TS150™ vs TS150e™ COMPARISON GUIDE

TS150™

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TS150e™

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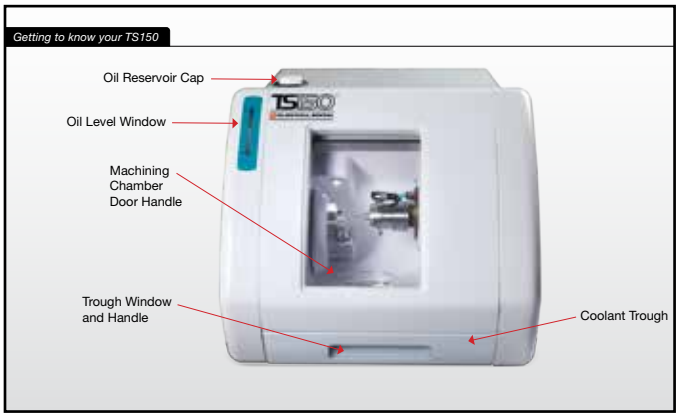
SYSTEM COMPONENTS



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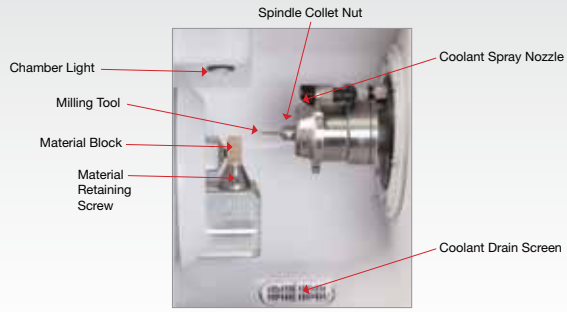
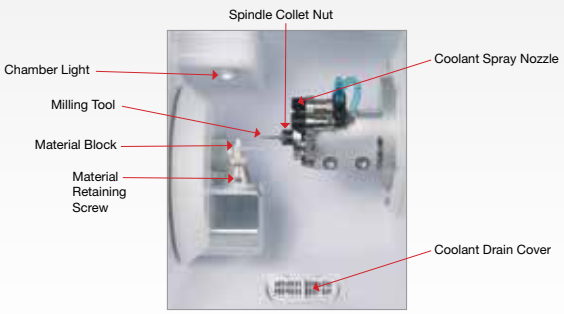
SYSTEM COMPONENTS

Machining Chamber Components



Machining Chamber Components



BASIC SETUP

Basic Setup

1. Locate the TS150 mill in a spare room with a sturdy support, such as table or cabinet top surface, that is capable of holding a weight of 150 lbs.
2. Mount the supplied air pressure regulator on the back of the unit or on the wall near the unit.
3. Connect the office air supply to the regulator (3/8" inch OD tubing), the output of the regulator to the air inlet located on the rear of the unit. (Air Consumption Requirement: 4.5 CFM at 85–90 psig)
4. Use the power cord to connect the system to a grounded power outlet.
5. Switch the power on at the power inlet on the back of the unit.
6. Load the coolant trough with a mixture of distilled or R.O. water and TS150 coolant solution. (See Routine Maintenance for instructions.)
7. Fill the oil reservoir with TS150-approved lubricant. (See Routine Maintenance for instructions.)
8. The TS150 requires a USB ready "out-of-the-box" cable to the computer running FastDesign™. (Your Technical Support Specialist will help set up this connection.)

Basic Setup

1. Locate the TS150e™ mill near the office air supply in a spare room on a sturdy table, desk or countertop capable of supporting 150 lbs.
2. Set up the computer components: monitor, keyboard and mouse close to the mill.
3. Connect the office air supply to the air inlet located on the back of the unit. (Air Consumption Requirement: 0.9 CFM or greater with a psi range of 50–80 psi)
4. Connect the power cord to the system and to a grounded power outlet.
5. Connect the computer to the mill with the USB cable.
6. Switch the power on at the power inlet on the back of the unit.
7. Fill the coolant trough with a mixture of distilled or reverse osmosis water and Glidewell Dental Mill Coolant Concentrate. (See Routine Maintenance for instructions.)

