



**Batch-type  
Convection Ovens**

**w/ STAT-350, PRO-350, or PRO-550 Controller**

**Installation, Operation, and Maintenance Manual**



2121 Reach Road  
Williamsport, PA 17701  
570-326-1770 Fax: 570-326-7304

Publication I-3015 REV B 07/2004

---


**Table Of Contents**

<b>1 Safety, Installation, &amp; Operation</b>	1.1	Instruction Notes .....	2
	1.2	Product Description .....	2
	1.3	Operating Parameters .....	3
	1.4	Cautions and Warnings .....	4
	1.5	Caution/Warning Labels .....	5
	1.6	Specifications .....	6
	1.7	Installation .....	8
	1.8	Control Layout .....	10
	1.9	Operating Controls & Features .....	11
	1.10	Optional Instruments .....	12
	1.11	Optional Instrument Functions .....	13
	1.12	Unit Operation: STAT/PRO-350 .....	15
	1.13	Unit Operation: PRO-550 .....	17
	1.14	Use of "One Pass" Air Flow System .....	18
<b>2 Maintenance, Troubleshooting, &amp; Parts</b>	2.1	Maintenance .....	20
	2.2	Troubleshooting .....	22
	2.3	Troubleshooting Guide .....	23
	2.4	Parts Diagram .....	24
	2.5	Parts List .....	25
	2.6	Maintenance Log .....	26

## 1.1 Instruction Notes

This manual contains **Notes**, **CAUTIONS**, and **WARNINGS** which must be followed to reduce the risk of improper maintenance, equipment damage, or personal injury. Read and follow all instruction notes. A description of these terms is as follows:

**Note:** *Contains any additional information important to a step or procedure.*

 **CAUTION:** Contains information on hazards or practices which could lead to moderate personal injury or equipment damage.

 **WARNING:** Contains information on hazards or practices which could lead to severe personal injury or death!

The  symbol (lightning bolt within safety alert triangle) precedes an electric shock warning statement.

## 1.2 Product Description

The Blue M batch ovens are industrial convection ovens available in single or double-door models. Common uses for the ovens are: epoxy curing, annealing plastics, pre-heating, PC board drying, post mold curing, and a variety of other uses.

The ovens come in various sizes ranging from 9 cubic feet (225 liter) to 96 cubic feet (2720 liter).

Temperature ranges for the ovens are as follows:

- Standard units: to 316°C (600°F)
- Extended range models: to 399°C (750°F)

Basic oven construction consists of heavy gauge cold-rolled steel outer chamber panels. Interior panels are constructed

of type 304 stainless steel. Four inches of Fiberglass insulation is used between interior and exterior oven walls.

Heavy-gauge, high temperature, nickel chromium wire elements provide heating. Horizontal air flow is provided by direct drive blower that is self-lubricated.

Temperature control is accomplished through single-set-point or profiling temperature controllers. A separate controller with its own thermocouple provides overtemperature protection.

All models are available with a variety of options such as: light towers, chart recorders, redundant overtemperature protection controllers, and timers. See the sales order for the options included on your unit.

### 1.3 Operating Parameters

Equipment damage, personal injury, or death may result if this equipment is operated or maintained by untrained personnel. Operators and service personnel must be familiar with the location and function of all controls and the inherent dangers of the equipment before operating or maintaining it. Blue M shall not be liable for any damages, including incidental and/or consequential damages, regardless of the legal theory asserted, including negligence and/or strict liability. Observe the following operating parameters to reduce the risk of equipment damage and personal injury:

 **WARNING**

- Read and understand this instruction manual and supplied drawings before operating or maintaining the equipment.
- Before using any of the materials or components specified in this manual, be aware of the handling, storage, and disposal precautions recommended by the manufacturer or supplier of the component. Failure to comply with the supplier's or manufacturer's recommendations may result in personal injury or component damage. See the supplier or manufacturer's manual(s) for more information.
- Do not remove or bypass any safety items or electrical circuits.
- Do not modify or change any component on this unit. Replacement parts must be original equipment manufacturer (OEM) specified replacement equipment. Modification or use of equipment other than its intended use may cause severe bodily injury and/or component damage and is therefore strictly prohibited.
- Obey all "DANGER", "WARNING", and "CAUTION" signs/labels mounted on the equipment. Do not remove any of these signs/labels.
- Never operate the equipment with any guards or shields missing. If it is necessary for guards and shields to be removed for service, replace them before operating the equipment.

**This equipment is designed to operate safely when the following environmental conditions are met:**

- 1) Indoor use only.
- 2) Within a temperature range of 5°C to 40°C.
- 3) Maximum (non-condensing) relative humidity 90% at 40°C.
- 4) Supply voltage fluctuations do not exceed +/-10% of nominal voltage.

