Thermo
SCIENTIFIC

Educational Plant Chambers

Installation and Operation Manual

7003768 Rev. 0

Models	Voltage
3768 (846)	120V
3769 (846-3)	220V

MANUAL NUMBER 7003768

REV	ECR/ECN	DATE	DESCRIPTION	By
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Important Read this instruction manual. Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel, and poor equipment performance. ▲

Caution All internal adjustments and maintenance must be performed by qualified service personnel. ▲

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Important operating and/or maintenance instructions. Read the accompanying text carefully.

Potential electrical hazards. Only qualified persons should perform procedures associated with this symbol.

Equipment being maintained or serviced must be turned off and locked off to prevent possible injury.

Hot surface(s) present which may cause burns to unprotected skin, or to materials which may be damaged by elevated temperatures.

Marking of electrical and electronic equipment, which applies to electrical and electronic equipment falling under the Directive 2002/96/EC (WEEE) and the equipment that has been put on the market after 13 August 2005.

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the WEEE symbol. Thermo has contracted with one or more recycling/disposal companies in each EU Member State European Country, and this product should be disposed of or recycled through them. Further information on Thermo's compliance with this directive, the recyclers in your country and information on Thermo products will be available at www.thermo.com.

- ✔ Always use the proper protective equipment (clothing, gloves, goggles, etc.)
- ✔ Always dissipate extreme cold or heat and wear protective clothing.
- ✔ Always follow good hygiene practices.
- ✔ Each individual is responsible for his or her own safety.

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Our **Service Support** staff can supply technical information about proper setup, operation or troubleshooting of your equipment. We can fill your needs for spare or replacement parts or provide you with on-site service. We can also provide you with a quotation on our Extended Warranty for your Thermo Scientific products.

Whatever Thermo Scientific products you need or use, we will be happy to discuss your applications. If you are experiencing technical problems, working together, we will help you locate the problem and, chances are, correct it yourself...over the telephone without a service call.

When more extensive service is necessary, we will assist you with direct factory trained technicians or a qualified service organization for on-the-spot repair. If your service need is covered by the warranty, we will arrange for the unit to be repaired at our expense and to your satisfaction.

Regardless of your needs, our professional telephone technicians are available to assist you Monday through Friday from 8:00 a.m. to 6:00 p.m. Eastern Time. Please contact us by telephone or fax. If you wish to write, our mailing address is:

Thermo Fisher Scientific
401 Millcreek Road, Box 649
Marietta, OH 45750

International customers, please contact your local Thermo Scientific distributor.

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Section 1 Introduction

Thank you for selecting Thermo Scientific for your equipment needs.

The Thermo Scientific Educational Chambers have been specifically designed to bring controlled environments, natural or experimental, to the classroom. Automatically timed lighting of variable intensity provides for photoperiodism and photosynthesis demonstrations. In addition, the effects of various light color balances can be observed; experiments can be performed in darkness, hydroponic growth and aquatic or marine life studies can be conducted, as well as comparative experiments using a variety of plants and soils.

Section 2 Specifications

Power Requirements

3768: 120 VAC, 60 Hz, 800 Watts

3769: 240 VAC, 50 Hz, 800 Watts

Timer

24-hour cycle; can be set in 15-minute increments.

Fluorescent Tubes

Requires 4, 40-watt, rapid-start 48"-long tubes. Full spectrum "grow lamp" type tubes may be used provided that they are the rapid-start type.

Incandescent Tubes

Requires 3 bulbs, no more than 150-watts each. Clear, frosted or colored incandescent bulbs may be used. Bulbs rated at unit line voltage.

