# VANESSA KILN CONTROLLER

# INSTRUCTION MANUAL

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# Chapter 1

# Introduction

This manual introduces your **Vanessa** Kiln Controller, a sophisticated yet easy-to-use device designed by Digitry Company, Inc., makers of temperature controllers for artists since 1980.

Simply touch the panel with your finger to control your kiln.

The **Vanessa** controls the heat in your kiln by reading its temperature and turning power on and off as required. The simplest way to specify the required temperature is by means of a "setpoint", similar to an ordinary kitchen oven or a simple home heating system. You enter a temperature, and if the oven is below that temperature, the controller turns the power on; if the oven is above that temperature, the controller turns the power off.

A more sophisticated approach allows the desired temperature to vary over time, increasing or decreasing according to a programmed "profile", allowing the desired "target" temperature to be calculated minute-by-minute.

The **Vanessa** supports both these methods of controlling the temperature. The user can specify a setpoint and three profiles that can be programmed with up to nine steps each.

The layout of the **Vanessa** panel is organized in groups. First we will describe the displays and then the controls.
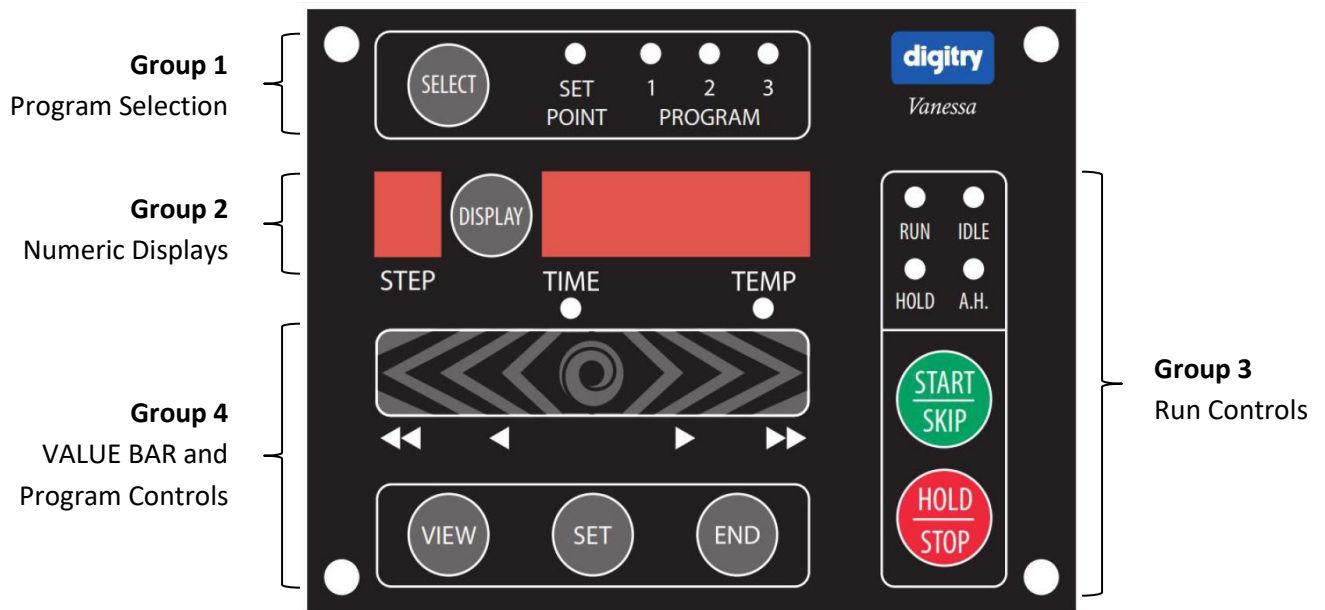
**Group 1**
Program Selection

**Group 2**
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**Group 4**
VALUE BAR and
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**Group 3**
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Figure 1.1: Front Panel

## 1.1   Vanessa Displays

The most obvious, both because they are in the center and because they consist of large lighted digits, are the numeric displays. The single digit on the left is referred to as the STEP. The four digits on the right are used to show time or temperature. The white TIME and TEMP lights indicate which of these two is being shown. If the white light is steady, the displayed value represents a current reading, either time or temperature. If it flashes, it represents a stored reading, e.g. the programmed setpoint. Note also that whenever a time is shown, a "decimal point" is displayed to separate hours from minutes.

When a program is selected, the left most digit displays the step of the profile, both while it is being programmed and while it is running. If the kiln is idle and not in program mode, the display shows a single horizontal bar.

When the **Vanessa** is used as a setpoint controller, the STEP display indicates approximately how far the actual temperature of the kiln is from its programmed temperature. These are indicated by horizontal bars as described below on page 8.

Above the step and numeric displays are four program selection lights that show whether the **Vanessa** is acting as a setpoint controller or if it's using one of three programmed profiles.

