LEC Start Up Procedure

1 Dry cycle mold, apply full tonnage, 3–4 times
(pinch any wires in advance of operation)

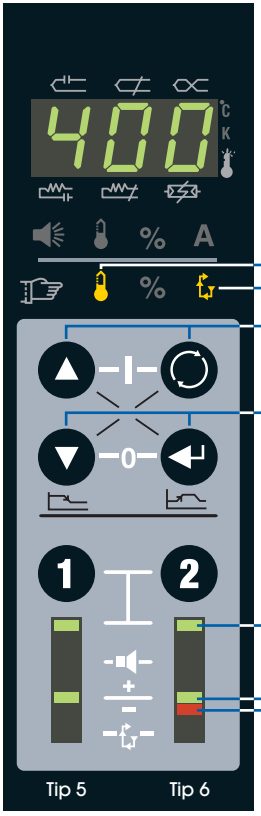
2 Turn “On” main disconnect

3 Select ◎ automatic set point
Select Zone 1❶, Zone 2❷ or “both”❶❷
Enter automatic set point ▲▼. Press enter ↵
Repeat for other zones or modules

4 Select ◎ automatic/manual mode
Select Zone 1❶, Zone 2❷ or “both”❶❷
Enter “0” for automatic ▲▼. Press enter ↵
Repeat for other zones or modules

5 Select Zone 1❶, Zone 2❷ or “both”❶❷
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



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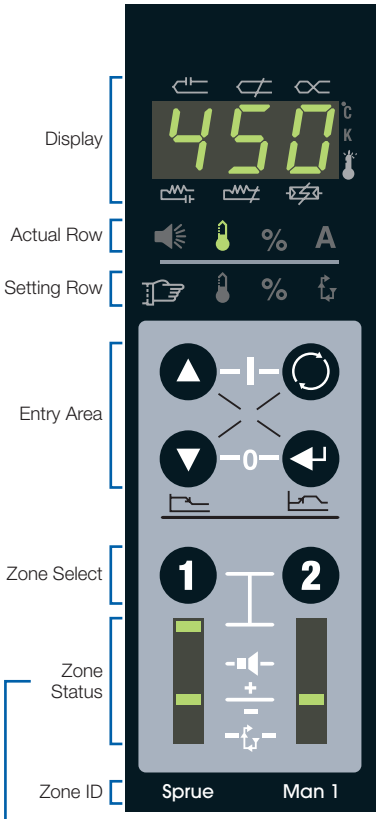
Gammaflux®

Version 2.0
English

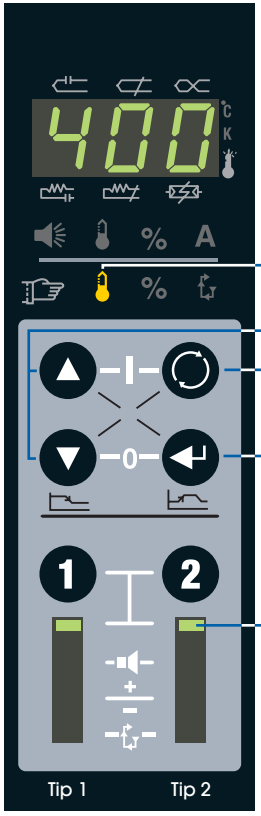
LEC
Temperature Controller

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)

How to Enter a Set Point



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)

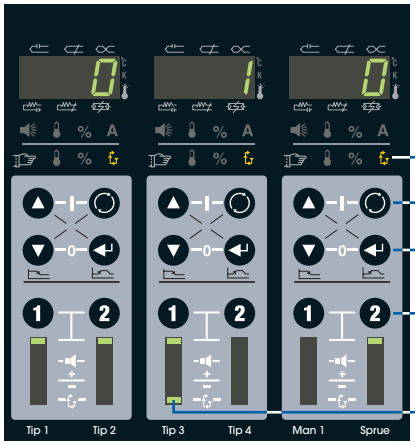
Select

Enter

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

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

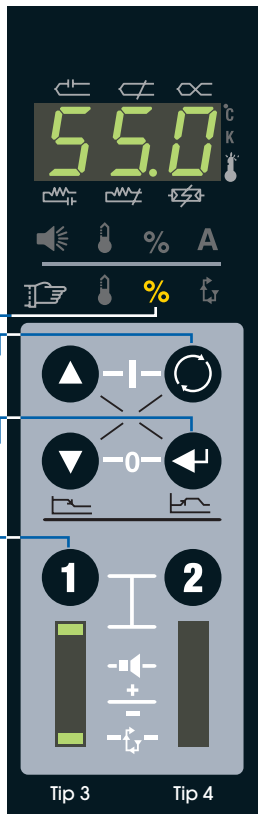
Select

Enter

Zone select

Manual mode light
(No light = automatic mode)

