



Isotemp Digital Hotplates, Stirrers and Stirring Hotplates

OPERATION MANUAL AND PARTS LIST

<u>Catalog #</u>	<u>Type</u>	<u>Top Plate Size and Material</u>	<u>Voltage</u>
1130049HP	Hotplate	7x7 Ceramic	120
1130049S	Stirrer	7x7 Ceramic	120
1130049SHP	Stirring Hotplate	7x7 Ceramic	120
1130149HP	Hotplate	7x7 Ceramic	100
1130149S	Stirrer	7x7 Ceramic	100
1130149SHP	Stirring Hotplate	7x7 Ceramic	100
1130249HP	Hotplate	7x7 Ceramic	230
1130249S	Stirrer	7x7 Ceramic	230
1130249SHP	Stirring Hotplate	7x7 Ceramic	230
1140049HP	Hotplate	7x7 Aluminum	120
1140049SHP	Stirring Hotplate	7x7 Aluminum	120

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Safety Information

Alert Signals



Warning

Warnings alert you to a possibility of personal injury.



Caution

Cautions alert you to a possibility of damage to the equipment.



Hot Surface

Hot surfaces alert you to a possibility of personal injury if you come in contact with a surface during use or for a period of time after use.



Warning

Refer servicing to qualified personnel.



Note

If the equipment is used in a manner not specified by the manufacturer the protection provided by the equipment may be impaired.

Your Fisher Isotemp Hotplate, Stirrer or Stirring Hot Plate has been designed with function, reliability, and safety in mind. It is your responsibility to install it in conformance with local electrical codes. For safe operation, please pay attention to the alert signals throughout the manual.

Warning: These products should be used only under the operating conditions specified in the Operating Manual. Always use safe laboratory practices and do not leave the hotplate in operation while unattended as product functionality or laboratory practice failures could occur that might lead to uncontrolled or excessive heating of the top surface. Safety procedures (including, but not limited to, unplugging when not in use) and response plans should be put in place to address the worst case possibility. If an over-temperature failure occurs, the top surface temperature could rise to the maximum temperature (300-540°C depending on your model's specification) and remain at that temperature indefinitely. Under these conditions, the material being heated on the surface of the hotplate could reach levels in excess of the maximum temperature.

This manual contains important operating and safety information. The user must carefully read and understand the contents of this manual prior to the use of this equipment.

Warnings

To avoid electrical shock, always:

1. Use a properly grounded electrical outlet of correct voltage and current handling capacity.
2. Disconnect from the power supply prior to maintenance and servicing.

To avoid personal injury:

1. Do not use in the presence of flammable or combustible materials — fire or explosion may result. This device contains components which may ignite such materials. Not rated for use in hazardous atmospheres.
2. Use caution when heating volatile materials; top surface and element can reach the "Flash Point Temperature" of many chemicals. These stirring

SAFETY INFORMATION

hotplates are not explosion proof. Fire or explosion may result. Unit contains components which may ignite such materials.

3. Keep top surface clean. Use a non-abrasive cleaner. Alkali spills, hydrofluoric acid spills or phosphoric acid spills may damage top and lead to thermal failure. Unplug unit and remove spills promptly. Do not immerse unit for cleaning.
4. Replace the top immediately if damaged by etching, scratching or chipping. A damaged top can break in use.
5. Do not use metal foil on hotplate which may block air flow. Overheating will result.
6. Do not remove or modify grounded power plug. Use only properly grounded outlets to avoid shock hazard.
7. Use appropriate hand and eye protection when handling hazardous chemicals.
8. Gross weight of items placed on top of stirrers should not exceed 25 lbs. (11.3 kg).
9. The top plate of the unit can remain hot for some time after use. A "CAUTION - HOT TOP" light will remain on until top plate temperature cools to below 50°C.
10. Do not leave an active probe out of the fluid. This may cause uncontrolled heating of the fluid on the hotplate and unintentional boiling or an explosion could occur.
11. Note that the exterior housing will be hot during and for a period of time after use.
12. Refer servicing to qualified personnel.

