



Mechanical Convection Ovens

Model No.
52100-00
52100-05
52100-10
52100-15

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Introduction

Thank you for selecting Cole-Parmer instruments for your equipment needs.

Product Overview

Cole-Parmer's Low Cost Gravity Convection Ovens are designed for use in hospitals, industry, and school laboratories—wherever there is a need for low-cost, yet reliable ovens for drying, sterilization, baking, evaporation or similar type work.

A hydraulic thermostat provides reliable temperature control with a range from slightly above ambient to 210°C. A sheathed heater is positioned in the bottom of the chamber along with a constant-speed fan that circulates heated air rapidly throughout the chamber. The metal cover shields the fan and protects against splattering in the event that any material is accidentally spilled in the area of the fan.

Chamber temperature is conveniently monitored via an LED display on the control panel. To guard against overtemperature conditions, a factory-set hi-limit thermostat is an integral part of the electrical system.

One-inch thick silica-based insulation in the double-walls of the chamber helps retain chamber heat. The interior walls of the chamber are stainless steel and the shelves are chrome-plated steel for ease of maintenance and clean up.

These ovens also have a steel exterior finished in baked enamel and are rigidly constructed for long, trouble-free service.

Safety Information

Alert Signals

**Warning**

Warnings alert you to a possibility of personal injury.

These instructions contain important operating and safety information. The user must carefully read and understand these instructions before using the unit. Your unit has been designed to optimize function, reliability, safety and ease of use. It is the user's responsibility to install the incubator in conformance with local electrical codes.

**Caution**

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

**Note**

Notes alert you to pertinent facts and conditions.

**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.

Specifications

Power Requirements

52100-00:	120 Volts, 50/60 Hz, 12 Amps, 1100 Watts
52100-05:	240 Volts, 50/60 Hz, 6 Amps, 1100 Watts
52100-10:	120 Volts, 50/60 Hz, 15 Amps, 1100 Watts
52100-15:	240 Volts, 50/60 Hz, 8 Amps, 1100 Watts

Overall Dimensions

52100-00/52100-05:	18-7/16"W x 15-9/16"D x 25"H (47 x 39-1/2 x 63-1/2 cm)
52100-10/52100-15:	20-7/16"W x 17-11/16"D x 31"H (52 x 45 x 79 cm)

Chamber Dimensions

52100-00/52100-05:	16"W x 11-1/2"D x 16"H (40.6 x 29 x 40.6 cm)
52100-10/52100-15:	18"W x 13-1/2"D x 22"H (46 x 34 x 56 cm)

Volume

52100-00/52100-05:	1.7 cu. ft.
52100-10/52100-15:	3.1 cu. ft.

Shipping Weight

52100-00/52100-05:	34 lbs. (15.5 kg)
52100-10/52100-15:	47 lbs. (21.4 kg)

Performance Characteristics

Temperature Range:	All models slightly above ambient to 210°C
Thermostat, Control:	±5.0°C over entire range
Thermometer, Digital:	±2.0°C over entire range

Environmental Operating Conditions

Pollution Degree*:	2
Installation Category*:	II
Altitude:	2000 Meters MSL (Mean Sea Level)
Humidity:	80% maximum, non-condensing
Electrical Supply:	120VAC or 240VAC
Voltage Tolerance:	±10% of normal rated line
Temperature:	15°C to 40°C
Product Usage:	This product is intended for use indoors only

*Refer to IEC 664-1

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

The oven should be located in an area free from drafts and sources of heat, as well as allowing for natural air movement to dissipate heat from the oven.

Leveling

The oven should be on a level surface, in order to facilitate movement of materials into and out from the chamber.

Shelving

Slide shelves into place inside the oven and position according to the height required for the items or materials to be heated.

Electrical Requirements

The 120V unit is supplied with a 3-wire line cord with molded plug. It should be plugged into an outlet designed for 3-prong plugs. For an outlet designed to accept 2-prong plugs (ungrounded), it is required that a qualified electrician replace the outlet with a new grounded type.



