



Vacuum Control Ovens SVO-10-VC-2P SVO-10-VC-2HP Installation and Operation Manual

Pictured on Front Cover: SVO-10-VC-2P

These ovens require permanent connect wiring (also known as hardwiring) to a power supply.

Model Differences

- The SVO-10-VC-2P comes with 2 thermal platen shelves built into the oven chamber.
- The SVO-10-VC-2HP comes with 2 high-performance thermal platen shelves built into the oven chamber.

The models are identical in external appearance. The component differences are all internal.

Warning: This product contains chemicals, including triglycidyl isocyanurate, known to the State of California to cause cancer as well as birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.



¡Advertencia! Este producto contiene sustancias químicas, incluido el triglicidil isocianurato, que el estado de California sabe que causa cáncer, así como defectos de nacimiento u otros daños reproductivos. Para obtener más información, visite www.P65Warnings.ca.gov.

Avertissement! Ce produit peut vous exposer à des produits chimiques, dont l'isocyanurate de triglycidyle, reconnu par l'État de Californie pour provoquer le cancer, des anomalies congénitales ou d'autres problèmes de reproduction. Pour plus d'informations, visitez le site www.P65Warnings.ca.gov.



Vacuum Control Ovens 220 – 240 Voltage

Part Number (Manual): 4861813

Revised: November 15, 2021

Cascade TEK Part ID Number:

Model Name	SVO-10-VC-2P	SVO-10-VC-2HP
Part ID	CTVRQ1022-H	CTVRX1022-H

The Part ID denotes the build type of the model. The manufacturer periodically releases new build types incorporating new features and refinements of existing ones.

Cascade TEK Solutions, LLC is an ISO 9001 certified manufacturer.





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MODEL CERTIFICATIONS

Model Certification and Compliance Statements

SAFETY CERTIFICATIONS

61010 Safety Certified

Electrical, mechanical, and fire hazards

The unit models in this manual are CUE listed by TÜV SÜD America as vacuum ovens for professional, industrial, or educational use in conditions in which no flammable, volatile, or combustible materials are being heated and the unit is being operated under an environmental air pressure range of 22.14 – 31.3 inHg (75 – 106 kPa).

These models have been tested to the following requirements:

CAN/CSA C22.2 No. 61010-1:2012/A1:2018 CAN/CSA C22.2 No. 61010-2-010:2015 UL 61010-1:2012/R:2018-11 UL 61010-2-010:2015 EN 61010-1:2010/A1:2019 EN 61010-2-010:2014

TÜV SÜD America, Inc. is a Standards Council of Canada accredited certification body, an OSHArecognized NRTL, and an EU Notified Body.

CE Compliant

CASCADE

These unit models meet all required EU EMC, low-voltage, and RoHS directives.









Thank you for purchasing a Cascade TEK oven. We know you have many choices in today's competitive marketplace when it comes to constant temperature equipment. We appreciate you choosing ours. We stand behind our products and will be here if you need us.

READ THIS MANUAL

Failure to follow the guidelines and instructions in this user manual may create a protection impairment by disabling or interfering with the unit safety features. This can result in injury or death.

Before using the unit, read the manual in its entirety to understand how to install, operate, and maintain the unit in a safe manner. Ensure all operators are given appropriate training before the unit begins service.

Keep this manual available for use by all operators.

SAFETY CONSIDERATIONS AND REQUIREMENTS

Follow basic safety precautions, including all national laws, regulations, and local ordinances in your area regarding the use of this unit. If you have any questions about local requirements, please contact the appropriate agencies.

SOPs: Because of the range of potential applications, this unit can be used for, the operator or their supervisors must draw up a site-specific standard operating procedure (SOP) covering each application and associated safety guidelines. This SOP must be written and available to all operators in a language they understand.

Intended Applications and Locations: SVO vacuum ovens are engineered for thermal cycle, curing, and baking applications under vacuum in professional, industrial, and educational environments. The ovens are not intended for use at hazardous or household locations.

Power: Your unit and its recommended accessories are designed and tested to meet strict safety requirements.

- Always hardwire the unit power feed to a protective earth-grounded electrical source that conforms to national and local electrical codes. If the unit is not grounded, parts such as knobs and controls may conduct electricity and cause serious injury.
- Position the unit so operators can quickly and easily disconnect or uncouple the power feed in the event of an emergency.
- Avoid damaging the power feed. Do not bend it excessively, step on it, or place heavy objects on it. A damaged power feed can easily become a shock or fire hazard. Never use a power feed after it has been damaged.
- Use only approved accessories. Do not modify system components. Any alterations or modifications to your unit not explicitly authorized by the manufacturer can be dangerous and will void your warranty.



CONTACTING ASSISTANCE

Phone hours for Customer Support are 6 am – 4:30 pm Pacific Coast Time (west coast of the United States, UTC -8), Monday – Friday. Please have the following information ready when calling or emailing Customer Support: the **model number**, **serial number**, **part number**, and **part ID** (see page 17).

support@cascadetek.com 1-888-835-9250 1-971-371-4096 FAX: 1-(503) 640-1366

Manufacturing and Customer Support

Cascade TEK Solutions, LLC PO Box 625 300 N 26th Ave Cornelius, OR 97113 USA

MANUFACTURING WARRANTY

For information on your warranty and online warranty registration please visit:

https://www.cascadetek.com/warranty/

ENGINEERING IMPROVEMENTS

Cascade TEK continually improves all of its products. As a result, engineering changes and improvements are made from time to time. Therefore, some changes, modifications, and improvements may not be covered in this manual. If your unit's operating characteristics or appearance differ from those described in this manual, please contact your Cascade TEK dealer or customer service representative for assistance.



VACUUM PUMP OPTIONS

SVO-10-VC platen ovens can be ordered with one of several vacuum pump types installed inside the oven utility cabinet. Pumps vary in evacuation flow rates and suitability for different baking or thermal cycle applications.

Refer to the vacuum pump manufacturer manual included with the oven for specifications and compatibility with applications. Consult the manual for operating requirements such as any pump oil or sorbent use.

Shipping Locks: The roughing pump comes with built-in shipping locks to prevent damage during transit. See page 24 for instructions on disengaging the locks prior to putting the oven into operation.

Damage Caution: Many vacuum pumps can be damaged or destroyed by drawing full atmosphere for extended periods. For example, if the pump is attempting to pump down the oven chamber while the chamber door is open. Always consult the pump manual for the maximum allowed continuous inlet pressure.

COMPRESSED AIR SUPPLY REQUIRED

Compressed air provides the mechanical pressure needed to operate the automated vacuum and gas backfill vent valves on the back of the oven. The oven chamber cannot be evacuated or auto backfilled without a compressed air supply.

Use ¼ inch OD (outside dimension) tubing to connect the supply to the ¼ inch push fitting on the back, right side of the oven labeled Air 70 PSI.

The oven requires **70 psi** of air pressure delivered at the port to function. **Never exceed 80 psi**.







LIQUID NITROGEN

The oven requires a supply of liquid nitrogen to chill the platen shelves. When chilling, LN_2 is pulsed or flushed through the platens and expelled from the oven through a port located on the back of the oven as gas nitrogen.

Venting from Workspace Required

Gas nitrogen (GN_2) expelled from the oven must be vented away from the workspace area to prevent nitrogen from crowding out oxygen in the room.

