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# Installation Guide

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## Rack Mount Kits

For rack mounting Agilent 86120A/B/C instruments.



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**Safety Symbols.**  
CAUTION

The *caution* sign denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in damage to or destruction of the product. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

WARNING

The *warning* sign denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning sign until the indicated conditions are fully understood and met.



The instruction manual symbol. The product is marked with this warning symbol when it is necessary for the user to refer to the instructions in the manual.



The laser radiation symbol. This warning symbol is marked on products which have a laser output.



The AC symbol is used to indicate the required nature of the line module input power.



The ON symbols are used to mark the positions of the instrument power line switch.



The OFF symbols are used to mark the positions of the instrument power line switch.



The CE mark is a registered trademark of the European Community.



The CSA mark is a registered trademark of the Canadian Standards Association.



The C-Tick mark is a registered trademark of the Australian Spectrum Management Agency.

ISM1-A

This text denotes the instrument is an Industrial Scientific and Medical Group 1 Class A product.

**Typographical Conventions.**

The following conventions are used in this book:

Key type for keys or text located on the keyboard or instrument.

*Softkey type* for key names that are displayed on the instrument's screen.

Display type for words or characters displayed on the computer's screen or instrument's display.

**User type** for words or characters that you type or enter.

*Emphasis type* for words or characters that emphasize some point or that are used as place holders for text that you type.

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## General Safety Considerations

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**WARNING** There are many points in the instrument which can, if contacted, cause personal injury. Be extremely careful.

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**WARNING** These servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing unless you are qualified to do so.

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**WARNING** The opening of covers or removal of parts is likely to expose dangerous voltages. Disconnect the instrument from all voltage sources while it is being opened.

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**WARNING** The power cords on instruments are connected to internal capacitors that may remain live for five seconds after disconnecting the plug from its power supply.

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### Laser classification

The Agilent 86120A/B/C is classified as an FDA LASER Class 1 product according to 21 CFR1040.10 and IEC Laser Class 1 according to IEC 60825.

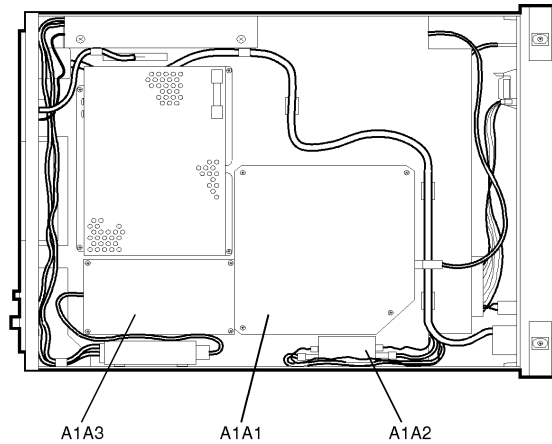
The total power of light energy radiated out of the OPTICAL OUT connector is no greater than +8.1 dBm (6.5 mW). Operator maintenance or precautions are not necessary to maintain safety. No operator accessible controls, adjustments, or performance of procedures result in hazardous radiation exposure.

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**WARNING** To avoid exposure to the laser path of a CLASS IIIa LASER PRODUCT, do not open the A1A1, A1A2, or A1A3 assemblies. There are no serviceable components inside. Laser paths outside of the A1A1, A1A2, or A1A3 assemblies do not require precautions to maintain safety.

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### General Safety Considerations



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#### CAUTION

Do not disturb any of the screws on the A1A1, A1A2, or A1A3 assemblies. Loosening or tightening these screws destroys the amplitude and wavelength calibration so that the Agilent 86120A/B/C no longer meets its published specifications. If the position of these screws is changed, return the instrument to Agilent Technologies for service.

