

# **TC-200 Two Channel Temperature Control**

Part 108 229A



NORDSON CORPORATION • AMHERST, OHIO • USA

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## Section 1

### Safety Summary

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#### 1.1. Introduction

This section provides safety guidelines for use of Nordson® equipment. These guidelines apply to all operations and service personnel working with the application equipment and its components. Safety warnings are repeated throughout this manual, along with specific warnings and cautions not included in this section. These safety guidelines cover installation, operation and servicing.



**Warning:** Failure to follow these recommendations can result in personal injury from burns or electrocution and/or cause equipment and property damage.

#### 1.2. Explanation of Terms and Symbols

The following safety symbols and signal words are used throughout this publication, alerting the reader to personal safety hazards, or identifying conditions that can result in equipment or property damage.



**Warning:** General Warning. Failure to observe can result in personal injury or death.



**Warning:** Risk of electrical shock. Failure to observe can result in personal injury or death.



**Caution:** General Caution. Failure to observe can result in minor personal injury or damage to property.

**Note:** Important information. Failure to observe can result in equipment damage.

#### 1.3. Safety During Installation

##### 1.3.1. Electrical

- a. A protective electrical ground connection to a reliable earth ground is essential for safe operation. Without a reliable ground, all accessible conductive components (including knobs and controls that appear insulated) can render an electric shock.
- b. A disconnect switch with lockout capability must be provided between the power source and the equipment.
- c. The power supply's wire gauge and insulation must be sufficient to meet application equipment temperature and power requirements.
- d. Only fuses of the correct type, voltage rating and current rating should be used. Refer to the application equipment parts list for fuse recommendations. Using incorrect or non-recommended fuses can present a fire hazard.

##### 1.3.2. Pneumatic

It is recommended that a three-way, manual valve with lockout capability, be installed in the air supply line to Nordson equipment. This valve makes it possible to relieve air pressure and lock out the pneumatic system before undertaking maintenance or repairs.

#### 1.4. Safety During Operation

**Do Not** operate Nordson application equipment under the following conditions:

- a. At pressures higher than the rated maximum working pressure of any system component.
- b. Near volatile or otherwise explosive gases or materials.

#### 1.4. Safety During Operation (Continued)

- c. Without equipment covers, panels and safety guards properly installed.
  - d. At atmospheric temperatures below 20° F (-6° C) or above 120° F (50° C).
  - e. With hoses enclosed in any material impeding heat dissipation, including electrical conduit, insulation of any type or tight metal covers.
  - f. With large areas of hose contacting a cold floor, cold supports or other such surfaces. Cold points along the hose restrict the flow of adhesive inside the hose and can create potential problems during operation.
  - g. In drafty areas with the applicator guns unshielded from the draft. Rapid heat dissipation due to air movement across the guns can cause operational problems.
  - h. If applicator handguns are used, with the handguns left unlocked while the guns are unattended.
- In addition:
- i. Use only the metal base when attempting to lift or move an applicator. **Do Not** use equipment covers, doors, panels or hose connectors as braces or grips.
  - j. **Never** use application equipment as a ladder or stepping stool.
  - k. Route all hoses such that damage from kinking, abrasion and other physical damage is prevented. **Do Not** allow a hose to be installed with a bend radius of less than 6 in. (15.2 cm).
  - l. **Never** point an applicator handgun at yourself or anyone else.

#### 1.5. Safety During Servicing

- a. **Do Not** perform internal service or adjustment on any equipment unless another person

capable of rendering first aid and resuscitation is present.

- b. Only qualified personnel should service the application equipment.
- c. Avoid personal injury by never touching exposed connections and components while electrical power is on. Dangerous voltages exist at several points in the equipment.
- d. Disconnect, lock out and tag external electrical power before removing protective panels or replacing electrical components.
- e. Remove all jewelry (rings, watches, etc.) before servicing equipment.
- f. If possible, stand on a rubber mat when servicing applicator equipment or its components. **Do Not** work on equipment if standing water is present. Avoid working in a high-humidity atmosphere. Cover exposed terminals and work areas with rubber sheeting to avoid accidental contact while the electrical power is on.
- g. Always wear safety goggles (ANSI Z87.1-1989 or equal), protective gloves (Nordson P/N 902 514 or equivalent), and long-sleeve protective clothing to prevent injury from hot applicator parts, splashed hot melt adhesive and hot gun surfaces.
- h. To prevent serious injury from molten adhesive under pressure, always relieve system hydraulic pressure (by triggering the gun, for example) before opening any hydraulic fitting or connection.
- i. **Never** use an open torch, drill, or broach when cleaning a nozzle.
- j. **Never** operate equipment with a known system leak.



## 1.6. Safety When Using Hot Melt Adhesives and Solvents

### 1.6.1. Hot Melt Adhesives

Use extreme care when working with molten hot melt adhesives. Molten hot melt adhesives solidify rapidly at high temperatures, presenting a hazard. Severe burns can occur if the molten materials come in contact with the skin. Even when first solidified, they are still hot.

a. Always wear protective clothing and eye protection when handling molten material or working near equipment containing hot melt adhesives under pressure.

#### b. If molten material comes in contact with the skin:

- **Do Not** try to remove molten material from the skin.
- Immediately immerse the affected area in cold, clean water. Keep the affected areas immersed until the material has cooled.
- **Do Not** try to remove the cooled material from the skin.
- Cover the affected area with a clean, wet compress.
- In cases of severe burns, look for signs of shock. If shock is suspected, have the patient lie down, use a blanket to preserve body heat and elevate the feet several inches.
- Call a physician immediately.

### 1.6.2. Heating Solvents

a. **Do Not** use an open flame or uncontrolled heating device to heat solvents (for example, a small pan on an unregulated hot plate).

b. Avoid fire hazard by using a controlled heating device to heat solvents (for example, a small deep fat fryer or thermostatically-controlled hot plate).

c. **Do Not use paint-type solvents under any circumstances!** These solvents are

volatile, presenting fire and/or toxic-vapor hazards, even at room temperature.

d. Always be sure the work area is adequately ventilated. Avoid prolonged or repeated breathing of solvent vapors.

e. **Never** clean any aluminum component or flush any system using halogenated hydrocarbon solvents. Halogenated hydrocarbon solvents are dangerous when used to clean aluminum components in a pressurized fluid system. No available stabilizers prevent halogenated hydrocarbon solvents from reacting under all conditions with the applicator's aluminum components. Use Type R (P/N 270 755) solvents or contact your solvent or hot melt supplier for a non-halogenated hydrocarbon solvent for cleaning and flushing.

Halogenated fluids include the following solvents:

#### Fluorinated Solvents:

- Dichlorofluoromethane
- Trichlorofluoromethane

#### Chlorinated Solvents:

- Carbon Tetrachloride
- Chloroform
- Dichloromethane
- Ethylene Dichloride
- Methylene Chloride
- Monochlorobenzene
- Monochlorotoluene
- Orthodichlorobenzene
- Perchloroethylene
- Trichloroethylene

#### Brominated Solvents:

- Ethylene Dibromide
- Methyl Bromide
- Methylene Chlorobromide

### **1.6. Safety When Using Hot Melt Adhesives and Solvents (Continued)**

Iodinated Solvents:

- Ethyl Iodide
- Methyl Iodide
- N-butyl Iodide
- Propyl Iodide

## Section 2

### Equipment Familiarization

#### 2.1. Introduction

The Nordson® TC-200 Two Channel Temperature Control (TC-200) provides complete temperature control for Nordson RTD-style hoses and guns. This PI-type control provides two control loops, one for the hose and one for the gun.

Other advanced features include:

- Digital temperature display
- Digital temperature setpoint
- Supervisor keypad lockout
- Safety overtemperature protection
- Adjustable overtemperature setpoint
- Remote fault relay
- Remote unit ready signal
- Temperature standby
- Temperature sleep

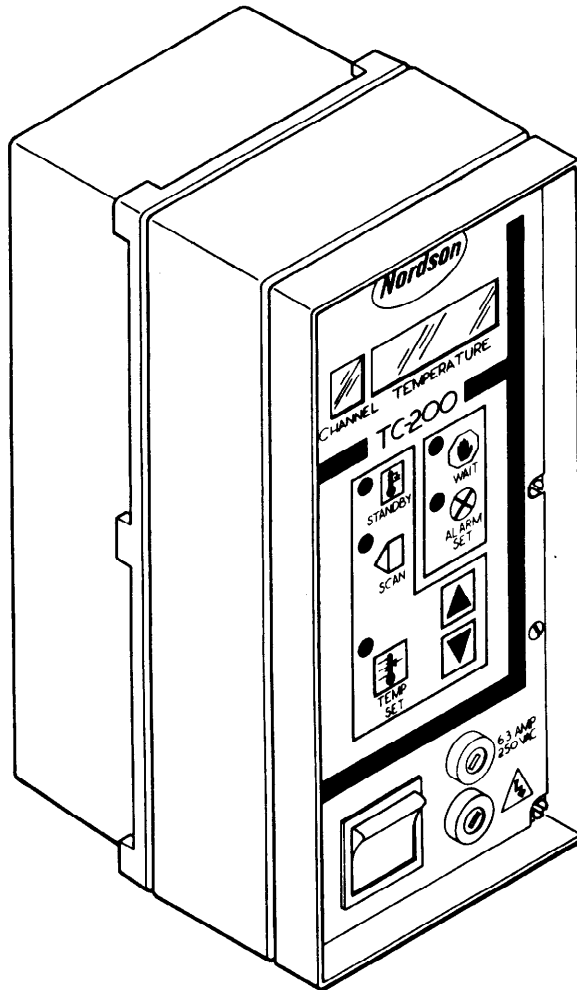


Figure 2.1 - TC-200 Two Channel Temperature Control

## 2.2. TC-200 Modes

### 2.2.1. Operating Modes

The three operating modes are Run, Standby, and Sleep.

