Winesmart User Guide

The **Wine Smart Controller**

By Wine Cellar Systems

FEATURES

The Wine Smart Controller is designed to work with all systems that WCS manufactures. By providing a Programmable Keypad Display Unit, an owner can easily set parameters for their system.

Start Up Protection

Wine cellar cooling systems are designed to operate at 55° to 58°. When the system starts for the first time, the temperature is usually about 70°. This places a tremendous load on the compressor, usually causing it to overheat. This can be tolerated for short periods of time, but when the cellar is loaded with all your favorite bottles of wine and something happens to cause the cellar to warm up (maybe the door was accidentally left open or there was a power failure) then the compressor has to work very hard to cool the cellar back down. If the cellar temperature has gone very high, the condenser sometimes becomes heat soaked and the system cannot cool the cellar back down to the set point without some additional steps being taken.

With the Wine Smart Controller the operation of the system is changed automatically to compensate during these conditions. This prevents a compressor overload while allowing the system to cool your cellar back to the desired set point without any intervention by you or your service technician.

Temperature

The Wine Smart Controller is specifically designed for the specific needs of wine cellars. It is not a product that has been adapted or modified to work. The temperature set points are programmable from the keypad display unit.

Dehumidification

Controlling humidity can be very difficult. Just changing the temperature will cause the relative humidity to change. Opening the door or leaks in the vapor barrier can add a great deal of humidity to the wine cellar. Most systems do not have the ability to adjust for these situations since they do not actually monitor both temperature and humidity. If the humidity is too high, system operation is automatically modified to remove the excess humidity. How well this actually controls humidity will depend on how well your cellar is constructed. However, even in a cellar that is poorly constructed the Wine Smart Controller will control humidity much better than a system without it.

Humidification

If the humidity is too low, the Wine Smart Controller can turn on an optional humidifier and add humidity. The set points are programmable from the Keypad/Display unit.

Freeze Protection

If the evaporator coil should freeze, the Wine Smart Controller automatically turns off the compressor to defrost the coil. When the coil is sufficiently defrosted, normal operation will resume. This protects both the compressor and your valuable wine collection.

Short-Cycle Protection

The term called “Short-Cycling” in refrigeration equipment is recognized by two possible conditions; lack of lubricating oils in the crankcase of the compressor and stress on the motor windings. Bot conditions are a result of the compressor running in short cycles which can be devastating to motor windings, starting controls and bearings because of overheating and flexing. (Copeland Application Engineering Bulletin AE-1262) The WineSmart Controller has a built in timer that eliminates this problem, by preventing the compressor from turning on too soon after the last time it turned off.

Displays

Each system is provided with one Programmable Keypad Display Unit. You can have up to 7 additional remote displays (without keypads) added to your Wine Smart Controller. These can be

placed anywhere within 200 feet connecting in a daisy chain fashion using simple CAT5 computer cables.

Settings

Settings can be easily changed using the 3 buttons and a user-friendly menu -up -down type menu system, similar to most digital computer monitors.

Internet – Coming Soon!

An optional Internet module will be available. This interface will allow users to look at real time performance data such as temperature, humidity, and evaporator temperature, blower speed, and set points. If you have access to a computer and the Internet you will be able to view this data anywhere in the world.

Programming Options and Set Points

The menu system is very intuitive and easy to use. The set points that you enter will remain in memory, so in the event of a loss of power, the system will remember the last set points entered.

MENU BUTTON: The menu button is used to step through the various options and set points. Stepping through the menus is in the forward direction only, no backing up is provided. To complete a programming session, you must step through the entire menu

(**Press menu after updating an option or set point.**)

As you step through the menu, you will know when you are finished when you see the message "**WAITING**." This means that it is at the end of the menu program and the keypad/display unit is trying to reconnect to the "Main Controller." After reconnecting, the display will show the temperature and humidity values.

To begin

Press the MENU button:

"SL YES or NO" will be displayed:

If you have a SL system installed,
select YES.
If you have any other system installed, select NO.

By default SL is NO.

Press MENU

"***VANE YES or NO" will be displayed:***

If you have previously selected a SL system this option will appear. By selecting YES the vane on the front of the evaporator unit, will oscillate up and down.
By default Vane is NO.