This product has been designed and tested in accordance with IEC Publication 1010, Safety Requirements for Electronic Measuring Apparatus, and has been supplied in a safe condition. The instruction documentation contains information and warnings which must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

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#### WARNING

**If this instrument is not used as specified, the protection provided by the equipment could be impaired. This instrument must be used in a normal condition (in which all means for protection are intact) only.**

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#### WARNING

**To prevent electrical shock, disconnect the Agilent 86120A/B/C from mains before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.**

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#### WARNING

**This is a Safety Class 1 product (provided with a protective earthing ground incorporated in the power cord). The mains plug shall only be inserted in a socket outlet provided with a protective earth contact.**

## General Safety Considerations

**Any interruption of the protective conductor inside or outside of the product is likely to make the product dangerous. Intentional interruption is prohibited.**

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**WARNING**

**No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock, do not remove covers.**

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**WARNING**

**For continued protection against fire hazard, replace line fuse only with same type and ratings, (type T 0.315A/250V for 100/120V operation and 0.16A/250V for 220/240V operation). The use of other fuses or materials is prohibited. Verify that the value of the line-voltage fuse is correct.**

- For 100/120V operation, use an IEC 127 5×20 mm, 0.315 A, 250 V, Agilent Technologies part number 2110-0449.
- For 220/240V operation, use an IEC 127 5×20 mm, 0.16 A, 250 V, Agilent Technologies part number 2110-0448.

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**CAUTION**

Before switching on this instrument, make sure that the line voltage selector switch is set to the line voltage of the power supply and the correct fuse is installed. Assure the supply voltage is in the specified range.

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**CAUTION**

This product is designed for use in Installation Category II and Pollution Degree 2 per IEC 1010 and 664 respectively.

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**CAUTION**

**VENTILATION REQUIREMENTS:** When installing the product in a cabinet, the convection into and out of the product must not be restricted. The ambient temperature (outside the cabinet) must be less than the maximum operating temperature of the product by 4°C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, then forced convection must be used.

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**CAUTION**

Always use the three-prong ac power cord supplied with this instrument. Failure to ensure adequate earth grounding by not using this cord may cause instrument damage.

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**CAUTION**

*Do not* connect ac power until you have verified the line voltage is correct. Damage to the equipment could result.

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**CAUTION**

This instrument has autoranging line voltage input. Be sure the supply voltage is within the specified range.

## Introduction

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# Introduction

The installation instructions in this book apply to the following kits:

- Rack-mount kit, 86120-60030
- Rack-mount kit with handles, 86120-60031
- Rack-slide kit, 1494-0059

These kits mount 4.5-inch instruments into a rack with 482.6 mm (19 inch) spacing. For a list of parts contained in the kits, refer to “Replacement Parts” on page 19.

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### CAUTION

When installing the rack-mount kits, the instrument’s cover must be temporarily removed. Because this exposes the internal circuits to electrostatic discharge, perform the procedure at a static-safe workstation. Refer to “Electrostatic Discharge Information” on page 21.

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### Required Tools

The following tools are needed to assemble the rack-mount kits. If a 7 mm nut driver is unavailable, the needle-nose pliers may be substituted.

#1 pozidrive screwdriver  
#2 pozidrive screwdriver  
4 mm hex key (included with kit)  
7 mm nut driver (preferred) or needle-nose pliers  
5.5 mm nut driver (preferred) or needle-nose pliers  
T-6 TORX driver  
T-10 TORX driver, right angle (included with kit)  
T-15 TORX driver

For any assistance, contact your nearest Agilent Technologies Sales and Service Office. Refer to “Agilent Technologies Service Offices” on page 23.

**Introduction**

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## To Rack Mount the Instrument

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# To Rack Mount the Instrument

Please observe the following. Circled numbers in this procedure refer to items shown in figures. Agilent Technologies part numbers are listed in parenthesis. You will find these part numbers listed on the bags that contain the parts.

