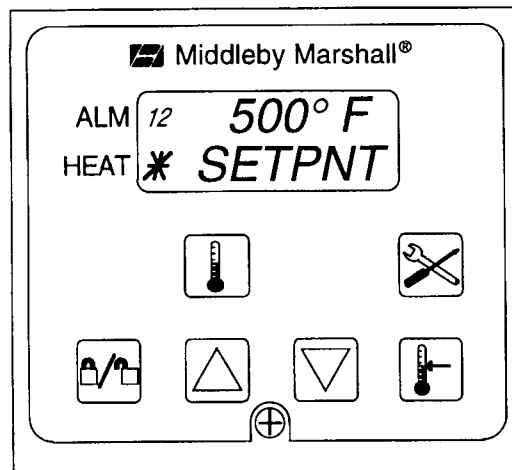


Digital Temperature Controller

(Service Kit P/N 37626)

Installation, Programming and Troubleshooting Instructions



THIS SERVICE KIT CONTAINS:

<i>Qty.</i>	<i>P/N</i>	<i>Description</i>
1	36021	Digital Temperature Controller
1	37624	Installation, Programming, and Troubleshooting Instructions, Digital Temperature Controller
1	37625	Operator's Instructions, Digital Temperature Controller

Middleby Marshall Inc. • 1400 Toastmaster Drive • Elgin, IL 60120 • (847) 741-3300 • FAX (847) 741-4406
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INSTALLATION INSTRUCTIONS

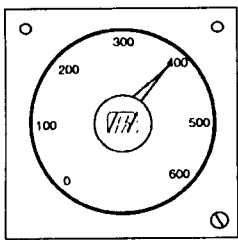
This manual provides instructions for the following conversions:

from:

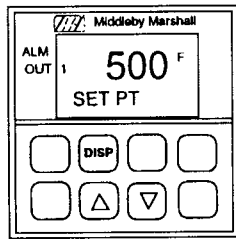
- A. Analog Temperature Controller, P/N 28071-0012 (no high limit or cooldown functions)
- A. Analog Temperature Controller, P/N 28071-0018 (with high limit and cooldown functions)
- B. Digital Temperature Controller, P/N 28071-0027 (blue plastic face)
- C. Digital Temperature Controller, P/N 28071-0028 (gray rubberized face, no symbols)
- D. Digital Temperature Controller, P/N 28071-0028 (gray rubberized face, with symbols)
- D. Digital Temperature Controller, P/N 30871 (gray rubberized face, set for "high voltage" - used for PS360WB70)

to:

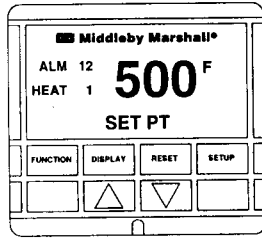
- E. Digital Temperature Controller, P/N 36021



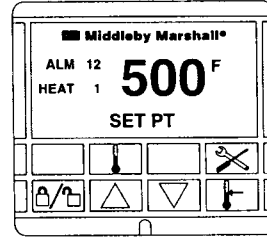
A



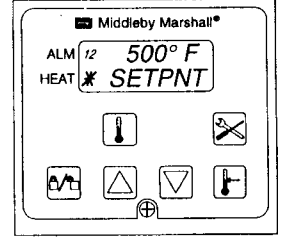
B



C



D



E

The installation process consists of:

- Disconnecting the existing wiring and removing the existing Temperature Controller.
- Mechanically installing the replacement Digital Temperature Controller.
- Making the appropriate electrical connections.

When the installation is completed, check the Digital Temperature Controller for the desired oven operation. Also, demonstrate the use of the Digital Temperature Controller for the owner (operator) and leave a copy of the Operating Instructions (P/N 34025).

NOTE

The Digital Temperature Controller, P/N 36021, is factory set to display the oven temperature in degrees Fahrenheit. To display the temperature in degrees Celsius, refer to the section on Programming.

Unpacking

The Digital Temperature Controller was checked before leaving the factory. Inspect the shipping container carefully for evidence of improper handling during shipment. In case of damage, make an immediate claim to the parts distributor from whom the unit was purchased. If the Digital Temperature Controller was shipped to you, notify the carrier without delay and file a claim.