## 1.4 Cautions and Warnings

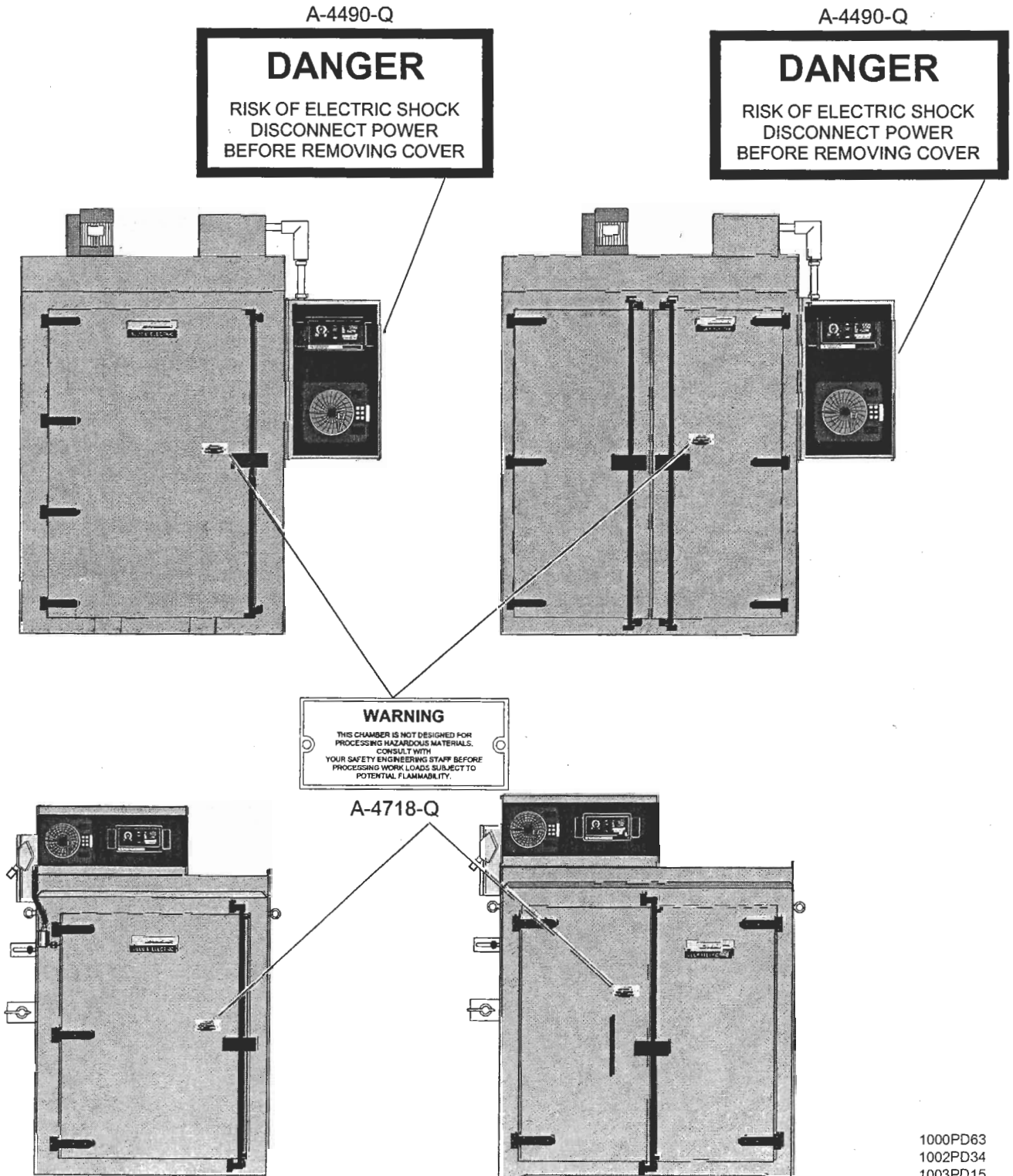
The following list of cautions and warnings will be found throughout this manual. Observe the cautions and warnings to reduce the risk of equipment damage and personal injury.

 **WARNING**

- Do not install unit in corrosive environment. Corrosive environment may lead to poor performance and deterioration of unit.
- Explosion hazard. Do not place the unit near combustible materials or hazardous fumes or vapors.
- Pinch point hazard. To ensure proper operation of unit and for safety, make sure that unit is level when installed. Door(s) may swing shut on personnel if unit is tilted.
- Electric shock hazard. Connect unit to proper line voltage. Connection to improper voltage may lead to equipment damage and serious personal injury.
- Electric shock hazard. Disconnect power before entering control panel.
- Explosion hazard. Do not process explosive or hazardous materials in this unit. Equipment damage and severe personal injury can result from processing combustible or hazardous materials.
- Equipment damage hazard. Blower motor must have correct rotation. Severe damage will occur if unit is run with incorrect blower rotation.
- Do not overload the floor of the oven or load the oven unevenly.
- Do not arbitrarily change controller configuration settings. Autotuning should be done with a "dummy" load to prevent product work load damage. See controller instructions for detailed configuration and operation information.
- Severe burn hazard. Do not touch hot surfaces of oven.
- Electric shock hazard. Multiple power sources may be connected to the equipment. Shutting off power at the control panel does not necessarily mean that all power supplies are disconnected from the equipment, nor to any power panels or transformers. Before performing maintenance on any electrical equipment, verify that power is disconnected and locked out. Maintenance personnel must be aware of procedures for disconnecting power.
- Electric shock and severe burn hazard. Never perform troubleshooting while the unit is in operation.

1.5 Caution/Warning Labels

Replace any missing or hard-to-read caution/warning labels.



- 1000PD63
- 1002PD34
- 1003PD15
- 1000PD58
- 1008PD14
- 1008PD15

1.6 Specifications

**General Specifications**

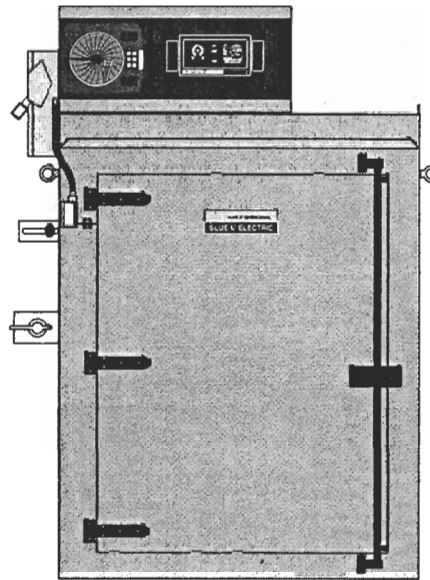
Temperature range: 15°C above ambient to 316°C (650°F)

