

## High-voltage Differential Probes

TMDP0200 - THDP0200 - THDP0100 - P5200A - P5202A - P5205A - P5210A



Tektronix offers a broad portfolio of high-voltage probing solutions that enable users to safely and accurately make floating measurements.

### Key performance specifications

- Bandwidths up to 200 MHz
- Up to 6000 V differential (DC + pk AC)
- Up to 2300 V common (RMS)

### Key features

- Overrange Indicator
- Safety Certified
- Switchable Attenuation
- Switchable bandwidth limit

### Applications

- Floating measurements
- Switching power supply design
- Motor drive design
- Electronic ballast design
- CRT display design
- Power converter design and service
- Power device evaluation

### Connectivity

- BNC interface (P5200A probes)
- TekVPI<sup>®</sup> interface (TMDP and THDP Series probes)

- TekProbe<sup>®</sup> interface (P5202A, P5205A, and P5210A Series probes)

### Safe high-voltage probe solutions

The THDP0100 and P5210A have the largest differential dynamic range capability from Tektronix, allowing users to safely measure up to  $\pm 6000$  V. The THDP0100 supports bandwidths up to 100 MHz and slew rates up to 2500 V/ns at 1/1000 gain. These probes are supplied with two sizes of hook tips and have an overrange visual and audible indicator which warns the user when they are exceeding the linear range of the probe.

The THDP0200 and P5205A are active differential probes that are capable of safely measuring differential voltages up to  $\pm 1500$  V. The probes are effective in making measurements in IGBT circuits such as motor drives and power converters. The THDP0200 supports bandwidths up to 200 MHz and slew rates up to 275 V/ns at 1/250 gain.

The TMDP0200 and P5202A are designed for medium-voltage applications with differential requirements up to  $\pm 750$  V. These probes have lower attenuation ranges and offer better signal-to-noise ratio.

The P5200A can be used with any oscilloscope and enables users to safely make measurements of floating circuits with their oscilloscope grounded. The P5200A Active Differential Probe converts floating signals to low-voltage ground-referenced signals that can be displayed safely and easily on any ground-referenced oscilloscope.

**WARNING:** For safe operation, do not use the P5200A High-voltage Differential Probe with oscilloscopes that have floating inputs (isolated inputs), such as the Tektronix TPS2000 and THS3000 Series oscilloscopes. The P5200A High-voltage Differential Probe requires an oscilloscope or other measurement instrument with grounded inputs.



### Connectivity options

The TMDP and THDP Series probes are equipped with the TekVPI<sup>®</sup> interface which allows smart communication between the oscilloscope and probe. Pushing the probe menu button will launch the probe control menu on the oscilloscope display providing access to all relevant probe settings and controls. These probes are designed to operate on TekVPI<sup>®</sup> oscilloscopes without requiring the TPA-BNC adapter.

The P52xxA Series probes are equipped with the Tektronix TekProbe<sup>®</sup> interface which communicates scale information to the oscilloscope. Direct connections can be made to oscilloscopes configured with the TekProbe<sup>®</sup> interface or to any oscilloscope when used with the 1103 TekProbe<sup>®</sup> Power Supply.

## Specifications

All specifications are guaranteed unless noted otherwise. All specifications apply to all models unless noted otherwise.

### Model Overview

#### Probes with the TekVPI® interface

	TMDP0200	THDP0200	THDP0100
Attenuation	25X / 250X	50X / 500X	100X / 1000X
Differential Voltage (Typical)	250X: ±750 V	500X: ±1500 V	1000X: ±6000 V
	25X: ±75 V	50X: ±150 V	100X: ±600 V
Common Mode Voltage (Typical)	±750 V	±1500 V	±6000 V
Maximum Input Voltage-to-Earth (Typical)	450 V CAT I	1000 V CAT II	2300 V CAT I
	300 V CAT III	600 V CAT III	1000 V CAT III
Bandwidth (Typical)	200 MHz	200 MHz	100 MHz
Rise Time	<2 ns	<2 ns	<3.6 ns
Slew Rate (Typical)	<275 V/ns at 1/250 gain	<650 V/ns at 1/500 gain	<2500 V/ns at 1/1000 gain
Input Impedance at the Probe Tip (Typical)	5 MΩ    <2 pF	10 MΩ    <2 pF	40 MΩ    <2.5 pF
Typical CMRR (Typical)	DC: > -80 dB	DC: > -80 dB	DC: > -80 dB
	100 kHz: > -60 dB	100 kHz: > -60 dB	100 kHz: > -60 dB
	3.2 MHz: > -30 dB	3.2 MHz: > -30 dB	3.2 MHz: > -30 dB
	100 MHz: > -26 dB	100 MHz: > -26 dB	100 MHz: > -26 dB
Cable Length (Typical)	1.5 m	1.5 m	1.5 m
DC Gain Accuracy	±2%	±2%	±2%

