

Suretrol Manufacturing Inc.

# MA052X-2

**Kiln Controller User's Manual**

**Versions:**

- **MA052X-2 1.10**
- **MA052X-2 2.00**

**Revision Date: 2013**



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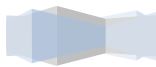
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## 1.0 INTRODUCTION

The Suretrol Manufacturing, MA052X temperature controller is the next generation of controller based on the highly reliable MA014X unit. It is a unique product developed specifically to control the temperature and humidity during the curing process. This compact controller provides a solution for controlling and monitoring the temperature and humidity in today's demanding environment. The product line has been enhanced to include the control of the intake damper to maintain constant wet bulb temperature. (Opinion 2) This model also has a "MAN/AUTO" switch so that the damper opening can be set with the rotation of a potentiometer (MAN) or automatically with the "Adc" setting (AUTO).

The controller is programmed via three toggle switches. The controller is easy to setup and operate; minimum effort is required for setup and changes.

The controller is easy to install on existing or new bulk kilns and replaces all the functions of existing controls while providing a simultaneous numeric display of wet and dry bulb temperatures.

The controller has been developed through years of experience. Similar units from the product family have been in operation for years with excellent reliability and performance.

The MA052X controller can be monitored remotely via wireless communication on the internet and cell phones for even greater flexibility.

Suretrol Manufacturing is proud that you have chosen our product for your demanding application. Every effort has been made to supply you with a reliable product.

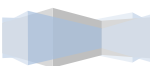
## 2.0 FUNCTIONAL DESCRIPTION

The controller replaces all the existing controls on the bulk kiln. It controls the dry bulb and wet bulb temperature with an electronic advance on the dry bulb. Both dry and wet temperatures are displayed simultaneously on a numeric display, with a red and green three digit display for the dry and wet bulb respectively.

The user may program the advance rate, the upper limit temperature; the starting temperature and the wet bulb stop advance temperature. All the above programmable entries are via two toggle switches located on the circuit board.

The controller has a unique power fail recovery system which does not require a battery, and all stored memory is retained for a minimum of ten years. The operator settings are automatically recovered when power returns to the system. If power fails the controller recovers when the power returns. It remembers the settings from before the power interruption and continues from that point when the power returns.

The temperature displays are in degrees Fahrenheit and is displayed to the nearest degree. Three digits are used for the temperature display. When the temperature is below 100 degrees, the leading zero on the display is not displayed.



Two light emitting diodes (LEDs) which are an integral part of the left most digits on the numeric displays are used to indicate the advance status information and the programming information.



**Figure 1** MA052X-2 Temperature Controller, Shown with optional radio

A separate red LED is used to indicate the status of the burner. The location of the displays, LEDs and the programming switches are detailed in Fig. 1.

### 3.0 USER INTERFACE

Three toggle switches are used to provide a user interface to the controller; they are used to program all functions of the control. No additional user inputs are required for programming the control.

#### 3.1 ON/OFF SWITCH

This switch is not used to turn the power ON/OFF on the controller. The function of this switch is to determine if the controller is active and detect a power fail condition. The switch **MUST** be in the OFF position before you start curing the kiln and it must remain in the ON position for the duration of the curing cycle. When the curing cycle is complete it must be returned to the OFF position.

When the switch position is changed from OFF to ON the following sequence of events take place:

1. The dry and wet bulb temperatures are measured and displayed in the kiln.
2. The set point temperature and the upper limit temperatures are set to measure



dry bulb temperature.

3. The advance status is complete and the advance LED indicator is OFF.
4. The controller starts to control the temperature and display the dry and wet bulb temperatures on the display.

In summary switching the ON/OFF toggle switch from the OFF to ON position RESETS all the programmed temperature settings to the kiln temperature and controls the temperature based on the above temperatures. This does not include the wet bulb set temperature. It also resets the clock to 0 hours.

If the switch is in the ON position and the main power comes back on the following sequence of events take place:

The programmed values for set temperature advance rate, upper limit temperature and wet bulb temperature is recovered from memory.

The temperature is controlled based on the programmed settings.

The dry and wet bulb kiln temperatures are displayed on the display.

