

Neycraft[®] Furnace

Owner & Operator's Manual

| Model No | Voltage |
|-----------------|----------------|
| 9491003A | 100V |
| 9491001 | 120V |
| 9491002C | 220V |
| 9491002B | 240V |

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SAFETY



- Never operate furnace in close proximity to combustible materials or place materials on top of the furnace.
- The furnace must be electrically grounded to a three wire electrical outlet or receptacle. The electrical service provided must be a dedicated line of the proper size according to local electrical codes.
- Disconnect the line cord before attempting to service the furnace.
- Do not attempt to service the furnace unless you have an understanding of electrical problems and circuits.
- Do not place firing trays or other hot objects directly in front of the furnace; they will melt the control knob.
- As a routine working precaution, always wear safety glasses and protective gloves when operating, loading and unloading the furnace.

OSHA AND CALIFORNIA PROPOSITION 65:

MUFFLE DUST EXPOSURE

In keeping with the policy of DENTSPLY Neytech to build safe products, comply with all National and State statutes and keep you, the valued customer informed; the services of a Certified Industrial Hygienist firm were employed to test and evaluate the lab operator's exposure to respirable refractory ceramic fiber (RCF) and crystobalite (a form of crystalline silica) present in the furnace muffle.

The findings of this test revealed that levels of exposure during the normal operation of this equipment, as outlined in the operator's manual, were far less than the Permissible Exposure Limit set by the Federal Government.

When it becomes necessary to replace the muffle, the person doing this work is recommended to wear a HEPA filter respirator and protective gloves as a precautionary matter.

Seal used muffle in a plastic bag and dispose of in accordance with local, state and Federal regulations.

Because this product and many similar products on the market today contain crystalline silica and ceramic fibers, it is necessary under the statutes of California Proposition 65 that DENTSPLY Neytech include the following statement:

"This product contains substance(s) known to the State of California to cause cancer."

Material Safety Data Sheets for RCF materials supplied upon request.

Canadian Standards Association (CSA).

FEATURES

- High Performance All Fiber Muffle Features Low Mass For Fast Heating and Cooling
- Wide Operating Temperature Range:
200°C (392°F) --- 1100°C (2012°F)
- Type **K** Thermocouple
- Durable Steel Cabinet and Door
- Automatic Power Controller
- Safety Agency Approval: ETL (Canada)
- Easy and Low Cost Muffle Servicing

APPLICATIONS

- WAX BURNOUT
- HEAT TREATING
- JEWELRY ENAMELING
- MATERIAL ASHING
- CERAMIC FIRING

INSTALLATION INSTRUCTIONS

UNPACKING:

CAUTION:

Carefully unpack and remove the furnace from its shipping carton. Save the carton and other packing material for future use in transporting the furnace.

Shipping damage should be reported to the carrier as soon as detected.

The furnace shipping carton contains the following:

- 1 Furnace complete with power cord
- Owner's & Operator's Manual plus Calibration Pellets
- 1 Ceramic Floor tray
- 1 Bottle of Muffle Hardening Agent

INSTALLATION:

1. Remove all packing materials from in and around the furnace. The furnace should be located at least 15cm (6") away from walls, shelves and heat sensitive materials. Open the furnace door and remove the packing material from the furnace. NOTE: The furnace front panel will show some discoloration around the muffle due to the calibration and burn-in cycles performed at the factory.
2. The furnace should **NOT** be located directly under shelves or other airflow restrictions.
3. On high voltage (200-250 volt) units, connect the line cord packaged in the rear of the furnace to the socket on rear of furnace.
4. Install floor tray to prevent material from entering the furnace insulation.
5. Burnout or Combustion Process Position the furnace under a vent hood or connect the exhaust port to a ventilation system to prevent exposure to the exhaust fumes. The furnace exhaust port 25 mm (1") OD by 25 mm (1") long can be ducted into the exhaust hood for more effective ventilation. Stainless steel flexible metal tubing can be used for this purpose.
6. Connect the furnace to a power circuit or receptacle with an overcurrent protection (circuit breaker or fuse) rating of 20 Amps on the low voltage model and 15 Amps on the high voltage model. The furnace should be the only load on this circuit.
7. At this time, your new furnace is ready to be operated. Please review the operations section of the manual before proceeding to operate the furnace.

