

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Pico Electronics TA041* at our website: ***Click HERE***

TA041

25 MHz ±700 V Differential Probe

User's Manual

This probe complies with IEC-1010.1, IEC-1010.2-031 CAT III, Pollution Degree 2.

1. Safety terms and symbols

Terms appearing in this manual:



WARNING	Warning statements identify conditions or practices that could result in injury or death.



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

Symbols appearing on the product:



Danger
High Voltage



Protective
(Earth) Terminal



Attention
Refer to Manual

2. General safety summary

Please review the following safety precautions to avoid injury and prevent damage to this probe or any products that are connected to it.

Observe maximum working voltage

To avoid any injury, do not use the probe above 1000 V RMS CAT III between each input lead and earth or between the two input leads. This voltage rating applies to both the 1:10 and the 1:100 settings.

Ground the probe

This probe is grounded with the shell of the BNC connector and an auxiliary grounding terminal.



WARNING

Before making connections to the input leads of this probe, ensure that its output lead is grounded. You may do this either by connecting the BNC shell to a grounded measurement instrument, or by connecting the auxiliary grounding terminal to a reliable ground point. Read the next paragraph for further advice.

You must verify that the probe is securely grounded before connecting the probe input leads. Some types of measuring instrument, such as a USB oscilloscope connected to a laptop, are unlikely to be grounded even if the laptop is powered from the mains. Bench-top oscilloscopes are usually grounded, but in some cases may have been isolated from ground. A USB oscilloscope connected to a desktop computer is usually grounded. In any case, do not assume that the measurement instrument is grounded. **Always verify the ground connection for yourself before connecting the probe input leads.**

Use fused test prods if necessary

If this probe is intended to use for measurements in circuits of INSTALLATION CATEGORY III, it should incorporate with fused test prods.

Do not operate without covers

To avoid electric shock or fire hazard, do not operate this probe with the covers removed.

Do not operate in wet or damp conditions

To avoid electric shock, do not operate this probe in wet or damp conditions.

Do not operate in explosive atmosphere

To avoid injury or fire hazard, do not operate this probe in an explosive atmosphere.

 © Copyright Pico Technology 2008–2012

Avoid exposed circuitry

To avoid injury, remove jewelry such as rings, watches and other metallic objects. Do not touch exposed connections and components when power is present.

Use proper power source

To ensure proper functioning of this probe, use four AA cells, a 6 V DC 60 mA mains adaptor, a 9 V DC 40 mA mains adaptor, or power leads.

Do not operate the probe if it is damaged

If you suspect there is damage to this probe, have it inspected by qualified service personnel.

3. Description

By enabling conventional oscilloscopes to display and measure in-circuit waveforms that are referenced to high common-mode voltages, this differential probe extends the measurement capability of oscilloscopes to electronic power converters, inverters, motor speed controls, switch-mode power supplies and many other applications.

4. Installation

Simply plug in the BNC output connector to the vertical input of a general-purpose oscilloscope or other measurement instrument, and connect the auxiliary grounding terminal to a proper ground. The measurement instrument must have a ground reference.

Install four AA cells or connect an appropriate power source to this probe.

Select the proper attenuation ratio. When measuring signals below 70 V, switch the attenuation ratio to 1:10 in order to get higher resolution and less noise. Otherwise, set the attenuation to 1:100.



WARNING To protect against electric shock, use only the accessories designed for use with this differential probe.

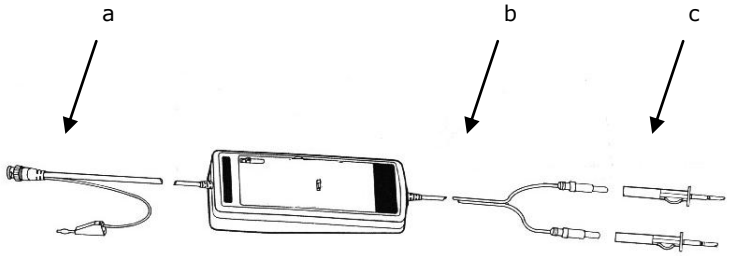
Using the appropriate probe accessories, connect the input to the circuits under measurement.