Finally, to the right of the step and numeric displays are four run status lights. The top two indicate whether the kiln is on (the green RUN light) or off (the red IDLE light). The bottom two give some extra information about the status of a running profile. If the kiln has been manually set to hold a specific temperature (see page 17), the yellow HOLD light will be on. If the kiln is behind its programmed profile (see page 19), the yellow A.H. ("AutoHold") light will be on.

## 1.2   Vanessa Buttons

There are seven "buttons" and a "VALUE BAR" on the **Vanessa** panel. These are "capacitive touch" buttons, which means that they are activated by placing your finger on top of them, but it is not necessary to depress them. Consequently there is no tactile feedback when they are activated, nor will they work reliably through any clothing such as a glove. Despite the fact that no pressure is necessary to use these buttons, we will use the convenient terms associated with mechanical buttons, such as "press the button" or "hold the button" in this manual. We use the word "key" interchangeably

with "button".

There are four groups of buttons with associated lights and displays, as shown in Figure 1.1.

**Group 1** has the SELECT button. This is used for program selection, to choose either the setpoint or one of three temperature profiles.

**Group 2** has the DISPLAY button, which chooses between TIME and TEMPERATURE on the numeric display when running a program. For those **Vanessa** controllers that have proportional output, the DISPLAY button cycles from TIME to Power Level to TEMPERATURE when running a program.

**Group 3** has the START|SKIP and the HOLD|STOP buttons, which are run controls, used to start and stop the kiln. These also have secondary functions for temporary manual overrides of a running profile, as described below, beginning on page 18.

**Group 4** has a "VALUE BAR" and the VIEW, SET, and END buttons. These are program controls used for entering temperatures and times.

## 1.3   The VALUE BAR

The VALUE BAR is a series of seven buttons — disguised as chevrons on the front panel — that act as a coordinated group. If you hold your finger close to the right edge, the display will go up by hundreds, slowly at first and then faster. If you move it slightly to the left of that, the increment will be by tens. And even a little further to the left, the increment will be by units. Similarly, if you hold your finger at the left edge, the value will decrease by hundreds, and moving to the right changes to tens and then units. Once you are near the desired value, you can slide your finger along the VALUE BAR to change by small amounts. Move left-to-right to go up, and right-to-left to go down. Or just tap quickly somewhere on the right half to go up by one or on the left half to go down by one.

## 1.4   Selecting the Behavior

When you first turn on the **Vanessa**, it will greet you with "Hello", followed by a countdown in the STEP display. When this finishes, it will revert to whatever state it was in when it was last turned off.

To select a new behavior, do the following:

- Make sure the kiln is IDLE. This is important because the SELECT button is inoperative while the kiln is running. If the green RUN light is on, turn the kiln off by pressing the red HOLD|STOP key until the red IDLE light comes on. While doing this, the yellow HOLD light may come on; just keep holding the key.

- Once the kiln is OFF, you can use the SELECT button to choose among the three programs and the setpoint. Just press the button until the one you want is lighted. You must lift your finger and press again to move from one to the next.

# Chapter 2

# Setpoint Control

Since it doesn't involve time considerations, setpoint control is the **Vanessa**'s simplest method, so we begin with it. Even if your interest is in programming profiles, it is important that you read this section, because it introduces techniques that apply both to entering setpoint temperatures and to entering steps for profiles. We will describe how to view and set the setpoint temperature and then how to start and stop the kiln when using setpoint control.

## 2.1 Viewing and Setting the Setpoint Temperature

- Make sure the setpoint option has been chosen, i.e., the yellow SETPOINT indicator light is on. If it is not, select SETPOINT as described above (page 4). Although you can change the setpoint temperature for a kiln while it's running, we suggest the kiln be stopped, so any changes you make do not have an immediate effect.

- To make changes to the setpoint temperature, you must first press the VIEW button. This will cause the numeric display to show the programmed setpoint temperature rather than the actual temperature of the kiln. As a reminder of this, the white TEMP light will flash.

- You can now use the VALUE BAR, as described in the next section (page 4) to modify the setpoint temperature. To save the new temperature, push the SET key. The numeric display will revert to the actual temperature and the white TEMP light will become steady. If you want to cancel your changes, push the END key. The original setpoint temperature will remain in force.

If a kiln is running while you are changing its setpoint temperature, the original setpoint temperature remains in effect until you push the SET key. If neither a key nor the VALUE BAR is pushed for approximately ten seconds, the result is the same as if the END key were pushed, so any modifications will be ignored and the numeric display will show the actual temperature. This makes it convenient to check the value of the setpoint temperature for a running kiln. Just push the VIEW key and then nothing else. Or push the VIEW key and then the END key.

## 2.2   Starting and Stopping the Kiln

After setting the setpoint temperature, you can start the kiln by holding down the green START|SKIP key until the green RUN light turns on. This key must be held for several seconds so the kiln won't start inadvertently if someone accidentally touches the START|SKIP key. The red HOLD|STOP key behaves similarly and stops the kiln when held for several seconds.

