MINICHEF™ 2000

Applications 7, 8 & 9

Convection Oven Applications Guide

Programming & Operating Steps

WATLOW

CE 97

TOTAL CUSTOMER SATISFACTION

ISO 9001

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Application 7
Automatic Convection Oven

One Heat Channel, Six Menus

Application 7 allows you to program as many as six menu keys to control one temperature channel, a fan and cooking time for an automatic convection oven.

Overview of Key Steps

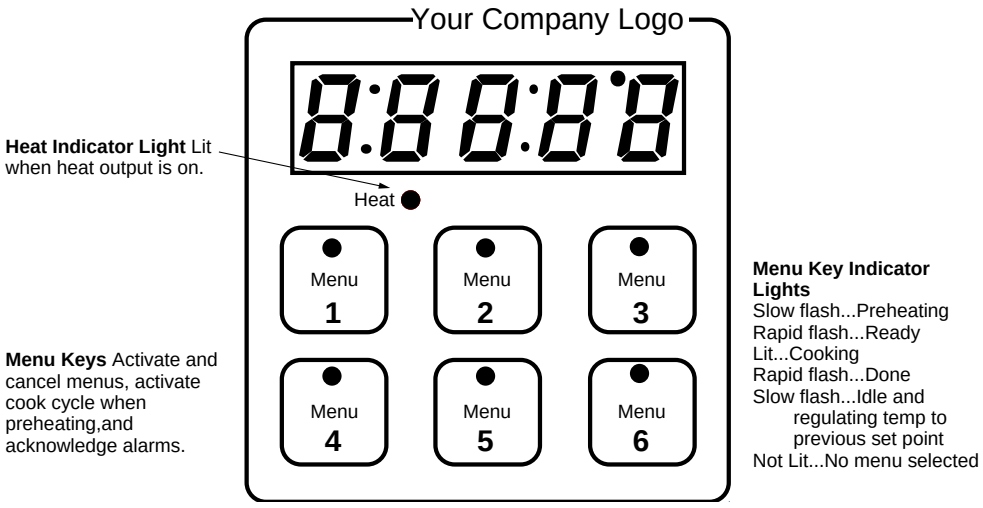
1. Install the MINICHEF 2000.
2. Wire the controller.
3. Configure the controller.
4. Program the menus.
5. Set the controller security.
6. Set the Real-time Clock.

For instructions on Steps 1, 2, 3, 4, 5 and 6, see the *Hardware & Software Setup Guide.*

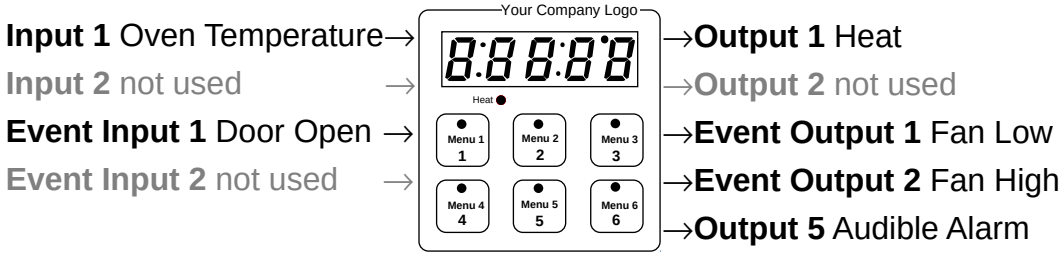
7. Design, manufacture and apply faceplate overlay for end-users. (For a suggested design to suit this application, see this section. For overlay dimensions and guidelines, see the *Hardware & Software Setup Guide.*)
8. Operate the controller. (See this application guide.)

Key Functions in Configuration Mode

Key Functions in Operation Mode



Summary of Input/Output Functions



Note: For details, see wiring instructions in the *Hardware & Software Setup Guide*.

Configuration Mode Quick Reference

These are the functions, parameters and values included in the Configuration Mode for this application. You must select Application 7 to access them. For directions, see the *Hardware & Software Setup Guide*. The Appendix of that guide includes an explanation of all parameters and values.

Function	Parameter	Value	Your Settings
EtYPE Equipment-Type	APPL Application Number	1 - 28	7
	A_Loc Application Number Security Lock	yes, no	
	Sound Audible Alarm	0 - 5	
	FAn Fan Speed	1 spd, 2 spd	
	dELAY Fan Delay Time	0 - 120	
SEtUP Setup	°C_F Temperature Display Format	°C or °F	
	t.FmtE Time Display Format	MMM:SS, HH:MM, H:MM:SS (H=Hours, M=Minutes, S=Seconds)	
	ChirP Key Chirp	On, Off	
	Loc Menu Security Lock	Yes, No	
	tc Thermocouple Type	J, K (shown as ...H), E	
	rtd RTD Curve	DIN, JIS	
	tconP WatCurve™ Temperature Compensation	On, Off	
	OFSt 1 Temperature Offset, Channel 1	-99° to 99°F (-55° to 55°C)	
	tr Lo Temperature Range Low	0°F (-18° C) for RTD inputs 32°F (0°C) for tc inputs to tr Hi	
	tr Hi Temperature Range High	tr Lo to 1200°F (649°C)	
	rEAdy Preheat Ready Feature	Yes, No	
	rbAnd Ready Band	1 to 1200°F (649°C)	
	CLoc Real Time Clock Display	Yes, No	
	PLOSS Power Loss Menu Resume	Yes, No	
	AL 1 Alarms for channel 1	None, Dev, Proc, Both	
	AL P1 Absolute Process Alarm 1	100 to 1200°F (38 to 649°C)	
	AldL1 Low Deviation Alarm 1	-999 to 0°F (-555 to 0°C)	
	AldH1 High Deviation Alarm 1	0 to 999°F (0 to 555°C)	
tHErL Thermal	tYPE Temperature Control Type	PID, On-Off	
	HYSt 1 Hysteresis 1	1 to 99°F (1 to 55°C)	
	Pid U PID Units	SI, US	
	tunE 1 Auto-tuning 1	on, OFF	
	ProP 1 Proportional Band 1	1 to 999°F (1 to 555°C)	
	rSEt 1 Reset (integral) Gain 1	0.00 to 9.99 repeats/minute	
	int 1 Integral Gain 1	0.00 to 99.99 minutes/repeat	
	rAtE 1 Rate (derivative) Gain 1	0.00 to 9.99 minutes	
	dEr 1 Derivative Gain 1	0.00 to 9.99 minutes	
	tYcL 1 PID Cycle Time 1	1 to 60 seconds	
diAG WatHelp Diagnostics	Used for equipment troubleshooting and testing. Not used when programming. See the *Hardware & Software Setup Guide.*		

Program Mode Quick Reference

These are the functions, parameters and values included in the Program Mode for this application. You must select Application 7 to access them. For menu programming directions, see the *Hardware & Software Setup Guide*. The Appendix of that guide includes a detailed explanation of all parameters and values.

Function	Parameter	Value	Your Settings
Menu Numbers 1 - 6	SEPt 1 Set point 1 Temperature of set point 1.	Temperature range low to range high.	
	t inE 1 Time 1 Run time of set point 1.	Setting Time 1, Time 2, Time 3 and Time 4 all to zero invalidates selected menu. Format varies based on configuration.	
	FAn 1 Fan 1 Speed Speed of fan during time 1.	Single Speed: On, Off Two Speed: Off, Low, Hi	
	SEPt2 Set point 2 Temperature of set point 2.	Temperature range low to range high.	
	t inE2 Time 2 Run time of set point 2.	Setting Time 1, Time 2, Time 3 and Time 4 all to zero invalidates selected menu. Format varies based on configuration.	
	FAn 2 Fan 2 Speed of fan during time 2.	Single Speed: On, Off Two Speed: Off, Low, Hi.	
	SEPt3 Set point 3 Temperature of set point 3.	Temperature range low to range high.	
	t inE3 Time 3 Run time of set point 3.	Setting Time 1, Time 2, Time 3 and Time 4 all to zero invalidates selected menu. Format varies based on configuration.	
	FAn 3 Fan 3 Speed of fan during time 3.	Single Speed: On, Off Two Speed: Off, Low, Hi	
	SEPt4 Set point 4 Temperature of set point 4.	Temperature range low to range high.	
	t inE4 Time 4 Run time of set point 4.	Setting Time 1, Time 2, Time 3 and Time 4 all to zero invalidates selected menu. Format varies based on configuration.	
	FAn 4 Fan 4 Speed of fan during time 4.	Single Speed: On, Off Two Speed: Off, Low, Hi	

