

Compresstome[®] VF-300-0Z User Manual



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INTRODUCTION

Congratulations on your purchase of a Compresstome[®] VF-300-0Z from Precisionary Instruments! The VF-300-0Z tissue slicer model is the flagship product in the Compresstome[®] slicer family with patented Auto Zero-Z[®] technology. The VF-300-0Z is fully automated to section both fixed and live tissues with a thickness range of 4 μ m to 1000 μ m with an adjustable precision of 1 μ m.

The Compresstome[®] VF-300-0Z excels at sectioning slices used for:

- Electrophysiology
- Immunohistochemistry
- Organotypic culture slices
- Precision cut tissue slices
- Sectioning of mature or older brain tissues
- And much more!

At Precisionary Instruments, we are thrilled to help you get started with the new vibrating microtome, and we take great pride in quality customer service. Please read the following manual to help you get started with the Compresstome[®] VF-300-0Z.

CONTACT US

We have multiple ways for you to contact us:

E-mail: info@precisionary.com

Phone:

Customer Service & Quotes: (617) 682-0586

Technical Support: (508) 810-0111

Fax: 1-866-424-2217

Mailing address for documents:

Precisionary Instruments
207 Union Street
2nd Floor
Natick, MA 01760

Mailing address for slicers/parts:

Precisionary Instruments
2340 Dovedale Drive, B
Greenville, NC 27834

TRAINING VIDEOS

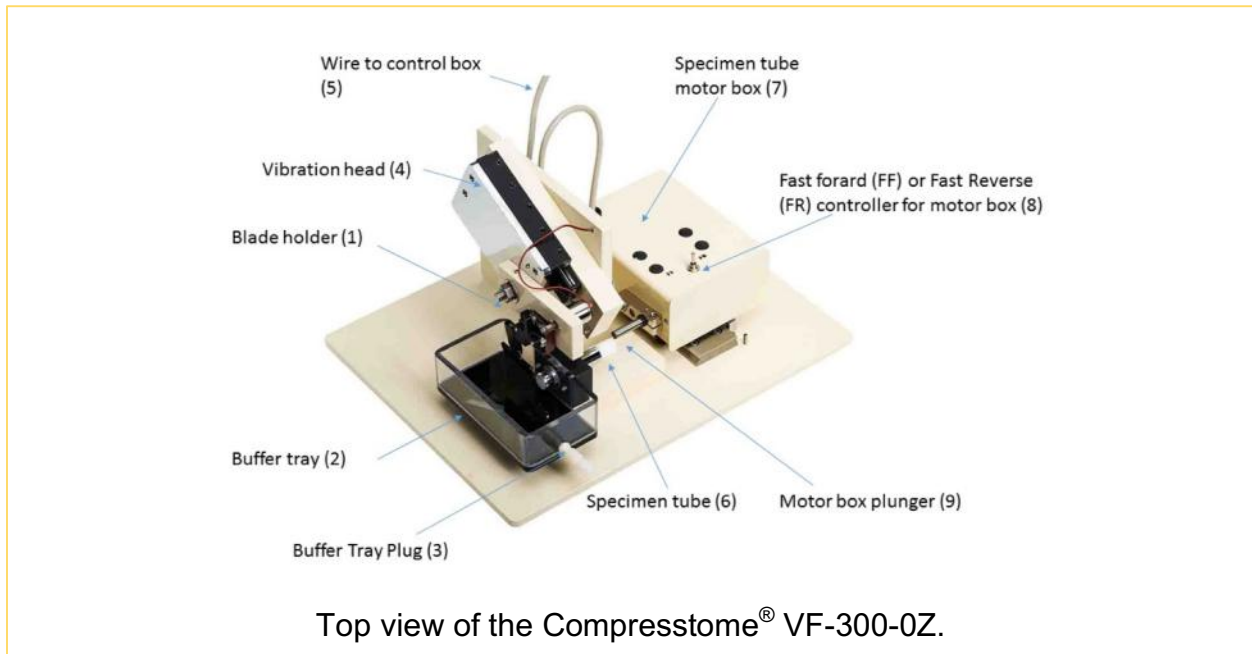
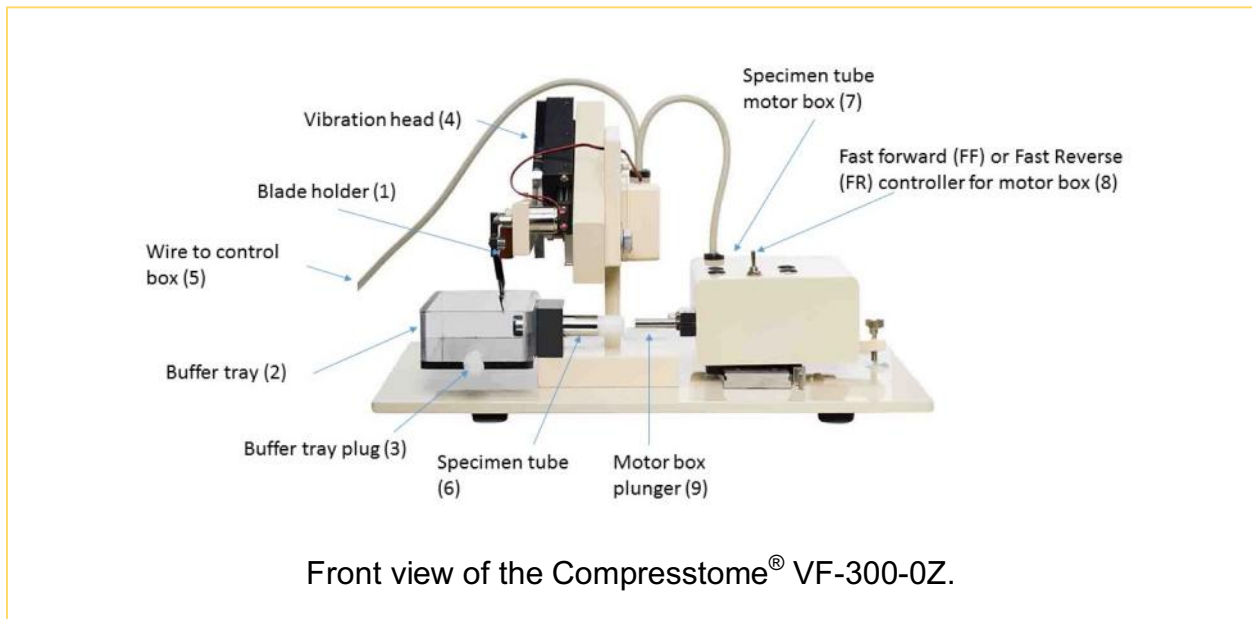
To supplement this user manual, full visual training videos for all steps in successfully using the Compresstome[®] slicer are available online.

