



ECONOMY OVENS

MODELS: 1310, 1320, 1321F,
1324, 1325F, 1326, 1327F

INSTALLATION AND OPERATION MANUAL

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These units are general purpose utility ovens for professional, industrial or educational use where the preparation or testing of materials is done at approximately atmospheric pressure and no flammable volatile, or combustible materials are being heated. These units are not intended for hazardous or household locations or use.

RECEIVING AND INSPECTION

Your satisfaction and safety require a complete understanding of this unit, including its proper function and operational characteristics. Read the instructions thoroughly and be sure that all operators are given adequate training before attempting to put the unit in service. **Note: This equipment must be used only for its intended application; any alterations or modifications will void your warranty.**

- 1.1 Inspection:** The carrier, when accepting shipment, also accepts responsibility for safe delivery and is liable for loss or damage claims. On delivery, inspect for visible exterior damage, note and describe on the freight bill any damage found and enter your claim on the form supplied by the carrier.
- 1.2** Inspect for concealed loss or damage on the unit itself, both interior and exterior. If any, the carrier will arrange for official inspection to substantiate your claim.
- 1.3 Return Shipment:** Save the shipping carton until you are sure all is well. If for any reason you must return the unit, first contact your customer service representative for authorization, and supply data plate information including serial number. Please see the manual cover for information on where to contact customer service.
- 1.4 Accessories:** Verify that all of the equipment indicated on the packing slip is included with the unit. Carefully check all packaging before discarding. Each unit is equipped with 2 shelves, 8 shelf clips, a thermometer and thermometer clip.

GRAPHIC SYMBOLS

Your oven is provided with a display of graphic symbols to help in identifying the use and function of the available adjustable components.

2.1



This symbol, when shown, indicates that you should consult your manual for further description or discussion of a control or user item.

2.2



Indicates **"AC Power"**

2.3



Indicates **"Adjustable Temperature"**

2.4



Indicates **"Manual Control"**

2.4



Indicates **"Heating"**

2.5



Indicates **"Over Temperature"**

2.6



Indicates **"Protective Earth Ground "**

2.7



Indicates **"Potential Shock Hazard"**

INSTALLATION

Local city, county, or other ordinances may govern the use of this equipment. If you have any questions about local requirements, please contact the appropriate local agency. Installation may be performed by the end user.

Under normal circumstances this unit is intended for use indoors, at room temperatures between 5° and 40°C, at no greater than 80% Relative Humidity (at 25°C) and with a supply voltage that does not vary by more than 10%. Customer service should be contacted for operating conditions outside of these limits.

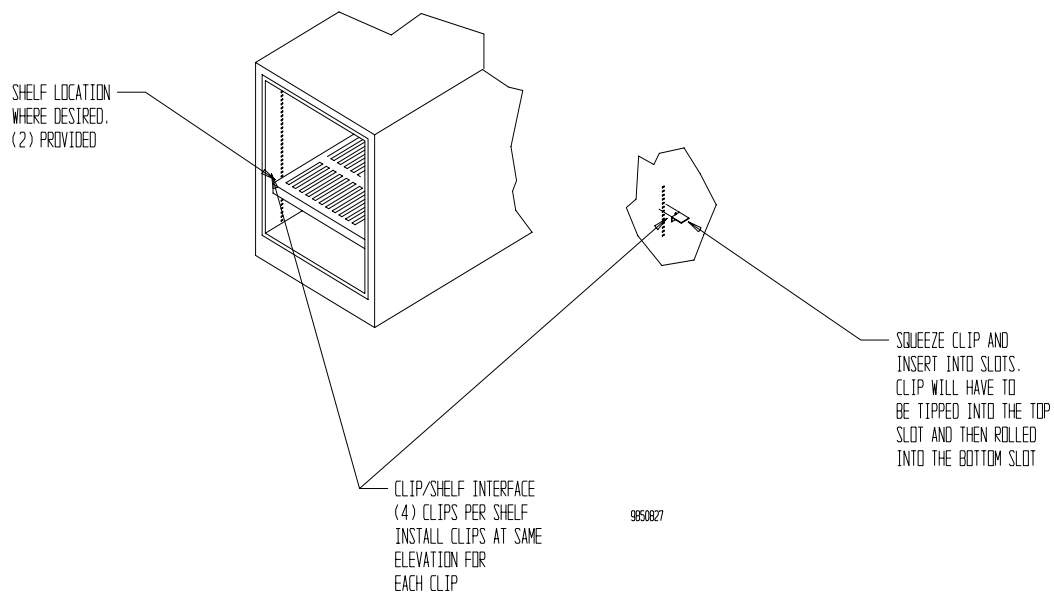
- 3.1 Power:** The power source must match the voltage, cycle, phase and ampere requirements listed on the data plate (located just above the power cord on the back side of the oven). The unit is intended for 50/60 HZ application. Make sure your power supply matches that shown on the data plate. VOLTAGE SHOULD NOT VARY MORE THAN 10% FROM THE DATA PLATE RATING. A separate circuit is recommended to preclude loss of product due to overloading or circuit failure. Note that the electrical supply to the unit must conform to all national and local electrical codes.
- 3.2 Location:** When selecting a site for the oven, consider conditions that may effect performance, such as heat or cold from air vents, fast moving air currents, other ovens, autoclaves, direct sun, etc. Avoid high traffic areas that may reduce accessibility to the oven and allow at least 5cm between the unit and surrounding walls or partitions that might obstruct free airflow.
- 3.3 Lifting/Handling:** These units are heavy and care should be taken to use appropriate lifting devices that are sufficiently rated for these loads. Units should only be lifted from their bottom surfaces. Doors, handles, and knobs are not adequate for lifting or stabilization. The unit should be completely restrained from tipping during lifting and transport. All moving parts, such as shelves and trays should be removed and doors need to be positively locked in the closed position during transfer to prevent shifting and damage.
- 3.4 Leveling:** The unit must sit level and solidly. The oven is equipped with non-adjustable rubber feet to raise it off the counter and prevent sliding; however, the counter must be level to provide optimum working and safety conditions.
- 3.5 Cleaning:** The oven was cleaned at the factory, but not sterilized. Remove all interior parts, including shelves and shelf clips. If assembled and clean the inside of the chamber thoroughly with a disinfectant that is appropriate for your application. DO

