the Ramp Point menu is displayed to change the ramp point number.

Each day at midnight, the controller scans the ramp table and a new temperature setpoint is determined and substituted for yesterday's setpoint. The controller selects the setpoint temperature based on the ramp point ages and temperatures. For in-between ages and temperatures, the controller calculates an appropriate setpoint temperature (see graph below). This allows subtle temperature changes from day to day.

If you enter a Temperature Ramp Offset, it is added (or subtracted) from the temperature determined by the ramp table. This allows you to temporarily adjust a ramp table without re-entering all the values.



TEMPERATURE CONTROL SETTING
Temperature Ramp Offset: +1.0

Z1-S02

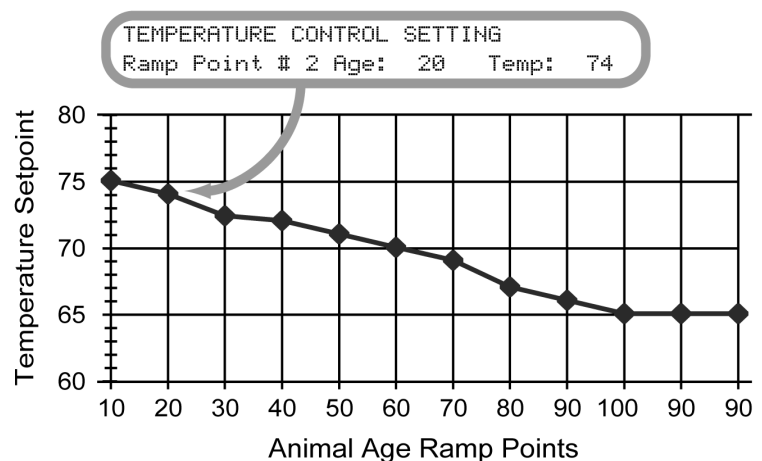


*You can also adjust all ramp point temperature values by editing the Temperature Ramp Offset value, and then holding the **ENTER** key for several seconds. After the values have been updated, the Temperature Ramp Offset value will be 0. You must manually readjust temperatures to return the ramp table to the previous values.*

The graph illustrates how up to 12 ramp points might be configured.

Notice in the graph how the temperature ramps smoothly between ramp point ages. Also note how the temperature stays constant at 65 degrees beyond the age of 100. The reason is the age for Ramp Point 11 is a descending value (100 days down to 90 days) which disables further ramping.

Temperature Ramping Example



Temperature Control Settings Menu- continued

Floor Type

The floor type of the building



(or zone) contributes to the calculated effective temperature. It should be set to **CONCRETE** for all concrete slab surfaces and **OTHER** for all other floor types.



TEMPERATURE CONTROL SETTING
Floor Type: CONCRETE

Z1-S02

Curtain Temperature Inhibit

Set an outside temperature at which all natural curtains in the building (or zone for multi-zone controllers) are not allowed to open. This menu only appears if at least one fan capable of providing minimum ventilation and an outside temperature sensor are installed. The curtain inhibit does not affect purge cycles, static pressure controlled curtains, or tunnel mode curtains. When the temperature rises to at least one degree higher than this setting, normal operation resumes. Enter -60 to have the controller ignore this setting.



TEMPERATURE CONTROL SETTING
Close Curtains Below Outside Temp: -10.0

Z1-S02



This setting does not change when the setpoint temperature changes.



Minimum Venting and Purging

Introduction:

Purging is the process of evacuating stale contaminated air and replacing it with fresh outside air. Any combination of fans and inlets can be set up to purge.

Minimum ventilation is the process of bringing outside air into a building even when the indoor temperature and humidity do not require it. This helps keep ammonia, dust and carbon dioxide from accumulating. When outside temperatures are cold, minimum ventilation may be necessary even though you are also heating the building. You will see one of two menus depending on how the building is set up:

- Building Purge Setting menu - If no fans, or only stir fans are installed, the controller assumes you are running a simple **natural-ventilated building** and displays the Building Purge Setting menu.
- Minimum Ventilation and Purge Settings menu - If fans (other than stir fans) are installed, then the controller assumes you are running a **power-ventilated building** and displays the Minimum Ventilation and Purge Settings menu.



The humidity-related menu items shown below appear only when at least one humidity sensor is installed. If more than one Humidity sensor is installed, the average reading of all sensors is used to determine if the purge should be performed.

Building Purge Setting Menu

Natural Ventilation

If you are running a natural-ventilated building, the Building Purge Setting menu is displayed.



Conditions for Purging

A purge cycle can be triggered by the Purge Delay timer or by the Humidity Delay timer. The purge cycle runs for the time specified by either the Purge Time ON or the Humidity Purge ON depending on which delay timer triggered the purge cycle. The two possible purge conditions are:

- All curtains and ridge vents have been fully closed for the duration specified by the Purge Delay timer. Air inlets are not considered to be curtains when checking for all curtain devices closed. Or,
- All curtains and ridge vents have been fully closed and the humidity level has been continuously at or above the Humidity Purge Setpoint for the duration specified by the Humidity Delay timer.

Normally the Humidity Delay timer would be set for less time than the Purge Delay timer so that under high humidity conditions a purge cycle would take place more frequently. The default Humidity Setpoint of 100% disables the humidity purge.



When a purge occurs in a natural-ventilated building, the curtains and inlets open to the Purge Opening Size that you entered for each device group.

Building Purge Setting Menu - continued

Purge Time On and Delay Time

The Purge Time ON determines how long the building will purge when triggered by the Purge Delay timer. The Purge Delay timer is the length of time the building must be continuously closed before starting a purge.



BUILDING PURGE SETTING

Purge Time ON: 0:10:00

Delay: 1:00:00

Z1-S01



The rule that having pit fans means a building is “*power ventilated*” may cause a problem for growers who use only pit fans and curtains. The Purge Time ON menu item is not available for power ventilated buildings. The solution is to install the Pit Fans as Stir Fans so that the Purge Time ON menu item is available.

Humidity Purge Setpoint

If the building is closed and the humidity rises above this setting for the length of the Humidity Delay timer, a purge is initiated. If the humidity sensor gives a bad reading, humidity purges will not occur, but timed purges will occur.



BUILDING PURGE SETTING

Humidity Purge Setpoint: 90%

Z1-S01

Humidity Purge On Time and Delay Time

The Humidity Purge ON time determines how long the building will purge when triggered by the Humidity Purge Setpoint and Humidity Delay timer. The Humidity Delay timer is the length of time the building must be continuously closed and humidity at or above the Humidity Purge Setpoint before starting a purge based on humidity.



BUILDING PURGE SETTING

Humidity Purge ON: 0:10:00

Delay 0: 50:00

Z1-S01

High and Low Temperature Inhibit

If the working temperature falls below the Purge Inhibit Temp LOW setting, purging is inhibited. If the temperature falls below the Purge Inhibit Temp LOW setting while a purge is in progress, the purge is stopped. If the temperature rises above the Purge Inhibit Temp HIGH setting, purging is inhibited. If the temperature rises above the Purge Inhibit Temp HIGH setting while a purge is in progress, the purge is stopped.



BUILDING PURGE SETTING

Purge Inhibit Temp LOW: 60.0 HIGH: 95.0

Z1-S01

Heat zone before purging

It is possible to heat the zone before purging. Heated air holds more moisture, causing more moisture to be removed during purging. You can heat the zone to a maximum of 5 degrees above the Temperature Setpoint. This value will change with the Temperature Setpoint.



BUILDING PURGE SETTING

Before purge raise Temperature to: 73.0

Z1-S01

Set the Abort time to prevent the heater from running constantly because the Heat Temperature can't be reached. If the Heat Temperature is not reached in this amount of time, the heating will be aborted and the purge will commence.



BUILDING PURGE SETTING

Time to Abort Heat before Purge: 2:00

Z1-S01



A Heater MUST be installed and Use during Heat Purge set to Yes before these two menus will appear.



Minimum Vent and Purge Settings Menu

Power Ventilation

If you are running a power-ventilated building, the Minimum Ventilation and Purge Settings menu is displayed.



Only a humidity purge is available in a power-ventilated building. When a purge occurs in a power-ventilated building, the curtains and inlets open to the Purge Opening Size for each device group. Fans that have Purge as a part of their operating mode are turned on.

Minimum Ventilation Timer

This is the ON and OFF times (minutes and seconds) used for fans designated as Temp or Minimum Vent when those fans are not running based on temperature. Minimum ventilation is important when a building purge is not triggered frequently enough to keep inside air fresh. Minimum ventilation runs inlets using their proportional settings or by static pressure control depending on how you've set up the inlet or curtain.



MINIMUM VENT AND PURGE SETTING
Minimum Vent Timer ON: 5:00 OFF: 5:00

Z1-S01

Minimum Vent Ramping

You can automatically adjust the Minimum Vent timers by creating a ramp table with appropriate On/Off times for different ages. The animal age used here is the same animal age used within the Current Animal Information menu.



MINIMUM VENT AND PURGE SETTING
Today's Age: 5 Days

Z1-S01



MINIMUM VENT AND PURGE SETTING
Min Vent #1 Age: 10 ON: 4:00 OFF: 6:00

Z1-S01

A ramp point is an age at where you want the building's (or zone's) minimum ventilation times to be. Set a series of ramp points, up to 9, to adjust the minimum vent times over a growing cycle. Press the **PLUS** or **MINUS** keys when the Ramp Point menu is displayed to change the ramp point number.



Each day at midnight, the controller scans the ramp table and new Minimum Vent On and Off times are determined and substituted for yesterday's times. The controller selects the On and Off times based on the ramp point settings. For in-between ages, the controller calculates appropriate times based on the ages and times between the nearest Ramp point ages. This allows subtle changes from day to day. A decrease in age from one Ramp point to the next will cause the ramping to stop at that age.

Humidity Purge Setpoint

If the humidity remains at or above this setting for the length of the Humidity Delay Timer, a purge is initiated.



MINIMUM VENT AND PURGE SETTING
Humidity Purge Setpoint: 90%

Z1-S01



If you do not have any fans designated as Purge fans, the Humidity Purge Setpoint menu item does not appear.

Minimum Vent and Purge Settings Menu - continued

Humidity Purge On Time and Delay Time

The Humidity Purge ON time determines how long the building will purge when triggered by the Humidity Purge Setpoint and Humidity Delay timer. The Humidity Delay timer is the length of time humidity must be at or above the Humidity Purge Setpoint before starting a purge based on humidity.

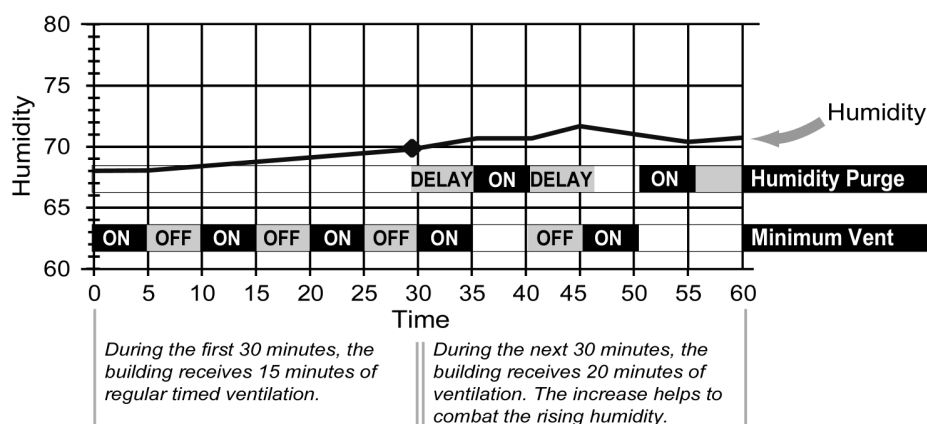


MINIMUM VENT AND PURGE SETTING
Humidity Purge ON: 0:10:00 Delay 1:00:00

Z1-S01

Humidity Purge and Minimum Ventilation

Minimum Vent Timer ON: 5:00 OFF: 5:00
Humidity Purge Setpoint: 70%
Humidity Purge On: 0:05:00 Delay: 0:06:00



Note: The minimum ventilation and the humidity purge will not occur simultaneously. When a purge cycle completes, the controller resets the minimum ventilation OFF timer so that it needs to cycle completely before a new purge can start.

Humidity Purge and Min Vent Chart.eps

Val-Co™ recommends setting the Humidity Purge Delay slightly longer than the minimum ventilation cycle. The Humidity Purge ON time should be similar to the Minimum Vent Timer ON. This approach increases the amount of ventilation the building receives as humidity increases.

If you do not have any fans designated as Purge fans, the menu item shown below is displayed.



MINIMUM VENT AND PURGE SETTING
Humidity Purge: NO Purge Fans Installed

Z1-S01



Minimum Vent and Purge Settings Menu - continued

High and Low Temperature Inhibit

If the working temperature falls below the Purge Inhibit Temp LOW setting, purging is inhibited (or stopped if a purge is in progress) If the temperature rises above the Purge Inhibit Temp HIGH setting, purging is inhibited (or stopped if a purge is in progress).



MINIMUM VENT AND PURGE SETTING
Purge Inhibit Temp LOW: 60.0 HIGH: 95.0

Z1-S01



The minimum ventilation and the humidity purge cannot occur simultaneously. When a purge cycle completes, the controller resets the minimum ventilation OFF timer so that it needs to cycle completely before a new purge can start.



We recommend you set your **HIGH Purge Inhibit Temp** at the point you begin turning on fans based on temperature.

Heat zone before purging

It is possible to heat the zone before purging. Heated air holds more moisture, causing more moisture to be removed during purging. You can heat the zone to a maximum of 5 degrees above the Temperature Setpoint. This value will change with the Temperature Setpoint.



MINIMUM VENT AND PURGE SETTING
Before purge raise Temperature to: 73.0

Z1-S01

Set the Abort time to prevent the heater from running constantly because the Heat Temperature can't be reached. If the Heat Temperature is not reached in this amount of time, the heating will be aborted and the purge will commence.



MINIMUM VENT AND PURGE SETTING
Time to Abort Heat before Purge: 2:00

Z1-S01



A Heater has to be installed and it's Use during Heat Purge set to Yes before these two menus will appear.

Static Pressure Setting Menu

Using an optional static pressure sensor, the controller monitors the difference in air pressure between air outside the building and inside the building. Static pressure can be used to control inlet devices. As more fans turn on or off, the controller adjusts the inlet size to compensate for changes in static pressure. There is two different Static Set-points, Natural ventilation mode and Tunnel mode.

Natural Setpoint, Open and Close

Input the target static pressure while the controller is in Natural Ventilation mode. Then, input the pressure at which static-pressure-controlled inlets should close to increase the static pressure. The Close static pressure must be lower than the Setpoint static pressure. Finally, input the pressure at which inlets should open more. Open static pressure must be higher than the Setpoint static pressure.



STATIC PRESSURE - NATURAL
Setpoint: 0.040 Close 0.030 Open 0.050

Z1-S01



The static pressure sensor delivers a maximum reading of 0.250.

Tunnel Setpoint

Input the target static pressure while the controller is in Tunnel mode. The Tunnel Close and Open settings are calculated based on the offsets of the Natural Setpoint's Close and Open settings and cannot be changed.



STATIC PRESSURE - TUNNEL
Setpoint: 0.030 Close 0.020 Open 0.040

Z1-S01

Static Pressure Ramping

You can create a static pressure ramp table to automatically change the Natural static pressure settings (setpoint, close and open) based on outside temperatures.

An outside air sensor must be installed to use ramping.



STATIC PRESSURE SETTING
Ramp #1 Temp: 30.0

Static Press: 0.070

Z1-S01

Input up to five ramp points by using the **PLUS** or **MINUS** keys to change the ramp point number. After the ramp point number is displayed, press **ENTER** to move the cursor to the Temp field. Change the temperature to the desired setting using the **PLUS** or **MINUS** keys. Press **ENTER** again to move the cursor to the Static Pressure field. Change the static pressure to the desired setting using the **PLUS** or **MINUS** keys.



Consult your county extension agent or other specialist for the best use of static pressure control in your region.



Sound Alarm When...Menu

Use the **UP** or **DOWN** keys to scroll through the available menu items in this category. Use the **PLUS** or **MINUS** keys to select the device groups when setting the feeder and water flow alarm settings.



The alarm system should be tested periodically to ensure proper operation.

Alarm Relay Operation

During normal operation the relay terminals labeled C-NC (in the controller) do not have continuity, and the terminals labeled C-NO have continuity. In the event of an alarm condition, the C-NC terminals make contact (complete a circuit), and the C-NO contacts open. The alarm relay is momentarily in an alarm state during controller power up and always in an alarm state during a power interruption.

There are user-adjustable alarm settings plus a number of factory-preset errors and alarms. To minimize nuisance alarms, all alarm conditions include a built-in time delay or the requirement for a repeat occurrence.

Fixed High Temperature Alarm

Input a fixed high temperature at which an alarm state should occur. Fixed means the setting doesn't change even when temperature ramping is set up or the outside temperature is influencing the High Temperature Alarm setting. This setting is always compared to actual average temperature. This is the highest possible temperature allowed before a high temperature alarm is activated.



SOUND ALARM WHEN....
Fixed High Temp Exceeds: 92.0

Z1-S01

High/Low Temperature Alarm

Input the high and low temperatures at which an alarm state should occur. These settings change when temperature ramping is set up. These temperature settings are always compared to actual average temperature.



SOUND ALARM WHEN....
Temperature Above: 80.0 Below: 60.0

Z1-S01

The High Temperature Alarm can change automatically based on the outside temperature (see below). If the outside temperature is influencing the High Temperature Alarm setting, the top line of the display will show **"influenced"** and means the High value is currently based on the outside temperature and not the Temperature setpoint.



SOUND ALARM WHEN.... (influenced)
Above: 92.0 Below: 60.0

Z1-S01

Outside Temp Influence HI Alarm Temp

It is possible to increase the High Temperature Alarm setting automatically when the Outside temperature is higher than the Temperature Setpoint. If this is set to YES, the High Temperature Alarm setting will ramp with the Outside temperature, as long as the Outside temperature is above the Setpoint. If the Outside temperature is below the Setpoint, the High Temperature Alarm setting will not change. The Fixed High Temperature Alarm is the highest possible temperature allowed before a high temperature alarm is activated regardless of this setting.



SOUND ALARM WHEN....
Outside Temp Influence HI Alarm Temp: YES

Sound Alarm When...Menu

Feeder Alarm

Feeder motors can run up to 30 times per day using the feeder timers. When enabled to run, and a feed sensor is installed, the feeder motor current can be checked to determine if the feeders are on (running) for too long or off for too long. Setting the alarm times to zero disables the time check. During the enabled time, the on/off time of a single period is continuously checked against the maximum values entered below.



If a feeder on time alarm is generated, that feeder is turned off until the alarm is cleared or the controller is reset. If a feeder off time alarm is generated, it is automatically cleared if the feeder is later determined to be running.



SOUND ALARM WHEN.... **Z1-S01**
Feeder #1 ON Time Exceeds: 1:00:00



SOUND ALARM WHEN.... **Z1-S01**
Feeder #1 OFF Time Exceeds: 5:00:00

Water Use Exceeds Alarm

This setting determines the flow rate in gallons per hour that, if exceeded for more than one minute, triggers an alarm. Setting the value to zero disables the flow check. If more than one water meter sensor is installed, press the **PLUS** and **MINUS** keys to scroll through the list of water meter sensors.



SOUND ALARM WHEN.... **Z1-S01**
Water #1 GPH Flow Exceeds: 800

Water Flow Drop Alarm

Each hour, the number of gallons used for each water meter is totaled. The most recent 24-hour total for the water meter is compared to the previous 24-hour total. If the total has dropped by a percentage larger than your setting, an alarm is triggered. Setting the value to zero disables the flow check. The check is also disabled if both of the totals being compared are less than 10 gallons. If more than one water meter sensor is installed, press the **PLUS** and **MINUS** keys to scroll through the list of water meter sensors.



SOUND ALARM WHEN.... **Z1-S01**
Water #1 24-Hr DROP 10%

Static Pressure Alarms

All static pressure settings are in inches of water. Times are in minutes and seconds. Low static pressure may indicate malfunctioning fans. Either the fan is not operating or it is not pushing air (possibly a bad belt or obstruction). High static pressure may indicate malfunctioning inlets or curtains.

The static pressure high limit is usually set to a level that represents danger to the building. The static pressure needs to stay above the level you set for the time period you set before the controller alarms.



SOUND ALARM WHEN.... **Z1-S01**
Stat Pressure Stays Above: 0.140 for 0:30

To have the curtains/inlets open fully, if the static pressure is high enough to cause an alarm, set the High Pressure Alarm Open All Inlets to yes. This will prevent the static pressure from rising to high and causing damage to the building.



SOUND ALARM WHEN.... **Z1-S01**
High Pressure Alarm Open All Inlets: YES



Sound Alarm When...Menu

There are two types of static pressure low limit settings. The first type is constantly monitored. If this low limit is exceeded (falls below) for the time period you enter, the alarm is triggered. This is useful during minimum ventilation to ensure that fans are being turned on, and during tunnel operation when a drop in static pressure is intolerable.



SOUND ALARM WHEN....
Stat Press Stays Below: 0.010 for 10:00

Z1-S01

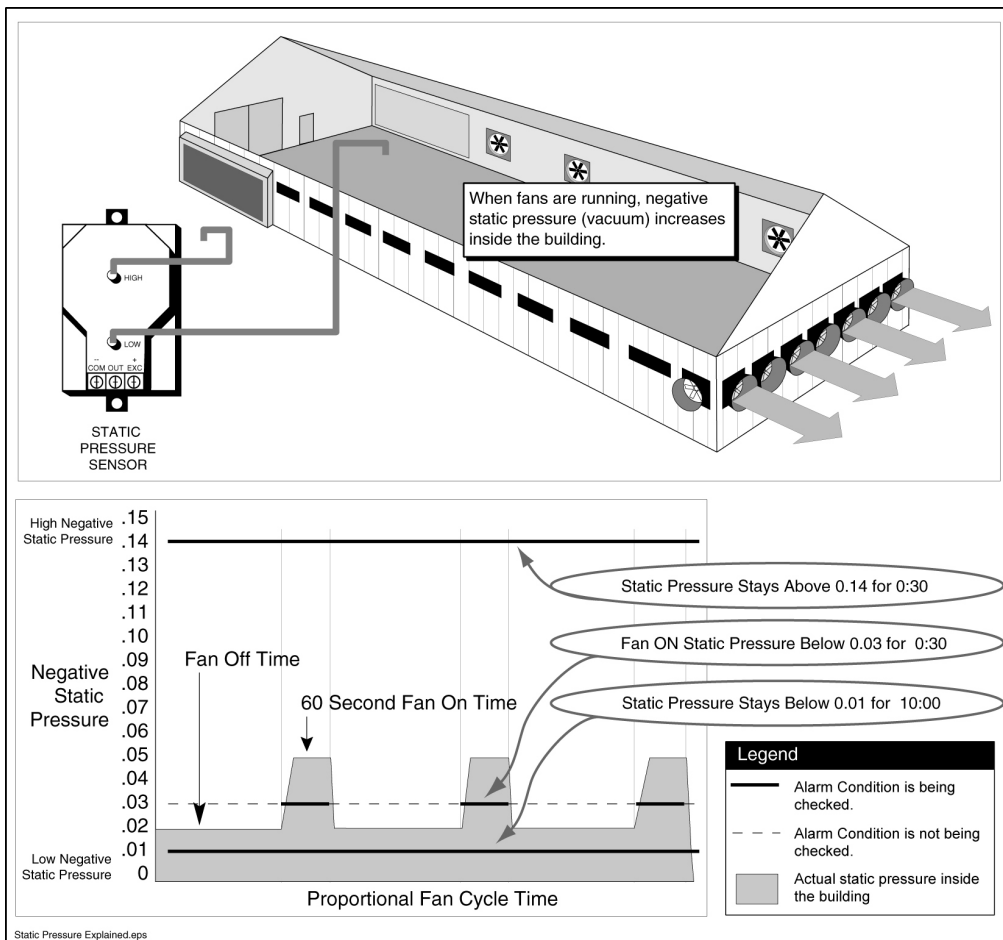
The second type is checked only while one or more fans set as **proportional** are running. Set the static pressure alarms for a level that might indicate problems with fans or inlets. Also, enter a time that the condition must exist. However, be sure the time is less than the time the proportional fans run since the controller only checks for this static pressure alarm condition while proportional fans are running.



SOUND ALARM WHEN....
Fan ON Stat Press Below: 0.030 for 0:30

Z1-S01

The following illustration provides an example of the possible static pressure alarm settings.



Sound Alarm When...

Humidity Sensor Reading is Invalid Alarm

When this menu item is set to YES for each humidity sensor, the controller alarms if the humidity sensor fails. The alarm requires the humidity sensor to give 10 invalid readings during a single hour to avoid false alarms. The humidity sensors are checked every 15 seconds, so a complete failure would cause an active alarm state in as little as 150 seconds. All invalid readings are recorded in the Alarm History. If more than one humidity sensor is installed, press the **PLUS** and **MINUS** keys to scroll through the list of humidity sensors to set each alarm.

This alarm setting is especially useful if you rely on the humidity sensor to trigger humidity-based purges or to enable and disable evaporative cooling devices.



SOUND ALARM WHEN....
Humidity Sensor #1 Reading is Bad: YES

Z1-S01

Temperature Range Alarm

Setting this menu item will activate the alarm relay, with a "Temp Range" alarm, if the difference of the temperature readings of any two temperature sensors is greater than the value you set. The alarm will display the two sensors that caused the alarm, and the readings of those two sensors at the time the alarm activated. This alarm can notify you when the temperature changes drastically from one end of the barn to the other. It also can indicate when a temperature sensor is going bad and starts sending lower or higher readings than it should. When the alarm is active, the controller continues to use the readings from the temperature sensors to control devices. To prevent nuisance alarms when the temperature only changes momentarily, as when a door is opened and closed, the alarm will not activate until it has taken ten readings that were off by the set value. The "Range Alarm" is not self-clearing, so the alarm could activate within a few minutes (10 continuous out-of-range readings) or a few hours/days/months (intermittent out-of-range readings). Press **DOWN** arrow key to set this alarm.



SOUND ALARM WHEN.....
Highest/Lowest Air Probes differ by: 99

Z1-S01

If the alarm is active, as show below, you should determine why the readings between the two temperature sensors were so far apart before clearing the alarm.

ACTIVE ALARM FOR 11/8 AT 9:20
#01 Temp Range: #03 61.7 #02 75.2

ZONE 1
CNT 12



The alarm system should be tested periodically to ensure proper operation.



Setting up the Control Software

System & Control Device Set-up Menu



You are now ready to set up all the devices



This menu allows you to enter basic information such as date and time as well as adding control devices.

Date and Time Setup

Press the **SYSTEM SETUP** hotkey. Press **ENTER** to edit the current time (24-hour format) or the current date (month/day/year format for American and day/month/year for Metric).

			SYSTEM & CONTROL DEVICE SET-UP Z1-S01
			Time Set-Up: 12:24:21
			SYSTEM & CONTROL DEVICE SET-UP Z1-S01
			Date Set-Up: 11/23/2010



The controller does not update the clock for Daylight Savings Time because not all global areas recognize this adjustment.

Power Up Load Delay Time

Press **ENTER** to edit the power up load delay time. Use the **PLUS** or **MINUS** key to change the minutes and seconds. This prevents groups of fans and heaters from all starting at the same moment. Load delay time is designed to reduce the peak demand power requirements for your buildings and reduce the electrical load capacity for backup generators. The load delay time should be set just long enough to get a motor up to speed, about 2 to 5 seconds. The load delay time is only used for the first five minutes after a controller is powered on.















	SYSTEM & CONTROL DEVICE SET-UP Z1-S01
	Power Load Delay Time: 0:00

System & Control Device Set-up Menu - continued

List Control Devices





Press **ENTER** at the LIST Control Devices menu to display a list of all the installed control devices. **Menu screens will not appear unless you install the associated equipment.** To view the LIST of Control Devices you can scroll through the list by pressing the **PLUS** or **MINUS** key.



	SYSTEM & CONTROL DEVICE SET-UP Press ENTER to LIST Control Devices.	Z1-S01
 	LIST: Air Sensor to Module 01 Channel 01.	# 1 Z1-S01
	LIST: Feed Sensor to Module 01 Channel 02.	# 1 Z1-S01
	LIST: Outside Air Sensor to Module 01 Channel 03.	# 1 Z1-S01
	LIST: Static Pressure Sensor to Module 01 Channel 04.	# 1 Z1-S01
	LIST: Humidity Sensor to Module 01 Channel 05.	# 1 Z1-S01
	LIST: Water Meter Sensor to Module 01 Channel 01.	# 1 Z1-S01
	LIST: Digital Alarm to Module 01 Channel 02.	# 1 Z1-S01
	LIST: Whisker Switch to Module 01 Channel 03.	# 1 Z1-S01
	LIST: Position Sensor to Module 01 Channel 09.	# 1 Z1-S01
	LIST: Side Curtain to Module 01 Channel 10.	# 1 Z1-S01
	LIST: Ridge Vent to Module 01 Channel 11.	# 1 Z1-S01
	LIST: Sidewall Inlet to Module 01 Channel 12.	# 1 Z1-S01



System & Control Device Set-up Menu- continued






	LIST: Tunnel Inlet to Module 01 Channel 13.	# 1 Z1-S01
	LIST: Ceiling Inlet to Module 01 Channel 14.	# 1 Z1-S01
	LIST: Chimney Damper to Module 01 Channel 20.	# 1 Z1-S01
	LIST: Furnace to Module 01 Channel 22.	# 1 Z1-S01

Add a Control Device

Press **ENTER** when viewing the ADD menu to add a device.


		SYSTEM & CONTROL DEVICE SET-UP Press ENTER to ADD a Control Device.	Z1-S02
---	---	--	--------

You are prompted with a control device name to add. Use the **PLUS** or **MINUS** keys to scroll through the list of possible devices. Use the **LEFT** or **RIGHT** arrow keys to move between fields. Use the **PLUS** or **MINUS** keys to change values in fields. *Refer to the Menu Guide (Appendix 6 on pages 156- 163) for a complete list of all device types.*

			ADD: Air Sensor to Module 01 Channel 01	# 1 Z1-S02
				Group/Device Number

Specify device number and which zone to install the device to. Use same process to scroll as explained previously.

Press the **ENTER** key **twice (2 times)** to accept the new values.

		ADD: Air Sensor ARE YOU SURE? <ENTER> to confirm.	#2 Z1-S02
---	---	--	-----------



When adding devices to an expansion station, refer to the expansion stations's instructions to set DIP switches so the controller can communicate with those devices.



- When adding a control device you must specify a group/device number. This is simply the number of the device you are adding. For example, if four air sensors are installed, they would be numbered 1 through 4.
- Every input/output device type must be assigned a unique group/device number. For example, there can be only one #1 air sensor.

System & Control Device Set-up Menu - continued



When a device that has open/close capability is added, the controller allows only odd channel numbers and automatically allocates the specified channel as open and the next output channel as the close channel (for example, channel 1 is open and channel 2 is closed).

The Air Sensor Shared device is an exception to the rule where a device must be assigned a unique module/channel number. See page 91-92 on complete details on installing, changing and deleting Air Sensor Shared devices and their associated air sensor.

Each Output device needs to be installed to it's own channel number. Input devices will be installed to the channel number based on where they are wired into the input connections. The analog input channels will be 1 to 14, and the digital inputs channels (Water Sensor, Digital Alarm, Whisker Switch) will be 1 to 6. It is possible to have an Air Sensor installed on "Module 01 Channel 01" and a Water Sensor installed on "Module 01 Channel 01". On Expansion Station modules, the digital inputs are channels 11 to 14.



The outside air sensor is always #13 and the static pressure sensor is always #0. The channel number is the input terminal number in the case of sensors, or the output channel (relay) number for controlled devices.

Errors Possibilities When Adding Devices

When adding devices, there are (4) four errors that may occur:

- An attempt has been made to install a duplicate device.
- An attempt has been made to install a device to a duplicate station/channel number.
- An attempt has been made to add too many devices.
- An attempt has been made to install a "Air Sensor Shared" device to a module/channel that doesn't have an "Air Sensor" device installed on it.

If one of these errors occurs, press CANCEL and try again with the correct information. Remember, some devices with open/close capability use two consecutive channels and the first channel must be odd.



Set-Up Error: Cannot Add Device!
Maximum Device Count is 90



Set-Up Error: Duplicate Station/Channel!
Press CANCEL to continue.



Set-Up Error: Duplicate Device Found!
Press CANCEL to continue.



Set-Up Error: Shared Device Not Found!
Press CANCEL to continue.



System & Control Device Set-up Menu - continued

Change Control Device

Press **SYSTEM SETUP**, **ENTER** when viewing the CHANGE menu to change a device. Press **PLUS** or **MINUS** key to change values. If changing an Air Sensor, see page 91-92 on the "Air Sensor Shared" devices.

SYSTEM SETUP		ENTER	SYSTEM & CONTROL DEVICE SETUP Z1-S02 Press ENTER to CHANGE a Control Device.
---------------------	--	--------------	---

This menu item allows you to change the assigned channel. If you want to change device-specific settings, go to the menu for that device (refer to the *Viewing, Entering or Changing Equipment Operation Parameters* section).

ENTER	+	ENTER	CHANGE: Air Sensor # 1 Z1-S02 to Module 01 Channel 01
--------------	----------	--------------	--



Changing channels for two-channel devices, such as curtains, requires both of the new output channels to be unused. To change a group/device number (#1 in the example above) you must **DELETE** the old device then **ADD** the new device. This requires scrolling to the **DELETE** Control Device.

Delete Control Device

While in the System & Control Device Set-Up menu scroll to the **DELETE** menu and press **ENTER** to remove a device. If deleting an Air Sensor, see page 91-92 dealing on "Air Sensor Shared" devices.

