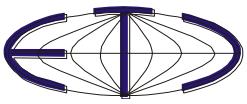
EA121

Differential probe for M520 and M570 families of oscilloscopes

User's guide

Version 1.0



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Should you need any information or have any additional questions, please do not hessitate to contact us either mail or preferably via e-mail. Our contact details are as follows:

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Contents

Package contents

- EA121 probe – 1pc
- flat cable for connection to oscilloscope – 1pc
- inštalation leaflet – 1ks

Limited Waranty

The ETC s.r.o. company guarantees reliable operation of the EA121 series probe in compliance with this documentation during a period of 24 months from the date of purchase.
Should a malfunction occur during the warranty period, excluding errors for which ETC can not be held responsible, ETC guarantees the repair of the product or its replacement with a new or repaired one free of charge.
The ETC company shall not be responsible for malfunctions on the device caused by an accident, incorrect manipulation, unauthorized interventions or similar.
When requesting the warranty service, the customer should send the device in its original package to the dealer from whom it was purchased or directly to the ETC company. The warranty certificate together with a description of the defect or malfunction should be included in the package. The customer agrees that a new or repaired product to be shipped would be insured against damage or loss during the transport and that he will cover the costs for the shipment and insurance.

Precautions

Please observe following recommendations to avoid possible problems that might occur while using the probe:

- Do not connect voltages lower then -300V or higher than 300V (with respect to oscilloscope's ground) to the input
- Do not use the probe in wet environment
- Then measuring voltages above 50V please be careful. Touching parts under voltages higher than 50V could be dangerous for your health.

1. Instalation

The layout of the front and rear panels are shown on figures 1.1 and 1.2.

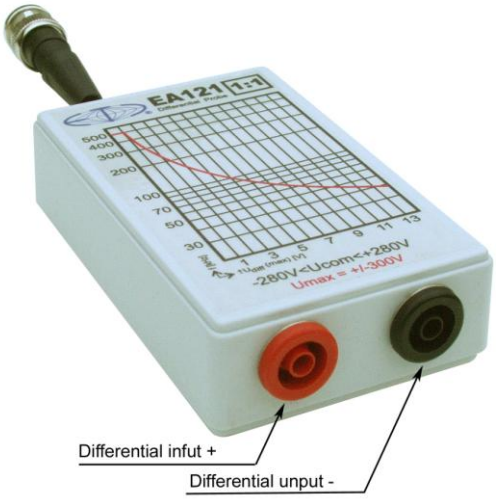

Fig. 1.1. – Front panel connectors

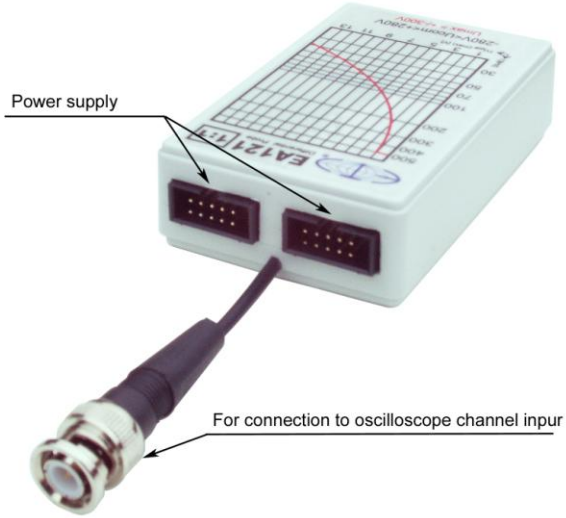

Fig. 1.2. – Rear panel connectors

When installing the probe you can face to one of two possible situations.

In first case, the connected probe is the only accessory connected to the oscilloscope's rear panel. In this case, simply insert one end of the flat cable to one of the probe rear panel's power supply connectors and the second end of the flat cable to the connector on the oscilloscope's rear panel.

In other case, when the oscilloscope's rear panel connector is occupied by other accessory, insert a second end of the flat cable into the free connector on the rear panel of the already connected accessory.

