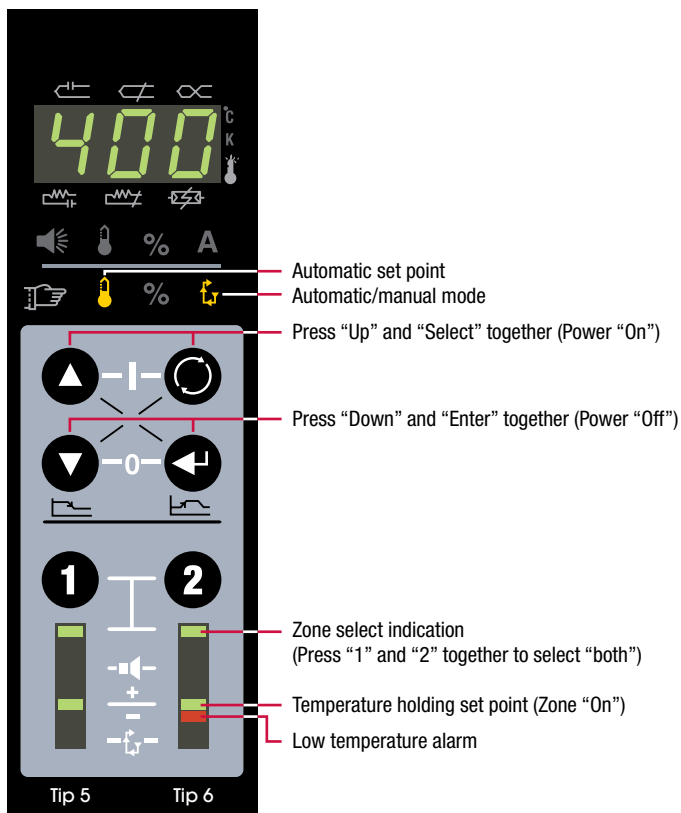


# LEC Start Up Procedure

- 1** Dry cycle mold, apply full tonnage, 3–4 times (pinch any wires in advance of operation)
- 2** Turn “On” main disconnect
- 3** Select automatic set point   
Select Zone 1 **1**, Zone 2 **2** or “both” **1 2**  
Enter automatic set point . Press enter   
Repeat for other zones or modules
- 4** Select automatic/manual mode   
Select Zone 1 **1**, Zone 2 **2** or “both” **1 2**  
Enter “0” for automatic . Press enter   
Repeat for other zones or modules
- 5** Select Zone 1 **1**, Zone 2 **2** or “both” **1 2**  
Press “Up” and “Select” together (Power “On”)   
Apply power to manifolds first if required by manifold supplier  
Repeat for other zones or modules
- 6** Zones will read a low temperature alarm  
Zones are close or holding set point when the green temperature holding set point light is illuminated



# LEC

## Temperature Controller

### Basic Operation / Advanced Setup / Troubleshooting

	Thermocouple Open
	Thermocouple Pinched
	Thermocouple Reversed
	Degrees C
	Type K Thermocouple
	Uncontrolled Output
	Open Fuse
	Shorted Heater
	Open Heater
	Alarm Status
	Actual Temperature
	Actual % Output
	Actual Current (Amps)
	Automatic/Manual Mode
	Manual % Output Set Point
	Automatic Set Point
	Select
	Enter
	Increment (Up)
	Decrement (Down)
	Power “On”
	Power “Off”
	Standby
	Boost
	First Zone (Zone 1)
	Second Zone (Zone 2)

Display

Actual Row

Setting Row

Entry Area

Zone Select

Zone Status

Zone ID

Sprue      Man 1

Zone selected

Alarm

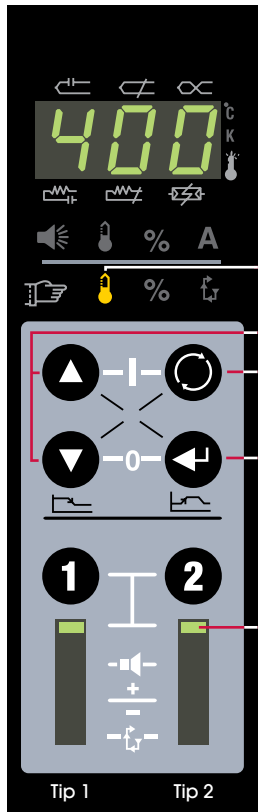
High Alarm

Zone “On”