	ENTER	SYSTEM & CONTROL DEVICE SET-UP Z1-S02 Press ENTER to DELETE a Control Device.
--	--------------	--

You are prompted with a control device name to delete. Use the **PLUS** and **MINUS** keys to scroll through the available devices to delete.

Deleting a device that has open/close capability will free two output channels.

DELETE:Air Sensor # 2 Z1-S02 to Module 01 Channel 01
DELETE:Air Sensor # 2 Z1-S02 Press <****> to confirm deletion.

Confirm the deletion by pressing the **LEFT** arrow, **RIGHT** arrow and **ENTER** keys all at the same time.

If deleting an Air Sensor, see page 191-192 dealing with the "Air Sensor Shared" devices also.

DELETE:Air Sensor # 2 Z1-S02 DELETED!!!

Add Zone



Press **ENTER** when viewing the ADD New Zone menu to add a zone. You are prompted with the next available zone number and asked to press **ENTER** again to accept it.

SYSTEM SETUP		ENTER	SYSTEM & CONTROL DEVICE SET-UP Z1-S02 Press ENTER to ADD New Zone.
		ENTER	Next available unused Zone number is 2. Press ENTER to accept this Zone number.

Attempting to add zone 10 will result in the error message below.

ENTER	** All 9 Zone numbers are used ** New Zone cannot be added.
--------------	--

System & Control Device Set-up Menu- continued

Delete Zone



Press **ENTER** when viewing the **DELETE** zone menu to remove a zone. You are prompted to confirm you want to delete the selected zone.



SYSTEM & CONTROL DEVICE SETUP
Press ENTER to DELETE Zone.

Z1-S02



All devices must be deleted from a zone before the zone can be deleted.

Confirm the deletion by pressing the **LEFT** arrow, **RIGHT** arrow and **ENTER** *keys all at the same time*. Zone 1 cannot be deleted.



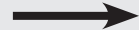
DELETING Zone 2. ARE YOU SURE?
Press <***> to confirm deletion.

Zones

Press the ZONE key to move the controller into another zone.



CURRENT ENVIRONMENTAL CONDITIONS
Avg Actual Temperature: 75.5



Z1-S01



Global Parameter Set-up Menu

The Global Parameters Setup menus allow you to change the global settings used by the controller. These include the animal type (bird or hog), unit of measure (English or metric), temperature style (Fahrenheit or Celsius), display language (English or Spanish), how many channels on the controller (16, 24 or 32), and the Startup Options password. It also shows how much free space is left on the SD card.

To access these menus, press the **SYSTEM SETUP** hotkey and the **RIGHT** arrow key.



The first three menus below are only visible when there are no devices installed on the controller. To change these three settings, you need to delete all the installed devices, or create a new Parameter Set.

Setup Animal Type

Select whether the controller will be used in a hog or bird application by pressing the **PLUS** or **MINUS** key.



or



GLOBAL PARAMETERS SETUP
Animal Type: Birds

Setup Units of Measure

Select the preferred unit of measurement.



or



GLOBAL PARAMETERS SETUP
Units of Measure: Inch/Pound/Gallon

Setup Temperature Measure

Select the preferred temperature measurement.



or



GLOBAL PARAMETERS SETUP
Temperature Measure: Fahrenheit

The following 5 menus, 3 below and first 2 on the next page can be viewed at any time:

Setup Language

Select the English or Spanish language.



or



GLOBAL PARAMETERS SETUP
Display Language: English

SD Card Free Space

These screens show how much free space is remaining on the SD card. The first menu appears only when the controller is first started and the free space is being calculated. If the free space percentage gets low, the controller will start deleting the oldest alarm and history records from the card to free up more space.



GLOBAL PARAMETERS SETUP
Counting FAT: 3373 remaining. (counts down to zero then next screen appears)



GLOBAL PARAMETERS SETUP
CARD Free Space: 1930.7MB, 100.0% free.

Global Parameter Set-up Menu- continued

Number of Switches on Front Panel

Set this to the number of toggle switches mounted on the front cover. Setting this value incorrectly can cause the Channel hotkeys to not work right, and may cause additional problems.

			GLOBAL PARAMETERS SETUP Number of SWITCHES on front panel: 16 (use + or - keys to change value)
--	---	---	--

Start Up Options Password

To prevent unauthorized user from accessing the startup options, enter an eight digit password here. If a password is entered here, the user will have to enter the password in order to gain access to the Startup Options. See page 142 for more information.

			GLOBAL PARAMETERS SETUP Enter Options Password: 00000000
--	---	---	---



A security level 7 is needed to view and change the Options password. Otherwise the screen will display "xxxxxxx" instead of the password.



Viewing, Entering or Changing Equipment Operating Parameters

Input operating parameters for the devices you have installed.

1. Go to the first menu screen in the Device/Equipment Settings menu (using the **RIGHT** or **LEFT** arrow keys) and press **ENTER** to view the device settings.



DEVICE / EQUIPMENT SETTINGS
PRESS ENTER TO VIEW SETTINGS

Z1-S01



You may also press the "SYSTEM SETUP" Hot-Key to navigate to "DEVICE EQUIPMENT SETTINGS" menu.

2. Press the **LEFT** or **RIGHT** arrow key to scroll through the devices until you come to the device group you want to change.
3. Press the **DOWN** arrow key until the device setting you want to change is displayed.
4. Press **ENTER** to enter the EDIT mode. A "_" cursor will appear under the first data field.
5. Use the **PLUS** or **MINUS** keys to change the value.
6. Press **ENTER** to accept the setting and move to the next data field if there is one.

The following pages provide details for inputting parameters for each type of device.

The sensor menu items are grouped in the controller's Sensor Calibration & Setting menu. Refer to the accompanying *Menu Guide* for help in locating device menus and their menu items.



Devices are either an Input Device or Output Device. To see a list of devices please refer to Menu Guide in Appendix 19 pages 125 - 128.

Setting up Input Devices

Air Sensor Settings



"See the Air Sensor Shared device on page 63, if deleting an air sensor or changing it's module and/or channel number."



Clean air sensors are essential to proper operation. Dip the air sensors into a cup of room temperature water and swish around. Do not bump the sensor on the side of the cup. Shake off the water droplets and leave to dry. The sensors read cooler during the cleaning process so **only perform cleaning when the building is empty (or, temporarily turn off the controller)**. Verify the sensors are reading the correct temperature after they dry.

Cable Length

Input the length of cable connecting the air sensor to the controller. The air sensor is an analog resistive device so improper cable length settings can cause erroneous temperature readings. If you enter the proper cable length and still get an erroneous reading, you can essentially calibrate the sensor by adding or subtracting the cable length value entered here. Adding about 5 to 15 feet of length (the variance depends on the cable gauge) drops the air sensor's temperature reading by 0.1 degree Fahrenheit. Press **SYSTEM SETUP**, & **LEFT** arrow key.



SENSOR CALIBRATION & SETTING

Z1-S01

Air Sensor #01 Cable Length: 100'



***For your information:** You can get to the main menu in more than one way. You will use the "SYSTEM SETUP" Hot-Key most of the time but depending on which screen you are working with in the control, you can get to the main menu using other Hot-Keys, as exemplified below. In the pages to follow other Hot-Keys are shown their image for your convenience.*



DEVICE EQUIPMENT SETTINGS

Z1-S01

PRESS ENTER TO VIEW SETTINGS



SENSOR CALIBRATION & SETTING

Z1-S01

Air Sensor #01 Cable Length: 100'

Wire Gauge / Diameter

Input the gauge of the cable connecting the air sensor to the controller. The air sensor is an analog resistive device so improper cable gauge settings can cause erroneous temperature readings. Use shielded wire, 16 to 24 gauge (.5 to 1.2mm) stranded, such as Carol® AWM style 2426, to connect sensors to input channels.



SENSOR CALIBRATION & SETTING

Z1-S01

Air Sensor #01 Wire Gauge: 24AWG

Location

Select the location of the air sensor. The location is important because the controller needs to know which sensors to use for the various house control mode settings (found in the Temperature Control Settings menu).



SENSOR CALIBRATION & SETTING

Z1-S01

Air Sensor #01 Location: BROOD



***Note:** You can set up devices in any zones at any time, but if you don't have an air sensor (or shared air sensor) installed in the zone, the zone will be alarming.*



Air Sensor Settings - continued

Use for Wind Speed



If you are using an effective environmental temperature (EET) air sensor, and you want to factor air speed into the temperature calculation, set this menu item to YES. If you are not using EET air sensors, this menu item must be set to NO.



SENSOR CALIBRATION & SETTING
Air #01 Use for Wind Speed: YES

Z1-S01

Cal Values

If you are using an effective environmental temperature (EET) air sensor, input the calibration values printed on the sensor's tag. If no calibration values are available, use the default values that the controller displays. *Cal Values menu will not show up for an air sensor if that air sensor's "Use for Wind Speed" setting is set to NO.*



SENSOR CALIBRATION & SETTING
Air #01 CAL Values: 550/ 90

Z1-S01

Outside Air Sensor Settings



The Outside Air Sensor is always #13 and has its own Cable Length and Wire Gauge settings. Press the Down arrow key, when viewing the same Air Sensor Setting, to set the Outside Air Sensor settings.



SENSOR CALIBRATION & SETTING
Air Sensor #13 Cable Length: 50'

Z1-S01



SENSOR CALIBRATION & SETTING
Air Sensor #13 Wire Gauge: 24AWG

Z1-S01



*Reminder: Use the **PLUS** or **MINUS** key to change, increase or decrease a value or group within a menu.*



or



Air Sensor Shared Device



The Air Sensor Shared device is special air sensor. *When installing an "Air Sensor Shared" device, the group/device number has to be unique, but the Module and Channel numbers need to match another "Air Sensor" device that is already been set up.* This allows a zone to share an air probe that is installed in another zone, allowing you to control devices based on the temperature in a different zone. If you try to install a shared air sensor to a station/channel that does not have an air probe installed, you will receive an error message. *Use the **ENTER**, **PLUS** or **MINUS** keys to scroll to the group or number that you desire to set-up or change.*



SYSTEM & CONTROL DEVICE SET-UP
Press ENTER to ADD a Control Device. **(this could be CHANGE or DELETE menu)**

Z1-S01



ADD: Air Sensor Shared
to Module 01 Channel 01.

#1 Z1-S01



Set-Up Error: Sharing Device Not Found!
Press CANCEL to continue.

Air Sensor Shared device - continued

The Air Sensor Shared device uses all the settings from the air probe that it is being shared with, except for the Location setting. The Air Sensor Shared Location setting has it's own menu. This allows you to use an air probe installed in a Growout location to be used while the controller is in Brood mode, for example. Press the Down arrow key, when viewing the Air Sensor Location Settings, to view or change the Shared Sensors location. *Use the **ENTER**, **PLUS** or **MINUS** keys to scroll to the group or number that you desire to set-up or change.*



SENSOR CALIBRATION AND SETTINGS

Z1-S01

Air Sensor #03 Location: BROOD



- If you change the Module/Channel number of a “Air Sensor” device, make sure you change them for any associated “Air Sensor Shared” device or the shared device will not work and the module/channel being used by the shared device will not be available.
- If you delete the Air Sensor associated with this Air Sensor Shared device, make sure to delete this shared device also. If the Air Sensor is deleted, but the Air Sensor Shared device isn't, the channel number of the Air Sensor will no longer be available and there will be alarms for the shared sensor.



Feeder Sensor Settings



The feeder sensor measures amps and is normally used to determine if there should be a feeder alarm. The controller assumes the feeder is on when the measured current is above the minimum amps setting. The group number of the feed sensor has to be the same as the feeder group number being monitored in order for the alarms to work.

Minimum Amps

Input a value less than the minimum amps draw of the feeder. When the controller detects current higher than this value, it assumes the feeder is on. This menu also displays the current actual reading.



DEVICE / EQUIPMENT SETTINGS Z1-S01
PRESS ENTER TO VIEW SETTINGS



SENSOR CALIBRATION & SETTINGS Z1-S01
Feed #9 Minimum: 10.0A Actual: 11.1A

Cal Value

Unless otherwise specified in the feeder sensor's documentation, the calibration value is 100.



SENSOR CALIBRATION & SETTINGS Z1-S01
Feed #9 CAL Value: 100

Static Pressure Sensor Settings



ADC Cal 1 and ADC Cal 2

Input the ADC calibration values for the static pressure sensor.



SENSOR CALIBRATION & SETTING Z1-S01
Static Pressure ADC CAL 1: 6554



SENSOR CALIBRATION & SETTING Z1-S01
Static Pressure ADC CAL 2: 58982

WC Cal 1 and WC Cal 2

Input the Water Column calibration values for the static pressure sensor.



SENSOR CALIBRATION & SETTING Z1-S01
Static Pressure WC CAL 1: 0.000



SENSOR CALIBRATION & SETTING Z1-S01
Static Pressure WC CAL 2: 0.250



- The values shown in these examples are the values typically used.
- Specific static pressure control settings are entered in the Temperature Control Settings menus.

Humidity Sensor Settings



Cal Value

Input the calibration values shown on the tag attached to the humidity sensor. If no calibration values are available, use the default values shown below.


SYSTEM SETUP			SENSOR CALIBRATION & SETTING		Z1-S01
			Humidity #01 CAL1 = 10485 CAL2 = 51118		

Water Meter Sensor Settings



Cal Value (PPG / PPL)

Input the pulses per gallon (PPG) or pulses per liter (PPL) calibration value for the water meter sensor. Unless otherwise specified, the value is 25.

	SENSOR CALIBRATION & SETTING		Z1-S01
	Water #1 CAL Value (PPG): 25		



Digital Alarm Sensor Settings



Digital alarms provide warnings of almost any emergency condition you need to be informed about. Any no-voltage circuit ("dry" contact) that can be switched will provide an alarm to the controller. The term "digital" refers to two possible states for a circuit: open and closed. Set up each digital alarm input to sense for an open or a closed circuit.

Trigger Alarm on Active Input

Set this to YES if you want the controller to alarm when the input is active.

SYSTEM SETUP			DIGITAL ALARM GROUP #1 SETTING		Z1-S01
			Trigger alarm on Active input: YES		

Input is Active When

Set this to CLOSED if you want the controller to alarm when the digital input circuit becomes closed. Set this to OPEN if you want the controller to alarm when the digital input circuit becomes open.

	DIGITAL ALARM GROUP #1 SETTING		Z1-S01
	Input is Active when: CLOSED		

Alarm Delay Time

Input the time (minutes and seconds) the alarm condition must exist before the alarm is triggered. For example, the controller should alarm when a door is left open. Set the Alarm Delay Time to 30 seconds to prevent a false alarm from normal building entry and exiting.

	DIGITAL ALARM GROUP #1 SETTING		Z1-S01
	Alarm Delay Time: 0:30		



Position Sensor Settings



A position sensor is mainly used to verify the correct movement of a curtain, ridge vent, chimney damper or inlet that it is attached to. Its main purpose is to create an alarm situation if the reading from the position sensor does not match the attached device's calculated position from the controller.

A secondary benefit of the position sensor is the ability of the controller to use the position sensor reading to correct the attached device's position. After the inlet device has moved, if the calculated position and the position sensor reading do not match, the controller will move the inlet device again to correct the position. ALL of the following have to be true in order for the controller to use the position sensor in this way.

1. The position sensor has to be attached to a curtain, ridge vent, chimney damper or inlet.
2. The position sensor has to be calibrated so the device and position sensor settings match.
3. The "Enable Position Alarm" has to be set to YES.
4. The difference between the device's calculated position and the position sensor reading has to be within the percentage set in the "Percent OUT of Position to alarm" setting.
5. The device's calculated position and the position sensor reading have to be more than 3 seconds of travel time apart.

If ALL the above are true, then if the controller finds that the device's calculated position and the position sensor's reading are different, the controller will move the device again until the calculated position and position sensor reading are within 3 seconds of time. If less than 3 seconds of travel time is required to make the position's match, the controller will not move the device again. If the positions are greater than the percentage to alarm, the controller will create an alarm and stop using the position sensor until the alarm is cleared. Once the alarm is cleared, the controller will assume the position sensor reading shows the device's correct position, and will move the device to its calculated position, if required.



Two conditions will cause the position sensor to be completely ignored by the controller.

- 1. If the position sensor is in an alarm state.***
- 2. If the "Enable Position Alarm" setting is set to NO.***

Assign to a Device

Press the **PLUS** and **MINUS** keys to scroll through the list of installed curtains, inlets, ridge vents and chimneys. Press **ENTER** to assign the position sensor to the device it is attached to. *The POSITION SENSOR menu is a submenu of the DEVICE / EQUIPMENT SETTINGS menu and can be found quickly by pressing the **SYSTEM SETUP** Hot-Key then **LEFT** arrow twice.*



POSITION SENSOR #1 NOT CALIBRATED
Attached To: NO DEVICE

Z1-S01

Position Sensor Settings - continued

Calibrate

Before attempting to calibrate a position sensor, be sure:

- The curtain, ridge vent, chimney damper or inlet device is properly wired.
- The position sensor is properly wired to the controller.
- The curtain, ridge vent, chimney damper or inlet device is installed in the controller software.
- The Full Open Size menu item has been properly set for the device.
- The Full Open Travel Time menu item has been properly set for the device.
- The ON-OFF-AUTO switches for the device's open/close channels are set to AUTO.
- The Position Sensor Alarm setting is set to NO, otherwise an out-of-position alarm will activate.

Press the **DOWN** arrow key and then press **ENTER** when the menu item shown below is displayed.



POSITION SENSOR #1 NOT CALIBRATED Z1-S01
Attached to: **Side Curtain #2**



POSITION SENSOR #1 NOT CALIBRATED Z1-S01
Press Enter to calibrate this sensor



A reminder message to verify the device fully opens and closes is displayed. Press **ENTER** to proceed. An automated calibration process starts. Do not press any keys or move any switches during the calibration process. Press **CANCEL** to exit calibration.

The following screens will show the progress of the calibration.

1. The controller tries to open the device for a few seconds.

POSITION SENSOR GROUP #1 SETTING Z1-S01
1) Check Pot Open Resistance : 4492

2. The controller tries to close the device for a few seconds.

POSITION SENSOR GROUP #1 SETTING Z1-S01
2) Check Pot Close Resistance : 4350

3. The controller closes the device fully.

POSITION SENSOR GROUP #1 SETTING Z1-S01
3) Go to Close Resistance : 4300

4. The controller opens the device fully measuring the time it takes to open.

POSITION SENSOR GROUP #1 SETTING Z1-S01
4) Measure Full Open Resistance : 5200

5. The controller closes the device fully measuring the time it takes to close.

POSITION SENSOR GROUP #1 SETTING Z1-S01
5) Measure Full Close Resistance : 4492

The remainder of screens showing progress of calibration are on the next page.



Position Sensor Settings - continued

6. The controller updates the Full Open Time and Full Close Time menu items for the device the position sensor is attached to.

POSITION SENSOR GROUP #1 SETTING
Travel Open to Close: 5:10

Z1-S01



If the calibrate fails, an abort code will be displayed for one minute.

POSITION SENSOR GROUP #1 SETTING
Position Sensor not Calibrated: Reason :0

Z1-S01

The abort codes and their meanings are:

Abort code "0" – The calibration was canceled by pressing the CANCEL key.

Abort code "A" – The change in the reading of the sensor is too small (less than 2 ohms per second).

Abort code "B" – The pot in the sensor is not moving.

Abort code "C" – The Close to Open Travel Time is less than 15 seconds.

Abort code "D" – Open to Close Travel Time is less than 15 seconds.

Enable Position Alarm

When this menu item is set to YES, the controller activates the alarm relay and displays an active alarm menu item if the expected device position is off by more than the Percent OUT of Position to Alarm setting (see below).



IMPORTANT NOTE: This setting has to be set to YES in order for the auto-correct feature of the position sensor and inlet device to work. If this is set to NO, it's the same as not having the position sensor installed.



POSITION SENSOR GROUP #1 SETTING
Enable Position Alarm? YES

Z1-S01

Percent OUT of Position to Alarm

Set this menu item to the percentage the expected device position needs to be off before an alarm will be activated. This prevents false alarms when an inlet doesn't move smoothly. This value can be set from 0% to 80%, where the higher the percentage is, the farther the inlet has to be out of position before the controller will activate an alarm.



POSITION SENSOR GROUP #1 SETTING
Percent OUT of Position to Alarm: 5.0%

Z1-S01



IMPORTANT NOTE: When setting this percentage, care should be taken to set it high enough to eliminate nuisance alarms but low enough to alarm when the position is off enough to cause problems with the animals.

Whether or not the alarm is enabled, if the expected device position (based on Open and Close times) differs three or more seconds from the inlet's current reading, the controller automatically corrects the time-based position. If the Enable Position alarm is set to Yes and there are no active position sensor alarms, then the position sensor reading is used to adjust the inlet. If the Enable Position alarm is set to No, the internal inlet's current reading is used to adjust the inlet.

Whisker Switch



A Whisker Switch is an electrical contact that allows the controller to determine if a curtain, ridge vent, chimney damper or inlet is open or closed a set percentage. The purpose of a whisker switch is to allow the controller to alarm if the inlet doesn't move correctly and allows the controller to shut off fans when the inlet is open. The switch circuit is closed when the inlet is opened and the circuit is opened when the inlet is closed. *Reminder: The Whisker Switch menu is a submenu under the DEVICE / EQUIPMENT SETTINGS but can be found quickly by pressing the **SYSTEM SETUP** Hot-Key then using the **RIGHT** or **LEFT** arrow key.*


Assign to a Device

Press **ENTER** to assign a device to the whisker switch. Press the **PLUS** and **MINUS** keys to scroll through the list of installed curtains, inlets, ridge vents and chimneys. Press **ENTER** to assign the whisker switch to the device it is attached to.

SYSTEM SETUP			WHISKER SWITCH GROUP #1 SETTING	Z1-S01
			Attached To: NO DEVICE	

Validate Switch

Set the Low percentage to the closed percent of the inlet where the switch circuit changes from closed to open. This shows the controller the inlet closed pass the switch. Set the High percentage to the open percent of the inlet where the switch circuit changes from opened to closed. This shows the controller the inlet opened pass the switch.

	WHISKER SWITCH GROUP #1 SETTING	Z1-S01
	Validate Switch – Low: 45% High: 50%	



You can assign both a Whisker Switch and Position Sensor to the same curtain/inlet. The Position Sensor will take precedents if one of each is assigned.



An out-of-position alarm will activate if the switch and controller differ in whether the switch should be open or closed.



Setting up Output Devices

Sensor Assignment

This controller uses Shared Sensor Technology to control all the devices in the building. Any combination of sensors can be averaged to control any device. You may assign up to four sensors to each equipment group. Enter four zeros to assign all indoor temperature sensors to a group.

To change sensor numbers while you are setting up operating parameters for an output device (operating parameters are discussed later in this manual). *You may use Channel Hot-Keys next to each toggle switch on the main control for accessing the menu item for that channel's device. Expansion stations do not have Hot-Keys.*

1. Press **ENTER** while you are viewing a menu item where sensors can be selected (usually displays Use Sensors).



2. Press the **PLUS** or **MINUS** keys to input the sensor number you want to have control the equipment group.
3. Press **ENTER** to confirm.
4. Repeat steps 2-3 for each sensor.



5. If the cursor is still present, press **ENTER** until it disappears.
6. The average temperature of all controlling sensors is listed at the right.

Curtains and Inlets

Introduction:

You must designate how curtains and inlets will operate. Ridge vents are natural only. There are four basic operating modes:

- **Natural** - Operates for all ventilation below the Tunnel Entry Temperature. Often referred to as power, minimum, or natural ventilation. Natural curtains and inlets are closed during tunnel mode.
- **Tunnel** - Operates only during tunnel mode. Tunnel curtains and inlets are closed during natural mode.
- **Static** - Operates automatically based on the static pressure sensor readings. Static pressure control menus are displayed only when a static pressure sensor is installed. Static-pressure-controlled devices open or close based on the Open and Close values entered in the Static Pressure Setting menu.
- **Temp** - Operates based on temperature (typically curtains) or operates proportionally (typically inlets) based on the number of fans running.

The above modes are combined for the following menu choices.

- **Static Tunnel Only** - The device only operates during tunnel mode and is controlled by static pressure.
- **Temp Natural Only** - The device only operates during natural mode. An inlet opens or closes based on the number of fan groups running (proportional control). A curtain opens or closes based on its Open Temp and Close Temp.
- **Static Natural Only** - The device only operates during natural mode and is controlled by static pressure.
- **Temp Natural/Temp Tunnel** - During natural mode, an inlet operates based on the number of fan groups running (proportional control). A curtain operates based on its Open Temp and Close Temp settings. During tunnel mode, the inlet or curtain operates based on proportional control.
- **Temp Natural/Static Tunnel** - During natural mode, an inlet operates based on the number of fan groups running (proportional control). A curtain operates based on its Open Temp and Close Temp settings. During tunnel mode, the inlet or curtain operates based on static pressure.
- **Temp Tunnel Only** - The inlet or curtain operates only during tunnel mode and its position is based on the number of fan groups running (proportional control).
- **Static Natural/Temp Tunnel** - During natural mode, the device operates based on static pressure. During tunnel mode, the device operates based on proportional control.
- **Static Natural/Static Tunnel** - The device operates based on static pressure during natural mode and tunnel mode.

See Appendix 17 page 123 for a summary of how inlets/curtains behave in each mode.



On HotKey-equipped controllers, the output channel labels are also hot keys. Pressing a channel label key will take you directly to the operating parameters menus for the related device.

Side Curtain Settings



Reminder: Curtain Settings are listed under the DEVICE/EQUIPMENT menu.



DEVICE / EQUIPMENT SETTINGS
PRESS ENTER TO VIEW SETTINGS

Z1-S01

Use Sensors

Input the group numbers of the air sensors you want to use for controlling the curtain. The controller uses Shared Sensor Technology to average the temperature readings of any sensors you want to use to control any device. This menu item only appears when the curtain uses a temperature-controlled mode (refer to the Operating Modes: Curtains and Inlets section).



SIDE CURTAIN GROUP 1 SETTINGS
Use Sensors: ALL

Z1-S01

(Avg 74.7)

Opening and Closing Temp

Input the temperatures at which the controller should open and close the side curtain (when the curtain is in a temperature-control mode). When the temperature is at or above the Open Temp, the controller opens the curtain as many inches as you designate (see below). When the temperature is at or below the Close Temp, the controller closes the curtain as many inches as you designate (see below).



SIDE CURTAIN GROUP 1 SETTINGS
Open Temp: 80.0 Close Temp: 75.0

Z1-S01



This menu item doesn't appear for curtains set up for tunnel or static control (refer to the Operating Modes: Curtains and Inlets section).

Open This Distance and Pause

Input the distance the controller should open the curtain before pausing. Then input the Pause time. After the Pause time, the controller checks the temperature and determines if it should open the curtain more, do nothing, or begin closing it.



SIDE CURTAIN GROUP 1 SETTINGS
Open 12" and Pause: 0:02:00

Z1-S01



This menu item doesn't appear for curtains set up for static control (refer to the Operating Modes: Curtains and Inlets section).

The controller has a minimum motion time of three seconds. For example, if a curtain moves 60 inches in 60 seconds, 3 inches is the smallest change in opening size that can be made. Opening sizes should be set large enough to allow a minimum of three seconds movement from one setting to the next.



Side Curtain Settings - continued

Close This Distance and Pause

Input the distance the controller should close the curtain before pausing. Then input the Pause time. After the PAUSE time, the controller checks the temperature and determines if it should close the curtain more, do nothing, or begin opening it.



SIDE CURTAIN GROUP 1 SETTINGS

Z1-S01**Open 12" and Pause: 0:02:00**

This menu item doesn't appear for curtains set up for static control (refer to the Operating Modes: Curtains and Inlets section).

Maximum Opening below Temperature

Set the maximum opening size of the curtain if the temperature is below a certain point. If the temperature is below the set value then the curtain will only open to the maximum opening size. If the temperature is higher than the set temperature then the curtain is allowed to open fully. This menu only appears if a position sensor is attached to it, is calibrated and set to alarm is out of position. If the position sensor is in an alarm state then the Maximum Opening is ignored.



SIDE CURTAIN GROUP 1 SETTINGS

Z1-S01**Maximum Opening: 0 Below Temp: 70.0**

Static Pressure Pause Timer

Input the time the curtain should pause after it moves due to a change in static pressure. The pause time prevents the curtain from responding too often to changes in static pressure. This menu item appears only when the curtain is set up to run according to static pressure. If the curtain moves too often, try increasing the time entered here.



SIDE CURTAIN GROUP 1 SETTINGS

Z1-S01**Static Pressure Pause Timer: 0:15**

Operating Mode

Refer to the Operating Modes: Curtains and Inlets section for a list of modes. This menu item appears only when a tunnel fan (allows for tunnel mode) or a static pressure sensor (allows for static pressure controlled modes) is installed. Otherwise, the controller assumes the curtain is Temp Natural Only.



SIDE CURTAIN GROUP 1 SETTINGS

Z1-S01**Operate as: Temp Natural Only**

Refer to the Temperature Control Settings section for information about interlocking a heater or ridge vent to your curtains. Interlocking a heater prevents it from turning on when the curtain is open more than one inch. Interlocking a ridge vent allows it to open and close in sync with a curtain resulting in enhanced air quality.

Side Curtain Settings - continued

Natural Mode Operation

There are three conditions that can cause natural curtains to react differently than described above.

Stop Sooner

The curtain immediately stops opening or closing when the temperature returns to between the Open Temp and Close Temp.

Abort Pause Time

The controller aborts the open or close pause time if the opposite movement temperature is reached during the pause time. This reduces drastic temperature changes inside the building especially in winter when rapid cooling can occur.

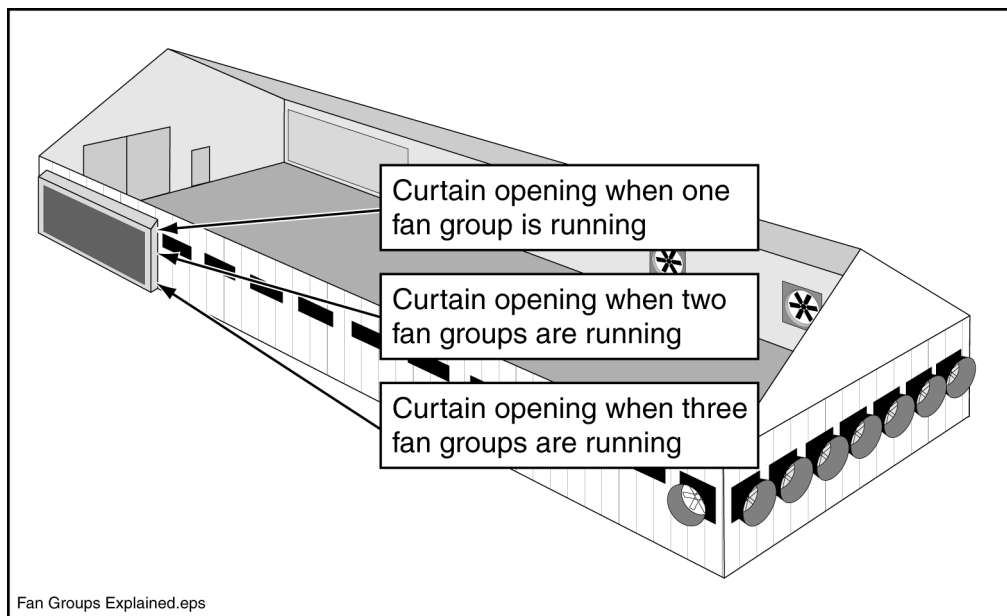
Skip a Movement (double the pause time)

The controller skips a curtain open or close movement if the temperature appears to be moving in the right direction after the first movement is completed. The controller skips only one movement in a given open or close cycle. This reduces curtain movement.

Proportional Control (Tunnel Modes Only)



The following menu items allow the curtain to open proportionately to fans set up for proportional control. You must use a static pressure sensor (even if you don't plan on using one with the controller) to set up the curtain openings for each stage of fan ventilation. Measure the static pressure while one fan group is running and adjust the curtain opening until the static pressure is at the correct level. Record the curtain opening size. Next, measure the static pressure while two fan groups are running and adjust the curtain opening until the static pressure is at the correct level. Repeat the process until all of the fan groups are running.





Side Curtain Settings - continued

Tunnel Fan Groups On \ Opening Size

Input the desired curtain opening size for each potential number of simultaneously operating tunnel fan groups. Fans are designated as tunnel in the Operating Mode menu (this includes combinations such as tunnel & cool). You can specify zero (a minimum opening size) through nine fan groups.



Variable speed tunnel fans can be entered in 0.5 increments to account for ramping operating speeds.

SIDE CURTAIN GROUP #1 SETTINGS	Z1-S01
#01 Tunnel Fans ON: 0.0 Open: 0.0	
SIDE CURTAIN GROUP #1 SETTINGS	Z1-S01
#02 Tunnel Fans ON: 0.5 Open: 12.0	
SIDE CURTAIN GROUP #1 SETTINGS	Z1-S01
#03 Tunnel Fans ON: 1.0 Open: 24.0	

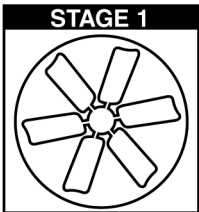
Press the **PLUS** or **MINUS** keys when this menu item is displayed to change the setting number (one through nine).



If there is no “0 Tunnel Fans ON” position, the curtain will NOT open until the fan setting specified by the first ramp position table entry is reached. The zero position allows the controller to interpolate between zero and the next specified Fans ON position.

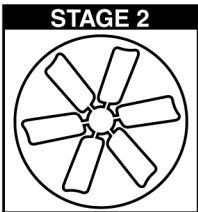
Variable Speed Fan Power Settings

STAGE 1



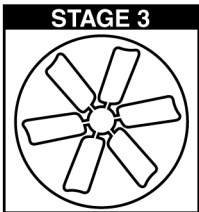
Full Power = 30

STAGE 2



Full Power = 30

STAGE 3



Full Power = 30

Even though the variable speed fans in this example reach full power at 30, the controller considers each fan as "0.5" since the potential full power setting is 60. Refer to the *Fan Settings* section for more information about Full Power Setting.

