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Force-Balanced Precision Inclinometer Selector Guide



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MEMS Inclinometer Selector Guide



MEMS Accelerometer Selector Guide





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 Excellent Repeatability Excellent Repeatability Environmentally Rugged Choice of Square or Round Mounting Flanges Built In Self-Test System Rail Maintenance Track Geometry Wind Tunnel Testing Wind Tunnel Testing Navigation Grade Performance Survey Applications Survey Applications Excellent Repeatability Excellent Repeatability Environmentally Rugged Choice of Square or Round Mounting Flanges Built In Self-Test System Borehole Mapping Wind Tunnel Testing Navigation Grade Performance Survey Applications Survey Applications Acceleration Range, g Max. (Note 1) ±30 ±20					
Features & Benefits Mid-Temperature Range Excellent Repeatability E-minomentally Rugged Choice of Square or Round Mounting Flanges Built In Self-Test System Mid-Temperature Range E-scellent Repeatability E-minomentally Rugged Choice of Square or Round Mounting Flanges 					
 Excellent Repeatability Excellent Repeatability Excellent Repeatability Environmentally Rugged		QFA - 125	QFA - 150	QFA - 180	QFM - 180
 Excellent Repeatability Excellent Repeatability Excellent Repeatability Environmentally Rugged					Alternation of the second seco
Geometry wind Tunnel Testing Navigation Grade Perfor- mance Survey Applications• Wand Tunnel Testing warie instrumentation • 3D Modeling Equip- ment for Large Scale Geometries• Measure While Drilling • Survey Applications • Orientation Systems for Drilling Applications • Orientation Systems for Drilling Applications • RoboticsPerformance SpecsAcceleration Range, g Max. (Note 1) ± 30 ± 30 ± 30 ± 30 ± 20 Scale Factor, mA/g (Note 2)1.1 to 1.41.1 to 1.41.1 to 1.41.1 to 1.41.8 to 2.8Bias, millig Max. (@ 25° C)400204002040020Axis Alignment, mRad, Max. (@ 25° C)1.5 ± 1.5 1.54Breshold and Resolution, µg Max.100100100100Bandwidth, Hz. Min.3000300300300300Scale Factor Temp. Sens, PPM/*C, Max: $\pm 55^\circ$ Cto $\pm 125^\circ$ Ct $\pm 100^\circ$ Ct $\pm 125^\circ$ Ct ± 10	Features & Benefits	 Excellent Repeatability Environmentally Rugged Choice of Square or Round Mounting Flanges 	 Excellent Repeatability Environmentally Rugged Choice of Square or Round Mounting Flanges 	 Excellent Repeatability Environmentally Rugged Choice of Square or Round Mounting Flanges 	Design Environmentally Rugged Square Mounting
Acceleration Range, g.M.x. (Note 1) ±30 ±30 ±30 ±30 ±20 Scale Factor, mA/g (Note 2) 1.1 to 1.4 1.1 to 1.4 1.1 to 1.4 1.8 to 2.8 Bias, milling, Max, (@ 25° C) 40 20 40 20 Axis Alignment, mRad, Max, (@ 25° C) 1.5 ±1.5 1.5 4 Breshold and Resolution, µg Max 10 10 10 10 Bandwidth, Hz, Min. 300 300 300 300 300 Scale Factor Temp. Sens, PPM/°C, Max: ±55° C to ±125°C : ±120 ±25° C to ±100°C : ±80 ±55° C to ±180°C : ±120 ±200 ±100° C to ±125°C : ±170 ±100°C to ±125°C : ±150 ±100°C to ±180°C : ±170 ±150 Bias Temp. Sens, µg/°C, Max ±100 ±100°C to ±125°C : ±150 ±150 ±150 Scale Factor Stability (1 month composite) less than 250 µg less than 500 µg less than 250 µg	Applications	Geometry Wind Tunnel Testing Navigation Grade Performance 	 Wind Tunnel Testing Marine Instrumentation 3D Modeling Equipment for Large Scale 	 Measure While Drilling Structural Monitoring Survey Applications Orientation Systems for 	 Measure While Drilling Structural Monitoring Oil Drilling Survey Applications