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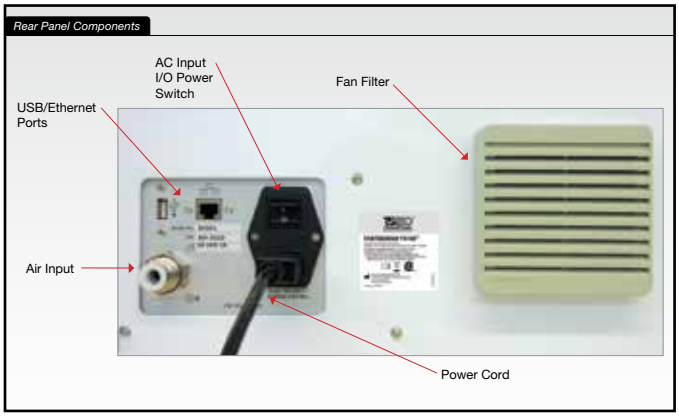
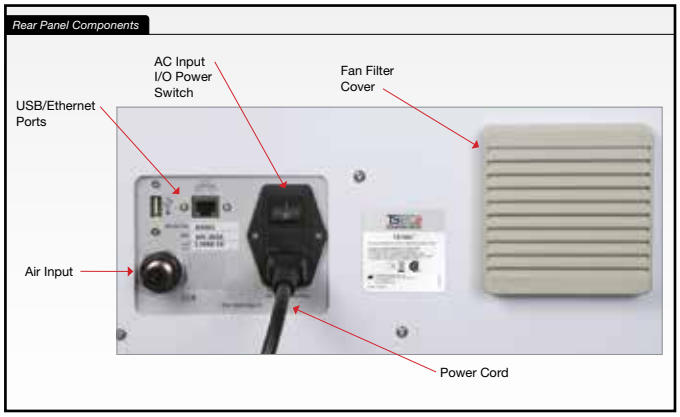
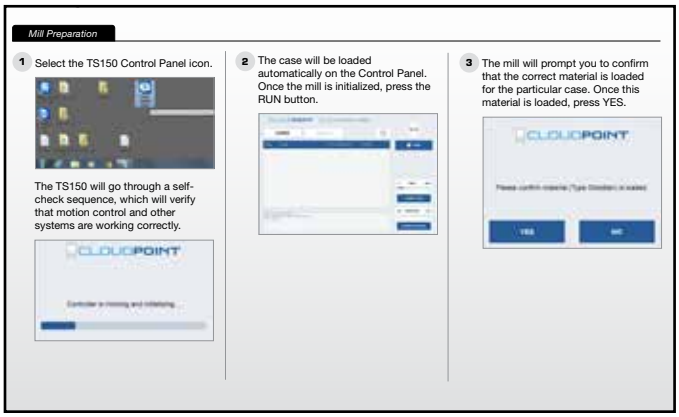
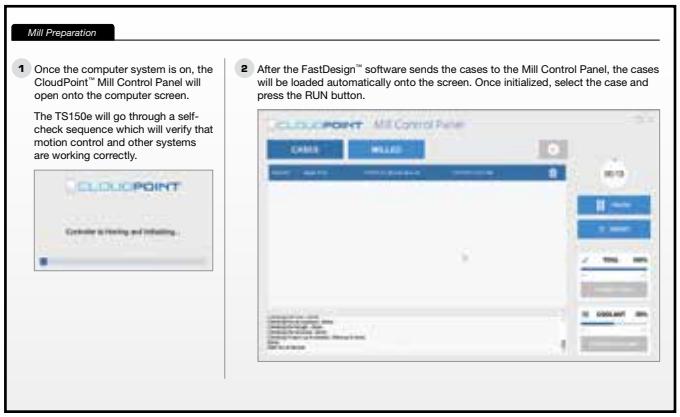




RUNNING THE MILL





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4 Allow the spindle to warm up to temperature if needed.

5 With the door closed, the TS150 will automatically begin machining. The timer on the top right corner will indicate how much time has passed. The blue outer ring will indicate how much longer the process will take to complete.

6 The process can be paused at any time by clicking the PAUSE button on the top right corner of the screen.

The job can be resumed at any time after it has been paused.

7 Once the job is finished, a "Program Finished" message will appear as well as a tool wear reading.

8 If the tool life is low, click CHANGE TOOL and then click YES on the following pop up.

9 Load the new tool when prompted and then click OK.

3 The mill will prompt you to confirm that the correct material is loaded for the particular case. Once this material is loaded, press YES.

4 The mill will prompt you to load a new tool when the tool life has expired or BruxZir NOW material is loaded. Click YES to load the tool.