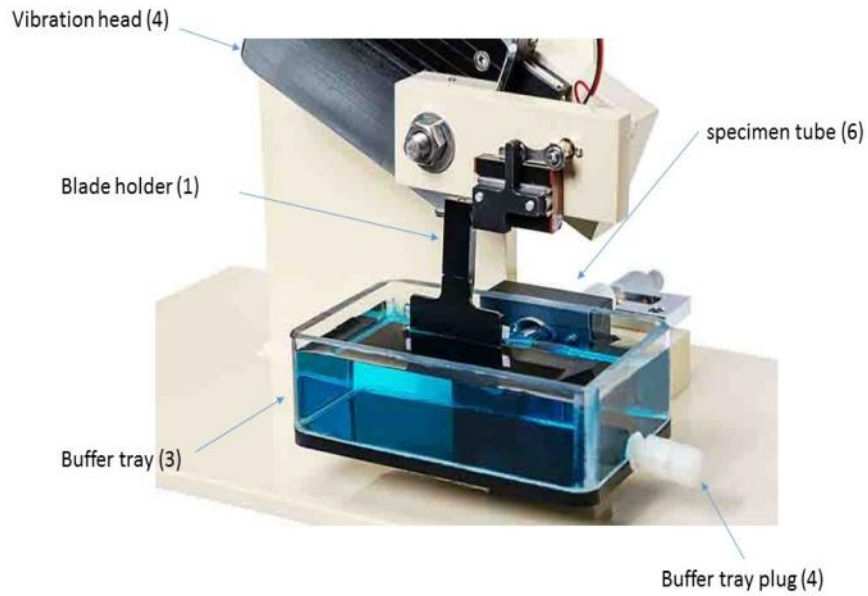
Our company's YouTube account site is called, "Precisionary Instruments LLC." You can find all of these videos in our account. The videos can also be found on our website (www.precisionary.com) and include instructions for:

1. Setting up the Compresstome[®]
<https://www.youtube.com/watch?v=q-fhdkCseyc&t=15s>
2. Setting up your Compresstome[®] (cords and outlets)
<https://www.youtube.com/watch?v=KLZz2vhLMqA>
3. Using the motor box on the Compresstome[®]
<https://www.youtube.com/watch?v=lbbMAdWM6p8>
4. Using the control box on for the Compresstome[®]
<https://www.youtube.com/watch?v=LINkgZSwMOk>
5. Adjusting the blade holder angle & height on the Compresstome[®]
<https://youtu.be/p2l-0mrYmM>
6. Specimen tube insertion on the Compresstome[®]
<https://www.youtube.com/watch?v=SYOpr9mX-H4>
7. Making the agarose solution for tissue embedding
<https://www.youtube.com/watch?v=0CW5j5AG4w8>
8. Embedding tissue samples into specimen tubes
<https://youtu.be/IDmodsRS8s0>
9. Embedding spinal cord samples into specimen tubes
<https://youtu.be/PC1INk5K-VI> (part 1)
<https://youtu.be/QirvV40ZNBQ> (part 2)
10. Preparing tissue transfer pipettes for moving tissue slices
<https://www.youtube.com/watch?v=4Sh-0TwJbKU>

11. Transferring tissue slices cut with Compresstome®
<https://www.youtube.com/watch?v=dbHuRX9eigA>
12. Compresstome® machine cleaning
https://www.youtube.com/watch?v=x7Pe2D_uJkM
13. Machine oil maintenance for the Compresstome®
<https://www.youtube.com/watch?v=QEDwy2eK9yg>
14. Cleaning the specimen tube (part 1) for Compresstome®
<https://www.youtube.com/watch?v=lny-ey8wTWM>
15. Cleaning the specimen tube (part 2) for Compresstome®
<https://www.youtube.com/watch?v=Yhad3-b5nDg>
16. Blade removal and clean up for the Compresstome®
<https://www.youtube.com/watch?v=IXqXNHCMlQ0>
17. Starter Kit contents for the Compresstome®
<https://www.youtube.com/watch?v=wZiGllXpRI>

ANATOMY OF THE COMPRESSTOME[®] VF-300-0Z





Close up front view of the Compresstome® VF-300-0Z.



Control box for Compresstome® VF-300-0Z.

LIST OF VF-300 COMPONENTS

All of our Compresstome[®] parts can be ordered online at:

<http://precisionary.com/e-store/>

Contact us at info@precisionary.com, and we will sent you a quote.

Figure Number	Compresstome [®] part	Part Number	Function
1	Blade holder	VF-BH-VM-300-0Z	Holds and stabilizes the cutting blade.
2	Buffer tray	VF-BT-VM-LP	Holds buffer or solutions during sectioning.
3	Buffer tray plug	VF-BT-PL	Removable for easy disposal of buffer after sectioning.
4	Vibration head	VF-VHU-VM-300-0Z	Blade oscillation assembly, which includes a blade holder, and an oscillation motor.
5	Wire to controller box	--	Connects the motor box to the controller box.
6	Specimen tube	VF-SPS-VM-12.5	Holds the specimen for sectioning and embeds tissue in agarose.
7	Motor box	--	Automated motor box that pushes and drives the specimen tube for sectioning slice to slice.
8	FF/FR controller	--	Fast Forward and Fast Reverse dial for more rapid control of the specimen tube.
9	Motor Box Plunger	--	Aligns with tube for advancement

LIST OF STARTER KIT COMPONENTS

All of our Compresstome[®] consumables can be ordered online at:

<http://precisionary.com/e-store/>

Contact us directly at info@precisionary.com, and we will sent you a quote.

Consumable	Part Number	Application and Advantages
Agarose Tablets	VF-AGT-VM-10	The Starter Kit comes with 10 agarose tablets. This is low melting agarose for embedding the tissue.
Blades	VF-BL-VM-SSB	Included are 10 double-edged stainless steel blades.
Pipettes	—	Plastic disposable pipettes are included for easy transfer of agarose into the specimen tubes for embedding.
Glue	VF-VM-GLUE	Used for securing tissue specimens to the specimen tube.
Forceps	—	Small forceps for easy manual manipulation of tissue sample.
Machine Oil	VF-VM-Oil	Clear, colorless, and environmentally friendly machine oil for maintenance. Recommended use: 1X/week apply to all moving and oscillating parts of tissue slicer, then run machine for 5-10 minutes continuously to ensure thorough application.