Chamber Capacity

14.2 cubic feet (0.4 cubic meters)

Dimensions

Exterior:

Height . . . . . .38 in (97 cm)

Width . . . . . .52 in (132 cm)

Depth . . . . . .18.5 in (47 cm)

Interior:Height . . . . . .29 in (74 cm)

Width . . . . . .50 in (127 cm)

Depth . . . . . .17 in (43 cm)

Operating Environment

Pollution Degree: 2

Installation Category: II

Altitude: 2000 Meters MSL (Mean Sea Level)

Humidity: 80% maximum, non-condensing

Electrical Supply: 120VAC Or 240VAC

Voltage Tolerance: ±10% of normal rated line

Temperature: 15°C To 40°C

Product Usage: This product is intended for use indoors only

Section 3 Features

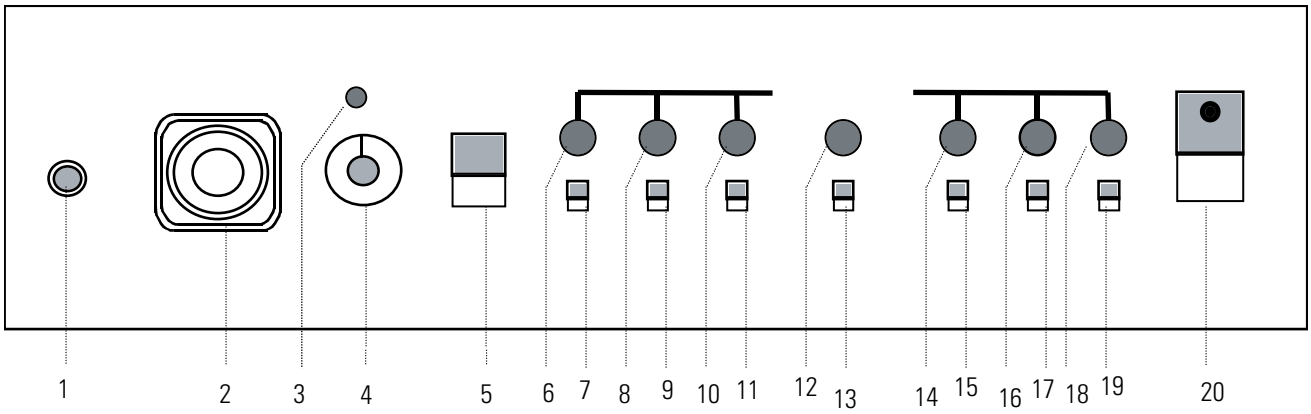

Figure 3-1. Control Panel

1. CIRCUIT BREAKER: Circuit breaker pops out in the event of power interruption. Push in to reset.

2. 24-HOUR TIMER: Controls the fluorescent and incandescent lights only. Each tab controls a 15-minute increment. Trippers pushed toward center place timer in non-timing mode; trippers pushed outward select timing periods. Inside selector must be centered for timing operation, Model 3769 only.

3. TEMPERATURE CONTROL THERMOSTAT STATUS LAMP: Lit when thermostat is operating.

4. TEMPERATURE CONTROL THERMOSTAT: This hydraulic thermostat can be set to control chamber temperature automatically by controlling power to the lamps and heater strip plugged into the right-hand receptacle. The sensor bulb and capillary tube can be suspended in the chamber, immersed in plant tray water or buried in plant soil.

5. AUTOMATIC/MANUAL OPERATION SELECTOR SWITCH: This 2-position rocker switch selects manual or automatic control of lights in unison with the position of the individual switches of the lights. When lower half of the switch is depressed, manual control of individual lights is possible; upper half depressed effects timer control of lights.

6. FAN CONTROL STATUS LAMP: Lit when fan is operating.

7. FAN CONTROL SWITCH: This 3-position switch is unaffected by the 24-hour timer (2) or the automatic/manual switch (3). The fan will stay on at all times, if the switch is placed either in the up or down position - center position is off.

8 & 10. FLUORESCENT LAMP STATUS LAMPS: These indicate whether the lights are on or off.

9 & 11. FLUORESCENT LAMP SWITCHES: These two rocker switches each control a pair of fluorescent lights. The left-hand switch (9) controls the front pair of lights; the right-hand switch (11) controls the rear pair. Switches have 3 positions.

12, 14 & 16. INCANDESCENT LAMP STATUS LAMPS: These indicate whether the lights are on or off.

