



orion
by sunstone

Orion c Series Welding System User Manual



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| Orion 100c Pulse Arc and Resistance Welding System | |
|--|--|
| WELDER | |
| Pre-Programmed Metal Settings | 11 |
| Customizable Save Settings | 30 (15 Arc & 15 Tack) |
| Languages | 20 + (Ask rep if we have your language) |
| Display | 5" Capacitive Multi Touch Screen (12.5cm) |
| Energy (Ws) | 3 – 100 Ws |
| Switching Power Supply | 110/240VAC (Auto Detected) |
| Estimated Weld Spot Diameter Range | 0.5 – 2.5mm |
| Footprint (L x W x H) | 10.75" x 6" x 6.65" (27.3 x 15.2 x 16.9cm) |
| Weight | 12 lbs (5.45 kg) |
| MICROSCOPE | |
| Stereo Microscope Magnification | 5x |
| Stereo Microscope Eye Protection | >UV 16 and >IR 16 |

1-39-1685-490

Chapter 1: Welder Setup & Assembly

In the Box

ALL 100c MODELS:

- (1) Manual
- (1) Power Supply
- (1) Power Supply Power Cord
- (1) Stylus Hand Piece
- (1) Foot Pedal
- (1) Shielding Gas Hose
- (1) Electrode Vial (5 – 0.5mm and 5 – 1.0mm Electrodes)
- (1) Fiberglass Brush
- (1) System Cover
- (2) Grounding Alligator Clips
- (1) Grounding Cross Lock Tweezer
- (1) Grounding Pliers

100C WITH MICROSCOPE:

- (1) Articulating Arm
- (1) Articulating Arm Accessories
- (1) Microscope
- (2) Microscope Eye Piece Shields
- (1) Microscope Arm Support Bar

100C WITH DARKENING LENS:

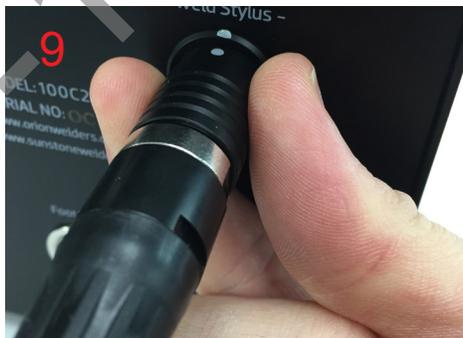
- (1) Base Plate and Phillips Screw
- (1) Base Plate Stand and Cap
- (1) Darkening Lens
- (1) Darkening Lens Arm
- (1) RJ45 Darkening Lens to Welder Cable

Power Supply Setup

BACK PANEL

The Orion has an internal switching power supply that can accept both 120 and 240VAC.

1. Plug the female end of the power cable into the "90-240 VAC" port.
2. Connect the male end of the power cable to 90-240 VAC power.
3. Insert the 1/4" gas tube firmly into the "Shield Gas" port.
4. Gently pull on gas tube to make sure it is connected.
5. When removing the gas tube be sure push in the white quick release and then pull back on the gas tube.
6. Plug the foot pedal into the "foot pedal" port.
7. Plug the RJ45 microscope cable into the "Shutter" port.
8. Plug the stylus into the "Weld Stylus -" port. Be sure that the white indicator on the stylus lines up with the white indicator on the stylus port before connecting.
9. When removing the stylus be sure only pull back on the black section where the white dot is located.
10. "Pulse Arc and Tack +" and "Tack -" ports are for Tack Welding. See tack welding section in user manual.



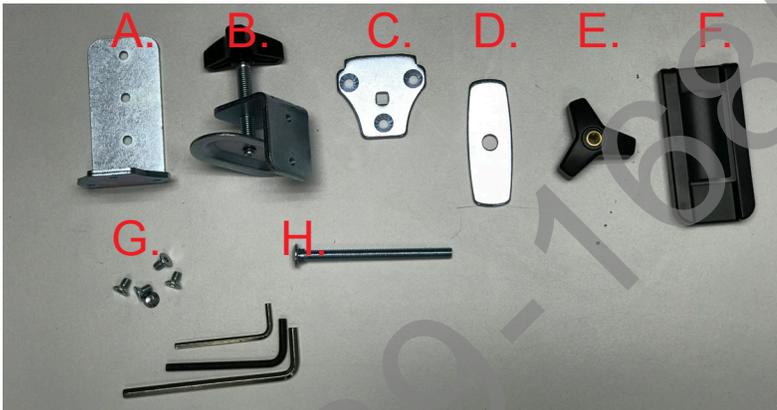
FRONT PANEL

- Pulse-Arc Welding Port – Plug an alligator clip into the Pulse-Arc Welding Port at the bottom right of the front panel. Be sure to clip your workpiece before welding.
- Alternatively, you can use the "Pulse Arc and Tack +" port on the back of the welder if it is more convenient for you.
- Push in the power button to start the welder.



Articulating Arm and Microscope Setup

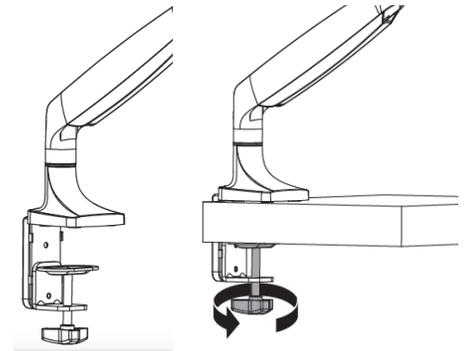
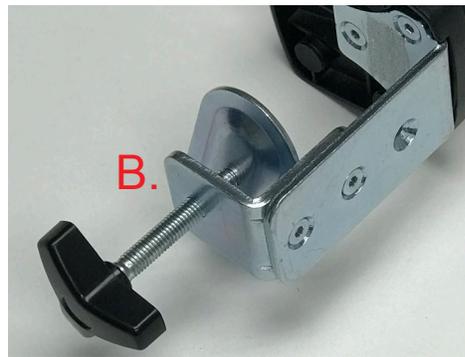
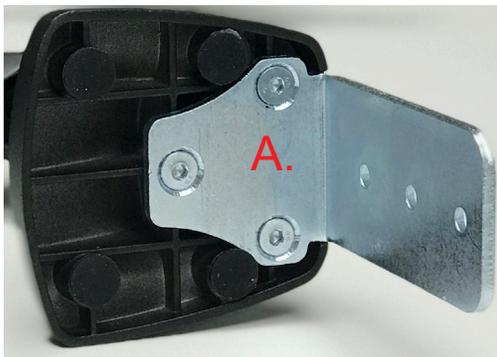
MOUNT THE ARTICULATING ARM TO THE TABLETOP



There are three available options for mounting the arm assembly to your table. Select one of the following methods and use the required mounting hardware shown in the image to the left.