## 2.3   Setpoint Temperature Indicator

When the **Vanessa** is used as a setpoint controller, the STEP display provides a quick overview of the difference in temperature between the actual temperature of the kiln and its programmed temperature.

A single bar at the bottom means the actual temperature is far below the target; two at the bottom means that the kiln is almost hot enough; all three bars at once means that the temperature is essentially at the programmed temperature. Two bars at the top mean the kiln is slightly too hot, and one at the top means that it is well over the programmed temperature.

# Chapter 3

# Profiles

## 3.1 Introduction

A profile for the **Vanessa** may be thought of as a series of points, with each point consisting of a time and a temperature. When these points are connected by straight lines, they form a continuous graph. This graph represents the temperature profile you want your kiln to follow. A profile may consist of up to 9 such points, each of which is called a *step*. You program your **Vanessa** by entering these time-temperature points. The time you enter is always the length of the step; the temperature is in Fahrenheit or Celsius, depending on how your **Vanessa** was originally configured. Your **Vanessa** automatically calculates the rate ("ramp") at which the temperature rises or falls between successive time-temperature points.

Once you start the kiln by holding the green START|SKIP button, the profile begins at step 1. For each minute, the **Vanessa** calculates the target temperature so that at the end of the step, the kiln will have smoothly arrived at the programmed temperature. It then automatically advances to the next step until it reaches the end of the profile, at which point it shuts the kiln off. The display can show either the time remaining in the step or the current temperature of the kiln, whichever you choose (see below, page 10).

Some people are used to being forced to describe temperature profiles in terms of ramp rates up and down, expressed as degrees per minute, and in terms of timed soaks. The **Vanessa** relieves you of the calculations required to specify profiles in this arcane manner. It also eliminates fractions for describing slow ramp rates.

If you wish to maintain a certain temperature for a specific time (a "timed soak"), you simply program it in the standard manner, using the same temperature for two consecutive steps.

For example, let's say your kiln is at 100°. In 2 hours, you want it to reach 500°. Then, in 3 more hours you want your kiln to be at 650°. The only information you must enter is the two time-temperature points: 2 hours, 500°; and 3 hours, 650°. Behind the scenes, the **Vanessa** then calculates and executes the ramp up between 100° and 500° in 2 hours, as well as a different ramp rate up from 500° to 650° in 3 hours. These are the first two steps of the sample profile are explained in more detail in section 3.2.1 on page 12.

As the profile runs, information on the front panel allows you to monitor its progress.

- The green RUN light indicates that the program is running.

- STEP displays the number of the running step.

- If the **Vanessa**'s output is on|off, the more common configuration, pressing the DISPLAY key causes the numeric display to switch between time and temperature.

  – The steady white TIME light indicates that the number is the time remaining in the step, in the form HH.MM, for hours and minutes, separated by a "decimal point".

  – The steady white TEMP light indicates that the number is the actual temperature of the kiln.

- If the **Vanessa** is configured for proportional control, pressing the DISPLAY key causes the numeric display to cycle among three values, time, power level and temperature. The power level is shown as `PLxx`, where `xx` is the output power as a percent of full power.

## 3.2   Entering and Reviewing Profiles

- Select the profile to be programmed using the SELECT key as previously described (page 4). Remember, the kiln must be IDLE before the SELECT key can be used. It must also be IDLE in order to enter or modify a profile.

- To enter or modify a profile, press the VIEW key. The STEP display will show 1, indicating that you are programming step 1. The white TIME light will flash, to

indicate that the value in the numeric display is the programmed profile time, not the remaining time of the step.

- Adjust the time using the VALUE BAR, as described on page 4.

- Then push the SET key to save the adjusted time. The numeric display will change to show the profile temperature. The decimal point will disappear, and the white TEMP light will flash in place of the TIME light. STEP will still show 1.

- Now adjust the temperature with the VALUE BAR and push SET to save the adjusted temperature. STEP will advance to 2, and the white TIME light will flash.

- Repeat this procedure up to nine times, once for each step of the profile. You cannot advance past a step where the time is zero (displayed as .00).

  Once you enter the temperature for step 9, STEP will display "⊣", indicating that you've reached the end of the available steps.

  Note that you can also press the VIEW key instead of SET key. The display will advance in the same way as if you had pressed the SET key, but any changes will be cancelled and the original value of the time or temperature will remain.

- When you are finished entering or modifying the steps of the profile, press END. The display will show the current temperature, so the white TEMP light will be steady. The STEP will show −, indicating that the profile is ready to start (see page 18). You can stop entering or modifying the profile at any time; you do not need to go all the way to the end. Just push the END key after storing your last change.

A blank Digitry programming form is included at the end of this manual (see **??**). Copies of it can be useful both for planning and for recording your profiles.