General Specifications

Overall Dimensions - W x H x D

All Models: 8.2 x 8.2 x 8.2" (20.8 x 20.8 x 20.8 cm)

Top Plate Dimensions - W x H x D

All Models: 7.25 x 7.25 x 7.25" (18.4 x 18.4 x 18.4 cm)

Weight

All Models: 11 lbs. (5.0 kg)

Catalog #	Electrical (Volts/Amps/Watts/Freq./Phase)	Temperature Range*	Speed Range (rpm)	Top Plate Capacity
1130049HP	120/8.8/1060/60/1	1 - 540° C	N/A	4L flask / 25 lbs.
1130049S	120/.41/25/60/1	N/A	50-1200 rpm	4L flask / 25 lbs.
1130049SHP	120/8.9/1070/60/1	1 - 540° C	50-1200 rpm	4L flask / 25 lbs.
1130149HP	100/10.7/1070/50-60/1	1 - 540° C	N/A	4L flask / 25 lbs.
1130149S	100/.42/25/50-60/1	N/A	50-1200 rpm	4L flask / 25 lbs.
1130149SHP	100/11.0/1095/50-60/1	1 - 540° C	50-1200 rpm	4L flask / 25 lbs.
1130249HP	220-240/4.8/1150/50-60/1	1 - 540° C	N/A	4L flask / 25 lbs.
1130249S	220-240/.18/25/50-60/1	N/A	50-1200 rpm	4L flask / 25 lbs.
1130249SHP	220-240/4.9/1170/50-60/1	1 - 540° C	50-1200 rpm	4L flask / 25 lbs.
1140049HP	120/5.5/660/60/1	1 - 300° C	50-1200 rpm	4L flask / 25 lbs.
1140049SHP	120/5.7/680/60/1	1 - 300° C	50-1200 rpm	4L flask / 25 lbs.

* These digital plates do not cool. The minimum temperature is 1°C if used in a cold room below 1°C.

GENERAL SPECIFICATIONS

Heating Specifications

Top Plate Surface - Solid Ceramic

Temperature range

All 4" x 4" and 7" x 7" models:

41°F to 1004°F (5°C* - 540°C)

All 10" x 10" models:

41°F to 752°F (5°C - 400°C)

Heat-up time to maximum temperature (unloaded top plate).

8 minutes

Temperature stability at the center of the top plate surface (@ 100°C).

± 2.0°C

Accuracy of the temperature display vs the actual average temperature of a 2" diameter of setting area at the center of the top plate (setpoint 100°C).
(Top plate temperature was verified with an infrared camera mounted approx. 26" above the center of the top plate surface; temperature accuracy at the edges of the top plate may vary from the stated accuracy.)

± 5.0°C

Stirring Speed Specifications

Accuracy of the stirring setpoint (600 ml of water in a 100 ml glass flask above 200 rpm): ± 2.0%

Speed Range 60 to 1200 RPM

(Maximum speed is dependent on the viscosity of the solution)

Speed Dial Position	Estimated Stirring Speed
2	60 rpm
4	125 rpm
6	350 rpm
8	700 rpm
10	1100 rpm
12	1200 rpm

Stability of the stirring speed setpoint (600 ml of water in a 1000 ml glass flask)

± 5.0%

Top Plate Size	Max Recommended Flask Size	Max Weight on Top Plate
4" x 4"	1 liter	15 lbs
7" x 7"	4 liters	25 lbs
10" x 10"	6 liters	35 lbs

* This stirring hot plate does not cool. The minimum temperature is 5°C if used in a cold room.

Environmental Conditions

Operating: 17°C to 27°C; 20% to 80% relative humidity, non-condensing. Installation category II (overvoltage) in accordance with IEC 664. Pollution degree 2 in accordance with IEC 664.
Altitude Limit: 2,000 meters.