SETTING UP THE COMPRESSTOME[®] SLICER:

Please remove the transportation fixture before your first-time use. Be sure to save the transportation fixture, because the fixture will need to be mounted back to the machine before any future shipment.

*** IMPORTANT NOTE:**

Before using the Compresstome[®] slicer, you **MUST** remove the “transportation stabilization plate” on the machine. The small metal plate is screwed in at the back of the vibrating head and is there to help stabilize the Compresstome[®] during shipment. Failure to remove the transportation stabilization plate may result in damage to the vibrating head.



The transportation fixture **MUST** be unscrewed and removed before use!

OPERATION OF THE COMPRESSTOME[®]

MOUNTING THE CUTTING BLADE TO THE BLADE HOLDER

For each double-edged stainless steel blade, cut the blade horizontally to form two separate blades. You will only need one of the two resulting blades for each use. For ceramic blades, remove one of the blades carefully from the pack.

Squeeze a small amount of super glue onto a petri dish or other solid surface.



Pipette **5 μ L** of the super glue onto the blade holder.



Position the cutting blade onto the blade holder. For the double edge blade, you may notice that along the edge where you cut them, the edge may be curled up. Cut the curled edges of the blade before gluing.

CAUTION! Make sure that you do not touch the blade edge!

Allow the glue to dry for 3 minutes before use.

Make sure there is no glue on blade to avoid tissue sticking to the blade.



After the glue dries, you are ready to use the blade holder and blade for sectioning.

Remember: The blade holder needs to be cleaned with acetone between each blade change, so that the glue residue does not build up.



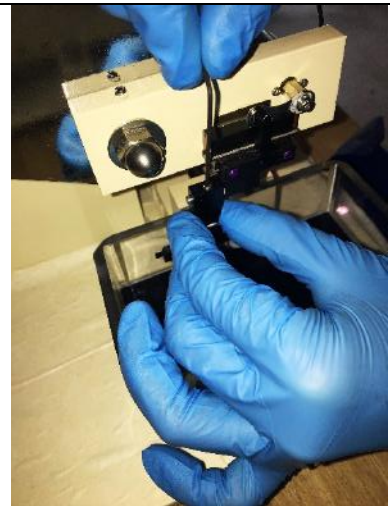
CHANGING THE CUTTING BLADE

The sharpness of the blade can directly affect the quality of the slices. We recommend that double edge razor blades be changed after cutting 3-5 samples (examples: brain, lung, gastrointestinal, and skin tissues). If tissues are more fibrous, blades should be changed after cutting 1-2 samples (examples: lymph nodes, liver, spleen, and kidney tissues).

Ceramic blade typically lasts 2-3 months depending on the degree of usage. Double edge razor blades and ceramic blades are ideal for this microtome, and these blades are what we include in the Compresstome[®] Starter Kit. The blades should be cleaned with acetone and ethanol before use.

Follow these instructions on changing blades for the VF-300-0Z.

To remove the blade holder from the vibrating head unit, loosen the small screw on top of the blade holder with a small Allen wrench, and remove blade holder from the axial bar.



Remove the old cutting blade and dispose of it safely into a sharps container.



Soak the blade holder in the acetone bath for **5 minutes**. Wipe off any residual glue on the blade holder using a paper towel.

DISCLAIMER – Please only use acetone to clean the blade holder and specimen tube. The buffer tray is not made of Acetone safe materials.



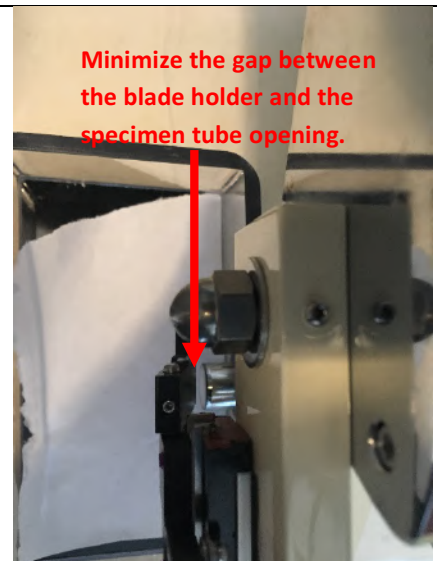
Follow the instructions under “Mounting the Cutting Blade onto the Blade Holder” to install a new cutting blade.

