700 and 1400 series

CONTROL GRADE ACCELEROMETERS

The most cost-effective control grade accelerometers

The 700 and the 1400 series are a range of self-contained fused-quartz pendulous accelerometers in a small hermetic package designed to address a variety of moderate performance applications requiring not better than 1mg and 1000ppm 1-year repeatability figures, but still with an output noise consistent with higher classification inertial grade accelerometers (VRW < 0.25 µg/√Hz). These applications include stabilisation platforms, flight control systems, train tilt systems and many others at sea, on land and in the air.

The core technology used in the 700 and 1400 series is IXSENS improved Fused Quartz Pendulous Servo Accelerometers technology, designed, engineered, and manufactured by IXSENS.

At the heart of the accelerometer is a proof mass made of a high purity fused quartz disc structure connected to a rigid outer frame by two thin hinges. A deposited gold film is used to form an electrode pattern on the surface of the pendulum for capacitive detection. The outer frame is clamped symmetrically between two magnetic structures comprising a high stability magnet and a nickel–iron alloy case. When acceleration is applied perpendicularly to the proof mass, a servo loop circuit derives an error signal from the capacitive detection and delivers a current into a coil attached to the proof mass. Laplace forces are then applied to the winding and the proof mass is maintained in a capture mode with its center in a null position. As the current running through the coil is proportional to the applied acceleration, the same current flowing through an external load resistor will then generate an output voltage proportional to acceleration.

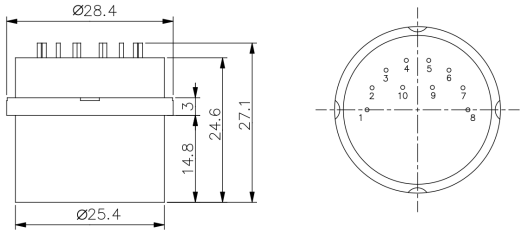
The 700 and the 1400 series are available in a type-C version for applications limited to 15g, and a type-D version for applications with extended range up to 60g.

FEATURES

- 15g and 60g measurement range
- Navigation-grade accuracy
- ITAR-free
- Superior reliability (MTBF ≥ 500,000 hr)
- 1-axis measurement
- Analogue output
- Internal temperature sensor for thermal compensation
- Low power electronics
- Built-in self-test

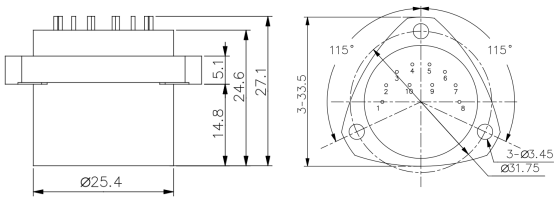
DIMENSIONS – ELECTRICAL INTERFACE

2201-700-020



Pin	Function	Characteristics
1	Signal Out	Acceleration output, current signal
2	Current Torque	Current input test pin
3	Negative Power Supply	-13 V to -28 V
4	Positive Power Supply	+13 V to +28 V
5	Factory test	Do not connect to that pin
6	Temperature Sensor Output	Temperature output, current signal
7	Voltage Self-Test	Voltage input test pin
8	Signal & Power Return	Ground reference for power supplies and signals
9	Voltage output	-10 V DC
10	Voltage output	+10 V DC

2201-1400-020



IXSENS
Beyond Expectations

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PERFORMANCE AND KEY CHARACTERISTICS

Type D – Dual-use accelerometers

Performance	2201-700-020 No flange	2201-1400-020 Triangle flange
Input Range	±60 g	±60 g
Bias	≤5 mg	≤5 mg
Bias stability (FTR, compensated)	≤200 µg	≤200 µg
Bias one-year composite repeatability	≤1,000 µg	≤1,000 µg
Bias temperature slope	≤70 µg/°C	≤70 µg/°C
Scale factor	1.20 to 1.46 mA/g	1.20 to 1.46 mA/g
Scale factor stability (FTR, compensated)	≤400 ppm	≤400 ppm
Scale factor one-year composite repeatability	≤1,000 ppm	≤1,000 ppm
Scale factor temperature slope	≤60 ppm/°C	≤60 ppm/°C
Axis misalignment	≤2,000 µrad	≤2,000 µrad
Axis misalignment stability (FTR, compensated)	≤60 µrad	≤60 µrad
Axis misalignment one-year composite repeatability	≤200 µrad	≤200 µrad
Axis misalignment temperature slope	≤5 µrad/°C	≤5 µrad/°C
Vibration Rectification	≤50 µg/g²rms (50-200 Hz) ≤100 µg/g²rms (200-750 Hz) ≤150 µg/g²rms (750-2 kHz) ≤60 µg/g²rms (50-500 Hz) ≤150 µg/g²rms (500-2 kHz)	≤50 µg/g²rms (50-200 Hz) ≤100 µg/g²rms (200-750 Hz) ≤150 µg/g²rms (750-2 kHz) ≤60 µg/g²rms (50-500 Hz) ≤150 µg/g²rms (500-2 kHz)
Intrinsic Noise	≤7 µg-rms (0-10 Hz) ≤70 µg-rms (10-500 Hz) ≤1,500 µg-rms (500-10 kHz)	≤7 µg-rms (0-10 Hz) ≤70 µg-rms (10-500 Hz) ≤1,500 µg-rms (500-10 kHz)
Environment		
Operating Temperature Range	-55 to +95 °C	-55 to +95 °C
Shock, half-sine, 4ms	250 g	250 g
Vibration Peak Sine	25 g @ 20-2 kHz	25 g @ 20-2 kHz
Resolution/Threshold	≤1 µg	≤1 µg
Bandwidth	>800 Hz	>800 Hz
Temperature sensor output		
	Yes	Yes
Electrical		
Quiescent Current per Supply	≤18 mA	≤18 mA
Quiescent Power (±15 V DC)	≤480 mW	≤480 mW
Input Voltage	±13 to ±28 V DC	±13 to ±28 V DC
Physical		
Weight	53 ±2 grams	65 ±2 grams
Diameter below mounting surface	Ø25.4 mm Max	Ø25.4 mm Max
Height bottom to mounting surface	14.8 mm Max	14.8 mm Max
Case Material	300 Series Stainless Steel	300 Series Stainless Steel