Storage: -25°C to 65°C
10% to 85% relative humidity

Declaration of Conformity

(for 230 volt)

We hereby declare under our sole responsibility that this product conforms with the technical requirements of the following standards:

EMC:	EN 61000-3-2	Limits for harmonic current emissions
	EN 61000-3-3	Limits for voltage fluctuations and flicker
	EN 61326-1	Electrical equipment for measurement, control, and laboratory use; Part I: General Requirements
Safety:	EN 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use; Part I: General Requirements
	EN 61010-2-010	Part II: Particular requirements for laboratory equipment for the heating of materials (Hotplates and Stirring Hotplates)
	EN 61010-2-051	Part II: Particular requirements for laboratory equipment for mixing and stirring (Stirrers and Stirring Hotplates)

per the provisions of the Electromagnetic Compatibility Directive 2004/108/EC, and per the provisions of the Low Voltage Directive 2006/95/EC.

The authorized representative located within the European Community is:

Thermo Fisher Scientific
Robert-Bosch-Straße 1
63505 Langenselbold
Germany

Copies of the Declaration of Conformity are available upon request.

Unpacking and Installation



Warning

Use a properly grounded electrical outlet of correct voltage and current handling capacity.

Do not remove or modify grounded power plug. Use only properly grounded outlets to avoid shock hazard. Not rated for use in hazardous atmospheres.

General Usage

Do not use this product for anything other than its intended usage.

Unpacking

Remove your Isotemp hotplate, stirrer or stirring hotplate from the carton. Inspect to ensure that the unit has not been damaged during shipment. If the unit appears to have sustained shipping damage contact Fisher Scientific Customer Service at:

North America: USA/Canada +1 866 984 3766 (866-9-THERMO) www.thermo.com

Europe: Austria +43 1 801 40 0, Belgium +32 2 482 30 30, France +33 2 2803 2180, Germany national toll free 08001-536 376,

Germany international +49 6184 90 6940, Italy +39 02 02 95059 434-254-375, Netherlands +31 76 571 4440,

Nordic/Baltic countries +358 9 329 100,

Russia/CIS +7 (812) 703 42 15, Spain/Portugal +34 93 223 09 18, Switzerland +41 44 454 12 12, UK/Ireland +44

870 609 9203

Asia: China +86 21 6865 4588 or +86 10 8419 3588,

India toll free 1800 22 8374, India +91 22 6716 2200,

Japan +81 45 453 9220,

Other Asian countries +852 2885 4613

Countries not listed: +49 6184 90 6940 or +33 2 2803 2180

The following items are included in the shipment:

Isotemp Hotplate, Stirrer or Stirring Hotplate

Stir Bar (Stirring models only)

Adapter (100V models only)

Temperature Probe (Heating models only)

Knob

Operator's Manual

Rod

Clamp (Heating models only)

If any of these items are missing from the carton, contact Fisher Scientific.

Installation

Set the unit on a flat stable surface at least 12" away from combustible materials, and plug the cordset into a properly grounded electrical outlet of correct voltage and current handling capacity.

Run the stirrer at maximum speed for 10 minutes prior to using the product.

Operation



Warning

Use caution when heating volatile materials; top surface and element can reach the "Flash Point Temperature" of many chemicals. These stirring hotplates are not explosion proof. Fire or explosion may result. Unit contains components which may ignite such materials.

Use appropriate hand and eye protection when handling hazardous chemicals.

"Caution: Hot Top. Avoid Contact." The top plate of the unit can remain hot for some time after use. A "CAUTION -HOT TOP" light will remain on until top plate temperature cools to below 50°C.



"Stir" key



"Heat" key

Powering the Unit

Set the unit on a flat stable surface at least 12" away from combustible materials, and plug the cordset into a properly grounded electrical outlet of correct voltage and current handling capacity. Press the power button or ANY button on the control panel. When the unit is turned on, there will be three beeps, the unit will initialize and then "OFF" will be displayed on both the "HEAT" and "STIR" display screens until a temperature and/or stirring speed are entered. To turn off power to the unit, press the power button.