Press MENU

"***STAGE 1" will be displayed:***

Stage One is automatically selected for any configuration. The default settings are: ON at 57° and OFF at 55°. The On Set Point is the temperature at which the compressor will turn on. The OFF set point is the temperature at which the compressor will turn off. You must have the ON temperature higher than the OFF, This is called temperature differential. There should be a differential so the compressor does not short

cycle (turning on and off too quickly). For efficient operation a minimum differential should be 2 degrees.
I.e., 55°-57°, 56°-58° etc.

Press MENU

"C1 ON Set Point" will be displayed:

Use the ↑ /YES to increment or
↓ /NO to decrement the set point.

Press MENU

"C1 OFF Set Point" will be displayed:

Use the ↑ /YES to increment or
↓ /NO to decrement the set point.

Press MENU

*"**STG 2 YES or NO" will be displayed:***

Stage Two. If you have a two-compressor system, select YES.
By default STG2 is NO.

Similar set points as mentioned in STG1 are available for STG2. The exception is, the On Set Point must be at least one deg above the STG1 On Set point. The program will not let you set a lower set point. This is because Stage Two is not needed until the temperature goes too high (one deg above the STG1 On Set point). .

Press MENU

"C2 ON Set Point" will be displayed:

Use the ↑ /YES to increment or
↓ /NO to decrement the set point.

Press MENU

"C2 OFF Set Point" will be displayed:

Use the ↑ /YES to increment or
↓ /NO to decrement the set point.

Press MENU

"H*EAT YES or NO" will be displayed:*

If your system has the Heater Option installed, select YES.
By default HEAT is NO.

Press MENU

"HT ON Set Point" will be displayed:

Use the ↑ /YES to increment or

↓ /NO to decrement the set point.

Press MENU

"HT OFF Set Point" will be displayed:

Use the ↑ /YES to increment or
↓ /NO to decrement the set point.

Press MENU

"HUM YES or NO" will be displayed:

If your system has a
humidifier installed, select YES

By default HUM is NO.

If humidity is selected, similar set points As the STG1 are available. "ON Set Point", "Off Set Point", and maybe "MAX Set Points". Again, you need a differential for the same reasons as Cooling, as for Humidifying. A differential of 2 seems to work best. Usually the humidity will settle to about the mid point of the two set points.

Press MENU

"HU ON Set Point" will be displayed:

Use the ↑ /YES to increment or
↓ /NO to decrement the set point.

Press MENU

"HU OFF Set Point" will be displayed:

Use the ↑ /YES to increment or
↓ /NO to decrement the set point.

Press MENU

("HUMAX Set Point" may be displayed, otherwise you'll be at the end of the menu as described above)

If you had selected HEAT above then you will have the HUMAX Set Point option to set. If the system ever reaches the Max Set Point, the system will suspend humidifying and/or go into Cooling/ Dehumidifying Mode. The fan speed will be reduced to help dehumidify. The Cooling will continue, (to remove humidity quickly) and heat will come on as necessary to maintain the Stage1Cooling OFF Set Point. The Max Set Point is basically a humidity set point where the system will make greater efforts to reduce the humidity quickly.

Press MENU

"HUMAX Set Point" may be displayed:

Use the ↑ /YES to increment or
↓ /NO to decrement the set point.

Press MENU

"Waiting" will be displayed.

You should be at the end of the menu as described above.

This system as mentioned in the Feature Section is designed to enhance Humidifying or Dehumidifying. When doing this you'll notice the fan changing speed, this is normal.

The system is constantly monitoring all parameters and making changes on the fly to keep the system operating at the most efficient way. As result the compressor will not over heat and the evaporator will not have the opportunity to frost over. In the unlikely event it does, the system will sense this and take appropriate measures.

Cable Installation Procedure

Refer to the Wiring Diagram at the end of this section.

First, be sure the power to the control box is turned off.
The Installer is responsible to follow all building codes and standards where applicable.

Not all of the following cables are needed to complete the installation.
You must determine what type of system you have and install the appropriate cables as indicated in the directions below.