Auto-tuning Note:

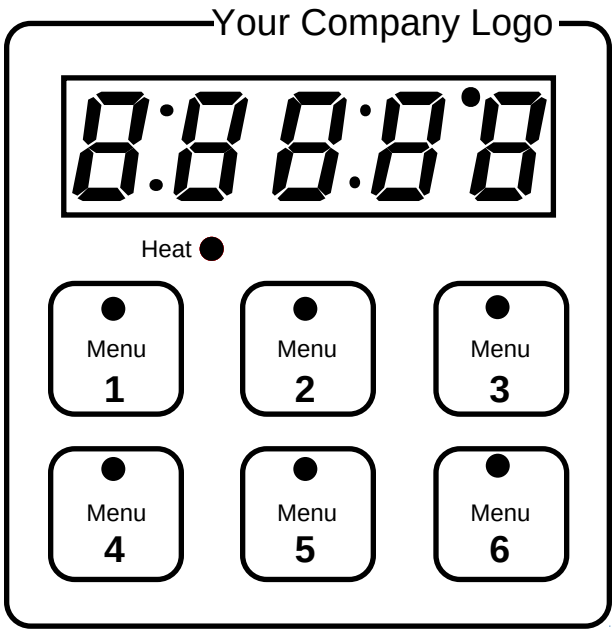
Before auto-tuning Application 7, the Set Point 1 of Menu 1 must first be set to a value that is typical of your application. (See *Hardware & Software Setup Guide* for information on programming menus.) Then set tHErL / tunE 1 to on. After you accept on, by pressing "Enter," the controller will display tunE while auto-tuning is taking place.

The controller will cancel the auto-tuning process if it cannot be completed in 80 minutes. You can cancel the auto-tuning process at any time by pressing either key C or key D and accepting OFF, by pressing "Enter," when it appears.

Step 7 Design a Faceplate Overlay

To complete the installation, you must apply a graphic membrane to the front panel of the controller. The following artwork will help you design and create a membrane for this application. For more dimensions and guidelines, see the *Hardware & Software Setup Guide.*

Suggested End-user Overlay:



This Prototyping and Training Membrane Overlay will help you with the configuration and programming steps. To order it, see the Ordering Information at the back of this guide.

Step 8 Operate the Controller

Summary of Key Functions in Operation Mode

Key	Function
A	Menu 1
B	Menu 2
C	Menu 3
D	Menu 4
E	Menu 5
F	Menu 6

Start-up

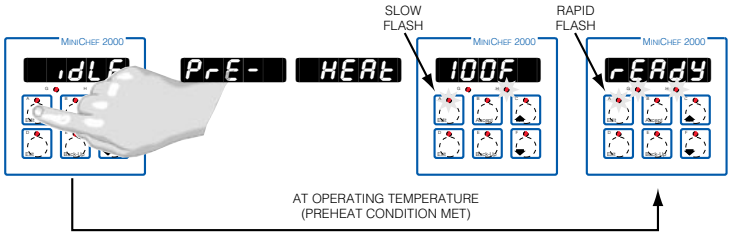
Apply power to the oven.

idLE will appear on the display.

If the Real Time Clock Display option is installed and SEtUP / t iME is programmed, the time of day will appear on the display.

Preheat

If the rEAdy parameter under the SEtUP function in the Configuration Mode is set to yes, the controller will detect temperatures and preheat to operating temperature (above the relative set point minus the ready band) as required.



- Press the key for the menu you want to run. Each key selects a different menu. You can select from up to six menus that control temperature and cooking time. Only one menu may be run at a time.

Note: The controller will not respond if you select an invalid menu (one for which the total of Time 1, Time 2, Time 3, and Time 4 is set to 0).

The menu you have chosen becomes the current menu for controller operation. Until the menu is completed or canceled, the indicator light above the menu key will light up (flashing or steady) to indicate the active menu.

- If the oven is not at operating temperature, it will preheat. Meanwhile:

  The word PrE- HEAt will appear on the display for a few moments. The menu key indicator light will flash slowly. The temperature of Channel 1 will be displayed until the operating temperature is reached.

The heat output indicator light - G, just below the display- will light up whenever the controller is calling for heat.

When the oven is at operating temperature (above the relative set point minus the ready band) rEAdY will appear on the display and the menu key indicator light will flash rapidly. You are now ready to cook with the active menu.

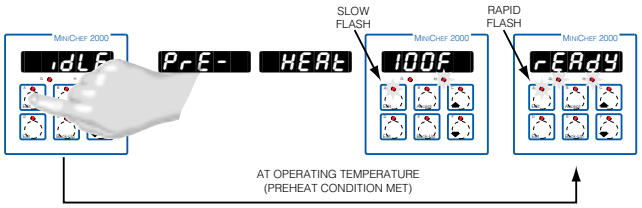
- If the oven is at operating temperature, the display goes directly to rEAdY without indicating preheat or temperature.

Note: you can skip preheat and go directly to the cooking sequence by pressing the menu key a second time.

Run a Menu (when preheat feature is active)

This procedure describes how to run an active menu when the preheat feature is active - that is, when the rEAdY parameter in the SEtUP function of the Configuration mode is set to YES.

1. With idLE or time of day on the display, press the key for the menu you want to run.



If the preheat condition has not been met, the oven will preheat until rEAdY appears on the display.

Note: You can skip preheat and go directly to the cooking sequence by pressing the menu key a second time.

If the oven is already at operating temperature rEAdY will appear on the display.

2. With rEAdY on the display, place the food in the oven. Then press the active menu key (indicated by the rapidly flashing indicator light).

   The menu key indicator will light up. Time will count down on the display.

   The unit will run the following four-step cooking sequence:

   Countdown time is displayed. It is the total of the programmed Time 1 plus Time 2 plus Time 3 plus Time 4.

   Set point 1 and Fan 1 will run until Time 1 expires.

   Set point 2 and Fan 2 will run until Time 2 expires. You will not see the switch-over from Time 1 to Time 2.

   Set point 3 and Fan 3 will run until Time 3 expires. You will not see the switch-over from Time 2 to Time 3.

   Set point 4 and Fan 4 will run until Time 4 expires. You will not see the switch-over from Time 3 to Time 4.

3. When the cooking sequence is finished, one of the following will happen, depending on the way the controller was programmed at EtYPE / Sound:

With Sound set to 0, the controller automatically switches to idle in which the controller does not maintain temperature and does not run time. idLE or time of day will appear on the display. The menu key indicator light will be off.

With Sound set to 1, 2, or 3, End will appear on the display and an audible tone will be emitted. The menu key indicator light will flash rapidly. You can acknowledge the tone by pressing the active menu key or it will time out in 1 to 20 seconds and go into idle. The menu key indicator light will flash slowly.

With Sound set to 4 or 5, end will appear on the display and the menu key indicator light will flash rapidly. You must acknowledge the audible signal by pressing the active menu key. Once acknowledged the audible signal is silenced and the controller goes into idle. The menu key indicator light will flash slowly.

4. Once the controller goes into idle, the menu key indicator light and the heat outputs will switch off. The controller will not regulate to any temperature.
5. To repeat cooking, repeat steps 1 through 2 or 3.

Run a Menu (when preheat feature is not active)

This procedure describes how to run an active menu when the preheat feature is inactive - in other words, when the rEAdY parameter in the SEtUP function of the Configuration mode is set to no.

1. With idle on the display, place the food in the oven.
2. Press the key for the menu you want to run.

   The menu key indicator will light up. Time will count down on the display.

   The unit will run the following four-step cooking sequence:

   Countdown time is displayed. It is the total of the programmed Time 1 plus Time 2 plus Time 3 plus Time 4.

   Set point 1 and Fan 1 will run until Time 1 expires.

   Set point 2 and Fan 2 will run until Time 2 expires. You will not see the switch-over from Time 1 to Time 2.

   Set point 3 and Fan 3 will run until Time 3 expires. You will not see the switch-over from Time 2 to Time 3.

   Set point 4 and Fan 4 will run until Time 4 expires. You will not see the switch-over from Time 3 to Time 4.

3. When the cooking sequence is finished, one of the following will happen, depending on the way the controller was programmed at EtYPE / Sound:

   With Sound set to 0, the controller automatically switches to idle in which the controller does not maintain temperature and does not run time. idLE or time of day will appear on the display. The menu key indicator light will be off.

   With Sound set to 1, 2, or 3, End will appear on the display and an audible tone will be emitted. The menu key indicator light will flash rapidly. You can acknowledge the tone by pressing the active menu key or it will time out in 1 to 20 seconds and go into idle. The menu key indicator light will flash slowly.

