

Sciencetech SCI-SCC Series Solar Cell Chuck
Heating/Cooling Accessories
User's Manual

Version 1.5

Sciencetech Inc.

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Introduction

Sciencetech's SCI-SCC series solar cell chucks cover a wide range of the sizes and capabilities required by leading Solar Cell researchers.

We offer Solar Cell Chucks in many sizes:

- 2" diameter (48mm Diagonal)
- 4" x 4" (10cm x 10cm)
- 6.5" x 6.5" (16cm x 16cm)
- 12" x 12" (30cm x 30cm)

All our cell chucks are vacuum-holding ready and are available without temperature control, with water recirculating cooling or with Liquid or Thermoelectric temperature control.



Sciencetech SCI-SCC3-TE Solar Cell Chuck System with 4-Probe Station

Please read this manual completely before operating the unit.

1 **POWER SUPPLY**

1.1 *12VDC Power Supply (For SCI-SCC3-TE)*

The Sciencetech 590-0282 power supply operates the TE cooling system installed in the SCI-SCC3-TE solar cell chuck. This power supply is fixed and offers constant power.



1.1.1 *POWER SUPPLY SPECIFICATIONS*

Model 590-0282	
Input:	95-264 VAC , 47 to 63 Hz
Output Power:	80W Max
Output Voltage:	12V
Maximum Current:	6.66A
Line Voltage Regulation:	±0.5%
Operating Temperature	0 – 40 degrees C
Storage Temperature	-20 – 85 degrees C

1.2 24VDC Power Supply

The Sciencetech 590-0201 power supply operates the temperature monitor installed in Sciencetech's liquid cooled cell chucks.



1.2.1 POWER SUPPLY SPECIFICATIONS

Model 590-0201	
Input:	100-250VAC , 50 to 60 Hz
Output Power:	60W Max
Output Voltage:	24V
Maximum Current:	2.5A
Line Voltage Regulation:	±1%
Operating Temperature	0 – 40 degrees C
Storage Temperature	-20 – 85 degrees C

2 SHIPPING AND UNPACKING

2.1 Unpacking

The instrument is packaged in such a way as to minimize damage during transport. If the package is damaged or if after unpacking any signs of damage become apparent, a claim should be filed with the carrier immediately.

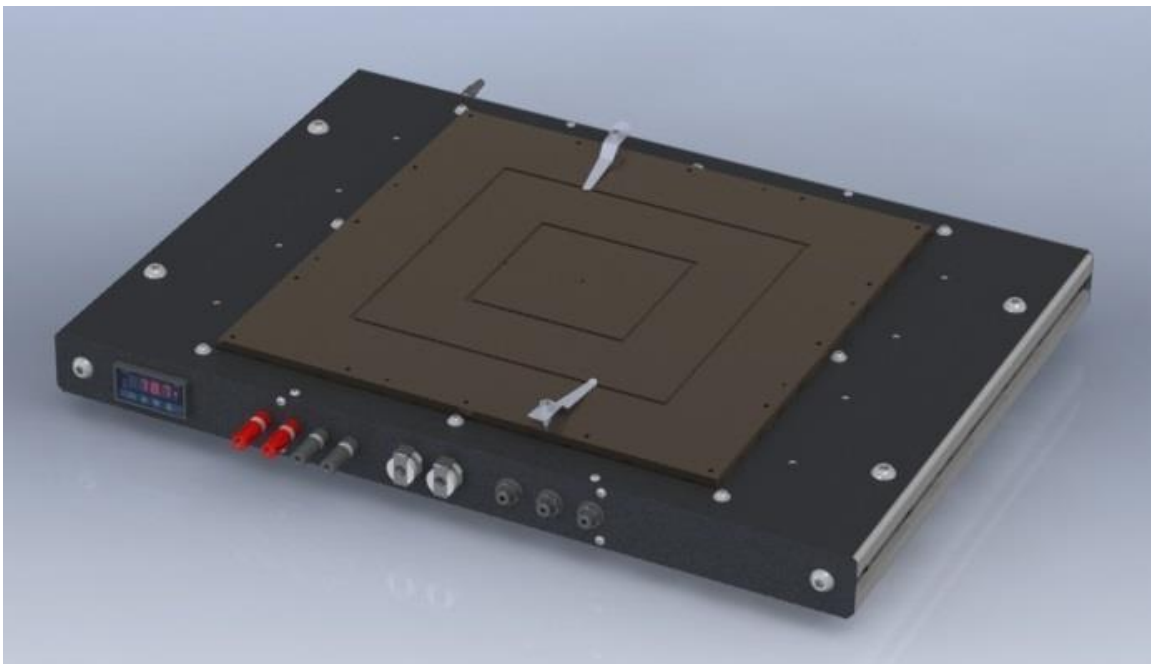
If the instrument must be returned, contact Sciencetech Inc. for approval prior to shipping. A full description of the reason for return should be included.

Inspect the exterior of the system for any noticeable defects. If any are present, contact Sciencetech Inc. immediately.