Scale Factor, m4/g (Note 2) 1.1 to 1.4 1.1 to 1.4 1.1 to 1.4 1.1 to 1.4 Bias, milling, Max. (@ 25° C) 40 20 40 20 Axis Alignment, mRad, Max. (@ 25° C) 1.5 ±1.5 1.5 4 Brashwidth, Hz, Min. 300 300 300 300 300 Scale Factor Temp. Sens, PPM/*C, Max. ±55° to ±125° C: ±100 ±25° to ±100° C: ±80 ±55° to ±180° C: ±200 ±200 ±100° to ±125° C: ±100 ±100° C to ±125° C: ±100 ±100° C to ±180° C: ±100 ±100° C to ±180° C: ±100 ±100° C to ±180° C: ±100 Scale Factor Stability (1 month composite) less than 250 µg less than 350 µg less than 250 µg less than 220 µg Bias Stability (1 month composite) less than 250 µg less than 500 µg less than 250 µg less than 250 µg less than 250 µg Neight (grams) 55 55 55 25 25 Electrical ±13 to ±18 ±12 to ±18 ±13 to ±18 ±12 to ±15 Input Voltage, Vdc ±13 to ±18 ±12 to ±18 ±13 to ±18 ±12 to ±15 Input Volta	Performance Specs				
Bias, milling, Max. (@ 25° C) 40 20 Axis Alignment, mRad, Max. (@ 25° C) 1.5 ±1.5 1.5 4 Threshold and Resolution, µg Max 10 10 10 10 Bandwidth, Hz, Min. 300 300 300 300 300 Scale Factor Temp. Sens, PPM/*C, Max: +55°C to +125°C : ±100 +55°C to +180°C : ±200 +±100°C to +125°C : ±150 +±100°C to +180°C : ±100 ±100°C to +125°C : ±100 +±100°C to +180°C : ±100 ±100°C to +125°C : ±100 ±150 ±150 Bias Temp. Sens, µg/*C, Max. ±1100 ±100 ±150 ±150 ±150 Scale Factor Stability (1 month composite) Iess than 250 µg Iess than 250 µg <t< td=""><td>Acceleration Range, g Max. (Note 1)</td><td>±30</td><td>±30</td><td>±30</td><td>±20</td></t<>	Acceleration Range, g Max. (Note 1)	±30	±30	±30	±20
Aks Alignment, mRad, Max, @ 25° C) 1.5 ±1.5 1.5 4 Threshold and Resolution, µg Max 10 10 10 10 Bandwidth, Hz, Min. 300 300 300 300 Scale Factor Temp. Sens, PPM/°C, Max. +55° C to +125° C : ±100° +25° C to +100° C : ±180 +55° C to +180° C : ±200 +200 Holo° C to +125° C : ±100 +100° C to +125° C : ±100 +100° C to +180° C : ±200 +100° C to +180° C : ±200 +200 Bias Temp. Sens, µg /° C, Max. ±100 ±100 ±100 ±150 ±150 Scale Factor Stability (1 month composite) Iess than 250 ppm Iess than 350 ppm Iess than 250 µg Iess than 220 µg Noise, ngrms, Max. (0Hz to 10kHz) (Max) 3 3 4 4 Weight (grams) 55 55 55 25 Electrical ±13 to ±18 ±12 to ±18 ±13 to ±18 ±12 to ±15 Input Voltage, Vdc ±13 to ±18 ±12 to ±15 20 20 Environmental 12 12 12 20 Operational Temp Range, °	Scale Factor, mA/g (Note 2)	1.1 to 1.4	1.1 to 1.4	1.1 to 1.4	1.8 to 2.8
Threshold and Resolution, µg, Max. 10 10 10 Bandwidth, Hz, Min. 300 300 300 300 Scale Factor Temp. Sens, PPM/*C, Max. +55°C to +125°C : ±200 +25°C to +100°C : ±80 +55°C to +180°C : ±200 ±200 +100°C to +125°C : ±100 +100°C to +125°C : ±100 +100°C to +180°C : ±100 ±100°C to +180°C : ±100 ±100°C to +180°C : ±100 Bias Temp. Sens, µg/°C, Max. ±100 ±100 ±150 ±150 Scale Factor Stability (1 month composite) less than 250 µpm less than 350 µpm less than 250 µg less than 220 µg Noise, mgms, Max. (OHz to 10kHz) (Max.) 3 3 3 4 Weight (grams) 55 55 25 25 Electrical ±113 to ±18 ±12 to ±18 ±13 to ±18 ±12 to ±15 Input Current (quiescent), mA (Max.) 12 12 12 20 Environmental -55°C to ±125°C -55°C to ±150°C 25°C to ±160°C 25°C to ±160°C 25°C to ±00°C 25°C to ±00°C	Bias, milli-g, Max. (@ 25 ° C)	40	20	40	20