NOT USE chlorine-based bleaches or abrasive cleaners, as they will damage the ovens interior surfaces. DO NOT USE spray cleaners that might leak through openings and cracks and get on electrical parts or that may contain solvents that will harm coatings. A regular periodic cleaning is recommended.

WARNING: Never clean the unit with alcohol or flammable cleaners with the unit connected to the electrical supply. Always disconnect the unit from the electrical service when cleaning and assure all volatile or flammable cleaners are evaporated and dry before reattaching the unit to the power supply.

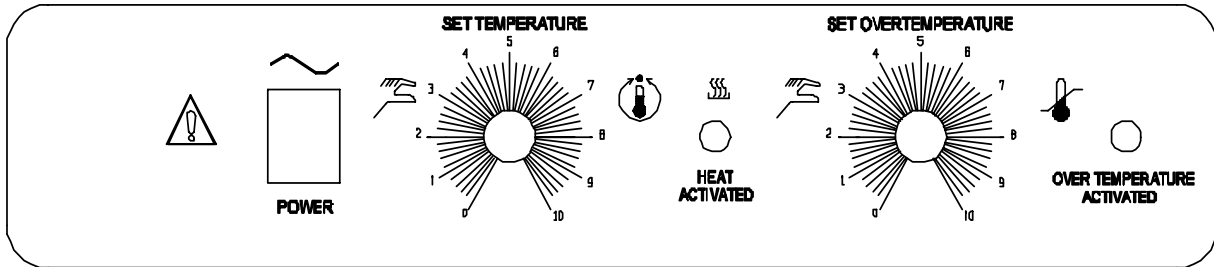
3.6 Shelves: Place shelves in the chamber at desired position. See **Figure 1**.

Figure 1



CONTROL PANEL OVERVIEW

Figure 2



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- 4.1 Power Switch:** The main power I/O (on/off) switch controls all power to the oven. It must be in the I, or ON position before any systems are operational.
- 4.2 Main Temperature Controller:** Marked SET TEMPERATURE, this control is equipped with an adjustment knob and a graduated dial. The graduated dial is marked with 10 major increments and 50 minor increments. The increments can be used as index points for setting and returning to set point temperatures.
- 4.3 HEATING light:** This green pilot light is marked HEAT ACTIVATED and indicates when the element has been activated and the oven is heating. When set point is reached the pilot light will cycle on and off as the elements maintain the temperature selected.
- 4.4 Over Temperature Thermostat:** Marked SET OVERTEMPERATURE, this control is completely independent of the Main Temperature control and is equipped with an adjustment knob that requires a flat-edged tool when making adjustments to eliminate accidental changes. It provides safety temperature protection for the oven. If for any reason the oven temperature rises above the Main Temperature control's set point, the Over Temperature Thermostat will limit the rise to approximately 10°C above the set point selected.