BURN-IN INSTRUCTIONS:

Read and understand operation instructions prior to use.

To properly condition your new muffle heating elements for maximum life, please follow this simple burn-in procedure.

Setup and run the furnace, EMPTY, for two (2) hours with the power control knob set to 5.

OPERATIONS

DESCRIPTION:

The Neycraft® furnace is a simple system containing 5 active components consisting of: the muffle (heating chamber), thermocouple, power controller (infinite controller), pyrometer, and pilot light. The thermocouple and pyrometer are **NOT** connected to the controller circuit. The pyrometer reads the voltage generated by the thermocouple to display a temperature reading. It does not supply feedback for temperature control. The power to the muffle is controlled by the power control knob. The power control knob regulates the power to the muffle, **it does not measure or control the temperature.**

STARTING OPERATION:

Close the furnace door. Turn the power control knob to the desired power setting. The power-on light will come on. The furnace temperature will start to increase after 4 or 5 minutes and is indicated on the pyrometer. The final temperature will now be attained in approximately 30 to 60 minutes without a load (longer with a load).

Adjust the power control knob to a lower setting to reduce the muffle temperature. Adjust it to a higher setting to increase muffle temperature. The furnace will require time to stabilize at the new temperature.

CAUTION: Leaving the power control knob setting at 7 or above can cause premature muffle failure. The power knob does **NOT** sense the furnace temperature, it only adjusts the power going into the furnace.

Note: Because of the nature of the power controller, the first 80% of the temperature change will be relatively fast while the last 20% takes somewhat longer. Once the desired temperature is achieved, use a marker or tape to mark the power controller setting for that temperature.

OPERATING EXAMPLES:

LOST WAX BURNOUT:

The burnout process is one of burning clean the investment mold cavity and then raising it to desired casting temperature. This process is achieved when the investment cavity slowly rises to a temperature of 1100-1300°F (595-705°C) for most commercial investments. The time required for burnout varies with the flask size. A small flask, such as a 2" x 2" (50mm x 50mm) will heat saturate in 20 to 30 minutes after the furnace reaches temperature. Large ones may take up to 2 hours. Heat saturate means that the temperature inside the flask is the same as the furnace temperature. The number of flasks also has an impact on the heat up time of the furnace. A large number will increase the heat up time by 50 to 100%.

Several experimental runs are usually required to establish the Power Controller settings and the burnout times necessary for good results. Start by running the furnace without a load and setting the Power Controller to 5. Then adjust the Power Controller so the furnace stabilizes at the desired maximum temperature recommended on the investment material instructions.

ENAMELING:

The furnace offers the enameling artisan the advantage of quick heat-up and even heat distribution. Trivets or racks, should not be placed directly on the furnace fiber floor. The ceramic tray provided should be used to protect the floor from enamel spillage. Since most enameling is done at 1400 to 1600°F (760 to 870°C) it is especially important that proper handling equipment is used: high temperature gloves, sturdy enameling fork, and trivets. By taking adequate time and caution in loading and unloading the furnace, the risk of injury will be eliminated.

SPECIFICATIONS

PARAMETER

- Temperature Range: 200°C (392°F) - 1100°C (2012°F)
- Temperature Accuracy: na
- Muffle Temperature Uniformity: $\pm 8^{\circ}\text{C}$ ($\pm 15^{\circ}\text{F}$) at steady state

| ELECTRICAL | 100V | 120V | 220V | 240V |
|-----------------------------|-------------|-------------|-------------|-------------|
| <u>Steady State</u> | | | | |
| Current: Amps | 15 | 12.5 | 6.8 | 6.3 |
| Max Power Watts: | 1500 | 1500 | 1500 | 1500 |
| Watts to Maintain 1000°C | 1050 | 1050 | 1050 | 1050 |