   With Sound set to 4 or 5, end will appear on the display and the menu key indicator light will flash rapidly. You must acknowledge the audible signal by pressing the active menu key. Once acknowledged the audible signal is silenced and the controller goes into idle. The menu key indicator light will flash slowly.

4. Once the controller goes into idle, the menu key indicator light and the heat outputs will switch off. The controller will not regulate to any temperature.
5. To repeat cooking, repeat steps 1 through 2 or 3.

Pause a Menu

While cooking, you can pause cooking time by pressing the active menu key once. The menu key indicator light will flash rapidly. PAUSE will appear on the display. Countdown time will resume when you press the active menu key again.

Cancel a menu

Canceling a menu stops the controller completely. The controller does not maintain set point temperatures or run time. You cancel a menu to run another menu, stop menu operation for any reason, or are preparing to shut off the oven.

- Press the active menu key for 2 seconds. Heat outputs will switch off. Heat output indicator lights will switch off. idLE or time of day will be on the display.

Change Menus or Restart

With the controller in idle press the key for the menu you want to run.

Door Opening

When you open the oven door (when the oven door is open, the switch is closed and Event Input 1 is turned on) the unit will act as described below.

During the cooking sequence: time is paused - door will appear on the display. The heat and fan output signals will shut off.

During the preheat sequence: door will appear on the display. The heat and fan output signals will be shut off.

During idle, the fan output signals will be shut off.

When you close the door the unit will operate normally.

Event Outputs

While running a menu when the Configuration Mode EtYPE / FAn is set to 2 :
When Low fan speed is on, Event Output 1 is on.
When High fan speed is on, Event Output 2 is on.

While running a menu when the Configuration Mode EtYPE / FAn is set to 1 :When the fan is on, Event Output 1 is on.

⚠

WARNING: Starting or initiating a menu can cause or initiate fan motion. Appropriate reasonable care should be taken to prevent personal injury or machine damage as a result of operator initiated or unexpected fan motion.

Temperature Alarms

The controller will alert you to temperature alarm conditions if they occur. If an alarm occurs, take action as determined by your supervisor. See the Appendix in the *Hardware & Software Setup Guide* for a Troubleshooting Chart and a summary of temperature alarms.

Errors

The controller will alert you to errors if they occur. Errors are critical problems that shut down the unit. If an error occurs, an error message will appear on the display. You should switch off the power and call for service.

See the Appendix in the *Hardware & Software Setup Guide* for a Troubleshooting Chart and a summary of errors.

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Application 8
Automatic Convection Oven

One Heat Channel, 15 Menus

Application 8 allows you to program as many as fifteen menus to control one temperature channel, a fan and cooking time for an automatic convection oven.

Overview of Key Steps

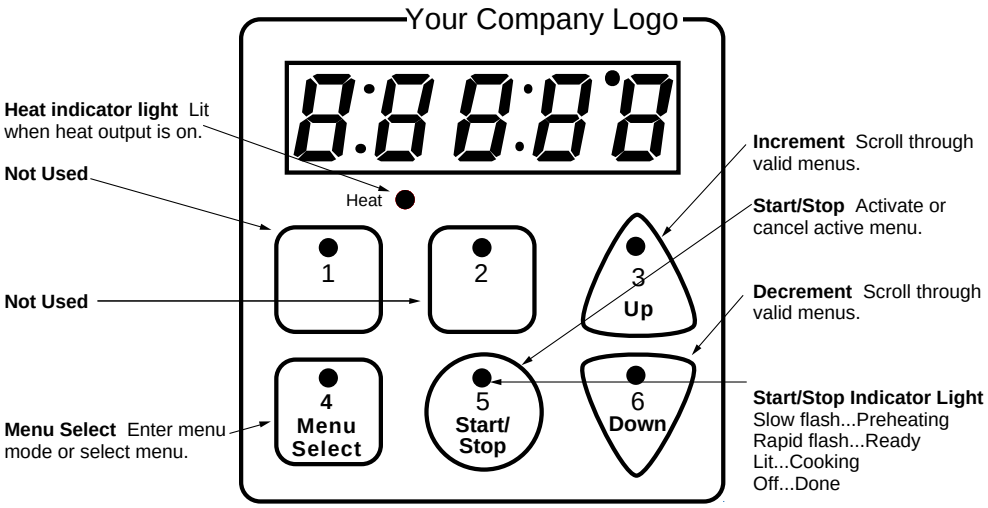
1. Install the MINICHEF 2000.
2. Wire the controller.
3. Configure the controller.
4. Program the menus.
5. Set the controller security.
6. Set the Real-time Clock.

For instructions on Steps 1, 2, 3, 4, 5 and 6, see the *Hardware & Software Setup Guide.*

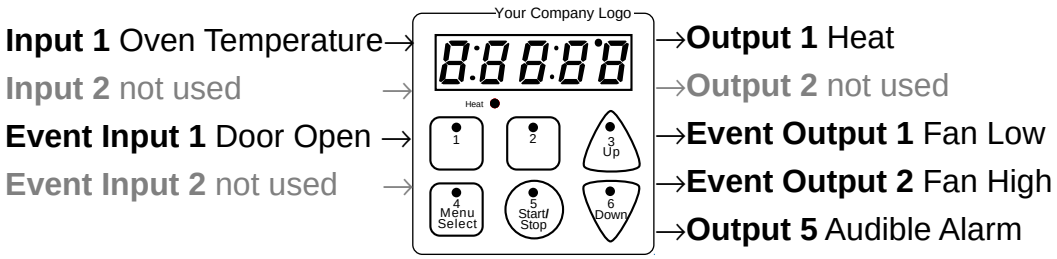
7. Design, manufacture and apply faceplate overlay for end-users. (For a suggested design to suit this application, see this section. For overlay dimensions and guidelines, see the *Hardware & Software Setup Guide.*)
8. Operate the controller. (See this application guide.)

Key Functions in Configuration Mode

Key Functions in Operation Mode



Summary of Input/Output Functions



Note: For details, see wiring instructions in the *Hardware & Software Setup Guide*.

Configuration Mode Quick Reference

These are the functions, parameters and values included in the Configuration Mode for this application. You must select Application 8 to access them. For directions, see the *Hardware & Software Setup Guide.* The Appendix of that guide includes an explanation of all parameters and values.

Function	Parameter	Value	Your Settings
EtYPE Equipment-Type	APPL Application Number	1 - 28	8
	A_Loc Application Number Security Lock	Yes, No	
	Sound Audible Alarm	0 - 5	
	FAn Fan Speed	1 spd, 2 spd	
	dELAY Fan Delay Time	0 - 120	
SEtUP Setup	°C_F Temperature Display Format	°C or °F	
	t.FmtE Time Display Format	MMM:SS, HH:MM, H:MM:SS (H=Hours, M=Minutes, S=Seconds)	
	ChirP Key Chirp	On, Off	
	Loc Menu Security Lock	Yes, No	
	tc Thermocouple Type	J, K (shown as K), E	
	rtd RTD Curve	DIN, JIS	
	tconP WatCurve™ Temperature Compensation	On, Off	
	OFSt1 Temperature Offset, Channel 1	-99 to 99°F (-55 to 55°C)	
	tr Lo Temperature Range Low	0ºF (-18° C) for RTD inputs 32°F (0°C) for tc inputs.to tr Hi	
	tr Hi Temperature Range High	tr Lo to 1200°F (649°C)	
	rEAdy Preheat Ready Feature	Yes, No	
	rbAnd Ready Band	1 to 1200°F (649°C)	
	CLoc Real Time Clock Display	Yes, No	
	PLOSS Power Loss Menu Resume	Yes, No	
	AL 1 Alarms for channel 1	None, Dev, Proc, Both	
	AL P1 Absolute Process Alarm 1	100 to 1200°F (38 to 649°C)	
	AldL1 Low Deviation Alarm 1	-999 to 0°F (-555 to 0°C)	
	AldH1 High Deviation Alarm 1	0 to 999°F (0 to 555°C)	
tHErL Thermal	tYPE Temperature Control Type	PID, On-Off	
	HYSt1 Hysteresis 1	1 to 99°F (1 to 55°C)	
	Pid U PID Units	SI, US	
	tunE1 Auto-tuning 1	on, OFF	
	ProP1 Proportional Band 1	1 to 999°F (1 to 555°C)	
	rSEt1 Reset (integral) Gain 1	0.00 to 9.99 repeats/minute	
	int 1 Integral Gain 1	0.00 to 99.99 minutes/repeat	
	rAtE1 Rate (derivative) Gain 1	0.00 to 9.99 minutes	
	dEr 1 Derivative Gain 1	0.00 to 9.99 minutes	
	CYcL1 PID Cycle Time 1	1 to 60 seconds	
diAG WatHelp Diagnostics	Used for equipment troubleshooting and testing. Not used when programming. See the *Hardware & Software Setup Guide.*		

Program Mode Quick Reference

These are the functions, parameters and values included in the Program Mode for this application. You must select Application 8 to access them. For menu programming directions, see the *Hardware & Software Setup Guide*. The Appendix of that guide includes a detailed explanation of all parameters and values.