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### WARNING

**The opening of covers or removal of parts is likely to expose dangerous voltages. Disconnect the instrument from all voltage sources while it is being opened.**

- 1 Disconnect the power cord from the instrument.
- 2 Place the instrument face down as illustrated in Figure 1.
- 3 Remove the eight screws (four per side) securing the front bumpers ② to the instrument.
- 4 Remove the two screws securing the handle, and remove the handle.
- 5 Use a 4 mm hex key (8710-1755) to loosen the four screws ③ in the rear feet to disengage the cover assembly ① from the instrument.

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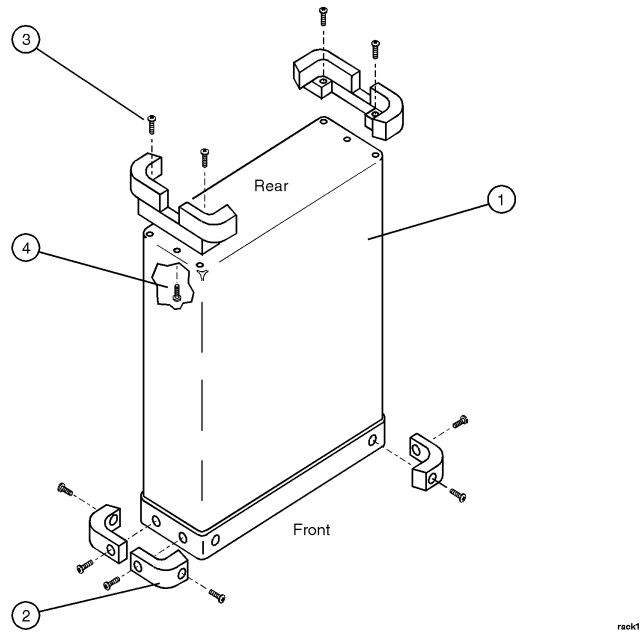
### CAUTION

Beneath the cover, located in the vicinity of the handle attachment screws, are two finger springs that reduce electro-magnetic interference (EMI). These springs can be damaged. To avoid damage, perform the following steps carefully to remove the cover.

- 6 Located the side of the instrument opposite to where the handles were attached. While applying pressure to this side, simultaneously pull on the instrument foot that is located on the side where the handle was attached. This action relieves strain on the springs while removing the cover.



**To Rack Mount the Instrument**



**Figure 1. Preparing the cover assembly**

- 7** Slide the instrument cover assembly toward the rear of the instrument, and remove the cover from the instrument.
- 8** Remove the two screws ④ that attach the rear feet to the cover assembly, and remove the feet. These screws are located inside the cover.
- 9** Remove the six screws that secure the two bottom tilt-stand feet, and remove the feet. The screws are located inside the cover. Use the T-10 right-angle TORX key included with the kit.

**CAUTION**

Be careful to protect the instrument's cable assemblies and components from damage when you replace the cover assembly. Use key caution to avoid damaging the EMI springs. If you damage an EMI spring, you can order a new one using Agilent Technologies part number 8160-0656.

- 10** Slide the cover assembly back onto the instrument chassis while applying pressure to the side of the cover that is opposite the handle attachment points. Gentle pressure ensures that the cover will not bind against the EMI springs. Make sure that the seam in the cover is located on the bottom of the instru-

**To Rack Mount the Instrument**

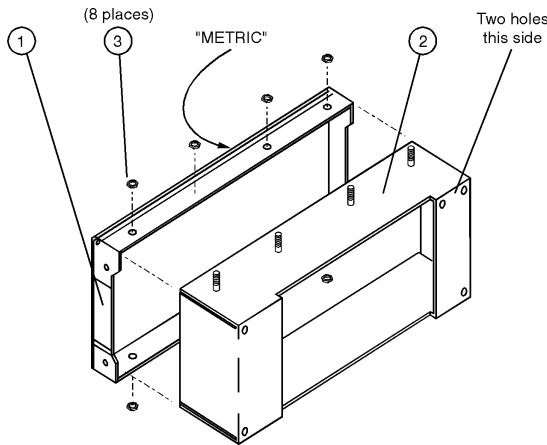
ment.

