

Service Manual



P5210

High-Voltage Differential Probe

070-9895-01

Warning

The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.

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General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

Observe Maximum Working Voltage

Do not use the P5210 above 1,000 V_{RMS} CAT II from ground on either input or $\pm 1,300$ V (DC + peak AC) between the leads.

To Avoid Fire or Personal Injury

Avoid RF Burns While Handling Probe. To avoid RF burns, do not handle the probe while the input leads are connected to circuits above the voltage and frequency limits specified in Figure 1 on page 3. Use only probe accessories that are rated for the application.

Connect and Disconnect Properly. Connect the probe output to the measurement instrument before connecting the probe to the circuit under test. Disconnect the probe input and the probe ground from the circuit under test before disconnecting the probe from the measurement instrument.

Ground the Product. This product is indirectly grounded through the grounding conductor of the mainframe power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Use Proper AC Adapter. Use only the AC adapter specified for this product.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

Avoid Exposed Circuitry. Do not touch exposed connections and components when power is present.

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Safety Terms and Symbols

Terms in This Manual. These terms may appear in this manual:



WARNING. *Warning statements identify conditions or practices that could result in injury or loss of life.*



CAUTION. *Caution statements identify conditions or practices that could result in damage to this product or other property.*

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product. These symbols may appear on the product:



CAUTION
Refer to Manual



WARNING
High Voltage



Double
Insulated



Protective Ground
(Earth) Terminal



Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

Do Not Service Alone. Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

Use Care When Servicing with Power On. Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

Contacting Tektronix

| | |
|--------------------------|---|
| Phone | 1-800-833-9200* |
| Address | Tektronix, Inc. 14200 SW Karl Braun Drive P.O. Box 500 Beaverton, OR 97077 USA |
| Web site | www.tektronix.com |
| Sales support | 1-800-833-9200, select option 1* |
| Service support | 1-800-833-9200, select option 2* |
| Technical support | Email: techsupport@tektronix.com 1-800-833-9200, select option 3* 1-503-627-2400 6:00 a.m. – 5:00 p.m. Pacific time |

* **This phone number is toll free in North America. After office hours, please leave a voice mail message. Outside North America, contact a Tektronix sales office or distributor; see the Tektronix web site for a list of offices.**

Operating Basics

To help you use the P5210 High Voltage Differential Probe safely and effectively, this section provides important information about safety limits, operating characteristics, and probing techniques.



WARNING. *Due to the inherent hazards associated with taking high-voltage measurements, the product is intended for use by qualified personnel who have had the training to make these types of measurements. Read and follow the precautions specified in this manual.*

Before you make any oscilloscope measurement, observe all safety precautions described in the user and service manuals for the equipment you are working on. Some general rules about using and servicing electrical equipment are worth repeating here.

- Observe the safety instruction symbols for the equipment you are working on.
- Consult the instruction or service manuals for the equipment you are working on.
- Don't operate or service an electrical device in an explosive atmosphere.
- Avoid personal injury by never touching exposed connections or components in the circuit-under-test when the power is on.

Operating the Probe Safely

Before connecting the inputs of the probe to a circuit, read the safety information in this section, and attach the appropriate accessories to the input connectors of the probe.

NOTE. *To avoid shock or fire hazard, use only accessories that are rated for the application.*

Minimizing Risk of RF Burn (Probe Leads)



WARNING. *To avoid personal injury, do not handle the probe leads when the leads are connected to a source that is above the voltage and frequency limits given in Figure 1 on page 3. The area above these limits poses a risk of radio frequency (RF) burns.*

If you need to use the probe within the risk area for RF burn, turn power off to the source before connecting or disconnecting the probe leads. Do not handle the input leads while the circuit is active.

Maximum Input Limits

To prevent damage to the probe, you must observe both the peak and RMS ratings. (The rating for DC voltage is the same as the rating for RMS voltage.) You must also observe the ratings between the differential inputs and between each input and earth ground.



CAUTION. *To avoid damaging the input circuitry of the P5210, do not apply voltage of more than 2,200 V_{RMS} CAT II between either input and earth ground or more than 4,400 V_{RMS} CAT II between the inputs. In addition, the peak voltage must be less than 5,600 V (DC + peak AC) between the inputs.*

Above 1.5 MHz, the voltage limit decreases as frequency increases. See Figure 1. The input limit applies to both the 100X and 1,000X settings.

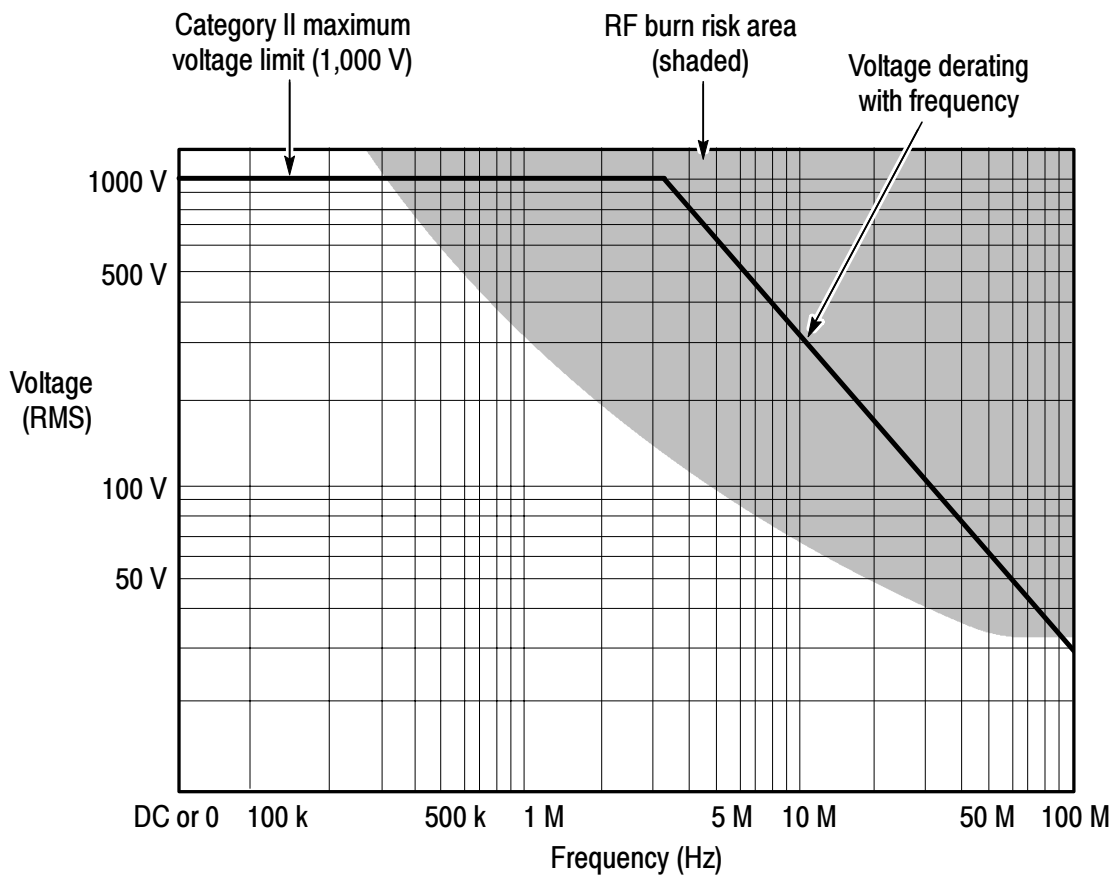


Figure 1: Safety Limits (voltage between either input and earth ground)

Operating Characteristics and Probing Techniques

This section explains the operating characteristics of the P5210 along with techniques you can use to maximize the performance of the probe.

