

# CS-3A Cell Stand ver.1.1

## Instruction manual



## Table of Contents

Chapter 1	Introduction	3
	Features	3
	Specification	3
Chapter 2	General information	4
	User updates	4
	Technical changes	4
	Damaged shipments	4
	Product warranty	4
	Service information	5
Chapter 3	Installation	6
	Inspection of shipment	6
	Cell stand connection	6
	Power requirements	6
	Power cord connection	6
	Cell lead connection	7
	Gas inlet connection	8
	Cell leads	8
	Purging/Blanketing lines	8
	Cell cap/Test Via Placement	9
Chapter 4	Operation	10
	Identification of front panel control	10
	Identification of rear panel control	11
	Gas purge	12
	Test sample	12
	Next sample	12
	Stir	12
	Remote control	12
	Faraday cage and cell holder	13
	Setup for pico ampere booster	14
	Removal of back panel	14
	Cable connection	15
	Polishing Electrodes	16
Chapter 5	Service	18
	Cautions and general maintenance	18
	Service procedure	18
Appendix	Accessories for CS-3A cell stand and CV electrode	19
	Accessories and Reference electrodes	20
	CE Certificate	21

## Chapter 1 - Introduction

Analytical electrochemistry used for analytical purposes has progressed dramatically recently. There have been a number of reasons for this progress:

Operation interface becomes more user friendly and reliability is improved.

The use of solid electrodes has also been significant and popular among chemists. CS-3A Cell Stand is specifically designed to conveniently use the variety of solid electrodes and cell accessories available from ALS.

The CS-3A Cell Stand adopted with CHI series Electrochemical Analyzers and other apparatus directly. The cell is enclosed in a Faraday Cage to reduce electrical interference. A built-in gas control allows purging of the sample. Gas line is provided to purge the next sample, while analyzing the present sample separately, thus increasing productivity. The magnetic stirrer allows for controlling the mixing of the sample for experiments requiring mass transport of electrolyte or analyte to the electrode surface. The cell top positioner with detachable cell cap allows easy removal and replacement of the cell vial as well as the electrodes for rinsing, cleaning, or replacement.

### Features

- Input gas line connection is easy and quick.
- Manual or Remote on-off control of gas purge-blanket.
- Control of 'next sample' gas purge separately.
- Manual or remote on-off control of magnetic stirrer.
- Adjustments of magnetic stirrer rate is controlled manually.
- Voltammetry cell cap.
- Small volume glass cell vials.
- Mounted cell top compatible with electrochemical accessories by ALS.
- Stainless steel drip tray to catch spills.
- Cell lead connects directly to electrochemical analyzers.
- Easy and positive contact cell leads to electrodes.
- Vertically sliding cell top positioner for easy cell vial placement and removal, and rinsing or replacement of purging glass tubing, working, reference and counter electrodes.
- Cell enclosed in Faraday Cage for reduction of electrical interference.

### Specification

Power:	100 VAC/240VAC 50/60 Hz, V/A 30W
Gas pressure:	34 Kpa maximum
Size:	28.5cm (W) x 23cm (D) x 31cm (H)
Fuse	1A
Weight:	approx. 3.8 Kg

## Chapter 2 - General information

User updates	<p>After receiving product update information news, the valuable information related to this and other ALS products, please register your e-mail address at our local distributors. We would like to know who you are, and what else you want to know about electrochemical analysis.</p>
Technical changes	<p>We reserve the right to make technical changes to improve the instrument without notice.</p>
Damaged shipment	<p>Breakage of any part of this instrument during shipping should be reported immediately to the freight handler and ALS Customer service. It is necessary to keep the original packing box and contents for inspection by the freight forwarder. ALS will replace any new instrument damaged in shipping with an identical product as expediently as possible after the claim filing date. Claims not filed within 7 days after shipping may be invalid.</p> <p>Do not return damaged goods to ALS. Please contact with local distributor and tell its damaged status and detail. They will contact with our service department.</p>
Product warranty	<p>ALS Co., Ltd warrants equipment manufactured by the company to be free from defects in material and workmanship for a period of 90 days from the date of shipment. This assumes normal usage under commonly accepted operating parameters. ALS agrees to either repair or replace, at its sole option and free of part charges to the buyer, any parts of such instrumentation which, under proper and normal conditions of use, prove to be defective within 90 days from date of shipment. Electrochemical cells and working electrodes are warranted for 30 days.</p> <p>ALS neither assumes nor authorizes any person to assume for it any other liability in connection with the sale, installation, service, or use of its instrumentation.</p> <p>All products manufactured by ALS are tested and inspected prior to shipment. Upon prompt notification by the buyer, ALS will correct any defects in warranted equipment of its manufacture either (by our option) by return of the item to our factory, or shipment of a repaired or replacement part. ALS will not be obliged, however, to replace or repair any piece of equipment which has been abused, improperly installed, altered, damaged or repaired by others. Defects in equipment do not include decomposition, wear, or damage by chemical action or corrosion.</p> <p>This instrument is manufactured, either wholly or in part, for research purposes only. Use in medical diagnosis is not intended, implied or rec-</p>

ommended by the manufacturer. Use for this purpose and accountability for the same rests entirely with the user.

Limited obligations covered by this warranty include:

In the case of instruments not of ALS manufacture, the original manufacturer's warranty applies.

Shipping charges under warranty are covered only in one direction. The buyer is responsible for shipping charges to the factory, if return of the part is required.

Expendable items including disposable items such as working electrode, reference electrodes, source lights, panel lights, fuses, etc. are excluded from the warranty

#### Service information

ALS provides a skilled service staff to solve your equipment oriented problems. For further details, please contact by e-mail ([sales@bas.co.jp](mailto:sales@bas.co.jp)). Following discussion of your specific difficulties, an appropriate course of action will be described and the problem resolved accordingly.

Please contact with local distributor and describe to them the problem you are having in full detail. They obtain a RETURN AUTHORIZATION NUMBER (RMA#). The RMA# identifies you as the sender. All correspondence and shipments should be sent to ALS.

