

Description

The hermetic sealed industrial piezoelectric accelerometer model 104 is design to monitor the vibration in harsh industrial environment.

It uses the industry standard [®]ICP 2-wire voltage transmission technique with a 4 mA minimum constant current supply.

Signal ground is isolated from the mounting surface and outer case to prevent ground loops. Faraday shielding will limit sensitivity to ESD to a minimum. Annular shear mode design will prevent from thermal transient and from spurious signal from high transverse vibrations.

Low noise electronic and a temperature compensated design will give you accurate result over the complete temperature range.

Large choice of frequency range will help to fit almost every customer requirements. Low frequency accelerometers (A=9) incorporate a low-pass filter within the conditioning electronics. This filter attenuate the sensor mechanical resonance and the associated distortion and overload.

Typical applications

Vibrations measurement in the rugged environments of industrial machinery monitoring. High frequency version will monitor the vibration on roller bearing, pumps cavitation, Medium frequency version will monitor overall vibration on pumps, motors, fans, ... Low frequency model is used in the petrochemical, machine tool, and paper industries for monitoring of slow speed agitators, cooling towers,



pic. 1 AC104.01 with M12-cable-set AC10.01-A1-E01-31-10m and M8x 1.25 captive bolt

Technical Specifications

Dynamic

Sensitivity (104.02 & 104.12)

A=3	10 mV/g ±5%
A=6	100 mV/g ±5%
A=9	500 mV/g ±5%

Frequency response (104.02 & 104.12)

	pic. 2
A=3	±10 % : 1 to 9000 Hz ±3 dB : 0.5 to 13000 Hz
A=6	±10 % : 1 to 6000 Hz ±3 dB : 0.5 to 10000 Hz
A=9	±10 % : 0.4 to 1600 Hz ±3 dB : 0.2 to 3700 Hz

Mounted Resonant frequency

A=3	32 kHz
A=6	22 kHz
A=9	16 kHz

Dynamic range

A=3	500 g pk
A=6	80 g pk
A=9	10 g pk

Transverse response sensitivity (20Hz, 5g)

<5% max

Temperature response

(see pic. 3)

Polarity

Suffix dependant

Linearity

±1% Max

Warm up time (Typical)

A=3, 6	< 1Sec
A=9	< 10 Sec

Electrical

Residual noise (@24°C): AC 104-10, AC 104-100

1 Hz to 25 kHz	300 ug rms
1 Hz	30 ug

Residual noise (@24°C): AC 104-500

1 Hz to 25 kHz	25 ug rms
1 Hz	2.4 ug

Power requirements

Constant current	+2 to +10mA DC
Voltage	+22 to +28 VDC

Protection

Overvoltage	Yes
Reverse polarity	Yes

Environmental

Temperature

Operating continuous : (max. current =4mA)

A=3, 6	-55 to 120 °C (-65 to 250 °F)
A=9	-55 to 90 °C (-65 to 212 °F)
AC 104.12-100	-55 to 150°C (-65 to 302 °F)

Humidity / Enclosure

MIL & M12 plug (B=1, 2) Not affected, hermetically sealed, 1E-8torr./s

Acceleration limit : Shock	5 000g peak
Acceleration limit : Continuous vibration.	500g peak
Base strain sensitivity	0.0002 ug pk/u strain
Temp. transient sens. (3Hz, LLF, 20dB/dec)	5 mg/°C
Acoustic sensitivity (164 dBSP)	0.5 mg
Electromagnetic sens. (50Hz, 0.03 T)	0.2 g
Mean time between failure (MTBF)	10 Years Nom
ESD Protection	> 40 V
Safety.	EN 61010-1 and IEC 1010-1
EMC emission	EN 50081-1, EN 50081-2
EMC immunity (1)	EN 50082-1, EN 50082-2

Physical

Dimensions

see pic. 5 & pic. 6

Sensor design

Ceramic, preloaded annular shear mode

Weight

A=3	150 gr Nom.
A=6	155 gr Nom.
A=9	165 gr Nom.