**CAUTION**

Make sure that the instrument's cover properly engages the gasket in the instrument's front frame.

- 11** Onto each of the four socket-head cap screws (0515-0049), place a split-lock washer (2190-0587) and a flat washer (3050-0894).
- 12** Use these screws to temporarily attach the instrument's cover.
- 13** Locate the rack-mount kit's rear support ② (5002-0634) and rear frame ① (5021-5804) as illustrated in Figure 2.

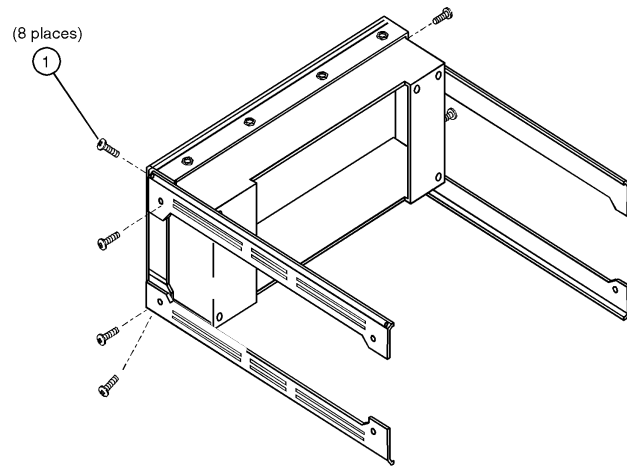
The text "METRIC" on the frame and the two adjacent holes illustrated in the figure identify the top sides. This orientation ensures that the top of the frame and the top of the rear support are joined correctly.



**Figure 2. Assembling the rack's rear frame**

- 14** Position the rear support's studs into the corresponding top row of holes in the rear frame.
- 15** Slightly squeeze the rear support until the bottom row of studs clears the rear frame and insert into the bottom row of holes. Fasten with eight nuts ③ (0535-0031). Alternately tighten each nut to the recommended torque of 6 inch-pounds.
- 16** Attach the four side struts (5021-5837) to the rack's rear frame using eight screws ① (0515-1331). See Figure 3.

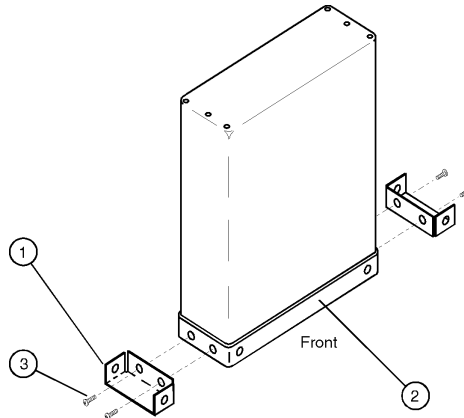
## To Rack Mount the Instrument



**Figure 3. Attaching the side struts**

- 17** Connect the two front mounting brackets ① (5002-0633) to the instrument's front frame using four pan-head screws ③ (0515-1079). See Figure 4. Tighten each screw to a torque of 6 inch-pounds.
- 18** Locate the kit's front frame (5021-8403). Look into the frame as if you were looking into the front of an instrument. Find the two vent holes which are about half an inch long and a quarter of an inch high. When the frame is installed, these holes must be oriented along the bottom of the instrument.