## Chapter 3 - Installation

**INSPECTION OF SHIPMENT** After unpack the instrument carefully, check the package contents and inspect for breakage. Table 1 lists the parts of the CS-3A Cell Stand. This list is subject to change. Please refer to the packing slip with your instrument. Assembly of these various parts will be outlined in the following chapters.

Please retain the shipping box and packing material until you have fully tested the unit to be certain that no damage was incurred during shipping. If a shortage exists, please contact with local distributor or ALS Customer Service and describe the shortage. A replacement part will be sent immediately subject to stock availability.

CS-3A Cell Stand Package list

Cat #	Description	Qty
012779	CS-3A Cell Stand ver1.1	1
012065	Male connector for gas purge (PP)	1
	Power cable	1
	Instruction and Operations Manual	1
	Option	
012669	<a href="#">SVC-3 Voltammetry cell</a>	1
010880	<a href="#">CB-EE Remote cable</a>	1

**Cell stand connection** The connection of the cell stand to the cell and cell stand controllers is described.

### POWER REQUIREMENTS

The CS-3A Cell Stand can be used with either 100V to 220V (50-60 Hz) power supply. Power switching regulator is used, and then it can be used any place without any modification.

#### Power Cord Connection

Push the socketed end of the power cord into the port located in the back-panel (See Figure 1). After make this connection, make certain the power on/off switch is in the certain position. This switch is labeled with a and When in position, the power is off and when in the power is on.

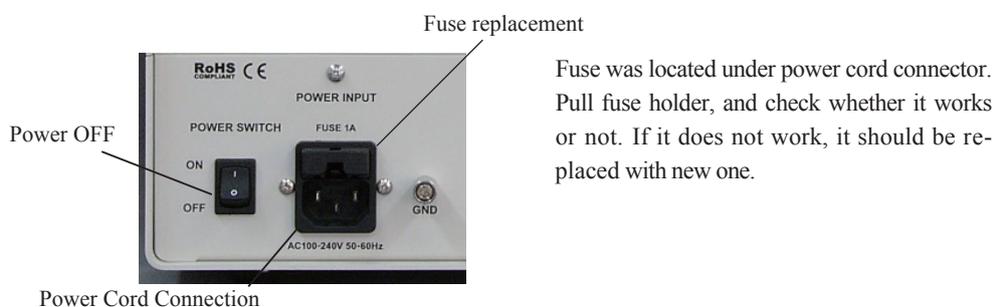


Figure 1. Power cord connection

The CS-3A gas purge and stirring can be controlled by the CHI Electrochemical Analyzer. The control line is 25 pin cable Cat No ([010880 CB-EE Remote cable](#)) between the remote connector on the rear of the cell stand and the cell stand connector on the rear panel of the CHI Models. See Figure 2.

The electrode leads are connected to CELL input connector on the rear panel of the CHI Models.

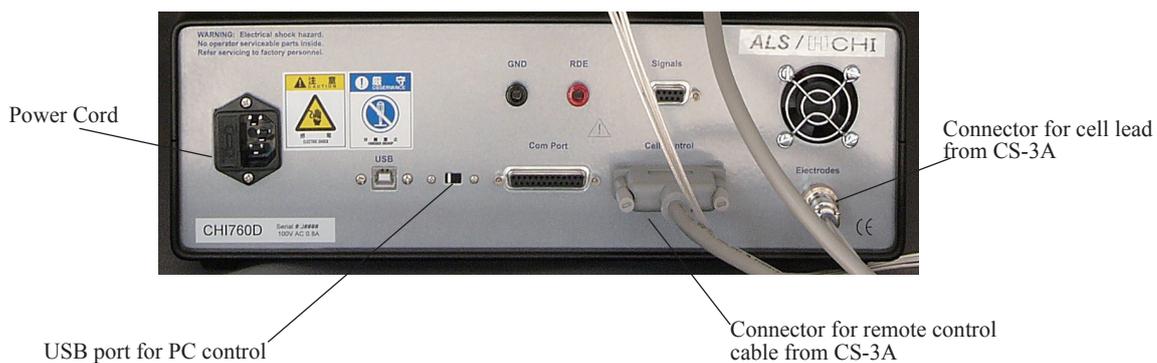


Figure 2. Connection of CS-3A to CHI Models

### Cell lead Connection

The cell leads are passed into rear panel of CS-3A cell stand, and see fig 3a to 3c. Each of alligator clip is passed through the hole carefully.



Figure 3a. Pass alligator clips through hole of CS-3A



Figure 3b. Cell lead's to connect with electrode terminal connector of rear panel of CHI models

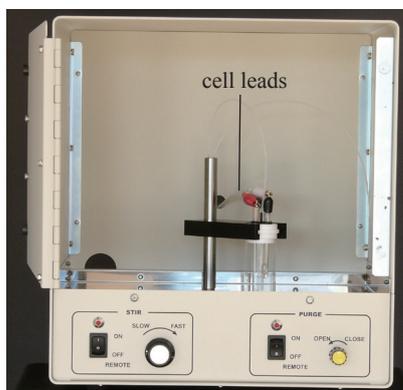


Fig 3c. Confirmation of cell leads having enough length to connect with each electrodes

After electrode leads are passed, communication cable is connected with PC, electrode leads and control line cable is connected between CHI models and CS-3A cell stand.

