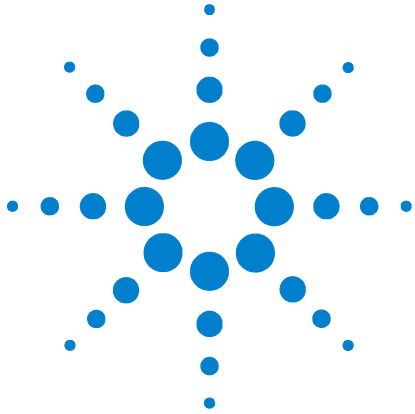


Agilent TS-5400 Functional Test System Series IIB

Site Preparation and Getting Started Manual



Manual Part Number E8770-90037



Agilent Technologies

Notices

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Documentation History

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Safety Notices

Caution

A **Caution** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **Caution** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Safety Summary

The following general safety precautions must be observed during all phases of operation of this system. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the system. Agilent Technologies, Inc. assumes no liability for the customer's failure to comply with these requirements.

General

This product is provided with a protective earth terminal. The protective features of this product may be impaired if it is used in a manner not specified in the operation instructions.

WARNING: DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the system in the presence of flammable gases or flames.

If the equipment in this system is used in a manner not specified by Agilent Technologies, the protection provided by the equipment may be impaired.

Cleaning Instructions

Clean the system cabinet using a soft cloth dampened in water.

WARNING: DO NOT REMOVE ANY SYSTEM COVER

Operating personnel must not remove system covers. Component replacement and internal adjustments must be made only by qualified service personnel. Equipment that appears damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

Environmental Conditions

Unless otherwise noted in the specifications, this system is intended for indoor use in an installation category II, pollution degree 2 environment. It is designed to operate at a maximum relative humidity of 80% and at altitudes of up to 2000 meters. Refer to the specifications tables for the ac mains voltage requirements and ambient operating temperature range.

Before applying power

Verify that all safety precautions are taken. Note the external markings described in "Safety Symbols and Regulatory Markings" on page 4.

Ground the System

To minimize shock hazard, the system chassis must have a hard-wired connection to an electrical protective earth ground. The system must also be connected to the ac power mains through a power cable that includes a protective earth conductor. The power cable ground wire must be connected to an electrical ground (safety ground) at the power outlet. Any interruption of the protective grounding will cause a potential shock hazard that could result in personal injury.

Fuses

Use only fuses with the required rated current, voltage, and specified type (normal blow, time delay). Do not use repaired fuses or short-circuited fuse holders. To do so could cause a shock or fire hazard.

Operator Safety Information

MODULE CONNECTORS AND TEST SIGNAL CABLES CONNECTED TO THEM CANNOT BE OPERATOR ACCESSIBLE: Cables and connectors are considered inaccessible if a tool (e.g., screwdriver, wrench, socket, etc.) or a key (equipment in a locked cabinet) is required to gain access to them. Additionally, the operator cannot have access to a conductive surface connected to any cable conductor (High, Low or Guard).

ASSURE THE EQUIPMENT UNDER TEST HAS ADEQUATE INSULATION BETWEEN THE CABLE CONNECTIONS AND ANY OPERATOR-ACCESSIBLE PARTS (DOORS, COVERS, PANELS, SHIELDS, CASES, CABINETS, ETC.): Verify there are multiple and sufficient protective means (rated for the voltages you are applying) to assure the operator will NOT come into contact with any energized conductor even if one of the protective means fails to work as intended. For example, the inner side of a case, cabinet, door, cover or panel can be covered with an insulating material as well as routing the test cables to the module's front panel connectors through non-conductive, flexible conduit such as that used in electrical power distribution.

Safety Symbols and Regulatory Markings

Symbols and markings on the system, in manuals and on instruments alert you to potential risks, provide information about conditions, and comply with international regulations. Table 1 defines the symbols and markings you may encounter.

Table 1 Safety Symbols and Markings

Safety symbols	
	Warning: risk of electric shock.
	Caution: refer to accompanying documents.
	Alternating current.
	Both direct and alternating current.
	Earth (ground) terminal
	Protective earth (ground) terminal
	Frame or chassis terminal
	Terminal is at earth potential. Used for measurement and control circuits designed to be operated with one terminal at earth potential.
	Switch setting indicator. ○ = Off, | = On.
	Standby (supply); units with this symbol are not completely disconnected from ac mains when this switch is off. To completely disconnect the unit from ac mains, either disconnect the power cord, or have a qualified electrician install an external switch.
Regulatory Markings	
	The CE mark is a registered trademark of the European Community.
	The CSA mark is a registered trademark of the Canadian Standards Association.
 N10149	The C-tick mark is a registered trademark of the Spectrum Management Agency of Australia. This signifies compliance with the Australian EMC Framework regulations under the terms of the Radio Communications Act of 1992.
ISM 1-A	This text indicates that the product is an Industrial Scientific and Medical Group 1 Class A product (CISPR 11, Clause 4).

Service and Support

Any adjustment, maintenance, or repair of this product must be performed by qualified personnel. Contact your customer engineer through your local Agilent Technologies Service Center.

Agilent on the Web

You can find information about technical and professional services, product support, and equipment repair and service on the Web:

http://www.agilent.com

Click the link to **Test & Measurement**. Select your country from the drop-down menus. The Web page that appears next has contact information specific for your country.

Agilent by Phone

If you do not have access to the Internet, call one of the numbers in Table 2.

Table 2 Agilent Call Centers and Regional Headquarters

United States and Canada:	Test and Measurement Call Center (800) 452 4844 (toll-free in US)
Europe:	(41 22) 780 8111
Japan:	Measurement Assistance Center (81) 0426 56 7832
Latin America:	305 269 7548
Asia-Pacific:	(85 22) 599 7777

Agilent Technologies

DECLARATION OF CONFORMITY

According to ISO/IEC Guide 22 and CEN/CENELEC EN 45014

CE

Manufacturer's Name: Agilent Technologies, Incorporated
Manufacturer's Address: 815 – 14th St. SW
Loveland, Colorado 80537
USA

Declares, that the product

Product Name: TS5400, TS5430, TS5450 Series Automotive Test Systems
Model Number: E6170A/B, E6230A/B, E8770A, E8780A, E8785A, E8786A
Product Options: *This declaration covers all options of the above product(s).*

Conforms with the following European Directives:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC, and the EMC Directive 89/336/EEC (including 93/68/EEC) and carries the CE Marking accordingly.

Conforms with the following product standards:

EMC	**Standard**	**Limit**
	IEC 61326-1:1997+A1:1998 / EN 61326-1:1997+A1:1998	
	CISPR 11:1990 / EN 55011:1991	*Group 1 Class A*
	IEC 61000-4-2:1995+A1:1998 / EN 61000-4-2:1995	*4kV CD, 8kV AD*
	IEC 61000-4-3:1995 / EN 61000-4-3:1995	*3 V/m, 80-1000 MHz*
	IEC 61000-4-4:1995 / EN 61000-4-4:1995	*0.5kV signal lines, 1kV power lines*
	IEC 61000-4-5:1995 / EN 61000-4-5:1995	*0.5 kV line-line, 1 kV line-ground*
	IEC 61000-4-6:1996 / EN 61000-4-6:1996	*3V, 0.15-80 MHz I cycle, 100%*
	IEC 61000-4-11:1994 / EN 61000-4-11:1994	*Dips: 30% 10ms; 60% 100ms Interrupt > 95%@5000ms*
	Canada: ICES-001:1998	
	Australia/New Zealand: AS/NZS 2064.1	

As detailed in: *Electromagnetic Compatibility (EMC) Certificate of Conformance No. 71301-KRQ/EMC 97-4165, dated 18 February 1997.*
Assessed by: *KEMA Registered Quality Nederland B.V.*
Utrechtseweg 310
6812 AR Arnhem, 6800 ET Arnhem
The Netherlands

The product was tested in a typical configuration with Agilent Technologies test systems.

Safety

IEC 61010-1:1990+A1:1992+A2:1995 / EN 61010-1:1993+A2:1995
Canada: CSA C22.2 No. 1010.1:1992
UL 3111-1: 1994 (NRTL approval issued by CSA)

16 August 2001
Date

Ray Corson
Product Regulations Program Manager

For further information, please contact your local Agilent Technologies sales office, agent or distributor.
Authorized EU-representative: Agilent Technologies Deutschland GmbH, Herrenberger Strabe 130, D 71034 Böblingen, Germany

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Chapter 1
Preparing Your Site for the System

The following gives information to prepares your site for using the Agilent TS-5400 Series IIB System. This chapter is separated as follows:

- Typical System . . . . . page 11
- The System Plan Drawing . . . . . page 12
- System Power Requirements . . . . . page 13
- Mains Wiring and Sizes . . . . . page 17

Typical System

The Agilent TS-5400 hardware provides the functionality to test control modules for automotive applications. Figure1-1 shows a typical hardware configuration of a test systems, in a single 2.0 meter rack.

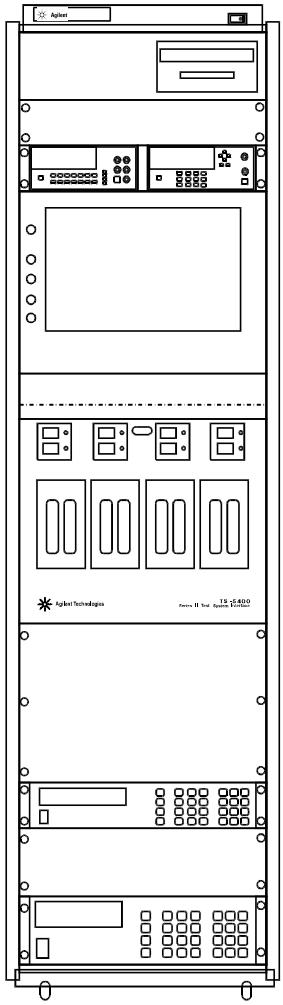


Figure 1-1. Typical Agilent TS-5400 System

The System Plan Drawing

Make a system plan drawing and use it for all aspects of the site preparation. A complete drawing details power availability, communications cabling, and system placement with respect to other equipment. It can also serve to verify physical access. Refer to Appendix A for specific site requirements (structural, environmental, etc.).