Operating Limits

The P5210 has two operating ranges that you select with the ATTENUATION button on the front panel: 1,000X and 100X. These ranges set the maximum differential voltage that can be measured.

- In the 100X position, the probe can measure differential voltages ≤ 560 V (DC + peak AC).

- In the 1,000X position, the probe can measure differential voltages $\leq 5,600$ V (DC + peak AC).

Always insure that the input voltages never exceed $2,200$ V_{RMS} CAT II from either input to ground or $4,400$ V_{RMS} CAT II between the inputs.

Overrange Detection

Differential voltage outside the operating range will overdrive the circuitry of the probe and distort the output signal. When this differential overrange occurs, the probe detects the condition and lights the overrange indicator. With the Audible Overrange ON, the probe will also emit an audible alarm.

NOTE. *Common-mode voltage greater than $2,200$ V_{RMS} CAT II can distort the output signal, but the probe will not indicate an overrange condition.*

Common-Mode Rejection

The common-mode rejection ratio (CMRR) is the specified ability of P5210 to reject signals that are common to both inputs. More precisely, CMRR is the ratio of the differential gain to the common-mode gain. The higher the ratio, the greater the ability of probe to reject common-mode signals. For detailed specifications, see pages 8 and 11 in the *Specification* section.

Common mode rejection decreases as the input frequency increases. Figure 5 on page 12 is a plot of typical CMRR of the probe versus input frequency. For example, if you apply a 60 Hz line voltage of 500 V_{P-P} to both input leads of the probe, the probe rejects the signal by 80 dB (typical) and the signal appears as only a 50 mV_{P-P} signal on the oscilloscope screen.

Twisting the Input Leads

Twisting the input leads as shown in Figure 2 on page 5 helps to cancel noise that is induced into the input leads and to improve the high-frequency response of the inputs.

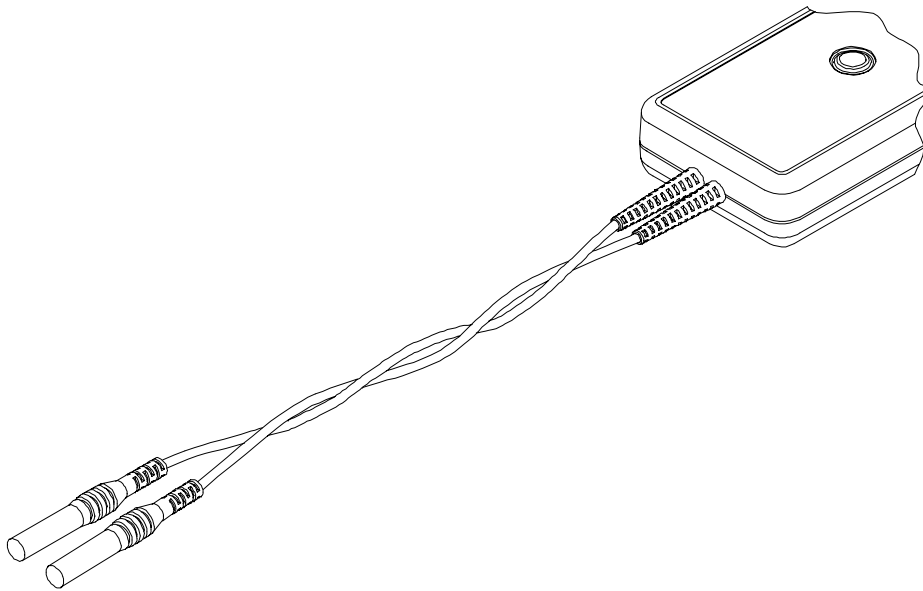


Figure 2: Twisting the Input Leads

Extension Leads

The extension leads allow you to reach widely spaced connection points. Connect the extension leads to the input leads using the adapters provided. Be sure to use both extension leads so that the input leads are the same length.

The extension leads, however, do affect the high-frequency performance of the probe. With longer lead length, differential noise induced into the input leads is greater. Also, because of the added inductance of the leads, voltage measurements at frequencies above approximately 10 MHz may not be as precise. Figure 3 on page 6 shows the affect on HF transient response.

The extension leads do not affect the performance of the probe when bandwidth is set to 5 MHz.

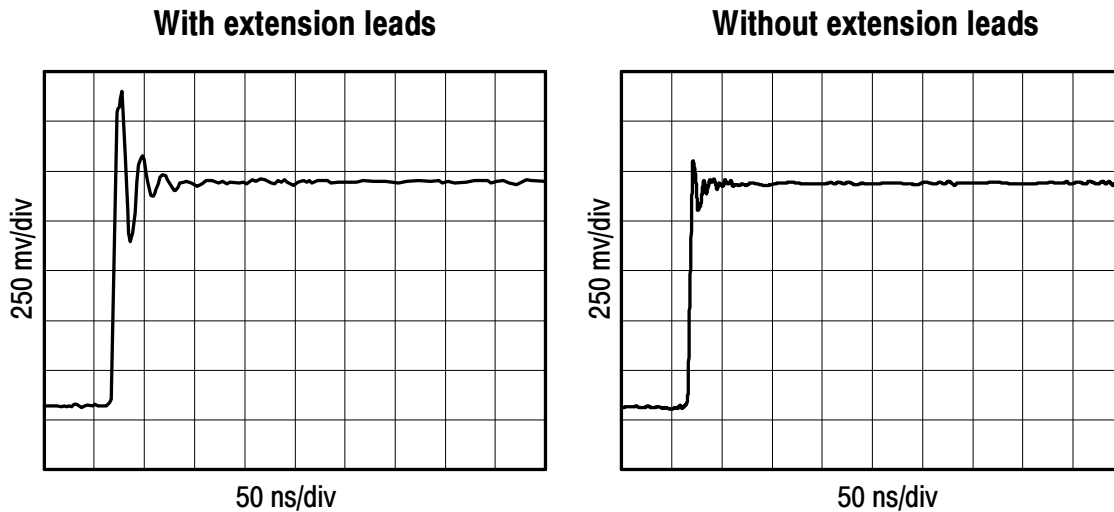


Figure 3: HF Transient Response with and without extension leads

Probe Loading

When you touch your probe tip to a circuit element, you are introducing a new resistance, capacitance, and inductance into the circuit.

Frequency and impedance of the source determine how much the probe loads the circuit you are measuring. As the frequency of the source starts to increase beyond 1 kHz, the input impedance of the probe begins to decrease. The lower the impedance of the probe relative to that of the source, the more the probe loads the circuit under test. For a graph of frequency versus input impedance, refer to Figure 6 on page 13 of the *Specifications* section.