Supply Quality

The oven requires high purity LN_2 4.8 at low pressure. The supply must deliver **24 – 50 psi** of pressure at the oven LN_2 in port(s). Platen chilling performance will vary based on LN_2 connection configuration and whether a single or dual supply of LN_2 is being used.

Usage

Usage rates are dependent on the temperature the platen will be chilled to and the duration and number of chilling phases. The use of well-insulated transfer lines will reduce LN_2 usage and improve platen chilling performance.

Potential Hazards

See the Nitrogen Precautions on page 39 for liquid and gas nitrogen hazards information.

GASKET CHEMICAL VULNERABILITIES

The oven comes with a *Viton®* gasket built into the oven door. The gasket must seal against the unnicked contact surface on the oven body in order for the oven chamber to hold vacuum.

The gasket is a low wear, long-duration component and typically replaced only during scheduled services on the oven. However, the gasket is attacked by ketones, low molecular weight esters, and compounds containing nitros. Exposing the gasket to these may damage its integrity and require an early replacement. The gasket is a consumable component and is not covered under the manufacturer warranty.







INSPECT THE SHIPMENT

Safe delivery becomes the responsibility of the carrier when a unit leaves the factory. **Damage sustained during transit is not covered by the manufacturing defect warranty**.

When you receive your unit, inspect it for concealed loss or damage to its interior and exterior. If you find any damage to the unit, **follow the carrier's procedure for claiming damage or loss**. Save the shipping carton until you are certain that the unit and its accessories function properly.

- 1. Carefully inspect the shipping carton for damage.
- 2. Report any damage to the carrier service that delivered the unit.
- 3. If the carton is not damaged, open the carton and remove the contents.
- 4. Inspect the unit for signs of damage. See the orientation depiction on the next page as a reference.
- 5. The unit should come with an operator Installation and Operation Manual, a profile programming guide, a user manual for the vacuum display, and a manufacturer vacuum pump manual.
- 6. Verify the correct number of accessory items has been included.
- 7. Carefully check all packaging for accessories before discarding.

Included Accessories:





ORIENTATION IMAGES

SVO-10-VC-2P





Back of Oven – SVO-10-VC-2P





DIMENSION VISUALS

SVO-10-VC-2P

Height: 70.4 inches (1788 mm)



Width: 38.8 inches (986 mm)

Chamber Height: 24.5 inches (622 mm)



Chamber Depth: 26.0 inches (660 mm)



Exterior

Platen Width: 28.2 inches (718 mm)



RECORD THE DATA PLATE INFORMATION

Record the unit **model number**, **serial number**, **part number**, and **part ID** below for future reference. Customer Support needs this information to provide accurate help during support calls and emails.

• The data plate is located on the back, right side of the oven, above the compressed air inlet port.

MODEL NO:	
SERIAL NO:	
PART NO:	
PART ID:	







HARDWIRE REQUIREMENT

These ovens require permanent connect wiring (commonly known as hardwiring). Wiring to the power source **must be performed by a qualified electrical technician.** All other Installation steps may be performed by the operator.

INSTALLATION PROCEDURES CHECKLIST

For installing the unit in a new workspace location.

Pre-Installation

- ✓ Verify that compressed air and liquid nitrogen supplies are available and can be connected to the oven. See pages 11 and 12.
- \checkmark Check that the required ambient conditions for the unit are met, page 20.
- \checkmark Check that the spacing clearance requirements are met, page 20.
 - Unit dimensions may be found on page 61.
- \checkmark Check that a suitable permanent connect power supply is present, page 21.

Install the oven in a suitable location

- ✓ Review the lifting and handling instructions, page 22.
- \checkmark Install the unit leveling feet, page 24.
- \checkmark Install the oven in its workspace location, page 22.

Set up the oven for use

- \checkmark Remove and disengage the shipping blocks and locks, pages 23 and 24.
- \checkmark Clean the chamber and platen shelves, page 25.
- ✓ Connect the oven to its pressurized air supply source and GN₂ venting, along with any optional backfill gas supply, page 26.
- Connect the oven vacuum pump exhaust to a ventilation system to remove outgassed byproducts from the workspace area, page 27.
- \checkmark Verify the chamber is empty and clean, page 28.
- \checkmark Hardwire the oven to its power supply, page 28.



REQUIRED AMBIENT CONDITIONS

These units are built for use indoors, at room temperatures between **15°C and 35°C (59°F and 95°F)**, at no greater than **80% Relative Humidity** (at 25°C / 77°F). The ambient temperature should not change by 2°C (3.6°F) or more during operation.

Operating outside these conditions may affect the oven temperature performance.

When selecting a location to install the unit, consider all environmental conditions that can adversely impact its temperature performance. These include:

- Proximity to other ovens, autoclaves, and any device that produces significant radiant heat
- Heating and cooling vents or other sources of fast-moving air currents
- High-traffic areas
- Direct sunlight

REQUIRED CLEARANCES

These clearances are required to provide airflows for ventilation and cooling.



This allows large sample trays to be removed safely from the chamber without damaging the door seal or the metal sealing surfaces.

6 inches (152 mm) of clearance is required on the sides.

12 inches (305 mm) of headspace clearance is required between the top of the unit and any overhead partitions.

Do not place objects on top of the oven.

Vacuum, backfill, liquid nitrogen, and access ports are located on the back of the oven. Leave sufficient clearance for operators to safely access these ports.



Power Source Requirements

When selecting a location for the oven, verify each of the following requirements is satisfied:

Power Source: The power source voltage and amperage must match the power requirements listed on the oven data plate:

• These units are intended for 50/60 Hz applications at the following amperages:

Model	AC Voltage	Amperage
SVO-10-VC-2P	220 – 240	50
SVO-10-VC-2HP	220 – 240	90

- The power source must be **protective earth grounded and single phase.**
- The power source must conform to all national and local electrical codes.
- The unit may be damaged if the supplied voltage varies by more than 10% from the data plate rating.
- A dedicated separate circuit for the oven is recommended to prevent possible loss of product due to overloading or failure of other equipment on the same circuit.

Switch or circuit-breaker: A wall switch or circuit-breaker must be used in the building installation to protect against overcurrent conditions.

- The recommended circuit-breaker for the wall power source for the SVO-10-VC-2P **60** amps.
- The recommended circuit-breaker for the wall power source for the SVO-10-VC-2HP **100** amps.

Power Feed Disconnect: The oven must be positioned so that all operators have access to the power feed disconnect in case of emergencies.

- The disconnect must be near the equipment and within easy reach of the operator.
- The disconnect must be marked as the disconnecting device for the equipment.

Internal Circuit Breakers: These ovens come equipped with multiple internal circuit breakers. Resetting these is **a service-level procedure**. The cause of the overcurrent conditions that tripped the breakers must be identified and repaired prior to resetting.



LIFTING AND HANDLING

The oven is heavy. Use appropriate lifting devices that are sufficiently rated for these loads. Follow these guidelines when lifting the oven:

- Lift the oven only from its bottom surface.
- Doors, handles, and knobs are not adequate for lifting or stabilization.
- Restrain the oven completely while lifting or transporting so it cannot tip.
- Remove all moving parts, such as shelves and trays, and lock doors in the closed position during transfers to prevent shifting and damage.