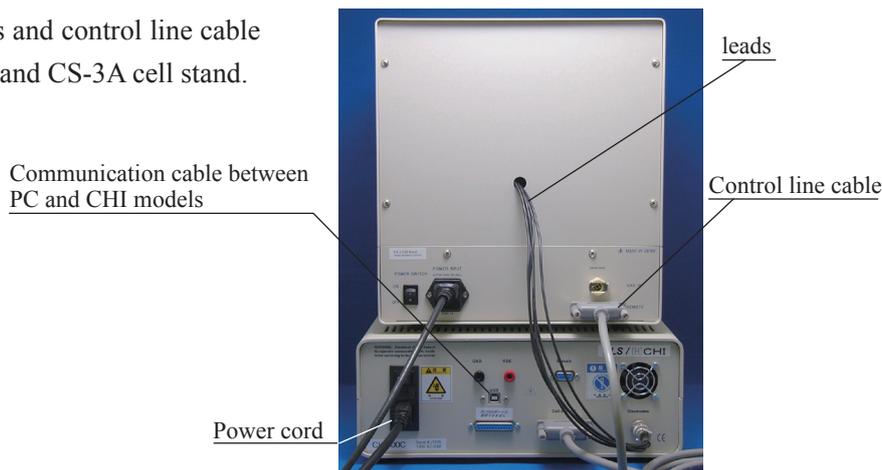


Figure 4. Cable setup for CS-3A and CHI models

### Gas Inlet Connection

The CS-3A Cell Stand package includes tygon tubing and a gas line fitting. One end of the gas line fitting is nipple to fit inside the tygon tubing. Push the nipple end into the tubing. The other end of the fitting connects to the 'GAS INLET' port on the rear panel of the CS-3A. To attach the line, simply push the connector into the port. A retaining clip will snap into place (See Figure 5). The open end of the tygon tube is connected to a regulated gas supply. The inlet gas pressure must not exceed 34 Kpa.



Figure 5. Gas line connection to CS-3A

To remove the tube from the cell stand, squeeze the retaining ring tab against the connector and then pull the tube and connector away from the cell stand.

### Cell Leads

The wires coming through the back panel are the electrode lead wires. The connectors are tightened by screws. Simply push the connector over the corresponding pin on the electrode to make the connection. The alligator clips are color coded to the electrode it attaches (See Figure 6).

- Green     working
- White    reference
- Red       counter
- Black     Sensing (large current measurement)

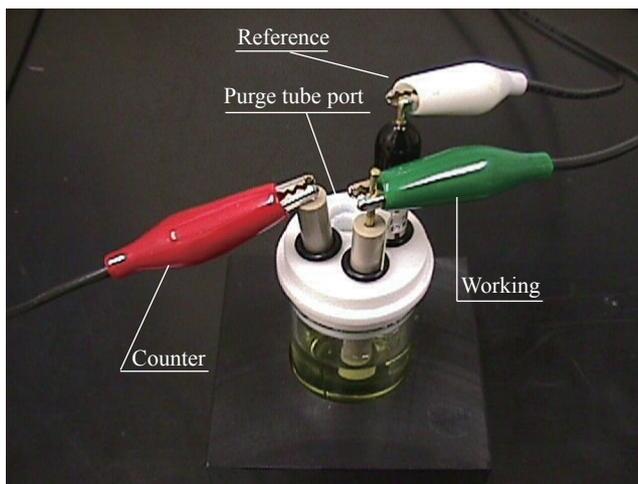


Figure 6. Color coded alligator clip

## Purging /Blanketing lines

CS-3A cell stands have the ability to purge the sample solution with an inert gas. The purge removes oxygen by bubbling an inert gas, typically nitrogen, helium or argon, through the solution. The blanketing function is to maintain an inert atmosphere above the sample to keep the oxygen or air components from reentering the sample solution.

The purge/blanket lines are the two plastic tubes coming out of the cell top positioner. The two larger 1/8" lines are labeled 'test sample'. To insert the teflon lines: place on a flat surface, press purge line into smaller opening of teflon cap.

The blanket line is pushed into the smallest hole in the center of the teflon cap. The blanket line should extend to just beyond the bottom of the teflon cap.

The CS-3A Cell Stand also allows purging of the 'next sample' to be tested.

## Cell Top/test vial placement

The cell top positioner is raised, the cell is placed under the teflon cap, and the cell top positioner is lowered onto the cell. The teflon cap snaps out of the cell top positioner for easy cleaning.

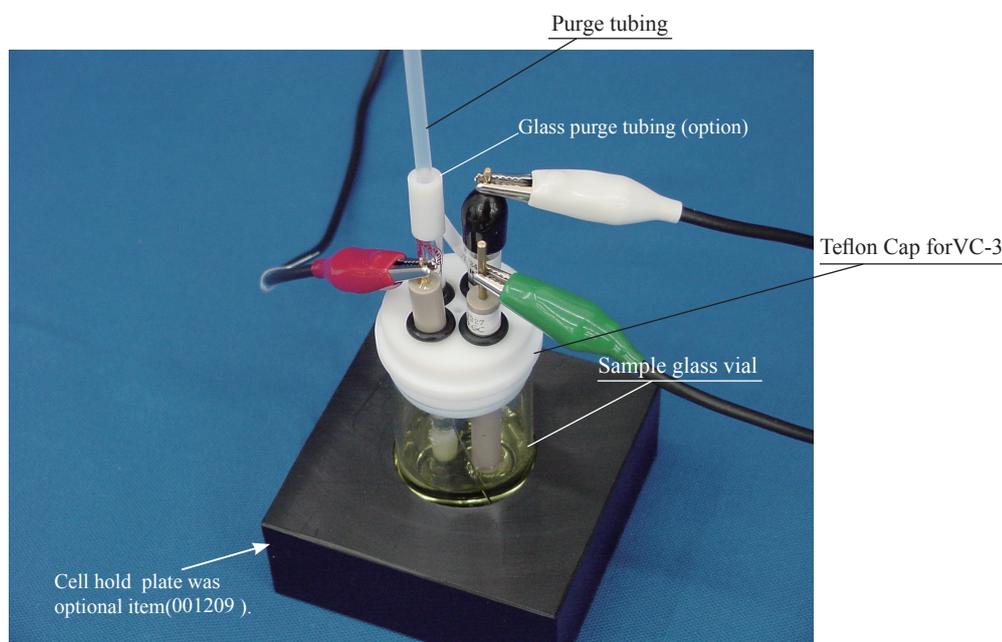


Figure 7. Placement of test sample vial

Teflon cap for CV-3 was fitted into cell top positioner, and it was slid out of cell top positioner.