### To Rack Mount the Instrument



**Figure 4. Attaching the mounting brackets**

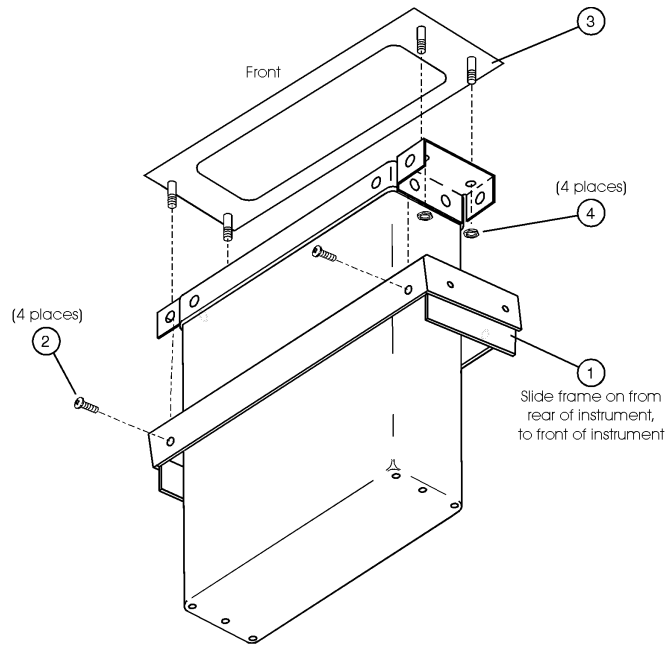
- 19** Slide the kit's front frame ① over the rear of the instrument until it is over the instrument's front frame. See Figure 5.
- 20** Attach the frame to the front brackets using four flat-head screws ② (0515-1234).
- 21** Place the dress panel ③ (5002-0640) over the instrument's front panel. Secure with four nuts ④ (0535-0082) tightened to a torque of 6 inch-pounds.

If you *do not* have a 7 mm nut driver, use the spring clips rather than the six nuts. Apply the spring clips to the dress panel studs using needle-nose pliers.

#### **CAUTION**

Do not over torque the nuts.

### To Rack Mount the Instrument



**Figure 5. Attaching the front**

- 22** Place the instrument on its front frame.

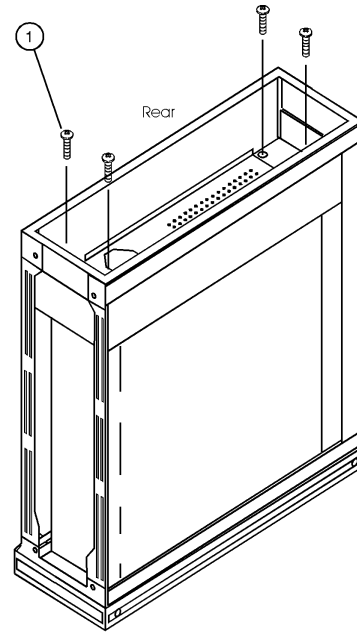
#### **CAUTION**

Avoid damaging the instrument's front panel and input connector by placing it onto a surface protected by cloth.

- 23** Remove the four socket-head cap screws that secure the instrument's cover. Do not remove the cover. You attached these screws in Step 12.
- 24** Place the rack-mount kit frame onto the instrument as shown in Figure 6.



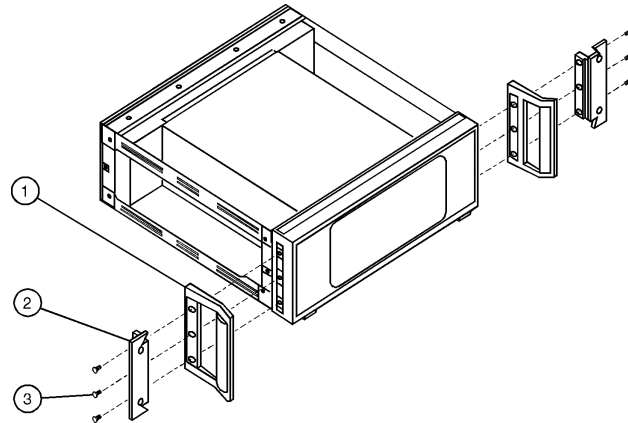
## To Rack Mount the Instrument



**Figure 7. Securing the frame**

- 27** Place the instrument in its operating position. See Figure 8.
- 28** If you are installing the rack-mount kit with handles (5062-3983), mount the handles ① and rack flanges ② to the rack frame using six pan-head screws ③. Tighten each screw to a torque of 12 inch-pounds.