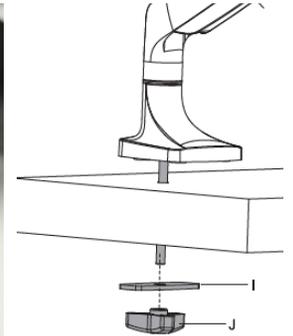
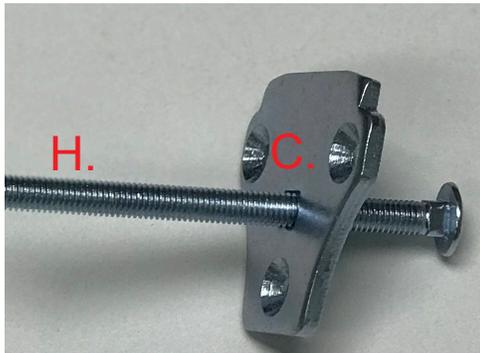
Mounting Option 1 – Clamp to table

- Determine the thickness of your tabletop.
- If it is thicker than 3-1/2" (9cm), follow mounting options 2 or 3.
- Lay the arm assembly down on the tabletop.
- Attach the angled bracket (A) to the bottom of the arm using three of the included allen screws (G). (4mm Allen wrench)
- Attach the clamp mechanism (B) to the angled bracket (A) using two of the included allen screws (G). Attach to the top two holes for skinny tabletop or bottom two holes for a thicker tabletop.
- Adjust the knob on the clamp mechanism until the gap is sufficient for the thickness of your table top.
- Lift the arm assembly up and slide the arm onto the tabletop.
- Lock it into place by turning the knob on the clamp mechanism until the clamp is pressed firmly against the bottom of the tabletop.
- A plastic cable guide cover (F) can be clipped on over the angled bracket if desired.



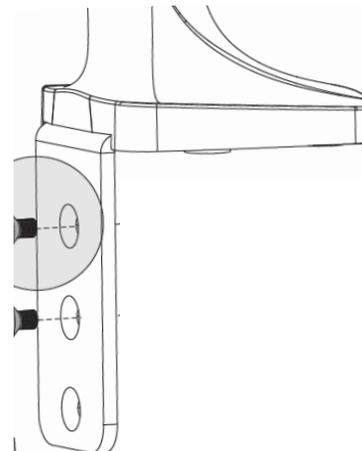
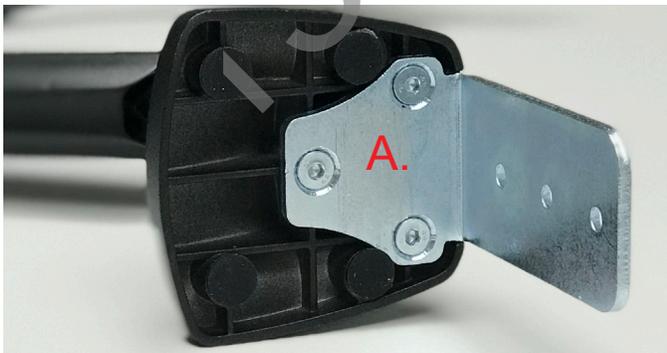
Mounting Option 2 - Bolt through table

- Put the included 8mm (5/16) bolt (H) through the included plate (C).
- Attach the plate (C) to the bottom of the arm using three of the included allen screws (G). (4mm Allen wrench)
- Drill a 3/8" (9.5mm) hole through the tabletop.
- Lower the bolt (H) at the bottom of the articulating arm into the hole.
- Slide the tightening plate (D) onto the bolt, then tighten the twist knob (E) onto the bolt until it is very snug.



Mounting Option 3 - Bolt to table

- Attach the angled bracket (A) to the bottom of the arm assembly using three of the included flat head screws (G).
- Lift and position the arm assembly onto the table in the desired location.
- Run screws through the bracket and into vertical surface of the table.



ATTACH WELDING STYLUS TO THE ARTICULATING ARM

1. Insert the welding stylus into the stylus holder underneath the microscope body.
2. Loosen the knob at the bottom of the stylus holder to move the stylus in and out.
3. When you look through the microscope, the tip of your stylus should be in the center of your view.
4. Turn the stylus holder knob clockwise until the stylus is secure.
5. Turn the allen-head bolt on the articulating arm clockwise if the arm does not hold the microscope and stylus up. Turn the allen-head bolt counter-clockwise if the articulating arm does not lower.



ADJUST THE MICROSCOPE FOCUS

1. While looking through the microscope, place your finger at the tip of the stylus.
2. With your other hand, twist the knob on the side of the microscope holder forward or backward to raise or lower the microscope body.
3. Raise or lower the microscope until your finger is clearly visible.



Microscope LCD Filter Shutter

The Microscope LCD Filter Shutter allows an unobstructed working view before welding and completely protects your eyes during the welding process. The machine's internal computer verifies that the Microscope LCD Filter Shutter has been fully closed before allowing the weld to take place. In the case that the Microscope LCD Filter Shutter does not close, the microscope lens is equipped with >UV 16 and >IR 16 for maximum eye protection.

Become Familiar with the Microscope

The Orion Microscope has been designed to provide maximum visual clarity, eye protection and ease of use. One challenge using the microscope is getting used to bringing the work piece to the welding electrode while looking through the microscope. This is an easy challenge to overcome. Follow the steps below before grounding your workpiece or pushing play on the welders touchscreen interface.

- Before looking into the microscope, rest your hands on the tabletop and use your fingers to position the workpiece close to the welding stylus.
- Look into the microscope.
- Use your fingers to move the workpiece up to the stylus.
- Use slow, controlled movements.
- Place the workpiece surface perpendicular to the stylus.
- The angle of the workpiece surface relative to the stylus tip is very important and will take practice.
- Now practice making soft contact with the workpiece to the stylus.