After loading the tool and closing the mill door, click YES.

5 The mill will prompt you to change the coolant if the coolant life has expired.

Note: The mill will prompt you to close the door whenever the door is open. Milling will not begin until the door is closed.

6 Allow the spindle to warm up to temperature if needed.

7 With the door closed, the TS150e will automatically begin machining. The timer on the top right corner will indicate how much time has passed. The blue outer ring will indicate how much longer the process will take to complete.

8 The process can be paused at any time by clicking the PAUSE button on the top right corner of the screen.

After pausing, press the RUN button to continue milling.

9 When the job is finished, click OK.

10 Remove the milled restoration and finish as needed.

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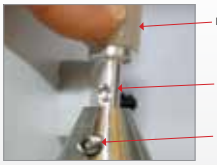
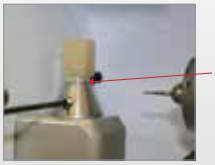
GENERAL OPERATION

Loading Material

Position slot on mandrel toward rear of mill so retaining screw hole is visible above the retaining screw. Push it all the way down until it is fully seated.



Slightly rotate the material block side-to-side while tightening the retaining screw clockwise until the retaining screw is fully seated into the depression. The retaining screw should be tightened firmly.



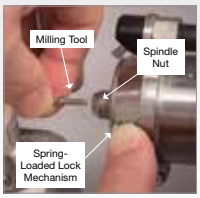
Loading Material

Position slot on mandrel toward rear of mill, so the retaining screw hole is visible above the retaining screw. Push mandrel down until fully seated.

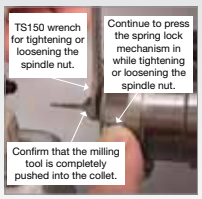
Using the allen wrench, tighten the retaining screw clockwise. As the fit of the screw becomes tight, gently align the retaining screw hole with the screw. **Fully seat** and **firmly tighten** the screw into the hole until the block sits flat against the screw.

Loading a Tool

The spindle contains a spring-loaded lock mechanism that prevents it from rotating while installing or removing tools. Push this lock in and apply a wrench to the nut. To remove a used tool, rotate the nut counter-clockwise to loosen. To install a new tool, rotate the nut clockwise to tighten.



When installing a new tool, push the tool all the way down to the nut and tighten the nut firmly while holding the spring-loaded lock. It will take about four 90° turns to completely tighten the tool.



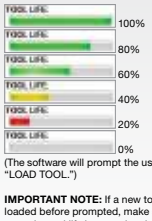
⚠ **IMPORTANT NOTE:**

After tightening the nut, make sure the spring-lock mechanism is all the way out and the spindle rotates freely. You are now ready to run the program.

Tool Life

OBSIDIAN®, VITA ENAMIC® AND LAVA™ MATERIALS ONLY

Each tool should mill 5 restorations. The software will calculate the tool usage and verify the TOOL LIFE on the home screen.

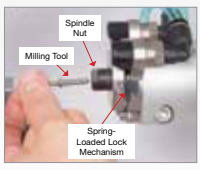


(The software will prompt the user to "LOAD TOOL.")

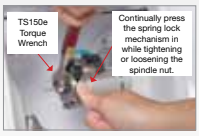
IMPORTANT NOTE: If a new tool is loaded before prompted, make sure to reset the tool life by pressing the icon, to the right of TOOL LIFE.

Removing and Loading a Tool

IMPORTANT: The spindle contains a spring loaded mechanism lock that prevents spindle rotation during the installation or removal of the milling tool. Once the spindle is locked in place, pressure on the lock mechanism must be maintained throughout the process.



Remove the tool from the collet. Rotate the spindle while pressing the lock mechanism until the spindle locks into place. Then, rotate the nut counter-clockwise using the TS150e torque wrench while pressing the lock mechanism. Remove the tool.



Insert the new tool completely into the collet. Rotate the spindle while pressing the lock mechanism until the spindle locks into place. Then, rotate the nut clockwise using the TS150e torque wrench while pressing the lock mechanism. When the red-handled torque wrench yields during tightening, tool installation is complete.

CAUTION: Release the lock mechanism BEFORE running the milling program to prevent mill damage. Make sure the spindle rotates freely and the lock mechanism is disengaged.

You are now ready to run the program.

