

®ICP Accelerometer, Model 105 Economy, Top connector

Main Characteristics

- Economy model
- -55°C to 120 °C (-67°F to 248°F)
- ®ICP transmission mode
- Compression mode
- Dual case isolation with Faraday shield
- Reverse wiring and ESD protection
- Complies with API 670 requirements (A=2, B=1 only)

Competitive advantage

- Price
- Exceptional bias voltage stability at elevated temperatures
- Low cost IP67 overmolded M12 cable assembly
- M12 cable assembly is available through local electronic distributor
- M12 offers compatibility with sensors used in automation.

Description

The sealed industrial piezoelectric accelerometer model 105 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. Low noise electronic and a temperature compensated design will give you accurate result over the complete temperature range.

Economy compression mode accelerometers should not be used whenever thermal transient, high transverse vibrations or high base strain are present. Compression accelerometers are also not recommended for low frequency (<1Hz) measurements. In such environments model 101 (annular shear mode) is preferred.

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, ...

Ordering information model 105.01 (±10% sensitivity)

To order, specify model number, options and suffix :

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

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

- 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 2, 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



Model 105.01-A-2 with Overmolded M12 cable assembly

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

Options :

Housing thread (Standard thread : M6x1)

- H1 : M16x2 (quick mounting + 120° positioning) (Not stocked)
 - H2 : Quick fit mounting (Not stocked)
 - H7 : 1/4" 28 UNF-2A.
- 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-pin connector

Special Agency Approval

None

Accessories:

- 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

Ordering example :

105.01-6-3 M6 Accelerometer, piezoelectric

Most Popular model :

105.01-6-3 / 105.01-6-1

Note : * = preferred and stocked items

Specifications

Dynamic

Sensitivity	
A=3.....	10 mV/g $\pm 10\%$
A=6.....	100 mV/g $\pm 10\%$
Frequency response.....	(See fig.4 & 5)
A=3, 6	$\pm 10\%$: 2 to 9000 Hz
.....	± 3 dB : 1 to 14000 Hz
Mounted Resonant frequency	
A=3, 6.....	35 kHz Nom
Dynamic range	
A=3.....	500 g pk
A=6.....	80 g pk
Transverse response sensitivity (20Hz, 5g)	<5% max
Temperature response	(See fig3)
Polarity	(see fig. 1) Suffix dependant
Linearity (up to 80 g peak).....	$\pm 1\%$ Max
Warm up time (Typical).....	< 1Sec
Option T0	
Output (between - and Temp).....	$V_{out} = 10mV/^{\circ}C * T(^{\circ}C)$
.....	0VDC at 0°C
Range	+2° to 120°C

Electrical

Electrical Grounding.....	Isolated from machine ground
.....	Internal shielding (see fig. 1)
Isolation (Case to shield)	100 M Ω Min
Capacitance to ground.....	70 pF Nom
Output impedance	50 Ω Nom
DC output bias, 4mA supply.....	12 VDC (See Fig 2)
Residual noise (24°C) A=2 :	
1 Hz to 25 kHz	300 ug rms
1 Hz at 24°C	30 ug
Residual noise (24°C) A=3 :	
1 Hz to 25 kHz	300 ug rms
1 Hz at 24°C	30 ug
Power requirements	Constant current : +2 to +10mA DC
.....	Voltage : +22 to +28 VDC
Protection : Overvoltage	Yes
Protection : Reverse polarity.....	Yes

Environmental

Temperature : Operating continous and storage (4 mA max)	
.....	-55 to 120 °C (-65 to 250 °F)
Humidity / Enclosure	
B=1, 2.....	Not affected, hermetically sealed, 1E-8torr./ls
B=3	Not affected, epoxy sealed
Acceleration limit : Shock	5 000g peak
Acceleration limit : Continuous vibration.....	500g peak
Base strain sensitivity	0.002 g pk/u strain
Temp. transient sens. (3Hz, LLF, 20dB/dec)	TBD 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
B=3.....	See Fig. 1c
B=5.....	See Fig. 1d
B=7.....	See Fig. 1e
Design	Ceramic, compression
Weight, A=2, 3	80 gr Nom (2.8 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 1.4435 (Stainless steel)
Mounting.....	M6x1 tapped centre hole
Mounting torque (M6, M7, M8 suffix).....	2.4N.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 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

