

Instruction Manual

Fisher 500 Series Isotemp[®] Incubator

Model 506D (Small)
11-690-506D (120V)
11-690-507D (240V)

Model (Large)
11-690-516D (120V)
11-690-517D (240V)



Fisher 500 series Isotemp® Incubators are compact and economically priced units. Designed to handle most of the basic heating applications in the laboratory. The two models (0.6 ft³ and 1.6 ft³) are controlled by an electronic temperature controller over a temperature range of ambient + 5° to 60°C. A Safety Sentinel temperature monitoring system is built in to protect valuable specimens from damage. The safety assumes control of the incubator, should the main temperature control fail. Double wall construction with fiberglass insulation between the steel outer cabinet and the aluminum inner chamber, reduces heat loss and contributes to uniformity and consistency of chamber temperature. All units are shipped with a full-width chrome-plated shelf and are equipped with a door that opens 180° for easy access to the chamber

Specifications

Temperature Range:	ambient + 5° to 60°C
Control Sensitivity:	±0.5°C.
Electrical Requirements:	
Model 506D:	120V, 50/60Hz, 1.8 Amps 230V 50-60Hz, 0.9 Amps
Model 516D:	120V, 50/60Hz, 2.2 Amps 230V 50Hz, 1.0 Amps
Heater Wattage:	
Model 506D:	200W
Model 516D:	225W
Chamber Volume:	
Model 506D:	0.6 ft ³
Model 516D:	1.6 ft ³
Chamber Size (Inches):	
Model 506D:	11 W x 10 D x 10 H
Model 516D:	14 W x 14 D x 14 H
Area per Shelf:	
Model 506D:	104.5 in ²
Model 516D:	188.6 in ²
Overall Size:	
Model 506D:	13.4 W x 12.2 D x 17.6 H
Model 516D:	16.4 W x 16.2 D x 21.6 H

UNPACKING

The 500 Series Isotemp® Gravity-Convected Incubator is shipped fully assembled in a single carton containing the items listed below. Should a shortage exist, notify your Fisher branch or representative, supplying the description and part number of the missing item; part numbers are listed in accessories and replacement parts sections.

Note: In the event shipping damage has occurred, retain the carton and packing material intact with the Incubator, and immediately file a claim with the final carrier, Usually the carrier will send an inspector to ascertain liability.

Qty	Item
1	500 Series Incubator
1	Thermometer Bracket
1	Shelf
1	Instructions

Safety Precautions

Before operation, always observe the following Safety precautions: This unit is not explosion proof. Do not use in the presence of flammable or combustible materials; fire or explosion may result. Unit contains components that may ignite such materials. Do not place volatile items on the heater cover. Fumes and spillage from acidic/basic solutions cause corrosion of the aluminum chamber. Care should be taken to maintain neutral pH at all times. The heater is located at the bottom of the chamber under the heater cover. The heater cover is not intended

to be a shelf. Do not set items directly on heater cover. The temperature of this surface is greater than set temperature.

INSTALLATION

After unpacking perform the following installation procedures.

1. Position the Incubator in a suitable location near an electrical outlet.

Note: To ensure proper air circulation, a minimum clearance of two inches should be provided around all sides of the incubator. Also, allow clearance above the incubator for a thermometer.

1. Drop the supplied thermometer bracket in the exhaust port atop the incubator. The bracket should be suspended in the port by its two tabs.
2. Check that the POWER switch is set to the OFF position, and then connect the line cord to an appropriate AC outlet.

Note: See data plate (located near the line cord) for voltage, current, and line frequency specifications. Make sure that the power requirements will not overload the AC circuit to which it will be connected.

4. The Incubator requires no preliminary adjustments and is now ready for operation. Depending on the customer application and customer laboratory procedures an initial calibration may be done at this point.

CONTROLS AND INDICATORS

All controls and indicators are located on the front panel, below the chamber door. An electronic temperature controller controls the 500 Series Incubator with a built in automatic Safety Sentinel to prevent temperature run away.

Power Switch: Controls all incubator power.

Temperature Controller: Controls temperature from ambient +5° to 60°C

Power Indicator: Illuminates when the power switch is on

Heat Indicator: Illuminates when power is applied to the heaters.

Safety Sentinel: Illuminates when an over temperature condition exists. This controller will activate automatically and take over control of the incubator within 5°C of the original set temperature.

OPERATION

The 500 Series Isotemp® Incubator are electronically controlled for operation at any temperature between ambient +5° and 60°C as follows:

1. Depress the upper section of the power switch - power indicator should light.
2. Set TEMPERATURE control to a dial position relative to the desired temperature. The HEAT indicator light should light and remain lit until the chamber temperature approaches the controllers set-point, then cycle on and off with heater operation.
3. Measure the Incubator temperature and adjust temperature control until chamber stabilizes and the desired set point is obtained.

