

Model 141 High Output Linear Accelerometer For Vibration, Shock, Impact

Ranges from: $\pm 2g$ to $\pm 600g$
With External R_{cal} Calibration



The Model 141 is a linear accelerometer that produces a high level instantaneous DC output signal proportional to sensed accelerations (ranging from static acceleration up to 3000 Hz as indicated below).

Setra accelerometers are unique in their ability to withstand exceedingly high g overload without damage. The Model 141 incorporates the super-rugged Setra capacitance-type sensor and a miniaturized electronic circuit.

Its excellent dynamic response is maintained by air damping, which varies with temperature

approximately one-tenth as much as the best fluid damping.

The electrical characteristics are compatible with conventional strain-gauge type signal conditioning, including the use of shunt R_{cal} over any selected range up to 100% full scale. The stainless steel case is O-ring sealed, has a well-defined base plane and is quite insensitive to mounting strain.

Cross axis interference is exceedingly low. The external easy-to-replace cable attachment facilitates installation and service.

Full Scale Ranges

For each of the available g ranges, the linearity is characterized by this range chart:
(Non-linearity as % full range, best straight line)

Nominal Range	Non-Linearity $\pm 1\%$	Natural Frequency (Nominal)	Flat Response (± 3 db) 0 Hz to:
$\pm 2g$	$\pm 2g$	300Hz	200Hz
$\pm 4g$	$\pm 4g$	440Hz	260Hz
$\pm 8g$	$\pm 8g$	570Hz	300Hz
$\pm 15g$	$\pm 15g$	840Hz	400Hz
$\pm 30g$	$\pm 30g$	1200Hz	700Hz
$\pm 60g$	$\pm 60g$	1560Hz	1000Hz
$\pm 150g$	$\pm 150g$	2600Hz	1600Hz
$\pm 600g$	$\pm 600g$	5000Hz	3000Hz

NOTE: Setra adheres to strict quality standards including ISO 9001 and ANSI-Z540-1. The calibration of this product is NIST traceable.

Features

- Excellent Static and Dynamic Response
- Temperature-Insensitive Gas Damping (0.7 Critical)
- High Output Signal
- High Overload Capability, (2000g static)
- Low Transverse Sensitivity (0.012 g/g)
- Wide-Range R_{cal} Type Calibration
- Easy-to-Replace Cable Attachment
- Compact, Lightweight
- Optional EMI Filter Upgrade
- Meets CE Conformance Standards

When it comes to a product to rely on, choose the Model 141.

When it comes to a company to trust, choose Setra .



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800-257-3872

Model 141A and Model 141B Specifications

Performance Data

Non-Linearity (Best Fit Straight Line)	$\pm 1.0\%$ Full Scale
Hysteresis	0.10%
Non-Repeatability	0.05%
Transverse Acceleration Response	$< \pm 0.012$ g/g
Damping	Approximates second order system with 0.7 critical damping (Gas Squeeze-Film 0.7 ± 0.2 of critical at 77°F [25°C]). Damping ratio increases approximately 0.15%/°F.
Frequency Band	Flat from static to approx. 60% of natural frequency (all ranges)
Resolution	Infinite, limited only by output noise level

Thermal Effects

Operating Temperature °F (°C)	-10 to +150 (-23 to +65)
Zero Shift	$< \pm 0.02\%$ Nominal Range/°F ($< \pm 0.36\%$ /°C)
Sensitivity Shift	$< \pm 0.02\%$ Nominal Range/°F ($< \pm 0.36\%$ /°C) Slightly higher thermal effects when 141A is operated at excitation voltage below 10 VDC
Zero G Output	$< \pm 25$ mV (factory calibrated at 10 VDC or 24 VDC excitation)
FS G Output	$< \pm 25\%$ of Nominal Output
Noise Level	$< \pm 0.01\%$ Nominal Range (RMS, in-band)

Performance Data (cont'd)

Calibration Data	Each unit is supplied with a computer generated plot of output vs. acceleration (centrifuge) at the specified excitation voltage.
Sensitivity	Reported at Nominal Range
Excitation Voltage	Model 141A calibrated at 10 VDC Model 141B calibrated at 24 VDC