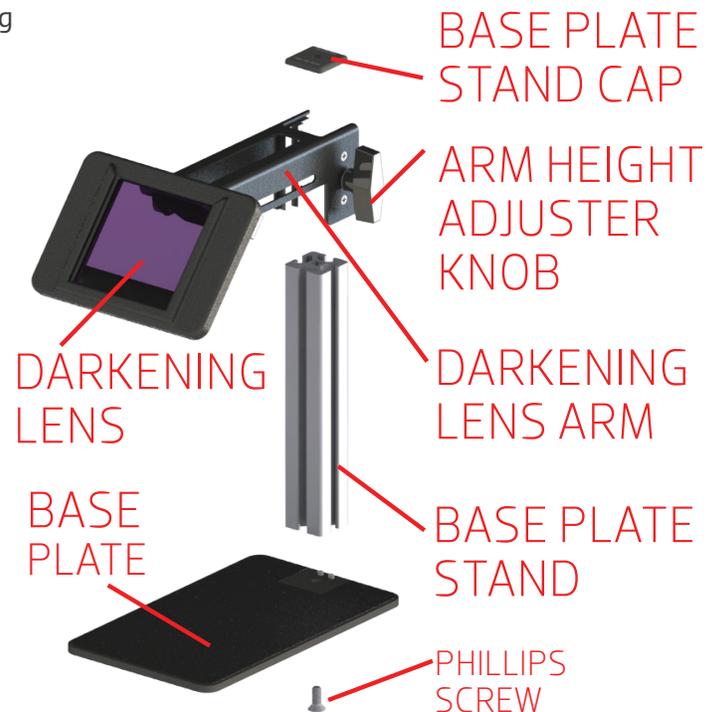


Darkening Lens Setup ^{*}(If you purchased the Darkening Lens System)

SET UP THE DARKENING LENS

The Orion's darkening lens system is easy to use. The darkening lens will automatically darken when the weld takes place. This allows the user to have a clear view of the work piece and protection from the flash during the welding process.

- Connect the Base Plate to the Base Plate Stand by running the included Phillips screw through the bottom of the Base Plate into the Base Plate Stand. ^{*}The Phillips screw will be attached to the bottom of the Base Plate Stand.
- Slide the Darkening Lens Arm onto the Base Plate Stand. Adjust it to your desired height then tighten the Arm Height Adjuster Knob.
- Place the Base Plate Stand Cap on top of the Base Plate Stand.
- Adjust the Darkening Lens Position by loosening/ tightening the adjuster knobs on the back of the Darkening Lens Arm.



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- Plug the Darkening Lens cable into the Darkening Lens light ring. Ensure that the other end of the cable is securely fastened into the "Microscope" port on the back of the welder.
- Insert the Orion stylus into the Stylus Holder on the Darkening Lens Arm. Adjust the position of the stylus by loosening/tightening the adjuster knobs on either side of the Darkening Lens Arm.



Electrode Setup

Your welding stylus will come assembled with the collet that holds 1.0mm electrodes

STYLUS COMPONENTS:

1. Stylus Shaft

2. Collet

3. Collet Cap

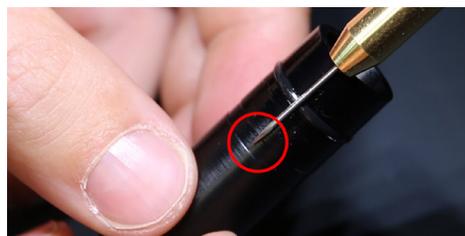
4. Electrode

5. Stylus Hull



INSTALL THE TUNGSTEN ELECTRODE ONTO THE WELDING STYLUS

- Remove the Stylus from the Stylus Holder on the Articulating Arm.
- Remove the Stylus Hull by pulling it away from the Stylus Shaft.
- Loosen the Collet Cap by twisting it counter-clockwise.
- Insert a 1.0mm Electrode into the Collet.
 - The welder comes with 2 electrode collets. One that fits 0.5mm electrodes and one that fits 1.0mm electrodes. The electrode stylus will be shipped with the 1.0mm electrode collet installed.
- The electrode should protrude from the stylus shaft 0.6 - 0.7in (1.5 - 2cm).
 - Helpful Tip: There is a groove cut around the Stylus Hull that will help measure the electrode length. Place the end of the Stylus Hull against the Collet Cap, then make sure the electrode tip is between the groove.
- Turn the Collet Cap clockwise to lock the electrode into place.
- Push the Stylus Hull onto the Stylus Shaft until you feel it snap back into place.
 - The electrode should stick out between 1/8 - 1/4in (3.75 - 6.75mm) after the Stylus Hull is snapped back into place.



WORK PIECE TO ELECTRODE PRESSURE

Touch the workpiece to the electrode with very light pressure. Too much pressure will cause the workpiece to stick to the electrode. We recommend cleaning or changing the electrode any time it gets stuck to the workpiece.

WHEN TO CLEAN/SHARPEN THE ELECTRODE

It is recommended that the user pay close attention to the electrode condition. An electrode that appears to be dark colored or covered with material from previous welds can lead to inconsistent welding and poor igniting of the weld. When this occurs, simply sharpen the electrode with the included diamond disk. The diamond disk can be attached to a flex shaft or Dremel tool. Follow these steps for sharpening the electrode.

- Completely remove the electrode from the stylus.
- Pinch the electrode between your thumb and index finger or middle finger.
- Power on the Dremel or flex shaft and hold it with the opposite hand.
- Place the electrode tip on the diamond disc in such a way that the disk is sharpening towards the tip of the electrode.
- Spin the electrode with your thumb and finger.
 - Helpful tip: Push down on the electrode with your index finger while twisting the electrode between your thumb and middle finger.
 - We recommend a sharpened electrode anytime you start on a new workpiece.



WHEN TO FLATTEN/BLUNT THE ELECTRODE

When you are working with silver, copper, or any other highly conductive metals at energy levels above 20ws, it is recommended to blunt the electrode instead of sharpening it.

- Completely remove the electrode from the stylus.
- Follow the same steps above for cleaning/sharpening your electrode.
- Once the electrode is sharp/clean, turn the electrode to a 90-degree angle and push it against the dremel. This will create a flat/blunt tip on the electrode.



Shielding Gas Setup

During the pulse-arc welding process high temperature plasma quickly melts metal into a molten pool. As the weld is performed, a small amount of shielding gas is released through the weld stylus to prevent oxygen from entering the molten pool. After the weld has occurred the protective gas turns off.

