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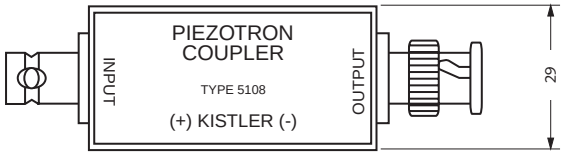
Piezotron® Coupler

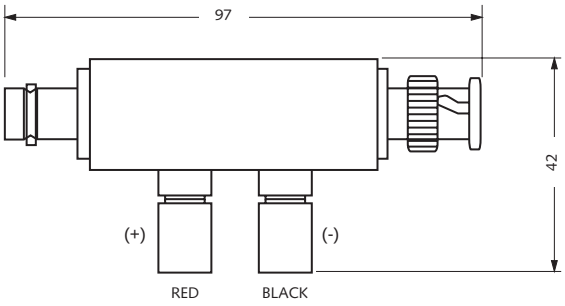
Type 5108A...

Passive, Low Impedance Sensor Coupler

A simple to use low impedance coupler that provides excitation power and conducts measured signal for voltage mode piezoelectric 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.

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Technical Data

Specification	Unit	Type 5108A
Input characteristics		
Sensor current supply	mA	4
Sensor signal voltage	Vpp	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	Vpp	20
Current, max.		see note (2)
Environmental		
Temperature range operating	°C	0 … 50
Temperature range storage	°C	–40 … 85
Vibration (5 … 2000 Hz)	g	±10
Shock, 1ms duration	gpk	100
Power:		
Supply voltage	VDC	22…30
Physical:		
Size with connector (L x H x W)	mm	58 x 22 x 22
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 (bias current -1mA)] [(Cc + 0,002 + Cin) (Vo)] 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
Cc	=	cable capacitance in µF, typically 30 pF/ft (100 pF/m)
Cin	=	input capacitance of oscilloscope or recording instrument, typically 20 pF for an oscilloscope
Vo	=	signal amplitude, in Vpp

- With a 5 Vpp signal and a 20 pF instrument, and 30 m of cable, f_{max} = 38 kHz.
- With a 5 Vpp signal and a 20 pF instrument, and 1,8 m 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

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