LEVELING

Install the 4 leveling feet in the corner holes in the bottom of the unit. The unit must be level and stable for safe operation.



Note: To prevent damage when moving the unit, turn all 4 leveling feet so that the leg of each foot sits inside the unit.

INSTALL THE OVEN

Install the unit in a workspace location that meets the criteria discussed in the previous entries of the Installation section.

• Do not connect the oven to its power source at this time.



REMOVE THE PLATEN SHIPPING BLOCKS

The oven comes with shipping blocks installed in the chamber to prevent damage to the platen shelves during transit. The oven may ship with two large blocks or four small blocks on each platen. Leaving the blocks in place will create virtual leaks when the chamber is under vacuum and impact the temperature uniformity of the platens.

This procedure requires an adjustable wrench.

- 1. Using the wrench, remove the square-head screws holding the shipping blocks in place.
 - The oven may ship with two or four shipping blocks on top of each platen.
- Square Head
- 2. Slide the blocks forward and out of the oven chamber.

Do not reinstall the screws. These are only intended for holding the blocks in place and will interfere with platen expansion or contraction during heating or chilling.

3. Repeat the above steps for the second platen.



Note: The manufacturer recommends that this procedure be performed by a qualified electrical technician. The oven should remain disconnected from its power source throughout the procedure.

DISENGAGE THE VACUUM PUMP LOCKS

The oven vacuum pump has four internal shipping locks on its base to cinch it to the floor of the electronics cabinet. This prevents damage from impacts or shifting during transit. The locks must be disengaged prior to placing the oven into operation. If the locks remain engaged, vibrations from the vacuum pump can cause the platens to rattle.

Required Tools:

- A Phillips Screwdriver
- T-Handle Allen Wrench (Included in the vacuum pump document package)

1. Use the Phillips screwdriver to remove the front and back cabinet access panels.



2. One at a time, insert the Allen wrench into each lock access port on the vacuum pump.

- The 4 ports are indicated by labels below each port.
- The order of disengaging the locks does not matter. Begin with any of the ports.

3. Turn the Allen wrench to the right until each lock spins freely. This disengages the locks. Disengage all 4 locks.

• If a lock will not turn, move to another lock. Disengaging the next lock may relieve tension on the first lock, allowing it to be released.

4. Once all the locks are disengaged, reinstall the front and back cabinet access panels.







INSTALLATION CLEANING

The manufacturer recommends cleaning the platen shelves and oven chamber prior to putting the unit into operation.

- The unit was cleaned at the factory but may have been exposed to contaminants during shipping.
- See the **Cleaning** topic in the Operator Maintenance section (see page 59) for more information on how to clean the oven chamber and platens.
- Do not clean with deionized water.



CONNECT GAS SUPPLIES AND GN2 EXHAUST

2. Connect a venting system to the 3/8" (9.5 mm) Gas Nitrogen out ports to safely remove expelled GN₂ from the workspace if you will be chilling the platens with LN₂.

Ensure that **both** out ports are connected to the venting system.

Note: Extreme temperatures. GN_2 exiting the Gas Nitrogen out ports can range from -100°C to 260°C.



1. Connect your compressed air supply to this ¼-inch (6.35 mm) push fitting.

- The oven requires 70 80 psi of pressure delivered at this port to operate its pneumatic valves.
- Never exceed 80 psi.
- Failure to connect a compressed air supply prevents the oven from evacuating or backfilling the oven chamber.



Optional: Connect equipment to the KF-25 auxiliary port. Comes with a blank and clamp.

In O ni su pu th D pu pu

Inert Backfill Gas Supply

Optional: Connect gas nitrogen or another inert gas supply to this 3/8" (9.5 mm) push fitting for backfilling the oven chamber. Do not exceed 15 psi of pressure delivered at the port.



Note: Outgassed byproducts may be hazardous to or noxious for operating personnel. Vacuum pump exhaust should be vented to a location outside the workspace in a safe manner in accordance with all applicable laws, ordinances, and regulations.

VENT THE VACUUM PUMP EXHAUST

The oven comes with a vacuum pump installed in the electronics cabinet at the base of the oven. Failure to vent the vacuum pump outside of the cabinet will result in outgassed byproducts coating oven electrical systems and poses a potential hazard to oven operators.

Pump Cabinet and Electronics

The cabinet housing the vacuum pump also contains high-voltage electronics and should only be accessed by a qualified electrical technician.

Vacuum Exhaust Connection Options



KF-40 Port: Ovens with high performance vacuum pumps come with a KF-40 port on the back of the electronics cabinet connected to the vacuum pump.





VERIFY THE OVEN CHAMBER IS EMPTY

Prior to placing the oven into operation, verify the oven chamber is clean and all shipping dunnage, the platen shipping locks, shipping lock screws, and any shelf wrappings have been removed.

Failure to do so may result in damage to the oven chamber interior or vacuum pumps.



HARDWIRE THE OVEN TO ITS POWER SUPPLY

The oven may now be connected to a power supply that meets the requirements on page 21.

Power Braid: Each oven comes provided with an integral 6-inch (150-mm) wire braid consisting of:

SVO-10-VC-2P:

- Two 10-gauge hot wires black, red
- One 10-gauge earth ground green-yellow

SVO-10-VC-2HP:

- Two 6-gauge hot wires black, black
- One 6-gauge earth ground green-yellow



Remove the cover to expose the power wire braid. Use a Phillips-head screwdriver.



The oven must be earth grounded using the protective conductor terminal (green with yellow stripe wire). Do not remove the protective conductor (earth connection). Removing the protective conductor will negate the oven's protections against potentially dangerous electric shocks and create a potential fire hazard.



GRAPHIC SYMBOLS

The oven is provided with graphic symbols on its exterior surfaces. These identify hazards and the functions of the adjustable components, as well as important notes in the user manual.

Symbol	Definition
	Consult the user manual Consulter le manuel d'utilisation
\sim	AC Power Repère le courant alternatif
A	Potential shock hazard Risque de choc électrique
	Recycle the unit. Do not dispose of it in a landfill. Recycler le four. Ne jetez pas dans une décharge.
	Protective earth ground Terre électrique
	Caution hot surface Attention surface chaude



SYMBOLS





Temperature Limit Controller

Temperature and Vacuum Controller





Temperature Limit Controller

This screen controls the temperature safety cutoffs for the oven chamber and the shelf-heating platen shelves inside the chamber.

- The Oven Limit tab sets a high-temperature heating cutoff limit for the chamber walls heating.
- The Platen 1 and Platen 2 tabs set the high temperature heating cutoff limits and cryogenic low-temperature cutoff limits for the two platens.
- Note: The Process Values (PV) are the current temperature of the chamber walls and platen interiors.





Vacuum Gauge Display – Backfill Limit

Shows the chamber pressure level in Torr and millitorr (mTorr). The gauge this display connects to measures the pressure of pure nitrogen (N_2) and is used to control the automated backfill function. Backfilling is commonly done using N_2 or other inert gases.





Start Buttons

The Start 1 button launches an automated heating recipe, Profile 1.

The Start 2 button launches Profile 2.

For the profiles to launch, the Pump Start function must be turned on from the Temperature and Vacuum controller homepage.



Stop / Backfill

Pushing and releasing the button aborts a running profile.

Pressing and holding the button backfills the oven chamber. Both vacuum functions must be turned off before the oven will backfill. See page 50.