- 4.5 Over Temperature light:** This red pilot light is marked OVERTEMPERATURE ACTIVATED and is on when the Over Temperature Thermostat has been activated and taken control of the elements. Under normal operating conditions this pilot light should never be on.

PRECAUTIONS

This unit has been designed with a dampered vent from the chamber. In order to work effectively and safely, some precautions will need to be taken by the operator.

- 5.1** In most applications, the exhaust damper will need to be open during drying or degassing for best results.
- 5.2** **THIS OVEN IS NOT AN EXPLOSION PROOF OVEN AND IS NOT DESIGNED TO HANDLE COMBUSTIBLE GASSES. Do not place explosive, combustible or flammable materials into the chamber.**
- 5.3** Some of the out-gassed byproducts may be hazardous or unpleasant to operating personnel. If this is the case, the exhausts should be positively ventilated to the outside and dealt with according to local regulations. Your dealer can provide you with a power exhaust that greatly helps under these applications.
- 5.4** Do not place sealed or filled containers in the oven chamber.
- 5.5** This oven is NOT designed for use in Class I, II, or III locations as defined by the National Electrical Code.
- 5.6** This oven is not intended, nor can it be used, as a patient connected device.

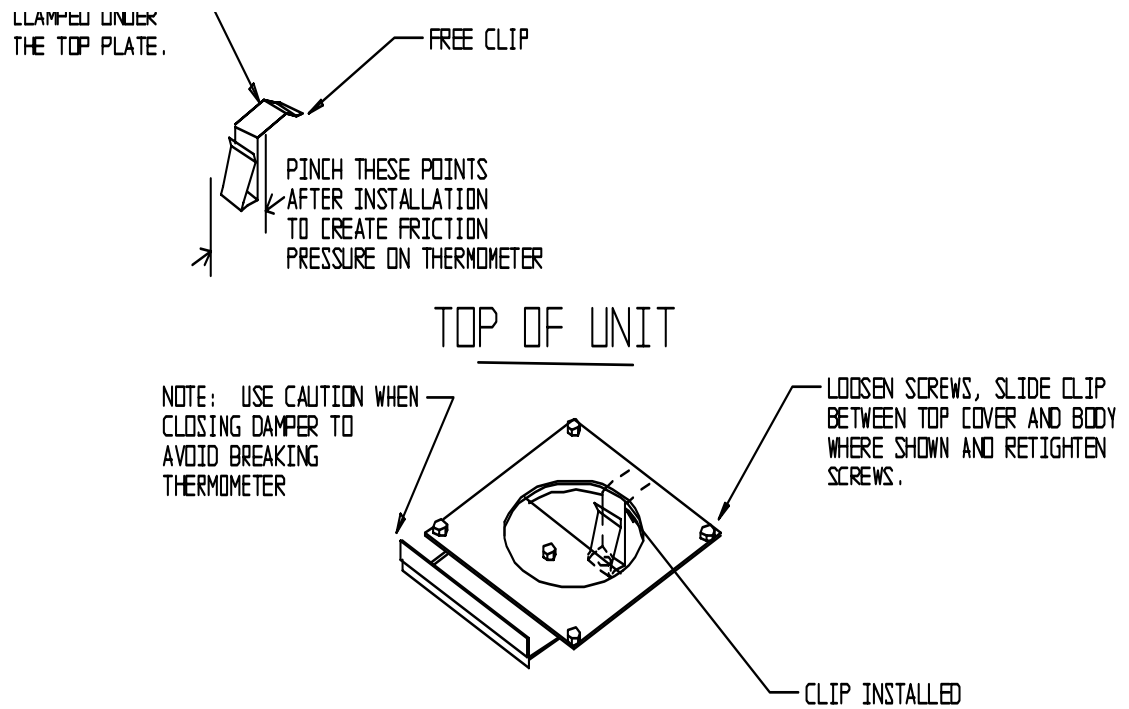
OPERATION

- 6.1 Power Supply:** The power supply must be properly grounded (earthed) and correctly sized to match the unit data plate rating. The supply voltage must match the data plate voltage within 10%. If supplied with a detachable cord set, plug the female end into the inlet on the unit and the male plug into the supply. Assure that units requiring a fuse have a fuse installed.
- 6.2** Push the power switch to the ON position and turn the Over Temperature Thermostat to its maximum position, clockwise so it will not interrupt the setting of the Main Temperature control.
- 6.3** Place the reference thermometer through the exhaust port on top of the unit; a clip is provided with your accessory package. See **Figure 3** on the following page.
- 6.4 Setting Main Temperature:** The operating range for this oven is ambient room temperature + 5°C to 200°C. To set the Main Temperature Controller turn the knob to the desired oven temperature, using the graduated dial as a reference guide. Allow one hour for the temperature to stabilize. Using the reference thermometer, verify the oven temperature; if it is not at the desired value, turn the control knob up or down as needed. Allow the temperature to re-stabilize, continuing the process until the exact desired temperature is achieved.

Note: Slight vapor or smoke may occur in the initial heat-up. This is a normal occurrence when the oven is first brought up to temperature and protective coatings on the element become hot.

- 6.5 Setting Over Temperature:** As stated in section 6.2, the Thermostat should be set to its maximum position. Now turn the control knob counterclockwise just until the OVERTEMPERATURE ACTIVATED light comes on. Next, slowly turn the control knob clockwise just until the light goes off. Then turn the control knob clockwise two (2) minor scale divisions past the point where the light went out. The Over Temperature Thermostat should now be set at approximately 10°C above the Main Temperature set point. Note that it is not recommended that the unit be allowed to operate using the Over Temperature Thermostat as the temperature controller for an extended period of time. See the Troubleshooting section if the Thermostat is activated.