Figure1-2 shows a layout suggestion for a typical Agilent TS-5400 Series IIB System. Allow 1 meter (3 feet) of space behind the system for service.

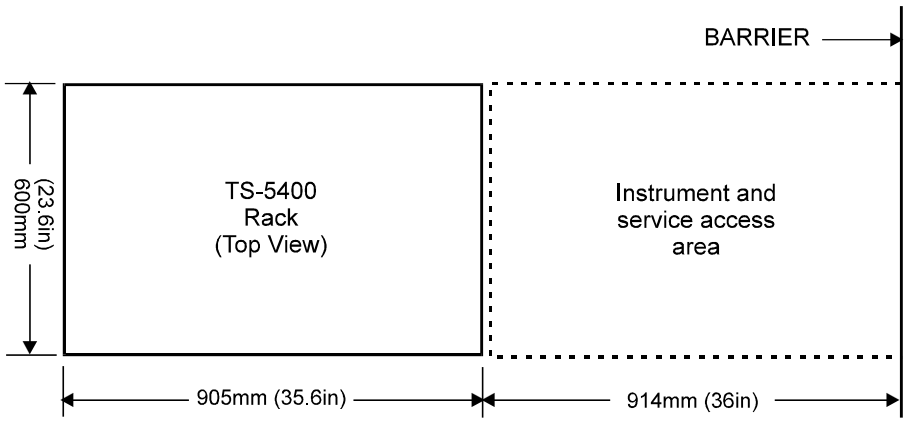


Figure 1-2. Recommended Agilent TS-5400 System Layout (overhead view)

System Power Requirements

This section describes the electrical power requirements of the Agilent TS-5400 Series IIB Test Systems using the Agilent E1135C Power Distribution Units (PDUs). It also describes how to connect AC mains power to the system. Figure1-3 shows the location of the power distribution unit in your system.

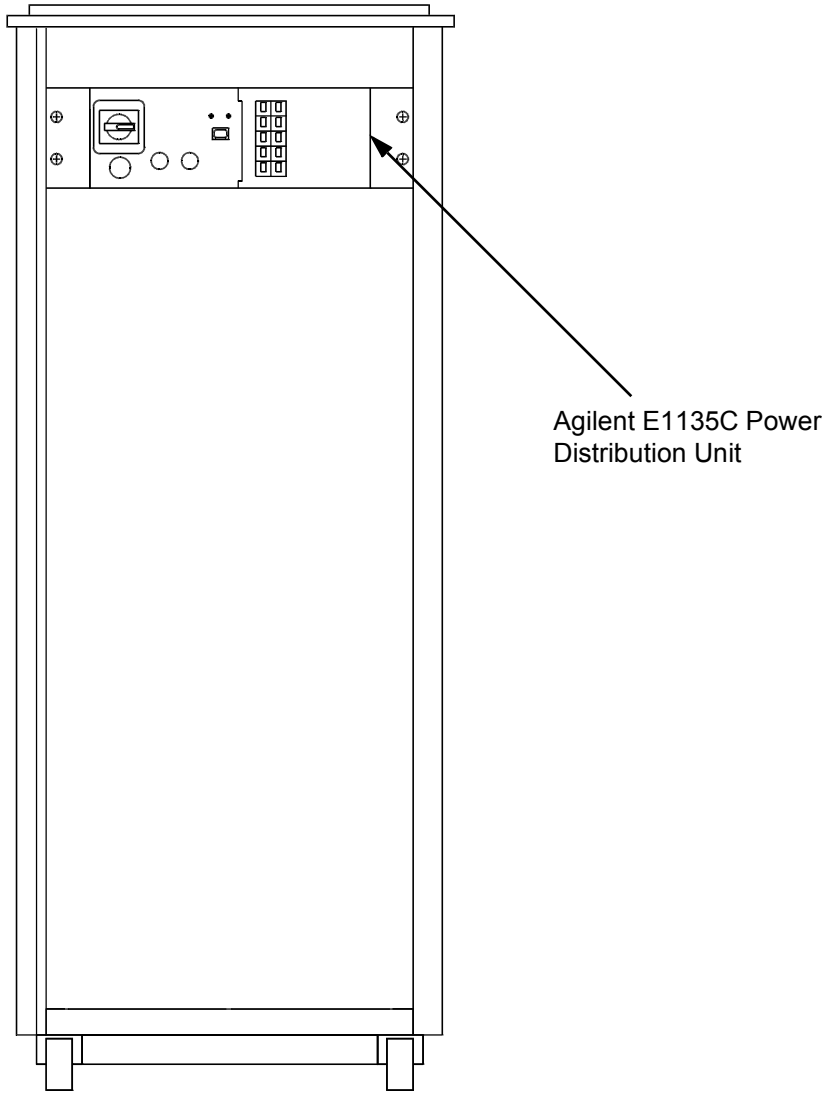


Figure 1-3. Rear View of Agilent TS-5400 System

Minimum Power Requirements

The following lists the minimum power requirements for the TS-5400 systems (see “Site Configuration for AC Power” on page 15" for more information).

The TS-5400 system requires the following:

1. AC mains power must be supplied to the system's Agilent E1135C Power Distribution Unit (PDU).
2. Customer must supply a power cord for all systems and power options.

3. The power cord must be wired by an electrician.

4. For the Agilent E1135C Power Distribution Unit, a jumper wire may need to be installed for some power options.

Power Recommendations

- Provide a separate AC mains service for the system due to high current requirements of the system.
- Use copper wire for the System Drop between the AC source and system.
- The power service must have a mains disconnect installed adjacent to the system to quickly remove power in case of emergency (see "Mains Disconnect Requirements" for more information). The Agilent E1135C PDU, used with newer TS-5400 Systems, contains a mains disconnect.
- On the PDU is a 25.4-millimeter (1-inch) hole to install a cable clamp and power cord. Use a power cord with a locking plug (one that cannot be easily pulled from its outlet) or hard-wire the system to the AC power.

Caution **Verify the AC source and that service conductors are sized correctly before connecting the system.**

Additional Power Information

- Conventional 50/60-hertz current probes can not make accurate input current measurements of the system's power supplies due to the harmonics on the currents. A current measuring instrument needs a bandwidth that is above 10 kHz. Improper instruments may yield results that are 50 percent less than actual.
- System input power connections on the PDU are made to an input connector block and the ground connection to a terminal bolted to the chassis. In the E1135C PDU, the power is connected to the mains disconnect switch and a ground terminal attached to the chassis. These connectors can accept wire up to 16-mm (4-AWG). For ease of installation, in areas where it meets local code requirements, use multi-strand wire from a AC mains to the PDU.

Caution **Ten thermally-activated circuit breakers designed to protect the output terminal block are located on the front of the Agilent E1135B/C PDU. Under normal operation, a detected fault sets the rocker on the breaker to the open position. Reset the rocker by gently pushing it back in place. These breakers must not be opened by force, or permanent damage can result. Damage caused by intentionally opening the breaker is not covered by warranty.**

Mains Disconnect Requirements

The Agilent 1135C PDU contains a lockable mains disconnect switch. If may also want to install an external mains disconnect circuit breaker. Be sure the circuit breaker is adjacent to the equipment for easy access. Usual mounting is an approved enclosure on a floor-mounted pedestal.

Disconnect Circuit Breaker Requirements

The disconnect circuit breaker must be:

- Rated for the maximum system amperes,
- Approved for use in building installations in your locality,
- Marked "Mains Disconnect" or the equivalent in your local language,
- Marked for the "Off" position,
- Capable of locking in the "Off" position, but not in the "On" position,
- Open all phases and neutral conductors, but not the safety grounding conductor.

Mains Circuit Breaker Requirements

Requirements for the mains circuit breaker are the same as the “Disconnect Circuit Breaker Requirements” above plus the breaker must be rated a minimum 10,000 amperes interrupting capacity (AIC), for 100-240 V AC circuit, or 14,000 AIC for higher voltage circuit.

Site Configuration for AC Power

The following information is not required, but may save time and effort implementing this configuration when installing the system.

Note The following requires that you:

1. Use a wire, and not conduit for the safety ground conductor
2. Use the same size wire for the neutral and ground as is used for the phase conductors
3. Bond the neutral and the ground wires together at the transformer, and not at the breaker box or anywhere else.

Use the following information to configure your site:

Tap into the main AC power source of the building consisting of 200, 208, 220, 230, 240 380, 400, 415 volts AC. Connect the power through a one-to-one or step-down transformer to the correct voltage for the system.

Important recommendations about wiring:

- Make certain that the wire used for the neutral is the same size as the hot leads or larger.
- Do not rely on conduit for the ground; always use at least one wire for the ground-the more strands the better.
- Use the same lengths of wire for the phase conductors, the neutral, and the ground.
- It is extremely important that the neutral and ground be connected only at the transformer using an X-O bond.

Mains Wiring and Sizes

The AC mains wires and size depend on the type of system and the wire length from the AC power source to the system. Table 1-1 to Table 1-7 lists the maximum required wire gauge needed according to length, the maximum circuit breaker size, and the current requirements of the system according to options. Determine these sizes using the system power option numbers.

Note The sizes given are for systems with the maximum number of instruments installed, including a VXI Mainframe. For systems without a VXI Mainframe, subtract approximately 500W of power. This comes to approximately 4.2 Amps of current for a line voltage of 120V and 2.4 Amps for a line voltage of 208V.