The probe has virtually no loading effect on sources with relatively low impedance and low frequency.

Specifications

The specifications in Tables 1 through 5 apply to a P5210 probe installed on a Tektronix TDS 460A oscilloscope. When the probe is used with another oscilloscope, the oscilloscope must have:

- An input impedance of 1 M Ω
- An input capacitance range of between 15 and 20 pF
- A bandwidth greater than 200 MHz

The probe must have a warm-up period of at least 20 minutes and be in an environment that does not exceed the limits described in Table 1 on page 8.

Specifications for the P5210 probe fall into three categories: warranted, typical, and nominal characteristics.



WARNING. *Special fixtures are required to examine specifications at the maximum frequency and voltage levels and should be conducted only by qualified Service Personnel. See the Service section for more details.*

Warranted Characteristics

Warranted characteristics in Tables 1 and 2 describe guaranteed performance within tolerance limits or certain type-tested requirements. Warranted characteristics that have checks in the *Performance Verification* procedure appear in **boldface** type. The *Performance Verification* procedure begins on page 19.

Table 1: Warranted electrical characteristics

| | |
|--|---|
| DC common-mode rejection ratio | >3000:1 at 500 VDC, 20-30° C, <70% RH |
| Bandwidth | DC to 50 MHz (-3dB) |
| Gain accuracy | ± 3% at 20-30° C, <70% RH |
| Maximum rated input voltage (Refer to Figure 4 on page 9) | |
| probe tip to probe tip | 4.4 kV _{RMS} ¹ , Category I & II 1 kV _{RMS} ¹ , Category III 5.6 kV _(DC + peak AC) ² |
| probe tip to earth | 2.2 kV _{RMS} ¹ , Category I & II ³ 1 kV _{RMS} ¹ , Category III 5.6 kV _(DC + peak AC) ² |
| Temperature ⁴ | Operating: 0 to 40° C Nonoperating: -30 to +70° C |
| Humidity ⁴ | Operating: <85% RH at or below +35° C Nonoperating: <85% RH at or below +60° C |

- 1 The rating for DC voltage is the same as the rating for RMS voltage.**
- 2 The input voltage must not exceed this peak rating or the RMS rating.**
- 3 The 2.2 kV_{RMS} CAT II rating applies to high-voltage secondary circuits that have a CAT III primary as described in IEC 664. This rating only applies when using the probe head that is in the 020-2195-00 accessory kit. If you use any other probe head, do not exceed the voltage-to-ground rating of that probe head or this 2.2 kV_{RMS} CAT II rating.**
- 4 Tektronix Design Standard 062-2847-00**



WARNING. To avoid personal injury, do not handle the probe leads when the leads are connected to a source that is in the voltage and frequency range indicated by the shaded area in Figure 4. This area of operation poses a risk of radio frequency (RF) burns.

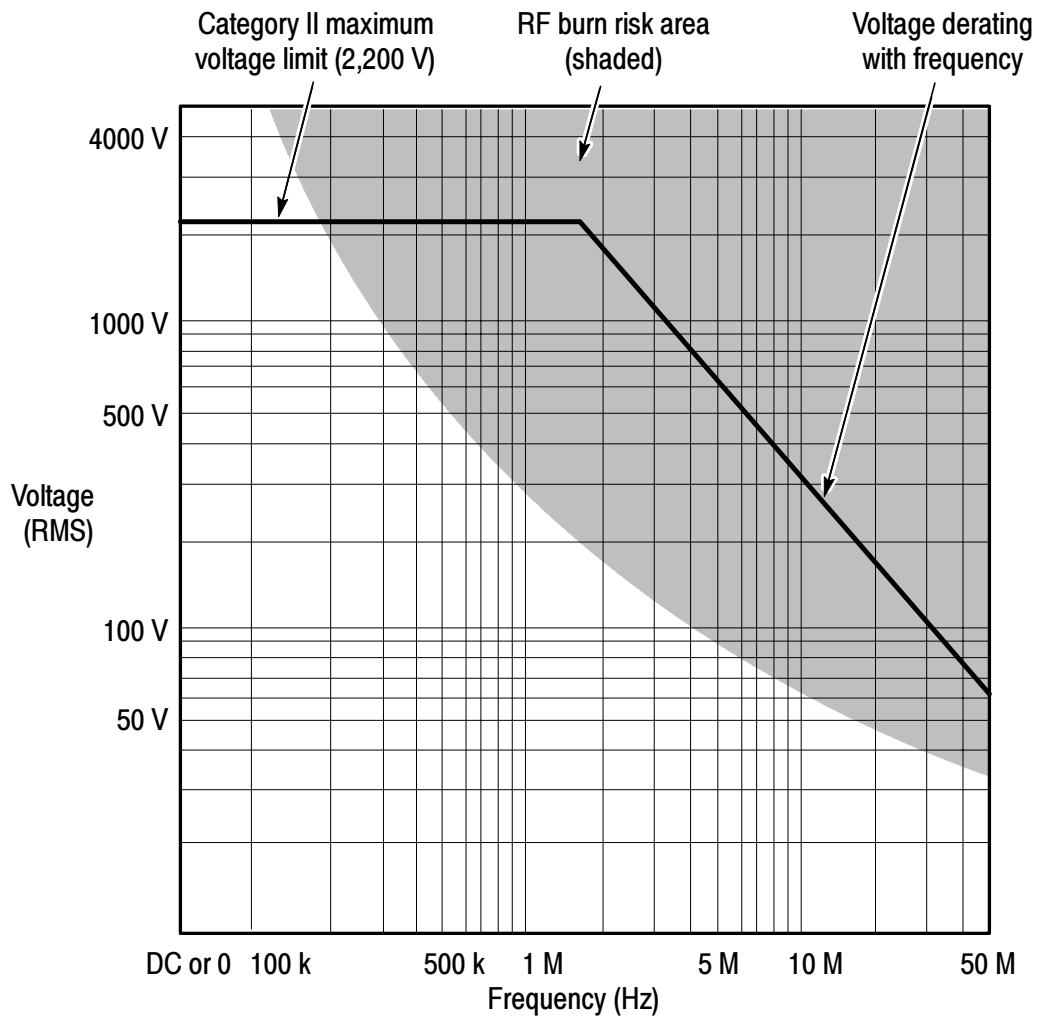


Figure 4: Safety limits (voltage between either input and earth ground)

Table 2: Certifications and compliances

| | |
|---|---|
| <p>EC Declaration of Conformity - Low Voltage</p> | <p>Compliance was demonstrated to the following specification as listed in the Official Journal of the European Communities:</p> <p>Low Voltage Directive 73/23/EEC, as amended by 93/68/EEC: EN 61010-1/A2:1995 Safety requirements for electrical equipment for measurement, control, and laboratory use EN 61010-2-031:1994 Particular requirements for hand-held probe assemblies for electrical measurement and test equipment</p> |
| <p>Approvals</p> | <p>UL3111-1 - Standard for electrical measuring and test equipment</p> <p>IEC 10106-2-031 - Particular requirements for hand-held probe assemblies for electrical measurement and test</p> <p>CAN/CSA-C22.2 No. 1010.1-92 and CAN/CSA-C22.2 No. 1010.2.031-94 - Safety requirements for electrical equipment for measurement, control, and laboratory use</p> |
| <p>Installation Category Descriptions</p> | <p>Terminals on this product may have different installation category designations. The installation categories are:</p> <p>CAT III Distribution-level mains (usually permanently connected). Equipment at this level is typically in a fixed industrial location</p> <p>CAT II Local-level mains (wall sockets). Equipment at this level includes appliances, portable tools, and similar products. Equipment is usually cord-connected</p> <p>CAT I Secondary (signal level) or battery operated circuits of electronic equipment</p> |
| <p>Pollution Degree 2</p> | <p>Do not operate in environments where conductive pollutants may be present.</p> |

Typical Characteristics

Typical characteristics in Tables 3 and 4 describe typical but not guaranteed performance.