## Purge function

Function	Purge	Gas blanket tube	Remarks
Purge OFF under test manually	Open	Gas	When purge is ON, gas is not purge through blanket tube, gas is released through gas purge tube
	Close	NO Gas	
Purge off under Remote	Open	Gas	
	Close	NO Gas	

## Chapter 4 Operation

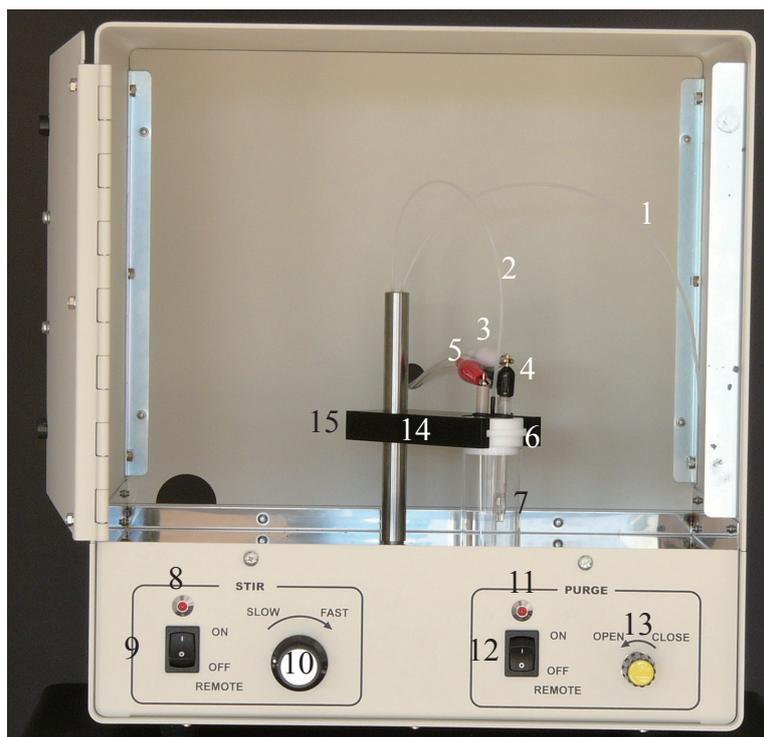


Figure 8. Front Panel

### Identification of front panel control

#	Function
1	Gas blanket line (Teflon tubing marked by black ring)
2	Gas purge line for test sample (Teflon tube).
3	Reference electrode (white lead).
4	Counter electrode (red lead).
5	Working electrode (black lead).
6	Teflon cell cap
7	Test sample cell
8	Stir LED: LED is flashing when stir is turned on, either manually or remotely.
9	Stir Control: switch to manually control stirrer or to select for remote control.
10	Knob switch to control stir rate.
11	Gas purge LED: LED is flashing when gas purge is turned on for test sample vial, either manually or remotely.
12	Gas purge control switch: Switch to manually control gas purge or to select for remote control.
13	Gas Purge Rate Control: Controlling rate of gas flow to Test Sample gas dispersion tube.
14	Cell top positioner
15	Thub screw to control height adjustment of cell top positioner

## Identification of rear panel connectors

#	Function
1	Screws. Four screws for easy removal of back panel.
2	Cell Lead. Cell lead connection with electrode terminal of CHI instruments or another potentiostats.
3	Power On/Off.
4	Power Cord. Socket for power cord. Be sure that the power cord is connected to a grounded outlet.
5	Fuse Holder.
6	Ground terminal
7	Gas Inlet Connector. Bulkhead fitting providing connection to external gas source. NOTE: 34 Kpa maximum pressure
7	Remote Connector. 25 pin D connector for remote control.

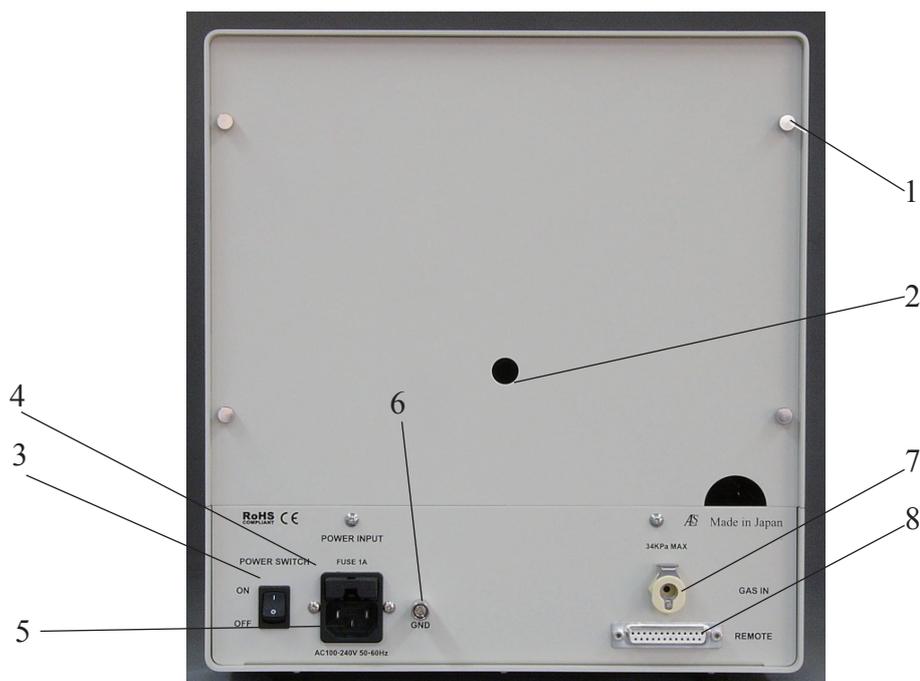


Figure 9. Rear Panel

## Remote Control Connector (DB-25 connector)

Pin #	Function
Stirrer control	
7	Digital Ground
8	Stir (active low level)
Purge Control	
7	Digital Ground
21	Purge (active low level)

If Stirrer and gas purge controlled by potentiostats, please use CB-ES Remote cable (012074), and 25pin connector plug into remote control connector into CS-3A cell stand, and 3 kinds of wires connect with TTL terminal of potentiostats, and please check above table.

Black wire: Ground, Red wire: Stir, Black wire: Purge



## Gas Purge

### Test Sample

The flow rate of the gas and whether it is directed toward purging or blanketing the sample is controlled by a front panel knob and switch Figure 8, No. 14 and 15.

