
Thermo
SCIENTIFIC

Low Cost Vacuum Ovens

Model No.
3608, 3608-1CE
3608-5, 3608-6CE
3618, 3618-1CE
3618-5, 3618-6CE

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Description

Thermo Scientific Vacuum Ovens are designed for drying media under carefully controlled conditions—in a normal atmosphere, a vacuum of up to 30 inches Hg, or an inert gas atmosphere.

The oven is primarily used for desiccating, vacuum embedding, plating and electronic component processing. Non-corrosive, nonflammable gases such as nitrogen and carbon dioxide can be used in the oven.

All controls and connections (except electrical power) are located on the front vertical panel—these include lighted power switch, vacuum gauge, temperature control, vacuum control valve and nickel-plated hose connectors.

Uniform radiant wall heat, with no internally exposed heaters, optimizes chamber space. 3" (76 mm) of glass wool insulation throughout helps maintain temperature uniformity effectiveness. Temperature is controlled by a hydraulic thermostat and can be read on a dial thermometer or LED display.

The chamber of the unit is not designed for exposure to concentrated solvents, oils, concentrated acids or dilute sodium hydroxide.

Vacuum levels are precisely held between 0" and 30" of mercury.

The silicone door gasket assures a tight seal at all vacuum levels. A high strength tempered glass window allows full view of oven contents. Two aluminum shelves provide good heat conduction to samples. The shelf assembly removes for easy cleaning.



Note

When operating in a vacuum, there is no transfer of heat from the evacuated chamber interior to objects within the chamber unless they are resting directly upon one of the shelves—do not put insulating material between a shelf and a vessel being heated. Also, be sure that a thermometer's sensor element is in direct contact with the surface of the center shelf when taking a reading.

Model Designations and Their Features

3608, 3608-1CE, 3618 and 3618-1CE: Models with dial thermometer.

3608-5, 3608-6CE, 3618-5 and 3618-6CE: Models with LED temperature display.

Safety Information

Alert Signals



Caution

Cautions alert you to a possibility of risk of danger. Consult documentation.



Caution

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



Note

Notes alert you to pertinent facts and conditions.



Caution

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.



Caution

Electrical shocks alert you to a possibility of personal injury if you come in contact with live circuits while the unit is plugged into a power source

Your Thermo Scientific Vacuum Oven has been designed with function, reliability, and safety in mind. It is your responsibility to install it in conformance with local electrical codes. It is most important that the user follow installation instructions exactly as written. Failure to do so is likely to lead to improper operation, erroneous calibrations and possible damage to the equipment. Do not use in a manner not specified by the manufacturer. The protection provided by the equipment may be impaired. Do not attempt operation without this information.

Specifications

Electrical Requirements

3608, 3608-5:	120 Volts, 50/60 Hz, 5.0 Amps, 600 Watts
3608-1CE, 3608-6CE:	240 Volts, 50/60 Hz, 2.5 Amps, 600 Watts
3618, 3618-5:	120 Volts, 50/60 Hz, 12.0 Amps, 1600 Watts
3618-1CE, 3618-6CE:	240 Volts, 50/60 Hz, 6.7 Amps, 1600 Watts

Temperature Range

All Models: Slightly above ambient to 220°C

Thermometer Type

3608, 3608-1, 3618, 3618-1:

Bimetallic, dial type; range from 0°C to 300°C in 5°C increments

3608-5, 3608-6, 3618-5, 3618-6:

LED Display; range from 0°C to 300°C in 1°C increments

Chamber Dimensions

3608, 3608-1CE, 3608-5, 3608-6CE: 10"W x 12"D x 10"H
(25 x 30 x 25 cm)

3618, 3618-1CE, 3618-5, 3618-6CE:

14"W x 20"D x 14"H (36 x 51 x 36 cm)

Overall Dimensions:

3608, 3608-1CE, 3608-5, 3608-6CE: 19-7/8"W x 16"D x
16-1/4"H (50 x 40 x 41 cm)

3618, 3618-1CE, 3618-5, 3618-6CE:

25"W x 25"D x 22"H (64 x 64 x 56 cm)

Volume

3608, 3608-1, 3608-5, 3608-6CE: 0.7 cubic feet
(19.8 liters)

3618, 3618-1CE, 3618-5, 3618-6CE:

2.3 cubic feet (65.1 liters)

Net Weight

3608, 3608-1CE, 3608-5, 3608-6CE:

83 lbs. (38 kg)

3618, 3618-1CE, 3618-5, 3618-6CE:

150 lbs. (68 kg)

SPECIFICATIONS

Environmental Conditions

Operating: 15°C to 40°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 220 to 240 volt, CE models only)

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

EMC: EN 61000-3-2
EN 61000-3-3
EN 61326-1

Limits for harmonic current emissions
Limits for voltage fluctuations and flicker
Electrical equipment for measurement, control, and laboratory use; Part I: General Requirements

Safety: EN 61010-1

EN 61010-2-010

Safety requirements for electrical equipment for measurement, control, and laboratory use;
Part I: General Requirements
Part II: Particular requirements for laboratory equipment for the heating of materials

per the provisions of the Electromagnetic Compatibility Directive 89/336/EEC, as amended by 92/31/EEC and 93/68/EEC, and per the provisions of the Low Voltage Directive 73/23/EEC, as amended by 93/68/EEC.

The authorized representative located within the European Community is:

Thermo Fisher Scientific
419 Sutton Road
Southend On Sea
Essex SS2 5PH
United Kingdom

Copies of the Declaration of Conformity are available upon request.

Unpacking and Installation

Shipping Carton

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.

Location

Place the unit where it will be operated, away from drafts and wide variations in ambient temperature. It should be near a power source that matches the unit nameplate requirements. Allow clearance of a minimum of 2" around the unit for free air convection, hose/accessory attachment and user-access. **DO NOT** put the oven on top of or underneath another oven, or on a combustible surface.

Hose Connections

Connect a 1/4-inch ID vacuum hose to the left hose connector on the control panel that is marked "EVACUATE". Connect the other end of the hose to a vacuum pump.

If operation will include replacing the vacuum in the chamber with an inert gas such as carbon dioxide or nitrogen, connect a 1/4-inch ID flexible hose to the right hose connector that is marked "VENT" and to the regulator for the gas supply. **DO NOT** use combustible, flammable or corrosive gases.

UNPACKING AND INSTALLATION



Note

Leave unit disconnected when not in use.



Caution

Disconnect plug from electrical outlet before attempting any maintenance or repair on this unit.