See page 9.

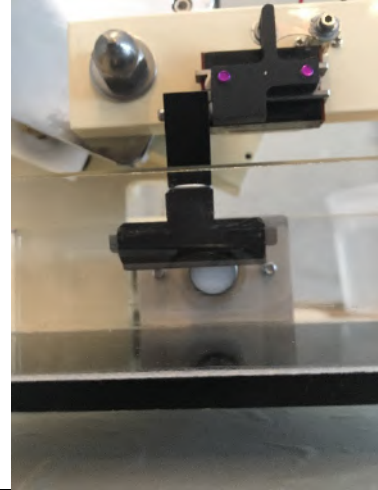
ALIGNING THE CUTTING BLADE FOR SECTIONING

Place the specimen syringe tube in the hole of the plastic base with the stopper facing up and the tapered end facing the buffer tank. Push the syringe tube all the way forward until the stopper reaches the plastic base.

Place a white piece of paper on the buffer tank as background. This helps you see the small gap between the blade holder and the specimen tube opening.



Rotate blade holder away from syringe tube, push start button on the control box and push the stop button when the sliding blade assembly has moved down past two-thirds of the syringe tube opening.



Rotate the blade holder towards the syringe tube. Watching from above, adjust the edge of the razor blade so that it is very close but not touching the outlet of the specimen syringe tube.



Tighten the set screw on the blade holder. Make sure that as the screw is tightened, the blade holder does not rotate.



Remove the specimen syringe for tissue embedding and loading.

PREPARING THE AGAROSE FOR EMBEDDING:

We recommend using agarose type-Ib, or low melting point agarose. All tissue specimens should be embedded in agarose. Type-Ib agarose powder can also be purchased through Sigma Aldrich at:


<http://www.sigmaaldrich.com/catalog/product/sial/a0576?lang=en®ion=US>

The following procedure assumes you are using a 0.5 mg agarose tablet. This table summarizes the buffer volumes to use for agarose tablets. We recommend using a 2.0% or 2.5% agarose solution.

Agarose Tablet Chart			
Solution volume needed to achieve % agarose (mL)			
Agarose %	1 tablet	2 tablets	3 tablets
1.5%	33	67	100
1.8%	28	56	83
2.0%	25	50	75
2.2%	23	45	68
2.5%	20	40	60
3.0%	17	33	50
3.2%	16	31	47
3.5%	14	29	43



Each tablet contains is 0.5 mg of agarose. Depending on the gel strength you want for slicing, you can add the appropriate amount of water or buffer solution to the glass vial. We recommend adding 20-25 mL of solution to each glass vial containing 1 agarose tablet.



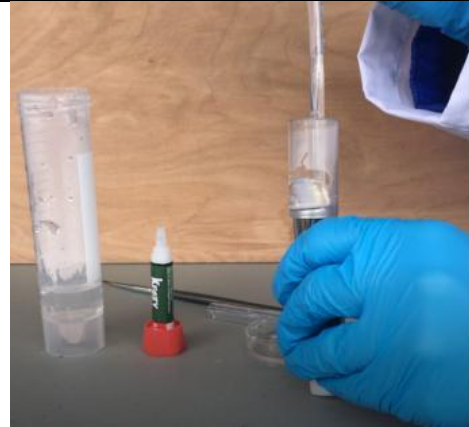
<p>Dissolve the agarose tablet for 2 minutes by swirling the glass vial.</p>	
<p>Heat the agarose as you normally would, which can be done in a microwave. Microwave the agarose solution for 10 seconds, then shake to mix it up, and repeat until the agarose solution has become clear. Heating the solution in 10 seconds bouts helps prevent the solution from overflowing. You may see a lot of bubbles in the solution, which is normal. Then allow it to cool for 5 minutes on a 32 °C bath.</p>	

1. We recommend using agarose that has a low transition temperature, which means that the agarose will remain in a “liquid-like” state without congealing at low temperatures. This way, keeping melted agarose in a warm water bath will allow you to have ready-made agarose when sectioning several different specimens.
2. Advantages of using our Compressstome[®] agarose preparation:
 - a. Eliminates weighing agarose for individual experiments
 - b. Agarose tablets are fast dissolving in just 2 minutes
 - c. Environmentally friendly with no organic solvents that could harm tissues
 - d. Produces consistent, reproducible gels that are clear

