PMK 400V Passive Probe with Extended Temperature Range 350 MHz Instruction Manual

Probing Solutions.
Made in Germany.

ENVI®
Passive Probe with extended Temperature Range

350 MHz, 400 V
Instruction Manual

Contents

Safety Information

Prevent personal injury, fire and product damage.
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 and probe accessory ratings.
Do not apply any electrical potential to the probe input which exceeds the maximum ratings of the probe or the accessories connected to it. In a combination always the lower rating / measurement category applies to both probe and accessories connected to it. Make sure to comply with the voltage versus frequency derating curve on page 20.

Keep away from hazardous 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 or damp environment. Keep the product dry and clean.
Do not operate the product in an explosive atmosphere.

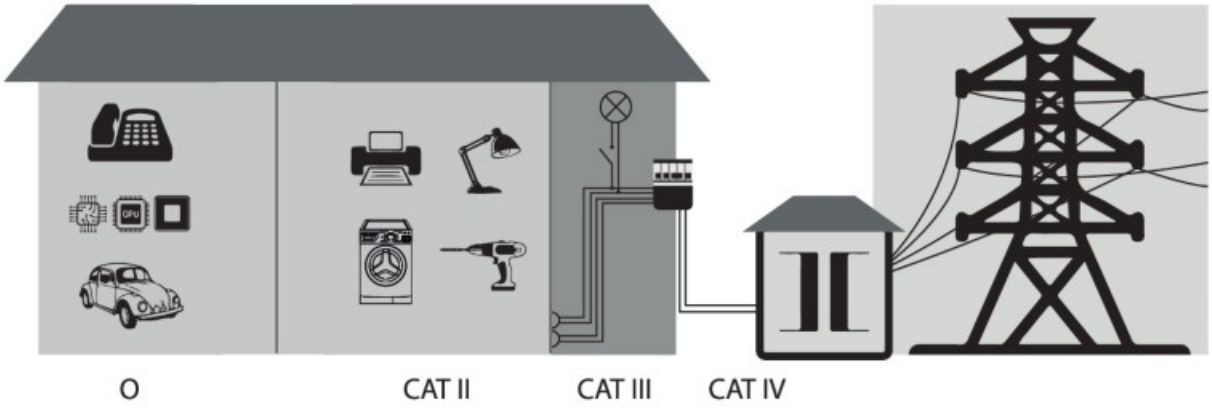
IEC Measurement Categories

Definitions and Examples

No Measurement Category not in CAT II, III or IV	Definition:	Many types of test and measuring circuits are not intended not in CAT II, III or IV to be directly connected to the mains supply. Some of these measuring circuits are intended for very low energy applications, but others of these measuring circuits may experience very high amounts of available energy because of high short-circuit currents or high open-circuit voltages. There are no standard transient levels defined for these circuits. An analysis of the WORKING VOLTAGES, loop impedances, temporary over voltages, and transient over voltages in these circuits is necessary to determine the insulation requirements and short-circuit current requirements.
	Examples:	Thermocouple measuring circuits, high-frequency measuring circuits, automotive testers, and testers used to characterize the mains installation before the installation is connected to the mains supply.
Measurement Category II	Definition:	MEASUREMENT CATEGORY II is applicable to test and measuring circuits connected directly to utilization points (socket outlets and similar points) of the low-voltage mains installation.
	Examples:	Measurements on MAINS CIRCUITS of household appliances, portable tools and similar equipment, and on the consumer side only of socket-outlets in the fixed installation.
Measurement Category III CAT III	Definition:	MEASUREMENT CATEGORY III is applicable to test and measuring circuits connected to the distribution part of the building's low-voltage mains installation. To avoid risks caused by the HAZARDS arising from these higher short-circuit currents, additional insulation and other provisions are required.
	Examples:	Measurements on distribution boards (including secondary meters), photovoltaic panels, circuit breakers, wiring, including cables, busbars, junction boxes, switches, socket-outlets in the fixed installation, and equipment for industrial use and some other equipment such as stationary motors with permanent connection to the fixed installation.
Measurement Category IV CAT IV	Definition:	MEASUREMENT CATEGORY IV is applicable to test and measuring circuits connected at the source of the building's low-voltage mains installation. Due to these high short-circuit currents which can be followed by a high energy level, measurements made within these locations are extremely dangerous. Great precautions shall be made to avoid any chance of a short circuit.
	Examples:	Measurements on devices installed before the main fuse or circuit breaker in the building installation.