Function	Parameter	Value	Your Settings
Menu Numbers 1-15	Set point 1 Temperature of set point 1.	Temperature range low to range high.	
	Time 1 Run time of set point 1.	Setting Time 1, Time 2, Time 3 and Time 4 to zero invalidates selected menu. Format varies based on configuration.	
	Fan 1 Speed Speed of fan during time 1.	Single Speed: On, Off Two Speed: Off, Low, Hi	
	Set point 2 Temperature of set point 2.	Temperature range low to range high.	
	Time 2 Run time of set point 2.	Setting Time 1, Time 2, Time 3 and Time 4 to zero invalidates selected menu. Format varies based on configuration.	
	Fan 2 Speed of fan during time 2.	Single Speed: On, Off Two Speed: Off, Low, Hi	
	Set point 3 Temperature of set point 3.	Temperature range low to range high.	
	Time 3 Run time of set point 3.	Setting Time 1, Time 2, Time 3 and Time 4 to zero invalidates selected menu.selected menu. Format varies based on configuration.	
	Fan 3 Speed of fan during time 3.	Single Speed: On, Off Two Speed: Off, Low, Hi	
	Set point 4 Temperature of set point 4.	Temperature range low to range high.	
	Time 4 Run time of set point 4.	Setting Time 1, Time 2, Time 3 and Time 4 to zero invalidates selected menu.selected menu. Format varies based on configuration.	
	Fan 4 Speed of fan during time 4.	Single Speed: On, Off Two Speed: Off, Low, Hi	

Auto-tuning Note:

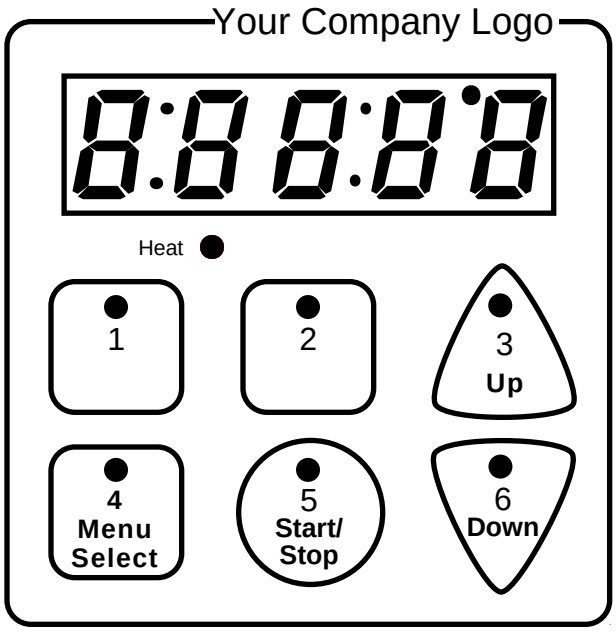
Before auto-tuning Application 8, the Set Point 1 of Menu 1 must first be set to a value that is typical of your application. (See the *Hardware & Software Setup Guide* for information on programming menus.) Then set tHErL / tunE 1 to on. After you accept on, by pressing "Enter," the controller will display tunE while auto-tuning is taking place.

The controller will cancel the auto-tuning process if it cannot be completed in 80 minutes. You can cancel the auto-tuning process at any time by pressing either key C or key D and accepting OFF, by pressing "Enter," when it appears.

Step 7 Design a Faceplate Overlay

To complete the installation, you must apply a graphic membrane to the front panel of the controller. The following artwork will help you design and create a membrane for this application. For more dimensions and guidelines, see the *Hardware & Software Setup Guide*.

Suggested End-user Overlay:



This Prototyping and Training Membrane Overlay will help you with the configuration and programming steps. To order it, see the Ordering Information at the back of this guide.

Step 8 Operate the Controller

Summary of Key Functions in Operation Mode

Key	Function
A	Not Used
B	Not Used
C	Menu Increment
D	Menu Select
E	Start/Stop
F	Menu Decrement

Start-up

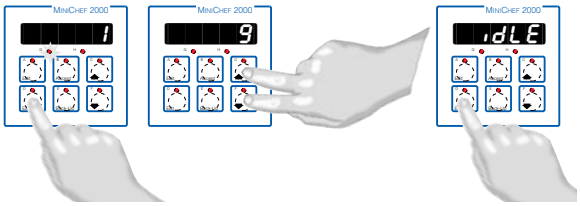
Apply power to the oven.

idLE will appear on the display.

If the Real Time Clock Display option is installed and SEtUP / t iME is programmed, the time of day will appear on the display.

Select a Menu

1. Press the Menu Select Key



   The controller will display the currently selected menu. If no menus have been programmed the word nonE will appear on the display.

2. Press the Up or Down key until the menu you want appears on the display.

   The controller will only display valid menus (those for which the total of Time1, Time 2, Time 3 and Time 4 for the menu is set to greater than 0).

3. Press the Menu Select key or press the Start/Stop key.

   If you press the Menu/Select key, idLE appears on the display and the menu you have chosen becomes the current menu for controller operation.

   If you press the Start/Stop key the menu will start (see the “Run a Menu” instructions elsewhere in this section)

Preheat

If the rEAdy parameter under the SEtUP function in the Configuration Mode is set to yes, the controller will detect temperatures and preheat to operating temperature (above the relative set point minus the ready band) as required.

- Activate the menu by pressing the Start/Stop key.
- If the oven is not at operating temperature, it will preheat. Meanwhile:

  The word PrE- HEAt will appear on the display for a few moments. The Start/Stop key indicator light will flash slowly. The temperature of Channel 1 will be displayed until the operating temperature is reached.

  The heat output indicator light - G, just below the display- will light up whenever the controller is calling for heat.

  When the oven is at operating temperature (above the relative set point minus the ready band) rEAdY will appear on the display and the Start/Stop key indicator light will flash rapidly. You are now ready to cook with the active menu.
- If the oven is at operating temperature, the display goes directly to rEAdY without indicating preheat or temperature.

Note: You can skip preheat and go directly to the cooking sequence by pressing the Start/Stop key a second time.

Run a Menu (when preheat feature is active)

This procedure describes how to run an active menu when the preheat feature is active - that is, when the rEAdY parameter in the SEtUP function of the Configuration mode is set to YES.

1. Select a menu as shown earlier.
2. With idLE, time of day or a menu number on the display, press the Start/Stop key.

   If the preheat condition has not been met, the oven will preheat until rEAdY appears on the display.

Note: You can skip preheat and go directly to the cooking sequence by pressing the Start/Stop key a second time.

   If the oven is already at operating temperature rEAdY will appear on the display.
3. With rEAdY on the display, place the food in the oven. Then press the Start/Stop key (indicated by the rapidly flashing indicator light).

   The Start/Stop key indicator will light up. Time will count down on the display.

   The unit will run the following four-step cooking sequence:

   Countdown time is displayed. It is the total of the programmed Time 1 plus Time 2 plus Time 3 plus Time 4.

   Set point 1 and Fan 1 will run until Time 1 expires.

   Set point 2 and Fan 2 will run until Time 2 expires. You will not see the switch-over from Time 1 to Time 2.

   Set point 3 and Fan 3 will run until Time 3 expires. You will not see the switch-over from Time 2 to Time 3.

   Set point 4 and Fan 4 will run until Time 4 expires. You will not see the switch-over from Time 3 to Time 4.
4. When the cooking sequence is finished, one of the following will happen, depending on the way the controller was programmed at EtYPE / Sound:

With Sound set to 0, the controller automatically switches to idle in which the controller does not maintain temperature and does not run time. idLE or current time will appear on the display. The Start/Stop key indicator light will be off.

With Sound set to 1, 2, or 3, End will appear on the display and an audible tone will be emitted. The Start/Stop key indicator light will flash rapidly. You can acknowledge the tone by pressing the Start/Stop key or it will time out in 1 to 20 seconds and go into idle. The Start/Stop key indicator light will be off.