Run Mode - The channels are connected and operating within the selected temperature setpoints.

Standby Mode - The TC-200 reduces the temperature of the heating channels to the standby temperature setpoint. This maintains the material well below application temperature, but above its melting point. Holding the material at standby temperature reduces charring and degrading during temporary interruptions to system operation. When Standby mode is exited, the system returns to the original temperature setpoints.

Sleep Mode - This mode enables remote turn off of power to the heating channels. Hot melt material can then cool to room temperature.

### 2.2.2. Display Modes

There are four display modes:

- Scan
- Hold
- Setpoint
- Alarm

Scan - This is the display mode that the TC-200 is in at start up. The unit continuously scans through the channels. The display sequentially shows each channel and its actual temperature.

Hold - The display shows one channel and the actual temperature of that channel. By pressing then releasing the up or down switches, the user can display the other channel.

Setpoint - There are three setpoints which can be displayed.

- Temperature Setpoint - Press and hold the Temperature Set switch. The display shows one channel and its setpoint if Hold display

mode is on. If Scan display mode is on, the display sequentially shows each channel and the setpoint temperature of the heater. This sequential display continues as long as the unit is in Scan display mode.

- Standby Setpoint - Press and hold the Standby switch until the Standby Active LED comes on. Press and hold the Temperature Set switch. The display shows the Standby setpoint.
- Alarm Setpoint - Press and hold the Alarm switch. The display shows the Alarm setpoint.

Alarm - The display shows the channel with the alarm condition, plus one of the error messages: "E--o", "E-ro", or "E-rS".

## 2.3. User Interface

### 2.3.1. Display

The display consists of five 7-segment LEDs (Figure 2.2). The display can show temperatures in Fahrenheit or Celsius. The default display is Fahrenheit. Celsius temperature will show if a shunt jumper is connected to SW7 on the printed circuit board. Refer to paragraph 3.5.1. in Section 3 for installation details.

### 2.3.2. LEDs

There are five LEDs.

Standby - The LED is on when the user selects the Standby mode and is setting the standby temperature. The LED is off when the TC-200 is in the run mode.

Scan Mode Active - The LED is on when the display is scanning through the channels. The LED is off when the display is in the Hold mode (showing information for only one channel).

Set Temperature - This LED is on when the user is changing or viewing the channel setpoint. The LED is off when the TC-200 is in the run mode.

Wait - This LED is on at start up or during Standby mode until all channels reach the temperature band (+/- 10° F from the setpoint).

**2.3. User Interface (Continued)**

**Alarm** - The LED is on when any of the following four conditions occurs:

- A channel's actual temperature is greater than the alarm temperature setpoint.
- There is an open RTD sensor for any channel.
- There is a shorted RTD sensor for any channel.

- While viewing or setting Alarm temperature setpoint.

**2.3.3. Operator Panel**

There are six switches on the operator panel.

**Standby Switch** - Pressing and releasing this switch turns Standby mode on or off.

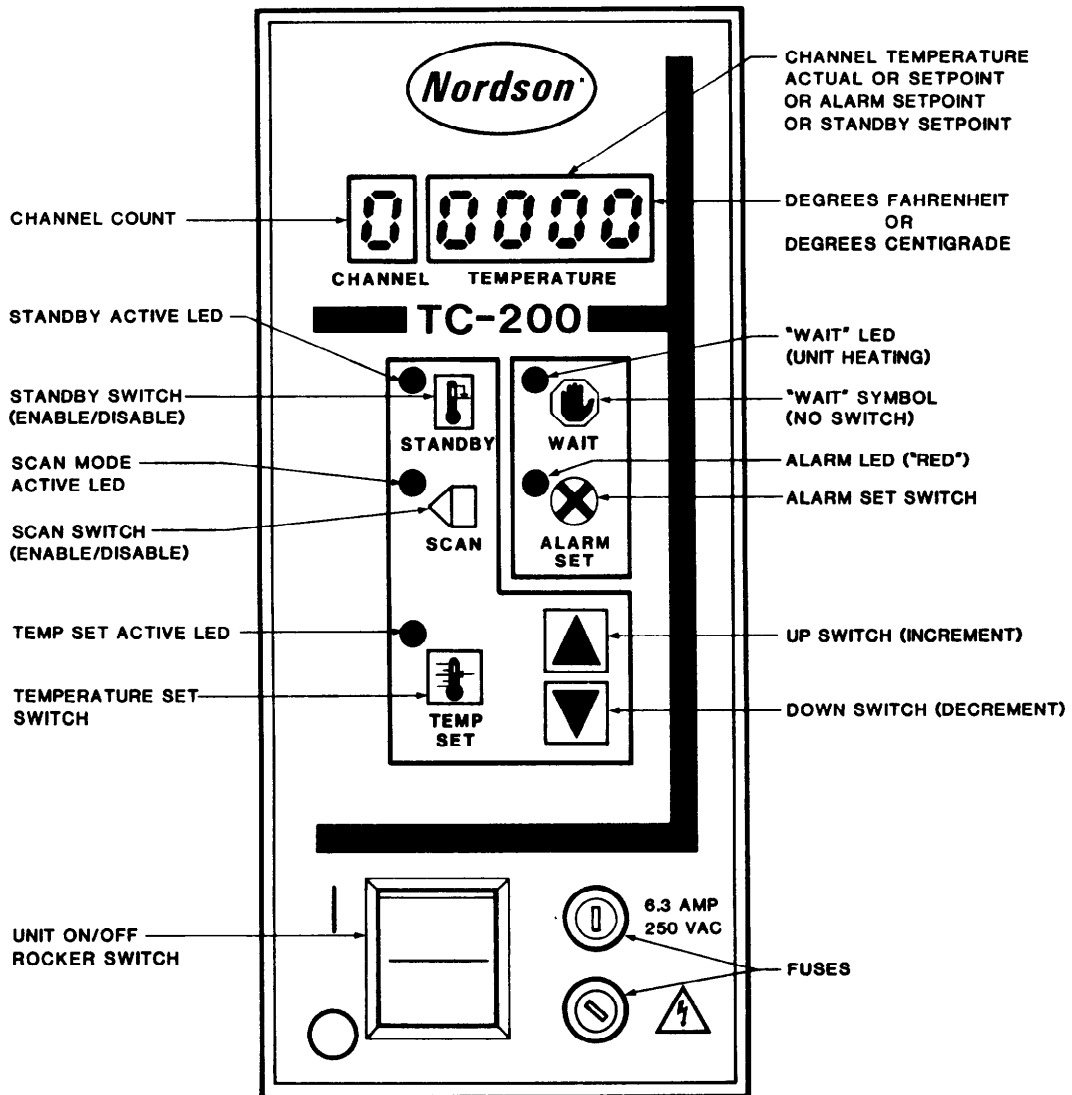


Figure 2.2 - TC-200 User Interface

### 2.3. User Interface (Continued)

Scan Switch - Pressing and releasing this switch selects either the Hold display mode (Scan Active LED off) or the Scan display mode (Scan Active LED on).

Temperature Set Switch - Pressing and holding this switch displays the channel temperature setpoint, and lets a user change values with the Up and Down switches.

Alarm Set Switch - Pressing and holding this switch displays the channel overtemperature value, and lets the user change values with the Up and Down switches.

Up Switch - This switch changes the channel number shown in Hold mode to the next higher channel number. The switch also increases temperature setpoint values.

Down Switch - This switch changes the channel number shown in Hold mode to the next lower

channel number. The switch also decreases temperature setpoint values.

**Note:** Pressing and releasing either the Up or Down switch increases or decreases the temperature value by one. Pressing and holding either switch changes the value slowly for the first five degrees. Then the value rapidly increases or decreases until the user releases the Up or Down switch.