Warning: Use the flat cable supplied together with the probe. Using other cable can damage the probe, oscilloscope or the computer.

The last connector which shoud be connected, is the BNC located on the rear pannel of the probe. Connect it to any of the channel inputs of the oscilloscope.

The differential inputs of the probe are located on its front pannel.

2. **Description**

The EA121 differential probe is the auxiliary equipment designed for M520 and M570 families of ETC oscilloscopes. It is connectable to any of the measuring inputs of the oscilloscope. It is powered directly from the oscilloscope.

The unique feature of the EA121 probe is very high common mode voltage connectable to the inputs while the differential voltage attenuation is 1:1. So, it is possible to measure differential voltages of tents of millivolts while the common mode voltage is up to 280V.

4. Performance characteristics

No. of channels	1
Input type	differentiial
Gain	1
Gain error at 20ºC	< 0.02 %
Gain versus temperature	< 0.001% / °C
Initial offset	< 1.1 mV
Common mode rejection (f < 10 kHz)	90 dB (< 32 µV/V)
Differential input resistance	800 kΩ typically
Input resistance to oscilloscope ground	400 kΩ typically
Differential input voltage range	-14V to +14V (fmax 38kHz) -1V to +1V (fmax 500 kHz)
Common mode voltage range (to oscilloscope's GND)	-280V to +280V
Maximum common mode voltage (to oscilloscope's GND)	-300V až +300V continuous -500V až +500V max 10s
Supply current	< 45 mA at 5V
Dimensions (w/h/d) in mm	58/25/97

Table 4.1.- Performance characteristics

The differential voltage input range depends on frequency as it is shown on picture 4.1. Up to +-1Vdiff (2Vpp) the limit is the -3dB drop of attenuation. For higher differential voltages the limit is the harmonic waveform distortion of 1%.