IEC Pollution Degrees

Definitions and Examples:



Overview of measurement categories according to IEC 61010-031
O = No Measurement Category (Other circuits that are not directly connected to mains)

Pollution Degree 1	No POLLUTION or only dry, non conductive POLLUTION. NOTE: The POLLUTION has no influence.
Pollution Degree 2	Only- non conductive POLLUTION. Occasionally, however, a temporary conductivity caus ed by condensation must be accepted.
Pollution Degree 3	Conductive POLLUTION occurs or dry, non-conductive POLLUTION occurs which becom es conductive due to condensation which is to be expected.

IEC Safety Symbols

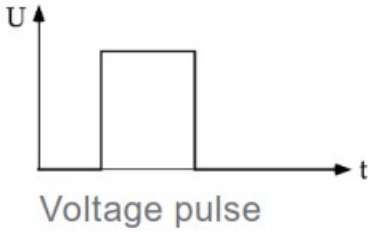
The following symbols may appear on the product or in this instruction manual:

	Caution, risk of danger. Refer to manual.
	Caution, risk of electric shock.
	Earth (ground) TERMINAL.

About ENVI® Probes

The passive probe ENVI ® is ideal for environmental testing, and measurements in climatic chambers from -55 °C to +155 °C. The world's first modern probe for this high temperature range with 300 V CAT II input voltage range, 10:1 divider and 350 MHz bandwidth is suitable for a variety of applications. Due to its BNC connector with read-out function the probe is universally connectable to any oscilloscope with BNC input and shows the correct measured voltage directly.

Specifications

	ENVI® PHT 312-RO
Order Number with Read-Out	835-312-001
Electrical Specifications	
Attenuation Ratio (± 2% at DC) (1)	10:01
System Bandwidth (- 3 dB)	350 MHz
Rise Time (10 % – 90 %)	1 ns
Voltage Coefficient (at DC)	0.00025 % / V
Input Resistance (System) (± 1 %)	5 MΩ
Input Capacitance (System)	20 pF
Compensation Range	10 pF – 25 pF
Input Coupling of the Measuring Instrument	1 MΩ AC / DC
Maximum Rated Input Voltages, CAT II (2)	
Pollution Degree	3
Measurement Category II	300 V CAT II
Maximum Rated Input Voltages, No Measurement Category, not in CAT II, III, IV (2)	
Pollution Degree	3
No Measurement Category	400 V / 1250 V peak
Maximum Pulse Rating, No Measurement Category, not in CAT II, III, IV (2)	
Upulse (3)	Upulse 1250 V (Step 0 V to 1250 V)  Voltage pulse

Mechanical Specifications

Weight (Probe only)	93 g
Cable Length	2 m
Probe Tip Diameter	5 mm

Environmental Specifications
Probe head and cable assembly

Altitude	operating	up to 2000 m
	non-operating	up to 15000 m
Temperature Range	operating	-55 °C to +155 °C
	non-operating	-55 °C to +155 °C
Maximum Relative Humidity	operating	98 % relative humidity