Tool Life

OBSIDIAN®, VITA ENAMIC®, LAVA™ ULTIMATE, CERASMART™ AND COMPOSITE MATERIALS ONLY

Each tool will mill 5 restorations. The mill will prompt you to load a new tool when the tool life has expired, click YES to change the tool.

After loading the tool, click YES.

BRUXZIR® NOW MATERIAL ONLY

The mill will prompt you to load a new tool every time BruxZir NOW material is loaded. Each job requires a new single-use diamond bur.

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ROUTINE MAINTENANCE

Cleaning the Coolant Trough

The time frame for changing the coolant is dependent on mill usage, but generally it should be changed on a weekly basis.

Cleaning the Coolant Trough

- To remove the coolant trough, press the coolant trough release button on the side of the system and remove trough using the trough handle.
- Grasp the filter and remove it from the top of the trough. Empty any large particles on top of the filter into a trash receptacle. Once the large particles have been removed, the filter can be washed in warm water with a mild detergent to remove the spindle oil. Be sure to rinse all of the detergent out of the filter before reusing it.
- Empty the trough using the rubber drain plug and then rinse the trough with distilled or R.O. water. Scoop out any remaining slurry using a large spoon or spatula.

NOTE: It helps to use a toothbrush to clean the inside crevices within the trough.

WARNING: Sharp glass particles may be present in the trough, so use care when emptying it. Using gloves is recommended.

IMPORTANT: Make sure to reinsert the plug before reinserting the trough.

Cleaning, Refilling the Coolant Trough

The Mill Control Panel will prompt coolant changes when the coolant life has expired. For frequent coolant changes, click CHANGE COOLANT on the Mill Control Panel.

Cleaning the Coolant Trough

WARNING: Sharp glass particles may be present on the filters or in the trough. Wear gloves when emptying and cleaning the trough.

- Press the release button and carefully remove trough using the trough handle.
- Remove the main filter. Discard any large particles on the filter. Invert the filter and rinse with water from the underside to remove fine particles.
- Remove the top rubber drain plug to empty the trough. Empty the trough of used coolant and debris. Without unplugging the internal filter, thoroughly rinse the internal filter and trough with water.
- Reinsert the top rubber drain plug into its original place.

IMPORTANT: Make sure the top rubber drain plug is in place before adding fresh coolant and reinserting trough.

Refilling the Coolant Trough

- Fill the trough with 2.4 L (2.5 quarts) of distilled or R.O. water and 240 mL (8 fl. oz.) of TS150 mill coolant concentrate. The coolant mixture level should be near the top edge of the handle.

IMPORTANT: Only use distilled or R.O. water in the trough. DO NOT USE standard tap water in the trough, as it contains minerals that will cause scale buildup and premature failure of the seals.

IMPORTANT: Only use mill coolant concentrate supplied by the manufacturer. This mill coolant concentrate was developed specifically for the TS150. Use of other fluids may damage the machine and void the warranty.

Refilling the Coolant Trough

- Fill the trough with 2.4 L (2.5 quarts) of distilled or reverse osmosis water and 240 mL (8 fl. oz.) of Glidewell Dental Mill Coolant Concentrate. The coolant mixture level should be near the top edge of the handle.

IMPORTANT: DO NOT USE tap water to make coolant. Tap water use will cause scale buildup and premature failure of the seals.

- Place the main trough filter on top of trough.
- Carefully reinsert trough until it clicks into place.

IMPORTANT: Only use Glidewell Dental Mill Coolant Concentrate. Use of other fluids may damage the machine and void the warranty.

Refilling the Oil Reservoir

The TS150 utilizes a 150,000 rpm air spindle that requires oil for lubrication. The system contains an automatic oiler to ensure long life of the spindle. The lubricator requires refilling at regular intervals, which are approximately ***every 40 hours of use***. A level sensor connected to the internal computer is used to ensure the lubricator system does not run dry.

- To refill the reservoir, simply remove the cap of the oil reservoir and slowly add oil until the amount as seen in the oil sensor window reads full.

IMPORTANT: Only use oil supplied by the manufacturer, as other oils may cause damage to the spindle and coolant pump and void the warranty.

Cleaning the TS150

The internal surfaces of the machining chamber should be cleaned ***weekly*** with a cloth and distilled water.

- Remove the lower drain cover by pulling it toward the front of the unit. Empty any glass fragments from the drain cover, rinse clean and reinsert into the machining chamber.
- The external surfaces of the TS150 can be cleaned with a mild detergent.