Cable Connector

B=1: 2-Pin-MIL	MIL-C-5015 glass seal, Type MS3143 10SL-4P
B=2: 4-Pin-M12	M12 glass seal, IEC 60947-5-2
Material	AISI 316L, DIN 1.4435 (Stainless steel)
Mounting torque (M6 suffix)	2.4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied

Sensitivity (5g, 160 Hz)
No frequency response

Repair

Consult factory for replacement of connector in case of broken or bended pins. Repair of electronic is not possible

(1) Guaranteed if using accessories listed in this datasheet only

Ordering information Model AC104.01 (120°C version)

To order, specify model number, options, accessories and suffix:

AC104.01 – A – B (CC-DD) – M8

A : Sensitivity (±5%)

- 3: *10 mV/g (high frequency)
6: *100 mV/g (medium frequency, general purpose)
9: *500 mV/g (low frequency)

B : Connector / Integral cable

- 1: 2pin MIL-C-5015, glass seal, lateral connection
2: 4pin M12 glass seal, lateral connection
5: Integral cable, not reinforced
7: Integral cable with stainless steel overbraid protection

Option 5, 7 needs additional information: (C-DD)

C : Cable Assembly

- 01: *Polyurethane twisted pair cable (90°C)
02: *Teflon FEP twisted pair Cable (200°C)

DD : cable length in Meter

- 10: 10m
15: 15m

Ordering information Model 104.12 (150°C Version)

High temperature version is only available with A=6 and B=1.

AC104.12–6–1–M8

Ordering information cable-set Model AC10.01:

Please choose cable set specification according to following scheme:

AC10.01 – AA – BBB – CC – DD

AA – Cable Version

- A1: Cable bare, open wire ends
A3: Cable covered with stainless steel braid, open wire ends
A4: Cable covered with protective sleeves, open wire ends

BBB – Plug Version

- B02: 2pin MIL-C-5015 plug, straight, cable shield connected, pic. 9
B03: 2pin MIL-C-5015 plug, straight, for stainless steel armored cable, pic. 9
B13: 2pin MIL-C-5015 plug, straight, stainless steel version, pic. 10
E01: 4pin M12 plug, straight, pic. 7
E31: 4pin M12 plug, 90°-angled, pic. 7
E61: 4pin M12 plug, straight, field mountable, pic. 8
E81: 4pin M12 plug, 90°-angled, field mountable, pic. 8

CC – Cable-Material

- 31: polyurethan, PU – isolated cable (90°C)
02: teflon, FEP- isolated cable (200°C)

DD – Cable-Length in Meter

- 10: length = 10m
15: length = 15m or specify length!

Apply for this datasheet our general business conditions:

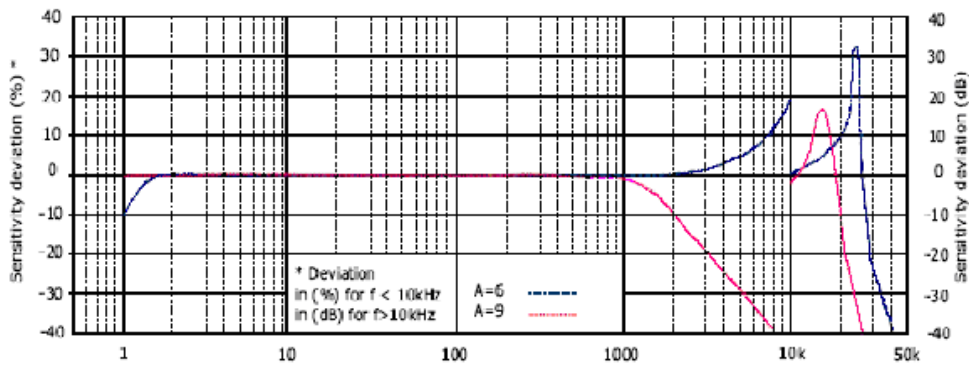
- General conditions for industrial applications
- General conditions for service and delivery
- Hourly- and daily rates

The general conditions and other documents can be downloaded from our website: www.acida.net.

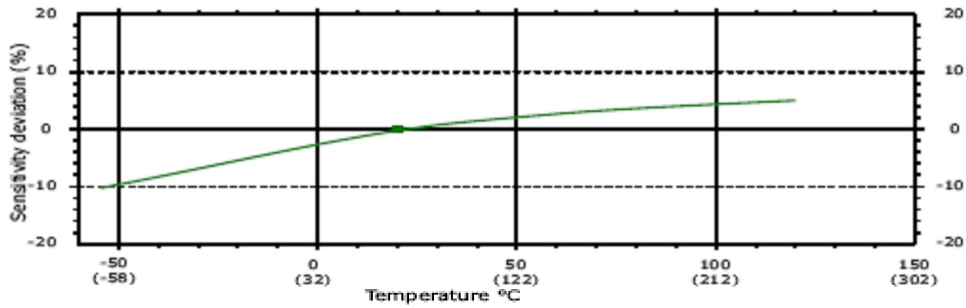
More information: info@acida.net.