FTR: Full Temperature Range

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CONTROL GRADE ACCELEROMETERS

PERFORMANCE AND KEY CHARACTERISTICS

Type C – Commercial accelerometers

Performance	2201-700-021 No flange	2201-1400-021 Triangle flange
Input Range	±15 g	±15 g
Bias	≤5 mg	≤5 mg
Bias stability (FTR, compensated)	≤200 µg	≤200 µg
Bias one-year composite repeatability	≤1,000 µg	≤1,000 µg
Bias temperature slope	≤70 µg/°C	≤70 µg/°C
Scale factor	1.20 to 1.46 mA/g	1.20 to 1.46 mA/g
Scale factor stability (FTR, compensated)	≤400 ppm	≤400 ppm
Scale factor one-year composite repeatability	≤1,000 ppm	≤1,000 ppm
Scale factor temperature slope	≤60 ppm/°C	≤60 ppm/°C
Axis misalignment	≤2,000 µrad	≤2,000 µrad
Axis misalignment stability (FTR, compensated)	≤60 µrad	≤60 µrad
Axis misalignment one-year composite repeatability	≤200 µrad	≤200 µrad
Axis misalignment temperature slope	≤5 µrad/°C	≤5 µrad/°C
Vibration Rectification	≤50 µg/g²rms (50-200 Hz) ≤100 µg/g²rms (200-750 Hz) ≤150 µg/g²rms (750-2 kHz) ≤60 µg/g²rms (50-500 Hz) ≤150 µg/g²rms (500-2 kHz)	≤50 µg/g²rms (50-200 Hz) ≤100 µg/g²rms (200-750 Hz) ≤150 µg/g²rms (750-2 kHz) ≤60 µg/g²rms (50-500 Hz) ≤150 µg/g²rms (500-2 kHz)
Intrinsic Noise	≤7 µg-rms (0-10 Hz) ≤70 µg-rms (10-500 Hz) ≤1,500 µg-rms (500-10 kHz)	≤7 µg-rms (0-10 Hz) ≤70 µg-rms (10-500 Hz) ≤1,500 µg-rms (500-10 kHz)
Environment		
Operating Temperature Range	-55 to +95 °C	-55 to +95 °C
Shock, half-sine, 4ms	250 g	250 g
Vibration Peak Sine	25 g @ 20-2 kHz	25 g @ 20-2 kHz
Resolution/Threshold	≤1 µg	≤1 µg
Bandwidth	>800 Hz	>800 Hz
Temperature sensor output		
	Yes	Yes
Electrical		
Quiescent Current per Supply	≤18 mA	≤18 mA
Quiescent Power (±15 V DC)	≤480 mW	≤480 mW
Input Voltage	±13 to ±28 V DC	±13 to ±28 V DC
Physical		
Weight	53 ±2 grams	65 ±2 grams
Diameter below mounting surface	Ø25.4 mm Max	Ø25.4 mm Max
Height bottom to mounting surface	14.8 mm Max	14.8 mm Max
Case Material	300 Series Stainless Steel	300 Series Stainless Steel

FTR: Full Temperature Range

Additional product specifications, outline drawings, block diagrams, and test data are available on request.

For More Information:
www.ixsens.com

General inquiries:
info@ixsens.com

DISCLAIMER:
Specifications are subject to change without notice. IXSENS does not assume any liability arising out of the application or use of the product.

FOR INFORMATION:
Type C series not subject to Export Control.
Type D series subject to Export Control.

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