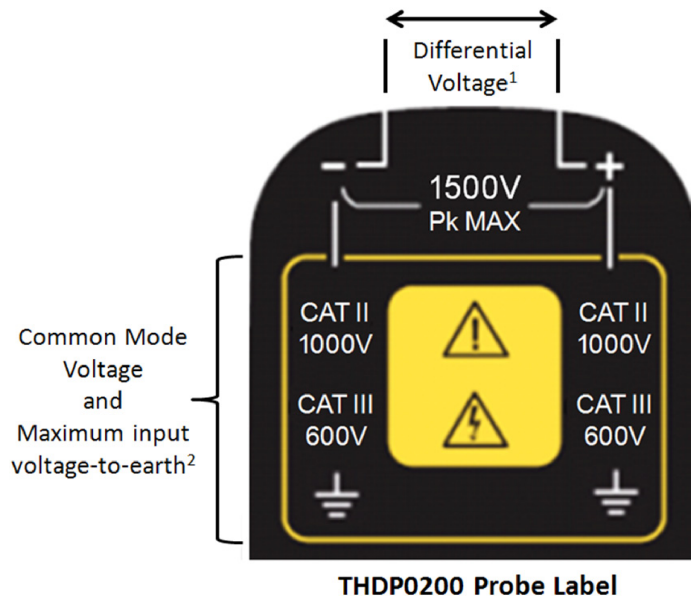
#### Probes with the BNC and TekProbe® interface

	P5200A	P5202A	P5205A	P5210A
Attenuation	50X / 500X	20X / 200X	50X / 500X	100X / 1000X
Differential Voltage (Typical)	500X: ±1300 V	200X: ±640 V	500X: ±1300 V	1000X: ±5600 V
	50X: ±130 V	20X: ±64 V	50X: ±130 V	100X: ±560 V
Common Mode Voltage (Typical)	±1300 V	±640 V	±1300 V	±5600 V
Maximum Input Voltage-to-Earth (Typical)	1000 V CAT II	450 V CAT I	1000 V CAT II	2300 V CAT I
		300 V CAT II		1000 V CAT III
Bandwidth (Typical)	50 MHz	100 MHz	100 MHz	50 MHz
Differential Input Impedance (Typical)	10 MΩ    2 pF	5 MΩ    2 pF	10 MΩ    2 pF	40 MΩ    2.5 pF
Input Impedance between each Input and Ground (Typical)	5 MΩ    4 pF	2.5 MΩ    4 pF	5 MΩ    4 pF	20 MΩ    5 pF
Typical CMRR (Typical)	DC: >80 dB	DC: >80 dB		
	100 kHz: >60 dB	100 kHz: >60 dB		
	3.2 MHz: >30 dB	3.2 MHz: >40 dB		
	50 MHz: >26 dB	50 MHz: >30 dB		
Cable length (Typical)	1.5 m			

Table continued...

	P5200A	P5202A	P5205A	P5210A
DC Gain Accuracy	±2%	±2%	±2%	±2%

**THDP0200 probe label**



1. The differential voltages the maximum measurable range between the (+) and (-) input leads of the probe. Beyond these limits, the output could be clipped.
2. The maximum common mode voltage and maximum input voltage-to-earth (RMS) are the maximum voltages that each input lead (+/-) can be from ground.

**Ordering information**

Use the following information to choose accessories and options for your probes.

**Standard accessories**

**P5200A, P5202A, and P5205A**

Description	Quantity included	Reorder part number
Hook clips	1 set of red and black hook clips	AC280-FL
Pincer clips	1 set of red and black pincer clips	AC283-FL
Alligator clips	1 set of red and black alligator clips	AC285-FL
Extension cables	1 set of red and black extension cables	196-3523-00

**TMDP0200 and THDP0200**

Description	Quantity included	Reorder part number
Hook clips	2	AC280-FL
Pincer clips	2	AC283-FL
Alligator clips	2	AC285-FL

Table continued...