Table 1-1. Agilent TS-5400 System Power Options 05B, 05G 05K

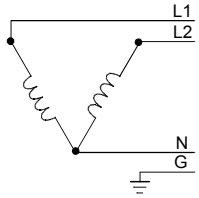
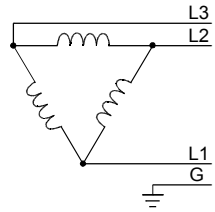
Power Type	Power Option	Country		Phase Voltage
Single-Phase Wye with Neutral 	05B	Brazil, China, Denmark, France, Germany, Hong Kong, Italy, S. Korea, United Kingdom		220/380V
	05G	Finland, Germany, Singapore, United Kingdom		230/400V
	05K	Malaysia, United Kingdom		240/415V
Source to System Distance in Meters (Feet)	**Full Load Amperes**	**Circuit Breaker Amperes / # Poles**	**Wire Size mm^2 (AWG)**	**Number of Conductors***
0-23 (0-75)	20 Amps	30 Amps / 2 Poles	6 (10)	4
23-30 (75-100)	20 Amps	30 Amps / 2 Poles	6 (10)	4
30-38 (100-125)	20 Amps	30 Amps / 2 Poles	6 (10)	4
38-46 (125-150)	20 Amps	30 Amps / 2 Poles	6 (10)	4
46-69 (150-225)	20 Amps	30 Amps / 2 Poles	10 (8)	4
69-76 (225-250)	20 Amps	30 Amps / 2 Poles	10 (8)	4
76-91 (250-300)	20 Amps	30 Amps / 2 Poles	16 (6)	4

Table 1-2. Agilent TS-5400 System Power Options 0ED, 05C, 05H, 0E6

Power Type	Power Option	Country		Phase Voltage
Three-Phase Delta 	0ED	Japan		200V
	05C	Brazil, France, S. Korea, Philippines, Taiwan		220V
	05H	Brazil, France, Philippines		230V
	0E6	United States		240V
Source to System Distance in Meters (Feet)	**Full Load Amperes**	**Circuit Breaker Amperes / # Poles**	**Wire Size mm^2 (AWG)**	**Number of Conductors***
0-23 (0-75)	29	40 Amps / 3 Poles	10 (8)	4
23-30 (75-100)	29	40 Amps / 3 Poles	10 (8)	4
30-38 (100-125)	29	40 Amps / 3 Poles	10 (8)	4
38-46 (125-150)	29	40 Amps / 3 Poles	10 (8)	4
46-69 (150-225)	29	40 Amps / 3 Poles	16 (6)	4
69-76 (225-250)	29	40 Amps / 3 Poles	16 (6)	4
76-91 (250-300)	29	40 Amps / 3 Poles	16 (6)	4

* Includes Safety Grounding Conductor

Table 1-3. Agilent TS-5400 System Power Options 0EF, 05D

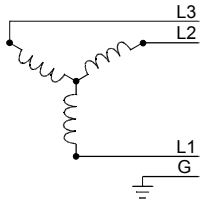
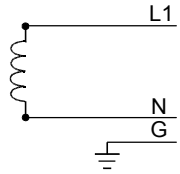
Power Type	Power Option	Country		Phase Voltage*
Three-Phase Wye 	0EF	United States		208V
	05D	Brazil, France, Italy, Mexico, Philippines		220V
Source to System Distance in Meters (Feet)	**Full Load Amperes**	**Circuit Breaker Amperes / # Poles**	**Wire Size mm^2 (AWG)**	**Number of Conductors***
0-23 (0-75)	29	40 Amps / 3 Poles	10 (8)	4
23-30 (75-100)	29	40 Amps / 3 Poles	10 (8)	4
30-38 (100-125)	29	40 Amps / 3 Poles	10 (8)	4
38-46 (125-150)	29	40 Amps / 3 Poles	10 (8)	4
46-69 (150-225)	29	40 Amps / 3 Poles	16 (6)	4
69-76 (225-250)	29	40 Amps / 3 Poles	16 (6)	4
76-91 (250-300)	29	40 Amps / 3 Poles	16 (6)	4

Table 1-4. Agilent TS-5400 System Power Options 05M, 05F, 05J

Power Type	Power Option	Country		Phase Voltage
Single-Phase Earthed 	05M	Brazil, China, Denmark, France, Germany, Hong Kong, Italy, S. Korea, United Kingdom		220V
	05F	Finland, Germany, Philippines, Singapore, United Kingdom		230V
	05J	Malaysia, United Kingdom		240V
Source to System Distance in Meters (Feet)	**Full Load Amperes**	**Circuit Breaker Amperes / # Poles**	**Wire Size mm^2 (AWG)**	**Number of Conductors***
0-23 (0-75)	39	50 Amps / 1 Pole	10 (8)	3
23-30 (75-100)	39	50 Amps / 1 Pole	10 (8)	3
30-38 (100-125)	39	50 Amps / 1 Pole	10 (8)	3
38-46 (125-150)	39	50 Amps / 1 Pole	10 (8)	3
46-69 (150-225)	39	50 Amps / 1 Pole	16 (6)	3
69-76 (225-250)	39	50 Amps / 1 Pole	16 (6)	3
76-91 (250-300)	39	50 Amps / 1 Pole	16 (6)	3

* Includes Safety Grounding Conductor

Table 1-5. Agilent TS-5400 System Power Options AWX, 0EB, 0EJ, 0EC

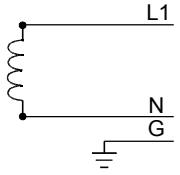
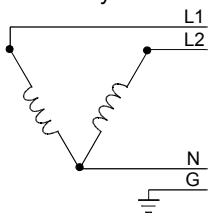
Power Type	Power Option	Country		Phase Voltage
Single-Phase, Non-Earthed 	AWX	Japan		200V
	0EB	Brazil, France, Italy, Mexico, Philippines, S. Korea, Taiwan		220V
	0EJ	Brazil, France, Philippines		230V
	0EC	United States		240V
Source to System Distance in Meters (Feet)	**Full Load Amperes**	**Circuit Breaker Amperes / # Poles**	**Wire Size mm^2 (AWG)**	**Number of Conductors***
0-23 (0-75)	39	50 Amps / 2 Poles	10 (8)	3
23-30 (75-100)	39	50 Amps / 2 Poles	10 (8)	3
30-38 (100-125)	39	50 Amps / 2 Poles	10 (8)	3
38-46 (125-150)	39	50 Amps / 2 Poles	10 (8)	3
46-69 (150-225)	39	50 Amps / 2 Poles	16 (6)	3
69-76 (225-250)	39	50 Amps / 2 Poles	16 (6)	3
76-91 (250-300)	39	50 Amps / 2 Poles	16 (6)	3

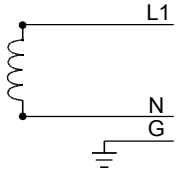
Table 1-6. Agilent TS-5400 System Power Options AWV, AWZ

Power Type	Power Option	Country		Phase Voltage
Single-Phase Wye with Neutral 	AWV	United States		120V/208V
	AWZ	Brazil, France, Italy, Mexico, Philippines		127/220V
Source to System Distance in Meters (Feet)	**Full Load Amperes**	**Circuit Breaker Amperes / # Poles**	**Wire Size mm^2 (AWG)**	**Number of Conductors****
0-23 (0-75)	39	50 Amps / 2 Poles	10 (8)	3
23-30 (75-100)	39	50 Amps / 2 Poles	10 (8)	3
30-38 (100-125)	39	50 Amps / 2 Poles	10 (8)	3
38-46 (125-150)	39	50 Amps / 2 Poles	10 (8)	3
46-69 (150-225)	39	50 Amps / 2 Poles	16 (6)	3
69-76 (225-250)	39	50 Amps / 2 Poles	16 (6)	3
76-91 (250-300)	39	50 Amps / 2 Poles	16 (6)	3

* Includes Safety Grounding Conductor

* * Includes Safety Grounding Conductor; neutral conductor is not required for the system

Table 1-7. Agilent TS-5400 System Power Options 0EA, 0EN

Power Type	Power Option	Country		Phase Voltage
Single-Phase, Non-Earthed 	0EA	United States		120V
	0EN	Mexico		127V
Source to System Distance in Meters (Feet)	**Full Load Amperes**	**Circuit Breaker Amperes / # Poles**	**Wire Size mm^2 (AWG)**	**Number of Conductors***
0-23 (0-75)	47	50 Amps / 1 Pole	10 (8)	3
23-30 (75-100)	47	50 Amps / 1 Pole	10 (8)	3
30-38 (100-125)	47	50 Amps / 1 Pole	10 (8)	3
38-46 (125-150)	47	50 Amps / 1 Pole	10 (8)	3
46-69 (150-225)	47	50 Amps / 1 Pole	16 (6)	3
69-76 (225-250)	47	50 Amps / 1 Pole	16 (6)	3
76-91 (250-300)	47	50 Amps / 1 Pole	16 (6)	3

* Includes Safety Grounding Conductor

Chapter 2

Installing the Keyboard, Mouse and Printer

This chapter describes how to install the keyboard shelf, mouse tray and printer tray onto the Test Rack, how to connect the keyboard and mouse, and how to connect an optional strip printer.

Tools Required

2 phillips screwdriver.

Note Four captive nuts are installed on the front of the test rack to receive the keyboard shelf screws. For systems with flat panel displays, these nuts are located immediately below the flat panel display. If you need to locate the shelf elsewhere, four additional captive nuts are included with the shelf kit.

Installation Procedure

1. Locate the keyboard and mouse extension cables hanging inside the Test Rack. Temporarily pull the extension cables through the slot in the keyboard tray and attach the keyboard shelf to the test rack using four 10-32 screws.