Table 3: Typical electrical characteristics

| | |
|--|---|
| Rise time | 7 ns |
| Bandwidth limit | 5 MHz |
| AC common-mode rejection ratio (20-30°C, <70% RH) See Figure 5 | 60 Hz: > 10,000:1 100 kHz: > 300:1 1 MHz: > 300:1 |
| AC noise (referenced to input) | 100X: < 150 mV _{RMS} 1,000X: < 800 mV _{RMS} |
| Input impedance | 16 MΩ, 3.5 pF between inputs 8 MΩ, 7 pF between each input and ground See Figure 6 on page 13 |
| Propagation delay | 20 nS |
| Overdrive recovery | < 50 ns to 10% of final value after 10X overdrive (100X range only) |
| DC offset adjust (referenced to input) | 100X: ± 1.0 V 1,000X: ± 10 V |

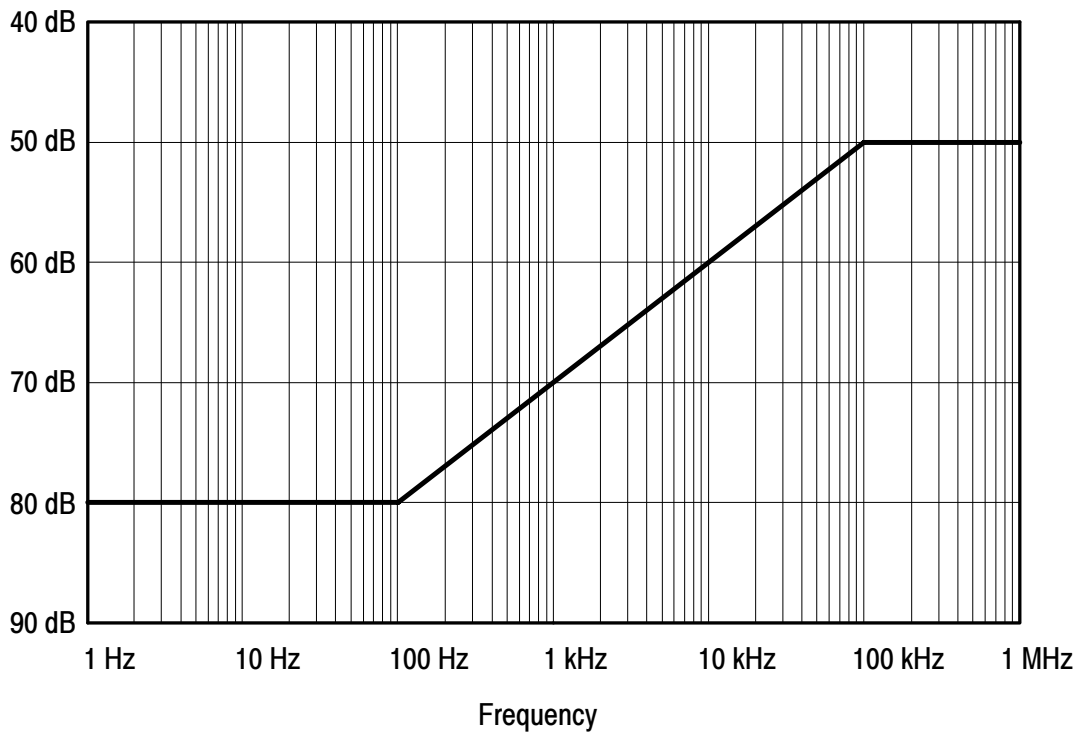
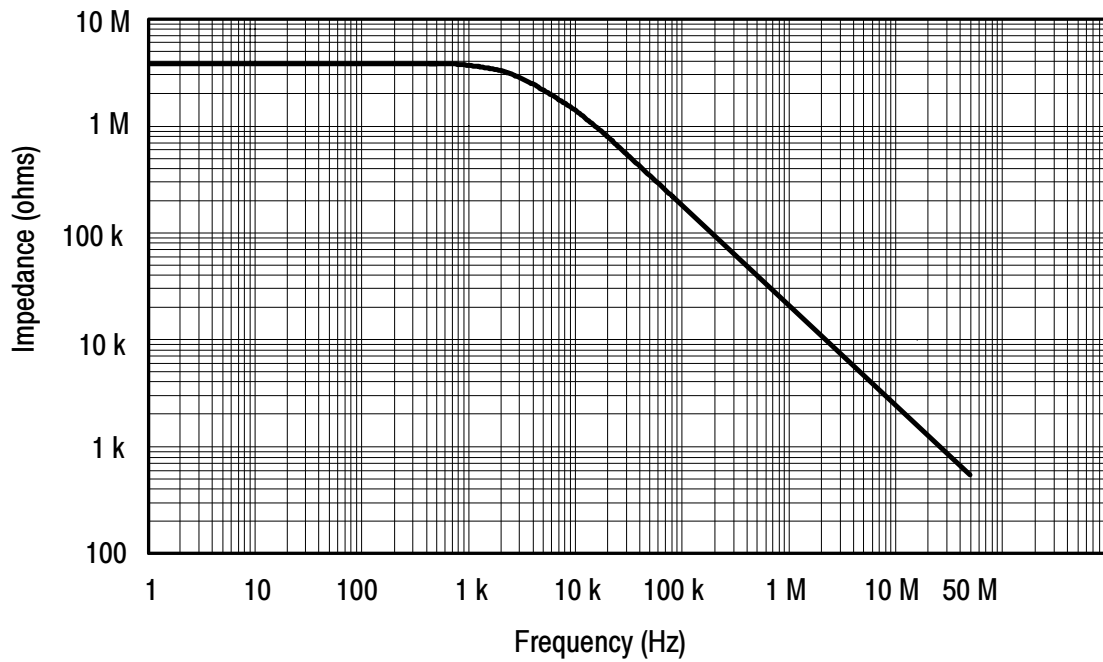


Figure 5: Typical common-mode rejection ratio (100X attenuation)

Table 4: Typical mechanical characteristics

| | |
|------------------------------------|--|
| Dimensions, case | 185 mm × 66 mm × 32 mm (7.2 in × 2.6 in × 1.3 in) |
| Dimensions, input leads | 45.7 cm (18 in) |
| Dimensions, output cable | 1.8 m (6 ft) |
| Unit weight (probe only) | 315 g (11 oz) |
| Shipping weight (with accessories) | 1.42 kg (3 lb, 2 oz) |

**Figure 6: Input impedance vs. frequency**

Nominal Characteristics

Nominal characteristics in Table 5 describe guaranteed traits, but the traits do not have tolerance limits.