Description	Quantity included	Reorder part number
Extension cables	2	196-3523-00
Test leads	2	TP175 (must be ordered through Fluke).
Probe holder	1	TPH1000

**THDP0100 and P5210A**

Description	Quantity included	Reorder kit part number
Probe tips	2	020-3070-00
Large hook clips	2	
Small hook clips	2	

**Probe and accessory derating table**

Common mode, relative to ground, when used with P52xxA Series probes

Accessory	Description	TMDP0200 / P5202A	THDP0200 / P5200A / P5205A	THDP0100 / P5210A
		450 V CAT I	1000 V CAT II	2300 V CAT I
		300 V CAT II	600 V CAT III	1000 V CAT III
196-3523-00	2x Extender Leads (1.5 m)	Standard	Standard	Standard
	2300 V CAT I	450 V CAT I	1000 V CAT II	2300 V CAT I
	1000 V CAT III	300 V CAT II	600 V CAT III	1000 V CAT III
AC280-FL	2x Hook Clips	Standard	Standard	Optional
	1000 V CAT III	450 V CAT I	1000 V CAT II	1000 V CAT I
	600 V CAT IV	300 V CAT II	600 V CAT III	1000 V CAT III
AC283-FL	2x Pincer Clips	Standard	Standard	Optional
	1000 V CAT III	450 V CAT I	1000 V CAT II	1000 V CAT I
	600 V CAT IV	300 V CAT II	600 V CAT III	1000 V CAT III
AC285-FL To prevent damage to the insulation on the AC285-FL alligator clips, do not use in high A/m magnetic fields at high frequencies, which can cause induction heating of the jaws.	2x Alligator Clips	Standard	Standard	Optional
	1000 V CAT III	450 V CAT I	1000 V CAT II	1000 V CAT I
	600 V CAT IV	300 V CAT II	600 V CAT III	1000 V CAT III
020-3070-00	Hook Clip Kit	Optional	Optional	Standard
	2300 V CAT I	450 V CAT I	1000 V CAT II	2300 V CAT I
	1000 V CAT II	300 V CAT II	600 V CAT II	1000 V CAT II

Table continued...

Accessory	Description	TMDP0200 / P5202A	THDP0200 / P5200A / P5205A	THDP0100 / P5210A
		450 V CAT I	1000 V CAT II	2300 V CAT I
		300 V CAT II	600 V CAT III	1000 V CAT III
TP175	2x Test Leads	Standard (TMDP0200)	Standard (THDP0200)	Optional
	1000 V CAT III	550 V CAT I	1000 V CAT II	2300 V CAT I
	600 V CAT IV	300 V CAT III	600 V CAT III	1000 V CAT III

## Options

### Power plug options (P5200A only)

Opt. A0	North America power plug (115 V, 60 Hz)
Opt. A1	Universal Euro power plug (220 V, 50 Hz)
Opt. A2	United Kingdom power plug (240 V, 50 Hz)
Opt. A3	Australia power plug (240 V, 50 Hz)
Opt. A4	North America power plug (240 V, 50 Hz)
Opt. A5	Switzerland power plug (220 V, 50 Hz)
Opt. A6	Japan power plug (100 V, 50/60 Hz)
Opt. A10	China power plug (50 Hz)
Opt. A11	India power plug (50 Hz)
Opt. A12	Brazil power plug (60 Hz)
Opt. A99	No power cord

### Service options

Opt. C3	Calibration Service 3 Years
Opt. C5	Calibration Service 5 Years
Opt. D1	Calibration Data Report
Opt. D3	Calibration Data Report 3 Years (with Opt. C3)
Opt. D5	Calibration Data Report 5 Years (with Opt. C5)
Opt. R3	Repair Service 3 Years (including warranty)
Opt. R5	Repair Service 5 Years (including warranty)
Opt. SILV200	Standard warranty extended to 5 years

Probes and accessories are not covered by the oscilloscope warranty and Service Offerings. Refer to the datasheet of each probe and accessory model for its unique warranty and calibration terms.



The P52xxA Series probes provide high-voltage differential measurement solutions for any oscilloscope.



Tektronix is ISO 14001:2015 and ISO 9001:2015 certified by DEKRA.

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**For Further Information.** Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit [www.tek.com](http://www.tek.com).

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