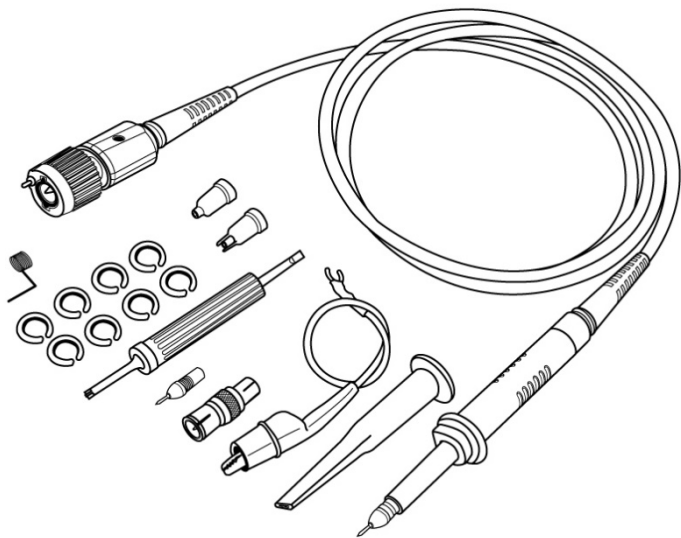




TELEDYNE LECROY
Everywhereyoulook™



User Manual

PP019 and PP020

Passive Probes



TELEDYNE LECROY
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PP019 and PP020 Passive Probes User Manual

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937456-00 Rev A
pp019-pp020-user-manual.pdf
March, 2025

Introduction

Teledyne LeCroy PP019 and PP020 are passive high impedance voltage oscilloscope probes designed and calibrated for use with general purpose oscilloscopes having an input impedance of 1 M Ω shunted by 16 pF. However, they may be compensated for use with instruments having an input capacitance from 10 to 30 pF for PP019, and 8 to 20 pF for PP020. They are compatible with oscilloscopes that automatically detect probe attenuation and adjust their readout accordingly.



To avoid electric shock, keep fingers behind the probe's finger guard during use.



Rated for indoor use only. Do not operate where conductive pollutants may be present.



The probe meets the intent of the European Council Directives 2014/35/EU and is compliant with EN IEC 61010-031:2023, Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 031: Safety requirements for hand-held and hand-manipulated probe assemblies for electrical test and measurement. Unless otherwise specified, all materials and processes are compliant with European Council RoHS Directive 2011/65/EU in its entirety, inclusive of any further amendments or modifications of said Directive.



The probe conforms to all applicable United Kingdom standards.



Unless otherwise specified, all materials and processes are compliant with the latest requirements of China RoHS 2.

PP019/PP020 Passive Probe

Specifications



To reduce risk of fire or electric shock, do not exceed the voltage or category ratings of the probe. See voltage derating curve on p.4.

Model	Attn.	Input Impedance		B/W (MHz)	Rise Time (ns)	Length (m)	Compensation Range (pF)
		R(MΩ)	C(pF)				
PP019	10x	10	12	250	1.4	1.2	10 - 30
PP020	10x	10	11	500	0.7	1.2	8 - 20

Attenuation Ratio..... 10:1 ±1%

Max. Input Voltage Circuits not directly connected to Mains: 500 Vrms,
..... 1500 V transient overvoltage

..... Measurement Category II*: 400 Vrms

Pollution Degree..... Pollution Degree 2*

Operating Altitude..... Up to 3000 meters

Max. Operating Temp 0 to 50 °C

Humidity..... 5% to 95% RH (10 to 30 °C)
5% to 75% RH (30 to 40 °C)
5% to 50% RH (above 40 °C)
RH not controlled below 10 °C

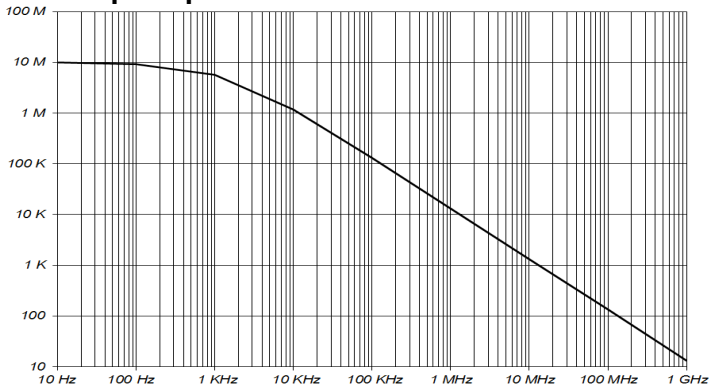
*Per EN IEC 61010-031:2023. See definitions below.