#### **CAUTION**

**THE SWITCH SHOULD BE TURNED OFF WHEN THE CURE IS FINISHED, IF NOT THE CONTROL WILL RESUME CURE WHERE THE LAST CURE ENDED (EG. 160-170 DEGREES)**

### **3.2 -/+ SWITCH**

This switch is used to change the following user programmable inputs, adjust selected parameter up or down in program mode.

1. Upper limit temperature (ULt)
2. Advance Rate (Adr)
3. Set temperature (SEt)
4. Advance stop temperature or Wet bulb setting (Adc).



When the switch is in the increase (INC) position the programmable entry will increment at approximately 1 second rate. When the switch is in the decrease (DEC) position the programmable entry will decrement at the preset rate of approximately 1 second, other rates are available.

This switch is active only when the display is in the program mode.

### 3.3 ENTER SWITCH

This switch has a dual function, which depends on the state of the display, selects your menus and enters your selected value.

When you have the dry and wet bulb temperatures on the display, this switch is moved to the ENTER position and released to change the display to the program mode.

When you are in the program mode and the switch is moved to the ENTER position and released it will advance to the next programmed entry available and update the display accordingly.

This switch maybe used at any time to review the settings on the controller.

**Selected menus are:**

1. **(Ult) upper limit ( 20-170 ) degrees Fahrenheit**
2. **(Adr) advance rate  $\frac{1}{4}$  to 4.0 degrees Fahrenheit**
3. **(Set) set dry temperature ( 20-170 ) degrees Fahrenheit**
  - **This menu is your normal thermostat**
4. **(Adc) wet bulb stop temperature (20-170) degrees Fahrenheit**
  - **This automatically sets the wet bulb stop at Adc + 2 degrees Fahrenheit**

## 4.0 DISPLAY AND PROGRAMMING

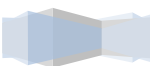
The controller has two three digit LED displays. Two different colors are used to differentiate between temperatures. The RED display is used for dry bulb temperature and the GREEN display is used for wet bulb temperature. All numeric displays are right justified with leading zeroes removed below 99 degrees Fahrenheit.

The display serves a multifunction purpose. It is used to display the kiln temperatures, as well as the programming information when you are programming the controller.

The format and a brief description of each display frame are described below.

### 4.1 PROGRAMMING

The controller is programmed via two toggle switches located on the front face. The user is prompted for each entry on the display. When the entry appears on the display the numerical value maybe increased or decreased via the -/+ toggle switch. To update the value press the ENTER switch down and release it. This will update the program memory and advance to the next programmable entry.



To enter the programming mode press the ENTER switch down and release it.

The display in the programming mode changes to allow you to adjust the programmable entries. The display in the programming mode has a numerical display and a three character description of the parameter, which you are changing.

The programmable entries always appear on the display in the same order. The order of the entries is as follows:

1. Upper Limit temperature ("ULt" on the GREEN display)
2. Advance rate ("Adr" on the GREEN display)
3. Set temperature ("SEt" on the GREEN display)
4. Automatic Damper Control ("Adc" on the RED display)

The +/- key is used to change the setting by approximately one second intervals. When the desired number is reached return the +/- key to the center position, press and release the ENTER key to store the new value, this will update the value in the controller memory and advance to the next entry in the program sequence.

When you have made all the changes and you do not move any switch for a ten second interval then the display will automatically return to the normal mode.

When a programming change is made the small indicator on the left most digit with the message will be ON, this is an indication that a change has been made.

If you do not want to change an entry then make sure that this indicator is OFF before you press the ENTER key to move to the next entry.