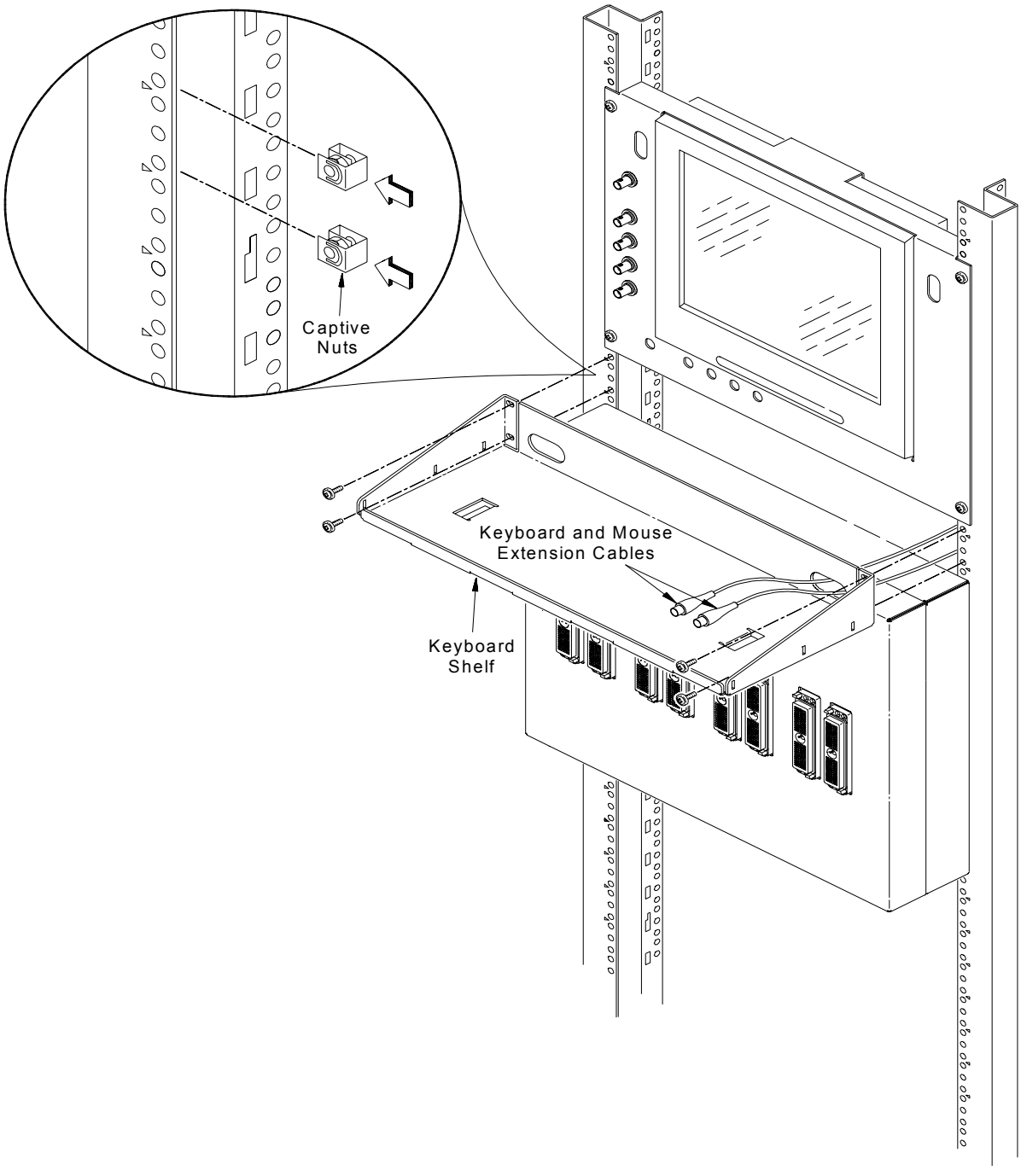


Figure 2-1. Attach Keyboard Shelf to Rack

Note The following figures assume a right-hand mouse and left-hand printer arrangement. You can reverse this orientation if necessary

2. Attach the printer tray to the keyboard shelf. Make sure that the two hooks engage the shelf and the bottom of the tray is inserted into the tab under the keyboard shelf.

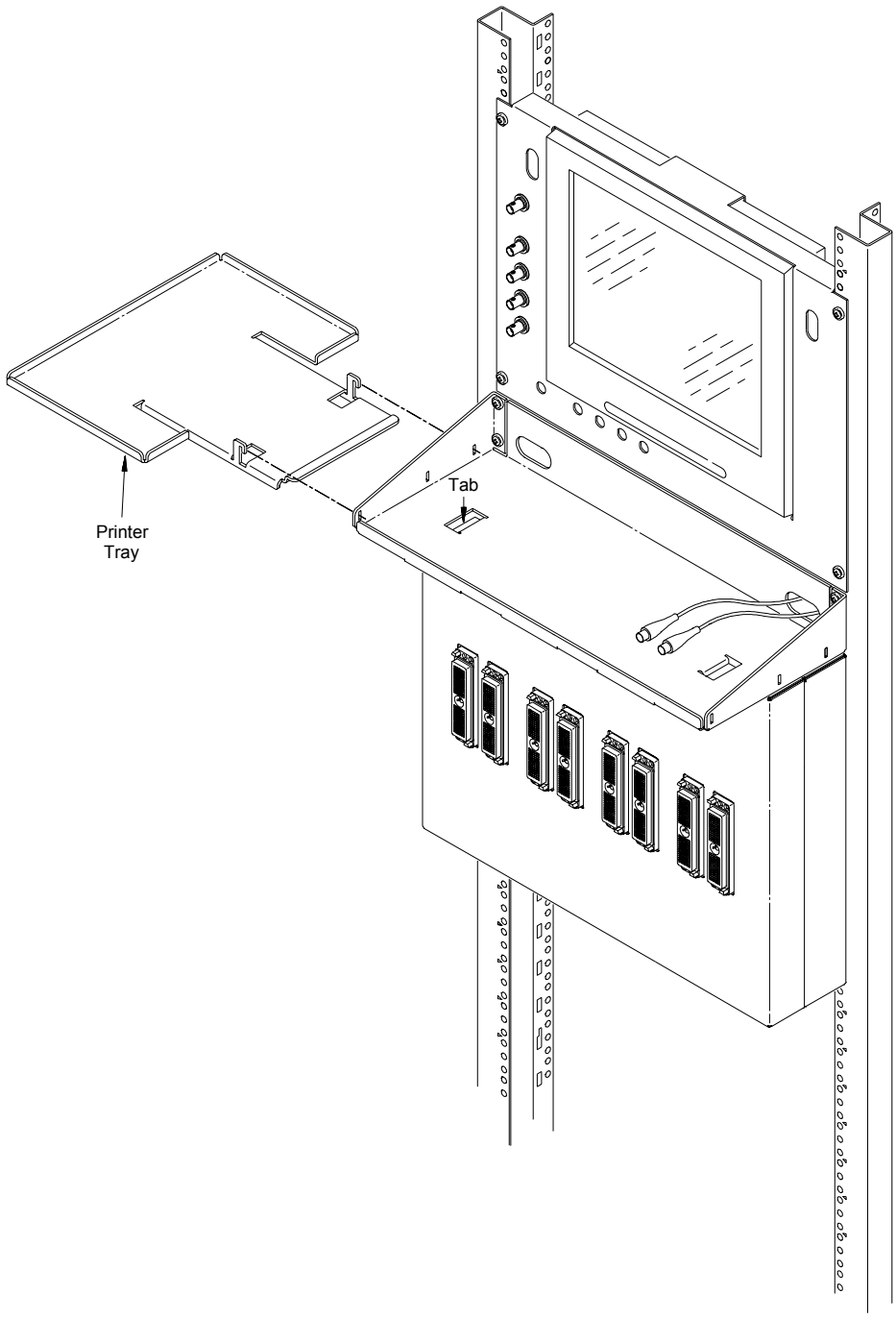


Figure 2-2. Attach Printer Tray

3. Attach the mouse tray to the keyboard shelf. Make sure that the two hooks engage the shelf and the bottom of the tray is inserted into the tab under the keyboard shelf.