Alarm Light

The red alarm light illuminates steadily when a temperature limit is activated.



Power Switch Controls all power to the oven and its systems.



Temperature and Vacuum Controller

- Manually sets constant heating or chilling temperature setpoints for the platen shelves.
- Manually sets a constant temperature setpoint (optional) for the oven walls heating.
- Controls turning on the pump and placing the oven chamber under limited or full vacuum.
- Can program and store automated heating/cooling temperature profile recipes.

Main		\checkmark	USER
PLATEN TEMP LOOP1	PLATEN TEMP LOOP2	OVEN WALL TEMP LOOP3	VACUUM LOOP4
PV: 23.1 C	PV: 23.1 C	PV: 22.3 C	PV: 760.0
SP: 0.0 C	SP: 0.0 C	SP: 0.0 C	SP: 800.0
PWR:	PWR:	PWR:	PWR:
		P	rofile Actions
			MP Output ART Actions
	Ē	•)	ŗ

• This includes automated vacuuming and backfill steps.



Home

Returns the display to the homepage.

Menu



Accesses the **password** for unlocking the temperature and vacuum profile programming menu.

Return

Help



Returns the display to the previous page or menu.



This button has no assigned functions.



Platen Temperature Tabs – Homepage





Platen 2 current temperature, -30°C.

-50°C entered on the setpoint button.

The N_2 solenoid value is approximately 80% open.

PV (Process Value): The current temperature of the platen as measured by thermocouples inside the platen. The display accurately shows the platen surface temperature when the platen temperature is stabilized. The actual surface temperature may lag behind the displayed temperature while heating and especially when chilling.

150.0 C SP

SP (Setpoint): When a profile is not running, the platen heats or actively chills to achieve the setpoint displayed on this button. Tapping it brings up the setpoint menu.

PWR: The top power bar indicates in orange the percentage of maximum power the oven is calling for to heat the platen. The lower power bar indicates in blue the percentage of LN_2 flow being called for to chill the platen.

Oven Wall Temperature Tab – Homepage



PV (Process Value)

- When an atmosphere is present in the chamber, the Process Value shows the gas temperature.
- When the oven chamber is pumped down, the Process Value shows the current chamber wall temperature.

150.0 C

SP: A target constant temperature the oven heats to and maintains when a profile is not running. Setting the setpoint to zero effectively gives the oven an unheated resting state.

PWR: The power bar indicates the percentage of maximum power the oven controller is calling for to heat the oven chamber.



Vacuum Control System Tab - Homepage



Chamber Evacuating

PV: The present chamber pressure level, down to 1 Torr.

SP (Setpoint) button: The Vacuum Control setpoint button. The oven pumps down to this target when the Pump Start and Vacuum Control functions are on.

PWR: Indicates the percentage of controlled air pressure to be used in opening the oven vacuum valve. This pressure level is not actually applied until the Vacuum Control function is turned on. This power level is not used by the Full Vacuum function.

Pump Start

Turns on the oven vacuum pump.

- Pump Start must be on for the Vacuum Control or Full Vacuum functions to evacuate the • chamber.
- Pump Start must always be manually turned on by an oven operator. It cannot be set to • automatically turn on as part of a profile.

An operator must be present while the oven is pumping down from room pressure to verify the oven is sealed.

Cool Enable

Turns the oven cryogenic cooling system on or off.

- The platen shelves will not chill unless this function is on.
- Cool Enable can be set to turn on and off as part of an automated temperature and vacuum profile recipe or manually enabled on the controller homepage.
- To prevent condensation or ice buildup on the platens, Cool Enable should not be turned on • until the chamber is evacuated.



200.





Note:

Both vacuum functions can be manually turned on from the homepage by tapping the button or turned on as a profile step parameter. The button indicator disk changes from gray to green when turned on.

Vacuum Control



The Vacuum Control function dynamically adjusts the chamber vacuum valve to achieve and then maintain a pressure level between room atmosphere pressure and 1 Torr. This level can either be set by the operator using the homepage vacuum tab setpoint or programmed as part of an automated profile recipe.

Full Vacuum



The Full Vacuum function opens the oven vacuum valve all the way, supplying the maximum draw of the pump to the oven chamber. It can evacuate the chamber to below 1 Torr **and overrides the Vacuum Control function**. The maximum achievable Full Vacuum level depends in part on which pump type is installed in the oven and the rate of outgassing from products or samples in the chamber.

Profile Actions

Profile Actions

This button brings up the temperature and vacuum profile menu options. These include:

- Running a profile (launching).
- Creating a new profile.
- Editing an existing profile.
- Exporting profiles.

Note: You must log in to create or edit profiles. These actions are hidden when not logged in.



Output Actions

Brings up the output menu, showing each output channel and the data type assigned to it.



Safe operation of the oven is dependent on the actions and behavior of the oven operators. **Operating personnel must read and understand the Operating Precautions in this section prior to operating the oven.** The operators must follow these instructions to prevent injuries and to safeguard their health, environment, and the materials being treated in the oven, as well as to prevent damage to the oven. Failure to adhere to the Operating Precautions, deliberately or through error, is a hazardous behavior on the part of the operator.

Le fonctionnement sûr du four dépend des actions et du comportement des opérateurs du four. Le personnel d'exploitation doit lire et comprendre les consignes de sécurité et les précautions d'utilisation de cette section avant d'utiliser le four. Les opérateurs doivent suivre ces instructions pour prévenir les blessures et protéger leur santé, leur environnement et les matériaux traités dans le four, ainsi que pour éviter d'endommager le four. Le non-respect des consignes de sécurité et des précautions d'utilisation, délibérément ou par erreur, est un comportement dangereux de la part de l'opérateur.





OPERATING PRECAUTIONS

- Do not use this oven in unsafe improper applications that produce flammable or combustible gases, vapors, liquids, or fuel-air mixtures in quantities that can become potentially explosive.
- Outgassed byproducts may be hazardous to or noxious for operating personnel. Vacuum pump exhaust should be vented to a location outside the workspace in a safe manner in accordance with all applicable laws, ordinances, and regulations. Do not operate the oven in an unsafe area with noxious fumes.
- Do not use this oven for applications heating hazardous fibers or dust. These materials can become airborne and come into contact with hot surfaces.
- Individual ovens are not rated to be explosion proof. Follow all building certification requirements and laws for Class I, II, or III locations as defined by the US National Electric Code.
- The bottom surface of the chamber should not be used as a work surface. It runs hotter than the shelf temperatures. Never place samples or product on the oven chamber floor.
- Do not place sealed or filled containers in the oven. These may burst open when the chamber is under vacuum.
- Do not place alcohol or mercury thermometers in the oven. With improper use, they can rupture.
- Do not move the oven until it has finished cooling.

Warning Hot Surfaces: These areas are marked with Hot Surface labels. Proper protective equipment should be employed to minimize the risk of burns.

Avertissement Surface Chaude: Ces zones sont marquées avec des étiquettes de surface chaude. Un équipement de protection approprié devrait être utilisé pour minimiser le risque de brûlures.





Nitrogen Hazards

Cryogenic Hazards

Liquid nitrogen (LN_2) poses a significant, rapid onset frostbite hazard. Gas nitrogen (GN_2) vented from the oven during platen chilling is also a significant frostbite hazard.