CAUTION This probe is designed for carrying out differential measurements between two points on the circuit under test. It is not intended for electrically insulating the circuit under test and the measuring instrument.

 © Copyright Pico Technology 2008–2012

5. Signal leads



a. Output Lead. The BNC output connector and an auxiliary grounding terminal are connected to the oscilloscope.

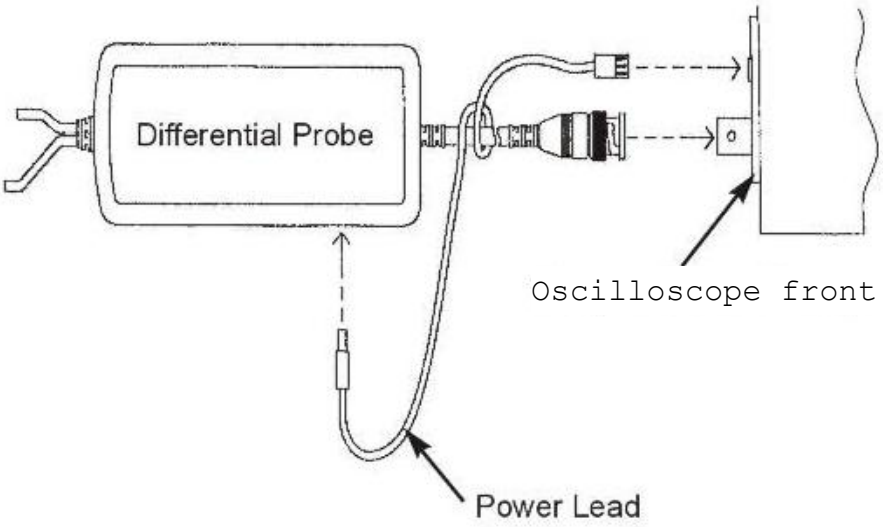
b. Input Leads. The input leads of the differential probe connect to sprung hooks that come with the probe.

c. Sprung Hooks. The sprung hooks are connected safely to test points in the circuits under test.

6. Power leads

Two types of power leads are available for use with this instrument:

1. Lemo® Lead: For oscilloscopes with Lemo® power connectors.
2. Probus® Lead: For oscilloscopes with Probus® power connectors.



 © Copyright Pico Technology 2008–2012

7. Specifications

Bandwidth	DC to 25 MHz (-3 dB)
Attenuation ratio	1:10 or 1:100 switchable
DC accuracy	±2%
Rise time	14 ns
Input Impedance	4 MΩ ‖ 5.5 pF each side to ground
Input Voltage	
Differential Range* (1/10) Differential Range* (1/100)	±70 V (DC + Peak AC) or 70 V RMS ±700 V (DC + Peak AC) or 700 V RMS
Common Mode Range*	±700V (DC + Peak AC) or 700 V RMS (1:10 and 1:100)
Absolute Max. Voltage* (Differential or common-mode)	±1400 V (DC + Peak AC) or 1000 V RMS CAT III (1:10 & 1:100)
Output	
Swing	±7 V into 2 kΩ load
Offset (typical)	<±5 mV
Noise (typical)	0.7 mV RMS
Source Impedance (typical)	1 Ω @ 1 kHz, 8 Ω @ 1 MHz
CMRR (typical)	−86 dB @ 50 Hz; −66 dB @ 20 kHz
Ambient Operating Temperature	−10 to +40 °C
Ambient Storage Temperature	−30 to +70 °C
Ambient Operating Humidity	25 to 85% RH
Ambient Storage Humidity	25 to 85% RH
Power Requirements	
Standard	4 AA cells or 6 V DC 60 mA mains adaptor** or regulated 9 V DC 40 mA mains adaptor**
Options	Power leads
Length of Input Leads	45 cm
Length of BNC Lead	95 cm
Weight	400 g (inc. probes and PVC jacket)
Dimensions	170 x 63 x 21 mm (LxWxH)