Electrical Requirements

The unit is supplied with a 3-wire line cord. It should be plugged into an outlet supplying the correct voltage for the unit and designed for 3-prong plugs.

For an outlet designed to accept 2-prong (ungrounded) plugs, the best recommendation is to have a qualified electrician replace it with a new grounded outlet.

If a plug must be installed, use only the 3-prong grounded type, rated for the unit load requirements and matching the power outlet. Make sure the green ground wire is secured to the plug ground post.

Turn the power switch **OFF** and insert the plug into the outlet.

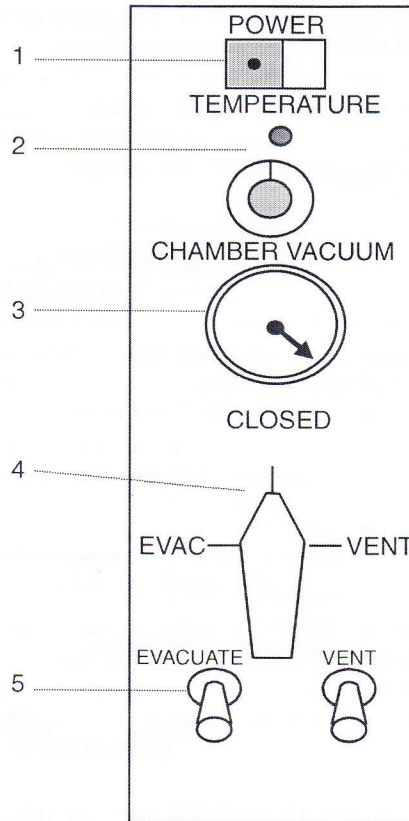
Thermometer

For models using the dial thermometer—3608, 3608-1CE, 3618 and 3618-1CE—place the thermometer so that the sensing element is in direct contact with the top shelf. The dial should be easily visible through the glass door.

Models with the LED display of temperature—3608-5, 3608-6CE, 3618-5 and 3618-6CE—are easily identifiable with the LED positioned just below the power switch. Ensure that the RTD block is installed and making contact with the shelf.

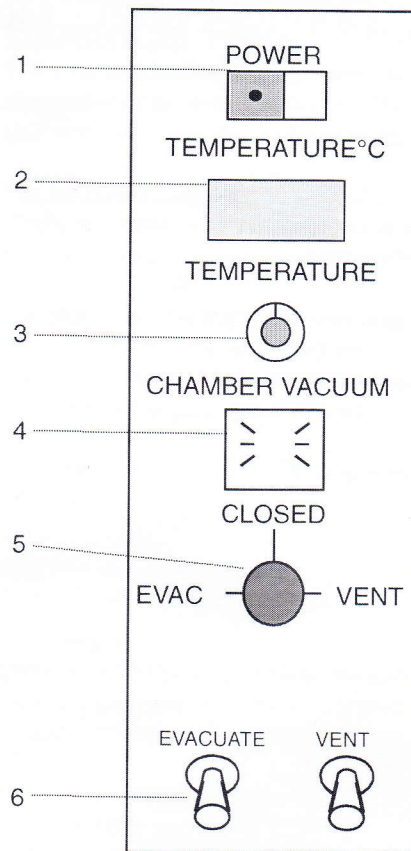
Features

Control Panel - Models with Dial Thermometer



1. **POWER SWITCH:** Power is on to the unit when this switch lamp is lit. (To reset the circuit breaker, press this switch to off, then on.)
2. **CONTROL THERMOSTAT & STATUS LAMP:** Adjust manually to control oven temperature. A permanently-set bimetallic thermostat (not on the panel) limits oven temperature at 250°C should the control thermostat fail.)
3. **VACUUM GAUGE:** Displays chamber level to 30-inches of mercury.
4. **VACUUM/VENT VALVE:** 3-way valve draws, holds or releases a vacuum.
5. **HOSE CONNECTORS:** Marked "EVACUATE" and "VENT" for 1/4" flexible tubing to connect to a gas source or vacuum pump.

Control Panel - Models with LED Readout



1. **POWER SWITCH:** Power is on to the unit when this switch lamp is lit. (To reset the circuit breaker, press this switch to off, then on.)
2. **LED TEMPERATURE DISPLAY:** Readout of temperature.
3. **CONTROL THERMOSTAT AND STATUS LAMP:** Adjust manually to control oven temperature. A permanently-set bimetallic thermostat (not on the panel) limits oven temperature at 250°C should the control thermostat fail.
4. **VACUUM GAUGE:** Displays chamber level to 30-inches of mercury.
5. **VACUUM/VENT VALVE:** 3-way valve draws, holds or releases a vacuum.
6. **HOSE CONNECTORS:** Marked "EVACUATE" and "VENT" for 1/4" flexible tubing to connect to a gas source or vacuum pump.

Operation



Caution

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.



Caution

Do not heat any substance above a temperature which will cause it to emit toxic fumes—death or severe injury may result.

Temperature Control

If it is necessary to set temperature before loading oven, push the power switch **ON** and note that the power switch light is lit. Rotate the thermostat knob to approximate the desired setting. The heater status lamp will be steadily lit until the chamber temperature approaches the thermostat setting. Wait several heat cycles until the temperature has stabilized.

Check the thermometer—dial or LED display—and rotate the thermostat knob clockwise to raise the set point or counterclockwise to lower it. After oven temperature has stabilized, check the temperature again and make further thermostat adjustments until the thermometer consistently shows the desired operating temperature. Push the power-switch **OFF** and allow the oven to cool down, or, if a batch is ready, the oven can be loaded immediately.

Loading the Oven

For units which utilize a dial thermometer, the thermometer can be removed and put back after loading if that is more convenient. Note that the thermometer sensing element must be in direct contact with a shelf for an accurate reading.

For best results, distribute the load evenly in the chamber, at least 1-inch away from chamber walls and resting directly on the shelves. **DO NOT PLACE FLAMMABLE SOLVENTS OR VAPORS** in the oven and avoid spilling acids. Be careful not to heat substances above their auto-ignition temperatures.

While the oven door is open, apply high quality vacuum grease to the door gasket. Close the door and push the power switch **ON**. If oven temperature was not previously set, review above at “TEMPERATURE CONTROL” to set the desired operating temperature.

Maintaining Proper Vacuum Level

The vacuum level will decrease slightly over a period of time. To bring it back up, rotate the vacuum/vent valve to "EVACUATE" and start the vacuum pump.

When the vacuum gauge again shows the desired level, rotate the vacuum/vent valve to the setting marked "CLOSED" and shut off the vacuum pump.

