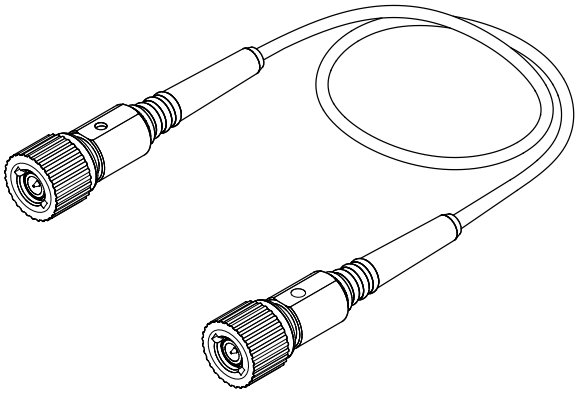
DEVICE SPECIFICATIONS

CP400X and CP500X

High Impedance Passive Cable Divider

This document lists specifications for the CP400X and CP500X cable divider. Use the CP400X and CP500X in an application with vibrating equipment like machines and engines, where a connection is made from BNC to BNC.

Figure 1. CP400X and CP500X



Caution The probe cable is a sensitive part of the probe. Do not damage through excessive bending or pulling. Avoid mechanical shock to this product for accurate performance and protection.

Cautions

To avoid personal injury and to prevent fire or damage to the CP400X and CP500X, review and comply with the following information.

Caution The protection provided by the CP400X and CP500X can be impaired if it is used in a manner not described in this document.

Caution Connect the probe to grounded instruments only. Always make sure the probe and the measuring instrument are grounded properly.

NATIONAL INSTRUMENTS

Caution Connect the probe output to the measuring instrument before connecting the probe to the circuit under test. Disconnect the probe input from the circuit under test before disconnecting the probe from the measuring instrument.

Caution 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, the lower rating and measurement category applies to both probe and the accessories connected to it. Make sure to comply with the voltage versus frequency derating curve.

Caution Avoid open circuitry. Do not touch connections or components when power is present.

Caution Do not operate the probe with suspected failures.

Caution Do not operate the probe in an explosive atmosphere.

Cleaning your Device

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

Electrical Specifications

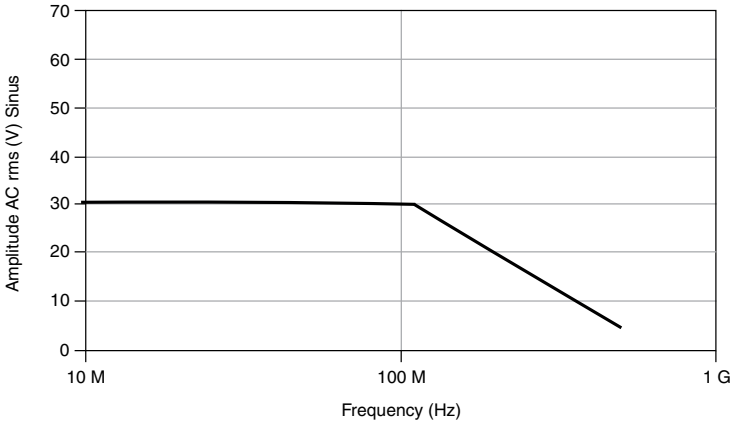
Voltage Coefficient	0.00025%/V at DC
Maximum Rated Input Voltage	60 VDC, 30 VAC
Attenuation Ratio[1]	10:1
System Bandwidth (-3dB)[2]	
CP400X	up to 400 MHz
CP500X	up to 500 MHz
Risetime (10% - 90%)	
CP400X	0.9 ns
CP500X	0.7 ns

[1] Connected to oscilloscope with an input impedance of 1 MΩ ± 1%.
[2] System bandwidth can vary with oscilloscope bandwidth.

Voltage Derating

The maximum input voltage rating of the cable divider decreases as the frequency of the applied signal increases.