Most profiles will comprise fewer than the full nine steps available. The **Vanessa** terminates the running profile when it reaches a step with a time of zero. When you enter a new profile, it is advisable to completely erase all the steps of any previously saved profile. It would be tedious to have to do this separately for each step, so the **Vanessa** has a shortcut. To erase all steps of a profile:

- Enter a time of zero in step 1.

- Press the SET key. The entire profile will be cleared to zeros and you will briefly see ⊢≡≡≡⊣ in the STEP and numeric display.

- After a few seconds, the STEP will display 1, the numeric display will display 0, and the white TIME light will flash. Now start entering your new profile as above.

If you want to modify an existing profile, alter the steps as desired. If the number of steps has changed, be sure to enter a time of zero in the step immediately following the last step in the profile and press SET. (Recall, this zero is how the **Vanessa** recognizes the end of the profile.) You will briefly see ⊢≡≡≡⊣ in the STEP and numeric display, followed by ⊣ in the STEP display. At this point, all steps after the last step in the profile have been cleared out. Press the END key to revert to monitoring the kiln; the current temperature will be displayed and − will be in STEP.

If your kiln is idle, reviewing its profile uses the same steps as modifying it. If you do not touch the VALUE BAR, you can use either the SET or VIEW key to advance through the profile. Of course, it is safer to use the VIEW key, so that if you inadvertently touch the VALUE BAR, no changes will be saved.

On the other hand, if your kiln is running, you may still review its profile, but you cannot make any changes. Use the same steps as if the kiln were idle, but always press the VIEW key to advance through the profile; the SET key is disabled while the kiln is running. As explained above, the END key will cause the display to revert to displaying the current temperature of the kiln. If you do not press any key for about ten seconds, the display will cease showing the profile and revert to showing the actual temperature of the running kiln.

### 3.2.1   Sample Profile

To help make programming profiles more concrete, we provide a sample profile below and show how to program it. This is an invented, simple profile, not one that corresponds to any specific project.

For this example, assume your kiln is at 100°.

| Step | Time | Temperature | Comment |
|------|------|-------------|---------|
| 1 | 2:00 | 500° | Ramp up at 200° per hour for two hours. |
| 2 | 3:00 | 650° | And up at 50° per hour for three hours. |
| 3 | 4:15 | 300° | Ramp down at 82.35...° for four-and-a-quarter hours. |
| 4 | 2:00 | 300° | Soak at 300° for two hours. |
| 5 | :00 | | The end (turn off). |

The graph in Figure 3.1 illustrates the four-step profile corresponding to this sample program.

After the kiln starts, you want it to reach 500° in two hours.

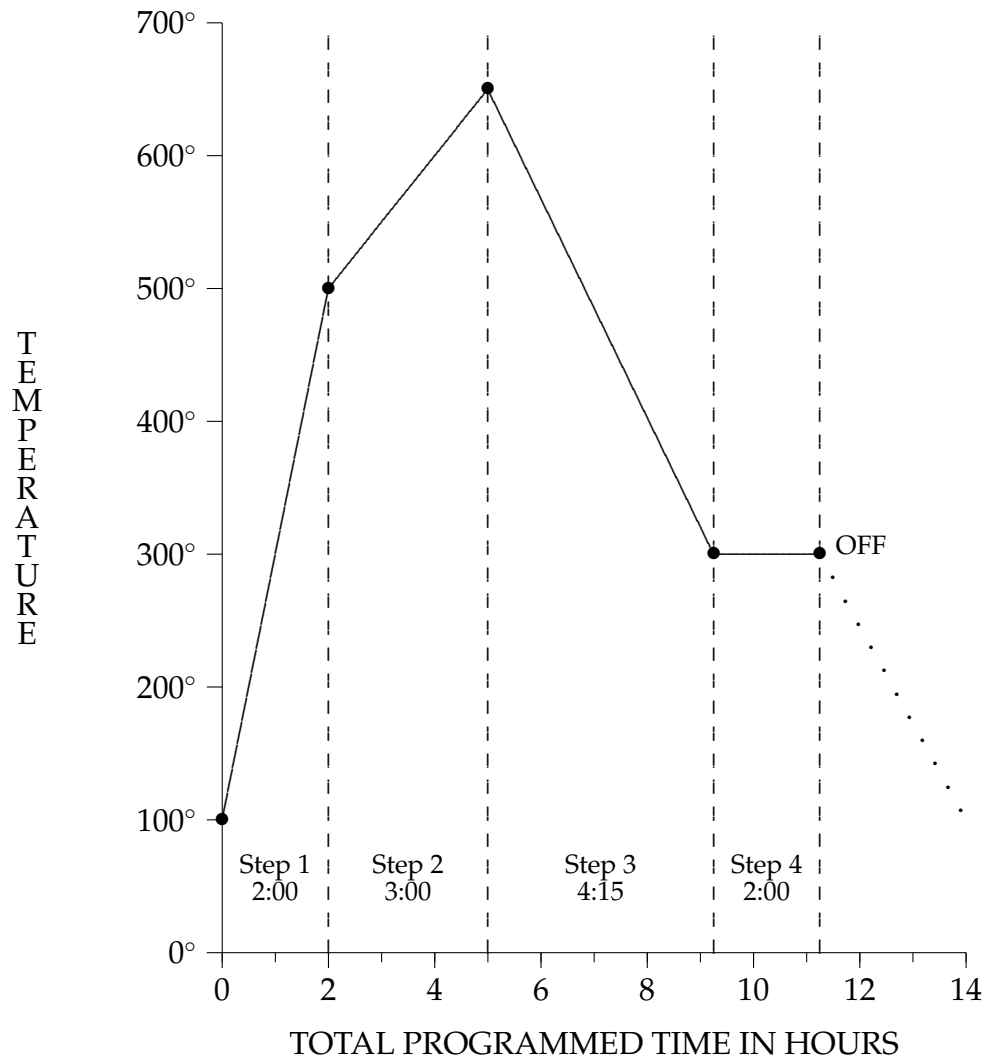Here is how you program this first step:

Figure 3.1: Sample Profile

- To start programming, make sure the unit is idle (*i.e.*, not running), and then select the correct program by pressing SELECT key until the program you want to store is lighted.

- Press the VIEW key. The STEP will display 1 and the white TIME light will flash.

- Clear out any existing program by setting the time to 0 using the VALUE BAR. Press SET to save this change. This is described in more detail on page 11.

- Next, using the VALUE BAR, enter the information about the desired time for the first step, 2.00 hours, and press SET.

- The white TEMP light will flash. Use the VALUE BAR to enter 500°, and press SET. The STEP will advance to 2 and the white TIME light will flash.

You are now ready to enter step 2.

For step 2 of this simple sample, in 3 more hours you want your kiln to be at 650°. So, again use the VALUE BAR to set the time to 3.00 hours, press SET, and then set the temperature to 650°. As always, press SET to save this. Since the step is complete, the display will show the next step.

Later, when the profile runs, the **Vanessa** calculates and executes the ramp up between 100° and 500° in 2 hours, as well as a different ramp rate up from 500° to 650° in 3 hours.

Now assume your third step is to cool off to 300° in 4 hours and 15 minutes. As before, set the time and temperature using the VALUE BAR and the SET key.

Note that since step 3 is entered simply as a time and temperature, you do not need to calculate its ramp rate and decide where to round off the decimal. In addition, if you decide that the time needed to get to 300° needs to be adjusted by adding twenty minutes, you just change the time from 4:15 to 4:35. You don't have to work from one fractional ramp rate and calculate a new fractional ramp rate.

The final step is to hold at 300° for 2 hours, sometimes called a "timed soak" (see page 10). So, with the VALUE BAR and the SET key, enter 2.00 hours for time and 300° for temperature.

After you press SET to enter the temperature for step 4, the **Vanessa** will show step 5. To be very sure that there are no more steps for this profile in memory, you can set the time to zero (it most likely is already zero when step 5 is displayed, so there is nothing to do), and press SET. You will again see the ⊢≡≡≡⊣ display followed by a ⊣ in the STEP display. This indicates that there are no more steps in the program.

At this point, press the END key to exit programming mode.

Once your program is entered, it remains in the **Vanessa** memory until you erase it. You may use it at any time.

To start your program, press and hold the START|SKIP key until the green RUN light turns on. To stop it at any time before it comes to its programmed finish, press the HOLD|STOP key until the red IDLE light turns on.

## 3.3 Programmed Hold

If you wish to hold a specific temperature for an indefinite period of time, you can use HOLD in the program. HOLD acts as a substitute for a time setting. During a HOLD, the timer does not run, so there is no remaining time period to display. Instead, the **Vanessa** displays "HoLd". When you are ready to continue with the program, you have to advance the **Vanessa** to the next step manually (see page 18). A programmed HOLD counts as one step.

A programmed hold is similar to a timed soak (see page 10) but has no time associated with it. If you wish to maintain a certain temperature for a *specific* time, you simply program it in the standard manner, using the same temperature for two consecutive steps.

Although related, the programmed hold is different from the manual hold (see page 17). The programmed hold occurs whenever the running profile gets to the appropriate step and does not require intervention to start. The manual hold occurs only when the user actively starts it. The manual hold allows the user to alter the setpoint, while the programmed hold does not. Ultimately, however, both accomplish the same basic task of holding the kiln at the specified temperature until the user ends the hold by pressing and holding the START|SKIP key.

When programming a profile, you designate an untimed soak by advancing the time beyond the maximum it can display. Simply press down at the right-most portion of the VALUE BAR until the time advances beyond 99:59, at which time it will show "HoLd". Because of the built-in acceleration, the longer you press, the faster the time will advance until it reaches HOLD. Select HOLD as you would a time, i.e., press the SET key. The temperature is then specified in the normal manner (see page 10). When this HOLD is reached while the profile is running, your oven will continue to hold at the indicated temperature forever or until you release it by pressing the START|SKIP key, which instructs the running profile to advance to the next step after the HOLD.