Low Alarm

Manual Mode

# How To Enter A Setpoint



## Enter Automatic Temperature Set Point

- 1** Select zone(s) **1**, **2** or **1 2**
- 2** Select **⊙** automatic set point **Ⓜ**
- 3** Enter temperature set point **▲▼**
- 4** Press enter to confirm **↵**

Automatic set point

Press "Up" or "Down" to adjust temperature  
(Press "Up" and "Down" together to change individual digits – 100, 10 or 1)

Select

Enter

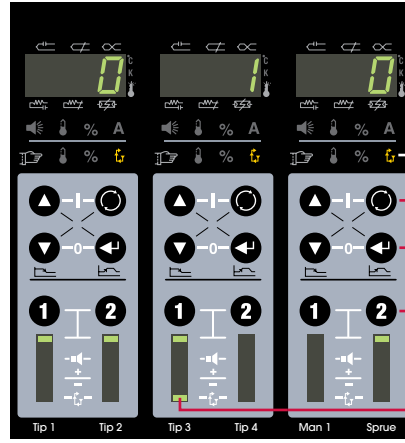
Zone select indication  
(Press "1" and "2" together to select "both")

Tip 1

Tip 2

# How to Select Automatic or Manual

- 1** Select zone(s) **1**, **2** or **1 2**
- 2** Select **⊙** automatic/manual mode **Ⓜ**
- 3** Enter "0" for automatic or closed loop control **▲▼**  
Enter "1" for manual or open loop control **▲▼**
- 4** Press enter to confirm **↵**



Automatic/Manual mode

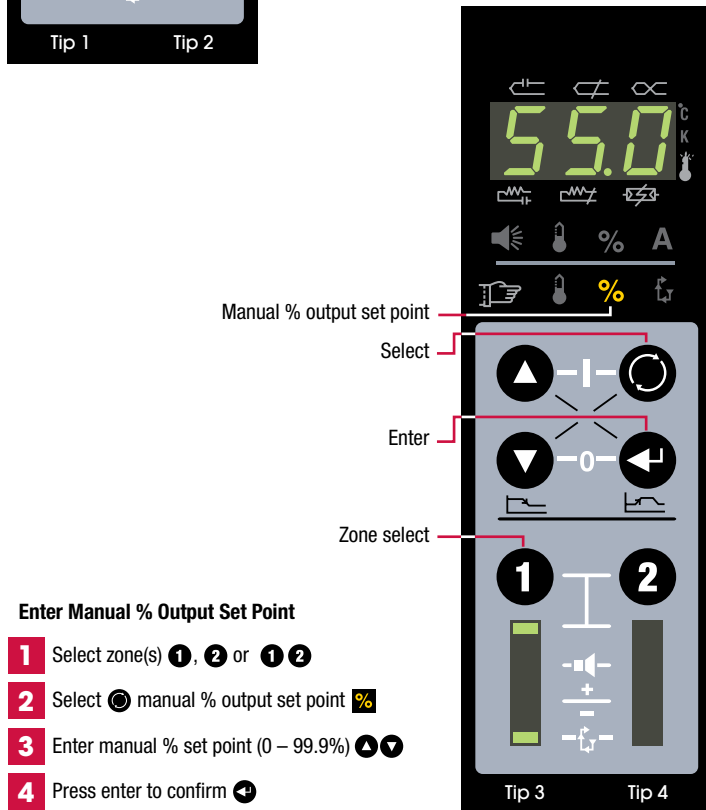
Select

Enter

Zone select

Manual mode light  
(No light = automatic mode)