Cleaning the TS150e

Clean the external surfaces of the TS150e with a mild detergent.

Clean the internal surfaces of the machining chamber on a ***weekly basis*** with a lint-free cloth and distilled water.

WARNING: Sharp particles may be present on the drain cover. Wear gloves. Use care when handling the drain cover and disposing of the contents.

- Remove the lower drain cover by pulling it toward the front of the unit. Empty any glass fragments from the drain cover, rinse clean and reinsert into the machining chamber.

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PREVENTATIVE MAINTENANCE

Cleaning the Spindle Collet and Nut

The spindle collet and nut ***periodically*** need to be removed and any ceramic material cleaned from the threads. If you are having difficulty loading tools, perform this cleaning procedure.

1. Unscrew the nut and remove the nut and collet from the machine. Pull the collet from the nut.
2. Use a cotton swab to remove any debris from the inside of the nut (use a little spindle oil on the cotton swap to help clean the threads).
3. Clean any debris from both the collet and the threaded portion of the spindle with a clean cloth.
4. Snap collet back into the nut and reinstall the nut and collet back into the machine (do not tighten at this step).
5. Install a new tool and reset the tool life indicator.

Nut

Nut & Collet

Cleaning the Spindle Collet and Nut

Clean the spindle collet and nut threads ***periodically*** or when loading tools is difficult.

1. Unscrew the nut and remove the nut and collet from the machine. Pull the collet from the nut.
2. Use a spindle brush and a cotton swab to remove any debris from the inside of the nut. Use white mineral oil on a cotton swab to help clean the threads.
3. Clean any debris from both the collet and the threaded portion of the spindle with a clean cloth.
4. Reinstall the collet and nut back into the machine.

   CAUTION: DO NOT tighten at this step.
5. Install a new Tool. (See Removing and Loading a Tool section for details.)

Cleaning the Fan Filter

The fan filter should be cleaned every ***six months*** of dirt and lint. To remove the filter, follow the steps below:

1. Power down the system and remove the AC cord from the rear of the unit. Grasp the plastic fan filter cover, unsnap the cover from the filter housing and remove the filter.
2. Rinse the filter out with warm water and a small amount of dishwashing detergent.
3. Allow the filter to dry completely. Reinsert it into the filter housing and replace the plastic cover.
4. Reattach the power cord to the AC supply and power up system.

Repair

Each TS150 system has been manufactured and calibrated to specifications. There are no serviceable or repairable components within the system by the customer. Please do not attempt to disassemble any part of the system. Any such action may void the product warranty. In the event you should experience a product failure, please call your Technical Support Specialist.

Cleaning the Fan Filter

Clean the fan filter of dirt and lint ***every six months.***

WARNING: DO NOT breathe dust. Wear appropriate personal protective equipment including mask and gloves.

1. Power down the system. Remove the AC cord from the rear of the unit.
2. Unsnap the fan filter cover from the fan filter housing and remove the filter.
3. Rinse the filter with warm water and a small amount of dishwashing detergent.
4. Dry the filter completely
5. Reinsert the dry filter into the filter housing and snap the fan filter cover into place.
6. Reattach the power cord to the AC supply and turn on the system.

Repair

CAUTION: Do not attempt to repair or disassemble any part of the system. Any such action may void the product warranty.

For scheduling maintenance or in the event of a TS150e system malfunction, contact your dealer for Technical Support.

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TROUBLESHOOTING GUIDE

Symptom	Possible Cause	Resolution
No power to unit	Power switch at the AC inlet is off (0)	Switch on AC power at rear panel
	AC cord not inserted correctly at rear panel or outlet	Reinsert power cord, check for power at AC outlet
	Blown fuse at AC supply	Replace AC fuse with correct fuse (see System Specifications)
Delays in machining, pop-up messages showing low air pressure	Inadequate air supply system/too much demand	Resize air compressor system to accommodate additional load
	Low air supply pressure	Increase air pressure regulator to deliver 85–90 psig at regulator during machining
	Too small of an air supply line	Increase size of tubing to regulator
	Too long of a hose from regulator to mill air input	Shorten hose and/or relocate regulator closer to mill
Very high-pitched whine coming from spindle, especially when tool is not in contact with material	Spindle bearings worn	Call your Technical Support Specialist
	Lack of oil	Failure of oil injection system; contact your Technical Support Specialist

