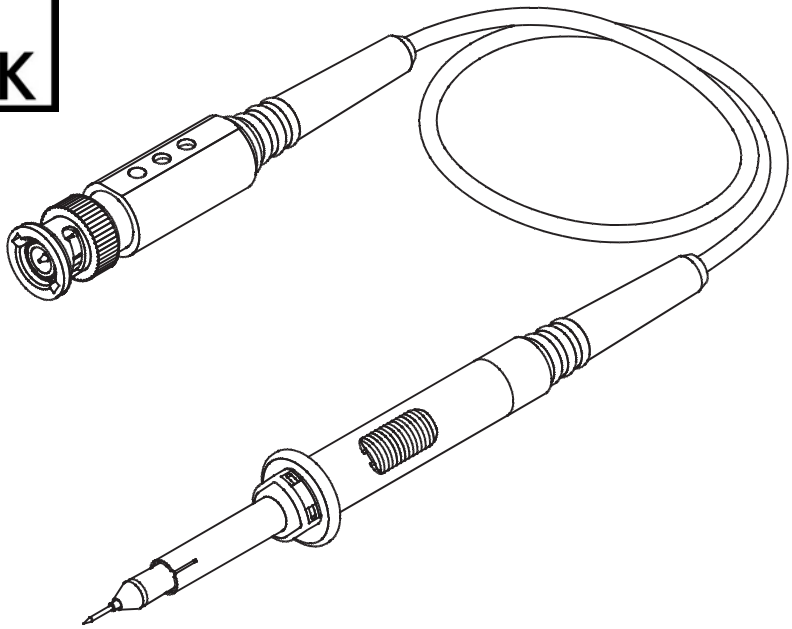
Instruction Manual

PMK



HIGH IMPEDANCE PASSIVE PROBE

PMTG321A

Information in this publication supersedes that in all previously published material.
Specifications are subject to change without notice.

Manufacturer

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Warranty

PMK GmbH warrants this oscilloscope accessory for normal use and operation within specifications for a period of two (2) years from date of shipment and will repair or replace any defective product which was not damaged by negligence, misuse, improper installation, accident or unauthorized repair or modification by the buyer. This warranty is applicable only to defects due to material or workmanship. PMK GmbH disclaim any other implied warranties of merchantability or fitness for a particular purpose. PMK GmbH will not be liable for any indirect, special, incidental, or consequential damages (including damages for loss of profits, loss of business, loss of use or data, interruption of business and the like), even if PMK GmbH has been advised of the possibility of such damages arising from any defect or error in this manual or product.

CE (EC conformity marking)

The manufacturer declares the conformity of this product with the actual required safety standards in accordance with the Low Voltage Directive (LVD) 73/23/EEC and amendment 93/68/EEC:

CEI/IEC 61010-031:2002	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 031: Safety requirements for hand-held probe assemblies for electrical measurement and test

WEEE/ RoHS Directives

(EC conformity marking)

This electronic product is classified within the WEEE/ RoHS* category list as monitoring and control equipment (category 9). Category 9 products are exempted from the restrictions under the scope of the RoHS directive.

Your help and efforts are required to protect and keep clean our environment. Therefore return this electronic product at the end of its life either to the manufacturer or take care of separate WEEE collection and professional WEEE treatment yourself. Do not dispose as unsorted municipal waste!

* EC Directives:

WEEE Directive 2002/96/EC	-	Waste Electrical and Electronic Equipment
RoHS Directive 2002/95/EC	-	Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment

IEC Measurement Categories Definitions and Examples (Clause 6.5.2) PMTG321A

Measurement Category I

Definition: Measurement category I is for measurements performed on circuits not directly connected to a mains supply.

Examples: Measurements in circuits not derived from a mains supply and specially protected (internal) circuits derived from a mains supply. In the latter case, transient stresses are variable; for that reason requires that the transient withstand capability of the equipment is made known to the user.

Measurement Category II
CAT II

Definition: Measurement category II is for measurements performed on circuits directly connected to the low voltage installation.

Examples: Household appliances, portable tools and similar equipment.

IEC Pollution Degrees Definitions (Clause 3.5.6)

Pollution Degree 2 Only- non conductive POLLUTION. Occasionally, however, a temporary conductivity caused by condensation must be accepted.

IEC Safety Symbols


Caution, risk of danger. Refer to manual.


Caution, risk of electric shock.


Earth (ground) TERMINAL.