Table 5: Nominal electrical characteristics

| | |
|------------------|---|
| Input type | Balanced differential |
| Output type | Single-ended. Source impedance of 50 Ω drives 1 M Ω oscilloscope input. Load impedance must be greater than 50 k Ω for stated accuracy |
| Gain | Switchable: 1/100 (100X) and 1/1,000 (1000X) |
| Overrange beeper | Overrange sounds whenever ON, and over range LED is lit. |

Maintenance

Refer to this section for information about maintaining and servicing the P5210 High Voltage Differential Probe.

For a list of replaceable parts, refer to the *Replaceable Parts* section on page 27. The replaceable parts of the TEKPROBE interface include the interface pins, the probe collar, and the compensation box covers.

Cleaning

Remove dirt with a soft cloth dampened in a mild detergent and water solution, or isopropyl alcohol.



CAUTION. *To avoid damaging the probe, use only a mild detergent and water solution or isopropyl alcohol and water; do not use any other solvents or abrasive cleaners. Do not immerse the probe.*

Replacing TEKPROBE Interface Pins

1. Remove the interface pin with pliers (see Figure 7 on page 16).
2. Insert a new pin and press it into the socket against a hard surface.

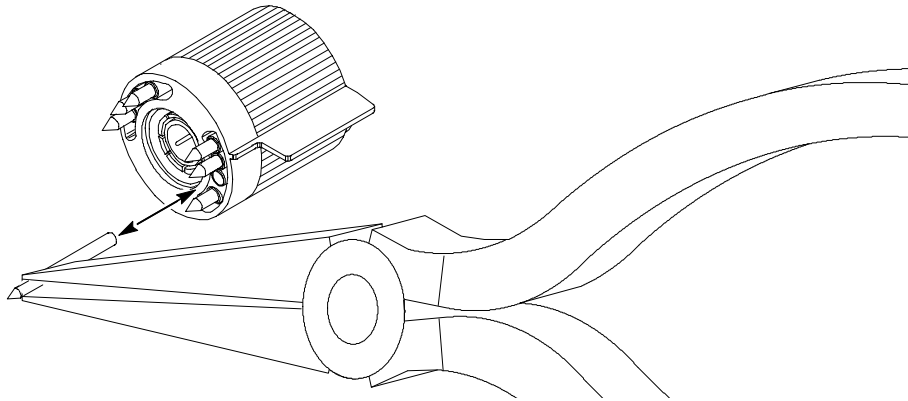


Figure 7: Replacing TEKPROBE interface pins

Removing and Replacing the TEKPROBE Interface Collar

1. Firmly pull the collar off by hand.
2. Align the smaller group of pins with the smaller of the two holes in the interface collar and align the tabs with the slots.
3. Gently press the two pieces together (see Figure 8 below).

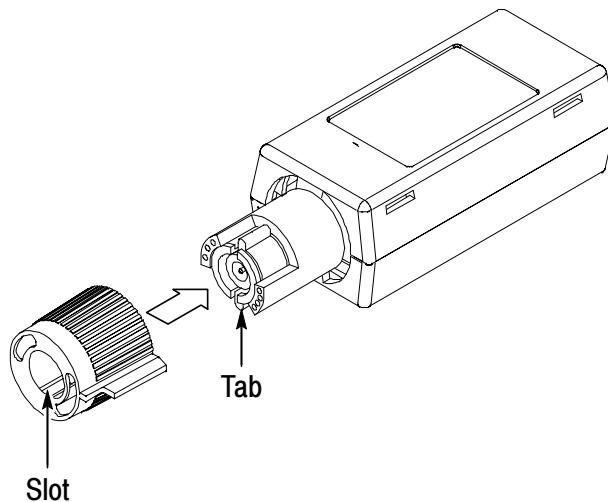


Figure 8: Replacing the TEKPROBE collar

Removing the Compensation Box Covers

1. Press the optional release tool pins into the cover catches.
2. Gently separate the each side of the compensation box. Refer to Figure 9 below.

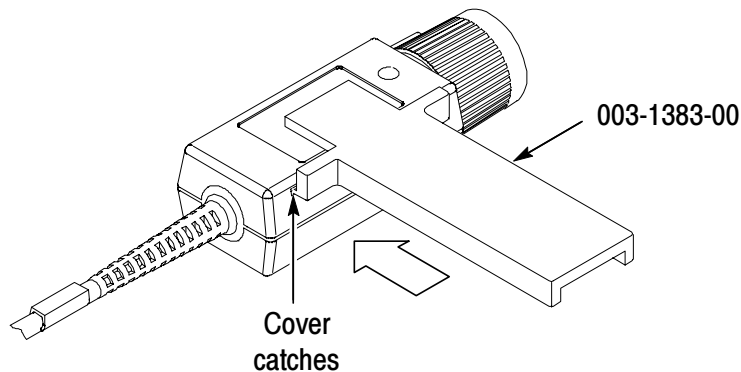


Figure 9: Removing the compensation box covers

Replacing the Compensation Box Covers

1. Carefully align the tab and cover catches. Refer to Figure 10 on page 18.
2. Firmly press the pieces together until the cover catches snap into place.

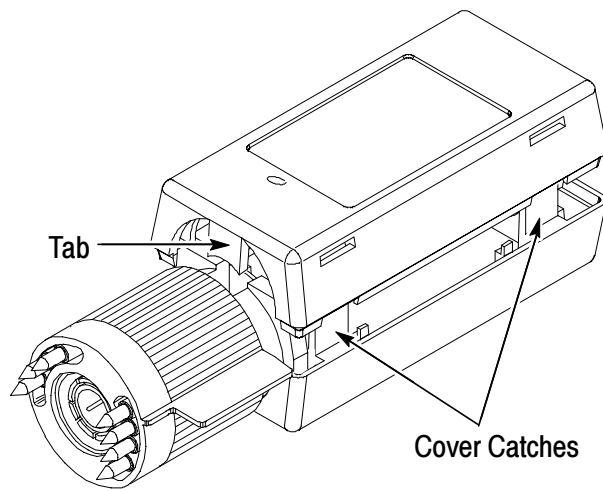


Figure 10: Replacing the compensation box cover

Performance Verification

The following procedure verifies the warranted electrical characteristics of the P5210 High Voltage Differential Probe. Table 6 itemizes the equipment required, provides an example or part number of the equipment, and explains the purpose of the equipment.