EMBEDDING TISSUE SAMPLES IN AGAROSE:

<p>Place the syringe chilling block into water and ice bath or a freezer to cool (usually at least 15 min).</p>	<p>Try cooling the chilling block at -20 °C (put it in the freezer for 10 min)</p>
<p>Prepare your tissue sample by cutting it so that the tissue fits inside the specimen tube.</p>	
<p>Squeeze a small amount of super glue onto the specimen tube base.</p>	
<p>Using forceps, position the tissue onto the specimen tube base and glue your tissue to the base.</p>	

Place the embedding cap onto the top of the specimen tube.



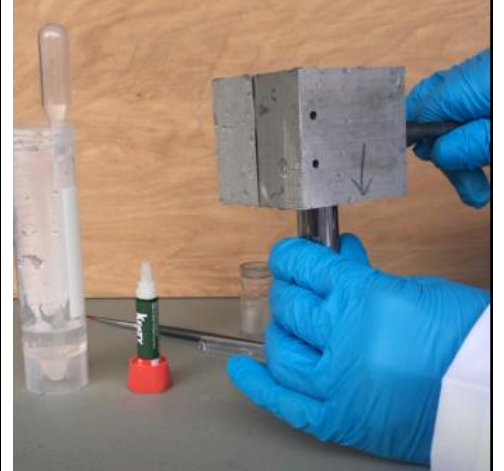
Pipette enough agarose to fully cover the tissue sample. Gently tap on the syringe cap to dispel any air bubbles.



Withdraw the syringe tube downwards so that the tissue sample enters the tube. You can then remove the syringe cap.



Place the syringe chilling block (should be pre-chilled, see step 1) over the specimen tube to chill the entire sample and help the agarose solidify. This process usually takes less than a minute, and at most 1.5 minutes.



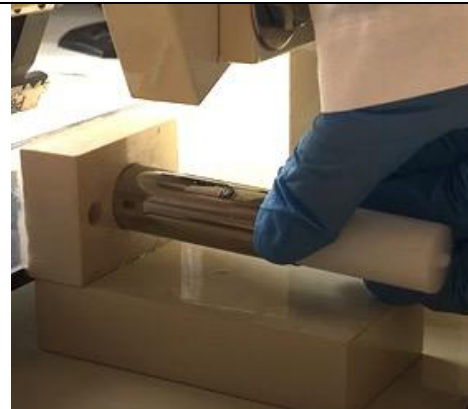
Once your tissue is embedded into agarose, you are ready for sectioning with the Compressome[®] slicer!

SECTIONING WITH THE COMPRESSTOME[®] SLICER:

Connect the supplied power cable to the control box and the control box to the VF-300-0Z microtome. Make sure the connections are good by tightening both screws on the connector or the machine will not work properly. Turn the power on.



Insert the specimen syringe tube into the buffer tray on the Compressstome[®] slicer.



Push the tube as far as it will go into the buffer tray with the tapered end going first. A small stopper knob on the tube will prevent it from sliding all the way into the buffer tray.



(Note that your blade should have already been aligned at this point to save time during the slicing process).

Continue cutting with the Compresstome[®] slicer. You can adjust the slice thickness, sectioning speed, and frequency of oscillation to best suite your experimental needs.



CLEANING UP THE COMPRESSTOME[®] VF-300-0Z:

Empty buffer from the buffer tank.