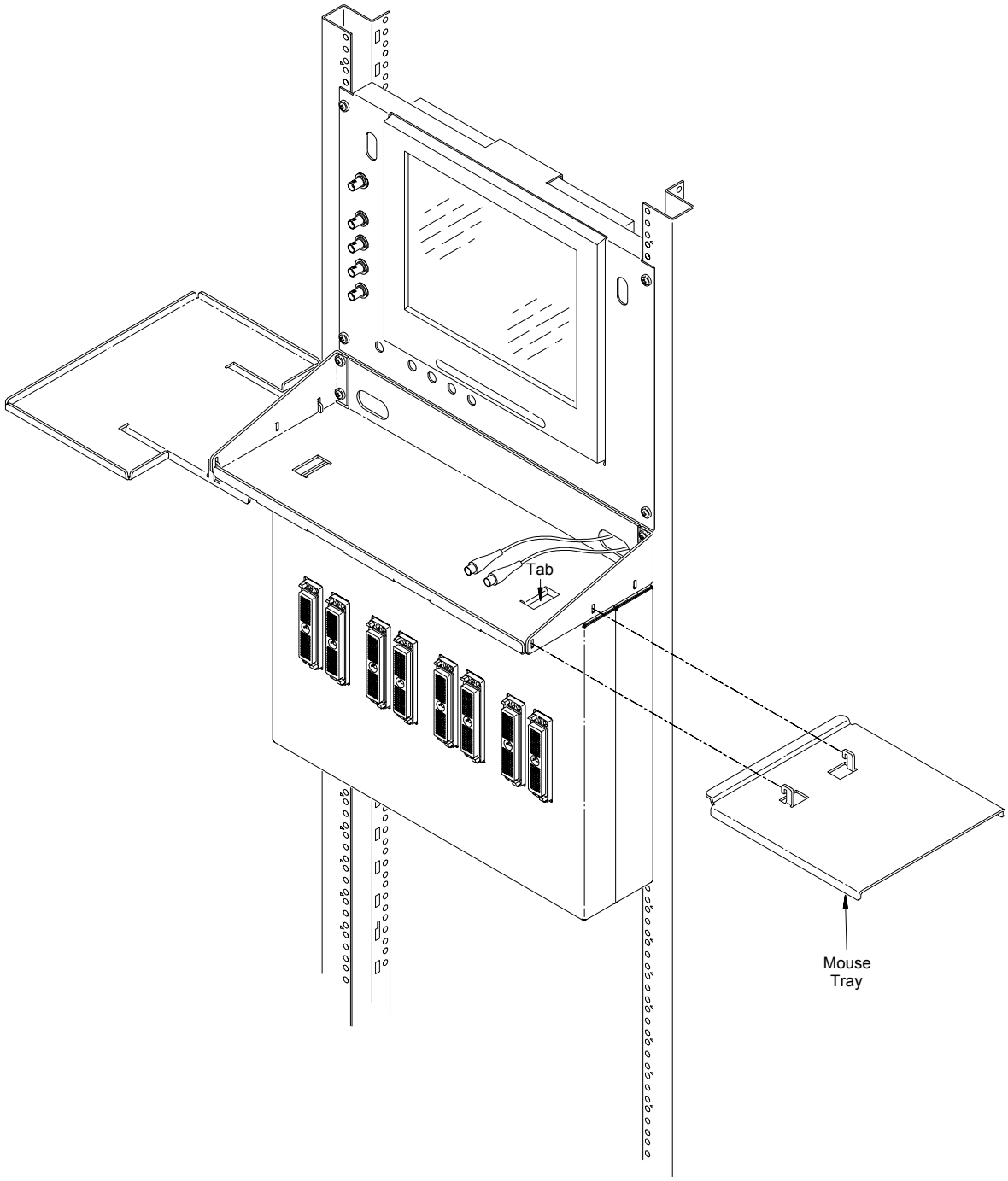


Figure 2-3. Attach Mouse Tray

4. Install the plastic palm rest by slipping it into the slots in the keyboard shelf.

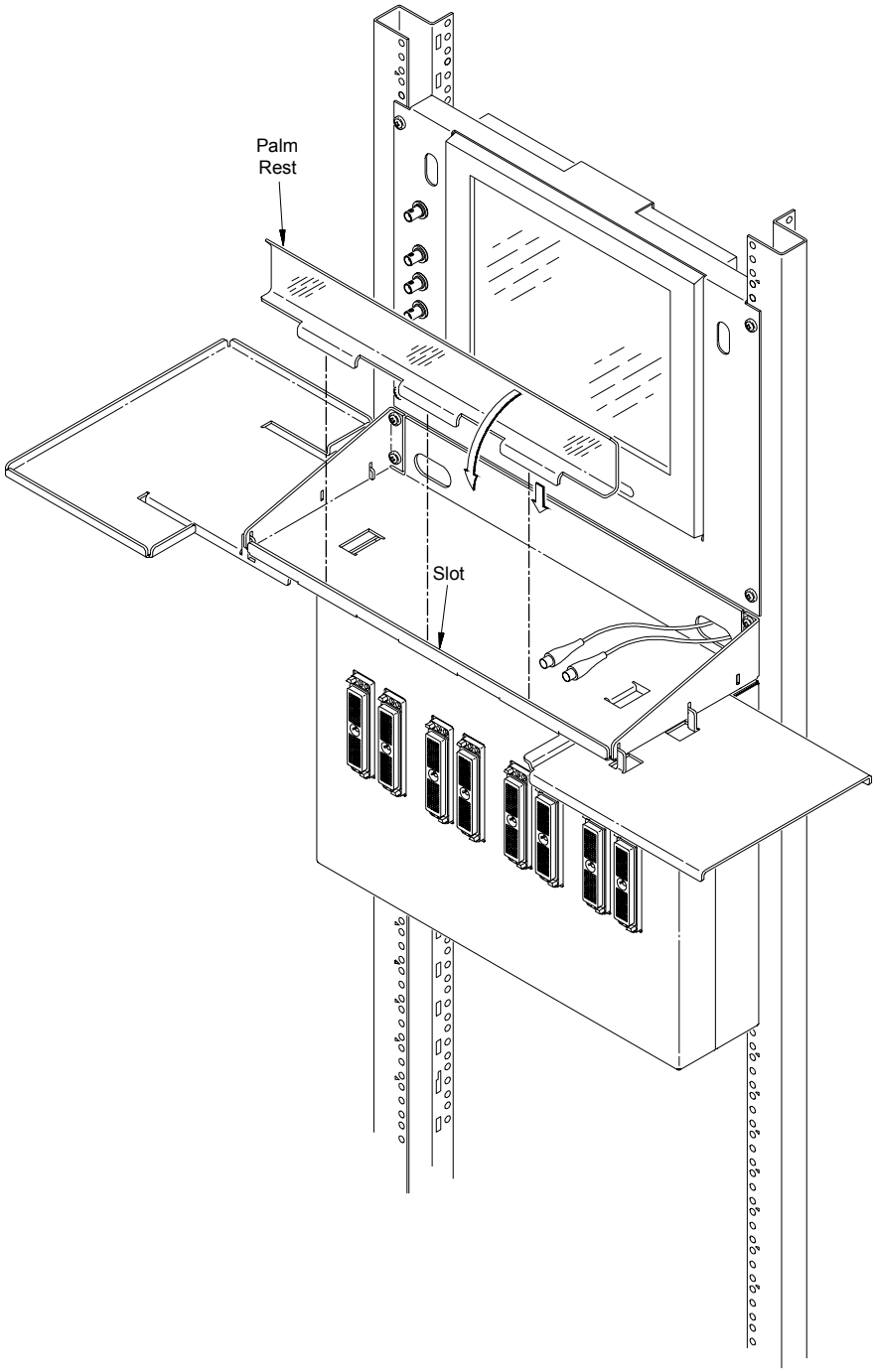


Figure 2-4. Install Palm Rest

5. Connect the keyboard and mouse connectors to the extension cables (extension cables are labelled “Keyboard” and “Mouse”). Slide the excess cabling into the slot in the keyboard shelf.

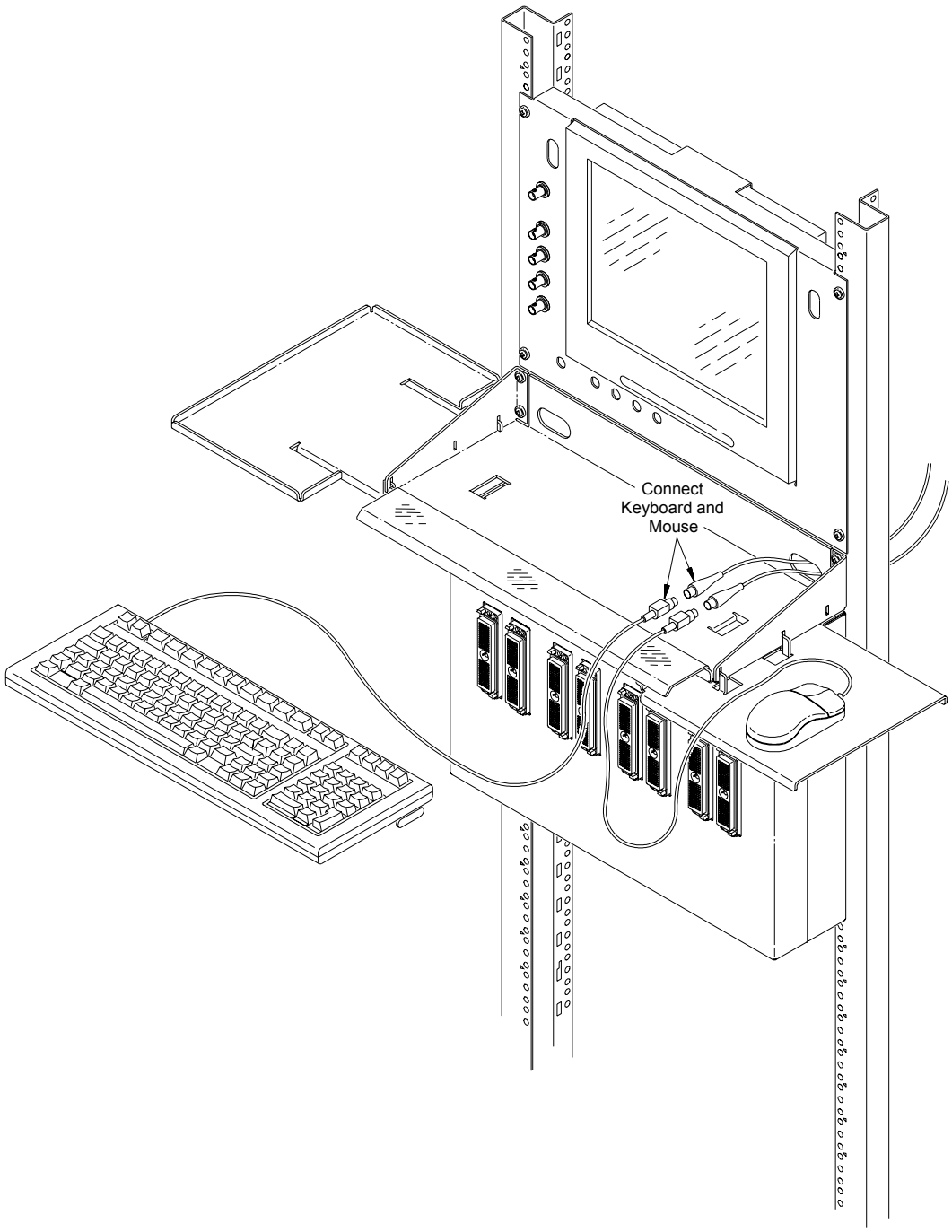


Figure 2-5. Connect Keyboard and Mouse

6. If you have an optional Strip Printer (not provided by Agilent Technologies) connect its serial cable the one of the PC’s serial ports. Power (ac mains) is provided at the PDU. You can route the ac power cable through the holes underneath the Test System Interface to the back of the system rack.

Chapter 3
Connecting Power and Getting Started

This chapter shows how to connect AC power to the system and how to turn it on and where to go next to get started with programming or connecting wiring to the system.

