VibraSens

Your Vibration Sensor Partner

Machinery Monitoring
Vibration Sensors & Accessories

CATALOG 2014

GOAL : Be your European vibration Sensor Partner

VibraSens is a European company that designs and manufactures vibration instrumentations such as industrial piezoelectric accelerometers, vibration sensors, vibration transmitters, signal conditioners, junction boxes, low noise cable assemblies, connectors, accessories and calibration equipments.

Mission

Vibrasens' mission is:

- Be one of the European leaders in the manufacture and design of piezoelectric accelerometer and piezoelectric dynamic pressure sensor.
- Offer innovative piezoelectric vibration sensor for niche market and harsh environment (700°C).
- Offer private labelling of our products for companies who want to outsource their piezoelectric accelerometer and pressure sensor manufacture.
- Be the ideal partner in terms of pricing, reliability and technical support.

Industry served

Our piezoelectric accelerometers are used throughout the following industry : Power generation (Gas turbine, Steam turbine, Wind turbine, Hydro generator), Petrochemical & Pipeline industry, Offshore platform industry, General process industry, Research and development facilities, Metals & Mining, Pulp and paper, Waste water treatment, Research and development and many others.....

Applications

Industrial piezoelectric accelerometers can sense vibrations in terms of acceleration, velocity and displacement for machines such as : Air compressors, Air handlers, Pulp and paper dryer sections, Conveyors, Cooling towers, Fans, Fourdriniers, Gear boxes, Motors, Press sections, Presses, Stamping, Pumps, Roll and process equipment, Spindles, ..

Experience

We have more than 20 years of experience in the piezoelectric accelerometer design, especially in harsh and high temperature environment (500°C, 700°C or even more).

In order to maintain our international expertise we closely work with two university laboratories LCEP (http://www.lcep.ens2m.fr) and LPMO (http://www.lpmo.edu) based in Besançon and specialized in Piezoelectricity.

We also have the chance to be located in a region where piezoelectricity, microtechnics, microelectronic, mechatronic, microsensors and precision are well known words. Besançon hosts one of the biggest microtechnology fair in Europe (http://www.micronora.com) devoted to microtechnology and strong of 850 exhibitors from 25 countries.

All this friendly environment strengthens our knowledge and gives our company a competitive advantage in the piezoelectric vibration sensor technology.

Technology

With advanced product development and manufacturing facilities in Besançon-France, VibraSens has the skills, experience and resources to provide the products and services that will fulfill your requirements.

A modern production facility exclusively engaged in the design and manufacture of piezoelectric vibration transducers, piezoelectric pressure sensor and vibration instrumentations help us to maintain a high quality level in our core business.

Our manufacturing and test equipment ranges from basic precision machinery for providing high quality sensor components,

to custom-built machinery specifically designed for piezoelectric vibration sensor fabrication.
During the years of development we have also built some specifically design systems to test our range of piezoelectric accelerometer. We have developed using ®Labview (National Instrument Trademark) a completely automated shaker test system to check the sensitivity and frequency response (up to 10 kHz) of our piezoelectric vibration sensors.
Our controlled process includes laser and microplasma welding, helium leak tester, resistance welding, temperature cycling, high emperature brazing. All those processes and others are strictly controlled by our process specification document.
We closely work with one of the best European company specialized in the manufacturing of hybrid circuit for the sensor industry. With this partnership, we are sure to stay ahead of this technology for the years to come.

Why should you buy from us:

We are focussed on the manufacture and design of piezoelectric vibration sensor. We could offer you the best quality price performance on the market.
We invest heavily in our core business and keep all of our products up to state of the art technology.
To better suit your market, we offer private labeling for all of our product line with two digits modifications in our part number.
Whatever your market is, condition monitoring, balancing, vibration diagnostic services company, we will be happy to serve you and share our extensive expertise. We are looking forward to being your vibration sensor partner.

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Accelerometer Technology Selection

If you want to assess the motion of an object then you need a sensor to do it. There are many styles like for example the eddy current probe, the velocimeter, the laser or the accelerometer. All have their output proportional to the motion of the object let it be acceleration, velocity or displacement. All have their own characteristic in terms of temperature, frequency response, linearity, sensitivity, etc. The accelerometer have proved to be successful in many applications.

Accelerometer exhibits 3 technologies:

- piezoelectric
- capacitive
- piezoresistive

Their intrinsic characteristics are sum up in the table below:

	Piezoelectric	Capacitive	Piezoresistive
Frequency	0.2 Hz to 50 kHz	DC to few hundreds hertz	DC to few thousands hertz
Shock resistance	<100 000 g	< 1000g	> 100 000g
Temperatu	-273°C to 800°C	-55°C to +120°C	-55°C to +120°C
Applications	Vibrations	Vibrations at low frequency andmotion with no shock	Vibrations at low frequency and motion in presence of very high shock

VibraSens designs and manufactures piezoelectric accelerometer only. We can also manufacture using commercially available chip, capacitive or piezoresistive accelerometers.

Piezoelectric Accelerometer Selection

Because they cover the broadest range of applications, piezoelectric accelerometers are among the most versatile.

Their main characteristics cover the range:

- temperature from cryogenic to +800 °C
- frequency from 0.1 Hz to 50 kHz
- resolution from 1 ug to 100 000 g

Their physical characteristics cover the range:

- Connector or integral cable
- MIL, industrial, RF connectors
- Few grammes to 200 grammes
- Stainless stee, aluminum or titanium material
- Hermetically or epoxy sealed

In a first approach, piezoelectric sensors can be distinguished by:

- Output (AC or DC, acceleration, velocity or displacement output)
- Piezoelectric material (ceramic, quartz, tourmaline,...)
- Transmission type, ®ICP, current, 4-20mA,....
- Stainless steel, aluminum or titanium material
- Hermetically or epoxy sealed

The table below sums up technology commercially available.

Piezo	Trans-mission	Output	Temp.	Pros	Cons	Application
PZT ce-ramic	®ICP (1)	Acc. AC	-55 to 150°C	High reliability Higher resolution than quartz Versatility (2) High volume pro-duction Low cost Numerous option (5)	Less stable than quartz	General industrial vibration monitoring.
		Vel. AC	-55 to 120°C	No external signal conditioning	Low reliability Lower temperature Sensitivity, frequency range and full scale is fixed No evolution 3) Limited options (5)	General industrial vibration monitoring.
		Dis. AC				
		Vel. DC		No external signal conditioning and processing		Industrial vibration process measurement where signal (4-20mA, 0-10V) is connected directly to PLC
Quartz	®ICP (1)	Acc AC	-273 to 200°C	High reliability Ageing stability Versa-tility (2) High volume production Low cost Numerous option (5)	Lower resolution than PZT ceramic (4)	General absolute laboratory Acceleration measurements. Cryogenic application.
Quartz	Charge	AC	-273 to 200°C	Very high reliabilityAgeing stability	Lower resolution than PZT ceramic (4)	Absolute laboratory Acceleration measure-ments Cryogenic application.
PZT Ce-ramic			-55 to 260°C	Very high reliabilityHigh resolution	Less stable than quartz	Industrial vibration measurements in high temp. environment
BT Ce-ramic			-55 to 500°C	Very high reliabilityHigh resolution compares to tourmaline	Less stable than tourmaline	Industrial vibration measurements in very high temp. environment
tour-maline or eq.			-273 to 800°C	Very high reliability	Very expensive	Industrial vibration measurements in very high temp. environment

(1) ®ICP is a worldwide voltage transmission standard that uses a constant current source supply. Some manufacturers still offer proprietary current transmission which is not useful for standard application: AC acceleration up to 10 kHz and 500 meters, AC velocity up to 5kHz and 1000 meters, displacement up to 1kHz and 2000 meters.

(2) The AC acceleration signal can be externally conditioned to have concomitamment AC velocity, AC displacement, DC acceleration, DC velocity or DC displacement.

(3) With no AC acceleration output, you will not be able to connect a portable analyzer with envelopping algorithm for roller bearing defect detection.

(4) Resolution is important if you plan to make measurements at low frequency (<10Hz) with vibration parameters like velocity or displace-ment.

(5) This type of sensors covers the broadest range of characteristics: few grams to kilograms, epoxy or hermetically sealed, large choice of connector, top or side connector,.....

Contents

Introduction

VibraSens offers a comprehensive selection of ®ICP industrial piezoelectric accelerometers and vibration sensors in a variety of industrial packages. Each sensor utilizes proven annular shear or compression piezoceramic and is housed in a welded, hermetically sealed, stainless steel case to withstand harsh industrial environments

General purpose, premium (Model 101, 103, 104, 108)

The most versatile, they use piezoceramic in the annular shear mode and provide Acceleration AC output (100 mV/g).
They usually sense vibration commonly find in industrial machinery : motors, fans, pumps, paper machine rolls, ...

General purpose, compact (Model 109)

They use piezoceramic in the annular shear mode and provide Acceleration AC output (100 mV/g)..
They usually sense vibration commonly find in industrial machinery : motors, fans, pumps, paper machine rolls, ...

Low frequency (Model 101, 103, 104, 108)

They use piezoceramic in the annular shear mode and provide AC acceleration output with increased sensitivity (500mV/g).
They are used when low frequency measurement down to 0.1 Hz is necessary to balance or evaluate mechanical condition of low speed machinery : cooling towers, low speed agitators, hydromachinery, structural testing, ...

High frequency (Model 101, 103, 104, 108)

They use piezoceramic in the annular shear and provide acceleration AC output with reduced sensitivity (10mV/g). They are used for modal testing or when very high frequency measurements up to 20-30kHz are needed.

High temperature, ©ICP mode (Model 101.11 & 103.12)

They use piezoceramic in the annular shear mode and provide AC acceleration output up to a temperature of 150°C.

Multi output with Temperature (Model 101, 103, 104, 111, 113)

Temperature output (10mV/°C, +2°C to +120°C) is available for Model 101, 103, 105, 107, 111, 113 . See ordering information to add the temperature output option.

4-20mA Vibration sensor (Model 125, 127)

They used the industry standard 4-20mA Loop that interfaces directly with PLC, DCS and 4-20mA monitor. Large choice of outputs are availbale : velocity, acceleration, RMS, equivalent Peak.
They are used in the rugged environments of industrial machinery monitoring. It allows continuous trending of overall machine vibration.

Most Popular Model

Model	Sensitivity	Frequency onse@3dB	Connec-torPos.	Connector Type	Max Temp.	Mode (1)	Isolation (2)	Price	Weight
GENERAL PURPOSE									
*101.51-6-2	100 mV/g ± 5%	0.5 Hz to 14 kHz	Top	M12 Glass	120°C	A. Shear	I+FS	++	85 gr
*101.51-6D-2	100 mV/g ±10%	“	“	M12 epoxy	“	“	“	+	“
*103.02-6-2	100 mV/g ± 5%	0.5 Hz to 10 kHz	Side	M12 Glass	“	“	“	+++	130 gr
*103.02-6D-2	100 mV/g ±10%	0.5 Hz to 12 kHz	Side	M12 Glass	“	“	“	++	130 gr
104.01-6-1	100 mV/g ± 5%	0.5 Hz to 10 kHz	Side	Mil-C-5015 Class	“	“	“	+++	130 gr
108.01-6-4	100 mV/g ± 5%	0.5 Hz to 14 kHz	Top	TNC	“	“	I	++++	34 gr
LOW FREQUENCY									
*101.01-9-2	500 mV/g ±5%	0.2 Hz to 3.7 kHz	Top	M12 Glass	90°C	“	I+FS	+++	90 gr
*103.02-9-2	“	“	Side	M12 Glass	“	“	“	++++	“140 gr
108.01-9-4	“	“	Top	TNC	“	“	I	++++	44 gr
HIGH FREQUENCY									
*101.01-3-2	10 mV/g ± 5%	0.5 Hz to 16 kHz	Top	M12 Glass	120°C	“	I+FS	++	80 gr
*101.51-3D-2	10 mV/g ± 10%	0.5 Hz to 16 kHz	“	M12 epoxy	“	“	“	+	75 gr
103.02-3-2	10 mV/g ± 5%	0.5 Hz to 13 kHz	Side	M12 Glass	“	“	“	+++	130 gr
103.02-3D-2	10 mV/g ± 10%	0.5 Hz to 13 kHz	“	M12 Glass	“	“	“	++	125 gr
108.01-3-4	10 mV/g ± 5%	0.5 Hz to 16 kHz	Top	TNC	“	“	I	++++	34 gr
HIGH TEMPERATURE									
101.11-6-1	100 mV/g ± 5%	0.5 Hz to 14 kHz	Top	Mil-C-5015 Glass	150°C	“	I+FS	+++	85 gr
103.12-6-1	“	0.5 Hz to 10 kHz	Side	Mil-C-5015 Glass	“	“	“	++++	“
PIEZOVELOCITY									
111.01-6-2	100 mV/in/sec ± %10	1.9 Hz to 7 kHz	Top	M12 Glass	120°C	“	I+FS	++++	90 gr
113.01-6-2	100 mV/in/sec ±10%	1.9 Hz to 7 kHz	Side	M12 Glass	120°C	“	I+FS	++++	140 gr
4-20mA									
*125.01-VR20-2	10mm/s RMS	3 to 1000 Hz	Top	M12 epoxy	90°C	“	I+FS	+	85gr
125.01-AR10-2	20 g RMS	3 to 10 000 Hz	Top	M12 epoxy	90°C	“	I+FS	+	85gr

Note : M12 connector is recommended for European and Asian market / MIL-C-5015 is recommended for North American market.
* : Best seller
Mode (1) : A. Shear = Annular shear; Comp = Compression

Isolation (2) : I : Isolated from machine surface ; I+FS = Isolated from machine surface+ Faraday shield

®ICP Accelerometer Model 101
Premium, Top connector

Main Characteristics

- Annular shear mode
- 10, 50, 100, 500 mV/g version availbale
- -55°C to 150 °C (-67°F to 302°F)
- Dual case isolation with Faraday shield
- Submersible version (150 metres) with associated IP68 overmolded cable
- life time hermetic sealing warranty (M12/Mil glass seal connector)

Competitive advantage

- Compare to obsolete compression design, annular shear piezoelectric sensors feature better frequency response, improved base strain, lower noise, smaller size, thermal transient imunity and insensitivity to cable motion. Annular shear mode is also less susceptible to transverse vibrations and better immune to electronic saturation at high frequency.
- 80 g dynamic range (thanks to exceptional bias stability) at elevated temperatures.
- Resistant to shock (magnet mounting) thanks to Jfet transistor input.
- ESD and reverse wiring protection.
- The glass seal hermetic connector protects the piezoelectric disc and the electronic from harmful environmental influences, significantly increasing their reliability and lifetime. Associated with low cost IP68 overmolded M12 cable assembly it is a perfect solution for submersible application down to 150 metres. Sensors with epoxy seal will always leak after few temperature cycles.
- M12 connector offers compatibility with numerous sensors used in automation. M12 overmolded cable assemblies are available from many cable manufacturers around the world. Mil cordset are expensive because they are only available from vibration sensor manufacturer.

Description

The hermetic sealed industrial piezoelectric accelerometer model 101 is design to monitor the vibration in harsh industrial environment. It uses the industry standard ©ICP / ©IEPE / ©LIVM 2-wire voltage transmission technique with a 4 mA standard constant current supply. Signal ground is isolated from the mounting surface and outer case to prevent ground loops. Faraday shielding will limit sensitivity to EMC 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 electronic. This filter attenuates 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 monitor the vibration on roller bearing, pumps cavitation, ... Medium frequency version 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, ... High temperature version is typically used where extra temperature protection is needed, such as the dryer section of a paper machine.

Ordering information model 101

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

101.51- AA - B - TT - MM - HH - YY

Model 101.51-A-2 with overmolded
IP 68 submersible M12 cable assembly

AA : Sensitivity

3 : 10 mV/g ±5 % (high frequency)
3D : 10 mV/g ±10 % (high frequecy)

5 : 50 mV/g ±5 % (high frequency)
5D : 50 mV/g ±10 % (high frequency)

6 : 100 mV/g ±5 % (medium frequency, general purpose)
6D : 100 mV/g ±10 % (medium frequency, general purpose)
6Q : 100 mV/g ±15 % (medium frequency, general purpose)

9 : 500 mV/g ±5 % (low frequency down to 0.2 Hz)
9D : 500 mV/g ±10 % (low frequency down to 0.2 Hz

Available suffix : N, negative polarity

B : Connector

1 : MIL-C-5015, glass seal
2 : M12 glass seal

B(CC-DD) Integral cable

5 (CC-DD) : Integral cable
7 (CC-DD) : Integral cable with sstl overbraid protection
8 (CC-DD) : Integral cable with stainless steel protection conduit
5, 7, 8 : epoxy seal.

CC : Cable Type

01 : *Polyurethane cable (90°C)
02 : *Teflon FEP Cable (200°C)
03 : Radox cable (120°C, halogen free)

DD : length in metre

TT : Temperature output.

omitted : no temperature output
T0 : 10 mV/°C. (range +2° to +120°C)
Not available with Mil-C-5015 2 pins connector

MM : Machine thread

omitted : no mounting stud will be shipped with the sensor.
M6 : M6x1
M7 : 1/4" 28 UNF 2A
M8 : M8x1.25

HH : Housing thread

H6 or omitted : M6x1 (China, Europe, India, South America, ...)
H1 : M16x2 (quick mouting + 120° positioning) (Not stocked)
H2 : Quick fit mounting (Not stocked)
H7 : 1/4" 28 UNF-2A. (U.S.A., UK, ...)

YY : Agency Approval

omitted : no agency approval

Y1 : Atex approved (July 2010)

Special Engraving :

Add ZXX at the end of the part number.
XX is a number supplied by VibraSens

In stock Model

Metric connector

101.51-6D-2-M6	100 mV/g ±10% general purpose version
101.51-6-2-M6	100 mV/g ±5 %general purpose version
101.51-9-2-M6	500mV/g ±5 %low frequency version
101.51-3-2-M6	10 mV/g ±5 %high frequency version
101.51-6D-2-T0-M6	100 mV/g ±10 %with temperature output

American/UK connector

101.51-6D-1-M7	100 mV/g±10 % general purpose
101.51-6D-1-H7-M7	100 mV/g±10% (1/4"28UNF housing thread)
101.11-6-1-M7	100mV/g±5 % high temp. version (150°C)
101.51-9-1-M7	500mV/g±5 % low frequency version
101.51-3-1-M7	10 mV/g 5 % high frequency version

Available Model with short lead time (1 week)

101.51-6D-5(01-Length)-M6	integral polyurethance cable
101.51-6D-6(02-Length)-M6	integral 200°C sstl overbraided teflon cable

Old Part number compatibility

101.21-6 is replaced by 101.51-6D

B=3 : M12 epoxy seal connector is obsolete. B=2 should be ordered.

Ordering example :

101.51-6D-2-M6	Premium accelerometer, 100mV/g, M12 glass seal connector
101.51-6D-7(02-05)-M6	Premium accelerometer, 5 metres Integral teflon cable with Stainless steel overbraid.

Specifications (24°C)

Dynamic

Sensitivity (101.01)
- A=3 ..... 10 mV/g ±5%
- A=3D ..... 10 mV/g ±10%
- A=6 ..... 100 mV/g ±5%
- A=6D ..... 100 mV/g ±10%
- A=6Q ..... 100 mV/g ±15%
- A=9 ..... 500 mV/g ±5%
- A=9D ..... 500 mV/g ±10%

Frequency response 101.01 & 101.51 (fig. 4a, 4b)
- A=3X ..... ±10 % : 1 to 11000 Hz
- ..... ±3 dB : 0.5 to 16000 Hz
- A=6X ..... ±10 % : 1 to 9000 Hz
- ..... ±3 dB : 0.5 to 14000 Hz
- A=9X ..... ±10 % : 0.4 to 1600 Hz
- ..... ±3 dB : 0.2 to 3700 Hz

Mounted Resonant frequency
- A=3X ..... 35 kHz Nom
- A=6X ..... 25 kHz Nom
- A=9X ..... 16 kHz Nom

Dynamic range
- A=3X ..... 500 g pk
- A=6X ..... 80 g pk
- A=9X ..... 10 g pk

Transverse response sensitivity (20Hz, 5g) ..... <5%
Temperature response fig3
Polarity ..... (fig. 1) Suffix dependant
Linearity ..... ±1% Max
Warm up time (Typical)
- A=3X, 6X ..... < 1Sec
- A=9X ..... < 10 Sec

Option T0 (only available if sensor is powered)
- Output (between - and Temp) ..... Vout=10mV/°C * Temp.(°C)
- ..... 0VDC at 0°C
- Range ..... +2° to 120°C

Electrical

Electrical Grounding ..... Isolated from machine ground
..... Internal Faraday shielding (fig. 1)
Isolation(Case to shield) ..... 100 MΩ Min
Capacitance to ground ..... 70 pF Nom
Output impedance ..... 50 ΩNom
DC output bias, 4mA supply ..... 12 VDC Nom (Fig 2)
Residual noise (24°C) : A=3X
- 1 Hz to 25 kHz ..... 300 ug rms
- 1 Hz ..... 30 ug

Residual noise (24°C) : A=6X
- 1 Hz to 25 kHz ..... 300 ug rms
- 1 Hz ..... 30 ug

Residual noise (24°C) : A=9X
- 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 : 101.01 & 101.51 (max. current =4mA)
- A= 3X, 6X ..... -55 to 120 °C (-65 to 250 °F)
- A=9X ..... -55 to 90 °C (-65 to 212 °F)

Temperature, operating continuous : 101.11 (max. current =4mA)
- A=6X, B=1 ..... -55 to 150°C (-65 to 302 °F)

Humidity / Enclosure
- B=1, 2 ..... Not affected, hermetically sealed, 1E-8torr.l/s
- B=5, 7, 8 ..... IP68, epoxy sealed

Acceleration limit : Shock ..... 5 000g peak
: Continuous vibration ..... 500g peak
Base strain sensitivity ..... 0.0002 g 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
- B=1 ..... Fig. 1a
- B=2 ..... Fig. 1b
- B=5 ..... Fig. 1d
- B=7 ..... Fig. 1e
- B=8 ..... Fig. 1f

Design ..... Ceramic, annular shear mode
Weight with connector
- A=3 ..... 80 gr Nom (2.8 Oz)
- A=6 ..... 85 gr Nom (3.0 Oz)
- A=9 ..... 95 gr Nom (3.4 Oz)

Connector
- B=1 ..... MIL-C-5015 glass seal, Type MS3143 10SL-4P
- B=2 ..... M12 glass seal, IEC 60947-5-2

Material ..... AISI 316L, DIN 1.4404 (Stainless steel)
Housing thread ..... Fig 1h
Mounting torque (M6, M7, M8 suffix) ..... 2,4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied
..... Sensitivity (5g, 160 Hz)
..... No frequency response

Accessories, not supplied

Cable assembly B=1 (Mil connector)
- Polyurethane cable 10.01-B22-A01-05-Length
- FEP Teflon cable 10.01-B22-A01-02-Length

Cable assembly B=2 (M12 connector)
- Polyurethane cable 10.01-E02-A01-31-Length
- FEP Teflon cable 10.01-E02-A01-02-Length
- For more cable option see Model 10.01 (specific cable harness).

Accessories, spares part

Mounting Stud with HH=H6
- M6 machine thread 191.01-06-06-1
- 1/4" 28 UNF machine thread 191.01-06-16-1

M8 mahine thread 191.01-06-08-1

Standard Wiring color

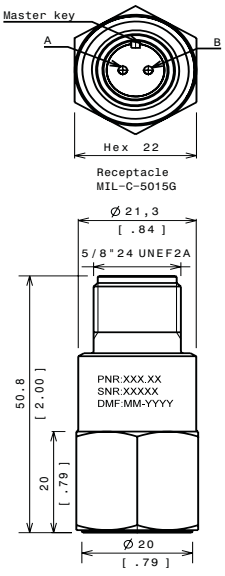
With Mil-C-5015 cable assembly: + = Red // - = White // Temperature=black
With M12 cable harness: : + = Black // - = Blue // Temperature=White

Repair

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

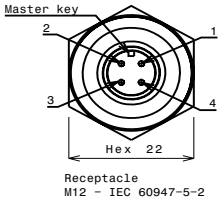
(1) Guaranted if using accessories listed in this product datasheet only

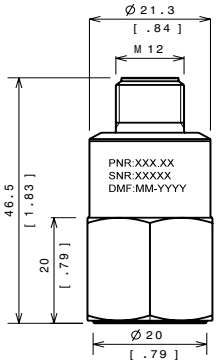
Drawings



Model Number	Pin A	Pin B
Standard, no option	(+)	(-)
T0 Option (10mV/°C)	N/A	N/A

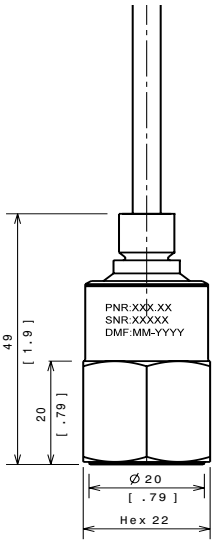
(N/A) : Not available
Fig 1a : Outline drawing & Electrical layout, B=1 (MIL-C-5015)





Model Number	Pin 1	Pin 2	Pin 3	Pin 4
Standard, no option	NC	NC	(-)	(+)
T0 Option (10mV/°C)	NC	(Temp)	(-)	(+)

(NC) : Not connected
fig 1b : Outline drawing & Electrical layout, B=2 (M12 glass seal)



CC=01, 02 (PU, Teflon)	White (-) / Red (+)
CC=03 (Radox)	White N°1 (-) / White N°2 (+)
CC=12 (Teflon) (1)	White (-) / Red (+) / Black (Temp.)
CC=13 (Radox) (1)	White N°1 (-)/ White N°2 (+) / / White N°3 (Temp)
CC=31 (PU) (1)	Blue (-) / Black (+) / White (Temp.) / Brown (NC)

(1) T0 option (10mV/*°C)
Fig 1d : Outline drawing & Electrical layout, B=5 (cable only)

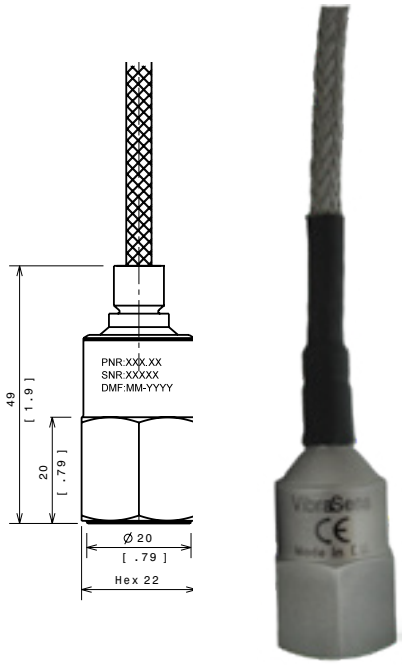


Fig 1e : Outline drawing B=7 (cable with overbraid)
electrical layout : See above B=5

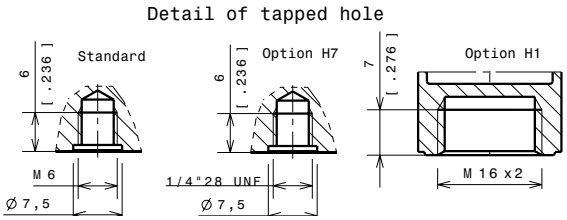


Fig 1h : Housing thread, option H1, H2, H7

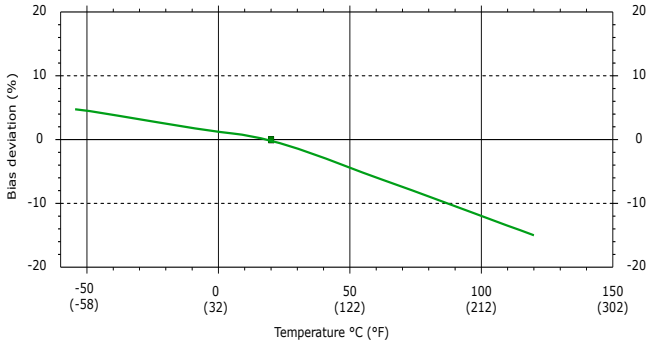


Fig 2 : DC (Bias) deviation versus temperature

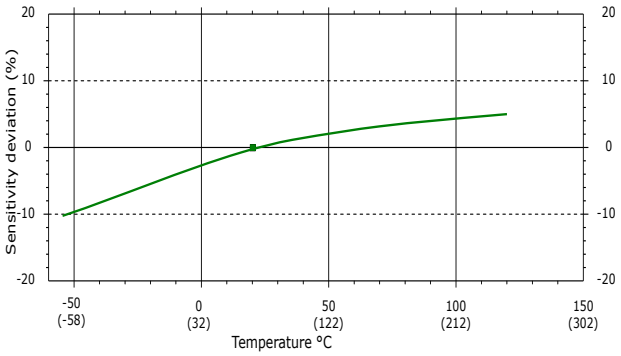


Fig 3 : Sensitivity deviation versus temperature

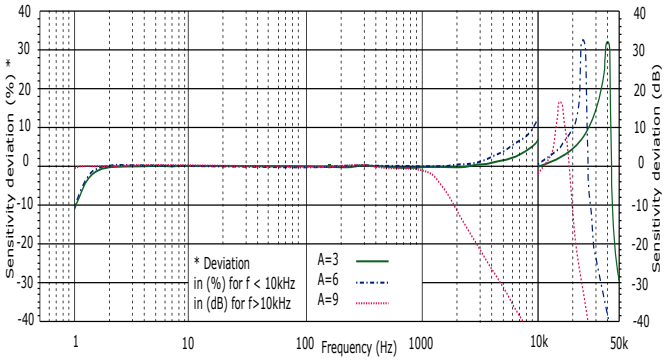


Fig 4a: Frequency response, amplitude

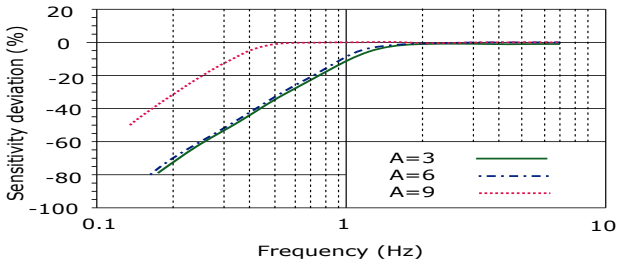


Fig 4b : Low Frequency response, amplitude

®ICP Accelerometer Model 109
Compact, Top connector

Main Characteristics

- Annular shear mode
- 20 kHz Bandwith
- 10, 50, 100 mV/g
- -55°C to 120 °C (-67°F to 250°F)
- Dual case isolation with Faraday shield
- Submersible version (150 metres) with associated IP68 overmolded cable
- life time hermetic sealing warranty (M12/Mil glass seal connector)

Competitive advantage

- Compare to obsolete compression design, annular shear piezoelectric sensors feature better frequency response, improved base strain, lower noise, smaller size, thermal transient imunity and insensitivity to cable motion. Annular shear mode is also less susceptible to transverse vibrations and better immune to electronic saturation at high frequency.
- Exceptional bias stability at elevated temperatures. (improved dynamic range, ex 80g dynamic for 100 mV/g sensitivity)
- Resistant to shock (magnet mounting) thanks to protected Mosfet transistor input.
- ESD and reverse wiring protection.
- The glass seal hermetic connector protects the piezoelectric disc and the electronic from harmful environmental influences, significantly increasing their reliability and lifetime. Associated with low cost IP68 overmolded M12 cable assembly it is a perfect solution for submersible application down to 150 metres. Sensors with epoxy seal will always leak after few temperature cycles.
- M12 connector offers compatibility with numerous sensors used in automation. M12 overmolded cable assemblies are available from many cable manufacturers around the world. Mil cordset are expensive because they are only available from vibration sensor manufacturer.

Description

The hermetic sealed industrial piezoelectric accelerometer model 109 is design to monitor the vibration in harsh industrial environment. It uses the industry standard ©ICP / ©IEPE / ©LIVM 2-wire voltage transmission technique with a 4 mA standard constant current supply. Signal ground is isolated from the mounting surface and outer case to prevent ground loops. Faraday shielding will limit sensitivity to EMC 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.

Typical applications

Vibrations measurement in the rugged environments of industrial machinery monitoring. High frequency version (10mV/g) monitor the vibration on roller bearing, pumps cavitation, ... Medium frequency (100 mV/g) version monitor overall vibration on pumps, motors, fans, ...

Model 109.01 with overmolded
IP 68 submersible angled M12 cable assembly

Ordering information model 109

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

109.01- AA - B - TT - MM - HH - YY

AA : Sensitivity

3 : 10 mV/g ±5 %
3D : 10 mV/g ±10 %
3V : 10 mV/g ±20 %

5 : 50 mV/g ±5 %
5D : 50 mV/g ±10 %
5V : 50 mV/g ±20 %.

6 : 100 mV/g ±5 % (medium frequency, general purpose)
6D : 100 mV/g ±10 % (medium frequency, general purpose)
6V : 100 mV/g ±20 % (medium frequency, general purpose)

Available suffix : N, negative polarity

B : Connector

2 : M12 glass seal

B(CC-DD) Integral cable

5 (CC-DD) : Integral cable
7 (CC-DD) : Integral cable with sstl overbraid protection
8 (CC-DD) : Integral cable with stainless steel protection conduit
5, 7, 8 : epoxy seal.

CC : Cable Type
02 : *Teflon FEP twisted pair Cable (200°C)

DD : length in metre

TT : Temperature output.

omitted : no temperature output
T0 : 10 mV/°C. (range +2° to +120°C)

MM : Machine thread

omitted : no mounting stud will be shipped with the sensor.
M6 : M6x1
M7 : 1/4" 28 UNF 2A
M8 : M8x1.25

HH : Housing thread

H2 : 10-32 UNF-2A
H7 : 1/4" 28 UNF-2A

YY : Agency Approval

omitted : no agency approval

Special Engraving :

Add ZXX at the end of the part number.
XX is a number supplied by VibraSens

In stock Model

109.01-6D-2-H7 100 mV/g ±10% general purpose version
109.01-3D-2-H7 10 mV/g ±10 % high frequency version

Available Model with short lead time (1 week)

109.01-6D-5(02-Length)-H7 integral 200°C teflon cable
109.01-6-6D-7(02-Length)-H7 integral 200°C sstl overbraided teflon cable

Old Part number compatibility

Not applicable

Ordering example :

109.01-6D-2-H7-M6	Compact accelerometer, 100mV/g, M12 glass seal connector
109.01-6D-7(02-05)-H7-M6	Compact accelerometer, 5 metres Integral teflon cable with Stainless steel overbraid.

Specifications (24°C)

Dynamic

Sensitivity (101.01)
- AA=3 ..... 10 mV/g ± 5%
- AA=3D ..... 10 mV/g ± 10%
- AA=3V ..... 10 mV/g ±20%

- AA=5 ..... 50 mV/g ± 5%
- AA=5D ..... 50 mV/g ± 10%
- AA=5V ..... 50 mV/g ±20%

- AA=6 ..... 100 mV/g ± 5%
- AA=6D ..... 100 mV/g ±10%
- AA=6V ..... 100 mV/g ±20%

Frequency response
- AA=3X, 5X, 6X ..... ±10 % : 1 to 10 000 Hz
- ..... ±3 dB : 0.5 to 20 000 Hz

Mounted Resonant frequency
- AA=3X, 6X ..... 40 kHz Nom

Dynamic range
- AA=3X ..... 800 g pk
- AA=5X ..... 160 g pk
- AA=6X ..... 80 g pk

Transverse response sensitivity (20Hz, 5g) ..... <5%
Temperature response fig3
Polarity ..... (fig. 1) Suffix dependant
Linearity ..... ±1% Max
Warm up time (Typical)
- AA=3X, 6X ..... < 1Secc

Option T0 (sensor should be powered to get temperature output)
- Output (between - and Temp) ..... Vout=10mV/°C * Temp.(°C)
- ..... 0VDC at 0°C
- Range ..... +2° to 120°C

Electrical

Electrical Grounding ..... Isolated from machine ground
..... Internal Faraday shielding (fig. 1)
Isolation(Case to shield) ..... 100 MΩ Min
Capacitance to ground ..... 70 pF Nom
Output impedance ..... 50 ΩNom
DC output bias, 4mA supply ..... 12 VDC Nom (Fig 2)
Residual noise (24°C) : A=3X
- 1 Hz to 25 kHz ..... 300 ug rms
- 1 Hz ..... 30 ug

Residual noise (24°C) : A=6X
- 1 Hz to 25 kHz ..... 300 ug rms
- 1 Hz ..... 30 ug

Power requirements Constant current : +2 to +10mA DC
..... Voltage : +22 to +28 VDC
Protection : Overvoltage ..... Yes
: Reverse polarity ..... Yes

Environmental

Temperature, operating continuous (4mA) ..... -55 to 120 °C (-65 to 250 °F)
Humidity / Enclosure
- B=2 ..... Not affected, hermetically sealed, 1E-8torr.l/s
- B=5, 7, 8 ..... IP68, epoxy sealed

Acceleration limit : Shock ..... 5 000g peak
: Continuous vibration ..... 500g peak
Base strain sensitivity ..... 0.0002 g 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
- B=2 ..... Fig. 1b
- B=5 ..... Fig. 1d
- B=7 ..... Fig. 1e
- B=8 ..... Fig. 1f

Design ..... Ceramic, annular shear mode
Weight with connector
- AA=3X, 6X ..... 20 gr Nom (0.7 Oz)

Connector
- B=2 ..... M12 glass seal, IEC 60947-5-2

Material ..... AISI 316L, DIN 1.4404 (Stainless steel)
Mounting torque (M6, M7, M8 suffix) ..... 2,4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied
..... Sensitivity (5g, 160 Hz)
..... No frequency response

Accessories, not supplied

Cable assembly B=2 (M12 connector)
- Polyurethane cable 10.01-E02-A01-31-Length
- FEP Teflon cable 10.01-E02-A01-12-Length
- For more cable option see Model 10.01 (specific cable harness).