2.2 Included Components

The packing box should contain the following components:

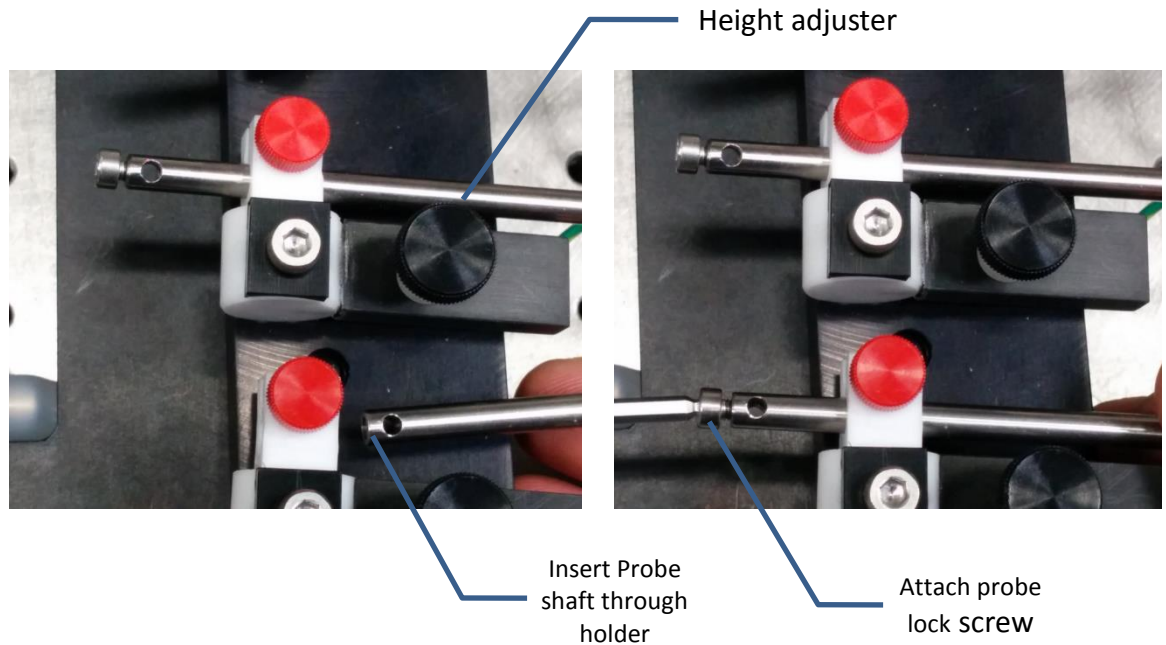
- Sciencetech SCI-SCC Series Solar Cell Chuck
- Power Supply
- Probe Station (If purchased)
- Connection wires for IV Measurement