With Sound set to 4 or 5, End will appear on the display and the Start/Stop key indicator light will flash rapidly. You must acknowledge the audible signal by pressing the Start/Stop key. Once acknowledged the audible signal is silenced and the controller goes into idle. The Start/Stop key indicator light will be off.

5. Once the controller goes into idle, the Start/Stop key indicator light and the heat outputs will switch off. The controller will not regulate to any temperature.
6. To repeat cooking, repeat steps 1 through 3 or 4.

Run a Menu (when preheat feature is not active)

This procedure describes how to run an active menu when the preheat feature is inactive - in other words, when the rEAdy parameter in the SEtUP function of the Configuration mode is set to no.

1. Select a menu as shown earlier.
2. With idLE, time of day or a menu number on the display, place the food in the oven.
3. Press the Start/Stop key.

   The Start/Stop key indicator will light up. Time will count down on the display.

   The unit will run the following four-step cooking sequence:

   Countdown time is displayed. It is the total of the programmed Time 1 plus Time 2 plus Time 3 plus Time 4.

   Set point 1 and Fan 1 will run until Time 1 expires.

   Set point 2 and Fan 2 will run until Time 2 expires. You will not see the switch-over from Time 1 to Time 2.

   Set point 3 and Fan 3 will run until Time 3 expires. You will not see the switch-over from Time 2 to Time 3.

   Set point 4 and Fan 4 will run until Time 4 expires. You will not see the switch-over from Time 3 to Time 4.
4. When the cooking sequence is finished, one of the following will happen, depending on the way the controller was programmed at EtYPE / Sound:

   With Sound set to 0, the controller automatically switches to idle in which the controller does not maintain temperature and does not run time. idLE or current time will appear on the display. The Start/Stop key indicator light will be off.

   With Sound set to 1, 2, or 3, End will appear on the display and an audible tone will be emitted. The Start/Stop key indicator light will flash rapidly. You can acknowledge the tone by pressing the Start/Stop key or it will time out in 1 to 20 seconds and go into idle. The Start/Stop key indicator light will be off.

With Sound set to 4 or 5, End will appear on the display and the Start/Stop key indicator light will flash rapidly. You must acknowledge the audible signal by pressing the Start/Stop key. Once acknowledged the audible signal is silenced and the controller goes into idle. The Start/Stop key indicator light will be off.

5. Once the controller goes into idle, the Start/Stop key indicator light and the heat outputs will switch off. The controller will not regulate to any temperature.
6. To repeat cooking, repeat steps 1 through 3 or 4.

Pause a Menu

While cooking, you can pause cooking time by pressing the Start/Stop key once. The Start/Stop key indicator light will flash rapidly. PAUSE will appear on the display. Countdown time will resume when you press the active menu key again.

Cancel a menu

Canceling a menu stops the controller completely. The controller does not maintain set point temperatures or run time. You cancel a menu to run another menu, stop menu operation for any reason, or are preparing to shut off the oven.

- Press the Start/Stop key for 2 seconds. Heat outputs will switch off. Heat output indicator lights will switch off. idLE or time of day will be on the display.

Change Menus or Restart

With the controller in idle:

1. Select a menu as shown earlier.
2. Press the Start/Stop key.

Door Opening

When you open the oven door (when the oven door is open, the switch is closed and Event Input 1 is turned on) the unit will act as described below.

During the cooking sequence: time is paused - door will appear on the display.

The heat and fan output signals will shut off.

During the preheat sequence: door will appear on the display. The heat and fan output signals will be shut off.

When you close the door the unit will operate normally.

Event Outputs

While running a menu when the Configuration Mode EtYPE / FAn is set to 2 :
When Low fan speed is on, Event Output 1 is on.
When High fan speed is on, Event Output 2 is on.

While running a menu when the Configuration Mode EtYPE / FAn is set to 1 :When the fan is on, Event Output 1 is on.

WARNING: Starting or initiating a menu can cause or initiate fan motion. Appropriate reasonable care should be taken to prevent personal injury or machine damage as a result of operator initiated or unexpected fan motion.

Temperature Alarms

The controller will alert you to temperature alarm conditions if they occur. If an alarm occurs, take action as determined by your supervisor. See the Appendix in the *Hardware & Software Setup Guide* for a Troubleshooting Chart and a summary of temperature alarms.

Errors

The controller will alert you to errors if they occur. Errors are critical problems that shut down the unit. If an error occurs, an error message will appear on the display. You should switch off the power and call for service.

See the Appendix in the *Hardware & Software Setup Guide* for a Troubleshooting Chart and a summary of errors.

9

Application 9
Manual Convection Oven

One Heat Channel

Application 9 allows you to program to control one temperature channel, a fan and cooking time for a manual convection oven.

Overview of Key Steps

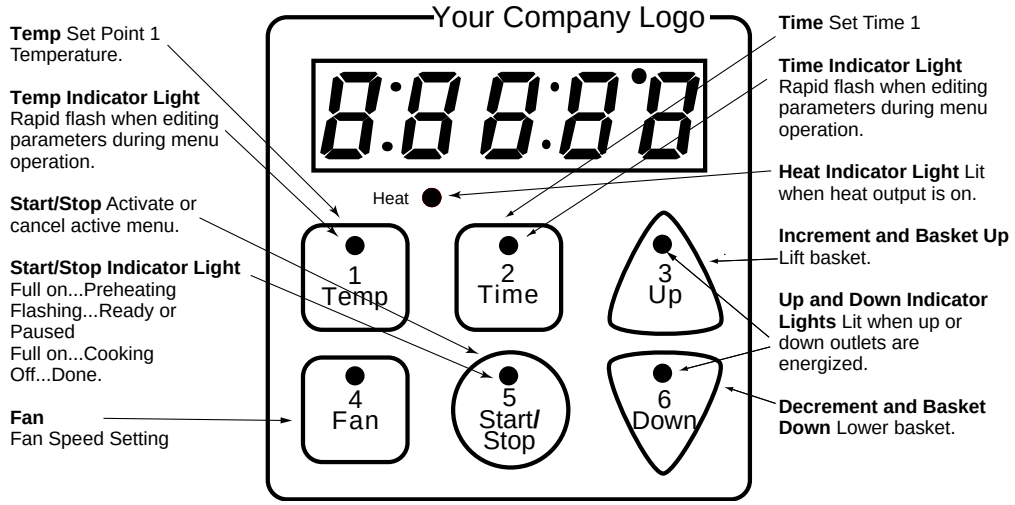
1. Install the MINICHEF 2000.
2. Wire the controller.
3. Configure the controller.
4. Program the menu.
5. Set the controller security.
6. Set the Real-time Clock.

For instructions on Steps 1, 2, 3, 4, 5 and 6, see the *Hardware & Software Setup Guide.*

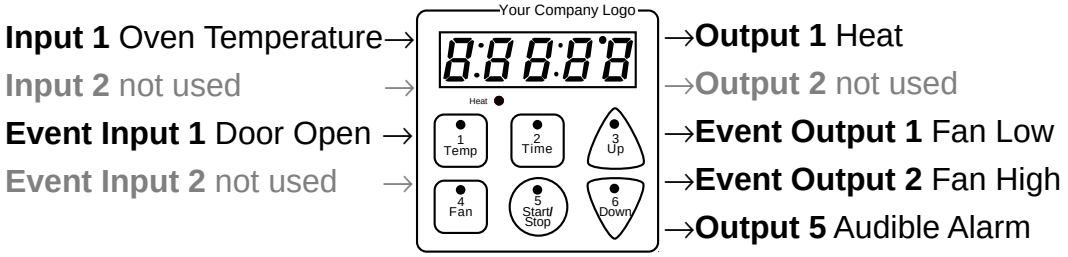
7. Design, manufacture and apply faceplate overlay for end-users. (For a suggested design to suit this application, see this section. For overlay dimensions and guidelines, see the *Hardware & Software Setup Guide.*)
8. Operate the controller. (See this application guide.)

Key Functions in Configuration Mode

Key functions in Operation Mode



Summary of Input/Output Functions



Note: For details, see wiring instructions in the *Hardware & Software Setup Guide*.

Configuration Mode Quick Reference

These are the functions, parameters and values included in the Configuration Mode for this application. You must select Application 9 to access them. For directions, see the *Hardware & Software Setup Guide*. The Appendix of that guide includes an explanation of all parameters and values.