BNC connector and (*) marked accessories

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

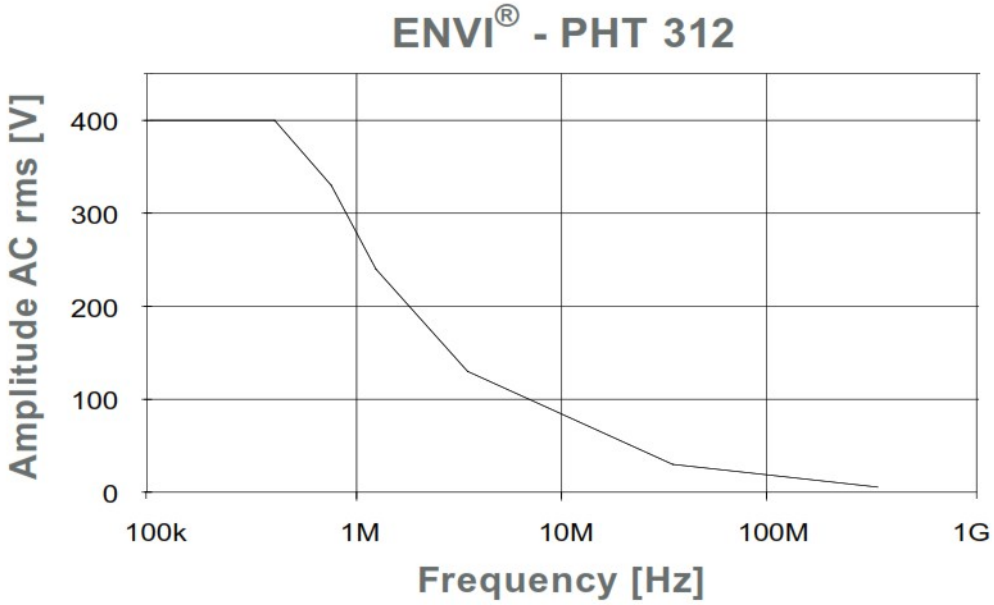
This product comes with 2 years warranty.
Specifications that are not marked as guaranteed are typical.

1. Connected to oscilloscope with an input impedance of 1 MΩ ±1 %.
2. As defined in IEC 61010-031. See definitions explained on page 16 and 17.
3. No overshoot permitted.

Typical Voltage Derating

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

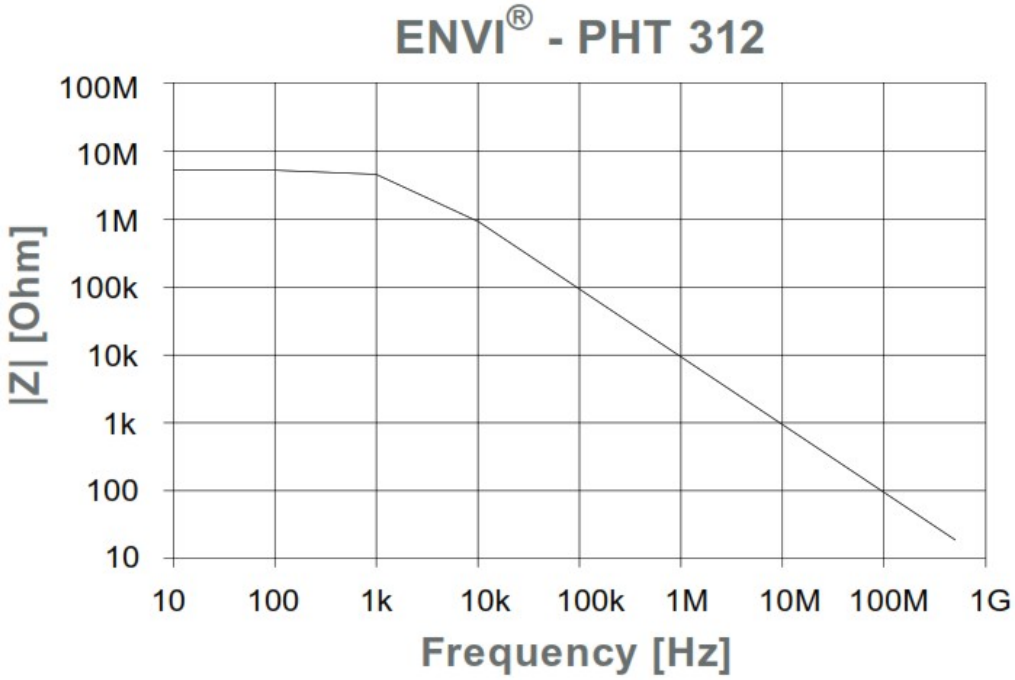
Valid for no measurement category, not in CAT II, III, IV (1):



Typical Input Impedance

⚠ Note that the input impedance of the probe decreases as the frequency of the applied signal increases.

Valid for no measurement category, not in CAT II, III, IV (1):



(1) As defined in IEC 61010-031. See definitions explained on page 16 and 17.