Warning

Do not place oven on or near any combustible surface to avoid the possibility of fire and resulting property loss and injury or death to personnel.



Caution

Do not remove the rubber spacer feet. Removal of the feet will prevent proper air venting (air used to cool the electronics is discharged out the bottom) of oven chamber that may cause excessive heat buildup on electrical components and erratic control of temperature.



Caution

Bottom shelf is fixed in place to guard against access to heater area and possibility of injury. Do not remove bottom shelf unless performing maintenance or repair.

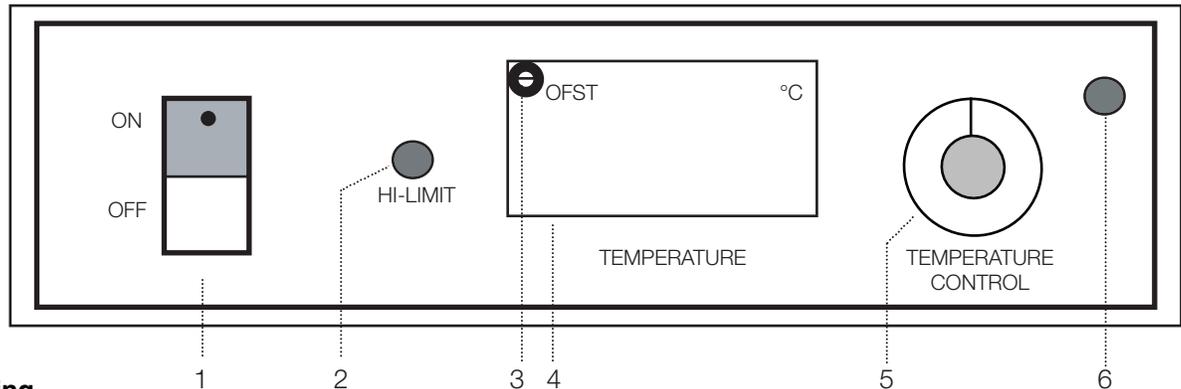
**Note**

Where it becomes necessary to make changes in electrical outlets, wiring and other characteristics, it is recommended that these be done by a qualified or journeyman electrician. This includes replacing 2-prong plugs (ungrounded), for example, with a 3-prong plug (grounded.) All changes need to be made to match the load requirements shown on the nameplate of the unit. It is best to leave the unit disconnected when not in use.

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 terminal.

The unit must be connected to a power source that meets the electrical requirements as specified on the unit's nameplate.

Operation



Warning

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

It is the user's responsibility to monitor oven action when setting and maintaining operating temperature; oven failure may occur with possible property damage and/or injury to personnel.

Control Panel

1. **POWER SWITCH:** Turns the unit ON (green status lamp) and OFF.
2. **HI-LIMIT RED STATUS LAMP:** Lights when the hi-limit thermostat is activated. It goes out when oven reverts to a safe operating range.
3. **CALIBRATION POTENTIOMETER:** Utilizing a jeweler's screwdriver, the temperature readout can be adjusted.
4. **LED DISPLAY:** Displays current chamber temperatures.
5. **TEMPERATURE CONTROL (THERMOSTAT):** Raises and lowers temperatures.
6. **HEATERS AMBER STATUS LAMP:** Lights when heaters are energized.

Temperature Control (Thermostat) Operation

1. With the temperature control thermostat (5) in the extreme counterclockwise position, turn the power rocker (1) to its ON position (switch's green status lamp will light).
2. Turn the temperature control thermostat in clockwise direction to increase the temperature and counterclockwise to lower it. The amber status lamp (6) above the thermostat goes on when the heaters are energized. Wait for the chamber temperature to stabilize before advancing thermostat too rapidly to reach target temperature. Note that dial setting to

**Hot Surface**

At the higher temperatures, the exterior of the oven and particularly the thermometer vent ring on the top become uncomfortably warm to the touch. To avoid burns, do not touch these surfaces.

obtain a specific temperature will need to be approximated and can be affected by such factors as changes in line voltage, ambient conditions and types of materials being heated.