Setting the Stirring Speed

Press "Stir" key located under the STIR display. Use the knob in the center of the console to select a speed. Turn the knob clockwise to increase the speed or counterclockwise to decrease the speed. When desired speed has been reached, press the "Stir" key again or wait a moment and the unit will beep indicating that it has been set.

The display will register ACTUAL speed until the setpoint has been reached. To check the setpoint, press "Stir" under the STIR display and your setpoint will be displayed again for a few seconds. The display will automatically return to indicating actual speed.

To turn stirring off, press and hold the "Stir" key until a beep is heard (approximately 3 seconds) or press the "Stir" key and turn the knob counterclockwise until the display reads "OFF."

Setting the Temperature

Press "Heat" key located under the HEAT display. Use the knob in the center of the console to select a temperature. Turn the knob clockwise to increase the temperature or counterclockwise to decrease the temperature. When desired temperature has been reached, press the "Heat" key again or wait a moment and the unit will beep indicating that it has been set.

The display will register ACTUAL temperature until the setpoint has been reached. To check your setpoint, press "Heat" key under the HEAT display and your setpoint will be displayed again for a few seconds. The display will automatically return to indicating actual temperature.

The "CAUTION - HOT TOP" indicator illuminates when the plate reaches 50°C. When the heating is turned off, the indicator will continue to flash until the plate temperature drops below 50°C.

Controlling Solution Temperature Using External Probe

Plug the included probe or an ungrounded Type K thermocouple probe into the probe receptacle located on the right side of the unit. Place the probe into the solution. The display will indicate the actual temperature of the solution as measured by the probe, and the probe indicator LED on the front panel will be illuminated.

To ensure accurate probe readings, as much of the probe sheath as possible should be immersed in the solution.

Over Temperature Protection Setpoint

The factory-set fixed over temperature setpoint is 570°C on the top surface of the plate.

Heating Metal Vessels and Sand Baths

Metal vessels and sand baths may be heated safely without the danger of the ceramic top breaking. Use the lowest temperature setting possible for applications to limit thermal stress to the top.

Setting the Timer

To set the timer, use the right and left arrows until the light above the number corresponds to the desired time. The default setting is turning off heating only. To change this setting, see "Service and Calibration/Timer Shutdown."

One minute before shutdown, the unit will beep three times and flash the 1 hour light. The unit will beep three more times to indicate it has timed out.

Service and Calibration

Service Menu

The Service Menu has many features that will allow a user to customize their unit.

A table of the features available in the Service Menu is given below. The features are given in order of their appearance in the Service Menu when rotating the center knob in a clockwise rotation. The Feature column is the name of the feature, the Display column is the designation of that feature as shown on the display of the unit, the Availability column gives which type of unit the feature is applicable (HP = hotplate, S = stirrer, and SP = stirring hotplate or stir plate), and the last column gives a brief description of the purpose of the feature.

Feature	Display	Availability	Brief Description
Temperature Probe Calibration	CAL	HP, SP	Allows calibration of the temperature probe and associated circuitry.
Timer Shutdown	End	HP, S, SP	When the timer elapses, a choice of what should turn off is selectable between heating, stirring, or both. Default is heating only on SP and HP; stirring only on S.
Probe Temperature Limit	PL	HP, SP	Allows the user to limit the maximum temperature of the heating set point when the probe is attached to 250° C or allow it to be unlimited. Default is 250° C.
Probe Response	Pr	HP, SP	Sets the minimum time required for the probe temperature to rise before signaling an error (E03). This is adjustable from 3 to 20 minutes in 1 minute increments. The default is 3 minutes.
Error Disable	Err	HP, S, SP	All errors except E12 (locked rotor) can be disabled if they are presenting problems with the operation of a unit. Care must be exercised when changing the default – All errors enabled.
Factory Defaults	dEF	HP, S, SP	All settings listed in this table will be reset to the default factory setting. Useful in troubleshooting.

