



SM-4 Geophone Element

- Precision machined, rotating coil design with precious metal contacts for consistent, reliable, & prolonged field performance.
- Choice of three standard natural frequencies (8 Hz, 10 Hz, & 14 Hz) and two standard coil resistances (375 Ω & 71 Ω)
- Vertical and horizontal versions available for 3-C applications
- 3-year limited warranty



The SM-4 digital-grade geophone element is designed for low weight, long field-life, and ultra-reliable performance. Precision engineered components and computerized test equipment ensure consistency in manufacture and operation throughout and beyond the limited replacement guarantee period of three years.

Applications: 2-D and 3-D seismic exploration with bandwidth from 10 Hz up to 190 Hz.

Implementations: Can be installed in a variety of standard I/O Sensor geophone cases.

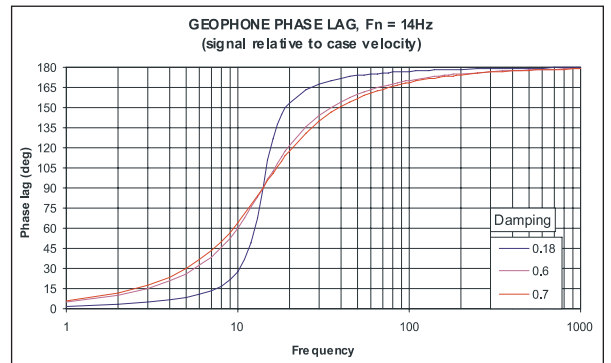
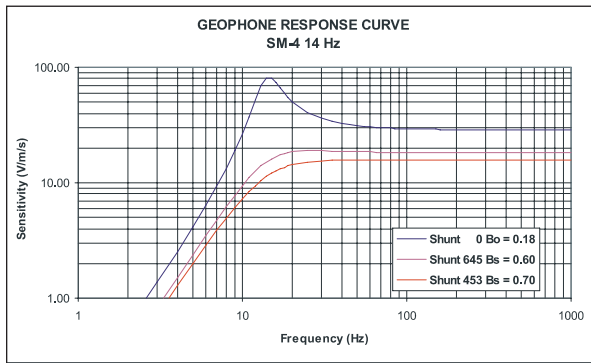
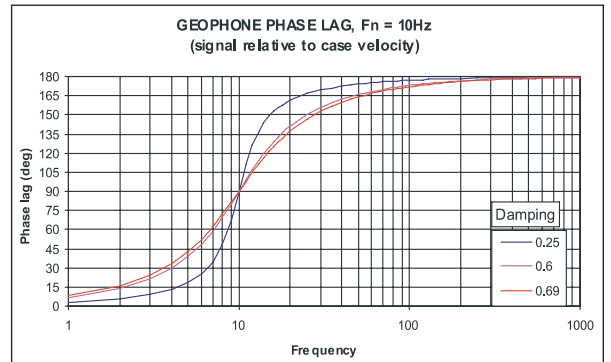
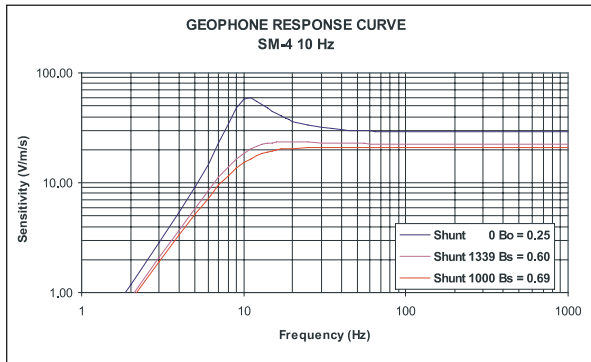
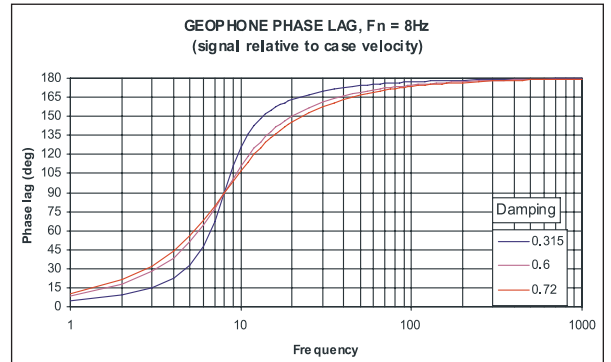
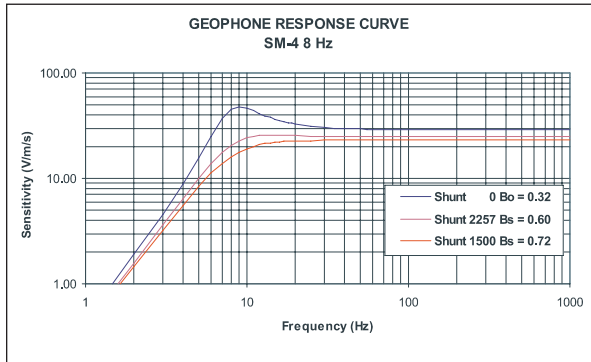
Specifications

INPUT/OUTPUT, INC.