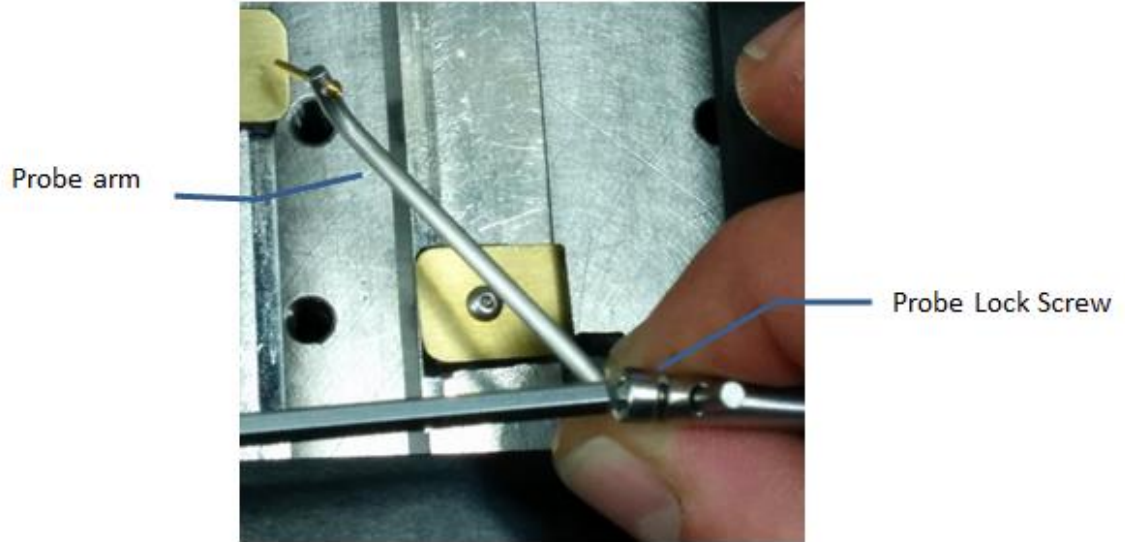
3 INSTALLATION PROCEDURE

3.1 *Probe Station Set-up (Optional)*

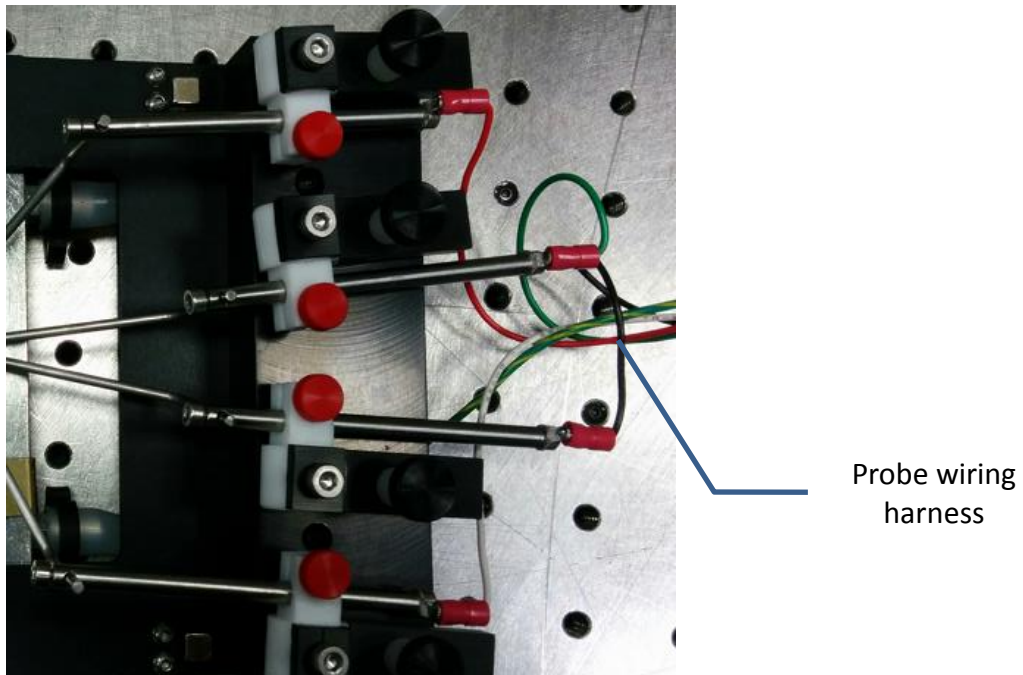
1. If the probe station is not installed. Position the probe station and use the provided screws to secure it to the sample stage. Probe station can be attached to any of the 4 positions surrounding the cell chuck.
2. Adjust the probe arms so they are in their highest position.



3. Install the probes.

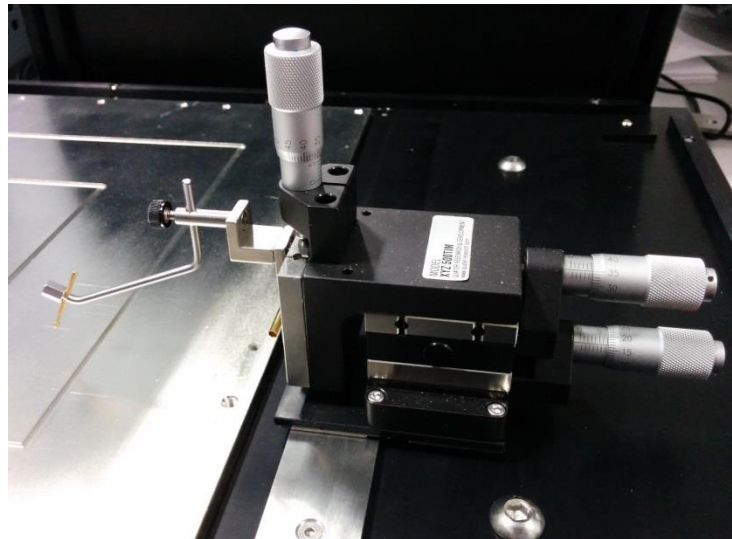


4. Attach lead wires from probes to binding posts on stage or attach disconnect



3.2 *Micro Manipulator Set-up (Optional)*

1. If the magnetic mounting bars are not already installed, use the provided screws to attach them in place.
2. The micromanipulator can be placed on the magnetic mounting bars in any position required.



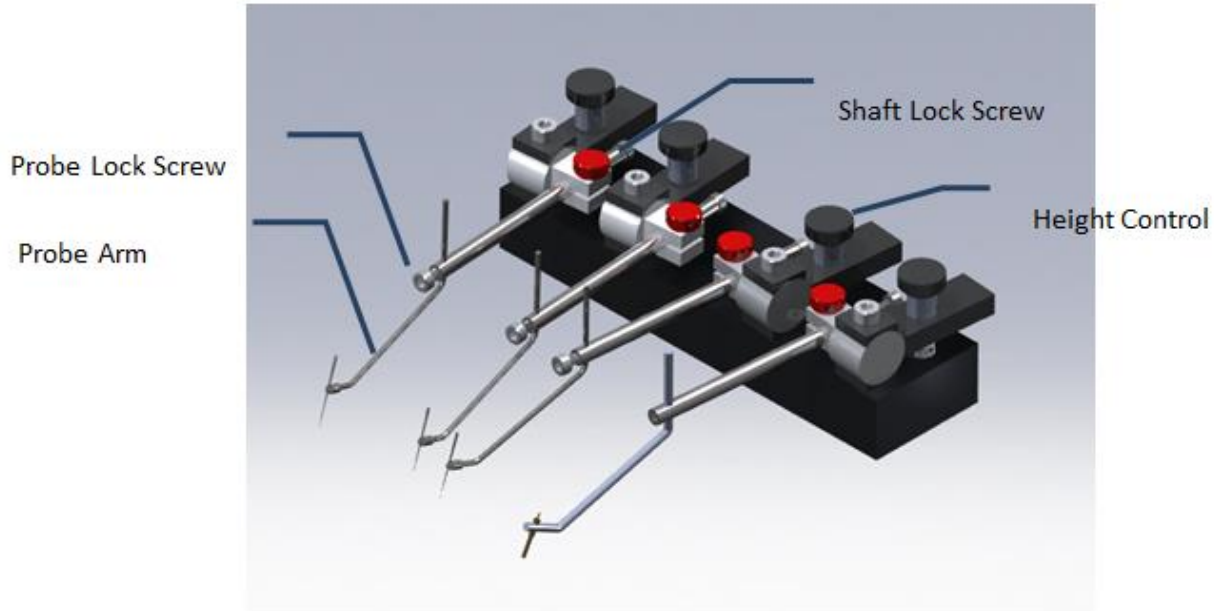
4 OPERATING PROCEDURE

4.1 *Stage operation*

1. Cell is held in place using vacuum suction (optional) or the included spring clips.
2. Connect test cell to binding post either:
 - Using soldered lead wires OR
 - Using optional probe station add-on
3. Connect IV measurement system to binding posts.
4. Set cooling system parameters and allow time for system to reach steady state.