To avoid personal injury and to prevent fire or damage to this product or products connected to it, review and comply with the following safety precautions. Be aware that if you use this probe assembly in a manner not specified the protection this product provides may be impaired.
Only qualified personnel should use this probe assembly.

Use only grounded instruments.
Do not connect the probe ground lead to a potential other than earth ground. Always make sure the probe and the measurement instrument are grounded properly.

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

Observe Probe Ratings.
Do not apply any electrical potential to the probe input which exceeds the maximum ratings of the probe. Make sure to comply with the voltage versus frequency derating curve on page 6.

Keep Away From Live Circuits.
Avoid open circuitry. Do not touch connections or components when power is present.

Do Not Operate With Suspected Failures.
Refer to qualified service personnel.

Indoor Use Only.
Do not operate in wet/damp environment. Keep product surfaces dry and clean.

Do Not Operate the Product in an Explosive Atmosphere.

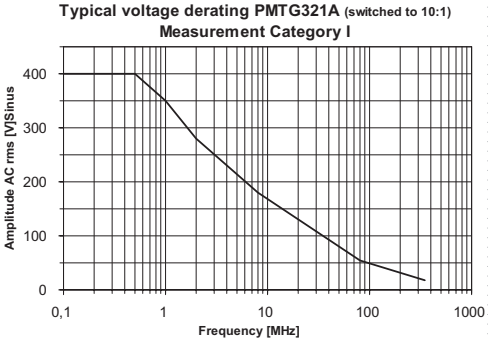
Specifications that are not defined to be guaranteed are typical and are published as general information to the user. The instrument should have warmed-up for at least 20 minutes and the environmental conditions do not exceed the probe `s specified limits.

Electrical Specifications

Attenuation Ratio (switchable) (1)	1:1	10:1	± 2 % at DC (at 10:1)
Voltage Coefficient	-	0.0025 %/V	(typical)
System Bandwidth (2)	20 MHz	350 MHz	(-3 dB)
Probe Risetime	17.5 nsec	1 nsec	(10 % - 90 %) (typical)
Maximum Rated Input Voltage (3)			
Measurement Categorie I:	-	400 V rms 1250 V transient overvoltage	
Measurement Categorie II:	55 V rms CAT II	300 V rms CAT II	
Pollution Degree	2		

Voltage Derating

Note that the max. input voltage rating of the probe decreases as the frequency of the applied signal increases.



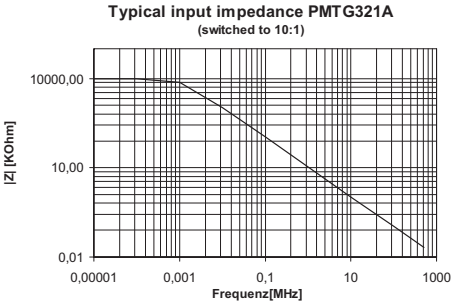
(1) Connect to oscilloscope with a input impedance of 1 MΩ ± 1 %.
(2) at 15 pF input capacitance of the measuring instrument.
(3) As defined in IEC 61010-031. See definitions explained on page 4.

Electrical Characteristics

	1:1	**10:1**	
Input Resistance (System)	-	10 MΩ	± 1 %
Input Capacitance (System)	105 pF inkl. Oszi	15 pF	(typical)
Compensation Range	-	10 pF - 35 pF	(typical)
Input coupling of the measuring instrument	1 MΩ AC / DC	1 MΩ AC / DC	

Input Impedance

Note that the Input Impedance of the probe decreases as the frequency of the applied signal increases.



Mechanical Characteristics

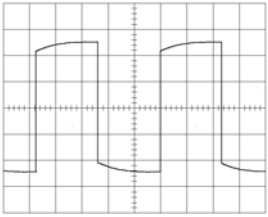
Weight (probe only)	59 g
Cable Length	1.2 m
Probe Tip Diameter	5 mm

Environmental Specifications

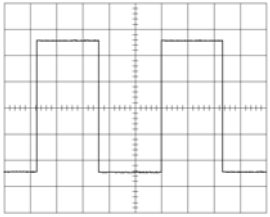
Altitude	operating	up to 2000 m
	non-operating	up to 15000 m
Temperature Range	operating	0° C to +50° C
	non-operating	-40° C to +71° C
Maximum Relative Humidity	operating	80 % relative humidity for temperatures up to +31° C, decreasing linearly to 40 % at +50° C

LF Compensation

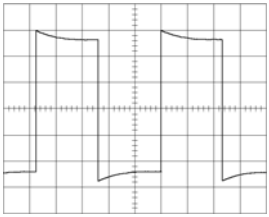
LF needs to be adjusted when the probe is connected to the scope input the first time. LF compensation matches the probes cable capacitance to the oscilloscope input capacitance.
LF compensation is performed by connecting the probe to the CAL - output on the oscilloscope front panel and adjusting the LF compensation trimmer to optimum square wave response. For clarification see below figures.