Oil Bath Method of Calibration

This method of calibration requires a calibrated water or oil bath with digital readout.

1. With the probe connected to the unit, insert the probe connected to the unit to be calibrated into a bath that has stabilized at the desired calibration temperature. Allow sufficient time for the probe to stabilize.
2. Plug the unit into the appropriate power, but do not turn it on (displays should be blank, unless Hot Top Warning System is indicating a hot surface), enter the Service Menu by pressing and holding the POWER key. After about 3 seconds a single beep will be heard and you may remove your finger from the POWER key. The display will change to **OSP**.
3. Rotate the center knob dial one position clockwise and the display will read **CAL**. This is the calibration menu. Press the "Heat" key under the HEAT display. The display will now read **Oil**. Press the "Heat" key again to accept, and the display will change to no. Rotate the center knob one position to change the display to **yES** and press the "Heat" key again.
4. The HEAT display will show the temperature that is currently measured at the probe. If the display shows "---" then the probe is not connected to the unit and must be connected before continuing. The "Heat" key indicator under the HEAT display will be flashing to let the user know that the display is ready to be adjusted using the center knob.
5. Adjust the HEAT display using the center knob until it matches the independent probe. When this is complete, press the "Heat" key under the HEAT display. The unit will turn OFF automatically. Calibration of the probe system is now complete.

System Method of Calibration - Recommended

This method of calibration requires an NIST calibrated thermometer with a resolution of 0.1°C or better.

1. Select an independent temperature probe to be placed in the load, along with the unit temperature probe before continuing with calibration. Select the load to be calibrated, and place on top of the hot-plate. Place a stir bar in the mixture if stirring is desired and available on the unit being calibrated. Make sure to have probe plugged into the unit and placed in the load. Also ensure that the OTP adjustment on the front edge of the unit is set high enough to allow the load to achieve the calibration temperature.
2. With the unit plugged into the appropriate power, but not turned on yet (displays should be blank, unless the Hot Top Warning System is indicating a hot surface), enter the Service Menu by pressing and holding the POWER key. After about 3 seconds a single beep will be heard and you may remove your finger from the POWER key. The display will change to **OSP**.
3. Rotate the center knob dial one position clockwise and the display will read **CAL**. This is the calibration menu. Press the "Heat" key under the HEAT display. The display will now read **OIL**. Rotate the center knob one position and the display will read **SyS**. Press the "Heat" key again to accept, and the display will change to no. Rotate the center knob one position to change the display to **yES** and press the "Heat" key again.
4. The "Heat" key under the HEAT display will be lit, and the displays will show the temperature at which the unit was last calibrated. The calibration temperature may be adjusted by using the center knob. Temperature can only be selected in whole degrees Celsius. The adjustable range is 1 – 540°C for ceramic top units or 1 – 300°C for aluminum top units. When the adjustment is completed, press the "Heat" key under the HEAT display to approve the selection.

5. If the unit undergoing calibration does not have stirring capability then skip to the next step. The "Stir" key under the STIR display will be lit, and the displays will show the stirring control set point. The speed may be adjusted by using the center knob. The adjustable range is 50 – 999, and also OFF (zero). When the adjustment is completed, press the "Stir" key under the STIR display to approve the selection.
6. The HEAT display will now show the temperature that is currently measured at the probe. If the display shows "---" then the probe is not connected to the unit and must be connected before continuing. The unit will begin heating to the setpoint. The HEAT and STIR displays will flash until the temperature is within $\pm 2^{\circ}\text{C}$ of the chosen setpoint.
7. Once the temperature is within $\pm 2^{\circ}\text{C}$ of the set point, a beep will sound and the "Heat" key under the HEAT display will begin flashing to let the user know that the display is ready to be adjusted using the center knob. Although it may be desirable to wait longer to allow the temperature of the unit and fluid to stabilize further.
8. Adjust the HEAT display using the center knob to make it match the independent probe. When this is complete, press the "Heat" key under the HEAT display. The unit will turn OFF automatically. Calibration of the probe system is now complete.