Releasing the Vacuum

If the vacuum is to be replaced by ambient air, disconnect any tubing attached to the hose connector marked "VENT" and rotate the vacuum/vent valve to its "VENT" setting.

Purging the Chamber with Inert Gas

Use only a non-combustible, nonflammable, non-corrosive gas—such as nitrogen or carbon dioxide—if application requires replacing the vacuum with an inert gas.

Connect 1/4-inch ID tubing to the hose connector marked "VENT" and connect the other end of the tubing to the regulator at the inert gas source.

Start the gas flowing at no more than 5 psi. Rotate the vacuum/vent valve to the "VENT" position and shut off the regulator when the vacuum gauge reads zero (normal atmospheric pressure).

The oven does not require very much gas to fill the chamber:

3608, 3608MP, 3608-1, 3608-5, 3608-6: Interior volume is 0.75 cubic feet.

3618, 3618-1, 3618-5, 3618-6: Interior volume is 2.30 cubic feet.



Caution

Do not pressurize the chamber above atmospheric pressure—the oven will not withstand a positive internal pressure. When the vacuum gauge reads zero, shut the gas off.

Unloading the Oven

When the bake is completed and the vacuum has been released or replaced as described earlier, push the power switch to **OFF**. Open the oven door and remove the dial thermometer. Take the contents from the chamber and reinsert the thermometer with the sensing element in direct contact with the center shelf.

Maintenance



Note

Make no attempt to service or repair a Thermo Scientific product under warranty before consulting your Thermo Scientific 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, please call Customer Service at 800-553-0039. No merchandise should be returned directly to the factory without obtaining a Return Materials Authorization (RMA) number from Customer Service.



Caution

Refer servicing to qualified personnel.



Caution

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



Caution

Electrolysis can damage stainless steel. This occurs when an object is allowed to rest directly on the surface of stainless steel, trapping moisture that becomes oxygen-starved, but is surrounded by water-containing oxygen.

Routine Cleaning

Wash the cabinet with a solution of water and mild soap or detergent to clean off surface dirt, marks or smudges.

Keep the vents clear of dust for free air circulation. This will add to the service life of components.

The aluminum shelf assembly should be washed with a mild soap and water. Do not use abrasive or halogen-based cleaners—they will damage the finish. Rinse thoroughly and dry completely.

Wipe interior glass with an ammonia-based glass cleaner and a soft, lint-free cloth.

Clean up spills inside the chamber as soon as possible to prevent them from being baked on. When the oven is cool, use hot soapy water and a soft cloth to clean the #304 stainless steel chamber. Do not use scouring pads with metallic content, chlorine bleach or halogen-based cleaners. (Special order units may come with stainless steel shelves, in addition to the stainless steel interior.)

Care and Cleaning of Stainless Steel

WARNING: Electrolysis can damage stainless steel. This occurs when an object is allowed to rest directly on the surface of stainless steel, trapping moisture that becomes oxygen-starved, but is surrounded by water containing oxygen.

The Alloy Called Stainless

Stainless steel is an alloy of steel with chromium and nickel that increase the metal's resistance to rust and corrosion. Yet, if not properly cared for, stainless steel can rust and corrode.

Exposure to air provides the passivation, or oxide layer coating, for clean stainless by producing a thin, durable chromium-oxide film that forms rapidly on the alloy surface to give stainless its characteristic "stainless" quality. Also exposure of the surface to other oxidizing environments can produce a passivating film or coating.

However, if free oxygen is not available due to scale or contamination buildup the metal surface may become vulnerable to rusting and corrosion as well as pitting. But by maintaining neutral pH and conducting frequent cleanings with detergent and water, years of trouble-free service from stainless steel products can be obtained.

Stainless Guidelines

Distilled water is recommended. Please note, if this water is very pure it may be corrosive to stainless. When filling a bath or incubator, ALWAYS add 2 to 40 ppm (20 to 40 mg/liter) disodium phosphate or sodium bicarbonate, adjusting dosage to provide a pH value of 7 to 9. If not available, use clean, aerated soft tap water provided the total solids concentration is < 500 PPM. We do NOT recommend using 18 meg-ohm deionized water. If this is the only source of treated water available, mix with regular tap water at a 50/50 ratio.

The pH Factor

Check pH regularly. If pH is <6.0, add disodium phosphate to increase pH to a 7 to 9 value. Sodium carbonate or sodium bicarbonate may be used but they tend to form scale that must be rinsed out regularly. If pH is >10.0, add sodium bisulfate to decrease pH to a 7 to 9 value. Avoid adding harsh alkalines or acids since these may cause localized corrosion and result in unstable pH.

Special Considerations

WARNING: If it is necessary to use the following chemicals, limit exposure time to a maximum of 3 hours.

Aluminum chloride	E.D.T.A.	Potassium permanganate
Barium chloride	Ferrous chloride	Potassium thiocyanate
Calcium chloride	Lysol	Sodium hypochlorite
Chlorinated Lime	Mercury salts	Stannous chloride
Citric acid (boiling)	Phenol	Tartaric acid
Dakin's solution		

Always clean surfaces immediately after use.

BE ADVISED: Never use the following on stainless steel:

- Aqua regia
- Ferric chloride
- Iodine
- Sodium acid
- Sodium azide

Chemical spills, especially those agents listed here, should be removed as soon as possible and the stainless steel surface cleaned with mild soapy water followed by a clean water rinse.

Cleansing Agents

Anti-fungal and anti-bacterial additives are permissible to use as long as the pH of the aqueous solution is kept within the range of 7 to 9. These are available through laboratory distributors—but be sure to CONFIRM that they are not harmful to stainless steel.

**Caution**

Extreme care must be taken when handling these materials. Always work in an area with adequate ventilation. Use the precautions as outlined in the Material Safety Data Sheet (MSDS) and the manufacturer's instructions for the product being utilized. Also, follow the personal protection index found in the Hazardous Materials Information System (HMIS) section of the MSDS.

**Note**

The use and disposal of these chemicals may be regulated by your local city codes; consult those regulations before of disposing of these materials.

**Note**

This information is intended as guidelines only and we make no claim as to the suitability to any particular situation. Consult your staff chemist to determine what would be best for your stainless steel product and laboratory.

Cleaning Methods

Do not use any metallic pads. Instead, for stubborn stains, use a plastic light-duty cleansing pad and rub GENTLY in the direction of the metal grain.