Table 6: List of equipment required

| Description | Minimum requirements | Example or part number | Purpose |
|--------------------------------|--|---|--|
| Digitizing oscilloscope | Bandwidth: ≥ 400 MHz TekProbe interface offset accuracy: $\leq 0.7\%$ | TDS 460A | Display probe output |
| Standard amplitude generator | Amplitude accuracy: $\leq 0.25\%$ | Wavetek 9100 with oscilloscope option 250 | Check probe attenuation, bandwidth, common-mode rejection ratio |
| Leveled sine wave generator | Rise time (standard amplitude): ≤ 3 ns | | |
| DC voltage source | | | |
| Plunger clamps (2 required) | Use clamps included in accessory kit | Accessory kit 020-2106-00 | Connection to binding post |
| BNC adapters | BNC male to dual binding post | 103-0035-00 | Interconnection between probe and generator |
| | BNC female to dual banana | 103-0090-00 | |
| BNC connector | BNC female to female | 103-0028-00 | Interconnection between probe and generator |
| Coaxial cables | 36 in (.9144 m), precision 50Ω | 012-0482-00 | Interconnection between probe and generator |
| | 36 in (.9144 m), 50Ω | 012-1341-00 | |

Table 6: List of equipment required (Cont.)

| Description | Minimum requirements | Example or part number | Purpose |
|----------------------|------------------------------------|------------------------|--|
| Terminator | 50 Ω precision feed through | 011-0049-01 | Termination of leveled sine wave output |
| Modified BNC adapter | BNC-male-to-dual binding post | 103-0035-00 | Interconnection between probe and Generator. (See Figures 11 and 13) |

Construction of Modified BNC Adapter

Construct the modified BNC Adapter from a BNC-male-to-dual binding post adapter, Tektronix part number 103-0035-00 (see Figure 11).

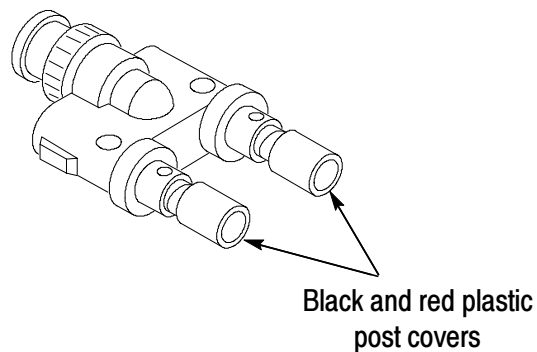


Figure 11: BNC-male-to-dual binding post adapter

To expose the posts that you will connect the P5210 High Voltage Differential probe leads to, remove the black and red plastic post covers of the BNC-male-to-dual adapter. Use a pair of pliers and a vise to remove the plastic covers, as shown in Figure 12 on page 22.

Setup



WARNING. *These procedures require the application of high voltage to the inputs of the P5210 probe. Because this adapter has exposed metal surfaces, only qualified personnel should perform any testing with voltage levels exceeding 40 V rms. Only qualified personnel should perform these procedures. All pertinent safety rules and guidelines for elevated voltage measurements should be followed and adhered to.*

Connect the output of the probe to the vertical input of the test oscilloscope. Let the probe warm up for 20 minutes.

NOTE. *These procedures assume that you are using an oscilloscope that automatically displays the correct volts/division scale factor for the attenuation setting of the probe. If not, you must take the attenuation setting of the probe into account when setting the volts/division on the oscilloscope.*

To expose the posts that you will connect the P5200 High Voltage Differential probe leads to, remove the black and red plastic post covers of the BNC-male-to-dual adapter. Use a pair of pliers and a vise to remove the plastic covers, as shown in Figure 12 on page 22.

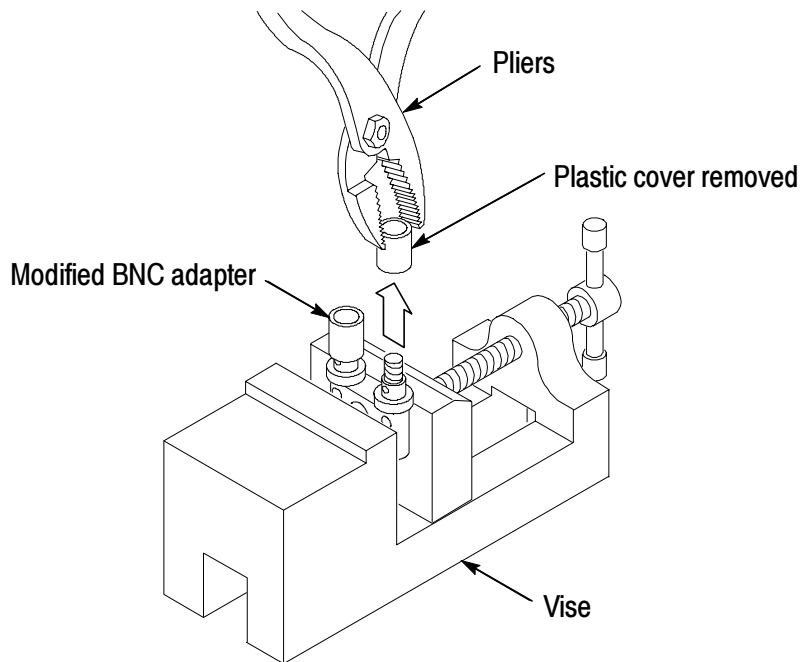


Figure 12: Removing plastic covers from binding posts

Differential Gain Accuracy

1. Use a 50 Ω coaxial cable to connect the generator trigger output to channel 2 of the oscilloscope.
2. Set the oscilloscope trigger edge source to channel 2.
3. Set the volts/division on both channels of the oscilloscope to 1 V.
4. Set the sec/div to 200 μ s and the acquisition mode to average 32.
5. Connect the Modified BNC adapter to the output connector of the calibration generator.
6. Attach the differential probe input leads (without attachment accessories) by sliding the banana plug of the leads onto the binding posts of the Modified BNC adapter, as shown in Figure 13 on page 23.

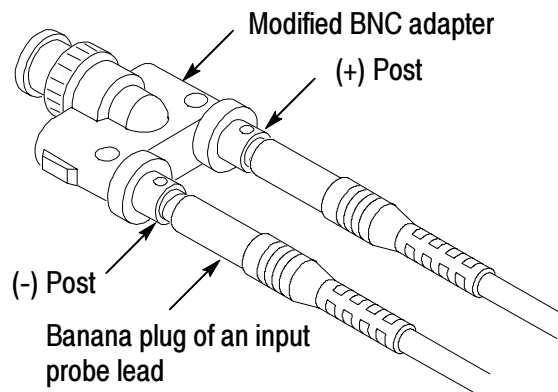


Figure 13: Slide probe leads onto the binding posts

7. Set the probe to 1000X (out). Set the generator for a 100 V/1 kHz standard amplitude (square wave) output.
8. Enable the output of the generator.
9. Adjust the zero offset on the compensation box of the probe for zero offset.
10. Adjust the channel 1 vertical offset until the top of the square wave is at the zero offset point on the oscilloscope.
11. Check that the vertical offset reads 97.0 to 103.0 V for the $\pm 3\%$ gain accuracy.
12. Set the attenuation button on the probe to 100X (in). Set the calibration generator for 10 V output.
13. Repeat steps 9 and 10.
14. Check that the vertical offset reads 9.7 to 10.3 V for the $\pm 3\%$ gain accuracy.
15. Reset the channel 1 vertical offset to zero. Disable the output and leave setup connected for the next procedure.