MECHANICAL INSTALLATION

CAUTION

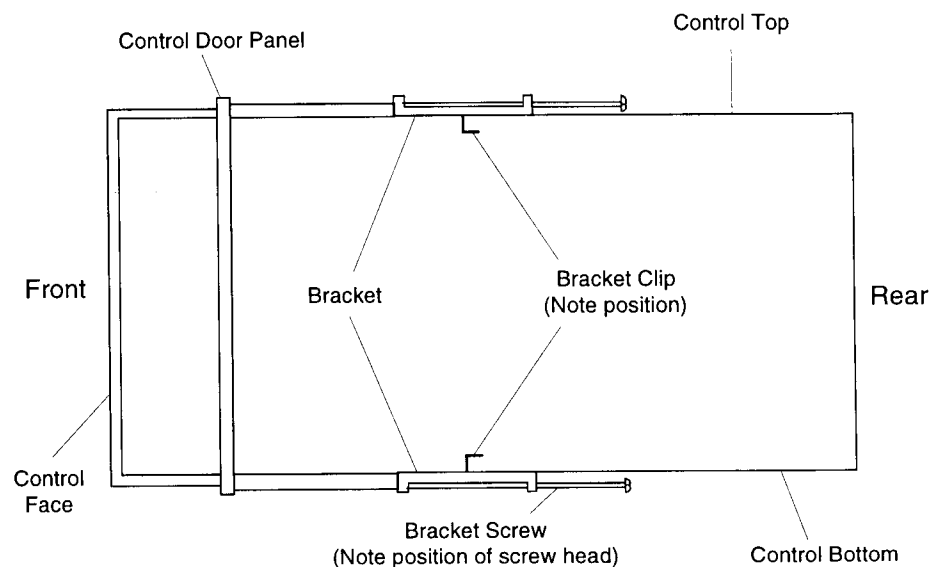
Before installing the Digital Temperature Controller, shut OFF all electrical power to the oven at the disconnect switch or circuit breaker.

To remove the existing Temperature Controller and install the new Digital Temperature Controller, proceed as follows:

Step Procedure

1. Disconnect all associated wiring from the terminals located on the rear of the Temperature Controller. Disconnect and retain any jumper wires.
 - If converting from an Analog Temperature Controller (P/N 28071-0012 or 28071-0018): Tag the ends of each controller wire with its terminal number. These old terminal numbers will be used later to match them with the new Digital control, as referenced in **Table 1**.
 - If converting from a Digital Temperature Controller (P/N 28071-0027, 28071-0028, 30871, or 36021): Replace wire-for-wire, because the terminal connections are exactly the same.
2.
 - If converting from an Analog Temperature Controller: Unscrew the two bracket screws, and remove the bracket securing the control to the oven. Slide the bracket away from the controller. Remove the controller by pulling it out through the front side of the panel.
 - If converting from a Digital Temperature Controller: Remove the two clip-style brackets on the top and bottom of the control. Remove the controller by pulling it out through the front side of the panel. See **Figure 1**.
3. Insert the Digital Temperature Controller into the panel slot that held the previous Temperature Controller, making sure that the face of the controller is upright with the display on top and the push buttons on the bottom.
4. Locate the two rectangular holes on the top and bottom of the control case. Attach the two panel mounting brackets with the clips of the brackets and the heads of the screws pointing towards the rear of the new controller into these rectangular holes. See Figure 1.
5. Tighten both screws evenly against the back side of the control panel until the controller seats securely.

Figure 1
Mounting Bracket Clip
and Screw Position
(Side View)



ELECTRICAL CONNECTIONS

All electrical connections on the Digital Temperature Controller are made on two terminal strips located on the rear of the unit.

Proceed as follows to make electrical connections:

- Use **Table 1** and **Figure 2** to identify the electrical connections. Refer to **Figures 3-8** for wiring information specific to the oven model.
- If converting from an ANALOG Temperature Controller:
Refer to the discontinued Analog Temperature Controller terminal numbers which are shown in brackets ([]) next to the matching Digital Controller terminal.
- If converting from a DIGITAL Temperature Controller:
Ignore the bracketed terminal numbers (which pertain to the Analog Controllers ONLY) and reconnect the wires to the same terminals as on the previous controller.