### 2.4. Supervisor Lockout

The TC-200 comes with the keypad ready to accept input to change the Setpoint, Alarm, and/or Standby temperatures. Enabling Supervisor Lockout prevents the TC-200 from accepting keypad changes to the setpoints. The lockout consists of a shunt jumper connected to SW8 on the printed circuit board. Refer to paragraph 3.5.2. in Section 3 for installation details.

## Section 3 Installation

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### 3.1. Introduction

This section includes:

- Procedures for inspecting the TC-200
- Safety precautions
- Instructions for opening the unit in order to make electrical connections
- Instructions for installing shunt jumpers for Celsius temperature display and Supervisor Lockout

### 3.2. Inspection

After unpacking the TC-200, inspect it for dents, scratches, corrosion, or other physical damage. In case of damage, contact your Nordson sales representative before installing the TC-200.

### 3.3. Safety Precautions

**Note:** It is urgent that personnel installing this equipment first refer to the applicator technical manual. The manual provides important safety, operation, and troubleshooting information used with procedures presented in this manual.



**Warning:** Even when switched off, the TC-200 and the applicator contain energized components with electrical potentials that can cause death. Disconnect and lock out the input power line to the TC-200 and the applicator before opening the unit. Also, avoid touching any energized components in the TC-200 or the applicator.

### 3.4. Opening the TC-200

a. Push the unit on/off rocker switch to the off position.



**Warning:** Even when switched off, the TC-200 and the applicator contain energized components with electrical potentials that can cause death. Disconnect and lock out the input power line to the TC-200 and the applicator before opening the unit. Also, avoid touching any

energized components in the TC-200 or the applicator.



**Warning:** Removing the wrong screws from the unit can result in printed circuit board damage during reassembly. Remove only the six screws specified below.

b. Loosen and remove the six screws shown in Figure 3.1.

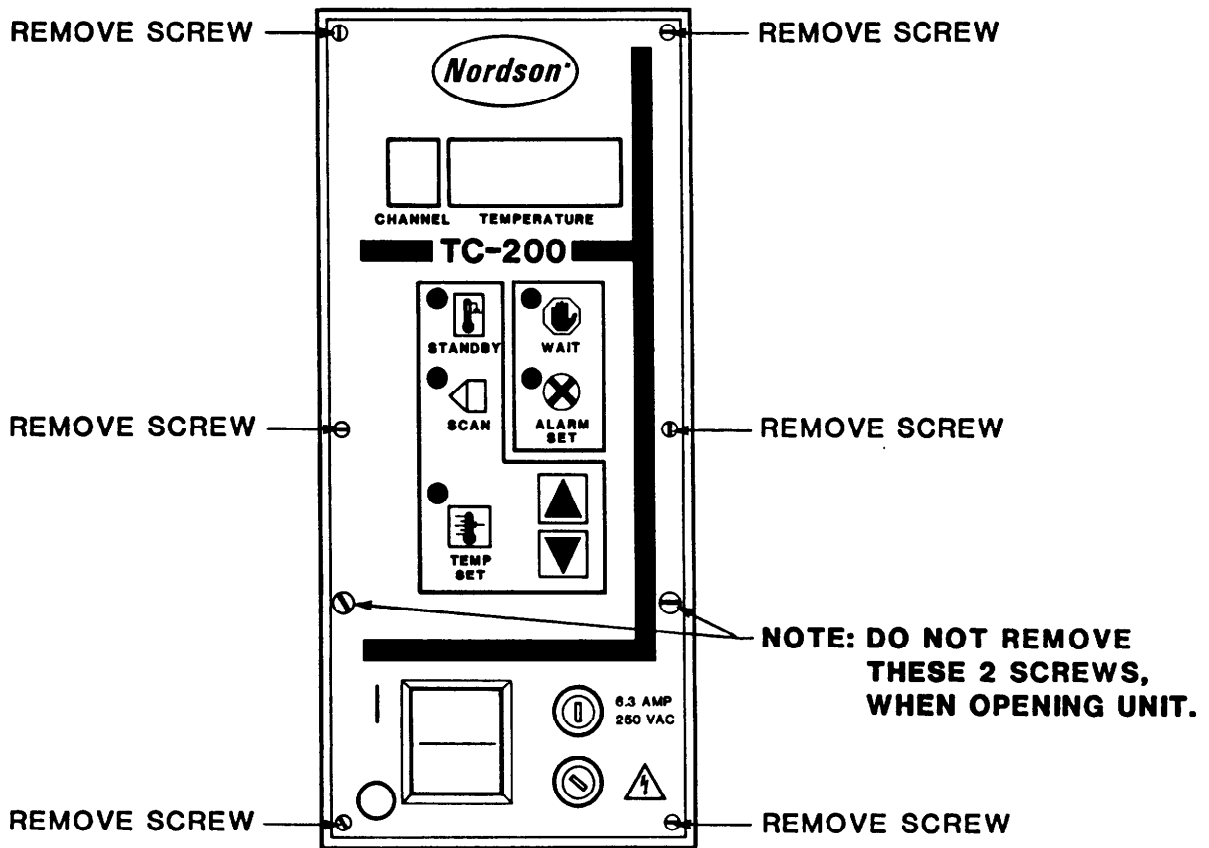


Figure 3.1 - Removing Screws to Open the TC-200



**3.4 Opening the TC-200 (Continued)**

- c. Hold the bottom half of the unit with one hand.
- d. Slightly lift the top half of the unit with the other hand. Then, open it as if opening a book (Figure 3.2, Detail A).
- e. Unplug connector J2 from the printed circuit board (Figure 3.2, Detail A).
- f. Place the top half of the unit face down on a flat, clean surface (Figure 3.2, Detail B).

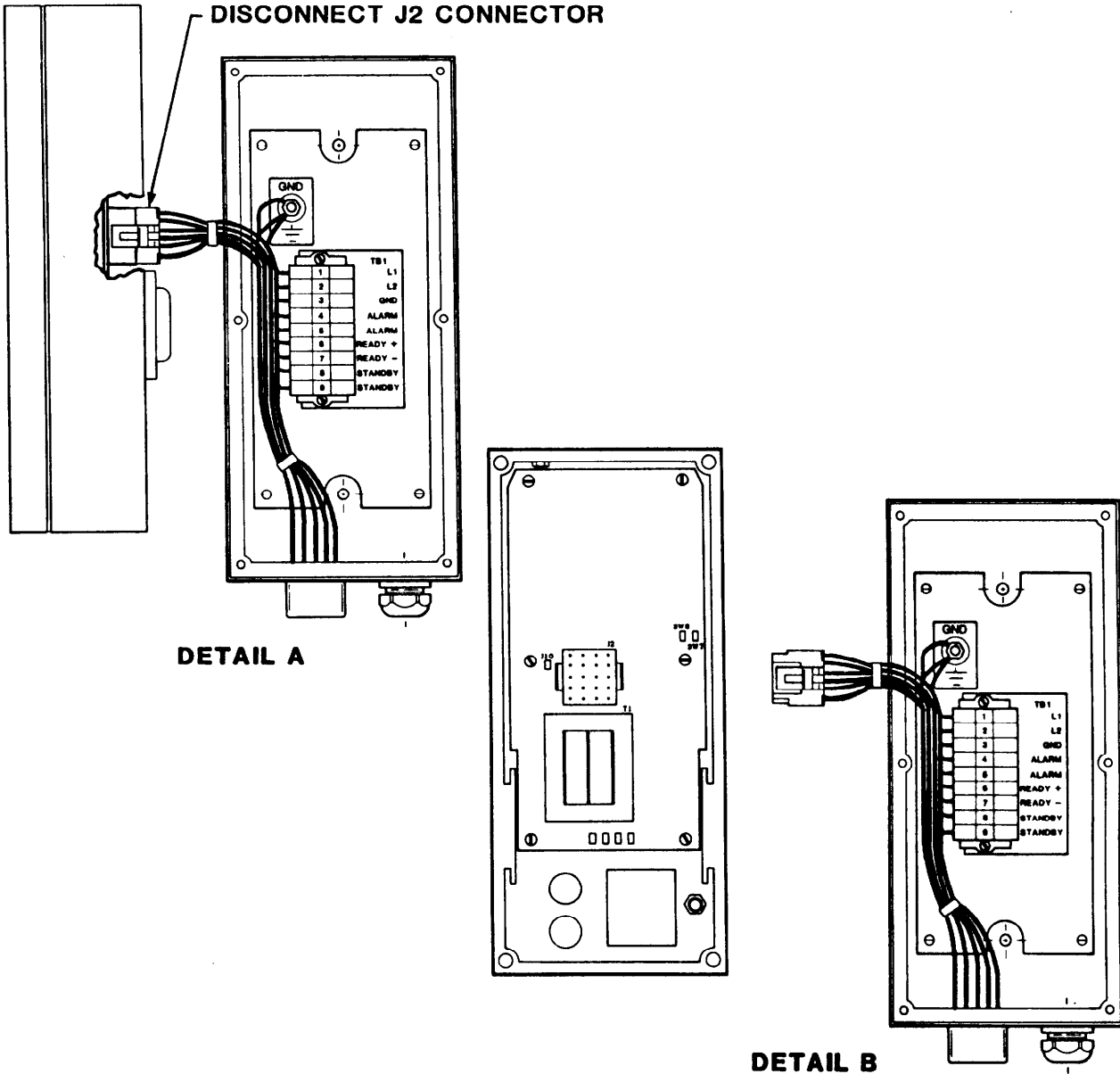


Figure 3.2 - Opening the TC-200

### 3.4 Opening the TC-200 (Continued)

g. Make the needed electrical connections to the terminal block located in the back half of the unit (Figure 3.3).

h. Reverse the previous steps to reassemble the unit.