For all SL systems installed:
Connect a Cat5 straight through cable from either of the black Cat5 sockets on the *Main Circuit Board* to the *SLK Interface Board*.

Connect a "Cat5 straight through cable" from either of the black cat5 sockets on the *Main Circuit board* to either the K*eypad/Display Unit* or D*isplay Only Unit*. If additional D*isplay Only Units* are installed or added later, connect a Cat5 cable from the other black Cat5 socket on the *Keypad/Display Unit* to the next *display only unit*. (You can use either **black** socket on Keypad/Display, Display Only Units or Main Circuit Board)

The following are acceptable cable arrangements:
Main Circuit Bld. →SL Circuit Bld.
Additionaly, you will have one of the following:
Main Circuit Bld.→ keypad/display → display only or
Main Circuit Bld. → display only → keypad/display or
Main Circuit Bld. →keypad/display →display only →display only→ display only

For all other systems installed
Connect a "Cat5 straight through cable" from either of the black cat5 sockets on the *Main Circuit board* to either the K*eypad/Display Unit* or D*isplay Only Unit*. If additional D*isplay Only Units* are installed or added later, connect a Cat5 cable from either ;the other black Cat5 socket on the *Keypad/Display Unit* ; or the other black Cat5 socket on the Main Circuit Board to the next *display only unit*.

The following are acceptable cable arrangements:
Main Cir.→ keypad/display → display only *or*
Main Cir → display only → keypad/display *or*
Main Cir →keypad/display →display only →display only →display only

Temperature & Humidity Sensor for all systems

Connect the 6 color coded telephone cable provided. Match each colored wire on the Main Circuit Board and the Sensor Circuit Board as labeled next to each connector. (Refer to the Wiring Diagram) Only 5 wires are used, the white wire is not used so cut it off to minimize confusion.

Blower Motor

Connect the **black** and **white** wires from the blower/fan assembly to the fan connectors on the VAC Connector as indicated on the **Installation Diagram.** Notice that the ground (green wire) from the blower is connected to the FAN GND. of the VAC connector.

Compressor 1, Compressor 2, Humidifier, Heater,

To make connections for the compressor/s, humidifier, heater; connect the appropriate **wire pairs** to the indicated positions on the **Green Connector Assembly** on the bottom left side of the Main Circuit Board, as shown in the Wiring Diagram. The controller is designed to handle different types of arrangements to activate the compressors, humidifier, or heater. Every effort will be made to have the different options set correctly for each individual installation before shipping. Therefore you most likely will not have to make any changes to the following jumpers. The controller can be set up to provide a contact closure or provide 24VAC output. These settings will be made at the factory for your specific sysytem.

If a DVX system is installed:

Connect the 2-wire cable provided, from the DVX evaporator to the 2-position connector on the left side of the Main Circuit Board. (Not Polarity dependent)

If an Internet Interface Module is installed

(As seen on the top left side of the Main Circuit Board), then connect a Cat5 straight through cable from this module to an available port on the customers Internet Router. Caution see text below!

CAUTION! VERY IMPORTANT:

Connecting a CAT 5 cable to the wrong socket WILL result in SEVERE damage to both the WireSmart Controller and the customer's router. Be certain that you know which cable you are connecting. Have the electrician label these CAT 5 cables when he installs them.

If you have the Internet Module, be certain that you connect a Cat5 cable from the Internet Module to the Customer's Router or Hub. Do not connect any Cat5 cable from a Internet Module to the keypad/display unit.

Do not connect a Cat5 cable from the Router or Hub to any Black Plastic Socket on any Controller Circuit Board.

Refer to the Installation Diagram.

Electrical Specifications

Controller Power Consumption: 75 W
Input Voltage: 120/240 VAC
Output Voltages: 5 VDC, 3.3 VDC, 24VAC

Cables*

Interconnecting cables: CAT5
Control cables :20/2 Thermostat cable
Blower motor power cable: 14/3 AWG
Temp/Hum cable: 22/6 AWG Telephone cable

Physical dimensions

Control Box: 8” W,10” L, 4” D
Display/Keypad Unit: 3.6”W, 2.7”L, 1.7”D

****All cables must meet local building code standards***

Wiring Diagram