Figure 2. CP400X and CP500X Typical Voltage Derating



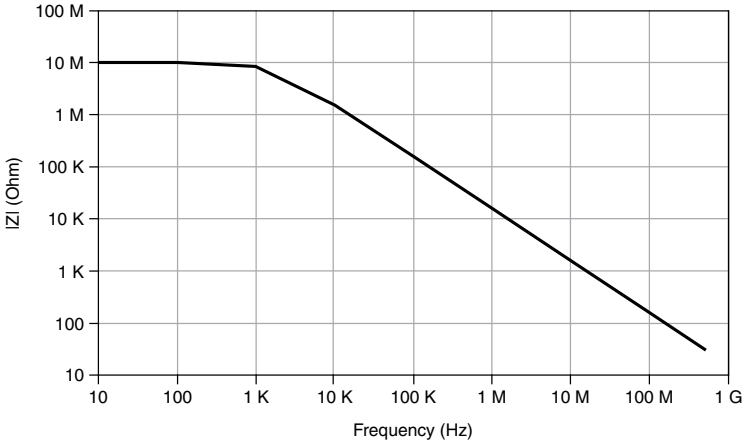
Electrical Characteristics

Input resistance (±1%)	10 MΩ
Input resistance	
CP400X	13 pF
CP500X	10 pF
Compensation range	
CP400X	10 - 40 pF
CP500X	7 - 25 pF

Input Impedance

Note Input impedance decreases as the frequency of the applied signal increases.

Figure 3. CP400X and CP500X Typical Input Impedance



Mechanical Characteristics

Weight	
CP400X	70 g
CP500X	58 g
Cable length	
CP400X	2 m
CP500X	1.2 m
Connection to signal	BNC

Operating Environment

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	80% relative humidity for temperatures up to +31° C, decreasing linearly to 40% at +50° C
Pollution degree	2

Indoor use only.

Adjusting for Low Frequency (LF) Compensation

LF needs to be adjusted when the probe is connected to the oscilloscope input the first time. LF compensation matches the probes cable capacitance to the oscilloscope input capacitance.

This matching assures good amplitude accuracy from DC to upper bandwidth limit frequencies. A poorly compensated cable divider clearly influences the overall system performance (cable divider + scope) and introduces measurement errors resulting in inaccurate readings and distorted waveforms.

1. Connect the cable divider to the CAL – output on the oscilloscope front panel
2. Adjust the LF compensation trimmer to optimum square wave response.