13, 15 & 17. INCANDESCENT LAMP SWITCHES: These three rocker switches each control one incandescent lamp. Lamps are located at left, center and right on back wall of chamber. Switches have 3 positions.

18. RIGHT-HAND RECEPTACLE STATUS LAMP: Lit when the temperature control thermostat switch is turned on.

19. RIGHT-HAND RECEPTACLE SWITCH: This 3-position switch controls power to the right-hand receptacle located on the light bank at the top of the chamber, but only when energized by the thermostat. The right receptacle is always controlled by the thermostat and is unaffected by the timer or automatic/manual switch. It will stay on at all times if the switch is placed either in the up or down position - center position is off.

20. MAIN POWER SWITCH: Controls power to the unit.

Inside the Chamber

RIGHT-HAND RECEPTACLE: Grounded outlet is powered when the main power switch and when the thermostat are turned on. Use it for the heater strip (supplied), a humidifier or other apparatus.

Warning Using any equipment in this unit not rated for the operating temperature of the unit may result in property damage and serious injury and/or death. ▲

Section 4 Unpacking and Installation

The shipping carton should be inspected upon delivery. When received, carefully examine for any shipping damage before unpacking. If damage is discovered, the delivering carrier should both specify and sign for the damage on your copy of the delivery receipt.

Open the carton carefully, making certain that all parts are accounted for before packaging materials are discarded - after unpacking, if damage is found promptly report it to the carrier and request a damage inspection promptly.

Important Failure to request an inspection of damage within a few days after receipt of shipment absolves the carrier from any liability for damage: you must call for a damage inspection promptly. ▲

Packing List

Use the list below when unpacking to verify that the complete unit has been received. Do not discard packing materials until all is accounted for.

The following items are included in the shipment:

Qty	Item	Part #
1	Immersion Heater (3768)	315646 (340-292-00)
1	Immersion Heater (3769)	315702 (340-133-00)
4	Plastic Pan w/Cover	315643 (190-025-00)
2	Glass Doors	315655 (540-052-00)
1	Blackout Panel	315682 (630-037-00)
1	Shelf Clip	315642 (170-029-00)

Location

Select a solid, level surface that can support at least 250 lbs. (113.4 kg) - unit weight plus contents. The location should be free of drafts and extraneous vibration.

Set-Up

- Position the bottom tray (full width of chamber).
- Install shelf clips at the desired level on the pilasters. Position the shelf brackets over the clips and carefully slide the shelf into position. (If an optional extra shelf has been ordered install it the same way.)
- Insert 4, 40-watt, rapid-start, 48" long fluorescent tubes in the sockets at the top of the chamber - full spectrum "grow lamp" type tubes may be used, if they are the rapid-start type.
- Insert 3 incandescent bulbs in the sockets located in the top of the chamber. Each bulb should be no more than 150 watts—use clear, frosted or colored incandescent bulbs.
- Insert the rear glass door in the top track; lift it up and over the bottom track and lower it into position. Install the front glass door the same way. Apply the self-adhesive finger pulls to the outer edge of each door at the center.
- To use the heater cable with thermostat or timer control, plug it into the right-hand outlet in the top of the chamber, between the fluorescent tubes. Stretch the cable evenly over the bottom of the chamber.

Caution Do not allow heater cable to touch, cross or overlap itself to prevent possibility of an electrical short, or of cable burning. To prevent possibility of a fire, do not place any combustible materials near cable. ▲

- To use the white plastic blackout panel, insert it into the channels on the front of the chamber. It can be stored in the channels on the outside rear of the chamber.

Electrical Connection

Check the outlet to make sure it provides the electrical requirements listed on the nameplate. Plug the cordset into a standard grounded 3-prong outlet.