Figure 3



DOCUMENT 9900526

MAINTENANCE

Note: *Prior to any maintenance or service on this unit, disconnect service cord from the power supply.*

- 7.1 Cleaning:** Clean the oven interior on a regular basis. When washing interior of unit, handle gasket carefully so as not to impair the positive seal. Clean the inside of the chamber thoroughly with a disinfectant that is appropriate for your application. Make sure to rinse the cleaned surface with a damp cloth. **DO NOT USE** chlorine-based bleaches or abrasive cleaners, as they will damage the oven chamber. **DO NOT USE** spray cleaners that might leak through openings and cracks and get on electrical parts or that may contain solvents that will harm coatings.

WARNING: Never clean the unit with alcohol or flammable cleaners with the unit connected to the electrical supply. Always disconnect the unit from the electrical service when cleaning and assure all volatile or flammable cleaners are evaporated and dry before reattaching the unit to the power supply.

- 7.2 Storage:** If the unit is to be shut down for an extended period of time, wipe the chamber clean and let dry before closing door to eliminate possibility of contamination. If the unit is to be transported, remove shelving and trays, clasp the door shut and disconnect the power supply. Please refer to Section 3.3, Lifting / Handling for further direction.
- 7.3** No maintenance is required on the electrical components. If oven fails to operate as specified please review Section 8.0 Troubleshooting, prior to calling customer service.

TROUBLESHOOTING

TEMPERATURE

Temperature too high

- 1/ controller set too high-see *section 6.4*
- 2/ controller failed on – *call Customer Service*
- 3/ wiring error – *call Customer Service*

Chamber temp spikes over set point and then settles to set point

Recalibrate – see *section 6.3 and 6.4*

Temperature too low

- 1/ Thermostat set too low – see *section 6.5*
- 2/ controller set too low – see *section 6.4*
- 3/ unit not recovered from door opening – *wait for heating indicator to turn off*
- 4/ unit not recovered from power failure or being turned off – *oven will need 1 hour to warm up and stabilize*
- 5/ element failure – *see if heating indicator is on; compare current draw to data plate*
- 6/ controller failure – *confirm with front panel light that controller is calling for heat*
- 7/ Thermostat failure – *confirm with front panel light that it is operating correctly*
- 8/ wiring problem – *check all functions and compare wiring to schematic in section 9.0 - especially around any areas recently worked on*
- 9/ loose connection – *call customer service*

Unit will not heat over a temperature that is below set point

- 1/ confirm amperage and voltage match data plate
- 2/ confirm that set point is set high enough –*turn Thermostat all the way clockwise and see if heating light or safety light comes on*
- 3/ check connections to sensor
- 4/ check calibration – *using independent thermometer, follow instructions in section 6.4*

Unit will not heat up at all

- 1/ verify that controller is asking for heat by looking for heating indicator light – *if pilot light is not on continuously at initial start up, there is a problem with the controller*
- 2/ check amperage – *amperage should be virtually at maximum rated (data plate) amperage*
- 3/ is the Thermostat set high enough? – *for diagnostics, should be fully clockwise with the pilot light never on*
- 4/ has the fuse/circuit breaker blown?