L'azote liquide (LN_2) présente un risque important de gelures d'apparition rapide. L'azote gazeux (GN_2) évacué du four pendant le refroidissement du plateau constitue également un risque de gelure important.

Asphyxiation Hazard

Evaporating liquid nitrogen and expelled gas nitrogen can create significant asphyxiation hazards by crowding out oxygen in the room atmosphere. The onset of asphyxiation can be difficult to detect until personnel lose consciousness or suffer cognitive impairment.

L'évaporation de l'azote liquide et de l'azote gazeux expulsé peut créer des risques d'asphyxie importants en évincant l'oxygène dans l'atmosphère de la pièce. L'apparition de l'asphyxie peut être difficile à détecter jusqu'à ce que le personnel perde connaissance ou souffre de troubles cognitifs.

Flammability and Explosion Hazards

Liquid nitrogen is cold enough to condense free atmospheric oxygen around leaking LN_2 plumbing or insufficiently insulated LN_2 containers. Such locally elevated O_2 levels create a significant flammability hazard.

Additionally, liquid nitrogen can expand explosively when heated because of its extreme low-temperature boiling point.

L'azote liquide est suffisamment froid pour condenser l'oxygène atmosphérique libre autour de la plomberie LN_2 qui fuit ou des conteneurs LN_2 insuffisamment isolés. Ces niveaux localement élevés d'O₂ créent un risque d'inflammabilité important.

De plus, l'azote liquide peut se dilater de manière explosive lorsqu'il est chauffé en raison de son point d'ébullition à basse température extrême.

Platen Ice Build-Up



Chilling the platen shelves with atmosphere in the chamber will result in an ice buildup on the platen surfaces. This can damage the oven chamber and the platens and severely damage the vacuum pump.

Le refroidissement de la plaques avec l'atmosphère dans la chambre entraînera une accumulation de glace sur les surfaces de la plaque. Cela peut endommager la chambre du four et le plateau et gravement endommager les pompes à vide.







Nitrogen Precautions

Required PPE

- Ensure all oven operators have received training and that proper personal protective equipment (PPE) for handling liquid nitrogen is on hand.
- Personnel handling liquid nitrogen containers must utilize personal protective equipment. This includes personnel connecting the oven to an LN₂ supply source.
- Most PPE provides only limited, short-duration protection against contact with liquid nitrogen.

Nitrogen Handling and Ventilation Precautions

- Before putting the oven into operation in a new location, contact your site safety officer and review your site procedures and any applicable ordinances and regulations for storing and using cryogenic fluids.
- Always use rated cryogenic cylinders for storing or transporting liquid nitrogen.
- The oven gas nitrogen vent must be connected to a ventilation system that safely removes all expelled GN₂ from the workspace area. The oven actively expels GN₂ when chilling the platens.
- Ensure all areas where LN₂ and expelled gas nitrogen are present are well ventilated with a minimum of 6 air changes per minute.

Oven Icing Precautions

- To avoid creating ice in the oven chamber, the manufacturer strongly recommends pumping down the oven chamber before chilling the platens.
- This removes humidity from the chamber.



THEORY OF OPERATION

Vacuum and Vacuum Automation



The pump is turned on or off using the Pump Start function. The current vacuum level is displayed on both the Vacuum Gauge display and the Main controller homepage vacuum tab.

The oven is intended for use in closed-cycle applications with the oven chamber partly or fully pumped down while controlling temperature. The lowest possible chamber pressure is dependent on both the pump type and the volume of outgassing from product or samples in the chamber.

Heating the platen shelves of the oven chamber walls with atmosphere in the oven can oxidize the platen and chamber surfaces. Chilling the platens while atmosphere is present in the chamber can lead to ice accumulating on the platen surfaces. This ice can damage the oven vacuum pump by streaming significant H_2O vapor through the pump when the ice melts. Additionally, ice can discolor or damage the chamber vessel and the platens if present when heating is applied.

Backfilling

The oven opens the pneumatic vacuum port when either the Full Vacuum or Vacuum Control functions are on. As soon as both these functions are turned off, the oven closes the vacuum valve, then opens the automated backfill port. This backfills the chamber to approximately 600 Torr. To restore the chamber to full room pressure (approximately 810 Torr N₂ / 760 Torr atmosphere), the operator manually presses and holds the Stop / Backfill button on the control panel.

The oven backfills using room atmosphere unless a clean or inert gas supply is connected to the push fitting Backfill / Vent port fitting on the back of the oven. The maximum allowed backfill pressure is 15 psi of delivery at the port. Inert gases, such as nitrogen (N₂), are typically used to avoid oxidizing the chamber surfaces or product as well as avoid particulate contamination and introducing water vapor into the hot chamber. Clean air can also be used to avoid water and particulate contamination.

Temperature Modes



Temperatures are set by one of two methods. One is by manually entering constant temperature setpoints on the Main controller homepage for the platen shelves and – optionally – the oven chamber walls. The other is by launching a multistep automated temperature profile. Temperature profiles are recipes programmed at your site that automate vacuum levels, heating ramps, heat soaks, passive cooldowns, active chilling, and cold soaks, as well as partial backfills of the chamber. Profiles override the manually set constant temperature setpoints when launched.



Heating in a Vacuum

In conventional ovens, powered elements transfer heat into the chamber air. The heated air then circulates by natural convection or blower fan action, surrounding the product on the shelves and gradually bringing it to temperature. In a vacuum oven, heat transfer takes place in part through infrared radiation. However, a significant portion happens through conduction. Either directly from the self-heating platen shelves or indirectly from heating elements located in the chamber walls and floor transferring heat to the platens

The displayed oven chamber walls temperature may change when a vacuum pump is pumping down the oven chamber. This reflects the chamber probe transitioning from measuring air temperature to the wall temperature, followed by a redistribution of thermal energy in the vacuum environment. This typically presents as a drop in temperature followed by an apparent rise. The drop may take place even if the oven is actively heating.

Controlling Temperature

The oven uses two major systems to control temperature. The oven chamber wall system employs heating elements built into the chamber walls. The platen thermal shelves are built with both internal heating elements and channels for pulsing liquid nitrogen (LN_2). This allows the platens to heat or chill. The oven chamber and the platens each have independent temperature setpoints.

The unit uses Proportional – Integral – Derivative (PID) control to avoid significantly over- or undershooting setpoints. In practice, this means the rate of heating or chilling slows as the chamber or platen temperature approaches a target temperature. PID loops also respond to environmental conditions to optimize heating and chilling rates. If the unit is operating in a cool room, the controller will gradually increase the length of the heating pulses. Likewise, when operating in a warm room the unit will gradually use shorter heating pulses. If the ambient temperature conditions change significantly, there may be minor over or undershoots as the unit adapts.

The oven chamber is well insulated when sealed. Additionally, the platens comprise a significant mass. It can take days for the chamber and platens to passively cool to ambient temperature. The platen chilling function can be used to cool the platens to just above ambient during the final steps of a profile or manual baking application.

Temperature Limit Cutoff Systems

The oven controller contains a Temperature Limit cutoff system with independent circuitry connected to redundant temperature sensor probes inside the oven chamber. This Temperature Limit system limits both heating and chilling of the platens. If the oven or platen exceeds its current high limit setting, the Temperature Limit system routes electrical heating pulses away from the oven or platen heating elements. If the platen temperature falls below its low limit setpoint, the limit system cuts off the flow of LN₂ chilling to the platen. A limit cutoff remains in effect until the temperature no longer exceeds the cutoff limit **and** the active limit alert is cleared by the oven operator. The alert always remains active until cleared.