#01	Tunnel Fans ON: 0.0	Open	0.0"
#02	Tunnel Fans ON: 0.5	Open	12.0"
#03	Tunnel Fans ON: 1.0	Open	24.0"
#04	Tunnel Fans ON: 1.5	Open	36.0"

Tunnel VS Fan Settings.eps

Side Curtain Settings - continued

Tunnel Interlock to Fan



This is an extension of the Tunnel Fan Groups On / Opening Size menu item. Instead of opening a curtain based on the number of fans running, you can interlock specific tunnel fans with curtains (open the curtain based on the number of interlocked fans running).

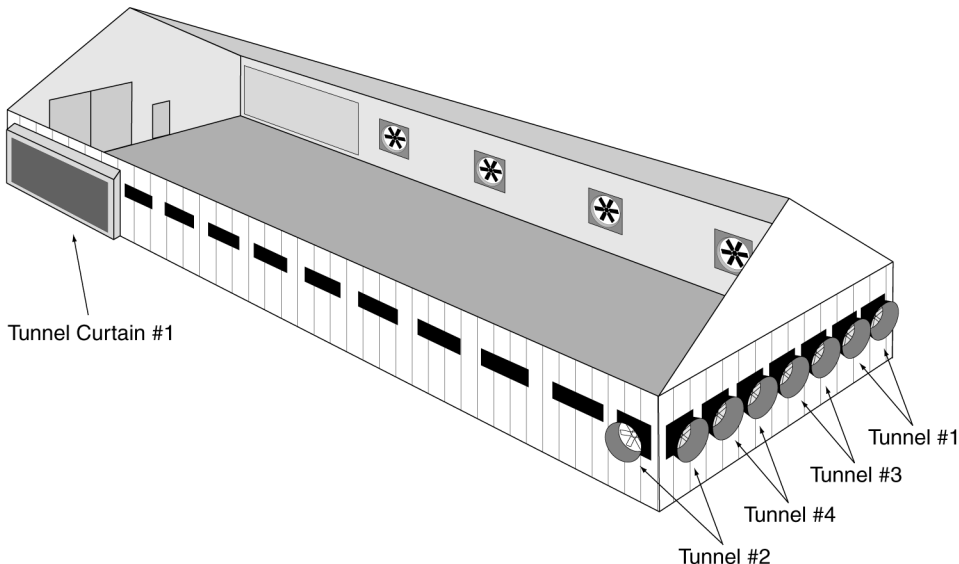


SIDE CURTAIN GROUP #1 SETTINGS

Z1-S01

Tunnel Interlock 1 to: Tunnel Fan#1

You can interlock up to nine specific fan groups with a curtain. Press the **PLUS** or **MINUS** key to change the Interlock number (one through nine). This menu item limits the fan groups counted when determining the appropriate position of the curtain (refer to the previous Fan Groups On / Opening Size Menu). It only allows selection of installed fans whose "Use for Proportional Control" setting is YES.



Interlock Number	Fan	Fan ON Temp	Tunnel Curtain will Open
Interlock 1	Tunnel 1	80	12"
Interlock 2	Tunnel 2	82	24"
Interlock 3	Tunnel 3	84	36"
Interlock 4	Tunnel 4	86	48"

Interlock Tunnel Curtains and Fans.eps



You can select each fan group only once for each curtain.



Side Curtain Settings - continued

Response Mode

Select a response mode:

Standard – Allows the curtains to open and pause for the times you input.

Aggressive – Allows the curtains to move faster if the temperature is changing quickly. If the temperature is more than 2 degrees Fahrenheit or Celsius beyond the open or close temperature, the curtain opens or closes twice the distance you input and then pauses for only half the time. If the temperature moves further from the open or close temperature, the curtain moves further and more often. *Side Curtain Settings are listed under the DEVICE/EQUIPMENT SETTINGS menu.*



SIDE CURTAIN GROUP #1 SETTING

Z1-S01

Response Mode: STANDARD



Reminder: Press ENTER , UP or DOWN keys to change group or response mode.



or



Calibration



The curtains readjust themselves automatically with the controller when they open or close completely. When opening or closing fully, the channel is left on and the limit switch of the curtains will cause the curtains to stop moving. If the curtains does not close completely in cool conditions, check to make sure the manual winch has been properly adjusted.

Full Opening Size

Input the full opening size.



SIDE CURTAIN GROUP #1 SETTING

Z1-S01

Full Opening Size (Inches): 48

Full Open Travel Time

Input the time it takes for the curtain to open completely. The controller uses this time to determine how open the curtain is, so enter the exact travel time. If a Position Sensor is attached to the curtain, the travel time will be set automatically when the Position Sensor is calibrated.



SIDE CURTAIN GROUP #1 SETTING

Z1-S01

Full Open Travel Time: 6:00

Full Close Travel Time

Input the time it takes for the curtain to close completely. The controller uses this time to determine how closed the curtain is, so enter the exact travel time. If a Position Sensor is attached to the curtain, the travel time will be set automatically when the Position Sensor is calibrated.



SIDE CURTAIN GROUP #1 SETTING

Z1-S01

Full Close Travel Time: 6:00

Side Curtain Settings - continued

Purge Opening Size

The curtain can be used as a purge opening for purge fans. This menu item appears only if you have entered purge settings in the Purge Settings menu. Input zero to disable the curtain during the purge function. The purge opening size must be large enough to allow at least three seconds of movement.



SIDE CURTAIN GROUP #1 SETTING

Z1-S01

Purge Opening Size (Inches): 6



Some curtains overlap the opening edge by several inches. A few inches of travel may not be enough to produce an opening. Make sure the purge setting allows travel beyond the edge of the opening.

Pre-Open Timer

This menu item allows static-pressure-controlled or proportional-controlled curtains to open in advanced of a timed fan turning on ("timed" includes minimum ventilation cycles). Input the number of seconds, up to one minute, the curtain should start opening prior to the start of a timed fan. The pre-open time alleviates the spike in static pressure that might otherwise occur when fans turn on before curtains are adequately open.



SIDE CURTAIN GROUP #1 SETTING

Z1-S01

Pre-Open Timer: 0:30



Normal static-pressure or proportional control is resumed once the timed cycle begins.



Side Curtain Settings - continued

Curtain Exercise Routine

This feature gives the ability to have the controller fully close the Sidewall curtains after long periods of being fully open. When curtains remain open for long periods of time, it is possible for rodents to build nests in the gathered curtain. This routine will help drive the rodents from the curtain. When the Exercise routine is being performed, the word “Exercising” is added to the Current Status screen of the curtain.

The exercise routine is only available when a curtain is set to one of the natural modes of operation based on temperature. If the curtain is controlled by static pressure or a position based on the number of fans running, then the exercise routine will not be performed and the following menus will not be displayed.

Exercise Delay Days

Set the number of consecutive days the curtain has to be open greater than 50 % before the exercise routine is run. The curtain can not close below 50 % during this period in order for the routine to run. This value has to be greater than 0 before the exercise routine is performed.



SIDE CURTAIN GROUP #1 SETTING

Z1-S01

Exercise Delay Days: 5

Perform Exercise At

Set the time of day the exercise routine should run. At the set time each day, the controller will check how many consecutive days the curtain has been open greater than 50 %. If the number of days matches the Exercise Delay Days, the curtain will be closed completely and then opened again. Setting the time to 24:00 will disable the exercise routine. The Exercise Delay Days has to be greater than 0 for the menu to appear.



SIDE CURTAIN GROUP #1 SETTING

Z1-S01

Perform Exercise At: 0:00

Exercise Aborted

If the exercise routine has not fully opened the curtain after 150% of the Open travel time plus the Close travel time, the routine will abort and return the curtain to natural ventilation mode operation.

Early finish to the exercise routine

Once the curtain has fully closed, three things can happen based on the current curtain temperature:

1. If the temperature is below the curtain's Close Temperature, the curtain will stay fully closed and normal operations will resume.
2. If the temperature is above the Close Temperature but below the Open Temperature, the curtain will open to 50% and normal operations will resume.
3. If the Temperature is above the Open Temperature, the curtain will open fully before normal operations resume.

Maximum Opening Size is ignored during the exercise routine. It is assumed that the temperature is hot enough for days-on-end and the Maximum Open Size Temperature is not in effect.

Curtain Movements at Power Up

When the controller is powered after a reset or power outage, curtains controlled by static pressure will:

- Go into their tunnel mode setting if the temperature is above the Tunnel Entry temperature.
- Fully close if the outside temperature is 10 degrees Fahrenheit (5.5 degrees Celsius) or more below the setpoint temperature. Then the curtains open to their proper opening size.
- Fully open, if the outside temperature is not more than 10 degrees Fahrenheit (5.5 degrees Celsius) below the setpoint temperature. Then the curtains close to their proper opening size.

Ridge Vent Settings



Ridge vents operate in natural mode only so there is no operating mode selection as in other types of inlets.



If you have interlocked ridge vents to curtains (see the Temperature Control Settings section) then only the Calibration, Full Open, Full Open Travel Time, Full Close Travel Time, Purge and Interlock menu items appear.



*Reminder: Ridge Vent Settings are a submenu of DEVICE / EQUIPMENT SETTINGS menu and can be found most quickly by pressing the **SYSTEM SETUP** Hot-Key and then **RIGHT** or **LEFT** arrow key. Use the **UP** and **DOWN** arrow keys to find the submenu for your settings.*

Use Sensors

Input the group numbers of the air sensors you want to use for controlling the ridge vent. The controller uses Shared Sensor Technology to average the temperature readings of any sensors you want to use to control any device.



RIDGE VENT GROUP #1 SETTING

Z1-S01

Use Sensors: ALL

(Avg 74.7)

Opening and Closing Temp

Input the temperatures at which the controller should open and close the ridge vent. When the temperature is at or above the Open Temp, the controller opens the ridge vent as many inches as you designate (see below). When the temperature is at or below the Close Temp, the controller closes the ridge vent as many inches as you designate (see below).



RIDGE VENT GROUP #1 SETTING

Z1-S01

Open Temp: 80.0 Close Temp: 75.0

Open This Distance and Pause

Input the distance the controller should open the ridge vent before pausing. Then input the Pause time. After the Pause time, the controller checks the temperature and determines if it should open the ridge vent more, do nothing, or begin closing it.



RIDGE VENT GROUP #1 SETTING

Z1-S01

Open 12" and Pause: 00:02:00



The controller has a minimum motion time of three seconds. Opening sizes should be set large enough to allow a minimum of three seconds movement from one setting to the next.

Close This Distance and Pause

Input the distance the controller should close the ridge vent before pausing. Then input the Pause time. After the PAUSE time, the controller checks the temperature and determines if it should close the ridge vent more, do nothing, or begin opening it.



RIDGE VENT GROUP #1 SETTING

Z1-S01

Close 12" and Pause: 00:02:00



Ridge Vent Settings - continued

Response Mode

Select a response mode:

Standard – Allows the ridge vent to open and pause for the times you input.

Aggressive – Allows the ridge vent to move faster if the temperature is changing quickly. If the temperature is more than 2 degrees Fahrenheit or Celsius beyond the open or close temperature, the ridge vent opens or closes twice the distance you input and then pauses for only half the time. If the temperature moves further from the open or close temperature, the ridge vent moves further and more often.



RIDGE VENT GROUP #1 SETTING
Response Mode: STANDARD

Z1-S01



Reminder: Press **ENTER**, **UP** or **DOWN** keys to change group or response mode.



or



Calibration



The ridge vents readjust automatically with the control when they open or close completely. When opening or closing fully, the channel is left on and the limit switch of ridge vent will cause the ridge vent to stop moving. If the ridge vent does not close completely in cool conditions, check to make sure the vent has been properly adjusted. After an electrical failure, the controller restarts and assumes ridge vents are half open. Ridge vents readjusts when the controller completely opens or closes them again.

Full Opening Size

Input the full opening size.



RIDGE VENT GROUP #1 SETTING
Full Opening Size (Inches): 14"

Z1-S01

Full Open Travel Time

Input the time it takes for the ridge vent to open completely. The controller uses this time to determine how open the ridge vent is, so enter the exact travel time. If a Position Sensor is attached to the ridge vent, the travel time will be set automatically when the Position Sensor is calibrated.



RIDGE VENT GROUP #1 SETTING
Full Open Travel Time: 0:45

Z1-S01

Full Close Travel Time

Input the time it takes for the ridge vent to close completely. The controller uses this time to determine how closed the ridge vent is, so enter the exact travel time. If a Position Sensor is attached to the ridge vent, the travel time will be set automatically when the Position Sensor is calibrated.



RIDGE VENT GROUP #1 SETTING
Full Close Travel Time: 0:45

Z1-S01

Ridge Vent Settings - continued

Purge Opening Size

The ridge vent can be used as a purge opening for purge fans. This menu item appears only if you have entered purge settings in the Purge Settings menu. Input zero to disable the ridge vent during the purge function. The purge opening size must be large enough to allow at least three seconds of movement.



RIDGE VENT GROUP #1 SETTING
Purge Opening Size (Inches): 4"

Z1-S01

Interlock Curtain Groups

If you have set the Ridge to Curtains Interlock (refer to the Temperature Control Settings section) you can specify the curtain groups here. Interlocking ridge vents to curtains enhances air quality in a building while maintaining good temperature control. When ridge vents are interlocked, their open and close settings are ignored. The interlocked ridge vent attempts to open the same number of inches as the curtain with the largest opening size. For example, a curtain has a maximum opening size of 48 inches, and the ridge vent's maximum opening size is 10 inches. As the curtain opens, the ridge vent will also open the same amount as the curtain. When the curtain is open 10 inches, the ridge vent will be fully open at 10 inches.



RIDGE VENT GROUP #1 SETTING
Interlock Curtain Grps: 1, 2, 3, 0, 0, 0

Z1-S01

Chimney Damper Settings



Input up to six curtain groups.

The chimney damper is a unique device because it contains a fan and an inlet. If you use this type of device, install the fan portion as a ridge fan and the damper portion as a chimney damper.

Proportional Control



The following menu items allow the chimney damper to open or close based on the number of ridge fan groups running. When interlocked fans are disabled due to open curtains (or no ridge fans are installed), the chimney damper opens or closes based on curtain opening size. The chimney damper attempts to open the same number of inches as the curtain with the largest opening size. For example, a curtain has a maximum opening size of 48 inches, and the chimney damper's maximum opening size is 10 inches. When the curtain is open 10 inches, the chimney damper is fully open at 10 inches.

Cool Fan Groups On \ Opening Size



Input the desired chimney damper opening size for each potential number of simultaneously operating ridge fan groups. The fans must be designated as cool in the Operating Mode menu (this includes combinations such as tunnel & cool). You can specify one through nine fan groups. Press SYSTEM SETUP Hot-Key then RIGHT or LEFT arrow. Use the **PLUS** or **MINUS** key to scroll Cool Fans and Open readings.



CHIMNEY DAMPER GROUP #2 SETTING
#01 Cool Fans ON: 0 Open: 0

Z1-S01



or



CHIMNEY DAMPER GROUP #1 SETTING
#02 Cool Fans ON: 1 Open: 3

Z1-S01



*When variable speed ridge fans are installed, they can be entered in 0.5 increments to account for ramping operating speeds. Press the **PLUS** or **MINUS** keys when this menu item is displayed to change the setting number (one through nine).*



Chimney Damper Settings - continued

Interlock to Fan



This is an extension of the Cool Fan Groups On / Opening Size menu item. Instead of opening a chimney damper based on the number of fans running, you can interlock specific ridge fans with a chimney damper. That way, the chimney damper opens based on interlocked ridge fans.



CHIMNEY DAMPER GROUP #1 SETTING
Natural Interlock 1 to: Ridge Fan #1

Z1-S01

Interlock up to nine specific ridge fan groups with a chimney damper. Press the **PLUS** or **MINUS** key to change the Interlock number (one through nine). This menu item only allows selection of ridge fans whose “Use for Proportional Control” setting is YES. You can select each fan group only once for each chimney damper.

Calibration



The chimney dampers adjust themselves automatically with the controller when they open or close completely. When opening or closing fully, the channel is left on and the limit switch of the chimney dampers will cause the chimney dampers to stop moving. If the chimney dampers does not close completely in cool conditions, check to make sure the manual winch has been properly adjusted.

Full Opening Size

Input the full opening size.



CHIMNEY DAMPER GROUP #1 SETTING
Full Opening Size (Inches): 14”

Z1-S01

Full Open Travel Time

Input the time it takes for the chimney damper to open completely. The controller uses this time to determine how open the damper is, so enter the exact travel time. If a Position Sensor is attached to the Chimney Damper, the travel time will be set automatically when the Position Sensor is calibrated.



CHIMNEY DAMPER GROUP #1 SETTING
Full Open Travel Time: 0:45

Z1-S01

Full Close Travel Time

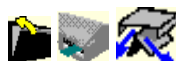
Input the time it takes for the chimney damper to close completely. The controller uses this time to determine how closed the damper is, so enter the exact travel time. If a Position Sensor is attached to the Chimney Damper, the travel time will be set automatically when the Position Sensor is calibrated.



CHIMNEY DAMPER GROUP #1 SETTING
Full Close Travel Time: 0:45

Z1-S01

Sidewall, Tunnel & Ceiling Inlet Settings



Inlets are typically a proportionally controlled device so the menu items Open this distance and Close this distance are not used. Instead, when an inlet needs to open or close more, the proportional control or static pressure control settings are used. *Reminder: The Inlets are listed under the DEVICE / EQUIPMENT SETTINGS menu.*



DEVICE / EQUIPMENT SETTINGS
PRESS ENTER TO VIEW SETTINGS

Z1-S01



The controller has a minimum motion time of three seconds. Opening sizes should be set large enough to allow a minimum of three seconds movement from one setting to the next.

Static Pressure Pause Timer

Input the time the inlet should pause after it moves due to a change in static pressure. The pause time prevents the inlet from responding too often to changes in static pressure. This menu item appears only when the inlet is set up to run according to static pressure. If the inlet moves too often, try increasing the time entered here. **The following display screens use readings from one of each three inlet groups. The inlet groups are all the same, so for the purpose of space, we have used some from each group.**



SIDEWALL INLET GROUP #1 SETTING
Static Pressure Pause Timer: 0:15

Z1-S01

Operating Mode

Refer to the *Operating Modes* section for a list of operating modes.



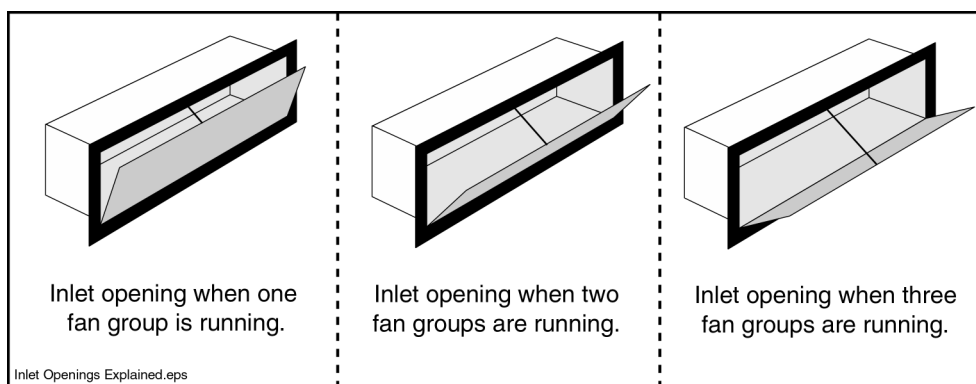
SIDEWALL INLET GROUP #1 SETTING
Operate as: Temp Natural Only

Z1-S01

Proportional Control



The following menu items allow the inlet to open proportionately to fans set up for proportional control. Natural inlets typically open proportionately to the fans. You must use a static pressure sensor (even if you don't plan on using one with the controller) to set up the inlet openings for each stage of fan ventilation. Measure the static pressure while one fan group is running and adjust the inlet opening until the static pressure is at the correct level. Record the inlet opening size. Next, measure the static pressure while two fan groups are running and adjust the inlet opening until the static pressure is at the correct level. Repeat the process until all of the fan groups are running.





Sidewall, Tunnel & Ceiling Inlet Settings - continued

Cool Fan Groups On \ Opening Size

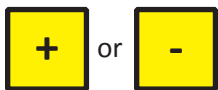


Input the desired inlet opening size for each potential number of simultaneously operating cool fan groups. Fans are designated as cool in the Operating Mode menu (this includes combinations such as tunnel & cool). You can specify zero (a minimum opening size) through nine fan groups.

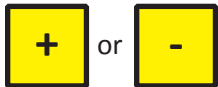
When variable speed fans are installed, they can be entered in 0.5 increments to account for ramping operating speeds.



CEILING INLET GROUP #1 SETTING		Z1-S01
#01	Cool Fans ON: 0.0 Open: 0.0	



CEILING INLET GROUP #1 SETTING		Z1-S01
#02	Cool Fans ON: 0.5 Open: 12.0	



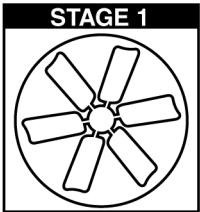
CEILING INLET GROUP #1 SETTING		Z1-S01
#03	Cool Fans ON: 1.0 Open: 24.0	

Press the **PLUS** or **MINUS** keys when this menu item is displayed to change the setting number (one through nine).

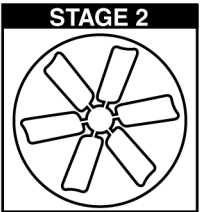


If there is no “0 Cool Fans ON” position, the inlet will NOT open until the fan setting specified by the first ramp position table entry is reached. The zero position allows the controller to interpolate between zero and the next specified Fans ON position.

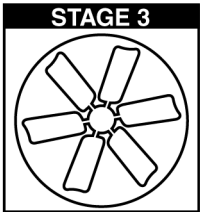
Variable Speed Fan Power Settings



Full Power = 30



Full Power = 30



Full Power = 30

Even though the variable speed fans in this example reach full power at 30, the controller considers each fan as “0.5” since the potential full power setting is 60. Refer to the *Fan Settings* section for more information about Full Power Setting.

#01	Tunnel Fans ON: 0.0	Open	0.0"
#02	Tunnel Fans ON: 0.5	Open	12.0"
#03	Tunnel Fans ON: 1.0	Open	24.0"
#04	Tunnel Fans ON: 1.5	Open	36.0"

Tunnel VS Fan Settings.eps

Sidewall, Tunnel & Ceiling Inlet Settings - continued

Natural Interlock to Fan

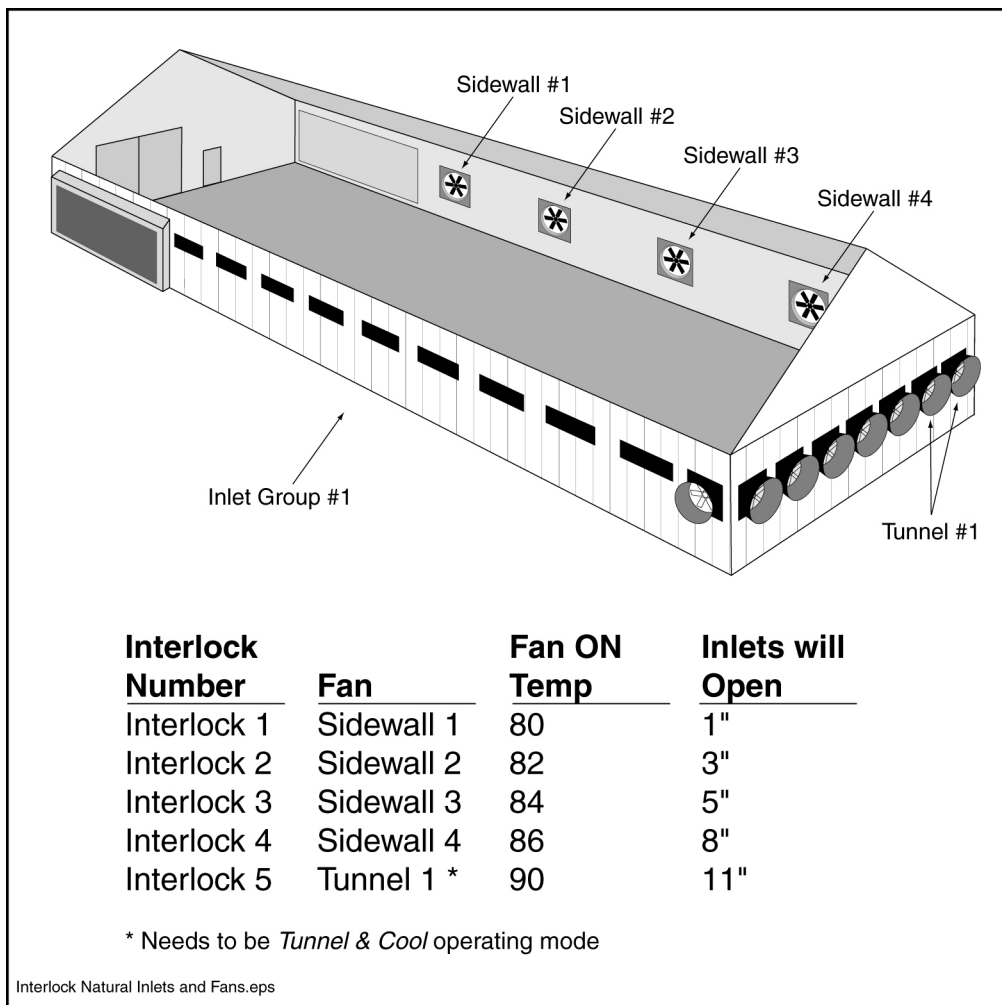
This is an extension of the Cool Fan Groups On / Opening Size menu item. Instead of opening an inlet based on the number of fans running, you can interlock specific fans with inlets (open the inlet based on the number of interlocked fans running).



TUNNEL INLET GROUP #1 SETTING
Natural Interlock 1 to: Sidewall Fan#1

Z1-S01

You can interlock up to nine fan groups with an inlet. Press the **PLUS** or **MINUS** key to change the Interlock number (one through nine). This menu item limits the fan groups counted when determining the appropriate position of the inlet (refer to the previous Fan Groups On / Opening Size Menu). This menu item only allows selection of installed fans whose "Use for Proportional Control" setting is YES.





Sidewall, Tunnel & Ceiling Inlet Settings - continued

Tunnel Fans Groups On \ Opening Size

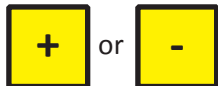
Input the desired inlet opening size for each potential number of simultaneously operating tunnel fan groups. Fans are designated as tunnel in the Operating Mode menu (this includes combinations such as tunnel & cool). You can specify zero (a minimum opening size) through nine fan groups.



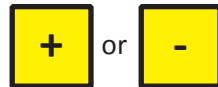
Variable speed tunnel fans can be entered in 0.5 increments to account for ramping operating speeds.



TUNNEL INLET GROUP #1 SETTING	Z1-S01
#01 Tunnel Fans ON: 0.0 Open: 0.0	



TUNNEL INLET GROUP #1 SETTING	Z1-S01
#02 Tunnel Fans ON: 0.5 Open: 12.0	



TUNNEL INLET GROUP #1 SETTING	Z1-S01
#03 Tunnel Fans ON: 1.0 Open: 24.0	

Press the **PLUS** or **MINUS** keys when this menu item is displayed to change the setting number (one through nine).

If there is no “0 Tunnel Fans ON” position, the inlet will NOT open until the fan setting specified by the first ramp position table entry is reached. The zero position allows the controller to interpolate between zero and the next specified Fans ON position.

Tunnel Interlock to Fan

This is an extension of the Tunnel Fan Groups On / Opening Size menu item. Instead of opening an inlet based on the number of fans running, you can interlock specific tunnel fans with inlets (open the inlet based on the number of interlocked fans running).

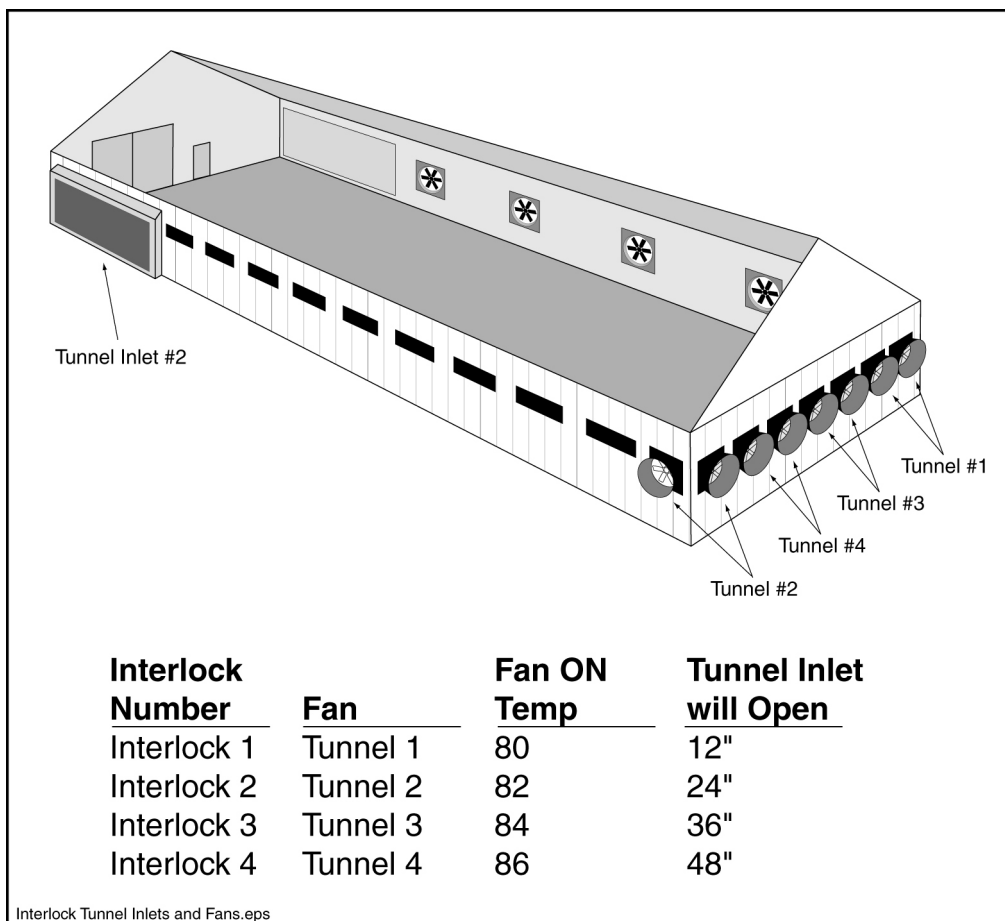


TUNNEL INLET GROUP #1 SETTING	Z1-S01
Tunnel Interlock 1 to: Tunnel Fan#1	



*You can interlock up to nine fan groups with an inlet. Press the **PLUS** or **MINUS** key to change the Interlock number (one through nine). This menu item limits the fan groups counted when determining the appropriate position of the inlet (refer to the previous Fan Groups On / Opening Size Menu). This menu item only allows selection of installed fans whose “Use for Proportional Control” setting is YES.*

Sidewall, Tunnel & Ceiling Inlet Settings - continued



You can select each fan group only once for each inlet.

Calibration



The inlets adjust themselves automatically with the controller when they open or close completely. When opening or closing fully, the channel is left on and the limit switch of the inlets will cause the inlet to stop moving. If the inlet does not close completely in cool conditions, check to make sure the manual winch has been properly adjusted.

Full Opening Size

Input the full opening size. If a Position Sensor is attached to the Inlet, the travel time will be set automatically when the Position Sensor is calibrated.



TUNNEL INLET GROUP #1 SETTING

Z1-S01

Full Opening Size (Inches): 12

Full Open Travel Time

Input the time it takes for the inlet to open completely. The controller uses this time to determine how open the inlet is, so enter the exact travel time. If a Position Sensor is attached to the Inlet, the travel time will be set automatically when the Position Sensor is calibrated.



TUNNEL INLET GROUP #1 SETTING

Z1-S01

Full Open Travel Time: 1:00



Sidewall, Tunnel & Ceiling Inlet Settings - continued

Full Close Travel Time

Input the time it takes for the inlet to close completely. The controller uses this time to determine how closed the inlet is, so enter the exact travel time.



TUNNEL INLET GROUP #1 SETTING

Z1-S01

Full Close Travel Time: 1:00

Purge Opening Size

The inlet can be used as a purge opening for purge fans. This menu item appears only if you have entered purge settings in the Purge Settings menu. Input zero to disable the inlet during the purge function. The purge opening size must be large enough to allow at least three seconds of movement.



TUNNEL INLET GROUP #1 SETTING

Z1-S01

Purge Opening Size (Inches): 6

Pre-Open Timer

This menu item allows static-pressure-controlled or proportional-controlled inlets to open in advanced of a timed fan turning on ("timed" includes minimum ventilation cycles). Input the number of seconds, up to one minute, the inlet should start opening prior to the start of a timed fan. The pre-open time alleviates the spike in static pressure that might otherwise occur when fans turn on before inlets are adequately open.



TUNNEL INLET GROUP #1 SETTING

Z1-S01

Pre-Open Timer: 0:30

Normal static-pressure or proportional control resumes once the timed cycle begins.

Inlet Movements at Power Up

When the controller is powered after a reset or power outage, inlets controlled by static pressure will:

- Go into their tunnel mode setting if the temperature is above the Tunnel Entry temperature.
- Fully close if the outside temperature is 10 degrees Fahrenheit (5.5 degrees Celsius) or more below the setpoint temperature. Then the inlets will open to their proper opening size.
- Fully open, if the outside temperature is not more than 10 degrees Fahrenheit (5.5 degrees Celsius) below the setpoint temperature. Then the inlets will close to their proper opening size.