3. Read the LED display (4) for the chamber temperature produced by each setting of the temperature control thermostat. (As experience is gained with the temperature control thermostat, improved results will be obtained in setting it to achieve specific target temperatures.)
4. Always allow time for the oven to reach target temperature and to stabilize before making further adjustments of the temperature control thermostat.
5. A factory-set hi-limit thermostat cuts off power to the heater in the event that the maximum operating range is exceeded. The red status lamp (2) on the control panel indicates when the hi-limit thermostat is controlling. It goes out when oven reverts to a safe operating range.

Maintenance



Note

Make no attempt to service or repair a Cole-Parmer product under warranty before consulting Cole-Parmer. After the warranty period, such consultation is still advised, especially when the repair may be technically sophisticated or difficult.

If assistance please call our Customer Satisfaction Department at 800-323-4340 (outside Illinois) or at 847-549-7600 (inside Illinois). No merchandise, however, should be returned directly to Cole-Parmer without prior approval.



Warning

Disconnect from the power supply prior to maintenance and servicing.



Warning

Disconnect oven from the power source before cleaning or performing any maintenance or repair work.

Cleaning

Because of their rugged, simple construction, these ovens require very little maintenance. The bottom shelf that covers the heater can be removed for easy access to the heater area.

Clean up any spills as soon as possible to prevent materials being baked on surfaces. When the oven is cool, use a mild soap and water to clean surfaces. Rinse thoroughly and dry. It is best to avoid highly abrasive cleaners that can damage the finish of the interior surfaces and shelves.

Failure to Heat

If the oven fails to heat, there may be several possible causes:

- Oven is not receiving electrical power.
- Heater is burned out.
- Thermostat is malfunctioning.

Have a qualified electrical technician determine the cause of the problem and make the necessary repairs.

Part Replacement Procedures

The following should be performed only by authorized personnel. Unplug unit from power source. If oven has been used recently, be certain that surfaces are safe to touch before attempting to carry out any of the following procedures. Remove contents of oven and thermometer from top of unit.

Replacing Thermostat

1. Lay unit on its side with door latch facing down.
2. Remove back by unscrewing Phillips screws. Save.
3. Carefully remove insulation. Note how it is positioned, so that it can be easily reinstalled.

4. Remove bottom panel by unscrewing Phillips screws. Save.
5. Remove control knob by unscrewing 2 Allen-head screws. Save.
6. Disconnect wires from thermostat. Note position of wires for subsequent reattachment in same sequence.
7. Knob removal allows access to 2 screws that mount thermostat to panel. Remove the screws and save.
8. Remove bottom shelf inside chamber. Loosen screw on clamp that holds thermostat sensing bulb to heater. Note position of temperature sensing bulb, so that new one can be clamped in same location.
9. Slide bulb toward exit hold at the back of unit.
10. Move to back of unit and pull temperature sensing bulb and tube through hole.
11. Next, pull bulb and tube through bottom hole.
12. Thermostat, sensing bulb, and tube assembly can now be removed.
13. Reverse above procedure to install new thermostat.
14. Avoid making sharp bends in temperature sensing tube; otherwise, flow of temperature sensing fluid will be impeded.

Replacing Power Switch

1. With unit on its side as in the preceding, remove bottom plate and save screws.
2. Disconnect wires from switch. Note sequence of pin numbers on the side of the switch and attachment of wires. The replacement switch must be oriented in the same manner and wires

attached in the same sequence.

3. Compress holding tabs on switch and push out.
4. Insert new switch from the front. When inserting, follow same orientation of pin numbers as on the switch just removed.
5. Attach wires in **SAME SEQUENCE** as originally attached. To verify that correct sequence has been followed, refer to wiring schematic.
6. Reverse remainder of procedure.