The oven and platen limits are set by the operator to a minimum of 10°C above the highest temperature and 10°C below the lowest temperature the platens are intended to be run at during your baking application. Each temperature cutoff is set separately and acts independently. Failure to set the temperature limits voids the oven manufacturing defect warranty in the event of an overtemperature or cryogenic undertemperature event.



PUT THE OVEN INTO OPERATION

Perform the following procedures and steps to put the unit into operation after installing it in a new workspace environment.



Turn on the oven

✓ **Optional:** Back up the oven controller.



• The manufacturer recommends backing up your oven controller configuration. See the Logging In and Out procedure on page 43 and the File Export and Import procedure on page 44.



- ✓ Perform the Set the Temperature Cutoff Limits procedure on page 45.
- ✓ Perform the Latch the Oven Chamber Door procedure on page 46.



- ✓ Perform the **Pump Down the Oven Chamber** procedure on page 47.
 - Hold the oven chamber under vacuum for **a minimum of 10 minutes** to verify the integrity of the vacuum system.



Optional: Perform the **Connect to the Liquid Nitrogen Supply** procedure on page 51 if your application calls for chilling the platens.



- \checkmark Review how to set the Operating Temperatures.
 - Perform the Setting Constant Temperatures procedure on page 52, OR
 - Program multistep Temperature and Vacuum Profiles, page 53.

Note: The oven chamber should always be under vacuum prior to heating or chilling.

The oven is now ready for use.



You must be logged in on the main temperature and vacuum controller to perform the following:

- Exporting or importing configuration files.
- Programming or editing profiles.

Profiles can be launched, paused, or terminated without logging in.



End of Procedure

Changing the Password

The default oven password is **ctek**. The password may be changed using Watlow Composer[™] software. However, Cascade TEK **cannot recover a lost password**.



Note: A USB must be inserted into the USB-A drive on the control panel next to the main controller display screen to access the File Transfer menu.

FILE EXPORT AND IMPORT

The manufacturer recommends exporting the controller software configuration when first putting the oven into use. Profiles can also be imported and exported using this procedure.





SET THE TEMPERATURE CUTOFF LIMITS

Note: Test the temperature limit systems once per year for functionality.

Set the temperature thresholds where the independent Temperature Limit circuitry cuts off heating or cooling of the oven chamber or platens. Failure to set the temperature limits **voids the manufacturing warranty** in the event of an overtemperature or under temperature event.

Considerations when setting temperature limit cutoffs:

- Set the limits prior to activating heating or chilling.
- The high limit cutoff setpoints should be set **at least 10°C** above the highest temperature of your baking or thermal cycle application.
- The low limit cutoff setpoints should be set **at least 10°C** below the lowest temperature of your chilling or thermal cycle application.

Temperature Limit Controller









- 1. Tap the High Setpoint and Low Setpoint buttons for each tab.
- 2. Set the cutoff limits on each tab.



LATCH THE OVEN CHAMBER DOOR

Ensure the oven door is securely latched before placing the chamber under vacuum.

1. Position the door handle.

• Swing the handle wheel all the way to the left, until it is facing forward.



2. Secure the chamber door.

• Turn the handle wheel clockwise (to the right) until the tongue of the handle wheel just touches the hasp on the chamber body.



3. Tighten the handle wheel.

- Turn the wheel a **maximum of 3 more times** to tighten the door handle.
 - **Do not force or overtighten the wheel**. This can damage the door handle or latch.
- **4.** Pump down the oven chamber to seal the door. See page 47.

5. Loosen the handle wheel after the oven chamber pressure drops below 400 Torr.

This helps safeguard against overpressurizing the chamber while backfilling.



- Turn the wheel **3 times** counterclockwise (to the left) to loosen the handle.
- Leave the handle facing forward. This prevents the door from springing open if the chamber is overpressurized.



PUMP DOWN THE OVEN CHAMBER

Note: Perform a Full Vacuum pump down of the chamber for at least 10 minutes when first putting the oven into operation in a new location to verify the vacuum supply system integrity.



Operator Must be Present: An operator must always be present to observe the vacuum gauge pressure display decreasing while the oven is drawing a vacuum to ensure the system is sealed. The oven door must be closed and latched prior to pumping down the chamber.

Reminder: Loosen the chamber door handle **after the oven chamber pressure drops below 400 Torr**. See page 46.

Vacuum Options: There are 3 options for pumping down the chamber.

Option 1 – Manual Full Vacuum

Opens the vacuum valve to its maximum position.

Turning on the vacuum pump and then the Full Vacuum function.



The oven then pumps down to the vacuum pump's best achievable vacuum level.



1. Tap Pump Start to turn on the oven vacuum pump.

2. Tap the Full Vacuum button on the homepage, fully opening the vacuum valve.

- The chamber pumps down to the lowest achievable pressure.
- **Reminder:** The main controller vacuum tab does not display a PV of less than 1 Torr.
- 3. Loosen the chamber door latch, leaving it in position facing forward.





Option 2 – Manual Vacuum Control

Pumps down the oven chamber to a setpoint between room pressure and 1 Torr.

Entering a vacuum level setpoint.



Turning on the vacuum pump and then the Vacuum Control function.



The oven then pumps down to the vacuum level setpoint.





Procedure Steps

- 1. Enter a vacuum setpoint between 1 Torr and 760 Torr on the homepage vacuum tab.
- 2. The manufacturer strongly recommends entering an initial setpoint of at least 500 Torr to ensure the oven chamber seals completely.
- 3. Tap Pump Start to turn on the oven vacuum pump.
- 4. Tap the Vacuum Control function, partly opening the oven vacuum valve.
 - The oven will pump down to and then maintain the vacuum tab setpoint.
- 5. Loosen the chamber door latch, leaving it in position facing forward.



Option 3 – Launch a Heating Profile

The Vacuum Control or Full Vacuum functions may be programmed to automatically turn on and off as part of an automated heating profile recipe. Vacuum level setpoints are set as part of each step when the Vacuum Control function is active. See page 53.

Reminder: Pump Start cannot be turned on automatically. An operator must always be present to turn on the vacuum pump and verify the oven chamber is sealed as the oven pumps down.

End of Procedure





BACKFILLING THE CHAMBER

Atmosphere is restored to the chamber in two stages.

Stage 1: Automatic Partial Backfill

The oven automatically closes the vacuum valve and partly backfill the oven chamber to approximately 600 Torr when one of two trigger events takes place.

Manual Backfill Trigger

The oven partially backfills the chamber whenever **both** the vacuum functions have been manually turned off.





Profile Automatic Trigger

The oven partially backfills the chamber when an active profile reaches a step in which both vacuum function event parameters are turned off.





Holding Under Vacuum: If one of the vacuum functions remains on during the End step of a profile, the oven will hold the chamber under vacuum indefinitely with the vacuum valve open and the backfill valve closed.