Notes: After controlling at a given temperature, if the temperature control is rotated CCW, the Safety Sentinel indicator will come on; this is normal operation.

External surfaces do get hot during normal operation at higher temperatures.

Upon initial installation and subsequent heat-up this Incubator may produce an odor and trace evolution of non-toxic vapor that results from the bake-out of the insulation binder. This is a normal condition and is to be expected.

SERVICE

Fisher 500 Series Isotemp® Incubators are fabricated of high-quality long-life components. However, even with normal use, certain parts may need to be replaced. Information is provided here to assist in disassembling the incubator for the removal and replacement of these components. Included is a wiring diagram of the electrical circuit, along with replacement procedures for the heater, the temperature controller and the front panel components. It is recommended that qualified personnel perform service procedures. The following numbers are provided for additional support:

Technical Service: 1-800-926-0505
Fisher Service Division: 1-800-395-5442
Fisher Sales Support: 1-800-766-7000

Replacing Heater

1. Disconnect power cord from AC outlet.
2. Remove thermometer bracket from the exhaust port of the chamber.
3. Open chamber door and remove the shelf.
4. Disengage sensor probe from the clip on bottom panel at rear of chamber.
5. Remove the two screws securing the bottom panel, then lift the panel upward, carefully guiding sensor probe through opening in panel, then remove panel from the chamber.
6. Remove the two nuts and the two washers securing the heater leads, and then pull the lead terminals off the heater studs.
7. Remove the screws securing the heater to the cabinet, and then lift the heater out of the cabinet.
8. Install the replacement heater and reassemble the incubator by reversing the disassembly steps above.

Gaining Access to Front Panel Components

1. Disconnect power cord from AC outlet.
2. Remove thermometer bracket from the exhaust port of the chamber.
3. Open chamber door and remove the shelf, then close and secure door.
4. Lay the incubator on its side with the door hinges facing upward.
5. Remove the four feet and any additional screws securing the perforated bottom panel. Remove the panel by sliding it forward; all front panel components should now be accessible.

Replacing Front Panel Switch

1. Gain access to the front panel components as previously described.
2. Locate the defective POWER switch and remove the push-on connectors from the components terminals.

Note: Mark the leads so that reconnection to the replacement switch is identical to the original.

3. Depress the locking tabs at the top and bottom of the switch and remove the component through the front panel.
4. Insert the replacement switch through the front panel so that the locking tabs snap open to secure the component in place.
5. Reconnect switch leads observing the conditions noted after step 1.
6. Reassemble by reversing the applicable disassembly steps described above.

Replacing Temperature Controller

1. Gain access to the front panel components as previously described.
2. Remove the in-chamber temperature sensor from the clip and lower through the hole, to the underside of the unit.
3. Remove the knob from the temperature set dial, along with the locking nut.

4. Remove the 4 screws that secure the control board to the front panel.

Note: Mark the leads so that reconnection to the replacement controller is identical to the original.

5. Remove the push-on connectors and remove controller board.
6. Install the replacement control by generally reversing the appropriate disassembly steps above.
7. To position the control knob, rotate the control knob fully CCW, then secure the knob to the shaft with the pointer lined up with the first line in the CCW position. Make sure the sensor bead is lined up with the hole on the incubator floor.

Replacing the Thermocouple

1. Unclip the sensor at the bottom of the unit and lower through the hole at the bottom of the chamber.
2. Observe the thermocouple terminal location and conductor color (Yellow +, Red -). Disconnect old and connect new.
3. Position the new sensor in the chamber. Make sure that the sensor bead is lined up with the hole on the unit floor.

Calibrating of Temperature Controller

The temperature controller can be calibrated by adjusting the HI and LO temperature potentiometers located under the skirt of the set temperature knob. Calibration can be accomplished per the following instructions:

1. Set the unit temperature control to position 2. Carefully remove the knob without rotating it.
2. Slowly adjust the LO potentiometer CCW until the heat indicator comes on, then rotate CW slowly until the heat indicator just goes out.