# How to Turn the Power "On" & "Off"



Manual % output set point

Select

Enter

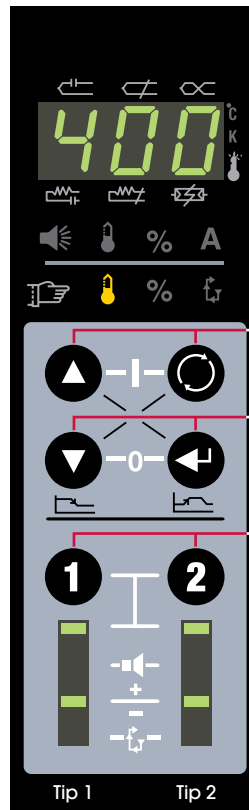
Zone select

Tip 3

Tip 4

## Enter Manual % Output Set Point

- 1** Select zone(s) **1**, **2** or **1 2**
- 2** Select **⊙** manual % output set point **%**
- 3** Enter manual % set point (0 – 99.9%) **▲▼**
- 4** Press enter to confirm **↵**



Zone(s) "On"

Zone(s) "Off"

Press "1", "2", or "1 & 2"  
together to select "both"

## Turn zone(s) "On"

- 1** Select zone(s) **1**, **2** or **1 2**
- 2** Press "Up" **▲** and "Select" **⊙** together to turn power "On" **Ⓜ**

## Turn zone(s) "Off"

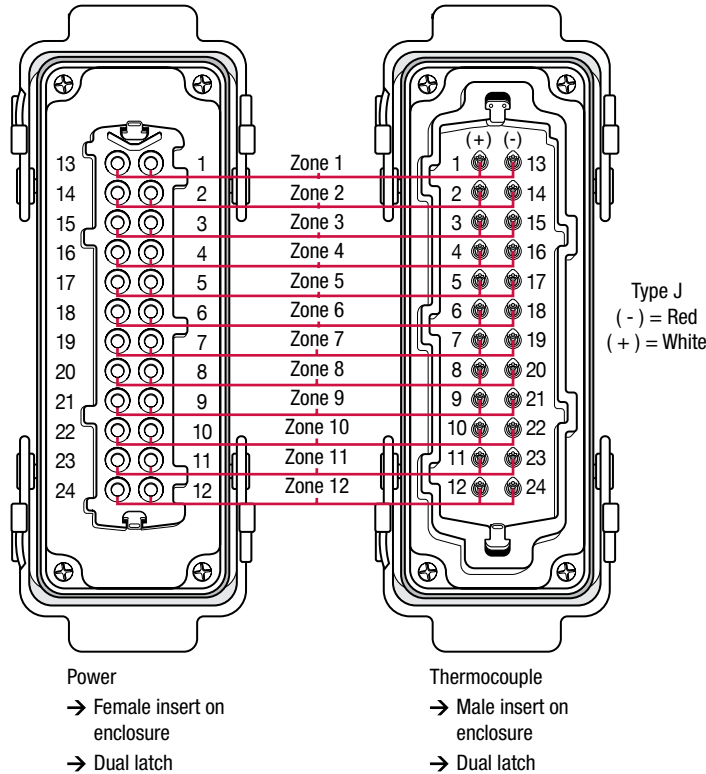
- 1** Select zone(s) **1**, **2** or **1 2**
- 2** Press "Down" **▼** and "Enter" **↵** together to turn power "Off" **Ⓜ**

# Standard Controller Enclosure Wiring

# Optional Network Module Wiring

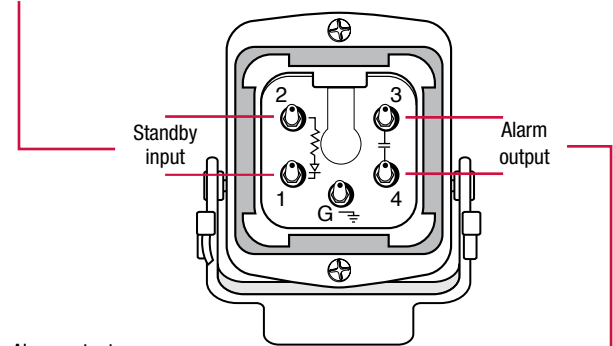
All Wiring Diagrams Represent Actual Connectors on Back Panels of LEC Controllers