Standard Wiring color

With Mil-C-5015 cable assembly: + = Red // - = White

With M12 cable harness: : + = Black // - = Blue // Temperature=White

Repair

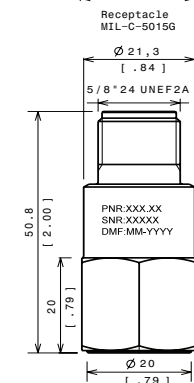
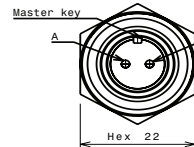
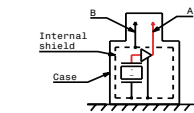
Consult factory for replacement of connector in case of broken or bended pins. Repair of electronic is not possible.

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

Version History

105.01-2 has been replaced by 105.01-6

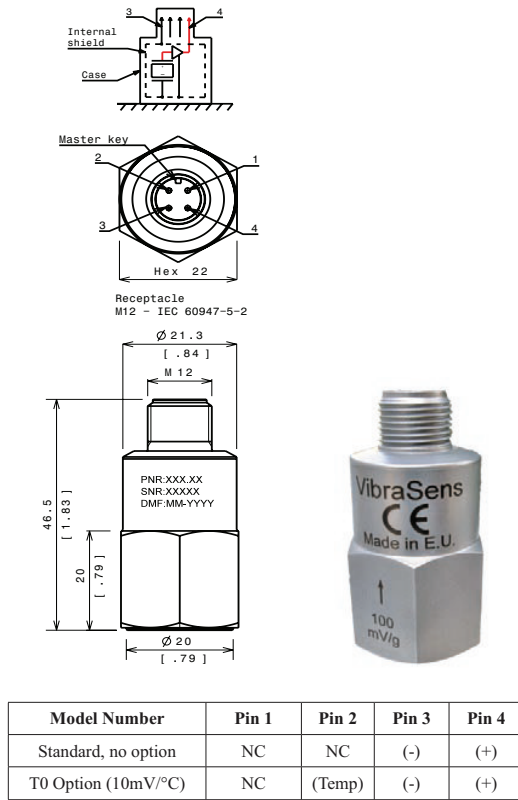
Drawings



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)



(NC) : Not connected

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

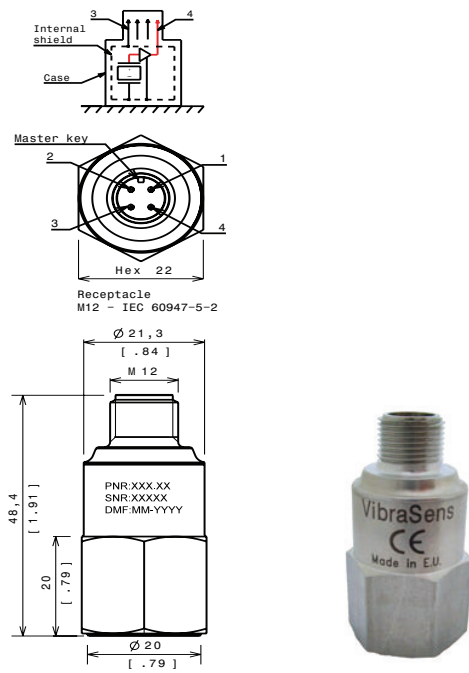
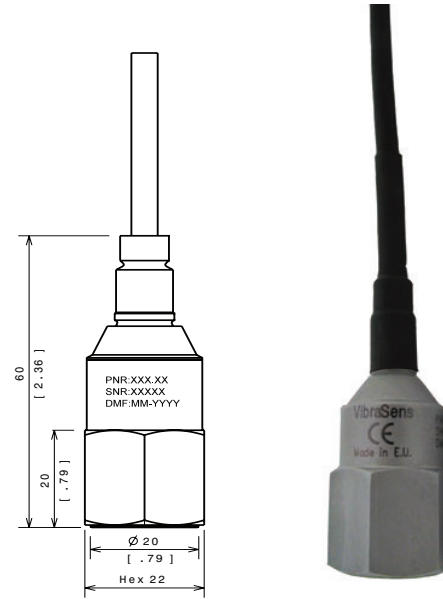