NOTE
All wires, including jumpers, will be reused from the existing temperature controller (either analog OR digital) with the new digital controller.

Table 1: Terminal Cross Reference




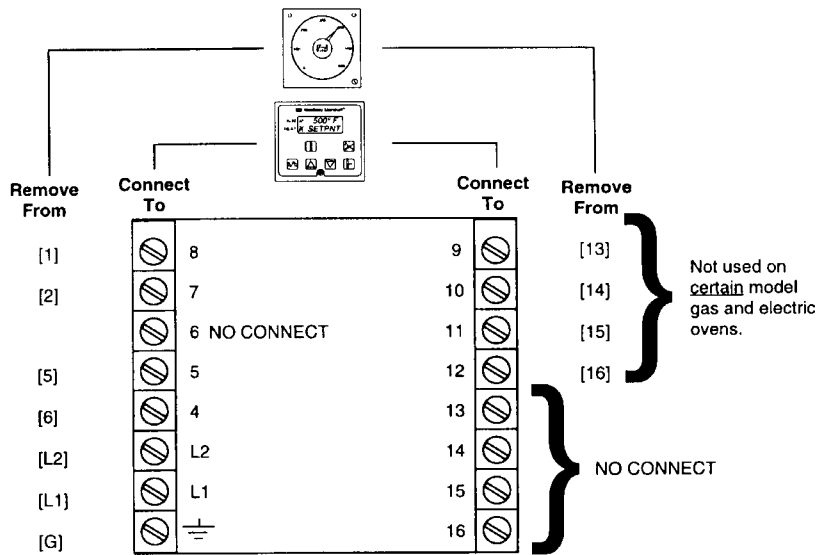
ANALOG CONTROLLER TERMINAL 	DESCRIPTION OF TERMINAL	DIGITAL CONTROLLER TERMINAL 
1	+ T/C	8
2	- T/C	7
5	Input to Temperature Control Relay	5
6	Output to High Flame Solenoid or Heater Contactors	4
L2	Neutral	L2
L1	Power	L1
G	Ground	
13	Input to Cool-Down Relay	9
14	Output from Cool-Down Relay	10
15	Input to High-Limit Relay	11
16	Output from High-Limit Relay	12

Figure 2: Back Side of Temperature Controller



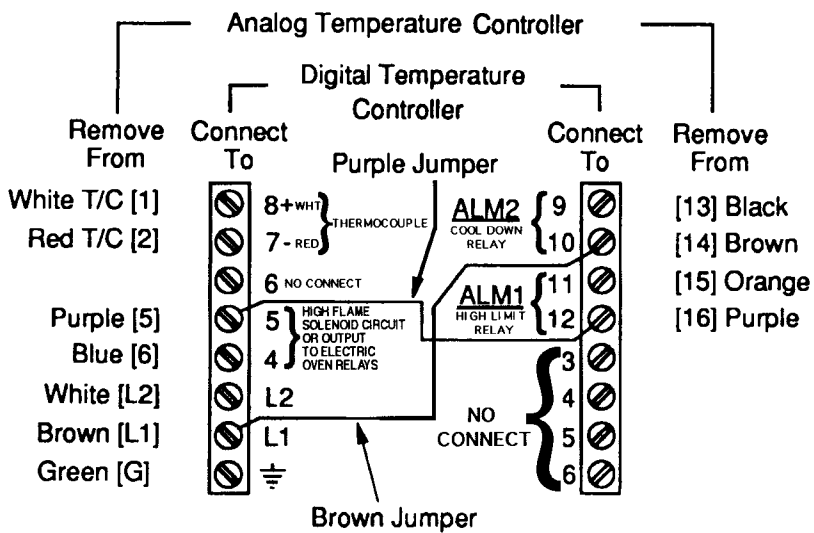


Figure 3

Wiring Diagram of Electrical Connections for:

• **PS200 Gas Oven:**

- 208-240V, 50/60Hz, 1 Ph, 3W
- 200V, 50/60Hz, 1 Ph, 2W (*Export*)
- 208V, 50/60Hz, 1 Ph, 2W (*Export*)
- 220-240V, 50/60Hz, 1Ph, 2W (*Export*)