### To Rack Mount the Instrument



**Figure 8. Attaching the flanges and handles**

- 29** If your installing the rack-mount kit without handles (5062-3977), mount rack flanges ② directly to the rack frame using six pan-head screws ③. Tighten each screw to a torque of 12 inch-pounds.
- 30** The instrument is now ready to mount into the system rack.

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**WARNING**

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**If an instrument handle is damaged, it should be replaced immediately. Damaged handles can break while the instrument is being moved or lifted. This may cause damage to the instrument or personal injury.**





### To Install the Rack-Slide Kit

(two per side) M5 × 0.8 × 14 mm pan-head screws ③.

- 6 Insert two unistrut nuts ④ in each of the four vertical columns of the systems rack.
- 7 Compress each outer-slide member to its shortest length, revealing the holes ⑤ for screws ⑥. If necessary, press the release button ⑦.
- 8 Attach an outer slide member to each side of the systems rack, using two M4 × 0.7 × 12 mm flat-head screws ⑥ in the front and two M4 × 0.7 × 12 mm pan-head screws ⑧ in the rear.
- 9 Place the instrument into the rack by sliding the inner slide members into the outer slide members. Use the release buttons, located on the slides, to enable complete compression of the slides.
- 10 To prevent the rack slides from accidentally opening, use screws to secure the rack frame to the system cabinet.

## Replacement Parts

# Replacement Parts

**Table-1. Rack-Mount Kits (86120-60030 and 86120-60031)**

Agilent Part Number	Quantity	Description
5062-3983	1	Front-handle kit ( <i>with handles</i> ). Supplied with 86120-60031 kit.
5062-3977	1	Front-handle kit ( <i>without handles</i> ). Supplied with 86120-60030 kit.
8710-1755	1	Hex Key, 4mm
8710-1657	1	T10 right-angle TORX key
5002-0640	1	Dress Panel
5021-8403	1	Front Frame
5002-0633	2	Front Bracket
5002-0634	1	Rear Support
5021-5804	1	Rear Frame
5021-5837	4	Side Strut
0535-0031	8	Nut M3 × 0.5mm
0535-0082	4	Nut M4 × 0.7mm
2190-0587	4	Lock Washer M5.0 ID
3050-0894	4	Flat Washer M5.0 ID
0510-1148	6	Push-On Retainer Clips
0515-0049	4	Screw, Socket-Head M5 × 0.8 × 12 mm-LG
0515-1079	4	Screw, Mach M3 × 0.5 8 mm-LG PAN-HD
0515-1234	4	Screw, Mach M3.5 × 8 mm-LG FLAT-HD
0515-1331	16	Screw, Mach M4 × 0.7 6 mm-LG FLT-HD