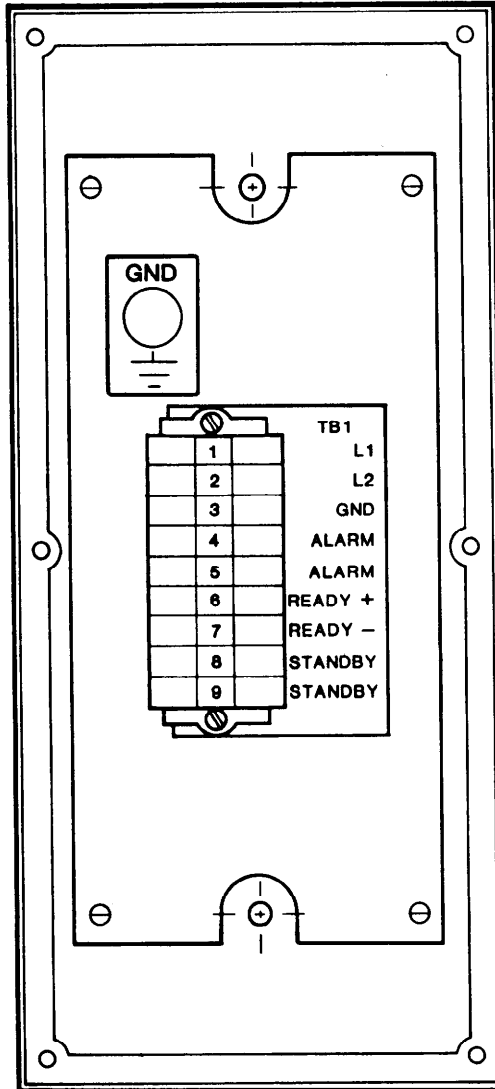


Figure 3.3 - TC-200 Terminal Block Installation

### 3.5. Installing Shunt Jumpers

#### 3.5.1. Celsius Temperature Display

The display will show Celsius temperature if a shunt jumper is connected to SW7 on the printed circuit board.

The shunt jumper comes in the TC-200 mounting hardware package. Figure 3.4 shows the location of SW7 and how to install the jumper.

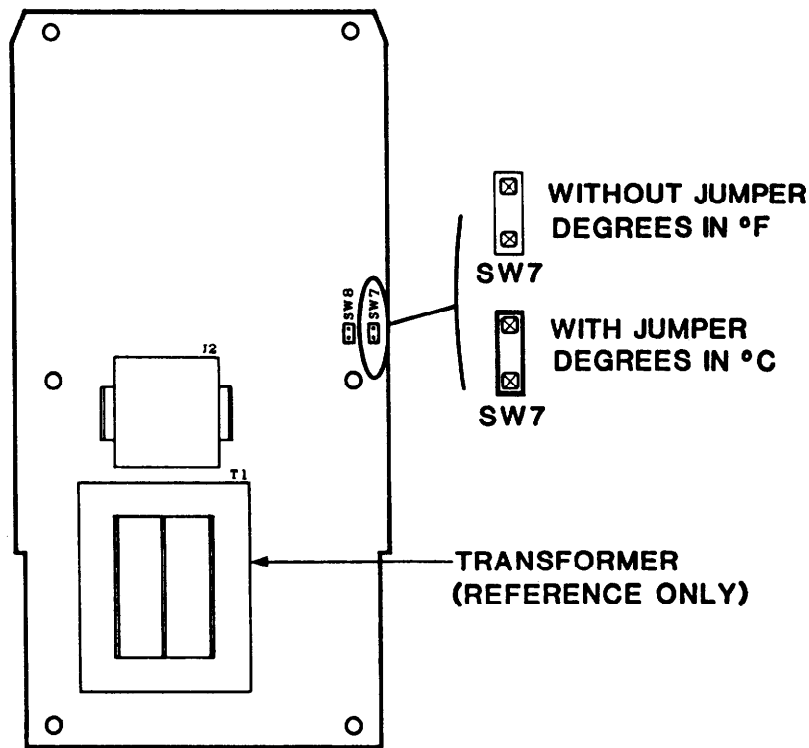


Figure 3.4 - Temperature Display Shunt Jumper Installation

### 3.5. Installing Shunt Jumpers (Continued)

#### 3.5.2. Supervisor Lockout

Enabling Supervisor Lockout still allows the user to view the Temperature, Alarm, and/or Standby setpoints. However, Supervisor Lockout prevents the TC-200 from accepting keypad

changes to the setpoints. Supervisor Lockout is enabled by installing a shunt jumper on SW8 on the printed circuit board.

The shunt jumper comes in the TC-200 mounting hardware package. Figure 3.5 shows the location of SW8 and how to install the jumper.

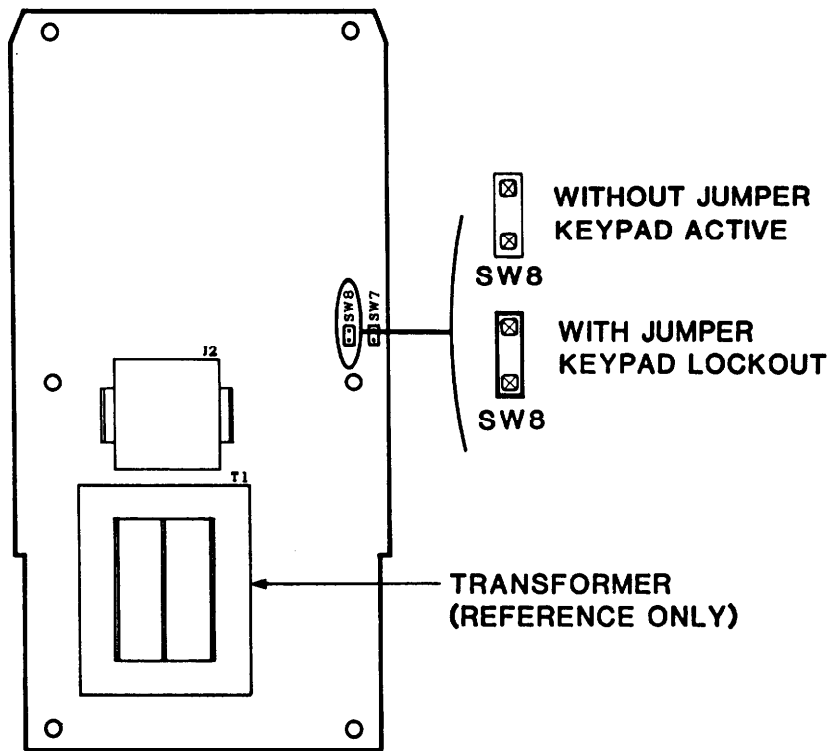


Figure 3.5 - Supervisor Lockout Shunt Jumper Installation

## Section 4 Operating Instructions

### 4.1. Start Up

Press the unit On/Off rocker switch (Figure 4.1) to the on position.

The TC-200 starts up in the Scan display mode. The Wait LED is on. Scan display sequentially shows each channel number and the low temperature indication (see Figure 4.1). The low temperature indication remains on until the channel RTDs reach 150° F (66° C). Then, the display will show the channel number and the actual channel temperature. The temperature value will increase until the channel heaters reach setpoint. The Wait LED will turn off when all channels reach their setpoint band (within +/- 10° F of their respective temperature setpoints).

### 4.2. Setting Temperature Values

Table 4.1 lists the factory default values initially stored in the TC-200.