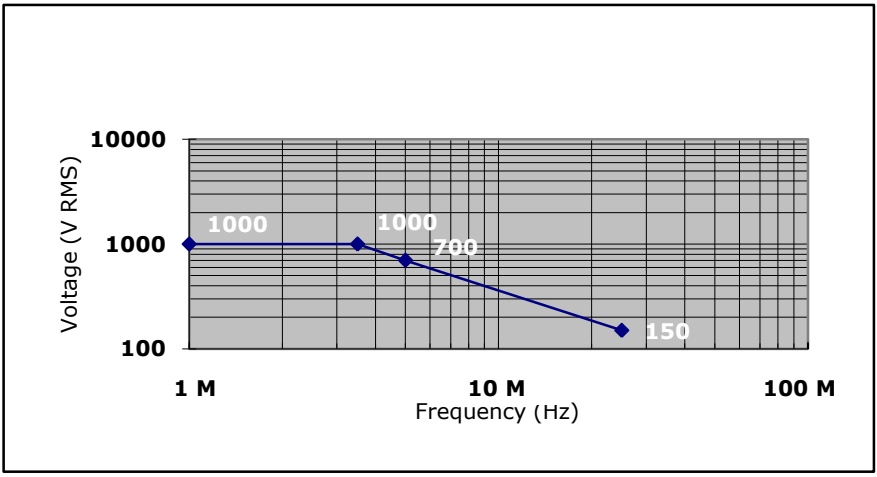
* Voltage limit is the lesser of the DC+Peak AC and RMS values.
**

1. The supplied voltage must be less than 12 V and greater than 4.4 V, otherwise the probe could be damaged or might not operate properly.
2. Polarity is "+" inside and "−" outside. If the polarity is wrong, a built-in circuit protects the probe so that no danger or damage will occur.
3. When the voltage of the cells becomes too low, the power indicator on the panel will flicker.

 © Copyright Pico Technology 2008–2012

8. Derating curve

The derating curve for absolute maximum input voltage is as follows:



 © Copyright Pico Technology 2008–2012

9. Test procedure

1. Connect the BNC output connector to the vertical input of a general-purpose oscilloscope.
2. Install four AA cells or connect an appropriate mains adaptor to this probe.
3. Set the oscilloscope input coupling to DC and 1 V/div. Center the trace on the display.
4. Connect the sprung hooks of the probe to power lines.
5. Set the range of the probe to 1:100.
6. A 50 Hz or 60 Hz sine wave of proper amplitude will be displayed on the screen of the oscilloscope. This means the probe is working properly.

10. Calibrating the unit

There are three main sources of uncertainty when calibrating a Pico differential probe in addition to any uncertainty in the test setup. These are:

1. The stated DC accuracy of the probe under test (±2%).
2. Any DC offset or noise in the probe output. The values in this manual are typical, so to find the DC offset for a given unit a reading must be taken with the inputs to the probe shorted together.
3. The AC performance of the probe. This is specified as being within 3 dB over the entire frequency range of the probe. Any absolute voltage accuracy testing must be done under DC conditions.

One other possible source of noise is the power source for the probe. It is recommended that where possible the probes are calibrated using a battery supply rather than a mains supply unit.

The adjustment procedure is available from Pico Technology on request.

11. Cleaning

Use a soft cloth to clean the probe, taking care not to cause damage.

1. Do not immerse the probe.
2. Do not use abrasive cleaners.
3. Do not use chemicals containing benzene or similar solvents.

 © Copyright Pico Technology 2008–2012

Issue history:

1	28.08.08	First issue.
2.	24.09.08	Renamed to TA041.
3.	06.08.10	Reformatted derating curve axis labels. Corrected 'Swing' data.
4.	11.04.12	Added calibration notes.

Pico Technology
James House
Colmworth Business Park
St. Neots
Cambridgeshire
PE19 8YP
United Kingdom

www.picotech.com

Lemo®, Probus® and Pico Technology are registered trademarks.

Manufactured in Republic of China.

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP