

®ICP Triaxial Accelerometer, Model 131

Main Characteristics

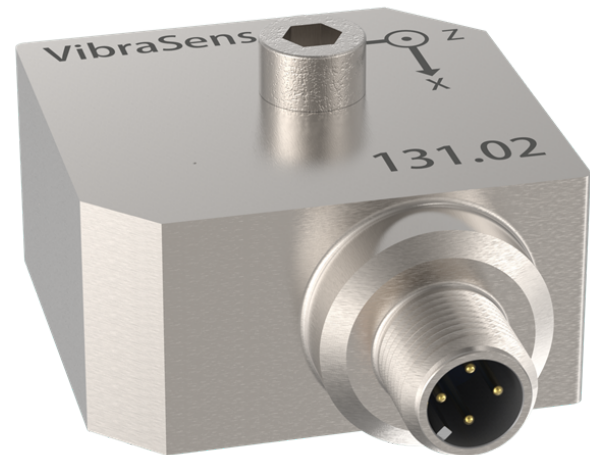
- ®ICP transmission mode
- Annular shear mode (better than obsolete compression design)
- Dual case isolation with internal Faraday shield (suitable for permanent installation, no need for insulation pad, no ground loop)
- Low, medium and high frequency version (10, 50, 100, 250, 500, 1000 mV/g)
- Hermetically 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 immunity 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 always leak after few temperature cycles.
- M12 connector offers compatibility with sensors used in automation.
- M12 overmolded cable assemblies are available from many cable manufacturers around the world. Mid cordset are expensive because they are only available from vibration sensor manufacturer.

Description

The hermetic sealed triaxial industrial piezoelectric accelerometer model 131 is designed 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.



Model 131.02

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 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, ...

Approvals



Revision History

- May 2003 : Released
- Dec 2014 : electronic upgrade
- Sept 2016 : improved case electrical isolation
- Dec 2017 : New housing, M8 availability

Ordering information

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

131.01- AA - B - HH - YY

AA : Sensitivity

3	.....	10 mV/g ± 5 %
3D	.....	10 mV/g ± 10 %
5	.....	50 mV/g ± 5 %
5D	.....	50 mV/g ± 10 %
6	.....	100 mV/g ± 5 %
6D	.....	100 mV/g ± 10 %
7	.....	250 mV/g ± 5 %
7D	.....	250 mV/g ± 10 %
8	.....	250 mV/g ± 5 %
8D	.....	250 mV/g ± 10 %
9	.....	500 mV/g ± 5 %
9D	.....	500 mV/g ± 10 %
0	.....	1000 mV/g ± 5 %
0D	.....	1000 mV/g ± 10 %

Note: 7, 9, 0 High pass frequency = 0.2 Hz.

Available suffix : N, negative polarity

B : Connector (Hermetic lifetime warranty)

2	M12 glass seal
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B (CC-DD) : Integral Cable

5(31-DD)	90°C Polyurethane cable
8(31-DD)	90°C PU cable with sstl protection conduit

DD length in metres. Standard length are 2m, 5m, 10m, 15m, 20m, 30m.

HH : Housing Thread

Omitted	.....	¼" 28 UNF
H8	.....	M8x1.25

YY : Agency Approval

Omitted	.....	No agency approval
Y1	.....	Atex : Not released

Special Engraving :

OEM or Customer Engraving :

Add ZXX at the end of the part number.
XX is a number supplied by VibraSens
Customer Engraving is not allowed for Explosion proof sensor.

In stock model :

131.02-6D-2 // 131.02-9-2 // 131.J2-0D-2 //

Ordering example :

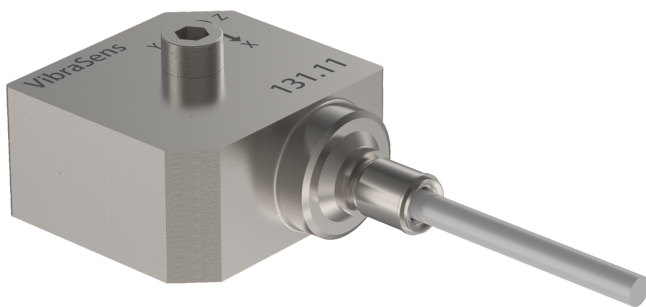
131.02-0D-2 Premium triaxial accelerometer, 1000mV/g, M12 glass seal side connector.