**Table 4.1 - Factory Default Temperature Values**

Standby Temperature (applies to all channels)	155° F (68° C)
Overtemperature (applies to all channels)	405° F (207° C)
Setpoint Temperature (selectable for each channel)	300° F (149° C)

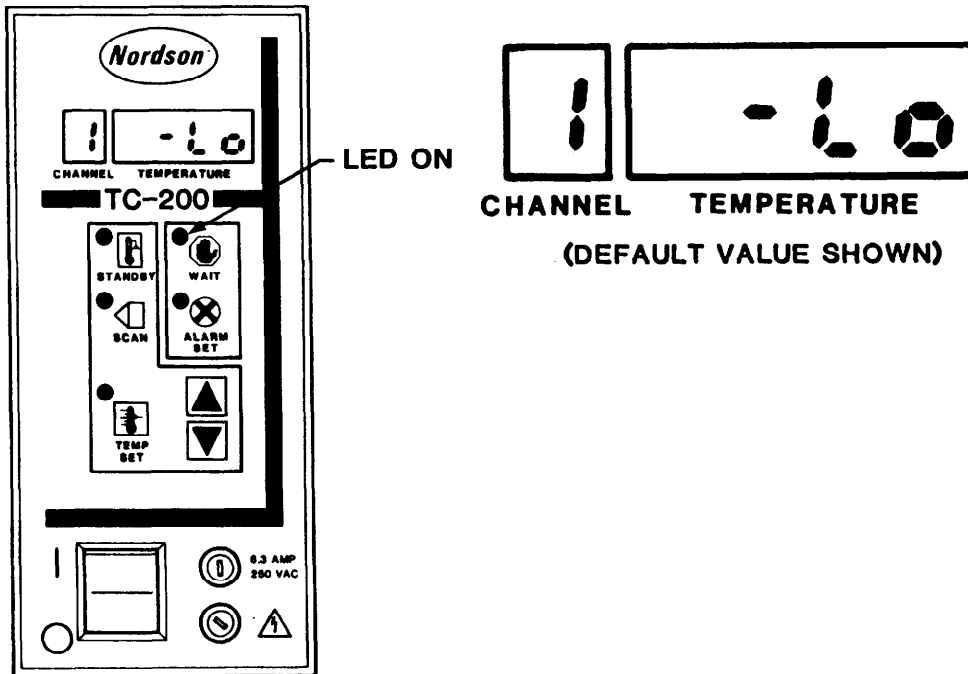


Figure 4.1 - Start Up Display

## 4.2. Setting Temperature Values (Continued)

### 4.2.1. Setting the Standby Temperature

**Note:** The same Standby temperature setting applies to all channels. Also, the Standby temperature cannot equal or exceed the lowest channel setpoint value. The TC-200 software automatically stops increasing the standby value when it is one degree less than the lowest channel setpoint value.

- a. Press and hold the Standby switch until the Standby Active LED comes on (Figure 4.2).
- b. Press and hold the Temp Set switch. The Temp Set LED comes on. The display shows the current standby temperature (Figure 4.2).

**Note:** To leave the current value unchanged, release the Temp Set switch.

- c. Press the Up switch to increase the value or the Down switch to decrease the value.
- d. Release the Temp Set switch when the display shows the desired temperature. The Set Temperature LED will go off.
- e. Press and hold the Standby switch until the Standby Active LED goes off.

### 4.2.2. Setting Sleep Mode

Set the Standby temperature (refer to paragraph 4.2.1., above) to 151° F or less (66° C). When the Standby switch is pressed or the Standby mode is remotely enabled, the system will enter the Sleep mode.

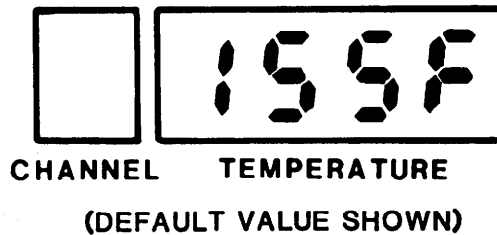
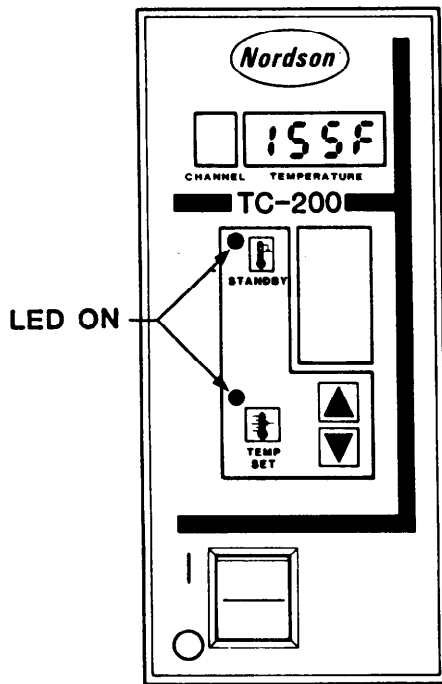


Figure 4.2 - Setting Standby Temperature

## 4.2. Setting Temperature Values (Continued)

### 4.2.3. Setting the Overtemperature Value

**Note:** The same overtemperature setting applies to all channels. The overtemperature value cannot be lower than the highest channel setpoint value plus 5° F. The TC-200 software automatically stops decreasing the overtemperature value when it is 5° F higher than the highest channel setpoint value.

- a. Press and hold the Alarm Set switch (Figure 4.3).
- b. Press the Up switch or the Down switch until the display shows the desired overtemperature setpoint.
- c. Release the Alarm Set switch.

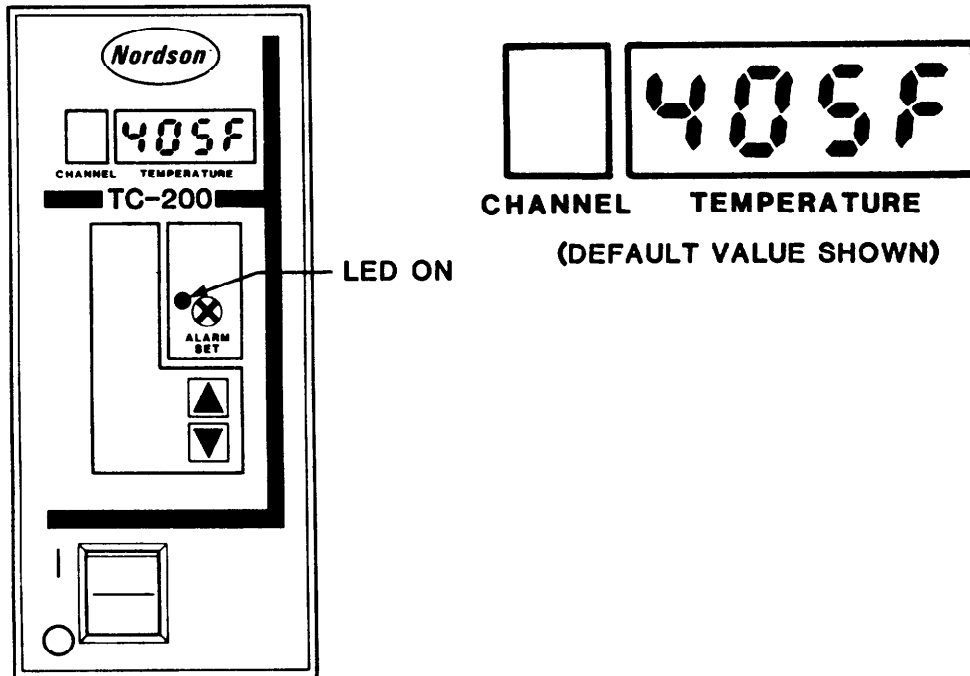


Figure 4.3 - Setting the Overtemperature Value

## 4.2. Setting Temperature Values (Continued)

### 4.2.4. Setting Setpoint Temperatures

**Note:** A setpoint temperature must be set for each channel. The setpoint temperature for each channel must be between the Standby and Overtemperature values. To select a setpoint temperature that is lower than the current Standby temperature, or higher than the current Overtemperature value, first adjust those values accordingly.

a. Press and release the Scan switch (Figure 4.4) until the Scan Mode Active LED is off.

b. Press and release the Up switch or the Down switch until the display shows the desired channel number.

c. Press and hold the Temp Set switch (Figure 4.4). The display shows the current setpoint temperature.

**Note:** To leave the current value unchanged, release the Temp Set switch.

d. Press the Up switch to increase the value or the Down switch to decrease the value.

e. Release the Temp Set switch when the display shows the desired temperature value.