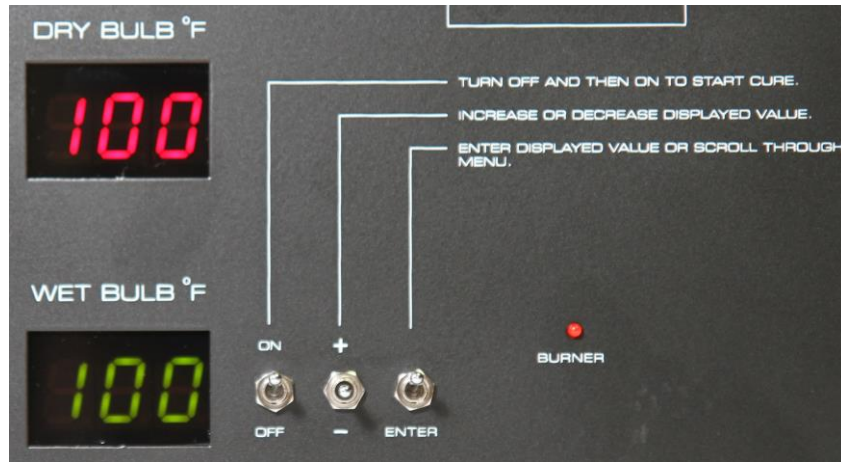
When you have reached the end of the menu sequence, press and release the ENTER key and the next display will be the first entry in the program sequence.





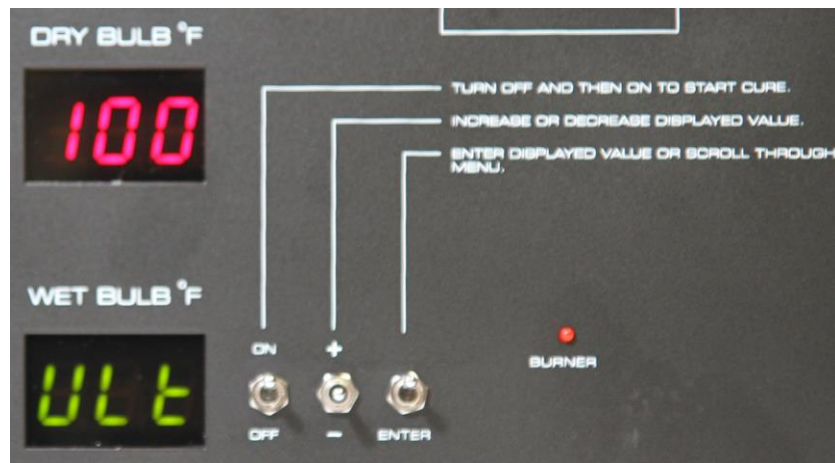
#### 4.1 TEMPERATURE DISPLAY

This display format is used to display the wet and dry bulb temperatures in the kiln. The +/- switch has no effect on this display.



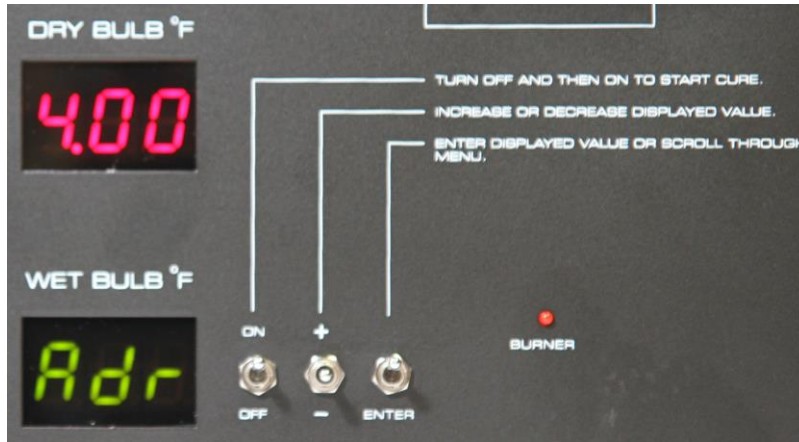
#### 4.2 UPPER LIMIT TEMPERATURE DISPLAY

This display format is used for the upper limit set point temperature or the temperature you are advancing to. The upper limit set point temperature appears on the RED display and the message "ULt" appears on the GREEN display.