• **PS310/314/360 Gas Oven:**

- 208-240V, 50/60Hz, 1 Ph, 3W
- 208-240V, 50/60Hz, 1 Ph, 2W (*Export*)
- 190-380V, 50/60Hz, 1 Ph, 2W (*Export*)

• **PS310/314/360 Electric Oven:**

- 480V, 50/60Hz, 3 Ph, 3W
- 380V, 50-60Hz, 3 Ph, 3W (*Export*)
- 400-440V, 50/60Hz, 3 Ph, 3W (*Export*)

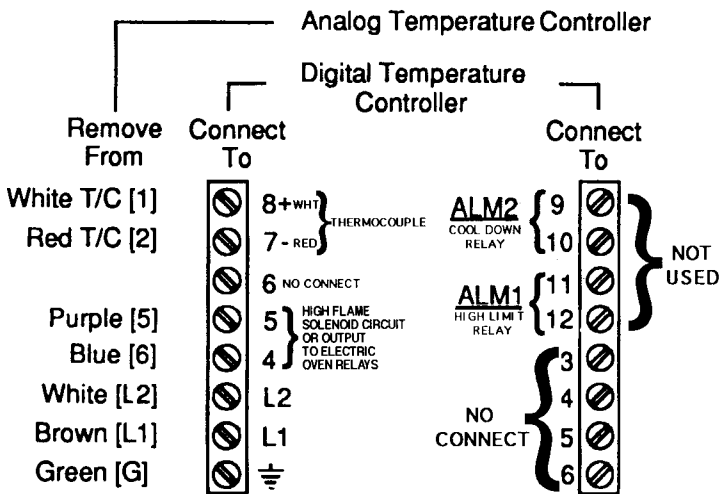


Figure 4

Wiring Diagram of Electrical Connections for ovens with BOTH the High Limit AND Cooldown features controlled by a separate board:

• **PS200 Electric Oven:**

- 208-240V, 50/60Hz, 3Ph, 4W
- 380V, 50/60Hz, 3Ph, 4W (*Export*)
- 400-416V, 50/60Hz, 3 Ph, 4W (*Export*)

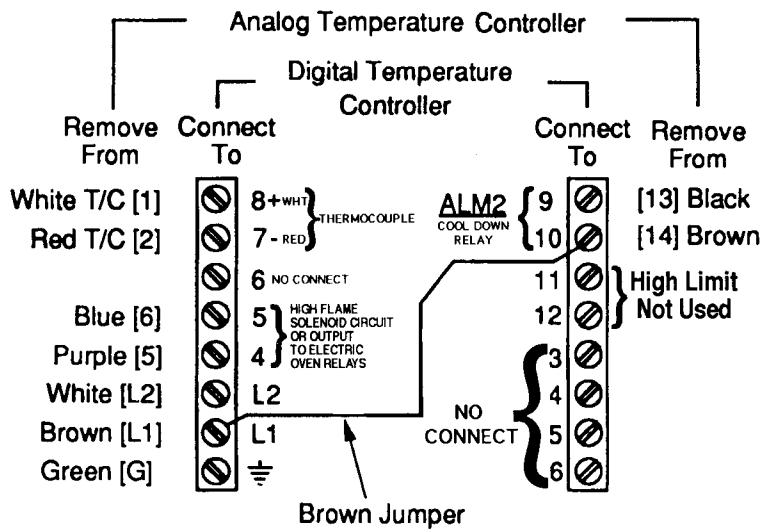


Figure 5

Wiring Diagram of Electrical Connections for ovens with ONLY the High Limit feature controlled by a separate board:

• **PS200 Electric Oven:**

- 208-240V, 50/60Hz, 3Ph, 4W
- 380V, 50/60Hz, 3Ph, 4W (*Export*)
- 400-416V, 50/60Hz, 3 Ph, 4W (*Export*)