Accessories, spares part

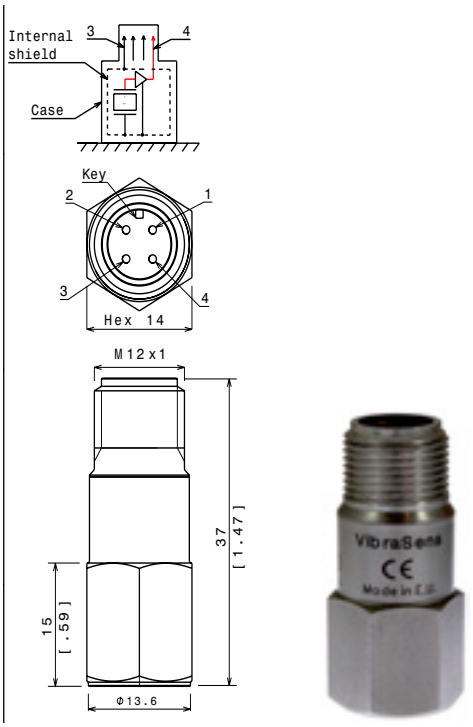
Mounting Stud with HH=H6
- M6 machine thread 191.01-16-06-1
- 1/4" 28 UNF machine thread 191.01-16-16-1
- M8 mahine thread 191.01-16-08-1

Repair

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

(1) Guaranted if using accessories listed in this product datasheet only

Drawings



Model Number	Pin 1	Pin 2	Pin 3	Pin 4
Standard, no option	NC	NC	(-)	(+)
T0 Option (10mV/°C)	NC	(Temp)	(-)	(+)

(NC) : Not connected
fig 1b : Outline drawing & Electrical layout, B=2 (M12 glass seal)

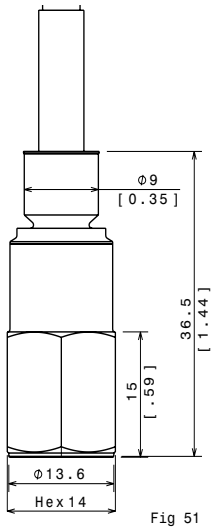


Fig 51

CC=01, 02 (PU, Teflon)	White (-) / Red (+)
CC=03 (Radox)	White N°1 (-) / White N°2 (+)
CC=12 (Teflon) (1)	White (-) / Red (+) / Black (Temp.)
CC=13 (Radox) (1)	White N°1 (-)/ White N°2 (+) / / White N°3 (Temp)
CC=31 (PU) (1)	Blue (-) / Black (+) / White (Temp.) / Brown (NC)

(1) T0 option (10mV/*°C)
Fig 1d : Outline drawing & Electrical layout, B=5 (cable only)

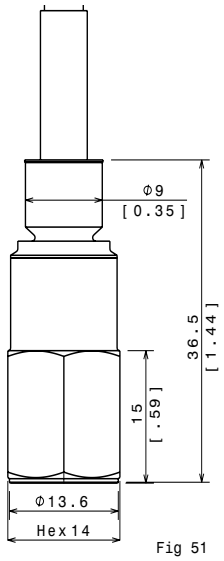


Fig 51

Fig 1e : Outline drawing B=7 (cable with overbraid)
electrical layout : See above B=5

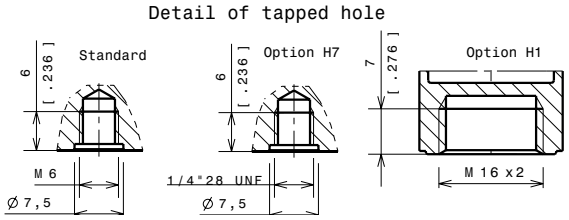


Fig 1h : Housing thread, option H1, H2, H7

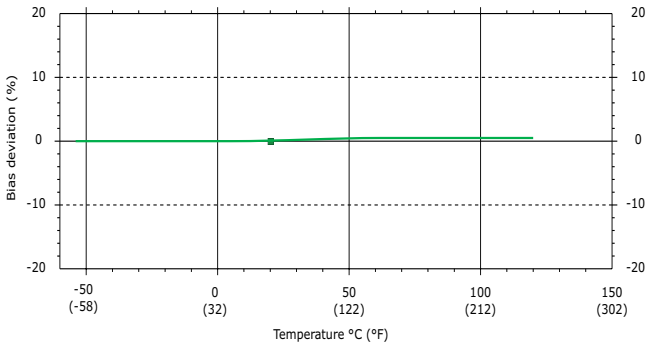


Fig 2 : DC (Bias) deviation versus temperature

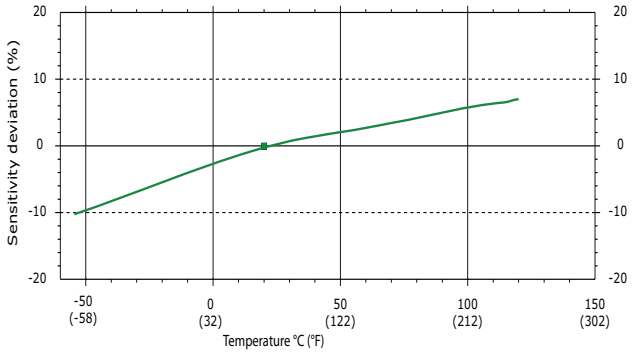


Fig 3 : Sensitivity deviation versus temperature

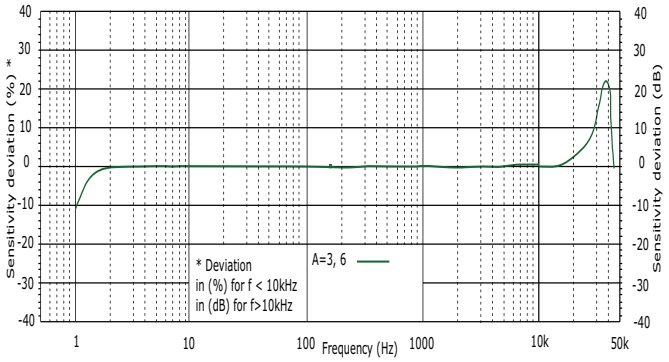


Fig 4a: Frequency response, amplitude

®ICP Accelerometer Model 103
Premium, Side connector

Main Characteristics

- -55°C to 150 °C (-67°F to 302°F)
- ®ICP transmission mode
- Annular shear mode
- Dual case isolation with Faraday shield
- Low, medium and high frequency version
- High temperature version
- IP67 with associated cable (B=2 only)
- Complies with API 670 requirements (A=6 only)

Competitive advantage

- Annular shear mode is less susceptible to transverse vibrations and better immune to electronic saturation at high frequency
- Exceptional bias voltage stability at elevated temperatures.
- Low cost IP67 overmolded M12 cable assembly
- M12 overmolded cable assembly is available through local electronic distributor
- M12 offers compatibility with sensors used in automation

Description

The hermetic sealed industrial piezoelectric accelerometer model 103 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, ...

Ordering information Model 103.51

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

103.51- A - B (CC-DD) - Options - Accessories

To order, specify model number, options and suffix :

A : Sensitivity (±5%)
3 : *10 mV/g (high frequency)
6 : *100 mV/g (medium frequency, general purpose)
9 : *500 mV/g (low frequency)
Available suffix : N, negative polarity

B : Connector / Integral cable
1 : MIL-C-5015, glass seal
2 : *M12 glass seal
5 : Integral cable
7 : Integral cable with stainless steel overbraid protection
8 : Integral cable with stainless steel protection conduit
Option 5, 7, 8 needs additional information :(CC-DD)
Options 5, 7, 8 are not stocked. Leadtime : 2 to 4 weeks.

CC : Cable Type (only integral cable B=5, 7, 8)

Model 103.02-A-2 with Overmolded M12 cable assembly

01 : *Polyurethane twisted pair cable (90°C)
02 : *Teflon FEP twisted pair Cable (200°C)
03 : Radox twisted pair cable (120°C, halogen free)
12 : Teflon FEP twisted triple Cable (200°C). For TO option.
13 : Radox twisted triple (120°C, halogen free). For TO option
31 : *Polyurethane 4 conductors cable (90°C). For T0 option

DD : length in metre (only integral cable B=5, 7, 8)

Options :

Temperature output
T0 : 10 mV/°C. (+2° to +120°C)
Not available with Mil-C-5015 connector

Special Agency Approval
X1 : Atex approved (July 2009)

Accessories (Machine thread):
M6 : M6x1 Bolt, captive, hex socket
M7 : 1/4" 28 UNF 2A Bolt, captive, hex socket

Special Engraving :
Add ZXX at the end of the part number.
XX is a number supplied by VibraSens

Note : * = prefered and stocked items

Ordering information Model 103.12 (150°C Version)

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

103.12- A - B - Options - Accessories

A : Sensitivity (±5%)
6 : *100 mV/g (medium frequency, general purpose)
Available suffix : N, negative polarity

B : Connector / Integral cable
1 : *MIL-C-5015, glass seal

Options & Accessories : see model 103.02

Ordering information Model 103.22 (±10% sensitivity)

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

103.22- A - B (CC-DD) - Options - Accessories

To order, specify model number, options and suffix :

A : Sensitivity (±10%)
3 : *10 mV/g (high frequency)
6 : *100 mV/g (medium frequency, general purpose)
Available suffix : N, negative polarity

B : Connector / Integral cable
see model 103.02

CC : Cable Type (only integral cable B=5, 7, 8)
see model 103.02

DD : length in metre (only integral cable B=5, 7, 8)

* Most Popular model :

103.02-6-2 / 103.02-9-2 / 103.02-3-2 / 103.02-6-2-T0
103.22-6-2

Ordering example :

103.02-6-2-M6 Premium Accelerometer, 100mV/g, M12 connector

Specifications

Dynamic

Sensitivity (103.02)
- A=3 ..... 10 mV/g ±5%
- A=6 ..... 100 mV/g ±5%
- A=9 ..... 500 mV/g ±5%

Sensitivity (103.12)
- A=6 ..... 100 mV/g ±5%

Sensitivity (103.22)
- A=3 ..... 10 mV/g ±10%
- A=6 ..... 100 mV/g ±10%

Frequency response (103.02 & 103.12) ..... fig. 14a, 14b
- 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 Nom
- A=6 ..... 22 kHz Nom
- A=9 ..... 16 kHz Nom

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 fig13)
Polarity ..... Suffix dependant
Linearity ..... ±1% Max
Warm up time (Typical)
- A=3, 6 ..... < 1Sec
- A=9 ..... < 10 Sec

Option T0
- Output (between - and Temp) ..... Vout=10mV/°C * T(°C)
- z ..... 30 ug

Residual noise (24°C): A=6
- 1 Hz to 25 kHz ..... 300 ug rms
- 1 Hz ..... 30 ug

Residual noise (24°C): A=9
- 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
Protection : Reverse polarity ..... Yes

Environmental

Temperature :
Operating continuous : 103.02 & 103.22 (max. current =4mA)
- A=3, 6 ..... -55 to 120 °C (-65 to 250 °F)
- A=9 ..... -55 to 90 °C (-65 to 212 °F)

Operating continuous : 103.12 (max. current =4mA)
- B=1 ..... -55 to 150°C (-65 to 302 °F)

Humidity / Enclosure
- B=1, 2 ..... Not affected, hermetically sealed, 1E-8torr.l/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
- B=1 ..... See Fig. 1a
- B=2 ..... See Fig. 1b

Design ..... Ceramic, preloaded annular shear mode
Weight
- A=3 ..... 150 gr Nom (5.2 Oz)
- A=6 ..... 155 gr Nom (5.6 Oz)
- A=9 ..... 165 gr Nom (6.0 Oz)

Connector
- B=1 ..... MIL-C-5015 glass seal, Type MS3143 10SL-4P
- B=2 ..... M12 glass seal, IEC 60947-5-2

Material ..... AISI 316L, DIN 1.4435 (Stainless steel)
Mounting torque (M6, M7 suffix) ..... 2.4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied
..... Sensitivity (5g, 160 Hz)
..... No frequency response

Accessories, not supplied

Cable assembly
- MIL connector (B=1), Polyurethane cable 10.01-B01-A01-01-Length
- MIL connector (B=1), FEP Teflon cable 10.01-B01-A01-02-Length
- M12 connector B=2, 3 Polyurethane cable 10.01-E01-A01-31-Length
- PU and FEP Armored cables are also available. See Model 10.01.

Accessories, spares part

Mounting Stud
- M6 machine thread 193.01-06-1
- 1/4" 28 UNF machine thread 193.01-16-1

Standard Wiring color

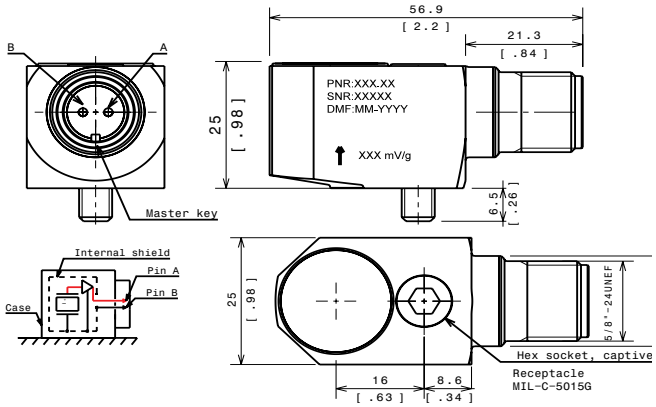
With Mil-C-5015 cable assembly: + = Red // - = White
With M12 cable harness: : + = Black // - = Blue // Temperature=White

Repair

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

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

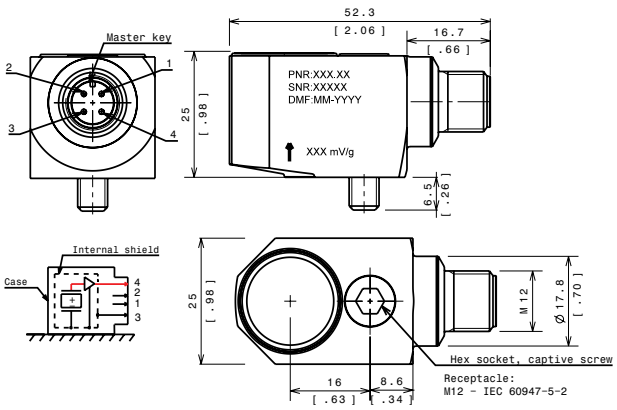
Drawings



Model Number	Pin A	Pin B
Standard, no option	(+)	(-)
T0 Option (10mV/°C)	N/A	N/A

(N/A) : Not available

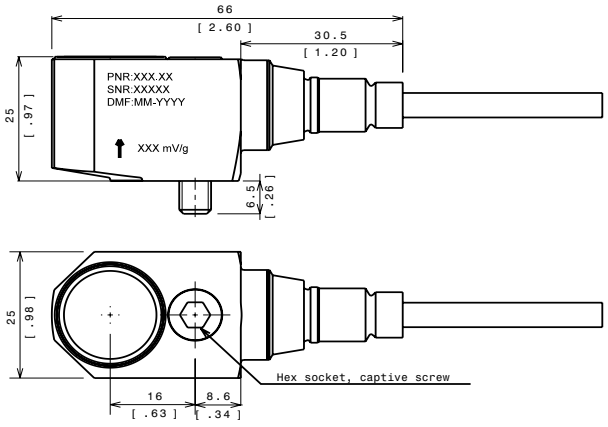
Fig 1a : Outline drawing & Electrical layout for MIL-C-5015 Connector (B=1)



Model Number	Pin 1	Pin 2	Pin 3	Pin 4
Standard, no option	NC	NC	(-)	(+)
T0 Option (10mV/°C)	NC	(Temp)	(-)	(+)

(NC) : Not connected / (Temp) : Temperature

Fig 1b : Outline drawing & Electrical layout for M12 Glass seal Connector (B=2)



CC=01, 02 (PU, Teflon)	White (-) / Red (+)
CC=03 (Radox)	White N°1 (-) / White N°2 (+)
CC=12 (Teflon)	White (-) / Red (+) / Black (Temp.)
CC=13 (Radox)	White N°1 (-)/ White N°2 (+) / / White N°3 (Temp)
CC=31 (PU)	Blue (-) / Black (+) / White (Temp.) / Brown (NC)

Fig 1d : Outline drawing & Electrical layout, B=5 (cable only)

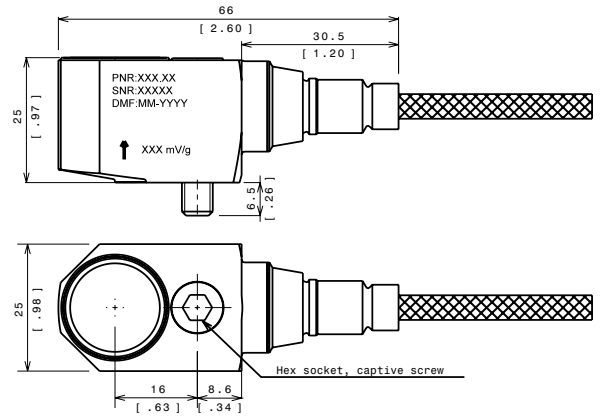


Fig 1e : Outline drawing B=7 (cable with overbraid)
electrical layout : See above B=5

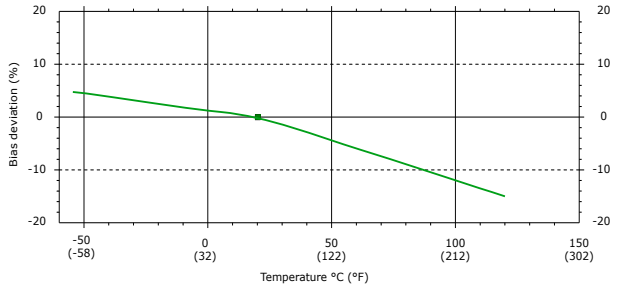


Fig 12 : DC (Bias) deviation versus temperature

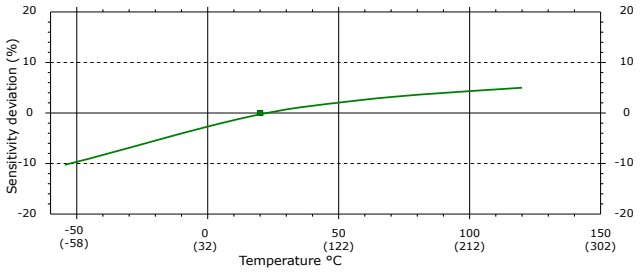
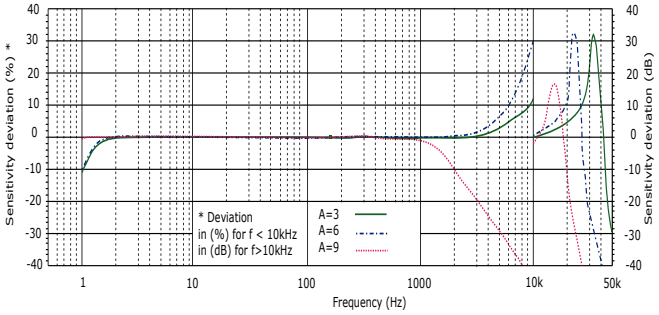


Fig 13 : Sensitivity deviation versus temperatur



14a : Frequency response, amplitude

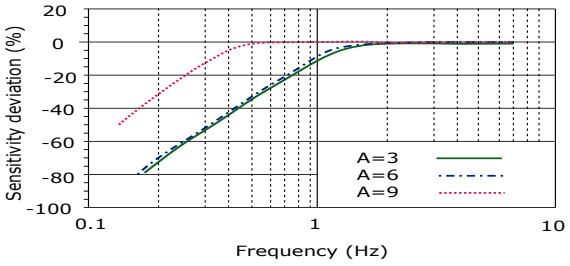


Fig 14b :Low Frequency response, amplitude

®ICP Accelerometer Model 104
Premium, Side connector

Model 104.01-A-2 with overmolded connector

Main Characteristics

- -55°C to 120 °C (-67°F to 250°F)
- ®ICP transmission mode
- Annular shear mode
- Dual case isolation with Faraday shield
- Low, medium and high frequency version
- High temperature version
- IP67 with associated cable (B=2 only)
- Complies with API 670 requirements (A=6 only)

Competitive advantage

- Annular shear mode is less susceptible to transverse vibrations and better immune to electronic saturation at high frequency
- Exceptional bias voltage stability at elevated temperatures.
- Low cost IP67 overmolded M12 cable assembly
- M12 overmolded cable assembly is available through local electronic distributor
- M12 offers compatibility with sensors used in automation

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, ...

Ordering information Model 104.01 (120°C version)

To order, specify model number, options and suffix :

104.01- A - B - Options - Accessories

A : Sensitivity

3 : 10 mV/g (high frequency)
6 : *100 mV/g (medium frequency, general purpose)
9 : 500 mV/g (low frequency)
Available suffix : N, negative polarity

B : Connector / Integral cable

1 : *MIL-C-5015, glass seal
2 : *M12 glass seal

Options :

Temperature output

T0 : 10 mV/°C. (+2° to +120°C)
Not available with Mil-C-5015 connector

Special Agency Approval

none

Accessories

M8 : M8x1.25 Hex Bolt, captive

Special Engraving :

Add ZXX at the end of the part number.
XX is a number supplied by VibraSens

Ordering example :

104.01-6-2M8 Accelerometer, piezoelectric, 100mV/g, M12 glass seal connector

*Most Popular model :

104.01-6-1 and 104.01-6-2

Specifications

Dynamic

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

Frequency response ..... fig. 14a, 14b
- 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 Nom
- A=6 ..... 22 kHz Nom
- A=9 ..... 16 kHz Nom

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 fig13)
Polarity ..... Suffix dependant
Linearity ..... ±1% Max
Warm up time
- A=3, 6 ..... < 1Sec
- A=9 ..... < 10 Sec

Option T0
- Output (between - and Temp) ..... Vout=10mV/°C * T(°C)t
- Range ..... +2° to 120°C

Electrical

Electrical Grounding ..... Isolated from machine ground
..... Internal shielding
Isolation (Case to shield) -55°C to +120°C ..... 100 MΩ Min
Capacitance to ground ..... 70 pF Nom
Output impedance ..... 50 ΩNom
DC output bias, 4mA supply ..... 12 VDC (See Fig 12)
Residual noise (24°C) : A=3
- 1 Hz to 25 kHz ..... 300 ug rms
- 1 Hz ..... 30 ug

Residual noise (24°C): A=6
- 1 Hz to 25 kHz ..... 300 ug rms
- 1 Hz ..... 30 ug

Residual noise (24°C): A=9
- 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
Protection : Reverse polarity ..... Yes

Environmental

Temperature :
Operating continuous : 104.01
- A=3, 6 ..... -55 to 120 °C (-65 to 250 °F)
- A=9 ..... -55 to 90 °C (-65 to 212 °F)

Humidity / Enclosure
- B=1, 2 ..... Not affected, hermetically sealed, 1E-8torr.l/s
- B=3 ..... IP67, epoxy sealed

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
- B=1 ..... See Fig. 1a
- B=2 ..... See Fig. 1b

Design ..... Ceramic, preloaded annular shear mode
Weight
- A=3 ..... 150 gr Nom (5.2 Oz)
- A=6 ..... 155 gr Nom (5.6 Oz)
- A=9 ..... 165 gr Nom (6.0 Oz)

Connector 104.01
- B=1 ..... MIL-C-5015 glass seal, Type MS3143 10SL-4P
- B=2 ..... M12 glass seal, IEC 60947-5-2
- B=3 ..... M12 epoxy seal, IEC 60947-5-2

Material ..... AISI 316L, DIN 1.4404 (Stainless steel)
Mounting torque (M8 suffix) ..... 2.4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied
..... Sensitivity (5g, 160 Hz)
..... No frequency response

Accessories, not supplied

Cable assembly
- MIL connector (B=1), Polyurethane cable 10.01-B01-A01-01-Length
- MIL connector (B=1), FEP Teflon cable 10.01-B01-A01-02-Length
- M12 connector B=2, 3 Polyurethane cable 10.01-E01-A01-31-Length
- PU and FEP Armored cables are also available. See Model 10.01.

Mounting Bolt
- M8 ..... 194.01-08-1

Standard Wiring color

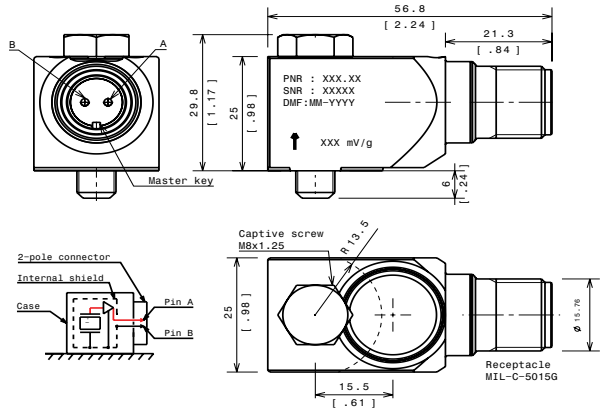
With Mil-C-5015 cable assembly: + = Red // - = White
With M12 cable harness: : + = Black // - = Blue // Temperature=White

Repair

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

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

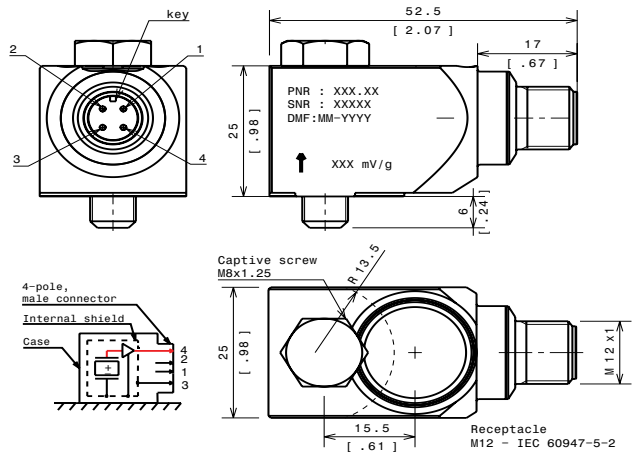
Drawings



Model Number	Pin A	Pin B
Standard, no option	(+)	(-)
T0 Option (10mV/°C)	N/A	N/A

(N/A) : Not available

Fig 1a : Outline drawing & Electrical layout for B=1 (MIL-C-5015)



Model Number	Pin 1	Pin 2	Pin 3	Pin 4
Standard, no option	NC	NC	(-)	(+)
T0 Option (10mV/°C)	NC	(Temp)	(-)	(+)

(NC) : Not connected / (Temp) : Temperature

Fig 1b : Outline drawing & Electrical layout for M12 Connector (B=2)

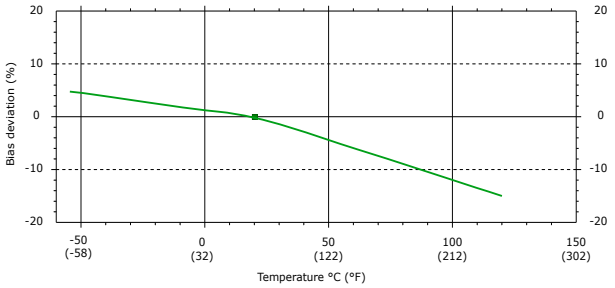


Fig 12 : DC (Bias) deviation versus temperature

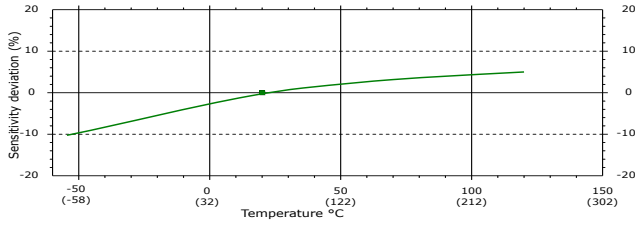
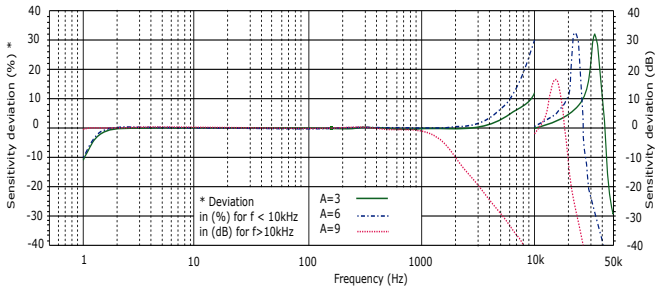


Fig 13 : Sensitivity deviation versus temperatur



14a : Frequency response, amplitude

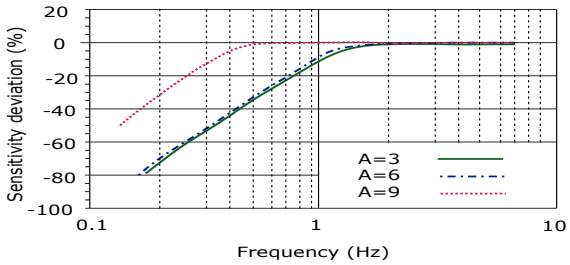


Fig 14b :Low Frequency response, amplitude

®ICP Accelerometer Model 108 Premium, Top connector

Main Characteristics

- Low size
- -55°C to 120°C (-67°F to 248°F)
- ®ICP transmission mode
- Annular shear mode
- Low, medium and high frequency version
- IP67 with associated cable (B=2 only)

Competitive advantage

- Annular shear mode is less susceptible to transverse vibrations and better immune to electronic saturation at high frequency
- Exceptional bias voltage stability at elevated temperatures.
- Low cost IP67 overmolded M12 cable assembly
- M12 overmolded cable assembly is available through local electronic distributor
- M12 offers compatibility with sensors used in automation.

Description

The epoxy sealed piezoelectric accelerometer model 108 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 standard constant current supply. Signal ground is isolated from the mounting surface to prevent ground loops. 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 electronic. This filter attenuates the sensor mechanical resonance and the associated distortion and overload.

Typical applications

Ideal for walk-around vibrations measurement in the rugged environments of industrial machinery monitoring. High frequency version monitor the vibration on roller bearing, pumps cavitation, ... Medium frequency version 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, .. .

Model 108 sensors are not recommended for permanent monitoring because they have external faraday shield subject to loss of isolation. For such applications, Models 101, 103, 104, 105, 107 with internal faraday shield are prefered.

Model 108.01-A-4

Ordering information.

To order, specify model number, options and suffix :

108.01- A - B - Options - Accessories

A : Sensitivity

3 : *10 mV/g (high frequency)
6 : *100 mV/g (medium frequency, general purpose)
9 : *500 mV/g (low frequency)
Available suffix : N, negative polarity

B : Connector

1 : MIL-C-5015, glass seal
2 : M12 glass seal
4 : *TNC epoxy seal

Options :

Special Agency Approval

none

Accessories (Machine thread):

M2 : 10-32 UNF 2A mounting stud
M5 : M5x0.8 mounting stud

Special Engraving :

Add ZXX at the end of the part number.
XX is a number supplied by VibraSens

*** Popular model (in stock) :**

108.01-3-4 / 108.01-6-4 / 108.01-9-4

Ordering example :

108.01-6-4 M5 Accelerometer, TNC top connector, 100mV/g, M5 machine thread.

Specifications (24°C)

Dynamic

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

Frequency response ..... fig. 4a, 4b
- A=3 ..... ±10 % : 1 to 11000 Hz
- ..... ±3 dB : 0.5 to 16000 Hz
- A=6 ..... ±10 % : 1 to 9000 Hz
- ..... ±3 dB : 0.5 to 14000 Hz
- A=9 ..... ±10 % : 0.4 to 1600 Hz
- ..... ±3 dB : 0.2 to 3700 Hz

Mounted Resonant frequency
- A=3 ..... 35 kHz Nom
- A=6 ..... 25 kHz Nom
- A=9 ..... 16 kHz Nom

Dynamic range
- A=3 ..... 500 g pk
- A=6 ..... 80 g pk
- A=9 ..... 10 g pk

Transverse response sensitivity (20Hz, 5g) ..... <5%
Temperature response fig3
Polarity ..... (fig. 1) Suffix dependant
Linearity ..... ±1% Max
Warm up time (Typical)
- A=3, 6 ..... < 1Sec
- A=9 ..... < 10 Sec

Electrical
Electrical Grounding ..... Isolated from machine ground
Isolation (Case to shield) ..... 100 MΩ Min
Capacitance to ground ..... 70 pF Nom
Output impedance ..... 50 ΩNom
DC output bias, 4mA supply ..... 12 VDC (Fig 2)
Residual noise (24°C) : A=3
- 1 Hz to 25 kHz ..... 300 ug rms
- 1 Hz ..... 30 ug

Residual noise (24°C) : A=6
- 1 Hz to 25 kHz ..... 300 ug rms
- 1 Hz ..... 30 ug

Residual noise (24°C) : A=9
- 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
Protection : Reverse polarity ..... Yes

Environmental

Temperature :
Operating continuous (4mA max)
- A=3, 6 ..... -55 to 120 °C (-65 to 252 °F)
- A=9 ..... -55 to 90 °C (-65 to 212 °F)

Humidity / Enclosure ..... IP67, epoxy sealed
Acceleration limit : Shock ..... 5 000g peak
Acceleration limit : Continuous vibration ..... 500g peak
Base strain sensitivity ..... 0.0002 g 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
- B=1 ..... Fig 1a
- B=2 ..... Fig. 1b
- B=4 ..... Fig 1d

Design ..... Ceramic, preloaded annular shear mode
Weight
- A=3 ..... 34 gr Nom (2.8 Oz)
- A=6 ..... 39 gr Nom (3.0 Oz)
- A=9, ... 44 gr Nom (3.4 Oz)

Connector
- B=1 ..... MIL-C-5015 glass seal, Type MS3143 10SL-4P
- B=2 ..... M12 glass seal, IEC 60947-5-2
- B=4 ..... TNC

Material ..... AISI 316L, DIN 1.4435 (Stainless steel)
..... AISI 303, DIN 1.4301 (Stainless steel)
Mounting torque (M2, M5 suffix) ..... 1.8 N.m (16 in-lbs)

Accessories, supplied

Calibration supplied
..... Sensitivity (5g, 160 Hz)
..... frequency response (20Hz to 10 kHz)

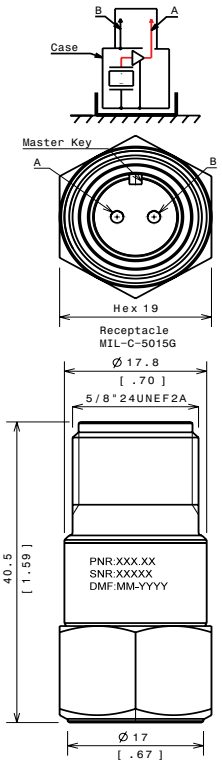
Accessories, not supplied

Cable assembly
- MIL (B=1), Polyurethane cable dia 5mm 10.01-B01-A01-01-Length
- M12 (B=2)Polyurethane cable dia 5mm 10.01-E01-A01-31-Length
- TNC (B=4) PVC RG 174 dia 2.8 ..... 10.01-T02-F02-51-Length
- TNC (B=4) PVC RG 58 dia 5 ..... 10.01-T02-F02-52-Length

Mounting Stud
- M5 ..... 191.01-15-05-1
- 10-32 UNF 2A 191.01-15-15-1

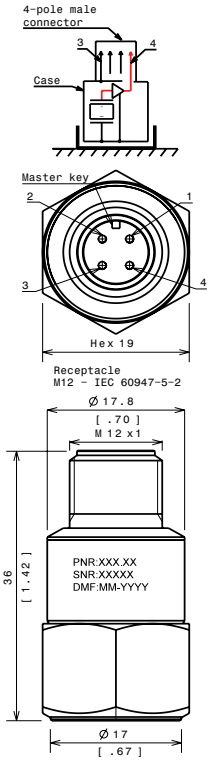
Repair : Consult factory for replacement of connector in case of broken or bended pins.
Repair of electronic is not possible
(1) Guaranted if using accessories listed in this product datasheet only

Drawings



Model Number	Pin A	Pin B
Standard	(+)	(-)

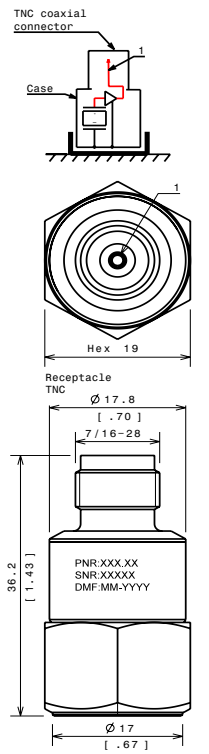
Fig 1a : Outline drawing & Electrical layout, B=1 (MIL-C-5015)



Model Number	Pin 1	Pin 2	Pin 3	Pin 4
Standard, no option	NC	NC	(-)	(+)

(NC) : Not connected

fig 1b : Outline drawing & Electrical layout, B=2 (M12 glass seal)



Model Number	Pin 1	TNC thread
Standard, no option	(+)	(-)

fig 1d : Outline drawing & Electrical layout, B=4 (TNC connector)

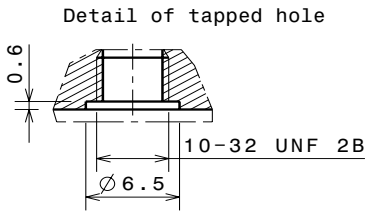


Fig 1c : Standard Housing Thread

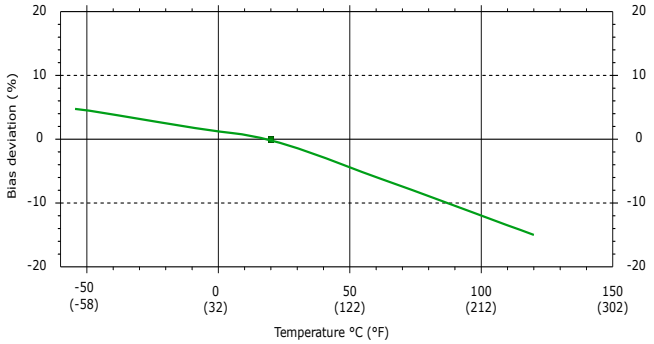


Fig 2 : DC (Bias) deviation versus temperature

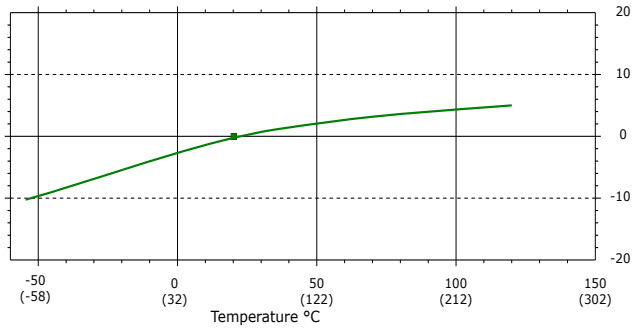


Fig 3 : Sensitivity deviation versus temperature

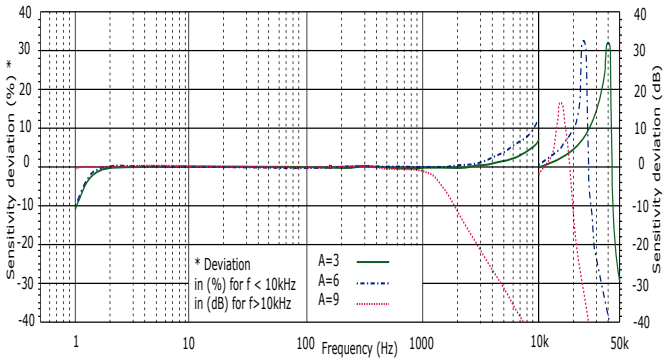


Fig 4a: Frequency response, amplitude

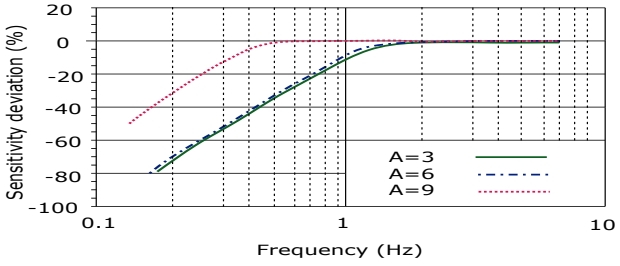


Fig 4b : Low Frequency response, amplitude

®ICP PiezoVelocity sensor Model 111 Top Connector

Main Characteristics

- 100 mV/ips or 4 mV/mm/s
- -55°C to 120 °C (-67°F to 248°F)
- ®ICP transmission mode
- Annular shear mode
- Dual case isolation with Faraday shield
- IP67 with associated cable (B=2, 3 only)

Competitive advantage

- Annular shear mode is less susceptible to base strain.
- Ultra low noise electronic
- Miswiring and surge protections
- Low cost IP67 overmolded M12 cable assembly
- M12 overmolded cable assembly is available through local electronic distributor
- M12 offers compatibility with sensors used in automation.