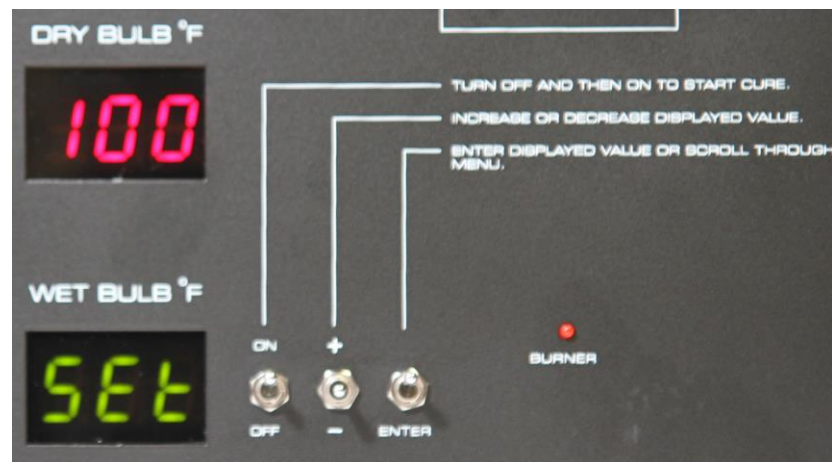
### 4.3 ADVANCE RATE DISPLAY

This display format is used to display the programmed advance rate. The advance rate appears on the RED display and the message "Adr" appears on the GREEN display. The GREEN display provides a short description of the parameter, which you are changing.



### 4.4 SET TEMPERATURE DISPLAY

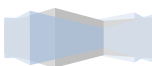
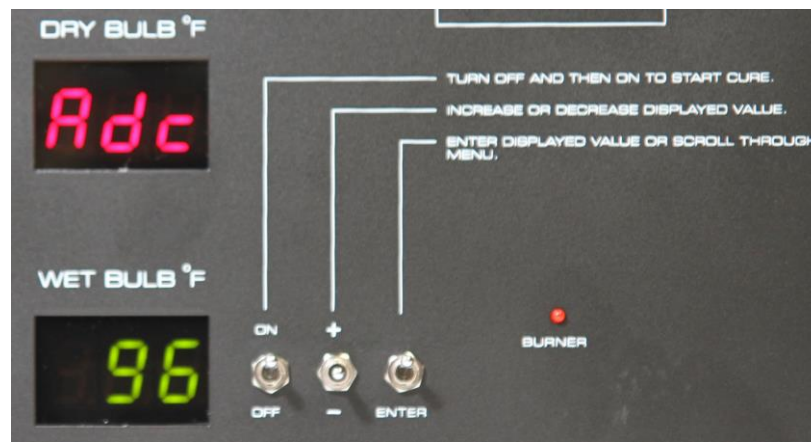
This display format is used for the set temperature (SEt). This is the temperature where your advance will start from. The set temperature appears on the RED display while confirmation appears on the GREEN display.



#### 4.5 AUTOMATIC DAMPER CONTROL (Adc)

This display format is used to display the wet bulb temperature that the control is keeping the kiln at. The control will use the attached Belimo NMX24-SR damper actuator in order to open or close the damper as required to reach and keep this temperature. The numeric temperature appears on the GREEN display and the message "Adc" will appear on the RED display. If the current temperature is 2 degrees above the Adc set temperature the control will stop the advance.

IF YOU HAVE A MA052X-1 OR OLDER SYSTEM THEN THIS DISPLAY WOULD HAVE "ASr" AND THE SETTING WOULD BE THE TEMPERATURE AT WHICH THE CONTROL ADVANCES THE DRY BULB.