Figure 4. Overcompensated Square Wave Response

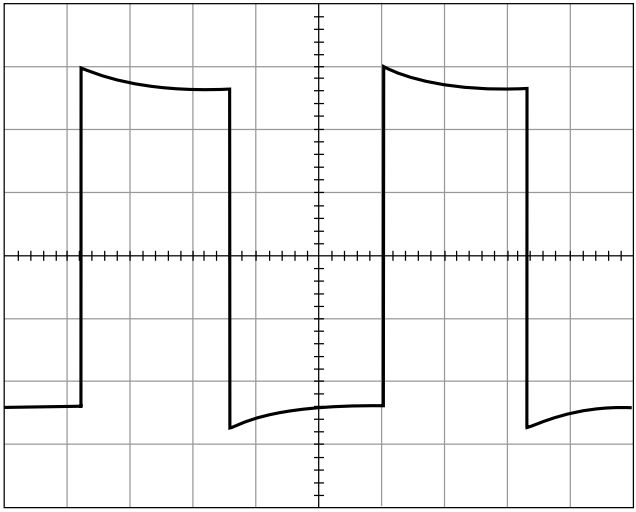


Figure 5. Optimum Square Wave Response

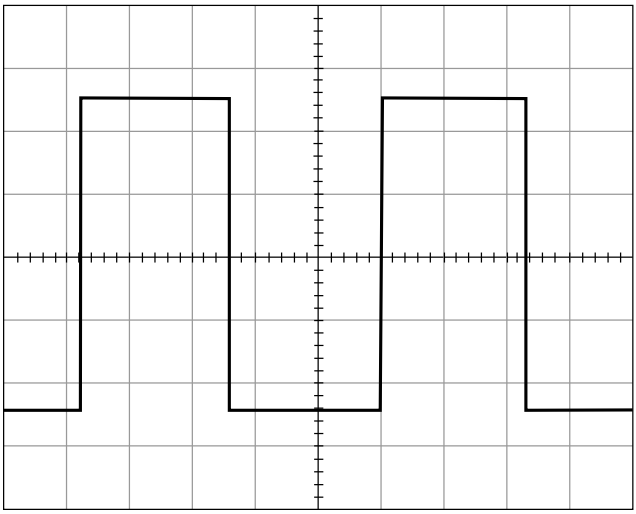


Figure 6. Undercompensated Square Wave Response

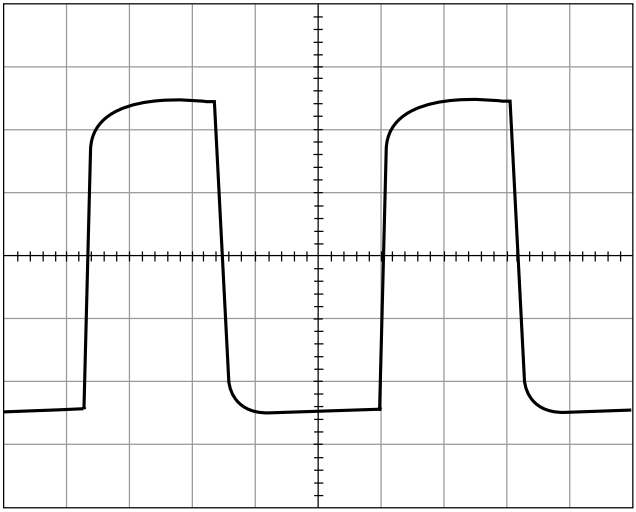
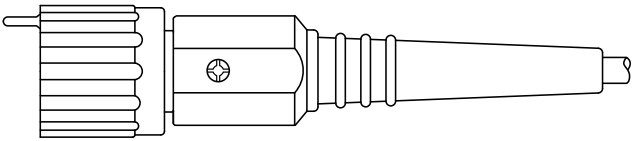


Figure 7. LF Compensation Trimmer



Adjusting for High Frequency (HF) Compensation

HF needs to be adjusted when the cable divider is connected to the scope input the first time.

Use a rectangular wave generator with a rise time faster than 700 ps, 50 Ω feed-through for proper HF compensation.

1. Connect the cable divider to the rectangular wave generator.
2. Adjust trimmers (T1 and T2) for optimum square wave response.

   T1 is used for rise time adjustment. T2 influences cable divider response time.

Figure 8. Optimum Square Wave Response

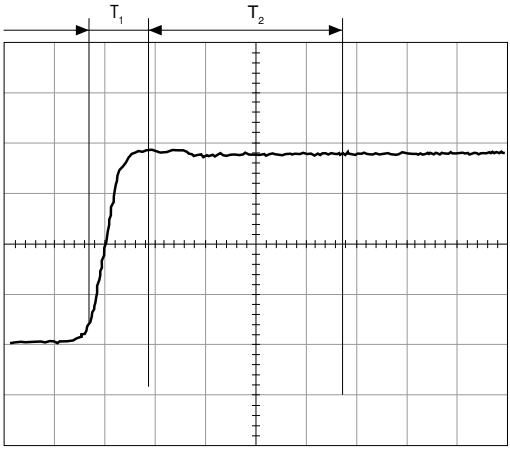
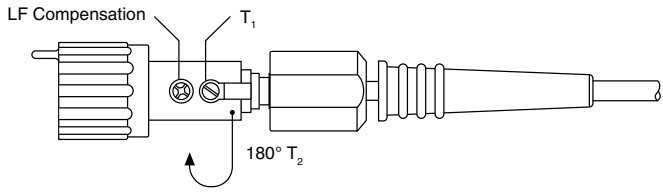


Figure 9. HF Compensation Trimmer



Verifying the Kit Contents

- Adjust tool T
- Coding rings set 3 x 4 colors
- Instruction manual
- Cable divider

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

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, visit *ni.com/certification*, search by model number or product line, and click the appropriate link in the Certification column.

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *Minimize Our Environmental Impact* web page at *ni.com/environment*. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit *ni.com/environment/weee*.

电子信息产品污染控制管理办法（中国 RoHS）

中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令(RoHS)。关于 National Instruments 中国 RoHS 合规性信息，请登录 ni.com/environment/rohs_china。(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)

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