Bandwidth

1. Connect the Modified BNC adapter through a 50 Ω terminator to the leveled sine wave output of the generator.
2. Attach the differential probe input leads without attachment accessories by sliding the banana plug of the leads onto the binding posts metal sleeves on the Modified BNC adapter.
3. Set the Volts/Division on the oscilloscope to 1 V, and sec/div to 10 μ s.
4. Set the bandwidth on the probe to FULL and the attenuation button to 100X.
5. Enable the output.
6. Set the sine wave generator to 50 kHz and the amplitude to display 6 divisions on screen.
7. Set the generator to 50 MHz and set the oscilloscope to 5 ns/division. Check for ≥ 4.2 divisions peak to peak of signal.
8. Disable the generator output and disconnect the probe input.

DC CMRR

1. Set the attenuation of the probe to 100X.
2. Set the oscilloscope input coupling to DC, the vertical to 100 mV/div, and the sec/div to 200 μ s. Center the trace on the display.
3. Ground the negative terminal of the calibrator with the sliding ground spade on the calibrator.
4. Connect the BNCs of the BNC adapters together (Modified BNC Adapter 103-0035-00 and BNC Adapter 103-0090-00), and insert the banana plugs into the DC output of the generator.
5. Attach the plunger clamps on the differential probe input leads.
6. Twist the input leads together as shown in Figure 2 on page 5, and connect both probe inputs to the positive terminal of the calibrator.
7. Adjust the offset on the probe output to zero.
8. Set the output of the generator to 500 VDC.
9. Enable the output.
10. Check that the trace on the oscilloscope shifts less than 3.33 divisions (167 mV) from center.
11. Disable the generator output and disconnect all test equipment.

This completes the performance verification procedure.

Replaceable Parts

This section contains a list of the replaceable modules for the P5210 probe. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest circuit improvements. Therefore, when ordering parts, it is important to include the following information in your order:

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

You may exchange your module for a remanufactured module. These modules cost significantly less than new modules and meet the same factory specifications. For more information about the module exchange program, For more information about the module exchange program, refer to *Contacting Tektronix*, on page viii.

Using the Replaceable Parts List

This section contains a list of the mechanical and/or electrical components that are replaceable for the P5210 probe. Use this list to identify and order replacement parts. Table 7 describes each column in the parts list.

Table 7: Parts list column descriptions

| Column | Column name | Description |
|---------|-----------------------|--|
| 1 | Figure & index number | Items in this section are referenced by figure and index numbers to the exploded view illustrations that follow. |
| 2 | Tektronix part number | Use this part number when ordering replacement parts from Tektronix. |
| 3 and 4 | Serial number | Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entries indicates the part is good for all serial numbers. |
| 5 | Qty | This indicates the quantity of parts used. |
| 6 | Name & description | An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification. |
| 7 | Mfr. code | This indicates the code of the actual manufacturer of the part. |
| 8 | Mfr. part number | This indicates the actual manufacturer or vendor part number. |

Abbreviations

Abbreviations conform to American National Standard ANSI Y1.1-1972.