*Tip*: You can start your annealing profile with a HOLD at your annealing temperature.

When run, this causes the oven to heat to this temperature as quickly as possible. Then, you place each piece in the oven as it is completed. When your oven is loaded, end the HOLD using the START|SKIP sequence described above, and the **Vanessa** will continue with the rest of your annealing profile.

## 3.4  Delayed Start

The **Vanessa** has a "coast" feature: whenever the temperature is set to zero, the **Vanessa** will run its clock without turning on the kiln and without engaging AutoHold — *i.e.*, just "coasting" along. While this can be used at any point in a profile, it is intended to be used as the first step to program a delayed start. This allows you to have your kiln waiting for you at working temperature when you arrive at your studio in the morning.

One way to accomplish this is to follow the initial coasting step by a second step with a one-minute rise to the desired morning temperature and a third step to hold at this temperature for a very long time (*e.g.*, 99 hours). Be sure to start the soak soon enough to allow the kiln to attain desired temperature before you need to use it.

For example, assume it is 5:00 p.m. and you want your kiln, which is currently at room temperature, to be at 850° by 9:00 the next morning. Estimating that it takes 40 to 50 minutes for the kiln to reach 850° from a cold start, you should program the **Vanessa** to begin heating the kiln at 8:00 a.m. (15 hours from the present time). The first three steps of your profile would then be:

| Step | Time | Temperature | Comment |
|---|---|---|---|
| 1 | 15:00 | 0° | Coast for 15 hours. |
| 2 | 0:01 | 850° | Rise to 850° as quickly as possible. |
| 3 | 99:00 | 850° | Soak at 850° for 99 hours. |

The second step will cause the kiln to heat as quickly as possible to 850° by invoking AutoHold (see page 19). The 99 hours of step 3 is intentionally excessive, but when you are ready to use another profile, you can stop this one and switch to the one you want to use.

Perhaps a more elegant solution would be to add the remaining steps of your profile after the delayed start. Then use the skip step feature (page 18) to move from step 3 to step 4.

An alternative, and perhaps the best one, is to use a programmed hold (page 15). This would replace both steps 2 and 3. The resultant program would be:

| Step | Time | Temperature | Comment |
|------|------|-------------|---------|
| 1 | 15:00 | 0° | Coast for 15 hours. |
| 2 | HOLD | 850° | Rise to 850° and stay there. |

The HOLD will cause the kiln to rise as quickly as possible to 850° and then stay there. You could add the remainder of your profile starting at step 3. When this program is run, the kiln will remain at step 2 until you either stop it with the HOLD|STOP key or advance it to step 3 using the START|SKIP key.

## 3.5   Stopping Time: Manual Holds

Sometimes you may want to soak a piece "on the fly", even if you didn't include a timed soak in your program or included one that was too short. For example, you may be waiting for something to complete, e.g., glass to slump or fuse, and it is taking longer than anticipated. This is no problem, because at any time you may initiate a manual hold function, temporarily stopping the clock of a running profile using the red HOLD|STOP key as described below (see page 18). The yellow HOLD light will come on, and the **Vanessa** will stop its internal clock and temporarily use setpoint control, with the current temperature as its setpoint.

When you decide to re-start the profile from where you left off, use the green START|SKIP key to cancel the manual hold, as described below (page 18).

During a manual hold, you can also change the holding temperature. In effect, the manual hold behaves like an "instant setpoint". This is the only situation in which you can manually change the temperature while a profile is running. If made, this change in temperature is only temporary. It reverts to the profile's calculated temperature when the manual hold is released.

This adjustable temperature is particularly useful to glass flame workers and sculptors, For example, it makes it very easy to "strike" certain colors by temporarily raising the temperature until the desired effect has been achieved.

To change the holding temperature, simply push the VIEW key and adjust the temperature using the VALUE BAR, just as you would if you were using the setpoint profile. The white TEMP light will flash to indicate that the temperature is being adjusted. Push the SET key to store the change. The new temperature setting does not take effect until the SET key has been pushed. If you do nothing for ten seconds after adjusting the temperature, the white TEMP light will stop flashing and no change will be recorded. The display will again show the actual temperature.

If you start to adjust the temperature and then change your mind, you may simply do nothing for ten seconds as above, or push the END key: the result will be the same, i.e., no change will be made to the holding temperature.

## 3.6   Starting and Skipping

The green START|SKIP key has three related functions.

1. If your kiln is idle, holding this key for several seconds starts the kiln. It will now commence running the profile at step 1. This is shown by a change in the display. The red IDLE light is replaced by the green RUN light and the − in the STEP display becomes a 1.

2. If the kiln is in the keyboard hold state (yellow HOLD light on), pushing the START|SKIP key will remove the hold and the profile will resume its normal progress.