## 6 & 12 Zone Enclosures



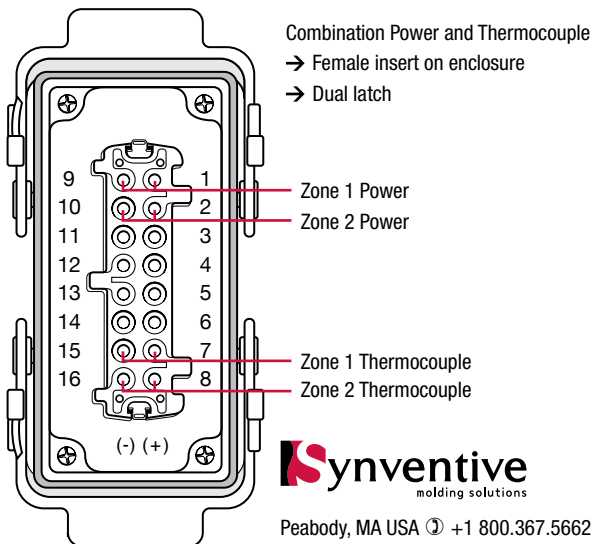
## HA4 Input/Output Connector

- Standby input
  - 24 or 120 VAC/VDC input to activate
  - All zones go to standby mode
  - If standby set point is "1", module will be inhibited
  - Configure in Advanced Setup
  - Male insert on enclosure



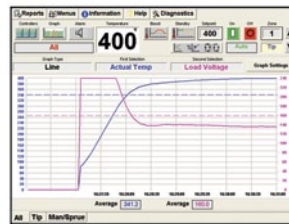
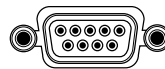
- Alarm output
  - 22 – 265 VAC/VDC must be supplied
  - Normally open contact
  - Contact is closed when any zone is in alarm for 16 seconds
  - Fused at 5 amps

## 2 Zone Enclosure



## Remote Computer & Enclosure Link Connections

- Female DB25 enclosure link connector on network module enclosure
- Male DB25 enclosure link connector on stacked enclosure
- Connect two enclosures to one network module
- Share input, output and communications



- Female DB9 remote computer connector on enclosure
- Complimentary monitoring software including Gammavision, Mold Monitor, Mold Doctor and Field Calibrator



Peabody, MA USA ☎ +1 800.367.5662  
 Bensheim, Germany ☎ +49 (0)6251 9332 0  
 Suzhou Industrial Park, China ☎ + 86 512 62838870  
[www.synventive.com](http://www.synventive.com)

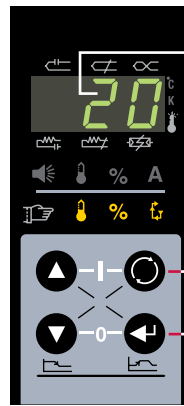
## Advanced Setup

The LEC controller is shipped to the customer so that no setup work is required for basic operation. Set points in automatic and manual may be entered and the zone will be controlled by turning “On” the power. Many customers require advanced features to satisfy their operation. This page will describe the basics of “Advanced Setup”. Please note that security level codes are not standard. To place security on the LEC controller you must activate security by selecting your own personalized security codes (network module required).



