Version 3.0
English

LEC

Temperature Controller

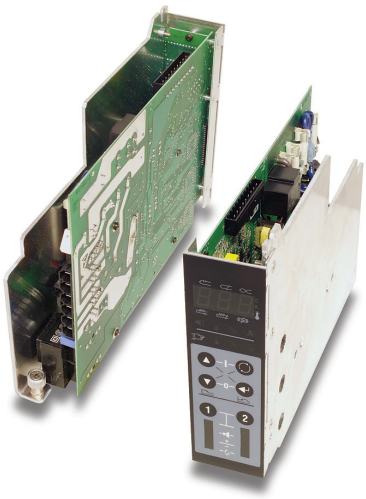
Global Hot Runner Control Solutions

Gammaflux®

A business of BARNES GROUP INC

Full Featured Hot Runner Temperature Control . . .

. . . competitively priced to fit your budget



The Gammaflux LEC temperature controller provides field-proven hot runner controller performance, reliability, and affordability. No longer do you have to pay top dollar to get top hot runner temperature control.

Control for Up To 24 Zones

Designed for smaller hot runner system applications, the LEC is offered with 2, 6 and 12 zone enclosures. A network module allows you to link two 6 or 12 zone enclosures together for up to 24 zones of control. The LEC features a modular design for simple control card removal, addition or replacement.

Extensive Diagnostics

Each 6 and 12 zone LEC enclosure comes prewired, ready to accept an optional network module. With a network module, users can connect the LEC to a laptop or PC to take advantage of advanced features including; security settings, remote input, and unique Gammaflux software including Gammavision (SPC data/graphing analysis), Mold Doctor (advanced mold troubleshooting), and Field Calibrator. The network module also enables a link to plant monitoring systems.

Triangulated Control Technology™

All Gammaflux hot runner temperature controllers feature Triangulated Control Technology™. Using this unique technology, our controllers:

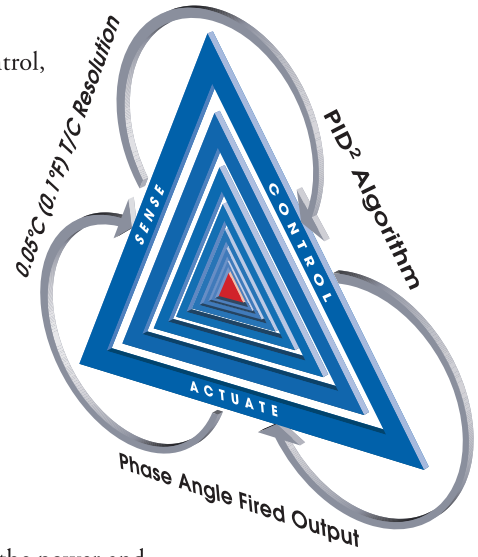
1) **Sense** – 20 times per second, Gammaflux controllers precisely measure the thermocouple;

2) **Control** – the proprietary self-optimizing Gammaflux PID² control algorithm adjusts if the actual temperature deviates 0.1° F (0.05° C) from setpoint. The second derivative (PID²) monitors the actual temperature rate of change. As a result, the LEC module regulates the output to the heater in advance of achieving setpoint to limit or eliminate over or undershoot.

3) **Actuate** – using phase angle fired output, the Gammaflux controller delivers smooth and exact power to each heater in 0.24 VAC increments for the ultimate in temperature control.

Triangulating your process with a Gammaflux controller means achieving better temperature control, that could result in:

- enhanced part quality
- reduced scrap
- improved part weight consistency
- material savings
- higher profit margins



Power Priority™

"Low mass", or extremely small hot runner nozzles are a unique challenge to control. To smooth the power and ultimately the melt heat history, Gammaflux has created Power Priority™. Power Priority™ smoothes the power output to individual zones. Users have the option to manually apply a Power Priority™ set point from 1 (light) to 4 (heavy) output, providing unparalleled control for applications where it is most needed.

Protection

Closed loop wet heater bakeout - 120 times per second (at 60 Hz), the LEC module checks the heater for a short, steadily ramping up the voltage for the fastest possible time to set point. If the heater is wet or shorted, the output is adjusted within 8.3 milliseconds to protect the heater, cables and controller.

5 YEAR WARRANTY

Every LEC controller comes with a full 5-year warranty and is backed by the industry-leading worldwide service and support that our customers expect from Gammaflux.