If stains continue to persist, use one of the following chemicals and methods:

- Any of a variety of "scale removers" available at local supermarkets or hardware stores used for the cleaning of coffee marks, humidifiers or vaporizers.
- A 15% to 35% phosphoric acid solution available from laboratory supply distributors for scale and rust removal. Allow solution to soak the surface affected until rust and scale is loosened. Immediately follow with a clean water rise.
- Citric acid based cleaners.
- Bathroom tub and tile cleaners.
- A mixture of 20% nitric acid and 1.5% hydrofluoric acid (or 1.5% hydrochloric acid). Swab solution on surface allowing it to remain until rust is loosened. Immediately follow with a clean water rise. (This method should ONLY be used if SEVERE rust and scale stains are present.)
- Oxalic acid 2% to 5% in warm water. Swab solution on surface allowing it to remain until rust is loosened. Immediately follow with a clean water rise. (This method should ONLY be used if SEVERE rust and scale stains are present.)

Regardless of the approach utilized, ALWAYS follow the manufacturer's directions and allow the chemicals to do the cleaning with MINIMAL scrubbing.

Always follow cleanings with a clean water rinse. Air dry.

Materials Effective in Disinfecting

- Glutaraldehyde
- Alcohol

MAINTENANCE

Door Gasket Lubrication

Apply a high-quality vacuum grease to the door gasket frequently, especially before initiating a vacuum. Also apply vacuum grease to the gasket after shutdown, if the oven will not be used in the near future.

Troubleshooting

There are few oven parts that will require repair. In case of a malfunction, the control thermostat, limit thermostat, heater status lamp, heaters, power switch, vacuum/vent valve and vacuum gauge are fairly easy to replace.

Use this troubleshooting guide to find a possible source of any problem, then test and/or make replacement as described.



Caution

Before attempting any repair, disconnect power cord from outlet.

SYMPTOM

POSSIBLE CAUSES OF PROBLEM

Excessive vacuum leaks:

Check door gasket and door alignment.

Check for loose connections/fittings.*

Check the vacuum/vent valve—order a replacement if it is leaking.*

Won't vent or evacuate:

Check for open fittings, large leaks.*

Check vacuum/vent valve; replace if bad.*

Check tubing & fittings for obstruction.*

Apply high quality vacuum grease to door gasket.

Vacuum gauge not at zero when oven door is open:

Replace the vacuum gauge.*

Power switch does not light:

Check power cord and outlet for power.

Check main fuses inside back cover.

Replace the power switch if necessary.

Heater status lamp is out when cold oven is heating up:

Replace the heater status lamp.

The thermostat is set at maximum and thermometer does not register or only registers partial heating:

Move thermometer in contact with shelf.

Check both thermostats—replace if bad.

Make ohmmeter check of heater resistance and replace faulty heater(s).

Servicing



Caution

Push the power switch **off** and **unplug** the oven before attempting any service or repairs on the unit.

Control Thermostat Replacement

Disconnect power and remove the control panel, back panel (edge screws) and insulation.

- Locate the thermostat bulb from the back of the oven attached to the right-side heater on the vacuum chamber. Slide the bulb from its bracket.
- Remove the thermostat knob by loosening the setscrew and take the old thermostat from the control panel. Move the 3 leads to new thermostat, referring to the wiring schematic if necessary.
- Install the new thermostat on the control panel and tighten the knob onto it. Uncurl enough sensor tubing to slide the new bulb into its bracket with several inches of slack. Route the sensor tubing to prevent electrical shorts to other components.
- Replace the insulation and the back panel. Replace the control panel, power up and test run the oven.

Heater Status Lamp Replacement

Disconnect power. Refer to the wiring schematic.

- Remove the status lamp lead at the terminal block and thermostat.
- Push the new lamp in place. Attach the new lamp leads to the thermostat and terminal block.
- Power up and test the new status lamp.



Note

The valve body has an anti-rotation/stop tab. This needs to be located in the top right quadrant when facing the control panel.



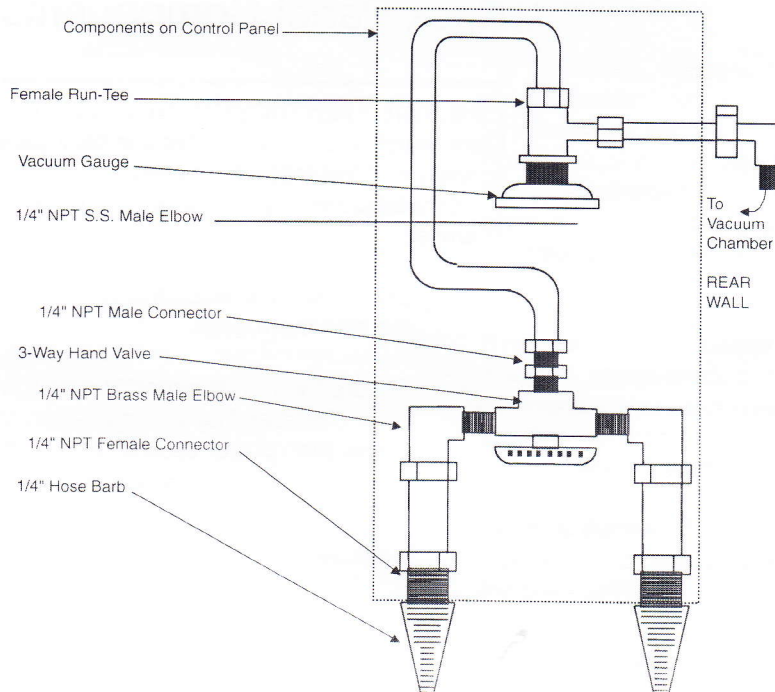
Note

All tubing to be 1/4" stainless; all threaded connection to be sealed with thread sealer.

Vacuum/Vent Valve Replacement

Disconnect power. Referring to the upcoming piping diagram below, loosen the tubing from 3 compression fittings on the vacuum/vent valve on the control panel.

- Remove the control panel valve handle by loosening the hex setscrew. Then unscrew the valve retaining nut on front of the panel and take the old valve from the back of the panel.
- Remove the 2 elbows and the straight connector from the valve body and install on the new valve using a thread sealant.
- Remove the valve handle from the new valve body.
- Install the new valve in the panel and tighten the retaining nut. Replace the valve handle and tighten the setscrew.
- Connect the valve assembly to the vacuum gauge tubing and compression fittings.
- Draw a vacuum and check for leaks.



Vacuum Gauge Replacement

After disconnecting power and removing the control panel, remove copper tubing from both compression fittings on the vacuum gauge—refer to the piping diagram on previous page if necessary.

