S500

Administrative Guide

PA-939 Rev. B / October 2007

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WARRANTY

Keithley Instruments, Inc. warrants this product to be free from defects in material and workmanship for a period of one (1) year from date of shipment.

Keithley Instruments, Inc. warrants the following items for 90 days from the date of shipment: probes, cables, software, rechargeable batteries, diskettes, and documentation.

During the warranty period, Keithley Instruments will, at its option, either repair or replace any product that proves to be defective.

To exercise this warranty, write or call your local Keithley Instruments representative, or contact Keithley Instruments headquarters in Cleveland, Ohio. You will be given prompt assistance and return instructions. Send the product, transportation prepaid, to the indicated service facility. Repairs will be made and the product returned, transportation prepaid. Repaired or replaced products are warranted for the balance of the original warranty period, or at least 90 days.

LIMITATION OF WARRANTY

This warranty does not apply to defects resulting from product modification without Keithley Instruments' express written consent, or misuse of any product or part. This warranty also does not apply to fuses, software, non-rechargeable batteries, damage from battery leakage, or problems arising from normal wear or failure to follow instructions.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE. THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES.

NEITHER KEITHLEY INSTRUMENTS, INC. NOR ANY OF ITS EMPLOYEES SHALL BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF ITS INSTRUMENTS AND SOFTWARE, EVEN IF KEITHLEY INSTRUMENTS, INC. HAS BEEN ADVISED IN ADVANCE OF THE POSSIBILITY OF SUCH DAMAGES. SUCH EXCLUDED DAMAGES SHALL INCLUDE, BUT ARE NOT LIMITED TO: COST OF REMOVAL AND INSTALLATION, LOSSES SUSTAINED AS THE RESULT OF INJURY TO ANY PERSON, OR DAMAGE TO PROPERTY.

KEITHLEY

A GREATER MEASURE OF CONFIDENCE

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Safety Precautions

The following safety precautions should be observed before using this product and any associated instrumentation. Although some instruments and accessories would normally be used with non-hazardous voltages, there are situations where hazardous conditions may be present.

This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid possible injury. Read and follow all installation, operation, and maintenance information carefully before using the product. Refer to the user documentation for complete product specifications.

If the product is used in a manner not specified, the protection provided by the product warranty may be impaired.

The types of product users are:

Responsible body is the individual or group responsible for the use and maintenance of equipment, for ensuring that the equipment is operated within its specifications and operating limits, and for ensuring that operators are adequately trained.

Operators use the product for its intended function. They must be trained in electrical safety procedures and proper use of the instrument. They must be protected from electric shock and contact with hazardous live circuits.

Maintenance personnel perform routine procedures on the product to keep it operating properly, for example, setting the line voltage or replacing consumable materials. Maintenance procedures are described in the user documentation. The procedures explicitly state if the operator may perform them. Otherwise, they should be performed only by service personnel.

Service personnel are trained to work on live circuits, perform safe installations, and repair products. Only properly trained service personnel may perform installation and service procedures.

Keithley Instruments products are designed for use with electrical signals that are rated Measurement Category I and Measurement Category II, as described in the International Electrotechnical Commission (IEC) Standard IEC 60664. Most measurement, control, and data I/O signals are Measurement Category I and must not be directly connected to mains voltage or to voltage sources with high transient over-voltages. Measurement Category II connections require protection for high transient over-voltages often associated with local AC mains connections. Assume all measurement, control, and data I/O connections are for connection to Category I sources unless otherwise marked or described in the user documentation.

Exercise extreme caution when a shock hazard is present. Lethal voltage may be present on cable connector jacks or test fixtures. The American National Standards Institute (ANSI) states that a shock hazard exists when voltage levels greater than 30V RMS, 42.4V peak, or 60VDC are present. A good safety practice is to expect that hazardous voltage is present in any unknown circuit before measuring.

Operators of this product must be protected from electric shock at all times. The responsible body must ensure that operators are prevented access and/or insulated from every connection point. In some cases, connections must be exposed to potential human contact. Product operators in these circumstances must be trained to protect themselves from the risk of electric shock. If the circuit is capable of operating at or above 1000V, no conductive part of the circuit may be exposed.

Do not connect switching cards directly to unlimited power circuits. They are intended to be used with impedance-limited sources. NEVER connect switching cards directly to AC mains. When connecting sources to switching cards, install protective devices to limit fault current and voltage to the card.

Before operating an instrument, ensure that the line cord is connected to a properly-grounded power receptacle. Inspect the connecting cables, test leads, and jumpers for possible wear, cracks, or breaks before each use.

When installing equipment where access to the main power cord is restricted, such as rack mounting, a separate main input power disconnect device must be provided in close proximity to the equipment and within easy reach of the operator.

For maximum safety, do not touch the product, test cables, or any other instruments while power is applied to the circuit under test. ALWAYS remove power from the entire test system and discharge any capacitors before: connecting or disconnecting cables or jumpers, installing or removing switching cards, or making internal changes, such as installing or removing jumpers.

Do not touch any object that could provide a current path to the common side of the circuit under test or power line (earth) ground. Always make measurements with dry hands while standing on a dry, insulated surface capable of withstanding the voltage being measured.

The instrument and accessories must be used in accordance with its specifications and operating instructions, or the safety of the equipment may be impaired.

Do not exceed the maximum signal levels of the instruments and accessories, as defined in the specifications and operating information, and as shown on the instrument or test fixture panels, or switching card.

When fuses are used in a product, replace with the same type and rating for continued protection against fire hazard.

Chassis connections must only be used as shield connections for measuring circuits, NOT as safety earth ground connections.