UNDER COMPENSATED



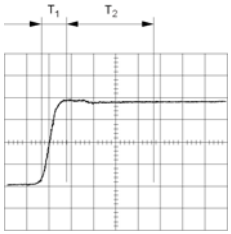
OPTIMUM



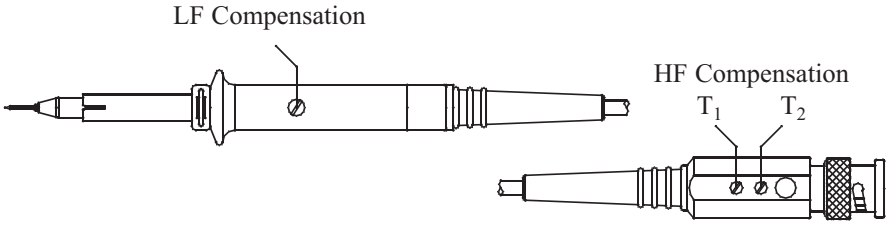
OVER COMPENSATED

HF Compensation

HF needs to be adjusted when the probe is connected to the scope input the first time. HF adjustment is performed by connecting the probe to a rectangular wave generator with a fast rise time.
Adjust the trimmers (T_1 und T_2) for optimum square wave response.



OPTIMUM



Handle with care especially when fitted with the extra thin and sharp spring contact tip to avoid any injury. Note that the probe cable is a sensitive part of the probe. Do not damage through excessive bending or pulling. Avoid mechanical shock to this product in general to guarantee accurate performance and protection.

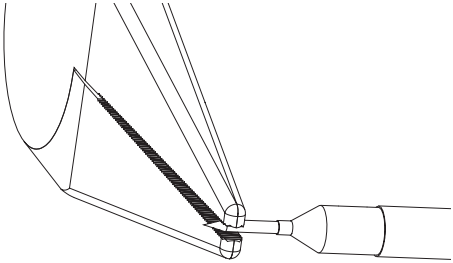
Maintenance

Cleaning

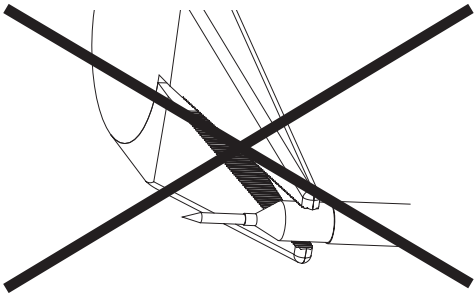
To clean the exterior of the probe use a soft cloth moistened with either distillated water or isopropyl alcohol. Before use allow the probe to dry completely.