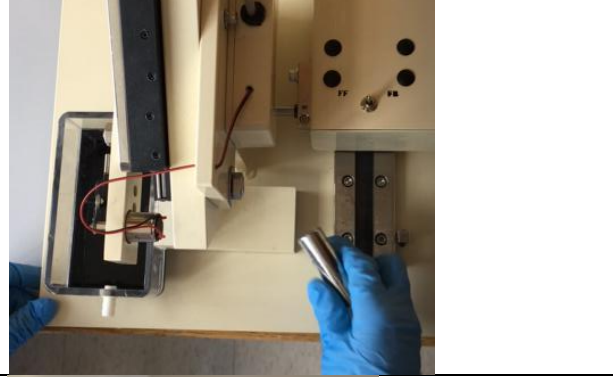

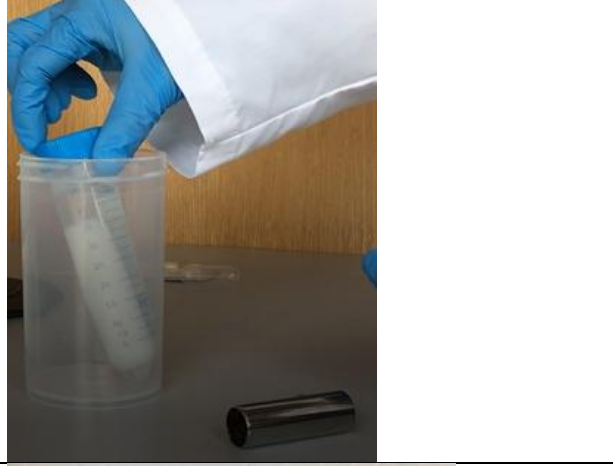

DISCLAIMER – Please only use acetone to clean the blade holder and specimen tube. The buffer tray is not made of Acetone safe materials.

We recommend using 70% ethanol solution or 10% bleach solution to clean the buffer tray.



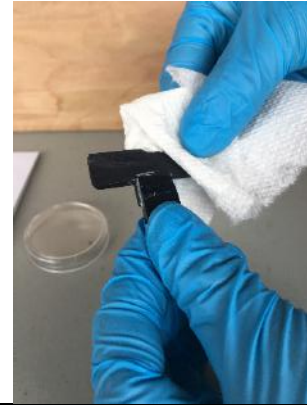
Loosen thumbscrew and push the step motor drive away.



<p>Remove the specimen syringe from the plastic base.</p>	
<p>Remove plunger from the metal syringe and scrape residual glue from the front end of the plunger.</p>	
<p>Clean up any debris on the plunger and inside of the syringe tube with acetone swabs or soft brush.</p> <p>DISCLAIMER – Please only use acetone to clean the blade holder and specimen tube. The buffer tray is not made of Acetone safe materials.</p>	
<p>Remove razor blade from blade holder.</p>	

Dip the blade holder into the acetone bath for 5 minutes. Clean up the residual glue on the blade holder with acetone swabs.

DISCLAIMER – Please only use acetone to clean the blade holder and specimen tube. The buffer tray is not made of Acetone safe materials.



THE AUTO ZERO-Z[®] TECHNOLOGY

Auto Zero-Z[®] is our latest breakthrough technology at Precisionary Instruments. This is a patented feature designed to allow the blade holder to operate in near zero Z-axis deflection without the need to optically align every single time.

Before arriving to your lab, the Compresstome[®] slicer is precisely aligned in the factory to work in the optimal condition (zero ΔZ). Please ensure that you follow the special instructions for blade mounting to ensure that Auto Zero-Z[®] works every time you slice.

The advantages of the Auto Zero-Z[®] combined with Compresstome[®] techniques are:

- Healthier slices and better surface structure preservation.
- Thinner minimum slice thickness. By combining the Auto Zero-Z[®] and Compresstome[®] technology it is now possible to achieve an unprecedented fixed brain slice thickness of 4 μm without paraffin embedding or freezing.
- No vibration marks on the fixed brain slices. The result is a very smooth and flat slice surface which is optimal for histological processing.
- No optical alignment device is required for zero-Z operation.
- No blade alignment procedure is required when changing to a new blade.

TROUBLESHOOTING

- Avoid trapping any air bubbles in the agarose during embedding.
- The blade holder is a user aligned, delicate part. Glue residue on either sides of the blade holder will deteriorate the slice quality.
- **Do not** bubble the ACSF during slicing to avoid contaminating and damaging the linear bearing of the vibration head. This is the most critical step to increase the work life of the machine.

WARRANTY

There is a one (1) year warranty for the VF-300-0Z microtome. Additional years of warranty are available for purchase. All demos for Compresstome® slicers and consumables are considered to last 30 days from date of delivery (arrival).

Consumables and accessories are non-returnable after any use. Delivery is considered to be completed when items arrive to the customer. Acceptance of items is deemed complete after 7 days of delivery (arrival), with no further signature required.

CONTACT INFORMATION

Additional questions? Want some assistance?

We have multiple ways for you to contact us, including:

E-mail: info@precisionary.com

Phone:

Customer Service & Quotes: (617) 682-0586

Technical Support: (508) 810-0111

Fax: 1-866-424-2217

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