If oxygen from the air enters this molten pool, the result is a metal oxide that is brittle, porous and burnt-looking. If possible we recommend that you use 99.996% pure Argon (Argon 4.6) or higher, to prevent these effects. Shielding gas is necessary to produce clean and repeatable pulse-arc welds. This can be purchased at your local welding supply shop. Argon gas is a non toxic, non flammable inert gas.

PRESSURIZED GAS SAFETY

There are several important rules that should be followed when using a compressed shielding gas such as argon.

- Always secure the pressurized gas tank to a fixed location (such as a sturdy table leg).
- Always turn off the shielding gas at the main valve when finished. * This will help your shielding gas supply last longer.



SHIELDING GAS TANK AND REGULATOR SETUP



- Securely fasten your tank to a stationary point near the welding area.
- Turn the regulator knob COUNTER CLOCKWISE until it stops.
- Screw the gas regulator onto the shielding gas tank.
- Connect the other end of the gas tubing (from the back panel of your welder) to the gas regulator.
- Open the gas tank slowly.
- The gas tank pressure dial on the right side of the regulator should pressurize and the flow pressure dial on the left should remain at zero.
- Slowly turn the regulator knob CLOCKWISE until the flow pressure dial reads between 7-10 psi.

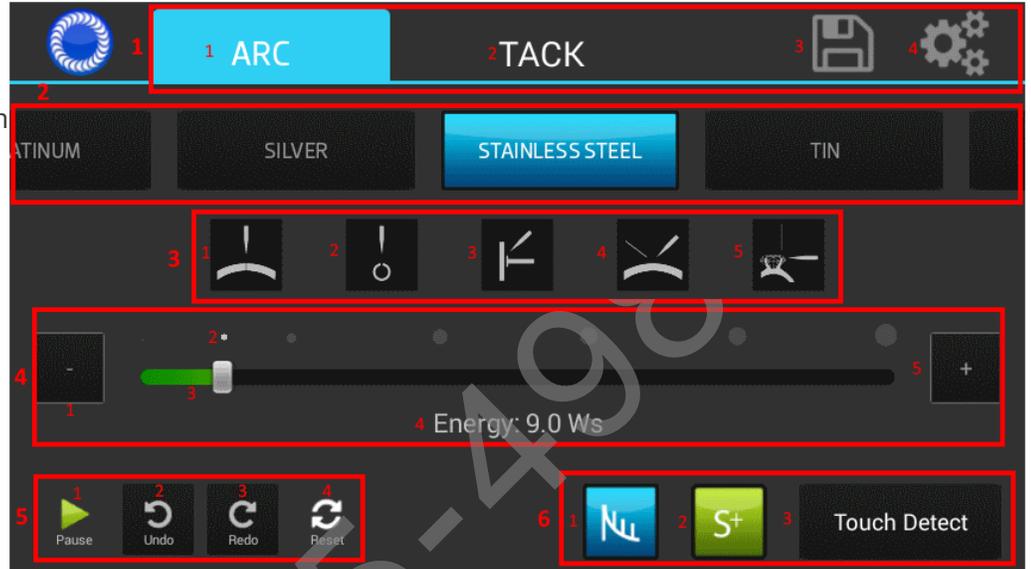


Chapter 2: The Touch Screen Interface

Below is an explanation of all the various buttons and options found on the Orion user interface.

Arc Screen

1. Top Navigation Bar: Allows the user to change screens.
 - a. Arc Button: Switches the Main Screen to the Arc Screen
 - b. Tack Button: Switches the Main Screen to the Tack Screen
 - c. Save Load Button: Brings up the Save Load Window
 - d. Settings Button: Switches the Main Screen to the Settings Screen



2. Metals Selection

- a. Rotating Scroll View with many different Metals allows the user to load recommended settings based on the metal they are using.

3. Application Selection Buttons: Allows the user to get recommended settings based on their application
 - a. Large Join Button: Loads the recommended settings for a large join weld based on the metal selected.
 - b. Small Join Button: Loads the recommended settings for a small join weld based on the metal selected.
 - c. Post Button: Loads the recommended settings for a post weld based on the metal selected.
 - d. Add Metal Button: Loads the recommended settings for adding metal based on the metal selected.
 - e. Prong Button: Loads the recommended settings for tipping a prong based on the metal selected.

4. Energy Selection Area: Allows the user to customize the energy settings of the welder.
 - a. Minus Button: Lowers the energy in increments. (Hold to continue lowering the energy)
 - b. Spot Size Calculator: Shows the user the estimated spot size in real time and at 6 different positions.
 - c. Energy Slider: Allows the user to quickly switch energies.
 - d. Energy Display: Shows the user the current energy value.
 - e. Plus Button: Increases the energy in increments. (Hold to continue increasing the energy)

5. Options Buttons

- a. Play/Pause Button: Switches the welder from a ready state to a pause state.
- b. Undo Button: Allows the user to undo the last change they have made.
- c. Redo Button: Allows the user to redo the last change they have undone.
- d. Reset Button: Allows the user to reset the basic arc settings to their factory default settings.

6. Advanced Options Buttons

- a. Agitation Button: Allows the user to cycle through the available agitations. (None, Sustained, Negative)
- b. Ignition Button: Allows the user to cycle through the available ignitions. (Standard, Standard+)
- c. Trigger Button: Allows the user to cycle through the available trigger types. (Touch Detect, Foot Pedal)

Tack Screen

1. Top Navigation Bar: Allows the user to change screens.

1. Arc Button: Switches the Main Screen to the Arc Screen
2. Tack Button: Switches the Main Screen to the Tack Screen
3. Save Load Button: Brings up the Save Load Window
4. Settings Button: Switches the Main Screen to the Settings Screen

2. Energy Selection Area: Allows the user to customize the energy settings of the welder.

1. Minus Button: Lowers the energy in increments. (Hold to continue lowering the energy)
2. Energy Slider: Allows the user to quickly switch energies.
3. Energy Display: Shows the user the current energy value.
4. Plus Button: Increases the energy in increments. (Hold to continue increasing the energy)