Technical data and images can be modified at any time..

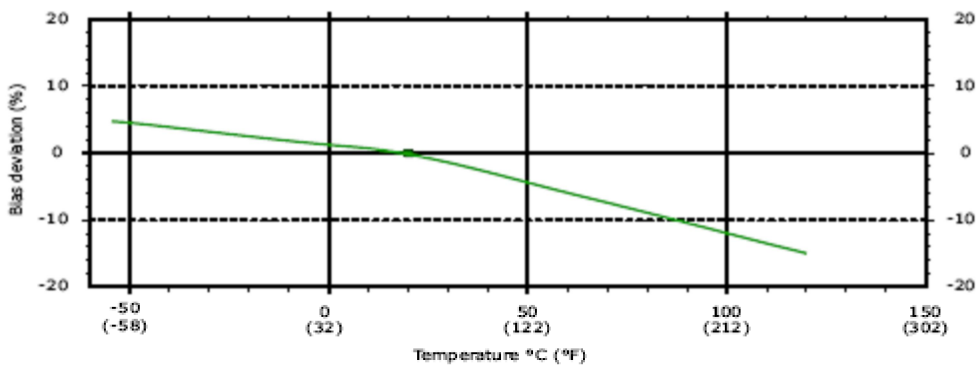
Characteristic curves



pic. 2 Frequency response, Amplitude; A =6 (100mV/g); A =9 (500mV/g)