3. If the kiln is already running but the HOLD light is not on, pushing the START|SKIP key for several seconds causes it to immediately terminate the current step and jump to the beginning of the next step. The starting temperature for the ramp of the next step is the temperature of the kiln at the moment when the START|SKIP button was pushed. The action of skipping the step is reflected in the changed numeral in the step display. Note that if you are in the last step when you skip a step, the kiln will return to the idle state, indicated by the red IDLE light, since you will have skipped to the end of the profile.

## 3.7   Holding and Stopping

In the case of setpoint control, pushing the HOLD|STOP button simply stops the kiln. In the case of a profile it is slightly more complex.

• After pushing the HOLD|STOP button for a certain time, the yellow HOLD light will come on. If you release the button at this point the kiln will be in a manual HOLD condition.

• You can prematurely stop the kiln before its program has completely run its course. If you continue pushing the button after the HOLD light comes on, you will eventually cause the kiln to stop. The yellow HOLD light will be replaced by the red IDLE light. There is enough time between the appearance of the HOLD light and

its changing to the IDLE light that there is no danger of stopping the kiln inadvertently unless you are not paying attention. If you haven't been paying attention, there is no way to get back to the exact point where you were. You can start the kiln and skip steps (see the previous section) until you are at the beginning of the step in question, but there is no way to get to the exact minute.

## 3.8   Automatic Hold

Using the profile you entered, the **Vanessa** calculates a target temperature for each minute of the cycle. It bases its decision about "automatic holding" on this temperature. This means that if your kiln is not able to keep up with the temperature changes you requested, the **Vanessa**'s internal clock will be stopped until the kiln catches up, i.e., the clock is *automatically held* (hence the term "AutoHold") until the target temperature is achieved. This process is completely automatic, and unlike a manual HOLD initiated by a user, AutoHold cannot be cleared using the START|SKIP key unless you hold it long enough to skip to the next step, which is likely not what you intended.

On heating steps (ramping up), the AutoHold light, labelled "A.H.", will come on if the kiln temperature is more than 40°F (20°C) below the calculated target temperature for the current minute. On cooling steps, the AutoHold light will come on whenever the kiln temperature exceeds the target temperature for the current minute by more than 40°F (20°C). AutoHold is not active for soaks (same temperature at start and finish of step).

Once the AutoHold is engaged, the **Vanessa** keeps its internal clock stopped until the target temperature is actually achieved.

Under normal circumstances, AutoHold is usually thought of as something that compensates for unusual demands placed on your kiln's ability to follow a profile. However a creative use of AutoHold allows you to program your kiln to ramp up to a given temperature as quickly as the kiln's capability allows. Simply allot only one minute for the step to reach its temperature. The **Vanessa** then will go into AutoHold until the programmed temperature is reached and then go on to the next step. Similarly, this same technique can be used to cool the kiln as fast as it is capable, though often this achieved by opening the kiln door and "crash cooling".

## 3.9   Guaranteed Temperatures

Sometimes it is very important that the final temperature of a ramp be attained before going on to the next step of the profile, and it can never hurt, so the **Vanessa** guarantees that the kiln actually reaches the temperature specified at each point in the profile before allowing it to go on to the next step. When necessary, the clock will be stopped during the last minute of a step to allow the kiln to reach this temperature. The AutoHold light will come on while the clock is stopped. Nevertheless, you can always skip to the next step manually, in which case AutoHold is, of course, ignored. A subtle difference here is in the starting temperature of the new step, which is used in the calculation of the target temperature for each minute in the step. If the controller advances automatically, the start temperature is the one you programmed into the profile. If you manually skip to the next step, the starting temperature is the one existing at the time of you skipped to the new skip.

# Chapter 4

# Reference

## 4.1 Warnings

There are certain serious problems that could cause improper temperature readings or overheating of the oven. When this happens the an error code of the form "BAD TCPL" or "Err" will appear in the display to identify the problem. The Vanessa will attempt to shut down the oven by turning off the contactor.[1]

**BAD TCPL:** The most common error concerns the thermocouple.

It is normal for thermocouples to burn out after a certain amount of use. When this happens, a BAD THERMOCOUPLE message will appear. Because of the limitations of the four character, seven-segment display, THERMOCOUPLE will be abbreviated to TCPL, and the two words of the message will alternate. The characters will look a little odd: a lower-case b, an upper-case A, a lower-case d, for BAD, and ⊣ (think of it either as an upper case T on its side or a lower case t, missing its right half), a lower-case c and upper case PL for TCPL. Thus, BAD TCPL looks a little like bAd alternating with ⊣cPL. We mention all this because it can be very confusing when first seen.

In addition to a burned out thermocouple, this warning can be caused if there is no thermocouple attached to the Vanessa or by a bad connection in the thermocouple extension wire.

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[1]The attempt will fail if the contactor is locked on and no longer under the control of the Vanessa.

Once the problem with the thermocouple has been corrected, the BAD THERMO-COUPLE message will go away and the Vanessa will resume normal operation.