3. Pre-Weld Delay Buttons: Allows the user to change the delay before a tack occurs.

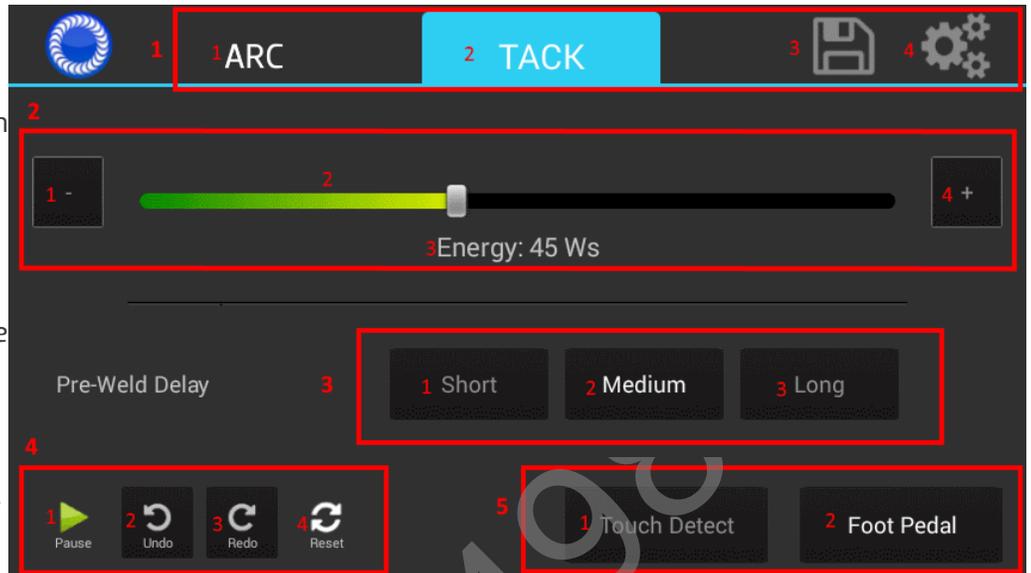
1. Short Button: Changes the Pre-Weld Delay to a quarter of a second.
2. Medium Button: Changes the Pre-Weld Delay to a half second.
3. Long Button: Changes the Pre-Weld Delay to a full second.

4. Options Buttons

1. Play/Pause Button: Switches the welder from a ready state to a pause state.
2. Undo Button: Allows the user to undo the last change they have made.
3. Redo Button: Allows the user to redo the last change they have undone.
4. Reset Button: Allows the user to reset the tack settings to their factory default settings.

5. Trigger Buttons: Allows the user to change the way the welder triggers a weld.

1. Touch Detect Button: Changes the welder to start a weld when it detects the positive and negative terminal connection.
2. Foot Pedal Button: Changes the welder to start a weld when it detect that the foot pedal has been pressed.



Save/Load Screen

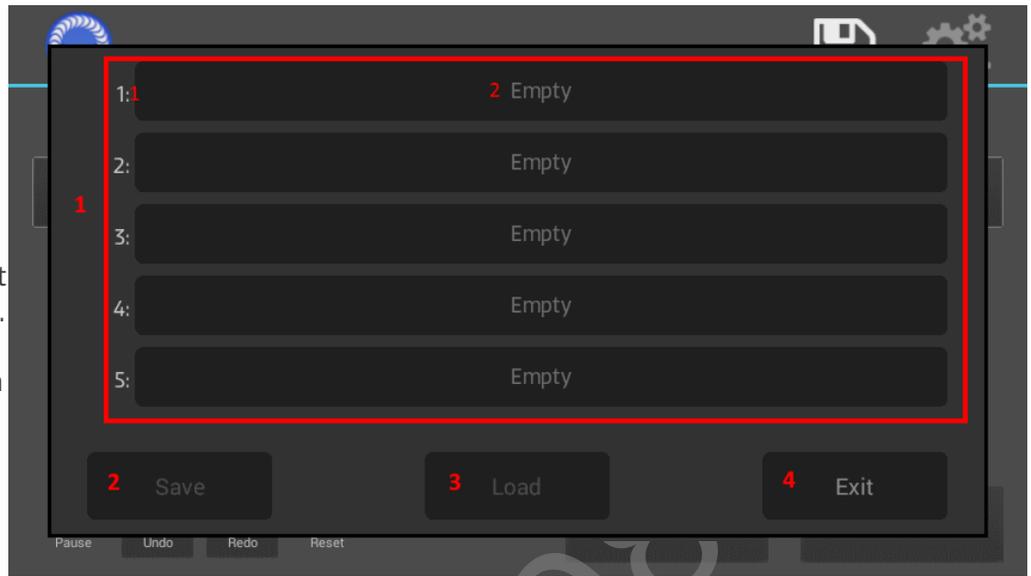
1. List of Saved Welds: Current list of welds that are saved on the welder. Currently the max is 30.

1. Number of the weld.
2. Weld Button: Contains a short description of the saved weld. Ex: "Yellow Gold Joint - 16.0 Ws" User clicks on this button to activate the Save / Load Buttons.

2. Save Button: Saves the current weld settings to the welders memory. The name of the weld is automatically populated, based on the weld settings.

3. Load Button: Loads the weld settings that the user has selected from the list. Returns the User to the Arc screen.

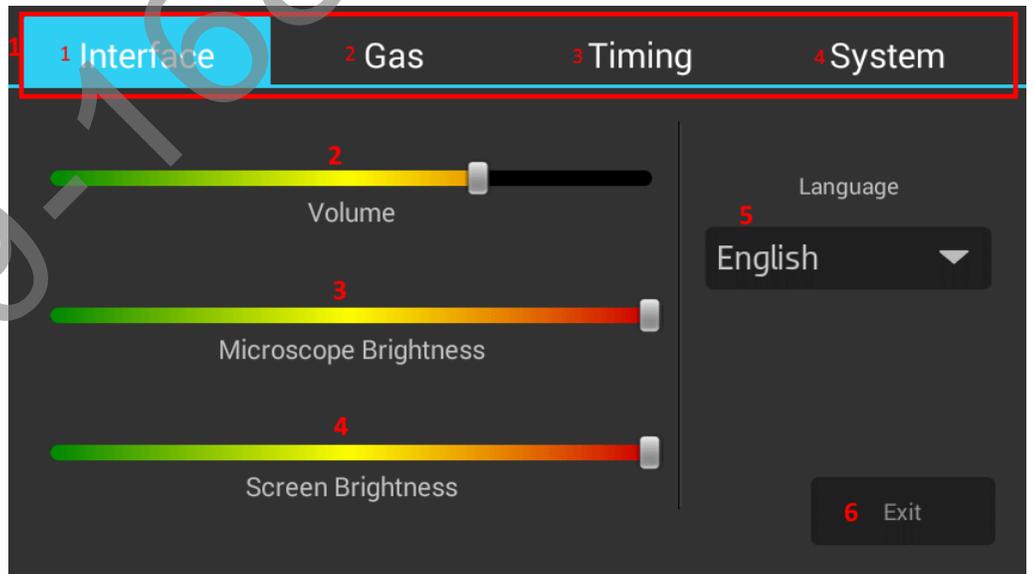
4. Exit Button: Exits the save load screen and returns the user to the arc screen.