Uniformity: ±1% of setpoint

Control accuracy: ±0.5°C

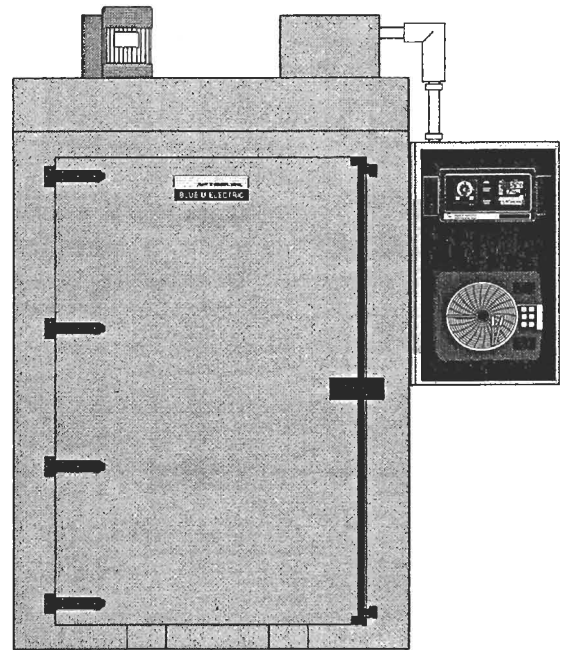
Resolution: ±0.1°C

- Empty chamber performance at rated voltage -



Condensed Specifications — Top Mounted									
Model	106 (top mounted)	166 (top mounted)		246 (top mounted)		326 (top mounted)		366 (top mounted)	
Interior Volume ft <sup>3</sup> (l)	9.0 (255)	16.0 (453)		24.0 (680)		32.0 (906)		36.0 (1020)	
Interior Dimensions WxDxH in. (mm)	19 x 20 x 39 (483 x 508 x 991)	24 x 24 x 48 (607 x 607 x 1219)		36 x 24 x 48 (914 x 607 x 1219)		48 x 24 x 48 (1219 x 607 x 1219)		36 x 36 x 48 (914 x 914 x 1219)	
Exterior Dimensions WxDxH in. (mm)	ENGINEERED TO ORDER CONTACT BLUE M ELECTRIC	51 x 39 x 85 (1295 x 991 x 2159)		63 x 39 x 85 (1600 x 991 x 2159)		75 x 39 x 85 (1905 x 991 x 2159)		63 x 51 x 85 (1600 x 1295 x 2159)	
Machine Footprint ft <sup>2</sup> m <sup>2</sup>		13.8 (1.28)		17.1 (1.59)		20.3 (1.88)		22.3 (2.07)	
Electrical Service		Standard	High power	Standard	High power	Standard	High power	Standard	High power
208 VAC 3Ph 50/60 Hz Line Current (per ph)		9.0kW 29	13.5kW 42	11.0kW 33	16.0kW 48	14.0kW 42	20.0kW 61	14.0kW 42	20.0kW 61
240 VAC 3Ph 50/60 Hz Line Current (per ph)		12.0kW 33	18.0kW 47	14.0kW 38	21.0kW 54	18.0kW 47	27.0kW 70	18.0kW 47	27.0kW 70
480 VAC 3Ph 50/60 Hz Line Current (per ph)		12.0kW 17	18.0kW 24	14.0kW 19	21.0kW 28	18.0kW 24	27.0kW 35	18.0kW 24	27.0kW 35

**General Specifications**  
 Temperature range: 15°C above ambient to 316°C (650°F)  
 Uniformity: ±1% of setpoint  
 Control accuracy: ±0.5°C  
 Resolution: ±0.1°C  
 - Empty chamber performance at rated voltage -



*Allied Mechgr @ AOL.com  
 Glen*

Condensed Specifications — Side Mounted							
Model	606 (side mounted)		756 (side mounted)	806 (side mounted)		966 (side mounted)	
Interior Volume ft <sup>3</sup> (l)	60.0 cu. ft.		75.0 (2125)	80.0 (2266)		96.0 (2720)	
Interior Dimensions WxDxH in. (mm)	36 x 48 x 60 (914 x 1219 x 1524)		36 x 60 x 60 (914 x 1524 x 1524)	48 x 48 x 60 (1219 x 1219 x 1524)		48 x 48 x 72 (1219 x 1219 x 1829)	
Exterior Dimensions WxDxH in. (mm)	80 x 63 x 93 (2032 x 1600 x 2362)		ENGINEERED TO ORDER CONTACT BLUE M ELECTRIC	92 x 63 x 93 (2339 x 1600 x 2362)		92 x 63 x 104 (2339 x 1600 x 2642)	
Machine Footprint ft <sup>2</sup> m <sup>2</sup>	35.0 (3.25)			40.2 (3.7)		40.2 (3.7)	
Electrical Service	Standard	High power		Standard	High power	Standard	High power
208 VAC 3Ph 50/60 Hz Line Current (per ph)	18.0kW 59	26.0kW 84		21.0kW 67	30.0kW 93	24.0kW 76	NA
240 VAC 3Ph 50/60 Hz Line Current (per ph)	24.0kW 47	34.5kW 96		28.0kW 76	40.0kW 106	32.0kW 87	NA
480 VAC 3Ph 50/60 Hz Line Current (per ph)	24.0kW 34	36.0kW 48		28.0kW 38	40.0kW 53	32.0kW 43	48.0kW 62



## 1.7 Installation

These Installation Instructions contain general information on initial inspection and installation of unit. Read and understand these instructions before attempting to operate or service this equipment.

### A. Uncrating

Carefully uncrate unit and all accessories. Visually inspect for any signs of damage from improper handling. Report all claims for damage to carrier immediately. Blue M will assist you with your claim, if requested. Do not return goods to Blue M without written authorization.

Do not discard the shipping container. A request for an inspection of the shipping container and equipment should be made to the carrier when a claim is submitted for shipping damage.


### B. Location

This unit will maintain temperatures within its range to close tolerances for extended periods without adjustment. Producing results compatible with this unit's capabilities requires reasonable care in choice of location. Line voltage variations should be kept to a minimum for best control accuracy. Do not locate unit in areas of wide ambient temperature variation such as near vents or outdoor entrances. Unit should be placed at least 30 centimeters from walls, although more may be required for ease of maintenance. Do not install unit in circumstances that would inhibit venting.

Corrosive environments may lead to shortened life or deterioration of unit and performance.

 **WARNING: Explosion hazard. Do not place the unit near combustible materials or hazardous fumes or vapors.**

 **CAUTION: Do not install unit in corrosive environment. Corrosive environment may lead to poor performance and deterioration of unit.**

 **CAUTION: Pinch point hazard. To ensure proper operation of unit and for safety, make sure that unit is level when installed. Door(s) may swing shut on personnel if unit is tilted.**

### C. Power Connection

 **WARNING: Electric shock hazard. Connect unit to proper line voltage. Connection to improper voltage may lead to equipment damage and serious personal injury.**

**Chamber must be grounded.** For personal safety and to ensure trouble-free operation, this unit must be properly grounded before it is used.