Stage 2: Manual Backfill to Full Room Pressure

1. Press and hold the Stop / Backfill button.

- Release the button when the chamber has backfilled to room pressure.
- The oven door can be opened once the chamber is at room pressure.
 Stop / Backfill





Press and Hold



CONNECT TO THE LIQUID NITROGEN SUPPLY

The oven manufacturer recommends waiting to connect an LN_2 supply to the oven until just before launching a temperature process that requires chilling. This helps minimize LN_2 hazards in the workspace.

See page 39 for a list of precautions for handling LN_2 when connecting the supply to the oven.



Note: Platen performance will vary based on LN_2 supply and connection configurations.





MANUALLY SETTING CONSTANT TEMPERATURE SETPOINTS

Constant temperature setpoints run the oven or platens at steady state temperatures and are manually set and adjusted by the oven operator.

Reminder: The manufacturer recommends fully vacuuming down the oven chamber before heating or chilling.

Тар	Тар					
Main			USER	C/	ASCADE TEK	
PLATEN 1EMP LOOP1	PLATEN TE MP LOOP2	OVEN WALL TEMP LOOP3	VACUUM LOOP4		Set Point	0.0 <mark>c</mark>
PV: 48.1 C	PV: 48. C	PV: 47.5 C	PV: 200.0			
SP: 150.0 C	SP: 150.0 C	SP: 0.0 C	SP: 200.0			
				→		4 5 6 Clear
PWR:	PWR:	PWR:	PWR:			1 2 3 Bksp
		P	rofile Actions		Cancel	- O . Enfer
		COOL PU	MP Output ART Actions			A summittee De

Enabling Platen Chilling

Two conditions trigger and maintain chilling in the platens while running a constant temperature setpoint:

- The platen setpoint (SP) must be lower than the current platen temperature process value (PV).
- And the Cool Enable function must be turned on.

The cryogenic chilling system will not activate if **both** conditions are not met.

Main			USER	
PLATEN TEMP LOOP1	PLATEN TEMP	OVEN WALL TEMP LOOP3	VACUUM LOOP4	
PV: -35.6 C	PV: -35.6 C	PV: -35.4 C	PV: 200.0	
SP: -60.0 C	SP: -60.0 C	SP: 0.0 C	SP: 200.0	COOL
PWR:	PWR:	PWR:	PWR:	
Profile Actions				
		COOL	MP Output ART Actions	

Reminder: Cool Enable can be used to quickly cool down the platens at the end of a heating application while the chamber is still under vacuum. Always cool the platens to a temperature **above** the ambient room temperature to avoid condensate forming on the platens when the chamber door is opened.



TEMPERATURE PROFILES OVERVIEW

Please see the *Profile Programming Manual* document for instructions on how to program automated recipe profiles. This manual comes included with the oven and provides illustrated explanations for all major functions and programming steps.

You must be logged on to the main controller to create or edit profiles. See page 43.

Backup: The manufacturer recommends exporting profiles as a backup using the USB-A port next to the main controller on the front of the control panel. See page 44.

LAUNCHING A PROFILE

A profile may be launched using one of two methods. The control panel Start buttons launch profile 1 or 2. Profiles may also be launched in the Profile Actions menu on the Main controller.

Note: Only one profile can be active at a time.

Pump Start and Cooling Enable

Perform the following steps to ready the oven for running a profile.

1. **Turn on the vacuum pump:** Tap the Pump Start button on the Main controller homepage. The oven will not vacuum down unless the pump is on.



- 2. Enable the Cooling function: If your profile calls for chilling one or both platens, tap the Cool Enable button on the Main controller homepage. The platens will not chill unless Cool Enable is on.
 - Cool Enable may be left off if your profile does not call for chilling.



Continued next page



Launch Option 1: Start Button Launch

Profile 1 or Profile 2 may be launched using the mechanical Start buttons on the oven control panel.



- Start 1 launches automated heating recipe Profile 1.
- Start 2 launches automated heating recipe Profile 2.

Note: Only one profile may be active.

Launch Option 2: Profile Actions Menu Launch

All currently programmed profiles can be launched from the Profile Actions menu.

1. On the Main Controller homepage, tap the Profile Actions Button.



2. Select Run Last or Run Profile from the menu.

Run Last
Run Profile
Go to Profiles
Cancel

Run Last immediately launches the profile that was last run.

Run Profile brings up the list of programmed Profiles. Choose which profile to launch.

Profile Status Icons





OVERRIDING PROFILE STEP VACUUM SETTINGS

The Vacuum Control and Full Vacuum functions can be turned On or Off on the Homepage while a profile is running. This temporarily changes the profile vacuum settings for the current profile step. When the profile reaches the next programmed step, the Vacuum Functions will revert to the settings of that profile step.

Reminder: The oven partially backfills the chamber automatically when both vacuum functions are set to off.



PAUSING OR TERMINATING A PROFILE



While a profile is active, tap the Profile Actions button to pause or abort a running profile.

	Pause
Profile Actions	Terminate
Тар	Cancel



Pause stops the profile timer. The oven will continue to heat or chill, and any active Vacuum Function will continue to operate.

To end the pause, tap the Profile Actions button and tap the **Resume** option.



Terminate immediately ends the profile, advancing it to the End step.

Cancel returns the screen to the homepage and leaves the profile running.



TEMPERATURE LIMIT CUTOFF ACTIVE

Limit activations are persistent, protective interruption of heating or chilling in the affected temperature control system — either the platens or the oven. **Always identify and correct** the cause of a temperature limit activation before restoring heating or chilling.



High Limit Active on the Oven



Low Limit Active on Platen 1



The red Alarm Light on the Control Panel illuminates steadily during a temperature limit cutoff.

Possible Limit Activation Causes

- Launching a heating profile with a temperature setpoint near to or exceeding the current High Limit settings.
- Launching a chilling profile with a temperature setpoint near to or exceeding the current Low Limit settings.
- Heating the oven chamber walls while running the platens can cause platen high limit activations.
- The chamber or platen temperature is within 9°C of the High or Low Limit setting.
- An external temperature source or a heat source in the oven chamber is pushing the oven temperature to or above the High Limit setting.
- The temperature controller circuitry or sensor probe has failed, allowing uncontrolled heating or chilling in the chamber to meet or exceed the Limit settings.

If you suspect a hardware failure or an ignition event in the chamber, **turn off the oven and wait for the oven to cool to room temperature before backfilling the chamber.**

Continued next page



Clearing an Active Limit Cutoff

The oven and platen temperatures must be back within the Limit bounds — between the high and low limits — before a Limit interruption can be cleared (canceled).

Always identify and correct the cause of a temperature limit activation before restoring heating or chilling.



Alarm Message: This alert window appears the first time a button is tapped during a Limit cutoff. Tap Dismiss to close the message.



The platen 1 PV temperature is now at 150.0 placing it within the Limit boundaries.





- 1. Tap the Down arrow on the top ribbon to bring up the Error screen.
- 2. Tap the Clear button on the Error screen to cancel the Limit temperature cutoff.
- 3. Tap the Up arrow at the bottom of the screen to return to the home page.

The red Alarm Light on the control panel will turn off automatically once the Limit activation has been cleared.



DATA PORTS

Front of Unit

Control Panel USB A Ports

The USB ports located on the front control panel access the Main and High Limit controllers and can be used for the following:

- Exporting and importing heating profiles from the controller
- Updating firmware

Back of the Unit

Ethernet Port

The ethernet port located on the back of the oven accesses the Temperature and Vacuum controller. With the correct configurator software, the port can be used for the following:

- Downloading profiles and uploading profiles to the controller.
- Programming heating profiles in a desktop or laptop environment.
- Backing up and loading backed-up oven configurations.