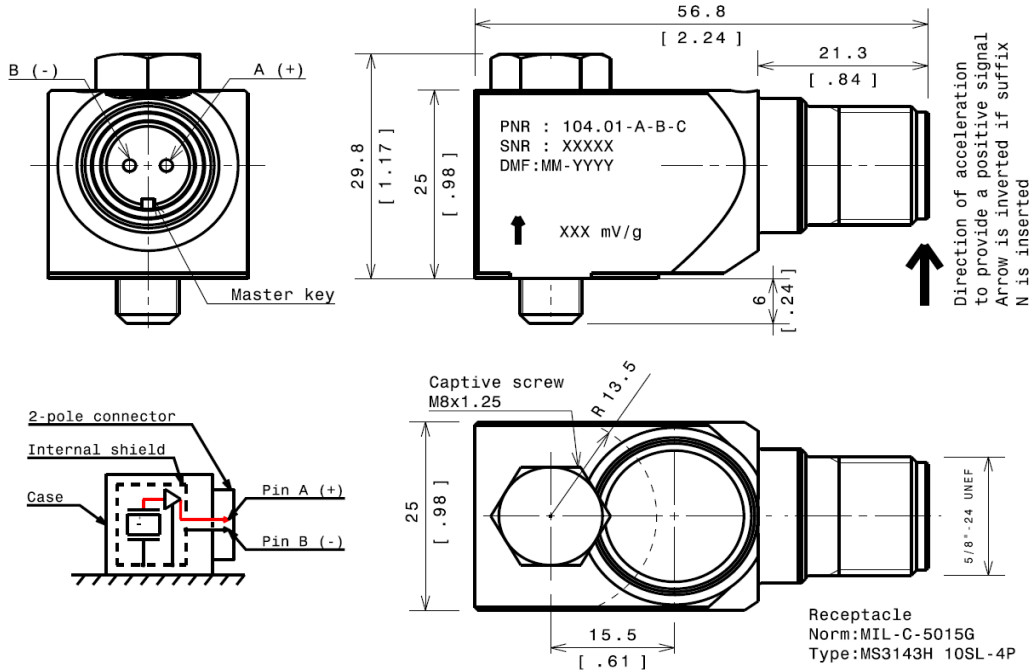


pic. 3 Sensitivity deviation versus temperature

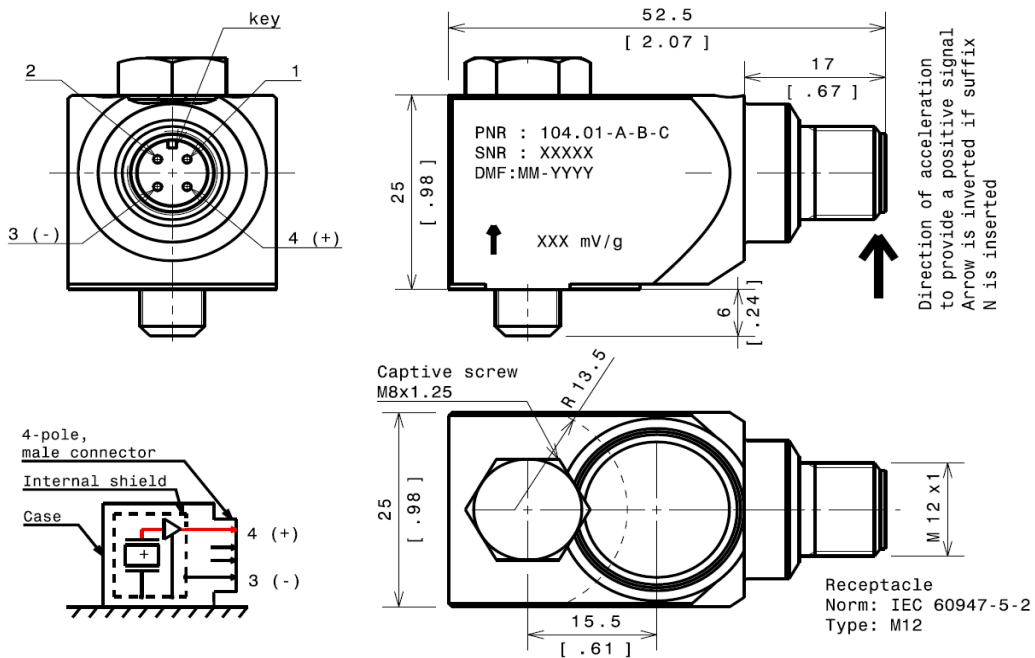


pic. 4 DC (Bias) deviation versus temperature

Dimensions

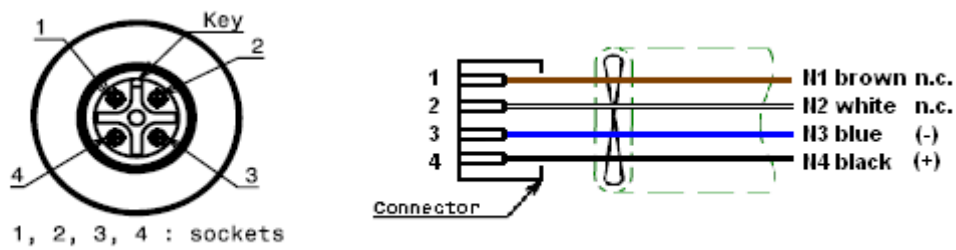


pic. 5 Dimensions and electrical connection of the sensor model B =1 (2-Pin MIL-plug)



pic. 6 Dimensions and electrical connection of the sensor model B =2 (4-Pin M12-plug)

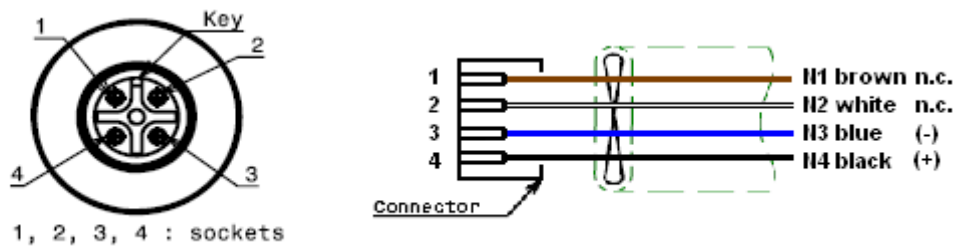
Plug- and Cable-Versions, Model AC10.01



pic. 7 Cable Set-1 and -2 with M12 plug made off PU by IEC 60947-5-2,
max. operating temperature: +90°C

Cable: twisted pair,
low-cost with good oil and fluid resistance;
material: PU, bore: 4.9 mm