If you are using a test fixture, keep the lid closed while power is applied to the device under test. Safe operation requires the use of a lid interlock.

If a ⏚ screw is present, connect it to safety earth ground using the wire recommended in the user documentation.

The ⚠ symbol on an instrument indicates that the user should refer to the operating instructions located in the user documentaion.

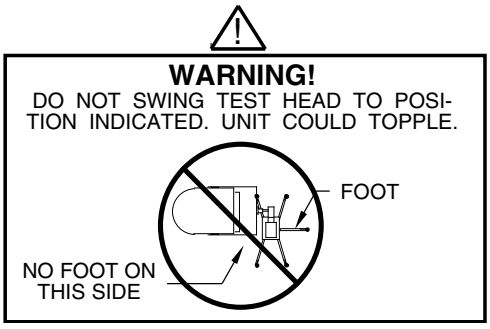
The ⚠ symbol on an instrument shows that it can source or measure 1000V or more, including the combined effect of normal and common mode voltages. Use standard safety precautions to avoid personal contact with these voltages.

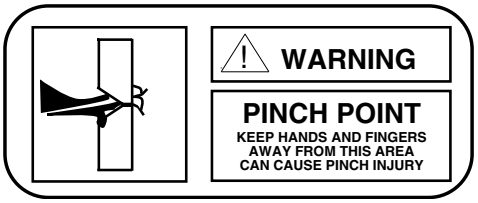
The ⚠ symbol on an instrument shows that the surface may be hot. Avoid personal contact to prevent burns.

The ⏚ symbol indicates a connection terminal to the equipment frame.

If this Hg symbol is on a product, it indicates that mercury is present in the display lamp. Please note that the lamp must be properly disposed of according to federal, state, and local laws.

The **WARNING** heading in a manual explains dangers that might result in personal injury or death. Always read the associated information very carefully before performing the indicated procedure.





The **CAUTION** heading in the user documentation explains hazards that could damage the instrument. Such damage may invalidate the warranty.

Instrumentation and accessories shall not be connected to humans.

Before performing any maintenance, disconnect the line cord and all test cables.

To maintain protection from electric shock and fire, replacement components in mains circuits - including the power transformer, test leads, and input jacks - must be purchased from Keithley Instruments. Standard fuses with applicable national safety approvals may be used if the rating and type are the same. Other components that are not safety-related may be purchased from other suppliers as long as they are equivalent to the original component (note that selected parts should be purchased only through Keithley Instruments to maintain accuracy and functionality of the product). If you are unsure about the applicability of a replacement component, call a Keithley Instruments office for information.

To clean an instrument, use a damp cloth or mild, water-based cleaner. Clean the exterior of the instrument only. Do not apply cleaner directly to the instrument or allow liquids to enter or spill on the instrument. Products that consist of a circuit board with no case or chassis (e.g., a data acquisition board for installation into a computer) should never require cleaning if handled according to instructions. If the board becomes contaminated and operation is affected, the board should be returned to the factory for proper cleaning/servicing.

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S500
Administrative Guide

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I. System Description

The S500 is an instrument based system configuration from Keithley Instruments primarily for semiconductor parametric characterization testing. The system has a wide degree of hardware flexibility enabling users to configure systems better suited for their applications. The table below and Figure 1 describe the configuration details for the system.

Table 1
S500 system configuration choices:

Series 2600 System SourceMeters®	▪ 0 to 22 ▪ Any combination of 2612s and/or 2636s. ▪ Maximum number of units depends on other items in the system rack (eg., PC, switch, 4200, etc...)
Model 4200-SCS/C Semiconductor Characterization System	▪ 0 to 1 ▪ With 4200-SMUs, 4210-SMUs, 4200-CVU, 4205-PG2s, 4200-PIV, and other 4200 options. ▪ A flat panel display option must be chosen with a 4200 in the system.
Switching	▪ One of the following four choices: 1. None 2. 0 to 1 ea. 708A. Choice of switching card: a) 1 ea. 7072, or b) 1 ea. 7072-HV, or c) 1 ea. 7174A 3. 0 to 1 ea. 707A. Choice of switching cards: a) 1 to 6 ea. 7072, or b) 1 to 6 ea. 7072-HV, or c) 1 to 6 ea. 7174A 4. 0 to 6 ea. 3706-S. Choice of switching cards (per mainframe): a) 1 to 6 ea. 3720, or b) 1 to 6 ea. 3721, or c) 1 to 6 ea. 3722, or d) 1 to 6 ea. 3723, or e) 1 to 6 ea. 3730, or f) 1 to 6 ea. 3740
Agilent 4980 LCR Meter	▪ 0 to 1
3402 Pulse Pattern Generator	▪ 0 to 1 ▪ 3401-R or 3402-R
Computer selection	▪ None ▪ Computer in the cabinet ▪ Computer external to the cabinet
Flat Panel Display selection	▪ None ▪ Pull-out flip-open monitor (with integrated keyboard) ▪ Stand-alone monitor

Examples of other items and accessories to accompany S500 system:

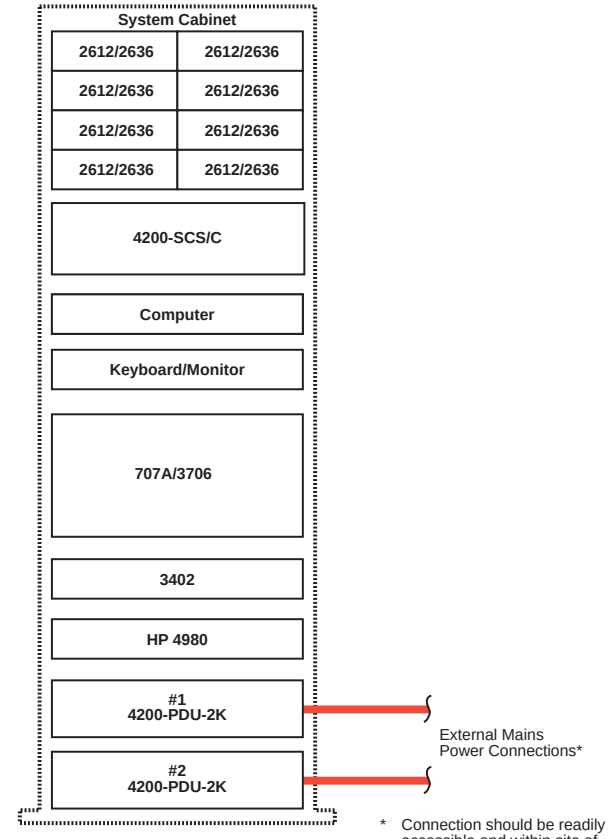
1. Cables (from system to probe station)
2. 9139A probe card adapter
3. ACS (Automated Characterization Suite)

There are several options for system software within the S500.

1. Because the S500 includes the 4200-SCS Semiconductor Characterization system, the KTE Interactive software within this product can serve as the system software. KTE Interactive includes Keithley User Library Tool (KULT) which enables users to develop specific test modules, or serves as a means for Keithley to provide system software customization.
2. For higher levels of automation or for S500 system software, Keithley can provide its Automated Characterization Suite (ACS). Keithley refers to such systems comprised of ACS and various instrumentation as “ACS integrated test systems”. These are highly configurable and flexible instrument-based systems intended to work with semi-automatic and fully automatic probe stations for applications such as semiconductor device characterization, wafer level reliability (WLR), parametric testing, and component functional testing.
3. Users can also develop and manage their own system software.

Keithley Instruments can also supply various cables that interface to test fixtures such as wafer probers as well as a probe card adaptor (PCA).

Figure 1
Block diagram of typical S500 configuration



II. Equipment Startup

All of the instruments in the equipment rack will be connected to one or two PDUs (Power Distribution Units) depending on configuration. They will be located at the bottom of the rack. If there are two, they will be mounted back to back so that one would be located at the front of the cabinet and one at the back of the cabinet. If there is only one, it will be located at the rear of the cabinet.

NOTE	***Check that all line cords for the system cabinet are connected to AC power line receptacles. Make sure the PDU (Power Distribution Unit) circuit breaker is in the ON position. Also, make sure the monitor is turned on.***

On the front of the system, turn the power switch to the ON position. The power switch will be located on a panel on the front door of the cabinet or on the power panel near the top of the rack depending on which cabinet option is selected. One cabinet option has a front door and one has no front door. For the remainder of this manual, when referring to system cabinet power it refers to the power switch either on the cabinet door or the panel mounted in the rack.

Emergency Off (EMO) button

An Emergency Off (EMO) button is provided either on the system cabinet door or mounted near the top of the rack if the cabinet option without the door is selected. Pushing this button shuts down power to all system cabinet equipment (computers mounted in the cabinet can bypass the EMO button). The EMO Tripped indicator light turns on when the system has undergone an emergency shutdown. The power can only be turned back on by turning the EMO button to release it and toggling the power switch from ON to OFF (EMO Reset), and then back to ON again. This reset operation is the same for the EMO panel in the door or the EMO panel in the cabinet rack.

III. Maintenance

Hardware Replacement

WARNING	***The information in this section is intended only for qualified service personnel. Some of the procedures may expose you to hazardous voltages that could result in personal injury or death. Do not attempt to perform these procedures unless you are qualified to do so.***

This section provides information on removal and installation of system cabinet components. Use this section to replace components determined to be faulty.

Handling and cleaning precautions

CAUTION	***Contamination will degrade the performance of the components. To avoid contamination, always grasp cards by the side edges and shields. Do not touch the connectors, the board surfaces, or components. On plugs and receptacles, do not touch areas adjacent to the electrical contacts.***

Because of high impedance areas, take care when handling or servicing to prevent possible contamination, which could degrade performance. Take the following precautions when servicing any system component:

- Do not store or operate the system in an environment where dust could settle on the components.
- Use dry nitrogen gas to clean dust off the components, if necessary.
- Handle cards only by the side edges and shields. Do not touch any board surfaces, components, or connectors. Do not touch areas adjacent to electrical contacts.

- When servicing any component, wear clean cotton gloves.
- If making solder repairs on a circuit board, use an OA-based (organically activated) flux. Remove the flux from the work areas when the repair is complete. Use pure water along with plenty of clean cotton swabs or a clean soft brush to remove the flux. Take care not to spread the flux to other areas of the components. Once the flux is removed, swab only the repaired area with methanol, then blowdry the board with dry nitrogen gas.
- After cleaning, place the components in a 50°C low humidity environment for several hours before use.

Special handling of static-sensitive devices

CAUTION	***System components can be damaged by electrostatic discharge (ESD). Wear a ground strap and attach the clip lead to the grounding bar in the test head or the system cabinet frame before working on the unit. Assume all parts are static sensitive.***

High impedance devices are subject to possible static discharge damage because of the high impedance levels involved. When handling such devices, assume all parts are static sensitive:

- Such components should be transported and handled only in containers specially designed to prevent or dissipate static buildup. Typically, these components will be received in anti-static containers made of plastic or foam. Keep these parts in their original containers until ready for installation or use.
- Remove the components from their protective containers only at a properly grounded workstation. Also, ground yourself with an appropriate wrist strap while working with these components.
- Handle the connectors only by their bodies. Do not touch the boards, pins, or terminals.
- Any printed circuit board into which the device is to be inserted must first be grounded to the bench or table.
- Use only anti-static type de-soldering tools and grounded-tip soldering irons.