Consult the National Electric Code and local codes to ensure safety and compliance with appropriate codes. Utilize proper grounding techniques to reduce RFI (radio frequency interference) and EMI (electro-magnetic interference) for electronic gear. Do not connect unit to already overloaded power lines—lower voltage to unit will decrease power to heating elements.

 **WARNING: Electric shock hazard. Disconnect power before entering control panel.**

**D. Blower Rotation**

Unit must be checked for proper blower rotation. Incorrect blower rotation results in a substantial reduction of airflow. Rotation is correct when a rapid movement of air can be felt from the right side of chamber interior.

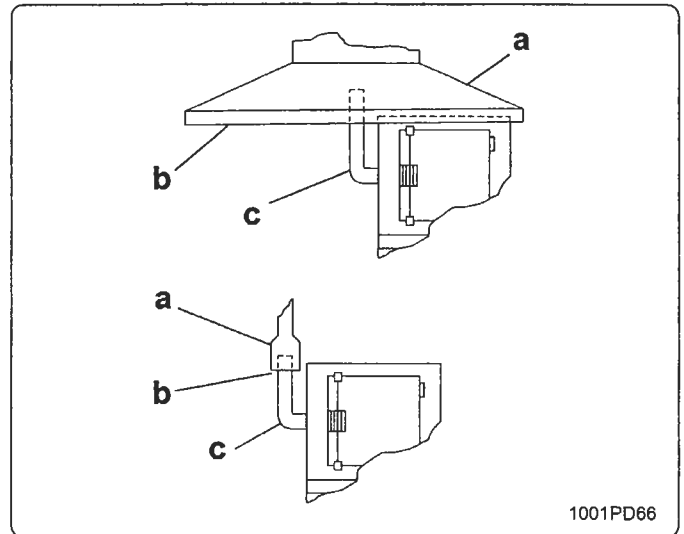
On three phase units, reversing any two of the incoming power lines will reverse blower rotation. Check airflow both ways to determine which produces greatest airflow.

**Note:** *The heating elements on three phase units will not energize if blower rotation is incorrect. As a safety feature, the unit has an air flow switch installed in the blower plenum of the oven. The pressure switch is used to sense the pressure differential created by the blower. If airflow is not great enough, caused by incorrect blower rotation, elements will not energize.*

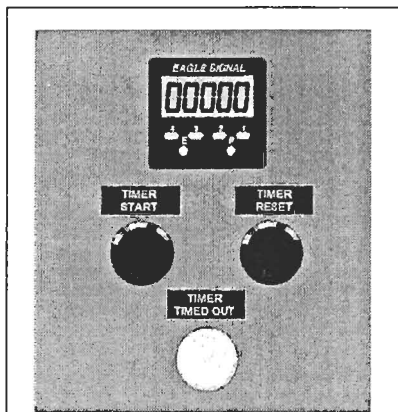
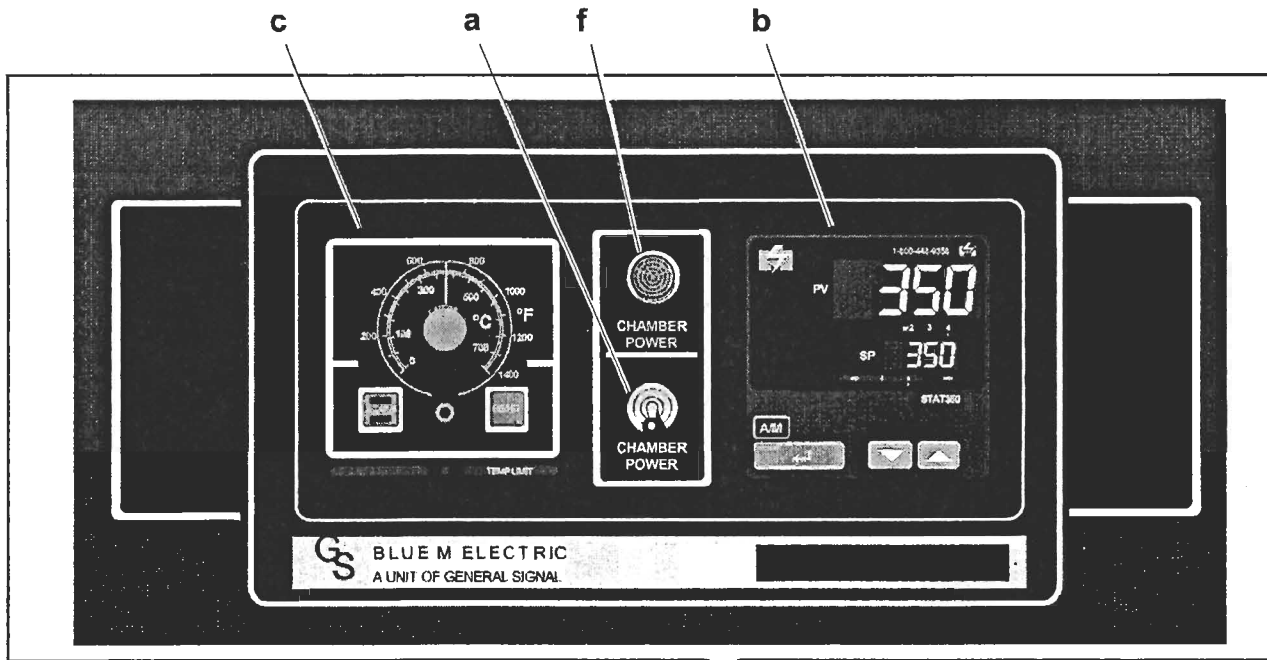
**E. Exhaust Modifications**

**Note:** *Never use an exhaust stack directly between unit and the exhaust. A draft diverter, vacuum breaker, exhaust hood, or similar device as shown in illustration must be connected between unit and exhaust. This is to prevent "chimney effect" which would suck heat out of chamber resulting in slow run-up time or poor temperature uniformity.*

In the illustration, (a) refers to point of negative pressure where a vacuum draws exhaust. Point (b) is atmospheric pressure and no vacuum exists which would suck out exhaust from the exhaust outlet. Point (c) is the actual exhaust stack itself with direction of exhaust rising up to hood.



