PMD SCIENTIFIC, INC

ROBUST COMPACT ECONOMICAL BROADBAND SEISMOMETERS

BB313, BB313-OBS

The BB313 instruments are designed as extremely robust, versatile, compact, light-weight, broadband seismic sensors. Unlike traditional seismometers, they are based on proprietary electrochemical technology[1] that provides many advantages over the conventional electromechanical sensors. Each of the three identical sensor elements in BB313 is equipped with an efficient electrodynamic force-balancing feedback. BB313 is a more compact, lighter version of our BB303 seismometer, the difference being in a slightly higher noise at longer periods.
The instruments are offered in two application-dependent versions. The standard BB313-(LN) is the reduced noise version. The BB313-SM has a higher clip level and is used for strong motion applications. Both versions have the same dynamic range, which is shifted up by approximately 10db in the '*SM*' relatively to the standard '*LN*' version. The BB313 instruments have been recently redesigned. Also available are a single component version BB313U, a very low power customized lightweight, compact ocean-bottom seismometer (OBS) BB313-OBS (photo on the right above), and a narrow (83mm diameter) borehole model BB313-BH

The latest BB313 seismometer contains a microcontroller which maintains exceptionally accurate parameter stability over the full operating temperature range and over the life of the instrument. Optionally, the microcontroller can also generate internally calibrating sine or other waveform signals. The calibration can be initiated by applying a logic level to the Calibration Enable input or via an optional serial port. If the latter is provided, the user can also select and set the Generator Constant value in the 350-20,000 V/m/s range.

The BB313 has an exceptionally rugged design and does not require mass lock, mass centering across the full operating temperature range, special installation equipment, or technical installation procedures. The units are operational over a wide range of installation tilts. Optional inclinometers may be installed. The BB313 seismometers provide a low cost of ownership, REQUIRING no maintenance over the life of the instrument.
Three and five-year extended warranties are available.

[1] US patent No.6,576,103

Specifications subject to change without notice 01/06

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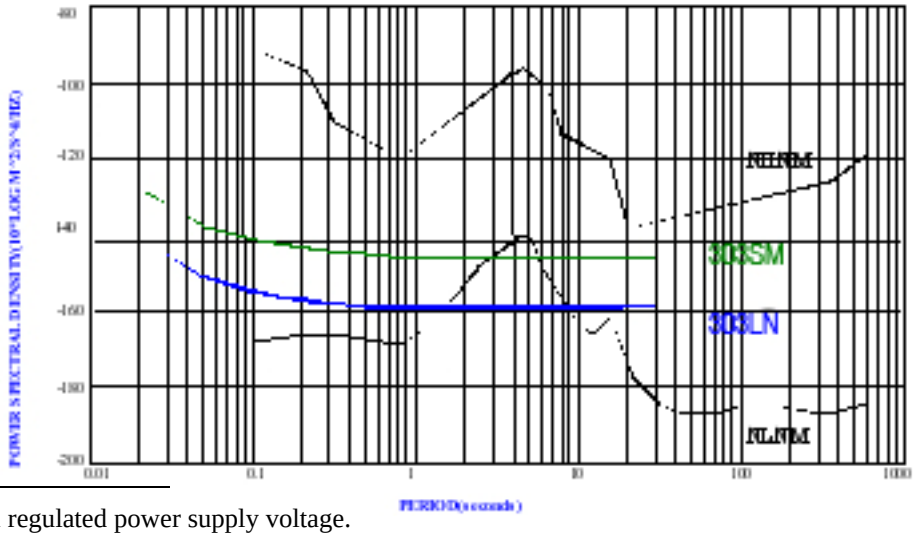
BB313 Specifications

PARAMETER	BB313	BB313 -OBS
Operating principle	Force-balanced Proprietary Electrochemical Sensor[Error! Bookmark not defined.]	
Output signals	2 horizontal, 1 vertical; broad band, velocity flat response	
Standard output swing: Same, Low Power Version	±10 V single-ended; (±20 V p-p)	See Low Power Version below
	±(Vcc-1) single-ended; ±2(Vcc – 1) p-p[2]	
Dynamic Range	135 dB	
Bandwidth	0.033 – 50 Hz	
Generator constant[3]	Standard: 2000 V/m/s; Optional: 350 – 20,000 V/m/s	
Calibration input	Std: 1kΩ; 1V in – 1V out; Optional – internally generated calibration waveforms initiated via optional serial port	
Mass Lock	NONE REQUIRED	
Mass centering	NONE REQUIRED	
Maximum installation tilt[4]	±12 °	
Mechanical resonances	>140Hz	
Environmental	Waterproof, submersible (1m)	Vacuum tight to 0.5 atm
Temperature range	-12 to + 55 °C	
Housing material	Aluminum	Custom
Case diameter	155 mm	Custom
Case height	185 mm	Custom
Weight	5.5kg	Custom
Mounting connection	n/a	Custom
Power – Regular	9 – 30 Vdc; (Nominal 12Vdc); 28mA	
Power – Low power[5]	5 – 15 Vdc; 12mA @ 12 Vdc	
Connectors	Main:14-pin circular Optional Serial Port: 3-pin circular	Custom

NOISE CURVES



[2] Vcc is the external regulated power supply voltage.
[3] Factory preset or selected via an optional serial port
[4] All three sensors stay fully operational, however their sensitivity axes will rotate in accordance with the tilt.
[5] Low-power option requires external battery or a regulated power source.

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