- Remove the T-fitting from the back of the gauge and take off the gauge retaining bracket by removing the two thumbnuts. Pull the old gauge out from the front of the control panel.
- Install the new gauge in the panel and replace the retaining bracket with thumbnuts.
- Clean old sealant from all male threads and apply new sealant. Install the T-fitting on the back of the new gauge and attach tubing with compression fittings to the gauge.
- Replace the control panel, draw a vacuum and check for leaks.

Back Panel Components

Hi-Limit Thermostat Replacement

Disconnect power and remove the back panel (edge screws) and insulation from around components. Locate the bimetallic limit thermostat on the back of the oven chamber.

- Remove the nut holding the thermostat in place. Disconnect the leads from it and attach them to the new thermostat.
- Secure the new thermostat onto the back of the oven chamber. Replace insulation and the back panel, then power up and test run the oven.

Fusible Link Replacement

Disconnect power and remove the back panel (edge screws) and back insulation. Locate the bimetallic limit thermostat on the back of the oven chamber.

- Disconnect the fusible link from the bimetallic thermostat and control thermostat/terminal block as connected. This is the wire assembly with the high temperature sleeving on it.
- Connect the new fusible link to the bimetallic thermostat and control thermostat/terminal block.
- Replace the insulation and back panel, then power up and test the oven.

Heater Replacement

Disconnect power and remove the back panel (edge screws) and insulation from the back and sides. Note that oven model 3608 has 2 heaters, one located on each side of the chamber; 3618 models have 4 heaters, 2 located on each side.

- For 3618 models, the oven housing must be removed. The oven housing is held by screws around the bottom edges. Lift it off and remove the rest of the insulation.
- For all models, unscrew the heater brace nuts to remove heater braces. Pull the leads from heater terminals and test each heater for shorts or low resistance at the heating element sheath. An ohmmeter resistance reading that differs greatly from 48 ohms for Model 3608 or 36 ohms for Model 3618, indicates a faulty heater.
- Install a new or original heater with terminals facing down, using a new heater brace if a new heater is installed. Attach leads to the heater, so that wires do not touch any heated surfaces (see the upcoming wiring schematic). Tighten mounting nuts securely using a nickel based antisieze on the threads.
- Replace the oven housing and front insulation and repack side as well as back insulation, and replace the back panel.



Note

Do not let petroleum, silicone oil or grease contact the gasket or mounting groove.

Door Gasket Repairs

Door Gasket Replacement

After pulling the old gasket from its groove, remove all dirt and foreign matter from the groove and from the mating surface on the oven.

- Press the new gasket onto the mounting surface in the middle of the top section. Press top corners into place, then the sides. Next, fit the bottom corners, then the bottom section into place. Press and spread the gasket to set it solidly in the door groove.
- Close the door to help seat the gasket. Open the door and apply a high-quality vacuum grease to the gasket. Evacuate the oven while pressing on the door to seat the gasket firmly.

Door Alignment

Inspect the door-to-gasket seal to find where the door is out of alignment. Note that there are 2 (inner and outer) sets of hinge bolts.

- Adjust vertical door position by loosening inner hinge-to-oven bolts. Tighten them securely when the door is straight.
- Adjust gasket compression tolerance (in/out movement) by the outer hinge-to-door bolts, then tighten them securely.
- After adjustment is made, check it by opening and closing the door several times. Re-grease the gasket and test the seal by evacuating the oven. (Make further adjustments if necessary.)

Replacement Parts

DESCRIPTION	MODELS 3608, 3608-1CE, 3608-5, 3608-6CE	MODELS 3618, 3618-1CE, 3618-5, 3618-6CE
Cordset	CRX72 (3608, -5) CRX70 (3608-1CE, -6CE)	CRX73 (3618, -5) CRX70 (3618-1CE, -6CE)
Door Gasket	530-158-00	530-159-00
Glass Door	540-181-00	540-182-01
Heater	340-331-00	340-171-00
Heater Braces	014-247-00	583-657-00
Rubber Feet	790-225-00	790-078-00
Shelf	810-439-00	810-440-00
Status Lamp Base	PL1483X2	PL1496X2
Status Lamp Lens	360-235-00	360-235-00
Switch, Power (120V)	440-359-00 (3608,-5)	440-359-00 (3618,-5)
Switch, Power (240V)	440-292-00 (3608-1CE,-6CE)	440-292-00 (3618-1,-6)
Thermometer, Dial	910-017-00 (3608,-1CE)	910-017-00 (3618,-1)
Thermometer, LED	910-126-00 (3608-5, -6CE)	910-126-00 (3618-5,-6)
Thermostat, Bimetallic	920-416-00	920-416-00
Thermostat, Hydraulic	920-223-00	920-223-00
Thermostat, Knob	560-223-00	560-223-00
Transformer	TN1496X1 (3608-5) TN1495X2 (3608-6CE)	TN1496X1 (3618-5) TN1496X2 (3618-6CE)
Vacuum Gauge	660-103-00 (3608,-1CE)	660-103-00 (3618,-1)
Vacuum Gauge	660-097-00 (3608-5, -6CE)	660-097-00 (3618-5,-6)
Vacuum/Vent Valve	950-125-00	950-125-00
Fuse, Main	264306 (3608, -5) 710-0022 (3608-1CE, -6CE)	266058 (3618, -5) 261575 (3618-1CE, -6CE)
Fuse, Transformer	FZX35 (3608-5, -6CE)	FZX35 (3618-5, -6CE)
Thermal Fuse	WM1495X2	WM1496X18
RTD	410-667-00 (3608-5, -6CE)	410-667-00 (3618-5, -6CE)

Wiring Diagrams

Diagram Component List

Ref. No.	Description	Model No. and Our Part No.
DS1	Cycle Light	3608-1CE
F1	Fuse	PL1483X2
F2	Fuse	264306
FL1	Line Filler	264306
HR1	Heating Element	330-346-00
HR2	Heating Element	340-331-00
P1	Power Entry Module	340-331-00
S1	Switch, Power	340-331-00
S2	Thermostat, Control	710-0019
S3	Thermostat, Bi-Metal	440-359-00
TB1	Terminal Block	920-223-00
		920-416-00
		TRX17B