Timer Shutdown - End

This feature is available for all units, but not all sub-menu options will be applicable. The purpose of this feature is to control what is turned off when the timer elapses. The default is Heating Off for hotplates and stir plates, and Stirring Off for stirrers.

To modify/view the Timer Shutdown follow the instructions given below:

1. Plug the unit into the appropriate power, but do not turn it ON (displays should be blank, unless Hot Top Warning System is indicating a hot surface), enter the Service Menu by pressing and holding the POWER key. After about 3 seconds a single beep will be heard and you may remove your finger from the POWER key. The display will change to **OSP**.
2. Rotate the center knob until the display reads End. Press the "Heat" or "Stir" key under either display to accept, and the display will change to **H** (Heating off), **H S** (Heating and Stirring Off), or **S** (Stirring Off). Rotate the center knob to change the display to the method of choice and press the key under either display again.
3. The unit will return to the previous menu. Select another feature to change, or press the POWER key again to return to the off mode.

Probe Temperature Limit - PL

This feature is available for units with heating functionality and is only applicable when using a probe. The purpose of this feature is to limit the heating set point to 250°C or allow it to be unlimited only when the probe is plugged in. The reason a user may want to limit the set point when using a probe is to protect the Teflon coated probes from the damage of over-heating. If that is not a concern or a different material of probe is chosen, then unlimited is a safe choice.

To modify/view the Probe Temperature Limit follow the instructions given below:

1. Plug the unit into the appropriate power, but do not turn it on (displays should be blank, unless Hot Top Warning System is indicating a hot surface), enter the Service Menu by pressing and holding the POWER key. After about 3 seconds

a single beep will be heard and you may remove your finger from the POWER key. The display will change to **OSP**.

2. Rotate the center knob until the display reads PL. Press the "Heat" key under the HEAT display to accept, and the display will change to **250** (250°C limit), or **UL** (unlimited). Rotate the center knob to change the display to the method of choice and press the "Heat" key again.
3. The unit will return to the previous menu. Select another feature to change, or press the POWER key again to return to the off mode.

Probe Response - Pr

This feature is available for units with heating functionality and is only applicable when using a probe. The purpose of this feature is to select the minimum time required for a temperature change to be detected before signaling a Probe Out of Solution error (E03). A choice between 3 and 20 minutes in 1 minute increments is possible. The default is 3 minutes, but if a large load is placed on the top, the time may need to be extended to avoid nuisance E03 errors.

To modify/view the Probe Response follow the instructions given below:

1. Plug the unit into the appropriate power, but do not turn it on (displays should be blank, unless Hot Top Warning System is indicating a hot surface), enter the Service Menu by pressing and holding the POWER key. After about 3 seconds a single beep will be heard and you may remove your finger from the POWER key. The display will change to **OSP**.
2. Rotate the center knob until the display reads Pr. Press the "Heat" key under the HEAT display to accept, and the display will change to the current time chosen. Rotate the center knob to change the display and press the "Heat" key again.

3. The unit will return to the previous menu. Select another feature to change, or press the POWER key again to return to the off mode.

Error Disable - Err

The purpose of this feature is to enable or disable a particular error from being detected and displayed. All errors except E12 (locked rotor – stirring control) are able to be disabled. A general option is also available to re-enable all errors at once. When disabling errors though they must be done one at a time.