When toggled to the ON position, the gas flow is diverted to the purge tube and cannot be changed by REMOTE control. When switched to the OFF/REMOTE position, the gas is directed to the BLANKET tube. It must be in this position to control PURGE via external control through the REMOTE connector on the rear panel. Thus, without REMOTE control the ON position activates the PURGE line and the REMOTE position activates the blanket line. For REMOTE control of PURGE and BLANKET functions, the switch must be in the REMOTE position. The rate of flow is controlled by rotating the knob labeled Test Sample. Counterclockwise rotations will increase the flow, clockwise rotation will decrease the flow to the cell. The LED is flashing when the purge function is switched on, manually or remotely.

### Stir

The CS-3A Cell Stand has a magnetic stirrer built into the unit. The stirring functions on, off and rate can be controlled by the front switches.

The switch under the STIR label controls whether the stirrer is ON or OFF or is controlled remotely (See Figure 8, No. 10). The ON position overrides all other commands and turns the stirrer motor on. The REMOTE position is equivalent to off in manual operation but is the required position for turning on the stirrer by external (REMOTE) control.

The rate of stirring is controlled by the knob directly to the right of the control switch. The “O” position is no stirring and the stir rate increases with an increase in the position number. The LED is flashing when the stir function is switched on, manually or remotely.

### Remote control

The remote connector of the CS-3A cell stand allows the stirring and gas purge functions to be controlled by an external unit. CS-3A was specifically designed to be controlled by the appropriate commands from CHI Electrochemical Analyzer. These functions can be activated from any controller providing a contact closure to ground and at 5V DC and 100 mA power supply.

**Warning** Do not use Hydrogen gas as purge, because teflon tubing is used for gas flow, and small molecule such as hydrogen is penetrated from teflon tubing. Hydrogen gas has possibility to leak from teflon tubing. Please use inert gas such as nitrogen gas or argon gas as purge purpose.

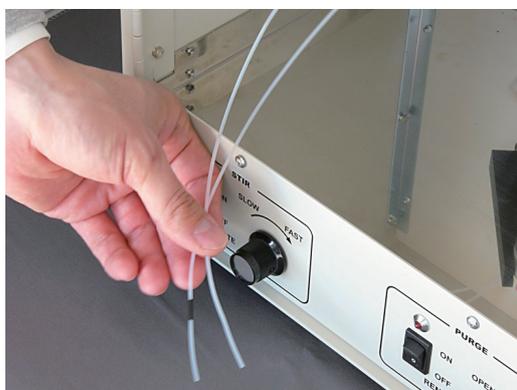
## Faraday cage and cell holder

The Faraday cage will shield the cell from most electrical interferences. The cell door must be closed during the experiments for proper shielding. The Faraday cage should be on a relatively vibration free table and the Faraday cage should not be moved during the experiment. Movement of the cell leads during an experiment may result in a noisy voltammogram.

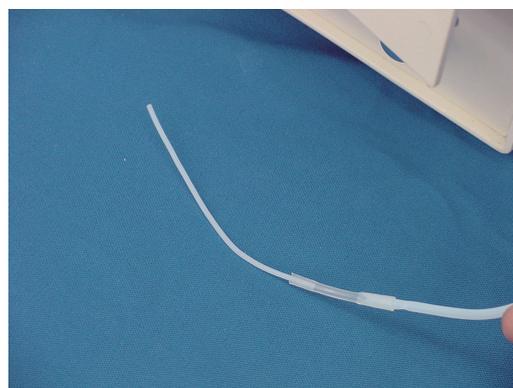
Unconnected wires (cell leads) passing through the wall of the faraday cage are sources of line frequency interference for small signals. For best results, remove any unnecessary leads and properly ground line.

The cell is placed on the stainless steel drip pan in the Faraday cage. The teflon cap is moved down onto the glass cell. The electrodes are inserted into the teflon cap and electrode connections made. The teflon cap slides out of the cell top positioner for easy cleaning.

### <Connection with Blanket tubing>



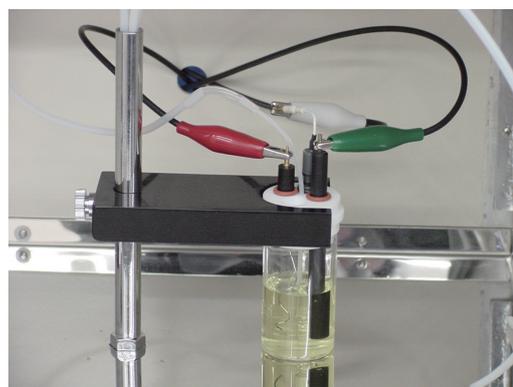
There are 2 kinds of teflon tubing, and please select blanket tubing. 1/16" teflon tubing is connected with blanket tubing using silicone tubing.



If blanket tubing is not inserted into silicon tubing, cut teflon tubing at sharp angle by razor, and top of tubing is dipped into water. It goes into silicon tubing smoothly, and jointed with it completely.



1/16" teflon tubing is passed into center of teflon cap, and positioned on the sample. Inert gas is purged into air space.



After blanket tubing is fixed, working, counter and reference electrode are set into cell vial.

## Set up for Pico Ampere booster (Option)

Pico Ampere booster is designed to measure low current under Cyclic Voltammetry (CV) techniques. There are 2 kinds of pico ampere booster for Model 600A/B/C series, and Model 700A/B/C series.

They can not combine with other instruments. When the Pico ampere booster is connected with Model 600A/B/C series, the sensitivity scale is at or below  $1 \times 10^{-8} \text{ A/V}$ , and it will be enabled. Otherwise it will be disabled.

### Removal of back panel

The back panel may be easily removed by unscrewing the four screws shown in Figure 10, and take it away in Fig 11.



Figure 10. Unscrewing the four screws



Figure 11. Removal of back panel

### Fixation of pico ampere booster

After the back panel is removed, and please check position to fix pico ampere booster in Fig 11A, and then drill the four holes for screw in Fig 11B, and then pico ampere booster is fixed on the back panel by 4 screws shown in Figure 12, and the back panel is back to CS-3A cell stand using screwing the four thumb screws in Fig 13.