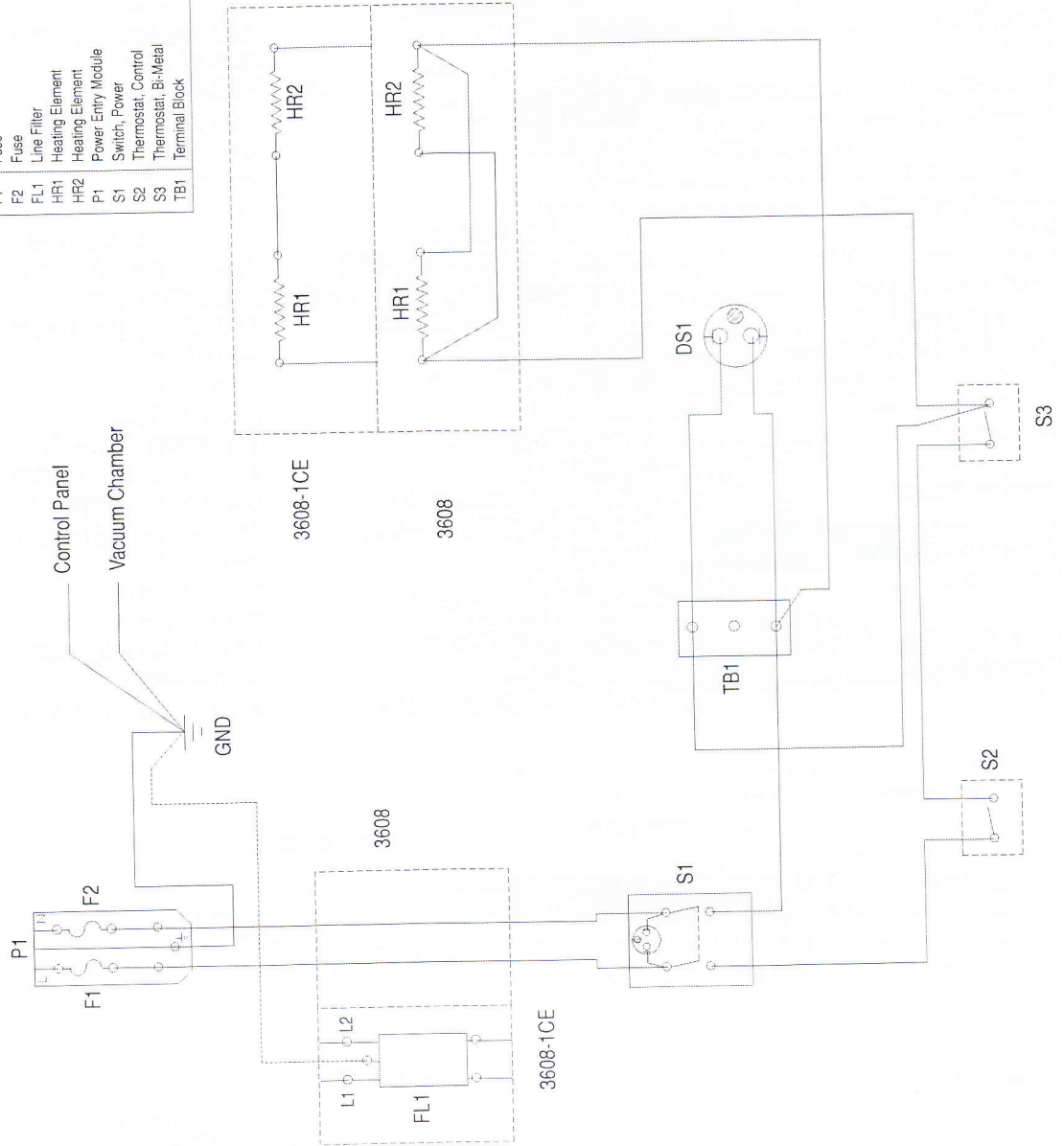
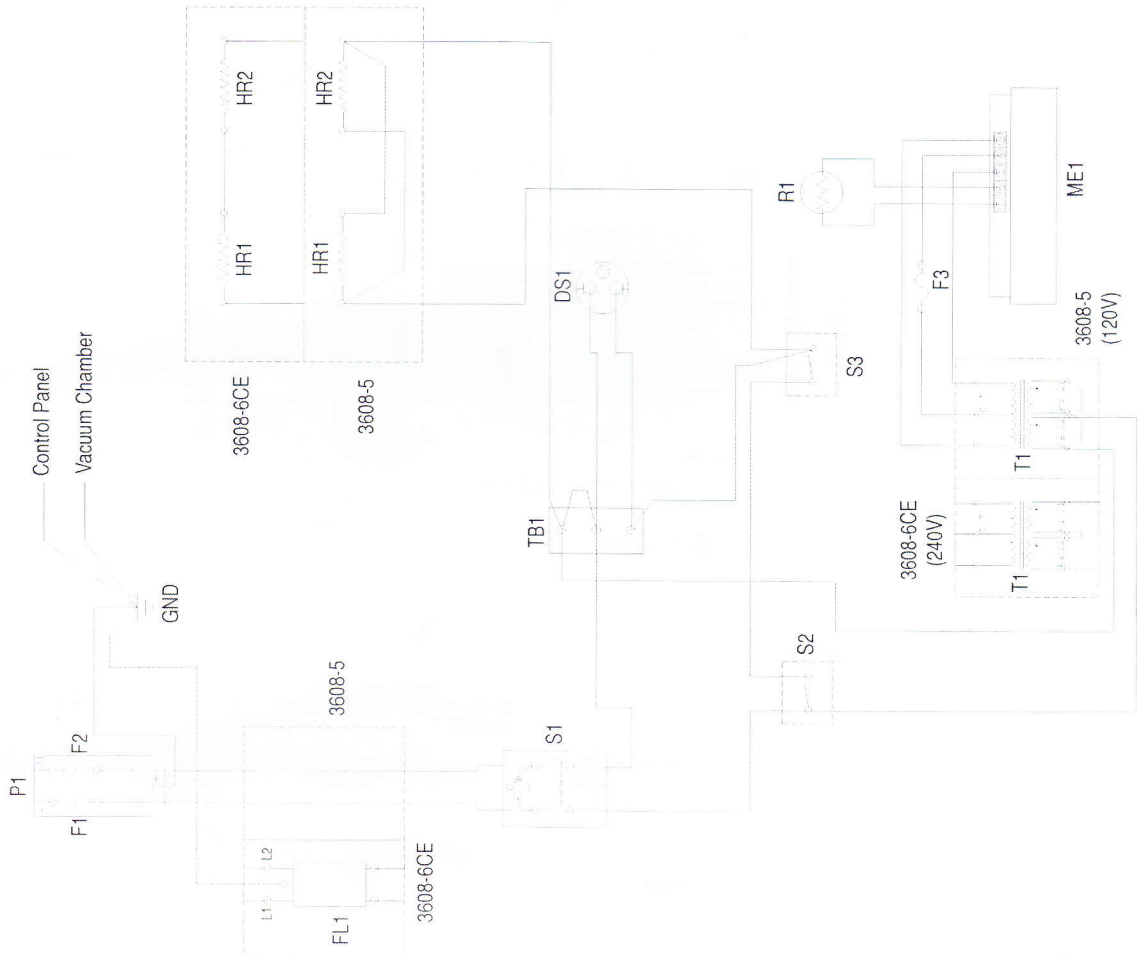