Probe Accessories

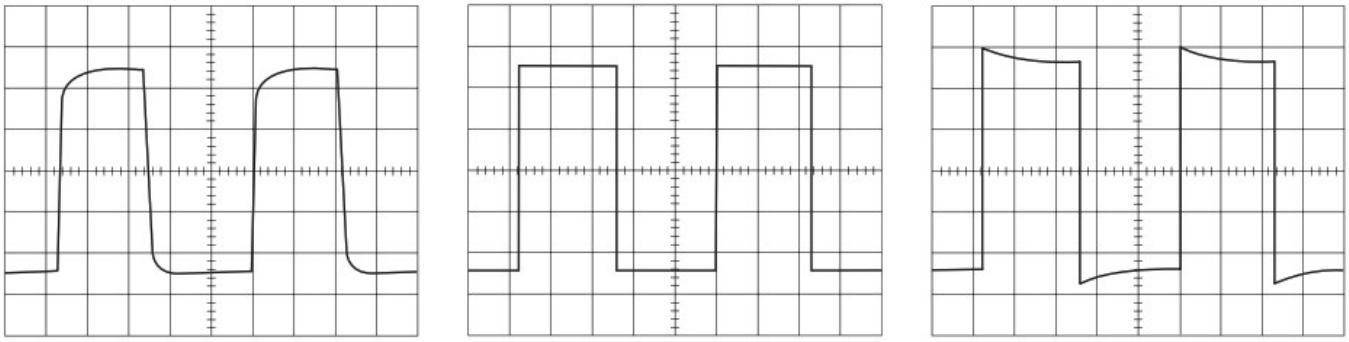
The parts supplied are “highlighted”, see also “Scope of Delivery” on page 24.

(*) Ambient temperature may not exceed specified limits. See “Environmental Specifications” on page 19 for clarification.

Adjustment Procedures

The probe can be adjusted for DC gain, low frequency (LF) compensation and for high frequency (HF) compensation.
A factory calibration is possible at any time on request.
The trimmers are sensitive components. Too much mechanical pressure during adjustment might damage the trimmers.

● LF Compensation
When the probe is connected to the oscilloscope input the first time probes cable capacitance needs to be matched to the oscilloscope input capacitance. This matching assures good amplitude accuracy from DC to the probes bandwidth.
A poorly compensated probe clearly influences the overall system performance (probe + scope) and causes measurement errors resulting in inaccurate readings and distorted waveforms.
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.



undercompensated optimum overcompensated

Adjustment Procedures

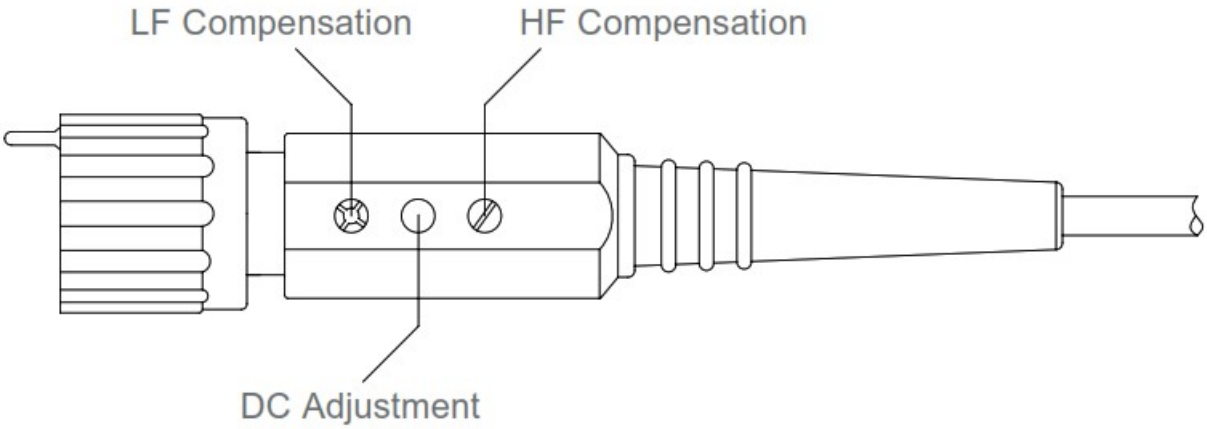
● HF Compensation

Overshoot doesn´t necessarily need to be adjusted when connecting the probe to your oscilloscope for the first time.