Indicated chamber temperature
unstable

- 1/ ± 0.1 may be normal but gravity models may vary ± 2.0 degrees
- 2/ is ambient room temperature radically changing – either door opening or room airflow from heaters or air conditioning ? – *stabilize ambient conditions* .
- 3/ it may happen if exhaust stack is 100% open – *adjust stack to at least $\frac{1}{4}$ closed*.
- 4/ calibration sensitivity – *call Customer Service*
- 5/ Thermostat set too low – be sure that it is more than five degrees over desired set point; check if pilot is on continuously; turn controller knob completely clockwise to see if problem solved then follow instructions in section 6.5 for correct setting.

Will not maintain set point

- 1/ assure that set point is at least 5 degrees over ambient room temperature.
- 2/ see if ambient is fluctuating

MECHANICAL

Door not sealing

- 1/ Confirm that the door gasket is aligned properly.
- 2/ Confirm that unit has not been damaged and that the body is square.

OTHER

Unit or wall fuse/circuit breaker is
blown

- 1/ check wall power source
- 2/ compare current draw and compare to specs on data plate
- 3/ see what other loads are on the wall circuit

Unit will not turn on

- 1/ check wall power source
- 2/ check fuse/circuit breaker on unit or in wall
- 3/ check all wiring connections, esp. around the on/off switch

Unit is smoking – out of box

Put unit under vent and run at full power for one hour.

Contamination in chamber

- 1/ See cleaning procedure section 7.1
- 2/ Develop and follow a standard operating procedure for specific application; include definition of cleaning technique and maintenance schedule

PARTS LIST 1310 , 1320 & 1321F

Description	115V	220V
Cord Set – European	NA	1800500
Cord Set – USA	1800516	101990
Door Gasket	600002	600002
Door Handle	300142	300142
CIRCUIT BREAKER	1100505	1100505
Fan 1321F	2600502	2600502
Fan Blade 1321F	104073	104073
Heating Element, 1310	9570637	9570642
Heating Element, 1320	9570640	9570644
Heating Element 1321F	9570746	9570802
Knob, Main Temperature	X1000771	X1000771
Knob, Over Temperature	4450506	4450506
Main Temperature Controller	100026	100026
Motor 1321F	4880527	4880528
On/Off (I/O) Switch	103351	103351
Over Temperature Thermostat	1750615	1750615
Pilot Light, green	200021	200021
Pilot Light, red	200020	200020
Shelf Clips	200116	200116
Shelf, 1310	5080538	5080538
Shelf, 1320, 1321F	5080539	5080539
Thermometer	200063	200063
Thermometer Clip	5080865	5080865

UNIT SPECIFICATIONS

Weight	Shipping	Net
1310	45 lbs.	38 lbs.
1320	67 lbs.	60 lbs.

Dimensions	Exterior WxDxH	Interior WxDxH
1310	18X16.5X21.25"	12 X 12 X 14"
1320	21 X 17.5 X 23.5"	17 X 12 X 17"

Capacity	Cubic Feet
1310	1
1320	2

Temperature	Range	Uniformity
1310	Amb+5° to 200°C	+4°C
1320	Amb+5° to 200°C	+4°C

PARTS LIST 1324 & 1325F

Description	115V	220V
Main Temperature Control	100026	100026
Over Temperature Control	1750615	1750615
Cord Set	1800516	101990
Door Handle	300142	300142
Heating Element 1324	9570771	9570801
Heating Element 1325F	9570777	9570804
On/Off Switch	103351	103351
Knob Main Temperature	X1000771	X1000771
Knob Over Temperature	4450506	4450506
Pilot Light Green	200021	200021
Pilot Light Red	200020	200020
Shelf Clips	200116	200116
Shelf	5500629	5500629
Thermometer Clip	5080865	5080865
Thermometer	200063	200063
Fan Motor 1325F	4880527	4880528
Fan Blade 3" 1325F	104073	104073
Fan Blade 4.75" 1325F	2600502	2600502

UNIT SPECIFICATIONS

Weight	Shipping	Net
1324	lbs.	lbs.
1325F	125 lbs.	85 lbs.