Electrical hazard tasks

This section contains a listing by type of energized electrical hot work tasks for type 3 or higher electrical hazard tasks. Refer to the specific diagnostics, troubleshooting, or maintenance section for specific written instructions.

Type 4 or Type 5: Live circuit tests

Live circuit tests are classified as Type 4 or Type 5 energized electrical hot work dependent on the particular circuit tested. Type 4 classification means that the equipment is energized. Live circuits are exposed and accidental contact is possible. Voltage potentials are greater than 30 volts RMS, 42.2 volts peak, 240 volt-amps, 20 joules or contains radio frequency (RF). Type 5 classification means that the equipment is energized and measurements and adjustments require physical entry into the equipment or equipment configuration will not allow the use of clamp-on probes.

Replacement

Manuals included with the system cover the individual operation and maintenance of the instruments, card file and cards.

Heavy instrument removal/installation

When installing or removing equipment over 50 lbs, use a mechanical lifting device such as the Presto Device Model M466 or equal (Figure 2). If there is an instrument mounted below the heavy instrument, it must be removed to provide clearance for the lifting forks. Refer to the lifting device operating manual for proper usage.

Figure 2
Mechanical lifting device (Presto model shown)

General replacement procedure

4. Remove power and lockout/tagout system (see Lockout/tagout in Section A of this document).
5. Disconnect and tag cabling to the unit requiring removal. Make sure not to change cable routing or securement.
6. Properly supporting unit, remove it from the system cabinet.

Removing system power

Remove system power before performing maintenance/replacement of components:

1. Shut down software. Follow precautions for removing hazardous voltage from the probe or other types of test fixture before handling.
2. Shut down the computer.
3. Place the system cabinet power switch to the OFF position.
4. If cabinet has doors, open them.
5. Place the main circuit breaker on the power distribution unit(s) in the OFF position.
6. Disconnect the source power to the S500 system (1 or 2 power cords dependant on system configuration).
7. Place the locks and tags on the source power connection, main circuit breaker, power switch, and EMO button.
8. Wait 30 minutes before accessing any high voltage units.

Calibration and Repair

Refer to individual instrument manuals for details.

Restoring system power

Restore system power after properly performing required maintenance/replacement of components:

1. Make sure all connections are secure and connected correctly.
2. Remove the locks and tags placed on the source power connection, main circuit breaker, power switch, and EMO button.
3. If necessary, connect the source power to the S500 system.
4. Place the main circuit breaker on the power distribution unit(s) in the ON position.
5. Close cabinet doors if applicable.
6. With the power switch in the OFF position, the EMO light should be off.
7. If the EMO light stays on, the power is not restored. To restore power, it may be necessary to push in and hold the Remote EMO Bypass switch until power has been restored to all units in the cell connected through the Remote or Auxiliary EMO. The Remote EMO Bypass switch is located on the front panel of the PDU (Power Distribution Units) within the system cabinet.
8. Place the system cabinet power switch in the ON position.

Fuses

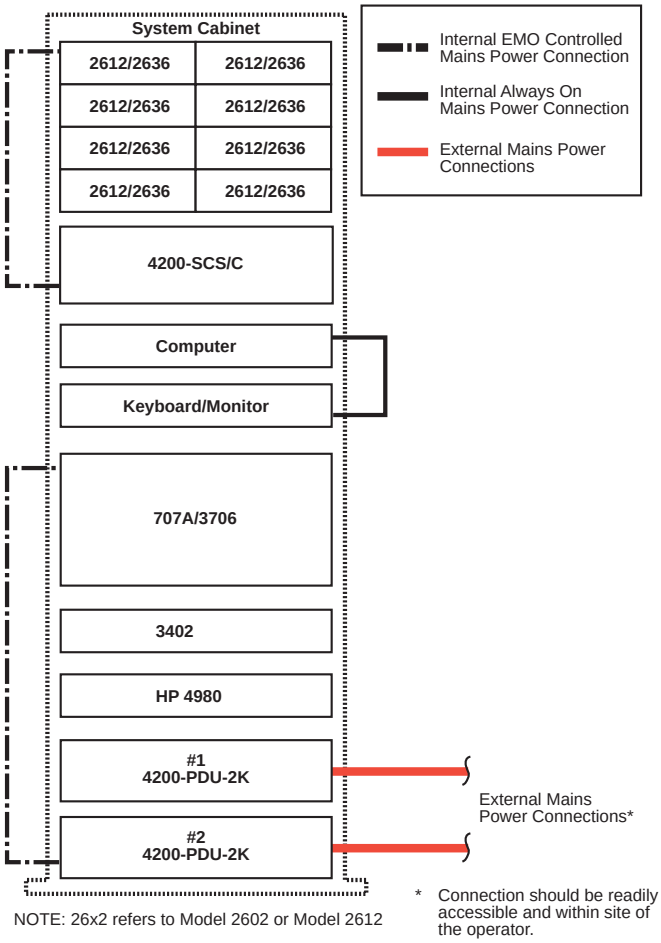
Refer to the applicable manual that is included with the product for fuse replacement.

Power distribution and EMO

System cabinet power distribution basics

Figure 3 contains simplified connection schematics for the various components of the S500.