Tools Required

- 1/8-in. flat blade screwdriver to connect AC mains conductors to the Agilent E1135 Power Distribution Unit (PDU) and to remove or install VXI modules from the mainframe
- T10 Torx driver for removing covers (access plates)
- Wire strippers to connect cables to the Agilent E1135 PDU

Connecting AC Mains Power to the Agilent TS-5400 System

For all power options, a customer-supplied power cord/plug assembly must be wired to the system's Agilent E1135C Power Distribution Unit (PDU) by an electrician. The following describes how to determine the correct power cord wire size and how to connect it to the Agilent E1135C PDU.

Note PDU loads (outputs) have already been pre-wired at the factory. Where applicable, the loads have been balanced across phases.

WARNING **These procedures must be performed by qualified service-trained personnel only.**

Hazardous voltages, capable of causing injury or death, are present inside the PDU whenever mains power is connected to the PDU. This is true even with the 'Branch Circuits Enabled' switch in the “disabled” position. Disconnect mains power at the circuit breaker and place a warning sign to ensure that power is not switched on before you have completed your work or on the PDU turn the main switch to “0” and padlock.

To prevent the possibility of electrical shock, which could cause injury or death, connect an AC mains ground wire to the “GND” terminal of the Mains Disconnect Switch inside the PDU. Holes are provided in the front, side and rear covers for wire egress. For safety, use strain relief cable clamps (0400-0377) on all wires. Install filler plugs (6960-0177) in all unused holes.

Procedure

The steps on the following pages show in detail, how to determine the power cord needed and how to connect it to the Agilent TS-5400 System.

WARNING **All steps are to be done by a qualified, licensed Electrician with AC POWER SHUT OFF.**

Determine the Power Cord Type Needed

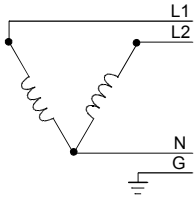
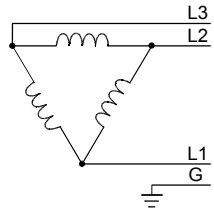
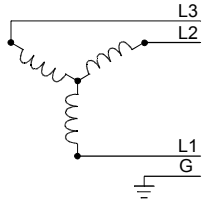
Table 3-1 shows the recommended wire size and number of conductors for your power option.

Note Table 3-1 shows *recommended* wire sizes. The electrician should ensure that the power cord used is in conformance with the branch circuit voltage drop per your local/national electrical code.

For some systems that do not have a VXI Mainframe, the current requirements may be lower and a smaller wire may be used (see see "Mains Wiring and Sizes" on page 17 for more information).

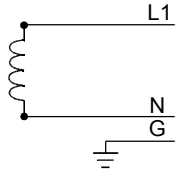
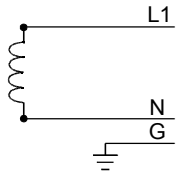
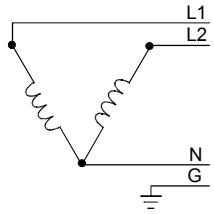
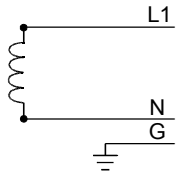
In addition to supplying a power cord, you must supply a power cord strain relief and a power plug that mates with your style of power receptacle (see Table 3-1).

Table 3-1. TS-5400 Recommended Power Cord Wire Sizes

Power Type	Power Option	Country**	Voltage	Full Load Amps	Power Cord Wire Size/ Number of Conductors (Including Ground)*
Single-Phase Wye with Neutral 	05B	Brazil, China, Denmark, France, Germany, Hong Kong, Italy, S. Korea, United Kingdom	220/380V	20A	6 mm^2 (10 AWG), 4-wire
	05G	Finland, Germany, Singapore, United Kingdom	230/400V	20A	6 mm^2 (10 AWG), 4-wire
	05K	Malaysia, United Kingdom	240/415V	20A	6 mm^2 (10 AWG), 4-wire
Three-Phase Delta 	0ED	Japan	200V	29A	10 mm^2 (8 AWG), 4-wire
	05C	Brazil, France, S. Korea, Philippines, Taiwan	220V	29A	10 mm^2 (8 AWG), 4-wire
	05H	Brazil, France, Philippines	230V	29A	10 mm^2 (8 AWG), 4-wire
	0E6	United States	240V	29A	10 mm^2 (8 AWG), 4-wire
Three-Phase Wye 	0EF	United States	208V	29A	10 mm^2 (8 AWG), 4-wire
	05D	Brazil, France, Italy, Mexico, Philippines	220V	29A	10 mm^2 (8 AWG), 4-wire

* Use a larger wire size if the voltage drop between the AC source and system is greater than 2%

Table 3-1. TS-5400 Recommended Power Cord Wire Sizes

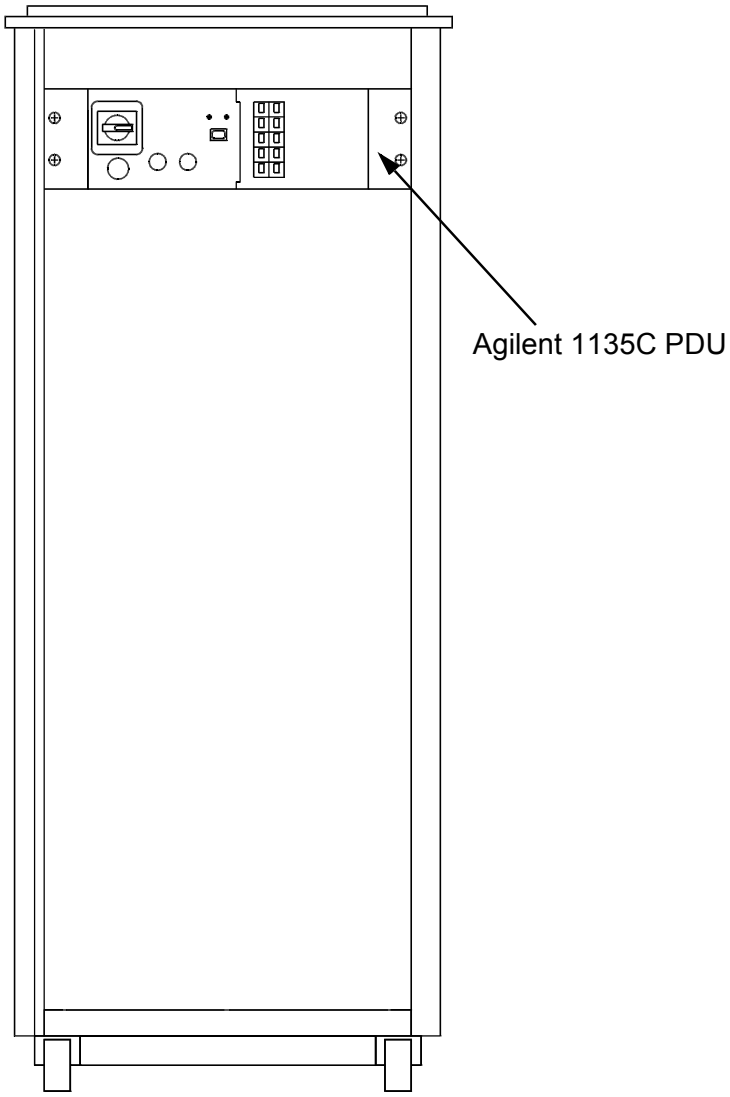
Power Type	Power Option	Country**	Voltage	Full Load Amps	Power Cord Wire Size/ Number of Conductors (Including Ground)*
Single-Phase Earthed 	05M	Brazil, China, Denmark, France, Germany, Hong Kong, Italy, S. Korea, United Kingdom	220V	39A	10 mm^2 (8 AWG), 3-wire
	05F	Finland, Germany, Philippines, Singapore, United Kingdom	230V	39A	10 mm^2 (8 AWG), 3-wire
	05J	Malaysia, United Kingdom	240V	39A	10 mm^2 (8 AWG), 3-wire
Single-Phase, Non-Earthed 	AWX	Japan	200V	39A	10 mm^2 (8 AWG), 3-wire
	0EB	Brazil, France, Italy, Mexico, Philippines, S. Korea, Taiwan	220V	39A	10 mm^2 (8 AWG), 3-wire
	0EJ	Brazil, France, Philippines	230V	39A	10 mm^2 (8 AWG), 3-wire
	0EC	United States	240V	39A	10 mm^2 (8 AWG), 3-wire
Single-Phase Wye with Neutral 	AWV	United States	120V	39A	10 mm^2 (8 AWG), 3-wire
	AWZ	Brazil, France, Italy, Mexico, Philippines	127/220V	39A	10 mm^2 (8 AWG), 3-wire
Single-Phase, Non-Earthed 	0EA	United States	120V	47A	10 mm^2 (8 AWG), 3-wire
	0EN	Mexico	127V	47A	10 mm^2 (8 AWG), 3-wire

* Use a larger wire size if the voltage drop between the AC source and system is greater than 2%

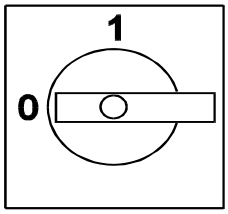
***Primary countries using the Agilent TS-5400 are shown. If your country is not shown, contact your Agilent Sales and Service office to determine which power option you should use.*