The controller checks the inside air sensors if no outside air sensor is installed.

Furnace, Heater & Brooder Settings



Reminder: The Furnace, Heater and Brooder Settings are listed under the DEVICE / EQUIPMENT SETTINGS menu.



DEVICE / EQUIPMENT SETTINGS
PRESS ENTER TO VIEW SETTINGS

Z1-S01

Use Sensors

Input the group numbers of the air sensors you want to use for controlling the furnace, heater or brooder. The controller uses Shared Sensor Technology to average the temperature readings of any sensors you want to use to control any device.



FURNACE GROUP #2 SETTING
Use Sensors: ALL

(Avg 74.7)

Z1-S01

On and Off Temps

Press ENTER to input the temperature at which the controller should turn on the furnace, heater or brooder. Press ENTER again to input the temperature at which the controller should turn the device off.



FURNACE GROUP #2 SETTING
ON Temp: 71.0 OFF Temp: 75

Z1-S01

Interlock Curtain Groups

If you have set the Heater to Curtains Interlock (refer to the Temperature Control Settings section) specify the curtain (and ridge vent) groups here. When interlocking is enabled for heaters (and brooders and furnaces), and the controller detects that the heater's ON Temp has been reached, the heater will not turn on if the interlocked curtains are open more than about one inch.



FURNACE GROUP #2 SETTING
Interlock Curtain Grps: 1, 2, 3, 0, 0, 0

Z1-S01



Input up to six curtain groups. Enter all zeros to interlock the heater with all groups.

Use During Heat Purge

Set Use During Heat Purge to YES to have this heater used to heat the building before a purge. (See Purge Settings for more information)



FURNACE GROUP #2 SETTING
Use During Heat Purge: Yes

Z1-S01



Cool Pad, Mister & Fogger Settings

Reminder: The Cool Pad, Mister and Fogger Settings are listed under the DEVICE / EQUIPMENT SETTINGS menu..



DEVICE / EQUIPMENT SETTINGS
PRESS ENTER TO VIEW SETTINGS

Z1-S01

Use Sensors

Input the group numbers of the air sensors you want to use for controlling the cool pad, mister or fogger (mister or fogger is not available as a menu item on some controllers). The controller uses Shared Sensor Technology to average the temperature readings of any sensors you want to use to control any device.



COOL PAD LOW GROUP #5 SETTING

Z1-S01

Use Sensors: ALL

(Avg 74.7)

Time of Day to Enable / Disable

The cool pad, mister or fogger (evaporative cooling devices) can be enabled for a certain period of day to prevent having the device turned on at an undesirable time. The device only operates between the enable and disable times. The times input here must be in a 24 hour clock format.



COOL PAD LOW GROUP #5 SETTING

Z1-S01

Time of Day Enable: 11:40 Disable: 19:00

Humidity Disable / ReEnable

Evaporative cooling loses its effectiveness as humidity inside the building increases. Input a relative humidity level at which evaporative cooling should be disabled. Then, input the level at which evaporative cooling will be re-enabled.



COOL PAD LOW GROUP #5 SETTING

Z1-S01

HUMIDITY Disable: 85% ReEnable: 75%

When the humidity reaches the Disable value, the evaporative cooling device remains disabled until the humidity drops to the ReEnable value. Set the Disable or ReEnable value to 100 percent to have the controller ignore the disable/re-enable feature entirely.



To use this feature, the controller must have a humidity sensor attached.

Stress Index Disable

Either high temperature or high humidity can stress animals, but a combination of high temperature and high humidity is very stressful and it can be deadly. The combination of humidity plus temperature is called the stress index.

Input a stress index level at which evaporative cooling should be disabled. Then, input a stress index level at which evaporative cooling will be re-enabled.



COOL PAD LOW GROUP #5 SETTING

Z1-S01

TEMP+HUMIDITY Disable: 160 ReEnable 140

A chart on the next page illustrates how combinations of temperature and humidity produce a Stress Index of 175.

Cool Pad, Mister and Fogger Settings - continued

This chart illustrates how different combinations of temperature and humidity produce a Stress Index of 175.

Degrees Fahrenheit	+ Relative Humidity	= Stress Index
75	100	175
80	95	175
85	90	175
90	85	175
95	80	175
100	75	175
105	70	175
110	65	175

Set the Disable or ReEnable value to 220 to have the controller ignore the disable/enable feature entirely.

To enable this feature, an air sensor and humidity sensor must be installed.

Full On and Off Temp

The FULL ON Temp is the temperature at which the controller should turn on evaporative cooling continuously. When the temperature is between the OFF Temp and the FULL ON Temp, the cycle table is used (see below).



COOL PAD LOW GROUP #5 SETTING
FULL ON Temp: 88.0 OFF Temp: 75.0

Z1-S01

Cycle On Temp and On/Off Timers

When the temperature is between the OFF Temp and the FULL ON Temp, the controller scans the on temperature values input here. It locates the current temperature and uses the ON and OFF timers specified for that temperature. If Cycle Timers are not set up, the controller simply uses the FULL ON Temp and the OFF Temp.

Cycle one should be the lowest temperature and cycle four should be the highest. The cycle one temperature is usually slightly higher than the OFF Temp.

Setting the ON and OFF timers to any non-zero value enables their operation. When the ON timer is complete, the OFF timer starts running. When it is complete, the ON timer starts again. This cycle repeats for as long as the cycle timer is on.



COOL PAD LOW GROUP #5 SETTING
Cycle #1 ON Temp: 76.5

Z1-S01



COOL PAD LOW GROUP #5 SETTING
Cycle #1 Timer ON: 0:01:00 OFF: 0:00:30

Z1-S01

Press the **PLUS** and **MINUS** keys to navigate through cycles 1 through 4. Input an ON TEMP as well as the ON and OFF times for each cycle you want to use.

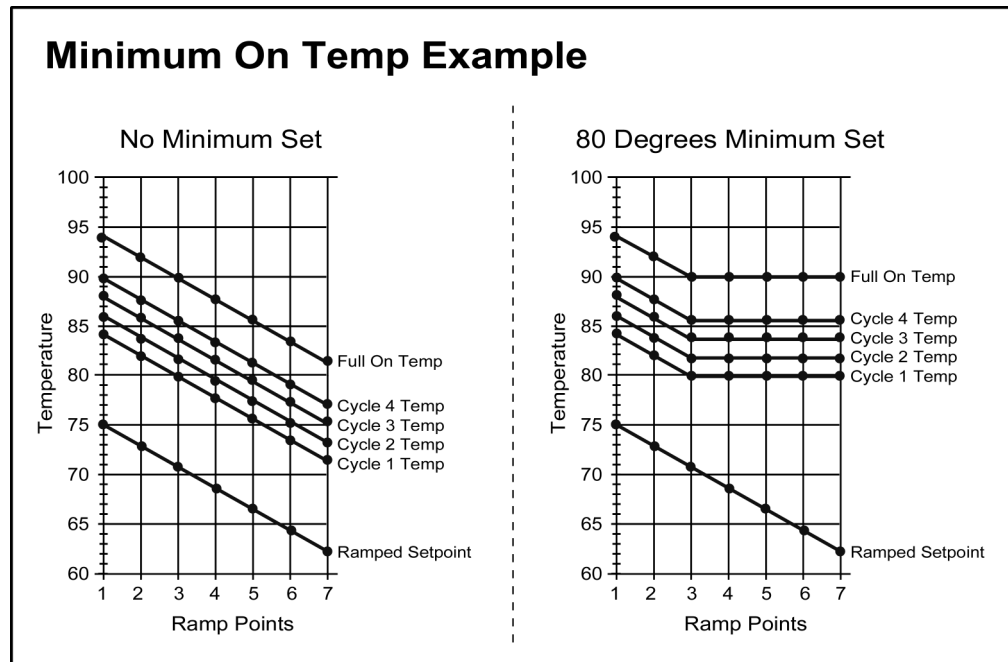


Cool Pad, Mister and Fogger Settings - continued

Minimum On Temp

As the temperature ramps down over the growing period (assuming you use the temperature ramping feature), you may reach a temperature at which evaporative cooling should not be used. Specify a Minimum On Temp for the evaporative cooling devices. If you have set up staged cycles for a device, the minimum is applied to Cycle 1. The temperature differences for the other cycles are maintained (cycle one should be set up as the lowest temperature when you use cycles).

The following charts illustrate the effect of using a Minimum On Temp for an evaporative cooling device.



The device will not turn on unless the temperature is at or above the temperature you input here.



COOL PAD LOW GROUP #5 SETTING

Z1-S01

Minimum On Temp: 80.0

The next menu item is the current On Temps for each evaporative cooling cycle. The last temperature displayed is the current Full On Temp. The Full On Temp is also influenced by the Minimum On Temp.



COOL PAD LOW GROUP #5 SETTING

Z1-S01

Min Temps: 84.0, 86.0, 88.0, 90.0, 94.0

Stir, Sidewall, Tunnel, Pit and Ridge Fan Settings

(Includes: Vari-Stir, Vari-Side, Vari-Tunnel, Vari-Pit and Vari-Ridge)

Introduction

This section provides information for fixed-speed fans and variable-speed fans *which have the same functions/screens available. Any exceptions are appropriately listed.* Menu items specific only to variable speed fans, *in the screen examples to follow*, have the variable-speed fan symbol next to them.

Reminder: The Fan Settings are listed under the DEVICE / EQUIPMENT SETTINGS menu.



DEVICE / EQUIPMENT SETTINGS
PRESS ENTER TO VIEW SETTINGS

Z1-S01

Use Sensors

Input the group numbers of the air sensors you want to use for controlling the fan group. The controller uses Shared Sensor Technology to average the temperature readings of any sensors you want to use to control any device.



STIR FAN GROUP #1 SETTING
Use Sensors: ALL

Z1-S01

(Avg 74.7)

Operating Mode

Each fan can operate in one of nine different operating modes:

Cool – The fan exhausts hot air from the building. The fan turns on when the temperature rises to the ON temperature and turns off when the building cools to the OFF temperature (if set up to run on temperature).

Heat – The fan blows hot air into the building from a warmer area. The fan turns on at a low temperature set as the ON temperature and turns off at a higher temperature set as the OFF temperature.

Purge – The fan runs during a purge cycle to clear humidity, ammonia, and bad air from the building. The fan runs based on the purge settings you entered in the Purge Settings menu.

Cool & Purge – The fan runs in cool mode when the temperature is at or above the fan's ON temperature and during purge cycles when the temperature is below the ON temperature.

Heat & Purge – The fan runs in heat mode when the temperature is below the fan's ON temperature and during purge cycles when the temperature is above the ON temperature.

Tunnel – The fan runs during tunnel mode. Tunnel mode moves air from the tunnel inlets, through the building, and out through the tunnel fans. It closes all natural sidewall inlets and curtains. Typically, more groups of tunnel fans turn on as the temperature rises.

Tunnel & Cool – The fan runs in cool mode when the temperature is below the Tunnel Entry temperature (refer to the Temperature Control Setting section) and in tunnel mode when the temperature is at or above fan's ON temperature.

Tunnel & Purge – The fan runs during purge cycles when the temperature is below the Tunnel Entry temperature and in tunnel mode when the temperature is at or above the fan's ON temperature.

Tunnel, Cool, Purge – The fan runs during purge cycles when the temperature is below the ON temperature, in cool mode when the ON temperature is reached, and in tunnel mode when the temperature is at or above the fan's ON temperature.



TUNNEL FAN GROUP #3 SETTING
Operating Mode: Tunnel, Cool, Purge

Z1-S01



Stir, Sidewall, Tunnel, Pit and Ridge Fan Settings - continued

Fan On and Off Temps

Input the temperatures at which the fan group should turn on and turn off. *Note the use of variable speed fans below.*



VARI - TUNNEL FAN GROUP #1 SETTING	Z1-S01
ON Temp: 71.0 OFF Temp: 70.0	

Fan On Power Setting

Input a value from 0 (off) to 60 (full power) for the power level the fan should operate at when the temperature is at or above the ON Temp.



VARI - TUNNEL FAN GROUP #1 SETTING	Z1-S01
Fan ON Power Setting: 25	

Test the power setting as you adjust it by selecting YES when prompted. Press the **PLUS** or **MINUS** keys to switch between YES and NO.



VARI - TUNNEL FAN GROUP #1 SETTING	Z1-S01
Test New Power Setting: YES	



VARI - TUNNEL FAN GROUP #1 SETTING	Z1-S01
Fan ON Power Setting: 25	



The RPM of most PSC type fan motors is controlled by varying the amount of power (voltage) applied. The way a PSC motor responds to a given power setting varies considerably between fan motor manufacturers. One motor may require a setting of 50 to run at full speed while another just 35.

Fans always get a five second full power burst (see the Full Power Setting menu item) at start up before adjusting to the specified power setting.

Power Ramp Starting Temp

Input the temperature at which power ramping should start. The power level of a variable speed fan ramps up and down as the temperature fluctuates. The power level fluctuates from the "Fan On Power Setting" (see above), when the temperature is at this setting, to the "Full Power Setting" (see below).



VARI - STIR FAN GROUP #1 SETTING	Z1-S01
Power Ramping Start Temp: 73.0	

Full Power Temp

Input the temperature at which the fan group should be operating at the FULL Power Setting (see below).



VARI - STIR FAN GROUP #1 SETTING	Z1-S01
FULL Power Temp: 80.0	

Full Power Setting

Input the power setting value the fan group should operate at when the FULL Power Temp is reached (see above).



VARI - STIR FAN GROUP #1 SETTING	Z1-S01
Full Power Setting: 50	

Test the power setting as you adjust it by selecting YES when prompted. Press the PLUS or MINUS keys to switch between YES and NO.

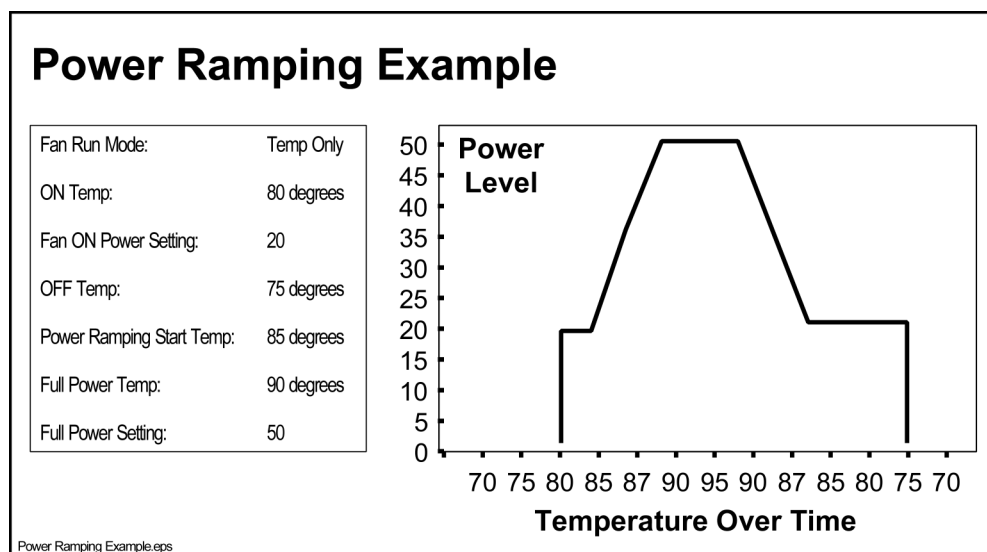


VARI - STIR FAN GROUP #1 SETTING	Z1-S01
Test New Power Setting: YES	

Stir, Sidewall, Tunnel, Pit and Ridge Fan Settings - continued

Power Ramping Example

The graph below shows how the fan power automatically adjusts as the building temperature rises from 70 degrees to 95 degrees and falls back to 70 degrees again.



Observe that fan power stays at zero until the ON Temp is reached. As temperature falls the power stays at the Fan ON Power setting until the OFF Temp is reached.

Fan Run Mode

Each fan can operate in one of five different run modes. The ON/OFF temperature descriptions below assume “cool” fans. Reverse the description for “heat” fans.

Temp Only – The fan runs when the temperature is at or above the ON temperature. The fan turns off when the temperature is at or below the OFF temperature.

Timed Only – The fan cycles on and off continuously based on the ON and OFF times you input.

Temp or Timed – The fan runs according to temperature control when the temperature is at or above the ON setting. The fan runs according to timed setting when the temperature drops back to or below the OFF setting.

Temp and Timed – The fan runs according to the timed settings when the temperature is at or above the ON setting. When the temperature drops back to or below the OFF setting, the fan does not operate.

Temp or Minimum Ventilation – The fan runs according to temperature control when the temperature is at or above the ON setting. The fan runs according to the minimum ventilation times (entered in the Minimum Ventilation and Purge Settings menu) when the temperature drops back to or below the OFF setting. This mode does not appear when only stir fans are being used.



VARI - TUNNEL FAN GROUP #1 SETTING
Run Mode: Temp and Timed

Z1-S01

Fan On and Off Timers

This item is for timed fans. Input the number of hours, minutes and seconds (up to nine hours) you want the fan group to run when in a timed mode. Then, input the number of hours, minutes and seconds (up to nine hours) you want the fan group to remain off after the ON Timer is complete.



VARI - TUNNEL FAN GROUP #1 SETTING
ON Timer: 0:10:00 OFF Timer: 0:10:00

Z1-S01



Stir, Sidewall, Tunnel, Pit and Ridge Fan Settings - continued

Timed Power Setting

This item is for timed fans. Input the power setting that should be used when the fan is operated on time.



VARI - TUNNEL FAN GROUP #1 SETTING
Timed Power Setting: 40

Z1-S01

Test the power setting as you adjust it by selecting YES when prompted. Press the **PLUS** or **MINUS** keys to switch between YES and NO.



VARI - TUNNEL FAN GROUP #1 SETTING
Test New Power Setting: YES

Z1-S01

Purge Mode Power Setting

Input the power setting that should be used for this fan when the building is in purge mode.



VARI - TUNNEL FAN GROUP #1 SETTING
Purge Mode Power Setting: 50

Z1-S01

Test the power setting as you adjust it by selecting YES when prompted. Press the **PLUS** or **MINUS** keys to switch between YES and NO.



VARI - TUNNEL FAN GROUP #1 SETTING
Test New Power Setting: YES

Z1-S01

Run While ENTRY/EXIT of Tunnel Mode

Select this feature when you want the fan group to run while the building transitions into or out of tunnel mode. Typically, several fans are allowed to run during the transition to continue effective ventilation. Too many fans can create excessive suction and cause inlets to stick shut.



VARI - TUNNEL FAN GROUP #1 SETTING
Run While ENTRY/EXIT of Tunnel Mode?:YES

Z1-S01

Use for Proportional Control

Select this feature when you want the fan group to be used in proportional control. When a fan group is included in proportional control, it is counted in determining the total number of fan groups running. The total number of running fan groups determines the positioning of inlets and curtains. Refer to the Curtain Settings and Inlet Settings sections for more information about proportional control.



VARI - TUNNEL FAN GROUP #1 SETTING
Use for Proportional Control?: YES

Z1-S01



Stir fans cannot be used for proportional control since they are not designed to produce negative static pressure in a building.

Stir, Sidewall, Tunnel, Pit and Ridge Fan Settings - continued

Curtain Open Size Inhibits Fans

In buildings where curtains, inlets and fans are used, it may be desirable to inhibit a fan group when any curtain\inlet is open enough to provide natural ventilation. This is especially useful in applications where ridge fans are used. This menu item only appears when a position sensor or whisker switch is installed on at least one curtain or inlet and there are no active out-of-position alarms. Input an opening size at which the fan group should be disabled.



VARI - TUNNEL FAN GROUP #1 SETTING	Z1-S01
Fans OFF at Curtain Opening of: 24"	

Override Fans Off

This menu item is an extension of the Fans Off menu item described above. When the temperature reaches the value you input here, the fan group resumes operation according to its time and temperature settings. The temperature input here changes daily if a temperature ramp table is set up.



VARI - TUNNEL FAN GROUP #1 SETTING	Z1-S01
Fan OVERRIDE Curtain Open Temp: 95.0	

Using certain curtains\inlets to determine if fan should run

By default the Fans Off setting is determined by any curtain. If any curtain opens above the Fans Off setting, the fan will shut off.



VARI - TUNNEL FAN GROUP #1 SETTING	Z1-S01
Looking At(1): All Sidewall Curtains	



It is possible to change this default behavior. Set the Looking At menus to select up to 4 different curtains and inlets to be used to determine if the fan should be running. Only curtains/inlets that have a position sensor and/or a whisker switch attached can be used.

VARI - TUNNEL FAN GROUP #1 SETTING	Z1-S01
Looking At(1): Side Curtain#1	

VARI - TUNNEL FAN GROUP #1 SETTING	Z1-S01
Looking At(2): Sidewall Inlet#1	

VARI - TUNNEL FAN GROUP #1 SETTING	Z1-S01
Looking At(3): Ridge Vent#1	

VARI - TUNNEL FAN GROUP #1 SETTING	Z1-S01
Looking At(4): Not Used	

A good example for using this would be to allow Pit fans in a hog barn to turn off when the inlets are open enough to allow circulation of air.

Warning:



“Use For Proportional Control” should be set to NO for this fan, if you set one of the Looking At settings to an inlet that uses the number of running fans to determine the opening size. Having this set to YES can cause the fan to turn on and off and the inlet to open and close constantly.





Lights Settings

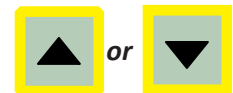


Age, On Time and Off Time

30 time slots are provided to allow turning the lights on and off based on the age of the animals. To set the timer slots, enter the age of the animals the time slot should be used for and then enter the times to turn on and off the lights. The on and off times use a 24-hour clock format. To set a light group for continuous on, set the ON time to 00:00 and the OFF time to 24:00.



Reminder: Press **UP** or **DOWN** keys to change the Setting number.
Press **ENTER** to set desired number, then flashing cursor will move to next value.



CONTROL SETTINGS	▶	DEVICE / EQUIPMENT SETTINGS PRESS ENTER TO VIEW SETTINGS	Z1-S01
ENTER	▶	▼	LIGHTS GROUP #1 TIMER SETTING Setting #1 Age= 5 ON= 9:00 OFF=13:00
		▼	LIGHTS GROUP #1 TIMER SETTING Setting #2 Age= 5 ON=15:00 OFF=20:00
		▼	LIGHTS GROUP #1 TIMER SETTING Setting #3 Age= 10 ON=12:00 OFF=14:00

You can enter as many time slots per age as are available. There is no incremental ramping of the times between age settings. The program uses the time slots with the oldest Age setting that is less than or equal to the current animal age and uses those Age slots to control the lights. Example: In the images above, the controller will use time slots #1 and #2 from Age 5 to Age 9. At Age 10, the controller will use time slot #3. *There are a total of 30 slots, "Settings #1 - #30" available.)*



You can enter the time slots in any order you want. Shortly after you enter the information, the controller will sort the time slots from the earliest Age to the oldest Age.

Feeder Settings



Age, On Time and Off Time

30 time slots are provided to allow turning the Feeders on and off based on the age of the animals. To set the timer slots, enter the age of the animals the time slot should be used for and then enter the times to turn on and off the feeders. The on and off times use a 24-hour clock format. To set a feeder group for continuous on, set the ON time for to 00:00 and the OFF time to 24:00. Press the UP and DOWN arrow keys to change the Setting number.

CONTROL SETTINGS		DEVICE / EQUIPMENT SETTINGS Z1-S01	
		PRESS ENTER TO VIEW SETTINGS	
ENTER		+	FEEDER GROUP #1 SETTING Z1-S01 Setting #1 Age= 5 ON= 9:00 OFF=13:00
		+	FEEDER GROUP #1 SETTING Z1-S01 Setting #2 Age= 5 ON=15:00 OFF=20:00
		+	FEEDER GROUP #1 SETTING Z1-S01 Setting #3 Age= 10 ON=12:00 OFF=14:00

You can enter as many time slots per age as are available. There is no incremental ramping of the times between age settings. The program uses the time slots with the oldest Age setting that is less than or equal to the current animal age and uses those Age slots to control the lights. Example: In the images above, the controller will use time slot #1 from Age 5 to Age 9. At Age 10, the controller will use time slot #2.

You can enter the time slots in any order you want. Shortly after you enter the information, the controller will sort the time slots from the earliest Age to the oldest Age.



Test Control Center Hardware

TEST

This menu allows you to test the input and output channels of the controller. After selecting the Test Control Center Hardware menu, press the DOWN arrow key to enter the test menu.

TEST

TEST CONTROL CENTER HARDWARE

Z1-S01

Press MENU DOWN to enter test menu !!!

Continue to press the **DOWN** arrow key to scroll through the tests (described below). Press **ENTER** to initiate a test. Any changes you make during this test are terminated after 60 seconds.



TEST ALARM RELAY

Z1-S01

Press ENTER to start ALARM TEST !!!

Test Alarm Relay

This menu item tests the integrity of the controller's alarm relay, and any attached visual or audible warning devices.

ENTER

TEST ALARM RELAY

Z1-S01

Alarm relay is OFF - Press +/- to CHANGE

To energize the alarm relay, press the **PLUS** key. Any installed warning devices should activate.

+

TEST ALARM RELAY

Z1-S01

Alarm relay is ON - Press +/- to CHANGE

To turn off the alarm relay, press the **MINUS** key.

-

TEST ALARM RELAY

Z1-S01

Alarm relay is OFF - Press +/- to CHANGE

Press **CANCEL** to return to the test menu.

CANCEL

TEST CONTROL CENTER HARDWARE

Z1-S01

Press MENU DOWN to enter test menu !!!

Testing continued on next page.

Test Control Center Hardware

Test Outputs

This menu item tests the controller's output relays.

You must have a device installed on a relay before that relay can be tested.

Select which station/module (if applicable) and output channel (called relay on some controllers) to test by scrolling through the station and channel numbers with the **PLUS** and **MINUS** keys. After you've selected an output channel by pressing **ENTER**, the display changes to show you what device is currently installed on that relay.

+	ENTER	TEST OUTPUT of SIDE CURTAIN #01 OUTPUT is OFF – Press +/- to CHANGE Z1-S01
---	-------	---

Turn the output channel on or off by using the **PLUS** and **MINUS** keys *as shown with the Alarm Relay test*. If you are testing an interlocked channel, the controller turns off the sister channel if necessary prior to beginning the test.

Test Inputs

This menu item displays the sensor input as interpreted by the controller.

You must have a device installed on an input before that input can be tested.

This is designed for use by technicians when troubleshooting controller components or sensors. Select which input channel to test by scrolling through the input numbers with the **PLUS** and **MINUS** keys. After you've selected an input by pressing **ENTER**, the display shows the value of the input signal as reported by the analog to digital converter. The value will be a five digit number such as 34056. The controller takes another reading each time you press **ENTER**.

+	ENTER	TEST INPUT of AIR SENSOR #01 Input reading 34285 - ENTER to READ
---	-------	---

Test Output Status

This menu item displays the On/Off status of the output relays. Select which station/module to test by scrolling through the station numbers with the **PLUS** and **MINUS** keys. After you've selected a number by pressing **ENTER**, the display changes to show you the channel numbers of the output relays which are currently on. Flip the toggle switch to verify a channel is working.

OUTPUTS are ON for STA 01 -Press ENTER 1 2 4 7 11 12 16 18 21 24 31 32

*If the display cannot show all the channel numbers of output relays turned on, pressing the **PLUS** and **MINUS** keys to narrow down the channels displayed in increments of ten.*

+	OUTPUTS are ON for STA 01 -Press ENTER 11 12 16 18 21 24 31 32
+	OUTPUTS are ON for STA 01 -Press ENTER 21 24 31 32

Test Digital Input

This test displays the digital inputs that are currently open for the selected station. Press the **PLUS** or **MINUS** keys to select a station number.

+	ENTER	TEST DIGITAL INPUT for STA 1 Press ENTER to display the digital inputs that are currently open.
---	-------	--

Press **ENTER** to display the digital inputs that are currently open.

+	ENTER	INPUTS are OPEN for STA 01 -Press ENTER 1 2 4 6 (Note: 3 and 5 are missing to show they are CLOSED)
---	-------	--



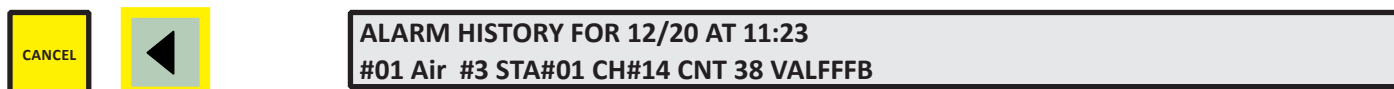
Alarm History

Alarm history displays conditions or events that may cause an active alarm condition. The Error Detail is a long-term record of any type of system, device or building abnormality that provides important information to help evaluate system problems.

Alarm History

The alarm history stores up to 20 of the most recent alarms. An alarm record is created each time a new type of alarm condition is detected. Most alarm conditions require multiple occurrences to activate the alarm relay. All alarm records that are currently active or were previously active will always be displayed. If no key has been pressed for one minute, the display will show the most recent alarm. Pressing **ENTER** while viewing an active alarm clears the alarm condition and changes the display from active alarm to alarm history. Some alarms are automatically cleared when the alarm condition is no longer detected.

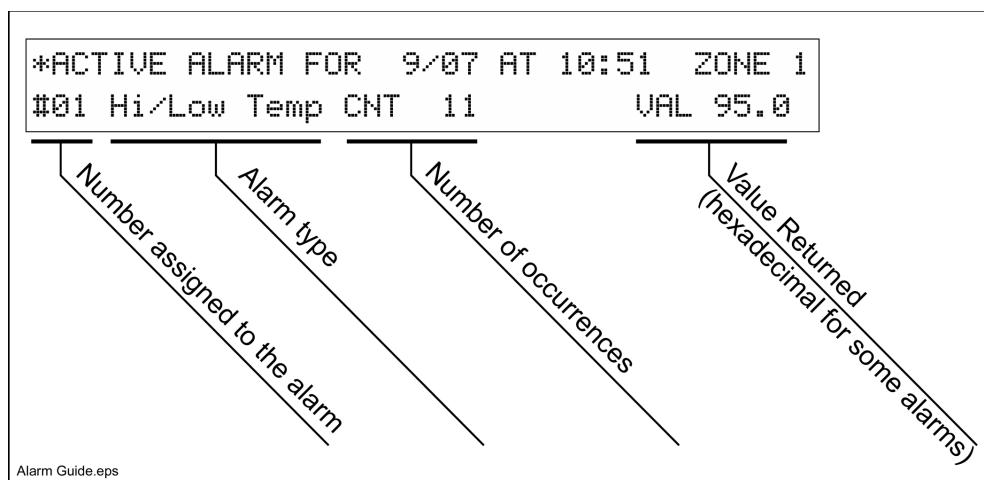
Press **CANCEL** (3) three times (Home Screen) and then the **LEFT** arrow key to Alarm History. This will allow you to get to the alarm screen from any other screen.



Press the **PLUS** and **MINUS** keys to move through the HISTORY of alarms.



- If the control keeps displaying the Alarm History menu but does not display an active alarm, you must use the **PLUS** or **MINUS** keys to scroll through the history and locate the active alarm.
- If the control is idle for over a minute and there is an active alarm, the control will return to the screen above automatically.



“Zone 0” alarms occur when an alarm relates to all zones (if applicable). For example, a possible hardware problem would generate a Zone 0 alarm.

Possible Alarm Conditions on next page.

Possible Alarm Conditions

The following alarms may be displayed. They are not listed in any particular order. The alarms will be displayed in the order that they first occur.

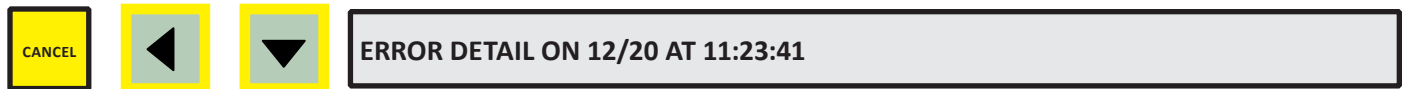
#01 Hi/Low Temp CNT 200 VAL 101.9
Temperature exceeded alarm limits.
#01 Air #01 STA#01 CH#02 CNT251 VALFFFE
Invalid temperature reading from air sensor.
#01 24-Hour Water Used - CNT 2
The total gallons used in the past 24 hours dropped more than the alarm percent drop setting.
#01 ADC5Volt STA#01 ADC:32789 CNT 104
Malfunction in the power supply or analog circuit on the station.
#01 ADC9Volt STA#02 ADC:65531 CNT 20
Malfunction in the power supply or analog circuit on the station.
#01 ADC0Volt STA#03 ADC:32802 CNT 3
Malfunction in the power supply or analog circuit on the station. Possible faulty ground going to the controller or station.
#01 Erase Error: Sctr:04 CNT 1
Error erasing parameters, history, or errors in the system FLASH memory.
#01 Write Error: Sctr:05 Add:1034 CNT 1
Error writing parameters, history, or errors to the system FLASH memory.
#01 Voltage Low CNT 12
A low power condition was detected when updating FLASH memory. The 12 VDC supplied by the control power supply is low. Check input voltage for correct value.
#01 Temp Chg STA01/05 78.1 30.9 CNT 1
An air sensor reading has changed more than 15 degrees Fahrenheit (or about 8.5 degrees Celsius) from the last reading. The new reading is marked with an "*" (to the left of the affected temp reading) in current conditions, and is ignored until it reads within 15 degrees of the previous temperature reading.
#01 Water #2 GPH Exceeds Limit CNT 105
The water flow exceeded the set limit.
#01 Feeder #01 ON Time Exceeded
The feeder run time has exceeded the set limit. This alarm may also show "OFF Time Exceeded" or "Overload Detected" or "No-Load Detected."
#01 W.Dog CNT 1
The program watch dog timer caused the system to reset.
#01 Comm 13 STA#10 CH#11 CNT145
There is an error communicating with portions of the control or other stations (expansion, modem or serial interface).
#01 Low Stat Press CNT 140 VAL 0.250
Static pressure has fallen below the limits you entered. This alarm may also show "High Stat Press" or "Lo Cyc Stat Press" or "Fan Lo Stat Press."
#01 Digital Alarm #1 Activated CNT 130
The digital alarm has been activated.
#01 Sidewall Inlet #1 Out of Position
The position sensor is reporting a device position that is different than what the controller expected based on the device's Open and Close times.
#01 Position Sta 01/05 C: 11.9 A: 75.0
A position sensor or Whisker Switch is reporting a device position that is different than what the controller expected. For a Position Sensor, C is the controller calculated position and A is the position sensor reported position. For a Whisker Switch, C is the controller calculated position and A is the Whisker Switch reported percentage open.
#01 Position Sensor 2 Bad Reading
The position sensor is reporting bad reading. The reported ohms are out of range of the fully open to fully closed ohms.
#01 HUMIDITY STA#01 CH#03 CNT 12 VALC17C
A humidity sensor is giving an invalid reading.