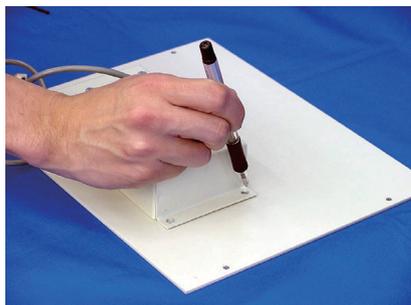


Figure 11A. Check to position the pico ampere booster



Figure 11B. Drill 4 hole for screws

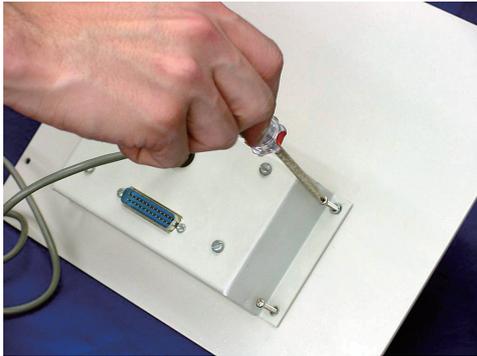


Fig 11C. Pico ampere booster is fixed by screws

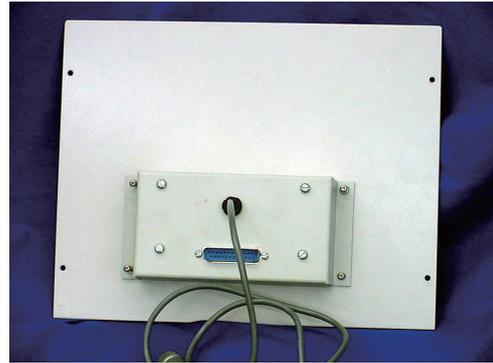


Fig 11D. Pico ampere booster is on the CS-3A back panel



Figure 12. Back panel is returned to CS-3A



Figure 13. cell cable plugs into cell leads connector

### Cable connection

Cable for pico ampere booster is connected at electrode connector, and DB-25 interface cable connects the DB-25 connector of the pico ampere booster to the cell control connector at the rear panel of instruments in Fig 14.

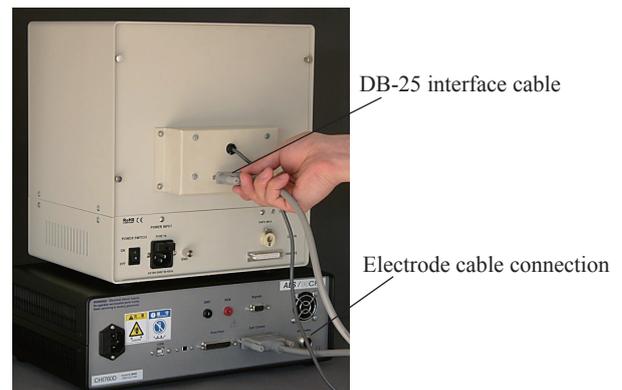


Figure 14. Cable connection

## Repolishing Electrodes

1. Carefully remove the electrode as outlined above.
2. Polish the electrode according to instructions using the PK-3 Polishing Kit

The objective of polishing the electrode is to remove the products of the redox reaction or physical adsorption which accumulate during some experiments. The rate of electrode coating (and corresponding decrease in responsiveness) will depend upon the following factors:

1. Analyte molecule
2. Concentration of the analyte molecule
3. Composition of stationary phase
4. Applied potential
5. Frequency of use

Electrodes used in electrochemistry may need repolishing after each experiment, depending on the application. Rotating disk and hydrodynamic modulation applications have the advantage of a moving solution which helps to remove redox products and often deals with lower concentrations of analyte than are typically seen with voltammetry methods in non-stirred solutions. The need for polishing varies greatly with the application. Polishing is justified when a gradual decrease in electrode response is observed. Electrodes also can accumulate contaminants by adsorption from the environment. Cigarette smoke, aerosols, and other airborne materials can be adsorbed quite easily.

The polishing process should remove a negligible amount of electrode material. A series of one to three different abrasive systems are used, progressing from coarse particle sizes to very fine polishing powders. Most electrode surfaces need only a single polishing step to physically remove the contaminants. Rare metal (gold, silver, and platinum) electrodes may do best with either an alumina or a diamond polishing. It is best to start with the diamond polish and then determine if the desired results are obtained with that step alone.

Chemically modified (gold/mercury amalgam) and glassy carbon electrodes tend to require a two or three step series of abrasives to restore the original mirror like finish.

All polishing steps require extensive rinsing of the electrode before moving onto the next stage.

Without thorough rinsing, minute particulates from the previous polishing step will hinder the progression towards a finely polished surface. A major concern to polishing is that you do not corrode the softer electrode material below the level of the supporting plastic or glass. This can be avoided by always polishing the electrode on a very flat surface. Always follow the general precautions listed below when handling your working electrode:

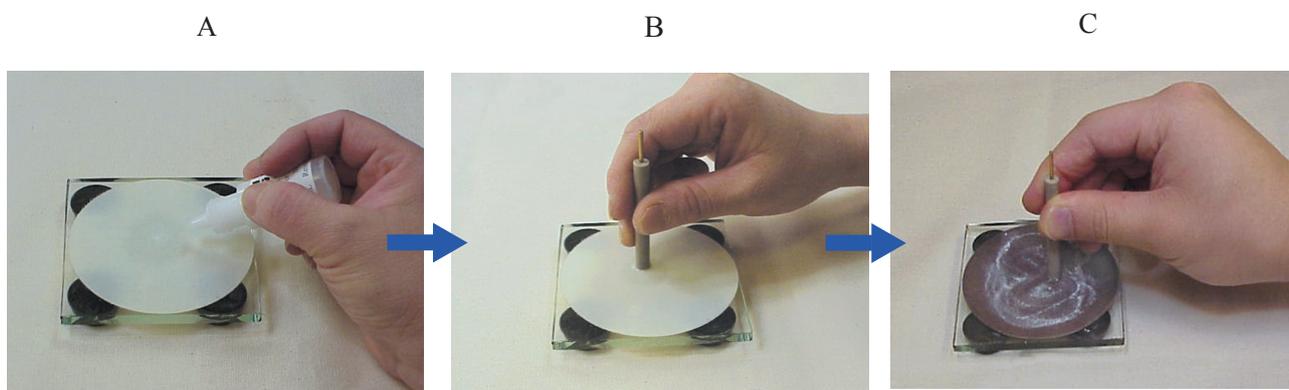
1. It is important that you use only ALS polishing materials and that you follow the recommended procedure, the PK-3 kit provides the materials needed for all polishing procedures.