Symptom	Possible Cause	Resolution
No power to unit	Power switch at the AC inlet is off (0)	Switch on AC power at the rear panel.
	AC cord not inserted correctly at rear panel or outlet	Reinsert power cord and check for power at the AC outlet.
	Blown fuse at AC supply	Replace the AC fuse with the correct fuse. (See System Specifications.)
Delays in machining, pop-up messages showing low air pressure	Inadequate/too much air supply from system	Resize air compressor system to accommodate the load. Call your Technical Support Specialist.
	Low air supply pressure	Increase the office supplied air pressure to deliver at least 50 psi at the rear panel during machining. Call your Technical Support Specialist.
	Too small of an air supply line	Increase tubing size.
	Too long of a hose from the office air supply to the air inlet on the back of the mill	Shorten the hose and relocate the mill so it is closer to the office air supply. Call your Technical Support Specialist.
Very high-pitched whine coming from spindle, especially when tool is not in contact with material	Spindle bearings worn	Call your Technical Support Specialist.

Symptom	Possible Cause	Resolution
Repeated tool breakage and/or broken blocks	Coolant stream not directed at tool	Visually check to verify coolant is striking tool along length; if not, call your Technical Support Specialist
	Coolant system not pumping correct amount	Verify coolant stream is adequate; if not, call your Technical Support Specialist
Failure of machine during initialization routine, display of error	Motion control failure	Contact your Technical Support Specialist
Restorations excessively in or out of occlusion	Failure of tool touch probe	Contact your Technical Support Specialist
	Tool touch probe out of calibration	Contact your Technical Support Specialist
Coolant trough will not lock into position	Locking latch in "locked" position	Press trough release button and reinsert trough
Collet nut is removed, but collet remains in spindle	Collet and collet nut installed without snapping collet into nut	Gently tap collet with non-metallic item to break it free from the spindle

Symptom	Possible Cause	Resolution
Repeated tool breakage and/or broken blocks	Coolant stream not directed at tool	Visually check to verify coolant is striking tool along length; if not, call your Technical Support Specialist.
	Coolant system not pumping correct amount	Verify coolant stream is adequate; if not, call your Technical Support Specialist.
Failure of machine during initialization routine, display of error	Motion control failure	Contact your Technical Support Specialist.
Restorations excessively in or out of occlusion	Failure of tool touch probe	Contact your Technical Support Specialist.
	Tool touch probe out of calibration	Contact your Technical Support Specialist.
Coolant trough will not lock into position	Locking latch in "locked" position	Press trough release button, reinsert trough into its slot until it clicks into place.
Collet nut is removed, but collet remains in spindle	Collet nut overtightened	Break collet free from the spindle by gently tapping the collet with something non-metallic.

SYSTEM SPECIFICATIONS

Product Name	FastDesign TS150 CNC Mill	TS150e Mill
Power Input Voltage	100–250 V ~ (Auto Range)	100–240 V ~ (Auto Range)
Power Input Frequency	50–60 Hz	50–60 Hz
Power Input Current	5.0A Max	4.0 A Max
Power Input Fuse (115 VAC)	10.0 A Slow Blow ¼ x 1-¼" or 6.36 x 31.75 mm	4.0 A, Slow Blow ¼ x 1-¼" or 6.35 x 31.75 mm
Power Input Fuse (240 VAC)	5.0 A Slow Blow ¼ x 1-¼" or 6.35 31.75 mm	N/A
Air Consumption	4.5 CFM at 85–90 psig	0.9 CFM or greater with a psi at 50–80 psl
Wireless Communication	802.11 N (or better)	N/A
Operating Temperature Range	16° C to 30° C (stabilized for 1 hour at operating temperature after cold storage prior to operation)	18° C to 32° C (stabilized for 1 hour at operating temperatureafter cold storage prior to operation)
Storage Temperature Range	-18° C to 60° C	-18° C to 60° C
Operating and Storage Humidity Range	10% to 90% (Non-Condensing Relative Humidity)	0% to 85% (Non-Condensing Relative Humidity)
Water Ingress	Non-immersive with exception of matching area, damp wipe only on outside.	Non-immersive with exception of matching area, damp wipe only on outside.
Weight	55 kg	55 kg (115 lbs)
Dimensions (W.H.D)	50 cm x 50 cm x 60 cm	44.5 cm x 53 cm x 58.5 cm

NOTES

GLIDEWELL DENTAL

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