Diagram Component List

Ref. No.	Description	Model No. and Our Part No.
DS1	Cycle Light	3608-5
F1	Fuse	PL1483X2
F2	Fuse	710-0022
F3	Fuse	710-0022
FL1	Fuse	FZ35
FL1	Line Filter	330-346-00
HR1	Heating Element	340-331-00
HR2	Heating Element	340-331-00
ME1	Thermometer, Digital	340-331-00
P1	Power Entry Module	910-126-00
R1	RTD	710-0019
S1	Switch, Power	410-667-00
S2	Thermostat, Control	440-292-00
S3	Thermostat, Bi-Metal	920-223-00
T1	Transformer	920-416-00
TB1	Terminal Block	TN1495X1
		TRX178



WIRING DIAGRAMS

Diagram Component List

Ref. No.	Description	Model No. and Our Part No.
DS1	Cycle Light	3618
F1	Fuse	PL1496X2
F2	Fuse	266058
FL1	Line Filter	261575
HR1	Heating Element	330-346-00
HR2	Heating Element	340-171-00
HR3	Heating Element	340-171-00
HR4	Heating Element	340-171-00
P1	Power Entry Module	CEX149
S1	Switch, Power	440-359-00
S2	Thermostat, Control	920-223-00
S3	Thermostat, Bi-Metal	920-416-00
TB1	Terminal Block	TRX178

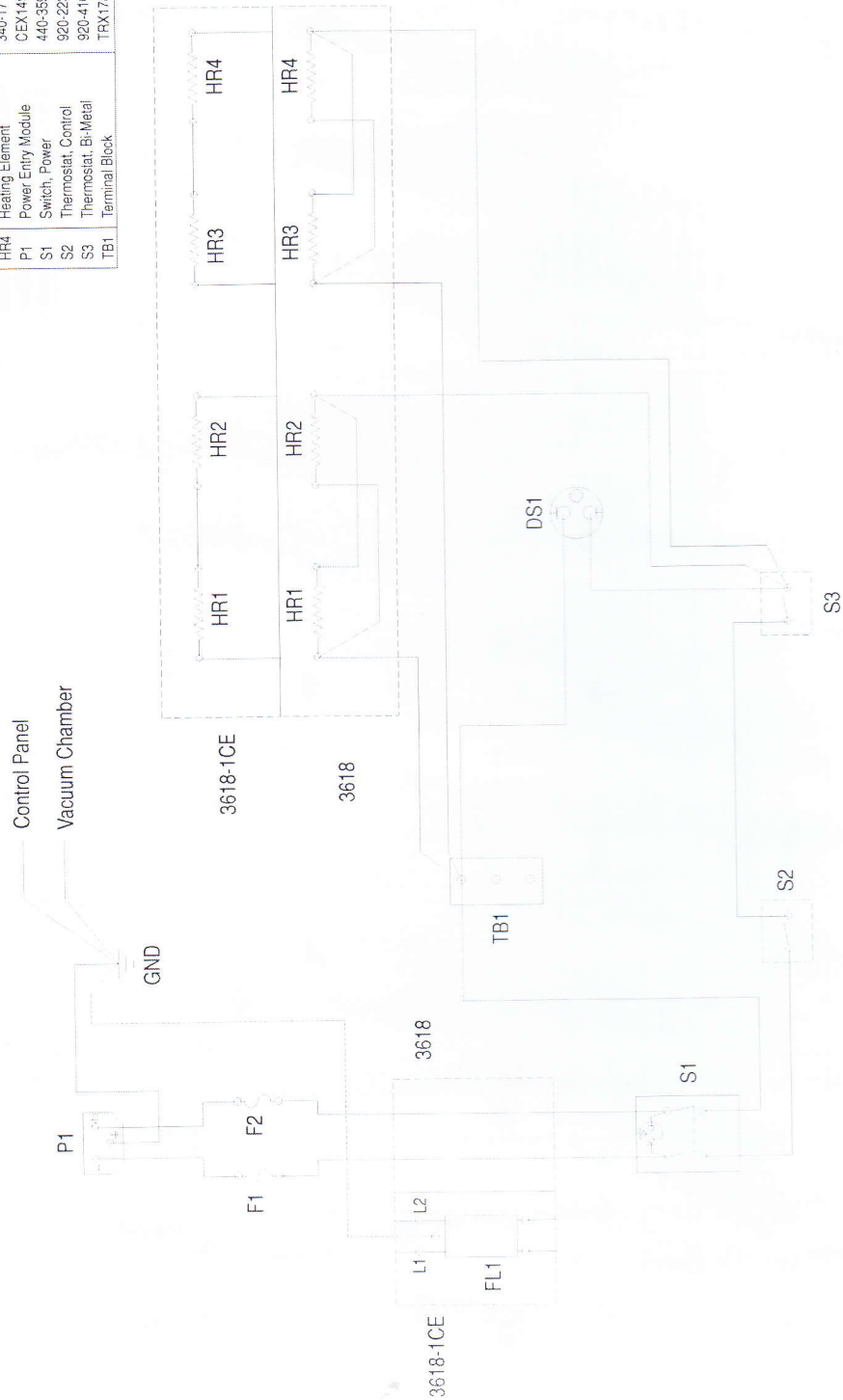
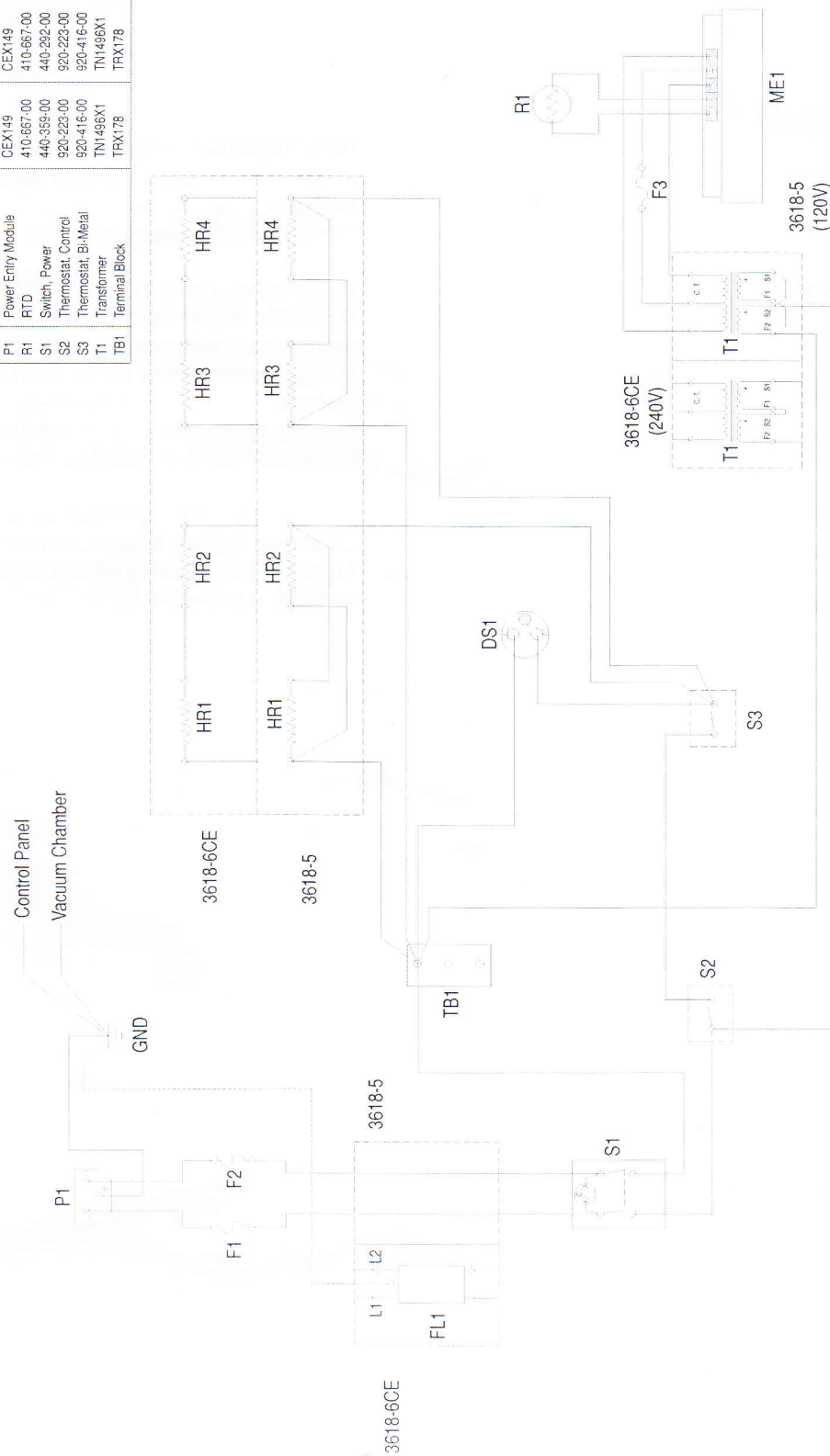