**Note:** The maximum temperature setpoint is 400° F.

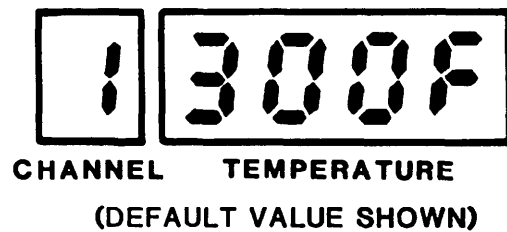
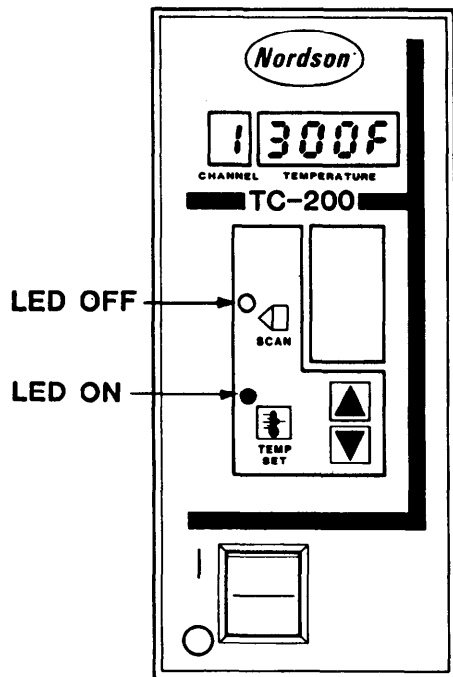


Figure 4.4 - Setting Setpoint Temperatures



### 4.3. Placing the TC-200 in the Standby Mode

a. Press and hold the Standby switch until the Standby Active LED comes on.

The Wait LED comes on. The display will appear as shown in Figure 4.5. The TC-200 cycles power off until the hot melt material reaches Standby temperature. Then, it cycles power on and off to keep the material at Standby temperature.

b. To exit the Standby mode and return to the Run mode, press and hold the Standby switch until the Standby Active LED goes off.

The display will show the channel and its actual temperature. The Wait LED will stay on until all channel temperatures are within their set-point band ( $\pm 10^\circ\text{F}$  of their respective temperature setpoints).

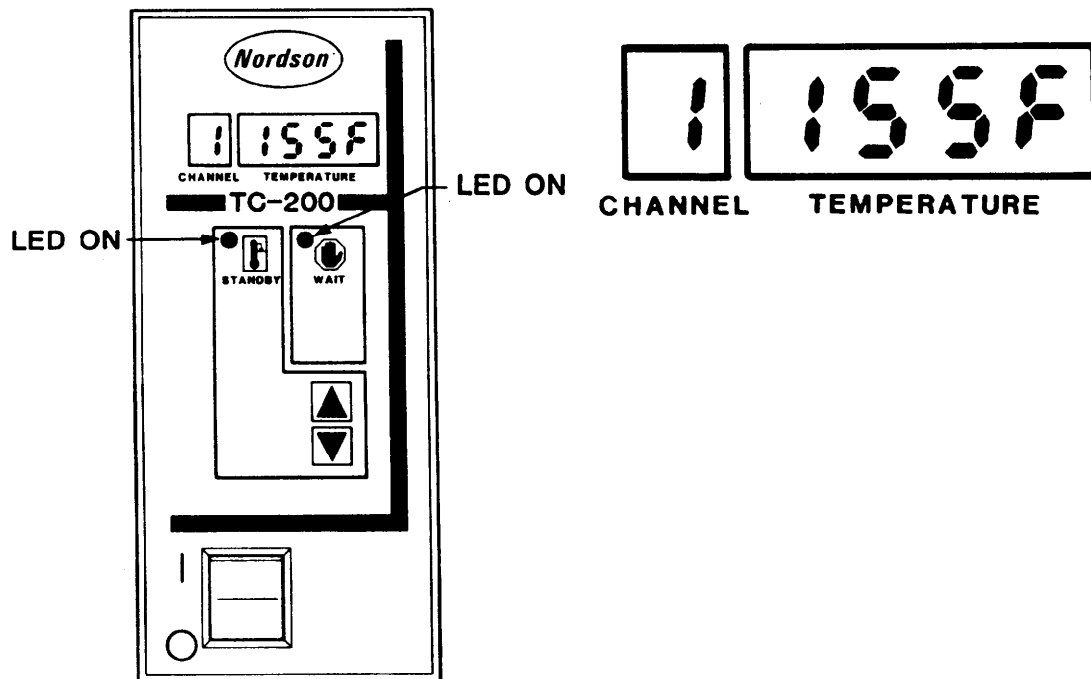


Figure 4.5 - Standby Mode Display and LED Status

#### 4.4. Placing the Unit in Sleep Mode

- a. Check that the Standby temperature is set to 151° F or less (66° C; refer to paragraph 4.2.2.).
- b. Press and hold the Standby switch until the Standby Active LED is on.

The Wait LED also comes on. The display continues to show the actual temperatures. The TC-200 removes power to the heating channels. The hot melt material then cools to room temperature.

- c. To exit the Sleep mode and return to the Run mode, press and hold the Standby switch until the Standby Active LED turns off. The display will show the channel and its actual temperature. The Wait LED will stay on until all channel temperatures are in the setpoint band.

#### 4.5. Channel Status Messages

The TC-200 can display two channel status messages.

The first channel status message is the low temperature indication (Figure 4.6, below). This display shows when a channel temperature is below 150° F (66° C).

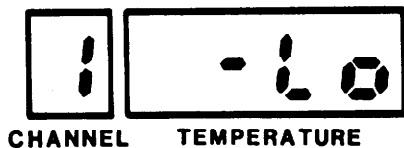


Figure 4.6 - Low Temperature Display

The second channel status message is shown in Figure 4.7, below. This display shows when no channels are connected.

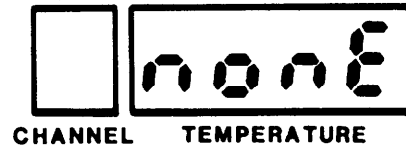


Figure 4.7 - Display When No Channels Connected

#### 4.6. Error Messages

There are three error messages that the TC-200 can display. The Alarm LED is on while any error condition exists.

**Note:** If the error condition goes away within 45 seconds, the error message goes away and the Alarm LED turns off.

After an error condition continues for longer than 45 seconds, the TC-200 removes power from the heaters. If the error condition goes away, the TC-200 on/off rocker switch must be turned off, then on. Otherwise, the display will still show the error message, and the channels will not resume heating.

Each error message display and a brief explanation of its cause are shown below. Corrections for the problem are covered in the Troubleshooting Guide in Section 5.

**Figure 4.8** - A channel's actual temperature is greater than the overtemperature value. When displayed, that channel will appear as shown below. The Alarm LED is on.

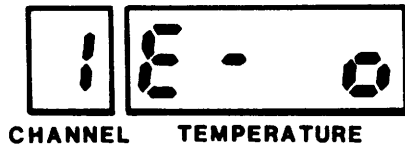


Figure 4.8 - Alarm Overtemperature Display

**Figure 4.9** - A channel RTD has an open circuit. When displayed, that channel will appear as shown below. The Alarm LED is on.

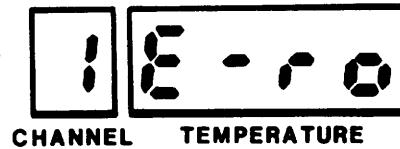


Figure 4.9 - RTD Open Circuit

**Figure 4.10** - A channel RTD has a short circuit. When displayed, that channel will appear as shown below. The Alarm LED is on.

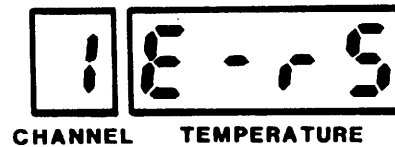


Figure 4.10 - RTD Short Circuit



## Section 5 Troubleshooting

### 5.1. Introduction

In this section, you will find the troubleshooting guide. The symptoms are followed by possible causes listed in order of probability.

The TC-200 wiring diagram (Figure 5.1) and schematic (Figure 5.2) are located at the end of this section.

### 5.2. Safety During Troubleshooting



**Warning:** Before performing the following troubleshooting procedures, thoroughly review SECTION 1, SAFETY SUMMARY, in this manual. Only qualified personnel should perform the following procedures.



**Warning:** It is imperative that personnel operating, maintaining, or troubleshooting the TC-200 refer to the

technical manuals for the bulk melter, applicator, and/or its associated equipment. The manuals provide important safety, operation, and troubleshooting information used in conjunction with procedures presented in this manual.



**Warning:** Even when switched off, the TC-200 contains energized components with electrical potentials that can cause death. Disconnect and lock out the input power line to the TC-200 before checking or making any wiring connections. Only qualified personnel should make such checks or connections.