Dimensions	Exterior WxDxH	Interior WxDxH
1324	20 X 24 X 31"	16 X 19 X 22"
1325F	20.5 X 25.25 X 31.5"	16 X 17.5 X 22"

Capacity	Cubic Feet
1324	3.9
1325F	3.6

Temperature	Range	Uniformity
1324	Amb+5° to 200°C	+4°C
1325F	Amb+5° to 200°C	+4°C

PARTS LIST 1326 & 1327F

Description	115V	220V
Main Temperature Control	100026	100026
Over Temperature Control	1750615	1750615
Cord Set	1800516	101990
Door Handle	300142	300142
Heating Element 1326	9570774	9570803
Heating Element 1327F	9570778	9570805
On/Off Switch	103351	103351
Knob Main Temperature	X1000771	X1000771
Knob Over Temperature	4450506	4450506
Pilot Light Green	200021	200021
Pilot Light Red	200020	200020
Shelf Clips	200116	200116
Shelf	5130714	5130714
Thermometer Clip	5080865	5080865
Thermometer	200063	200063
Fan Motor 1325F	4880527	4880528
Fan Blade 3" 1325F	104073	104073
Fan Blade 4.75" 1325F	2600502	2600502

UNIT SPECIFICATIONS

Weight	Shipping	Net
1326	lbs.	lbs.
1327F	lbs.	lbs.

Dimensions	Exterior WxDxH	Interior WxDxH
1326	24 X 24 X 37"	20 X 19 X 28"
1327F	24 X 24.5 X 37"	20 X 17.5 X 28"