### PROGRAMMING NOTES

- THE UPPER LIMIT TEMPERATURE ("ULT") CANNOT BE SET BELOW THE SET ("SET") TEMPERATURE, THIS MEANS THAT YOU CANNOT ADVANCE IN THE REVERSE DIRECTION.
- THE ADVANCE STOP FEATURE CAN BE DISABLED IF YOU DO NOT WANT TO USE IT. IF YOU DON'T PLAN TO USE THIS FEATURE SIMPLY SET THE WET BULB TO 170 DEGREES FAHRENHEIT.
- THE MINIMUM TEMPERATURE ENTRY FOR ANY PROGRAMMABLE PARAMETER IS 20 DEGREES FAHRENHEIT.
- THE MAXIMUM TEMPERATURE ENTRY FOR ANY PROGRAMMABLE PARAMETER IS 170 DEGREES FAHRENHEIT.
- WHEN CHANGING THE UPPER LIMIT TEMPERATURE OR THE ADVANCE RATE AND THE CONTROLLER IS ADVANCING THE ADVANCE TIMERS WILL NOT CHANGE AS IT IS ALWAYS OPTIMIZED FOR THE SHORTEST TIME.
- YOU MAY VIEW ALL THE SETUP PARAMETERS WITHOUT MAKING ANY CHANGES IN THE CONTROLLER MEMORY. THIS IS ACCOMPLISHED BY PRESSING AND RELEASING THE ENTER KEY. EACH TIME THE KEY IS PRESSED AND RELEASED THE NEXT PROGRAMMED ENTRY IS DISPLAYED. YOU WILL NOT CHANGE ANY ADVANCE RELATED TIMERS WHEN YOU VIEW THE PROGRAMMED ENTRIES IF THE CONTROL IS IN THE ADVANCE MODE.
- YOU CAN TERMINATE THE ADVANCE CYCLE IN TWO WAYS, INCREASING THE SET TEMPERATURE TO THE UPPER LIMIT TEMPERATURE OR DECREASING THE UPPER LIMIT TEMPERATURE TO THE SET TEMPERATURE. REMEMBER WHEN YOU MAKE A CHANGE TO PRESS AND RELEASE THE ENTER KEY.



## 5.0 SENSOR SPECIFICATIONS

### Original Type Sensor SM 1010



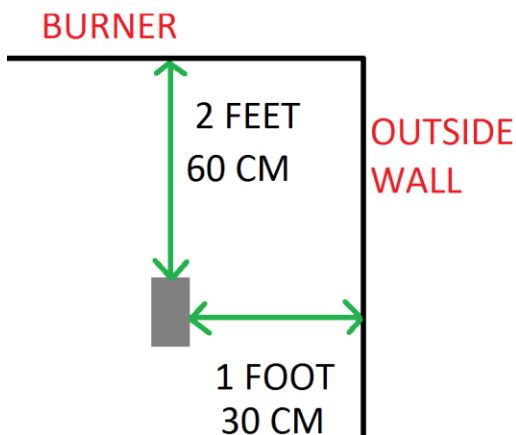
- $\pm \frac{1}{2}$  degrees Fahrenheit accuracy – (20- 180 degrees Fahrenheit)
- True dry bulb and wet bulb

### New Waterless Sensor SM 2010

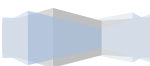


- $\pm \frac{1}{2}$  degrees Fahrenheit accuracy – (20-180 degrees Fahrenheit)
- True dry bulb
- Calculated wet bulb from RH sensor

### LOCATION OF SENSOR IN KILN



- The sensor must be placed printing up, or slotted cover down, in order to operate properly
- The sensor needs to be located 2 feet (60 centimeters) in from the burner cabinet
- The sensor needs to be placed at least 1 foot (30 centimeters) in from the closest outer wall
- It is recommended that the sensor wire be protected from damage



## SENSOR PINOUT

	BROWN - Safety Sensor
	BLUE - +5V
	RED - +5V
	BLACK - Negative
	WHITE - Dry Bulb Temp.
	GREEN - Wet Bulb Temp.

### NOTICE:

IT IS IMPORTANT THAT THE SENSOR WIRES BE CONNECTED SUCH THAT THEY ARE COLOR MATCHED TO THE LABEL ON THE MAIN CIRCUIT BOARD

## 6.0 LED INDICATORS

Several LED indicators are used to provide user feedback during programming and control operation.

A RED LED display is used to indicate the status of the burner; when this LED is ON the burner should be ON. When this LED is OFF the burner should be OFF. This indication is the output of the controller and if the relay or burner is faulty the burner will not be ON.

There are two small LEDS located on the top left-hand corner of the left most digit on the RED and GREEN displays. When in the control mode with the standard display the GREEN indicator should always be OFF. The RED indicator in the normal display mode provides the following information:

- Indicator OFF: The advance is complete, upper limit and set temperatures are the same.
- Indicator ON: The control is advancing to the upper limit temperature at the programmed rate. The red display will also flash.
- Indicator flashing: The control is advancing but the kiln wet bulb temperature is greater than the programmed advance stop temperature. The dry bulb temperature will not advance until the wet bulb temperature is less than or equal to the advance stop temperature (Adv +2 degrees.)