Possible Alarm Conditions - continued

Error Detail

The Error Detail is an activity log for the alarm records. Alarm detail is displayed only when no passwords are set up for the controller, or the user has a level 5 password. Press **CANCEL** (3) three times (Home screen), **LEFT** arrow (alarm History), then **UP** or **DOWN** arrow key.



Information from an alarm record is saved in the error detail under any of the following conditions:

- On the first occurrence of any error or alarm condition.
- On the first occurrence during the current hour.
- When the occurrence of an error causes it to be an active alarm.
- When you manually clear an active alarm.
- When the active alarm is cleared by the system because the error condition (High Temp, Feeder OFF time, etc.) no longer exists.

Updating the controller with a NEW Version of Software

Introduction

Updates to the controller software are done using either a Valco provided SD card, or a Valco provided "update.bin" file. The update will only be performed if the version displayed on the controller doesn't match the version of the update.

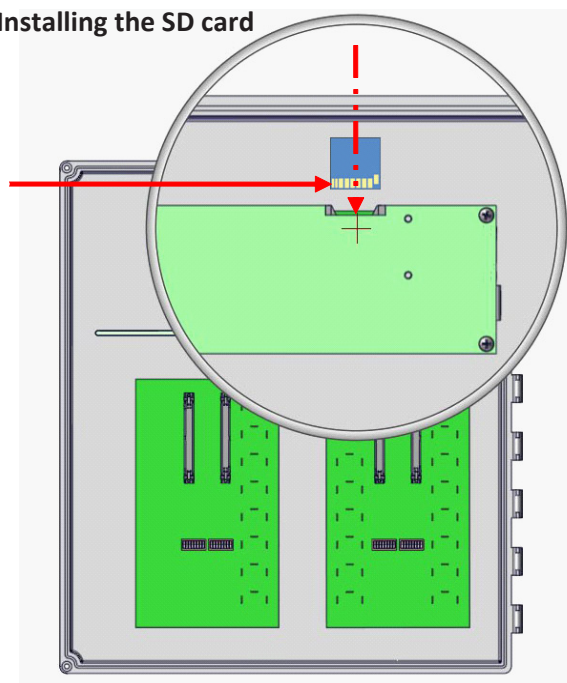
To perform the update, follow one of the procedures below, depending on the type of update received.

Read warnings below before you begin.

If the Update came on an SD card:

1. Disconnect power to the controller.
2. Remove the current SD card from the controller.
3. Insert the new SD card containing the update.
4. Restart the controller.
5. As soon as the update is finished, disconnect power to the controller.
6. Remove the update card.
7. Reinsert the original SD card.
8. Power up the controller and resume operations.

Installing the SD card



if you fail to reinsert the original SD card, the controller will no longer contains your previous history and alarm records.

If the update was provided as a file only (for example, you received the update by email):

1. Disconnect power to the controller.
2. Remove the current SD card from the controller.
3. Using a computer, with an SD card reader, and using a Windows operating system, copy the "update.bin" file to the root directory of the SD card.
4. Reinsert the SD card containing the update file into the controller.
5. Restart the controller.
6. As soon as the update is finished, the controller will resume normal operations.



Removing the SD card without disconnecting the power may cause an "SD Card Error" alarm, if the controller has to access the card while it is removed. Keep the time the controller does not have the SD card installed to a minimum to avoid these alarms.



Warning!



1. **DO NOT shut off the controller while the update is proceeding. Doing so will corrupt the software on the controller and will not work correctly, if at all. If the software becomes corrupted, the controller will have to be updated with a previous version of the software, before it will start working correctly and update process can be resumed.**
2. When working with the SD card, do not delete or rename any of the files on the SD card. These files contain all the information needed to set up and run the controller and also contain all the Alarm and History information of the controller. If these files are deleted or changed in any way, you may have to set up the controller again from the beginning.
3. When updating the controller, manually set the toggle switches for the Output relays as needed to control the environment of the barn. Updating the controller takes approximately 10 minutes. During the update process, the controller is not monitoring or controlling the devices in the barn. Once the update is done, the controller will resume operations and you can set the toggle switches back into their normal operating positions.
4. The Alarm relay is activated during the update and will set off any alarm system attached to the controller.



Updating the Controller in Process - Display Screen Views

Updating of the controller when the versions DON'T MATCH:

When the controller powers up with an update SD card installed, it will compare the version number of the update to the version currently installed. The Update process only takes place if these versions are different.

If the versions do not match, the following screens will be displayed:

Ventra HMI Bootloader v1.00.003
Revisions are not identical

Ventra HMI Bootloader v1.00.003
Validating update file (command 1298)

Ventra HMI Bootloader v1.00.003
Processing update (987 of 1307) *These numbers are examples*

Ventra HMI Bootloader v1.00.003
Update competed successfully



The display screen for non matching versions displays for as long as the controller is processing the information.

Updating of the controller when the versions DO MATCH:

If the software versions match, the following screen will display only briefly:

Ventra HMI Bootloader v1.00.003
Revisions are identical

Since the versions are identical, no update takes place so the controller resumes normal operation. See page 49 for further details of Power Up Sequence.

Start Up Options

When the controller powers up, you have the ability to run some optional procedures before the controller starts to control the environment of the building. These options include:

- Creating a new parameter set.
- Creating a copy of a parameter set from an existing parameter set, either on the same SD card or another SD card.
- Changing the current Parameter Set used by the controller.
- Clearing the alarm records stored in memory.
- Clearing the current hours' history record.

To access the Start Up Options, press **ENTER** a few seconds after the controller starts and the screen below is displayed



Start-up Procedure Option:
Press ENTER to change *(Displays for approximately 2 seconds)*

If you are asked for a password when you press **ENTER**, you will need to enter the Options password before you can continue with the options. See page 142 for information on the Options password.

Start Up Options - continued

The first option allows you to copy an existing Parameter Set, either to the same SD card or to another SD card. Press **ENTER** to skip this option or use the **PLUS** or **MINUS** key to set this option to YES to run the copy procedure, (see page 137 on Creating or Copying Parameter Sets, for more information on this procedure)



Start-Up Procedure Options: COPY PARMS-----
Copy Parameter File on SD CARD? **NO**

The second option allows you to create a new Parameter Set or to change the Parameter Set used by the controller to control the environment. Use the **PLUS** and **MINUS** key to set the number to an existing Parameter set, which will be loaded, or to an unused number to have a new Parameter Set created. Press **ENTER** to save the new parameter number and to continue to the next option. See page 139-141 for more information on Creating new parameter sets or changing parameter sets.



Start-Up Procedure Options: Parameter Set
Load Parameter Set Number: **1**

The third option allows the clearing of the 20 - slot Alarm table stored in memory. Press the **PLUS** key to set the option to YES, if you want to clear the memory table. Press **ENTER** to continue to the next option.



Start-Up Procedure Options: ALARM RESET
REMOVE all alarm records? **YES**

The fourth option allows the clearing of the current hours' history table stored in memory. Press the **PLUS** key to set the option to YES, if you want to clear the memory table. Press **ENTER** to continue to the next option.



Start-Up Procedure Options: HISTORY RESET
CLEAR HISTORY Collect Structure? **YES**



The third and fourth options only clear the alarm and history tables in memory. All alarm records and history records stored on the SD card are retained.



Parameter Sets

Introduction

The Ventra Pro™ allows the user to set up 24 different Parameter Sets to be used by the controller. A Parameter Set is a complete set of operating parameters the controller uses to control the input and output devices in order to maintain the correct environmental conditions for the animals.

These Parameter sets can be used in multiple ways. Instead of changing operating parameters multiple times during a grow out period, the user can set up multiple Parameter sets, with different parameters for the different ages of the animals, and change the Parameter set number as the animals grow. The Parameter Sets can also be used for seasonal changes to the operating parameters. Instead of changing multiple parameter settings each time the seasons change or the animals grow, just change the Parameter Set number being used by the controller.

StartUp Procedure Options: Parameter Set Load Parameter Set Number: 1



1. The current Parameter Set being used by the controller is displayed in the upper right hand corner of most screens, "S01".
2. Each Parameter Set is completely independent of the other Parameter sets. The settings from one Parameter Set will not affect the operation of the controller when a different Parameter Set is selected. However, the History and Alarm records are controller-based and will not be affected by changes in Parameter Sets. This allows for a continuous record of the history and alarms of the controller, regardless of the operating parameters.

When the controller is first started, it will use Parameter Set #1 as the initial parameter set. Using the information from the rest of the manual, begin on page 81, Setting up the Control Software. Global parameters to be used by the controller and the input and output of devices and their settings are discussed. Once Parameter Set #1 is set up there is two ways to create new Parameter Sets. You can copy an existing parameter set to the same or another SD card, or you can create a new Parameter set and start from scratch.

Copying Parameter Sets

This option allows you to copy an existing Set and save the steps of setting up all the inputs and outputs again. *This option does not change the active parameter set.* The steps are:

1. To make sure the current parameters are saved, do the following:
 - a. Press the **CANCEL** key (3) three times.
 - b. Press the **DOWN** arrow key, to display the Revisions Date/Time screen.
 - c. Press the **ENTER** key (Writing PARAMETERS to Flash will be displayed).
2. **Restart the controller.**
3. Press the **ENTER** key when the screen displays "Press **ENTER** to change".
 - a. This screen will display a few seconds after startup.



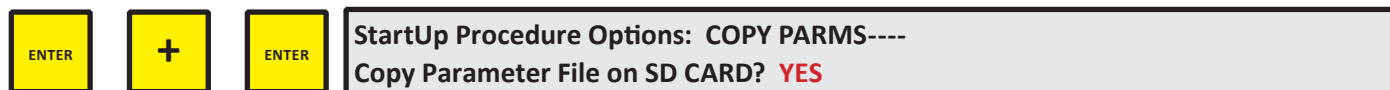
Start-Up Procedure Options: Press ENTER to Change

4. If an "Options" password has been entered, enter the 8-digit password to access the Startup Options menus. See "Password for Parameter Set Options" on page 142 of this manual for more information .

Start-Up Procedure Options: SET PASSWORD Enter Options Password: 0xxxxxxx

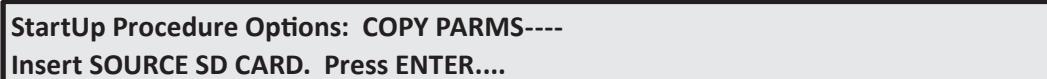
Copying Parameter Sets - continued

5. Press **ENTER**, then the **PLUS** key to set "Copy Parameter File on SD CARD?" to YES.



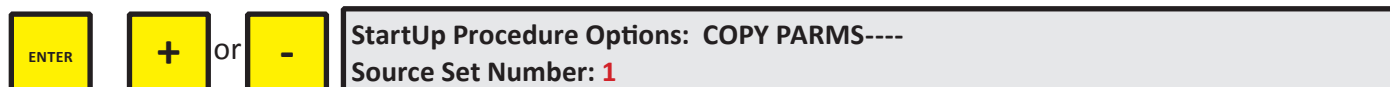
6. Press **ENTER** to continue.

7. If you are copying a parameter set from a different SD card than the one currently in the controller, remove the current SD card from the controller and insert the SD card you want to copy a parameter set from into the controller.



8. Once the correct SD card is inserted in the controller, press the **ENTER** key to continue.

9. Using the **PLUS** and **MINUS** keys, select the Parameter Set number you want to copy from.



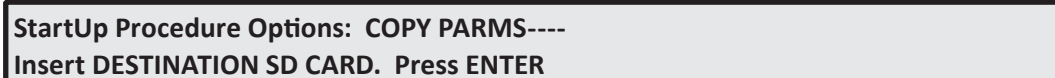
10. Press **ENTER** to continue.

- a. If you select a parameter set number *that does not exist* on the SD card and press **ENTER**, you will receive a SD Card Error message and *will need to cycle the power on the controller to repeat all the steps again*, this time selecting an existing parameter set number.



11. The "Insert DESTINATION SD CARD" screen will be displayed, in a few seconds, after the selected parameter set is copied to memory.

- a. If you are copying the parameter set from one SD card to another SD card, remove the current SD Card from the controller and insert the SD card you want to copy to into the controller.
- b. If you are just copying the parameter set to a different set number on the same SD card that you are copying from, then continue to the next step.



12. Press **ENTER** to continue.

13. Using the **PLUS** and **MINUS** keys, select the Parameter Set number you want to copy to.

- a. Make sure you set the correct parameter set number to copy to. If the SD card contains a parameter set that matches the number you selected, that parameter set will be updated to match the parameter set you are copying from.





Copying Parameter Sets - continued

14. Press **ENTER** to continue.
15. After the copy is created, you can either copy another parameter set or restart the controller.
 - a. To copy another parameter set, press **ENTER** and repeat the steps starting with step 7.
 - b. If you are done copying parameter sets, cycle the power on the controller to restart normal operations.



PARAMETER COPY FINISHED! Press ENTER to copy another Set or CYCLE THE POWER



Due to memory constraints and file sizes, only one Parameter set can be copied at a time. To copy all the parameter sets from one SD card to another, either repeat the steps above for each parameter set or use a computer, with a SD card reader, to copy all the files from one SD card to the other.



If you receive a message stating "Cycle POWER to controller to continue...", too much time elapsed before a key was pressed and the controller needs to be restarted.

StartUp Procedure Options: COPY PARMS----
Cycle POWER to controller to continue....



Copying parameter sets does not change the current parameter set used to control the buildings environment. See "Changing Parameter Sets" to load one of the newly copied parameters sets.

Creating NEW Parameter Sets

This option requires you to set up the Global parameters, install the input and output devices and set all the associated settings. This option changes the active parameter set to the one you create. The steps are:

1. Make sure the current parameters are saved:
 - a. Press the CANCEL key three times.
 - b. Press the Down arrow key, to display the Revisions Date/Time screen.
 - c. Press the ENTER key (Writing PARAMETERS to Flash will be displayed).
2. Restart the Controller
3. Press the ENTER key when the screen displays "Press ENTER to change."
 - a. This screen only appears for a few seconds shortly after the controller starts



StartUp Procedure Options:
Press ENTER to Change!

4. If an Options password has been entered, enter the 8-digit password to access the Startup Options menus. See "Password for Parameter Set Options" on page 142 of this manual for more information.

StartUp Procedure Options: SET PASSWORD
Enter Options Password: 0xxxxxxxxx

Creating NEW Parameter Sets - continued

5. Leave "Copy Parameter File on SD CARD?" set to NO and press **ENTER**.



StartUp Procedure Options: COPY PARMS----
Copy Parameter File on SD CARD? **NO**

6. Press the **PLUS** and **MINUS** keys to select an unused Parameter Set number.
a. If you select the number of an existing Parameter Set, that Parameter set will be loaded into the controller memory and be used to control the environment.



StartUp Procedure Options: Parameter Set
Load Parameter Set Number: **1**

7. Press **ENTER** to continue.
8. Optional: Press the **PLUS** key to set "REMOVE all alarm records?" to Yes if you want to clear the current Alarm table in the controller.
a. Only the 20-slot alarm table in memory is cleared. The Alarm Detail records, which are stored on the SD card, will not be deleted.



StartUp Procedure Options: ALARM RESET
REMOVE all alarm records?: **NO**

9. Press **ENTER** to continue.
10. Optional: Press the **PLUS** key to set "CLEAR HISTORY Collect Structure?" to Yes if you want to clear the current hour's history record stored in memory.
a. Only the current hour's history in memory is cleared. All previous history records, which are stored on the SD card, will not be deleted.



StartUp Procedure Options: HISTORY RESET
CLEAR HISTORY Collect Structure?: **NO**

11. Press **ENTER** to continue.
12. The controller will now load a new, blank, parameter set, using the number you selected and continue the normal startup operations.
a. You will be asked to set the Global parameters for the set during the startup procedure.
b. Once the controller starts, you will need to add and set up all the input and output devices for the new parameter set.



When changing Parameter Sets, no information is transferred to the new parameter set. Before changing parameter sets be sure to record important settings you want to transfer to the new parameter set, such as the animal's age and weight, the Temperature, Humidity, and Static Pressure setpoints, etc.. Once the parameter set is changed, enter the recorded information into the new parameter set.

See "Changing the Parameter Sets" below or on the next page to activate the newly created Parameter Set.



Changing Parameter Sets

Once there are multiple Parameter Sets set up, use the following steps to change the Parameter Set used to control the environment.

1. Make sure the current parameters are saved:
 - a. Press the **CANCEL** key (3) three times.
 - b. Press the **DOWN** arrow key, to display the Revisions Date/Time screen.
 - c. Press the **ENTER** key (Writing PARAMETERS to Flash will be displayed).



2. Restart the Controller

3. Press the **ENTER** key when the screen displays "Press **ENTER** to change."
 - a. This screen only appears for a few seconds shortly after the controller starts



StartUp Procedure Options:
Press ENTER to Change!

4. If an Options password has been entered, enter the 8-digit password to access the Startup Options menus. See "Password for Parameter Set Options" on page 142 of this manual for more information.

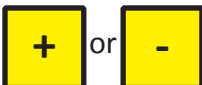
StartUp Procedure Options: SET PASSWORD
Enter Options Password: 0xxxxxxx

5. Leave "Copy Parameter File on SD CARD?" set to NO and press **ENTER**.



StartUp Procedure Options: COPY PARMS----
Copy Parameter File on SD CARD?: NO

6. Press the **PLUS** and **MINUS** keys to select an existing Parameter Set number to be used.
 - a. If you select the number of a nonexistent Parameter Set, a new, blank, parameter set will be loaded into the controller memory and you will need to set everything up from scratch.



StartUp Procedure Options: Parameter Set
Load Parameter Set Number: 1

7. Press **ENTER** to continue.
8. Optional: Press the **PLUS** key to set "REMOVE all alarm records?" to Yes if you want to clear the current Alarm table in the controller.
 - a. Only the 20-slot alarm table in memory is cleared. The Alarm Detail records, which are stored on the SD card, will not be deleted.



StartUp Procedure Options: ALARM RESET
REMOVE all alarm records?: NO

9. Press **ENTER** to continue.
10. Optional: Press the **PLUS** key to set "CLEAR HISTORY Collect Structure?" to Yes if you want to clear the current hour's history record stored in memory.
 - a. Only the current hour's history in memory is cleared. All previous history records, which are stored on the SD card, will not be deleted.



StartUp Procedure Options: HISTORY RESET
CLEAR HISTORY Collect Structure?: NO

11. Press **ENTER** to continue.
12. The controller will now load the selected parameter set and continue the normal startup operations.

Editing an Existing Parameter Set

In order to make changes to an existing Parameter Set, the Parameter Set needs to be loaded into memory. Use the steps in "Changing Parameter Sets" starting on page 141 to load the Parameter Set you want to change into memory.



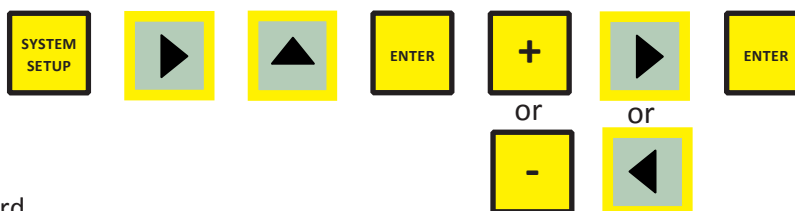
When you load a Parameter Set into memory, the controller will use the loaded Parameter Set to control the devices. It is not possible to make changes to one Parameter Set, while another Set is controlling the devices.

Password for Parameter Set Options

It is possible to set an 8-number password to prevent unauthorized people from accessing the Startup options and from copying, or changing Parameter Sets. When this password is set and ENTER is pressed when the "Press ENTER to change" screen appears, the correct password needs to be entered or the controller will not allow access to the startup options. To enter the password use the Plus or Minus keys to change the number under the cursor and the Left or Right Arrow keys to change the cursor position.

The Options password is found by:

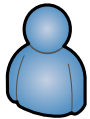
1. Press the **SYSTEM SETUP** key.
2. Press the **RIGHT** Arrow key.
3. Press the **UP** Arrow key.
4. Press **ENTER** to change the password.
 - a. use the **PLUS** or **MINUS** keys to change the number under the cursor and the **LEFT** or **RIGHT** Arrow keys to change the cursor position.
5. Press **ENTER** again to save the password.



A security level of 7 is needed to view and change the Options password.



Resetting the Control to a “New State”



ADVANCED USERS:

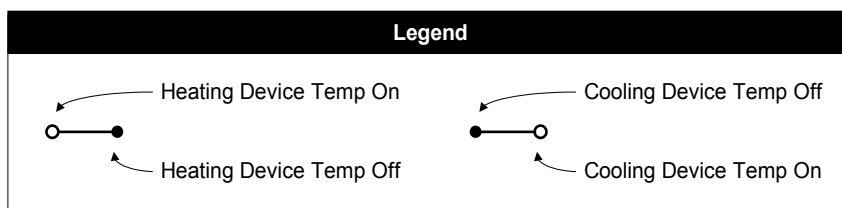
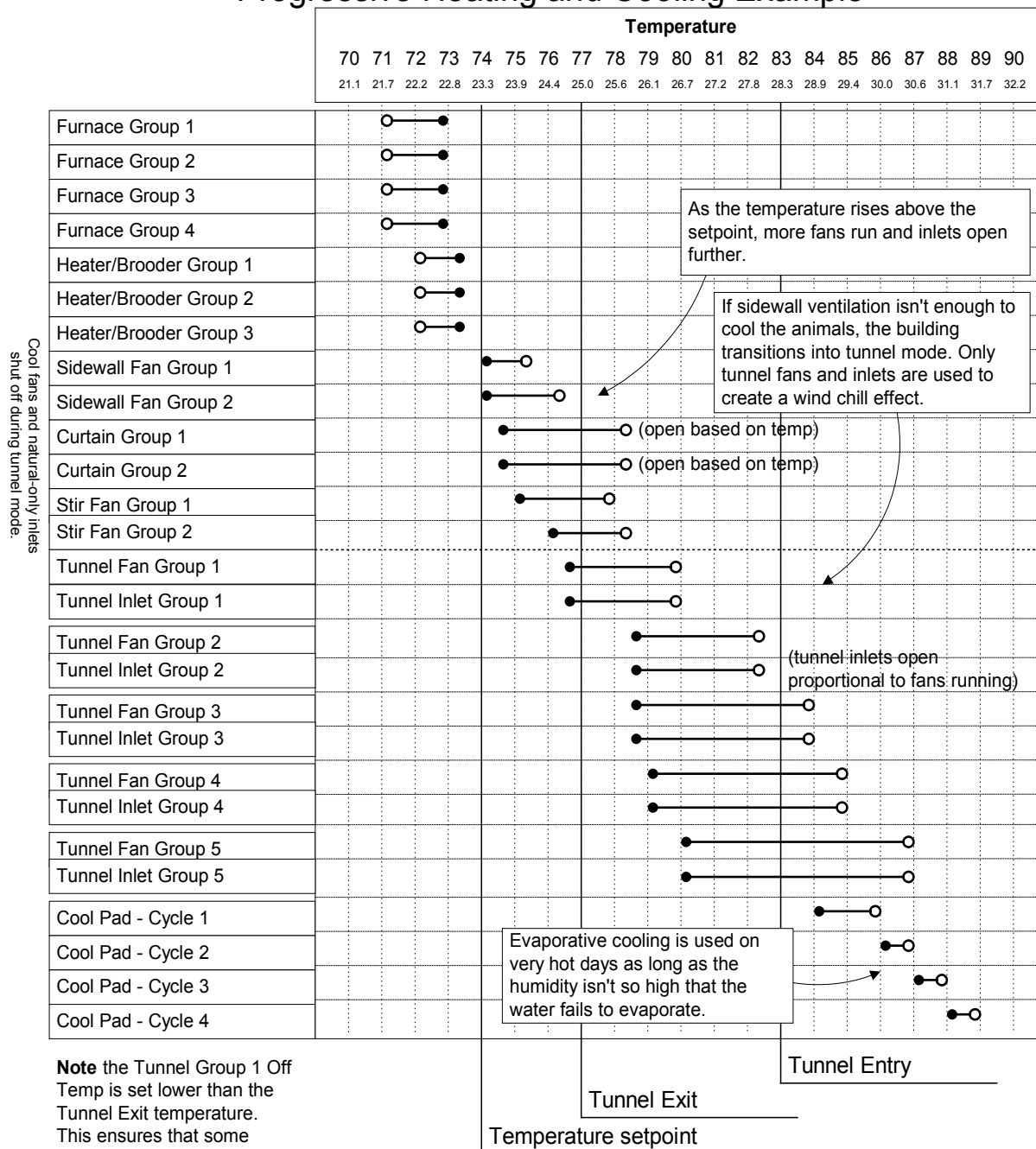
On a rare occasion there might be cause to reset the control to a “new or factory fresh state”.
Instructions are listed below.

1. Using a PC, delete all the files and directories on the SD card. (you can format the card but this is not necessary.)
2. Reinsert the SD Card and restart the controller.
3. Press ENTER at the Start-Up Prodcedure Optiton and set the Options as shown in the screens below.

	Ventra HMI Bootloader v1.00.003 Revisions are identical
	Checking Real Time Clock Correct operation clears message
	Start-Up Procedure Options 030 Internal Timer initalization This screen displays for approximate 2 seconds
ENTER	Start-Up Procedure Options Press ENTER to change. This screen displays for approximately 2 seconds
+ ENTER	Start-Up Procedure Options: COPY PARMS---- Copy Parameter File on SD CARD? NO
+ ENTER	Start-Up Procedure Options: Parameter Set Load Parameter Set Number: 1
+ ENTER	Start-Up Procedure Options: ALARM RESET REMOVE all alarm records? YES
+ ENTER	Start-Up Procedure Options: HISTORY RESET CLEAR HISTORY Collect Structure? YES
	Start-Up Procedure Options 031 Setup SD Card operations This screen displays for approximately 2 seconds
	Start-Up Procedure 032 Power Reset Slave Modules (5 seconds) 11:47 (Displays approximately 1 second)
+ ENTER	GLOBAL PARAMETERS SETUP Animal Type: BIRDS

APPENDIX 1 - Progressive Heating and Cooling Example

Progressive Heating and Cooling Example





Sample Device Setpoints.vsd



APPENDIX 2 - Curtain and Inlet Behavior

Curtain and Inlet Behavior

Device	Mode Assigned to Device	Behavior During:	
		Natural Mode	Tunnel Mode
Curtain 	Static Tunnel Only	Closed.	Operates based on static pressure.
	Temp Natural Only	Operates based on the device's Opening Temp and Closing Temp.	Closed.
	Static Natural Only	Operates based on static pressure.	Closed.
	Temp Natural/Temp Tunnel	Operates based on the device's Opening Temp and Closing Temp.	Operates based on proportional control
	Temp Natural/Static Tunnel	Operates based on the device's Opening Temp and Closing Temp.	Operates based on static pressure.
	Temp Tunnel Only	Closed.	Operates based on proportional control
	Static Natural/Temp Tunnel	Operates based on static pressure.	Operates based on proportional control
	Static Natural/Static Tunnel	Operates based on static pressure.	Operates based on static pressure.
Inlet 	Static Tunnel Only	Closed.	Operates based on static pressure.
	Temp Natural Only	Operates based on proportional control.	Closed.
	Static Natural Only	Operates based on static pressure.	Closed.
	Temp Natural/Temp Tunnel	Operates based on proportional control	Operates based on proportional control
	Temp Natural/Static Tunnel	Operates based on proportional control	Operates based on static pressure.
	Temp Tunnel Only	Closed.	Operates based on proportional control
	Static Natural/Temp Tunnel	Operates based on static pressure.	Operates based on proportional control
	Static Natural/Static Tunnel	Operates based on static pressure.	Operates based on static pressure.

Operates based on static pressure - A static pressure sensor monitors negative static pressure inside the building and adjusts the inlet or curtain based on your static pressure Setpoint, Open and Close settings (Static Pressure menu).

Operates based on proportional control - The controller monitors the number of fan groups designated for proportional control that are running. The curtain or inlet is adjusted according to this number and the settings you enter in the device's Fan Groups On \ Opening Size menu.

Operating Modes Summary.vsd

APPENDIX 3 - Service Technician Features

Service Technician Features:

The new service technician security level allows access to additional menus that support the following functions:



To use these features: User must call Val-Co™ customer service to access.

Zone Copy: This allows the technician or operator to set up all the devices and parameters in a zone, and then copy all those devices and their settings to another zone. This screen is found in the System Setup menus.

Expansion Module Disable: This setting will cause the controller to stop attempting to communicate with the specified Station number (not allowed for Station Number 1). This is a temporary setting useful for servicing or troubleshooting the system. Once power is reset, all Stations will be enabled. This screen is found in the System Setup menus.

Number of Hours a curtain is 50% open: This curtain setting allows a service technician to set the number of hours a curtain has been open at least 50%. It is used to test the Curtain Exercise Routine. This screen is found in each of the Curtain's menus.

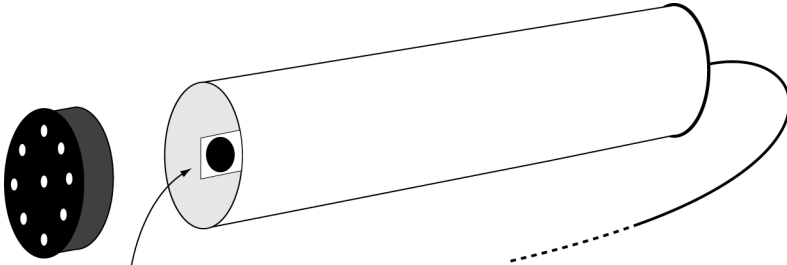
Temperature Simulator: This allows an installer to simulate the air probe temperatures to test the controller and the device settings. If being used, when any request, by the software, for an air probe temperature reading is received, the simulated temperature is used, instead of the actual probe reading. The Current Conditions screens will show the simulated temperatures. This feature can be disabled by entering a new security code, setting the simulated temperature to -55.0 or is automatically disabled after 10 minutes of no key presses. This screen can be found in the Temperature Control Settings menus.



APPENDIX 4 - Troubleshooting

1. Power/Display		
No Display.	1.1a	Verify the controller has power by turning a toggle switch to ON. If a light comes on, try step 1.1b. If no light, you probably do not have power coming to the controller. Check 1.2a.
	1.1b	Display is too light. Press DISPLAY DARK on controller keypad for several seconds.
	1.1c	A row of dark boxes means the memory is possibly dead or the memory card is not installed. Open the control and verify the connection of ribbon cables between boards. Make sure the memory card is securely put into the board. Disconnect and then reapply power.
No Power.	1.2a	Circuit breakers are tripped or turned off.
	1.2b	Fuse on the controller power supply is blown. Replace with equivalent.
	1.2c	Terminal connections on power supply are not tight.
Display light keeps turning off.	1.3a	Normal operation. It's programmed to turn off one minute after you're done using the keypad. This will add years to its useful life and save electricity.
2. Sensor Readings		
Temperature reading is N/A or -412°.	2.1a	Air sensor is disconnected or wire is cut. Check continuity in cable/sensor. Resistance through the cable and sensor should be about 1100 ohms. If higher check for cable, splice, or sensor damage.
	2.1b	Temperature is beyond the operating range (Outside -60°F to 120°F, Inside 30° to 130°F).
	2.1c	Sensor is defective. Connect new sensor.
	2.1d	If readings are N/A, verify that sensor is installed by checking the List Control Devices menu.
Temperature reading is wrong.	2.2a	Check temperature at sensor with an accurate thermometer.
	2.2b	Wrong wire gauge input. Read wire gauge from wire and input in Sensor Calibration & Setting menu for all air sensors.
	2.2c	Wrong cable length input. Check cable length to each sensor and input to Sensor Calibration & Setting menu.
	2.2d	Mis-calibrated sensor. Adjust by adding/subtracting cable length. Add about 7 feet (varies by wire gauge) to drop the reading by 0.1 degree F. Subtract length to increase reading.
	2.2e	Sensors mis-numbered in programming. Verify position of sensors by dipping in water then swinging rapidly to cool them. Within 20 seconds, you should see a noticeably cooler reading for that sensor (Current Status menu). If sensors are mis-numbered, a different sensor reading will drop. To correct, you must rewire the sensors in question to the proper input channels.
	2.2f	Sensor or connection splice is bad. Cut sensor above splice. Cut off splice. Reconnect and check to see if sensor is working. If not, replace sensor.