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



Manual % output set point

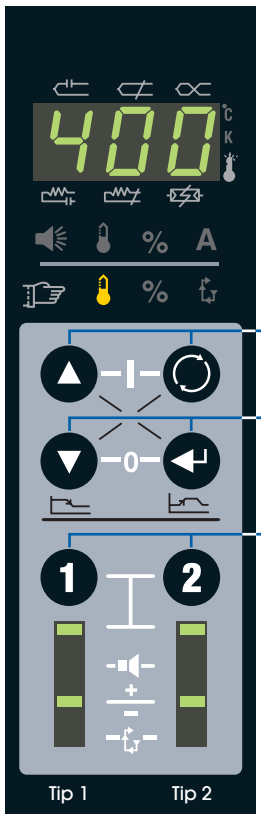
Select

Enter

Zone select

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



Turn zone(s) "On"

1. Select zone(s) 1, 2 or 1 2
2. Press "Up" and "Select" together to turn power "On" -I-

Zone(s) "On"

Zone(s) "Off"

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

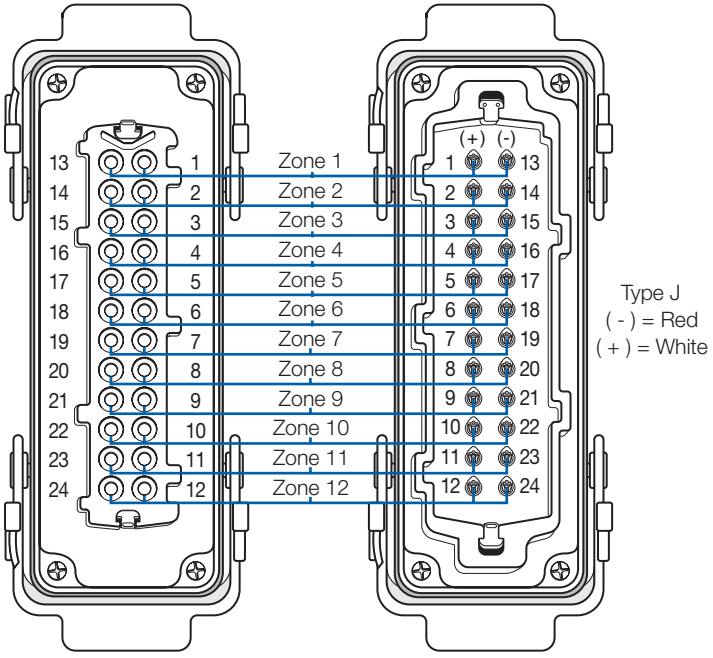
Turn zone(s) "Off"

1. Select zone(s) 1, 2 or 1 2
2. Press "Down" and "Enter" together to turn power "Off" -0-

Standard Controller Enclosure Wiring Optional Network Module Wiring

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

6 & 12 Zone Enclosures

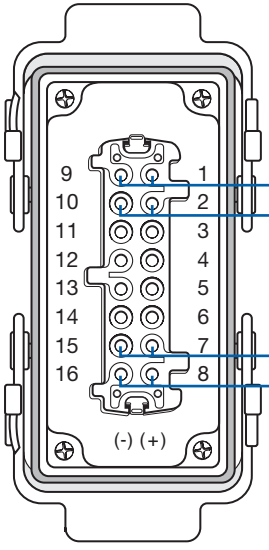


Type J
(-) = Red
(+) = White

Power
- Female insert on enclosure
- Dual latch

Thermocouple
- Male insert on enclosure
- Dual latch

2 Zone Enclosure



Combination Power and Thermocouple
- Female insert on enclosure
- Dual latch

Zone 1 Power
Zone 2 Power

Zone 1 Thermocouple
Zone 2 Thermocouple

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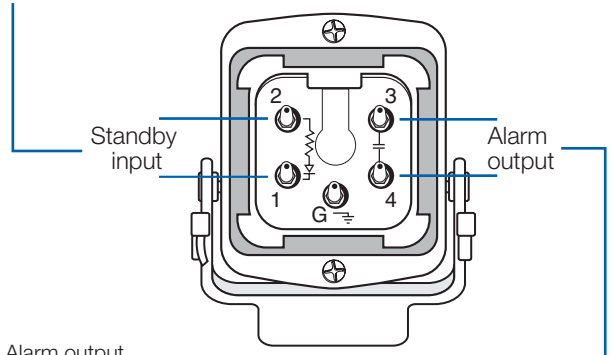
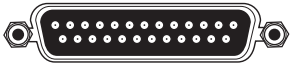
HA4 Input/Output Connector

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

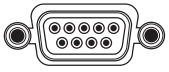


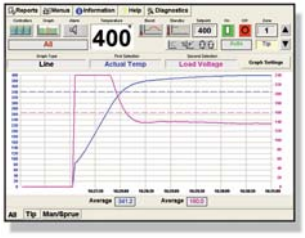
Alarm output
- 22 – 265 VAC/VDC must be supplied
- Normally open contact
- Contact is closed when any zone is in alarm for 16 seconds
- Fused at 5 amps

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

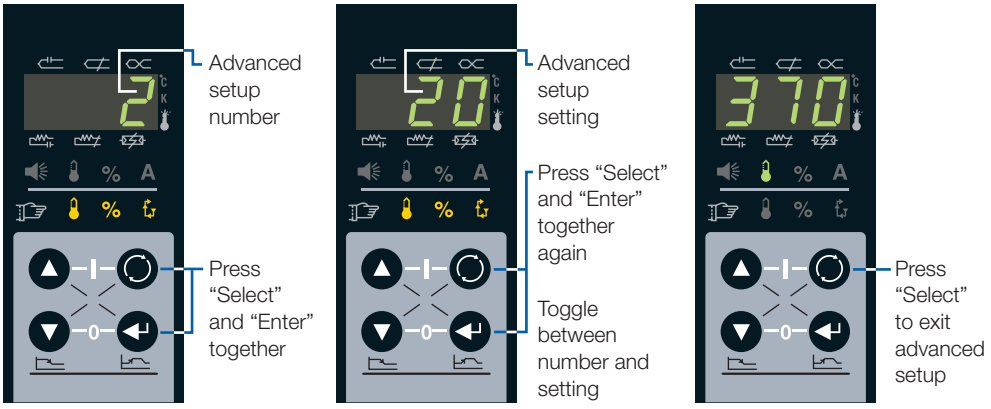




- Female DB9 remote computer connector on enclosure
- Complimentary monitoring software including Gammavision, Mold Monitor, Mold Doctor and Field Calibrator

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 Guide - Level 2 Security to Change

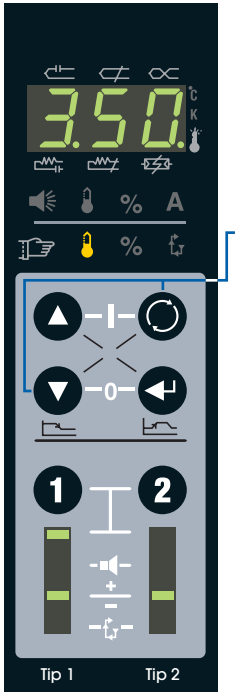
Set individually by zone

#	Limit (default)	Explanation
(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)	0-100º F/55º C (20º F/11º 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)	0-932º F/500º C (220º F/104º 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, 20º F/11º C in 5 minutes - default. Change alarm timer amount. 0 = disabled
(7)	32-999º F/0-537º C (779º F/415º 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. 999º F (537º C) = disabled
(8)	32-932º F/0-500º C (752º F/400º 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)	0-999º F/537º C (100º F/55º C)	* Boost limit. The maximum amount of degrees an operator can raise or lower the zone(s) during a boost
(11)	+/-99º F/55º C (36º F/20º 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 20º F/11º 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 Gammaflux
† (18)	0-999 (none)	* Security code level 2. You must be in level 2 to change. Refresh procedure available, call Gammaflux
(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=supervisior. 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

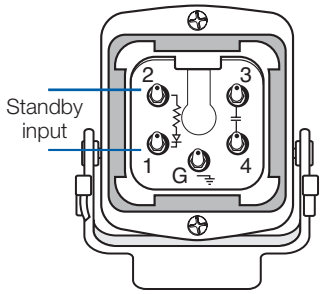
The outer decimal points will flash during standby

To cancel standby,
press "down" and "select" together

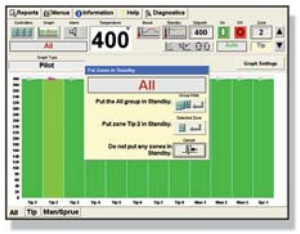
The original standby source must be cancelled to clear standby. Please reference alternate standby inputs, shown to the right

Alternate Standby Inputs

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

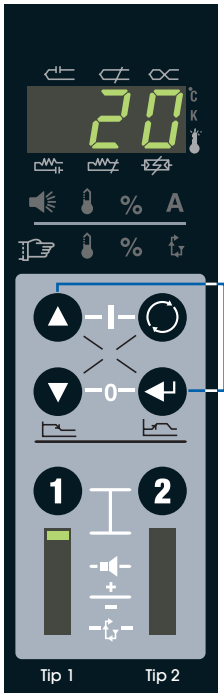


- 24 or 120 VAC/VDC input to activate
- All zones go to standby mode (network module required)



- 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.

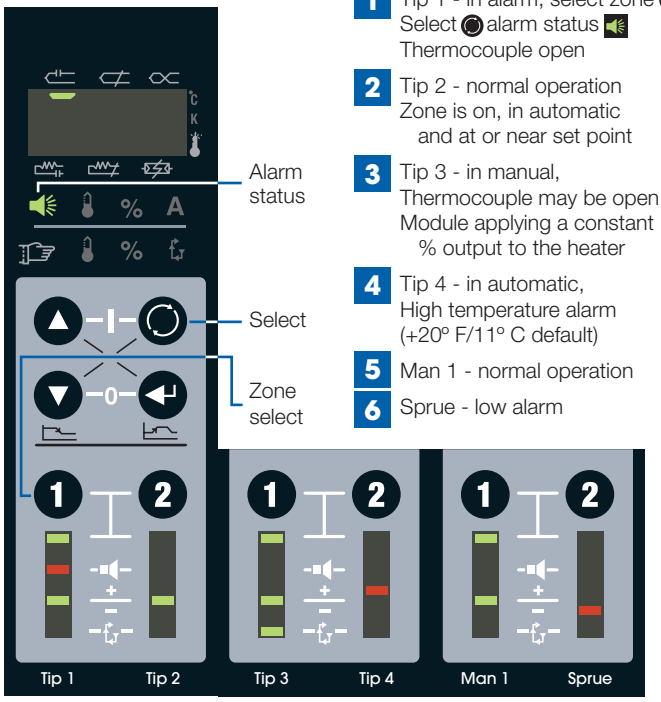
Select zone(s) to boost 1, 2 or 1 2
Press "up" and "enter" together
Enter boost amount . Press enter

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



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

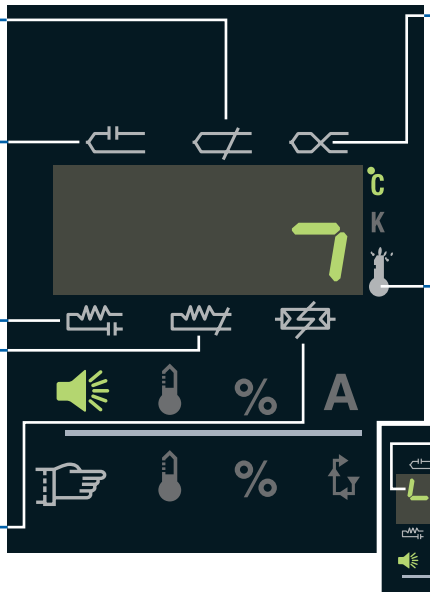
Thermocouple pinched - The T/C is pinched or the controller thinks it is pinched. (Default: 98+ % output, must see +20º F/11º C in 5 minutes). True pinch - the T/C is sensing the temperature further away from the heat source than intended. Without alarm, temperature reads low, controller applies power, 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

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



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: 779ºF/ 415º 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)

Over-Voltage - The module line voltage exceeded 280 VAC for 1 minute (informational only)

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:

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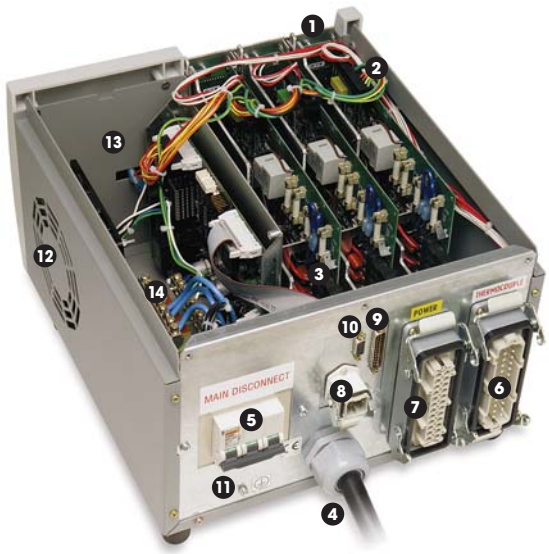

1. Output module
2. Module thermocouple/ communications cable
3. Module power input/ output connector (base of module)
4. Input power cable
5. Main disconnect (circuit breaker)
6. Thermocouple input connector
7. Power output connector
8. Auxiliary input/output connector
9. Enclosure link connector
10.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