Settings: Interface Screen

1. Top Navigation Bar: Allows the user to change screens.

1. Interface Button: Switches the screen to the Interface screen.
2. Gas Button: Switches the screen to the Gas screen.
3. Timing Button: Switches the screen to the Timing screen.
4. System Button: Switches the screen to the System screen.



2. Volume Slider Bar: Allows the user to adjust the volume of the errors.

3. Microscope Brightness Slider Bar: Allows the user to adjust the brightness level coming out of the Microscope or ADL.

4. Screen Brightness Slider Bar: Allows the user to adjust the brightness level of the welder's screen.

5. Language Drop Down Menu: Allows the user to change the language that is displayed on the welder.

*Current languages supported: English, German, Spanish, French, Greek, Italian, Polish, Dutch, Portuguese, Romanian, Turkish, Vietnamese, Finish, Russian, Armenian, Hindi, Korean, Chinese, Taiwanese

6. Exit Button: Exits out of the settings screens and returns to the last screen the user was on.

Settings: Gas Screen

1. Top Navigation Bar: Allows the user to change screens.

1. Interface Button: Switches the screen to the Interface screen.

2. Gas Button: Switches the screen to the Gas screen.

3. Timing Button: Switches the screen to the Timing screen.

4. System Button: Switches the screen to the System screen.

2. Pre-Flow Delay Slider: Allows the user to adjust the flow time of the gas before a weld occurs.

1. Current Value: Shows the user what the current value is.

2. Slider Bar: Allows the user to adjust the value.

3. Minimum Value: Shows the user the lowest amount the slider can go.

4. Title: Shows the user what setting they are adjusting.

5. Maximum Value: Shows the user the highest amount the slider can go.

3. Post-Flow Delay Slider: Allows the user to adjust the flow of gas after a weld has occurred.

1. Current Value: Shows the user what the current value is.

2. Slider Bar: Allows the user to adjust the value.

3. Minimum Value: Shows the user the lowest amount the slider can go.

4. Title: Shows the user what setting they are adjusting.

5. Maximum Value: Shows the user the highest amount the slider can go.

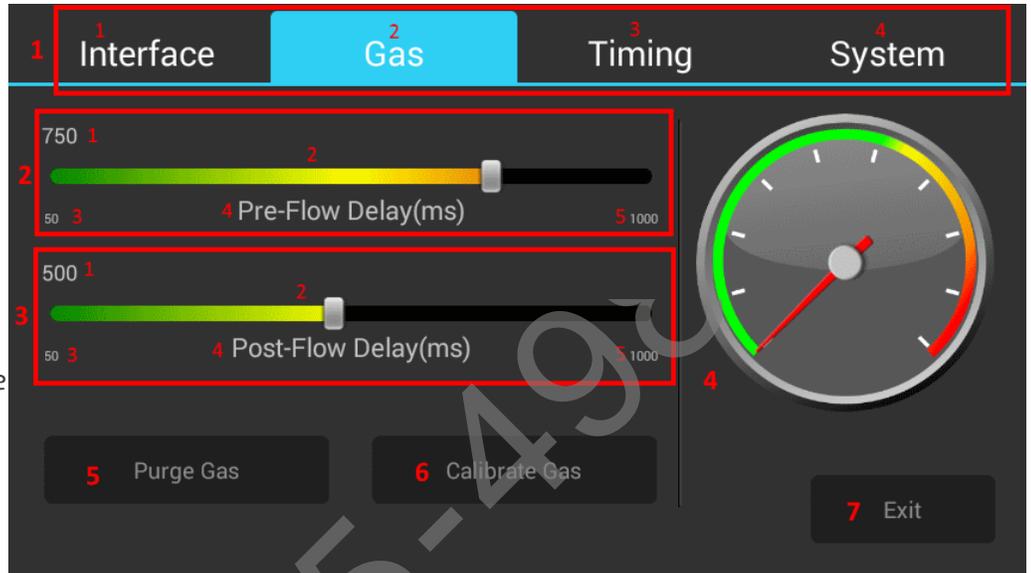
4. PSI gauge: Gives the user a graphical representation of the gas pressure that is present in the welder.

*Sunstone recommends staying in the Green area and avoiding the Yellow / Red area.

5. Purge Gas: Allows the user to clear the gas line of any unwanted gasses.

6. Calibrate Gas: Allows the user to calibrate the PSI gauge.

7. Exit Button: Exits out of the settings screens and returns to the last screen the user was on.



Settings: Timing Screen

1. Top Navigation Bar: Allows the user to change screens.

1. Interface Button: Switches the screen to the Interface screen.
2. Gas Button: Switches the screen to the Gas screen.
3. Timing Button: Switches the screen to the Timing screen.
4. System Button: Switches the screen to the System screen.

2. Pre-Weld Delay Slider: Allows the user to adjust the time between trigger and weld.

1. Current Value: Shows the user what the current value is.
2. Slider Bar: Allows the user to adjust the value.
3. Minimum Value: Shows the user the lowest amount the slider can go.
4. Title: Shows the user what setting they are adjusting.
5. Maximum Value: Shows the user the highest amount the slider can go.