To modify/view the Error Disable menu follow the instructions given below:

1. Plug the unit into the appropriate power, but do not turn it on (displays should be blank, unless Hot Top Warning System is indicating a hot surface), enter the Service Menu by pressing and holding the POWER key. After about 3 seconds a single beep will be heard and you may remove your finger from the POWER key. The display will change to **OSP**.
2. Rotate the center knob until the display reads Err. Press the "Heat" or "Stir" key under either display to accept, and the display will change to **CLr** (re-enable all disabled errors). Rotate the center knob to change the display to the error number of choice and press the key under either display again.
3. The display will now indicate either **On** (the error detection is enabled), or **OFF** (the error detection is disabled). Rotate the center knob to change the display if desired and press the "Heat" or "Stir" key under either display.
4. The unit will return to the previous menu. Select another error to change, or press the POWER key to return to the root Service Menu. Pressing the POWER key one more time will turn the unit off.

Factory Defaults - deF

This feature is available for all units and is designed to restore the control to the default factory settings.

To reset to the Factory Defaults follow the instructions given below:

1. Plug the unit into the appropriate power, but do not turn it on (displays should be blank, unless Hot Top Warning System is indicating a hot surface), enter the Service Menu by pressing and holding the POWER key. After about 3 seconds a single beep will be heard and you may remove your finger from the POWER key. The display will change to **OSP**.
2. Rotate the center knob until the display reads **dEF**. Press either "Heat" or "Stir" key to accept, and the display will change to **no**. Rotate the center knob to change the display to **yES** and press either "Heat" or "Stir" key.
3. The unit has now been returned to the factory default settings. The unit will return to the previous menu. Select another feature to change, or press the POWER key again to return to the off mode.

General Cleaning Instructions

Keep top surface clean. Use a non-abrasive cleaner. Alkali spills, hydrofluoric acid spills or phosphoric acid spills may damage top and lead to thermal failure. Unplug unit and remove spills promptly. Do not immerse unit for cleaning. Wipe exterior housing with lightly dampened cloth containing mild soap solution.

Troubleshooting

Error Codes

Errors E01 through E07 are heating errors. Error Handler will lock out heating functions if heating error is detected. Stirring functionality is unaffected. If the condition that caused the error is no longer present, pressing the POWER button or unplugging the unit will clear Errors E01-E07.

Displayed Message	Intended to Detect	Cause	Solution
E01	Internal thermocouple out of range.	Internal thermocouple not connected. Thermocouple open. Thermocouple connected backwards (reversed polarity).	Ensure proper connection and polarity of thermocouple. Replace thermocouple (attached to element). Ensure proper connection and polarity of thermocouple.
E02	Excessive top heat-up time.	Internal thermocouple short circuit. Failure in Internal thermocouple. Failure in Element. Failure in optocoupler/triac circuit.	Remove short. Replace thermocouple (attached to element). Replace Element. Replace Control Board.
E03	External Probe left out of solution.	External Probe left out of solution. OTP potentiometer set too low. User selected timeout (Probe Response) too short for current load. External probe connected backwards.	Place external probe into solution. Increase OTP setting. Increase external probe timeout (Probe Response). Correct orientation of external probe.
E04	OTP thermocouple out of range.	OTP Circuit failure.	Replace Control Board.
E06	OTP detected over temperature condition, relay has opened, power to the element removed.	OTP thermocouple temperature is above the OTP potentiometer setting. OTP thermocouple temperature is above the OTP potentiometer setting. OTP thermocouple not connected.	Increase OTP potentiometer setting. Reduce Hotplate set point. Ensure proper connection and polarity of OTP thermocouple.

TROUBLESHOOTING

Errors E11 and E12 are stirring errors. Error Handler will lock out stirring functions if stirring error is detected. To avoid boil over, the unit will cease heating (the user can restart heating if desired). Pressing the POWER button or unplugging the unit will clear Error E12. Unplugging the unit will clear Error E11.