APPENDIX 4 - Troubleshooting - continued

	2.2e	If all sensors are reading low by about the same amount, the control board must be replaced.
Humidity sensor reading bad.	2.3a	<p>Sensor is dirty or has moisture inside. Disconnect sensor from controller or shut off controller power. Remove bottom cap. Dip a cotton swab in rubbing (isopropyl) alcohol and then gently clean the sensor element. The sensor may read high for a short period of time after cleaning.</p>  <p>Disconnect the humidity sensor from the controller or turn off the controller power, and then gently clean the sensor element with a cotton swab dipped in rubbing (isopropyl) alcohol.</p> <p>NEVER TOUCH sensor with fingers.</p>
	2.3b	Ensure there is nothing draining the 12 volt supply to the input. If there is, disconnect the other device. Then turn off the power to the controller and back on again.
Feeder sensor is wired but reading improperly.	2.4a	Is the amperage set above zero and below the actual amperage reading?
	2.4b	Is the wire running through the loop of the sensor?
	2.4c	If there is a second feeder wire, do the two run the same direction through the sensor loop?
	2.4d	Have you set feeder ON/OFF time cycles? The sensor will not read power outside of a feeder ON cycle.
3. Equipment		
One equipment group does not turn on.	3.1a	Is the controller on?
	3.1b	Manually turn the toggle switch for that group to ON. If the equipment turns on, go to 3.1c. If it does not turn on, go to 3.1d.
	3.1c	Check the programming for the equipment group. The group is either not installed or is not set up right. Check <i>Operating Manual</i> for information on how to set up this type of equipment.



APPENDIX 4 - Troubleshooting - continued

	3.1d	Check the fuse by the appropriate relay. Replace it if it is blown. Otherwise, do you hear the relay inside the enclosure click when you turn the toggle switch ON and OFF? If it clicks, go to 3.1m. If not, go to 3.1e.
	3.1e	Do other groups in the same column turn on? If not, open the enclosure and check ribbon cable connection from relay board to control board. If it still does not turn on, go to 3.1f.
	3.1f	If there is still no relay click when you flip the switch ON, bypass the relay to see if equipment works. If it does, change out relay board.
	3.1m	Check the circuit breaker for that equipment group. If tripped or off, turn on. If on, go to 3.1n-p.
	3.1n	Equipment may not be wired correctly. Verify wiring of all groups by turning them on one at a time manually and making sure the equipment is on.
	3.1o	Wire may be damaged. Check wiring for damage. Verify wire connection in electrical box and at equipment.
	3.1p	Equipment may be bad.
	3.1q	Are sensors properly programmed? Verify that your sensor parameters are entered properly and that temp sensors are properly numbered. See item 2.2.
Nothing runs when on AUTO.	3.2a	Beginning Head Count is zero. Must be more than zero for auto control to operate.
	3.2b	Check the List Equipment menu. Equipment may not have been programmed into the controller.
Fuses/circuit breakers keep blowing on a channel.	3.3a	Verify that you don't have more than 16A on the circuit. You may have to divide the equipment on that channel or wire in a contactor. If your thermal-protected contactor is shutting the group off, check to see it is set for the proper amperage.
	3.3b	Motor may not have thermal overload protection device or may not be impedance protected.
	3.3c	Equipment is defective, shorting out circuit.
	3.3d	Wire may be damaged. Follow wire to check condition. Especially possible if plastic Romex [®] wire staples were not used to hold wires.
	3.3e	Relay board may need to be replaced.
Group turns off when another group turns on.	3.4a	Interlock is enabled for a channel. Check the Channel Interlocking section of the <i>Installation Manual</i> for information on adjusting Channel Interlock switches.
Feeder is not turning on.	3.6a	If feeder turns on when you manually turn it to ON, you must program the feeder cycles. Check the <i>Operation Manual</i> for setting up feeder cycles.
	3.6b	Scroll through alarms and clear any feeder run time alarms. Excessive feeder run time alarms turn off feeder.
Curtain is open more/less than machine says.	3.7a	Check curtain drops. Do the curtains need to be cranked up manually and reconnected to the curtain drops?

APPENDIX 4 - Troubleshooting - continued

	3.7b	Turn the curtain close or open channel ON and move curtain to top or bottom manually. Turn back to AUTO. The curtain will self adjust the next time it tries to open or close completely.
	3.7c	Are the limit switches on the curtain machine set properly?
My static pressure is too high/low.	3.8a	Refer to the <i>Operation Manual</i> for information on adjusting the curtain/inlet open size settings to the number of fans running.
Equipment groups are set to come on at same temp but don't.	3.9	Is the Power Up Load Delay Time set more than a few seconds? This will delay the time between groups turning on for the first five minutes after the controller is powered up.
Furnace does not start.	3.10	Has the furnace been off during summer months? Have you bled the line?
	3.10a	Is the furnace/heater interlocked with a curtain? If it is, the heater will not start if the curtain is open.

4. Setpoint Temperature

The setpoint I set yesterday didn't hold. It's too low today.	4.1a	If your animal age was 1 yesterday and you set up ramping yesterday, your animal age is changing daily. If you want to return to an age of 1, go to the Current Animal Information menu (Current Bird Information menu for controllers used in poultry operation).
	4.1b	Make sure that ramping is set up properly. For an explanation of ramping, see the <i>Operation Manual</i> .
I want to make a one day or short term change in my setpoint without changing everything.	4.2a	You can change the ramp temporarily without changing any settings by using the Ramp Offset in the Temperature Control Settings menu. Raise or lower the temperature up to 12 degrees Fahrenheit. You must change it back to zero when you want to return to your normal settings.
I've input my ramp points and setpoints, but nothing's working.	4.3a	Is your animal age between ramp points? The controller calculates setpoint temperatures for in-between ages each day at midnight. In that case, the setpoint temperature won't appear to be adjusted until the next day.
	4.3b	Check the Temperature Control menu item to ensure the controller isn't in a "parked" (OFF) state.

5. Security

Someone has changed the parameters I set.	5.1	Add a password code for security (see the <i>Operation Manual</i>). The controller is not secure without a password. Those who need to can collect data from the controller but they will be limited in what they can change.
I forgot my password.	5.2	Call service and ask for a one-day password.



APPENDIX 4 - Troubleshooting - continued

6. Control Pad		
I can't get out of a menu category.	6.1a	Press CANCEL until you move to the first menu screen.
	6.1b	If you press keys and the menu does not change, you are probably still in the process of changing information. Finish making your change with PLUS/MINUS. Press ENTER to confirm. If you do not want the changes you've made, press CANCEL to prevent an accidental change from being entered into the controller. Now you should be ready to move to another menu screen.
I have no idea where I am in the menu system.	6.2	Press CANCEL three times. You will always return to the starting menu by using CANCEL.
I'm unable to change the group number.	6.3	Use PLUS/MINUS to change a group number. After you press ENTER to change a parameter, you cannot change the group until you confirm your choice with ENTER or exit with CANCEL. If you change duty cycles for fogger/mister/cool pad groups or the number of fans for curtains or inlets, the process is a little different. While on a duty cycle/fan group menu, PLUS/MINUS changes the cycle/fan groups number rather than the group number. To change group, scroll with UP to the FULL ON menu. Press PLUS/MINUS to change the group number. Press DOWN to move into the duty cycle/fan group menus, and change your cycle parameters for that group.
7. Alarm		
I get alarms on screen but no alarm dial out or siren.	7.1a	Do you have an auto dialer or audio alarm hooked to the controller? The controller has an alarm connection but does not provide an alarm.
	7.1b	Have you cleared previous alarms? Check the Alarms/Error menu for an active alarm. Press ENTER to clear an alarm.
	7.1c	Are your controller alarms hooked up as a normally closed, series circuit? Do you have a short across the wires between the controller and the alarm that prevents the controller from communicating alarms to the alarm device?
	7.1d	Is the alarm hooked up to the alarm relay connection on the controller input/output board?
I get constant alarms.	7.2a	Is the alarm device hooked up to the proper normally closed or normally open side of the alarm relay?
My feeder/water alarms are increasing.	7.3a	As your animals grow, they consume more water and feed. Assuming they are healthy, that you have no leaks in the water or feed lines, and that feed and water are getting to the animals, you probably need to raise your limits.
	7.3b	If your feeder shows a constant run time, make sure the Minimum Amps calibration setting for the feeder sensor is above 0.

APPENDIX 4 - Troubleshooting - continued

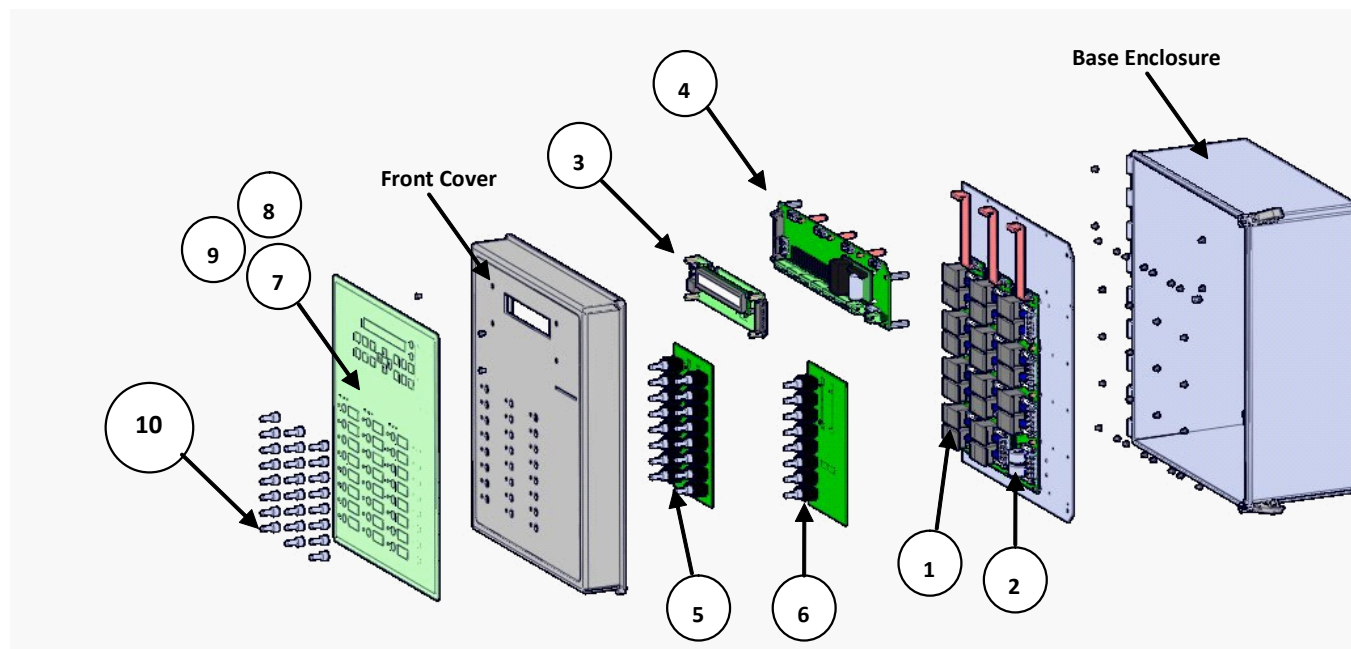
8. Communications		
Communications station is not talking with the controller.	8.1a	Are the communications station and controllers wired properly? Multiple controllers should be wired in parallel with the communications station. Check the polarity (+/-) of the connections. See the instructions that came with the communications station.
	8.1b	Is the modem set right for terminal or non-terminal position in wiring order? See the instructions that came with the communications station.
	8.1c	Ensure you have entered the controller's serial number in the communication software.
9. Purge Settings		
My controller never purges.	9.1a	Purging does not occur when the curtains are open, so if they are always open, it will appear that purging does not occur.
	9.1b	Purge ON/DELAY times are incorrect. Make sure your times are in hours, minutes and seconds. Refer to the <i>Operation Manual</i> for Purge Settings.
	9.1c	High/low temp inhibits are wrong. Purges will not occur when inside temperature is above high temp inhibit or below low temp inhibit.
	9.1d	Do you have any sidewall fan groups designated as Purge fans?
	9.1e	Are curtains set for the Natural operating mode and the Opening Temp is too low? If curtains are opening on their own, they restart purge timer.
	9.1f	Do you have purge openings for curtains or inlets set above zero?
Fans purge, but they all run at separate times.	9.2a	Check the time settings for your purge fans.
	9.2b	Is the Power Up Load Delay Time set too long? More than a few seconds?
10. Inlet/Curtain Settings		
Full opening not enough or too much.	10.1a	Check the Fan Groups On and Full Opening Size menu items to make sure both are correct.
	10.1b	Is the cable machine at the end of its run? Maybe it is geared wrong. Change the pulley system to allow a wider opening.
	10.1c	Check run time and full opening distance. If these are not correct, the inlet/curtain will not open properly for any setting.
Not opening when fans run.	10.2a	Have you set them up to open proportionally to number of fan groups running? See the <i>Operation Manual</i> for setting up inlets and curtain openings.
Not shutting completely.	10.3a	Is the Minimum Opening Size correct? Choose zero if you want them to shut all the way.
	10.3b	If the Equipment Status screen shows a 0 inch opening, use a manual winch to close the device completely.



APPENDIX 4 - Troubleshooting - continued

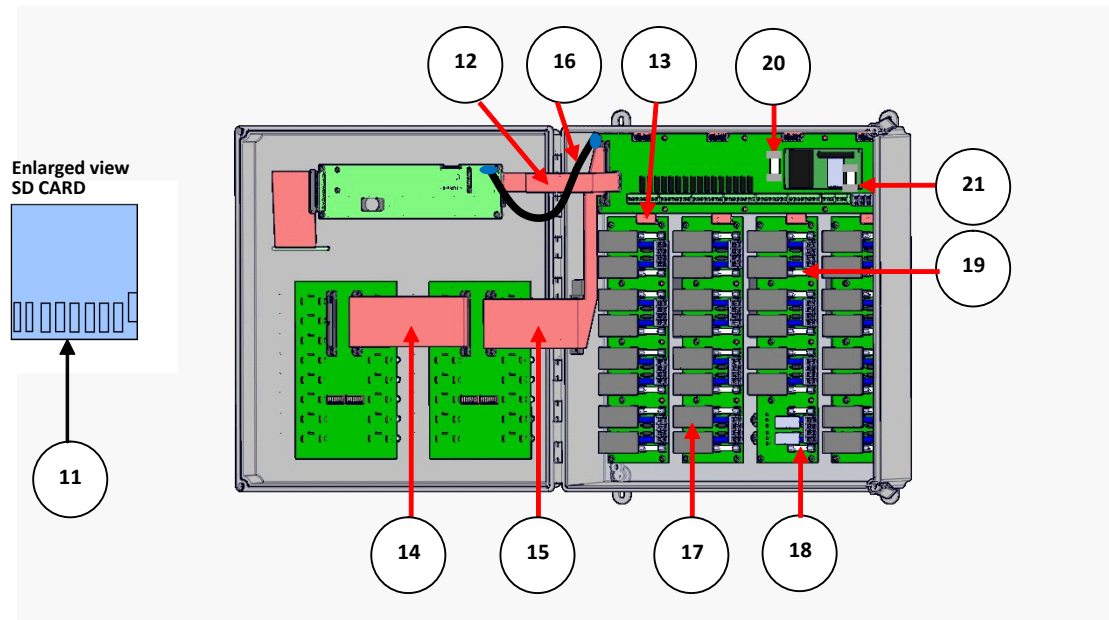
11. Position Sensor		
I keep getting Out of Position Alarms.	11.1a	Run the calibration process for the position sensor that appears to be causing the problem. Refer to the <i>Operation Manual</i> for instructions. Check the position sensor to controller wiring.
12. Static Pressure		
My inlets or curtains are opening more than they need.	12.1a	Under the inlet or curtain menu, check the Fan Groups On X Open Size XX” menu items. These settings are minimum openings for your inlets with a given number of fan groups on.
My inlets aren’t responding to fans going on.	12.2a	Fan groups for exhausting air should be marked Yes for proportional control in the fan menus.
My Fan On Static Pressure Below alarm is not working.	12.3a	The alarm’s delay time must be set for less than the fan run time. The alarm is checked only when one or more fans set as proportional are running.
My inlets keep moving and can’t find a proper position.	12.4a	Are you trying to run two groups of static pressure controlled devices at once? For example, two sets of inlets? Set one to open automatically to fixed positions (Operating mode: Natural only) and the other to respond to static pressure.
	12.4b	Increase the Static Pressure Pause Timer setting in the inlet menu.
	12.4c	Full Open and Full Close distances and times need to be set accurately.
	12.4d	Setpoint Close and Open may be too tight to the Static Pressure Setpoint.
Static Pressure reading .250 constantly.	12.5a	The static pressure sensor is not connected to input terminal.

APPENDIX 5 - Ventra Pro™ Parts List



KEY	PART #	DESCRIPTION	QTY
	VPR-016-001	16 Channel Control	1
	VPR-016-201	16 Channel Control (2VS)	1
	VPR-024-001	24 Channel Control	1
	VPR-024-201	24 Channel Control (2VS)	1
	VPR-032-001	32 Channel Control	1
	VPR-032-201	32 Channel Control (2VS)	1
	VPR-032-401	32 Channel Control (4VS)	1
	920911	Mounting Hardware Kit (included w/control can be ordered as replacement part)	1
REPLACEMENT PARTS			
1	PA-201-001	Output Board #1 (8 NO Electromechanical Relays) v1	1
2	PA-201-002	Output Board #2 (6 NO Relays + 2 Variable Speed) v1	1
3	PA-201-008	HMI Circuit Board v1.02 (Ethernet)	1
4	PA-201-004	Interconnect Circuit Board v1.0	1
5	PA-201-006	Toggle Switch Circuit Board v1 Type A (16 out)	1
6	PA-201-007	Toggle Switch Circuit Board v1 Type B (8 out)	1
7	920895	MEMBRANE, VENTRA PRO 16 CHANNEL	1
8	920896	MEMBRANE, VENTRA PRO 24 CHANNEL	1
9	920897	MEMBRANE, VENTRA PRO 32 CHANNEL	1
10	920898	SWITCH BOOT, SILICONE, BLACK	1

APPENDIX 5 - Ventra Pro™ Parts List - continued



KEY	PART #	REPLACEMENT PARTS - continued	QTY
11	920899	SD CARD,2GB, FAT32 FORMAT	1
12	920900	RIBBON CABLE, HMI TO INTECONNECT BOARD	1
13	920901	RIBBON CABLE, INTECONNECT TO RELAY BOARD	1
14	920902	RIBBON CABLE, SWITCH BOARD TO SWITCH BOARD	1
15	920903	RIBBON CABLE, INTERCONNECT TO SWITCH BOARD	1
16	920904	GROUND WIRE, HMI TO INTERCONNECT	1
17	920905	POWER RELAY, SPST, 30A, 12VDC, PLUGGABLE	1
18	920906	FUSE, 15A, 250V T-LAG CRM MDA (Variable speed fuse)	1
19	920907	FUSE, 20A, 250V T-LAG CRM MDA (Relay fuse)	1
20	920908	FUSE, 4A, 250V IEC FA LBC, 5X20MM (power supply 12V fuse)	1
21	920909	FUSE, 2A, IEC SLO-BLO, 5X20MM (power supply 120V fuse)	1

APPENDIX 6 - (MAIN) Menu Guide

CONTROLLER	CURRENT ENVIRONMENT CONDITIONS	CONTROL EQUIPMENT STATUS	CURRENT ANIMAL INFORMATION
Software Revision Number Revision Date/Time Control Center Serial Number Enter Password / Security Level Edit Password / Security Level Table Compile Options Copyright Information	Avg Actual Temp E Avg Actual*-Effective Temp Sensor Temps 1-4 Sensor Temps 5-8 Sensor Temps 9-12 Outside Temp E Avg Air speed 1-4 E Avg Air speed 5-8 E Avg Air speed 9-12 Relative Humidity 1-3 Avg Static Pressure Ventilation Mode H Animal Stress Index (needs Age and Weight above zero)	B Brooder Groups H Heater Groups Furnace Groups Stir Fan Groups Sidewall Fan Groups Tunnel Fan Groups H Pit Fan Groups Ridge Fan Groups Vari-Stir Fan Groups Vari-Side Fan Groups Vari-Tunnel fan Groups H Vari-Pit Fan Groups Vari-Ridge Fan Groups Cool Pad Low Groups Cool Pad High Groups B In House Fog Groups H Mister Groups Side Curtain Groups Sidewall Inlet Groups Tunnel Inlet Groups Ceiling Inlet Groups Ridge Vent Groups Chimney Damper Groups Feeder Groups 24 Hr Feeder Run Time Feeder Total Run Time Light Groups Digital Alarm Groups Whisker Switch Groups 24 Hr Water Used Total Gallons Used	Today's Age / Weight Finish Age / Weight Beginning Head Count Total Mortality Head Count Total Sold Head Count
<div> Legend B - Bird Only H - Hog Only E – EET Capable Controllers Only </div>		<div>Note: Some menu items will not be visible if devices/equipment have not been installed.</div>	



APPENDIX 6 - (MAIN) Menu Guide - continued

HISTORY	TEMPERATURE CONTROL SETTING	MINIMUM VENT and PURGE SETTINGS	STATIC PRESSURE
Temperature Control B House Control Mode Setpoint Temperature Avg Temperature Zone Avg Temp High/Low Temps (actual) Low @ / High @ E Avg Air Speed Avg Outside Temp Avg Humidity Static Pressure Setpoint High/Low Static Pressure Purge Cycles (Humidity/ Timed) Mortality changed this hour by: H Stress Index B Brooder Grp ON Time Furnace Grp ON Time H Heater Grp ON Time Stir Fan Grp ON Time Sidewall Fan Grp ON Time Tunnel Fan Grp ON Time H Pit Fan Grp ON Time Ridge Fan Grp ON Time Vari-Stir Fan Grp ON Time Vari-Side Fan Grp ON Time Vari-Tunnel Fan Grp ON Time H Vari-Pit Fan Grp ON Time Vari-Ridge Fan Grp ON Time Cool Pad Low Grp ON Time Cool Pad High Grp ON Time B In House Fog Grp ON Time H Mister Grp ON Time Side Curtain Grp Avg Open Side Curtain Grp Actual Sidewall Inlet Grp Avg Open Sidewall Inlet Grp Actual Tunnel Inlet Grp Avg Open Tunnel Inlet Grp Actual Ceiling Inlet Grp Avg Open Ceiling Inlet Grp Actual Ridge Vent Grp Avg Open Ridge Vent Grp Actual Chimney Damper Avg Open Chimney Damper Grp Actual Feeder Grp ON Time Water Meter Amount used System Restart Incidents	Temp Setpoint, Ramping ON/OFF Temp Control B House Control Mode Ridge to Curtains Interlock Heater to Curtains Interlock Enter Tunnel Temperature Exit Tunnel Temperature Remain in Tunnel Time Enable Tunnel Entry. Outside Temp Today's Age Ramp Point / Age / Temp Temperature Ramp Offset H Floor Type Close Curtains Below Outside Temp	Minimum Vent Timer On/Off Min Vent #X Age/On/Off (X equals 1 to 9) Humidity Purge Setpoint Humidity Purge On/Delay Purge Inhibit Low/High Temp Before purge raise Temperature to Time to Abort Heat before Purge -----OR----- Building Purge Setting Purge Time On/Delay Humidity Purge Setpoint Humidity Purge On/Delay Purge Inhibit Low/High Temp Before purge raise Temperature to Time to Abort Heat before Purge	Natural Setpoint / Close / Open Tunnel Setpoint / Close / Open Ramp #X Temp / Static Pressure (X equals 1 to 5)

APPENDIX 6 - (MAIN) Menu Guide - continued

SOUND ALARM WHEN....	DEVICE/EQUIPMENT SETTINGS	TEST CONTROL CENTER HARDWARE	SUMMARY
Fixed High Temp Exceeds Temperature Above Feeder ON Time Exceeds Feeder OFF Time Exceeds Stat Press Stays Above High Pressure Alarm Open ALL inlets Stat Press Stays Below Fan ON Stat Press Below Hightest/Lowest Air Probes differ by	Feeder Lights Vari-Ridge Fan H Vari-Pit Fan Vari-Tunnel Fan Vari-Side Fan Vari-Stir Fan Ridge Fan H Pit Fan Tunnel Fan Sidewall Fan Stir Fan B In House Fog H Mister Cool Pad High Cool Pad Low H Heater Furnace B Brooder Chimney Damper Ceiling Inlet Tunnel Inlet Sidewall Inlet Ridge Vent Side Curtain Position Sensor Tunnel Inlet Sidewall Inlet Ridge Vent Side Curtain Whisker Switch Digital alarm Water Meter Sensor Humidity Sensor Static Pressure Sensor Feed Sensor Outside Air Sensor Air Sensor Shared Air Sensor	Test Alarm Relay Test Outputs Test Inputs Test Output Status Test Digital Input Test KeyBoard Keys	Low / High 24 Hr. Feeder Run Side Curtain Avg Open Side Curtain Actual Ridge Vent Avg Open Ridge Vent Actual Chimney Damper Avg Open Chimney Damper Actual

For the devices listed under the DEVICE/EQUIPMENT SETTINGS column, the settings are submenus of this main menu. Press **ENTER** to access the submenus. The guide to the submenus are listed on the next (3) three pages.



APPENDIX 6 - (SUBMENU) Menu Guide DEVICE/EQUIPMENT SETTINGS

Feeder and Lights	Stir, Sidewall, Tunnel, Pit (Hog) and Ridge Fans	Vari-Stir, Vari-Side, Vari-Tunnel, Vari-Pit (hog) and Vari-Ridge	Brooder (bird) Heater (hog) and Furnaces
Setting #X Age= 0 ON= 0:00, OFF= 0:00 { 0:00-24:00} (X = 1 - 30)	Use Sensors Operating Mode ON Temp / OFF Temp Run Mode ON Timer / OFF Timer Run While ENTRY/EXIT of Tunnel Mode? Use for Proportional Control? (Not in Stir fans) Fans OFF at Curtain Opening (Note 1) Fan OVERRIDE Curtain Open (Note 2) Looking At (x) (Note 2) ----- Note 1: Enabled only if Position Sensor is installed and Calibrated and Operating Mode is not Tunnel only and Position Sensor alarm is on Note 2: Enabled only when Fans Off At Curtain Opening is enabled and is greater than 0.	Use Sensors Operating Mode ON Temp / OFF Temp Fan ON Power Setting Power Ramping Start Temp Full Power Temp Full Power Setting Run Mode ON Timer / OFF Timer Timed Power Setting Purge Mode Power Setting Run While ENTRY/EXIT of Tunnel Mode? Use for Proportional Control? (Not in Stir fans) Fans OFF at Curtain Opening (Note 1) Fan OVERRIDE Curtain Open (Note 2) Looking At (x) (Note 2) ----- Note 1: Enabled only if Position Sensor is installed and Calibrated and Operating Mode is not Tunnel only Note 2: Enabled only when Fans Off At Curtain Opening is enabled and is greater	Use Sensors ON Temp / OFF Temp Interlock Curtain Grps Use During Heat Purge



APPENDIX 6 - (SUBMENU) Menu Guide DEVICE/EQUIPMENT SETTINGS

Cool Pad Low/High, In House Fog (<i>bird</i>), and Mister (<i>hog</i>)	Side Curtain	Sidewall, Tunnel and Ceiling Inlets	Ridge Vent
Use Sensors Time of Day to Enable / Dis- able Humidity Disable / ReEnable Temp+Humidity Disable / ReEnable FULL ON Temp / OFF Temp Cycle #X ON Temp Cycle #X ON Timer / OFF Timer Minimum ON Temp Min Temps (X=1 - 4)	Use Sensors Static Pressure Pause Timer Open Temp / Close Temp Open This Distance & Pause Close This Distance & Pause Maximum Opening /Below Temp Operate As Tunnel Fans ON X, Open Size Tunnel Interlock Y to Fan Response Mode Full Opening Size Full Open Travel Time Full Close Travel Time Purge Opening Size Pre-Open Timer Exercise Delay Days Perform Exercise At (X=0 - 9) and (Y=1 - 9)	Static Pressure Pause Timer Operate As Cool Fans ON X, Open Size Natural Interlock X to Fan Tunnel Fans ON X, Open Size Tunnel Interlock X to Fan Full Opening Size Full Open Travel Time Full Close Travel Time Purge Opening Size Pre-Open Timer (Not Tunnel Inlets) (X=0 - 9)	Use Sensors Open Temp / Close Temp Open This Distance & PAUSE Close This Distance & PAUSE Response Mode Full Opening Size Full Open Travel Time Full Close Travel Time Purge Opening Size Interlock Curtain Groups



APPENDIX 6 - (SUBMENU) Menu Guide DEVICE/EQUIPMENT SETTINGS

Chimney Damper	Digital Alarm	Whisker Switch	Position Sensor
Cool Fans On X, Open Size Interlock X to Ridge Fan Full Opening Size Full Open Travel Time Full Close Travel Time (X=0 - 9)	Trigger alarm on Active input Input is Active when Alarm Delay Time	Attached To Validate Switch – Low \ High	<p>Attached To Press Enter to calibrate this sensor Enable Position Alarm? Percent OUT of Position to Alarm -----</p> <p>Note: These menus appear when calibrating: 1) Check Pot Open / Resistance 2) Check Pot Close / Resistance 3) Go To Close / Resistance 4) Measure Full Open / Resistance 5) Measure Full Close /Resistance</p>
			<p>Sensor Calibration and Setting</p> <p>Air Sensor Cable Length Air Sensor Wire Gauge/Diameter B Air Sensor Location E Air Sensor Cal Values E Use for Wind Speed Humidity CAL 1 Cal 2 Static Pressure ADC Cal 1 Static Pressure ADC Cal 2 Static Pressure WC Cal 1 Static Pressure WC Cal 2 Feed Minimum / Actual Feed CAL Value Water Cal Value</p>

APPENDIX 6 - (SUBMENU) Menu Guide DEVICE/EQUIPMENT SETTINGS

System-wide Parameters Setup - quick instructions

1. Press **ENTER** at the “Press Enter to View Settings” menu. Press the **LEFT** arrow key until you see the System & Control Device Set-Up menu.
2. Use the menu **DOWN** arrow to view the following selections:

Time Set-Up
Date Set-Up
Power Up Load Delay Time
Press Enter to List Control Devices
Press Enter to Add a Control Device
Press Enter to Change a Control Device
Press Enter to Delete a Control Device
Press Enter to Add New Zone
Press Enter to Delete Zone

3. To add your first device, press **ENTER** when you see the “Press Enter to Add a Control Device” selection. Then, continue to step #4.



- You can set the Language setting anytime from within the DEVICE/EQUIPMENT SETTINGS menu by pressing the right arrow key when viewing the SYSTEM & CONTROL DEVICE SET-UP menu.
- A Global Parameters menu appears within the DEVICE/EQUIPMENT SETTINGS menu if you delete all of the installed devices. Global Parameters allows for basic configuration such as Hogs or Birds, English or Metric measurement, Fahrenheit or Celsius temperature, and English or Spanish language.

4. Use the (+) or (-) key to navigate from one device to the next. *List of devices is on page 154 under the DEVICE/EQUIPMENT SETTINGS*
5. Once you have located and selected the device to add, use the **RIGHT** or **LEFT** menu arrows to move the cursor (_) to the desired setting (channel, etc.). To change the default number, use the (+) or (-) keys.
6. Press **ENTER** to accept the settings and then press **ENTER** again to confirm the settings.

The controller returns you to the “Add a Control Device” selection (Step # 4) to select another control device.

When you are done adding devices, proceed to Device Parameters on the next page.



Pressing the Cancel key allows you to back out of a selection if no changes are desired or if you enter a selection unintentionally.



APPENDIX 6 - (SUBMENU) Menu Guide DEVICE/EQUIPMENT SETTINGS

Device Parameters - quick instructions

1. When your input and output devices have been entered, use the **RIGHT** or **LEFT** menu arrows to locate the devices just installed so that you can enter your detailed parameter settings.
2. Device names are listed on the previous pages 156-161.



If you do not install a device, the menu heading will not be displayed.

3. Once you have located the desired menu, use the **UP** or **DOWN** menu arrows to locate device parameters.
4. To change a parameter setting, press **ENTER** and use the plus and minus keys (+ –) to increase and decrease the value.
5. Press **ENTER** to save the change or Cancel to discard the change.