Function	Parameter	Value	Your Settings
EtYPE Equipment-Type	APPL Application Number	1 - 28	9
	A_Loc Application Number Security Lock	Yes, No	
	FAn Fan Speed	1 spd, 2 spd	
	dELAY Fan Delay Time	1 - 120 minutes	
SEtUP Setup	C_F Temperature Display Format	°C or °F	
	t.FME Time Display Format	MMM:SS, HH:MM, H:MM:SS (H=Hours, M=Minutes, S=Seconds)	
	ChirP Key Chirp	On, Off	
	tc Thermocouple Type	J, K (shown as H), E	
	rtd RTD Curve	DIN, JIS	
	tconP WatCurve™ Temperature Compensation	On, Off	
	OFSt1 Temperature Offset, Channel 1	-99 to 99°F (-55 to 55°C)	
	tr Lo Temperature Range Low	0ºF (-18° C) for RTD inputs 32°F (0°C) for tc inputs to tr Hi	
	tr Hi Temperature Range High	tr Lo to 1200°F (649°C)	
	rEAdy Preheat Ready Feature	Yes, No	
	rbAnd Ready Band	1° to 1200°F (649°C)	
	Cloc Real Time Clock Display	Yes, No	
	PLOSS Power Loss Menu Resume	Yes, No	
	AL 1 Alarms for channel 1	None, Dev, Proc, Both	
	AL P1 Absolute Process Alarm 1	100 to 1200°F (38 to 649°C)	
	ALdL1 Low Deviation Alarm 1	-999 to 0°F (-555 to 0°C)	
	ALdH1 High Deviation Alarm 1	0 to 999°F (0 to 555°C)	
tHErL Thermal	tYPE Temperature Control Type	PID, On-Off	
	HYSt1 Hysteresis 1	1° to 99°F (1° to 55°C)	
	Pid U PID Units	SI, US	
	tunE1 Auto-tuning 1	on, OFF	
	ProP1 Proportional Band 1	1 to 999°F (1 to 555°C)	
	rSEt1 Reset (integral) Gain 1	0.00 to 9.99 repeats/minute	
	int 1 Integral Gain 1	0.00 to 99.99 minutes/repeat	
	rAtE1 Rate (derivative) Gain 1	0.00 to 9.99 minutes	
	dEr 1 Derivative Gain 1	0.00 to 9.99 minutes	
	CYcL1 PID Cycle Time 1	1 to 60 seconds	
d.AG WatHelp Diagnostics	Used for equipment troubleshooting and testing. Not used when programming. See the *Hardware & Software Setup Guide.*		

Auto-tuning Note:

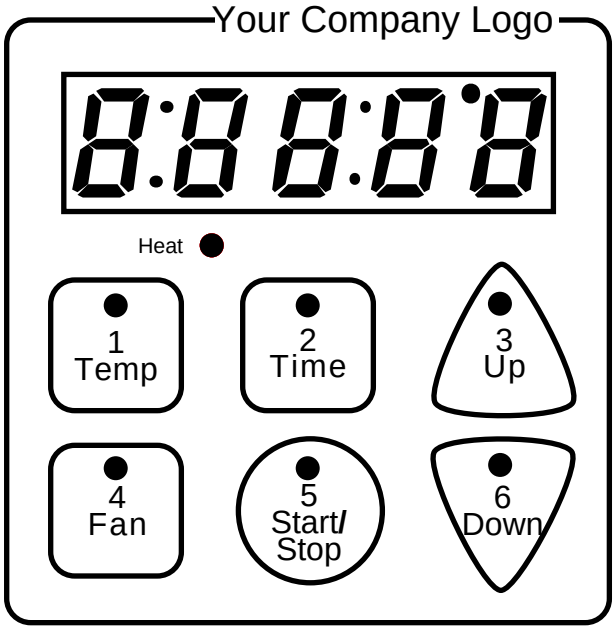
Before auto-tuning Application 9, tEMP 1 in the operations menu must first be set to a value that is typical of your application. (See *Hardware & Software Setup Guide* for information.) Then set tHErL / tunE 1 to on. After you accept on, by pressing "Enter," the controller will display tunE while auto-tuning is taking place.

The controller will cancel the auto-tuning process if it cannot be completed in 80 minutes. You can cancel the auto-tuning process at any time by pressing either key C or key D and accepting OFF, by pressing "Enter," when it appears.

Step 7 Design a Faceplate Overlay

To complete the installation, you must apply a graphic membrane to the front panel of the controller. The following artwork will help you design and create a membrane for this application. For more dimensions and guidelines, see the *Hardware & Software Setup Guide.*

Suggested End-user Overlay:



This Prototyping and Training Membrane Overlay will help you with the configuration and programming steps. To order it, see the Ordering Information at the back of this guide.

Step 8 Operate the Controller

Summary of Key Functions in Operation Mode

Key	Function
A	Cook Temp(s)
B	Cook Time(s)
C	Up (Increment)
D	Fan Settings
E	Start/Stop
F	Down (Decrement)

Start-up

Apply power to the oven.

idLE will appear on the display.

If the Real Time Clock option is installed and SEtUP / t iME is programmed, the time of day will appear on the display.

Set the Menu

Depending on the way the controller was programmed at EtYPE / StEPS you can set the menu to run in one step or two.

EtYPE / StEPS is set to 1: Single Step Menu

EtYPE / StEPS is set to 2: Two Step Menu

Single Step Menu

The single step menu consists of one cooking temperature, one cooking time and one fan setting.

Set the cooking temperatures.

1. Press the Cook Temp key.

   tEMP 1 and then the cooking temperature value will appear on the display.
2. Press the Up or Down key until the value you want appears on the display.
3. Press the Cook Temp key again.

   The cooking temperature has been set.

   idLE will appear on the display.

Set the cooking time:

1. Press the Cook Time key.

   t imE 1 and then the cooking time value will appear on the display.
2. Press the Up or Down key until the value you want appears on the display.
3. Press the Cook Time key again.

   The Cooking Time has been set.

   idLE will appear on the display.

Set the Fan

1. Press the Fan Settings key.

   FAn 1 and then the fan setting value will appear on the display.
2. Press the Up or Down key until the value you want appears on the display.
3. Press the Fan Settings key again.

   The Fan value has been set.

   idLE will appear on the display.

   The menu you have set becomes the current menu for controller operation.

Five Second Timeout

When using the up or down keys to change a value, if you do not press any key for 5 seconds, the controller will automatically be set to the last value on the display and return to idLE.

Two Step Menu

The two step menu consists of two cooking temperatures, two cooking times and one fan setting.

Set the two cooking temperatures.

1. Press the Cook Temp key.

   tEMP 1 and then the first cooking temperature value will appear on the display.
2. Press the Up or Down key until the value you want appears on the display.
3. Press the Cook Temp key again.

   The first cooking temperature has been set.

   tEMP2 and then the second cooking temperature value will appear on the display.
4. Press the Up or Down key until the value you want appears on the display.
5. Press the Cook Temp key again.

   The second cooking temperature has been set.

   idLE will appear on the display.

Set the two cooking times.

1. Press the Cook Time key.

   tinE 1 and then the first cooking time value will appear on the display.
2. Press the Up or Down key until the value you want appears on the display.
3. Press the Cook Time key again.

   The first cooking time has been set.

   tinE2 and then the second cooking time value will appear on the display.
4. Press the Up or Down key until the value you want appears on the display.
5. Press the Cook Time key again.

   The second cooking time has been set

   idLE will appear on the display.

Set the Fan

1. Press the Fan Settings key.

   FAn 1 and then the first fan setting value will appear on the display.

2. Press the Up or Down key until the value you want appears on the display.
3. Press the Fan Settings key again.

   The first fan value has been set.

   FAn2 and then the second fan setting value will appear on the display.

4. Press the Up or Down key until the value you want appears on the display.
5. Press the Fan Settings key again.

   The second fan value has been set

   idLE will appear on the display.

The menu you have set becomes the current menu for controller operation.

Five Second Timeout

When using the up or down keys to change a value, if you do not press any key for 5 seconds, the controller will automatically be set to the last value on the display and return to idLE.

Preheat

If the Ready parameter under the SEtUP function in the Configuration Mode is set to yes, when you press the Start/Stop key to activate the menu, the controller will detect temperatures and preheat to operating temperature (above relative set point minus the ready band) as required.

- If the oven is not at operating temperature, it will preheat. Meanwhile:

  The word PrE- HEAt will appear on the display for a few moments. The Start/Stop key indicator light will flash slowly. The temperature of Channel 1 will be displayed until the operating temperature is reached.

  The heat output indicator light - G, just below the display- will light up whenever the controller is calling for heat.