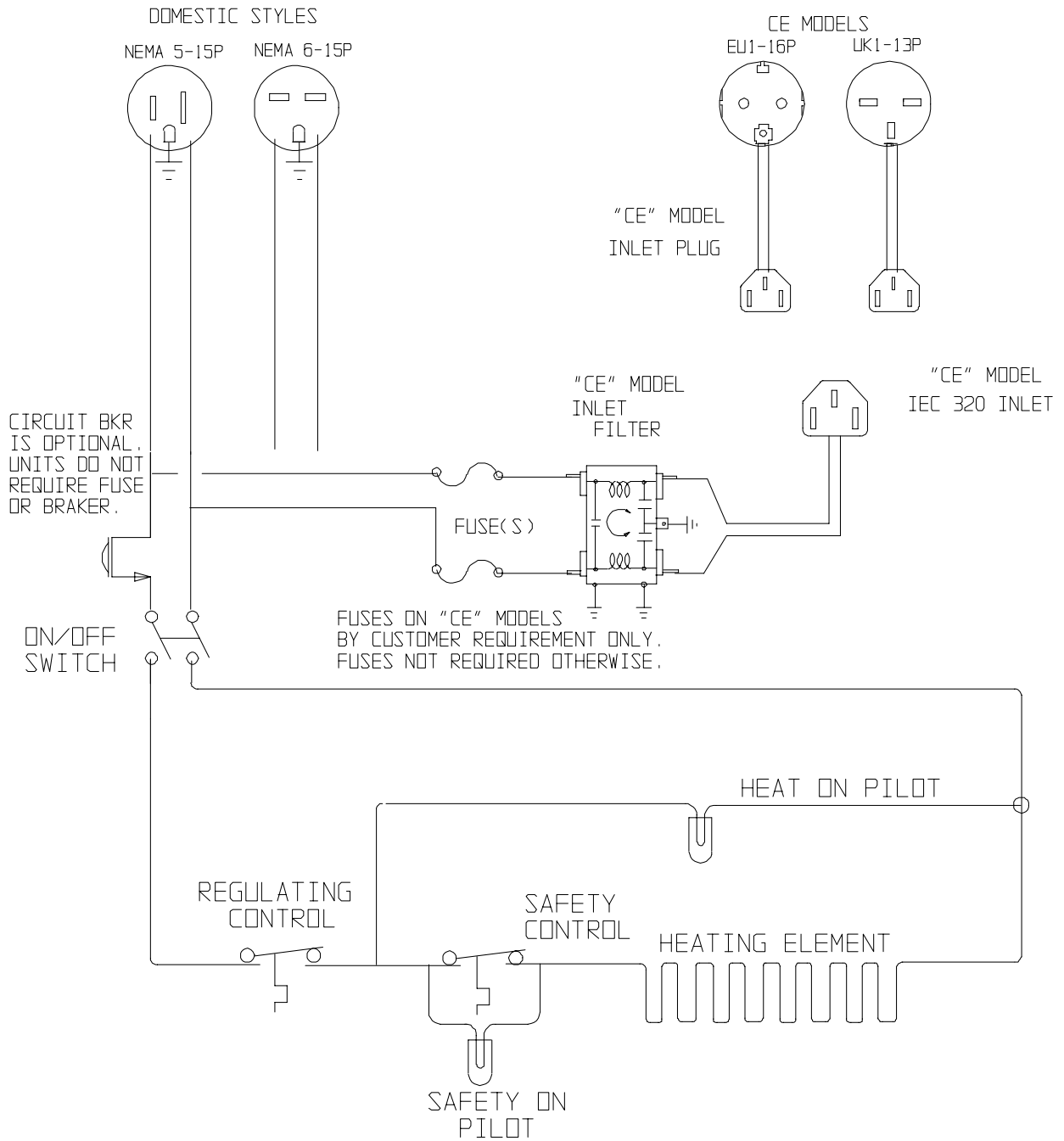
Capacity	Cubic Feet
1326	6.1
1327F	5.7

Temperature	Range	Uniformity
1326	Amb+5° to 200°C	+4°C
1327F	Amb+5° to 200°C	+4°C