Definitions:

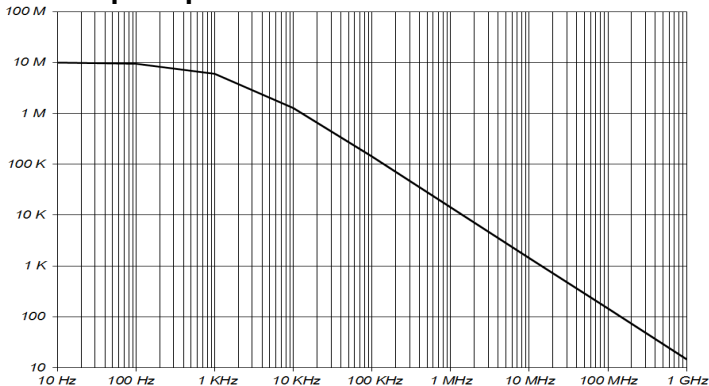
Measurement Category II (CAT II) refers to measurements performed on circuits directly connected to utilization points (socket outlets and similar) of the low-voltage mains installation.

Pollution Degree 2 refers to an operation environment where normally only dry non-conductive pollution occurs. Temporary conductivity caused by condensation must be expected.

PP019 Input Impedance Profile

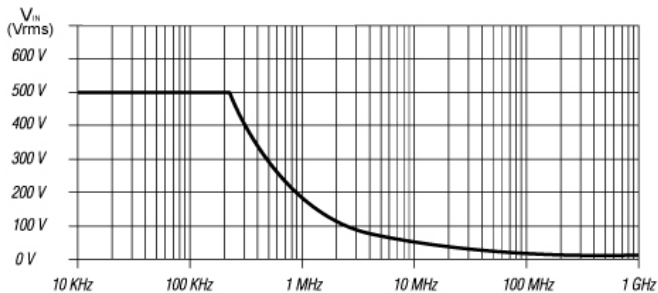


PP020 Input Impedance Profile



PP019/PP020 Passive Probe

Voltage vs. Frequency Derating Curve



General Safety Information



Observe generally accepted safety procedures in addition to those listed here to avoid personal injury or damage to equipment. **The overall safety of any system incorporating this accessory is the responsibility of the assembler of the system.**

Use only with compatible Teledyne LeCroy instruments with BNC frame connected to earth ground.

Use only with compatible accessories.

Do not connect to or disconnect from a live voltage source.

Do not overload. Do not apply any potential that exceeds the maximum rating of the probe.

Comply with the voltage derating curve in the probe manual.

Observe all terminal ratings marked on the body of the oscilloscope.

Use indoors only. Comply with safe operating conditions listed above. Do not use in wet or explosive atmospheres.

Handle with care. Probe tips may be sharp and can cause injury.

When present, keep fingers behind probe finger guard.

Keep probe surfaces clean and dry. Clean only with a soft cloth and water or weak isopropyl alcohol solution. Do not use harsh or abrasive cleansers. Do not submerge probe or allow moisture to penetrate it.

Except for adjustments (when available), do not remove the probe casing. Consult the probe manual for proper adjustment procedures.

Do not use with suspected failures. Inspect the probe, cable and leads before use and if any part appears worn or damaged, cease operation immediately and secure the probe from inadvertent use.

PP019/PP020 Passive Probe

Cleaning

- Clean only the exterior of the probe, cables, and accessories. Use a soft cotton cloth moistened with a mild detergent and water solution. Do not allow any portion of the probe to be submerged at any time.
- Dry the probe and accessory thoroughly before attempting to make any voltage measurement.
- Do not subject the probe to solvents or solvent fumes as these can cause deterioration of the probe body, cables, and accessories.

Disposal



The probe complies with the applicable European Union requirements to Directives 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE). For information about proper disposal, see: teledynelecroy.com/recycle.

Service

Refer all repairs to qualified service personnel. Contact Teledyne LeCroy at the following address to arrange to return the probe for service:

Teledyne LeCroy, Inc.
700 Chestnut Ridge Road
Chestnut Ridge, NY, 10977-6499
Ph: 800-553-2769 or 845-425-2000
Fax: 845-578-5985
contact.corp@teledynelecroy.com

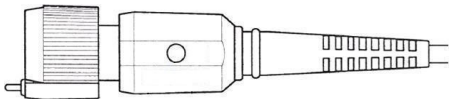
For the most complete and up-to-date list of sales and service centers by country, visit teledynelecroy.com/support/contact.