Section 5 Operation

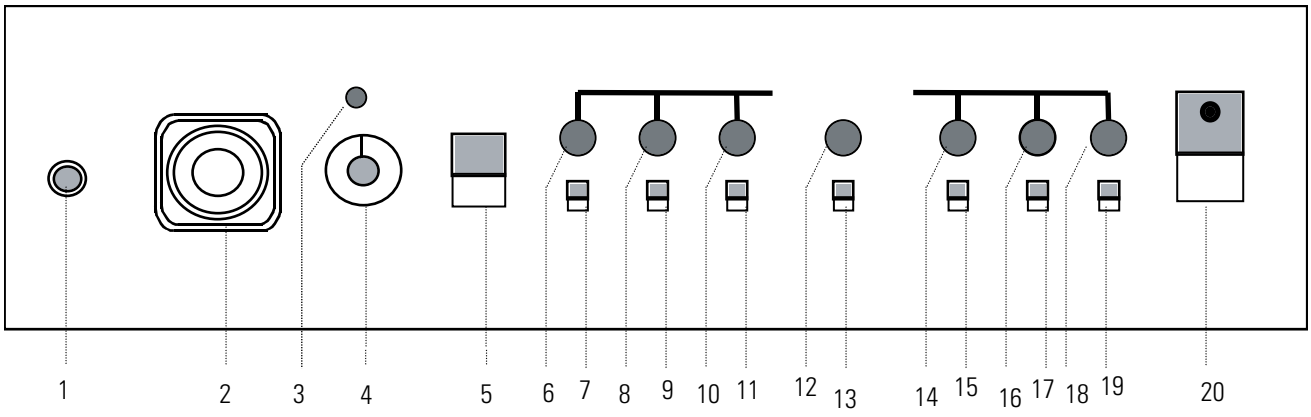

Figure 5-1. Control Panel

Warning Do not use in the presence of flammable or combustible materials or explosive gases. Do not use in the presence of pressurized or sealed containers – fire or explosion may result, causing death or severe injury. ▲

Note **The right hand receptacle is controlled by the thermostat** regardless of mode. It is recommended that the heater cable be plugged into the right hand receptacle. ▲

Manual Operation of Lights

- Power Switch (20): Turn on - green light on switch lights.
- Automatic/Manual Switch (5): Depress lower half of switch.
- Fluorescent Switches (9 &11): Depending on lighting requirements of work being conducted, depress upper half of one or both switches.
- Incandescent Switches (13, 15 & 17): Depending on lighting requirements of work being conducted, depress upper half of one, two or three incandescent switches.
- Right Receptacle Switch (19): If apparatus connected to right receptacle is to be used, depress upper half of this switch.

Manual Operation of Lights (continued)

- Fan Switch (7): Depress upper half of switch. This is recommended in order to circulate the air uniformly in the chamber and minimize temperature gradients.
- Temperature Control Thermostat (4): Rotate to control the level of heat desired in the chamber; doing so also powers up the right hand receptacle.

In the manual mode, the user has manual control of the action of the lights for any arbitrary time periods. The thermostat can be adjusted to provide whatever level of heat is desired (determine levels of head with a user-supplied thermometer.

The timer and thermostat have no control over the lights in this mode.

Timer-Controlled Operation

- Power Switch (20): Turn on - green light on switch lights.
- Automatic/Manual Switch (5): Depress lower half of switch.
- Fluorescent Switches (9 & 11): Depending on lighting requirements of work being conducted, depress upper half of one or both switches.
- Incandescent Switches (13, 15 & 17): Depending on lighting requirements of work being conducted, depress upper half of one, two or three incandescent switches.
- Right Receptacle Switch (19): If apparatus connected to right receptacle is to be used, depress upper half of this switch.
- Fan Switch (7): Depress upper half of switch. This is recommended in order to circulate the air uniformly in the chamber and minimize temperature gradients.
- Timer (2): Determine what timing periods are required and move trippers to outside circumference to coincide with the period(s) - each tripper controls a 15-minute time segment.
- Temperature Control Thermostat (4): Rotate to control the level of heat desired in the chamber; doing so also powers up the right hand receptacle.

Thermostat has no control over lights in this mode. In the timer-controlled mode, the action of the lights is controlled by the timing periods selected.