Locate the Agilent E1135C PDU

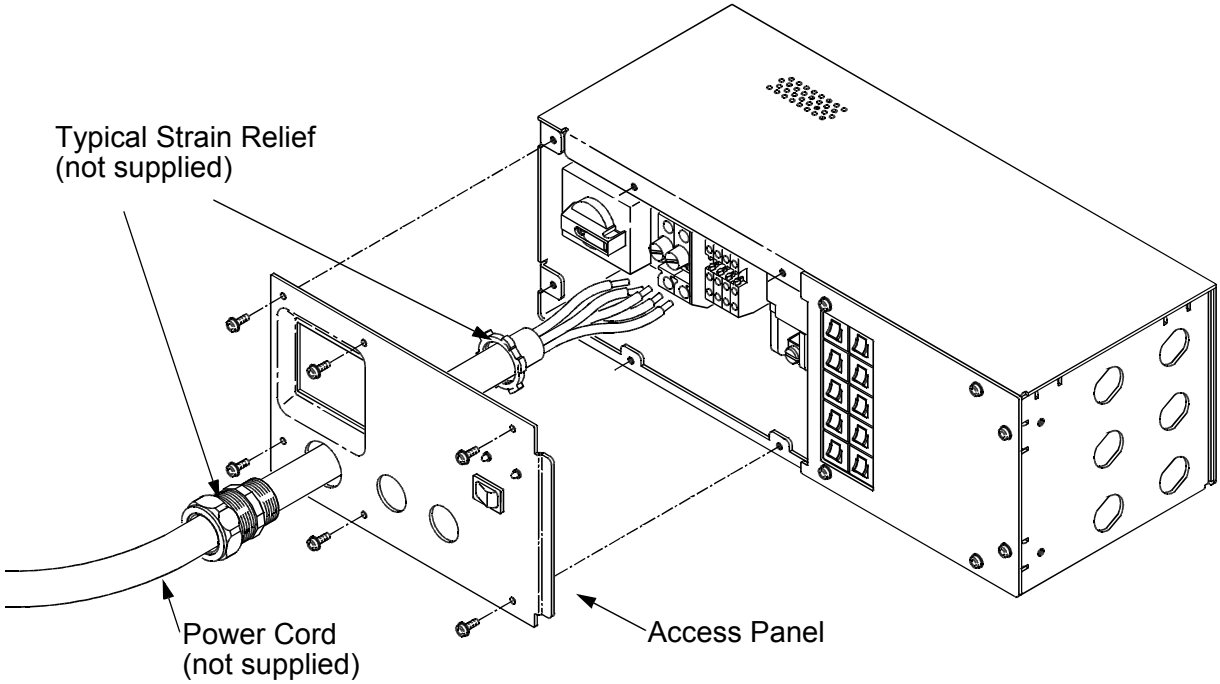
The Agilent 1135C is located in the back of the test stand. The figure below shows a typical location.



Set PDU Mains Disconnect to 0 (Off), Attach Strain Relief to the PDU's Access Panel



Note The power cord should slide freely through the strain relief--DO NOT tighten the strain relief at this point.



Connect Power Cord to PDU

The figures on the following pages show the wiring configurations for the various power options.

Stripping Wires and Torquing Terminals

To ensure that all wires are safely connected in the PDU, strip the wires and torque the terminal screws as shown in below.

Terminals	Strip Wires	Torque Terminals
Mains Disconnect terminals: T1, T2, T3, NEU, GND	15 mm (0.6 in)	1.7 N-m (15 in-lb)*

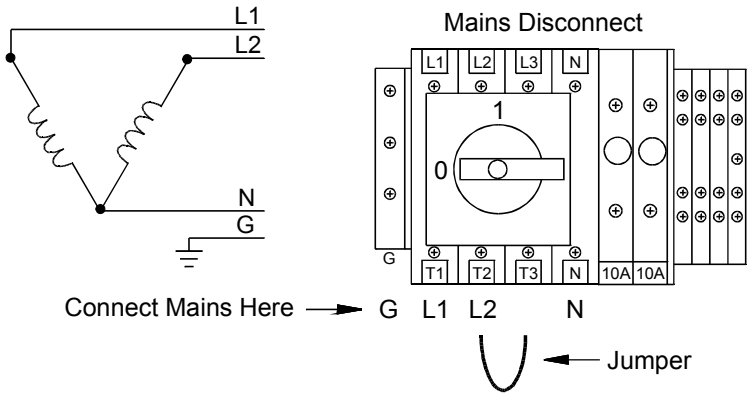
*Units of torque: "N-m" means newton-meters; "in-lb" means inch-pounds.

Making a Jumper

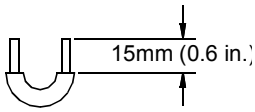
Some mains configurations require that you make a short jumper to be installed on the Mains Disconnect Switch. Make the jumper from a 50-millimeter (2-inch) length of wire with the same wire size as the power cord (Table 3-1 on page 29). Insert both the mains wire and the jumper wire in the same terminal on the Mains Disconnect Switch.

220-415V Single-Phase Wye with Neutral

Agilent Options: 05B, 05G, 05K

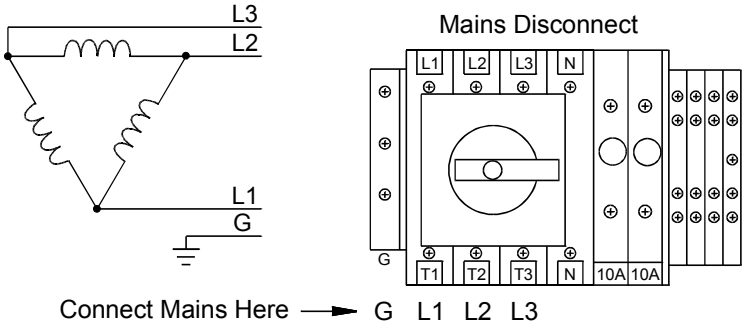


Note For phase voltage > 240V, loads on the **output block** are connected L1 to N, and L2 to N. Phase voltage is defined as the voltage potential between phases, L1 - L2.



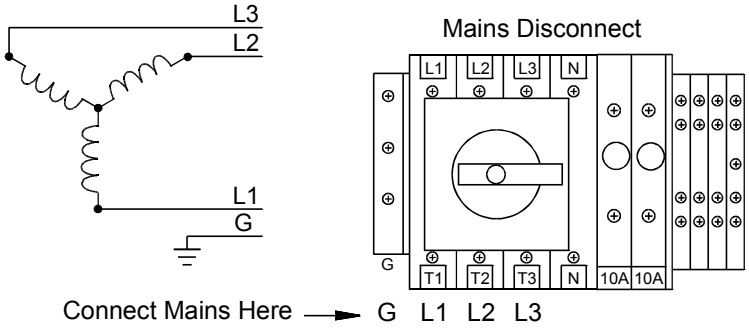
200-240V Three-Phase Delta

Agilent Options: 0ED, 05C, 05H, 0E6



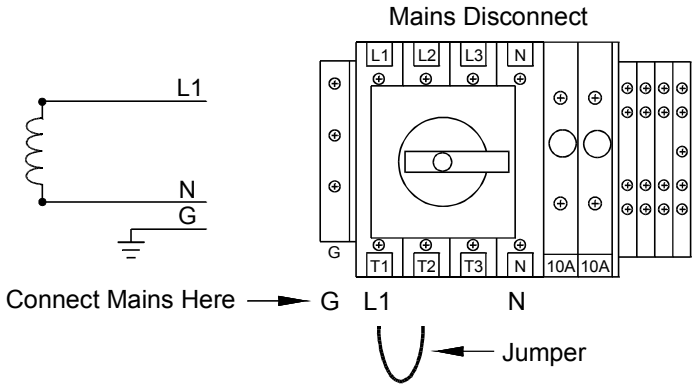
208 or 220V Three-Phase Wye

Agilent Options: 0EF, 05D



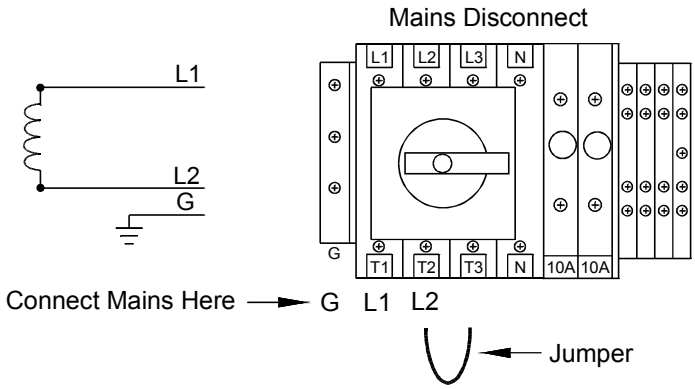
220-240V Single-Phase Earthed

Agilent Options: 05M, 05F, 05J



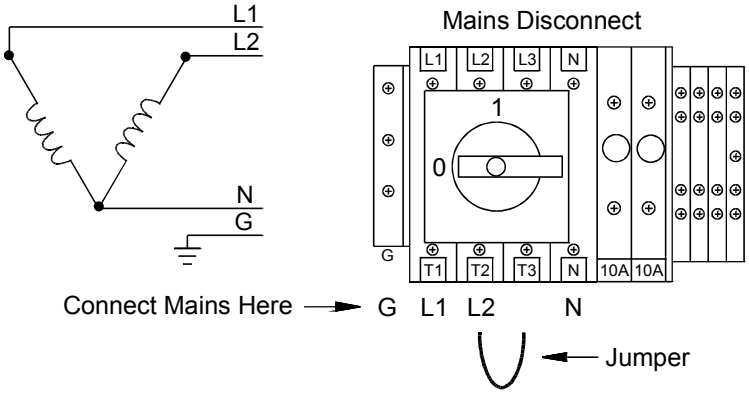
200V, or 220-240V Single-Phase Non-Earthed