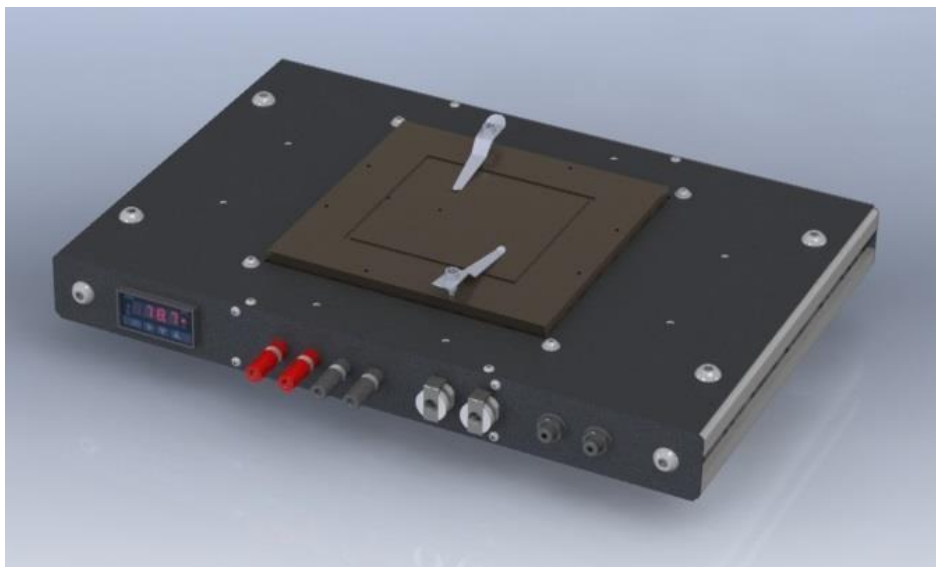


4.2 Probe Station Operation

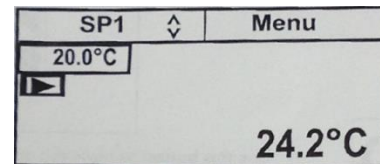


Use care when manipulating probes. Tungsten Probe tips are DELICATE and easily bent

- Lower and raise probe arms by turning the height control thumbscrew.
 - o Turning clockwise raises the arms
 - o Turning counter-clockwise lowers the arms
- Loosen the shaft lock screw to extend, retract or rotate the probe arm holder.
- Loosen the probe lock screw (2mm Allen wrench) to raise, lower or rotate the probe arm





4.3 Liquid Cooling System Quick Start Guide (Model TC-2000) (Optional)

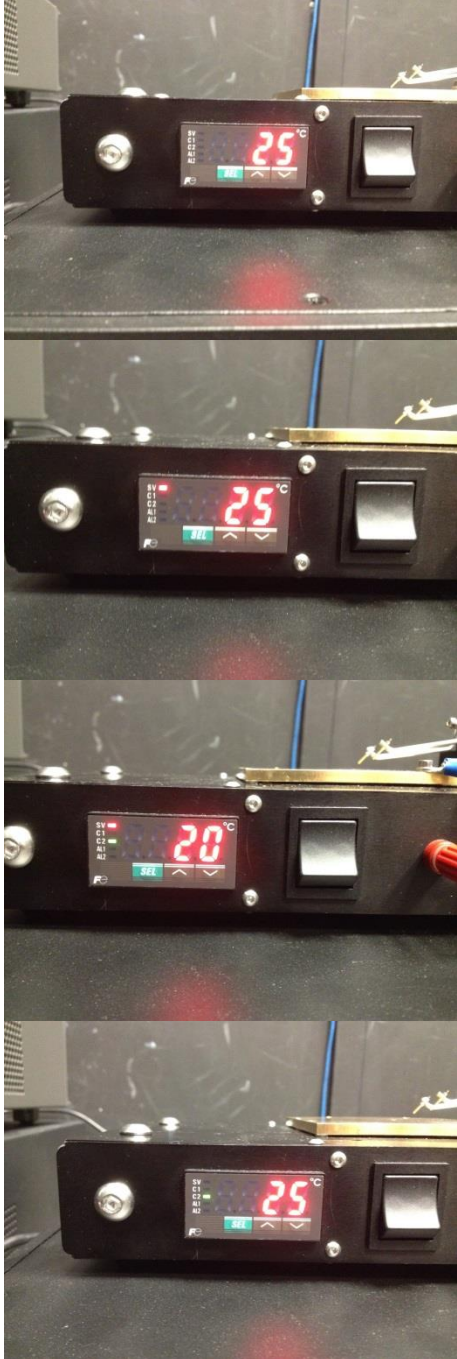


For full instructions on cooling system operation please see the PolyStat manual

MAXIMUM FLUID PRESSURE: 15psi

1. Plug the fluid input and output cables into the stage as labeled.
2. Turn the power on to put the system into standby.
3. Press the  button to turn the system on. The Current temperature of the reservoir fluid will show in the bottom right side of the display.
4. Use the arrow buttons to navigate to the set temperature. Press the center button to modify the value and again when you have to correct value.
5. Navigate to the box with a  symbol and hit the center button to start the controller.