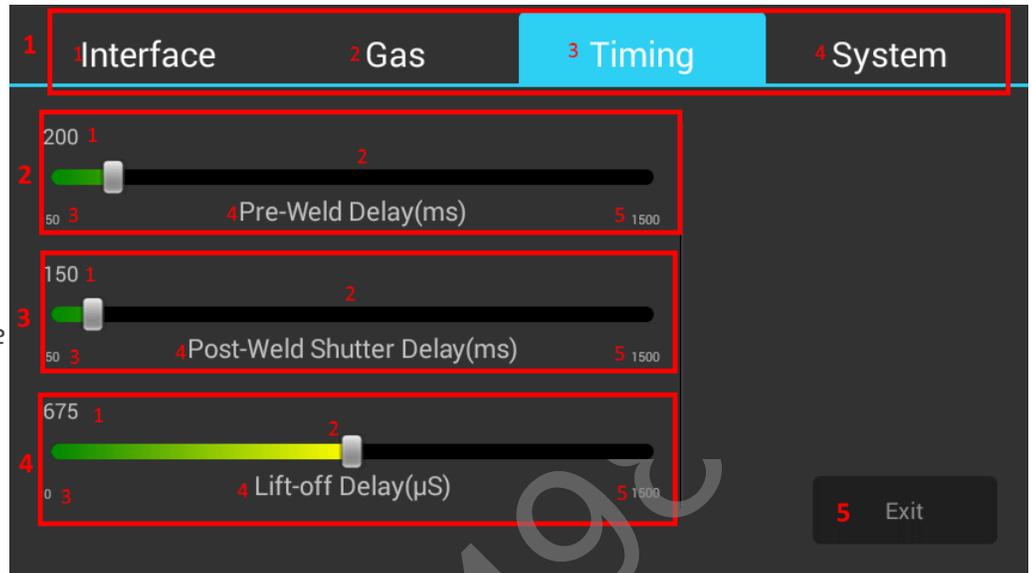
3. Post-Weld Shutter Delay Slider: Allows the user to adjust the amount of time it takes the shutter to return to normal after a weld has occurred.

1. Current Value: Shows the user what the current value is.
2. Slider Bar: Allows the user to adjust the value.
3. Minimum Value: Shows the user the lowest amount the slider can go.
4. Title: Shows the user what setting they are adjusting.
5. Maximum Value: Shows the user the highest amount the slider can go.

4. Lift-off Delay Slider: Allows the user to adjust the amount of time the welder waits before retracting the tip.

1. Current Value: Shows the user what the current value is.
2. Slider Bar: Allows the user to adjust the value.
3. Minimum Value: Shows the user the lowest amount the slider can go.
4. Title: Shows the user what setting they are adjusting.
5. Maximum Value: Shows the user the highest amount the slider can go.

5. Exit Button: Exits out of the settings screens and returns to the last screen the user was on.



Settings: System Screen

1. Top Navigation Bar: Allows the user to change screens.

1. Interface Button: Switches the screen to the Interface screen.
2. Gas Button: Switches the screen to the Gas screen.
3. Timing Button: Switches the screen to the Timing screen.
4. System Button: Switches the screen to the System screen.

2. Restore All Defaults Button: Allows the user to reset all of the welders settings

3. Clear All Memory Button: Allows the user to clear the memory of the welder. (Saves, Settings etc..).

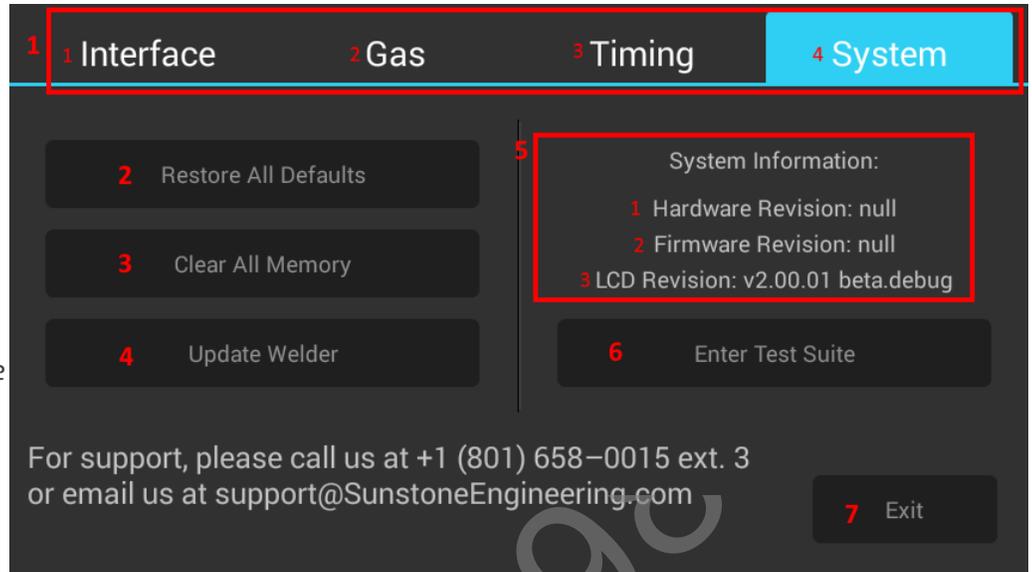
4. Update Welder: Allows the user to update the welder via USB.

5. System Information: Displays to the user the current Revisions of the welder.

1. Hardware Revision: Shows the user the revision of control board.
2. Firmware Revision: Shows the user the firmware revision of the control board.
3. LCD Revision: Shows the user the revision of the UI.

6. Enter Test Suite Button: Allows access to diagnostic screens for use with Sunstone Support.

7. Exit Button: Exits out of the settings screens and returns to the last screen the user was on.



WELDER SOFTWARE UPDATES

Orion users are able to receive free software updates as they are released. Updates are reported on orionwelders.com under the resources tab.

1. Download update ZIP file from email.
2. Unzip file, which produces files called "100Cupdate.apk".
3. Place the files in the root directory of the USB thumb drive. (Do not place the files into any subdirectory or folder on the USB drive. Do not rename the update file or the welder will not be able to perform the update.)
4. Plug the USB thumb drive into the USB port on the welder.
5. Turn the welder on.
6. Go to the Settings screen.
7. Press the update button and choose to update via USB.
8. A few pop-ups will show up indicating the progress of the update.
9. Once the update process is complete and reaches 100%, the welder will return to the main screen.

Chapter 3: Make a Weld

Pause Mode

Remember to push play in order to perform welds. The play button will be green when you are able to perform a weld.

Make An Arc Weld (using the provided weld plate)

- Select the metal you are welding and the joint type, then push play.
- Connect the alligator clip to your workpiece.
- Rest your hands on the table.
- Lift the workpiece up to the electrode with your fingers.
- Lightly touch the electrode.
- Maintain contact & keep hands steady.
- After the weld pull the workpiece away.
- Use the provided stainless steel weld plate as a guide to try different settings.
- Make several welds on the weld plate to get comfortable with the stylus and the different weld parameters.