2. Polish the electrode on pads attached to glass plate provided in PK-3 kit. While polishing, you must keep the electrode surface parallel to the surface of the glass as possible. This is especially important with the RRDE or RDE Working Electrodes and will ensure that the surrounding plastic is not worn unevenly. You must be sure to polish very slowly to maintain the surface as flat as possible. Any deviation will be obvious when the electrode rotates.

3. Never attempt to remove the actual electrode material from the supporting plastic. This will destroy the electrode.

4. Do not heat the electrodes when drying; allow them to dry at room temperature. Heating will cause problems due to the difference in the coefficients of expansion to the electrode material and the supporting plastic or glass.

5. You must be very careful to ensure that no debris enters the open back of the electrode body. The opening must be kept clean in order for the spring loaded pin to effectively contact the electrode material.



Rinse the electrode surface with water, and gently wipe dry using a fresh kimwipe. Polishing pad is attached to glass plate, and apply a few drops of the 1-um diamond polish slurry.

Place the electrode face down on the pad. Using a smooth circular or figure-eight motion and even pressure, move the electrode all over the pad. After 1-2 minutes, remove the electrode and rinse away with distilled water.

Turn over the glass and wet the micro-cloth disk surface with DISTILLED water. Shake the alumina suspension and add several drops of alumina polish, spacing them evenly around the pad surface.

## Chapter 5 Service

This section describes some general cautions, maintenance points, electronic troubleshooting, and the procedure for obtaining service.

### Caution and general maintenance

This is a very rugged instrument and proper care should give years of service. Following is a brief list of cautions and general maintenance considerations that will extend its lifetime. Follow customary, good laboratory practices. Clean all spills, especially salt solutions, from on or near the lab cabinet immediately. Avoid placing unit in a corrosive atmosphere. Avoid dropping, shaking, and other forms of mechanical abuse since this could cause loosening of components or subassemblies. Clean gas lines, i.e., rinse and wipe dry, after each use. Do not bend counter electrode (platinum wire) when removing or placing cell vial. Repeated bending will cause the wire to break.

### Procedure

There are no user serviceable parts in this unit and all service requests should be referred to local distributor or ALS service department. In certain cases, ALS will provide electronic schematics and service procedures to qualify electronic maintenance facilities but only upon written request and then only on the approval of the Service manager. If a problem arises and appears equipment oriented, please contact with local distributor or our customer service by e-mail.

## Appendix. Accessories for CS-3A cell stand and CV electrode

<b>Cat.No</b>	<b>Product Description</b>	<b>Specification</b>	
002408	PFCE 3 Carbon electrode OD:6mm ID:3mm*	OD:6mm	ID:3.0mm
002409	PFCE 1 Carbon electrode OD:6mm ID:1mm*	OD:6mm	ID:1.0mm
012745	LPTE Platinum electrode OD:6mm ID:3mm L:110mm	OD:6mm	ID:3.0mm
002420	PTE Platinum electrode OD:10mm ID:5mm	OD:10mm	ID:5.0mm
002422	PTE Platinum electrode OD:6mm ID:3mm	OD:6mm	ID:3.0mm
002013	PTE Platinum electrode OD:6mm ID:1.6mm	OD:6mm	ID:1.6mm
002313	SPTE Platinum electrode OD:3mm ID:1.6mm	OD:3mm	ID:1.6mm
012744	LGCE Glassy carbon electrode OD:6mm ID:3mm L:110mm	OD:6mm	ID:3.0mm
002417	GCE Glassy carbon electrode OD:10mm ID:5.0mm	OD:10mm	ID:5.0mm
002012	GCE Glassy carbon electrode OD:6mm ID:3mm	OD:6mm	ID:3.0mm
012297	GCE Glassy carbon electrode OD:6mm ID:1.6mm	OD:6mm	ID:1.6mm
002411	GCE Glassy carbon electrode OD:6mm ID:1mm	OD:6mm	ID:1.0mm
012298	SGCE Glassy carbon electrode OD:3mm ID:1.6mm	OD:3mm	ID:1.6mm
002412	SGCE Glassy carbon electrode OD:3mm ID:1mm	OD:3mm	ID:1.0mm
012746	LAUE Gold electrode OD:6mm ID:3mm L:110mm	OD:6mm	ID:3.0mm
002418	AUE Gold electrode OD:10mm ID:5mm	OD:10mm	ID:5.0mm
002421	AUE Gold electrode OD:6mm ID:3mm	OD:6mm	ID:3.0mm
002014	AUE Gold electrode OD:6mm ID:1.6mm	OD:6mm	ID:1.6mm
002314	SAUE Gold electrode OD:3mm ID:1.6mm	OD:3mm	ID:1.6mm
002416	AGE Silver electrode OD:10mm ID:5mm	OD:10mm	ID:5.0mm
002011	AGE Silver electrode OD:6mm ID:1.6mm	OD:6mm	ID:1.6mm
002419	AGE Silver electrode OD:6mm ID:3mm	OD:6mm	ID:3.0mm
002019	PDE Palladium electrode OD:6mm ID:1.6mm	OD:6mm	ID:1.6mm
002319	SPDE Palladium electrode OD:3mm ID:1.6mm	OD:3mm	ID:1.6mm
002016	NIE Nickel electrode OD:6mm ID:1.5mm	OD:6mm	ID:1.5mm
002017	CUE Copper electrode OD:6mm ID:1.6mm	OD:6mm	ID:1.6mm
012584	CUE Copper electrode OD:6mm ID:3mm	OD:6mm	ID:3.0mm
002018	FEE Iron electrode OD:6mm ID:1.5mm	OD:6mm	ID:1.5mm
012585	FEE Iron electrode OD:6mm ID:3mm	OD:6mm	ID:3.0mm
002250	Platinum gauze electrode 80mesh	80mesh	
002251	Gold gauze electrode 100mesh	100mesh	
002210	CPE Carbon paste electrode OD:6mm ID:3mm	OD:6mm	ID:3.0mm
002223	SCPE Carbon paste electrode OD:3mm ID:1.6mm	OD:3mm	ID:1.6mm
001010	CPO Carbon paste oil base (1g)		
002252	PGBE Pyrolytic Graphite electrode (Basal Plane) OD:6mm ID:3mm	OD:6mm	ID:3.0mm
002253	PGEE Pyrolytic Graphite electrode (Edge Plane) OD:6mm ID:3mm	OD:6mm	ID:3.0mm
	Microelectrode		
002007	MCE Micro Carbon fiber electrode OD:4mm ID:7um	OD:4mm	ID:7um
002002	MCE Micro Carbon fiber electrode OD:4mm ID:33um	OD:4mm	ID:33um
002005	MPTE Micro Platinum electrode OD:4mm ID:10um	OD:4mm	ID:10um
002015	MPTE Micro Platinum electrode OD:4mm ID:15um	OD:4mm	ID:15um
002003	MPTE Micro Platinum electrode OD:4mm ID:25um	OD:4mm	ID:25um
002009	MPTE Micro Platinum electrode OD:4mm ID:100um	OD:4mm	ID:100um
002006	MAUE Micro gold electrode OD:4mm ID:10um	OD:4mm	ID:10um
002004	MAUE Micro Gold electrode OD:4mm ID:25um	OD:4mm	ID:25um
002010	MAUE Micro Gold electrode OD:4mm ID:100um	OD:4mm	ID:100um
002271	MCUE Micro Copper electrode OD:4mm ID:25um	OD:4mm	ID:25um
002272	MWE Micro Tungsten electrode OD:4mm ID:10um	OD:4mm	ID:10um
002273	MNIE Micro Nickel electrode OD:4mm ID:100um	OD:4mm	ID:100um

