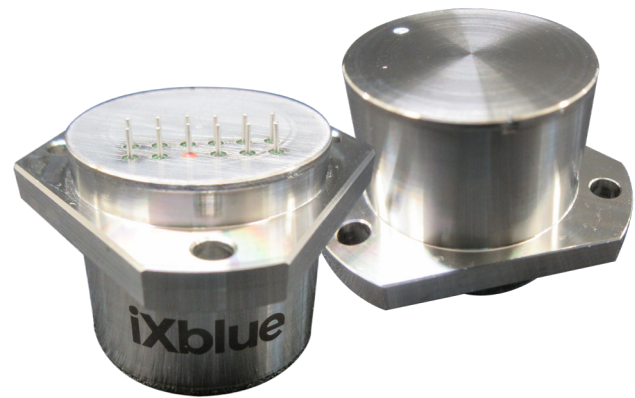


iXal A5

Quartz Vibrating Beam Accelerometer

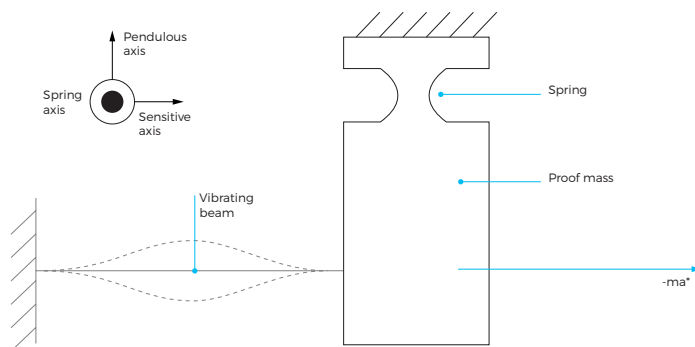
iXal Series are accelerometers based on the Vibrating Beam Accelerometer (VBA) technology. The measurement uses the change in the resonance frequency of a vibrating beam under the inertial loading of a proof mass when subjected to acceleration.



The iXal A5 accelerometer includes 2 identical VIA* transducers in a push-pull configuration in order to reduce all common parasitic sensitivities e.g. temperature, pressure, aging. Two oscillator circuits continually maintain the 2 beams at their resonance frequencies and the opposite variations of the two frequencies directly provide the applied acceleration.

iXblue is able to supply on request the thermal model coefficients and the electronic board including the signal processing for three sensors.

BASED ON VBA TECHNOLOGY



The specifications on the next pages are given with thermal compensation within the operating temperature range, using a fourth order polynomial for calculation of the temperature dependent coefficients.

FEATURES

- MIL STD qualified : 810G, 514 and 516
- Frequency output (allow custom interface for digitalization)
- Temperature sensor output for thermal compensation
- Rugged design
- ITAR free

BENEFITS

- High input range
- Navigation grade
- High accuracy
- Crystal quartz resonating stability
- No magnetic emission or sensitivity

APPLICATIONS

- Sea, Land, Air, Underwater navigation:
 - Inertial Measurement Unit (IMUs)
 - Attitude and Heading Reference Systems (AHRS)
- Guidance
- Bridge monitoring and stability
- Offshore drilling platform monitoring

* VIA = Vibrating Inertial Accelerometer based on French patent of ONERA

TECHNICAL SPECIFICATIONS

Performance

	iXal A5-50	iXal A5-80
Input range	+/- 50 g	+/- 80 g
Bias		
Nominal value	< 16 g	< 16 g
Temperature modeling residual	< 300 µg peak	< 500 µg peak
Long term repeatability (one year)	< 1000 µg peak	< 1000 µg peak
Scale factor		
Nominal value	19 to 25 Hz/g	19 to 25 Hz/g
Temperature modeling residual	< 100 ppm peak	< 100 ppm peak
Long term repeatability (one year)	< 300 ppm peak	< 300 ppm peak
Non linearity		
Nominal value	< 150 µg/g ² peak	< 150 µg/g ² peak
Temperature modeling residual	< 50 µg/g ² peak	< 100 µg/g ² peak
Misalignment		
Axis misalignment	< 15 mrad peak	< 15 mrad peak
Temperature modeling residual	< 100 µrad peak	< 100 µrad peak
Long term repeatability (one year)	< 300 µrad peak	< 300 µrad peak
Vibration rectification		
For operating vibration spectrum	< 50 µg/g ² rms	< 100 µg/g ² rms
Others		
White noise	< 10 µg / √Hz	< 10 µg / √Hz
Resolution / Threshold	< 5 µg	< 5 µg
Bandwidth	DC - 1000 Hz	DC - 1000 Hz

Environment

Temperature	
Operating temperature	-32 to +70°C
Storage temperature	-45 to +85°C
Magnetism	
Magnetic sensitivity (bias & scale factor)	No sensitivity
Vibration	
Operating vibration ⁽¹⁾	4.54 g rms (5 to 500 Hz)
Storage vibration ⁽²⁾	0.04 g ² /Hz (20 to 2000 Hz)
Shock	
Operating shock ⁽³⁾	40g 11ms 40g SRC (45 to 2000 Hz)
Storage shock ⁽⁴⁾	80g SRC (80 to 2000 Hz) 200g SRC (115 to 2000 Hz)

(1) according to MIL-STD-810C, change 1, table 514.7C-III category 4 + table 514.6C-IV- category 4 | (2) according to MIL-STD-810C, change 1, method 514.7, figure 514.7E-1 | (3) according to MIL-STD-810C, method 516.6, figure 516.6-10 table 516.6-II, procedure 1 and figure 516.6-8 table 516.6-I | (4) according to MIL-STD-810C, method 516.6, figure 516.6-8 table 516.6-I

Mechanical

Dimensions	Height 26 mm x Diameter below mounting surface Φ 26 mm
Weight	< 50 g
Housing material	Stainless steel 304L
Mounting	3 Φ 3.2 holes

Electrical

Input

Input current	2,5 mA
Input voltage	+/- 4.5 V to +/-4.6 V

Output

Output signal	2 frequencies 59000 to 66000 Hz
Output voltage	+/- 0.2 V to +/- 0.4 V
Power consumption	< 60 mW

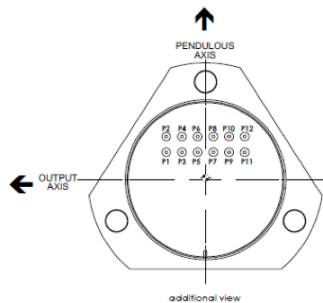
Temperature Sensor

Output current	300 μ A at 20 °C
Sensitivity	1 μ A / °C
Repeatability	+/- 0.1 °C

CONFIGURATION DRAWING & INTERFACES

Electrical interface

Pin #	signal
1	Input voltage -4.5 V (VB)
2	Output frequency signal (VB)
3	Input voltage +4.5 V (VB)
4	NC
5	Ground
6	Output temperature signal
7	Ground
8	Ground
9	Input voltage -4.5 V (VH)
10	NC
11	Input voltage +4.5 V (VH)
12	Output frequency signal (VH)



Mechanical interface