1.8 Control Layout

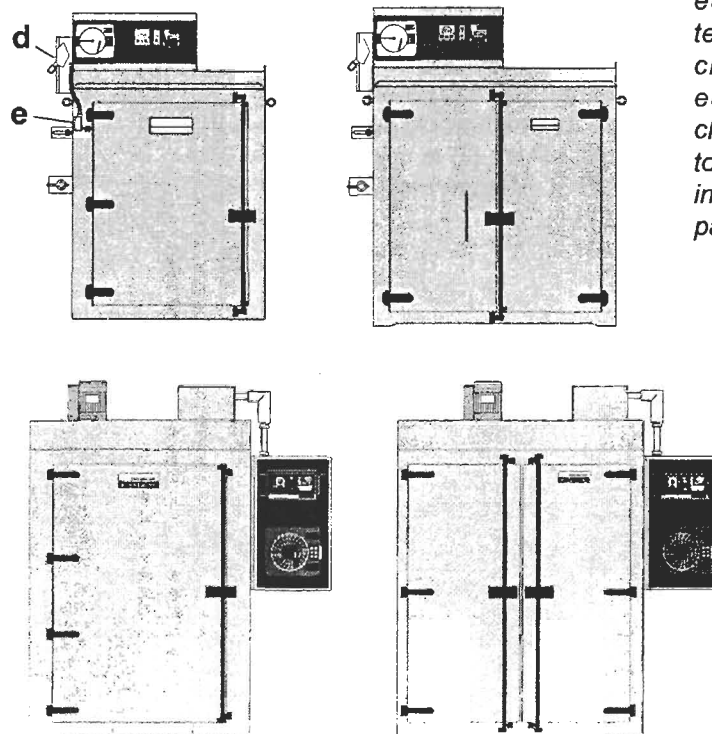


Typical Optional Timer Layout

**Typical Operation**

The controller (STAT-350) establishes the temperature setpoint. Once at setpoint, press TIMER START pushbutton, the oven holds the setpoint for the duration of the time set by the timer. The TIMER TIMED OUT pilot light illuminates at the end of the timed cycle. Press the TIMER RESET pushbutton to reset the system for the next cycle.

**Note:** *Timer operation procedures may vary, check sales order and quote for specific operation.*



**Note:** *As a unit equipped with over temperature protection circuitry (OTP), this equipment must be checked once a month to ensure it is performing according to design parameters.*

- 1000PD63
- 1000PD58
- 1008PD14
- 1008PD15
- 1011PD77

## 1.9 Operating Controls & Features

### Toggle Switch — Main (a)

This toggle switch turns power on and off to the control circuit.

### Temperature Controller — Main (b)

Your oven will utilize one of the following microprocessor based, PID-type controllers: STAT-350, PRO-350, or PRO-550. The STAT-350 functions as a single-setpoint controller. The PRO-350 is a programmable controller that can store 2 programs up to 10 segments each or a single 20 segment program. The PRO-550 is a programmable controller that can store up to 30 separate programs, 99 segments each, or one program of 300 segments.

Each controller controls power to the heating elements' solid state heat relays. A thermocouple is electrically connected to the controller to detect temperature data and automatically react as required. Each controller must be configured to your specific unit and its options before being used. **The controller is configured at the factory.** For more information on the configuration and operation of the controller refer to the appropriate controller user's guide included in your instruction package.

The PRO-550 utilizes a series of timers to enable "events". These events activate contactors, solenoids, or relays depending on the unit and how the controller is configured, which in turn control heating elements, water flow, inert gas flow, etc.. Refer to the wiring diagram event table for the specific events of your controller.

The PRO-550 controller may also be configured and programmed through LL-100 parameter setting software. This Windows-based software is included with your instruction package. Refer to the controller user's guide and the Yokogawa LL-100 instruction manual.

### Temperature Controller — OTP (Over-temperature Protection) (c)

The OTP control is a fully independent system with its own thermocouple and FM approved controller. At over-temperature, the OTP controller will remove power to the oven. Turning the knob on front of the controller to the desired value sets the OTP setpoint. Usually, the OTP will be set 10°C above the main temperature controller setpoint. *Once tripped, it is necessary to press the reset square on the OTP controller to return power to the heating system.* The red light on the control indicates over-temperature. A green

light indicates that unit is operating and not in an alarm condition. For additional information, refer to the Temp Limit instruction manual included in your instruction package.

### Fused Disconnect (d)

Switch serves as the main power supply shut off and power connection point. Fuses protect entire unit from excess current and shorts. Switch is located on rear of some units (DC-606, 806, 966).

**⚠ WARNING: Electric shock and fire hazard. Replace blown fuses with same amperage rating as original.**

### OTP Alarm Buzzer

The alarm buzzer sounds when the unit has shut down from an over-temperature condition.

### Pressure Switch

Pressure switch cuts power to the heating elements in event that airflow is insufficient due to blower motor failure, fan failure, or incorrect wiring of blower motor.

### Door Switch (e) (optional)

Switch cuts power to heating elements in event that door is opened during operation.

### Pilot Light — Chamber Power (red) (f)

This pilot light illuminates when chamber power switch is in the on position indicating power to control circuit.