Agilent Options: 0EB, 0EJ, 0EC, AWX, 0EA, 0EN

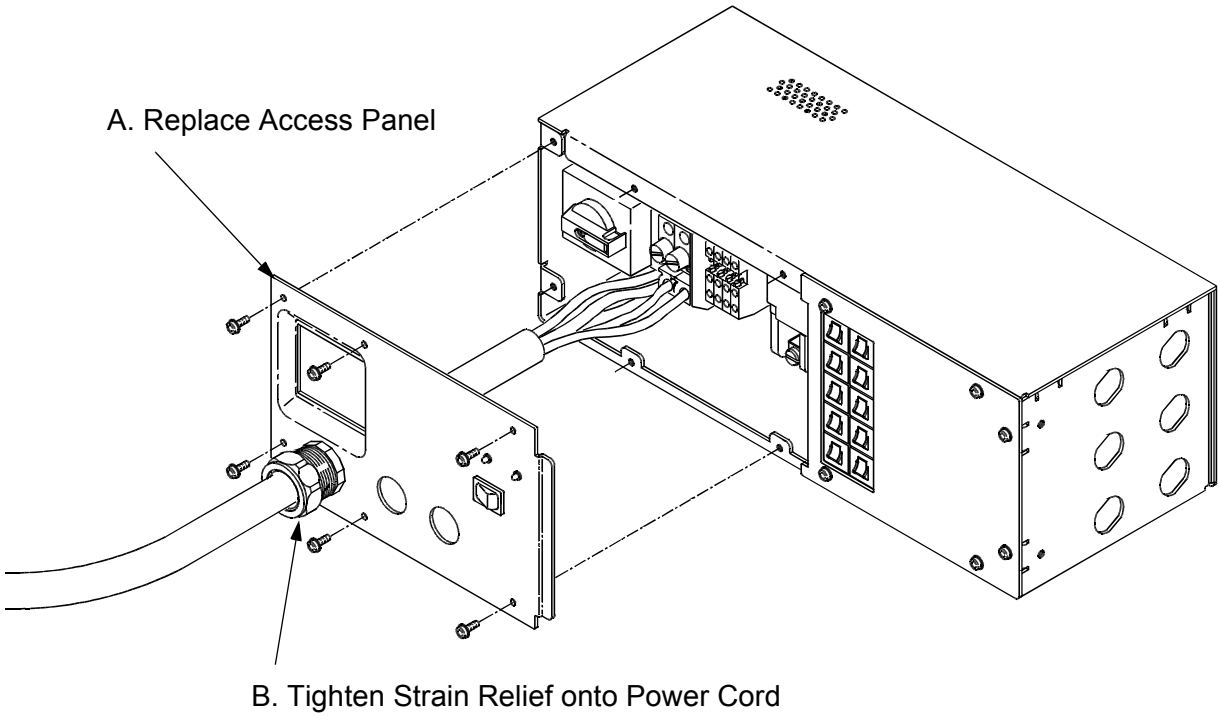


120, 127, 220V Single-Phase Wye with Neutral

Agilent Options: AWX, AWZ



Replace Access Panel, Tighten Strain Relief onto Power Cord



Connect Safety Ground

If the Agilent TS-5400 system is hardwired to the AC mains and includes a permanent earth ground, no other safety grounding is necessary. However, if the Agilent TS-5400 is connected to the AC mains by means of a plug/socket connection, a permanent earth ground must be supplied to reduce the risk of electric shock.

Make a permanent connection from the system rack to protective earth ground. This connection will serve as a redundant Protective Earth Connection to the primary Protective Earth connection, which is part of the AC power cord. The "Earth (ground) terminal" found at the bottom of the system rack, see Figure 3-1, should be connected by a wire separate from the system AC power cord to the Protective Earth connection at the AC source where the system AC power cord is connected. The wire must be the same wire size as the protective conductor of the system AC power cord. The wire may be either a bare conductor or a green with yellow stripe insulated conductor.

The redundant Protective Earth connection wire shall have a correctly sized wire lug on both ends. The wire lugs shall also be sized to fit the "Earth (ground) terminal" stud or bolt as found on the system rack and for the Protective Earth connection at the source end of system AC power cord. In some cases, the Protective Earth connection at the source end of the system AC power cord will receive the conductor without a wire lug.

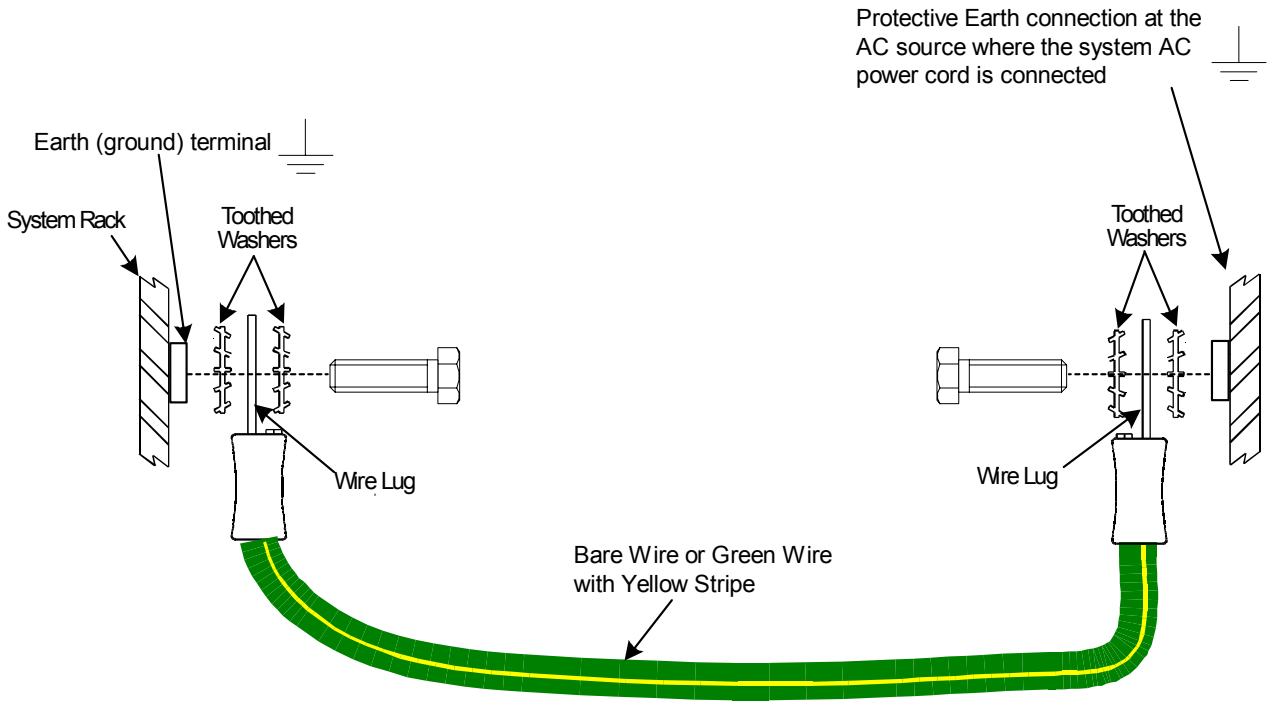
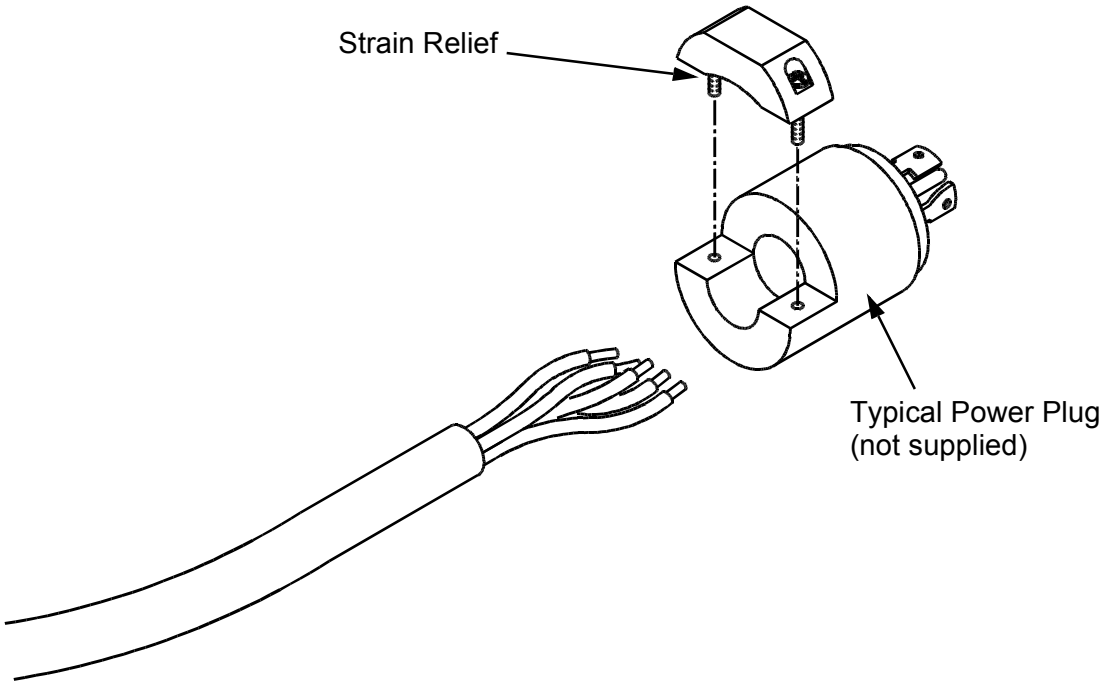


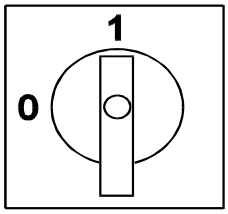
Figure 3-1. Safety Grounding Connections

Attach Power Plug (not supplied)

The figure below shows a typical power plug containing strain relief.



Plug-In Power Cord, Set PDU Mains Disconnect to 1 (On)

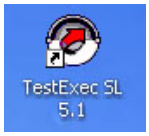


Turn On the System

Move the switch on the top front of the system rack to 1 (On) to turn on the system.

Selecting Agilent TestExec SL

The Agilent TestExec SL software is pre-installed on your PC controller's hard drive. Start TestExec SL from this icon in the PC desktop:



You can also run TestExec SL by clicking:

Start | Programs | Agilent TestExec SL 5.1 | TestExec SL 5.1

Getting Started Examples

The TS-5400 Online Help contains getting started examples for E8780/8786 systems. To access the getting started examples, from TestExec SL, click:

Tools | TS-5400 Online Help

The help file opens up to a selection of getting started examples. Click the link that corresponds to your system.

Wiring Information

A "Wiring Guide" is included with your system for either the Express Connect or Mac Panel Test System Interface. This guide shows you how to make connections to the system. This manual is also available from Test Exec SL by clicking:

Tools | TS-5400 Online Manuals

This opens a directory of all online manuals. Click the appropriate link to access the wiring guide for your system.

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