  When the oven is at operating temperature (above relative set point minus the ready band) rEAdY will appear on the display and the Start/Stop key indicator light will flash rapidly. You are now ready to cook with the active menu.

- If the oven is at operating temperature, the display goes directly to rEAdY without indicating preheat or temperature.

Note: You can skip preheat and go directly to the cooking sequence by pressing the Start/Stop key a second time.

Run a Menu (when preheat feature is active)

This procedure describes how to run an active menu when the preheat feature is active - that is, when the rEAdY parameter in the SEtUP function of the Configuration mode is set to YES.

1. Set the menu as shown earlier.

2. With idLE or time of day on the display, press the Start/Stop key.

   If the preheat condition has not been met, the oven will preheat until rEAdY appears on the display.

Note: You can skip preheat and go directly to the cooking sequence by pressing the Start/Stop key a second time.

   If the oven is already at operating temperature rEAdY will appear on the display.

3. With rEAdY on the display, place the food in the oven. Then press the Start/Stop key (indicated by the rapidly flashing indicator light).

   The Start/Stop key indicator will light up. Time will count down on the display.

   Depending on the way the controller was programmed at EtYPE / StEPS the menu will run in one step or two.

One Step

Countdown time is displayed. Set point 1 and Fan 1 will run until Time 1 expires.

Two Step

Countdown time is displayed. It is the total of the programmed Time 1 plus Time 2.

Set point 1 and Fan 1 will run until Time 1 expires.

Set point 2 and Fan 2 will run until Time 2 expires. You will not see the switch-over from Time 1 to Time 2.

4. When the cooking sequence is finished, End will appear on the display and an audible tone will sound for two seconds. The controller will then go into idle.
5. Once the controller goes into idle, the Start/Stop indicator light will switch off.
6. To repeat cooking, repeat steps 1 through 4.

Run a Menu (when preheat feature is not active)

This procedure describes how to run an active menu when the preheat feature is inactive - in other words, when the rEAdY parameter in the SEtUP function of the Configuration mode is set to no.

1. Set the menu as shown earlier.
2. With idle on the display, place the food in the oven.
3. Press the Start/Stop key.

   The Start/Stop key indicator will light up. Time will count down on the display.

   Depending on the way the controller was programmed at EtYPE / StEPS the menu will run in one step or two.

One Step

Countdown time is displayed. Set point 1 and Fan 1 will run until Time 1 expires.

Two Step

Countdown time is displayed. It is the total of the programmed Time 1 plus Time 2.

Set point 1 and Fan 1 will run until Time 1 expires.

Set point 2 and Fan 2 will run until Time 2 expires. You will not see the switch-over from Time 1 to Time 2.

4. When the cooking sequence is finished, End will appear on the display and an audible tone will sound for two seconds. The controller will then go into idle.
5. Once the controller goes into idle, the Start/Stop indicator light will switch off.
6. To repeat cooking, repeat steps 1 through 4.

View Actual Oven Temperature

While cooking you can view the actual oven temperature by pressing and holding the Cook Temp key for three seconds.

Adjust a Menu While Cooking

You can adjust the temperature and time settings during the cooking sequence by performing the actions shown under “Set the menu” earlier in this section.

Changes can be made to temperature and time only during the portion of the cooking sequence in which they are active. For example: a change to the first cooking temperature tEMP 1 can be made only when the first cooking temperature is being run during the cooking sequence.

Temperature changes made while cooking are saved and become part of the permanent menu. Time changes are not saved and do not become part of the permanent menu.

Pause a Menu

While cooking, you can pause cooking time by pressing the Start/Stop key once. The Start/Stop key indicator light will flash rapidly. PAUSE will appear on the display. To resume, press the Start/Stop key again.

Cancel a Menu

Canceling a menu stops the controller completely. The controller does not maintain set point temperatures or run time. You cancel a menu to change the menu, stop menu operation for any reason, or are preparing to shut off the oven.

- Press the Start/Stop key for 2 seconds. Heat outputs will switch off. Heat output indidicator lights will switch off. idLE or time of day will be on the display.

Change Menu or Restart

With the controller in idle:

1. Set a menu as shown earlier.
2. Press the Start/Stop key.

Door Opening

When you open the oven door (when the oven door is open, the switch is closed and Event Input 1 is turned on) the unit will act as described below.

During the cooking sequence: time is paused - door will appear on the display.

The heat and fan output signals will shut off.

During the preheat sequence: door will appear on the display. The heat and fan output signals will be shut off.

During idle, the fan output signals will be shut off.

When you close the door the unit will operate normally.

Event Outputs

While running a menu when the Configuration Mode ETYPE / FAn is set to 2 :
When Low fan speed is on, Event Output 1 is on.
When High fan speed is on, Event Output 2 is on.

While running a menu when the Configuration Mode ETYPE / FAn is set to 1 :When the fan is on, Event Output 1 is on.

WARNING: Starting or initiating a menu can cause or initiate fan motion. Appropriate reasonable care should be taken to prevent personal injury or machine damage as a result of operator initiated or unexpected fan motion.

Temperature Alarms

The controller will alert you to temperature alarm conditions if they occur. If an alarm occurs, take action as determined by your supervisor. See the Appendix in the *Hardware & Software Setup Guide* for a Troubleshooting Chart and a summary of temperature alarms.

Errors

The controller will alert you to errors if they occur. Errors are critical problems that shut down the unit. If an error occurs, an error message will appear on the display. You should switch off the power and call for service.

See the Appendix in the *Hardware & Software Setup Guide* for a Troubleshooting Chart and a summary of errors.

Specifications (1032)

Control Mode
- Single and dual heat channels, PID or on/off.[1]
- Microprocessor-based, programmable, reverse-acting control outputs.
- User-selectable embedded application software defines operation of display, keys, inputs, outputs, timing action.
- One-step auto-tuning, WatHelp diagnostics, WatCurve temperature compensation.

Agency
- CE approved:
  89/336/EEC Electromagnetic Compatibility Directive
  -EN 50081-1: Emissions
  -EN 50082-1: Immunity
  73/23/EEC Low-Voltage Directive
  -EN 60730-1 and EN 60730-2-9: Safety
- NSF Listed, Criteria 2.[5]
- AGA: UL tested to AGA standard Z21.23, UL File #E43684.
- UL and C-UL recognized, UL 197, 873, 991 and CSA standard C22.2-24, File # E43684.

Operator Interface
- Membrane overlay, contamination and water resistant, (supplied by customer).
- LED display, 5-digit, 0.56 in high, red.
- Displays times, temperatures, user prompts and diagnostic codes.
- User-selectable time and temperature display formats.
- Temperature display formats—˚F or ˚C.
- Time display formats—H:MM:SS, HH:MM, or MMM:SS.
- 8 discrete indicator LEDs, red.
- 6 tactile feedback keys.
- Menu-driven operation and manual modes available.
- WatHelp diagnostics.
- Real-time clock option displays time of day.

Accuracy
- Calibration accuracy and sensor conformity[2]: ± 2.0°F for Type J thermocouple and RTD, ± 0.35% of span for Type K and E thermocouples, ±1 LSD, 77°F ± 5°F ambient and rated line voltage of ±10%.
- Accuracy span: 1000°F (540°C) minimum.
- Temperature stability: ± 0.15˚F/˚F (0.15˚C/˚C) change in ambient typical.

Sensors/Inputs
- Contact inputs, TTL compatible with internal pull-up resistor, two available.
- Thermocouple,[3] software selectable Type J, K or E, 32 to 1200°F. (Dual-channel applications require at least one ungrounded thermocouple).
- RTD,[3] 2- or 3-wire, platinum, 100, 500, 1000Ω, at 0°C, software selectable DIN or JIS curves, 0 to 1200°F (3-wire will function as 2-wire).
- Input A/D resolution: 15 bit.

Output Options
- Solid-state relay, 0.4A, with or without contact suppression.
- Switched dc signal, 4.5V to 5.25V, 30mA maximum output, minimum load resistance > 150Ω, non-isolated.

Audible Output Options
- Switched dc signal, 4.5V to 5.25V, 30mA maximum output, minimum load resistance > 150Ω, non-isolated.
- Internal audible alarm, 75dB at 10 cm.

Connectors
- Sensor Input Terminal Strip[4]: RIACON, 6-position, quick-connect.
- Power Supply & Input/Output Terminal[4]: AMP, 15-position, quick-connect.