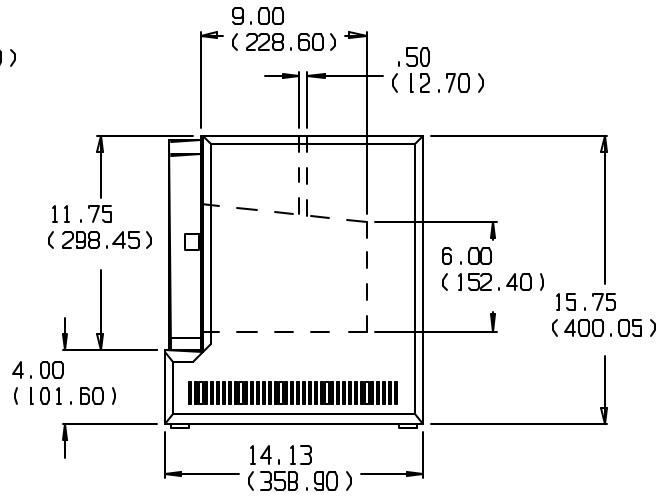
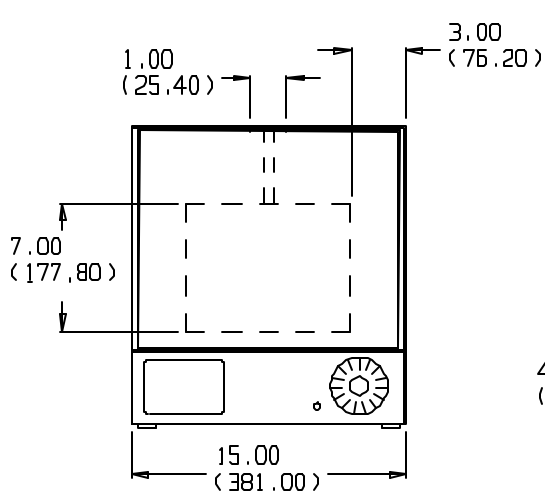
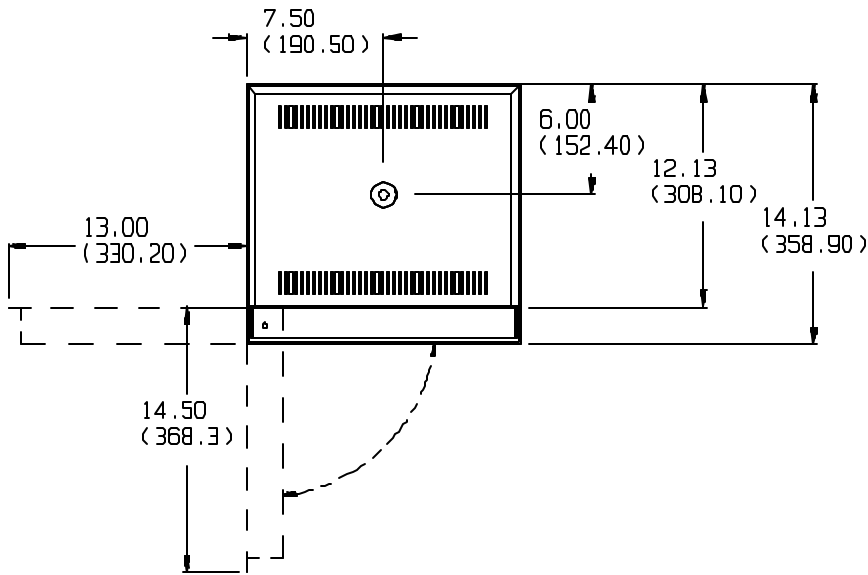
ENVIRONMENTAL

- Max. Ambient Operating Temperature: 40°C
- Relative Humidity: Maximum 80%, non-condensing







MECHANICAL

- Furnace Weight: 12kg (27.5lbs)
- Shipping Weight: 17kg (37lbs)

OUTLINE DRAWINGS in(mm)



SYMBOL TABLE

| | | |
|---|---------------------------------|---------------------------|
|  | - Alternating current | Courant alternatif |
|  | - On (Supply) | Marche (alimentation) |
|  | - Off (Supply) | Arrêt (alimentation) |
|  | - Caution, Hot Surface | Attention, surface chaude |
|  | - Protective Conductor Terminal | Borne de masse, châssis |
|  | - Caution | Attention |

SETUP & MAINTENANCE

CLEANING:

- Do not use compressed air. This will minimize the amount of air born dust particles.
- Use a soft damp cloth to clean all surfaces. Avoid excess water or solution when cleaning the furnace. Some solutions can attack the controls and cause the furnace to malfunction.