A second LED is used in the program mode to indicate if you have changed an entry. The LED for this purpose always appears on the same display as the message. When a change has been made via the +/- key, the indicator will be ON. If no changes have been made the indicator is OFF.

## 7.0 ELECTRONIC ADVANCE

The advance mechanism is entirely electronic with no moving parts. The advance timer is relative and the user is not required to set a clock. When the advance rate is selected all the required timers are automatically setup by the controller. If the advance rate or upper limit is changed when the controller is advancing the controller will calculate the optimal time for the change which is the shortest time for the next advance increment.



The following advance rates are available:

- 0.25 degrees per hour
- 0.50 degrees per hour
- 1.00 degree per hour
- 1.50 degrees per hour
- 2.00 degrees per hour
- 2.50 degrees per hour
- 3.00 degrees per hour
- 4.00 degrees per hour

The advance rate timers are accurate to within one percent within the operating temperature range.

## 8.0 SENSOR DIAGNOSTICS

The controller automatically monitors both sensors for faults, such as open sensor or shorted sensor. When a sensor fault is detected the result is reported via the display.

When a sensor fails the message "DEF" will appear on the display.

If the wet bulb sensor fails the GREEN display will have the message "DEF" displayed. If the advance stop is active the advance will continue at the programmed rate. A defective wet bulb sensor will NOT stop the advance.

If the dry bulb sensor fails the RED display will have the message "DEF" displayed. The burner will be shut OFF and the advance mechanism will continue to function.

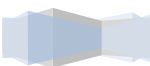
If both sensors FAIL then both displays will have the message "DEF" displayed. The burner is OFF.

The advance mechanism continues to function for all failure conditions. However the burner is OFF in all cases if the dry bulb sensor fails.

### **NOTE:**

**SENSORS ARE CHECKED CONTINUOUSLY; HOWEVER CERTAIN FAILURES CANNOT BE DETECTED. THE SYSTEM IS NOT A ONE HUNDRED PERCENT FAILSAFE.**

**IF A WRONG READING IS SUSPECTED, PLACE A GOOD HYGROMETER IN LOCATION AS CLOSE AS POSSIBLE TO THE SUSPECTED SENSOR. IF READING IS MORE THAN 5 DEGREES FAHRENHEIT DIFFERENT PLEASE CALL SERVICE.**





**WHEN ANY SENSOR IS DEFECTIVE CHECK THE CONTROLLER SETTINGS AND REMEMBER THE ADVANCE MECHANISM CONTINUES TO OPERATE IF EITHER ONE OR BOTH SENSORS FAIL. IF THE DRY BULB SENSOR FAILS THE BURNER IS AUTOMATICALLY SHUT OFF.**

**CONTROLS ARE EQUIPPED WITH A SECOND SENSOR THAT IS USED FOR ERROR CHECKING. THE CONTROL MUST HAVE BOTH SENSORS WITHIN 8 DEGREES FAHRENHEIT OR IT WILL DISABLE THE BURNER**

ITEM	MODEL NUMBER	REPLACES
Complete Control	MA052X-2	MA014X
Sensor (Wet or Dry)	SM2010	MA062X
Power Supply	MA099P1	MA073P1
Main Board	MA091P2 MARKV	Replaces all previous main boards

## 9.0 CONTROLLER INSTALLATION

The controller is simple to install and uses a minimum amount of wiring.

The controller uses high intensity displays. These displays are brighter than the normal displays. However the display is not visible in direct sunlight. The controller must not be mounted in such a manner that the sunlight will be in direct contact with the display if possible.

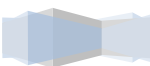
The controller should be mounted inside the kiln/barn where it cannot get wet from rain or condensation on cold days. The controller will function properly in the humid environment; however it **WILL NOT** operate if it gets wet.

Refer to Figure 2 below for wiring particulars.

