

Piezotron® Coupler

Type 5108A...

Passive, Low Impedance Sensor Coupler

A simple to use low impedance coupler that provides excitation power and conducts measured signal for voltage mode piezo-electric sensors.

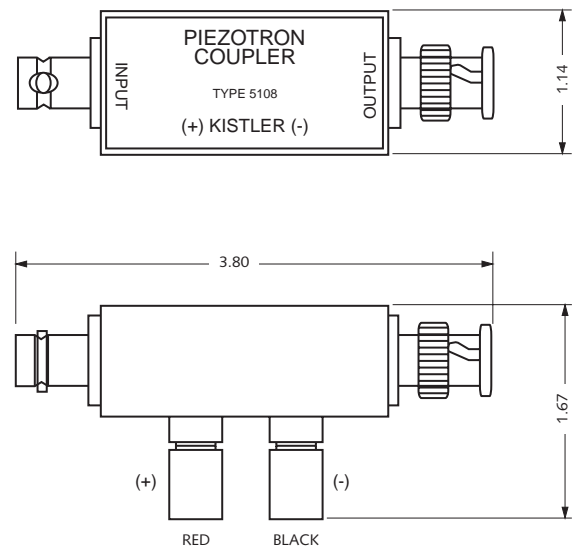
- Simple to operate
- AC coupled
- Reverse polarity protection
- Conforming to CE

Description

Type 5108A coupler is a small, easy-to-operate instrument for use with low impedance Piezotron sensors with build-in electronics. The primary function of this passive coupler is to serve as an inter-connecting device, simultaneously providing conditioned power to the low impedance sensor and a measured signal to recording equipment. Power is derived externally from a battery or inexpensive, unregulated line powered supply. Internal protection is provided to prevent damage resulting from an improperly connected (reverse polarity) power source. Type 5108A is AC coupled, thereby eliminating the sensor's bias voltage from the measured signal. Its small size and compact shape allows easy, direct attachment to the input connector of an oscilloscope.

Application

The primary use for Type 5108A coupler is to provide DC power to pressure, force and acceleration type sensors that contain miniature impedance converting circuits and to couple the signal generated in each to a electronic measurement instrument. The coupler is powered by a relatively inexpensive unregulated line powered supply, aircraft DC systems, or batteries.



Technical Data

Specification	Unit	Type 5108A
Input characteristics		
Sensor current supply	mA	4
Sensor signal voltage	V _{pp}	20

Transfer characteristics

Gain		1
Frequency response, min. (–3dB with 1 meg load)	Hz	0.02 ⁽¹⁾

Output characteristics

Coupling capacitor	μF	47
Full scale signal	V _{pp}	20
Current, max.		see note ⁽²⁾

Environmental

Temperature range operating	°F	32 ... 122
Temperature range storage	°F	–40 ... 185
Vibration (5 ... 2000 Hz)	g	±10
Shock, 1ms duration	gpk	100

Power:

Supply voltage	VDC	22...30
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Physical:

Size with connector (L x H x W)	in	2.3 x 0.87 x 0.87
Weight	grams	65

Connectors:

Input	Type	BNC neg.
Output	Type	BNC pos.
Power	Type	banana jacks polarity (+ red, – black)

1) Referring to Frequency response specification
 $f_{max} = [0.32 \text{ (bias current -1mA)}] [(C_c + 0.002 + C_{in}) (V_o)]$ where:

f_{max} = maximum undistorted sine wave frequency, in kHz, above which slew rate limiting distorts amplitude and waveform

bias current = operating current supplied by coupler, for the 5108A, bias current = 4mA

C_c = cable capacitance in μF, typically 30 pF/ft (100 pF/m)

C_{in} = input capacitance of oscilloscope or recording instrument, typically 20 pF for an oscilloscope

V_o = signal amplitude, in V_{pp}

- With a 5 V_{pp} signal and a 20 pF instrument, and 100 ft of cable, $f_{max} = 38$ kHz.
- With a 5 V_{pp} signal and a 20 pF instrument, and 6 ft of cable, $f_{max} = 87$ kHz.

2) 1 mA less than supplied by coupling

1 g = 9.80665 m/s², 1 Inch = 25.4 mm, 1 Gramm = 0.03527 oz, 1 lbf-in = 0.113 Nm

Ordering Key

Type 5108A 

Variants

Piezotron coupler 





Measure	Connect	Amplify	Output	Analyze
Type 87XX... Low impedance	 Type 1761B... 10-32 pos BNC pos.	 Type 51... Power supply / signal conditioner	 Type 1511 BNC pos. BNC pos.	 not supplied

Fig. 1: Measuring chain