Temperature-Controlled Operation

- Power Switch (20): Turn on - green light on switch lights.
- Automatic/Manual Switch (5): Depress lower half of switch.
- Fluorescent Switches (9 & 11): Depending on lighting requirements of work being conducted, depress upper half of one or both switches.
- Incandescent Switches (13, 15 & 17): Depending on lighting requirements of work being conducted, depress lower half of one, two or three incandescent switches.
- Right Receptacle Switch (19): If apparatus connected to right receptacle is to be used, depress upper half of this switch.
- Fan switch: Depress lower half of switch. Setting the thermostat to the desired level activates the fluorescent and incandescent lights, and any accessory connected to the right hand receptacle. The timer has no control over the lights in this mode.

Temperature Information

With all lights and heater strip on, the chamber will stabilize at about 50°F (10°C) above ambient temperature. If the blower is turned off, temperature will be about 59°F (15°C) above ambient. When lights are off for several hours, chamber temperature will approach ambient temperature. Since the greatest heat source comes from the incandescent lamps, further flexibility can be achieved by using lamps of lower wattage (75 to 100 watts) or by having only one or two lamps operating off the thermostat.

Section 6 Maintenance

Note Make no attempt to service or repair a Thermo product under warranty before consulting your Thermo dealer. After the warranty period, such consultation is still advised, especially when the repair may be technically sophisticated or difficult. If assistance is needed beyond what the distributor can provide, call the Technical Services Department. No merchandise should be returned directly to the factory without obtaining a Return Materials Authorization (RMA) number from Technical Services. ▲

Warning Disconnect plug from electrical outlet before attempting any maintenance or repair of this unit. ▲

Blower Motor

The blower motor is permanently sealed and requires no user maintenance. With the minimal attention described below, this environmental chamber can be expected to operate for many trouble-free years.

Repairs and Servicing

Unplug the unit from its outlet before servicing. Remove the screws on top and around the control panel to gain access to control panel components. Repairs and/or servicing should only be performed by qualified personnel.

Routine Cleaning

Clean the interior and exterior with mild soap and water only, using a soft cloth or sponge. Rinse thoroughly and dry completely. Do not use abrasives or scouring pads on any part of the unit. Glass may be cleaned with an ammonia-based glass cleaner and a soft cloth or paper towel.

Section 7 Replacement Parts

Description	Part Number
Axial Fan (3768)	315640
Axial Fan (3769)	315705
Ballast (3768 - 120V)	315598
Ballast 3769 - 240V)	315692
Blackout Panel	315682
Circuit Breaker	315645
Cordset (3768)	315566
Cordset (3769)	315689
Door, Glass	315655
Door Pull	315659
Door Track, Upper & Lower	315657
Heater, Immersion (3768 - 120V)	315646
Heater Strip (3769 - 240V)	315702
Knob	315656
For Fluorescent Tubes	Local supply
For Incandescent Bulbs	Local supply
Shelf	315667
Shelf Angle	315679
Shelf Clip	315642
Pilot Lights (7) for 3768	315593
Pilot Lights (1) for 3769	315595
Status Lamp Lens (Amber)	315525
Switches: Rocker, On-Off (120V) Illuminated	315439
Rocker, On-Off (240V) Illuminated	319725
Rocker, On-Off-On	315653
Rocker, On-Off	315652
Thermostat	315688
Tray, Bottom	315664
Tray, Plant-Holder	315643
24-Hour Timer (3768)	315520
24-Hour Timer (3769)	315701

Ordering

Refer to the Specification Plate for the complete model number, serial number, and series number when requesting service, replacement parts or in any correspondence concerning this unit. All parts listed herein may be ordered from the Thermo dealer from whom you purchased this unit, or can be obtained promptly from the factory. When service or replacement parts are needed, it is requested that you check first with your dealer. If the dealer cannot handle your request, then contact our Technical Services Department. Prior to returning any materials, contact Technical Services for a "Return Materials Authorization" number (RMA). Material returned without an RMA number will be refused.

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