## 10.0 SPARE PARTS LIST/OPTIONS

### NOTES:

### Monitoring options:





- 1. EACH UNIT IS WIRELESS AND CONTAINS A MASTER RF TRANSCEIVER. A SLAVE RF TRANSCEIVER UNIT (CL4490) IS REQUIRED FOR EVERY 128 KILNS TO BE MONITORED. THE CL4490 UNIT IS LOCATED IN THE LAST KILN WITH AN APPROPRIATE ANTENNA. ALL KILNS REQUIRE AN ADDRESS TO BE SET ON THE ADDRESS SWITCH FOUND ON THE BACK OF THE MA052X-2 MAIN CIRCUIT BOARD. IN THE MA091P2MKV THE ADDRESS SWITCH IS IN THE SERVICE MENU.**



## 10.1 CALL FOR SERVICE

**FOR SERVICE PLEASE CALL:  
JOE BUCEK  
SURETROL MANUFACTURING INC.**

### **United States of America**

**Suretrol USA**

**Joe Bucek**

**Cell: +1-252-294-8688**

**Business: +1-252-991-0533**

### **Canada**

**Suretrol Manufacturing Inc.**

**Business: +1-519-458-4953**

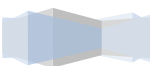
## LIMITED WARRANTY

Suretrol Manufacturing warrants each MA052X-2 controller manufactured to be free from defects in material and workmanship under normal use and service for the period of one year from the date of initial purchase.

All warranty part replacement and repairs must be made by authorized service representatives of Suretrol Manufacturing. Any outside work or alterations without the written approval from the factory will render this **LIMITED WARRANTY** void.

The obligations by Suretrol Manufacturing specifically excludes any liability for consequential damages, delays, loss of income, expenses, damage to goods or property used in connection with the product sold from whatsoever cause, whether or not such loss is due to negligence of the selling dealer or Suretrol Manufacturing. **AT NO TIME SHALL Suretrol Manufacturing BE LIABLE FOR DAMAGES GREATER IN AMOUNT IN AGGREGATE THAN THE PURCHASE PRICE OF THE PRODUCT IN RESPECT OF WHICH DAMAGES ARE CLAIMED.**

This **LIMITED WARRANTY** shall not apply to any item, which has been operated in a manner not recommended by Suretrol Manufacturing.



**THE FORE GOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OR MERCHANTABILITY, FITNESS OR ADEQUACY FOR ANY PARTICULAR PURPOSE OR USE. SURETROL MANUFACTURING SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER IN CONTRACT TORT OR OTHERWISE.**

**THIS UNIT IS ELECTRONIC AND AS SUCH SHOULD HAVE A BACKUP SAFETY THERMOSTAT WHICH IS MECHANICAL. ON ALL RETROFIT KILNS OUR INSTALLERS WILL CONNECT THE OLD MECHANICAL THERMOSTAT AS A BACKUP SAFETY WHICH SHOULD BE SET 10 DEGREES HIGHER DURING THE CURE. THE INSTALLER WILL EXPLAIN THE USE OF THIS BACK UP AND IT IS THE RESPONSIBILITY OF THE USER TO USE THIS BACKUP AND IF NOT THE USER TAKES THE RESPONSIBILITY OF ANY DAMAGE TO THE CONTENTS OF THE KILN DUE TO OVER TEMPERATURE. IF A KILN HAS NO EXISTING MECHANICAL THERMOSTAT THEN THE INSTALLER WILL INSTALL ONE AT A NOMINAL COST. IF THE USER INTENDS TO INSTALL THE UNIT HIMSELF THEN THESE PRACTICES SHOULD BE FOLLOWED TO MAINTAIN WARRANTY.**



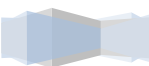
## INSTALLATION TIPS

1. Always use primary power and not switched power, make sure the power is not switched with a panel switch or flow switch. In some cases the flow switch oscillates and our system continually resets. Check to see where power comes in from the circuit breaker and connect at this point.
  - On monitoring system please connect to air switch, when the air stops the control shuts off creating an alarm.
2. Black Wire 115VAC HOT White Wire Neutral Green Wire Electrical Ground
3. Make sure there is a good ground connection.
2. The two red wires are the thermostat contacts, put these in series with the existing thermostat and if it is a new installation we strongly recommend that a high limit thermostat be used for safety. If you have the mister function then use the two blue wires for control of the water solenoid valve.
4. The existing thermostat has to be 10 degrees higher at all times otherwise our thermostat will not work.
5. On traditional sensors the Dry Bulb sensor is marked at the sensor end with red heat shrink while the Wet Bulb sensor is marked with green heat shrink.