### Replacement Parts

**Table-2. Rack Slide Kit (Agilent part number 1494-0059)**

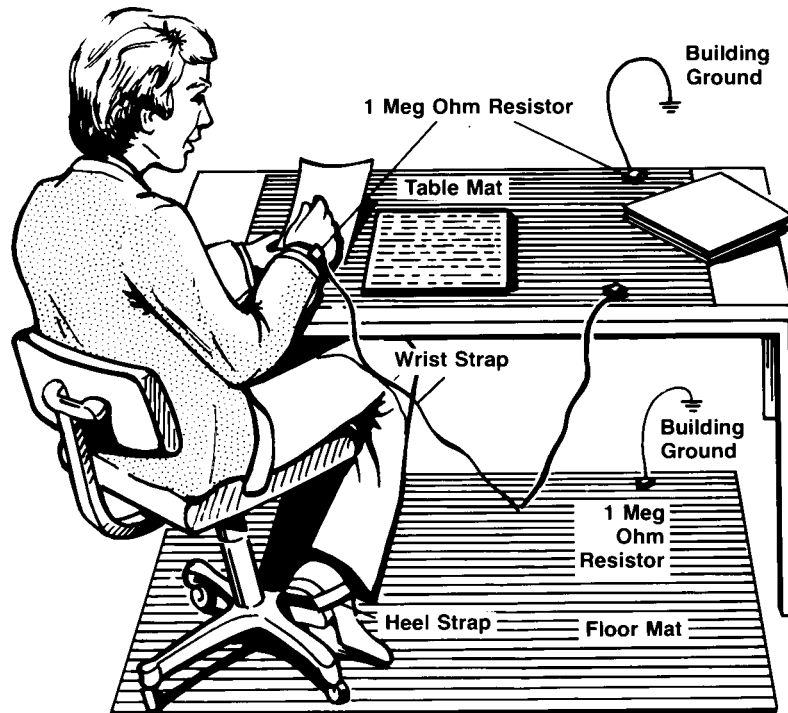
Agilent Part Number	Quantity	Description
—	2	Slides (not sold separately)
0515-0949	4	Screw, Mach M5 × 0.8 14 mm-LG PAN-HD
0515-1013	4	Screw, Mach M5 × 0.7 12 mm-LG FLAT-HD
0515-0909	4	Screw, Mach M4 × 0.7 12 mm-LG PAN-HD
0535-0080	8	Unistrut Nut M4 × 0.7

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## Electrostatic Discharge Information

Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe work station. The following figure shows an example of a static-safe work station using two types of ESD protection:

- Conductive table-mat and wrist-strap combination.
- Conductive floor-mat and heel-strap combination.



### Electrostatic Discharge Information

Both types, when used together, provide a significant level of ESD protection. Of the two, only the table-mat and wrist-strap combination provides adequate ESD protection when used alone.

To ensure user safety, the static-safe accessories must provide at least 1 MΩ of isolation from ground. Refer to Table 3 on page 22 for information on ordering static-safe accessories.

#### **WARNING**

**These techniques for a static-safe work station should not be used when working on circuitry with a voltage potential greater than 500 volts.**

The following suggestions may help reduce ESD damage that occurs during testing and servicing operations.

- Personnel should be grounded with a resistor-isolated wrist strap before removing any assembly from the unit.
- Be sure all instruments are properly earth-grounded to prevent a buildup of static charge.

Table 3 on page 22 lists static-safe accessories that can be obtained from Agilent Technologies using the Agilent part numbers shown.

**Table-3. Static-Safe Accessories**

Agilent Part Number	Description
9300-0797	Set includes: 3M static control mat 0.6 m × 1.2 m (2 ft× 4 ft) and 4.6 cm (15 ft) ground wire. (The wrist-strap and wrist-strap cord are not included. They must be ordered separately.)
9300-0980	Wrist-strap cord 1.5 m (5 ft)
9300-1383	Wrist-strap, color black, stainless steel, without cord, has four adjustable links and a 7 mm post-type connection.
9300-1169	ESD heel-strap (reusable 6 to 12 months).

**Agilent Technologies Service Offices**

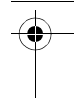
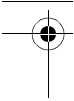
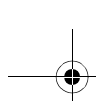
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## Agilent Technologies Service Offices

Before returning an instrument for service, call the Agilent Technologies Instrument Support Center at (800) 403-0801, visit the Test and Measurement Web Sites by Country page at <http://www.tm.agilent.com/tmo/country/English/index.html>, or call one of the numbers listed below.

### Agilent Technologies Service Numbers

Austria	01/25125-7171
Belgium	32-2-778.37.71
Brazil	(11) 7297-8600
China	86 10 6261 3819
Denmark	45 99 12 88
Finland	358-10-855-2360
France	01.69.82.66.66
Germany	0180/524-6330
India	080-34 35788
Italy	+39 02 9212 2701
Ireland	01 615 8222
Japan	(81)-426-56-7832
Korea	82/2-3770-0419
Mexico	(5) 258-4826
Netherlands	020-547 6463
Norway	22 73 57 59
Russia	+7-095-797-3930
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United Kingdom	01 344 366666
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## Agilent Technologies Service Offices