Electrical Data

Electrical Circuit*	Three-Wire (Com, -Exc, -Out)	
Isolation	100 M ohms	
Internal Frequency	20 MHz approx.	
Calibration Signal (R_{cal})	Available up to 100% Nominal Range by shunting external calibration resistor from calibration lead to -signal lead.	
Excitation/Output**	141A	141B
Excitation Range	5-15 VDC	10-28VDC***
Excitation Voltage	10 VDC	24 VDC
Excitation Current	5 mA	10 mA
Nominal Output (open circuit)	± 500 mV	± 1000 mV
EMI/RFI Filtering	See Option 649	

*Circuit is capacitively isolated from case. Power applied to output, or shorted output, will not damage unit. No reverse excitation protection.

**Typical performance for nominal g range:

Output is proportional to excitation voltage.

Output impedance 9k ohms (nominal).

***Operable on 28 VDC aircraft power. (Recommend high voltage transient protection to prevent damage by emergency power conditions as defined in MIL-STD-704A, and voltage regulation to attain highest accuracy.)

Physical Description

Electrical Connection	2 foot multiconductor cable
Weight	30 grams (not including cable)
Case	Stainless steel, O-ring

Options

Option 620	Calibration at Special Excitation
Option 649	EMI/RFI Filter (MIL-STD-462)
Option 701	Wide Operating Temperature -65°F to $+220^\circ\text{F}$ (-54°C to $+104^\circ\text{C}$)
Option 803-825	Up to 25 feet of cable can be supplied on your order; please specify cable length when ordering (e.g., 805 for 5ft. cable) Consult factory for cables longer than 25 feet.

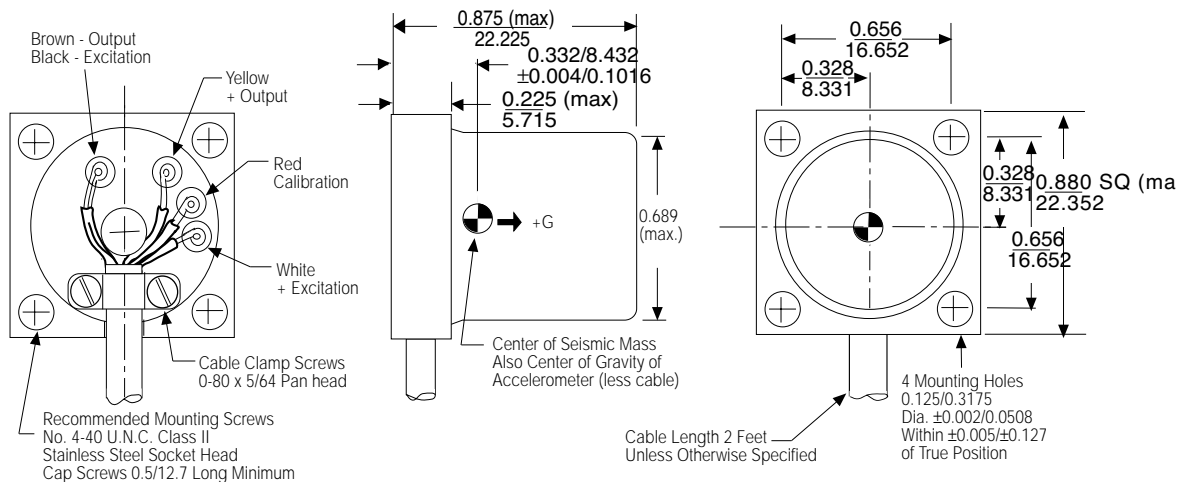
Ordering Information

Specify	Model 141A or Model 141B
Specify G Range	Nominal Range (\pm specific g)
Specify	Excitation voltage for calibration (if non-standard, use Option 620 at extra charge)

Specifications subject to change without notice.

Note: Setra adheres to strict quality standards including MIL-I-45208A and ANSI Z540-1. The calibration of this product is NIST traceable.

Outline Drawing



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