**THE FOLLOWING STATEMENTS ONLY APPLY TO TRADITIONAL SENSORS:**

**DO NOT FLEX THE SENSOR ENDS. THIS WILL DESTROY THE SENSOR.**

**MAKE SURE THAT THE WET BULB SENSOR IS MOUNTED PROPERLY. MOST OF THE PROBLEMS ARISE FROM THE WET BULB SENSOR TOUCHING WATER, HOT METAL ETC. THE WET BULB SENSOR SHOULD BE PLACED IN A WICK MATERIAL THAT IS WET AND IN CONTACT WITH AIR ONLY.**



## SAMPLE SETUP

### STARTING CURE

1. Turn on the power to barn or kiln. Wait until the fan reaches full speed
2. Put the ON/OFF switch in the “ON” position. Let’s assume the dry bulb temperature in the kiln is 80°F. You would like to start at 85°F and advance to 90°F at 0.50 degrees/hour, with a wet bulb of 95 °F.
3. To enter the programming mode simply press the ENTER switch down once and you should see “ULt” displayed on the wet bulb display. The dry bulb display should have the kiln temperature displayed which in our case is 80°F. Use the -/+ key to increase this number to 90°F by holding it in the upward direction. Press the ENTER switch down and you should see “ADr” displayed on the wet bulb display. As before use the -/+ key to select 0.50 degrees/hour. Press the ENTER switch down and you should see “Set” displayed on the wet bulb display. As before use the -/+ key to select 85°F. Press the ENTER switch down and you should see “Adc” on the dry bulb display. Use the -/+ switch to set this to 95 °F. This setting is required to stop the dry bulb advance at a set wet bulb. If you do not plan to use this then please set it to 170°F using the -/+ key. If you see “Adc” on your display then this is the required Wet bulb setting and will be maintained if the damper switch is set to “AUTO”. Press the ENTER switch down.
4. Now the controller will bring the kiln temperature to 85°F and then advance to 90°F at 0.50 degrees/hour.
5. With the Damper in “Auto” mode; the damper will start opening when the wet bulb reaches 95 °F



## COMMON PROBLEMS

1. TEMPERATURE IN KILN IS LOWER THAN SET AND BURNER LIGHT IS ON.
  - If you are using a mechanical back up thermostat then chances are that it is set lower than the required temperature. This is a backup and it will override the MA052X controller. To correct the problem simply increase the setting on the backup thermostat. A definite sign of this problem is that the burner light on the control is on, but the burner is not firing.
2. TEMPERATURE IS NOT ADVANCING AND MECHANICAL BACKUP IS SET PROPERLY.
  - Chances are that the “Adc” setting is too low or the wick is dry and the dry bulb advance is stopped. Check the wick and wet bulb reading. If you are using the wet bulb stop and the wick is wet then the kiln is building up humidity. You can maintain the damper opening and wait for it to clear (preferred) or you can increase the opening or you can disable the wet bulb stop by setting it to 170°F.
3. TEMPERATURE WENT DIRECTLY TO WHERE I WANTED TO ADVANCE TO.
  - Chances are you accidentally put the upper limit temperature in the “SEt” location. This is the starting temperature so the control simply went there.
4. I SET THE CONTROL AND IT DID NOT UPDATE THE INFORMATION.
  - Chances are you used the -/+ switch to select the value and forgot to press the ENTER switch down to store the value.
5. THE DISPLAY HAS “DEF” ON THE WET BULB DISPLAY.
  - Simply replace the wet bulb sensor. The dry bulb temperature will still be maintained.
6. THE DISPLAY HAS “DEF” ON THE DRY BULB DISPLAY.
  - Simply replace the dry bulb sensor. The control is inoperative and should be fixed.