\*PFCE(Plastic Formed Carbon) was developed by Mitsubishi pencil co and National Institute of Advanced Industrial Science and Technology.

## Appendix. Accessories and Reference electrodes

Cat.No	Product Description	Specification	
012167	RE-1B Reference electrode (Ag/AgCl)	Length:80mm	OD:6.0mm
013393	RE-1S Reference electrode (Ag/AgCl)	Length:50mm	OD:4.5mm
013429	RE-1CP Reference electrode (Ag/AgCl/Saturated KCl)	Length:90mm	OD:6.0mm
002056	RE-2B Calomel Reference electrode	Length:96mm	OD:6.0mm
013431	RE-2CP Reference electrode	Length:90mm	OD:6.0mm
012169	RE-3V Reference electrode screw type (Ag/AgCl)	Length:51.5mm	OD:10.0mm
012170	RE-3VP Reference electrode screw type (Ag/AgCl)	Length:51.5mm	OD:10.0mm
012171	RE-7 Non Aqueous reference electrode (Ag/Ag <sup>+</sup> )	Length:81mm	OD:6.0mm
012057	RE-7 Teflon cap with Ag wire		
013394	RE-7S Non Aqueous reference electrode (Ag/Ag <sup>+</sup> )	Length:62mm	OD:4.5mm
012058	RE-7S Teflon cap with Ag wire		
012549	RE-7 Electrolyte solution (10mL)		
012173	RE-7V Non Aqueous reference electrode screw type (Ag/Ag <sup>+</sup> )	Length:52mm	OD:10.0mm
012174	RE-7VP Non Aqueous reference electrode screw type (Ag/Ag <sup>+</sup> )	Length:52mm	OD:10.0mm
013395	RE-6AP Reference electrode for alkaline solution	Length:92mm	OD:6.0mm
012108	RE-PV Preservative vial for reference electrode		
002247	O-ring for CV electrode (10pcs)	10pcs	
012177	Sample holder dia 9mm (2pcs)	9mm Dia X 2pcs	
012307	Sample holder dia 9mm (22pcs)	9mm Dia X 22pcs	
012176	Sample holder dia 6mm (2pcs)	6mm Dia X 2pcs	
012306	Sample holder dia 6mm (22pcs)	6mm Dia X 22pcs	

Cat.No	Product Description	Specification	
013223	PK-3 Electrode Polishing kit		
<Contents of PK-3>			
012620	0.05um polishing alumina (20mL)	20 mL	
012621	1um polishing diamond (10mL)	10 mL	
-	Alumina polishing pad (10pcs)	10 pcs	
-	Diamond polishing pad (10pcs)	10 pcs	
013222	Replacement glass plate for PK-3	1 pc	
<Contents of PK-2>			
012620	0.05um polishing alumina (20mL)	20 mL	
012621	1um polishing diamond (10mL)	10 mL	
013234	6um polishing diamond (10mL)	10 mL	
012600	Alumina polishing pad (20pcs)	20 pcs	
012601	Diamond polishing pad (20pcs)	20 pcs	
012610	Coarse polishing Pad (20pcs)	20 pcs	
012611	Emery paper UF800 (20pcs)	20 pcs	
013225	SK-2 Electrochemical accessories kit		



# DECLARATION OF CONFORMITY

BAS INC

No. 1-36-6, Oshiage, Sumida-ku, Tokyo, 131-0045, Japan

Declare under our sole responsibility that the product;

Product : Cell Stand  
Model : CS-3A

To which this declaration relates is in conformity with the following standards or other normative documents;

EN61326-1: 2006  
EN61326-2-1: 2006  
EN61000-3-2: 2006

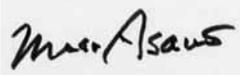
following the provisions of Directives;

2004/108/EC                      Electromagnetic Compatibility Directive  
and its amending directives:92/31/EEC, 93/68/EEC

Tokyo, Japan  
(Place)

Oct 30, 2009  
(Date of issues)

Masao Asano  
name

  
signature