4.4 Thermoelectric Cooling Operation (SCI-SCC3-TE)



1. With the power cable plugged in turn on the power switch.

2. Press the SEL button to display the **Set Temperature**.

3. Use the ▲ and ▼ buttons to select your desired temperature

4. Press the **SEL** button to accept.

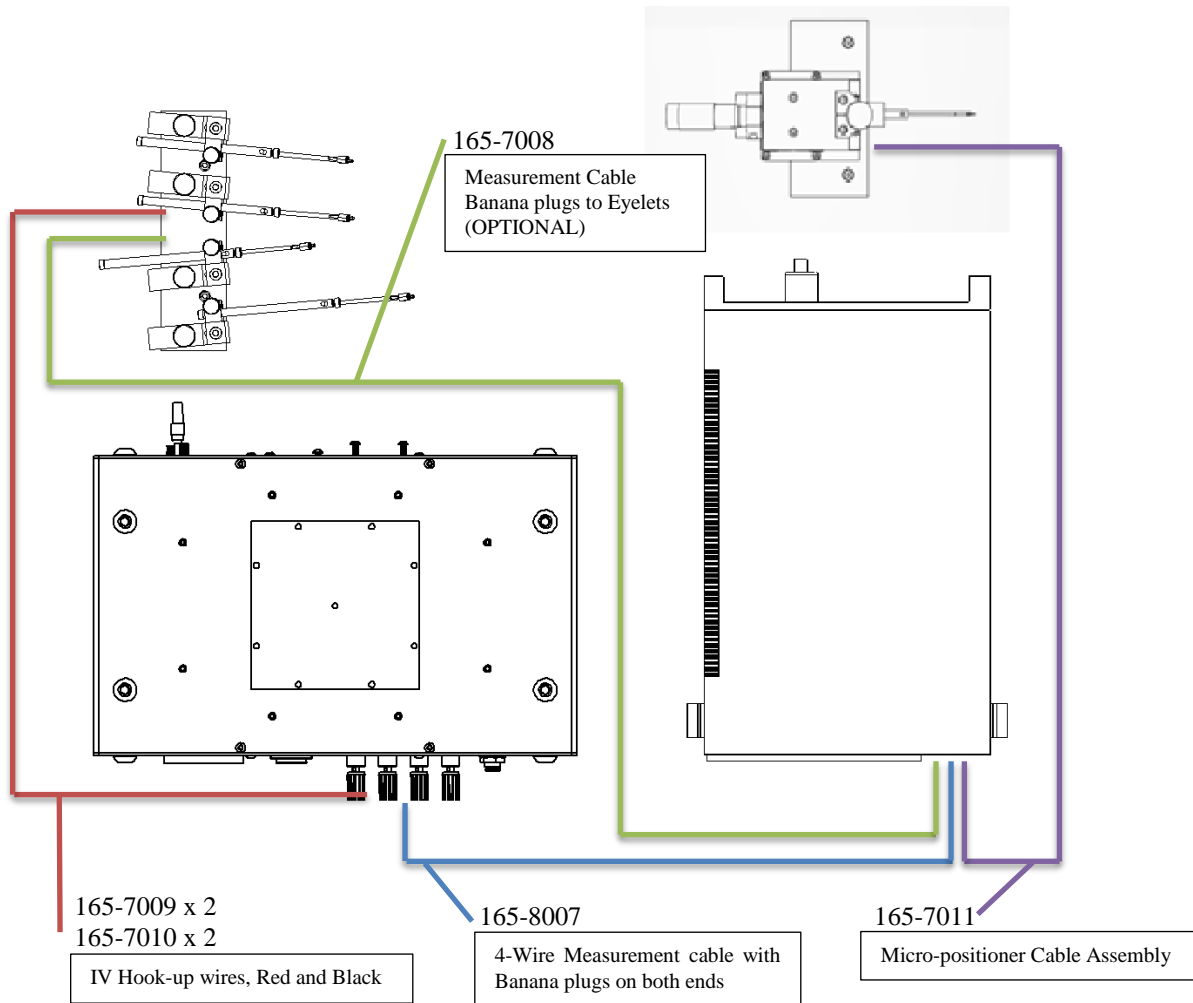
- C1 light indicates system is currently Heating
- C2 light indicates system is currently Cooling

5 WIRING INSTRUCTIONS

Sciencetech’s Cell Chucks, Probe Stations, and IV Test Systems can be combined in the following ways to provide electrical connections for IV Measurement.