Figure 3
Block diagram of typical S500 configuration



PDU connections and power distribution basics

The Model 42000-PDU consists of a 24 VDC output to supply EMO circuitry with power. This supply also provides 24 VDC out through banana jacks. Additional outlets provided are two specially switched power outlets (factory configuration: always on), and three strips of four switched outlets (off only with EMO condition). Control is through a 25-pin D-sub connector.

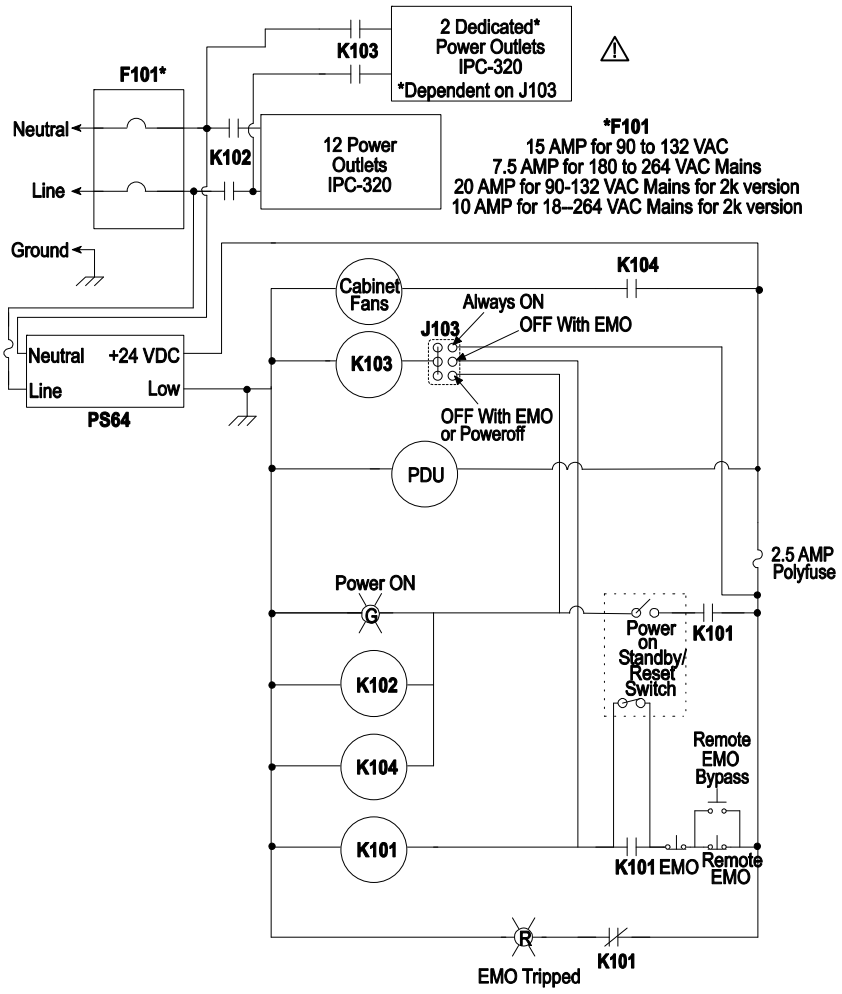
WARNING	***Properly lockout/tagout the system before beginning installation or connection. Also, never power up the system until all connections and safety grounds are installed. Make sure the main circuit breaker on the power distribution unit is placed in the OFF position before making or breaking any connections.***
WARNING	***Properly ground the 42000-PDU to avoid possible personal injury or death caused by electric shock.***

The connection schematic contained in Figure 4 provides power to the S500 cabinet fans. Figure 4 and Table 2 provide a detailed description of the available connections. Information on the EMO circuit's connection and operation is also provided. Refer to Model 42000-PDU documentation for detailed information.

Table 2
Connection descriptions

Item	Connection	Description
1.	Specially Switched Outlets	Two power outlets located on the PDU's rear panel. Do not use power outlets for accessories (e.g., soldering iron, drill, etc.). Use for instruments that do NOT have hazardous voltages and don't need to have power removed through the EMO circuit (e.g., a computer). In the factory default configuration, these outlets have dedicated power and will remain live even if power is removed through the EMO circuit. The specific configuration is marked on the PDU rear panel. Also see the note "Outlet connector description" contained at the end of this table.
2.	To PDU Box DB-25	Connector providing control of the PDU box. Connect the PDU box to the EMO box with the supplied DB-25 male to female cable.
3.	Switched Outlets	Twelve power outlets located on the PDU's rear panel. Do not use power outlets for accessories (e.g., soldering iron, drill, etc.). Use for equipment with hazardous voltages that need to be removed with the EMO circuitry. Also see the note "Outlet connector description" contained at the end of this table.
4.	Ground connection (Optional)	Connect to a quality ground within your facility with 18AWG wire.
5.	External Fan Connection	Connector providing 24VDC to cabinet fans. See Figure 4 for connection details.
6.	External EMO/Shorting Plug Connection	DB-25 providing connection to external EMO devices. Make sure the shorting plug is installed if the system is not configured for External EMO.
7.	To EMO Box DB-25	Connector providing control of the PDU box. Connect EMO box to the PDU box with the supplied DB-25 male to female cable.
8.	24 VDC (-)	Banana plug providing 24VDC (–) power connection.
9.	24 VDC (+)	- Banana plug providing 24VDC (+) power connection.
Outlet connector description: - Class 1 applications (10A International and 15A North American). - Type: push-in mount IEC 320 C14 (does NOT accept standard NEMA 2-15P power cords).		