Description

The hermetic sealed industrial piezovelocity transducer model 111 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 standard constant current supply. Signal ground is isolated from the mounting surface and outer case to prevent ground loops. Faraday shielding will limit sensitivity to EMC to a minimum. Annular shear mode design will prevent from thermal transient and base strain. Low noise electronic and a temperature compensated design will give you accurate result over the complete temperature range.

Typical applications

Velocity is the preferred measurement for most rotating machines with rolling element bearings. Unfortunately it is sometimes impossible to get velocity (with digital or analog integration) from standard piezoelectric accelerometer : very high frequency noise can overload the accelerometer and saturate the output. Piezovelocity sensors use an internal integration circuit which inherently decrease high frequency signals allowing better measurement of low frequency signal. Paper machine dryers (when steam leaks), pumps (cavitation high frequency noise) are prone to such phenomenom.

Ordering information model 111.01

To order, specify model number, options and suffix :

111.01- A - B (CC-DD) - Options - Accessories

A : Sensitivity (Suffix)
6 : 100 mV/ips (4mV/mm/s)
Available suffix : N, negative polarity

B : Connector / Integral cable
1 : *MIL-C-5015, glass seal
2 : *M12 glass seal
3 : M12 epoxy sealed
5 : *Integral cable
7 : *Integral cable with stainless steel overbraid protection
8 : Integral cable with stainless steel protection conduit
Option 5, 7, 8 needs additional information :(CC-DD)
Options 3, 5, 7, 8 are not stocked. Leadtime : 2 to 4 weeks.

CC : Cable Type (only integral cable B=5, 7, 8)
01 : *Polyurethane twisted pair cable (90°C)
02 : *Teflon FEP twisted pair Cable (200°C)
03 : Radox twisted pair cable (120°C, halogen free)
12 : Teflon FEP twisted triple Cable (200°C). For TO option.
13 : Radox twisted triple (120°C, halogen free). For TO option
31 : *Polyurethane 4 conductors cable (90°C). For T0 option

DD : length in metre (only integral cable B=5, 7, 8)

Model 111.01-A-2 with Overmolded M12 cable assembly

Options :

Housing thread (Standard thread : M6x1)
H1 : M16x2 (quick mouting + 120° positioning) (Not stocked)
H2 : Quick fit mounting (Not stocked)
H7 : 1/4" 28 UNF-2A. (Not stocked)
option H2 and H1 are recommended for integral cable.
option H7 is available for North American market.

Temperature output
T0 : 10 mV/°C. (+2° to +120°C)
Not available with Mil-C-5015 2 pins connector

Special Agency Approval
none

Accessories (Machine thread):
M6 : M6x1 mounting stud
M7 : 1/4" 28 UNF 2A mounting stud
M8 : M8x1.25 mounting stud
W6 : Swivel adaptor

Special Engraving :
Add ZXX at the end of the part number.
XX is a number supplied by VibraSens

* Most Popular model :

111.01-6-2 / 111.01-6-1

Ordering example :

111.01-6-1M6 Piezovelocity sensor, MIL 5015 glass seal top connector

Specifications (24°C)

Dynamic

Sensitivity A=6 ..... 100 mV/ips ±10% (4 mV/mm/s)
Frequency response (fig. 4a, 4b)
A=6 ..... ±10 % : 2.5 to 3500 Hz
..... ±3 dB : 1.9 to 7000 Hz
Mounted Resonant frequency A=6 ..... 16 kHz Nom
Dynamic range A=6 ..... 50 in/sec pk (1250 mm/sec)
Transverse response sensitivity (20Hz, 5g) ..... <5%
Temperature response fig3
Polarity ..... (fig. 1) Suffix dependant
Linearity ..... ±1% Max
Warm up time (Typical) A=6 ..... < 5Sec

Electrical

Electrical Grounding ..... Isolated from machine ground
..... Internal Faraday shielding (fig. 1)
Isolation(Case to shield) ..... 100 MΩ Min
Capacitance to ground ..... 70 pF Nom
Output impedance ..... 200 ΩNom
DC output bias, 4mA supply ..... 10 VDC (Fig 2)
Residual noise (24°C) : A=6
2.5 Hz to 25 kHz ..... 100 µin/sec
10 Hz ..... 10 µin/sec
1000 Hz ..... 0.1 µin/sec
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)
..... -55 to 120 °C (-65 to 250 °F)
Humidity / Enclosure
B=1, 2 ..... Not affected, hermetically sealed, 1E-8torr.l/s
B=3 ..... IP67, epoxy sealed
Acceleration limit : Shock ..... 2 500g peak
: Continuous vibration ..... 250g peak
Base strain sensitivity ..... 0.004 in/sec/µstrain
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
B=1 ..... Fig. 1a
B=2 ..... Fig. 1b
B=3 ..... Fig. 1c
B=5 ..... Fig. 1d
B=6 ..... Fig. 1e
Design ..... Ceramic, preloaded annular shear mode
Weight A=6 ..... 95 gr Nom (3.4 Oz)
Connector
B=1 ..... MIL-C-5015 glass seal, Type MS3143 10SL-4P
B=2 ..... M12 glass seal, IEC 60947-5-2
B=3 ..... M12 epoxy seal, IEC 60947-5-2
Material ..... AISI 316L, DIN 1.4401 (Stainless steel)
Sensor mounting thread ..... Fig 1h
Mounting torque (M6, M7, M8 suffix) ..... 2,4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied
..... Sensitivity (5 in/sec, 160 Hz)
..... No frequency response

Accessories, not supplied

Cable assembly
MIL connector (B=1), Polyurethane cable 10.01-B01-A01-01-Length
MIL connector (B=1), FEP Teflon cable 10.01-B01-A01-02-Length
M12 connector B=2, 3 Polyurethane cable 10.01-E01-A01-31-Length
PU or FEP Armored cables are also available. See Model 10.01.
Mounting Stud
M6 ..... 191.01-06-06-1
1/4" 28 UNF 191.01-06-16-1
M8 ..... 191.01-06-08-1

Repair

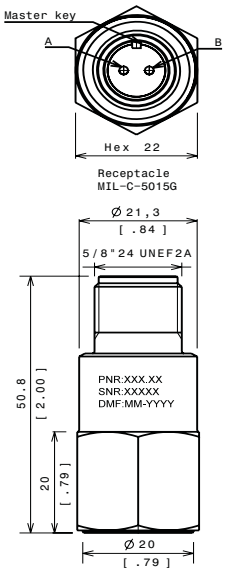
Consult factory for replacement of connector in case of broken or bended pins. Repair of electronic is not possible.

Standard Wiring color

With Mil-C-5015 cable assembly: + = Red // - = White
With M12 cable harness: : + = Black // - = Blue // Temperature=White

(1) Guaranted if using accessories listed in this product datasheet only

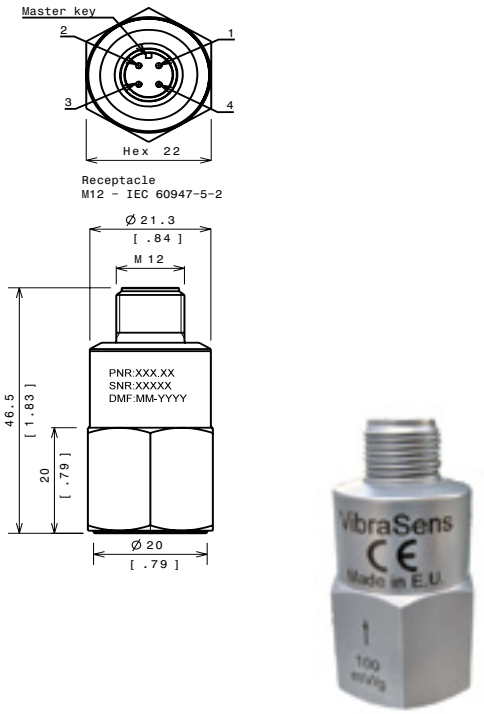
Drawings



Model Number	Pin A	Pin B
Standard, no option	(+)	(-)
T0 Option (10mV/°C)	N/A	N/A

(N/A) : Not available

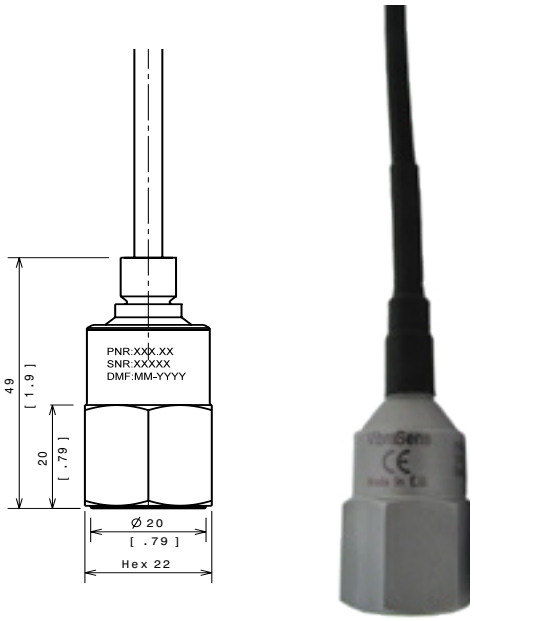
Fig 1a : Outline drawing & Electrical layout, B=1 (MIL-C-5015)



Model Number	Pin 1	Pin 2	Pin 3	Pin 4
Standard, no option	NC	NC	(-)	(+)
T0 Option (10mV/°C)	NC	(Temp)	(-)	(+)

(NC) : Not connected

fig 1b : Outline drawing & Electrical layout, B=2 (M12 glass seal)



CC=01, 02 (PU, Teflon)	White (-) / Red (+)
CC=03 (Radox)	White N°1 (-) / White N°2 (+)
CC=12 (Teflon) (1)	White (-) / Red (+) / Black (Temp.)
CC=13 (Radox) (1)	White N°1 (-)/ White N°2 (+) / / White N°3 (Temp)
CC=31 (PU) (1)	Blue (-) / Black (+) / White (Temp.) / Brown (NC)

(1) T0 option (10mV/*°C)

Fig 1d : Outline drawing & Electrical layout, B=5 (cable only)

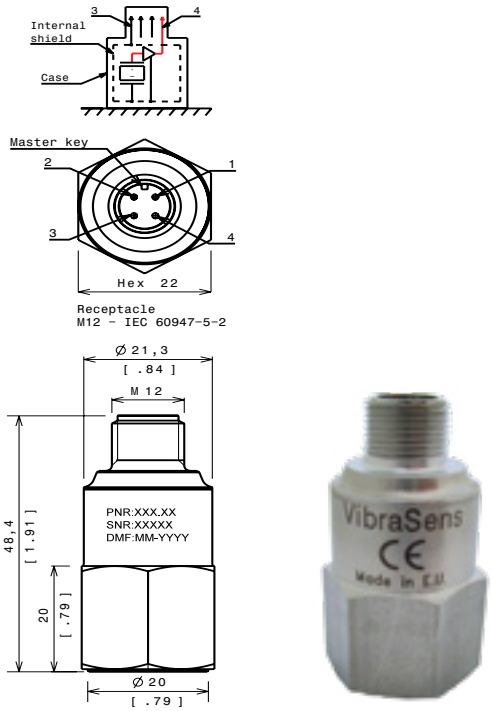


Fig 1c : Outline drawing B=3 (M12 Epoxy)
electrical layout : See above B=2

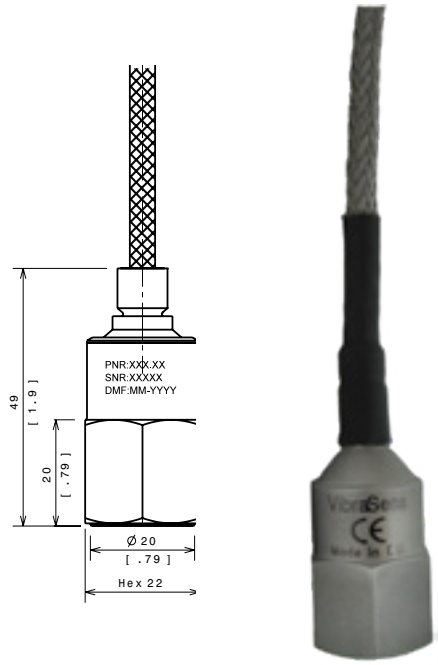


Fig 1e : Outline drawing B=7 (cable with overbraid)
electrical layout : See above B=5

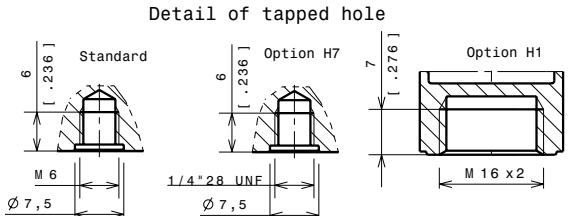


Fig 1h : Housing thread, option H1, H2, H7

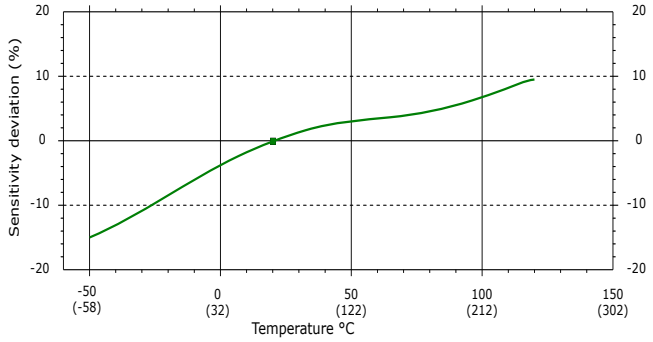


Fig 2 : DC (Bias) deviation versus temperature

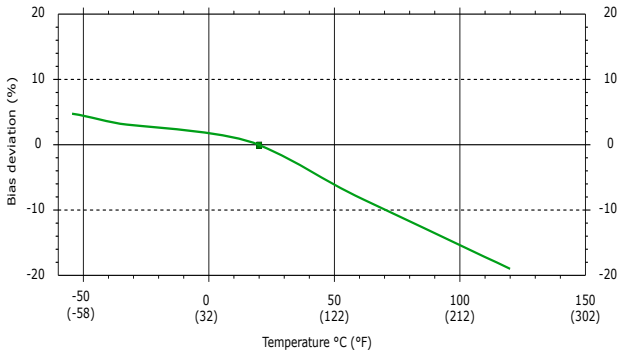


Fig 3 : Sensitivity deviation versus temperature

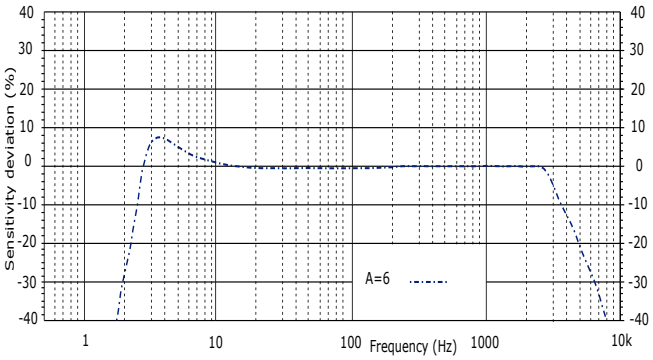


Fig 4a: Frequency response, amplitude

®ICP PiezoVelocity sensor Model 113 Side Connector

Model 113.01-A-2 with Overmolded M12 cable assembly

Main Characteristics

- 100 mV/ips or 4 mV/mm/s
- -55°C to 120 °C (-67°F to 248°F)
- ®ICP transmission mode
- Annular shear mode
- Dual case isolation with Faraday shield
- IP67 with associated cable (B=2, 3 only)

Competitive advantage

- Annular shear mode is less susceptible to base strain.
- Ultra low noise electronic
- Miswiring and surge protections
- Low cost IP67 overmolded M12 cable assembly
- M12 overmolded cable assembly is available through local electronic distributor
- M12 offers compatibility with sensors used in automation.

Description

The hermetic sealed industrial piezovelocity transducer model 113 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 standard constant current supply. Signal ground is isolated from the mounting surface and outer case to prevent ground loops. Faraday shielding will limit sensitivity to EMC to a minimum. Annular shear mode design will prevent from thermal transient and base strain. Low noise electronic and a temperature compensated design will give you accurate result over the complete temperature range.

Typical applications

Velocity is the preferred measurement for most rotating machines with rolling element bearings. Unfortunately it is sometimes impossible to get velocity (with digital or analog integration) from standard piezoelectric accelerometer : very high frequency noise can overload the accelerometer and saturate the output. Piezovelocity sensors use an internal integration circuit which inherently decrease high frequency signals allowing better measurement of low frequency signal. Paper machine dryers (when steam leaks), pumps (cavitation high frequency noise) are prone to such phenomenom.

Ordering information model 113.01

To order, specify model number, options and suffix :

113.01- A - B (CC-DD) - Options - Accessories

A : Sensitivity (Suffix)
6 : 100 mV/ips (4mV/mm/s)
Available suffix : N, negative polarity

B : Connector / Integral cable
1 : *MIL-C-5015, glass seal
2 : *M12 glass seal
5 : *Integral cable
7 : *Integral cable with stainless steel overbraid protection
8 : Integral cable with stainless steel protection conduit
Option 5, 7, 8 needs additional information :(CC-DD)
Options 5, 7, 8 are not stocked. Leadtime : 2 to 4 weeks.

CC : Cable Type (only integral cable B=5, 7, 8)
01 : *Polyurethane twisted pair cable (90°C)
02 : *Teflon FEP twisted pair Cable (200°C)
03 : Radox twisted pair cable (120°C, halogen free)
12 : Teflon FEP twisted triple Cable (200°C). For TO option.
13 : Radox twisted triple (120°C, halogen free). For TO option
31 : *Polyurethane 4 conductors cable (90°C). For T0 option

DD : length in metre (only integral cable B=5, 7, 8)

Options :

Temperature output
T0 : 10 mV/°C. (+2° to +120°C)
Not available with Mil-C-5015 connector

Special Agency Approval
None

Accessories (Machine thread):
M6 : M6x1 Bolt, captive, hex socket
M7 : 1/4" 28 UNF 2A Bolt, captive, hex socket

Special Engraving :
Add ZXX at the end of the part number.
XX is a number supplied by VibraSens

*Most Popular model (in stock) :

113.02-6-2 / 113.02-6-1

Ordering example :

113.02-6-2-M6 piezovelocity sensor, 100 mV/ips, M12 top connector

Specifications (24°C)

Dynamic

Sensitivity A=6	100 mV/ips ±10% (4 mV/mm/s)
Frequency response (fig. 4a, 4b)	
A=6	±10 % : 2.5 to 3500 Hz
	±3 dB : 1.9 to 7000 Hz
Mounted Resonant frequency A=6	16 kHz Nom
Dynamic range A=6	50 in/sec pk (1250 mm/sec)
Transverse response sensitivity (20Hz, 5g)	<5%
Temperature response	fig3
Polarity	(fig. 1) Suffix dependant
Linearity	±1% Max
Warm up time (Typical) A=6	< 5Sec

Electrical

Electrical Grounding	Isolated from machine ground
	Internal Faraday shielding (fig. 1)
Isolation(Case to shield)	100 MΩ Min
Capacitance to ground	70 pF Nom
Output impedance	200 ΩNom
DC output bias, 4mA supply	10 VDC (Fig 2)
Residual noise (24°C) : A=6	
2.5 Hz to 25 kHz	100 µin/sec
10 Hz	10 µin/sec
1000 Hz	0.1 µin/sec
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)	
	-55 to 120 °C (-65 to 250 °F)
Humidity / Enclosure	
B=1, 2	Not affected, hermetically sealed, 1E-8torr.l/s
B=3	IP67, epoxy sealed
Acceleration limit : Shock	2 500g peak
: Continuous vibration	250g peak
Base strain sensitivity	0.004 in/sec/µstrain

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
- B=1 ..... Fig. 1a
- B=2 ..... Fig. 1b
- B=5 ..... Fig. 1d
- B=6 ..... Fig. 1e

Design ..... Ceramic, preloaded annular shear mode
Weight A=6 ..... 165 gr Nom (5.8 Oz)
Connector
- B=1 ..... MIL-C-5015 glass seal, Type MS3143 10SL-4P
- B=2 ..... M12 glass seal, IEC 60947-5-2

Material ..... AISI 316L, DIN 1.4401 (Stainless steel)
Mounting torque (M6, M7, M8 suffix) ..... 2,4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied
..... Sensitivity (5 in/sec, 160 Hz)
..... No frequency response

Accessories, not supplied

Cable assembly
- MIL connector (B=1), Polyurethane cable 10.01-B01-A01-01-Length
- MIL connector (B=1), FEP Teflon cable 10.01-B01-A01-02-Length
- M12 connector B=2, 3 Polyurethane cable 10.01-E01-A01-31-Length
- PU or FEP Armored cables are also available. See Model 10.01.

Captive screw
- M6 ..... 193.01-06-1
- 1/4”28UNF 193.01-16-1

Standard Wiring color

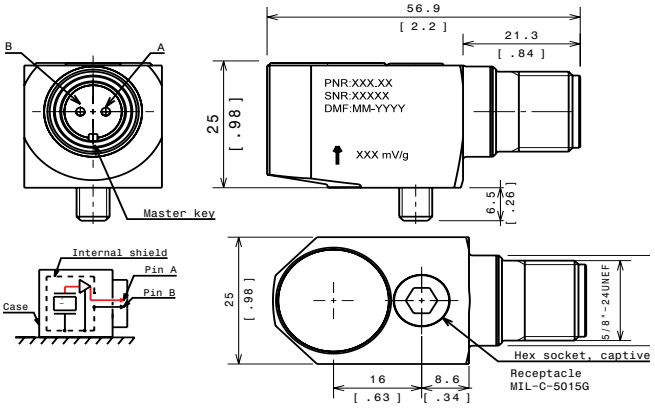
With Mil-C-5015 cable assembly: + = Red // - = White
With M12 cable harness: : + = Black // - = Blue // Temperature=White

Repair

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

(1) Guaranted if using accessories listed in this product datasheet only

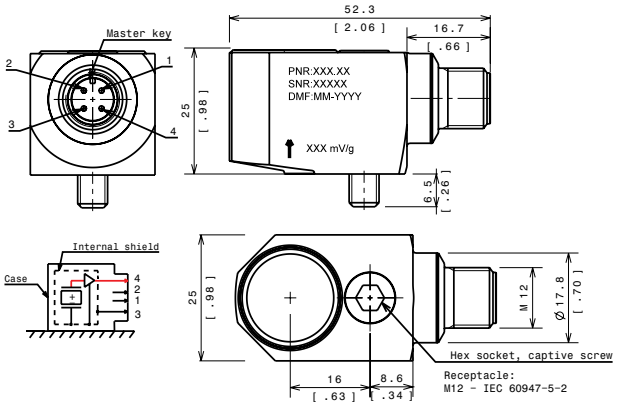
Drawings



Model Number	Pin A	Pin B
Standard, no option	(+)	(-)
T0 Option (10mV/°C)	N/A	N/A

(N/A) : Not available

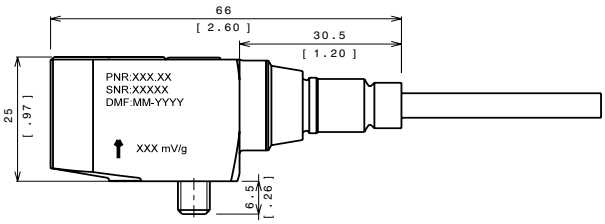
Fig 1a : Outline drawing & Electrical layout for MIL-C-5015 Connector (B=1)

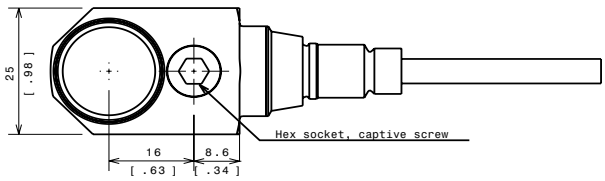


Model Number	Pin 1	Pin 2	Pin 3	Pin 4
Standard, no option	NC	NC	(-)	(+)
T0 Option (10mV/°C)	NC	(Temp)	(-)	(+)

(NC) : Not connected / (Temp) : Temperature

Fig 1b : Outline drawing & Electrical layout for M12 Glass seal Connector (B=2)





CC=01, 02 (PU, Teflon)	White (-) / Red (+)
CC=03 (Radox)	White N°1 (-) / White N°2 (+)
CC=12 (Teflon)	White (-) / Red (+) / Black (Temp.)
CC=13 (Radox)	White N°1 (-)/ White N°2 (+) / / White N°3 (Temp)
CC=31 (PU)	Blue (-) / Black (+) / White (Temp.) / Brown (NC)

Fig 1d : Outline drawing & Electrical layout, B=5 (cable only)

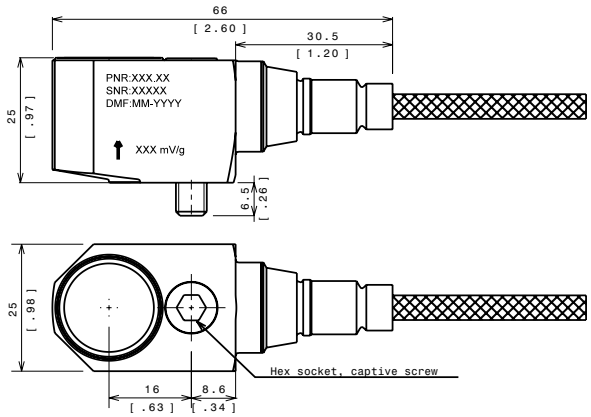


Fig 1e : Outline drawing B=7 (cable with overbraid)
electrical layout : See above B=5

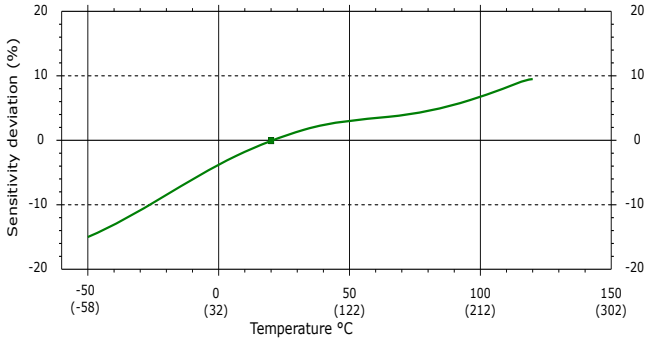


Fig 2 : DC (Bias) deviation versus temperature

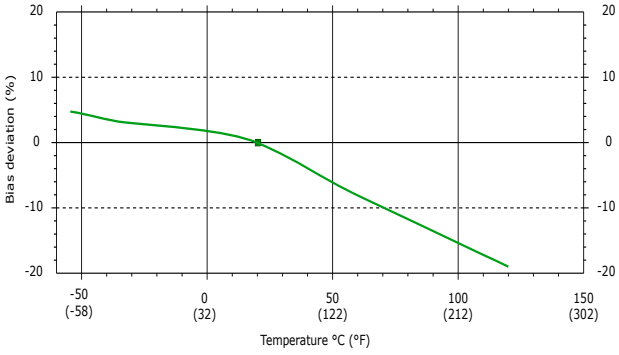


Fig 3 : Sensitivity deviation versus temperature

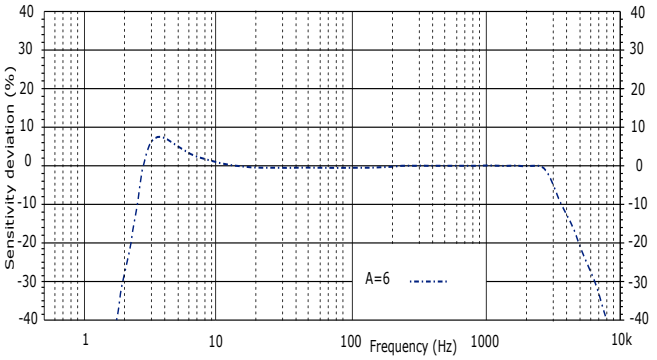


Fig 4a: Frequency response, amplitude

4-20 mA Vibration Sensor Model 125 Top Connector

Main Characteristics

- Annular shear mode (better than obsolete compression design)
- Velocity (RMS, Peak) or Acceleration (RMS, Peak)
- Dynamic output available : Velocity or Acceleration
- Temperature output available (10 mV/°C)
- Dual case isolation with Faraday shield
- Submersible version (150 metres) with associated IP68 over-molded cable
- life time hermetic sealing warranty (M12/Mil glass seal connector)

Competitive advantage

- Price
- Compare to obsolete compression design, annular shear piezoelectric sensors feature better frequency response, improved base strain, lower noise, smaller size, thermal transient imunity and insensitivity to cable motion (compression design will be affected by cable motion in the velocity range : 3Hz to 1000 Hz). Annular shear mode is also less susceptible to transverse vibrations and better immune to electronic saturation at high frequency.
- Resistant to shock (magnet mounting) thanks to protected Mosfet transistor input.
- ESD and reverse wiring protection.
- The glass seal hermetic connector protects the piezoelectric disc and the electronic from harmful environmental influences, significantly increasing their reliability and lifetime. Associated with low cost IP68 overmolded M12 cable assembly it is a perfect solution for submersible application down to 150 metres. Sensors sealed with epoxy will leak after few temperature cycles.
- M12 connector (4-Pin) offers compatibility with numerous sensors used in automation. M12 overmolded cable assemblies are available from many cable manufacturers around the world. Mil cordset are expensive because they are only available from vibration sensor manufacturer. Moreover the 2-Pin mil connector doesn't allow for optional outout like temperature or acceleration.

Description

The hermetic sealed 4-20 mA loop powered industrial accelerometer model 125 is design to monitor the vibration in harsh industrial environment. It uses the industry standard 4-20mA Loop that interfaces directly with PLC, DCS and 4-20mA monitor. Large choice of output (velocity, acceleration, RMS, equivalent Peak) and frequency range will help to fit almost every customer requirements. Their compact size allows for installation in tight places. The dynamic signal output (acceleration or velocity) can allow spectral vibration measurements.

Typical applications

Vibrations measurement in the rugged environments of industrial machinery monitoring. It allows continuous trending of overall machine vibration.

Model 125.01-AAAA-2 with Overmolded M12 cable assembly

Ordering information model 125.01

To order, specify model number, options and suffix :

125.01- AAAA - B - TT - MM - HH - YY

AAAA : Full Scale (=20mA)

AR05 : Acceleration RMS 5g (3Hz to 10kHz ±10%)
AR10 : Acceleration RMS 10g (3Hz to 10kHz ±10%)
AR20 : Acceleration RMS 20g (3Hz to 10kHz ±10%)
AR50 : Acceleration RMS 50g (3Hz to 10kHz ±10%)

AP05 : Acceleration Peak 5g (3Hz to 10kHz ±10%)
AP10 : Acceleration Peak 10g (3Hz to 10kHz ±10%)
AP20 : Acceleration Peak 20g (3Hz to 10kHz ±10%)
AP50 : Acceleration Peak 50g (3Hz to 10kHz ±10%)

VR10: Velocity RMS 10 mm/s (3Hz to 1000 Hz ±10%)
VR11: Velocity RMS 0.5 ips (3Hz to 1000 Hz ±10%)
VR20: Velocity RMS 20 mm/s (3Hz to 1000 Hz ±10%)
VR21: Velocity RMS 1 ips (3Hz to 1000 Hz ±10%)
VR51: Velocity RMS 2 ips (3Hz to 1000 Hz ±10%)
VR100: Velocity RMS 100 mm/s (3Hz to 1000 Hz ±10%)

SR10 : Velocity RMS 10 mm/s (10Hz to 1000 Hz ±10%)
SR11: Velocity RMS 0.5 ips (10Hz to 1000 Hz ±10%)
SR20: Velocity RMS 20 mm/s (10Hz to 1000 Hz ±10%)
SR21: Velocity RMS 1 ips (10Hz to 1000 Hz ±10%)
SR51: Velocity RMS 2 ips (10Hz to 1000 Hz ±10%
SR100: Velocity RMS 100 mm/s (10Hz to 1000 Hz ±10%)

VP10: Velocity Peak 10 mm/s (3Hz to 1000 Hz ±10%)
VP11: Velocity Peak 0.5 ips (3Hz to 1000 Hz ±10%)
VP20: Velocity Peak 20 mm/s (3Hz to 1000 Hz ±10%)
VP21: Velocity Peak 1 ips (3Hz to 1000 Hz ±10%)
VP51: Velocity Peak 2 ips (3Hz to 1000 Hz ±10%)
VP100: Velocity Peak 100 mm/s (3Hz to 1000 Hz ±10%)

SP10: Velocity Peak 10 mm/s (10Hz to 1000 Hz ±10%)
SP11: Velocity Peak 0.5 ips (10Hz to 1000 Hz ±10%)
SP20: Velocity Peak 20 mm/s (10Hz to 1000 Hz ±10%)
SP21: Velocity Peak 1 ips (10Hz to 1000 Hz ±10%)
SP51: Velocity Peak 2 ips (10Hz to 1000 Hz ±10%)
SP100: Velocity Peak 100 mm/s (10Hz to 1000 Hz ±10%)

Note : Peak is based on the true RMS value of vibration. For a sine wave, the equivalent peak output is 1.414 times the RMS. value.