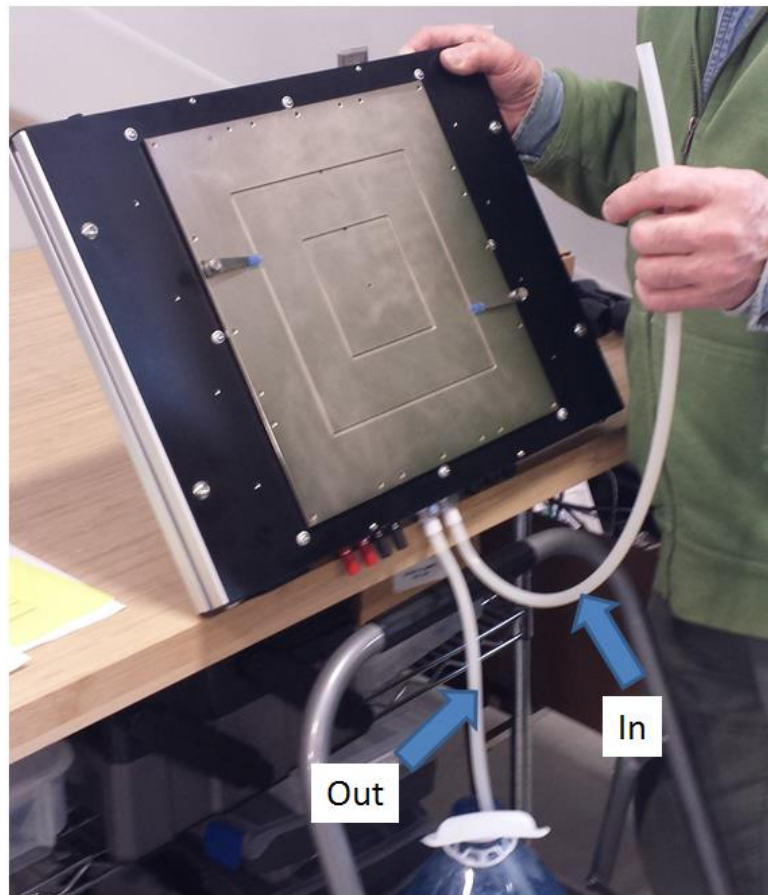
IMPORTANT NOTICE: These are guidelines on how to make connections using Sciencetech accessories. Depending on your application they may not be applicable.

5.1 *Sciencetech Probe Station or Micro-positioner*



6 DRAINING THE CELL CHUCK

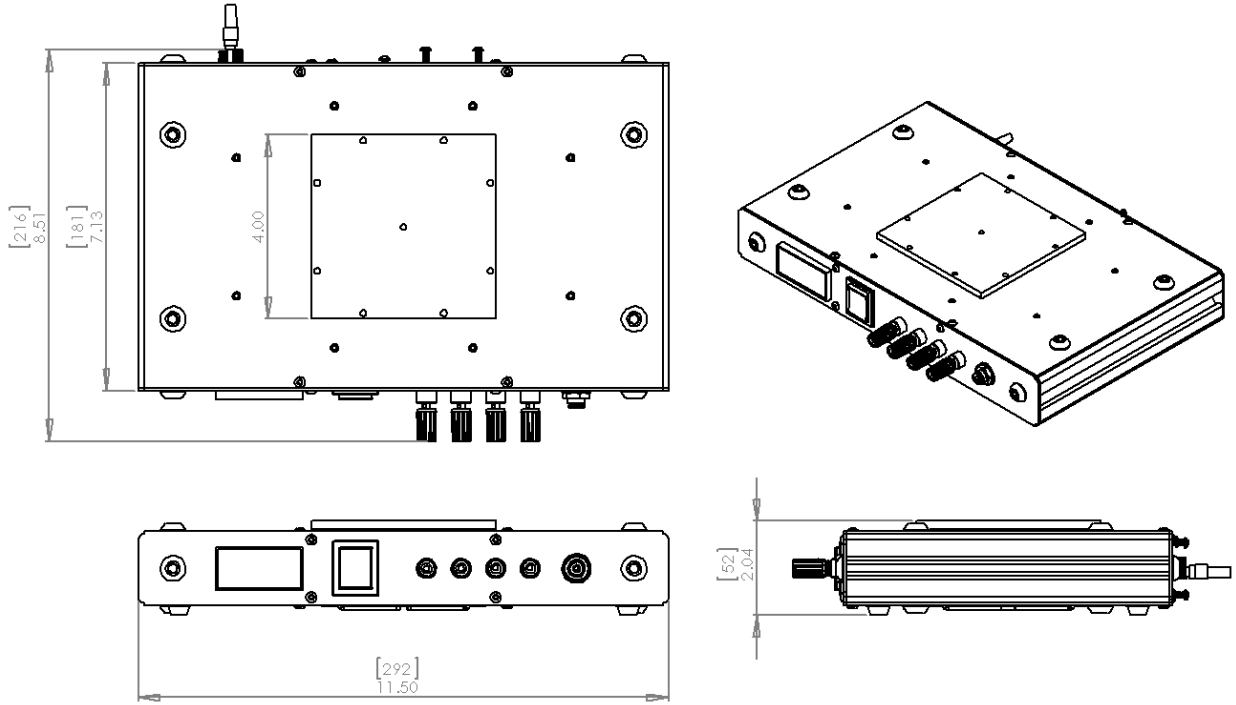
To drain the cell chuck, first attach the included two drainage lines to the front in and out coolant couplings. Route the out drain line into a suitable container and tilt the cell check forward at a sharp angle with one hand while holding the in drain line upwards with the other hand. See the figure below:



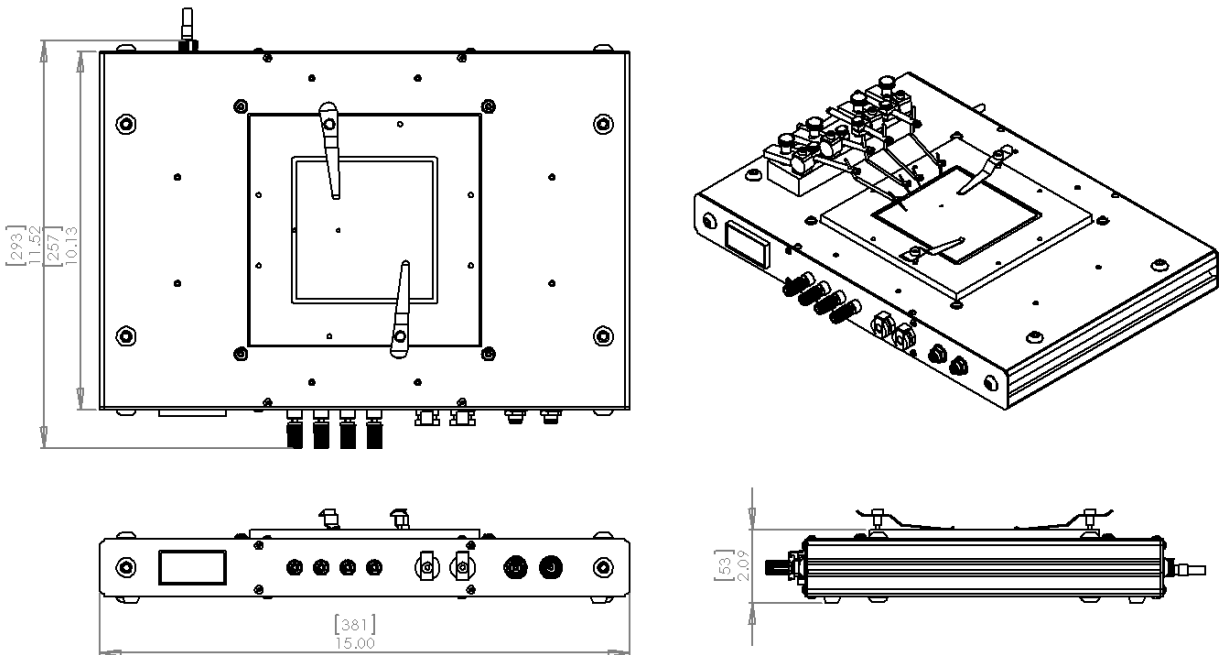
Allow as much coolant as possible to exit the cell chuck. Tilting the chuck back and forth while performing this procedure will help. Only after the step above may one gently and carefully evacuate the excess coolant using dry VERY LOW PRESSURE (i.e. similar to human breath) compressed air or nitrogen.

7 DIMENSIONS

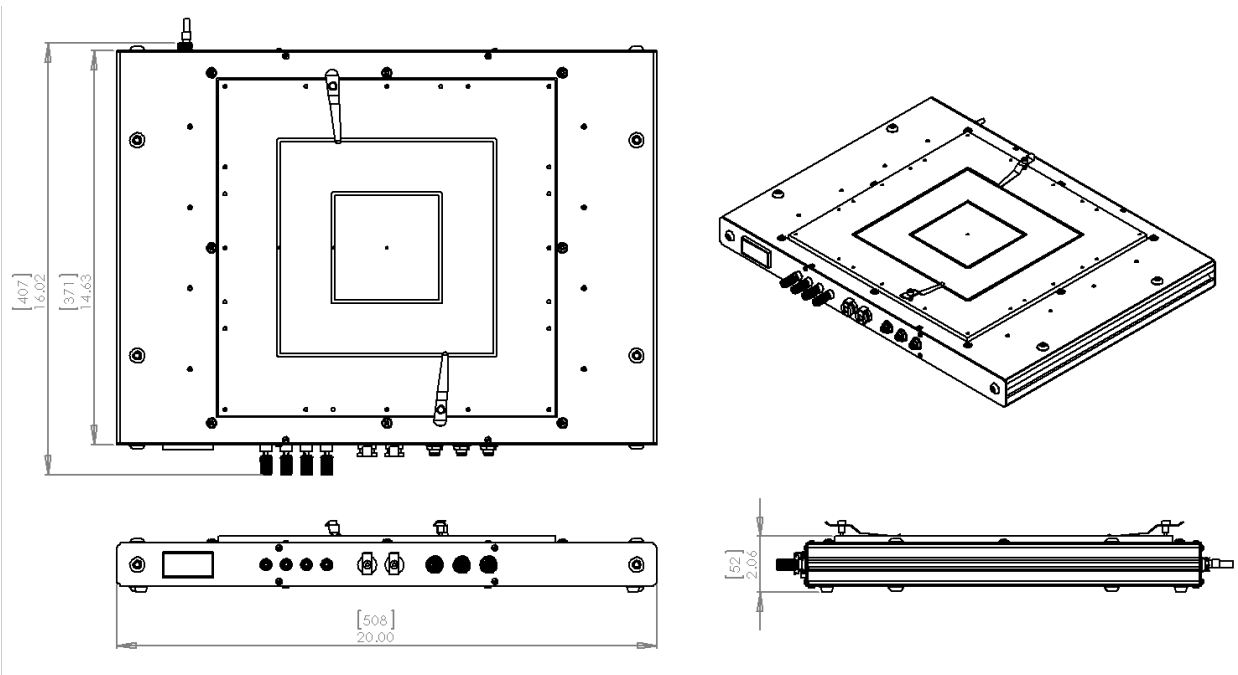
7.1 SCI-SCC3 Series



7.2 SCI-SCC6 Series



7.3 SCI-SCC12 Series



8 OPTIONS AND ACCESSORIES

Cell Chucks

Sciencetech offers a wide range of cell holding options for various sizes and budgets. We offer low-cost uncooled cell holders with probe stations or offer cooled option using Thermoelectric or liquid cooling and heating. All cell chucks have 4 binding posts to connect probe assembly to measurement electronics. Not all products are shown on the website. Contact our sales team for more information.

