



151B Series

BROADBAND SEISMOMETER “OBSERVER”

The 151B series Broadband Seismometer, “Observer”, is a force-balance feedback sensor available with frequency bandwidths:

- ▶ 0.0083 Hz (120 sec) - 50 Hz
- ▶ 0.0166 Hz (60 sec) - 50 Hz flat to velocity.

The 151B “Observer” contains three independent sensors (one vertical and two horizontal) with built-in electronic feedback circuit, control and power conversion circuits, featuring low noise, large dynamic range and easy installation and use.

The “Observer” has built-in leveling and mass lock/unlock facilities. The leveling mechanism includes two bubble levels, three adjustable feet and three locknuts which are located on the seismometer’s chassis.

The “Observer” has a built-in mass zero-position adjusting mechanism to perform automatic mass adjustment. As soon as the seismometer is powered it checks the zero position of each component’s mass and automatically adjusts the zero position if needed. Monitoring and adjustment of the mass can also be performed via the 130S series High Resolution Recorders using the Sensor Control Board (part number 97154-00).

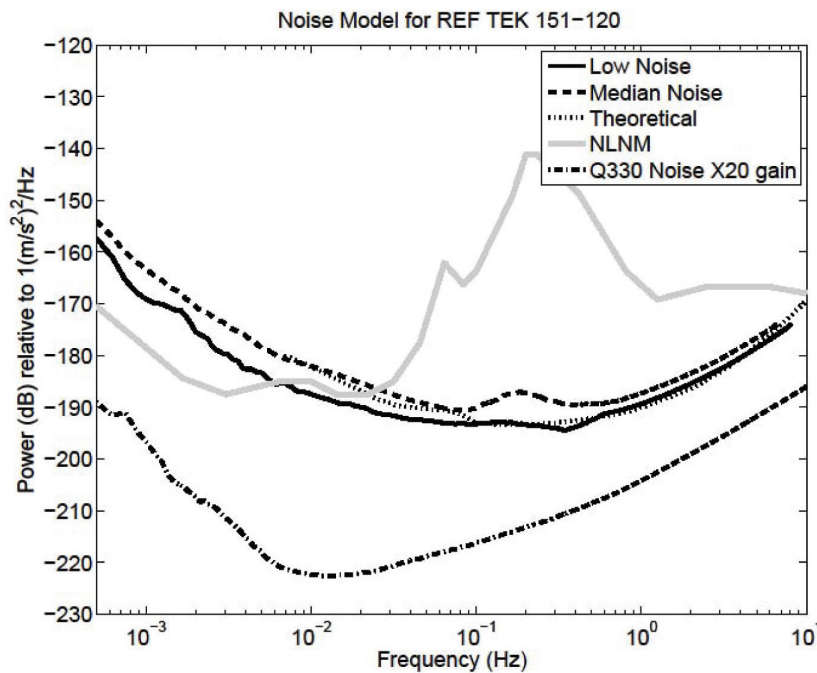
The “Observer” is an exceptionally low noise seismometer (see below Power Spectral Density plot). The low self noise performance makes the 151B an ideal seismometer for local, regional and global seismicity studies in different installation configurations, including observatory and portable, surface and posthole applications.

Key Features

- ▶ High Performance Seismometer
- ▶ Low Self-Noise
- ▶ Portable Design
- ▶ Low Power Consumption
- ▶ Force-Balance Electric Feedback
- ▶ Robust Mass Locking Mechanism
- ▶ Easy Installation

Applications:

- ▶ Broadband Surface Installation or Posthole Installation
- ▶ Local and Regional
- ▶ GSN Installation



Ringler, A. & Hutt, C. (2010, November - December).
Self Noise Models of Seismic Instruments. Seismological Research Letter, 81(6)

151B SERIES BROADBAND SEISMOMETER "OBSERVER"

Model	151B-120 (P/N 97118-00) 151B-60 (P/N 97117-00)
Mechanical	
Size	9.45" dia. x 10.6" high (24 cm x 27 cm)
Weight	26.4 lbs (12 Kg)
Watertight Integrity	IP67 for outdoor use and immersion resistance
Alignment	Removeable orientation N/S pins screw into the base (brass for N, silver for S)
Leveling	Two Integrated Bubble Levels; three adjustable leveling feet with locknuts
Mass Position	Remote Monitoring and Adjusting Zero-point using 3 Independent Voltage Outputs
Mass Locking	Mechanical Lock/Unlock Mechanism Accessible on Outside of the Case
Mechanical Zero	No need for Adjustment within Ambient Temperature Fluctuation $\pm 20^{\circ}\text{C}$
Environmental	
Operating Temperature	-20° to $+60^{\circ}\text{C}$
Power	
Power Input	+12 VDC (9V to 18 VDC)
Power Consumption	~1.1 W
Power-Fail Protection	Built-in
Signal Overload Protection	Built-in
Lightning Protection	Built-in
Auto-Recovery Time	Full operation recovery within 10 minutes after either power fail or signal overload

Electrical	
Sensor Type	Triaxial, Orthogonal
Feedback	Force-balance with Capacitive Displacement Transducer
Frequency Bandwidth:	
151B-120	0.0083 Hz (120 sec.) – 50 Hz
151B-60	0.0166 Hz (60 sec.) – 50 Hz
Sensitivity	2000 V/m/s
Full Scale Output	± 20 V Peak-to-Peak Differential
Dynamic Range	>140 dB @ 5 Hz
Self-Noise (low model)	Below NLNM from 145 sec. to 10 Hz
Output Impedance	<100 Ohms
Calibration	Coil Resistance 1,000 Ω Sensitivity: 10 m/s ² /A
Distortion	Total Distortion <-80 dB
Cross Axis Coupling	<1%
Low Spurious Resonance	Higher than 100 Hz
Damping	0.7 of Critical
Linearity	Better than 1% of full scale
Type	Free-running Oscillator

Ordering Information

Part No.	Description
97118-00	151B-120: Seismometer, 3 Component, 120 Sec. to 50 Hz, w/Case
97117-00	151B-60: Seismometer, 3 Component, 60 Sec. to 50 Hz, w/Case
97174-00	130-8803-33: Assembly, Cable, 130 to 151B-60/-120 Sensor, 33' (10m)
97177-00	151B-9802: Cover, Thermal Insulated

RELATED SUB-SYSTEMS:

High Resolution Seismic Recorders, 130S-01
Accelerometers, 131A & 131B, 147-01
Strong Motion Accelerographs, 130-SMHR & 130-SMA

Specifications subject to change without notice. Rev. 5.0

Contact your local dealer today

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