APPENDIX 7 - Sensor Data Sheet

Air Sensors	Cable Length	Wire Gauge	Location (If applicable)	Input Channel Number	Sensor Cal. Numbers
Air/Temp #1					
Air/Temp #2					
Air/Temp #3					
Air/Temp #4					
Air/Temp #5					
Air/Temp #6					
Air/Temp #7					
Air/Temp #8					
Air/Temp #9					
Air/Temp #10					
Air/Temp #11					
Air/Temp #12					
Outside Air/Temp #13					

Humidity Sensor	Cal. #1 (10485 is default)	Cal. #2 (51118 is default)	Input Channel Number
Humidity #0			

Water Meter Sensor	PPG Cal. (25 is default)	Input Channel Number
Water Meter #1		

Feed Sensor	Cal. # (100 is default)	Minimum Amps	Input Channel Number
Feeder #1			
Feeder #2			

Static Pressure Sensor	ADC Cal. #1 (6554 is default)	ADC Cal. #2 (58982 is default)	WC Cal. #1 (0.000 is default)	WC Cal. #2 (0.250 is default)	Input Channel Number
SPS #1					

Building Name:

Building Number:

Zone Number:

Sensor Calibration Worksheet.vsd



APPENDIX 8 -Parameter and Security Recording

Farm/Site _____ Date _____
 Building _____ Zone _____

CURRENT ANIMAL INFORMATION

Today's Age _____ Weight _____
 Finishing Age _____ Weight _____
 Beginning Head Count _____
 Total Mortality Head Count _____
 Total Sold Head Count _____

****Adjust set-point to desired temperature before changing any parameters****

TEMPERATURE CONTROL SETTINGS

Temp Set-point _____
 Temp Control Actual ----- Eff.
 House Control Mode (Bird) _____
 Ridge to Curtain Interlock _____ *No Interlock, Interlock
 Heater to Curtain Interlock _____ * No Interlock, Zone Interlock, All Zones
 Enter Tunnel Temp _____
 Exit Tunnel Temp _____
 Remain in Tunnel Time _____
 Enable Tunnel Entry Min Outside Temp _____
 Today's Age _____

Ramp Point #1	Age _____	Temp _____
Ramp Point #2	Age _____	Temp _____
Ramp Point #3	Age _____	Temp _____
Ramp Point #4	Age _____	Temp _____
Ramp Point #5	Age _____	Temp _____
Ramp Point #6	Age _____	Temp _____
Ramp Point #7	Age _____	Temp _____
Ramp Point #8	Age _____	Temp _____
Ramp Point #9	Age _____	Temp _____
Ramp Point #10	Age _____	Temp _____
Ramp Point #11	Age _____	Temp _____
Ramp Point #12	Age _____	Temp _____

Temperature Ramp Offset _____
 Floor Type _____
 Close Curtains Below Outside Temp _____

APPENDIX 8 - Parameter and Security Recording

STATIC PRESSURE SET-POINTS

Natural Set-point _____

Close _____ Open _____

Tunnel Set-point _____

Tunnel Close and Open points are based on the Natural close and Open points

Ramp Point #01 _____ SP _____

Ramp Point #02 _____ SP _____

Ramp Point #03 _____ SP _____

Ramp Point #04 _____ SP _____

Ramp Point #05 _____ SP _____

MINIMUM VENT & PURGE SETTINGS

Minimum Vent Timer ON _____ OFF _____

Ramp Point #1 Age _____ On _____ Off _____

Ramp Point #2 Age _____ On _____ Off _____

Ramp Point #3 Age _____ On _____ Off _____

Ramp Point #4 Age _____ On _____ Off _____

Ramp Point #5 Age _____ On _____ Off _____

Ramp Point #6 Age _____ On _____ Off _____

Ramp Point #7 Age _____ On _____ Off _____

Ramp Point #8 Age _____ On _____ Off _____

Ramp Point #9 Age _____ On _____ Off _____

Purge ON Time _____ Delay _____

Humidity Purge Set-Point _____

Humidity Purge ON _____ Delay _____

Purge Inhibit Temp LOW _____ HIGH _____

Before Purge Raise Temperature to _____

Time to Abort Heat before Purge _____



APPENDIX 8 - Parameter and Security Recording

SOUND ALARM WHEN....

Fixed High Temp Exceeds _____
Temperature Above _____ Below _____
Outside Temp Influence HI Alarm Temp _____
Feeder #1 ON Time Exceeds _____
Feeder #2 ON Time Exceeds _____
Feeder #1 OFF Time Exceeds _____
Feeder #2 OFF Time Exceeds _____
Water #1 GPH Flow Exceeds _____
Water #1 24-Hr. DROP _____
Humidity Sensor Reading is Invalid _____
Static Pressure Stays Above _____ for _____
High Pressure Alarm Open All Inlets _____
Static Pressure Stays Below _____ for _____
Fan ON Static Pressure Below _____ for _____
Humidity sensor # (1-3) Is Invalid _____

(FURNACE – HEATER – BROODER) #1

Zone _____

Use Sensors _____
ON Temp _____ OFF Temp _____ Ch _____ Sta _____
Use During Heat Purge _____
Interlock Curtain Grps _____

(FURNACE – HEATER – BROODER)

Zone _____

Use Sensors _____
ON Temp _____ OFF Temp _____ Ch _____ Sta _____
Use During Heat Purge _____
Interlock Curtain Grps _____

(FURNACE – HEATER – BROODER)

Zone _____

Use Sensors _____
ON Temp _____ OFF Temp _____ Ch _____ Sta _____
Use During Heat Purge _____
Interlock Curtain Grps _____



APPENDIX 8 - Parameter and Security Recording

VARI- (PIT – SIDEWALL – RIDGE – STIR – TUNNEL) FAN #1

Zone _____

Use Sensors	_____		
Operating Mode	_____	Ch _____	Sta _____
ON Temp	_____	OFF Temp	_____
Fan ON Power Setting	_____		
Power Ramping Start Temp	_____		
Full Power Temp	_____		
Full Power Setting	_____		
Run Mode	_____		
On Timer	_____	OFF Timer	_____
Timed Power Setting	_____		
Purge Mode Power Setting	_____		
Run While ENTRY/EXIT of Tunnel Mode?	_____		
Use for Proportional Control?	_____		
Fans OFF at Curtain Opening	_____		
Fan OVERRIDE Curtain Open Temp	_____		
Looking At #1	_____		
Looking At #2	_____		
Looking At #3	_____		
Looking At #4	_____		

VARI- (PIT – SIDEWALL – RIDGE – STIR – TUNNEL) FAN #

Zone _____

Use Sensors	_____		
Operating Mode	_____	Ch _____	Sta _____
ON Temp	_____	OFF Temp	_____
Fan ON Power Setting	_____		
Power Ramping Start Temp	_____		
Full Power Temp	_____		
Full Power Setting	_____		
Run Mode	_____		
On Timer	_____	OFF Timer	_____
Timed Power Setting	_____		
Purge Mode Power Setting	_____		
Run While ENTRY/EXIT of Tunnel Mode?	_____		
Use for Proportional Control?	_____		
Fans OFF at Curtain Opening	_____		
Fan OVERRIDE Curtain Open Temp	_____		
Looking At #1	_____		
Looking At #2	_____		
Looking At #3	_____		
Looking At #4	_____		



APPENDIX 8 - Parameter and Security Recording

VARI- (PIT – SIDEWALL – RIDGE – STIR – TUNNEL) FAN # Zone _____

Use Sensors _____
Operating Mode _____ Ch _____ Sta _____
ON Temp _____ OFF Temp _____
Fan ON Power Setting _____
Power Ramping Start Temp _____
Full Power Temp _____
Full Power Setting _____
Run Mode _____
On Timer _____ OFF Timer _____
Timed Power Setting _____
Purge Mode Power Setting _____
Run While ENTRY/EXIT of Tunnel Mode? _____
Use for Proportional Control? _____
Fans OFF at Curtain Opening _____
Fan OVERRIDE Curtain Open Temp _____
Looking At #1 _____
Looking At #2 _____
Looking At #3 _____
Looking At #4 _____

(PIT – SIDEWALL – TUNNEL – STIR - RIDGE) FAN #1 Zone _____

Use Sensors _____
Operating Mode _____ Ch _____ Sta _____
ON Temp _____ OFF Temp _____
Run Mode _____
Run While ENTRY/EXIT of Tunnel Mode? _____
Use for Proportional Control? _____
Fans OFF at Curtain Opening _____
Fan OVERRIDE Curtain Open Temp _____
Looking At #1 _____
Looking At #2 _____
Looking At #3 _____
Looking At #4 _____



APPENDIX 8 - Parameter and Security Recording

(PIT – SIDEWALL – TUNNEL – STIR - RIDGE) FAN # _____

Zone _____

Use Sensors _____
Operating Mode _____ Ch _____ Sta _____
ON Temp _____ OFF Temp _____
Run Mode _____
Run While ENTRY/EXIT of Tunnel Mode? _____
Use for Proportional Control? _____
Fans OFF at Curtain Opening _____
Fan OVERRIDE Curtain Open Temp _____
Looking At #1 _____
Looking At #2 _____
Looking At #3 _____
Looking At #4 _____

(PIT – SIDEWALL – TUNNEL – STIR - RIDGE) FAN # _____

Zone _____

Use Sensors _____
Operating Mode _____ Ch _____ Sta _____
ON Temp _____ OFF Temp _____
Run Mode _____
Run While ENTRY/EXIT of Tunnel Mode? _____
Use for Proportional Control? _____
Fans OFF at Curtain Opening _____
Fan OVERRIDE Curtain Open Temp _____
Looking At #1 _____
Looking At #2 _____
Looking At #3 _____
Looking At #4 _____

(PIT – SIDEWALL – TUNNEL – STIR - RIDGE) FAN # _____

Zone _____

Use Sensors _____
Operating Mode _____ Ch _____ Sta _____
ON Temp _____ OFF Temp _____
Run Mode _____
Run While ENTRY/EXIT of Tunnel Mode? _____
Use for Proportional Control? _____
Fans OFF at Curtain Opening _____
Fan OVERRIDE Curtain Open Temp _____
Looking At #1 _____
Looking At #2 _____
Looking At #3 _____
Looking At #4 _____



APPENDIX 8 - Parameter and Security Recording

Looking At #4 _____

(PIT – SIDEWALL – TUNNEL – STIR - RIDGE) FAN # _____

Zone _____

Use Sensors _____

Operating Mode _____ Ch _____ Sta _____

ON Temp _____ OFF Temp _____

Run Mode _____

Run While ENTRY/EXIT of Tunnel Mode? _____

Use for Proportional Control? _____

Fans OFF at Curtain Opening _____

Fan OVERRIDE Curtain Open Temp _____

Looking At #1 _____

Looking At #2 _____

Looking At #3 _____

Looking At #4 _____

(PIT – SIDEWALL – TUNNEL – STIR - RIDGE) FAN # _____

Zone _____

Use Sensors _____

Operating Mode _____ Ch _____ Sta _____

ON Temp _____ OFF Temp _____

Run Mode _____

Run While ENTRY/EXIT of Tunnel Mode? _____

Use for Proportional Control? _____

Fans OFF at Curtain Opening _____

Fan OVERRIDE Curtain Open Temp _____

Looking At #1 _____

Looking At #2 _____

Looking At #3 _____

Looking At #4 _____

(PIT – SIDEWALL – TUNNEL – STIR - RIDGE) FAN # _____

Zone _____

Use Sensors _____

Operating Mode _____ Ch _____ Sta _____

ON Temp _____ OFF Temp _____

Run Mode _____

Run While ENTRY/EXIT of Tunnel Mode? _____

Use for Proportional Control? _____

Fans OFF at Curtain Opening _____

Fan OVERRIDE Curtain Open Temp _____

Looking At #1 _____

Looking At #2 _____

Looking At #3 _____

Looking At #4 _____



APPENDIX 8 - Parameter and Security Recording

SIDE CURTAIN #1			Zone _____	
Use Sensors _____				
Open Temp _____	Close Temp _____	Ch _____	Sta _____	
Open _____	and Pause _____			
Close _____	and Pause _____			
Maximum Opening _____		Below Temp _____		
Static Pressure Pause Timer _____				
Operating Mode _____				
Tunnel Fans #1	On _____	Open _____		
Tunnel Fans #2	On _____	Open _____		
Tunnel Fans #3	On _____	Open _____		
Tunnel Fans #4	On _____	Open _____		
Tunnel Fans #5	On _____	Open _____		
Tunnel Fans #6	On _____	Open _____		
Tunnel Fans #7	On _____	Open _____		
Tunnel Fans #8	On _____	Open _____		
Tunnel Fans #9	On _____	Open _____		
Tunnel Interlock 1	_____	Tunnel Interlock 2	_____	
Tunnel Interlock 3	_____	Tunnel Interlock 4	_____	
Tunnel Interlock 5	_____	Tunnel Interlock 6	_____	
Tunnel Interlock 7	_____	Tunnel Interlock 8	_____	
Tunnel Interlock 9	_____			
Response Mode _____				
Full Opening Size _____				
Full Open Travel Time _____				
Full Close Travel Time _____				
Purge Opening Size _____				
Exercise Delay Days _____				
Perform Exercise at _____				

SIDE CURTAIN #			Zone _____	
Use Sensors _____				
Open Temp _____	Close Temp _____	Ch _____	Sta _____	
Open _____	and Pause _____			
Close _____	and Pause _____			
Maximum Opening _____		Below Temp _____		
Static Pressure Pause Timer _____				
Operating Mode _____				
Tunnel Fans #1	On _____	Open _____		
Tunnel Fans #2	On _____	Open _____		
Tunnel Fans #3	On _____	Open _____		



APPENDIX 8 - Parameter and Security Recording

SIDE CURTAIN #		(continued)		Zone _____	
Tunnel Fans #4	On _____	Open _____			
Tunnel Fans #5	On _____	Open _____			
Tunnel Fans #6	On _____	Open _____			
Tunnel Fans #7	On _____	Open _____			
Tunnel Fans #8	On _____	Open _____			
Tunnel Fans #9	On _____	Open _____			
Tunnel Interlock 1	_____	Tunnel Interlock 2	_____		
Tunnel Interlock 3	_____	Tunnel Interlock 4	_____		
Tunnel Interlock 5	_____	Tunnel Interlock 6	_____		
Tunnel Interlock 7	_____	Tunnel Interlock 8	_____		
Tunnel Interlock 9	_____				
Response Mode	_____				
Full Opening Size	_____				
Full Open Travel Time	_____				
Full Close Travel Time	_____				
Purge Opening Size	_____				
Exercise Delay Days	_____				
Perform Exercise at	_____				
SIDE CURTAIN #				Zone _____	
Use Sensors	_____				
Open Temp _____	Close Temp _____	Ch _____	Sta _____		
Open _____	and Pause _____				
Close _____	and Pause _____				
Maximum Opening _____	Below Temp _____				
Static Pressure Pause Timer	_____				
Operating Mode	_____				
Tunnel Fans #1	On _____	Open _____			
Tunnel Fans #2	On _____	Open _____			
Tunnel Fans #3	On _____	Open _____			
Tunnel Fans #4	On _____	Open _____			
Tunnel Fans #5	On _____	Open _____			
Tunnel Fans #6	On _____	Open _____			
Tunnel Fans #7	On _____	Open _____			
Tunnel Fans #8	On _____	Open _____			
Tunnel Fans #9	On _____	Open _____			
Tunnel Interlock 1	_____	Tunnel Interlock 2	_____		
Tunnel Interlock 3	_____	Tunnel Interlock 4	_____		
Tunnel Interlock 5	_____	Tunnel Interlock 6	_____		
Tunnel Interlock 7	_____	Tunnel Interlock 8	_____		
Tunnel Interlock 9	_____				



APPENDIX 8 - Parameter and Security Recording

SIDE CURTAIN #		(continued)	Zone	
Response Mode				
Full Opening Size				
Full Open Travel Time				
Full Close Travel Time				
Purge Opening Size				
Exercise Delay Days				
Perform Exercise at				
SIDE CURTAIN #			Zone	
Use Sensors				
Open Temp	Close Temp	Ch	Sta	
Open	and Pause			
Close	and Pause			
Maximum Opening	Below Temp			
Static Pressure Pause Timer				
Operating Mode				
Tunnel Fans #1	On	Open		
Tunnel Fans #2	On	Open		
Tunnel Fans #3	On	Open		
Tunnel Fans #4	On	Open		
Tunnel Fans #5	On	Open		
Tunnel Fans #6	On	Open		
Tunnel Fans #7	On	Open		
Tunnel Fans #8	On	Open		
Tunnel Fans #9	On	Open		
Tunnel Interlock 1		Tunnel Interlock 2		
Tunnel Interlock 3		Tunnel Interlock 4		
Tunnel Interlock 5		Tunnel Interlock 6		
Tunnel Interlock 7		Tunnel Interlock 8		
Tunnel Interlock 9				
Response Mode				
Full Opening Size				
Full Open Travel Time				
Full Close Travel Time				
Purge Opening Size				
Exercise Delay Days				
Perform Exercise at				



APPENDIX 8 - Parameter and Security Recording

RIDGE VENT #1

Zone _____

Use Sensors _____

Open Temp _____ Close Temp _____ Ch _____ Sta _____

Open _____ and Pause _____

Close _____ and Pause _____

Response Mode _____

Full Opening Size _____

Full Open Travel Time _____

Full Close Travel Time _____

Purge Opening Size _____

Interlock Curtain Groups _____

RIDGE VENT #

Zone _____

Use Sensors _____

Open Temp _____ Close Temp _____ Ch _____ Sta _____

Open _____ and Pause _____

Close _____ and Pause _____

Response Mode _____

Full Opening Size _____

Full Open Travel Time _____

Full Close Travel Time _____

Purge Opening Size _____

Interlock Curtain Groups _____

(MISTER – IN HOUSE FOGGER – COOL CELL PUMP) #1

Zone _____

Use Sensors _____

Time of Day Enable _____ Disable _____ Ch _____ Sta _____

HUMDITY Disable _____ ReEnable _____

TEMP+HUMIDITY Disable _____ ReEnable _____

Full ON Temp _____ OFF Temp _____

Cycle #1 ON Temp _____

Cycle #1 Timer On _____ OFF _____

Cycle #2 ON Temp _____

Cycle #2 Timer On _____ OFF _____

Cycle #3 ON Temp _____

Cycle #3 Timer On _____ OFF _____

Cycle #4 ON Temp _____

Cycle #4 Timer On _____ OFF _____

Minimum ON Temp _____



APPENDIX 8 - Parameter and Security Recording

(MISTER – IN HOUSE FOGGER – COOL CELL PUMP) #1

Zone _____

Use Sensors _____

Time of Day Enable _____ Disable _____ Ch _____ Sta _____

HUMDITY Disable _____ ReEnable _____

TEMP+HUMIDITY Disable _____ ReEnable _____

Full ON Temp _____ OFF Temp _____

Cycle #1 ON Temp _____

Cycle #1 Timer On _____ OFF _____

Cycle #2 ON Temp _____

Cycle #2 Timer On _____ OFF _____

Cycle #3 ON Temp _____

Cycle #3 Timer On _____ OFF _____

Cycle #4 ON Temp _____

Cycle #4 Timer On _____ OFF _____

Minimum ON Temp _____

(INLET>> CEILING – SIDEWALL – TUNNEL) #1

Static Pressure Pause Timer _____

Operate as _____ Ch _____ Sta _____

#01 Cool Fans ON _____ Open _____

#02 Cool Fans ON _____ Open _____

#03 Cool Fans ON _____ Open _____

#04 Cool Fans ON _____ Open _____

#05 Cool Fans ON _____ Open _____

#06 Cool Fans ON _____ Open _____

#07 Cool Fans ON _____ Open _____

#08 Cool Fans ON _____ Open _____

#09 Cool Fans ON _____ Open _____

Natural Interlock 1 _____ Natural Interlock 2 _____

Natural Interlock 3 _____ Natural Interlock 4 _____

Natural Interlock 5 _____ Natural Interlock 6 _____

Natural Interlock 7 _____ Natural Interlock 8 _____

Natural Interlock 9 _____

#01 Tunnel Fans ON _____ Open _____

#02 Tunnel Fans ON _____ Open _____

#03 Tunnel Fans ON _____ Open _____

#04 Tunnel Fans ON _____ Open _____

#05 Tunnel Fans ON _____ Open _____

#06 Tunnel Fans ON _____ Open _____

#07 Tunnel Fans ON _____ Open _____



APPENDIX 8 - Parameter and Security Recording

(INLET>> CEILING – SIDEWALL – TUNNEL) #

(continued)

#08	Tunnel Fans ON	_____	Open	_____
#09	Tunnel Fans ON	_____	Open	_____
Tunnel Interlock 1		_____	Tunnel Interlock 2 _____	
Tunnel Interlock 3		_____	Tunnel Interlock 4 _____	
Tunnel Interlock 5		_____	Tunnel Interlock 6 _____	
Tunnel Interlock 7		_____	Tunnel Interlock 8 _____	
Tunnel Interlock 9		_____		
Full Opening Size		_____		
Full Open Travel Time		_____		
Full Close Travel Time		_____		
Purge Opening Size		_____		
Pre-Open Timer		_____		

(INLET>> CEILING – SIDEWALL – TUNNEL) #

Static Pressure Pause Timer		_____		Ch _____	Sta _____
Operate as		_____			
#01	Cool Fans ON	_____	Open	_____	
#02	Cool Fans ON	_____	Open	_____	
#03	Cool Fans ON	_____	Open	_____	
#04	Cool Fans ON	_____	Open	_____	
#05	Cool Fans ON	_____	Open	_____	
#06	Cool Fans ON	_____	Open	_____	
#07	Cool Fans ON	_____	Open	_____	
#08	Cool Fans ON	_____	Open	_____	
#09	Cool Fans ON	_____	Open	_____	
Natural Interlock 1		_____	Natural Interlock 2 _____		
Natural Interlock 3		_____	Natural Interlock 4 _____		
Natural Interlock 5		_____	Natural Interlock 6 _____		
Natural Interlock 7		_____	Natural Interlock 8 _____		
Natural Interlock 9		_____			
#01	Tunnel Fans ON	_____	Open	_____	
#02	Tunnel Fans ON	_____	Open	_____	
#03	Tunnel Fans ON	_____	Open	_____	
#04	Tunnel Fans ON	_____	Open	_____	
#05	Tunnel Fans ON	_____	Open	_____	
#06	Tunnel Fans ON	_____	Open	_____	
#07	Tunnel Fans ON	_____	Open	_____	
#08	Tunnel Fans ON	_____	Open	_____	
#09	Tunnel Fans ON	_____	Open	_____	



APPENDIX 8 - Parameter and Security Recording

(INLET>> CEILING – SIDEWALL – TUNNEL)

(continued)

Tunnel Interlock 1	_____	Tunnel Interlock 2	_____
Tunnel Interlock 3	_____	Tunnel Interlock 4	_____
Tunnel Interlock 5	_____	Tunnel Interlock 6	_____
Tunnel Interlock 7	_____	Tunnel Interlock 8	_____
Tunnel Interlock 9	_____		
Full Opening Size	_____		
Full Open Travel Time	_____		
Full Close Travel Time	_____		
Purge Opening Size	_____		
Pre-Open Timer	_____		

(Chimney Damper) #1

#01	Cool Fans ON	_____	Open	_____		
#02	Cool Fans ON	_____	Open	_____	Ch	Sta
#03	Cool Fans ON	_____	Open	_____		
#04	Cool Fans ON	_____	Open	_____		
#05	Cool Fans ON	_____	Open	_____		
#06	Cool Fans ON	_____	Open	_____		
#07	Cool Fans ON	_____	Open	_____		
#08	Cool Fans ON	_____	Open	_____		
#09	Cool Fans ON	_____	Open	_____		
Interlock 1	_____	Interlock 2	_____			
Interlock 3	_____	Interlock 4	_____			
Interlock 5	_____	Interlock 6	_____			
Interlock 7	_____	Interlock 8	_____			
Interlock 9	_____					
Full Opening Size	_____					
Full Open Travel Time	_____					
Full Close Travel Time	_____					

(Chimney Damper)

#01	Cool Fans ON	_____	Open	_____		
#02	Cool Fans ON	_____	Open	_____		
#03	Cool Fans ON	_____	Open	_____	Ch	Sta
#04	Cool Fans ON	_____	Open	_____		
#05	Cool Fans ON	_____	Open	_____		
#06	Cool Fans ON	_____	Open	_____		
#07	Cool Fans ON	_____	Open	_____		
#08	Cool Fans ON	_____	Open	_____		
#09	Cool Fans ON	_____	Open	_____		



APPENDIX 8 - Parameter and Security Recording

(Chimney Damper)

(continued)

Interlock 1	_____	Interlock 2	_____
Interlock 3	_____	Interlock 4	_____
Interlock 5	_____	Interlock 6	_____
Interlock 7	_____	Interlock 8	_____
Interlock 9	_____		
Full Opening Size	_____		
Full Open Travel Time	_____		
Full Close Travel Time	_____		

POSITION SENSOR #1

Zone _____

Attached To _____

Enable Position Alarm? _____ Ch _____ Sta _____

Percent Out of Position to Alarm _____ % (0 – 80)

POSITION SENSOR

Zone _____

Attached To _____

Enable Position Alarm? _____ Ch _____ Sta _____

Percent Out of Position to Alarm _____ % (0 – 80)

POSITION SENSOR

Zone _____

Attached To _____

Enable Position Alarm? _____ Ch _____ Sta _____

Percent Out of Position to Alarm _____ % (0 – 80)

Whisker Switch #1

Zone _____

Attached To _____ Ch _____ Sta _____

Validate Switch - Low _____ % (0 – 99) High _____ % (1 – 100)

Whisker Switch

Zone _____

Attached To _____ Ch _____ Sta _____

Validate Switch - Low _____ % (0 – 99) High _____ % (1 – 100)

Whisker Switch

Zone _____

Attached To _____ Ch _____ Sta _____

Validate Switch - Low _____ % (0 – 99) High _____ % (1 – 100)

Digital Alarm #1

Zone _____

Trigger Alarm on Active Input _____

Input is Active when _____ Ch _____ Sta _____

Alarm Delay Time _____



APPENDIX 8 - Parameter and Security Recording

Digital Alarm # _____ Zone _____

Trigger Alarm on Active Input _____

Input is Active when _____ Ch _____ Sta _____

Alarm Delay Time _____

Digital Alarm # _____ Zone _____

Trigger Alarm on Active Input _____

Input is Active when _____ Ch _____ Sta _____

Alarm Delay Time _____

(FEEDER – LIGHTS) # _____ Zone _____

Setting #1 AGE		ON=		OFF=		
Setting #2 AGE		ON=		OFF=		
Setting #3 AGE		ON=		OFF=		
Setting #4 AGE		ON=		OFF=		
Setting #5 AGE		ON=		OFF=		
Setting #6 AGE		ON=		OFF=		
Setting #7 AGE		ON=		OFF=		
Setting #8 AGE		ON=		OFF=		
Setting #9 AGE		ON=		OFF=		
Setting #10 AGE		ON=		OFF=		
Setting #11 AGE		ON=		OFF=		
Setting #12 AGE		ON=		OFF=		
Setting #13 AGE		ON=		OFF=		
Setting #14 AGE		ON=		OFF=		
Setting #15 AGE		ON=		OFF=		
Setting #16 AGE		ON=		OFF=		
Setting #17 AGE		ON=		OFF=		
Setting #18 AGE		ON=		OFF=		
Setting #19 AGE		ON=		OFF=		
Setting #20 AGE		ON=		OFF=		
Setting #21 AGE		ON=		OFF=		
Setting #22 AGE		ON=		OFF=		
Setting #23 AGE		ON=		OFF=		
Setting #24 AGE		ON=		OFF=		
Setting #25 AGE		ON=		OFF=		
Setting #26 AGE		ON=		OFF=		
Setting #27 AGE		ON=		OFF=		
Setting #28 AGE		ON=		OFF=		
Setting #29 AGE		ON=		OFF=		
Setting #30 AGE		ON=		OFF=		



APPENDIX 8 - Parameter and Security Recording

Setting #30 AGE ON= OFF=

(FEEDER – LIGHTS)

Zone

Setting #1 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #2 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #3 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #4 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #5 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #6 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #7 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #8 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #9 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #10 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #11 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #12 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #13 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #14 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #15 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #16 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #17 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #18 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #19 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #20 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #21 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #22 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #23 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #24 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #25 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #26 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #27 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #28 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #29 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #30 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>

Ch Sta

(FEEDER – LIGHTS)

Zone

Setting #1 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #2 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #3 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #4 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #5 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #6 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #7 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #8 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>
Setting #9 AGE	<input type="text"/>	ON=	<input type="text"/>	OFF=	<input type="text"/>

Ch Sta



APPENDIX 8 - Parameter and Security Recording

(FEEDER – LIGHTS)

(continued)

Setting #10 AGE		ON=		OFF=	
Setting #11 AGE		ON=		OFF=	
Setting #12 AGE		ON=		OFF=	
Setting #13 AGE		ON=		OFF=	
Setting #14 AGE		ON=		OFF=	
Setting #15 AGE		ON=		OFF=	
Setting #16 AGE		ON=		OFF=	
Setting #17 AGE		ON=		OFF=	
Setting #18 AGE		ON=		OFF=	
Setting #19 AGE		ON=		OFF=	
Setting #20 AGE		ON=		OFF=	
Setting #21 AGE		ON=		OFF=	
Setting #22 AGE		ON=		OFF=	
Setting #23 AGE		ON=		OFF=	
Setting #24 AGE		ON=		OFF=	
Setting #25 AGE		ON=		OFF=	
Setting #26 AGE		ON=		OFF=	
Setting #27 AGE		ON=		OFF=	
Setting #28 AGE		ON=		OFF=	
Setting #29 AGE		ON=		OFF=	
Setting #30 AGE		ON=		OFF=	

SENSOR CALIBRATIONS & SETTINGS

Air Sensor #01 Cable Length		Zone	
Air Sensor #01 Wire Gauge			
Air Sensor #01 Location		Ch	Sta
Air #01 CAL Values			
Air #01 Use for Wind Speed			
Air Sensor #02 Cable Length		Zone	
Air Sensor #02 Wire Gauge			
Air Sensor #02 Location		Ch	Sta
Air #02 CAL Values			
Air #02 Use for Wind Speed			
Air Sensor #____ Cable Length		Zone	
Air Sensor #____ Wire Gauge			
Air Sensor #____ Location		Ch	Sta
Air #____ CAL Values			
Air #____ Use for Wind Speed			
Shared Air Sensor #____ Location		Ch	Sta
Shared Air Sensor #____ Location		Ch	Sta



APPENDIX 8 -Parameter and Security Recording

Shared Air Sensor #____ Location _____ Ch _____ Sta _____
 Shared Air Sensor #____ Location _____ Ch _____ Sta _____

SENSOR CALIBRATIONS & SETTINGS

(continued)

Air Sensor #____ Cable Length _____ Zone _____
 Air Sensor #____ Wire Gauge _____
 Air Sensor #____ Location _____ Ch _____ Sta _____
 Air #____ CAL Values _____
 Air #____ Use for Wind Speed _____
 Air Sensor #13 Cable Length _____ Ch _____ Sta _____
 Air Sensor #13 Wire Gauge _____

Humidity Sensor #01

Zone _____

Humidity CAL 1 Value _____
 Humidity CAL 2 Value _____ Ch _____ Sta _____

Humidity Sensor #02

Zone _____

Humidity CAL 1 Value _____
 Humidity CAL 2 Value _____ Ch _____ Sta _____

Humidity Sensor #03

Zone _____

Humidity CAL 1 Value _____
 Humidity CAL 2 Value _____ Ch _____ Sta _____

Static Pressure Sensor #0

Zone _____

ADC CAL 1 Value _____
 ADC CAL 2 Value _____ Ch _____ Sta _____
 WC CAL 1 Value _____
 WC CAL 2 Value _____

Feed #1 Minimum _____ Actual XX Ch _____ Sta _____
 Feed #1 Minimum _____ Actual XX Ch _____ Sta _____

Water #1 CAL Value (PPG) _____ Ch _____ Sta _____

Power Up Load Delay Time _____

Password _____	Security Level _____
Password _____	Security Level _____
Password _____	Security Level _____
Password _____	Security Level _____
Password _____	Security Level _____
Password _____	Security Level _____
Password _____	Security Level _____

Software Revision _____

Control Center Serial Number _____

APPENDIX 9 - Controller Info & Security Settings

Main Controller Menus

	Min	Max	Security levels	
			Display	Edit
Software Revision Number			0	na
Revision Date Time			0	na
Control Center Serial Number			0	7
Enter Password	0000	9999	0	0
Edit Password	0000	9999	5	5
Security Level	0	9	5	5
Compile Options			5	na
Valco Companies			0	na

Security Levels

Security levels are used to limit the information users are able to change in the controller software as well as in the database file.

LEVEL	ACCESS
0	Users at this level can view but not change settings.
1	Users can set Animal Information, Air Sensor settings and humidity Sensor Settings
2	Users can set Temperature setpoint and Ramping Offset, Time and Date
3	Users at this level can change current animal information, time & date, and feeder times.
4	Users at this level can change all settings except for adding/deleting control devices and passwords.
5-7	Users at this level are allowed to make any changes. NOTE: Level 7 is the default setting until you set up passwords and assign security levels. At least one person must be given access at this level in order to set up passwords and usernames for other people using this application.

APPENDIX 10 - Animal Information Min/Max Settings

Current Animal Information

Shows when controller is set to Hog

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Today's Age	0		0		900		1		0	1
Today's Weight	0	0.0	0	0.0	9999	500.0	1	0.1	0	1
Finish Age	0		0		900		1		0	1
Finish Weight	0	0.0	0	0.0	9999	500.0	1	0.1	0	1
Beginning Head Count	1		0		9999		1		0	1
Total Mortality Head Count	0		0		9999		1		0	1
Total Sold Head Count	0		0		9999		1		0	1

Current Bird Information

Shows when controller is set to Bird

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Today's Bird Age	0		0		9999		1		0	1
Today's Bird Weight	0.0	0	0.0	0	99.9	65000	0.1	1	0	1
Projected Finishing Age	0		0		9999		1		0	1
Projected Finishing Weight	0.0	0	0.0	0	99.9	65000	0.1	1	0	1
Beginning Bird Count	1		0		32700		1		0	1
Mortality Bird Count	0		0		32700		1		0	1
Total Sold Bird Count	0		0		32700		1		0	1



APPENDIX 11 - Temperature Control Min/Max Settings

Temperature Control Settings - need to enter tech password to see this menu

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Temp Setpoint (See Note 7 & 8)	70.0	21.1	30.0	-1.1	120.0	48.8	0.1		0	2
Temp Control	Actual		Off		Actual *----- Eff.				0	4
House Control Mode (Bird Only)	GrowOut2		"Brood", Growout1, Growout2						0	4
Ridge To Curtains (See Note 4)	No Interlock		"No Interlock" and "Interlock"						0	4
Heat to Curtains (See Note 5)	No Interlock		"No Interlock", "Zone Interlock" & "All Zone"						0	4
Enter Tunnel Temp (See Note 3)	85.0	29.4	30.0	-1.1	120.0	48.8	0.1		0	4
Exit Tunnel Temp (See Note 3)	80.0	26.6	30.0	-1.1	120.0	48.8	0.1		0	4
Remain in Tunnel Time (See Note 3)	1:00:00		0:00:00		9:00:00		N/A		0	4
Enable Tunnel Entry. Outside Temp (Note 1 & 3)	0.0	0.0	0.0	0.0	75.0	23.9	0.1		0	4
Today's Age (See Note 6)	0		0		900		1		0	4
Ramp Point #1 TO #12									0	4
Age	0		0		900		1		0	4
Temp	70.0	21.1	30.0	-1.1	120.0	48.8	0.1		0	4
Temperature Ramp Offset	0.0		-12.0		+12.0		0.1		0	2
Floor Type (Hog Only)	Concrete		"Concrete" and "Other"						0	4
Close Curtains Below Outside Temp (See Note 2)	-60.0	-51.1	-60.0	-51.1	120.0	48.8	0.1		0	4

NOTES:

- 1: Enabled only an Outside Temp Sensor are installed and Power vented
- 2: Enabled only when a Curtain and an Outside Temp Sensor are installed and Power vented
- 3: Enabled only with a Fan installed and set to a Tunnel mode
- 4: Enabled only when a Ridge Vent and a Curtain are installed
- 5: Enabled only when a Curtain is installed and either a Heater, Furnace, or Brooder is installed
- 6: If Temperature Ramp Table has values set, then changing age will cause Setpoint to change (See Note 8 & Ramp Table Theory)
- 7: If Ramping is on then this is disabled
- 8: Changing the Setpoint will cause the following values to change:

Temperature Control Settings

- Temp Setpoint
- Enter and Exit Tunnel Temp
- Close Curtains Below Outside Temp

Purge Settings

- Low and High Temp Inhibit
- Before Purge Raise Temperature

Sound Alarm When settings

- Temperature Above and Below
- Low Temp Drops Below

Fans – Ridge, Tunnel, Sidewall, Stir, Pit

- On/Off Temp
- Fan Override Curtain Open Temp

Variable Fans – Ridge, Tunnel, Sidewall, Stir, Pit

- On/Off Temp
- Fan Override Curtain Open Temp
- Power Ramping Start Temp
- Full Power Temp

Furnace, Heater, Brooder

- On/Off Temp

Foggers – In House, Mister & Cool Pads – High, Low

- Full On/Off Temp
- Cycle On Temps

Side Curtain & Ridge Vent

- Open/Close Temps

Ramp Table Theory:

If Age #1 is zero or Animal Age is zero, then Ramping is Off and all other values in Ramp table are ignored.