We recommend to use the following equipment for proper HF compensation:

Rectangular waveform generator with a rise time faster than 700 ps, 50 Ω feed through and probe BNC adapter. If you do not have the appropriate equipment we are pleased to help you. Simply send a message to our service department.

HF adjustment is performed by connecting the probe to the rectangular wave generator.



● DC Adjustment (Factory calibrated)

DC compensation is executed while connected to the oscilloscope. Use a precision input resistance of 1 MΩ ±0.01 %.

Scope of Delivery

Accessories delivered with each probe are highlighted in the graphical overview.

Item	Qty
Adjustment Tool T Adjustment Tool T	1
BNC Adapter 5.0-L	1
2 Footer Positioner	1
Ground Blade 2.5	1
HT-Dual Lead Adapter to 0.64 mm	1
HT-Insulating Cap	1
HT-Ground Lead 10 cm	1
HT-Ground Lead 10 cm to 4 mm Banana	1
Instruction Manual	1
Probe ENVI®	1
Solder-in Contact Pin 0.64 mm	10
Solid Tip CuBe 0.8 mm	1
Spring Tip 0.8 mm (1)	2

1. plugged on probe
2. installed in probe

Handling

 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.

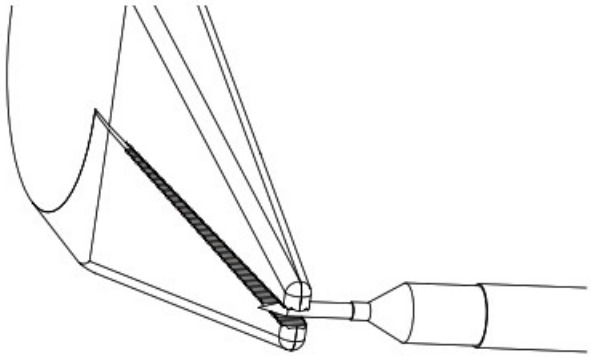
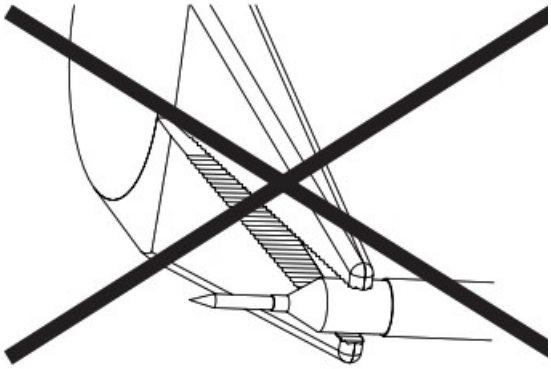
 Use ground lead only for connections to earth ground.

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

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.
Most oscilloscopes provide a build-in function generator to verify the passive probe is compensated correctly. After changing the probe tip always use the build-in function generator or other stand-alone instrument to make sure the probe is safe to operate.

	
Use pliers to grip and pull the probe tip carefully out of its cont act socket.	Do not grip the white plastic insulator or the probe t with pliers.

Manufacturer
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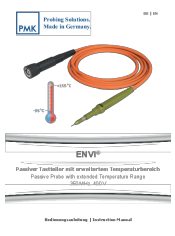
E-Mail: **sales@pmk.de**

Warranty

PMK warrants this product for normal use and operation within specifications for a period of two 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 disclaim any other implied warranties of merchantability orfitness for a particular purpose. PMK 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 has been advised of the possibility of such damages arising from any defect or error in this manual or product.

Information in this publication supersedes that in all previously published material. Specifications are subject to change without notice.
M35-PHT-001
Revision 07.2022

Documents / Resources

	**PMK 400V Passive Probe with Extended Temperature Range 350 MHz** [pdf] Instruction Manual PMK - ENVI PHT, 835-312-001, 400V Passive Probe with Extended Temperature Range 350 MHz, 400V Passive Probe with Extended Temperature Range, Passive Probe with Extended Temperature Range 350 MHz, Passive Probe with Extended Temperature Range, Passive Probe, Extended Temperature Range Probe, Probe

References

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