Figure 4
42000-PDU simplified schematic



A. Site Preparation & Installation

System cabinet size and weight

The size and weight specifications for the system cabinet are listed in Table 3. See “Floor plan” for details on designing a floor plan for the system cabinet.

Table 3
System cabinet size and weight

	Weight	
Size (width x depth x height)	**Low End (min.) configuration**	**High End configuration**
23.7 x 36.2 x 75.7 in 60.1 x 92 x 192 cm	600 lbs. 273.3 kg	800 lbs. 364.4 kg

Line power requirements

Nominal*: 100V, 115V, 220V, 240V (50Hz, 60Hz)

Power consumption: Rated at 1.8kVA for the 1.5KW PDU and 2.4kVA for the 2KW PDU.

> ***NOTE*** ***There could be up to 2 PDUs in a system depending on the configuration.***

System Power Dissipation

> ***NOTE*** ***This applies to the S500 only.***

The total power dissipated by the S500 is a function of the type and number of instruments; however, the power distribution unit (PDU) limits the incoming power to these instruments. While the PDU ensures electrical safety and compliance to the required standards, it does not prevent the system from over heating. Specifically, a large number Series 2600 SourceMeter® instruments can be programmed to dissipate sufficient heat to result in exceeding the maximum specified operating temperature of the instruments within the cabinet. When a Series 2600 instrument detects and excessive heat condition, the unit turns the output off to minimize power dissipation. This safeguard prevents damage to individual 2600 instruments, but may result is test instability.

Additional details on 2600 overheating protection can be found in the *Series 2600 System SourceMeter® Reference Manual* in the *Overheating Protection* section of the *Source-Measure Concepts* section.

Environmental conditions

The S500 will not perform within specifications if operated outside of the following environmental conditions:

Temperature: 23°C ±5°C (73.4°F ±9°F)

Operating humidity: 5 to 60% RH, noncondensing

Vibration: High ambient vibration levels may require isolation pads or the repositioning of equipment.

Air quality: The S500 system is compatible for use in a Class 10 cleanroom.

Altitude: Less than 2000 meters above sea level.

Noise interference — To prevent electrical noise from interfering with measurements, the ambient AC magnetic field must not exceed 2 x 10-3 gauss.

- Avoid locating the S500 next to plasma etchers, large motors, magnets, RF transmitters, equipment with flash lamp, or other sources of potential interference.
- Run power lines in grounded conduit.
- Avoid routing signal and power cables near sources of electrical noise. Position the equipment accordingly.

Triax connector handling (contamination)

Contamination can cause current leakage in the source-measure signal paths to the DUT. Leakage current can significantly degrade the test results. Care must be taken to keep source-measure triax cable connectors (if applicable) clean and free of any foreign contaminants. DO NOT touch the connector pins of the triax connectors.

CAUTION	***Contamination will degrade the performance of the test system. To avoid contamination, DO NOT touch any connector pins or the areas adjacent to the electrical contacts of the triax connectors.***

Cleaning — Contaminated connectors can be cleaned with methanol, then blow drying with nitrogen gas. Allow 24 hours to dry.

Unpacking system components

Carefully remove all system components from the crates. While unpacking, make sure there are no signs of damage to the components. Inspect shock sensors located on outside of shipping box. If the shock sensor indicates a shock condition, conduct a very thorough inspection of all components contained in the system cabinet. Report any damage to the shipping agent immediately.

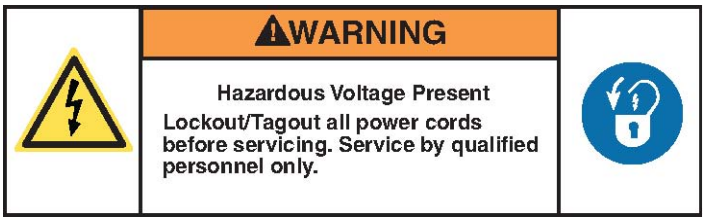
Crate 1 — System cabinet

The system cabinet is shipped from the factory with all the instruments installed. Most connections and wiring between the system cabinet instruments are made at the factory.

Crate 2 (Optional) — Computer peripherals and other accessories

A computer monitor, keyboard, and mouse. It includes required installation hardware, USB extension cables, connectors for the keyboard and mouse, and any other accessories that may have been ordered with the system.

Lockout/tagout



WARNING	***Disconnect the one or two system cabinet line cords from the AC line power receptacles before opening the system cabinet. Failure to remove line power before opening the cabinet exposes potentially high voltages to personnel. Severe personal injury due to electric shock may result if power is not removed before working inside the cabinet. Also, never power up the system until all connections and safety grounds are installed.***

When performing the removal and installation procedures in this section or any maintenance on the system, lockout and tagout line power as follows:

1. Press the Emergency Off (EMO) button on the system cabinet door. The location of the EMO is either on the front door or on a panel near the top of rack if the cabinet without the door is used.

NOTE	***Details on the "Emergency Off (EMO) button" are in Section II.***

2. Place the power switch for the PDU (Power Distribution Unit) in the OFF position. The location of the PDU is in the bottom of the cabinet facing forward. If two PDUs are present in the system, make sure to turn both power switches to the OFF position. The second PDU is in the bottom of the cabinet facing to the rear.
3. If working in the system cabinet, disconnect the system cabinet line cord(s) from the AC line power receptacles.

NOTE	***Larger S500 systems may have two Model 42000-PDU line cords. When removing power, make sure to disconnect all system cabinet line cords from AC line power receptacles.***

4. Verify that all power has been removed and discharged from the system cabinet. This can be done by switching the main power switch to the ON position. Verify that the green light does not illuminate. If light does not come on, the power is off. Turn main power switch back to the OFF position.
5. Lockout and tagout the system source power connection in accordance with your company's lockout/tagout policy. Attach a standard clamshell type of lockout device with a key lock on the male end of the disconnected line cords.