B : Connector
1 : MIL-C-5015, glass seal
2 : M12 glass seal
5 (CC-DD) : Integral cable
7 (CC-DD) : Integral cable with sstl overbraid protection
8 (CC-DD) : Integral cable with stainless steel protection conduit
CC : Cable Type / DD : length in metre
01 : *Polyurethane cable (90°C)
02 : *Teflon FEP Cable (200°C)
03 : Radox cable (120°C, halogen free)
5, 7, 8 : epoxy seal

TT : Optional output (only one optional output is possible)
Omitted : no optional output
T0: Temperature output
10 mV/°C. (range +2° to +120°C)
(Not available with Mil-C-5015 2-pin connector)
DA: Acceleration Dynamic Output
100 mV/g +-30% for VRXX, VPXX, AR05, AP05
10mV/g +-30% for AR10, AR20, AR50, AP10, AP20, AP50.
(not available with MIL-C-5015 2-pin connector)
DV: Velocity Dynamic Output
100 mV/ips +-30% for VRXX, VPXX, , ARXX, APXX
(not available with MIL-C-5015 2-pin connector)

MM : Machine thread
Omitted : no mounting stud will be shipped with the sensor.
M6 : M6x1
M7 : 1/4" 28 UNF 2A
M8 : M8x1.25

HH : Housing thread
Omitted or H6 : M6x1 (China, Europe, India, South America, ...)
H1 : M16x2 (quick mounting + 120° positioning) (Not stocked)
H2 : Quick fit mounting (Not stocked)
H7 : 1/4" 28 UNF-2A. (U.S.A., UK, ...)

YY : Agency Approval
omitted : no agency approval
Y1 : Atex approved (October 2010)

Special Engraving :
Add ZXX at the end of the part number.
XX is a number supplied by VibraSens

*Most Popular model (in stock) :

125.01-VR20-2-DA // 125.01-VR21-2-DA

Ordering example :

125.01-VR20-2-DA-M6 4-20mA sensor, FS=20mm/s RMS, M12 top connector, Dynamic acceleration output

Specifications (24°C)

Dynamic

Sensitivity
- No vibration ..... 4 mA ±5%
- Full scale (see AAAA ordering information) ..... 20 mA ±5%
- Note : Equivalent Peak is based on the true RMS value of vibration. For a sine wave, the equivalent peak output is 1.414 times the RMS. value.

Frequency response ..... See AAAA ordering information
Mounted Resonant frequency ..... 25 kHz Nom
Transverse response sensitivity (20Hz, 5g) ..... <5%
Linearity ..... ±1% Max
Turn on time, 4-20 mA loop ..... < 10 Sec

Option : Temperature output (T0)
Output ..... Vout=10mV/°C * Temp.(°C)
..... 0VDC at 0°C
Range ..... +2° to 120°C
Power ..... Need 4-20 mA loop

Option : Dynamic acceleration (DA)
Sensitivity ..... See ordering information : 10 or 100 mV/g
Dynamic ..... 25 g for 100 mV/g output
..... 250 g for 10 mV/g output
Power ..... Need 4-20 mA loop, no constant current source is needed, DC bias=2.6V.
Frequency response ..... ±10 % : 3 to 9000 Hz
..... ±3 dB : 1 to 14000 Hz

Option : Dynamic velocity (DV)
Sensitivity ..... 100 mV/ips (4 mV/mm/s)
Dynamic ..... 1.5 ips
Power ..... Need 4-20 mA loop, no constant current source is needed, DC bias=2.6V.
Frequency response ..... ±10 % : 3 to TBD Hz
..... ±3 dB : 1 to TBD Hz

Electrical

Electrical Grounding ..... Isolated from machine ground
..... Internal Faraday shielding (fig. 1)
Isolation(Case to shield) ..... 100 MΩ Min
Capacitance to ground ..... 70 pF Nom
Maximum Loop resistance ..... Rl Max=(Vdc power - 10V)/20mA
Minimum Rl wattage ..... Watt min=0.0004xRl
Power requirements for two wire loop ..... Voltage : +10 to +30 VDC
Protection : Overvoltage ..... Yes
: Reverse polarity ..... Yes

Environmental

Temperature, operating continuous
max. loop curent =10mA ..... -55 to 120 °C (-65 to 250 °F)
max. loop curent =20mA ..... -55 to 90 °C (-65 to 212 °F)
Humidity / Enclosure
- B=1, 2 ..... Glass seal, Not affected, hermetically sealed, 1E-8torr.l/s
- B=5, 7, 8 ..... Epoxy sealing

Acceleration limit : Shock ..... 2 500g peak
: Continuous vibration ..... 250g peak
Mean time between failure (MTBF) ..... 6 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
- B=1 ..... Fig. 1a
- B=2 ..... Fig. 1b
- B=5 ..... Fig. 1d
- B=7 ..... Fig. 1d
- B=8 ..... Fig. 1f

Design ..... ceramic annular shear
Weight ..... 85 gr Nom (3.0 Oz)
Connector
- B=1 ..... MIL-C-5015 glass seal, Type MS3143 10SL-4P
- B=2 ..... M12 glass seal, IEC 60947-5-2

Material ..... AISI 316L, DIN 1.4404 (Stainless steel)
Housing thread ..... Fig 1h
Mounting torque (M6, M7, M8 suffix) ..... 2,4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied
..... 4-20mA Loop // DA or DV if applicable

Accessories, not supplied

Cable assembly
- MIL connector (B=1), Polyurethane cable 10.01-B22-A01-01-Length
- MIL connector (B=1), FEP Teflon cable 10.01-B22-A01-02-Length
- M12 connector (B=2) Polyurethane cable 10.01-E02-A01-31-Length
- M12 connector (B=2), FEP Teflon cable 10.01-E02-A01-12-Length
- PU or FEP Armored cables are also available. See Model 10.01.

Accessories, spares part

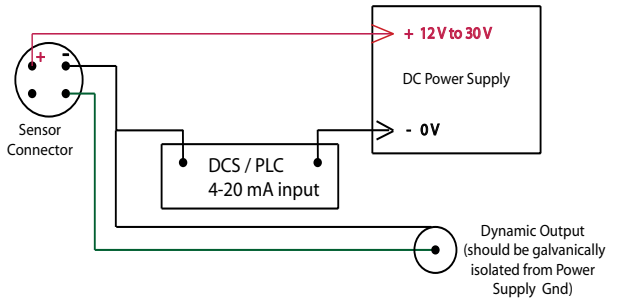
Mounting Stud with M6 Housing thread (HH=H6)
- M6 ..... 191.01-06-06-1
- 1/4" 28 UNF 191.01-06-16-1
- M8 ..... 191.01-06-08-1

Repair

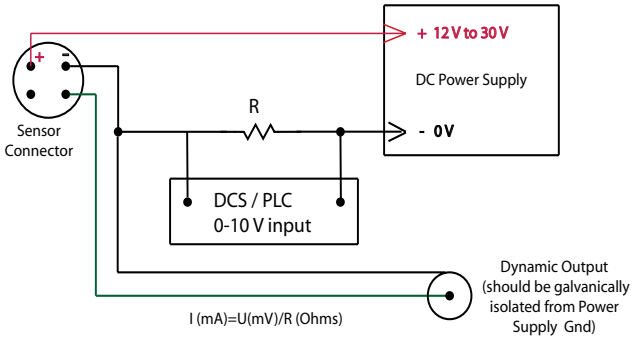
Consult factory for replacement of connector in case of broken or bended pins. Repair of electronic is not possible.

(1) Guaranted if using accessories listed in this product datasheet only

Wiring Schematic

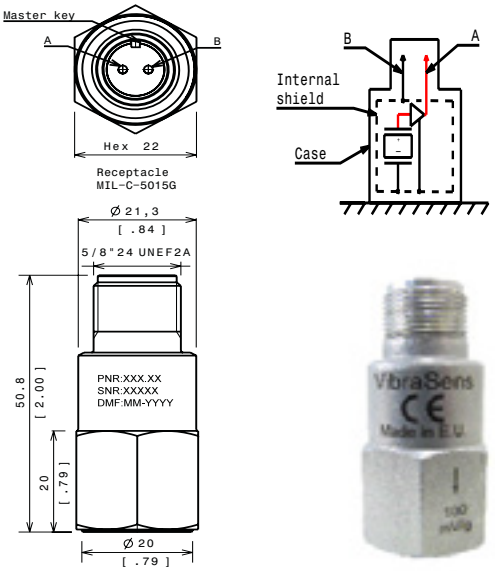


4-20 mA Input card



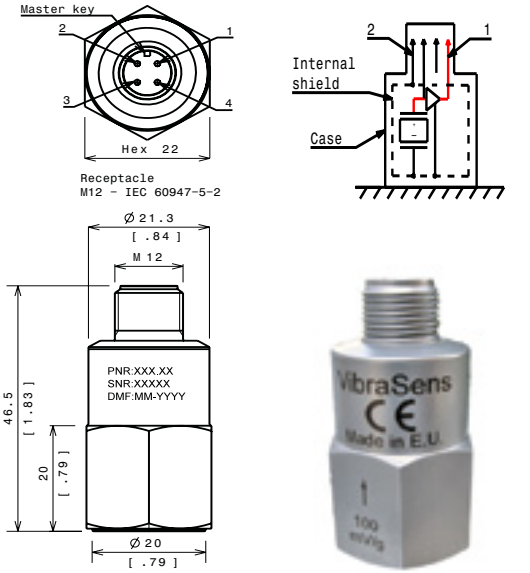
0-10 VDC Input card

Drawings



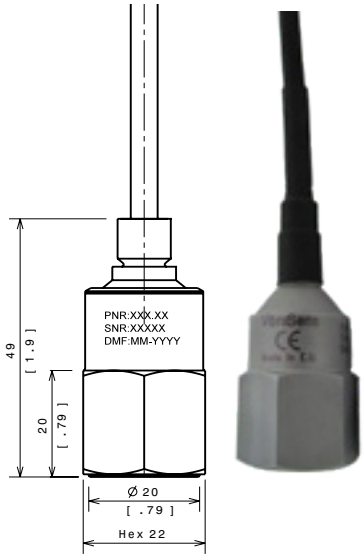
Model Number	Pin A	Pin B
Standard, no option	(+)	(-)

Fig 1a : Outline drawing & Electrical layout, B=1 (MIL-C-5015)



Model Number	Pin 1	Pin 2	Pin 3	Pin 4
Standard, no option	(+)	(-)	NC	NC
DA / DV Option	(+)	(-)	NC	DA or DV
Temperature T0 Option	(+)	(-)	T0 (-)	T0 (+)

(NC) : Not connected
fig 1b : Outline drawing & Electrical layout, B=2 (M12 glass seal)



Model Number	(+)	(-)	DA, DV (+)	T0 (+)	T0 (-)
CC=01, 02 (PU, Teflon), no option	Red	White	NA	NA	**NA**
CC=03 (Radox) with DA/DV option	White N°1	White N°2	White N°3	NA	NA
CC=01 (PU) with DA/DV option	Brown	White	Black	NA	NA
CC=02 (Teflon) with DA/DV option	Red	White	Black	NA	NA
CC=01 (PU) with T0 option	Brown	White	N/A	Black	**Blue**

(NA) : Not Applicable
Fig 1d : Outline drawing & Electrical layout, B=5 (cable only)

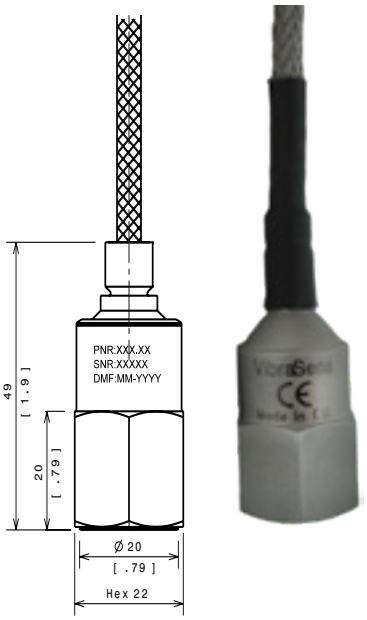


Fig 1e : Outline drawing B=7 (cable with overbraid)
electrical layout : See above B=5

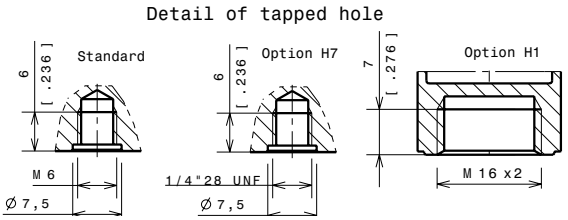


Fig 1h : Housing thread, option H1, H2, H7

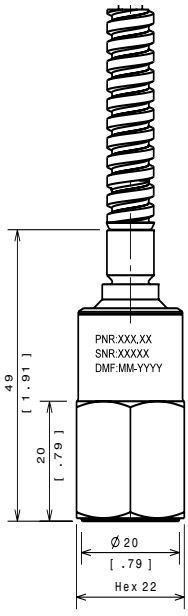


Fig 1f : Outline drawing B=8 (cable with conduit protection)
electrical layout : See above B=5

4-20 mA Vibration Sensor Model 127 Side Connector

Main Characteristics

- Velocity (RMS, Peak) or Accelration (RMS, Peak)
- Dynamic output available Velocity or Acceleration
- IP67 with associated cable (B=2, 3 only)

Competitive advantage

- Price
- Low cost IP67 overmolded M12 cable assembly
- M12 overmolded cable assembly is available through local electronic distributor
- M12 offers compatibility with sensors used in automation.

Description

The hermetic sealed 4-20 mA loop powered industrial accelerometer model 127 is design to monitor the vibration in harsh industrial environment. It uses the industry standard 4-20mA Loop that interfaces directly with PLC, DCS and 4-20mA monitor. Large choice of output (velocity, acceleration, RMS, equivalent Peak) and frequency range will help to fit almost every customer requirements. Their compact size allows for installation in tight places. The dynamic signal output (acceleration or velocity) can allow spectral vibration measurements.

Typical applications

Vibrations measurement in the rugged environments of industrial machinery monitoring. It allows continuous trending of overall machine vibration.

Ordering information model 127.01

To order, specify model number, options and suffix :

127.01- A AAA - B (CC-DD) - Options - Accessories

AAAA : Full Scale (=20mA)

AR05 : Acceleration RMS 5g (3Hz to 10kHz ±10%)
AR10 : Acceleration RMS 10g (3Hz to 10kHz ±10%)*
AR20 : Acceleration RMS 20g (3Hz to 10kHz ±10%)
AR50 : Acceleration RMS 50g (3Hz to 10kHz ±10%)

AP05 : Acceleration Peak 5g (3Hz to 10kHz ±10%)
AP10 : Acceleration Peak 10g (3Hz to 10kHz ±10%)
AP20 : Acceleration Peak 20g (3Hz to 10kHz ±10%)
AP50 : Acceleration Peak 50g (3Hz to 10kHz ±10%)

VR10: Velocity RMS 10 mm/s (3Hz to 1000 Hz ±10%)*
VR11: Velocity RMS 0.5 ips (3Hz to 1000 Hz ±10%)
VR20: Velocity RMS 20 mm/s (3Hz to 1000 Hz ±10%)
VR21: Velocity RMS 1 ips (3Hz to 1000 Hz ±10%)
VR51: Velocity RMS 2 ips (3Hz to 1000 Hz ±10%)

VP10: Velocity Peak 10 mm/s (3Hz to 1000 Hz ±10%)*
VP11: Velocity Peak 0.5 ips (3Hz to 1000 Hz ±10%)
VP20: Velocity Peak 20 mm/s (3Hz to 1000 Hz ±10%)
VP21: Velocity Peak 1 ips (3Hz to 1000 Hz ±10%)
VP51: Velocity Peak 2 ips (3Hz to 1000 Hz ±10%)

Note : Peak is based on the true RMS value of vibration. For a sine wave, the equivalent peak output is 1.414 times the RMS. value.

B : Connector / Integral cable

1 : *MIL-C-5015, glass seal
2 : *M12 glass seal
5 : *Integral cable
7 : *Integral cable with stainless steel overbraid protection
8 : Integral cable with stainless steel protection conduit
Option 5, 7, 8 needs additional information :(CC-DD)
Options 5, 7, 8 are not stocked. Leadtime : 2 to 4 weeks.

CC : Cable Type (only integral cable B=5, 7, 8)

Model 127.01-AAAA-2 with Overmolded M12 cable assembly
01 : Polyurethane twisted pair cable (90°C)
02 : Teflon FEP twisted pair Cable (200°C)
03 : Radox twisted pair cable (120°C, halogen free)
12 : Teflon FEP twisted triple Cable (200°C). For DA/DV option.
13 : Radox twisted triple (halogen free). For DA/DV option
31 : *Polyurethane 4 conductors cable (90°C). For DA/DV option

DD : length in metre (only integral cable B=5, 7, 8)

Options :

Acceleration Dynamic Output DA
100 mV/g +-30% for VRXX, VPXX, AR05, AP05
10mV/g +-30% for AR10, AR20, AR50, AP10, AP20, AP50.

Velocity Dynamic Output DV
100 mV/ips +-30% for VRXX and VPXX
Note : DA or DV are not available for MIL-C-5015 2-pin connector (B=1).

Agency approval
none

Accessories (Machine thread):
M6 : M6x1 Bolt, captive, hex socket
M7 : 1/4" 28 UNF 2A Bolt, captive, hex socket

Special Engraving :

Add ZXX at the end of the part number.
XX is a number supplied by VibraSens

*Most Popular model (in stock) :

127.01-VR10-2-DA // 125.07-VR21-2-DA
127.01-AR20-2-DA

Ordering example :

127.01-VR10-2-DA-M6 4-20mA sensor, FS=10mm/s RMS, M12 glass seal connector

Specifications (24°C)

Dynamic

Sensitivity
- No vibration ..... 4 mA
- Full scale (see AAAA ordering information) ..... 20 mA ±2%
- Note : Equivalent Peak is based on the true RMS value of vibration. For a sine wave, the equivalent peak output is 1.414 times the RMS. value.

Accuracy (Repeatability) 2%
Frequency response ..... See AAAA ordering information
Mounted Resonant frequency ..... 25 kHz Nom
Transverse response sensitivity (20Hz, 5g) ..... <5%
Linearity ..... ±1% Max
Turn on time, 4-20 mA loop ..... < 15 Sec

Option : Dynamic acceleration (DA)

Sensitivity ..... See ordering information
Dynamic ..... 25 g for 100 mV/g output
..... 250 g for 10 mV/g output
Power ..... Need 4-20 mA loop, no constant current source is needed., DC bias=2.6V
Frequency response ..... ±10 % : 3 to 9000 Hz
..... ±3 dB : 1 to 14000 Hz

Option : Dynamic velocity (DV)

Sensitivity ..... 100 mV/in/sec
Dynamic ..... 1.5 in/sec
Power ..... Need 4-20 mA loop, no constant current source is needed.
Frequency response ..... ±10 % : 3 to TBD Hz
..... ±3 dB : 1 to TBD Hz

Electrical

Electrical Grounding ..... Isolated from machine ground
..... Internal Faraday shielding (fig. 1)
Isolation(Case to shield) ..... 100 MΩ Min
Capacitance to ground ..... 70 pF Nom
Maximum Loop resistance ..... Rl Max=(Vdc power - 10V)/20mA
Minimum Rl wattage ..... Watt min=0.0004xRl
Power requirements for two wire loop ..... Voltage : +10 to +30 VDC
Protection : Overvoltage ..... Yes
: Reverse polarity ..... Yes

Environmental

Temperature, operating continuous
max. loop curent =10mA ..... -55 to 120 °C (-65 to 250 °F)
max. loop curent =20mA ..... -55 to 90 °C (-65 to 212 °F)
Humidity / Enclosure
- B=1, 2 ..... Not affected, hermetically sealed, 1E-8torr.l/s
- B=3 ..... IP67, epoxy sealed

Acceleration limit : Shock ..... 2 500g peak
: Continuous vibration ..... 250g peak
Mean time between failure (MTBF) ..... 7 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
- B=1 ..... Fig. 1a
- B=2 ..... Fig. 1b
- B=5 ..... Fig. 1e
- B=6 ..... Fig. 1f

Design ..... PZT Ceramic
Weight ..... 155 gr Nom (5.6 Oz)
Connector
- B=1 ..... MIL-C-5015 glass seal, Type MS3143 10SL-4P
- B=2 ..... M12 glass seal, IEC 60947-5-2

Material ..... AISI 316L, DIN 1.4404 (Stainless steel)
Mounting torque (M6, M7) ..... 2,4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied
..... DA or DV if applicable

Accessories, not supplied

Cable assembly
- MIL connector (B=1), Polyurethane cable 10.01-B01-A01-01-Length
- MIL connector (B=1), FEP Teflon cable 10.01-B01-A01-02-Length
- M12 connector B=2, 3 Polyurethane cable 10.01-E01-A01-31-Length
- PU or FEP Armored cables are also available. See Model 10.01.

Accessories, spares part

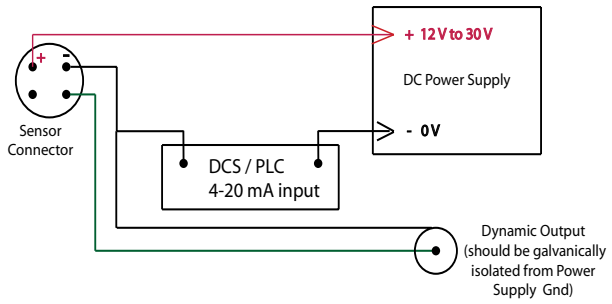
Mounting Stud
- M6 ..... 191.01-06-06-1
- 1/4" 28 UNF 191.01-06-16-1
- M8 ..... 191.01-06-08-1

Repair

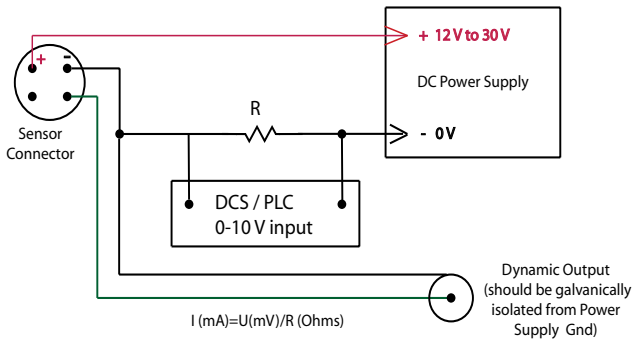
Consult factory for replacement of connector in case of broken or bended pins. Repair of electronic is not possible.

(1) Guaranted if using accessories listed in this product datasheet only

Wiring Schematic

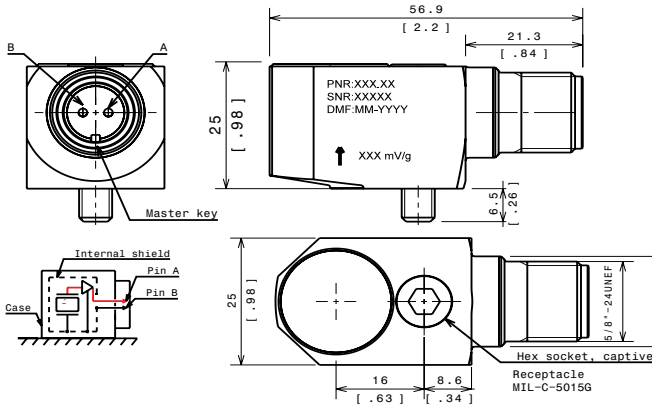


4-20 mA Input card



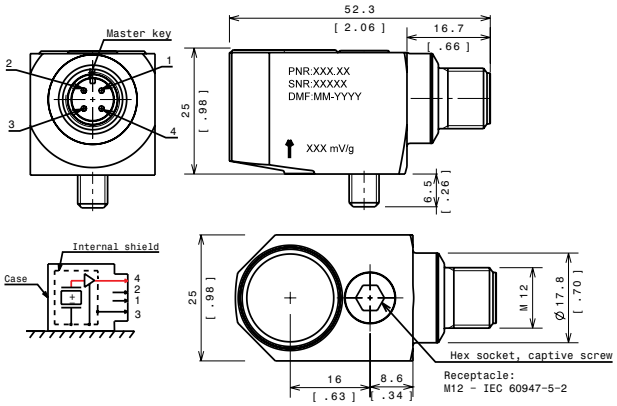
0-10 VDC Input card

Drawings



Model Number	Pin A	Pin B
Standard, no option	(+)	(-)

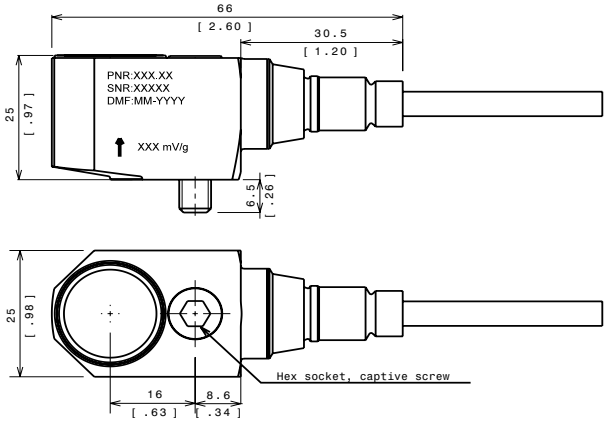
Fig 1a : Outline drawing & Electrical layout for MIL-C-5015 Connector (B=1)



Model Number	Pin 1	Pin 2	Pin 3	Pin 4
Standard, no option	(+)	(-)	NC	NC
DA / DV Option	(+)	(-)	NC	DA or DV

(NC) : Not connected / (Temp) : Temperature

Fig 1b : Outline drawing & Electrical layout for M12 Glass seal Connector (B=2)



CC=01, 02 (PU, Teflon)	White (-) / Red (+)
CC=03 (Radox)	White N°1 (-) / White N°2 (+)
CC=12 (Teflon)	White (-) / Red (+) / Black (DA or DV)
CC=13 (Radox)	White N°1 (-)/ White N°2 (+) / White N°3 (DA or DV)
CC=31 (PU)	Blue (NC) / Black (DA/DV) / White (-) / Brown (+)

(NC) : Not connected

Fig 1d : Outline drawing & Electrical layout, B=5 (cable only)

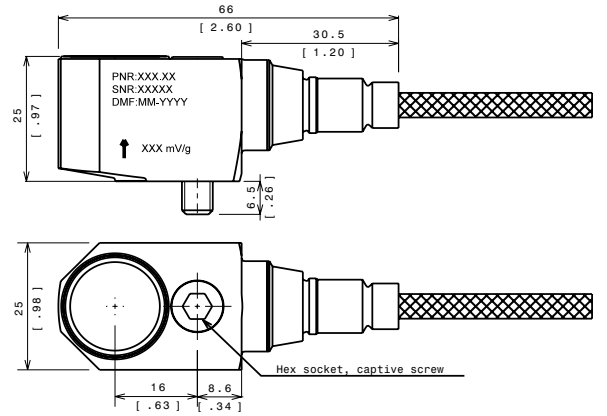


Fig 1e : Outline drawing B=7 (cable with overbraid)
electrical layout : See above B=5

OEM Piezoelectric Accelerometer Model 160

Main Characteristics

- T0-5 eq. Transistor-Style Package
- Small size (9mm), light weight (3 grammes, 0.1 Oz)
- Variety of Sensitivities : 100 mV/g, 11 pC/g, ...
- Variety of transmission : 2-Wire ®ICP/®IEPE transmission mode / 3-Wire Voltage output / 2-wire charge output
- Annular shear mode

Competitive advantage

- Low Cost
- Electronic is protected from Overload (Magnet mounting, shock protected)
- life time hermetic sealing warranty (glass seal and laser weld)
- base strain isolation (easier epoxy mounting)
- exceptional bias stability (improved dynamic range)

Description

The piezoelectric accelerometer model 160 uses a solid-state piezoelectric element in the annular shear mode. It is available with 2-wire ICP - IEPE - LIVM Voltage output for easy compatibility with existing piezoelectric accelerometer. 3-wire Voltage output is also available for simplified operation and connectivity to low power data acquisition unit.

Typical applications

The piezoelectric accelerometer model 160 is design for vibration and shock measurements in high-volume and OEM applications. It is well suited for vibration monitoring and machinery protection.

Ordering information model 160.01

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

160.01- AAA - B

AAA : Sensitivity

I6V : 100 mV/g ±20% / 2-wire ICP-IEPE transmission
I5V : 50 mV/g ±20% / 2-wire ICP-IEPE transmission
I3V : 10 mV/g ±20% / 2-wire ICP-IEPE transmission

V6V : 100 mV/g ±20% / 3-wire voltage output
V5V : 50 mV/g ±20% / 3-wire voltage outpu
V4V : 25 mV/g ±20% / 3-wire voltage output

P3V: 11 pC/g ± 20% / 2 wire charge output
Available suffix : N, negative polarity

B : Connector / Integral cable

1 : Glass seal header, 3-pin

Specifications (24°C)

Dynamic

Sensitivity
- AAA=I6V (2-Wire ICP) ..... 100 mV/g ±20%
- AAA=I5V (2-Wire ICP) ..... 50 mV/g ±20%
- AAA=I3V (2-Wire ICP) ..... 10 mV/g ±20%

- AAA=V6V (3-wire Voltage) ..... 100 mV/g ±20%
- AAA=V5V (3-wire Voltage) ..... 50 mV/g ±20%
- AAA=V4V (3-wire Voltage) ..... 25 mV/g ±20%

- AAA=P3V (2-Wire Charge) ..... 11 pC/g ±20%

Frequency response
- AAA=IXX, VXX ..... ±1 dB : 1 to 10 000 Hz
- AAA=IXX, VXX ..... ±3 dB : 0.4 to 20 000 Hz

Mounted Resonant frequency ..... >42 kHz Nom

Dynamic range
- AAA=I6X ..... 80 g pk
- AAA=I5X ..... 160 g pk

Model 160.01-AAA-1

- AAA=I3X ..... 800 g pk
- AAA=V3X (5 VDC supply) ..... 25 g pk
- AAA=V5X (5 VDC supply) ..... 50 g pk
- AAA=V4V (5 VDC supply) ..... 100 g pk
- AAA=P3V ..... Not Applicable

Transverse response sensitivity (20Hz, 5g) ..... <5%
Temperature response (sensitivity) ..... +12% at 120 °C
Polarity ..... (fig. 1) Suffix dependant
Linearity ..... ±1% Max
Warm up time (Typical)
- AA=IXX, VXX ..... < 2 Sec (Typical)
- AA=P3V ..... N/A

Electrical

Output impedance ..... < 100 Ω
DC output bias
- AA=IXX ..... 12 VDC±2%
- AA=VXX ..... 0.5 x Vsupply ±2%

Residual noise (24°C) : A=IXX
- 1 Hz to 25 kHz ..... TBD ug rms

Residual noise (24°C) : A=VXX
- 1 Hz to 25 kHz ..... TBD ug rms

Power requirements :
AA=IXX (Fig 2a) ..... Constant current : +2 to +10mA DC
..... Voltage : +22 to +28 VDC
Protection, overvoltage ..... Yes
Protection, reverse polarity ..... Yes
ESD Protection ..... > 20V
AA=VXX (Fig 2b) ..... Voltage : +3 to +5 VDC
Current draw ..... 1 mA max
Protection, overvoltage ..... Yes
Protection, reverse polarity ..... No
ESD Protection ..... none
AA=P3V (Fig 2c) ..... none

Environmental

Temperature, operating continuous
- AA= IXX ..... -55 to 120 °C (-65 to 250°F)
- AA= VXX ..... -55 to 120 °C (-65 to 250 °F)
- A=PXX ..... -55 to 120 °C (-65 to 250 °F)

Humidity / Enclosure
- B=1 ..... Not affected, hermetically sealed, 1E-8torr.l/s

Acceleration limit : Shock ..... 5 000g peak
: Continuous vibration ..... 500g peak
Base strain sensitivity ..... TBD g pk/u strain
Temp. transient sens. (3Hz, LLF, 20dB/dec) ..... 0.8 mg/°C
Acoustic sensitivity (164 dBSP) ..... TBD mg
Electromagnetic sens. (50Hz, 0.03 T) ..... TBD g
Mean time between failure (MTBF) ..... 10 Years Nom

Physical

Dimensions
- B=1 ..... Fig. 1a

Mounting ..... Fig 1b
Design ..... Ceramic, annular shear mode
Weight
- AA=2X, 3X, 41 ..... 3 gr Nom (0.1 Oz)

Material ..... AISI 304L, DIN 1.4306 (Stainless steel)

Accessories, supplied

Calibration supplied
..... Sensitivity check (5g, 160 Hz)

..... No frequency response

Drawings

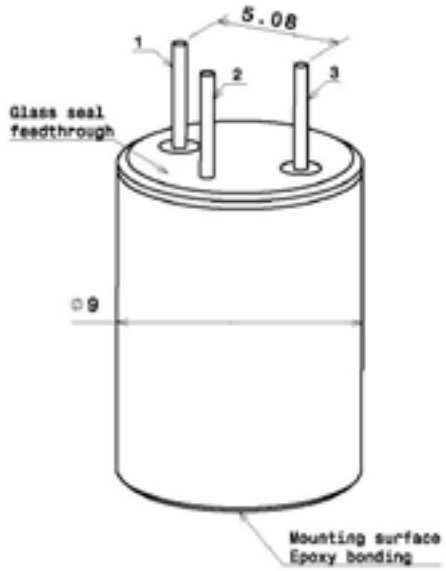


Fig 1a : Outline drawing)

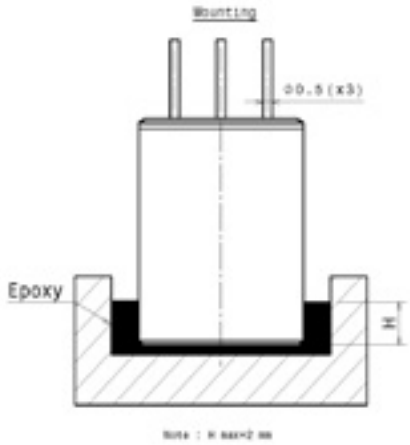


Fig 1b : Mounting drawing

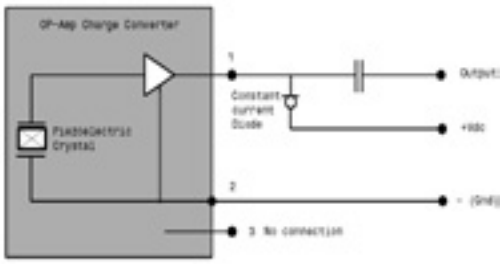


fig 2a : Electrical layout - 2-Wire ICP / IEPE

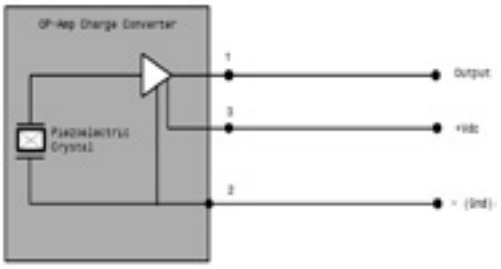


fig 2b : Electrical layout -3 Wire Voltage Output

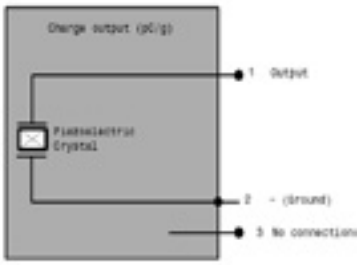


fig 2c : Electrical layout - 2-Wire Charge Output

®ICP Low cost triaxial accelerometer Model 131

Main Characteristics

- ®ICP transmission mode
- Annular shear mode (better than obsolete compression design)
- Dual case isolation with internal Faraday shield (suitable for permanent installation, no need for insulation pad, no ground loop)
- Low, medium and high frequency version (10, 50, 100, 500, 1000 mV/g)
- Hermetically sealed (laser welded)

Competitive advantage

- Compare to obsolete compression design, annular shear piezoelectric sensors feature better frequency response, improved base strain, lower noise, smaller size, thermal transient imunity and insensitivity to cable motion. Annular shear mode is also less susceptible to transverse vibrations and better immune to electronic saturation at high frequency.
- improved dynamic range (thanks to exceptional bias stability) at elevated temperatures.
- Resistant to shock (magnet mounting) thanks to Jfet transistor input.
- ESD and reverse wiring protection.
- The glass seal hermetic connector protects the piezoelectric disc and the electronic from harmful environmental influences, significantly increasing their reliability and lifetime. Associated with low cost IP68 overmolded M12 cable assembly it is a perfect solution for submersible application down to 150 metres. Sensors with epoxy seal will leak after few temperature cycles.
- M12 connector offers compatibility with numerous sensors used in automation. M12 overmolded cable assemblies are available from many cable manufacturers around the world. Mil cordset are expensive because they are only available from vibration sensor manufacturer.

Description

The hermetic sealed triaxial industrial piezoelectric accelerometer model 131 is design to monitor the vibration in harsh industrial environment. It uses the industry standard ®ICP 2-wire voltage transmission technique with a 2 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=9X, 0X) 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, ...

Model 131.01

3 : 10 mV/g ±5 % (high frequency)
3D : 10 mV/g ±10 % (high frequecy)

5 : 50 mV/g ±5 % (high to medium frequency)
5D : 50 mV/g ±10 % (high to medium frequency)

6 : 100 mV/g ±5 % (medium frequency, general purpose)
6D : 100 mV/g ±10 % (medium frequency, general purpose)
6Q : 100 mV/g ±15 % (medium frequency, general purpose)

9 : 500 mV/g ±5 % (low frequency down to 0.2 Hz)
9D : 500 mV/g ±10 % (low frequency down to 0.2 Hz

0 : 1000 mV/g ±5 % (low frequency down to 0.2 Hz)
0D : 1000 mV/g ±10 % (low frequency down to 0.2 Hz

Available suffix : N, negative polarity

B : Connector
2 : M12 glass seal

MM : Captive screw
M6 : M6x1
M7 : 1/4" 28 UNF 2A

YY : Agency Approval
omitted : no agency approval
Y1 : Atex approved (please call for availability)

Special Engraving :
Add ZXX at the end of the part number.
XX is a number supplied by VibraSens

*** Most Popular model :**
131.01-6D-2-M6 / 131.01-9-2-M6

Ordering information Model 131.01

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

131.01- AA - B - MM - YY

AA : Sensitivity

Specifications (24°C)

Dynamic

Frequency response (±3 dB)
- A=3X (Z axis) ..... 0.5 to 11000 Hz
- (X, Y axis) ..... 0.5 to 8000 Hz
- A=5X, 6X (Z axis) ..... 0.5 to 10000 Hz
- (X, Y axis) ..... 0.5 to 7000 Hz
- A=9X (X, Y, Z axis) ..... 0.2 to 3700 Hz
- A=0X (X, Y, Z axis) ..... 0.2 to 3700 Hz

Mounted Resonant frequency
- A=3X ..... 35 kHz Nom
- A=5X ..... 25 kHz Nom
- A=6X ..... 25 kHz Nom
- A=9X, 0X ..... 16 kHz Nom

Dynamic range
- A=3X ..... 800 g pk
- A=5X ..... 160 g pk
- A=6X ..... 80 g pk
- A=9X ..... 16 g pk
- A=0X ..... 8 g pk

Transverse response sensitivity (20Hz, 5g) ..... <5%
Temperature response ..... -10% at -50°C
..... +6% at 120 °C
Polarity ..... see figure 1b
Linearity ..... ±1% Max
Warm up time (Typical)
- A=3X, 6X ..... < 1Sec
- A=9X, 0X ..... < 10 Sec

Electrical

Electrical Grounding ..... Isolated from machine ground
..... Internal Faraday shielding (fig. 1)
Isolation(Case to shield) ..... 100 MΩ Min
Output impedance ..... 50 ΩNom
DC output bias, 4mA supply (AA=3X, 6X) ..... 12 VDC Nom (Fig 2)
DC output Bias, 4 mA supply (AA=9X, 0X) ..... 10 VDC Nom (Fig 2)
DC temperature response ..... +5% at -50 °C
..... -15% at max operating temperature
Residual noise (24°C) : A=3X
- 1 Hz to 25 kHz ..... 300 ug rms
- 1 Hz ..... 30 ug

Residual noise (24°C) : A=6X
- 1 Hz to 25 kHz ..... 300 ug rms
- 1 Hz ..... 30 ug

Residual noise (24°C) : A=9X
- 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= 3X, 5X, 6X ..... -55 to 120 °C (-65 to 250 °F)
- A=9X ..... -55 to 90 °C (-65 to 212 °F)
- A=0X ..... -55 to 70 °C (-65 to 158 °F)

Humidity / Enclosure
- B= 2 ..... Not affected, hermetically sealed, 1E-8torr.l/s

Acceleration limit : Shock ..... 5 000g peak
: Continuous vibration ..... 500g peak
Temp. transient sens. (3Hz, LLF, 20dB/dec) ..... 5 mg/°C
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
- B=2 ..... Fig. 1b

Design ..... Ceramic, annular shear mode
Weight with connector
- A=3X ..... 228 gr Nom (8.0 Oz)
- A=5X, 6X ..... 238 gr Nom (8.4 Oz)
- A=9X, 0X ..... 275 gr Nom (9.7 Oz)

Connector
- B=2 ..... M12 glass seal, IEC 60947-5-2

Material ..... AISI 316L, DIN 1.4404 (Stainless steel)
Mounting torque (M6, M7 suffix) ..... 2,4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied
..... Sensitivity (5g, 160 Hz)
..... No frequency response

Accessories, not supplied

Cable assembly B=2 (M12 connector)
- Polyurethane cable 10.01-E02-A01-31-Length
- For more cable option see Model 10.01 (specific cable harness).

Accessories, spares part

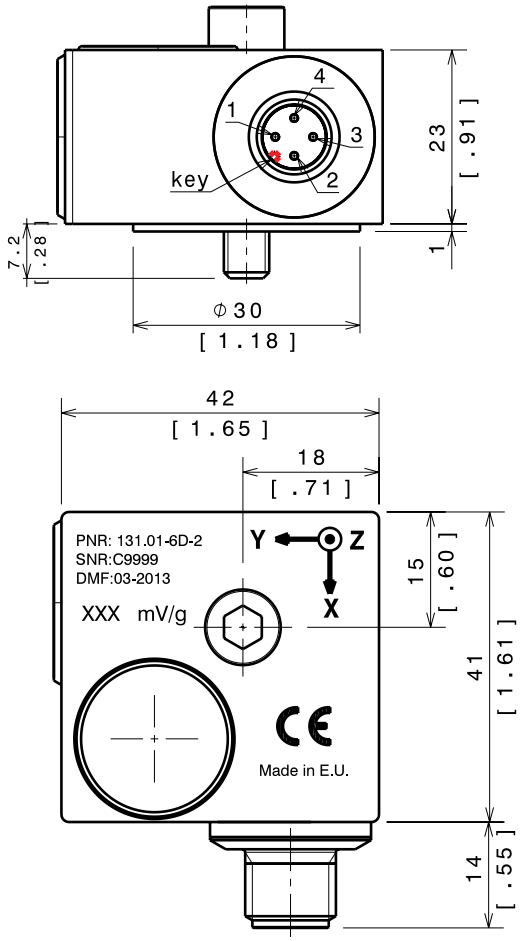
Mounting Stud
- M6 machine thread 193.31-06-1
- 1/4" 28 UNF machine thread 193.31-16-1

Repair

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

(1) Guaranted if using accessories listed in this product datasheet only

Drawings



	Pin 1	Pin 2	Pin 3	Pin 4
Connector Wiring	X	Y	GND	Z
M12 Cable Wiring 10.01-E02-XXX-31-Length	**Brown**	**White**	**Blue**	**Black**

Fig 1b : Outline drawing

®ICP, triaxial accelerometer Model 138

Main Characteristics

- ®ICP transmission mode
- Annular shear mode (better than obsolete compression design)
- Dual case isolation with internal Faraday shield (suitable for permanent installation, no need for insulation pad, no ground loop)
- medium and high frequency version (10, 50, 100 mV/g)
- Hermetically sealed (laser welded)

Competitive advantage

- World smallest industrial triaxial accelerometer. Industrial means with internal faraday shield isolated from mounting surface.
- Compare to obsolete compression design, annular shear piezoelectric sensors feature better frequency response, improved base strain, lower noise, smaller size, thermal transient imunity and insensitivity to cable motion. Annular shear mode is also less susceptible to transverse vibrations and better immune to electronic saturation at high frequency.
- improved dynamic range (thanks to exceptional bias stability) at elevated temperatures.
- Resistant to shock (magnet mounting) thanks to protected Mos-Fet transistor input.
- ESD and reverse wiring protection.
- The glass seal hermetic connector protects the piezoelectric disc and the electronic from harmful environmental influences, significantly increasing their reliability and lifetime. Associated with low cost IP68 overmolded M12 cable assembly it is a perfect solution for submersible application down to 150 metres. Sensors with epoxy seal will leak after few temperature cycles.
- M12 connector offers compatibility with numerous sensors used in automation. M12 overmolded cable assemblies are available from many cable manufacturers around the world. Mil cordset are expensive because they are only available from vibration sensor manufacturer.

Description

The hermetic sealed triaxial industrial piezoelectric accelerometer model 138 is design to monitor the vibration in harsh industrial environment. It uses the industry standard ®ICP 2-wire voltage transmission technique with a 2 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.

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, ...

Model 138.01

Ordering information Model 138.01

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

138.01- AA - B - MM - YY

AA : Sensitivity

3 : 10 mV/g ±5 % (high frequency)
3D : 10 mV/g ±10 %

5 : 50 mV/g ±5 % (high to medium frequency)
5D : 50 mV/g ±10 %

6 : 100 mV/g ±5 % (medium frequency, general purpose)
6D : 100 mV/g ±10 %
6Q : 100 mV/g ±15 %

Available suffix : N, negative polarity

B : Connector

2 : M12 glass seal

MM : Captive screw

M6 : M6x1
M7 : 1/4" 28 UNF 2A

YY : Agency Approval

omitted : no agency approval
Y1 : Atex approved (please call for availability)

Special Engraving :

Add ZXX at the end of the part number.
XX is a number supplied by VibraSens

*** Most Popular model :**

138.01-6D-2-M6 / 138.01-3D-2-M6

Specifications (24°C)

Dynamic

Frequency response (±3 dB)
A=3X , 5X, 6X (Z axis) ..... 0.5 to 13000 Hz
(X, Y axis) ..... 0.5 to 10000 Hz
Mounted Resonant frequency
A=3X, 5X, 6X ..... 40 kHz Nom
Dynamic range
A=3X ..... 800 g pk
A=5X ..... 160 g pk
A=6X ..... 80 g pkk
Transverse response sensitivity (20Hz, 5g) ..... <5%
Temperature response ..... -10% at -50°C
..... +10% at 120 °C
Polarity ..... see figure 1b
Linearity ..... ±1% Max
Warm up time (Typical)
A=3X, 5X, 6X ..... < 1Sec

Electrical

Electrical Grounding ..... Isolated from machine ground
..... Internal Faraday shielding
Isolation(Case to shield) ..... 100 MΩ Min
Output impedance ..... 50 ΩNom
DC output bias, 4mA supply (AA=3X, 5X, 6X) ..... 12 ± 2 VDC
DC temperature response ..... ±2% at -50 °C
..... ±2% at max operating temperature
Residual noise (24°C) : A=3X
1 Hz to 25 kHz ..... 300 ug rms
1 Hz ..... 30 ug
Residual noise (24°C) : A=6X
1 Hz to 25 kHz ..... 300 ug rms
1 Hz ..... 30 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= 3X, 5X, 6X ..... -55 to 120 °C (-65 to 250 °F)
Humidity / Enclosure
B= 2 ..... Not affected, hermetically sealed, 1E-8torr.l/s
Acceleration limit : Shock ..... 5 000g peak
: Continuous vibration ..... 500g peak
Temp. transient sens. (3Hz, LLF, 20dB/dec) ..... 5 mg/°C
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
B=2 ..... Fig. 1b
Design ..... Ceramic, annular shear mode
Weight with connector
A=3X, 5X, 6X ..... 84 gr Nom (3.0 Oz)
Connector
B=2 ..... M12 glass seal, IEC 60947-5-2
Material ..... AISI 316L, DIN 1.4404 (Stainless steel)
Mounting torque (M6, M7 suffix) ..... 2,4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied
..... Sensitivity (5g, 160 Hz)
..... No frequency response

Accessories, not supplied

Cable assembly B=2 (M12 connector)
Polyurethane cable 10.01-E02-A01-31-Length
For more cable option see Model 10.01 (specific cable harness).

Accessories, spares part

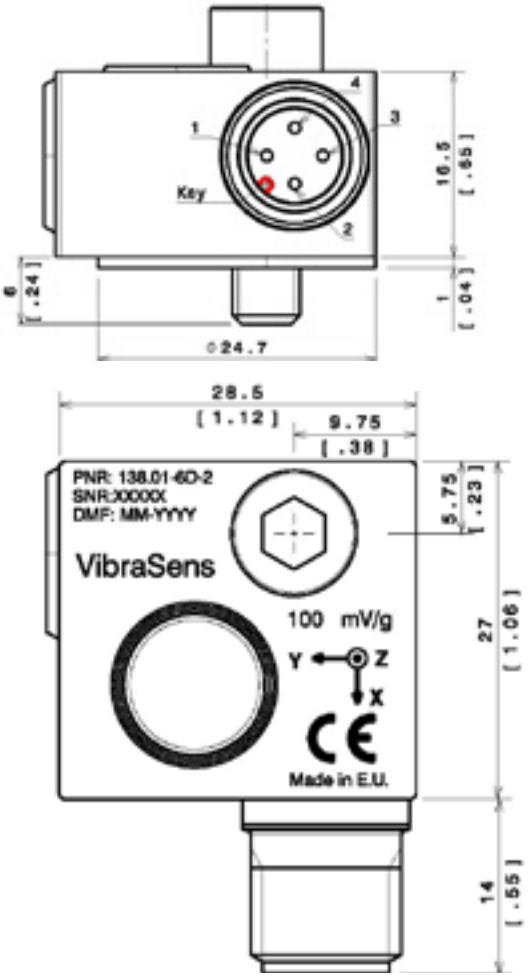
Mounting Stud
M6 machine thread 193.38-06-1
1/4" 28 UNF machine thread 193.38-16-1

Repair

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

(1) Guaranted if using accessories listed in this product datasheet only

Drawings



	Pin 1	Pin 2	Pin 3	Pin 4
Connector Wiring	X	Y	GND	Z
Standard M12 Cable Wiring 10.01-E02-XX-31-Length	**Brown**	**White**	**Blue**	**Black**

Fig 1b : Outline drawing

Contents

Stud, Non Isolated, Model 191

Main Characteristics

- -260°C to 700 °C (-436°F to 1292°F) (options dependant)
- Large choice of options for material and thread
- For top connector accelerometer model 101 and 105

Description

This is the most usual method for accelerometer mounting. These studs are detacheable, permiting rapid, low cost replacement. They are used by most accelerometer manufacturers but they are not fully compatible due to the sensor shoulder diameter and the thread length . You should not use ordinary machine screw because they lack a flange or shoulder and might bottom in the accelerometer and degrades his dynamic response. Stud mounting is considered as the most reliable way to mount a vibration sensor. Stud mounting will attain the maximum sensor frequency range. Stud mountind requires a tapped hole drilled directly into the structure. The sensor requires a flat spot faced surface with a perpendicular tapped hole.

Ordering information

To order, specify part number, options and suffix :

191.01- AA - B B - C (Mod)

AA : Sensor end
05 - M5x0.8
06 - M6x1
15 - 10-32 UNF 2A
16 - 1/4 28 UNF 2A

BB : Machine/Structure end
05 - M5x0.8
06 - M6x1
08 - M8x1.25
15 - 10-32 UNF 2A
16 - 1/4 28 UNF 2A

C : Material
1 - Aisi 303
2 - Aisi 316L
3 - Nimonic 90

(Mod)
(Mod)** : modification defined by customers. For example shoulder diameter.

Ordering example

191.01-05-05-1 Stud, non isolated

Stocked models :

191.01-15-15-1 / 191.01-15-05-1 / 191.01-06-06-1 / 191.01-06-16-1 / 191.01-06-08-1 / 191.01-16-06-1 / 191.01-16-16-1 / 191.01-16-08-1

Competitor's cross reference list

VibraSens Ref.	Competitor's Ref.
191.01-16-16-1	Wilcoxon SF6, PCB 081B20
191.01-16-06-1	PCB M081B20
191.01-15-15-1	Wilcoxon SF1, Endevco 2984-2, PCB 081B05
191.01-15-05-1	PCB M081B23
191.01-15-06-1	PCB M081B05
191.01-15-16-1	Wilcoxon SF3, Endevco 22330, PCB 081A08
191.01-16-08-1	Wilcoxon SF6M,
191.01-16-06-1	Wilcoxon SF6M-1,

Model 191.01-06-1

Specifications

Environmental

Temperature
C=1, 2 ..... -70°Cto 260 °C (-436 to 500 °F)
C=3 ..... -260 to 700 °C (-436 to 1292 °F)

Physical

Dimensions ..... See outline drawing
Weight ..... between 1.5 and 3 gr
..... between 0.05 and 0.1 Oz

Material

C=1 ..... AISI 303, DIN1.4301, AFNOR Z10 CNF 18 09
C=2 ..... AISI 316L, DIN1.4404, AFNOR Z2 CND 17 13
C=3 ..... Nimonic 90, WNR 2.4969

Mounting torque

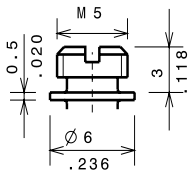
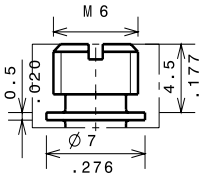
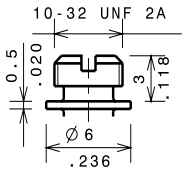
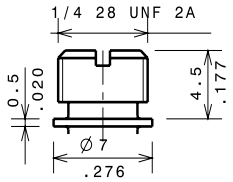
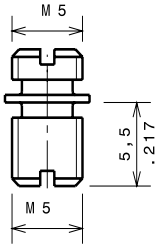
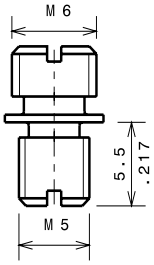
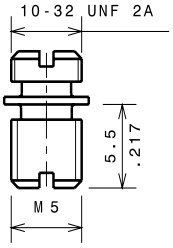
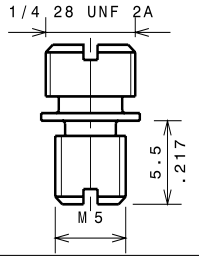
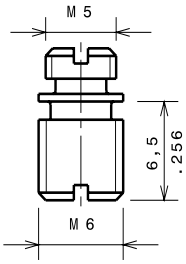
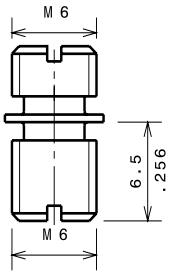
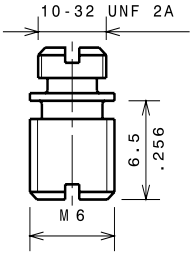
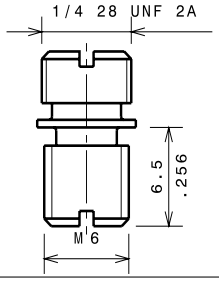
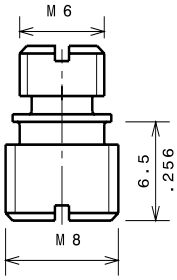
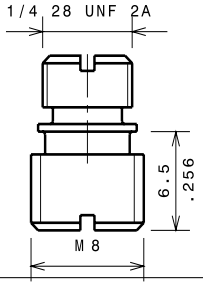
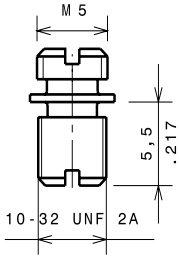
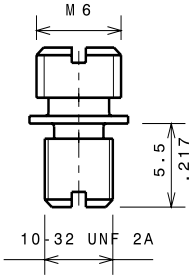
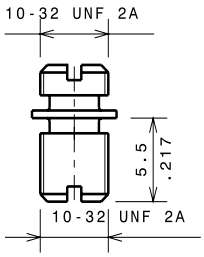
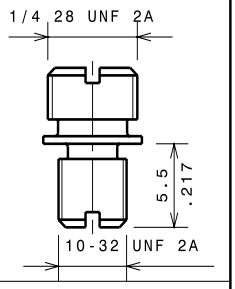
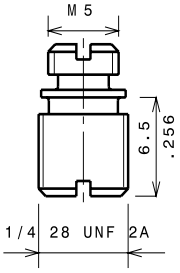
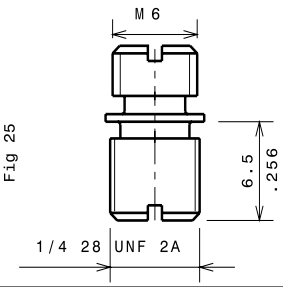
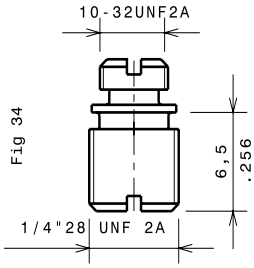
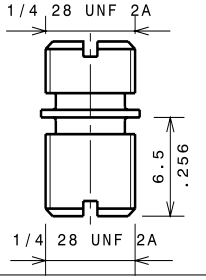
AA=05, 15 or BB=05, 15 ..... 2 N.m (18 in-lbs)
AA=06, 16 or BB=06, 16 ..... 2.7 N.m (24 in-lbs)

Outline drawing

See table below to check the associated drawing

			BB (Machine)				
			05	06	08	15	16
			M5x0.8	M6x1	M8x1.25	10-32 UNF 2A	1/4 28 UNF 2A
AA (sensor)	05	M5x0.8	Fig 11	Fig 12		Fig 13	Fig 14
	06	M6x1	Fig 21	Fig 22	Fig 23	Fig 24	Fig 25
	15	10-32 UNF 2A	Fig 31	Fig 32		Fig 33	Fig 34
	16	1/4 28 UNF 2A	Fig 41	Fig 42	Fig 43	Fig 44	Fig 45

Drawings

Sensor end	M5	M6	10-32 UNF 2A	1/4 28 UNF 2A
				
	Fig 11 	Fig 21 	Fig 31 	Fig 41 
	Fig 12 	Fig 22 	Fig 32 	Fig 42 
		Fig 23 		Fig 43 
	Fig 13 	Fig 24 	Fig 33 	Fig 44 
	Fig 14 	Fig 25 	Fig 34 	Fig 45 

Bolt, captive, Hex socket, Model 193

Model 193.01-06-1

Main Characteristics

- -260°C to 260 °C (-436°F to 500°F)
- Bolt for accelerometer model 103 and 107

Description

This bolt is used to mount side connector industrial accelerometers (model 103 and 107) with through hole mounting.

Ordering information

To order, specify part number, options and suffix :

193.01- AA - C (Mod)

AA : Machine/Structure end

06 - M6x1
16 - 1/4 28 UNF 2A

C : Material

1 - Aisi 303
2 - Aisi 316L

(Mod)

(Mod)** : modification defined by customers. For example shoulder diameter.

Ordering example

193.01-06-1 Bolt, captive, Hex socket

Stocked models :

193.01-06-1 and 193.01-16-1

Specifications

Environmental

Temperature .....-260 to 260 °C (-436 to 500 °F)

Physical

Dimensions ..... See outline drawing
Weight .....~7 gr (~ 0.25 Oz)

Material

C=1.....AISI 303, DIN1.4301, AFNOR Z10 CNF 18 09
C=2.....AISI 316L, DIN1.4435, AFNOR Z2 CND 17 13
Mounting torque..... 2.7 N.m (24 in-lbs)

Outline drawing

See table below to check the associated drawing

	AA	Figures
M6x1	06	Fig 21
1/4 28 UNF 2A	16	Fig 41

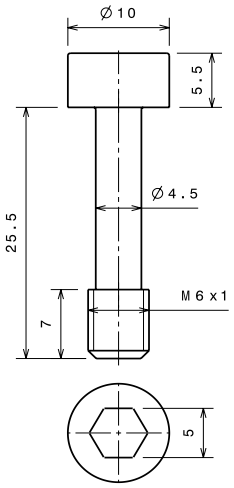


Fig 21

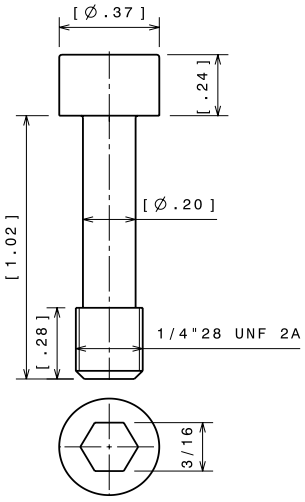


Fig 41

Bolt, captive, Hexagonal, Model 194

Model 194.01-08-1

Main Characteristics

- -260°C to 260 °C (-436°F to 500°F)
- Bolt for accelerometer model 104

Description

This bolt is used to mount side connector industrial accelerometers (model 104) with through hole mounting.

Ordering information

To order, specify part number, options and suffix :

194.01- AA - C (Mod)

AA : Machine/Structure end

08 - M8x1.25

C : Material

1 - Aisi 303

2 - Aisi 316L

(Mod)

(Mod)** : modification defined by customers. For example shoulder diameter.

Ordering example

194.01-08-1 Bolt, captive, Hex socket

Stocked models :

194.01-08-1

Specifications

Environmental

Temperature .....-260 to 260 °C (-436 to 500 °F)

Physical

Dimensions ..... See outline drawing

Weight ..... ~9 gr (~ 0.35 Oz)

Material

C=1.....AISI 303, DIN1.4301, AFNOR Z10 CNF 18 09

C=2.....AISI 316L, DIN1.4435, AFNOR Z2 CND 17 13

Mounting torque..... 2.7 N.m (24 in-lbs)

Outline drawing

See table below to check the associated drawing

	AA	Figures
M8x1.25	08	Fig 11

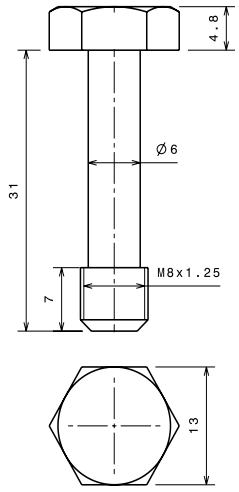


Fig 11

Flat magnet, Model 210

Main Characteristics

- portable route measurements
- high temperature up to 200°C
- for top connector sensors with M5 and 10-32 UNF thread
- for flat surfaces only
- Stainless steel

Description

The use of magnet bases is convenient and quick for many applications (route measurements). They produce an intimate and stiff contact between DC and few kilohertz. The high frequency response (above few kHz) is significantly distored. Obviously the machine surface should be magnetically attractive and free of paint chips and scale. Painted surface should use our stainless steel magnet target model 208 that greatly improve the high frequency response. We also recommend the use of coupling fluids, such as oil.

Customer should pay attention to magnet attaching on the machine. The shock could overload the vibration sensor and destroy the electronic.

Ordering information

To order, specify part number, options and suffix :

210.01- AA - BB

AA : Sensor thread

05 - M5x0.8
15 - 10-32 UNF

BB : Diameter

19 - 19 mm

Stocked models :

210.01-15-19

Ordering example

210.01-15-19 Flat magnet, 10-32 UNF

Specifications

Dynamic

Frequency response ..... 10% : DC to 2.5 kHz
..... see fig 4a

Environmental

Temperature ..... -55°C to 200 °C (-67°F to 320°F)

Physical

Dimensions ..... See outline drawing Fig 1a
Weight ..... ~9.5 gr (0.33 Oz)
Material ..... Stainless steel
Magnet ..... high temperature rare eath magnet
pull force ..... 23 kg (50 Lbs)

Accessories

Magnet targets ..... model 208

Competitors cross reference list

Wilcoxon B2a, B4 / CTC online TBD / PCB TBD / AMPO EMID 22 / Dytran

Model 210.01-15-19

Outline drawing

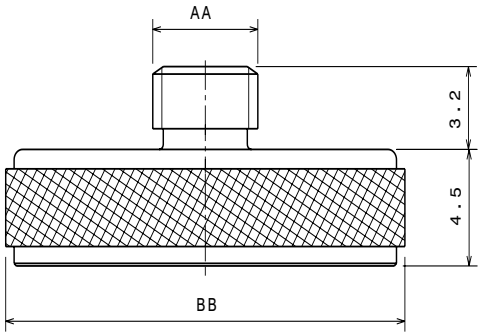


Fig 1a

Mounting drawing

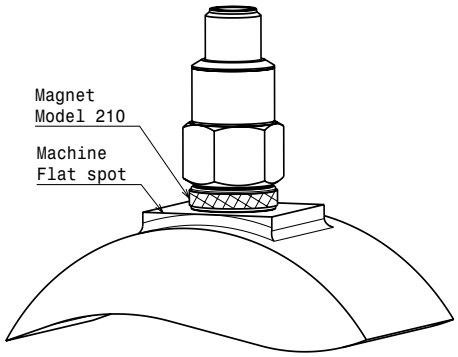


Fig 2a

Typical frequency response

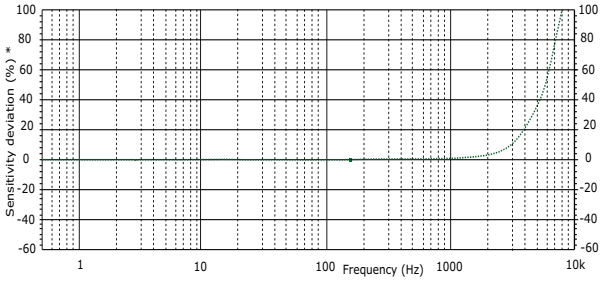


Fig 4a

Flat magnet, Model 211

Main Characteristics

- portable route measurements
- for top connector vibration sensors with M6 and 1/4" 28 UNF thread
- for flat surfaces only (to be used whenever possible with our magnet targets model 208)
- Stainless steel

Description

The use of magnet bases is convenient and quick for many applications (route measurements). They produce an intimate and stiff contact between DC and few kilohertz. The high frequency response (above few kHz) is significantly distored. Obviously the machine surface should be magnetically attractive and free of paint chips and scale. Painted surface should use our stainless steel magnet target model 208 that greatly improve the high frequency response. We also recommend the use of coupling fluids, such as oil.

Customer should pay attention to magnet attaching on the machine. The shock could overload the vibration sensor and destroy the electronic.

Ordering information

To order, specify part number, options and suffix :

211.01- AA - BB

AA : Sensor thread

06 - M6x1

16 - 1/4" 28 UNF

BB : Diameter

25 - 25 mm

Stocked models :

211.01-06-25 / 211.01-16-25

Ordering example

211.01-06-25 Flat magnet, M6

Specifications

Dynamic

Frequency response ..... 10% : DC to 2.5 kHz

..... see fig 4a

Environmental

Temperature ..... -55°C to 160 °C (-67°F to 320°F)

Physical

Dimensions ..... See outline drawing Fig 1a

Weight ..... ~ 42 gr (~ 1.5 Oz)

Material ..... Stainless steel

Magnet ..... high temperature rare eath magnet

pull force ..... 23 kg (50 Lbs)

Accessories

Magnet targets ..... model 208

Competitors cross reference list

Wilcoxon B3 / CTC online MH103-1B - MH136-1A / PCB 080A121 (080A120) / AMPO EMID 22 (very low pull force) / Dytran

Model 211.01-06-25

Outline drawing

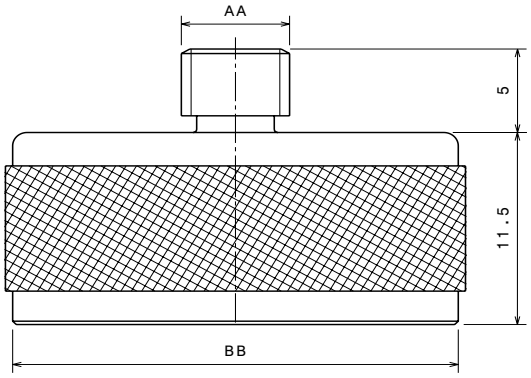


Fig 1a

Mounting drawing

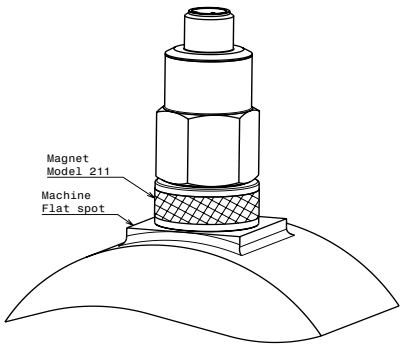


Fig 2a

Typical frequency response

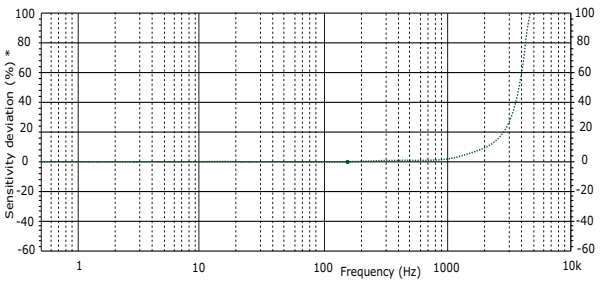


Fig 4a

Flat magnet, Model 212

Main Characteristics

- portable route measurements
- for side connector sensors with M6 and 1/4” 28 UNF thread
- for flat surfaces only (to be used whenever possible with our magnet targets)
- Stainless steel

Description

The use of magnet bases is convenient and quick for many applications (route measurements). They produce an intimate and stiff contact between DC and few kilohertz. The high frequency response (above few kHz) is significantly distored. Obviously the machine surface should be magnetically attractive and free of paint chips and scale. Painted surface should use our stainless steel magnet target model 208 that greatly improve the high frequency response. We also recommend the use of coupling fluids, such as oil.
Customer should pay attention to magnet attaching on the machine. The shock could overload the sensor and destroy the electronic.

Ordering information

To order, specify part number, options and suffix :

212.01- AA - BB

AA : Sensor thread
06 - M6x1
16 - 1/4” 28 UNF

BB : Diameter
25 - 25 mm

Stocked models :

212.01-06-25 / 212.01-16-25

Ordering example

212.01-06-25 Flat magnet, M6

Specifications

Dynamic

Frequency response ..... 10% : DC to 2.5 kHz
..... see fig 4a

Environmental

Temperature ..... -55°C to 160 °C (-67°F to 320°F)

Physical

Dimensions ..... See outline drawing Fig 1a
Weight ..... ~63 gr (~2.22 Oz)
Material ..... Stainless steel
Magnet ..... high temperature rare eath magnet
pull force ..... 23 kg (50 Lbs)

Accessories

Magnet targets ..... model 208

Competitors cross reference list

Wilcoxon B3 / CTC online MH103-1B - MH136-1A / PCB 080A121 (080A120) / AMPO EMID 22 (very low pull force)

Model 212.01-06-25

Outline drawing

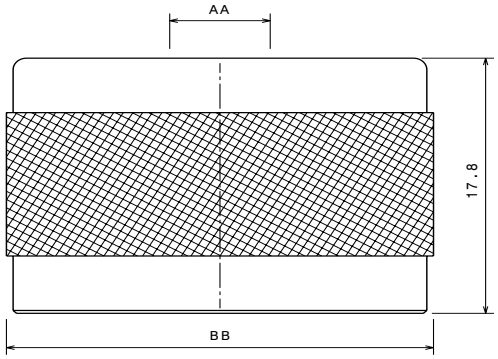


Fig 1a

Mounting drawing

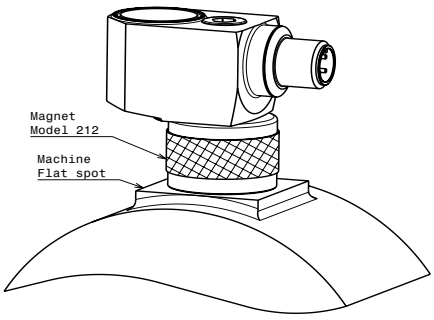


Fig 2a

Typical frequency response

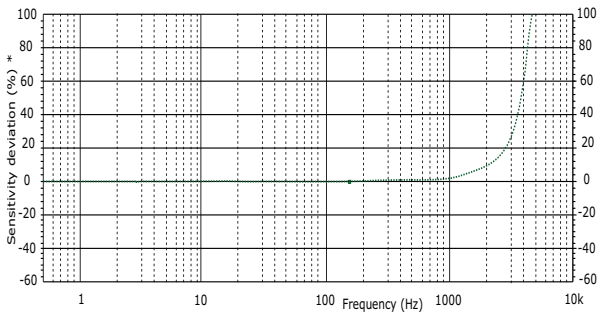


Fig 4a

Curved magnet, Model 220

Main Characteristics

- portable route measurements
- for top connector sensors with M6 and 1/4” 28 UNF thread
- for flat surfaces only (to be used whenever possible with our magnet targets)
- Stainless steel

Description

The use of magnet bases is convenient and quick for many applications (route measurements). They produce an intimate and stiff contact between DC and few kilohertz. The high frequency response (above few kHz) is significantly distored. Obviously the machine surface should be magnetically attractive and free of paint chips and scale. Painted surface should use our stainless steel magnet target model 208 that greatly improve the high frequency response. We also recommend the use of coupling fluids, such as oil.
Customer should pay attention to magnet attaching on the machine. The shock could overload the sensor and destroy the electronic.