***The following two switches are located inside the control panel.***

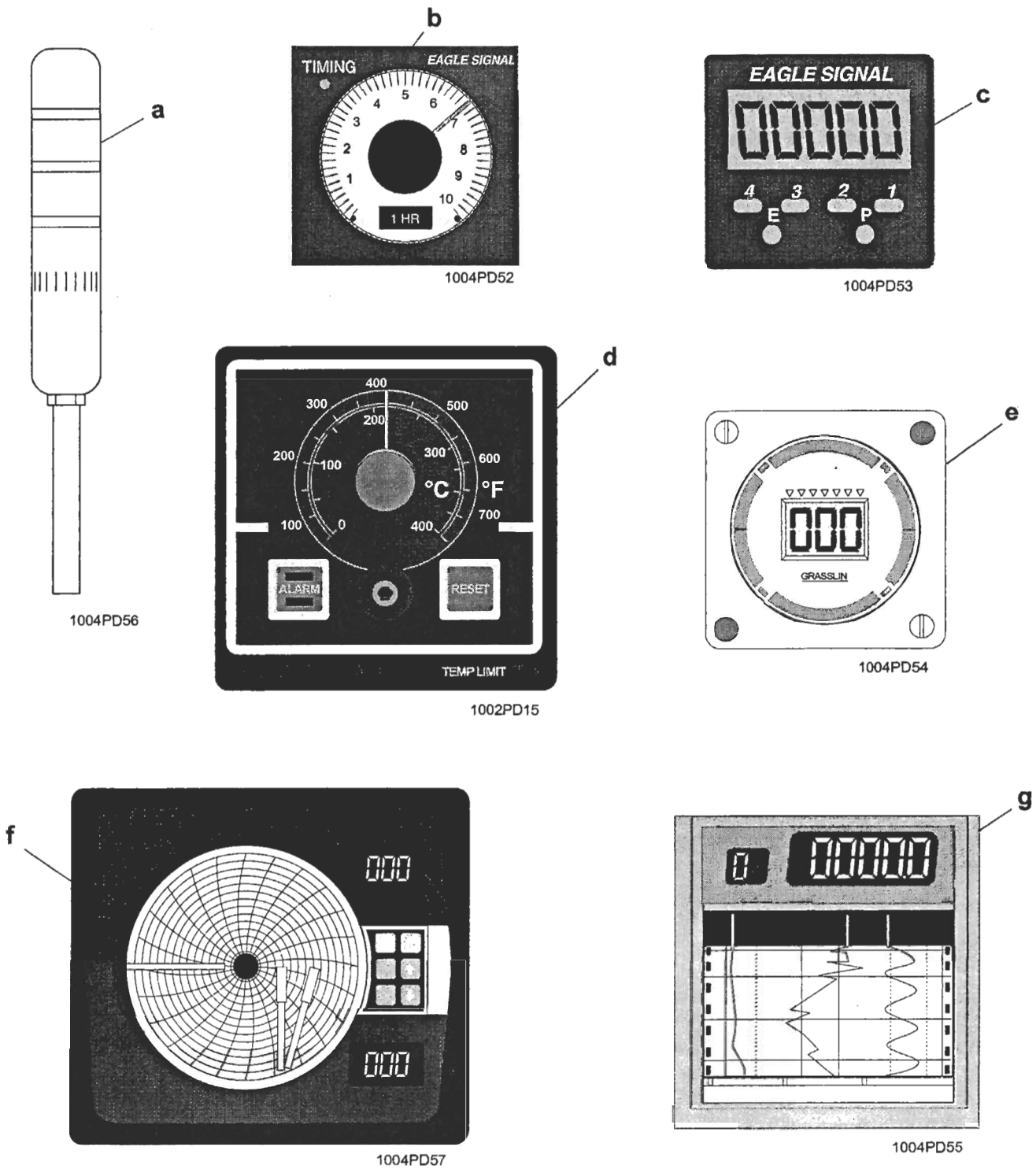
### Limit Switch — Panel Interlock

This safety switch disconnects power from most exposed terminals within the control compartment whenever the panel is removed for service. However, you should remove all power by disconnecting the main line breaker before attempting any service or maintenance.

### Keyed Switch — Interlock Override (if equipped)

This key lock switch is located on the side of the slide tray and is accessed when the control panel is slid out. This switch allows power to slide tray for troubleshooting when slide tray is out of unit. Switch is activated with key. Switch must be off and key removed before slide tray can be pushed back into unit.

1.10 Optional Instruments



Illustrations not to scale—for reference only.

## 1.11 Optional Instrument Functions

Items in *italics* are as shown on wiring diagram.

### Light Tower (a)

The light tower includes alarm buzzer, red, amber, and green lights. Green light is lit during normal operations of program—no alarm conditions. The alarm buzzer sounds and amber light flashes signifying end of program cycle. The red light will illuminate signifying system alarm during program process. System alarms include: door open, OTP trip, either of the two air flow switches tripped, and/or overload of either blower motor.

### Analog Timer (b)\*

The analog timer is used for simple timed thermal processes. The controller (STAT-350) establishes the temperature setpoint. Once the oven is loaded and at setpoint, the operator presses the "Timer" button, and the oven holds the setpoint for the duration of the time set by the timer. When the timer expires an alarm sounds and the oven shuts off. Pressing the "Timer" button silences the alarm. The timer is adjustable up to 10 hours. See manufacturer's instruction for further information.

### Digital Process Timer (c)\*

The digital timer enables the oven to be used for simple timed thermal process which require precise settings or long cycle settings. The controller (STAT-350) establishes the temperature setpoint. Once at setpoint, the operator presses start, a timing light will illuminate and the oven holds the setpoint for the duration of the time set by the timer. The timer is adjustable up to 9,999 hours. A reset button is provided to reset the system for the next cycle. See manufacturer's instruction for further information.

### Redundant OTP (d)

The OTP control is a fully independent system with its own thermocouple. At over-temperature, the OTP will remove power to the heating elements' solid state heat relays, but the chamber and forced exhaust blowers will remain on. The OTP setpoint is set by turning the knob on the front of the control to the desired value. Usually, the OTP will be set 10°C above the Main Temperature Controller. *Once tripped, it is necessary to press the reset square on the OTP control to return power to the heating systems.* The red light on the control indicates over-temperature. A green light indicates that unit is operating and not in an alarm condition. For additional information, refer to manufacturer's manual included in your instruction package.

### Digital 7-day/24-hour Timer (e)\*

This timer enables the oven to shut off at night and turn on and ramp back to temperature before the work day starts. The timer can be programmed to have different hours of operation for any day of the week. The controller (STAT-350) sets the temperature setpoint. The timer is then programmed with up to 10 on/off cycles which can be assigned to any combination of days. See manufacturer's instruction for more information.

### MRC-5000 or BM 7000 Recorder (f)

Single- or dual-pen circular chart recorder measures, displays, and records temperature. See manufacturer's instruction for detailed information.

### SR-1000 Recorder (g)

Single-pen strip chart recorder measures, displays, and records temperature. See manufacturer's instruction for more information.

---

#### \* Modes of Operation for Timers (on factory installed units)

**Standard Mode:** When timer expires power is shut off to heating elements and blower, an alarm sounds and must be silenced through timer reset button.