• **PS570 Gas Oven, all units**

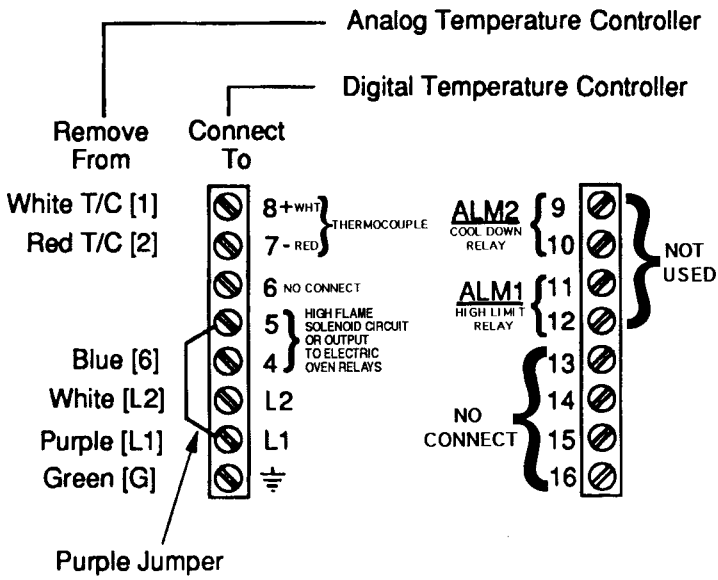


Figure 6

Wiring Diagram of Electrical Connections for:

- PS250 Gas and Electric Ovens with later-style Analog Temperature Controller (P/N 28071-0012)
- PS 300/304/350 Gas and Electric Ovens, all units
- PS310/314/360 Electric Oven:
 - 208-240V, 50/60Hz, 3 Ph, 4W
 - 240V, 50/60Hz, 3 Ph, 3W
 - 200-220V, 50/60Hz, 3 Ph, 3W (*Export*)

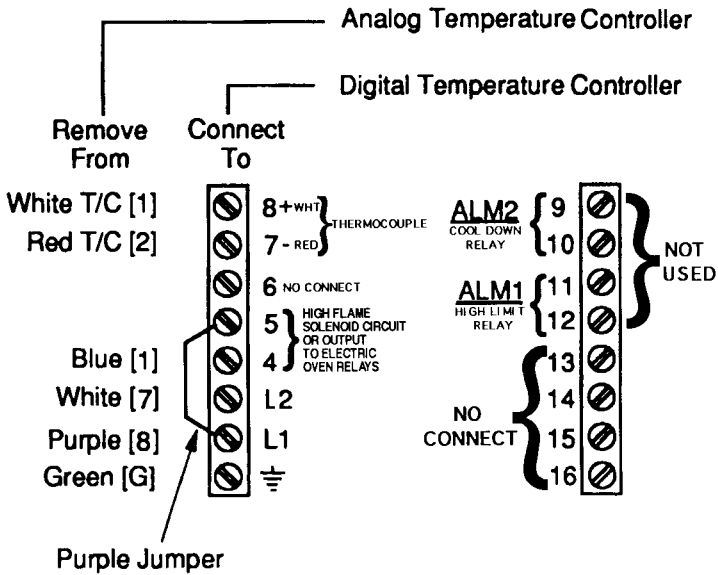


Figure 7

Wiring Diagram of Electrical Connections for:

- PS250 Gas and Electric Ovens with early-style Analog Temperature Controller (P/N 28071-0009)

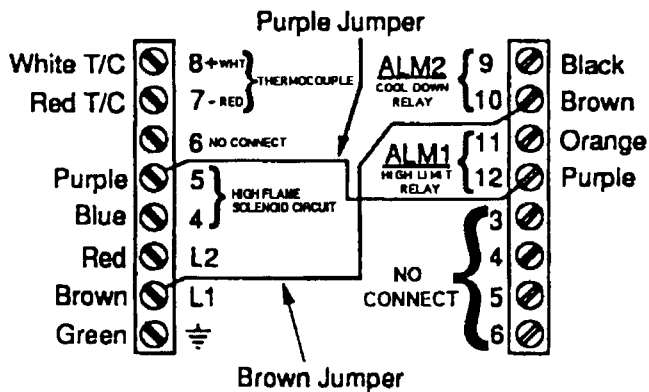


Figure 8

Wiring Diagram of Electrical Connections for:

- PS360WB70 Gas Ovens, all units

PROGRAMMING



After the Digital Temperature Control has been properly installed and wired, it is ready to be programmed as requested by the customer for set lock configuration, °F or °C operation, and display type. This function is to be done by the authorized service technician. See **Figure 9**, *Service's Instructions*, for details.