Diagram Component List

Ref. No.	Description	Model No. and Our Part No.
DS1	Cycle Light	3618-5
F1	Fuse	PL1496X2
F2	Fuse	266058
F3	Fuse	261575
FL1	Line Filter	FZX35
HR1	Heating Element	330-346-00
HR2	Heating Element	340-171-00
HR3	Heating Element	340-171-00
HR4	Heating Element	340-171-00
ME1	Thermometer, Digital	910-126-00
P1	Power Entry Module	CEX149
R1	RTD	410-667-00
S1	Switch, Power	440-359-00
S2	Thermostat, Control	920-223-00
S3	Thermostat, Bi-Metal	920-416-00
T1	Transformer	TN1496X1
TB1	Terminal Block	TRX178



Ordering Procedures

Please 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 Scientific** dealer from whom you purchased this unit or can be obtained promptly from the factory. When service or replacement parts are needed we ask that you check first with your dealer. If the dealer cannot handle your request, then contact our Customer Service Department at 563-556-2241 or 800-553-0039.

Prior to returning any materials, please contact our Customer Service Department for a "Return Materials Authorization" number (RMA). Material returned without an RMA number will be refused.

Two Year Limited Warranty

This Thermo Scientific product is warranted to be free of defects in materials and workmanship for two (2) years from the first to occur of (i) the date the product is sold by the manufacturer or (ii) the date the product is purchased by the original retail customer (the "Commencement Date"). Except as expressly stated above, the MANUFACTURER MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCTS AND EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF DESIGN, MERCHANT ABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

An authorized representative of the manufacturer must perform all warranty inspections. In the event of a defect covered by the warranty, we shall, as our sole obligation and exclusive remedy, provide free replacement parts to remedy the defective product. In addition, for products sold within the continental United States or Canada, the manufacturer shall provide free labor to repair the products with the replacement parts, but only for a period of ninety (90) days from the Commencement Date.

The warranty provided hereunder shall be null and void and without further force or effect if there is any (i) repair made to the product by a party other than the manufacturer or its duly authorized service representative, (ii) misuse (including use inconsistent with written operating instructions for the product), mishandling, contamination, overheating, modification or alteration of the product by any customer or third party or (iii) use of replacement parts that are obtained from a party who is not an authorized dealer of Thermo Scientific products.

Heating elements, because of their susceptibility to overheating and contamination, must be returned to the factory and if, upon inspection, it is concluded that failure is due to factors other than excessive high temperature or contamination, the manufacturer will provide warranty replacement. As a condition to the return of any product, or any constituent part thereof, to the factory, it shall be sent prepaid and a prior written authorization from the manufacturer assigning a Return Materials Number to the product or part shall be obtained.

IN NO EVENT SHALL THE MANUFACTURER BE LIABLE TO ANY PARTY FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR ANY DAMAGES RESULTING FROM LOSS OF USE OR PROFITS, ANTICIPATED OR OTHERWISE, ARISING OUT OF OR IN CONNECTION WITH THE SALE, USE OR PERFORMANCE OF ANY PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE), ANY THEORY OF STRICT LIABILITY OR REGULATORY ACTION.

For the name of the authorized Thermo Scientific product dealer nearest you or any additional information, contact us:

2555 Kerper Blvd., Dubuque, Iowa, 52004-0797

Phone: 563-556-2241 or 1-800-553-0039

Fax: 563-589-0516

E-mail: mkt@thermofisher.com

Web: www.thermo.com