	Cooling	Sample Size	Vacuum Ready
SCI-SCC2	TE	8-48mm Diam	Included
SCI-SCC3	None	9 x9 cm (3.5 x 3.5")	Yes
SCI-SCC3-TE	TE	10 x10 cm (4 x4")	Yes
SCI-SCC6	None	16.5 x 16.5 cm (6.5 x 6.5")	Yes
SCI-SCC6-L	Liquid	16.5 x 16.5 cm (6.5 x 6.5")	Yes
SCI-SCC6-TE	TE	16.5 x 16.5 cm (6.5 x 6.5")	Yes
SCI-SCC12	None	30 x 30 cm (12 x 12")	Yes
SCI-SCC12-L	Liquid	30 x 30 cm (12 x 12")	Yes
SCI-SCC12-TE	TE	30 x 30 cm (12 x 12")	Yes

Vacuum Pumps

Sciencetech provides temperature controllers for all our cooled cell chucks.

	Max Pressure	Power Req.
VP-600	60 psi	230VAC
VP-601	60 psi	115VAC
SCC-VP	10 psi	110-230VAC

Probe Stations

Sciencetech cell chucks are designed to be used with our probe stations. All cell chucks can take measurements from the bottom of the test cell but we have a number of options for the for the top side probes. Not all products are shown on the website. Contact our sales team for more information.

	Style	Probe Type
SCP-2G	2 Probe Station	Au-plated Copper Spring Probes
SCP-2T	2 Probe Station	Tungsten needle tip kelvin probes
SCP-4G	4 Probe Station	Au-plated Copper Spring probes
SCP-4T	4 probe Station	Tungsten needle tip kelvin probes
SCP-MP	Micrometer positioning probe with magnetic base	Tungsten needle tip kelvin probes
SCP-SP	Screw positioning probe with magnetic base	Tungsten needle tip kelvin probe

Temperature Control

Sciencetech provides temperature controllers for all our cooled cell chucks.

	Cooling	Capacity (Heating)	Capacity (Cooling)
TC-2000	Liquid	2000W	250W
130-REC	Water Recirculator	-	500W
160-REC	Water Recirculator	-	800W
TE-60	TE	60W	60W
TE-1000	TE + Water Rec		

9 IMPORTANT NOTICE

All electrical instruments may be dangerous if not handled in accordance with proper instructions and common precautions. Sciencetech Inc. will not be responsible for any damage caused by such units if the instructions herein are not followed and repairs are not attended to or performed by company-trained or licensed personnel. All instruments should be operated with proper grounds on the power line and should not be opened or handled without being switched off and disconnected from power receptacle.

Sciencetech Inc. reserves the right to make adjustments or improvements in its product without notice and without obligation to subsequent purchasers and without being required to make corresponding changes or improvements in products theretofore manufactured and sold.

We have done our very best in the manufacture and packing of this material. The transportation carrier is now responsible for delivering it to you in its original good condition, since all purchases are FOB London.

If the shipment is NOT delivered in good order and in accordance with quantity shown on Bill of Lading or Packing Slip, have the shortage or damage noted by the Carrier on both the delivery receipt and the freight bill, or by special form provided by United Parcel or the Post Office.

The Interstate Commerce Commission has ruled that Transportation Companies will not honor any losses or shortage claims unless exceptions are noted on the freight bill at the time of delivery. It is the buyer's responsibility to make a complete inspection immediately upon receipt of purchased goods.

If you accept shipment from the Transportation Carrier short of what is enumerated on the Bill of Lading – or in damaged condition – without having proper notation made by the Carrier, you do so at your own risk.

If bundles or crates are in apparent good order, but on opening contents are found to be damaged, call Carrier for adjuster to view same and have the Transportation Company/United Parcel/Post Office mark the freight bill or packing slip relative to such concealed damage. Make your claim at once for the Transportation Company/United Parcel/Post Office has a limited time for presentation of claims.

We are willing to assist you in every possible manner in collecting claims for loss or damage on this shipment, but this willingness on our part does not make us responsible for filing or collecting claims or replacing materials. Claims for Loss or Damage on shipment may not be deducted from our invoice, nor pay of the invoice withheld awaiting adjustment of such claims, as we cannot guarantee safe delivery.

Important: Do not return goods without written authority.

Contact factory for return material authorization.

Returned goods will not be accepted by us from the Transportation Company/United Parcel/Post Office unless written authorization has been issued by Sciencetech Inc.

Return of special or non-stock items cannot be authorized. Credit for goods returned - under authorization - will depend on the value to us based on our selling price, less a fair charge to cover the expense of shipping - re-handling - transportation - refinishing, etc, providing material is received in good condition - transportation charges prepaid - credit rendered to be used against future purchases.

All equipment manufactured by Sciencetech Inc. has been subjected to extensive performance and quality control testing. In order to constantly improve our product, we ask your assistance. Upon installation of our equipment, please fill out the attached card and return to us.

By completing the card and returning it to Sciencetech, you will register your instrument in warranty and enable us to provide you with the best possible service.

10 WARRANTY AND ASSISTANCE

All Sciencetech products are warranted against defects in materials and workmanship. This warranty applies for one year from the date of delivery, or, in the case of certain major components listed in the operating manual, for the specified period. Products sold or resold, but not manufactured by Sciencetech, carry the warranty, if any of the original manufacturer. We will repair or replace products that prove to be defective during the warranty period or employ our best efforts to effect repair or replacement of equipment sold, but not manufactured, by Sciencetech. No other warranty is expressed or implied.

We are not liable for consequential damages.

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