Installation and connections

WARNING	***The following installation and connection procedures are to be performed by trained site installers who are familiar with the associated physical and electrical hazards.***
NOTE	***Larger S500 systems may have two Model 42000-PDU line cords. Plug each PDU line cord into a separate 15A or 20A circuit depending type of system.***

Position the system cabinet

The system cabinet contains the controller and instrumentation for the test system. The cabinet is on casters allowing it to be rolled on a hard surface floor. The two steering casters in back swivel, while the two casters at the front are in fixed positions.

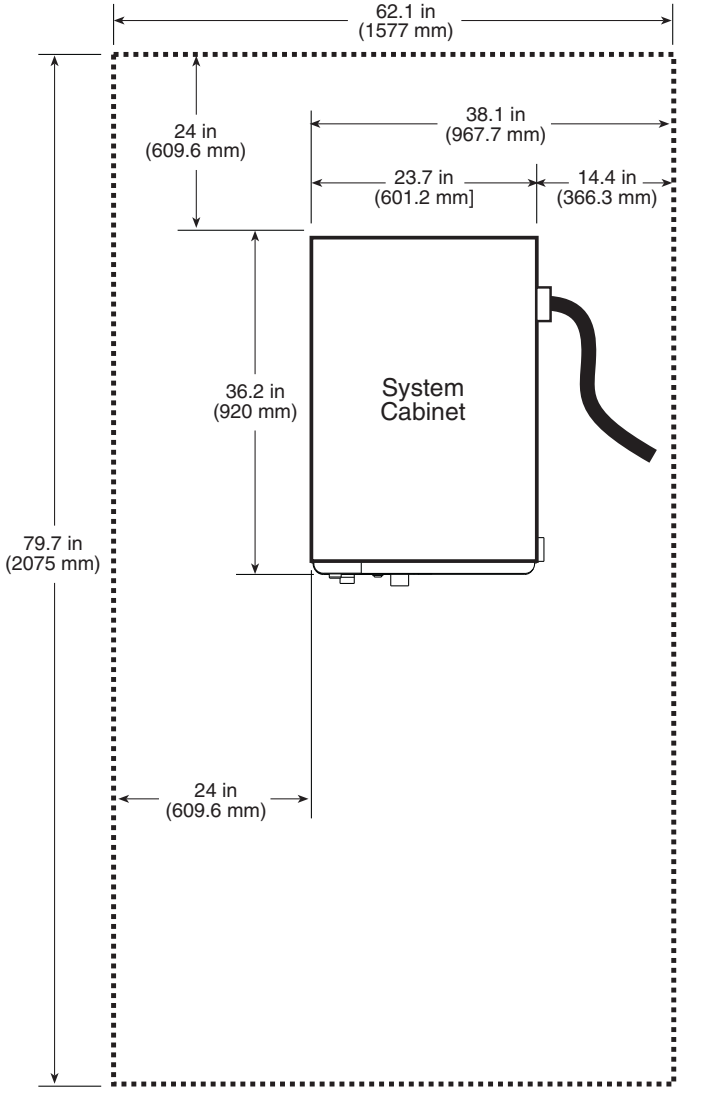
1. Carefully roll the system cabinet to its desired location next to the prober. Allow approximately 14 inches (nominal) of clearance between the cabinet and other instrumentation
2. Lock the casters by pushing down on the caster locking mechanisms located near the front-bottom of the cabinet.
3. Using the supplied wrench, adjust the height of the four legs such that the weight of the cabinet is on the legs and not on the casters. Adjust the legs so that the cabinet is level and does not wobble.

   If seismic securement is required, the legs adjacent to the four casters can be bolted to the floor. See the SIESMIC SECUREMENT section for details.

Floor plan

The following floor plan information is for the system cabinet only. Refer to the documentation for the prober or other test fixture equipment to determine its floor space requirements. The system cabinet requires a floor space of approximately 9ft x 10ft (2.7m x 3m). Figure 5 shows a top view of the floor plan. Table 3, in the “Site Preparation & Installation” section of this guide, lists the dimensions and weight of the system cabinet.

Figure 5
S500 floor plan – top view



NOTE: The two feet of clearance at rear and on the left side of the system cabinet are for service. The 14.4 inches at the right side of the cabinet is the minimum clearance between the system cabinet and the prober.

Seismic securement

Typical S500 system cabinet weight distribution and center of gravity are shown in Figure 6. If seismic securement is required, the system cabinet can be bolted down to the floor. Figure 7 shows the restraint brackets and bolt installation dimensions for the system cabinet.

Figure 8 shows how a floor mounting bracket is installed. Keithley part numbers are included for the required hardware.