Changing the probe tip

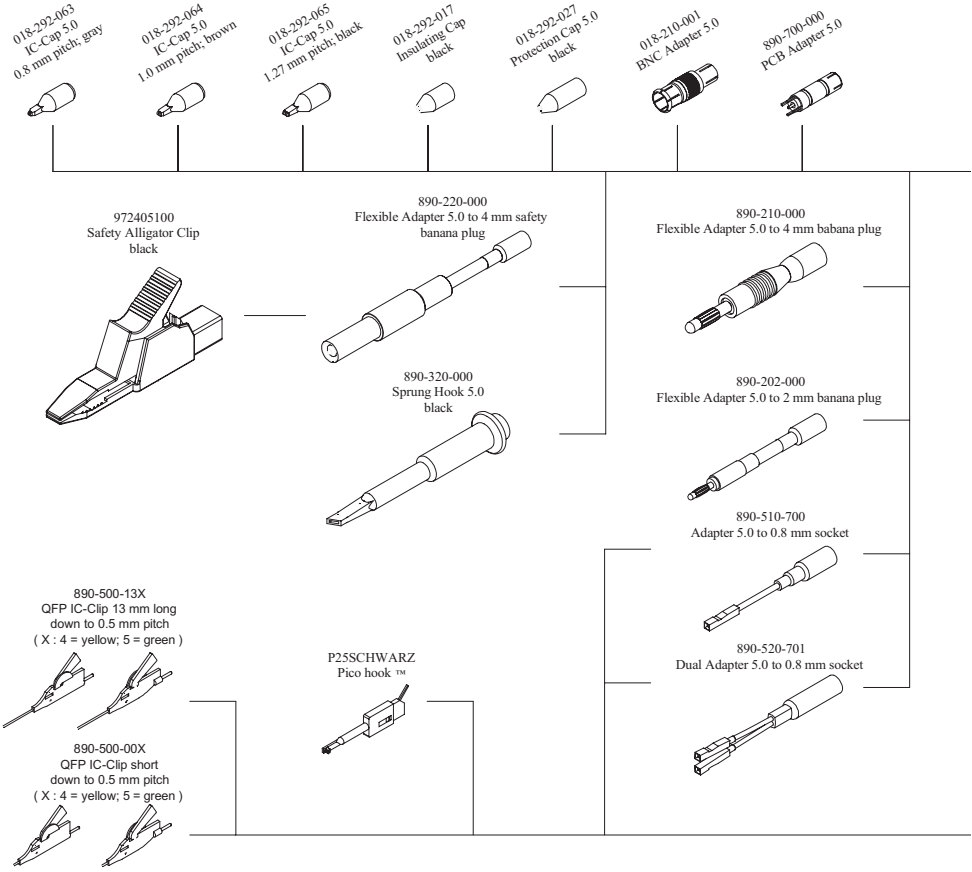
To change the probe tip use pliers to grip and pull it carefully straight out of its contact socket, along the axis of the probe. Do not grip the white plastic insulator or the housing with pliers, because the tip could be squeezed and cannot be removed and respectively the probe could be damaged.
If the probe tip is removed, the new tip can be inserted with pliers into the contact socket, along the axis of the probe. In order to insert the probe tip completely into the housing, press the probe tip against a hard surface carefully.