WIRE DIAGRAM

1310 AND 1320

PLUG STYLES

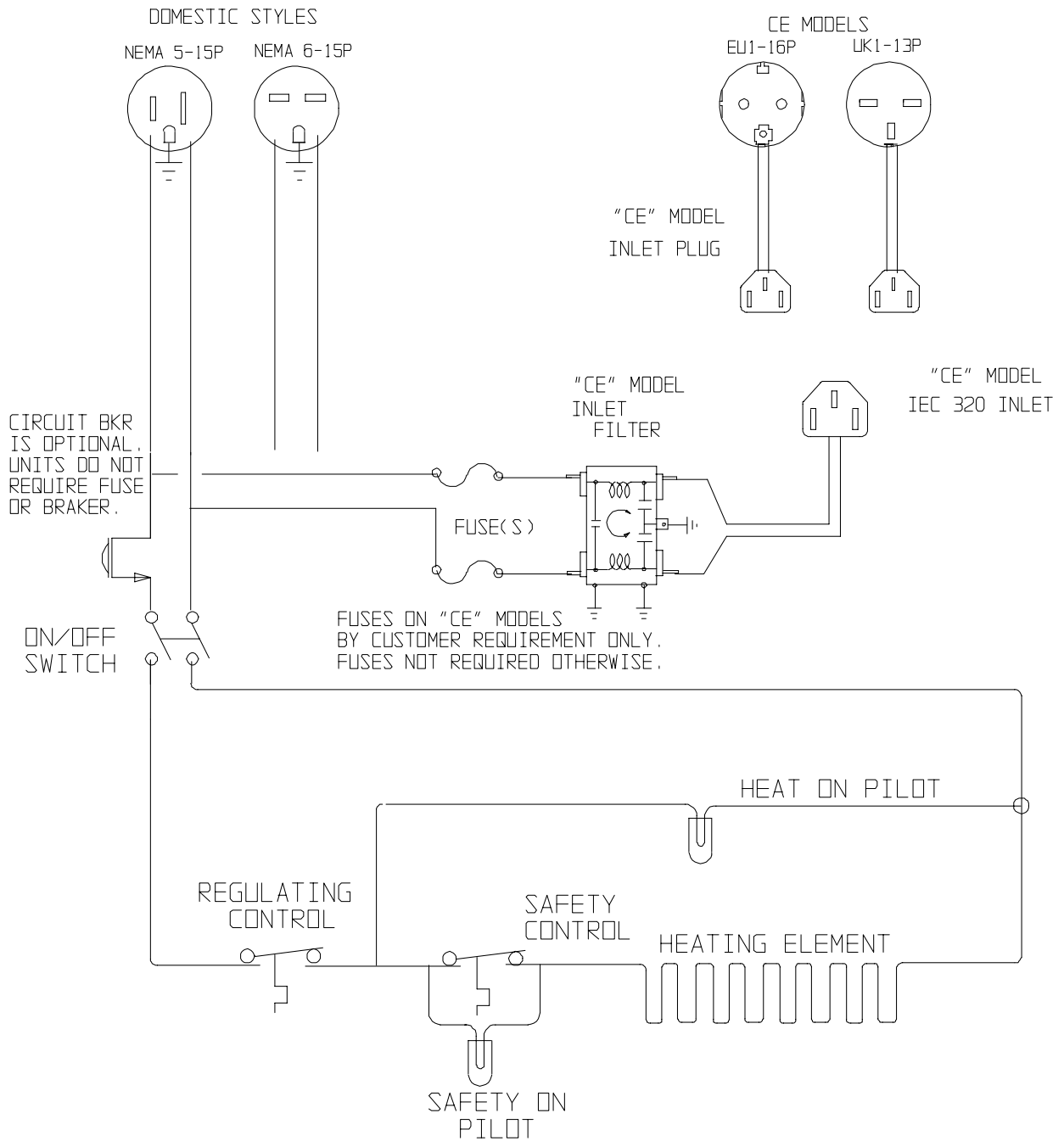


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WIRE DIAGRAM

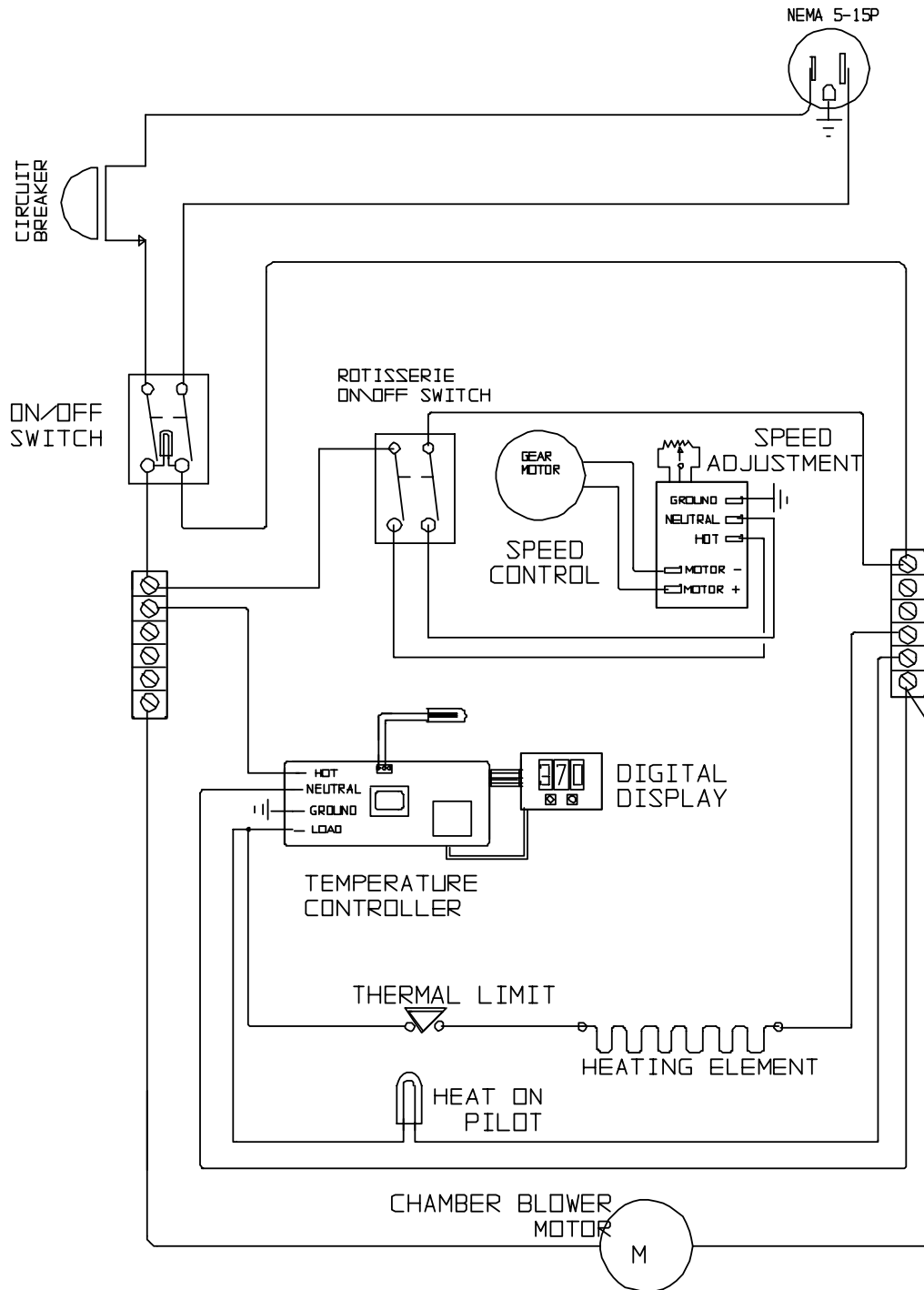
1324 AND 1325F

PLUG STYLES



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WIRING DIAGRAM **1321,1326,1327F**



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