Bandwidth, Hz, Min. 300 300 300 300 300 Scale Factor Temp. Sens, PPM/°C, Max. +55°C to +125°C : ±200 +25°C to +100°C : ±80 +55°C to +180°C : ±200 +200 +100°C to +125°C : ±170 +100°C to +125°C : ±150 +100°C to +180°C : ±170 +100°C to +180°C : ±170 ±100°C to +180°C : ±170 Bias Temp. Sens, µg/°C, Max. ±1100 ±100 ±100 ±1150 ±150 Scale Factor Stability (1 month composite) less than 250 µg less than 350 µg less than 250 µg less than 250 µg less than 250 µg less than 250 µg less than 220 µg Noise, mgrms, Max. (OHz to 10kHz) (Max) 3 3 3 4 Weight (grams) 55 55 25 25 Electrical 12 12 12 20 Input Current (quiescent), mA (Max.) 12 12 12 20 Environmental -55°C to +125°C -55°C to +150°C -55°C to +180°C -40°C to +180°C Operational Temp Range, °C 25 Hz to 500 Hz, 25g	Axis Alignment, mRad, Max. (@ 25° C)	1.5	±1.5	1.5	4
Scale Factor Temp. Sens, PPM/°C, Max.: +55°C to +125°C : ±200 +100°C to +125°C : ±100 +25°C to +100°C : ±800 +100°C to +125°C : ±100 +55°C to +180°C : ±200 +100°C to +180°C : ±100 ±200 Bias Temp. Sens, µg/°C, Max. ±100 ±100 ±150 ±150 Scale Factor Stability (1 month composite) less than 250 µg less than 350 µg less than 250 µg less than 220 µg Noise, mgrms, Max. (0Hz to 10kHz) (Max.) 3 3 3 4 Weight (grams) 55 55 55 25 Electrical ±13 to ±18 ±12 to ±18 ±13 to ±18 ±12 to ±15 Input Voltage, Vdc 12 12 20 20 Environmental -55°C to +125°C -55°C to +150°C 25 Hz to 500 Hz, 25g 25 Hz to 500 Hz, 25g 25 Hz to 500 Hz, 25g	Threshold and Resolution, µg, Max.	10	10	10	10
HOO°C to +125°C : ±170+100°C to +125°C : ±150+100°C to +180°C : ±170HOO°C to +180°C : ±170Bias Temp. Sens, µg/°C, Max.±100±100±100±150±150Scale Factor Stability (1 month composite)less than 250 µgless than 350 µgless than 250 µgless than 220 µgNoise, mgrms, Max. (OHz to 10kHz) (Max)3334220 µgNoise, mgrms, Max. (OHz to 10kHz) (Max)13 to ±18±12 to ±18±13 to ±18±12 to ±15Input Voltage, Vdc±13 to ±18±13 to ±18±12 to ±18±113 to ±18±12 to ±15Input Current (quiescent), mA (Max.)1212121220Operational Temp Range, °C-55°C to +125°C25 Hz to 500 Hz, 25g25 Hz to 500 Hz, 25g25 Hz to 500 Hz, 25g25 Hz to 500 Hz, 25g	Bandwidth, Hz, Min.	300	300	300	300
Image: Sense of the sense of	Scale Factor Temp. Sens, PPM/°C, Max.:	+55°C to +125°C : ±200	+25°C to +100°C : ±80	+55°C to +180°C: ±200	±200
Bias Temp. Sens, µg/°C, Max. \pm 100 \pm 100 \pm 1100 \pm 1100 \pm 1100 \pm 1100 \pm 1150 \pm 1150Scale Factor Stability (1 month composite)less than 250 µgless than 350 µgless than 250 µgless than 220 µgBias Stability (1 month composite)less than 250 µgless than 250 µgless than 250 µgless than 220 µgNoise, mgrms, Max. (0Hz to 10kHz) (Max)3334Weight (grams)55555525ElectricalInput Voltage, Vdc \pm 113 to \pm 18 \pm 12 to \pm 18 \pm 13 to \pm 18 \pm 12 to \pm 15Input Current (quiescent), mA (Max)12121220Derational Temp Range, °C -55° C to \pm 125°C -55° C to \pm 150°C -55° C to \pm 180°C -40° C to \pm 180°CVibration, (Sine)25 Hz to 500 Hz, 25g25 Hz to 500 Hz, 25g25 Hz to 500 Hz, 25g25 Hz to 500 Hz, 25g		+100°C to +125°C: ±170	+100°C to +125°C : ±150	+100°C to +180°C: ±170	