Advanced setup number

Press “Select” and “Enter” together



Advanced setup setting

Press “Select” and “Enter” together again

Toggle between number and setting

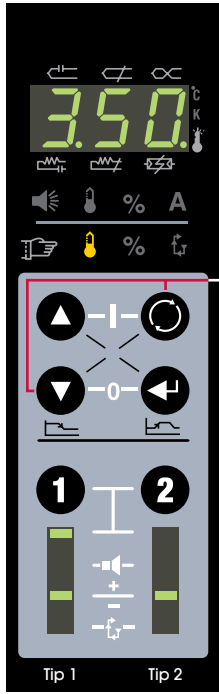


Press “Select” to exit advanced setup

## Advanced Setup Guide - Level 2 Security to Change

#	Limit (default)	Explanation	Set individually by zone
(0)	0 - 4 (0)	Power Priority™. 0 = (off). 1 - 4 = increased smoothing of power output. A = Power Priority™ is active (setup number)	
(1)	0-999 (0)	*Reset advanced setup to default values - enter 321; press enter to confirm	
(2)	0-100° F/55° C (20° F/11° C)	Temperature deviation alarm set point (individual) Actual temperature activates individual zone alarm at this amount +/- set point	
(3)	-31 to 27 (0)	Control algorithm adjustment (individual). 0=auto selection. To view actual tuning value select code 4 Manual Selections: 10 to 17 fast tuning with increasing lag. 20 to 27 slow tuning with increasing lag -17 to -10 fast manifold tuning with increasing lag. -27 to -20 very fast tuning with increasing lag -30 and -31 ultra fast low mass tuning. P = auto selection tune performed (setup number)	
(4)	-31 to 27 (none)	Algorithm set point (view only). View auto tuning selection or manual tuning value	
(5)	0-932° F/500° C (220° F/104° C)	Standby set point (individual). When standby is activated, all automatic zones selected will control to this set point Entering “1” will inhibit the module (both zones), when activated the relays will open, turning “off” the module power	
(6)	0 to 54.0 minutes (5.0)	T/C pinched detection time (individual) 98+% output, 20° F/11° C in 5 minutes - default. Change alarm timer amount. 0 = disabled	
(7)	32-999° F/0-537° C (779° F/415° C)	* Critical over temperature alarm. To clear the alarm, select alarm status and press enter If this temperature is exceeded for 8 seconds both zones turn “Off”. Max. 999° F (537° C) = disabled	
(8)	32-932° F/0-500° C (752° F/400° C)	* Automatic set point limit. The maximum set point an operator can enter in automatic on both zones	
(9)	0-99.9% (99.9%)	* Manual set point limit. The maximum set point an operator can enter in manual on both zones	
(10)	0-999° F/537° C (100° F/55° C)	* Boost limit. The maximum amount of degrees an operator can raise or lower the zone(s) during a boost	
(11)	+/-99° F/55° C (36° F/20° C)	* Initial boost set point. Amount of degrees added to automatic set point, module adjustable within the boost limit	
(12)	0-999 seconds (120)	* Boost time set point. The amount of time boost is active	
(13)	0 or 1 (0)	* Degree F or C selection. 0=“degree F”; 1=“degree C”	
(14)	0 or 1 (0)	* Type J or K thermocouple selection. 0=“type J”; 1=“type K”	
(15)	0 or 1 (0)	* Zone power status on power up. 0 = all zones turned “Off”; 1= zones “On” when shut down last, stay “On”	
†(16)	0 or 1 (0)	* Enable slaved power-up. 0=“Off”; 1=“On”. All zones heat within 20° F/11° C of one another until set point	
†(17)	0-999 (none)	* Security code level 1. You must be in level 2 to change. Refresh procedure available, call Synventive	
†(18)	0-999 (none)	* Security code level 2. You must be in level 2 to change. Refresh procedure available, call Synventive	
(19)	- - -	Output module controller software version/revision number (display only), select zone, version/revision displayed	
(20)	- - -	Temperature controller software version/revision number (display only), select zone, version/revision displayed	
(21)	0 (0)	LED test. To activate enter 0. Turns “On” all LED’s for troubleshooting	
†(22)	000-999 (level 2)	Security level indicated. 0=lockout; 1=operator; 2=supervisor. 0 - enter, drops one level Elevate one security level at a time with your customized code	
	† Network module required	* Network module distribution or value applies to both zones on the module	

## Why Standby? How to Activate



Some processors like to maintain a lower set point on command for all zones while they are working on something.