Once the Digital Temperature Control has been service programmed, it can be operator programmed for set point. See **Figure 10**, *Operator's Instructions*, for details.

Be sure to thoroughly go over the *Operator's Instructions* with the customer to be sure they are familiar with the operation of the new control. Leave the spare copy of the *Operator's Instructions* (P/N 37625) with the customer for their future reference. A copy is enclosed with the new temperature control.

Digital Temperature Controller Servicer's Instructions

Push the lock key and the service key together to reach *SETPNT LOCK* or *SETPNT UNLOCK*, then use the service key to step through the other functions listed below.

Use the   (arrow) keys as shown to change the function settings.

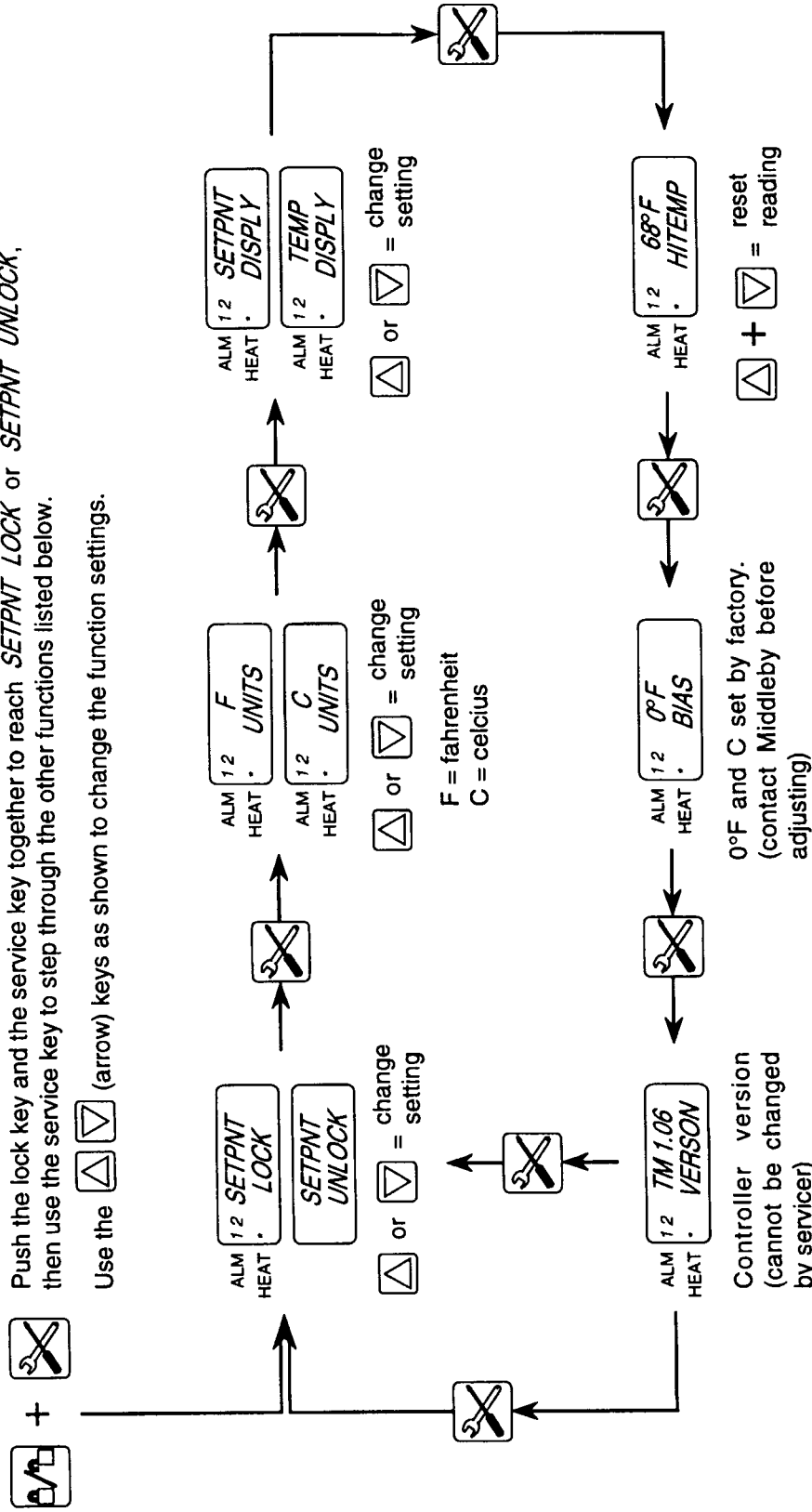


Figure 9
Servicer's Instructions

Digital Temperature Controller Operator's Instructions

ALARMS:

- 1 = high limit, on above 650° F
- 2 = cool down, on below 200° F

HEAT:

* (asterisk) = controller calling for heat, high flame on. Once the oven reaches temperature the * will cycle on and off.

DISPLAY KEY:

Use to switch between TEMP & SETPNT display. (SETPNT is the standard display.)

LOCK KEY:

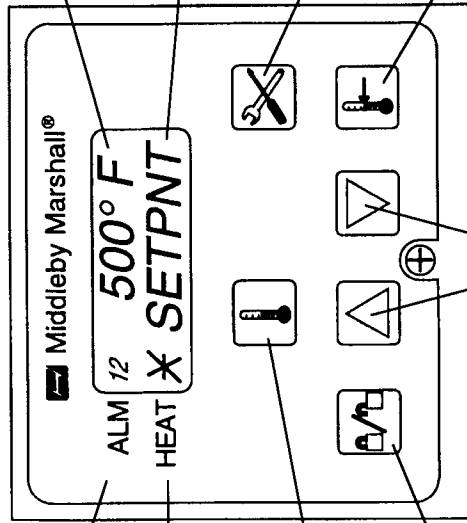
Used in conjunction with the SET POINT key to unlock SETPNT for 60 seconds.

UPPER DISPLAY:
Temperature displayed in degrees Fahrenheit or Celsius.

LOWER DISPLAY:
SETPNT = set point, temperature set by operator
TEMP = temperature, actual oven temperature

SERVICE KEY:
Service use only

SET POINT KEY:
Used in conjunction with LOCK KEY to unlock SETPNT for 60 seconds.



UP and DOWN arrow keys:
Used to change the set point.

If SETPNT will not change and lower display flashes see below:



Press LOCK & SET POINT keys simultaneously to unlock set point for 60 seconds.

Figure 10
Operator's Instructions

DIAGNOSTIC ERROR MESSAGES

The controller runs background tests during normal operation. If a problem with the background tests occurs, an error message is shown (flashing) in the display. In case of more than one simultaneous malfunction, only the error message with the highest priority appears in the display. These are called Diagnostic Error Messages, and are shown in **Table 2**.

Table 2 - Diagnostic Error Messages

<i>Display Message</i>	<i>Corrective Action</i>
<p>CHKSUM</p> <p>Controller's memory has become corrupted.</p>	<ol style="list-style-type: none"> 1. Press any button, or cycle the power to the controller, to load the default settings. 2. If error message continues, call the Factory for assistance.
<p>FAILSF</p> <p>Oven temperature has not reached at least 200°F (93°C) within 15 minutes of operation.</p> <p>GAS OVEN: Usually attributed to the burner not turned on, or the burner not lighting.</p> <p>ELECTRIC OVEN: Usually attributed to the heating elements not energizing, or not operating properly.</p>	<ol style="list-style-type: none"> 1. Turn Blower Switch OFF for 10 seconds, then turn Blower Switch ON. 2. Turn Heat Switch OFF for 10 seconds, then turn ON. 3. If problem does not clear, call the Factory for assistance.
<p>REVPRB</p> <p>Usually caused by a reverse-wired thermocouple.</p>	<ol style="list-style-type: none"> 1. Check the Thermocouple and Wiring. 2. If problem does not clear, call the Factory for assistance.
<p>OPNPRB</p> <p>Usually caused by an open in the thermocouple circuit.</p>	<ol style="list-style-type: none"> 1. Check that the Thermocouple is properly connected to terminals 7 and 8 of the temperature controller. 2. If the connections are correct, check the continuity of the thermocouple at room temperature. The resistance reading should be from 9-20Ω. <ul style="list-style-type: none"> • If the thermocouple reads as open, replace it. • If the continuity is correct, call the Factory for assistance.

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