Power/Line Voltage
- 20.4 to 26.4V~ (ac), 47 to 63Hz.
- 15VA maximum.
- For CE applications, input power must be limited to 15W external to the control.
- Program retention upon power failure via non-volatile memory.
- Battery/real-time clock option: 6-year lithium battery, provides power backup upon power failure, operation resumption after power recovery, ability to display time of day.

Operating Environment
- 32 to 176°F (0 to 80°C), 0 to 90% RH, non-condensing.

Storage Temperature
- -40 to 176°F (-40 to 80°C).

Mechanical
- Case: polycarbonate Lexan with adjustable mounting collar (vertical or horizontal orientation), designed for mounting on 16-, 18-, 20- and 22-gauge panels.
- Internal panel mounting requires a specified panel cutout and four #6-32 studs or equivalent.
- Overall width x height x depth: horizontal - 4.13 in x 3.25 in x 2.00 in; vertical - 3.25 in x 4.13 in x 2.00 in (Assumes mating connectors are attached. Does not include wire bundle space requirements.).
- Vibration: 2g, 10 to 150Hz, applied in any one of three axes.
- Weight: 6.50oz maximum.

Program Storage
- All non-embedded user and factory programs are stored in non-volatile memory. Can be changed by reprogramming.

Sample/Update Rates
- 1 input: 4Hz.
- 2 inputs: 4Hz.
- PID: 1Hz.
- Control outputs: 100Hz.
- Display: 10Hz.

[1] The MiniChef 2000 controller is to be used in systems with an external high temperature limiting device.

[2] Thermocouple lead resistance of 200Ω causes < 1°C error. RTD, 22 gauge wire will not contribute more than 0.086°F error/ft.

[3] Dual channel applications require either two thermocouple sensors or two identical RTD sensor types.

[4] For mating connector information, see Ordering Information Accessory section.

[5] Certified for thermometer accuracy (oven and hot food holding applications from 32°F to 60°F) when used with RTD or type J thermo couple probes.

Ordering Information

(1033)

F 2 H A - _ _ 1 - _ A A

MINICHEF 2000™
Cooking controller with numerous food equipment application software sets, single and dual channel on/off or PID temperature regulation, timer and machine-function control, microprocessor-based, programmable, auto-tuning, WatCurve, WatHelp diagnostics, 24V~ (ac) power input, agency approved, flush mounted (membrane faceplate supplied by customer).

Inputs
1 = Dual thermocouple, Type J, K or E
2 = Dual RTD, platinum, 100Ω, curve selectable
3 = Dual RTD, platinum, 500Ω, curve selectable
4 = Dual RTD, platinum, 1000Ω, curve selectable

Note: All models include two event inputs, switched dc logic signal, non-isolated.

Output Number 1
1 = Switched dc, 5V nominal, 30mA, non-isolated
2 = Solid-state relay, Form A, 0.4A, without RC suppression
3 = Solid-state relay, Form A, 0.4A, with RC suppression

Output Number 2
1 = Switched dc, 5V nominal, 30mA, non-isolated
2 = Solid-state relay, Form A, 0.4A, without RC suppression
3 = Solid-state relay, Form A, 0.4A, with RC suppression

Event Outputs 1 and 2
1 = 2 event outputs, switched dc, 5V nominal, 30mA, non-isolated

Battery and Real-time Clock
0 = None
1 = Includes battery and real-time clock

Audible Alarm
0 = Alarm signal available at connector, switched dc, 5V nominal, 30mA, non-isolated
1 = Internal alarm included

Software
AA = Standard Food Equipment Application Software Set
XX = Custom Set-up parameters or Made-To-Order custom software. Consult your local Watlow Sales Engineer. Code number assigned by factory.

Ordering Information: Part Numbers & Accessories

MiniChef 2000 Accessories

0836-0442-0000	Sensor Input Mating Connector, (RIACON #31007106), 6-position, quick-connect terminal, screw connection for 28-14 AWG wires, tighten to 7 in/lb
A001-0298-0000	Power Supply and I/O Mating Connector Kit. Includes: – 1 AMP #1-640523-0, 15-position, quick-connect terminal – 15 AMP #641300-1 crimp pins
0238-0679-0000	Prototyping & Training Membrane Overlay, adhesive-backed, 4.75 in x 4.75 in
0830-0479-0000	Prototyping EPROM Extraction Tool, AMP #821980-1
A001-0249-0001	120V~ to 24V~ (ac), stepdown transformer, class 2, quick-connect terminals included
A001-0249-0002	208/240V~ to 24V~ (ac), step-down transformer, class 2, quick-connect terminals included

Recommended Sources of Supply for Miscellaneous Items

DURA-TECH, Inc.
LaCrosse, WI
(608) 781-2570

- *Custom Membrane Faceplates*

AMP, Inc.
Harrisburg, PA
1-800-522-6752

- *Prototyping EPROM Extraction Tool* Part No. 821980-1
- *Pin Crimping Hand Tools* Part No. 90325-1 or 58514-1
- *Pin Extraction Hand Tool* Part No. 455822-2

RIA Electronic, Inc.
Eatontown, NJ
(908) 389-1300

- *RIACON Connectors*

MiniChef 2000 Documentation

WMC2-XUGN-0000	The Complete MiniChef 2000 User Guide
WMC2-XADN-0000	The Complete MiniChef 2000 User Guide on CD
WMC2-XTDN-0000	MiniChef 2000 Tutorial Disk
WMC2-XSGN-0000	Hardware & Software Setup Guide
WMC2-XAGN-0001	Cook-&-Hold Oven Application Guide
WMC2-XAGN-0002	Convection Oven Application Guide
WMC2-XAGN-0003	Deepfat Fryer Application Guide
WMC2-XAGN-0004	Griddle Application Guide
WMC2-XAGN-0005	Timer Application Guide
WMC2-XAGN-0006	Shelf-Timer Application Guide
WMC2-XAGN-0007	Rotisserie Oven Application Guide

Watlow Controls

Watlow Controls is a division of Watlow Electric Mfg. Co., St. Louis, Missouri, a manufacturer of industrial electric heating products since 1922. Watlow begins with a full set of specifications and completes an industrial product that is manufactured totally in-house, in the U.S.A. Watlow products include electric heaters, sensors, controls and switching devices. The Winona operation has been designing solid state electronic control devices since 1962, and has earned the reputation as an excellent supplier to original equipment manufacturers. These OEMs depend upon Watlow Controls to provide compatibly engineered controls that they can incorporate into their products with confidence. Watlow Controls resides in a 100,000-square-foot marketing, engineering and manufacturing facility in Winona, Minnesota.

Technical Assistance

If you encounter a problem with your Watlow controller, refer to the Troubleshooting Chart in this guide. Also review all of your configuration information for each step of the setup to verify that your selections are consistent with your applications.

If the problem persists after checking all the steps, you can get technical assistance by calling Watlow Controls at (507) 454-5300, between 7 a.m. and 5 p.m. CST, and asking for an applications engineer. When you call have the following information on hand: the controller's part number, date code, serial number, software revision number, and application number. Much of this information is available on the controller case. All of this information is also available via the MINICHEF 2000 main display by accessing the WatHelp Diagnostics Function under d.AG in the Configuration Mode.

We Value Your Feedback

Your comments and suggestions on this manual are welcome. Please send them to, Technical Writer, Watlow Controls, 1241 Bundy Blvd., P.O. Box 5580, Winona, MN 55987-5580 or call (507) 454-5300 or fax (507) 452-4507.

Contact

- Phone: (507) 454-5300.
- Fax: (507) 452-4507.
- For technical support, ask for an Applications Engineer.
- To place an order, ask for Customer Service.
- To discuss a custom option, ask for the MINICHEF 2000 Product Manager.

Warranty

The MINICHEF 2000 is warranted to be free of defects in material and workmanship for 36 months after delivery to the first purchaser for use, providing that the unit has not been misapplied. Since Watlow has no control over its use, or misuse, we cannot guarantee against failure. Watlow's obligations hereunder, at Watlow's option, are limited to replacement or refund of purchase price of a unit which upon examination proves to be defective within the warranty period. This warranty does not apply to damage resulting from transportation, alteration, misuse, or abuse.

Returns

- Call or fax Customer Service for a Return Material Authorization (RMA) number before returning a control.
- Put the RMA number on the shipping label, and also on a description of the problem.
- 20% of net price restocking charge applies to all standard units returned to stock.

Note: All documentation of the MINICHEF 2000 is subject to change without notice.

Notes

Notes

Watlow Controls, 1241 Bundy Blvd., P.O. Box 5580, Winona, MN U.S.A. 55987-5580 Phone: (507) 454-5300, Fax: (507) 452-4507