Fig 1c : Outline drawing B=3 (M12 Epoxy)
electrical layout : See above B=2



(1) T0 option (10mV/°C)

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

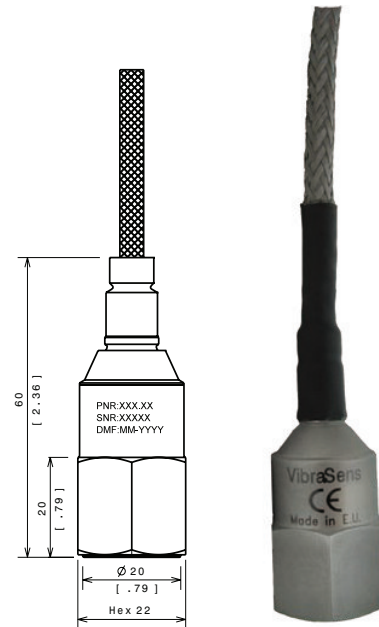


Fig 1e : Outline drawing B=7 (cable with overbraid)
electrical layout : See above B=5

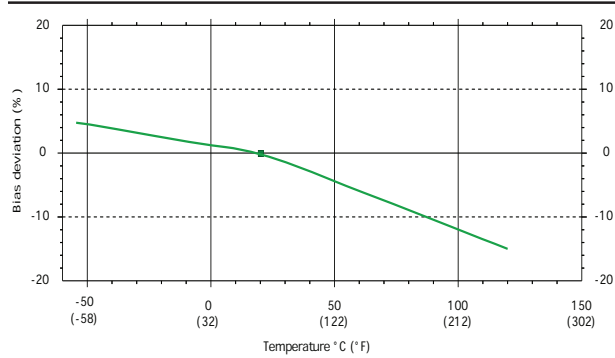


Fig 2 : DC (Bias) deviation versus temperature

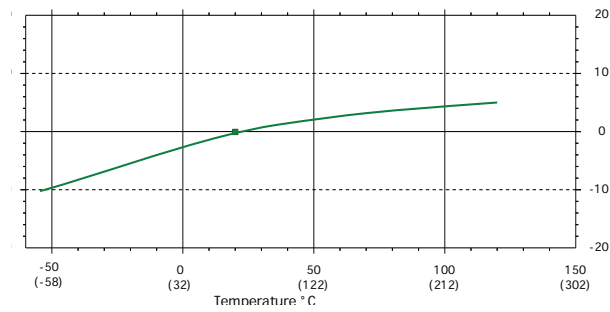


Fig 3 : Sensitivity deviation versus temperature

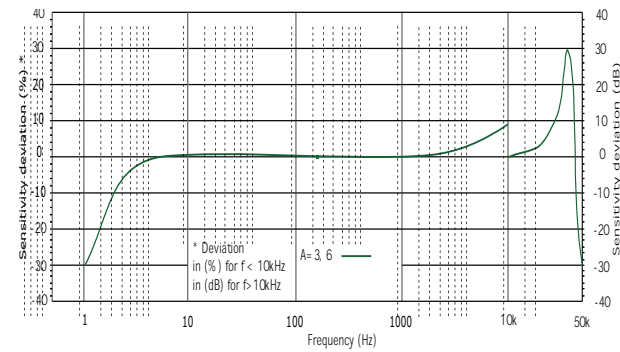


Fig 4a: Frequency response, amplitude

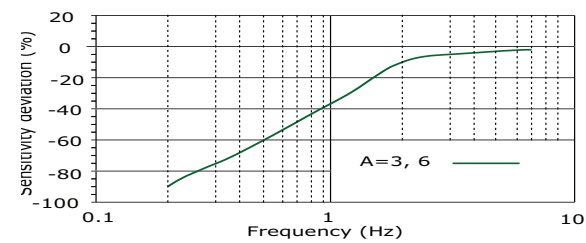


Fig 4b : Low Frequency response, amplitude