**Table 5.1 - Troubleshooting Guide**

Problem/Indication	Cause	Action
1. Display shows channel number plus "E- o", and Alarm LED is on.	Channel is overtemperature, because triac shorted on.	Replace TC-200.
2. Display shows channel number plus "E-rS", and Alarm LED is on.	Shorted RTD or RTD circuit.	Check display to determine channel with short. Disconnect failed hose or gun. Check RTD resistance; replace RTD if defective. If RTD ok, check for short in RTD circuit; repair short.
3. Display shows channel number plus "E-ro", and Alarm LED is on.	Open RTD or RTD circuit.	Check display to determine channel with open RTD. Disconnect failed hose or gun. Check RTD resistance; replace RTD if defective. If RTD ok, check for open RTD circuit; repair open circuit.

**Table 5.1 - Troubleshooting Guide (Continued)**

Problem	Cause	Action
4. Unrecognized message shown in display	Microprocessor or software failure.	Reset system by powering off, then on. Replace TC-200 if problem continues.
5. Setpoints don't change when switches pressed.	Unit in supervisor lockout.	Remove SW8 shunt jumper on printed circuit board (see Figure 3.5).
6. Setpoints won't change above a certain temperature.	Setpoint within 5° F of Alarm temperature setting.	If setpoint is not set to maximum of 400° F, set Alarm temperature higher. Then, reset setpoint.
7. Setpoints won't change below a certain temperature.	Setpoint within 1° F of Standby temperature setting.	Set Standby temperature lower if not set at 151° F or less (66° C). Reset channel setpoint.
8. No displays or LEDs on.	<p>a. Power switch off.</p> <p>b. Blown fuse(s).</p> <p style="padding-left: 20px;">1. Line voltage surge.</p> <p style="padding-left: 20px;">2. Heater shorted.</p> <p style="padding-left: 20px;">3. Shorted printed circuit board transformer.</p> <p>c. Loose electrical connection(s).</p>	<p>a. Turn switch on.</p> <p>b. Do the following:</p> <p style="padding-left: 20px;">1. Disconnect and lockout power. Replace fuses; power system off, then on.</p> <p style="padding-left: 20px;">2. Check heater circuit for short. Repair short.</p> <p style="padding-left: 20px;">3. Replace TC-200.</p> <p>c. Check connections to TC-200 input terminal, TB1, and connector J2. Tighten any loose connections.</p>

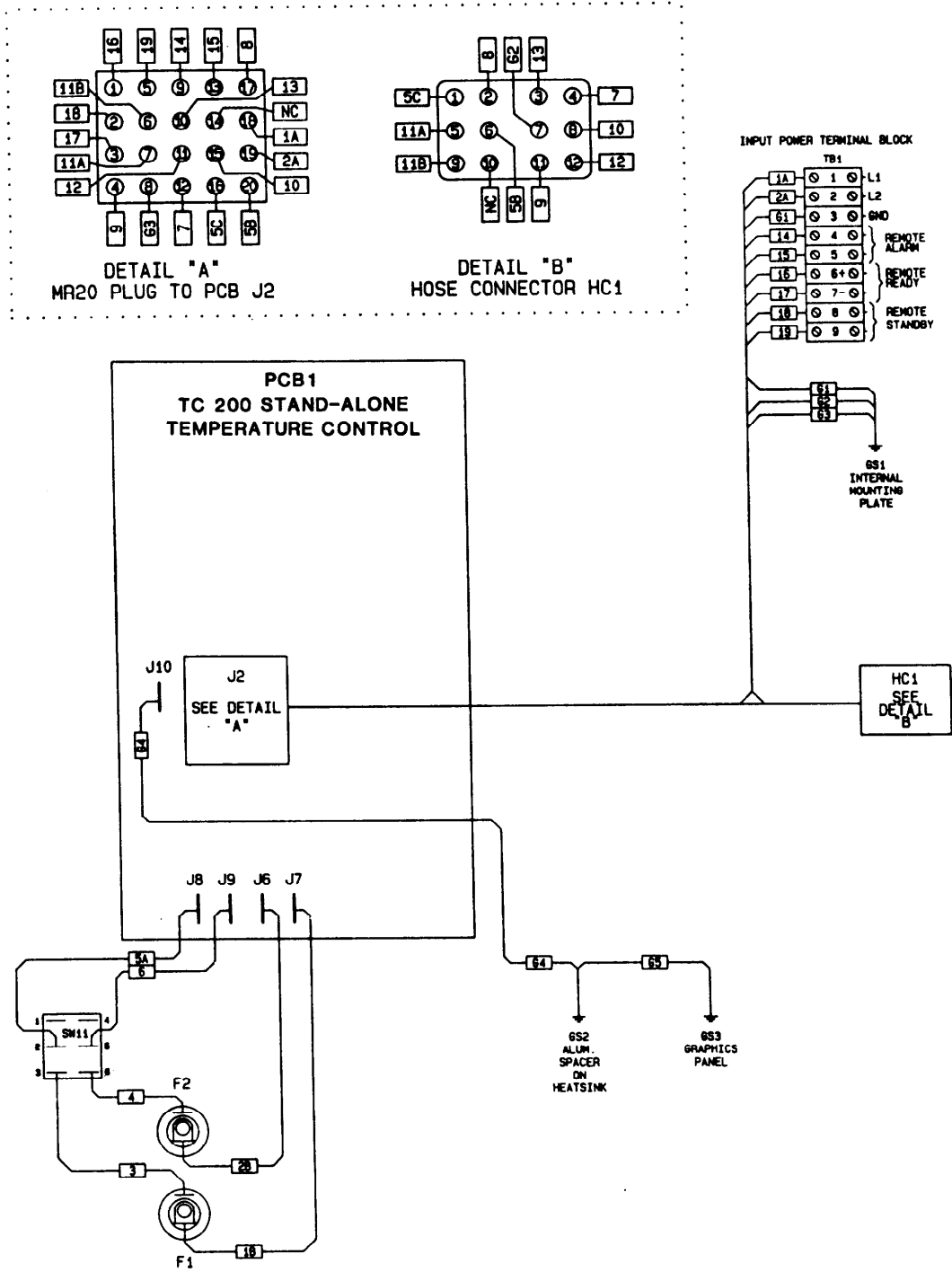
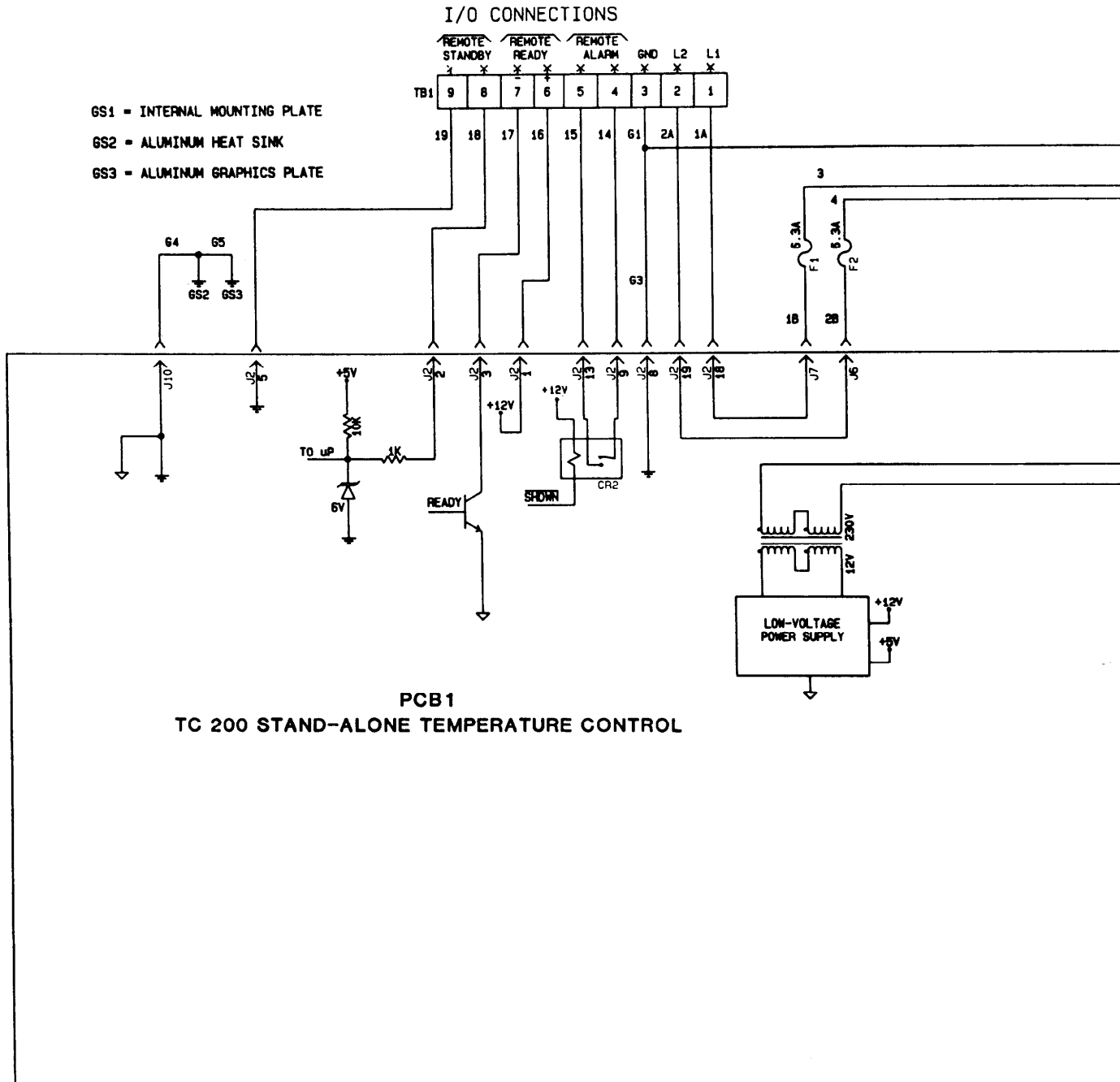


Figure 5.1 - TC-200 Electrical Wiring Diagram



**NOTE:**  
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DETAILS SHOWN FOR REFERENCE ONLY AND SHOULD NOT BE INTERPRETED LITERALLY.