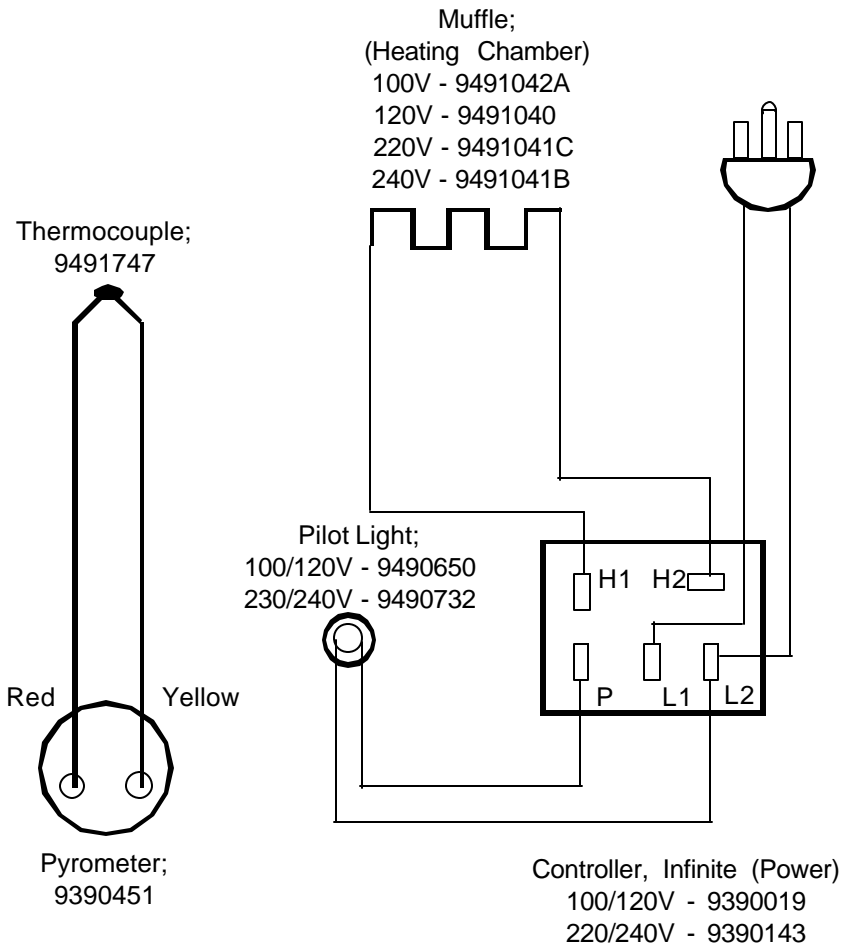
MUFFLE REPAIR:

- If the muffle should become cracked or damaged, the patching clay can be used to patch the muffle. This agent contains binders which when dried will harden the surface.
- In the course of normal high temperature operation, the fiber insulation will develop small cracks or fissures. This is not a matter of concern. The safety and durability of the equipment are not affected. This is a normal condition caused by the expansion and contraction of the material.