Probe Compensation

Proper compensation of the probe is required to assure amplitude accuracy of the waveform being measured by matching the probe to the oscilloscope's input capacitance. Compensation should be adjusted whenever the probe is connected to or transferred between oscilloscopes.

Low Frequency (PP019 and PP020)

1. Apply a 1 kHz square wave to the probe or connect to the oscilloscope's calibrator output.
2. Adjust the single LF trimmer on the PP019/20 BNC Compensation Box until you achieve a flat-topped square wave as in the center of the second illustration below.



LF trimmer on PP019 and PP020 BNC Compensation Box.



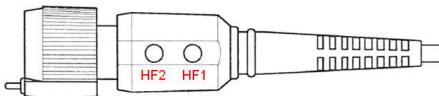
Over-compensated, correct, and under-compensated waveforms

PP019/PP020 Passive Probe

High Frequency (PP020 Only)

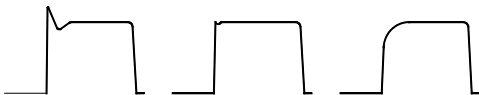
High frequency should rarely require adjustment. However, if adjustment is required:

1. Apply a 1 MHz square wave to the probe (< 0.7 ns rise-time).
2. Remove the plastic caps from the two, HF trimmers on the PP020 BNC Compensation Box.



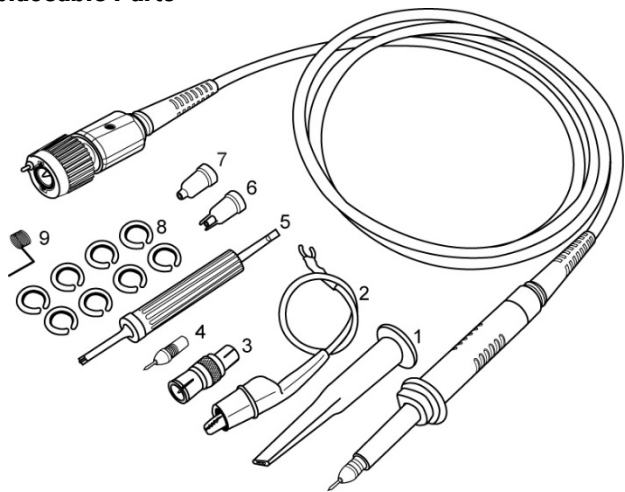
HF trimmers on PP020.

3. Adjust HF2 then HF1 until you achieve a flat-topped square wave as in the center illustration below.



Over-compensated, correct, and under-compensated waveforms

Replaceable Parts



Item	Description	Quantity
1	Sprung Hook, 5 mm, Black	1
2	GND Lead w/Alligator Clip	1
3	BNC Adapter, 5 mm	1
4	Replacement Tip, Black	1
5	Deluxe Trimmer Tool	1
6	IC Tip Insulator, 5 mm, Black	1
7	Tip Insulator, 5 mm, Black	1
8	Identifier Rings	1
9	Probe Tip GND	1

Standard Accessory Replacement Kit part number is **PKIT4-5MM-101**.

Warranty

NOTE: THE WARRANTY BELOW REPLACES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS, OR ADEQUACY FOR ANY PARTICULAR PURPOSE OR USE. TELEDYNE LECROY SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER IN CONTRACT OR OTHERWISE. THE CUSTOMER IS RESPONSIBLE FOR THE TRANSPORTATION AND INSURANCE CHARGES FOR THE RETURN OF PRODUCTS TO THE SERVICE FACILITY. TELEDYNE LECROY WILL RETURN ALL PRODUCTS UNDER WARRANTY WITH TRANSPORT PREPAID.

Teledyne LeCroy warrants this oscilloscope accessory for normal use and operation within specification for a period of one year from the date of shipment. Spare parts, replacement parts and repairs are warranted for 90 days.

In exercising its warranty, Teledyne LeCroy, at its option, will either repair or replace any assembly returned within the warranty period to the Customer Service Department of an authorized service center. However, this will be done only if the product is determined by Teledyne LeCroy's examination to be defective because of workmanship or materials, and the defect is not caused by misuse, neglect, accident, abnormal conditions of operation; or, damaged by attempted repair or modifications by a non-authorized service facility.

The customer will be responsible for the transportation and insurance charges for the return of products to the service facility. Teledyne LeCroy will return all products under warranty with transportation charges prepaid.

This warranty replaces all other warranties, expressed or implied, including, but not limited to, any implied warranty of merchantability, fitness, or adequacy for any particular purposes or use. Teledyne LeCroy shall not be liable for any special, incidental, or consequential damages, whether in contract or otherwise.

937456-00 Rev A
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