Ordering information

To order, specify part number, options and suffix :

220.01- AA - BB

AA : Sensor thread
06 - M6x1
16 - 1/4” 28 UNF

BB : Diameter
25 - 25 mm

Stocked models :

220.01-06-25 / 220.01-16-25

Ordering example

220.01-06-25 Curved magnet, M6

Specifications

Dynamic

Frequency response ..... 10% : DC to 2.5 kHz
..... see fig 4a

Environmental

Temperature ..... -55°C to 160 °C (-67°F to 320°F)

Physical

Dimensions ..... See outline drawing Fig 1a
Weight ..... ~48 gr (~ 1.70 Oz)
Material ..... Stainless steel
Magnet ..... high temperature rare eath magnet
pull force ..... 23 kg (50 Lbs)

Accessories

Magnet targets ..... model 208

Competitors cross reference list

Wilcoxon B3 / CTC online MH103-1B - MH136-1A / PCB 080A121 (080A120) / AMPO EMID 22 (very low pull force)

Model 220.01-06-25

Outline drawing

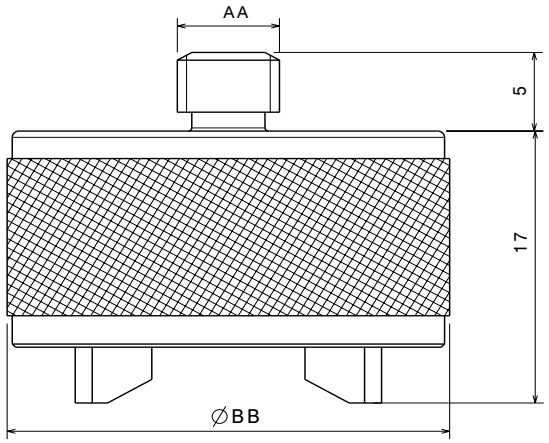


Fig 1a

Mounting drawing

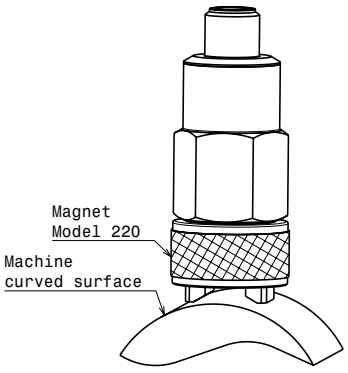


Fig 2a

Typical frequency response

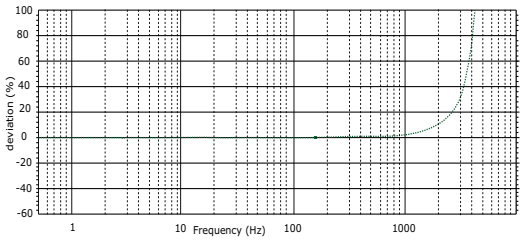


Fig 4a

Curved magnet, Model 221

Main Characteristics

- portable route measurements
- for side connector sensors with M6 and 1/4" 28 UNF thread
- for flat surfaces only (to be used whenever possible with our magnet targets)
- Stainless steel

Description

The use of magnet bases is convenient and quick for many applications (route measurements). They produce an intimate and stiff contact between DC and few kilohertz. The high frequency response (above few kHz) is significantly distored. Obviously the machine surface should be magnetically attractive and free of paint chips and scale. Painted surface should use our stainless steel magnet target model 208 that greatly improve the high frequency response. We also recommend the use of coupling fluids, such as oil.
Customer should pay attention to magnet attaching on the machine. The shock could overload the sensor and destroy the electronic.

Ordering information

To order, specify part number, options and suffix :

221.01- AA - BB

AA : Sensor thread
06 - M6x1
16 - 1/4" 28 UNF

BB : Diameter
25 - 25 mm

Stocked models :

221.01-06-25 / 221.01-16-25

Ordering example

221.01-06-25 Curved magnet, M6

Specifications

Dynamic

Frequency response ..... 10% : DC to 2.5 kHz
..... see fig 4a

Environmental

Temperature ..... -55°C to 160 °C (-67°F to 320°F)

Physical

Dimensions ..... See outline drawing Fig 1a
Weight ..... ~75 gr (~ 2.64 Oz)
Material ..... Stainless steel
Magnet ..... high temperature rare eath magnet
pull force ..... 23 kg (50 Lbs)

Accessories

Magnet targets ..... model 208

Competitors cross reference list

Wilcoxon B3 / CTC online MH103-1B - MH136-1A / PCB 080A121 (080A120) / AMPO EMID 22 (very low pull force)

Model 221.01-06-25

Outline drawing

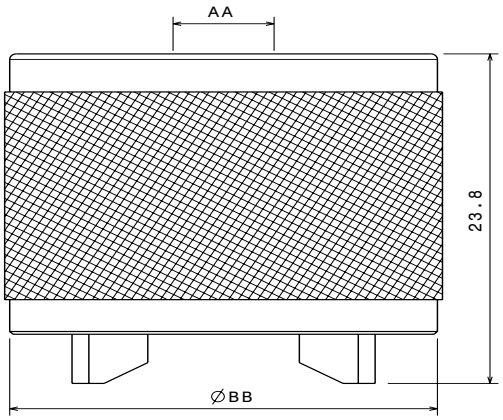


Fig 1a

Mounting drawing

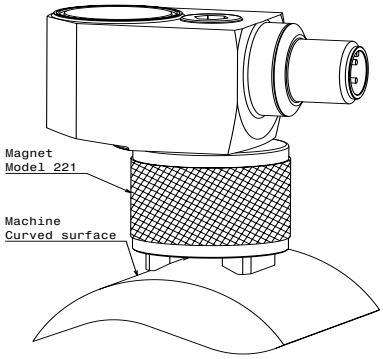


Fig 2a

Typical frequency response

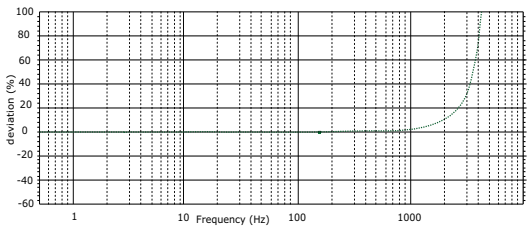


Fig 4a

Magnetic mounting pad, Model 208

Main Characteristics

- portable route measurements
- impoved frequency response when used with our magnet model 210, 211, ..
- Useful for machine without magnetic surface
- Stainless steel

Description

The use of magnetic mounting pad ensures consistent measurement location for accurate trending. It also greatly improves the frequency response when used with our magnet model 210, 211, ... Magnetic mounting pads / magnet targets are the only way to use flat or curved magnet when the machine to be monitored has no magnetic surface. Our pads feature an abraded adhesive mounting surface for superior bonding.

Ordering information

To order, specify part number, options and suffix :

208.01- BB

BB : Diameter

25 - 25 mm

Ordering example

208.01-25 Magnetic mounting pad, dia 25

Stocked models :

208.01-25

Specifications

Environmental

Temperature ..... depends on adhesive

Physical

Dimensions ..... See outline drawing Fig 1a
Weight ..... 22 gr (0.78 Oz)
Material ..... Stainless steel

Accessories

Magnet ..... model 21X, 22X
Adhesive ..... Loctite 330

Competitors cross reference list

Model 208.01-25

Outline drawing

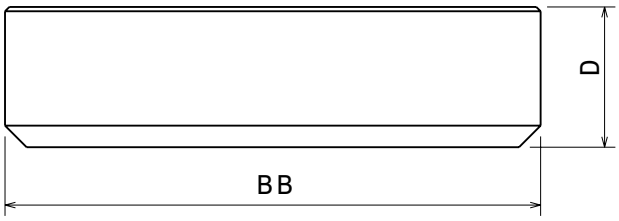


Fig 1a

Mounting drawing

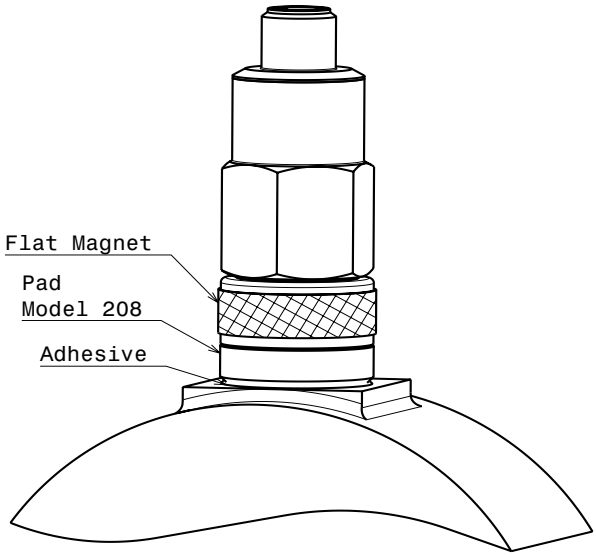


Fig 2a

Cementing - Adhesive pad, Model 202

Main Characteristics

- Permanent mounting in corrosive environment
- For industrial top connector accelerometer
- Stainless steel (AISI 316L)

Description

Cementing pads are used for permanent installations. It eliminates tapping into the structure but provide high frequency capability approaching stud mount. The pad is epoxied in place of the tapped hole; the sensor is then mounted to the pad. Cementing - adhesive pads can provide additional electrical isolation. Adhesive selection is critical for long term reliability. Our cemented pads feature a flat abraded mounting surface for superior bonding and a stud (M5, 10-32 UNF, M6 or 1/4" 28 UNF) for mounting the accelerometer.

Ordering information

To order, specify part number, options and suffix :

202.01- AA - BB - C

AA : Sensor thread
05 - M5x0.8
15 - 10-32 UNF
06 - M6x1
16 - 1/4" 28 UNF

BB : Hexagonal
13 - 13 mm
19 - 19 mm
22 - 22 mm

C : Material
2 - AISI 316L

Stocked models :

202.01-06-22-2 / 202.01-16-22-2

Ordering example

202.01-06-22-2 Adhesive pad, M6, AISI 316

Specifications

Environmental

Temperature ..... depends on adhesive

Physical

Dimensions ..... See outline drawing Fig 1a

Weight .....

202.01-X6-22-2 ..... 17 gr (0.60 Oz)

Material ..... Stainless steel AISI 316L

Accessories

Adhesive ..... Loctite 330

Competitors cross reference list

Wilcoxon SF8, SF8-2 / CTC online MH130-1A, MH133-1A / AMPO ERD20 (not stainless steel)

Model 202.01-06-22-2

Outline drawing

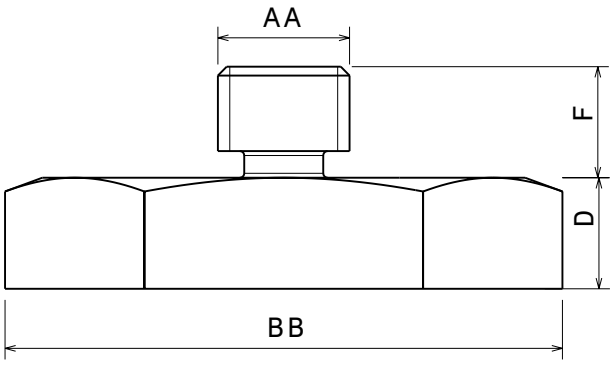


Fig 1a

Model	F (mm)	D (mm)	Application
202.01-06-22-2	3.2	3	Model 101, 105
202.01-16-22-2	4.3	5	101, 105 with H7 option

Mounting drawing

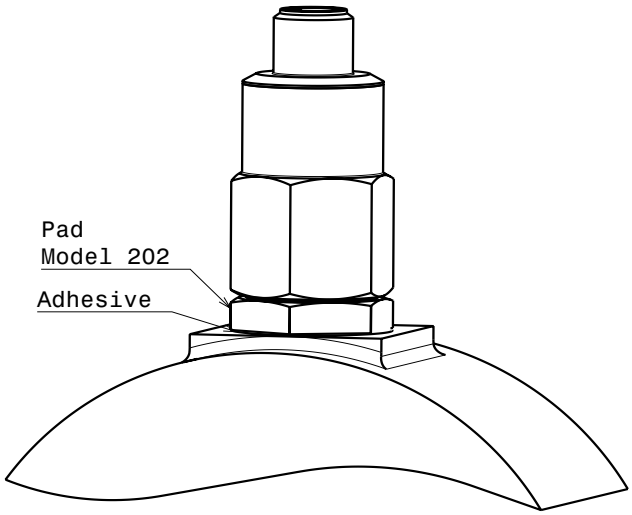


Fig 2a

Cementing - Adhesive pad, Model 204

Main Characteristics

- Permanent mounting
- For industrial top connector accelerometer
- Stainless steel (AISI 303)

Description

Cementing pads are used for permanent installations. It eliminates tapping into the structure but provide high frequency capability approaching stud mount. The pad is epoxied in place of the tapped hole; the sensor is then mounted to the pad. Cementing - adhesive pads can provide additional electrical isolation. Adhesive selection is critical for long term reliability. Our cemented pads feature a flat abraded mounting surface for superior bonding and a stud (M5, 10-32 UNF, M6 or 1/4" 28 UNF) for mounting the accelerometer.

Ordering information

To order, specify part number, options and suffix :

204.01- AA - BB - C

AA : Sensor thread
05 - M5x0.8
15 - 10-32 UNF
06 - M6x1
16 - 1/4" 28 UNF

BB : Diameter
13 - 13 mm
19 - 19 mm
22 - 22 mm

C : Material
1 - AISI 303

Stocked models :

204.01-15-17-1 / 204.01-06-22-1 / 204.01-16-22-1

Ordering example

204.01-06-22-1 Adhesive pad, M6, AISI 303

Specifications

Environmental

Temperature ..... depends on adhesive

Physical

Dimensions ..... See outline drawing Fig 1a
Weight .....
204.01-XX-17-1 ..... 5.5 gr (~ 0.19 Oz)
204.01-XX-22-1 ..... 9.5 gr (~ 0.33 Oz)
Material ..... Stainless steel AISI 303

Accessories

Adhesive ..... Loctite 330

Competitors cross reference list

Wilcoxon SF8, SF8-2 / CTC online MH130-1A, MH133-1A / AMPO ERD20 (not stainless steel)

Model 204.01-06-22

Outline drawing

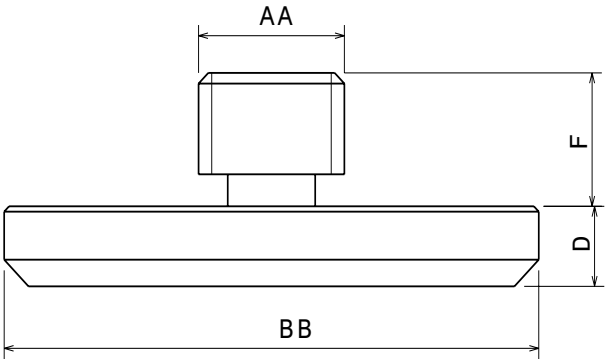


Fig 1a

Model	F (mm)	D (mm)	Application
204.01-15-17-1	3.2	3	Model 108
204.01-06-22-1	4.3	5	Model 101, 105
204.01-16-11-1	4.3	5	101, 105 with H7 option

Mounting drawing

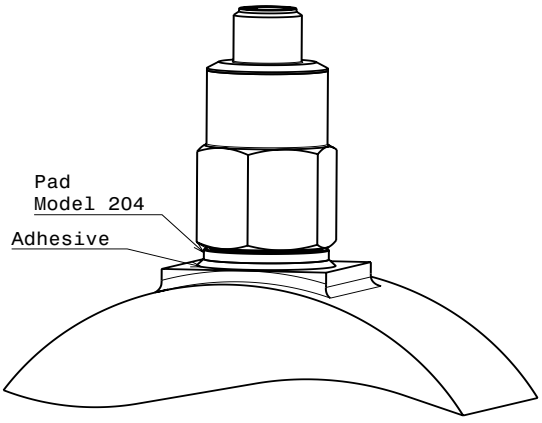


Fig 2a

Cementing - Adhesive pad, Model 206

Main Characteristics

- Permanent mounting
- For industrial side connector accelerometer
- Stainless steel (AISI 303, AISI 316L)

Description

Cementing pads are used for permanent installations. It eliminates tapping into the structure but provide high frequency capability approaching stud mount. The pad is epoxied in place of the tapped hole; the sensor is then mounted to the pad. Cementing - adhesive pads can provide additional electrical isolation. Adhesive selection is critical for long term reliability. Our cemented pads feature a flat abraded mounting surface for superior bonding and a tapped hole (M6, M8 or 1/4" 28 UNF) for mounting the accelerometer.

Ordering information

To order, specify part number, options and suffix :

206.01- AA - BB - C

AA : Sensor thread
06 - M6x1
16 - 1/4" 28 UNF

BB : Diameter
25 - 25 mm

C : Material
1 - AISI 303
2 - AISI 316L

Stocked models :

206.01-16-25-1 / 206.01-06-25-1

Ordering example

206.01-06-25-1 Adhsive pad, M6, AISI 303

Specifications

Environmental
Temperature ..... depends on adhesive

Physical
Dimensions ..... See outline drawing Fig 1a
Weight .....~XX gr (~ XX Oz)
Material .....Stainless steel

Accessories
Adhesive .....Loctite 330

Competitors cross reference list Wilcoxon SF8, SF8-2 / CTC online MH130-1A, MH133-1A / AMPO ERD20 (not stainless steel)

Picture not available

Model 206.01-06-25

Outline drawing

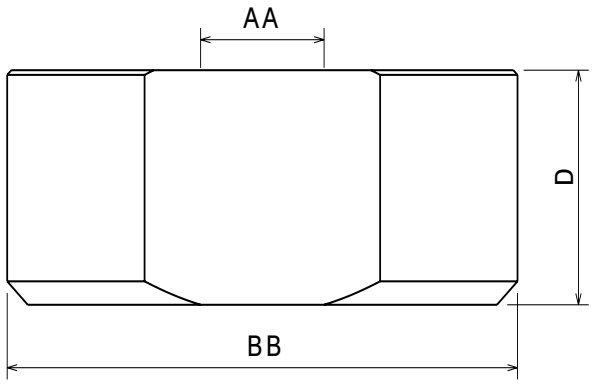


Fig 1a

Model	D (mm)	Application
206.01-06-25-1	10	Model 103
206.01-16-25-1	10	Model 103

Mounting drawing

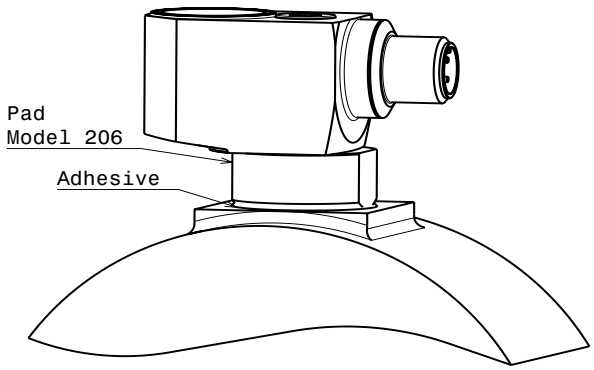


Fig 2a

Contents

Twisted Pair, Model 600103 & 600104

Main Characteristics

- Twisted pair shielded cable
- Rund cable
- -55°C to 200 °C (-67°F to 392°F)
- Selection of halogen free & flame retardant cable
- Selection of Stainless steel (AISI 316) overbraid

Description

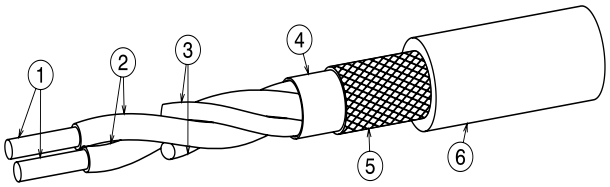


Fig 1 : without overbraid (PNR 600103.XX)

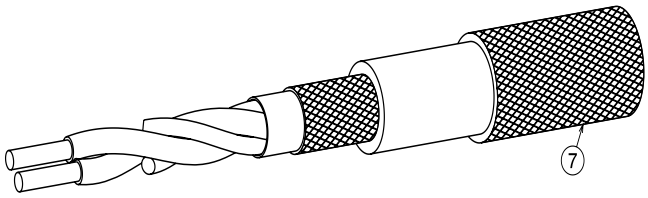


Fig 2 : with overbraid (PNR 600104.XX)

- These cables are specifically manufacture for our applications. they all have fillers for a perfectly rund cable.
- All cables are available with a stainless steel overbraid for harsh environment.

Typical application

- They are used for 2-pole sensors that exhibit a low impedance output :
- ®ICP, piezoresistive, capacitive accelerometer
- velocimeter
- piezoelectric accelerometer with integrated electronic

Ordering information

To order specify the part number with the following options :

600103.XX - AAA or 600104.XX - AAA (for overbraid version)

AAA : Length in meters

Ordering example :

600103.21-010 Twisted pair cable, PU, 10 metres

Overview

600103.21	 Polyurethane / -55 to 90 °C / dia 4.9 mm (0.193 inch) Low cost / good oil resistance / limited chemical resistance
600103.31	 Teflon FEP / -100 to 200 °C / dia 4.7 mm (0.185 inch) expensive / excellent oil resistance / excellent chemical resistance
600103.51	 Radox / -55 to 125 °C / dia 4.3 mm (0.169 inch) expensive / Halogen free and flame retardant
600103.61	Silicone / -50 to 180 °C / dia 6.5 mm (0.255 inch) / Halogen free and flame retardant
600104.21	 600103.21 with AISI 316L (V4A) stainless steel overbraid.
600104.31	 600103.31 with AISI 316L (V4A) stainless steel overbraid.
600104.51	 600103.51 with AISI 316L (V4A) stainless steel overbraid.

Specifications

Construction

(1) Conductors

Material ..... TPC (1)

Gauge (mm)

600103.21, 600103.31 ..... 19x0.203mm / AWG20 / 0.6 mm^2

600103.51 ..... 19x0.18mm / AWG20 / 0.5 mm^2

600103.61 ..... 16x0.2mm / AWG20 / 0.5 mm^2

Diameter (mm)

600103.21, 600103.31 ..... 1 mm

600103.51, 600103.61 ..... 0.9 mm

Lay (twist) ..... 30 mm min

(2) Dielectric

Material , diameter (mm)

600103.21 ..... TPE-E (polyester - ester), 1.33 mm

600103.31 ..... Teflon (FEP), 1.53 mm

600103.51 ..... Radox (see note 3), 1.30 mm

600103.61 ..... Silicone, 2.10 mm

Color conductor 1, conductor 2

600103.21, 600103.31, 600103.61 ..... White, Red

600103.51 ..... White + id 1, White + id 2

(3) Fillers / Rund cable

Filers material

600103.21 ..... Polyamide
600103.31 ..... Teflon (FEP)
600103.51, 600103.61 ..... N/A

(4) Foil

600103.21, 600103.31, 600103.61 ..... Polyester
600103.51 ..... None

(5) Screen

Material, Coverage ..... Braided TPC (note 1), 85% min
Diameter
600103.21 ..... 3.67
600103.31 ..... 3.27
600103.51 ..... 3.1
600103.61 ..... 4.2

(6) Outer sheat

Material / Color / Diameter mm (inch)
600103.21 ..... TPE-U (polyurethane) / Black / 4.9 ±0.2 (0.193 inch)
600103.31 ..... Teflon (FEP) / White / 4.7 ±0.2 (0.185 inch)
600103.51 ..... Radox (see note 3) / Black / 4.3 ±0.2 (0.169 inch)
600103.61 ..... Silicone / Red / 6.4 ±0.2 (0.255 inch)

(7) Overbraid PNR / Material / wire dia / Diameter / coverage

600103.21 ..... 600104.21 / AISI 316 Ti / 0.2 mm / 5.7 mm / 80% Min
600103.31 ..... 600104.31 / AISI 316 Ti / 0.2 mm / 5.5 mm / 80% Min
600103.51 ..... 600104.51 / AISI 316 Ti / 0.2 mm / 5.1 mm / 80% Min
600106.61 ..... N/A

Electrical

Impedance Ω ..... 50 Ω

Capacitance

Cond to Cond (pF/m) / Cond to shield (pF/m)
600103.21 ..... TBD, TBD
600103.31 ..... 96, TBD
600103.51 ..... 110, 190
600103.61 ..... TBD

Physical

Temperature Continuous °C (°F)
600103.21 ..... -50 to 90°C (-58 to 194°F)
600103.31 ..... -100 to 200°C (-148 to 392°F)
600103.51 ..... -40 to 120°C (-40 to 248°F)
600103.61 ..... -50 to 180°C (-58 to 382°F)
Dielectric strength (kV) 2
Voltage ratng Vrms
600103.21 250
600103.31, 600103.51, 600103.61 600
Resistance Conductor (Ω / km) / Shield (Ω / km)
600103.21, 600103.31 ..... 32.4 / TBD
600103.51 ..... TBD / 31.1
600103.61 ..... TBD / TBD
Weight (g/m)
600103.21 ..... TBD
600103.31 30
600103.51 34
600103.61 ..... 45.5
600106.21 ..... TBD
600106.31 ..... TBD
600106.51 ..... TBD
Bending Radius static / Dynamic
600103.21, 600103.31 ..... TBD / TBD
600103.51, 600103.61 ..... 3 x diameter / 5 x diameter

Fire

Flame retardant / Halogen free / Corrrosive gas

600103.21 ..... No / Yes / No
600103.31 ..... Yes / No / Yes
600103.51 ..... Yes / Yes / No
600103.61 ..... Yes / Yes / No

Limited oxygen index / Smoke

600103.21 ..... TBD / Medium
600103.31 ..... TBD / Slight
600103.51 ..... 38% / Low
600103.61 ..... TBD / Low

Standards

600103.21, 600103.31 ..... none
600103.51 ..... DIN 5510
..... NF F16-101
..... BS 6853
..... DIN EN 50265, 50267, 50268 NF C82-070, X10-702
IEC 60332-1 IEC 60754-1 IEC 61034-2
600103.61 .....
NF C 32-070 class C1 // IEC 79-14 // IEC 60332-1 // IEC 60331-21 // IEC 60754-2

Radiation resistant

600103.21, 600103.51 ..... Yes
600103.31 ..... No
600103.61 ..... TBD

Chemical .....see the tutorial polymer section in the appendix

Note :

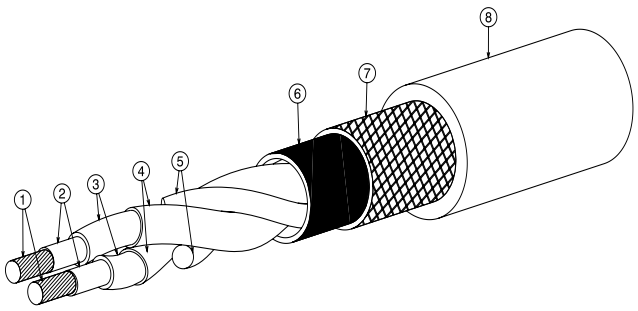
(1) TPC : Tin Plated Copper
(2) ®Radox is a trademark of Huber&Suhner. Radox is a radiation cross link copolymer.
TBD : To be determined

Twisted Pair, Low Noise
Model 600050.XX, 600052.XX

Main Characteristics

- Twisted pair shielded cable
- 2 Low noise treatments
- Teflon (PTFE) jacketed
- Rund cable
- -70°C to 260 °C (-94°F to 500°F)
- Stainless steel overbraid is optional

Description



When subjected to flexure and vibration, these cables must not generate noise (triboelectric noise) in excess of the below specifications.
To improve the sealing with stuffing gland, the cables use glass fiber fillers for a perfectly rund cable.
To improve the mechanical protection, a stainless steel overbraid is available.

Typical application

They are used to transmit low voltage signal from high impedance sensors to signal conditioner at audio frequencies. Twisted pair cables are mainly used by 2-pole differential sensors that have pico Coulomb output:

- Piezoelectric accelerometer or pressure sensor with Pico Coulomb charge output

A length not more than 30 metres is recommended between the sensor and his charge amplifier

Ordering information

To order specify the part number with the following options :
600050.01 - AAA
600052.XX - AAA
AAA : total length in meter
Please indicate minimum continuous length.

Overview

600050.01	 Teflon PTFE / -55 to 260 °C (-67 to 500 °F) dia 4.2 mm (0.165 inch)
600052.01	 Teflon PTFE / AISI 316 Overbraid / -55 to 260 °C (-67 to 500 °F) dia 5.8 mm (0.228 inch)

Competitors cross reference

Endevco 6960	600050.01	Endevco cable is not rund.
Vibro-Meter K 205A MTLN 205A	600050.01	Same specification

Specifications

Construction

(1) Conductors
Material ..... SPC (1)
Gauge (mm) ..... 19x0.16mm / AWG22 / 0.45 mm^2
Diameter (mm) ..... 0.76 mm
Lay (twist) ..... 30 mm min

(2) Primary low noise treatment ..... N/A

(3) Dielectric
Material, diameter (mm) ..... Teflon (PTFE) extruded, 1.40 mm
color conductor 1, color conductor 2 ..... Blue, White

(4) Secondary low noise treatment semiconductor black carbon tape

(5) Fillers / Rund cable ..... glass fibre

(6) Tertiary low noise treatment ... semiconductor black carbon tape

(7) Screen : Material, coverage, diameter (mm) Braided SPC (note 1), AWG38, 80% min, 3.45

(8) Outer sheat
Material 1 / Material 2 .... Polyimide Kapton F tape / PTFE double wrapped tape fused
Diameter mm (inch) / Color ..... 4.25 nominal / White

(9) Overbraid
PNR / Material / Dia / Coverage ..... 600052.01 / AISI 316 Ti / 6 mm / 80% Min
Protection / wire dia / Dia / carrierGlass fiber / 0.2 mm / 24 carriers, 4 wires/carrier
Identification ... **600050.01-DMF:MM-YYYY where YYYY = year, MM=Month**

Electrical

Capacitance
Cond to Cond pF/m / Cond to shield pF/m ..... 100 / 200

Physical
Temperature Continuous °C (°F) ..... -55 to 200°C (-67 to 392°F)
Temperature intermittent °C (°F) ..... -70 to 250°C (-90 to 482°F)
Dielectric strength (kV) 3
Voltage ratng Vrms 600
Dielectric Res. Ohm / m ..... 10^{12}
Resistance Conductor (Ω / km) / Shield (Ω / km) ..... 100 / 15
Weight (g/m)
600050.01 43
600052.01 ..... TBD
Bending Radius static / Dynamic
600050.01, 600052.01 ..... 5 x diameter / 10 x diameter

Fire

Flame retardant / Halogen free / Corrrosive gas .. Yes / No / Yes

Limited oxygen index / Smoke ..... TBD / Slight

Radiation resistant ..... No

Chemical ..... see the tutorial polymer section in the appendix

Triboelectric noise
2mm displacement (10-70 Hz) ..... <10 pC, 2Hz 40mm pk-pk
5 mm displacement (5-50 Hz) ..... <1 pC, 5 to 50Hz 5mm pk-pk
40 mm displacement (2 Hz) ..... <0.15 pC, 10 to 70Hz 2mm pk-pk

(1) SPC : Silver Plated Copper
TBD : To be determined
N/A : Not applicable

Twisted Triples, Model 600106 & 600107

Main Characteristics

- Twisted triples shielded cable
- Rund cable
- -55°C to 200 °C (-67°F to 392°F)
- Selection of halogen free & flame retardant cable
- Selection of Stainless steel (AISI 316L) overbraid

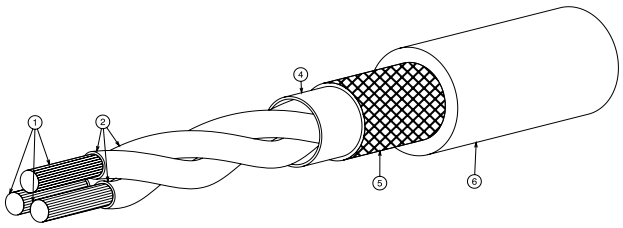


Fig 1 : without overbraid (PNR 600106.XX)

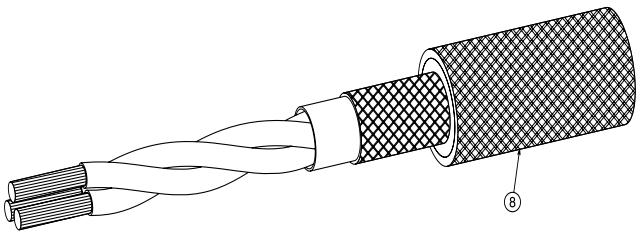


Fig 2 : with overbraid (PNR 600107.XX)

Description

These cables are specifically manufacture for our applications.
All cables are available with a stainless steel overbraid for harsh environment.

Typical application

They are used for 3-pole sensors that exhibit a low impedance output :
®ICP accelerometers with temperature output
Dual output sensor with dual acceleration & velocity

Ordering information

To order specify the part number with the following options :
600106.XX - AAA
600107.XX - AAA
AAA : Length in meters
Ordering example :
600106.31-010 Twisted triples cable, FEP, 10 metres

Overview

600106.31	 **T**eflon FEP / -100 to 200 °C / dia 4.7 mm (0.185 inch) expensive / excellent oil resistance / excellent chemical resistance
600106.51	 Radox / -55 to 125 °C / dia 4.3 mm (0.169 inch) expensive / Halogen free and flame retardant

600107.31	 600106.31 with AISI 316L (V4A) stainless steel overbraid.
600107.51	 600106.51 with AISI 316L (V4A) stainless steel overbraid.

SPECIFICATIONS

CONSTRUCTION

(1) Conductors
Material ..... TPC (1)
Gauge (mm)
600106.31 ..... 19x0.203mm / AWG20 / 0.6 mm^2
600106.51 ..... 19x0.18mm / AWG20 / 0.5 mm^2
Diameter (mm)
600106.31 ..... 1 mm
600106.51 ..... 0.9 mm
Lay (twist) ..... 30 mm min

(2) Dielectric
Material, diameter (mm)
600106.31 ..... Teflon (FEP), 1.53 mm
600106.51 ..... Radox (see note 3), 1.30 mm
Color conductor 1, conductor 2, conductor 3
600106.31 ..... White, Red, Black
600106.51 ..... White + id 1, White + id 2, White +id 3

(3) Fillers / Rund cable
Filers material
600106.31, 600103.51 ..... N/A

(4) Foil
600106.31 ..... Polyester
600106.51 ..... None

(5) Screen
Material, coverage, diameter (mm)
600106.31 ..... Braided TPC (note 1), 85% min, 3.92 mm
600106.51 ..... Braided TPC (note 1), 85% min, 3.3 mm

(6) Outer sheat
Material / Color / Diameter mm (inch)
600106.31 ..... Teflon (FEP) / White / 4.7 ±0.2 (0.185 inch)
600106.51 ..... Radox (see note 3) / Black / 4.5 ±0.2 (0.177 inch)

(7) Overbraid : PNR / Material / wire dia / Diameter / coverage
600106.31 ..... 600107.31 / AISI 316 Ti / 0.2 mm / 5.5 mm / 80% Min
600106.51 ..... 600107.51 / AISI 316 Ti / 0.2 mm / 5.1 mm / 80% Min

ELECTRICAL

Impedance Ω
600106.31 ..... 50 Ω
600106.51 ..... TBD

Capacitance : Cond to Cond pF/m / Cond to shield pF/m
600106.31 ..... 96 / TBD
600106.51 ..... 110 / 190

PHYSICAL

Temperature Continuous °C (°F)
600106.31 ..... -100 to 200°C (-148 to 392°F)
600106.51 ..... -40 to 120°C (-40 to 248°F)
Dielectric strength (kV)
600106.31 ..... 3.4
600106.51 ..... TBD
Voltage ratng Vrms
600106.31, 600106.51 600
Resistance Conductor (Ω / km) / Shield (Ω / km)
600106.31 ..... 32.4 / TBD
600106.51 ..... TBD / 31.1
Weight (g/m)
600106.31 49
600106.51 ..... TBD
600107.31 75
600107.51 ..... TBD

Bending Radius static / Dynamic

600106.31 ..... TBD / TBD

600106.51 ..... 3 x diameter / 5 x diameter

Fire

Flame retardant / Halogen free / Corrrosive gas

600106.31 ..... Yes / No / Yes

600106.51 ..... Yes / Yes / No

Limited oxygen index / Smoke

600106.31 ..... TBD / Slight

600106.51 ..... 38% / Low

Standards

600106.31 ..... none

600106.51 ..... DIN 5510

..... NF F16-101

..... BS 6853

..... DIN EN 50265, 50267, 50268 NF C82-070, X10-702

..... IEC 60332-1 IEC 60754-1 IEC 61034-2

Radiation resistant

600106.31 ..... No

600106.51 ..... Yes

Chemical ..... see the tutorial polymer section in the appendix

Contents

Cable assemblies, Model 10

Main Characteristics

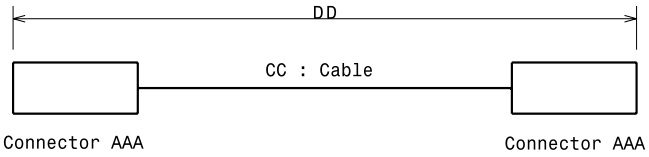
- Choice of connectors to interface with various sensor
- Choice of cable to suit various environment
- -55°C to 260 °C maxi (-67°F to 500°F)
- Rugged construction for harsh environment
- Conduit or stainless steel overbraid protection

Description

10 series are cable assemblies to interface with a variety of industrial sensors.

Typical application is to connect a sensor to a junction box or directly to the signal conditioner. It allows to get out in a cooler and less exposed environment where a standard multipair low cost cable could be used.

Ordering information



To order specify part number, options and suffix :

10.01 - AAA - AAA - CC - DD (EE)

Special Version :

(EE) is a deviation suffix. Omitted for standard version

Special Engraving :

Add ZXX at the end of the part number. (XX is a number supplied by VibraSens)

AAA : Connectors

AAA	Front	Plug Type / Material / Protection Application : Sealing :	Wiring	Shield (91)	Cables
Termination					
Blunt cut					
A01		None	WA 01	N/A	0X 1X 2X 3X
A03		Overbraid (101)			
A04		Conduit (15X)			
A05		Conduit (16X)			

AAA	Front	Plug Type / Material / Protection Application : Sealing :	Wiring	Shield (91)	Cables
Flying leads, Pigtails					
A11			WA 01	N/A	0X 1X 2X 3X
A13		Overbraid (101)			
A14		Conduit (15X)			
A15		Conduit (16X)			
Flying leads, Spade lug, 125°C					
A21			WA 01	N/A	0X 1X 2X 3X
A23		Overbraid (101)			
A24		Conduit (15X)			
A25		Conduit (16X)			
Sensors					
MIL-C-5015- 2 sockets - Field installable - MS 3106F Aluminum, cadmium olive with silver plated solder contact Sealing : IP64 - Operating continuous :125 °C Application : Industrial					
B01	Fig AB01	Connector only : order 600583.05	WB 01	SNC	0X 2X 4X 5X 6X
B02				SC	
B03		Overbraid (101)		SNC PNC	

AAA	Front	Plug Type / Material / Protection Application : Sealing :	Wiring	Shield (91)	Cables
MIL-C-5015- 2 sockets - Permanent monitoring PA 6.6 Shell with Gold plated solder contact Sealing : IP67 - Operating continuous :125 °C Application : Industrial					
B22	Fig AB01		WB 01	SNC	02 05
B23				SNC PNC	
B24				SNC PNC	
MIL-C-5015, AISI 316L (V4A) Sealing : IP 67 - Operating continuous :125 °C Application : Pulp and paper Wet location Available variant : AAA=B11, C11					
B13	Fig AB01	 size 10SL-4S, 2 gold plated Sockets Overbraid (101)	WB 01	SNC PC	0X 2X
C13	Fig AC01	 size 10SL-3S, 3 gold plated Sockets Overbraid (101)	WC 01	SNC PC	1X
M12, IEC 60947-5-2 - Gold plated contacts, nickel plated Brass self securing locking nut, Polyurethane overmolding. Sealing : IP 67 - Operating continuous : 90 °C Application : Permanent monitoring, standard industrial environment. . Fit accelerometer with M12 connector.					
E01	Fig AE01		WE 01	SC	31
E02				SNC	
E04		 Conduit (15X)		SC PNC	
E31				SC	
E34		 Conduit (15X)		SC PNC	

AAA	Front	Plug Type / Material / Protection Application : Sealing :	Wiring	Shield (91)	Cables
M12, IEC 60947-5-2 - Gold plated contacts , PVC, SSTL316L (V4A) locking nut. Sealing : IP 67 - Operating continuous : 90 °C Application : Permanent monitoring, corrosive industrial environment. Fit accelerometer with M12 connector. Available variant : AAA=E14 (conduit), E42 (angled), E44 (angled + conduit)					
E12	Fig AE01		WB 01	SNC	32
M12, IEC 60947-5-2 - CuSn plated contacts , PA self extinguishing housing, self securing locking nut. Sealing : IP 67 - Operating continuous : 90 °C Application : Permanent monitoring, field installable, standard industrial environment. Fit accelerometer with M12 connector.					
E51	Fig AE01	 Connector only : order 600597.01	WE 01	SNC	0X 1X 2X 3X
E71		 Connector only : order 600597.02			
M12, IEC 60947-5-2 - Gold plated contacts, PA self extinguishing housing, stainless steel AISI 316L nut. Sealing : IP 67 - Operating continuous : 90 °C Application : Permanent monitoring, field installable, corrosive industrial environment. . Fit accelerometer with M12 connector.					
E61	Fig AE01	 Connector only : order 600597.03	WE 01	SNC PNC	0X 1X 2X 3X
E63		 Overbraid (101)			
E64		Picture not available Conduit (15X)			
E81		 Connector only : order 600597.04			
E83		 Overbraid (101)			
E84		 Conduit (15X)			

AAA	Front	Plug Type / Material / Protection Application : Sealing :	Wiring	Shield (91)	Cables
M12, IEC 60947-5-2 - CuSn plated contacts, PA self extinguishing housing, Sealing : IP 67 - Operating continuous : 90 °C Application : Permanent monitoring, field installable, standard industrial environment. Fit EXX connector.					
H51	Picture not available	 Connector only : order 600597.31		SNC PNC	0X 1X 2X 3X
M12, IEC 60947-5-2 - Gold plated contacts, PA self extinguishing housing, , stainless steel AISI 316L nut. Sealing : IP 67 - Operating continuous : 90 °C Application : Permanent monitoring, field installable, corrosive industrial environment. Fit EXX connector.					
H61				SNC PNC	0X 1X 2X 3X
H64					
7/16" 27 UNS 2A, 2 Sockets , AISI 303 Operating continuous : 260 °C Application : Permanent monitoring, aero and industrial gas turbine					
	 Fig AD01	 Sealing : IP 64 Connector only : order 601.01-01	WD 01	SNC	0X 2X
D02		 Sealing : IP 64		SC	
D01 D13		 Sealing : IP 64 - Overbraid (101)		SNC PC	
D14		 Sealing : IP 64 - Conduitg (155)		SNC PC	
D15		 Sealing : IP 67 - Conduitg (170)		SNC PC	
Mil-C-26482, 3 pins, bayonet Applications : special vibration sensor with 3 Pins Bayonnet connector					
G02				SC	1X

AAA	Front	Plug Type / Material / Protection Application : Sealing :	Wiring	Shield (91)	Cables
Lemo, S serie, size 0 - Brass nickel plated, gold plated contacts Sealing : IP 64 - Operating continuous : 250 °C Application : Gas turbine connection of piezoelectric differential accelerometer					
L02	 Fig AL02	 FFA.OS.302	WD 01	SC	0X 2X
L22	 Fig AL22	 PCA.OS.302			
BNC, Gold plated contacts, Brass Nickel plated Sealing : IP 64 - Operating continuous : 80 °C					
F01			WF 01	SNC	0X 1X 2X 3X 4X 5X 6X
F02	 Fig AF01			SC	
TNC, Gold plated contacts, 80°C Sealing : IP 64 - Operating continuous : 80 °C					
T01			WF 01	SNC	0X 1X 2X 3X 4X 5X 6X
T02				SC	

Datalogger cable

Fischer, 6 pins, Brass nickel plated, gold plated contacts Sealing : IP 64 - Operating continuous : 250 °C Application : SKF datalogger					
I02	 Fig AI02	 Fischer 103 A 056 (6 contacts)	WI 02	SC	0X 2X 3X 5X
Lemo, K serie, size 1, Brass nickel plated, gold plated contacts Sealing : IP 64 - Operating continuous : 250 °C Application : Entek / IRD datalogger					
K02	 Fig AK02	 FGG.1K.307 (7 contacts)	WK 02	SC	0X 2X 3X 5X
Amphenol ECTA 133, gold plated pins, push pull, aluminum nickel plated Sealing : IP 67 - - Operating continuous : -40°C to +125 °C Application : 01dB - Metravib datalogger					
M02				SC	0X 2X 3X
Amphenol C091 A, gold plated pins, plastic shell, screw locking Sealing : IP 67 - - Operating continuous : -40°C to +85 °C Application : Schenck / Bruel & Kjaer datalogger					

AA	Front	Plug Type / Material / Protection Application : Sealing :	Wiring	Shield (91)	Cables
N02				SC	0X 2X 3X
Customer / Specific application					
Amphenol, C16-1, 4 gold plated pins (03), Nylon PA6.6 Sealing : IP 67 - Operating continuous : 125 °C Application : Metso sensodec, pulp and paper					
P03			WP 11	SNC PNC	0X 2X
P13	Fig AP01	Overbraid (101)			1X
Lemo, B serie, size 1, Brass nickel plated, gold plated contacts Sealing : IP 67 - Operating continuous : 250 °C Application : test bench connection of piezoelectric differential accelerometer					
J02	 fig AJ02	 FGG.1B.302	WD 01	SC	0X 2X

Note, wiring :

(91)

SC : Shield Connected to connector shell
SNC :Shield Not Connected to connector shell
PC : Protection (Overbraid or conduit) Connected to connector shell
PNC : Protection (Overbraid or conduit) Not Connected to connector shell

Note (Protection)

(101) Overbraid AISI 316L
(151) Conduit AISI 304, PNR 600626.01, d=5mm
(152) Conduit AISI 304, PNR 600626.02, d=6mm
(153) Conduit AISI 304, PNR 600626.03, d=7mm
(154) Conduit AISI 304, PNR 600626.04, d=8mm
(155) Conduit AISI 304, PNR 600626.05, d=9.5mm
(161) Conduit AISI 321, leak proof, rugged, PNR 600626.51, d=8.7mm
(171) Conduit AISI 316L, leak proof, standard, PNR 600626.61, d=9.6mm

CC : Cable

CC	Type	PNR	Material	T° Dia (1)	Note
01	Shielded Twisted pair	600103.21	Polyurethane	90°C d4.9 (d5.7)	Low cost with good oil & fluid resistance
02		600103.31	Teflon FEP	200°C d4.7 (d5.5)	improved oil & fluid resistance
03		600103.51	®Radox	120°C d4.3 (d5.1)	halogen free + + flame retardant
04		600103.61	Silicone	180°C d6.5	halogen free + fire retardant
05		600103.11	Polyurethane	90°C d4.9 (d5.7)	Low cost with good oil & fluid resistance
12	Shielded Twisted Triples	600106.31	Teflon FEP	200°C d4.7 (d5.5)	improved oil & fluid resistance
13		600106.51	®Radox	120°C d4.5 (d5.3)	Flame resistant & retardant halogen free
22	Low noise Shield. Twisted pair	600050.01	Teflon PTFE tape	250°C d4.2	2 Low noise treatments
31	Shielded 4 Conductors	600111.21	Poly-urethane black	90°C d5.7	Low cost with good oil & fluid resistance Flexible cable 0.34mm^2
32		600111.01	PVC	90°C d5.7	Low cost with excellent chemical resistance Flexible cable 0.34mm^2
42	Low noise Coaxial	600052.01	Teflon PFA extruded	260°C d2.0	Low noise treated. RGL196
51	Coaxial	600101.03	PVC	80°C d2.8	RG 174
52		600101.04	PVC	80°C d4.95	RG 58 C/U
53		600101.31	Teflon FEP	200°C d1.1	Miniature coaxial
54		600101.32	Teflon FEP	200°C d1.9	RG178

CC	Type	PNR	Material	T° Dia (1)	Note
61	Spiral	600120.xx	Polyure-thane	90°C d5	Spiral, 4x0.25 mm^2 shielded See note (11). Stock : 0.5 and 1 metre

(1) Diameter in bracket are for cable with overbraid
(11) For spiral cable, DD is extended length. (Divide by 4 for non extended length).

DD : Length

DD	Enter length in metres. Standard length : 02, 05, 10, 15, 20, 30 metres.

(EE) : Deviation suffix

Call us to define your deviation suffix for special stripping, length, engraving, ...

Ordering example :

10.01-B01-A01-01-05 Cable assembly, MIL-C-5015, 5 meters Polyurethane cable

SPECIFICATIONS

Electrical

Resistance

Between leads .....>1GOhms
Between either leads to shield .....>1GOhms
Capacitance .....See cable specification

Environmental

Temperature

See table above for the temperature rating of each component.

Physical

Drawing.....See drawing Below

Acceptance, tests performed

Resistance (@100VDC)

Between leads .....>1GOhms
Between either leads to shield .....>1GOhms

Wiring

Checked according to the wiring schematic

Repair

Call factory for info

DRAWINGS, ARRANGEMENTS

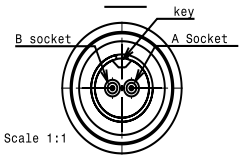


Fig AB01 (MIL-C-5015 2-Pole)

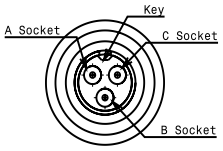


Fig AC01 (MIL-C-5015 3-Pole)

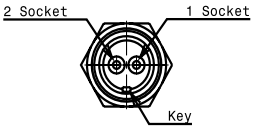


Fig AD01 (7/16” 27 UNS)

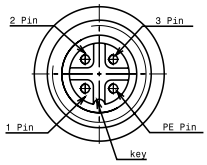


Fig AP01 (C16-1)

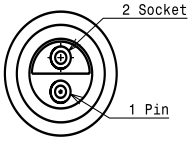


Fig AL02 (Lemo FFA.0S.302)

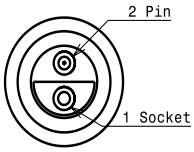


Fig AL22 (LEMO PCA.0S.302)

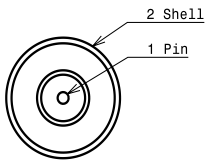


Fig AF01 (BNC, TNC)

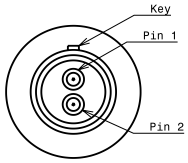


Fig AJ02 (Lemo FGG.1B.302)

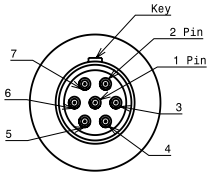


Fig AK02 (Lemo FGG.1K.307)

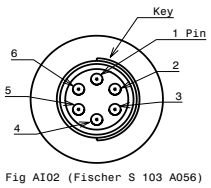


Fig AI02 (Fischer 103 A 056)

DRAWINGS, WIRING

	N1	N2	N3	N4
CC=01, 02	White	Red	--	--
CC=03	White (1)	White (2)	--	--
CC=12	White	Red	Black	--
CC=13	White (1)	White (2)	White (3)	--
CC=22	White	Blue	--	--
CC=3X	Blue	Black	White	Brown
C C = 4 X , 5X	Shield	Conductor		
CC=61	Green	Yellow	White	Brown

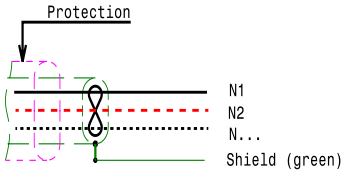


Fig WA01

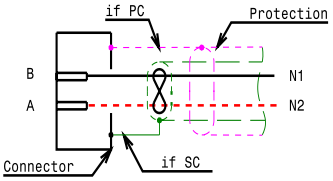


Fig WB01 (MIL-C-5015 10SL-4S)

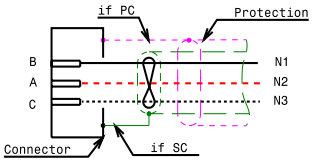


Fig WC01 (MIL-C-5015 10SL-3S)

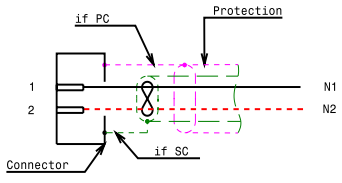


Fig WD01 (7/16 27 UNS 2A, Lemo PCA.0S.302, FFA.0S.302, FGG.1K.302)

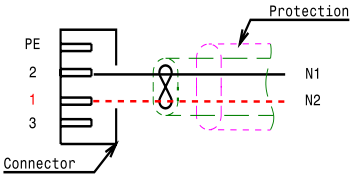


Fig WP11 (C16-1)

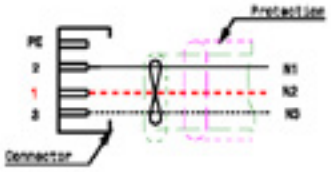


Fig WP12 (C16-1)

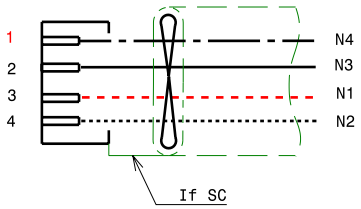


Fig WE01 (M12)

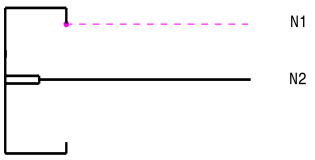


Fig WF01 (BNC & TNC)

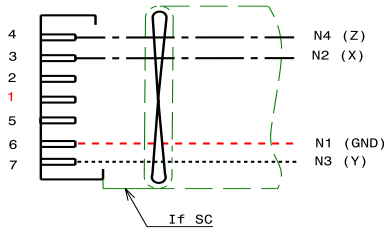


Fig WK02 (Lemo FGG.1K.307)

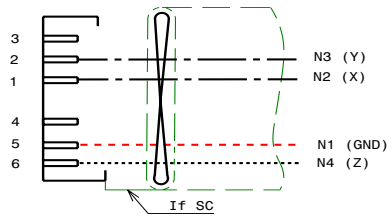
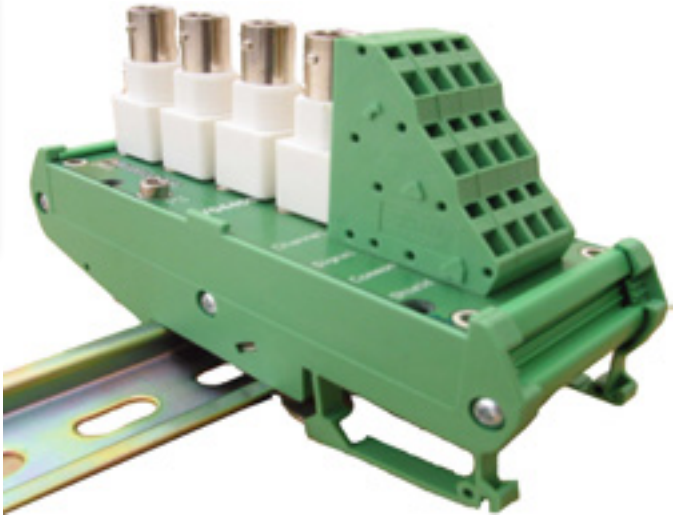


Fig WI02 (Fischer 103 A 056)

Contents



4 Channels, Bnc Interface Unit, Model 301

Main Characteristics

- 4 differential channels
- Compatible with all 2 wires sensor
- Din rail mounted (TS35 and TS32)
- Isolated BNC output
- Spring cage terminal block input
- PCB grounding plate connected to din rail

Description

The VibraSens BNC interface unit is a din rail mounted module for permanently installed vibration sensors. Pigtails (signal, common and shield) sensor cables are attached to spring cage terminal block. Data collection equipment with the sensor excitation power are mounted to BNC jack connectors. BNC interface unit do not supply sensor excitation. PCB grounding plates are connected to din rail which greatly improve EMC. VibraSens offers enclosure for 1, 2 or 4 modules but it is not mandatory as the module can take place on any TS35/TS32 Din rail.

Typical applications

BNC interface module is installed in a convenient centralized location away from noisy or unsafe environment where portable collector can record the sensor reading. Simply connect a data collector with sensor excitation power to the BNC jack of the sensor channel of interest to access that sensor's measurement signal

Ordering information

To order, specify model number :
301.11 BNC Interface unit, Din rail mounted
Popular model (in stock) : 301.11

Specifications

Electrical

Channels 4
2 Wire sensors ..... ©ICP Piezoelectric accelerometer
..... Velocimeter
..... Eddy current proximity sensor
Maximum Voltage 240V
Maximum Current 5A

Physical

Input ..... 3-pole spring cage terminal
..... AWG 24-14 / 0.2 - 1.5 mm^2
Output ..... Isolated BNC
Dimensions ..... see fig 1
Weight gr (oz) ..... 120 gr (4.3 Oz)
Material, Din rail profil ..... PVC Green (UL94)
Material, terminal ..... Polyamid green

Environmental

Temperature :
Operating continous ..... -20 to +55 °C (-4 to 130 °F)

Ratings

Flammability rating ..... UL 94 VO

Drawings

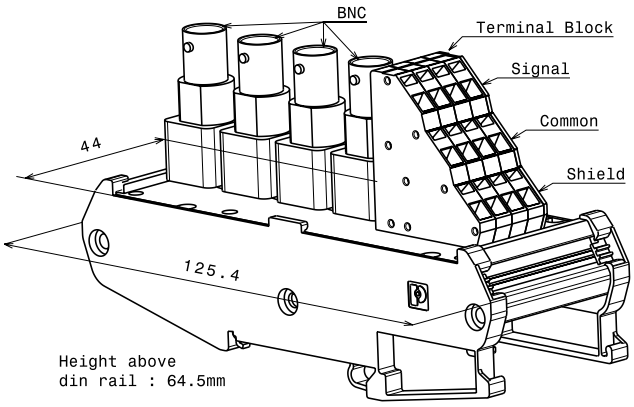


Fig 1 : Outline drawing, model 301.11

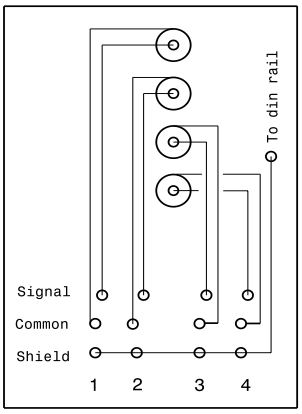


Fig 2 : Wiring

12 Channels, Bnc Interface Unit, Model 300

Main Characteristics

- 12 differential channels
- Compatible with all 2 wires sensor
- Din rail mounted (TS35 and TS32)
- Isolated BNC output
- Spring cage terminal block input
- PCB grounding plate connected to din rail

Description

The VibraSens BNC interface unit is a din rail mounted module for permanently installed vibration sensors. Pigtails (signal, common and shield) sensor cables are attached to spring cage terminal block. Data collection equipment with the sensor excitation power are mounted to BNC jack connectors. BNC interface unit do not supply sensor excitation. PCB grounding plates are connected to din rail which greatly improve EMC. VibraSens offers enclosure for 1, 2 or 4 modules but it is not mandatory as the module can take place on any TS35/TS32 Din rail.

Typical applications

BNC interface module is installed in a convenient centralized location away from noisy or unsafe environment where portable collector can record the sensor reading. Simply connect a data collector with sensor excitation power to the BNC jack of the sensor channel of interest to access that sensor's measurement signal

Ordering information

To order, specify model number :

300.01 BNC interface unit, Din rail mounted

300.11 BNC interface unit, Din rail mounted, right angle

Popular model (in stock) : 300.11 and 300.01

Specifications

Electrical

Channels 12
2 Wire sensors ..... ©ICP Piezoelectric accelerometer
..... Velocimeter
..... Eddy current proximity sensor
Maximum Voltage 240V
Maximum Current 5A

Physical

Input ..... 3-pole spring cage terminal
..... AWG 24-14 / 0.2 - 1.5 mm^2
Output ..... Isolated BNC
Dimensions ..... see fig 1
Weight gr (oz) ..... XXX gr (XX Oz)
Material, Din rail profil ..... PVC Green (UL94)
Material, terminal ..... Polyamid green

Environmental

Temperature :
Operating continous ..... -20 to +55 °C (-4 to 130 °F)

Ratings

Flammability rating ..... UL 94 VO

model 300.11

Drawings

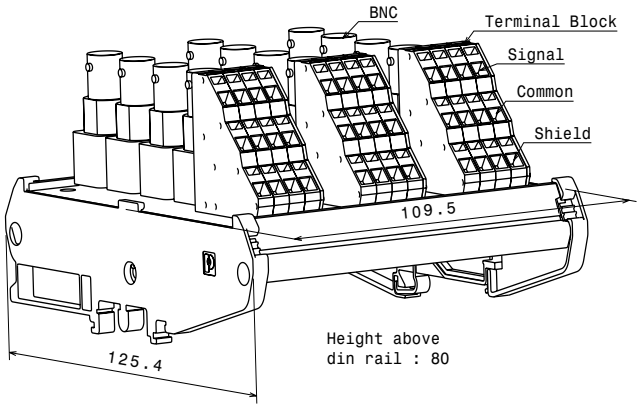


Fig 1 : Outline drawing, model 300.11

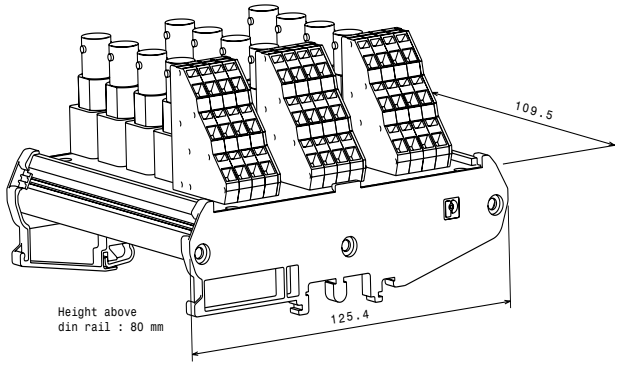
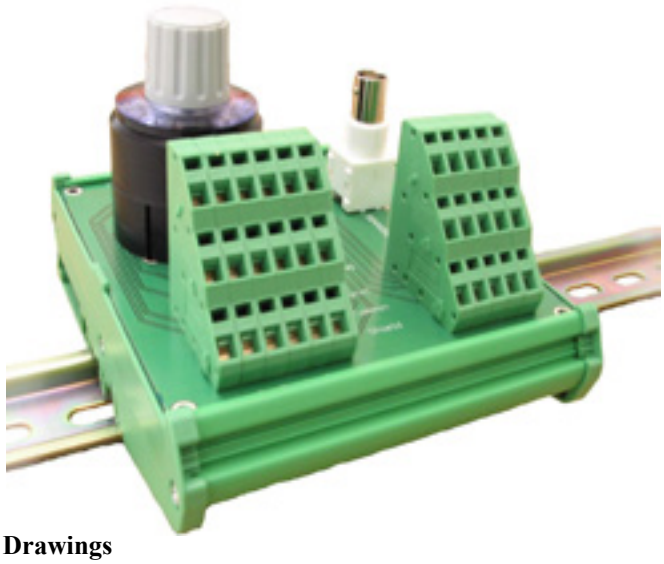


Fig 2 : Outline drawing, model 300.01

11 Channels, Switch Interface Unit, Model 302



Main Characteristics

- 11 channels differential switching unit
- High quality rotary switch with 3um gold plating
- Compatible with all 2 wires sensor
- Din rail mounted (TS35 and TS32)
- Isolated BNC output
- Spring cage terminal block input
- PCB Grounding plate connected to din rail

Description

The VibraSens switch interface unit is a multiple channel connecting centers for terminating and switching the outputs of up to 11 two-wire sensors. Pigtails (signal, common and shield) sensor cables are attached to spring cage terminal block. Data collection equipment with the sensor excitation power are mounted to BNC jack connector. Switch interface unit do not supply sensor excitation. PCB grounding plates are connected to din rail which greatly improve EMC. VibraSens offers enclosure for 1, 2 or 4 modules but it is not mandatory as the module can take place on any TS35/TS32 Din rail. Our module doesn't include Electrostatic Discharge protection already included in the electronic of our accelerometer.

Typical applications

Switchable interface module is installed in a convenient centralized location away from noisy or unsafe environment where portable collector can record the sensor reading. Simply connect the data collector with sensor excitation power to the BNC jack, and position the selector switch (1-11) in the appropriate position to access individual sensor measurement signals.

Ordering information

To order, specify model number :

302.01 Switch interface unit, Din rail mounted

302.11 Switch interface unit, Din rail mounted, right angle

Popular model (in stock) : 302.01 & 302.11

Specifications

Electrical

Channels	11
2 Wire sensors	©ICP Piezoelectric accelerometer
	Velocimeter
	Eddy current proximity sensor
Maximum switching voltage	42V
Maximum switching current	0.4A

Physical

Input	3-pole spring cage terminal
	AWG 24-14 / 0.2 - 1.5 mm^2
Output	Isolated BNC
Dimensions	see fig 1 & fig 2
Weight gr (oz)	300 gr (10.6 Oz)
Material, Din rail profil	PVC Green (UL94)
Material, terminal	Polyamid green

Environmental

Temperature :

Operating continous	-20 to +55 °C (-4 to 130 °F)

Ratings

Flammability rating	UL 94 VO

Drawings

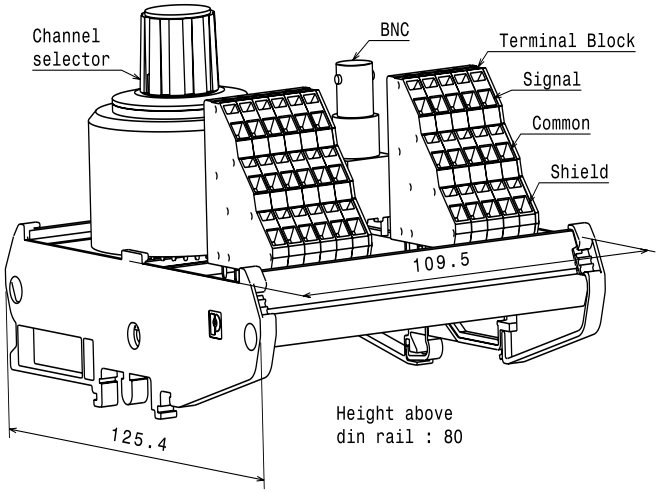


Fig 1 : Outline drawing, model 302.11

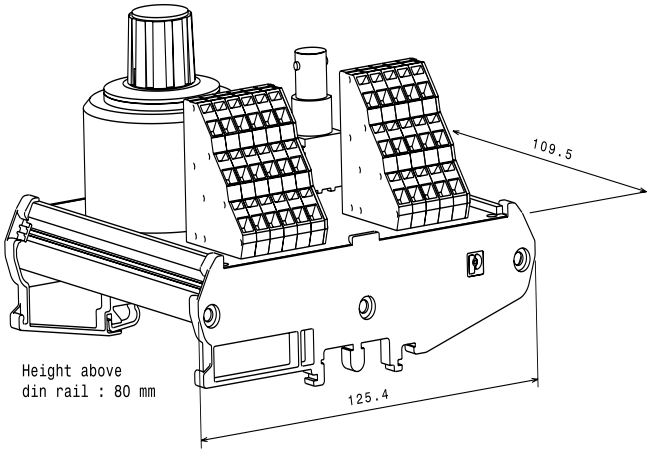


Fig 1 : Outline drawing, model 302.01

Contents

4 Ch. , BNC Termination Box, Model 751

Main Characteristics

- 4 differential channels
- Polycarbonate IP66/67 Box (NEMA 1, 4, 4X,6)
- Compatible with all 2 wires sensor
- Isolated BNC output
- Spring cage terminal block input
- PCB grounding plate connected to din rail

Description

Model 751.01-04-02(LH)-1

The VibraSens BNC termination box collect data for permanently installed vibration sensors. Pigtails (signal, common and shield) sensor cables are attached to spring cage terminal block. Data collection equipment with the sensor excitation power are mounted to BNC jack connectors. BNC interface unit do not supply sensor excitation. Vibrasens offer a large choice of enclosure (polycarbonate, polyester, AISI 316L stainless steel, ..) to be sure it will perfectly fit your application.

Typical applications

BNC termination box is installed in a convenient centralized location away from noisy or unsafe environment where portable collector can record the sensor reading. Simply connect a data collector with sensor excitation power to the BNC jack of the sensor channel of interest to access that sensor's measurement signal

Box introduction

Enclosures offer protection against the possible splashing of oil, water or corrosive substances encountered in severe industrial environments, such as off-shore or petrochemical application. These splash-proof enclosure are used for the mechanical and environmental protection of our BNC interface unit

Polycarbonate Box

Polycarbonate enclosures offer the following benefits :

- Better impact resistance than polyester.
- Better corrosion resistance than painted steel or stainless steel.
- Isolation of the electronic circuit preventing earth loop problems.
- standard industrial environment

Polyester Box

Polyester enclosures offer the following benefits :

- Better chemical resistance than polycarbonte
- Isolation of the electronic circuit preventing earth loop problems.
- recommended for petrochemical application

Stainless steel Box

Stainless steel enclosures offer the following benefits :

- Better impact resistance than polyester or polycarbonate
- Good chemical resistance
- recommended for pulp and paper application

Ordering information

To order, specify model number :

751.01 - AA - BB (Suffix) - C 4 CH., BNC termination box

AA : Channels
04 : 4 Channels

BB : Box
02 : Polycarbonate enclosure
Suffix : LH = Left Hinge, TH = Top Hinge, RH = Right Hinge
32 : Polyester
42 : Polyester, Atex approved
62 : Stainless steel (AISI316L)
99 : To be defined by customer

C : Stuffing glands
0 : Not installed
1 : installed (indicate diameter and number of cables)

Special engraving

Add Zxx at the end of the part number.
XX is a number supplied by VibraSens.

Popular model (in stock) : 751.01-04-02(LH)-1

Ordering example

751.01 - 04 - 02 (LH) - 1 4 CH., BNC termination box, 4 cables dia 5.5 mm

SPECIFICATIONS

BNC Module

See datasheet for model 301

Physical

Weight gr (oz)
BB=02 300

Environmental

Temperature :
Operating continuous ..... -40 to +85 °C

Enclosure BB=02

Dimensions & Weight

LxWxH mm (inch) ..... 130x80x60 (5.1x3.1x2.3) see fig 1
Weight gr (Oz) 180 (6.4)

Materials

Material ..... Polycarbonate
Base and cover color ..... RAL 7035
Cover screw (color) ..... Polyamide (Grey)
Gasket material ..... TPE Polyurethane

Environmental

Temperature :

Operating continous ..... -40 to +80 °C (-40 to 175 °F)
Short term ..... -40 to +120°C (-40 to 250 °F)
Chemical resistance ... Good resistance to sea water, acids, solvents, gasolines and oil
Outdoor use ..... Yes

Ratings

Ingress Protection (EN 60529) ..... IP 66/67
Nema Class ..... 1, 4, 4X, 6 (12 & 13)
Impact Resistance (EN 50102) ..... IK 08
Electrical insultaion ..... fully insulated
Halogen free (DIN/VDE 0472, part 815) ..... Yes
UV resistance ..... UL 508
Flammability rating (UL 746 C 5) ..... UL 94 5V
Glow wire test (IEC 695-2-1) ..... 960°C

Certificates

Germanischer Lloyd (GL), Underwriters Laboratories, Det Norske Veritas, Fimko, Europe EN 50298 1998 / EN 60950, Gost R

Accessories, spare parts

Screw for cover 711.96
Hinge (2 pieces & Screws) 711.91
Mounting foot kit without opening the enclosure 711.94

Drawings

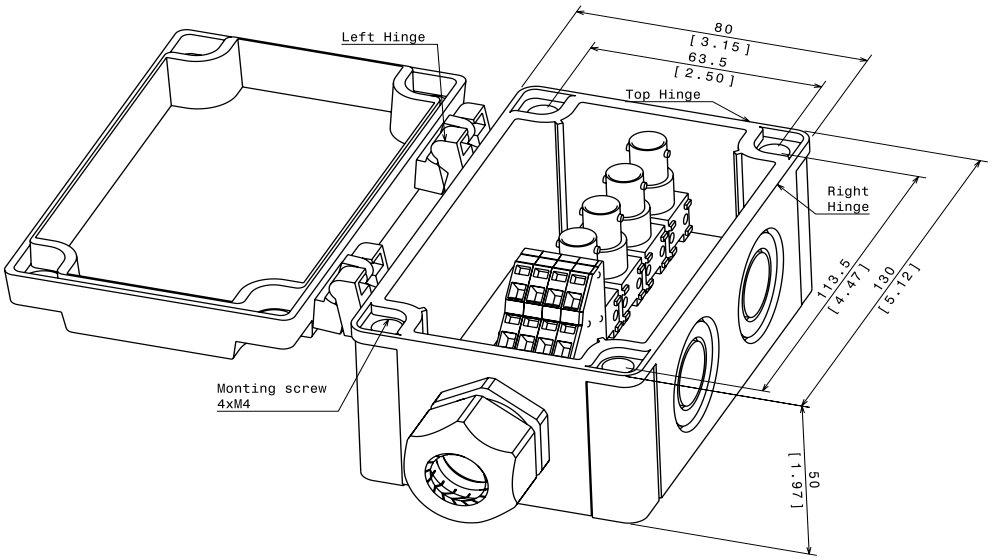


Fig 1 : Outline drawing, model 751.01-XX-02 (LH)

8 Ch. , BNC Termination Box, Model 750

Main Characteristics

- 8 differential channels
- Polycarbonate IP66/67 Box (NEMA 1, 4, 4X,6)
- Compatible with all 2 wires sensor
- Isolated BNC output
- Spring cage terminal block input
- PCB grounding plate connected to din rail

Description

The VibraSens BNC termination box collect data for permanently installed vibration sensors. Pigtails (signal, common and shield) sensor cables are attached to spring cage terminal block. Data collection equipment with the sensor excitation power are mounted to BNC jack connectors. BNC interface unit do not supply sensor excitation. Vibrasens offer a large choice of enclosure (polycarbonate, polyester, AISI 316L stainless steel, ..) to be sure it will perfectly fit your application.

Typical applications

BNC termination box is installed in a convenient centralized location away from noisy or unsafe environment where portable collector can record the sensor reading. Simply connect a data collector with sensor excitation power to the BNC jack of the sensor channel of interest to access that sensor's measurement signal

Box introduction

See model 751 for help.