Scale Factor Stability (1 month composite)less than 250 ppmless than 350 ppmless than 250 ppmless than 220 ppmBias Stability (1 month composite)less than 250 µgless than 500 µgless than 250 µgless than 220 µgNoise, mgrms, Max. (OHz to 10kHz) (Max)3334Weight (grams)55555525ElectricalInput Voltage, Vdc±13 to ±18±12 to ±18±13 to ±18±12 to ±15Input Current (quiescent), mA (Max.)12121220EnvironmentalOperational Temp Range, °C-55 °C to +125 °C-55 °C to +150 °C-55 °C to +180 °C-40 °C to +180 °CVibration, (Sine)25 Hz to 500 Hz, 25g25 Hz to 500 Hz, 25g			+125°C to +150°C : ±200		
Market Bias Stability (1 month composite)less than 250 µgless than 500 µgless than 250 µgless than 220 µgNoise, mgrms, Max. (OHz to 10kHz) (Max)3334Weight (grams)55555525ElectricalInput Voltage, Vdc±13 to ±18±12 to ±18±13 to ±18±12 to ±18Input Current (quiescent), mA (Max.)12121220EnvironmentalOperational Temp Range, °C-55°C to +125°C-55°C to +150°C-55°C to +180°C-40°C to +180°CVibration, (Sine)25 Hz to 500 Hz, 25g25 Hz to 500 Hz, 25g25 Hz to 500 Hz, 25g25 Hz to 500 Hz, 25g		±100	±100		±150
Dias Octability (1 month opinposite) Internet indication Interne	Scale Factor Stability (1 month composite)	less than 250 ppm	less than 350 ppm	less than 250 ppm	less than 220 ppm
Matching and reaction of the second	Bias Stability (1 month composite)	less than 250 µg	less than 500 µg	less than 250 µg	less than 220 µg
Electrical Input Voltage, Vdc ±13 to ±18 ±12 to ±18 ±13 to ±18 ±12 to ±15 Input Current (quiescent), mA (Max.) 12 12 12 20 Environmental -55°C to +125°C -55°C to +150°C -55°C to +180°C -40°C to +180°C Operational Temp Range, °C 25 Hz to 500 Hz, 25g	Noise, mgrms, Max. (OHz to 10kHz) (Max.)	3	3	3	4
Input Voltage, Vdc ±13 to ±18 ±12 to ±18 ±13 to ±18 ±12 to ±15 Input Current (quiescent), mA (Max.) 12 12 12 20 Environmental -55°C to +125°C -55°C to +150°C -55°C to +180°C -40°C to +180°C Operational Temp Range, °C 25 Hz to 500 Hz, 25g	Weight (grams)	55	55	55	25
Input Current (quiescent), mA (Max.) 12 12 12 20 Environmental -55°C to +125°C -55°C to +150°C -55°C to +180°C -40°C to +180°C Operational Temp Range, °C 25 Hz to 500 Hz, 25g	Electrical				
Environmental Operational Temp Range, °C -55°C to +125°C -55°C to +150°C -55°C to +180°C -40°C to +180°C Vibration, (Sine) 25 Hz to 500 Hz, 25g	Input Voltage, Vdc	±13 to ±18	±12 to ±18	±13 to ±18	±12 to ±15
Operational Temp Range, °C 55 °C to +125 °C 55 °C to +150 °C 55 °C to +180 °C 40 °C to +180 °C Vibration, (Sine) 25 Hz to 500 Hz, 25g	Input Current (quiescent), mA (Max.)	12	12	12	20
Operational Temp Range, °C 55 °C to +125 °C 55 °C to +150 °C 55 °C to +180 °C 40 °C to +180 °C Vibration, (Sine) 25 Hz to 500 Hz, 25g	Environmental				
		-55°C to +125°C	-55°C to +150°C	-55°C to +180°C	-40°C to +180°C
Shock, g (0.5 msec, 1/2 sine) 1000 1000 1000	Vibration, (Sine)	25 Hz to 500 Hz, 25g	25 Hz to 500 Hz, 25g	25 Hz to 500 Hz, 25g	25 Hz to 500 Hz, 30g
	Shock, g (0.5 msec, 1/2 sine)	1000	1000	1000	1000

Note 1: Specifications apply and are characterized up to ±1g range. The accelerometer is capable of supplying acceleration information up to ±30g but at reduced accuracy.

Note 2: Voltage output via customer supplied load resistor.



ELIABLE, HIGH PERFORMANCE PRODUCTS — EXCEPTIONAL SERVICE

EATURING: Precision Quartz Flexure Accelerometers

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Barbados Facility