Displayed Message	Intended to Detect	Cause	Solution
E07	Large difference between Internal thermocouple and OTP thermocouple.	Internal or OTP thermocouple not connected. Internal or OTP thermocouple short circuit. Internal or OTP thermocouple connected backwards (reversed polarity).	Ensure proper connection and polarity of affected thermocouple. Remove short of affected thermocouple. Ensure proper connection and polarity of affected thermocouple.
E11	AC power not properly detected.	Failure in AC power detection (zero cross) circuit	Replace Control Board.
E12	Locked rotor in stirring control.	Locked rotor condition. Failure in motor. Failure in motor optocoupler/triac circuit. Failure in motor optical encoder/encoder wheel.	Free locked rotor. Replace motor. Replace Control Board. Replace motor optical encoder.
E21	Corrupted data flash memory.	Checksum failure during data flash recovery.	Contact Customer Service or see footnote below.
Blank Display with continuous beep.	Corrupted program memory.	Checksum failure during unit initialization.	Replace Control Board. Reprogram Control Board.

Error E21 is a data flash memory error and can be corrected by following the steps below:

- Press any key to clear the error, this re-initializes data flash memory.
- At the 'SEL' menu, press the "Heat" or "Stir" key.
- Using the encoder knob, select your unit's model type (if your unit model number starts with SP, select ' SP', etc) and press either the "Heat" or "Stir" key.
- Using the encoder knob, select your unit's top size (either 7 or 10 inch) and press either the "Heat" or "Stir" key.
- Press the POWER key to exit the special functions menu.
- Note that it may be necessary to recalibrate the unit and/or re-enter custom settings as the unit has been reset to factory default.
- The unit can now be started normally using the POWER key.

Replacement Parts List

To ensure your safety and for proper operation, the ceramic top plates for hotplates and stir plates are only sold as complete assemblies. This assembly includes the ceramic top, element, thermocouple, insulation, baffle plate, and 2 ceramic top holders. **Fisher Scientific recommends not replacing individual components of the top plate.** (SHP = Stirring Hotplate, HP = Hotplate, S = Stirrer)

7x7 Ceramic Top Part No.	7x7 Aluminum Top Part No.	Description
261575	261575	PC Board Fuse - 220-240V
PCX120	PC1900X1	Control Board - 100V, 120V (SHP)
PCX120	PC1900X1	Control Board - 220-240V (SHP)
PC1896X1	PC1899X1	Control Board - 100V, 120V (HP)
PC1896X2	PC1899X2	Control Board - 220-240V (HP)
PC1897X1	----	Control Board - 100V, 120V (S)
PC1897X2	----	Control Board - 220-240V (S)
266058	266058	PC Board Fuse - 100V, 120V
261575	261575	PC Board Fuse - 220-240V
PCX115	PCX115	Display Board (SHP)
PCX121	PCX121	Display Board (HP)
PCX122	----	Display Board (S)
SWX217	SWX217	Encoder
KBX106	KBX106	Knob
CRX106	CRX106	Cord Set - 100 V, 120V
CRX104	CYX104	Cord Set - 220-240V
KBX110	KBX110	Knob
ZSX65A	ZSX65A	Stir Bar
MT1318X3	MT1318X3	Motor - 120V, 100V
MT1318X4	MT1318X4	Motor - 220-240V
ELX81	ELX77	Heating Element - 120V - w/thermocouple
ELX80	ELX78	Heating Element - 100V - w/thermocouple
ELX22	ELX79	Heating Element - 220-240V - w/thermocouple
710-0117	719-0073	Ceramic Top
EL1898X1	EL1900X1	Hot Plate Top Assembly - 120V
EL1898X2	EL1900X2	Hot Plate Top Assembly - 100V
EL1898X3	EL1900X3	Hot Plate Top Assembly - 220-240V
TCX16	TCX16	6" Chemically resistant stainless steel probe
----	TC1895X1	Thermocouple

Accessories

Part No.	Description
05-764Q	90° Clamp Holder
1000-2	12" Aluminum Rod
05-769Q	Large Clamp
05-769-5Q	Small Clamp (up to 1/2")
05-809Q	Thermometer Clamp
10-666-10GQ	Support Rod - 12"
14-666-10BQ	Support Rod - 18"
14-666-10CQ	Support Rod - 24"