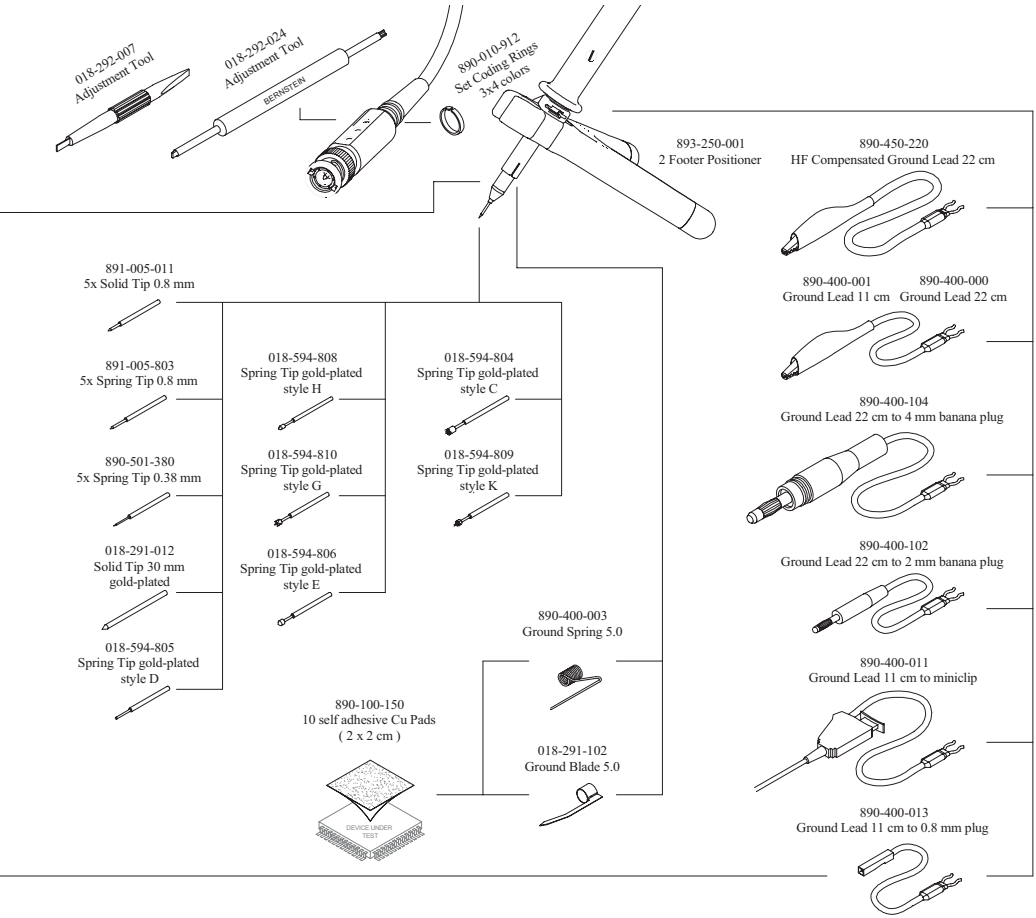


Use pliers to grip and pull the probe carefully out of its contact socket.



Do not grip the white plastic insulator or the probe housing with pliers.


018-292-063
IC-Cap 5.0
0.8 mm pitch; gray
018-292-064
IC-Cap 5.0
1.0 mm pitch; brown
018-292-065
IC-Cap 5.0
1.27 mm pitch; black
018-292-017
Insulating Cap
black
018-292-027
Protection Cap 5.0
black
018-210-001
BNC Adapter 5.0
890-700-000
PCB Adapter 5.0
972405100
Safety Alligator Clip
black
890-220-000
Flexible Adapter 5.0 to 4 mm safety
banana plug
890-210-000
Flexible Adapter 5.0 to 4 mm babana plug
890-320-000
Sprung Hook 5.0
black
890-202-000
Flexible Adapter 5.0 to 2 mm banana plug
890-510-700
Adapter 5.0 to 0.8 mm socket
890-500-13X
QFP IC-Clip 13 mm long
down to 0.5 mm pitch
(X : 4 = yellow; 5 = green)
P25SCHWARZ
Pico hook ™
890-520-701
Dual Adapter 5.0 to 0.8 mm socket
890-500-00X
QFP IC-Clip short
down to 0.5 mm pitch
(X : 4 = yellow; 5 = green)


018-292-007
Adjustment Tool
018-292-024
Adjustment Tool
BERNSTEIN
890-010-912
Set Coding Rings
3x4 colors
893-250-001
2 Footer Positioner
890-450-220
HF Compensated Ground Lead 22 cm
891-005-011
5x Solid Tip 0.8 mm
890-400-001
Ground Lead 11 cm
890-400-000
Ground Lead 22 cm
891-005-803
5x Spring Tip 0.8 mm
018-594-808
Spring Tip gold-plated
style H
018-594-804
Spring Tip gold-plated
style C
890-400-104
Ground Lead 22 cm to 4 mm banana plug
890-501-380
5x Spring Tip 0.38 mm
018-594-810
Spring Tip gold-plated
style G
018-594-809
Spring Tip gold-plated
style K
018-291-012
Solid Tip 30 mm
gold-plated
018-594-806
Spring Tip gold-plated
style E
890-400-102
Ground Lead 22 cm to 2 mm banana plug
018-594-805
Spring Tip gold-plated
style D
890-400-003
Ground Spring 5.0
890-400-011
Ground Lead 11 cm to miniclip
890-100-150
10 self adhesive Cu Pads
(2 x 2 cm)
DEVICE UNDER
TEST
018-291-102
Ground Blade 5.0
890-400-013
Ground Lead 11 cm to 0.8 mm plug

The following items are included in the scope of delivery. Please check the delivery for completeness. If any item is missing, send a message to our service department and we will send you this item immediately.

Item	Qty
Adjustment Tool	1
BNC Adapter	1
Ground Blade 5.0	1
Ground Lead 22 cm	1
Ground Spring 5.0 cm	1
IC-Cap 5.0 0.8 mm pitch; grey	1
IC-Cap 5.0 1.0 mm pitch; brown	1
IC-Cap 5.0 1.27 mm pitch; black	1
Instruction Manual	1
Insulating Cap	1
PMT Probe	1
Protection Cap 5.0	1
self adhesive Cu Pads (2 x 2 cm)	2
Solid Tip 0.8 mm	1
Spring Tip 0.8 mm	1
Sprung Hook II 5.0	1
2 Footer Positionier	1

Use ground lead only for connections to earth ground.

The BNC Adapter is rated: 100 V rms CAT II, Pollution Degree 1

The accessories provided with the probe have been safety tested. Do not use any other accessories than those "originally" provided.