Advanced Module Settings

(0)	Power Priority™
(1)	* Reset advanced setup to default values
(2)	Temperature deviation alarm set point
(3)	Control algorithm setting/adjustment
(4)	Algorithm set point (view only)
(5)	Standby set point
(6)	Thermocouple pinched detection time
(7)	* Critical over temperature alarm
(8)	* Automatic set point limit
(9)	* Manual set point limit
(10)	* Boost limit
(11)	* Initial boost set point
(12)	* Boost time set point
(13)	* Degree F or C selection
(14)	* Type J or K thermocouple selection
(15)	* Zone power status on power up
† (16)	* Enable slaved power-up
† (17)	* Security code level 1
† (18)	* Security code level 2
(19)	Output module controller software version/revision
(20)	Temperature controller software version/revision
(21)	LED test
† (22)	Security level indicated/change

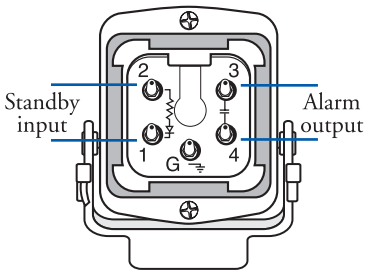
Set individually by zone

* Network module distribution or value applies to both zones on the module

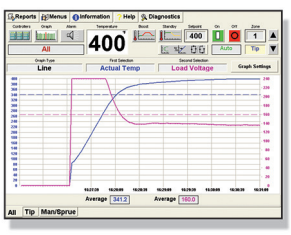
Network module required

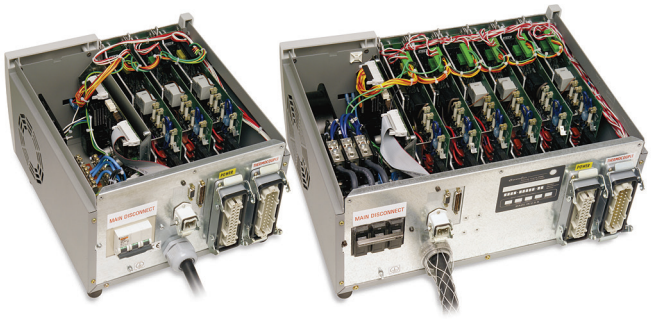
Network Module Features

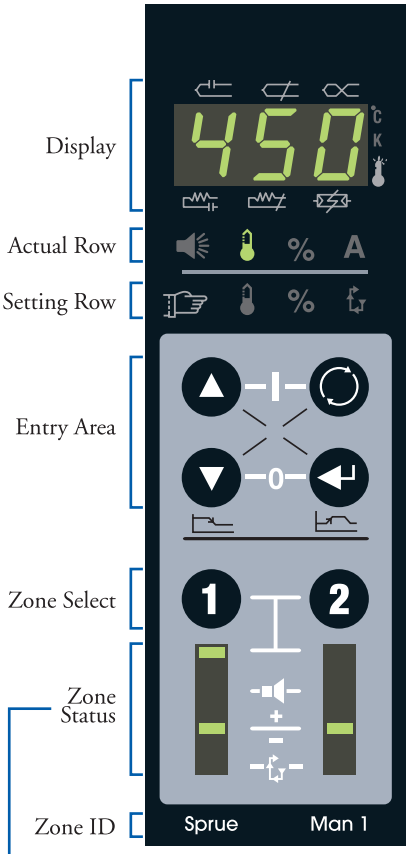
- Manages information for 1 or 2 enclosures
- Slaved Power Up – evenly heats all zones to setpoint
- Security Levels – Supervisor, Operator and Lockout
- Remote Input – Programmable Inhibit or Standby
- Alarm Output – when any alarm is active
- * Gammavision – SPC data/graphing
- * Mold Doctor – Advanced troubleshooting
- * Field Calibrator – Thermocouple offsets
- Link to plant monitoring system or machine

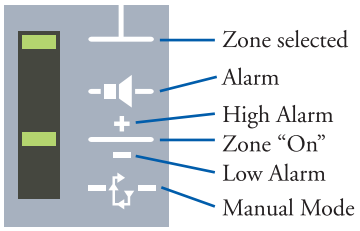


* Laptop/PC required









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)

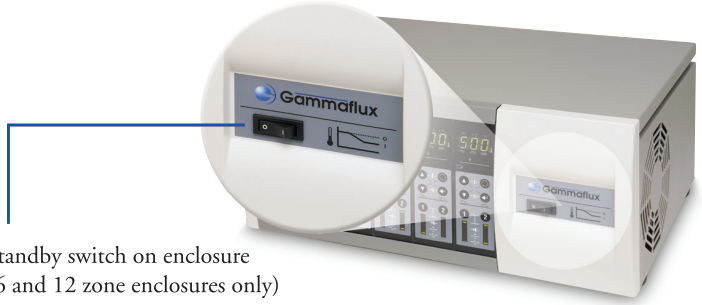
Automatic/Manual Mode
Manual % Output Set Point
Automatic Set Point

Select
Enter
Increment (Up)
Decrement (Down)

Power "On"
Power "Off"

Standby
Boost

First Zone (Zone 1)
Second Zone (Zone 2)



- Standby switch on enclosure (6 and 12 zone enclosures only)
- All zones go to standby mode

Since 1966 GAMMAFLUX has been the premier manufacturer of temperature control systems for hot runner injection molders. In addition to producing the most advanced temperature control and tool fault detection systems in the marketplace, our technology is available in a variety of temperature controllers that can accommodate any budget.