Select zone(s) to put into standby **1**, **2** or **1 2**

Press “down” **▼** and “select” **⊙** together

The selected zone(s) will go to the standby temperature

Hotter zones will cool to the standby temperature

Colder zones will heat to the standby temperature

Automatic zones = 220° F/104° C (default)

Manual zones = half of the manual set point

The outer decimal points will flash during standby

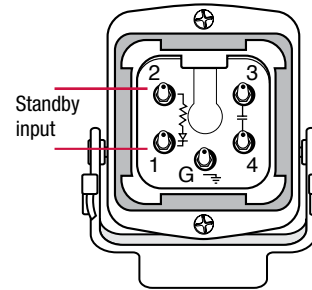
To cancel standby, press “down” **▼** and “select” **⊙** together

The original standby source must be cancelled to clear standby. Please reference alternate standby inputs, shown to the right

## Alternate Standby Inputs

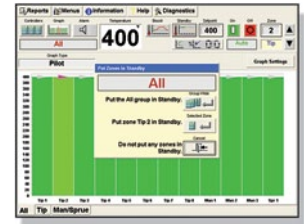


Standby switch on enclosure (if available) all zones go to standby mode



→ 24 or 120 VAC/VDC input to activate

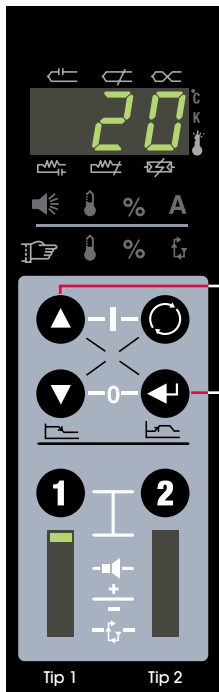
→ All zones go to standby mode (network module required)



→ Standby button from external software

→ Selected zone(s) go to standby mode (network module required)

## Why Boost? How to Boost



Boost temporarily raises a zone(s) temperature (typically tips) to clear a cold slug on start up.

Select zone(s) to boost **1**, **2** or **1 2**

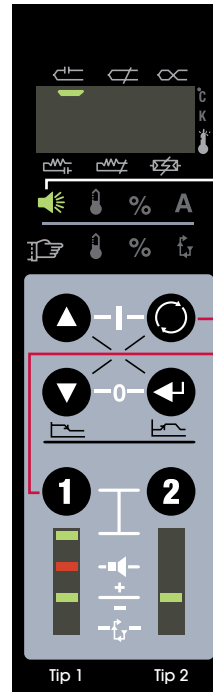
Press “up” **▲** and “enter” **⊕** together  
Enter boost amount **▲▼**. Press enter **⊕**

Zone(s) will boost 36°F/20°C (default) for 120 seconds (default)

The 7 segment display will flash during boost

To cancel boost, press “up” **▲** and “enter” **⊕** together

## How to View All Zones Quickly

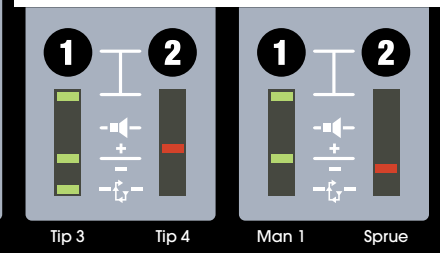


Alarm status

Select

Zone select

- 1** Tip 1 - in alarm, select zone **1**  
Select **⊙** alarm status **🔔**  
Thermocouple open
- 2** Tip 2 - normal operation  
Zone is on, in automatic and at or near set point
- 3** Tip 3 - in manual, Thermocouple may be open  
Module applying a constant % output to the heater
- 4** Tip 4 - in automatic, High temperature alarm (+20° F/11° C default)
- 5** Man 1 - normal operation
- 6** Sprue - low alarm



## Basic Troubleshooting

**Thermocouple pinched** - The T/C is pinched or the controller thinks it is pinched. (Default: 98+% output, must see +20° F/11° C in 5 minutes). True pinch - the T/C is sensing the temperature further away from the heat source than intended. Without alarm, temperature reads low, controller applies power, runaway heat. False T/C pinch - heater is too small to heat the zone or the T/C is located too far away. Replace heater, move T/C or adjust alarm. Selectable detection times in advanced setup