Make a Tack Weld

- Place the provided alligator clips in the positive and negative ports on the back panel of the welder.
- Select your tack weld energy (start lower and work your way up).
- Select Medium from the Pre-Weld delay section.
- Select Foot Pedal for the Trigger Type.
- Touch the Play button.
- Attach the negative alligator clip to one workpiece and the positive alligator clip to the other workpiece.
- Lightly touch the two workpieces together where you want to tack them.
- Step on the foot pedal.
- If the pieces do not stay together, move the Energy up and repeat step 7-8.
- If the workpieces stay together you can proceed to the Arc screen to perform a permanent weld using the Pulse Arc Welding Stylus. Remember to disconnect the alligator clips from the back panel and reconnect one alligator clip to the front panel before arc welding.



Chapter 4: Recommended Welder Settings

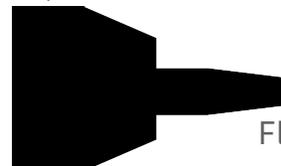
Electrode Shaping

Stylus Cone



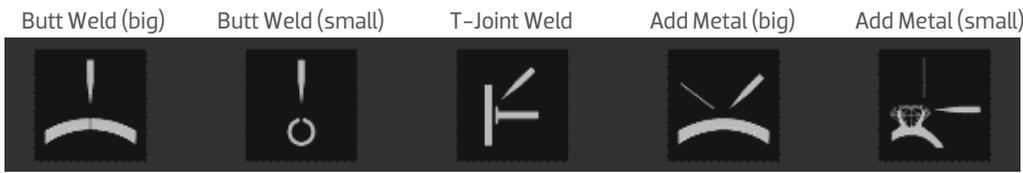
Sharp Electrode Tip

Stylus Cone



Flat Electrode Tip

Electrode placement examples



General Weld Parameter Settings

- These settings are to help users get started. Remember to adjust the power up and down as needed.

| 26 AWG wire/chain/jump ring | | | |
|-----------------------------|-----------|--------|-----------|
| Metal | Tip Shape | Energy | Agitation |
| 14k Gold | Sharp | 9 ws | Off |
| 24k Gold | Sharp | 8 ws | Off |
| Silver | Sharp | 10 ws | Off |
| Platinum | Sharp | 10 ws | Off |
| Stainless | Sharp | 8 ws | On |
| Palladium | Sharp | 8 ws | On |
| Titanium | Sharp | 10 ws | Off |
| Brass | Sharp | 9 ws | Off |

| Earring Post | | | |
|--------------|-----------|--------|-----------|
| Metal | Tip Shape | Energy | Agitation |
| 14k Gold | Sharp | 11 ws | Off |
| 24k Gold | Sharp | 10 ws | Off |
| Silver | Sharp | 12 ws | Off |
| Platinum | Sharp | 12 ws | Off |
| Stainless | Sharp | 8 ws | On |
| Palladium | Sharp | 8 ws | On |
| Titanium | Sharp | 12 ws | Off |
| Brass | Sharp | 11 ws | Off |

| Retip Prong (26 AWG wire) | | | |
|---------------------------|-----------|--------|-----------|
| Metal | Tip Shape | Energy | Agitation |
| 14k Gold | Sharp | 9 ws | Off |
| 24k Gold | Sharp | 8 ws | Off |
| Silver | Sharp | 10 ws | Off |
| Platinum | Sharp | 10 ws | Off |
| Stainless | Sharp | 8 ws | On |
| Palladium | Sharp | 8 ws | On |
| Titanium | Sharp | 10 ws | Off |
| Brass | Sharp | 9 ws | Off |

| 0.5mm thick Ring | | | |
|------------------|-----------|--------|-----------|
| Metal | Tip Shape | Energy | Agitation |
| 14k Gold | Sharp | 12 ws | Off |
| 24k Gold | Sharp | 11 ws | Off |
| Silver | Sharp | 17 ws | Off |
| Platinum | Sharp | 15 ws | Off |
| Stainless | Sharp | 14 ws | On |
| Palladium | Sharp | 14 ws | On |
| Titanium | Sharp | 15 ws | Off |
| Brass | Sharp | 15 ws | Off |

| 1mm thick Ring | | | |
|----------------|------------|--------|-----------|
| Metal | Tip Shape | Energy | Agitation |
| 14k Gold | Sharp | 22 ws | Off |
| 24k Gold | Sharp | 20 ws | Off |
| Silver | Semi Blunt | 45 ws | Off |
| Platinum | Sharp | 24 ws | Off |
| Stainless | Sharp | 22 ws | On |
| Palladium | Sharp | 20 ws | On |
| Titanium | Sharp | 26 ws | Off |
| Brass | Sharp | 26 ws | Off |

| Add Material (24 AWG wire) | | | |
|----------------------------|-----------|--------|-----------|
| Metal | Tip Shape | Energy | Agitation |
| 14k Gold | Sharp | 17 ws | Off |
| 24k Gold | Sharp | 16 ws | Off |
| Silver | Sharp | 18 ws | Off |
| Platinum | Sharp | 18 ws | Off |
| Stainless | Sharp | 14 ws | On |
| Palladium | Sharp | 14 ws | On |
| Titanium | Sharp | 18 ws | Off |
| Brass | Sharp | 17 ws | Off |

| 2mm thick Ring | | | |
|----------------|------------|--------|-----------|
| Metal | Tip Shape | Energy | Agitation |
| 14k Gold | Semi Blunt | 50 ws | Off |
| 24k Gold | Semi Blunt | 45 ws | Off |
| Silver | Blunt | 80 ws | Off |
| Platinum | Sharp | 60 ws | Off |
| Stainless | Sharp | 45 ws | On |
| Palladium | Sharp | 40 ws | On |
| Titanium | Sharp | 55 ws | Off |
| Brass | Blunt | 55 ws | Off |

| Add Material (30 AWG laser wire) | | | |
|----------------------------------|-----------|--------|-----------|
| Metal | Tip Shape | Energy | Agitation |
| 14k Gold | Sharp | 13 ws | Off |
| 24k Gold | Sharp | 12 ws | Off |
| Silver | Sharp | 14 ws | Off |
| Platinum | Sharp | 14 ws | Off |
| Stainless | Sharp | 10 ws | On |
| Palladium | Sharp | 10 ws | On |
| Titanium | Sharp | 14 ws | Off |
| Brass | Sharp | 13 ws | Off |

百赫科学仪器（上海）有限公司
139-1685-4983