Replacing Status Lamp Bulb Assembly

1. With unit on its side as in the preceding, remove bottom plate and save screws.
2. Note plastic lamp unit that houses bulb. Be alert that lens will pop out in next step.
3. Grasp lamp unit and pull a fraction of an inch toward the attached wires. Lens will pop out the front. Save.
4. Cut wires and remove lamp unit. Discard.
5. To install new pilot lamp unit, splice the two wires of the assembly to previously cut wires using insulated crimp connectors.
6. Reinstall lens.
7. Reinstall bottom plate.

Replacing Hi-Limit Thermostat

1. Remove back panel and carefully remove insulation for subsequent reinstallation. Save.
2. Hi-limit thermostat is mounted on back of inner chamber wall.
3. Unscrew 2 screws and nuts holding wires. Save.

4. Remove screw securing thermostat to back of inside wall.
5. Reverse preceding procedure to install a new hi-limit thermostat.

Replacing Heater

1. Heater is located in bottom of chamber. Be sure that unit has been turned off for a period of time, so that there is no residual heat on any of the surfaces.
2. Remove back panel by unscrewing Phillips screws and save.
3. Carefully remove insulation and save. Note how it is positioned, so that it can be easily reinstalled.
4. Remove two retaining clips that mount heater to back of inside wall. Save.
5. Remove wires to heater by uncoupling the quick-disconnects.
6. Remove bottom shelf inside chamber. Loosen screw on clamp which holds thermostat sensing bulb to heater. Note position of temperature sensing bulb, so that new one can be clamped in same location.
7. Install new heater and reverse the preceding steps.

Replacing Blower Wheel; Servicing

1. Disconnect power cord.
2. Remove shelves. Note that bottom shelf is retained by a clip at the back of the oven. Lift shelf at the front edge until the back edge can be withdrawn from the clip.
3. Remove Phillips screws holding shield that covers blower wheel.

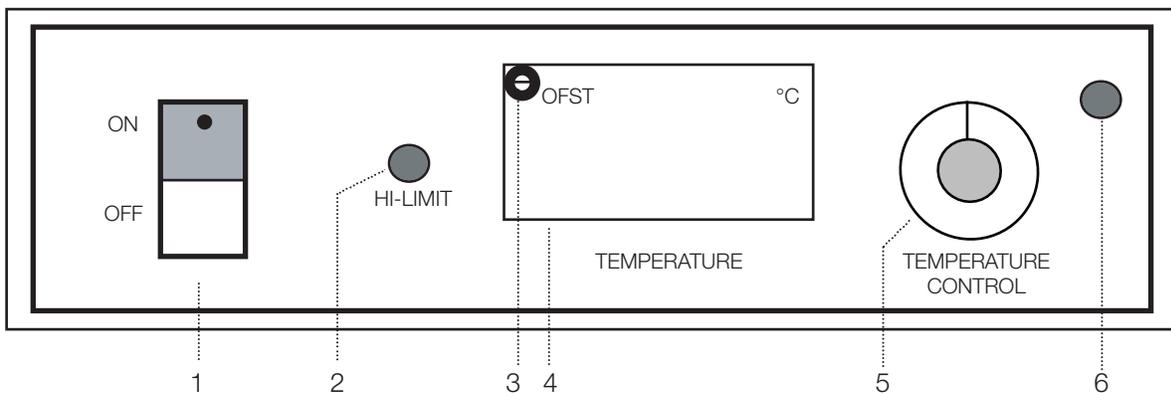
4. Inspect blower wheel assembly for tightness and any off-center operation. Inspect blower wheel itself for damage to vanes or other deterioration. If assembly is loose, tighten setscrew holding wheel to motor shaft until wheel turns true. If wheel is damaged, replace.
5. Replace the shield and shelves.

Replacing Blower Motor

1. Disconnect unit from power source. If previously in use, let unit cool down.
2. Lay unit on side. Remove shelves, including the bottom one.
3. Remove bottom cover, fan shield and blower fan.
4. Accessing the unit from the bottom, remove motor and bracket assembly. Disconnect wires.
5. Remove shaft extension, bottom fan and motor bracket from old motor and reinstall on new, replacement motor.
6. Reinstall motor assembly into unit in reverse order of removal.
7. Reconnect wires.
8. Reinstall shelves. Make sure that bottom shelf is securely in place to prevent access to the heater area.