Configurations



M12 glass seal (B=2)

Associated cable 10.01-A01-E02-31-Length
Brown (X Axis); White (Y Axis); Black (Z Axis); Blue (GND)



Integral Cable B=5(CC-DD)

CC=31 (Polyurethane) :
Brown (X Axis); White (Y Axis); Black (Z Axis); Blue (GND)

NOT YET AVAILABLE

Integral cable with overbraid B=7(CC-DD)

Same wiring color as B=5

PICTURE NOT AVAILABLE

Integral cable with protection conduit B=8(CC-DD)

Same wiring color as B=5

Specifications (24°C)

Dynamic

Frequency response (± 3 dB)	
A=3X (Z axis)	0.5 to 10000 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	Top
Linearity	$\pm 1\%$ Max
Warm up time (Typical)	
A=3X, 6X	< 1Sec
A=9X, 0X	< 10Sec

Electrical

Electrical Grounding	Isolated from machine ground
.....	Internal Faraday shielding (fig. 1)
Isolation (Case to shield)	100 M Ω Min
Output impedance	50 Ω Nom
DC output bias, 4mA supply (AA=3X, 6X)	12 VDC Nom (Fig 2)
DC output bias, 4mA supply (AA=9X, 0X)	12 VDC Nom (Fig 2)
DC temperature response	+5% at -50°C
.....	-15% at max operating temperature
Residual noise (24°C) : A=3X	
1 Hz	120 $\mu\text{g}/\sqrt{\text{Hz}}$
10 Hz	30 $\mu\text{g}/\sqrt{\text{Hz}}$
100 Hz	5 $\mu\text{g}/\sqrt{\text{Hz}}$
1000 Hz	3 $\mu\text{g}/\sqrt{\text{Hz}}$
Residual noise (24°C) : A=5X	
1 Hz	tbd $\mu\text{g}/\sqrt{\text{Hz}}$
10 Hz	tbd $\mu\text{g}/\sqrt{\text{Hz}}$
100 Hz	tbd $\mu\text{g}/\sqrt{\text{Hz}}$
1000 Hz	tbd $\mu\text{g}/\sqrt{\text{Hz}}$
Residual noise (24°C) : A=6X	
1 Hz	25 $\mu\text{g}/\sqrt{\text{Hz}}$
10 Hz	8 $\mu\text{g}/\sqrt{\text{Hz}}$
100 Hz	5 $\mu\text{g}/\sqrt{\text{Hz}}$

1000 Hz	5 ug /√ Hz
Residual noise (24°C) : A=9X	
0.2 Hz	8 ug /√ H
1 Hz	16 ug /√ Hz
10 Hz	3 ug /√ Hz
100 Hz	0.8 ug /√ Hz
1000 Hz	0.5 ug /√ Hz
Residual noise (24°C) : A=0X	
0.2 Hz	5 ug /√ H
1 Hz	9 ug /√ Hz
10 Hz	4 ug /√ Hz
100 Hz	0.5 ug /√ Hz
1000 Hz	0.4 ug /√ Hz
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	5000 g peak
Continuous vibration	500 g peak
Temp. transient sens. (3Hz, LLF, 20dB/dec)	5 mg/°C

Physical

Design	Piezo 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)
Weight with Integral cable : add sensor weight above + ...	
BB=5(CC-DD)	40gr/m
BB=8(CC-DD)	105 gr/m
Connector	
B=2	M12 glass seal, IEC 60947-5-2
Material	AISI 316L, DIN 1.4404 (Stainless steel)
Mounting torque (M6, M7, M8)	2.4 N.m (21 in-lbs)

European Directive

EMC Directive	2014/30/EU
Standards	61326-1

RoHS Directive	2011/65/EU
Certificate	101.51-YN_Rohs2

Accessories, supplied

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

Accessories, not supplied

Mounting Hex cap screw :	
10-32 UNF 2A	193.31-15-1
M6 machine thread	193.31-06-1
¼" 28 UNF machine thread	193.31-16-1
M8x1.25 (HH=08 is required)	193.31-08-1
M12 - 4 Pins cable to Flying leads Cable assembly (not for TO or T1 option)	
Polyurethane cable (90°C)	10.01-A01-E02-31-Length
Accessories for BNC output	301.11
M12 - 5 Pins cable to Flying leads Cable assembly (For T0 or T1 option)	
Polyurethane cable (90°C)	Not released, please call
Accessories for BNC output	301.11
M12 - 4 Pins to 3 BNC Cable assembly (not for TO or T1 option)	
Polyurethane cable (90°C)	10.01-TE01-TCF02-31-Length
Calibration traceable to PTB, back to back, single point., A4 certificates	501.01

Repair

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

Special Version / OEM Version

131.02-JXX	Lower noise than standard version.
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Outline Drawings

Download link : [131.02](#)

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