As Animal Age changes, the Temp Setpoint is changed to that Age's Setpoint in Ramp Table or incremented based on Ages and Setpoints in Ramp Table (See Note 8)

If the Ramp Table Age is less than or equal to the previous Ramp Table Age then that Setpoint and all additional Setpoints are ignored and Ramping is turned off.

APPENDIX 12 - Purge and Min. Vent Min/Max Settings

Building Purge Settings

This shows when no fans are installed except Stir fans

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Purge Time	0:00:00		0:00:00		9:00:00		N/A		0	4
Delay Time (Purge)	3:00:00		0:00:01		18:00:00		N/A		0	4
Humidity Setpoint (See Note 1)	100		0		100		1		0	4
Humidity Purge Time (See Note 1)	0:00:00		0:00:00		9:00:00		N/A		0	4
Delay Time (Humidity Purge) (See Note 1)	1:00:00		0:00:00		9:00:00		N/A		0	4
Purge Inhibit Temp LOW (See Note 2)	60.0	15.6	30.0	-1.1	119.9	48.7	0.1		0	4
High (Purge Inhibit Temp) (See Note 2)	74	23.3	Low Temp + 0.1		120.0	48.8	0.1		0	4
Before purge raise Temperature to: (See Note 2)	70.0	21.1	SetPoint		Setpoint + 5.0	Setpoint + 2.7	0.1		0	4
Time to Abort Heat before Purge (See Note 2)	0:00		0:00		59:59		N/A		0	4

Note 1: Enabled only when Humidity Sensor is installed

Note 2: Enabled when a heater is installed with "Use During Heat Purge" set to Yes and Purge Time and Delay are non-zero or Humidity Setpoint is 1% to 99% and Humidity Purge Time and Delay are non-zero

Minimum Vent Settings

This shows when fans are installed other than Stir fans

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Minimum Vent Timer ON	0:00		0:00		59:59		N/A		0	4
Off (Minimum Vent Timer)	0:00		0:00		59:59		N/A		0	4
Min Vent #1 to #9									0	4
Age	0		0		900		1		0	4
On\Off times	0:00		0:00		59:59		N/A		0	4
Humidity Setpoint (See Note 1)	100		0		100		1		0	4
Humidity Purge Time (See Note 1)	0:00:00		0:00:00		9:00:00		N/A		0	4
Delay Time (Humidity Purge) (See Note 1)	1:00:00		0:00:00		9:00:00		N/A		0	4
Purge Inhibit Temp LOW (See Note 2)	60.0	15.6	30.0	-1.1	119.9	48.7	0.1		0	4
High (Purge Inhibit Temp) (See Note 2)	74.0	23.3	Low Temp + 0.1		120.0	48.8	0.1		0	4
Before purge raise Temperature to: (See Note 2)	70.0	21.1	SetPoint		Setpoint + 5.0	Setpoint + 2.7	0.1		0	4
Time to Abort Heat before Purge (See Note 2)	0:00		0:00		59:59		N/A		0	4

Note 1: Enabled only when Humidity Sensor is installed and a Fan is set to a Purge mode

Note 2: Enabled when a heater is installed with "Use During Heat Purge" set to Yes and Humidity Setpoint is 1% to 99% and Humidity Purge Time and Delay are non-zero



APPENDIX 13 - Static Pressure Min/Max Settings

Static Pressure Settings

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Setpoint - Natural	0.040		WCCal1 + offset of Setpoint minus Close		WCCal 2 - offset of Open minus Setpoint		0.001		0	4
Close	0.030		WCCal 1		Setpoint		0.001		0	4
Open	0.050		Setpoint		WCCal 2		0.001		0	4
Setpoint - Tunnel (Note 1) (Open and close settings are set at setpoint Natural)	0.040		WCCal1 + offset of Setpoint minus Close		WCCal 2 - offset of Open minus Setpoint		0.001		0	4
Ramp #x Temperature (Note 2)	-60.0	32.2	-60.0	-51.1	130.0	32.2	0.1		0	4
Pressure (Note 2)	0.000		WCCal 1		WCCal 2		0.001		0	4

Note 1: Only available when Fan installed and set to a Tunnel mode. Open and close settings Info only settings. They are set at Setpoint - Natural

Note 2: Only Available when Outside air sensor installed

APPENDIX 14 - Sound Alarm When....Min/Max Settings

Sound Alarm When....

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Fixed High Temp Exceeds	90.0	32.2	30.0	-1.1	120.0	48.8	0.1		0	4
Temperature Above	80.0	26.6	30.1	-1.0	120.0	48.8	0.1		0	4
Below	60.0	15.6	30.0	-1.1	Above Temp -0.1		0.1		0	4
Outside Temp Influence HI Alarm Temp	No		Yes or No				N/A		0	4
Feed #x On Time Exceeds (See Note 2)	0:00:00		0:00:00		18:00:00		N/A		0	4
Feeder #x OFF Time Exceeds (See Note 2)	0:00:00		0:00:00		18:00:00		N/A		0	4
Water #x GPH Flow Exceeds (Note 1)	0		0		9999		1		0	4
Water #x 24-Hr. DROP (Note 1)	0%		0		100		1		0	4
Static Pressure Stays Above (See Note 3)	0.250		WCCal1		WCCal2		0.001		0	4
For (Static Pressure Stays Above) (See Note 3)	0:00		0:00		59:59		N/A		0	4
High Pressure Alarm Open All Inlets (See Note 3)	Yes		Yes/No				N/A		0	4
Static Pressure Stays Below (See Note 3)	0.250		WCCal1		WCCal2		0.001		0	4
For (Static Pressure Stays Below) (See Note 3)	0:00		0:00		59:59		N/A		0	4
Fan ON Static Pressure Below (See Note 3)	0.250		WCCal1		WCCal2		0.001		0	4
For (Fan ON Static Pressure Below) (See Note 3)	0:00		0:00		59:59		N/A		0	4
Humidity Sensor #xx Reading Is Bad (See Note 4)	No		"No" or "Yes"				N/A		0	4
Highest/Lowest Air Probes differ by:	99		10		99		1		0	4

Note 1: Water Meter settings enabled only when Water Sensor is installed

Note 2: Feed Sensor settings enabled only when Feed Sensor is installed

Note 3: Static pressure settings enabled only when Static Pressure Sensor installed

Note 4: Humidity setting enabled only when Humidity sensor installed



APPENDIX 15 - Sensor Min/Max Settings

Air Sensors (including the Outside Sensor (#13))	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Air Sensor #X Cable Length	100	30	1		9999		1		0	1
Air Sensor #X Wire Diameter	24	0.6	English allows only "16", "18", "20", "22" & "24" Metric allows only "0.5", "0.6", "0.7", "0.8", "0.9", "1.0", "1.1" & "1.2"						0	1
Air Sensor #X Location (Bird only)	Brood		"Brood", "Growout1", "Growout2"						0	1
Air #xx Use for Wind Speed	Yes		Yes/No						0	1
Air #xx Cal Values (see note 1)	550/90		400/40		1200/200		1		0	1

Note 1: Only enabled if Use for Wind Speed is Yes

Outside Sensor does not have Location, Use for Wind Speed, or Cal Values settings.

Air Sensors Shared	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Air Sensor #X Location (Bird only)	Brood		"Brood", "Growout1", "Growout2"						0	1

Air Sensor Shared uses the values from the Air Sensor it is attached to but it does have it's own Location setting for Birds

Humidity Sensors	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Humidity #xx Cal 1	10485		0		Cal Value 2		1		0	1
Cal 2	51118		Cal Value 1		65535		1		0	1

Static Pressure Sensors	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
ADC Cal 1	6554		0		ADC Cal 2		1		0	4
ADC Cal 2	58982		ADC Cal 1		65535		1		0	4
WC Cal 1	0.000		0.000		WC Cal 2		0.001		0	4
WC Cal 2	0.250		WC Cal 1		6.500		0.001		0	4

Feed Sensors	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Minimum Amps	0.1		0.0		25.0		0.1		0	4
Cal Value	100		0		999		1		0	4

Water Meter	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Cal Value (PPG) or (PPL)	25.0		0.0		99.9		0.1		0	4

Digital Alarm	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Trigger alarm on Active Input	No		"No" or "Yes"				N/A		0	4
Input is Active when	Closed		"Closed" or "Open"				N/A		0	4
Alarm Delay Time	0:01		0:00		59:59		N/A		0	4

Position Sensor (See Note 1)	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Attached To	Shows what Position Sensor is attached to - Allows all inlets installed						N/A		0	4
Enable Position Alarm	Yes		"No" or "Yes"				N/A		0	4
Percent OUT of Position to Alarm (Note 2)	10		0		80		1		0	4

Note 1: Shows "Sensor Not Calibrated" unless attached to an Inlet and calibrated correctly

Note 2: Only enabled if Enable Position Alarm is Yes

Whisker Switch	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Attached To	Shows what Whisker Switch is attached to - Allows all inlets installed						N/A		0	4
Validate Switch - Low	0%		0%		99%		1		0	4
High	0%		Low value + 1		100%		1		0	4

APPENDIX 16 - System & Control Device Setup

	Security levels	
	Display	Edit
Time Setup	0	2
Date Set-up	0	2
Power Up Load Delay time	0	4
Press Enter to LIST Control Devices	0	0
Press Enter to ADD Control Devices	5	5
Press Enter to CHANGE Control Devices	5	5
Press Enter to DELETE Control Devices	5	5
Press Enter to ADD New Zone	5	5
Press Enter to DELETE New Zone	5	5

APPENDIX 17 - Fan Min/Max Settings

Stir, Sidewall, Tunnel, Ridge, Pit (Hog Only) Fan Settings

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Use Sensors	ALL (0,0,0,0)		0		installed		1 (Only sensor #'s)		0	4
Operating Mode Note: Tunnel Fan default is Tunnel	Cool		"Cool", "Heat", "Purge", "Cool & Purge", "Heat & Purge", "Tunnel", "Tunnel & Cool", "Tunnel & Purge", "Tunnel, Cool ,Purge"						0	4
On Temp - All but Heat modes	74.0	23.3	30.1	-1.0	120.0	48.8	0.1		0	4
Heat Modes	74.0	23.3	30.0	-1.1	119.9	48.7	0.1		0	4
Off Temp - All but Heat modes	72.0	22.2	30.0	-1.1	On Temp - 0.1		0.1		0	4
Heat Modes	72.0	22.2	On Temp + 0.1		120.0	48.8	0.1		0	4
Fan Run Mode	Temp Only		"Temp or Timed", "Temp or Minimum Vent", "Temp and Timed", "Temp Only", "Timed Only"						0	4
On Timer	0:00:00		0:00:00		9:00:00		N/A		0	4
Off Timer	0:10:00		0:00:00		9:00:00		N/A		0	4
Run While Entry/Exit of Tunnel Mode	No		No		Yes		N/A		0	4
Use For Proportional Control Note: Not Available for Stir Fans	Yes		No		Yes		N/A		0	4
Fans Off at Curtain Opening of Note: Not available for Tunnel mode	0		0		250		1		0	4
Fan Override Curtain Open Temp Note: Not Available for Tunnel mode	80.0	26.6	30.0	-1.1	120.0	48.8	0.1		0	4
Looking at(x): (x = 1 to 4)	All curtains/inlets		Curtains/inlets with Position Sensor or Whisker Switch						0	4

See page 192 for determining which fan settings are enabled and disabled based on the fan's Run Mode.



APPENDIX 17 - Fan Min/Max Settings - continued

Variable Speed Stir, Sidewall, Tunnel, Ridge, Pit (Hog Only) Fan Settings

	Defaults		Min		Max		Steps By		Security levels		
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit	
Use Sensors	ALL (0,0,0,0)		0		installed		1 (Only sensor #'s)		0	4	
Operating Mode Note: Tunnel Fan default is Tunnel	Cool		"Cool", "Heat", "Purge", "Cool & Purge", "Heat & Purge", "Tunnel", "Tunnel & Cool", "Tunnel & Purge", "Tunnel, Cool ,Purge"						0	4	
On Temp - All but Heat modes	74.0	23.3	30.1	-1.0	120.0	48.8	0.1		0	4	
Heat Modes	74.0	23.3	30.0	-1.1	119.9	48.7	0.1		0	4	
Off Temp - All but Heat modes	72.0	22.2	30.0	-1.1	On Temp - 0.1		0.1		0	4	
Heat Modes	72.0	22.2	On Temp + 0.1		120.0	48.8	0.1		0	4	
Fan ON Power Setting	25		1		60		1		0	4	
Power Ramping Start Temp	78.0	25.5	Off Temp + 0.1		120.0	48.8	0.1		0	4	
Heat Modes	72.0	22.2	30.0	-1.1	Off Temp - 0.1		0.1		0	4	
FULL Power Temp	84.0	28.8	Off Temp + 0.1		120.0	48.8	0.1		0	4	
Heat Modes			30.0	-1.1	Off Temp - 0.1		0.1		0	4	
FULL Power Setting	50		1		60		1		0	4	
Run Mode	Temp Only		"Temp or Timed", "Temp and Minimum Vent", "Temp and Timed", "Temp Only", "Timed Only"						0	4	
On Timer	0:00:00		0:00:00		9:00:00		N/A		0	4	
Off Timer	0:10:00		0:00:00		9:00:00		N/A		0	4	
Timer Power Setting	50		1		60		1		0	4	
Purge Mode Power Setting (Note 1)	50		1		60		1		0	4	
Run While Entry/Exit of Tunnel Mode	No		No		Yes		N/A		0	4	
Use For Proportional Control Note: Not Available for Stir Fans	Yes		No		Yes		N/A		0	4	
Fans Off at Curtain Opening of Note: Not available for Tunnel mode	0		0		250		1		0	4	
Fan Override Curtain Open Temp Note: Not Available for Tunnel mode	80.0	26.6	30.0	-1.1	120.0	48.8	0.1		0	4	
Looking at(x): (x = 1 to 4)	All curtains/inlets		Curtains/inlets with Position Sensor or Whisker Switch						0	4	

Note 1: Enabled only when fan is set to purge, Humidity Setpoint is less than 100 and Humidity Purge Time and Delay Time are greater than 0:00:00

See the next page for determining which fan settings are enabled and disabled based on the fan's Run Mode.

APPENDIX 17 - Fan Min/Max Settings - continued

Stir, Sidewall, Tunnel, Ridge, Pit (Hog Only) Fan Settings

Enabled / Disabled Fan Settings based on the Fan's Run Mode (X means Enabled)

Run Mode	Temp or Timed	Timed Only	Temp Only	Temp and Timed	Temp or Minimum Vent
Use Sensors	X	X	X	X	X
Operating Mode	X	X	X	X	X
On \ Off Temp	X		X	X	X
Run Mode	X	X	X	X	X
On \ Off Timer	X	X		X	
Run While Entry/Exit of Tunnel Mode	X	X	X	X	X
Use For Proportional Control Note: Always disabled for Stir Fans	X	X	X	X	X
Fans Off at Curtain Opening of Note: Not available for Tunnel Mode	Enabled Only when Position Sensor/Whisker Switch is installed to a curtain and is calibrated correctly and Operating Mode is not Tunnel				
Fan Override Curtain Open Temp Note: Not Available for Tunnel Mode	Enabled Only when Fans Off at Curtain Opening is Enabled and Fans Off at Curtain Opening is greater than 0				
Looking at(x): (x = 1 to 4)	Enabled Only when Fans Off at Curtain Opening is Enabled and Fans Off at Curtain Opening is greater than 0				

Variable Speed Stir, Sidewall, Tunnel, Ridge, Pit (Hog Only) Fan Setting

Enabled and Disabled (X means Enabled)

Run Mode	Temp or Timed	Timed Only	Temp Only	Temp and Timed	Temp or Minimum Vent
Use Sensors	X	X	X	X	X
Operating Mode	X	X	X	X	X
On / Off Temp	X		X	X	X
Fan ON Power Setting	X		X	X	X
Power Ramping Start Temp	X		X	X	X
FULL Power Temp	X		X	X	X
FULL Power Setting	X		X	X	X
Run Mode	X	X	X	X	X
On \ Off Timer	X	X		X	
Timer Power Setting	X	X		X	X
Purge Mode Power Setting	Note 1	Note 1	Note 1	Note 1	Note 1
Run While Entry/Exit of Tunnel Mode	X	X	X	X	X
Use For Proportional Control Note: Always disabled for Stri Fans	X	X	X	X	X
Fans Off at Curtain Opening of Note: Not available for Tunnel mode	Enabled Only when Position Sensor/Whisker Switch is installed to a curtain and is calibrated correctly and Operating Mode is not Tunnel				
Fan Override Curtain Open Temp Note: Not Available for Tunnel mode	Enabled Only when Fans Off at Curtain Opening is Enabled and Fans Off at Curtain Opening is greater than 0				
Looking at(x): (x = 1 to 4)	Enabled Only when Fans Off at Curtain Opening is Enabled and Fans Off at Curtain Opening is greater than 0				

Note 1: Enabled only when fan is set to purge, Humidity Setpoint is less than 100 and Humidity Purge Time and Delay Time are greater than 0:00:00



APPENDIX 18 - Cool Pads, Fogger & Mister Min/Max Settings

Cool Pad Low/High, In House Fogger (Bird) and Mister (Hog) Settings

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Use Sensors	ALL (0,0,0,0)		0		# of Sensors		1 (Only sensor #'s)		0	4
Time of Day to Enable	0:00		0:00		24:00		N/A		0	4
Disable	24:00		0:00		24:00		N/A		0	4
Humidity Disable (See Note 1)	100		0		100		1		0	4
ReEnable (See Note 1)	100		0		Humidity Disable		1		0	4
Temp+Humidity Disable (See Note 1)	220		30		220		1		0	4
ReEnable (See Note 1)	220		30		T + RH Disable		1		0	4
Full On Temp	110.0	43.3	30.1	-1.0	120.0	48.8	0.1		0	4
Off Temp	79.0	26.1	30.0	-1.1	On Temp - 0.1		0.1		0	4
Cycle # X On Temp	90.0 to 90.3	32.2 to 32.5	30.0	-1.1	120.0	48.8	0.1		0	4
Cycle # X On Timer	0:00:00		0:00:00		9:00:00		N/A		0	4
Off Timer	0:10:00		0:00:00		9:00:00		N/A		0	4
Minimum On Temp	80.0	26.6	30.0	-1.1	120.0	48.8	0.1		0	4
Min Temps	90.0, 90.1, 90.2, 90.3, 110.0	32.2, 32.3, 32.4, 32.5, 43.3	Calculated valves equal to Cycle #1 thru #4 On Temps and Full On Temp If Min On temp is Greater than Cycle #1 On Temp then Values equal Cycle On Temps + Offset of Min On Temp to Cycle #1 Temp						0	4

Note 1: Enabled only if Humidity Sensor Installed

Menus that appear for Cool Pad Low/High, In House Fogger (Bird) and Mister (Hog)		
Enabled and Disabled (X means Enabled)		
	No Humidity Sensor	With Humidity Sensor
Use Sensors	X	X
Time of Day to Enable / Disable	X	X
Humidity Disable / ReEnable(See Note 1)		X
Temp+Humidity Disable / ReEnable(See Note 1)		X
Full On Temp / Off Temp	X	X
Cycle On Temp #X	X	X
Cycle On / Off Timer #1 to #4	X	X
Minimum On Temp	X	X
Min Temps		
Note 1: Enabled only if Humidity Sensor Installed		

APPENDIX 19 - Side Curtain Min/Max Settings

Side Curtain Settings										
	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Use Sensors	ALL (0,0,0,0)		0		# of Sensors		1 (Only sensor #'s)		0	4
Open Temp	72.0	22.2	30.1	-1.0	120.0	48.8	0.1		0	4
Close Temp	68.0	20.0	30.0	-1.1	On Temp - 0.1		0.1		0	4
Open	10	25	1		250		1		0	4
Pause (Open)	0:03:00		0:00:10		9:00:00		N/A		0	4
Close	10	25	1		250		1		0	4
Pause (Close)	0:03:00		0:00:10		9:00:00		N/A		0	4
Maximum Opening (See Note 8)	0		0		250		1		0	4
Below Temp	Setpoint		Setpoint		Setpoint + 15 degrees		0.1		0	4
Static Pressure Pause Timer (See Note 4)	0:00		0:00		1:00		N/A		0	4
Operate as (See Note 1 and 3)	Temp Natural Only		"Temp Natural Only", "Temp Natural/Temp Tunnel", "Temp Natural/Static Tunnel", "Temp Tunnel Only", "Static Natural Only", "Static Natural/Temp Tunnel", "Static Natural/Static Tunnel", "Static Tunnel Only"						0	4
Tunnel Fans ON #01 to #09	0 to 8		0		9		1		0	4
Tunnel Fans Open - #01 default is 0	48.0	121	0.0	0	250.0	250	0.1	1	0	4
Tunnel Fan Interlocks	All Fans		Interlock up to 9 installed fans that have "Use for Proportional Control" set to "Yes", except Stir fans						0	4
Response Mode	Standard		"Standard" and "Aggressive"						0	4
Full Opening Size	48	121	1		250		1		0	4
Full Open Travel Time	6:00		0:05		59:59		N/A		0	4
Full Close Travel Time	6:00		0:05		59:59		N/A		0	4
Purge Opening Size (See Note 2)	6	15	0		250		1		0	4
Pre-Open Timer (See Note 4)	0:00		0:00		1:00		N/A		0	4
Exercise Delay Days (See Note 5)	0		0		30		1		0	4
Perform Exercise at (See Note 6)	0:00		0:00		24:00		N/A		0	4

Note 1: Enabled only if Static Pressure sensor installed or a fan installed and Tunnel is part of Operating Mode

Note 2: Enabled only if Purge On/Off times are greater than 0:00:00, if power building then Humidity Sensor needs to be installed and one fan includes Purge and Humidity Purge Time and Delay has to be greater than 0 and Humidity Purge Setpoint is between 1 and 99.

Note 3: Static Modes will only show if Static Pressure Sensor Is Installed

Note 4: Enabled only if Static Pressure sensor installed and Operating mode includes Static Natural

Note 5: Enabled only if Operate As includes Temp Natural

Note 6: Enabled only if Exercise Delay Days is greater then 0

Note 7: Enabled only when attached to Position Sensor that is calibrated, alarm is enabled and not alarming

See next page for a table showing which settings are enabled/disabled based on the Operate As setting.



APPENDIX 19 - Side Curtain Min/Max Settings - continued

Menus that appear for Side Curtain Based on "Operate As"

Enabled and Disabled (X means Enabled)

	Natural Tunnel	Operate Disabled	— Static	Temp —	Temp Temp	Temp Static	— Temp	Static —	Static Temp	Static Static
Use Sensors		X		X	X	X				
Open/Close Temp		X		X	X	X				
Open & Pause		X		X	X	X				
Close & Pause		X		X	X	X				
Maximum Opening/Below Temp		Note 4		Note 4	Note 4	Note 4				
Static Pressure Pause Timer			X			X		X	X	X
Operate as (See Note 1)			Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
Tunnel Fans ON / Open					X		X		X	
Tunnel Interlock					X		X		X	
Response Mode		X		X	X	X				
Full Opening Size		X	X	X	X	X	X	X	X	X
Full Open Travel Time		X	X	X	X	X	X	X	X	X
Full Close Travel Time		X	X	X	X	X	X	X	X	X
Purge Opening Size (See Note 2)		Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
Pre-Open Timer (Note 4)								X	X	X
Exercise Delay Days		X		X	X	X				
Perform Exercise at		Note 3		Note 3	Note 3	Note 3				

Important Note: Static Modes will only show if Static Pressure Sensor Is Installed

Note 1: Enabled only if Static Pressure sensor installed or a fan installed and Tunnel is part of Operating Mode

Note 2: Enabled only if Purge On/Off times are greater than 0:00:00. If power building then Humidity Sensor needs to be installed and one fan has to run during Purge and Humidity Purge Time and Delay has to be greater than 0

Note 3: enabled only when Exercise Delay Days > 0

Note 4: Enabled only when attached to Position Sensor that is calibrated, alarm is enabled and not alarming

APPENDIX 20 - Ridge Vent Min/Max Settings

Ridge Vent Settings

Ridge Vent	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Use Sensors	ALL (0,0,0,0)		0		# of Sensors		1 (Only sensor #'s)		0	4
Open Temp	72.0	22.2	30.1	-1.0	120.0	48.8	0.1		0	4
Close Temp	68.0	20.0	30.0	-1.1	On Temp - 0.1		0.1		0	4
Open	7	17	1		250		1		0	4
Pause (Open)	0:01:00		0:00:10		9:00:00		N/A		0	4
Close	7	17	1		250		1		0	4
Pause (Close)	0:01:00		0:00:10		9:00:00		N/A		0	4
Response Mode	Standard		"Standard" and "Aggressive"						0	4
Full Opening Size	14	35	1		250		1		0	4
Full Open Travel Time	0:45		0:05		59:59		N/A		0	4
Full Close Travel Time	0:45		0:05		59:59		N/A		0	4
Purge Opening Size (See Note 1)	4	10	0		250		1		0	4
Interlock Curtain Groups (See Note 2)	All (0,0,0,0,0,0)		0		9		1		0	4

Note 1: Enabled only if Purge On/Off times are greater than 0:00:00, if power building then Humidity Sensor needs to be installed and one fan has to run during Purge and Humidity Purge Time and Delay has to be greater than 0

Note 2: Enabled only if Side Curtain installed and Ridge to Curtain Interlock set to Interlock

Menus that appear for Ridge Vent

Enabled and Disabled (X means Enabled)

	Natural	No
	Tunnel	Interlock
Use Sensors		X
Open / Close Temp		X
Open / Pause		X
Close / Pause		X
Response Mode		X
Full Opening Size	X	X
Full Open Travel Time	X	X
Full Close Travel Time	X	X
Purge Opening Size (See Note 1)	Note 1	Note 1
Interlock Curtain Groups (See Note 2)	Note 2	

Note 1: Enabled only if Purge On/Off times are greater than 0:00:00, if power building then Humidity Sensor needs to be installed and one fan has to run during Purge and Humidity Purge Time and Delay has to be greater than 0

Note 2: Enabled only if Side Curtain installed and Ridge to Curtain Interlock set to Interlock



APPENDIX 21 - Inlets Min/Max Settings

Sidewall, Tunnel, Ceiling Inlet Settings

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Static Pressure Pause Timer (See Note 3)	0:00		0:00		1:00		N/A		0	4
Operate as (See Note 1)	Temp Natural Only		"Temp Natural Only", "Temp Natural/Temp Tunnel", "Temp Natural/Static Tunnel", "Temp Tunnel Only", "Static Natural Only", "Static Natural/Temp Tunnel", "Static Natural/Static Tunnel", "Static Tunnel Only"						0	4
#1 to 9 Cool Fans ON	0 to 8		0		9		1		0	4
Open (#1 default is 0)	12.0	30	0.0	0	250.0	250	0.1	1	0	4
Natural Interlocks	All Fans Except Stir Fans		Interlock up to 9 installed fans that have "Use for Proportional Control" set to "Yes"						0	4
#1 to 9 Tunnel Fans ON	0		0		9		1		0	4
Open (#1 default is 0)	12.0	30	0.0	0	250.0	250	0.1	1	0	4
Tunnel Fan Interlocks	All Fans Except Stir Fans		Interlock up to 9 installed fans that have "Use for Proportional Control" set to "Yes"						0	4
Full Opening Size	12	30	1		250		1		0	4
Full Open Travel Time	1:00		0:05		59:59		N/A		0	4
Full Close Travel Time	1:00		0:05		59:59		N/A		0	4
Purge Opening Size (See Note 2)	0		0		250		1		0	4
Pre-Open Timer (not Tunnel Inlets)	0:00		0:00		1:00		N/A		0	4

Note: Operate As Static Modes will only show if Static Pressure Sensor Is Installed

Note 1: Enabled only if Static Pressure sensor installed or a fan installed and Tunnel is part of Operating Mode

Note 2: Enabled only if Purge On/Off times are greater than 0:00:00. If power building then Humidity Sensor needs to be installed and one fan has to run during Purge and Humidity Purge Time and Delay has to be greater than 0

Note 3: Enabled only if Static Pressure sensor installed

Sidewall, Tunnel, Ceiling Inlet Settings

Menus that appear for Inlets Based on "Operate As"

Enabled and Disabled (X means Enabled)

	Natural	Operate	Static	Temp	Temp	Temp	Static	Static	Static
	Tunnel	Disabled	Static	Temp	Temp	Temp	Temp	Temp	Static
Static Pressure Pause Timer (See Note 3)			X			X		X	X
Operate as (See Note 1)			X	X	X	X	X	X	X
Cool Fans ON / Open		X		X	X	X			
Natural Interlocks		X		X	X	X			
Tunnel Fans ON / Open					X		X		X
Tunnel Interlocks					X		X		X
Full Opening Size		X	X	X	X	X	X	X	X
Full Open Travel Time		X	X	X	X	X	X	X	X
Full Close Travel Time		X	X	X	X	X	X	X	X
Purge Opening Size (See Note 2)		Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
Pre-Open Timer (Not Tunnel Inlets)		X		X	X	X		X	X

Note: Static Modes will only show if Static Pressure Sensor Is Installed

Note 1: Enabled only if Static Pressure sensor installed or a fan installed and Tunnel is part of Operating Mode

Note 2: Enabled only if Purge On/Off times are greater than 0:00:00. If power building then Humidity Sensor needs to be installed and one fan has to run during Purge and Humidity Purge Time and Delay has to be greater than 0

Note 3: Enabled only if Static Pressure sensor installed

APPENDIX 22 - Chimney Damper Min/Max Settings

Chimney Damper Settings

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Cool Fans ON									0	4
#01 to #09 Fans ON (No Variable Fans)	0 - 8		0, 1, 2, 3, 4, 5, 6, 7, 8, 9				1		0	4
#01 to #09 Fans ON (Variable Fans)	0.0 to 8.0		0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0				0.5		0	4
#01 to #09 Cool Fans Open	0.0	0	0.0	0	250.0	250	0.1	1	0	4
Fan Interlocks	All Ridge Fans		Interlock up to 9 installed Ridge Fans that have "Use for Proportional Control" set to "Yes"						0	4
Full Opening Size	12	30	1		250		1		0	4
Full Open Travel Time	1:00		0:05		59:59		N/A		0	4
Full Close Travel Time	1:00		0:05		59:59		N/A		0	4

Note: All Menus are enabled at all times

APPENDIX 23 - Miscellaneous Device Min/Max Settings

Feeder and Lights

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Settings # 1 to 30									0	3
Age	0	0	0		900		1		0	3
Starting Time	00:00		00:00		24:00		N/A		0	3
Stop Time	00:00		00:00		24:00		N/A		0	3

Note: All Menus are enabled at all times

Brooder (Bird), Heater (Hog) and Furance

	Defaults		Min		Max		Steps By		Security levels	
	English	Metric	English	Metric	English	Metric	English	Metric	Display	Edit
Use Sensors	ALL (0,0,0,0)		0		# of Sensors		1 (Only sensor		0	4
On Temp	68.0	20.0	30.0	-1.1	119.9	48.7	0.1		0	4
Off Temp	70.0	21.1	On Temp + 0.1		120.0	48.8	0.1		0	4
Interlock Curtain Groups (See Note 1)	All (0,0,0,0,0,0)		0		9		1		0	4
Use During Heat Purge (See Note 2)	No		Yes or No				N/A		0	4

Note 1: Enabled only when a "Side Curtain" or "Ridge Vent" is installed and "Heater to Curtain Interlock" is set to "Zone Interlock" or "All Zone Interlock"

Note 2: Enabled only when a Humidity Sensor is installed, Fan set to purge, RH Stpoint less than 100 and purge time above 0



Appendix 24 - Customer Service

Dealer Name: _____ PHONE: _____

Street / PO Box _____

City _____

State / Province _____

Zip / Postal _____

Customer Service
210 E. Main Street
P. O. Box 117
Coldwater, OH 45828
800.998.2526

Phone _____

Fax _____

E-mail _____

Web site _____



North America:

Phone: 800.99VALCO
(800.998.2526)
Fax: 419.678.2200
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International:

Phone: (+1) 419.678.8731
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