Temperature Readout Calibration

A temperature readout calibration potentiometer (3) is located in the upper left hand corner of the LED display and is indicated by the word "OFST."



Control Panel

- Use a jeweler's screwdriver to make adjustments.
- Have a digital thermometer, known reliable thermocouple (Type-K or -T) and the jeweler's screwdriver on hand.
- Insert the thermocouple sensor through the outside top vent hold and position it in the center of the oven chamber.
- Set oven temperature to a desired setpoint and turn on the power.
- Allow temperature to stabilize for at least 2 hours before making any adjustments.
- Compare the chamber temperature on the digital thermometer to the temperature on the oven readout.
- Insert jeweler's screwdriver in calibration hole and adjust the oven readout to match the thermometer reading. Turn potentiometer clockwise to increase reading and counterclockwise to decrease it.

MAINTENANCE

- Take two additional readings within an approximate 30 minute time span and make any necessary adjustments to the potentiometer. This takes into account any temperature variations that might exist within the oven and the time delay in responding to such factors by the temperature sensors.

Replacement Parts

DESCRIPTION	PART NUMBER
Cordset, (52100-00, 52100-10)	470-105-00
Cordset, (52100-05, 52100-15)	470-236-00
Door Catch	600-093-00
Door Latch	600-113-01
Fan, Axial (2)	160-136-00
Fan Shield	805-398-00
Feet, Rubber (4)	790-350-00
Fuse, 8 A, (52100-05, 52100-15) (2)	330-053-00
Fuse, 15 A (52100-00, 52100-10)	330-298-00
Fuse Holder (52100-00, 52100-10)	330-297-00
Fuse Holder (52100-05, 52100-15) (2)	330-237-00
Gasket (52100-00, 52100-05)	530-196-00
Gasket (52100-10, 52100-15)	530-197-00
Grommet (2)	790-247-00
Heaters:	
52100-00, 52100-10 (120V, 1100W)	340-283-00
52100-05, 52100-15 (240V, 1100W)	340-296-00
Knob, Thermostat	
Motor, (52100-00, 52100-10)	560-223-00
Motor, (52100-05, 52100-15)	370-278-00
Motor, (52100-05, 52100-15)	370-279-00
Shelves:	
52100-00, 52100-05 (3)	810-303-00
52100-10, 52100-15(3)	810-304-00
Status Lamp Base (52100-00, 52100-10) (2)	360-232-01
Status Lamp Base (52100-05, 52100-15) (2)	360-233-01
Status Lamp Lens, Amber	360-235-00
Status Lamp Lens, Red	360-234-00
Switch, Power (52100-00, 52100-10)	440-359-00
Switch, Power (52100-05, 52100-15)	440-292-00
Temperature Sensor, RTD	410-654-00
Thermometer, Digital	910-126-00
Thermostat, Control	920-223-00
Thermostat, Hi-Limit	920-281-00
Transformer, Step-Down	460-266-00
Wiring Schematic (52100-00, 52100-10)	228-215-00
Wiring Schematic (52100-05, 52100-15)	228-234-00

Warranty

Cole-Parmer Instrument Company warrants this product to be free from significant deviations in material and workmanship for a period of 15 months from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse within the one year period, please return—freight pre-paid—and correction will be made without charge. Cole-Parmer alone will determine if the product problem is due to deviations or customer misuse.

Out of warranty products will be repaired on a charge basis.

RETURN OF ITEMS:

Authorization must be obtained from our Customer Service Department before returning items for any reason. When applying for authorization, please include data regarding the reason the items are to be returned. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Cole-Parmer will not be responsible for damage resulting from careless or insufficient packing. A restocking charge will be made on all unauthorized returns.

NOTE: THE COLE-PARMER INSTRUMENT COMPANY RESERVES THE RIGHT TO MAKE IMPROVEMENTS IN DESIGN, CONSTRUCTION, AND APPEARANCE OF PRODUCTS WITHOUT NOTICE.



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