To troubleshoot the problem, try the following: push one end of a small piece of wire into one of the two slots where the thermocouple attaches, and push the other end into the other slot. The BAD THERMOCOUPLE message should disappear, and the Vanessa should display ambient room temperature. If it does this, the Vanessa is functioning correctly, and you should replace your old thermocouple. Otherwise, your Vanessa will need to be sent in for repair.

Once you have completed the test, remove the wire; otherwise, when your kiln runs, it is likely to stay on indefinitely, because the Vanessa will be using the ambient temperature instead of the kiln temperature.

**Err:** Any error message marked "Err" represents an internal Vanessa hardware failure.

At this point, the only keys that are active are the START|SKIP and the HOLD|STOP keys. Press and hold either to clear the error report. The result of these keys is discussed below in the section on Clearing Warnings, page 24.

If this error occurs only rarely, it may be a transient problem from some external source. If the same error happens repeatedly, note the error number and contact Digitry.

### 4.1.1   Behavior During Power Failures

Special components and circuitry are used within the **Vanessa** to preserve its memory during power failures. The **Vanessa** will remember:

- whether your oven was running or idle when the power failed,

- the profile step and time when the outage occurred, and

- the last temperature reading at the time of the power failure.

When the **Vanessa** detects low power, it indicates this by displaying "LoPr" in the numeric display. This may be the result of a "brown out" or the prelude to total loss of power. The actual power loss may be so short that your only indication is this "LoPr" display.[2]

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[2]It is important to realize that many power failures are extremely short, so short that you may not even notice them. As a consequence, from time-to-time your **Vanessa** may appear to begin the count down cycle spontaneously. This is invariably a result of power difficulties of some sort.

During the power failure, the face of the **Vanessa** will look blank.

When power is restored, "8"s will appear in the numeric display while the **Vanessa** takes new, reliable temperature readings. Concurrently, the STEP display counts down from 5 to 1. The **Vanessa** then evaluates the temperature loss of your oven from the time the power failed to the time it was restored. If the actual temperature loss is less than 200°F (or 100°C for Celsius models), the profile will continue as if the power failure had not occurred. Since the vast majority of power failures are quite short (under one minute), the temperature drop will be insignificant and the oven thus will continue running according to your original profile.

If your oven cools more than 200°F (100°C) during a power failure, the display will read "cold", and the **Vanessa** will take special steps to help you try to rescue your work. In general, the temperature of the oven when power is restored will be maintained. This should protect your oven and its contents from reheating rapidly without your knowledge.

*Note*: Since a furnace should be kept at its running temperature, this "cold" behavior is not enabled for a **Vanessa** configured for furnace control.

It is rare, but possible, that when power is restored, the temperature of the oven will have dropped 200°F (100°C) but nevertheless will be above a (conservatively chosen) annealing temperature of glass. In this case, the oven will be allowed to cool to 900°F (482°C) and held at that temperature.

When you notice a "cold" condition, you have the opportunity to decide the most appropriate course of action from this point, as described in the following section.

## 4.1.2 "cold" Readings

As described above, if a power failure has lasted long enough that your oven has cooled more than 200°F (100°C) during the outage, its display will read "cold", and the current temperature will be maintained.

At this point, the only keys that are active are the START|SKIP and the HOLD|STOP keys. Press and hold either to clear the "cold" report. The result of these keys is discussed below in the section on Clearing Warnings, page 24.

If you choose to continue from where the program left off, as the oven lost more than 200°F during the power failure, the oven will begin heating in an attempt to return its temperature to the temperature of the kiln when power failed as fast as possible. If you do not want this behavior, you may want use the keyboard hold feature (see page 17)

to manipulate the temperature.  Or you may want to either modify the current profile or enter a program into one of the other profiles to recover your work. Remember, you will have to stop the oven to make changes to any profile, so you may want to use the keyboard hold feature, manually raising the temperature as appropriate, while you consider your other options.

If the oven was ramping up or holding when the power failed, AutoHold will go into effect until the oven reaches the programmed temperature.  If it was ramping down, AutoHold will not come on, because the temperature is lower than required, and the **Vanessa** assumes that the temperature is thus simply ahead of schedule. See section 3.8 for more details.

### 4.1.3   Clearing Warnings

Whenever the **Vanessa** warns you of an unusual condition (typically, "cold", but on occasion "Err"), you must clear the warning.  Only two keys are active at this point, the HOLD|STOP key, and the START|SKIP key. Press and hold either until the warning disappears.

- If you press the HOLD|STOP key, the **Vanessa** will go to the idle state, stopping the running profile, if necessary.

- If you press the START|SKIP key, the Vanessa will continue from where it was when it encountered the error. So, if it was running, it will continue to run.

However, no matter which key you press, if the condition has not been corrected, the error message will be reactivated as soon as the condition is again detected, often within a minute.

## 4.2   Sales and Service

Write or call Digitry for sales, service, and technical information. You can reach us at

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