Mfr. Code to Manufacturer Cross Index

The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

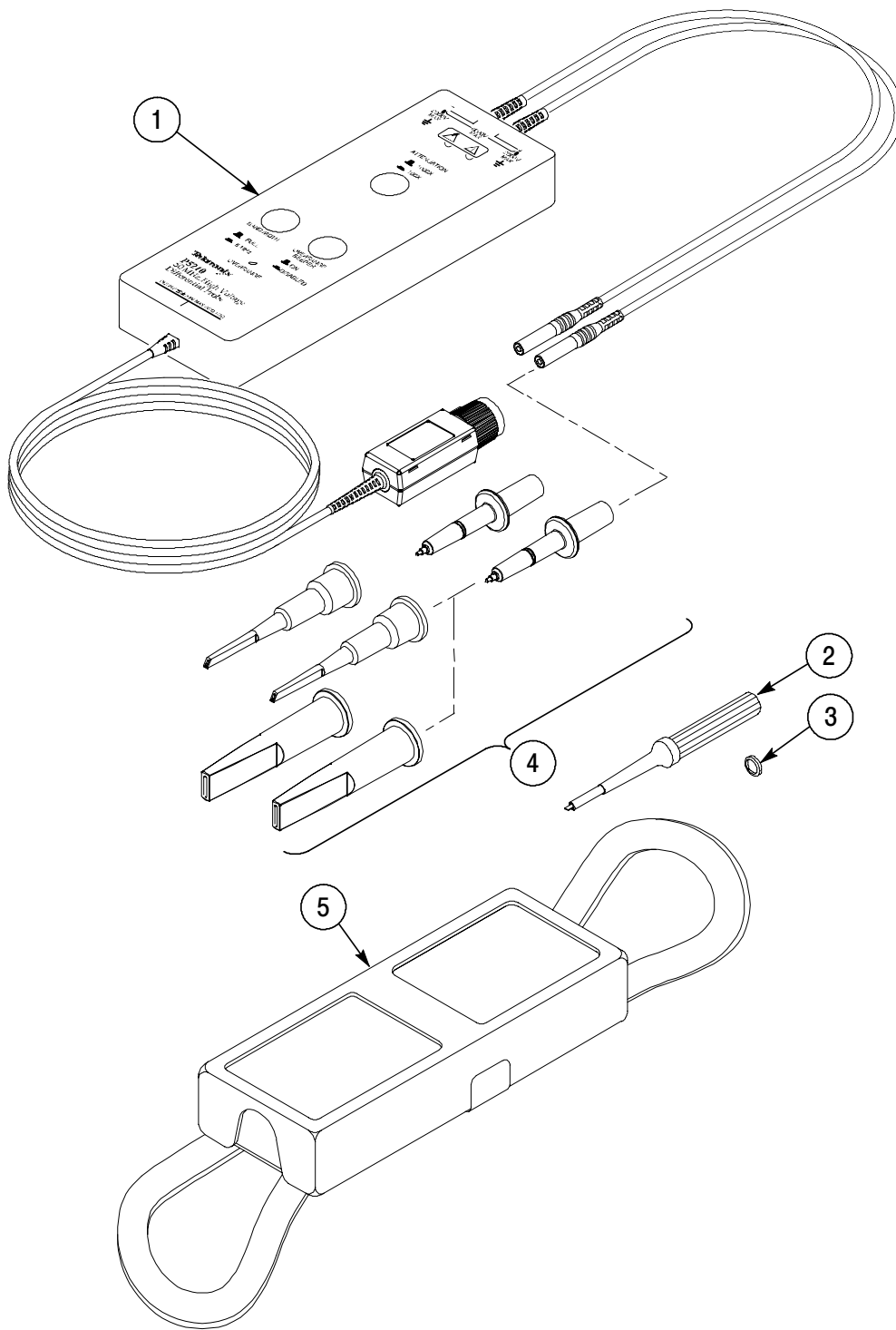


Figure 14: P5210 probe and replaceable accessories

∞ P5210 and replaceable accessories

| Fig. & index number | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name & description | Mfr. code | Mfr. part number |
|---------------------|-----------------------|----------------------|----------------------|-----|---|-----------|------------------|
| 14-1 | | | | 1 | PROBE, DIF ACT:TEK PROBE, P5210 | 80009 | |
| -2 | 003-1433-00 | | | 1 | SCREWDRIVER:ADJUSTMENT TOOL,METAL TIP PLASTIC,BLACK | TK2565 | 003-1433-00 |
| -3 | 016-0633-00 | | | 1 | MARKER SET,CA:2 EA VARIOUS COLORS | 80009 | 016-0633-00 |
| -4 | 020-2195-00 | | | 1 | ACCESSORIES KIT:ACCESSORIES FOR P5210 | 80009 | 020-2195-00 |
| -5 | 016-1461-00 | | | 1 | STRAP:SOFT CASE FOR P5205, P5200, SECURES PROBE TO INSTRUMENT UNDER TEST, SECURES ALL | TK6076 | 016-1461-00 |
| | 070-9841-00 | | | 1 | MANUAL,TECH:INSTRUCTION,4 LANGUAGES,P5210,DP | TK2548 | 070-9841-00 |
| | 070-9895-01 | | | 1 | MANUAL,TECH:SERVICE,P5210,DP | TK2548 | 070-9895-01 |

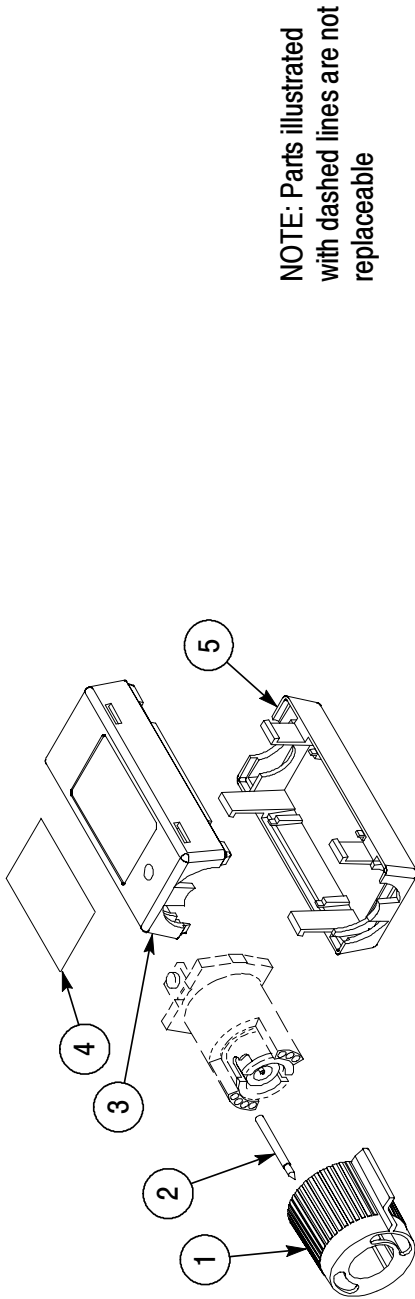


Figure 15: Replaceable parts - compensation box

Replaceable parts - compensation box

| Fig. & index number | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name & description | Mfr. code | Mfr. part number |
|---------------------|-----------------------|----------------------|----------------------|-----|---|-----------|------------------|
| 15-1 | 205-0191-00 | | | 1 | SHELL,ELEC CONN:BNC,ABS,DOVE GRAY | 80009 | 205-0191-00 |
| -2 | 131-3627-01 | | | 1 | CONTACT,ELEC:GOLD PLATED TIP | 18359 | P-6158-1 |
| -3 | 206-0429-08 | | | 1 | COMP BOX HALF:P5205,COMP BOX HALF | TK2565 | 206-0429-08 |
| -4 | 334-9265-00 | | | 1 | MARKER,IDENT:COMP BOX ID LABEL,GE LEXAN,P5210 | 80009 | 334-9265-00 |
| -5 | 206-0430-00 | | | 1 | COMP BOX:COVER,BOTTOM HALF | 80009 | 206-0430-00 |

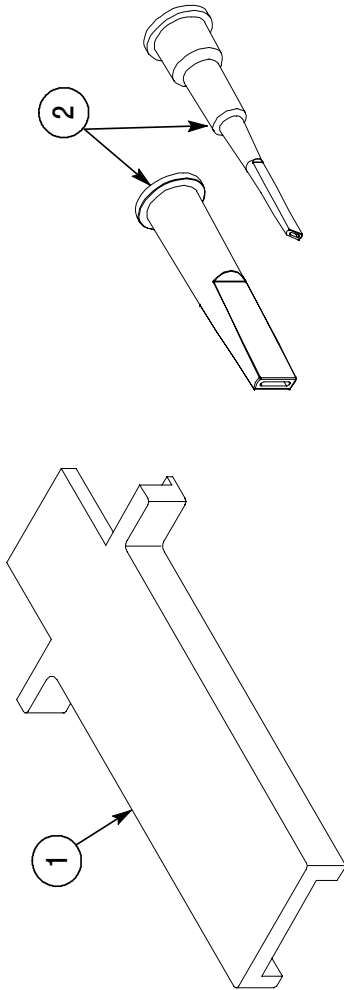


Figure 16: P5210 optional accessories

Optional accessories

| Fig. & index number | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name & description | Mfr. code | Mfr. part number |
|---------------------|-----------------------|----------------------|----------------------|-----|--|-----------|------------------|
| 16-1 | 003-1383-00 | | | 1 | RLSE TOOL,COVER:COMP BOX,POLYCARBONATE | TK2565 | 003-1383-00 |
| -2 | 013-0290-01 | | | 1 | HOOKTIP,SET:BLACK,LARGE AND SMALL | TK2469 | 012-0290-01 |
| | 1103 | | | 1 | TEKPROBE IF PS:W/OFFSET 2 CONN | 80009 | 1103 |

Manufacturers cross index

| Mfr. code | Manufacturer | Address | City, state, zip code |
|------------------|---------------------|--------------------------------------|------------------------------|
| 18359 | PYLON CO. INC. | 51 NEWCOMB ST | ATTLEBORO, MA 02703-1403 |
| 80009 | TEKTRONIX INC | 14150 SW KARL BRAUN DR PO BOX 500 | BEAVERTON, OR 97077-0001 |
| TK2469 | UNITREK CORPORATION | 3000 LEWIS & CLARK HWY SUITE 2 | VANCOUVER, WA 98661 |
| TK2548 | XEROX CORPORATION | 14181 SW MILLIKAN WAY | BEAVERTON, OR 97005 |
| TK2565 | VISION PLASTICS INC | 26000 SW PARKWAY CENTER DRIVE | WILSONVILLE, OR 97070 |
| TK6076 | FOARM INC | 501 E GUTIERREZ ST | SANTA BARBARA, CA 93103 |