	SM-4/U-B 8 Hz	SM-4/U-B 10 Hz	SM-4/U-B 14 Hz	
Frequency				
Natural frequency (f_n)	8 Hz	10 Hz	14 Hz	
Tolerance	+/-6.3%	+/-5%	+/-5%	
Max. tilt angle for specified f_n	20°	25°	25°	
Typical spurious frequency	160 Hz	180 Hz	190 Hz	
Distortion				
Distortion with 0.7 in/s coil-to-case velocity p.p.	<0.2%	<0.2%	<0.2%	
Distortion measurement frequency	12 Hz	12 Hz	14 Hz	
Max. tilt angle for distortion specification	15°	20°	20°	
Damping				
Open-circuit damping for 375- Ω coil	0.315	0.25	0.18	
Open-circuit damping for 71- Ω coil	0.3	0.24	0.17	
Damping calibration-shunt resistance 375- Ω coil	2,257 Ω	1,339 Ω	645 Ω	
Damping calibration-shunt resistance 71- Ω coil	393 Ω	235 Ω	114 Ω	
Damping with shunt	0.6	0.6	0.6	
Tolerance with shunt	+/-5%	+/-5%	+/-5%	
Resistance				
Standard resistances (other values available)	375 Ω or 71 Ω	375 Ω or 71 Ω	375 Ω or 71 Ω	
Tolerance	+/-5%	+/-5%	+/-5%	
Sensitivity				
Sensitivity with 375- Ω coil	28.8 V/m/s	28.8 V/m/s	28.8 V/m/s	(0.73 V/in/s)
Sensitivity with 71- Ω coil	12.8 V/m/s	12.8 V/m/s	12.8 V/m/s	(0.325 V/in/s)
Tolerance	+/-5%	+/-5%	+/-5%	
$R_c B_c f_n$ with 375- Ω coil	6,000 Ω Hz	6,000 Ω Hz	6,000 Ω Hz	
$R_c B_c f_n$ with 71- Ω coil	1,100 Ω Hz	1,100 Ω Hz	1,100 Ω Hz	
Moving mass 375- Ω coil	11 g	11 g	11 g	(0.38 oz)
Moving mass 71- Ω coil	11.7 g	11.7 g	11.7 g	(0.41 oz)
Maximum coil excursion p.p.	2 mm	2 mm	2 mm	(0.08 in)
Physical Characteristics				
Diameter	25.4 mm	25.4 mm	25.4 mm	(1.00 in)
Height	32 mm	32 mm	32 mm	(1.25 in)
Weight	74 g	74 g	74 g	(2.59 oz)
Operating temperature range	-40°C to +100°C	-40°C to +100°C	-40°C to +100°C	(-40°F to +212°F)
Limited Warranty Period*				
	3 years	3 years	3 years	

* Warranty excludes damage caused by high-voltage and physical damage to the element case.

All parameters are specified at +20°C in the vertical position unless otherwise stated.



Ordering Information

INPUT/OUTPUT, INC.

SM-4 8 Hz Geophone Elements

SM-4/U-B	8 Hz	71 Ω	P/N 1004010
SM-4/S-B	8 Hz	71 Ω	P/N 1004020
SM-4/U-B	8 Hz	375 Ω	P/N 1004030
SM-4/H-B	8 Hz	375 Ω	P/N 1004040
SM-4/S-B	8 Hz	375 Ω	P/N 1004050

SM-4 10 Hz Geophone Elements

SM-4/U-B	10 Hz	71 Ω	P/N 1004060
SM-4/H-B	10 Hz	71 Ω	P/N 1004070
SM-4/S-B	10 Hz	71 Ω	P/N 1004080
SM-4/U-B	10 Hz	375 Ω	P/N 1004110
SM-4/H-B	10 Hz	375 Ω	P/N 1004130
SM-4/S-B	10 Hz	375 Ω	P/N 1004120

SM-4 14 Hz Geophone Elements

SM-4/U-B	14 Hz	71 Ω	P/N 1004160
SM-4/S-B	14 Hz	71 Ω	P/N 1004170
SM-4/U-B	14 Hz	375 Ω	P/N 1004190
SM-4/H-B	14 Hz	375 Ω	P/N 1004210
SM-4/S-B	14 Hz	375 Ω	P/N 1004200

U-B indicates upright (pins upward) elements. H-B indicates horizontal elements. S-B indicates standard (pins downward) elements.

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