LEC Specifications

Performance

Thermocouple Calibration Accuracy	0.2°F (0.1°C)
Control Accuracy (steady state)	+/-0.1°F (+/-0.05°C)
Heater Short Detection Time	8.3 msec. or 120 times per second at 60 Hz
PID² Algorithm Execution Time	50 msec. or 20 times per second
Tuning	Automatic, self optimizing, manual override
Manual Mode	Power compensation for incoming voltage variation
Degree F or C	Field selectable
Operating Range	0 - 932°F (0 - 500°C)
Output Range	0 - 240 VAC, Phase angle fired, 1000 steps
Standby Temperature	User selectable, 0 - 932°F (0 - 500°C)
Remote Input (Network Module required)	24 or 120 VAC/VDC Programmable inhibit or standby

Input Specifications

Thermocouple	Type J standard, Type K selectable
Cold Junction Compensation	Internal to enclosure
External Resistance	10 Meg. Ohms
Temp. Variation due to T/C Length	None

Electrical

Input Voltage	180 - 265 VAC Delta/Wye
Frequency	47 - 53 Hz, 57 - 63 Hz
Ambient Temperature Range	32 - 115°F (0 - 45°C)
Humidity Range	10 - 95% non-condensing
Ouput Module Rating	240 VAC; 2 zone – 15 amps/zone 3600 watts/zone
Communications Electrical Standard	RS-232 standard, RS-485 selectable

Connections

Standard enclosure (2 zone)	HBE16 dual latch (combination power and thermocouple)
Standard enclosure (6 and 12 zone)	(2) HBE24 dual latch (one power, one thermocouple)
Standard tool end of cable	HA4 (2 zone only), HBE10, HBE16, HBE24, DME® (PIC/MTC5, 8 & 12), HBE48, or flying leads
Thermocouple cables	Stranded (stack mold or high stress applications)
Custom enclosure	Contact Gammaflux with your requirements
Custom tool end of cable	Contact Gammaflux with your requirements

Additional Customization

Input power cable	12 ft. (3.6m) standard, 15, 20 and 30 ft. (4.5, 6.1, and 9.1m) lengths available
Length of mold power and T/C cables	15 ft. standard (4.5m) and 30 ft. (9.1m) lengths available
Circuit breaker	Select the circuit breaker to meet your requirements

Performance Standards

U.S., Canadian and International	CE Mark; I.E.C. 801-1, 801-2, 801-3, 801-4 * Safety UL-508, UL-873 and CSA

*Designed to meet

Physical Specifications

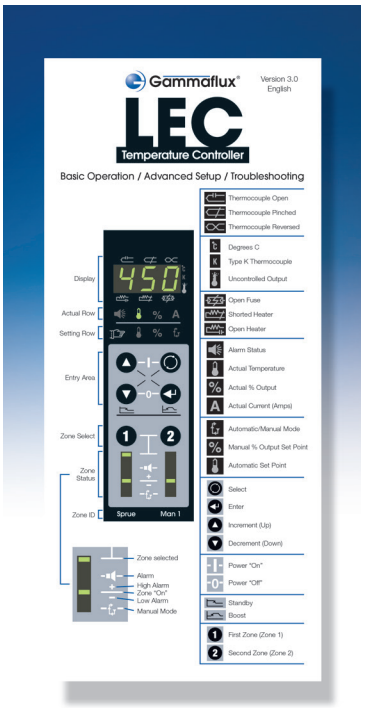
	Height (inches/millimeters)	Width (inches/millimeters)	Depth (inches/millimeters)	*Weight (pounds/kilograms)
2 Zone Enclosure	9/229	6/152	16/406	20/9
6 Zone Enclosure	9/229	13/330	16/406	28/13
12 Zone Enclosure	9/229	19/483	16/406	43/20
24 Zone Stacked Enclosure	18/457	19/483	16/406	86/36

*Weight includes maximum amount of output modules, excludes cables
Specifications subject to change without notice
DME® is a registered trademark of D-M-E Company

Summary

- Gammaflux Reliability
- Easy to Use
- Gammaflux Control
- Extensive Diagnostics
- Time Saving Features
- Material Saving Features
- Security
- Competitively Priced

User's Card



Step by step user's card eases system operation and is available in a variety of languages.

RoHS Compliant

Gammaflux®
A business of BARNES GROUP INC

Global Headquarters
Gammaflux L. P.
113 Executive Drive
Sterling, VA 20166 , USA
(800) 284-4477, or
+1-(703) 471-5050
+1-(703) 689-2131
info@gammaflux.com
www.gammaflux.com

European Headquarters
GF Controls GmbH Gammaflux
Peter Sander Straße 41a 55252
Wiesbaden Mainz-Kastel
Germany
+49-6134-938900
+49-6134-938902
info@gammaflux.de
www.gammaflux.com

Asia-Pacific Headquarters
Gammaflux Asia-Pacific
12B Gang Tian Industrial Square
Suzhou Industrial Park
China 215021
+ 86 512 62838870-866 (8:30am-5:00pm)
+ 86 13862017765 (after hours)
CN_Service_Request@synventive.com
www.gammaflux.com