OVEN COOLDOWNS

The oven chamber is well insulated, and the platens are a significant mass of metal in the vacuumisolated environment. The oven may require days for the chamber to cool down passively while the chamber is sealed.

Introducing free atmosphere into the oven chamber at temperatures above 100°C risks oxidizing chamber surfaces and possibly products or samples. Backfilling the oven with N_2 does not significantly increase the rate of cooling.

Reminder: The platen chilling function can be used to actively chill down the platens and chamber. Chill the platens to just above room temperature so that condensate will not form on the platens when the oven chamber door is opened.



Warning: Disconnect the unit from its power supply prior to maintenance or service.

Avertissement: Avant d'effectuer toute maintenance ou entretien de cet appareil, débrancher le cordon secteur de la source d'alimentation.



If a hazardous material or substance has spilled in the unit, immediately initiate your site Hazardous Material Spill Containment protocol. Contact your local Site Safety Officer and follow instructions per the site policy and procedures.

- Periodic cleaning is required.
- Do not use spray-on cleaners or disinfectants. These can leak through openings and coat electrical components.
- Do not use cleaners or disinfectants that contain solvents capable of harming paint coatings or stainless-steel surfaces. Do not use chlorine-based bleaches or abrasives; these will damage the chamber liner.
- Consult with the manufacturer or their agent if you have any doubts about the compatibility of decontamination or cleaning agents with the parts of the equipment or with material contained in it.

Warning: Exercise caution if cleaning the unit with alcohol or flammable cleaners. Always allow the unit to cool down to room temperature before cleaning and make sure all cleaning agents have evaporated or otherwise been completely removed prior to putting the unit back into service.

Avertissement: Soyez prudent lorsque vous nettoyez l'appareil avec de l'alcool ou des produits de nettoyage inflammables. Laissez toujours refroidir l'appareil à la température ambiante avant le nettoyage et assurez-vous que tous les produits de nettoyage se sont évaporés ou ont été complètement enlevés avant de remettre l'appareil en service.

Oven Chamber Cleaning Guidelines

- 1. Remove any removable chamber accessory items, if present.
- 2. Use 99% isopropyl alcohol to clean chamber surfaces and the platens. Apply using lint-free wipes.
- 3. Take special care when cleaning around temperature sensor probes. Do not clean the probes.
- 4. Clean all removable accessories and components.
- 5. Verify the cleaning alcohol has evaporated completely from all chamber surfaces and accessories prior to reconnecting the unit to its power source.







MAINTENANCE

MAINTAINING ATMOSPHERIC INTEGRITY

Periodically, inspect the door latch, trim, catch, and gasket for signs of deterioration. Failure to maintain the integrity of the door system shortens the lifespan of the unit.

GASKETS

The door gasket is a low-wear item. It typically only needs to be replaced due to being cut or nicked. The risk of this type of damage can be significantly reduced by opening the door to 130°, keeping it well out of the way of shelves or sample trays being removed from or inserted into the chamber.

Replacement Procedure: The manufacturer recommends having a rubber mallet and exam gloves on hand to perform this procedure. Cover the mallet head with a clean plastic bag to help reduce contamination of the door. Wearing exam gloves likewise reduces the chance of contaminating the chamber door interior.

- 1. Remove the old gasket by pulling it out of the gasket well in the door.
- 2. Insert a few centimeters (inches) of the narrow side of the replacement gasket into the gasket well on the top of the door.
- 3. Insert a few centimeters (inches) of the gasket's narrow side gasket into the well on the bottom of the door.
- 4. Insert a few centimeters (inches) of the narrow side of the gasket into the well on the left side, then on the right side of the door.
- 5. Continue around the door in this fashion, alternating sides.
 - a. The rubber mallet can be used to help seat the gasket. Use moderate strokes.

ELECTRICAL COMPONENTS

Electrical components do not require maintenance. If the oven fails to operate as specified, please contact your distributor or **Customer Support** for assistance.

STORAGE

To prepare the unit for storage, remove all removable accessories, dry the chamber completely, and disconnect the power supply. Verify that the door is positively locked in the closed position.



This oven is a 220 – 240 volt unit. Please refer to the oven data plate for individual electrical specifications.

Technical data specified applies to units with standard equipment at an ambient temperature of 25°C and at nominal voltage. The temperatures specified are determined in accordance with factory standards following DIN 12880 respecting the recommended wall clearances of 10% of the height, width, and depth of the inner chamber. All indications are average values, typical for units produced in the series. We reserve the right to alter technical specifications at all times.

Weight

Model	Shipping Weight
SVO-10-VC-2P	1,824 lb / 828 kg
SVO-10-VC-2HP	1,824 lb / 828 kg

DIMENSIONS

Inches

Model	Exterior W × D × H	Interior W × D × H
SVO-10-VC-2P	38.8 x 48.0 x 70.4 in	28.8 x 26.0 x 24.5 in
SVO-10-VC-2HP	38.8 x 48.0 x 70.4 in	28.8 x 26.0 x 24.5 in

Millimeters

Model	Exterior W × D × H	Interior W × D × H
SVO-10-VC-2P	986 x 1219 x 1788 mm	730 x 660 x 622 mm
SVO-10-VC-2HP	986 x 1219 x 1788 mm	730 x 660 x 622 mm



CAPACITY

Model	Cubic Feet	Liters
SVO-10-VC-2P	10.6	300.1
SVO-10-VC-2HP	10.6	300.1

VACUUM

Operational Vacuum Range*

mbar
910.5 to <0.0319 @ 150°C

*Pump dependent.

Chamber Pressure Display Range

torr	mbar
1100 to 0.1 mTorr	1466 to 0.001

Leak Rate

Rate	
Less than 30 mTorr per 30 minutes @ ambient temperature	



SPECIFICATIONS

TEMPERATURE PERFORMANCE

System	Range	Stability
Oven	Ambient +5° to 260°C	± 0.1°C @ All Temps
Platens	-100°C to 260°C	± 0.2°C @ All Temps
High Performance Platens	-100°C to 260°C	± 0.2°C @ All Temps

Uniformity

System	Heating Uniformity	Chilling Uniformity	
Oven	\pm 6% of setpoint	NA	
Platens	± 2°C across platen surface	±5.5°C across platen surface	
High-Performance Platens	± 2°C across platen surface	±5.5°C across platen surface	

Chilling and Heating Rates

System	Heating Rate	Chilling Rate
Platens	+2.5°C per minute	-5.1°C per minute*
High Performance Platens	+7.0°C per minute	-5.1°C per minute*

*Platen chilling rates may vary based on your LN_2 supply delivery configuration.

POWER

Model	AC Voltage	Amperage	Frequency
SVO-10-VC-2P	220 – 240	50	50/60 Hz
SVO-10-VC-2HP	220 – 240	90	50/60 Hz



SPECIFICATIONS







Ordering Parts and Consumables

Parts may be ordered from Cascade TEK by calling 1-888-835-9250. Please have the **model, part,** and **serial** numbers and **Part ID** of the unit ready, as Customer Support will need this information to match your unit to its correct part.







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> support@cascadetek.com cascadetek.com 1-888-835-9250 1-971-371-4096