Ordering information

To order, specify model number :

750.01 - AA - BB (Suffix) - C 8 CH., BNC termination box

AA : Channels
08 : 8 Channels

BB : Box
02 : Polycarbonate enclosure
Suffix : LH = Left Hinge, TH = Top Hinge, RH = Right Hinge
32 : Polyester
42 : Polyester, Atex approved
62 : Stainless steel (AISI316L)
99 : To be defined by customer

C : Stuffing glands
0 : Not installed
1 : installed (indicate diameter and number of cables)

Special engraving

Add Zxx at the end of the part number.
XX is a number supplied by VibraSens.

Popular model (in stock) : 750.01-08-02(LH)-1

Ordering example

750.01 - 08 - 02 (LH) - 1 8 CH., BNC termination box, 6 cables dia 5.5 mm

SPECIFICATIONS

BNC Module

See datasheet for model 301

Physical

Weight gr (oz)
BB=02 ..... TBD

Environmental

Temperature :

Model 750.01-08-02(LH)-1

Operating continuous ..... -40 to +85 °C

Enclosure BB=02

Dimensions & Weight

LxWxH mm (inch) ..... 130x130x75 (5.1x5.1x2.95) see fig 1
Weight gr (Oz) ..... TBD (TBD)

Materials

Material ..... Polycarbonate
Base and cover color ..... RAL 7035
Cover screw (color) ..... Polyamide (Grey)
Gasket material ..... TPE Polyurethane

Environmental

Temperature :
Operating continous ..... -40 to +80 °C (-40 to 175 °F)
Short term ..... -40 to +120°C (-40 to 250 °F)
Chemical resistance ... Good resistance to sea water, acids, solvents, gasolines and oil
Outdoor use ..... Yes

Ratings

Ingress Protection (EN 60529) ..... IP 66/67
Nema Class ..... 1, 4, 4X, 6 (12 & 13)
Impact Resistance (EN 50102) ..... IK 08
Electrical insultaion ..... fully insulated
Halogen free (DIN/VDE 0472, part 815) ..... Yes
UV resistance ..... UL 508
Flammability rating (UL 746 C 5) ..... UL 94 5V
Glow wire test (IEC 695-2-1) ..... 960°C

Certificates

Germanischer Lloyd (GL), Underwriters Laboratories, Det Norske Veritas, Fimko, Europe EN 50298 1998 / EN 60950, Gost R

Accessories, spare parts

Screw for cover 711.96
Hinge (2 pieces & Screws) 711.91
Mounting foot kit without opening the enclosure 711.94

Drawings

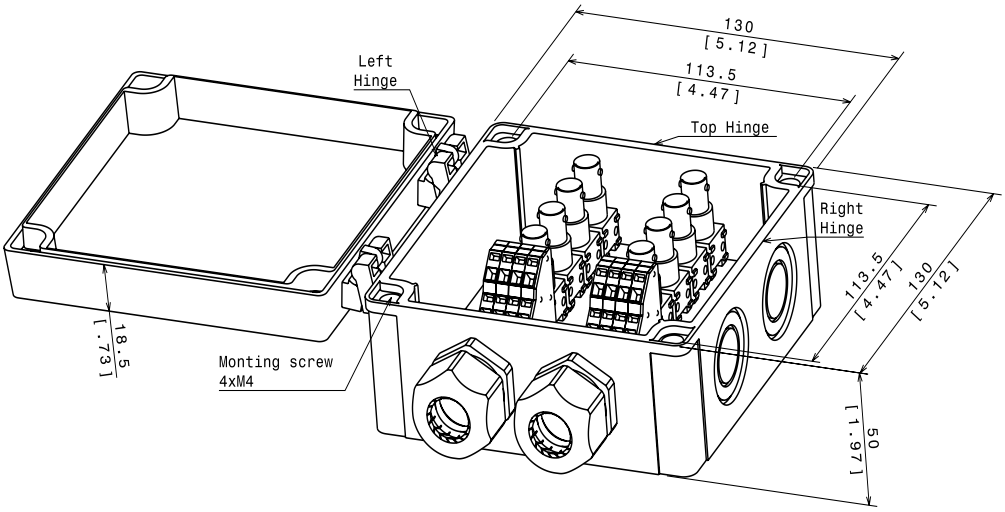


Fig 1 : Outline drawing, model 750.01-08-02(LH)-1

11/12 Ch. , Switch/BNC Termination Box, Model 749

Main Characteristics

- 11/12 differential channels
- Polycarbonate IP66/67 Box (NEMA 1, 4, 4X,6)
- Compatible with all 2 wires sensor
- Isolated BNC output
- Spring cage terminal block input
- PCB grounding plate connected to din rail

Description

The VibraSens BNC termination box collect data for permanently installed vibration sensors. Pigtails (signal, common and shield) sensor cables are attached to spring cage terminal block. Data collection equipment with the sensor excitation power are mounted to BNC jack connectors. BNC interface unit do not supply sensor excitation. Vibrasens offer a large choice of enclosure (polycarbonate, polyester, AISI 316L stainless steel, ..) to be sure it will perfectly fit your application.

Typical applications

BNC termination box is installed in a convenient centralized location away from noisy or unsafe environment where portable collector can record the sensor reading. Simply connect a data collector with sensor excitation power to the BNC jack of the sensor channel of interest to access that sensor's measurement signal

Box introduction

See model 751 for help.

Ordering information

To order, specify model number :

749.01 - AA - BB (Suffix) - C AA CH., BNC termination box

AA : Channels
11 : 11 Channels (Switch)
12 : 12 Channels (BNC)

BB : Box
02 : Polycarbonate enclosure
Suffix : LH = Left Hinge, TH = Top Hinge, RH = Right Hinge
32 : Polyester
42 : Polyester, Atex approved
62 : Stainless steel (AISI316L)
99 : To be defined by customer

C : Stuffing glands
0 : Not installed
1 : installed (indicate diameter and number of cables)

Special engraving

Add Zxx at the end of the part number.
XX is a number supplied by VibraSens.

Popular model (in stock) :

749.01-11-02(LH)-1 / 749.01-12-02(LH)-1

Ordering example

749.01 - 12 - 02 (LH) - 1 12 CH., BNC termination box, 10 cables dia 5.8 mm

SPECIFICATIONS

BNC Module

See datasheet for model 300

Physical

Weight gr (oz)

Model 749.01-12-02(LH)-1

BB=02 ..... TBD

Environmental

Temperature :
Operating continuous ..... -40 to +85 °C

Enclosure BB=02

Dimensions & Weight

LxWxH mm (inch) ..... 130x180x75 (5.1x6.9x2.95) see fig 1
Weight gr (Oz) ..... TBD (TBD)

Materials

Material ..... Polycarbonate
Base and cover color ..... RAL 7035
Cover screw (color) ..... Polyamide (Grey)
Gasket material ..... TPE Polyurethane

Environmental

Temperature :
Operating continous ..... -40 to +80 °C (-40 to 175 °F)
Short term ..... -40 to +120°C (-40 to 250 °F)
Chemical resistance ... Good resistance to sea water, acids, solvents, gasolines and oil
Outdoor use ..... Yes

Ratings

Ingress Protection (EN 60529) ..... IP 66/67
Nema Class ..... 1, 4, 4X, 6 (12 & 13)
Impact Resistance (EN 50102) ..... IK 08
Electrical insultaion ..... fully insulated
Halogen free (DIN/VDE 0472, part 815) ..... Yes
UV resistance ..... UL 508
Flammability rating (UL 746 C 5) ..... UL 94 5V
Glow wire test (IEC 695-2-1) ..... 960°C

Certificates

Germanischer Lloyd (GL), Underwriters Laboratories, Det Norske Veritas, Fimko, Europe EN 50298 1998 / EN 60950, Gost R

Accessories, spare parts

Screw for cover 711.96
Hinge (2 pieces & Screws) 711.91
Mounting foot kit without opening the enclosure 711.94

Drawings

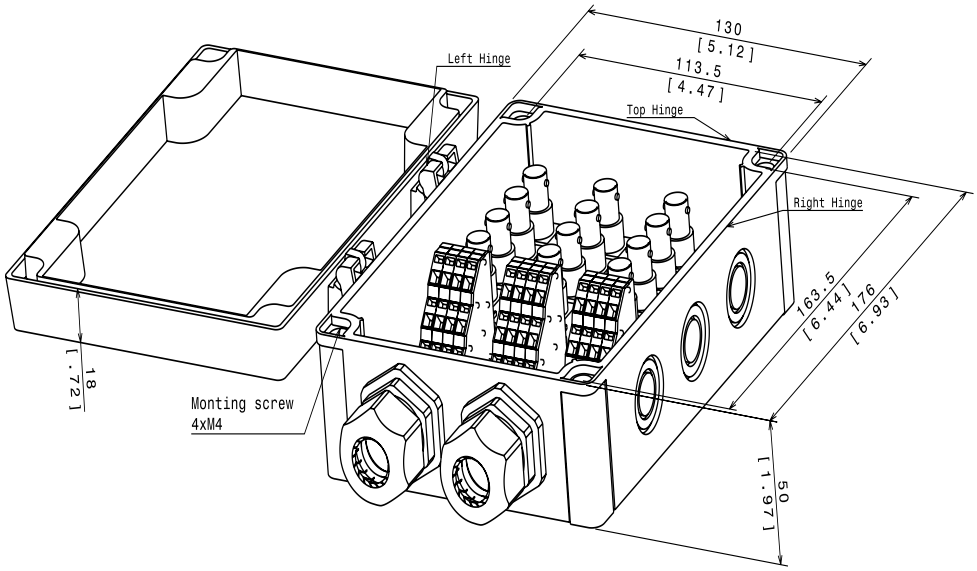


Fig 1 : Outline drawing, model 749.01-12-02(LH)-1

22/24 Ch., Switch/BNC Termination Box, Model 748

Main Characteristics

- 8 differential channels
- Polycarbonate IP66/67 Box (NEMA 1, 4, 4X,6)
- Compatible with all 2 wires sensor
- Isolated BNC output
- Spring cage terminal block input
- PCB grounding plate connected to din rail

Description

The VibraSens BNC termination box collect data for permanently installed vibration sensors. Pigtails (signal, common and shield) sensor cables are attached to spring cage terminal block. Data collection equipment with the sensor excitation power are mounted to BNC jack connectors. BNC interface unit do not supply sensor excitation. Vibrasens offer a large choice of enclosure (polycarbonate, polyester, AISI 316L stainless steel, ..) to be sure it will perfectly fit your application.

Typical applications

BNC termination box is installed in a convenient centralized location away from noisy or unsafe environment where portable collector can record the sensor reading. Simply connect a data collector with sensor excitation power to the BNC jack of the sensor channel of interest to access that sensor's measurement signal

Box introduction

See model 751 for help.

Ordering information

To order, specify model number :

748.01 - AA - BB (Suffix) - C AA CH., BNC termination box

AA : Channels
22 : 22 Channels (Switch)
23 : 23 Channels (12 BNC + 11 Switch)
24 : 24 Channels (BNC)

BB : Box
02 : Polycarbonate enclosure
Suffix : LH = Left Hinge, TH = Top Hinge, RH = Right Hinge
32 : Polyester
42 : Polyester, Atex approved
62 : Stainless steel (AISI316L)
99 : To be defined by customer

C : Stuffing glands
0 : Not installed
1 : installed (indicate diameter and number of cables)

Special engraving

Add Zxx at the end of the part number.
XX is a number supplied by VibraSens.

Popular model (in stock) :

748.01-22-02(LH)-1 / 748.01-23-02(LH)-1 / 748.01-24-02(LH)-1

Ordering example

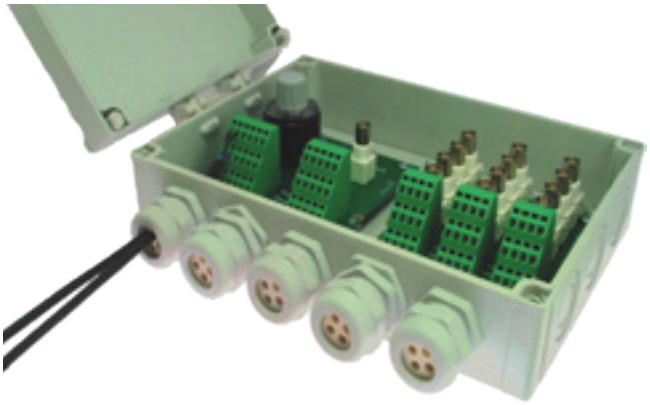
748.01 - 24 - 02 (LH) - 1 24 CH., BNC termination box, 18 cables dia 5.8 mm

SPECIFICATIONS

BNC Module

See datasheet for model 300

Physical



Model 749.01-23-02(LH)-1

Weight gr (oz)
BB=02 ..... TBD

Environmental

Temperature :
Operating continuous ..... -40 to +85 °C

Enclosure BB=02

Dimensions & Weight

LxWxH mm (inch) ..... 255x180x75 (10x6.9x2.95) see fig 1
Weight gr (Oz) ..... TBD (TBD)

Materials

Material ..... Polycarbonate
Base and cover color ..... RAL 7035
Cover screw (color) ..... Polyamide (Grey)
Gasket material ..... TPE Polyurethane

Environmental

Temperature :
Operating continous ..... -40 to +80 °C (-40 to 175 °F)
Short term ..... -40 to +120°C (-40 to 250 °F)
Chemical resistance ... Good resistance to sea water, acids, solvents, gasolines and oil
Outdoor use ..... Yes

Ratings

Ingress Protection (EN 60529) ..... IP 66/67
Nema Class ..... 1, 4, 4X, 6 (12 & 13)
Impact Resistance (EN 50102) ..... IK 08
Electrical insultaion ..... fully insulated
Halogen free (DIN/VDE 0472, part 815) ..... Yes
UV resistance ..... UL 508
Flammability rating (UL 746 C 5) ..... UL 94 5V
Glow wire test (IEC 695-2-1) ..... 960°C

Certificates

Germanischer Lloyd (GL), Underwriters Laboratories, Det Norske Veritas, Fimko, Europe EN 50298 1998 / EN 60950, Gost R

Accessories, spare parts

Screw for cover 711.96
Hinge (2 pieces & Screws) 711.91
Mounting foot kit without opening the enclosure 711.94

Drawings

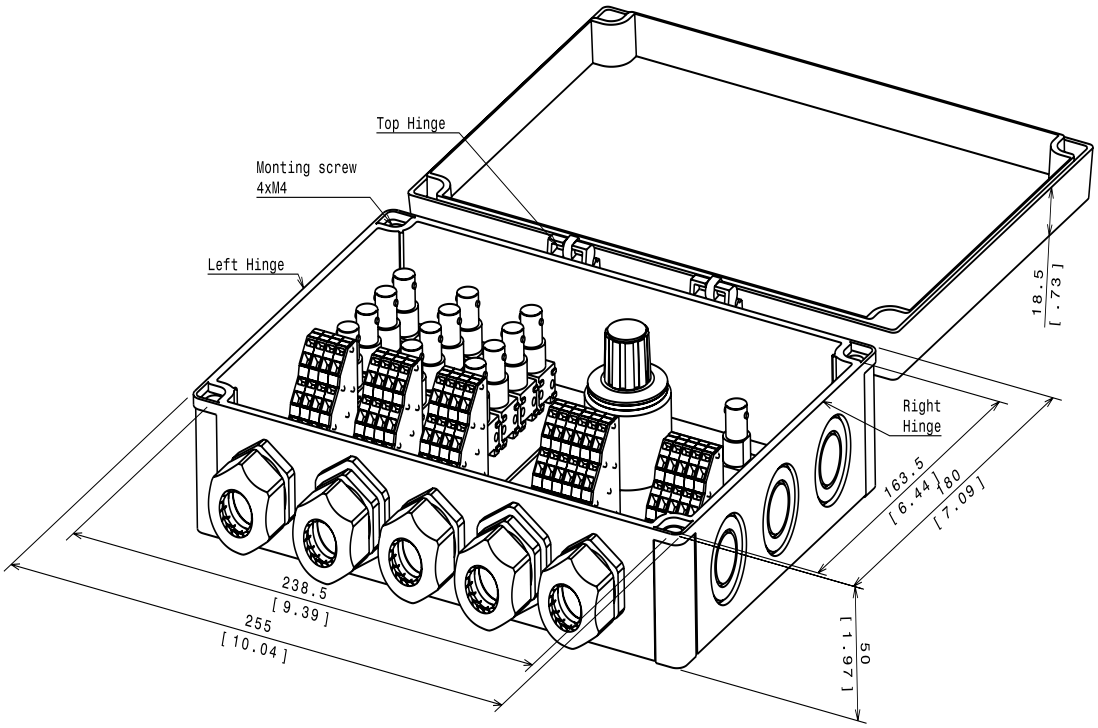


Fig 1 : Outline drawing, model 749.01-23-02(TH)-1

Contents

Sinusoid, Rms-Average Relation Ships

RMS and AVERAGE EQUATIONS

This is valid for all signal.

Average

$$\text{Average}=\frac{1}{T}\int_0^T |x(t)|dt$$

Average value gives the DC value of a periodic waveform.

RMS (ROOT MEAN SQUARE)

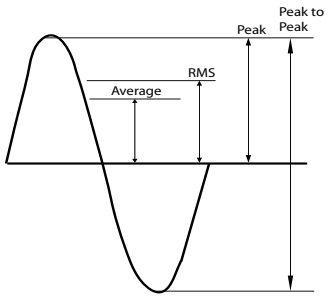
$$\text{RMS}=\sqrt{\frac{1}{T}\int_0^T x^2(t)dt}$$

RMS value represents the energy content of a signal.
if x(t) = DC + AC

Then $RMS(x(t)) = \sqrt{DC^2 + AC_{RMS}{}^2}$

TRMS : True Root Mean Square devices mean the calculation of the RMS value is based on the RMS formula.
RMS : Root Mean Square devices mean the calculation of the RMS value is calculated by rectifying the signal, averaging it and multiply it by 1.1. This way of doing is exact for sinusoidal waveform only.

Sinusoids applications



Average = 0.637 . peak

RMS = 0.707 . Peak

Peak = 1.414 . RMS

Peak to Peak = 2 . Peak

$$\text{Crest\_Factor}=\frac{\text{Peak}}{\text{RMS}}$$

Displacement, Velocity, Acceleration, Relationships

D is defined as the peak to peak value
V is defined as the peak velocity
A is defined as the peak acceleration

Typical applications

If the measured parameter is displacement (Eddy current probe), the 2 other parameters can be found through a single and double differentiation of the displacement signal.

$d = \frac{D}{2}\sin(\omega t)$
$v = \frac{d}{dt}(d)$ $v = \pi.f.D.\cos(\omega t) = V.\cos(\omega t)$
$a = \frac{d}{dt}(v) = \frac{d^2}{dt^2}(d)$ $a = -2.\pi^2.f^2.D.\sin(\omega t) = A.\sin(\omega t)$

Conversion from acceleration to displacement

If the measured parameter is acceleration, the 2 other parameters can be found through a single and double integration of the acceleration signal.

$a = A.\sin(\omega t)$
$v = \int a.dt$ $v = -\frac{A}{2.\pi.f}.\cos(\omega.t) = V.\cos(\omega.t)$
$d = \iint a.dt^2 = \int v.dt$ $d = -\frac{A}{4.\pi^2.f^2}.\sin(\omega.t) = \frac{D}{2}.\sin(\omega.t)$

Metric relationships

The following formulas are valid only for a sinusoidal signal. (D) Displacement, (V) Velocity, (A) Acceleration.

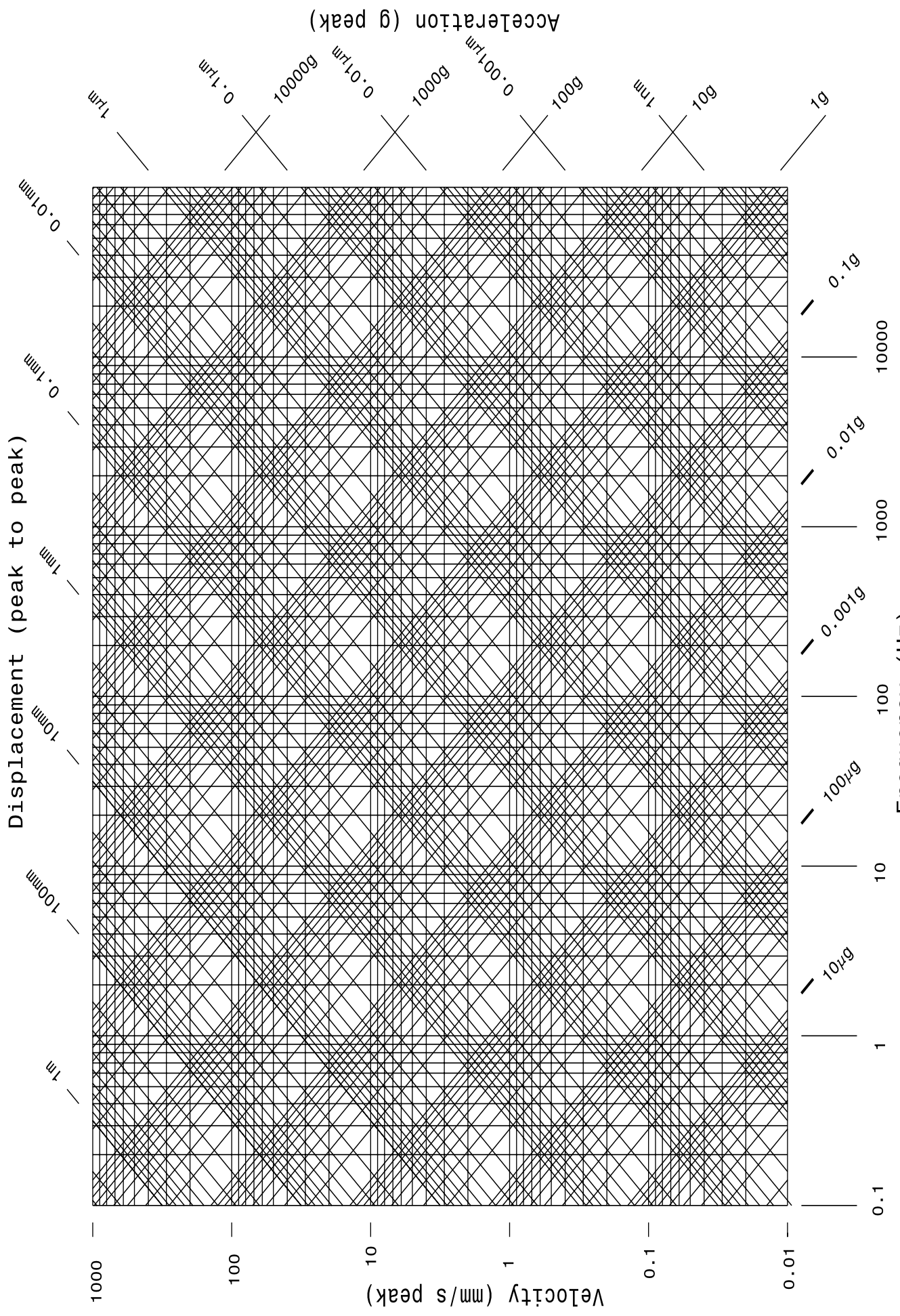
	D (mm p-p)	V (mm/s peak)	A (g peak)
D (mm p-p)	----	$D = \frac{1}{\pi}.\frac{V}{f}$ $D = 0,3183.\frac{V}{f}$	$D = \frac{g.10^3}{2.\pi^2}.\frac{A}{f^2}$ $D = 496,81.\frac{A}{f^2}$
V (mm/s peak)	$V = \pi.f.D$	----	$V = \frac{g.10^3}{2.\pi}.\frac{A}{f}$ $V = 1560,77.\frac{A}{f}$
A (g peak)	$A = \frac{2.\pi^2.10^{-3}}{g}.f^2.D$ $A = 2.10^{-3}.f^2.D$	$A = \frac{2.\pi.10^{-3}}{g}.f.V$ $A = 0,64.10^{-3}.f.V$	----

English relationships

	D (inch p-p)	V (ips peak)	A (g peak)
D (inch p-p)	----	$D = \frac{1}{\pi}.\frac{V}{f}$ $D = 0,3183.\frac{V}{f}$	$D = \frac{g.10^3}{25,4.2.\pi^2}.\frac{A}{f^2}$ $D = 19,559.\frac{A}{f^2}$
V (ips peak)	$V = \pi.f.D$	----	$\frac{g.10^3}{2.25,4.\pi}.\frac{A}{f}$ $V = 61,44.\frac{A}{f}$
A (g)	$\frac{50,8.\pi^2.10^{-3}}{g}.f^2.D$ $51,07.10^{-3}.f^2.D$	$\frac{2.25,4.\pi.10^{-3}}{g}.f.V$ $A = 16,27.10^{-3}.f.V$	----

g = 9.80665 m/s2(exact value)

Nomogram (Metric)


Acceleration (g peak)
1µm
0.1µm
10000g
0.01µm
6000g
0.001µm
1000g
100g
1mm
10g
1g
Displacement (peak to peak)
0.01mm
0.1mm
1mm
10mm
100mm
1m
Velocity (mm/s peak)
1000
100
10
1
0.1
0.01
Frequency (Hz)
0.1
1
10
100
1000
10000
10µg
100µg
0.001g
0.01g
0.1g

Conversion Factors, Dynamic

displacement

1 mm	=	0.03937 inch
1 um	=	0.03937 mil
1 inch	=	25.4 mm
1 mil	=	25.4 um

velocity

1 m/s	=	3.2808 feet/s
	=	88.0* feet/minute
1 feet/s	=	0.3048* m/s
1 feet/min	=	5.080* mm/s
1 inch/s	=	0.0254* m/s

accelereation

1 g	=	9.80665* meters/second2
	=	32.174 feet/second2
	=	386.088 inches/second2
1 foot/second^2	=	0.3048* meters/second2
1 inch/s2	=	0.02540 m/s2

Frequency

1 EU/g	=	0.1019 EU/ms^{-2}
1 EU/ms^{-2}	=	9.8065 EU/g
1 EU/ips	=	0.0394 EU/mm.s^{-1}
1 EU/mm.s^{-1}	=	25.4 EU/ips
1 EU/mil	=	0.0394 EU/um
1 EU/um	=	25.4 EU/mil

Pressure Sensor sensitivity

1 Eu/mbar	=	68.9 EU/PSI
1 EU/PSI	=	0.0145 EU/mbar
1 mbar/g	=	0.0145 PSI/g
1 PSI/g	=	68.9 mbar/g

*** exact value.**

EU : Engineering unit

Mathematics

Decibel scale (except power)

$$dB = 20.Log\left(\frac{Vout}{Vref}\right)$$

$$Gain = \frac{Vout}{Vref} = 10^{\left(\frac{db}{20}\right)}$$

$$Gain = e^{\left(\frac{db}{20Log(e)}\right)} = e^{\left(\frac{db}{8.686}\right)}$$

With Log (e) = Log (2.718) = 0.4342

Gain	dB - + <- -- ---->	Gain
10^{-7}	140	10^{7}
10^{-6}	120	10^{6}
10^{-5}	100	10^{5}
10^{-4}	80	10^{4}
10^{-3}	60	10^{3}
10^{-2}	40	10^{2}
10^{-1}	20	10^{1}
0.316	10	3.16
0.501	6	2
0.708	3	1.41
0.891	1	1.12
0.944	0.5	1.059
0.966	0.3	1.035
.988	0.1	1.012
1	0	1

Conversion Factors

Multiple And Submultiple Prefixes

Symbol	Prefix	Mul-tiple
T	tera	10^{+12}
G	giga	10^{+9}
M	mega	10^{+6}
k	kilo	10^{+3}
f	femto	10^{-15}
p	pico	10^{-12}
n	nano	10^{-9}
u	micro	10^{-6}
m	milli	10^{-3}

Length

1 um	=	0.03937 mil
1 m	=	39.370 * inches
	=	3.2808 feet
	=	1.094 yards
1 km	=	0.621 mile
1 mil	=	25.4 um
1 inch	=	25.4 mm
	=	1000 mil
	=	3* feet
1 foot	=	0.30480 m *
	=	12.0 inches *
1 yard	=	0.9144 m *
1 miles (statute)	=	5280 feet *
	=	1.6093 kilometers

Area

1 cm2	=	0.1550 square inches
1 m2	=	10.764 square feet
1 square inches	=	645.16 mm2 *
1 square feet	=	144.0square inches*
	=	0.09290 m2
1 acres	=	4047 m2

Volume

1 cm^3	=	0.06102 cubic inches
1 m^3	=	35.315 cubic feet
	=	1000 l
1 $inches^3$	=	16.387 cm^3
1 cubic feet	=	1728* cubic inches

Mass

1 gram	=	0.03527 ounces Oz (avdp.)
1 kilogram	=	2.2046 ponds (advp.)
1 ounce (Oz)	=	28.350 grams
1 pound (advp)	=	16* ounces (avdp)
	=	453.6 grams

Angle

1 degree	=	0.017453 Radian
1 radians	=	57.2958 degrees
1 Grade	=	0.900* degree

Force

1 Dynes	=	10E-5 Newton
1 kilogram force	=	9.80665* Newtons
1 Newton	=	0.1020 kilogram force

Moment Or Torque

1 pound (force) inch	=	0.1130 Newton meters
1 newton meters	=	8.849 pound (force) inch

Pressure

1 atmospheres	=	1.01325* bars
	=	760.0 mm of Hg
	=	101 325 k Pa
1 mm of Hg (Torr)	=	133.32 N/m2

FROM-TO	Bar	mBar	Pascal	kg/cm2	PSI
Bar	1	0.001	0.00001	0.98068	0.068946
mBar	1000	1	0.01	980.68	68.946
Pascal	100000	100	1	98607	6894.6
kg/cm2	1.0197	0.0010197	1.0197E-5	1	0.070305
PSI	14.504	0.014504	14504E-6	14.223	1

Note : 1 Pascal=1N/m2

Power

1 Horsepower	=	746.0* watts
1 BTU/second	=	1055.9 watts

Energy

1 BTU	=	1055.9 Joules

Temperature

1 °F	=	$\left(\frac{9}{5}\times°C\right)+32$
1°C	=	$\frac{5}{9}(°F-32)$
1°K	=	°C+273.15

*** exact value.**

Wire Gauge

AWG - Metric conversion

AWG N°	Number of Strands	Conductor Nominaldiameter (mm)	Conductorr Area (mm2)
54	Solid	0.015	0.00017
52	Solid	0.020	0.00031
50	Solid	0.025	0.00049
48	Solid	0.031	0.00075
46	Solid	0.040	0.00126
	7 x 54	0.045	0.00124
44	Solid	0.050	0.00203
44	7 x 52	0.060	0.00220
42	Solid	0.063	0.00316
	7 x 50	0.075	0.00343
41	Solid	0.070	0.00396
40	Solid	0.079	0.00490
	7 x 48	0.093	0.00528
39	Solid	0.089	0.00632
38	Solid	0.102	0.00795
	7 x 46	0.120	0.0088
37	Solid	0.114	0.0100

36	Solid	0.127	0.0123
	7 x 44	0.150	0.0137
35	Solid	0.142	0.0161
34	Solid	0.160	0.0200
	7 x 42	0.189	0.022
33	Solid	0.180	0.0252
32	Solid	0.203	0.0320
	7 x 40	0.237	0.034
	19 x 44	0.25	0.037
31	Solid	0.226	0.0400
30	Solid	0.254	0.0503
	7 x 38	0.304	0.057
	19 x 42	0.315	0.059
29	Solid	0.287	0.0646
28	Solid	0.320	0.0804
	7 x 36	0.381	0.089
	19 x 40	0.395	0.093
27	Solid	0.363	0.1020
26	Solid	0.404	0.1280
	7 x 34	0.480	0.141
	19 x 38	0.504	0.155
25	Solid	0.455	0.1630
24	Solid	0.511	0.2050
	7 x 32	0.609	0.227
	19 x 36	0.634	0.241
23	Solid	0.574	0.2590
22	Solid	0.643	0.3250
	7 x 30	0.762	0.355
	19 x 34	0.800	0.382
21	Solid	0.724	0.4120
20	Solid	0.813	0.5190
	7 x 28	0.960	0.563
	19 x 32	1.01	0.616
19	Solid	0.912	0.6530
18	Solid	1.024	0.8230
	19 x 30	1.27	0.962
17	Solid	1.151	1.04
16	19 x 29	1.43	1.23

DIN Norms

Gauge according to DIN 0295, IEC 228

Section (mm^2)	Classe 2 Nbr x Dia (mm)	Classe 5 nbr x Dia (mm)	Classe 6 Nbr x Dia (mm)
0.14		18 x 0.1	18 x 0.1
0.25		14 x 0.15	32 x 0.1
0.34		19 x 0.15	42 x 0.1
0.38		12 x 0.2	21 x 0.15
0.5	7 x 0.30	16 x 0.2	28 x 0.15
0.75	7 x 0.37	24 x 0.2	42 x 0.15
1.0	7 x 0.43	32 x 0.2	56 x 0.15
1.5	7 x 0.52	30 x 0.25	84 x 0.15

Color code according to DIN 47100

Conductor N°	Color
1	White
2	Brown
3	Green
4	Yellow
5	Grey
6	Rose
7	Blue
8	Red
9	Black
10	violet

Acronyms And Abbreviations

materials

PVC	polyvinylchloride
PE	polyethylene
PU	Polyurethane
FEP	Fluorinated ethylene propylene
	Teflon Hostaflon is a registred trademark of Dupont
PFA	perfluoroalkoxy
PTFE	polytetrafluorethylene
	Teflon : registred trademark of Dupont
	Halon is a registred trademark of allied chemical
	Fluon is a registred trademark of I.C.I.
PVDF	polyvinylidene fluoride
	Kynar is a trademark of Pennwalt
	Solef is a trademark of TBD
ETFE	ethylene-tetrafluorethylene-copolymer
	Tefzel is a registred trademark of Dupont
®Radox 125	polyolefin copolymer cross link (Trademark of Huber&Suhner)
SIR	silicon rubber

technical

pC	Pico Coulombs
cpm	Cycle Per Minute
cps	Cycle Per Second
RPM	Revolution per Minute
S	Second
F	Farad
V	Volt

Vibrasens

TBD	To Be determined
N/A	Not Applicable

Decimal - Inches

Inches						Decimal Equivalent	Millimeter Equivalent
1/32						.0313	0.794
	1/16					.0625	1.588
3/32						.0938	2.381
		1/8				.1250	3.175
5/32						.1563	3.969
	3/16					.1875	4.762
7/32						.2188	5.556
			1/4			.2500	6.350
9/32						.2813	7.144
	5/16					.3125	7.938
11/32						.3438	8.731
		3/8				.3750	9.525
13/32						.4063	10.319
	7/16					.4375	11.112
15/32						.4688	11.906
				1/2		.5000	12.700
17/32						.5313	13.494
	9/16					.5625	14.228
19/32						.5938	15.081
		5/8				.6250	15.875
21/32						.6563	16.669
	11/16					.6875	17.463
23/32						.7188	18.256
			3/4			.7500	19.050
25/32						.7813	19.844
	13/16					.8125	20.638
27/32						.8438	21.431
		7/8				.8750	22.225
29/32						.9063	23.019
	15/16					.9375	23.812
31/32						.9688	24.606
					1	1.0000	25.400

Polymer Characteristics

	PVC	PE	PUR	Halogenfree Radox 125	Silicone rubber	ETFE Tefzel	FEPTeflon	PFA Teflon	PTFE Teflon
Thermal									
Continous (°C) (20 000 hours)	70 to 105	70 to 105	80	125	180	155	200	260	260
1 day (°C)	100	100	TBD	200	260	220	240	TBD	300
Fire									
Halogen free	No	Yes	Yes	Yes	Yes	No	No	No	No
flame retardant	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Corrosive combustion gaz	Yes	No		No	No	Yes	Yes	Yes	Yes
Production of smoke	Severe	Medium	Severe	Slight	Medium	Slight	Slight	Slight	Slight
Mechanical									
Abrasion resistance	Satisfactory	Good	Very good	Good	Poor	Very good	Satisfactory	Satisfac-tory	Satis-factory
Flexibility (1)	Good	Poor	Very good	Satisfactory	Very good	Poor	Poor	Poor	Poor
Low temperature limite	-50 to -15	-40	-40	-30 to -50		-100	-100	-100	-200
Resistance to cold when moved (°C)	-5	-55	TBD	-40	-55	-55	-55	TBD	-70
Chemical									
Ionising radiation (kGy)	100	1000	10	1000	500	2000	100	TBD	1
Solvents (2)	Satisfactory	Satisfactory	Medium	Satisfactory	Satisfactory	Very Good	Very Good	Very Good	Very Good
Oils and fuel (2)	Satisfactory	Satisfactory	Low	Satisfactory	Satisfactory	Very Good	Very Good	Very Good	Very Good
Acids and Alkalis (2)	Good	Very Good	Low	Good	Satisfactory	Very Good	Very Good	Very Good	Very Good
Water (2)	Good	Very good	Medium	Good	Very good	Very Good	Very Good	Good	Very Good
Weathering/UV radiation	Good	Good	Very good	good	Very good	Very Good	Very Good	Good	Very Good
Other									
Pricing	€	€	€	€€	€€	€€€	€€	€€€€	€€€

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