Note: The heat indicator should come on at a setting of 2 with a unit temperature of between 25° and 35°C

3. Reinstall the knob and rotate it full CCW, the Safety Sentinel indicator should come on.
4. To set the upper temperature range, set the temperature control knob to position 18. Allow about 1 hour to completely stabilize, the unit temperature should be at 65°C ± 5°C. If it is not in this range continue the calibration procedure.
5. Carefully remove the knob without rotating it and adjust the HI potentiometer while observing the temperature and the heat indicator. Adjustments should be made in small increments to allow the incubator to stabilize. Adjust the hi potentiometer CW to increase temperature.
6. Reinstall the knob and rotate it CCW to position 17, the Safety Sentinel indicator should come on.
7. Repeat as necessary to obtain desired results within the controller's limitations.

REPLACEMENT PARTS

Item	Number
Heater Assembly:	
506D 120V	SPN 103019
230V	SPN 103086
516D 120V	SPN 60761
230V	SPN 64190
Power Switch	SPN 83373
Temperature Controller: 120V	SPN 83371
240V	SPN 88195
Knob, Controller	SPN 32615
Thermometer Bracket	SPN 37768
Thermocouple	SPN102715

Trouble-Shooting

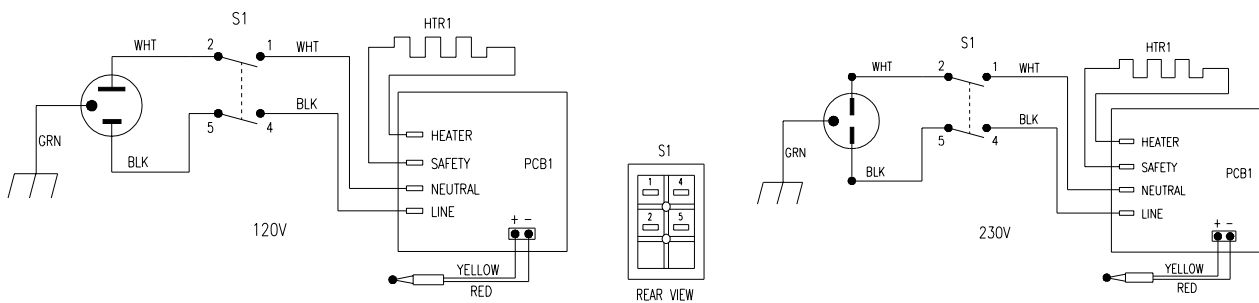
This table is intended to assist in resolving incubator problems by relating symptoms to their likely causes. The service discussed below is beyond the scope of most users and should be performed by qualified personnel.



Service procedures requiring access to the electronics compartment involve exposure to line voltage and should be done by qualified service personnel. Disconnect incubator from power before attempting repairs.

Symptom	Probable Cause	Action
No power	Unit not plugged in. Unit not turned on. Defective circuit breaker. Defective Control Board	Plug unit into power supply. Verify voltage at the plug with a voltmeter. Press the ON/OFF switch to ON () If voltage is present and the switch is on and no LED's, open bottom cover to expose the wiring. Verify voltage is available at the control board. Replace circuit breaker if no voltage is available at the control board. If voltage at control board and no LED's are on. Replace control board
Incubator temp erratically high	Defective thermocouple. Shorted thermocouple. Open thermocouple Defective controller.	Unplug the unit and check thermocouple by: 1. Connection to control board. 2. Visually check thermocouple insulation open (conductors that touch can give false readings and confuse the controller). Replace thermocouple if insulation open (Except at tip inside incubator). 3. Disconnect and perform continuity less than 20 ohms between 2 leads. If open (greater than 20 ohms), Replace thermocouple. If less than 20 ohm from last step, Replace controller.
Failure to heat	No LED's (No power) Set temp is below actual temp. (Power LED on and Safety LED on) Defective heater. Defective wiring Defective Thermocouple Defective controller.	See No power Above Change set temperature or wait unit cools below set temp. (Power LED on and safety LED on) To verify control is operational do the following: 1. Empty incubator (no customer samples in unit) and open wiring compartment. 2. Turn control to max temperature and verify line voltage across "heater" to "safety". 3. If voltage present, turn off power and perform a continuity check by lifting one lead of the heater. Verify the resistance is less than 100 ohm for 120V units and less than 300 ohm for 240V units. 4. If greater or open continuity is indicated, open heater cover and repeat at heater. If still greater replace heater. 5. If ok check /replace wiring to heater. See Defective thermocouple above. See Defective thermocouple above.

Figure 1 Schematics



ACCESSORIES

Item	Catalog Number
Thermometer, 40° to 240°C	11-682-30
Shelf for:	
11-690-506D, -507D	13-245-6S
11-690-516D, -517D	13-245-15S

Fisher Scientific Assistance

Fisher Technical Service: 1-800-926-0505

Fisher Service Division: 1-800-395-5442

Fisher Sales Support: 1-800-766-7000