**Option B:** When timer expires blowers remain on, heat is shut off, alarm sounds. Press the timer reset button to silence alarm.

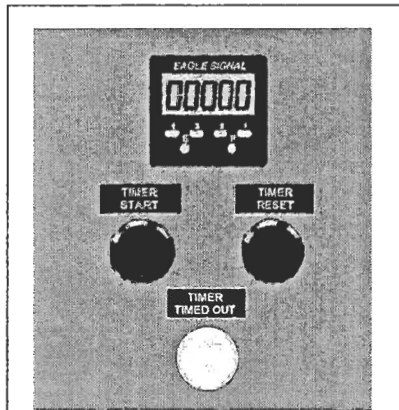
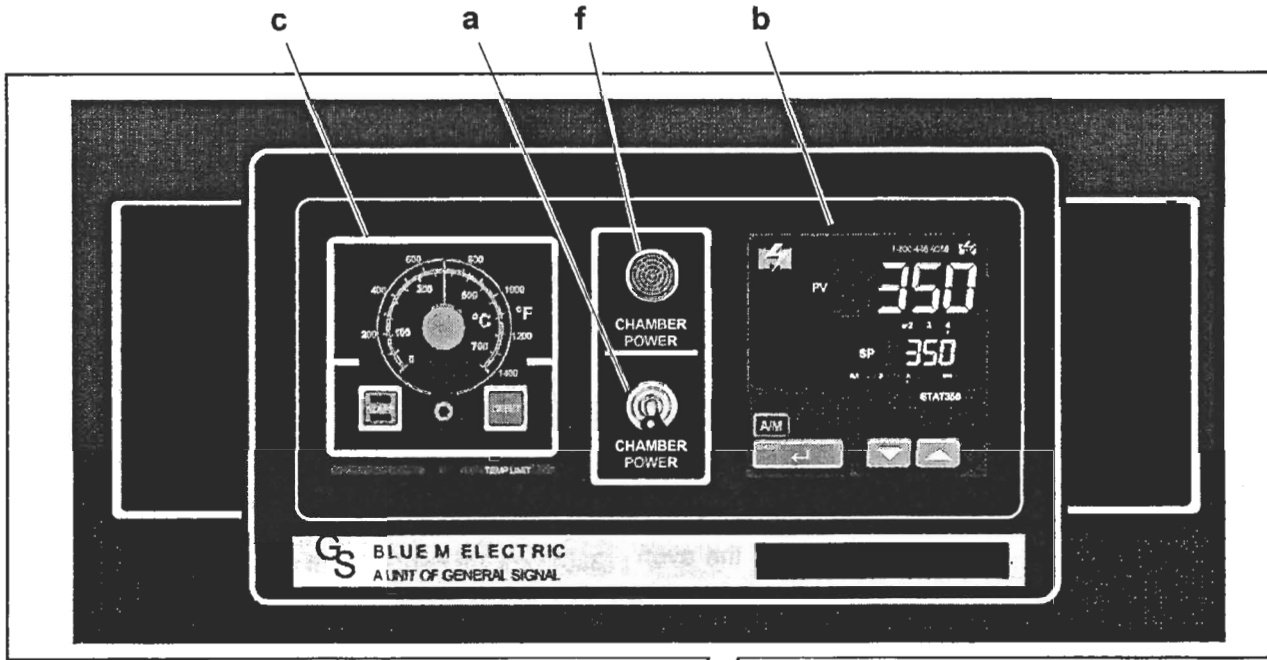
To configure: Remove wire from 5C terminal 5 and connect to terminal 29 on terminal block.

**Option C:** When timer expires oven stays at temperature, blowers remain on, and alarm sounds. Silence alarm by pressing timer reset button. Note this mode of operation is not available on 7-day/24-hour timers.

To configure: Place jumper from terminal 29 to terminal 4 on terminal block.

Control Layout

1008PD16

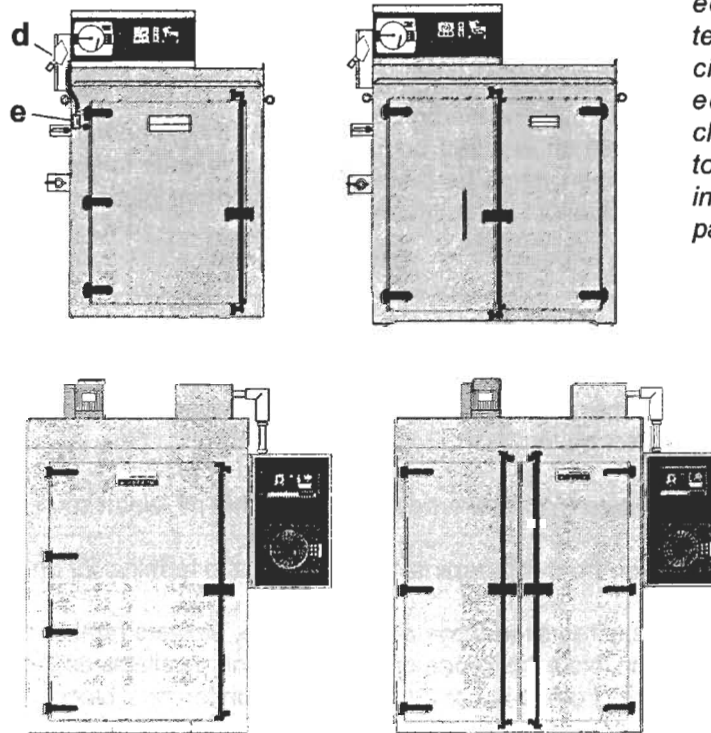


Typical Optional Timer Layout

Typical Operation

The controller (STAT-350) establishes the temperature setpoint. Once at setpoint, press TIMER START pushbutton, the oven holds the setpoint for the duration of the time set by the timer. The TIMER TIMED OUT pilot light illuminates at the end of the timed cycle. Press the TIMER RESET pushbutton to reset the system for the next cycle.

**Note:** Timer operation procedures may vary, check sales order and quote for specific operation.



**Note:** As a unit equipped with over temperature protection circuitry (OTP), this equipment must be checked once a month to ensure it is performing according to design parameters.