**Thermocouple (T/C) open** - the T/C connection is broken, follow general troubleshooting

**Open heater** - The heater connection is broken, follow general troubleshooting

**Shorted heater** - The heater is shorted or exceeds the maximum rating of the module, follow general troubleshooting



**Thermocouple reversed** - The T/C connection is wired + to - at some point. Visually inspect each connection, for type J (US standard) red wire should connect to red wires, not red to white

**Critical over temperature** - The temperature of a zone exceeded the alarm limit. (Default: 779°F/415° C). Both zones on the module shut "off" automatically. To clear the alarm, select alarm status and press enter. Noted by vertical indicator segment

**Uncontrolled output** - The module has an unregulated output. Both zones on the module shut "off" automatically. To clear the alarm, select alarm status and press enter. Noted by vertical and horizontal indicator segment (shown)

**Open fuse** - fuse on module bad. Turn "Off" main disconnect. Remove top cover, locate module, check all fuses (4 per module, 2 per zone)

## General Troubleshooting – Turn "Off" Main Disconnect

- 1** Check resistance from pin to pin, at the mold. T/C should read 3-50 ohms at room temperature. Heater should read greater than 16 ohms. If there is no continuity (open line) = broken connection, open heater or open T/C.
- 2** Check resistance from pin to ground, at the mold. Heaters only - no continuity (open line) = good. Some resistance is bad, heater shorted.
- 3** Reattach the cable to the mold, detach the cable from the controller. Check resistance from pin to pin on the cable. T/C should read 3-50 ohms at room temperature. Heater should read greater than 16 ohms. If there is no continuity (open line) = broken connection, open heater or open T/C. The connection is broken in the cable set or the connectors/pins are not making contact.
- 4** Reattach the cable to the mold, detach the cable from the controller. Check resistance from pin to ground on the cable. Heaters only - no continuity (open line) = good. Some resistance is bad, heater shorted. The wires are either shorted in the cable set or the connectors are shorted to ground.
- 5** At this point if everything is fine, the problem is in the controller. (1) turn "Off" main disconnect, (2) locate problem module, (3) check fuses on module, (4) swap bad module into a known good location, (5) turn "On" main disconnect, (6) test the zone. If the problem follows the module = bad module. If the alarm stays with the original zone, the problem is between the module and the connectors on the rear of the enclosure.
- 6** If the problem is not explained, or you need spare parts please contact:

### Synventive Molding Solutions

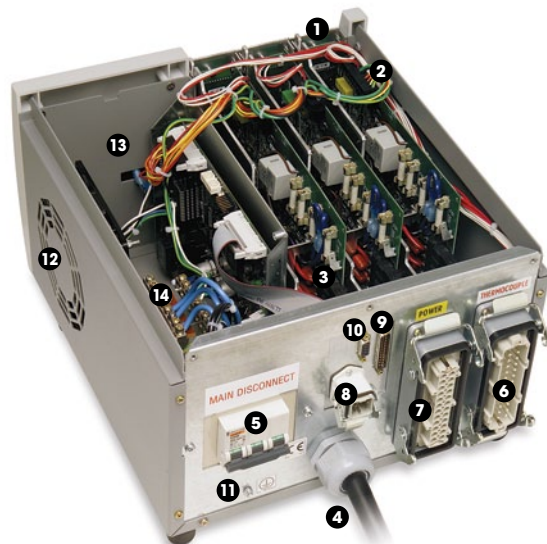
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- |   |   |
|---|---|
| <b>1</b> Output module  | <b>7</b> Power output connector                 |
| <b>2</b> Module thermocouple/communications cable             | <b>8</b> Auxiliary input/output connector       |
| <b>3</b> Module power input/output connector (base of module) | <b>9</b> Enclosure link connector               |
| <b>4</b> Input power cable                                    | <b>10</b> Communications port                   |
| <b>5</b> Main disconnect (circuit breaker)                    | <b>11</b> Ground stud                           |
| <b>6</b> Thermocouple input connector                         | <b>12</b> Fan                                   |
|   | <b>13</b> System wide standby switch (on front) |
|   | <b>14</b> Capacitors                            |