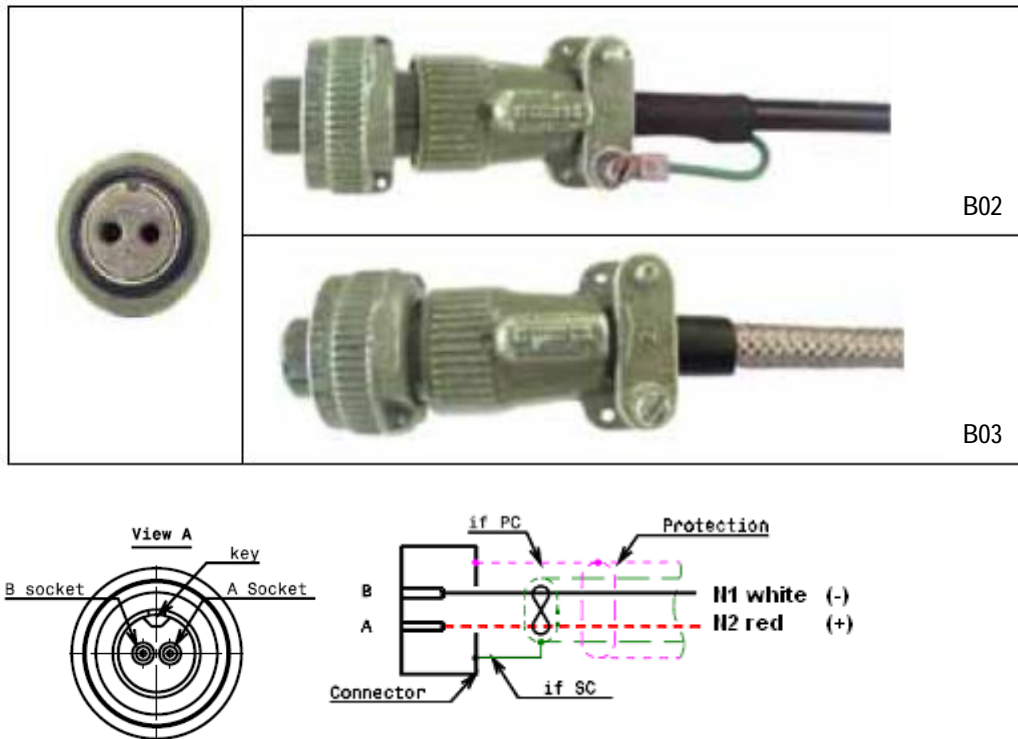
M12 plug: material: PA, self-extinguishing box, 4-Pin, gold-plated contacts,
protection: IP 67; PU-seal to the cable
available as straight (E01) and angled (E31) version.



pic. 8 Cable Set-3 and -4 with M12-plug made of PU by IEC 60947-5-2,
max. operating temperature: +90°C

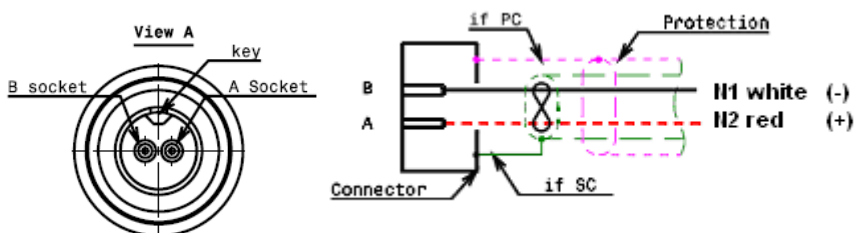
Cable: installed on site (unsealed), twisted pair,
low-cost with good oil and fluid resistance;
material: PU, bore: 4.9mm

M12-plug: material: PA, self-extinguishing box, 4-Pin, contacts mit CuSn-coating,
protection: IP 67; union nut made of stainless steel AISI 316L,
available as straight (E61) and angled (E81) version.



pic. 9 Cable Set-5 and -6 with MIL-C-5015 plug, made of aluminum, max. operating temperature: +120°C

- Cable-5: twisted pair, flame retardant, halogen-free, uncoated stainless steel material: teflon FEP, diameter: 4.3mm
- Cable-6: twisted pair, flame retardant, halogen free, covered with stainless steel material: teflon FEP, diameter: 4.3mm (without !)
- MIL-plug: material: AISI 316L, size 10SL-4S, 2-Pin, gold-plated contacts, protection: IP 67 available only as straight version (B02) + (B03).



pic. 10 Cable Set-7 with 2-pin MIL-C-5015 plug, made of stainless steel,
max. operating temperature: +125 °C

Cable: twisted pair, flame retardant , halogen free, covered with stainless steel overbraid
material: teflon FEP, bore: 4.3mm (without overbraid!)

MIL-plug: material: AISI 316L, size 10SL-4S, 2-Pin, gold-plated contacts ,
protection: IP 67
available only as straight version (B13).