Figure 6
Typical S500 system cabinet weight distribution and center of gravity

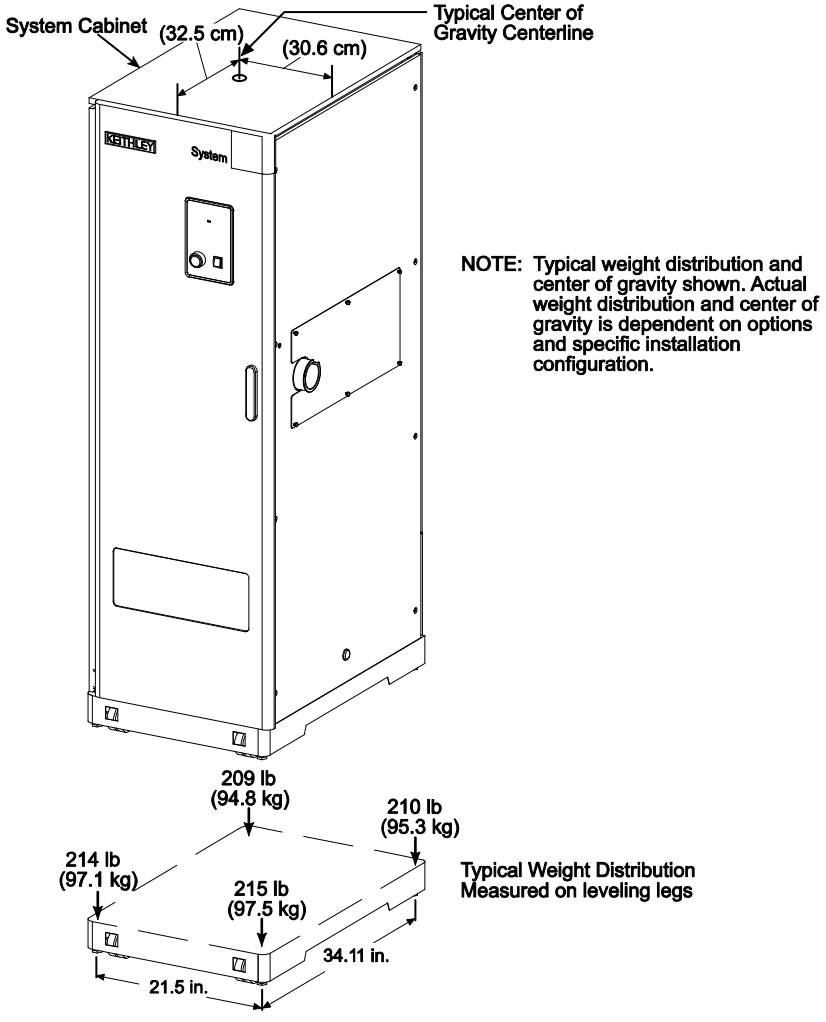


Figure 7
Seismic system cabinet restraints

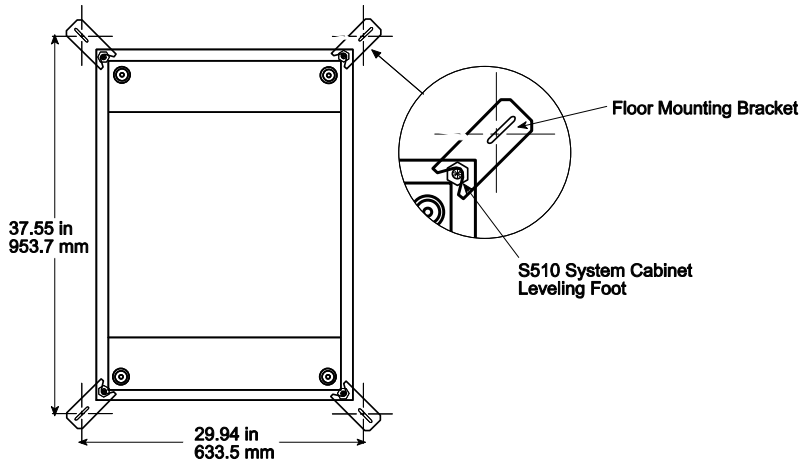
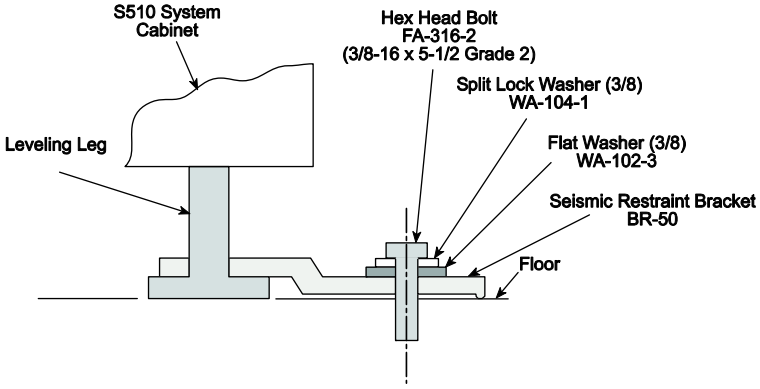


Figure 8
Floor mounting bracket installation



B. Specifications

Refer to individual instrument documentation and specifications.

KEITHLEY

Service Form

Model No. _____ **Serial No.** _____ **Date** _____

Name and Telephone No. _____

Company _____

List all control settings, describe problem and check boxes that apply to problem. _____

_____

_____

❑ Intermittent
❑ Analog output follows display
❑ Particular range or function bad; specify _____
❑ IEEE failure
❑ Obvious problem on power-up
❑ Batteries and fuses are OK
❑ Front panel operational
❑ All ranges or functions are bad
❑ Checked all cables

Display or output (check one)

❑ Drifts
❑ Unable to zero
❑ Unstable
❑ Will not read applied input
❑ Overload

❑ Calibration only
❑ Certificate of calibration required
❑ Data required

(attach any additional sheets as necessary)

Show a block diagram of your measurement system including all instruments connected (whether power is turned on or not). Also, describe signal source.

Where is the measurement being performed? (factory, controlled laboratory, out-of-doors, etc.)

_____

_____

What power line voltage is used? _____ Ambient temperature?°F _____

Relative humidity? _____ Other? _____

Any additional information. (If special modifications have been made by the user, please describe.)

_____

_____

Be sure to include your name and phone number on this service form.

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12/06