1000PD63  
 1000PD58  
 1008PD14  
 1008PD15  
 1011PD77

## SPECIFICATION

**Accuracy:**  
 ±0.5°C temp;  
 0.03% rdg. process typical

**Resolution:**  
 1°/0.1°; 10 µV process

**Temperature Stability:**  
 1°C/°C RTD;  
 0.5°C/°C TC @ 25°C (77°F);  
 50 ppm/°C process

**Display:**  
 4-digits, 9-segments LED,  
 10.2 mm (0.40") with red, green and  
 amber programmable colors

**Input Types:**  
 Thermocouple, RTD, Analog Voltage  
 and Current

**TC: (ITS 90)**  
 J, K, T, E, R, S, B, C, N, L

**RTD: (ITS 68)**  
 100/500/1000 ohm Pt sensor  
 2-, 3-, or 4-wire; 0.00385 or 0.00392  
 curve

**Voltage:**  
 0 to 100 mV, 0 to 1 V, 0 to 10 Vdc

**Current:**  
 0 to 20 mA (4 to 20 mA)

**Output 1:**  
 Relay 250 Vac @ 3 A Resistive Load,  
 SSR, Pulse, Analog Voltage and Current

**Output 2:**  
 Relay 250 Vac @ 3 A Resistive Load,  
 SSR, Pulse

**Options: Communication**  
 RS-232 / RS-485 or  
**Excitation:** 24 Vdc @ 25 mA  
*Not available for Low Power Option*

**Line Voltage/Power:**  
 90 - 240 Vac ±10%, 50 - 400 Hz\*,  
 or 110 - 375 Vdc, 4 W  
 \* No CE compliance above 60 Hz

**Low Voltage Power Option:**  
 12 - 36 Vdc, 3 W\*\*  
 \*\* Units can be powered safely with 24 Vac  
 but No Certification for CEUL are claimed.

**Dimensions:**  
 25.4 H x 48 W x 126.3 D mm  
 (1.0 x 1.89 x 5")

**Weight:**  
 127 g (0.28 lb)

**Approvals:**  
 UL, UL-C, CE per EN50081-1,  
 EN50082-2, EN61010-1



**WARNING:** These products are not designed for use in, and should not be used for, patient-connected applications.

This device is marked with the international caution symbol. It is important to read the Setup Guide before installing or commissioning this device, as the guide contains important information relating to safety and EMC.

It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

**TRADEMARK NOTICE:**

**omega.com**, **OMEGA**, and are Trademarks of OMEGA ENGINEERING, INC.

## iSeries i/32 Temperature & Process Controller



<b>OMEGAnet® On-Line Service</b> www.omega.com	<b>Internet e-mail</b> info@omega.com
---	--

### Servicing North America:

**USA:**  
 ISO 9001 Certified  
 One Omega Drive, P.O. Box 4047  
 Stamford CT 06907-0047  
 TEL: (203) 359-1660 FAX: (203) 359-7700  
 e-mail: info@omega.com

**Canada:**  
 976 Bergar  
 Laval (Quebec) H7L 5A1  
 TEL: (514) 856-6928 FAX: (514) 856-6886  
 e-mail: info@omega.ca

### For immediate technical or application assistance:

**USA and Canada:**  
 Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA®  
 Customer Service: 1-800-622-2378 / 1-800-622-BEST®  
 Engineering Service: 1-800-872-9436 / 1-800-USA-WHEN®

**Mexico and Latin American:**  
 TEL: (001)800-TC-OMEGA® FAX: (001) 203-359-7807  
 En Español: (001) 203-359-7803  
 e-mail: espanol@omega.com

### Servicing Europe:

**Benelux:**  
 Postbus 8034, 1180 LA Amstelveen, The Netherlands  
 TEL: +31 20 3472121 FAX: +31 20 6434643  
 Toll Free in Benelux: 0800 0993344  
 e-mail: sales@omegaeng.nl

**Czech Republic:**  
 Rudé armády 1868, 733 01 Karviná 8  
 TEL: +420 59 6311899 FAX: +420 59 6311114  
 e-mail: info@omegashop.cz

**France:**  
 11, rue Jacques Cartier, 78280 Guyancourt  
 TEL: +33 1 61 37 29 00 FAX: +33 1 30 57 54 27  
 Toll Free in France: 0800 466 342  
 e-mail: sales@omega.fr

**Germany/Austria:**  
 Daimlerstrasse 26, D-75392 Deckenpfronn, Germany  
 TEL: +49 7056 9398-0 FAX: +49 7056 9398-29  
 Toll Free in Germany: 0800 639 7678  
 e-mail: info@omega.de

**United Kingdom:**  
 ISO 9002 Certified  
 One Omega Drive  
 River Bend Technology Centre  
 Northbank, Irlam Manchester M44 5BD United Kingdom  
 TEL: +44 161 777 6611 FAX: +44 161 777 6622  
 Toll Free in England: 0800 488 488  
 e-mail: sales@omega.co.uk

**WARRANTY/DISCLAIMER**

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **one (1) year** from the date of purchase. In addition to OMEGA's standard warranty period, OMEGA Engineering will extend the warranty period for **four (4) additional years** if the warranty card enclosed with each instrument is returned to OMEGA.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

**RETURN REQUESTS/INQUIRIES**

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:

- Purchase Order number under which the product was PURCHASED.
- Model and serial number of the product under warranty, and
- Repair instructions and/or specific problems relative to the product.

FOR NON-WARRANTY REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

- Purchase Order number to cover the COST of the repair,
- Model and serial number of product, and
- Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords customers the latest in technology and engineering.

is a registered trademark of OMEGA ENGINEERING, INC.

Copyright 2001 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without the prior written consent of OMEGA ENGINEERING, INC.

**PATENT AND TRADEMARK NOTICE:** This product is covered by one or more of the following patents: U.S. Pat. No. Des. 336,895; 5,274,577; 6,243,021 / CANADA 2052589; 2052600 / ITALY 1249456; 1250838 / GERMANY DE 41 34398 C2 / SPAIN 2039150; 2048066 / UK Patent No. GB2 249 937; GB2 248 954 / FRANCE BREVET NO. 91 12756. The "Meter Bezel Design" is a trademark of Newport Electronics, Inc. USED UNDER LICENSE. Other U.S. and International Patents pending or applied for.