Figure 5.2 - TC-200 Electrical Schematic (1 of 2)



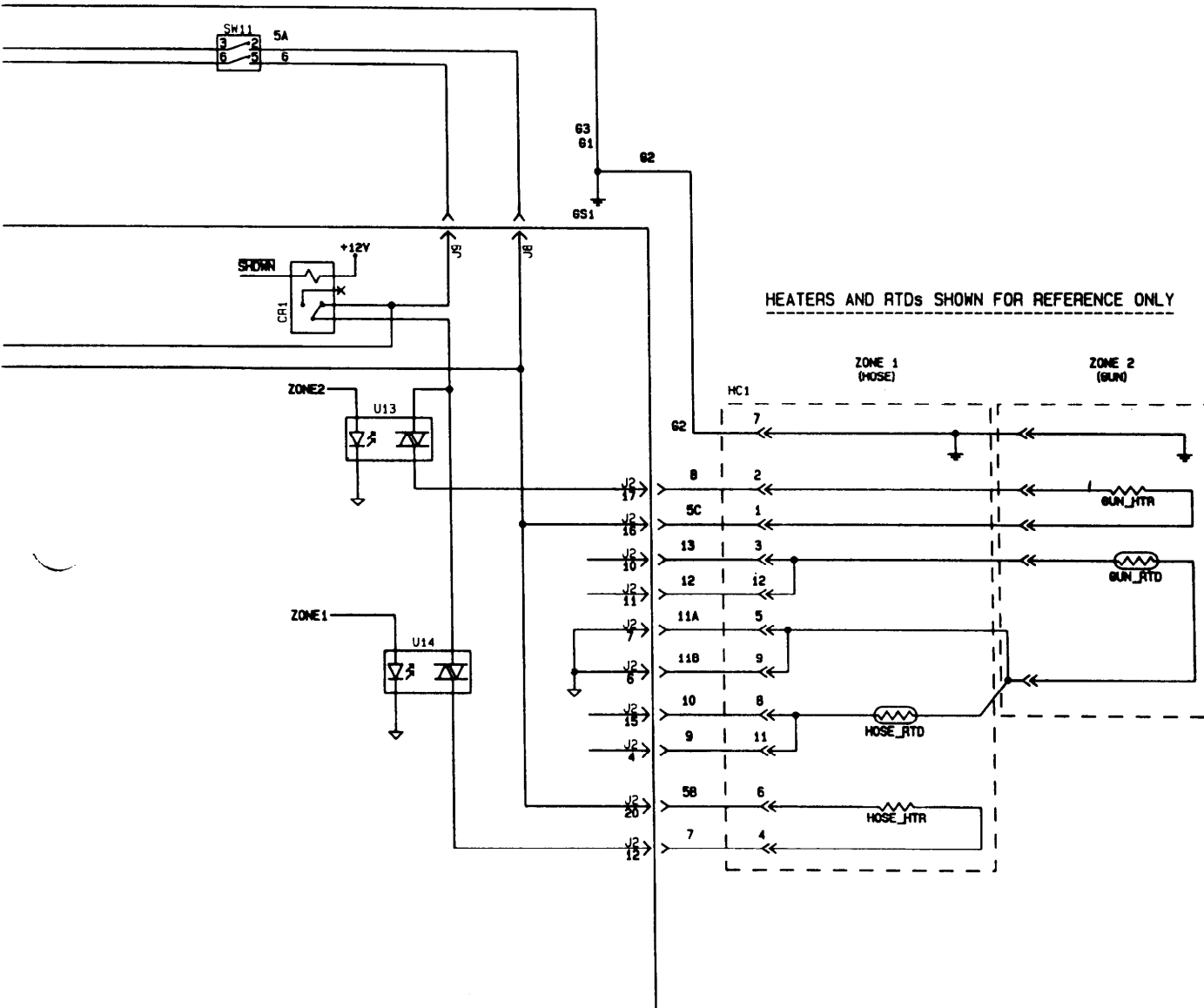


Figure 5.2 - TC-200 Electrical Schematic (2 of 2)



## Section 6 Parts List

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### 6.1. Introduction

This section contains the parts list for the TC-200.

#### 6.1.1. Using the Parts List

The three column parts list provides:

- the Nordson<sup>®</sup> Part Number.
- the part's Description. The part's name, dimensions, and physical properties are provided. Bullets indicate the level of

assembly of the part. A part preceded by one bullet (•) is a component of the assembly above it.

- the Req'd column indicates the quantity requirements per unit or assembly. If the item is listed for reference only, "Ref" or a dash appears in the column. The dash is used for items that exist in a nonquantitative form.

**Table 6.1 - TC-200 Parts List**

Part Number	Description	Req'd
136 899	Control, Temperature, Stand-alone, TC-200	Ref
939 683	• Fuse, 6.3A/250V	2
136 930	• Fuseholder, Panel, 5 x 20	2
136 923	• Switch, Rocker , DPDT, 250 VAC	1
—	Interface Cords, 12 Pin Feed-through (Hose)	—
145 211	• Cord, Hose, 2 Ft, TC-200	Ref
145 212	• Cord, Hose, 6 Ft, TC-200	Ref
145 213	• Cord, Hose, 12 Ft, TC-200	Ref
145 214	• Cord, Hose, 18 Ft, TC-200	Ref
145 215	• Cord, Hose, 24 Ft, TC-200	Ref
145 216	• Cord, Hose, 30 Ft, TC-200	Ref

**Table 6.1 - TC-200 Parts List (Continued)**

<b>Part Number</b>	<b>Description</b>	<b>Req'd</b>
125 364	Cordset, Splitter, 2 Gun, 2300 (splits 12 pin connector into two 6 pin connectors)	Ref
—	Interface Cords, 6-Pin Feed-through (Gun)	—
145 217	• Cord, Gun, 2 Ft, TC-200	Ref
145 218	• Cord, Gun, 6 Ft, TC-200	Ref
145 219	• Cord, Gun, 12 Ft, TC-200	Ref
145 220	• Cord, Gun, 18 Ft, TC-200	Ref
145 221	• Cord, Gun, 24 Ft, TC-200	Ref

## Section 7 Technical Data

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### 7.1. TC-200 Temperature Control Specifications

#### 7.1.1. Operator Interface

LED Screen.....	7-segment LED-type display
Set-up Controls .....	Keyswitch input for process setpoint adjustment
Control Mode .....	Two separate and independent PI-type temperature control loops
Setpoint Control Range .....	151° - 400° F

#### 7.1.2. Electrical Specifications

##### Inputs

Input Voltage.....	200/240 VAC, 50/60 Hz, single phase only
Fusing .....	Load heaters fused 6.3A, 250 VAC
Sensors.....	RTD-type, two-wire, nickel element
Remote Temperature Setback Enable .....	Contact closure (5 VDC, 1 mA)

##### Outputs

Heater Output Switches .....	Zero cross-Triac type
Maximum Switched Power .....	700W @ 240VAC
Remote Unit Fault Alarm.....	Contact closure (1 Form A, SPST 250 VAC, 5A)
Remote Unit System Ready.....	One open collector transistor (25 VDC, 0.1A)

**7.1.3. Dimensions**

Height ..... 10.5 in. (26.7 cm)  
Width ..... 8.5 in. (21.6 cm)  
Depth ..... 4.5 in. (11.4 cm)

**7.1.4. Safety**

Sensor Indication ..... Open and shorted sensor indication  
Power Removal ..... Adjustable overtemperature  
safety power removal

**7.1.5. Operating Environment**

Operating Temperature ..... 20° - 120° F (-7° to 49° C)