TROUBLESHOOTING THE NEYCRAFT FURNACE

| PROBLEM / SYMPTOM | CHECK LIST / CONCLUSION |
|--------------------------------------|--|
| No heat - power controller turned on | <ul style="list-style-type: none"> - Check power outlet for power to furnace - If pilot light does not light, <ul style="list-style-type: none"> 1) check wiring 2) replace controller - Muffle open? Check muffle continuity: <ul style="list-style-type: none"> - (approximately 9 ohms low voltage) - (approximately 36 ohms high voltage) - Controller bad? Does controller have output voltage to muffle? <ul style="list-style-type: none"> - Check wiring to muffle - Replace controller |
| Over heating | <ul style="list-style-type: none"> - Turn power controller to setting of 1, <ul style="list-style-type: none"> 1) If unit continues to heat - replace controller 2) Turn off controller - if muffle continues to heat check wiring, replace controller |
| Pyrometer reading high temperature | <ul style="list-style-type: none"> - Check furnace temperature with temp pellet - Replace pyrometer if needle sticks or does not move up and down freely. - Check thermocouple tip for damage |
| Pyrometer reading low temperature | <ul style="list-style-type: none"> - Check thermocouple for continuity, reading should be low or negative. - Check furnace temperature with temp pellet - Replace pyrometer if needle sticks or does not move up and down freely. |

WIRING DIAGRAM and SERVICE PARTS



ACCESSORIES

| DESCRIPTION | PART NUMBER |
|-----------------------------------|-------------|
| Tongs; 25cm (10") Stainless Steel | 9390014 |
| Tongs; 30cm (12") Stainless Steel | 9390015 |
| Tongs; 36cm (14") Plated Steel | 9491010B |
| Tray- Bottom, 8" x 8" | 9353027 |
| Muffle Hardening Agent | 9491006 |
| Temperature Pellets, Bottle of 25 | |
| 705 °C (1300 °F) | 9490911 |
| 815 °C (1500 °F) | 9490912A |
| Patching Clay | 9490258 |

PRODUCT SERVICE

Three methods of product service are available for the Neycraft® furnace. The first is telephone assistance available at the numbers listed below. The second is to return the furnace for servicing using the instructions below. The third method is to call DENTSPLY Neytech at the phone number below and obtain a service manual for a nominal fee.

BEFORE RETURNING THE FURNACE, DO THE FOLLOWING:

1. Remove all firing trays, shelves and other loose items from inside the muffle.
2. The original packing material should be used for the return shipment. Contact DENTSPLY Neytech for replacements if they are not available.
3. Call DENTSPLY Neytech for a RMA number (Return Material Authorization). This is used to track and identify your furnace. Material received without this number may not be identifiable.
4. Equipment damaged in shipment as the result of improper packing may not be paid by the carrier. DENTSPLY Neytech will not be responsible for damages resulting from improper packing.

| | |
|------------------|----------------------------|
| Ship Prepaid To: | DENTSPLY Neytech |
| TEL 909.795.2461 | RMA Number _____ |
| FAX 909.795.5268 | 13553 Calimesa Blvd. |
| | Yucaipa, CA 92399-2303 USA |

WARRANTY

WARRANTY: Except with respect to those component parts and uses which are hereinafter described, DENTSPLY Neytech warrants this furnace to be free from defects in material and workmanship for a period of one year from the date of sale. DENTSPLY Neytech's liability under this warranty is limited solely to repairing or, at DENTSPLY Neytech's option, replacing those products included within the warranty which are returned to DENTSPLY Neytech within the applicable warranty period (with shipping charges prepaid), and which are determined by DENTSPLY Neytech to be defective. This warranty shall not apply to any product which has been subject to misuse; negligence; or accident; or misapplied; or modified; or repaired by unauthorized persons; or improperly installed. Do not disassemble handpiece or components as this voids warranty.

INSPECTION: Buyer shall inspect the product upon receipt. The buyer shall notify DENTSPLY Neytech in writing of any claims of defects in material and workmanship within thirty days after the buyer discovers or should have discovered the facts upon which such a claim is based. Failure of the buyer to give written notice of such a claim within this time period shall be deemed to be a waiver of such claim.

DISCLAIMER: The provisions here-in stated DENTSPLY Neytech sole obligation and exclude all other remedies or warranties, expressed or implied, including those related to *MERCHANT-ABILITY* and *FITNESS FOR A PARTICULAR PURPOSE*.

LIMITATION OF LIABILITY: Under no circumstances shall DENTSPLY Neytech be liable to the buyer for any incidental, consequential or special damages, losses or expenses.

LIMITATION OF ACTIONS: The buyer must initiate any action with respect to claims under the warranty described in the first paragraph within one year after the cause of action has accrued.



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