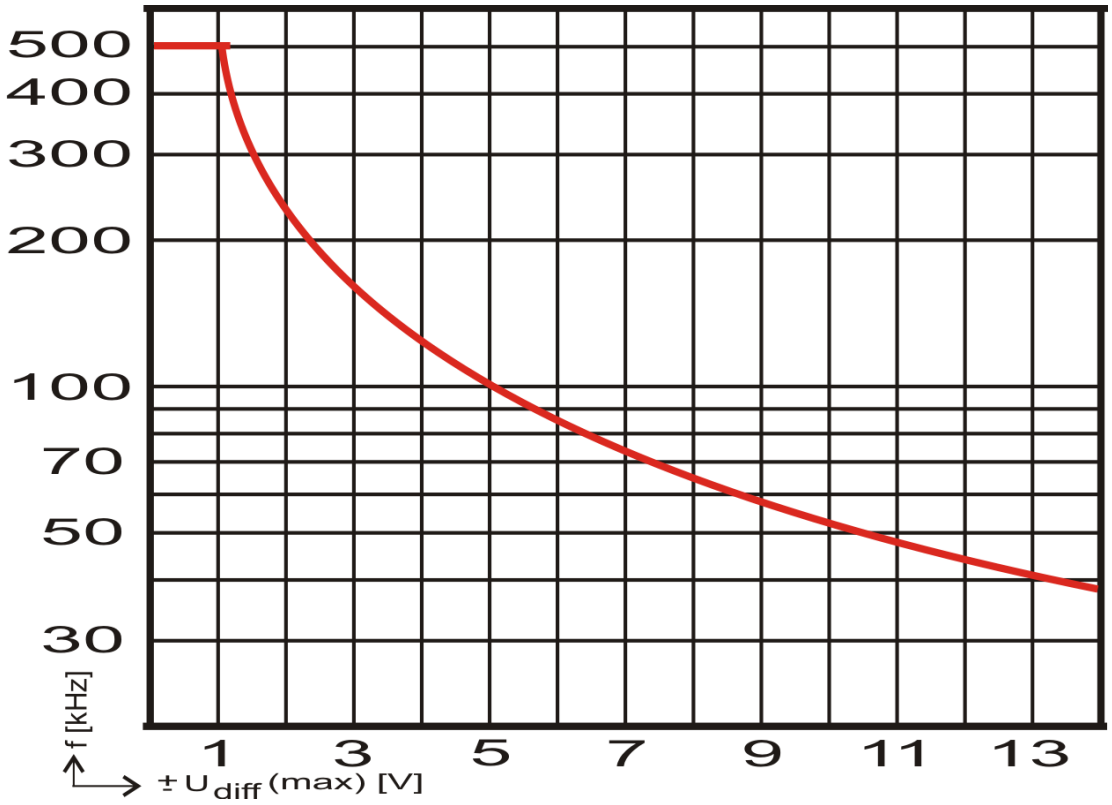

Fig. 4.1. – Differential input range

The "Common Mode Rejection" parameter is also frequency dependent. This dependency is shown on Fig. 4.2.

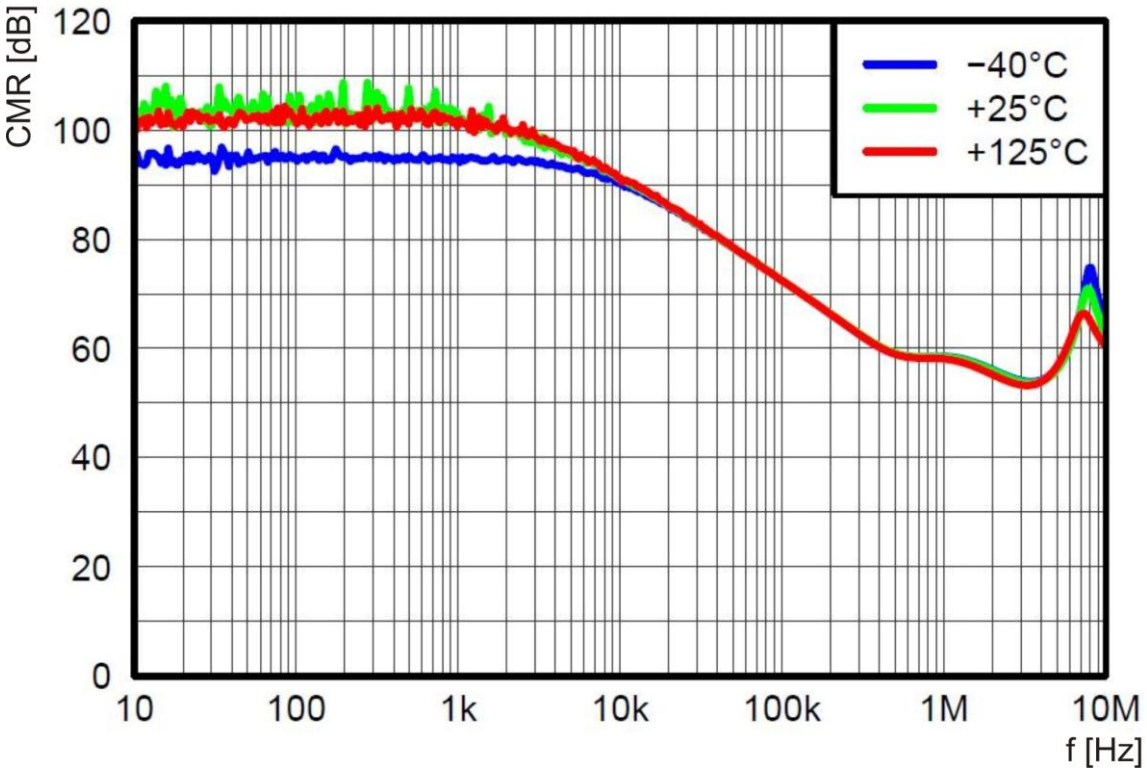

Fig. 4.2. – CMR dependency on frequency