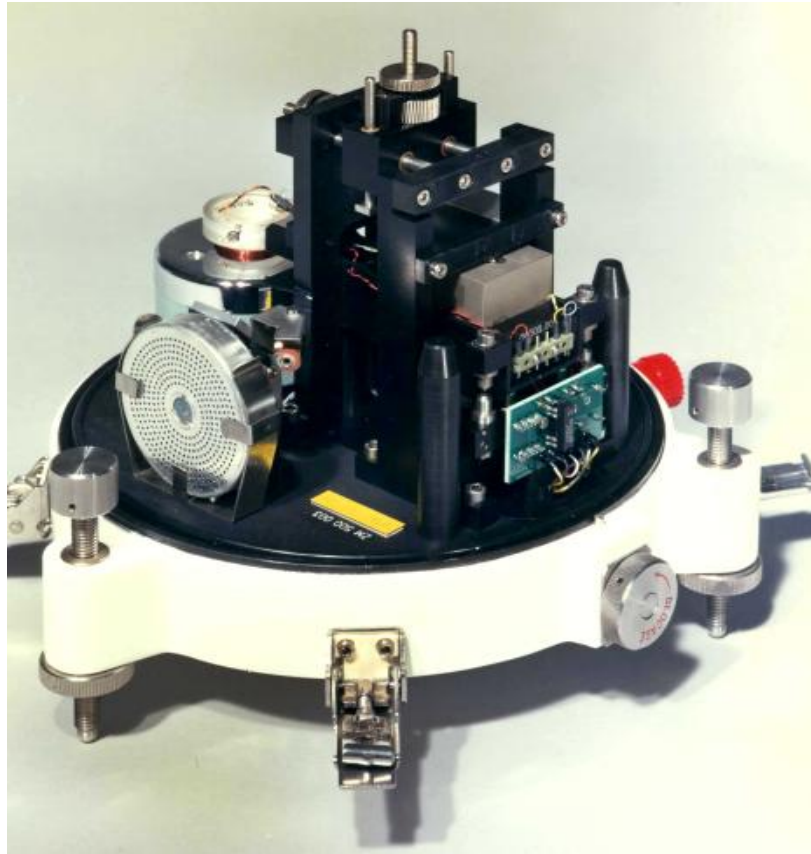


## CP ZM 500 short period vertical sensor



### Operating characteristics

<b>Natural frequency :</b>	$f_0 = 1 \text{ Hz}$ , adjustable from 0.6 to 1.4 Hz
<b>Mechanical damping:</b>	$< 0.01$ for $f_0 = 1 \text{ Hz}$
<b>Inertial mass:</b>	$766 \text{ g} \pm 2 \text{ g}$
<b>Transducer:</b>	
- <i>type</i>	Electrodynamic (magnet and coil)
- <i>damping value</i>	0.707
- <i>generator constant</i>	$2250 \text{ V/m.s}^{-1} \pm 115 \text{ V/m.s}^{-1}$
<b>Signal coil:</b>	
- <i>resistance</i>	$137\,500 \, \Omega \pm 7500 \, \Omega$
<b>Calibration coil:</b>	
- <i>resistance</i>	$950 \, \Omega \pm 115 \, \Omega$
- <i>motor constant</i>	8 N/A
<b>First parasitic resonant frequency:</b>	$> 400 \text{ Hz}$
<b>Power requirements:</b>	Nominal $\pm 12 \text{ V}$ ( $\pm 3 \text{ V}$ to $\pm 20 \text{ V}$ ), $< \pm 1 \text{ mA}$
<b>Standard preamplifier:</b>	
- <i>output type</i>	Single ended
- <i>output impedance</i>	$< 10 \, \Omega$
- <i>voltage gain</i>	1, 4, 8 or 32
<b>0.5 Hz correction preamplifier:</b>	
- <i>output type</i>	Single ended
- <i>output impedance</i>	$< 10 \, \Omega$
- <i>voltage gain</i>	1, 4, 8 or 32
- <i>correction</i>	+ 12 dB for $f < 0.5 \text{ Hz}$
<b>10 Hz noise level at input:</b>	$30 \text{ pm.s}^{-1} / \sqrt{\text{Hz}}$

## Physical characteristics

<b>Basic dimensions :</b>	
- <i>diameter</i>	0.30 m
- <i>height</i>	0.30 m
- <i>weight</i>	10.5 Kg
<b>Environmental characteristics:</b>	
- <i>in use temperature</i>	-20 to +60 °C
- <i>waterproof case</i>	
- <i>rugged for wet and salt saturated Atmosphere (IP68 guaranteed)</i>	

## Poles and zeros (response in velocity V/m.s<sup>-1</sup> unit)

- **seismo 1 Hz:** 
$$H_{v_1} = 2250 \cdot \frac{p^2}{p^2 + 8.886 p + 39.48}$$

**and poles and zeros:**

$$p_1 = (-4.44, -4.44j) ; z_1 = (0.0)$$

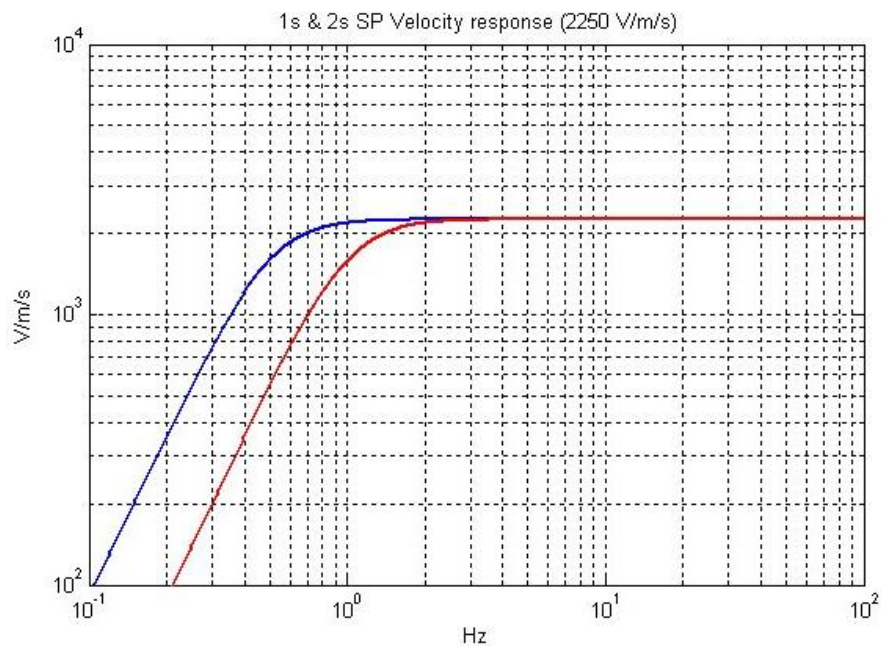
$$p_2 = (-4.44, +4.44j) ; z_2 = (0.0)$$

- **seismo 0.5 Hz:** 
$$H_{v_{0.5}} = 2250 \cdot \frac{p^2}{p^2 + 4.443 p + 9.870}$$

**and poles and zeros:**

$$p_1 = (-2.22, -2.22j) ; z_1 = (0.0)$$

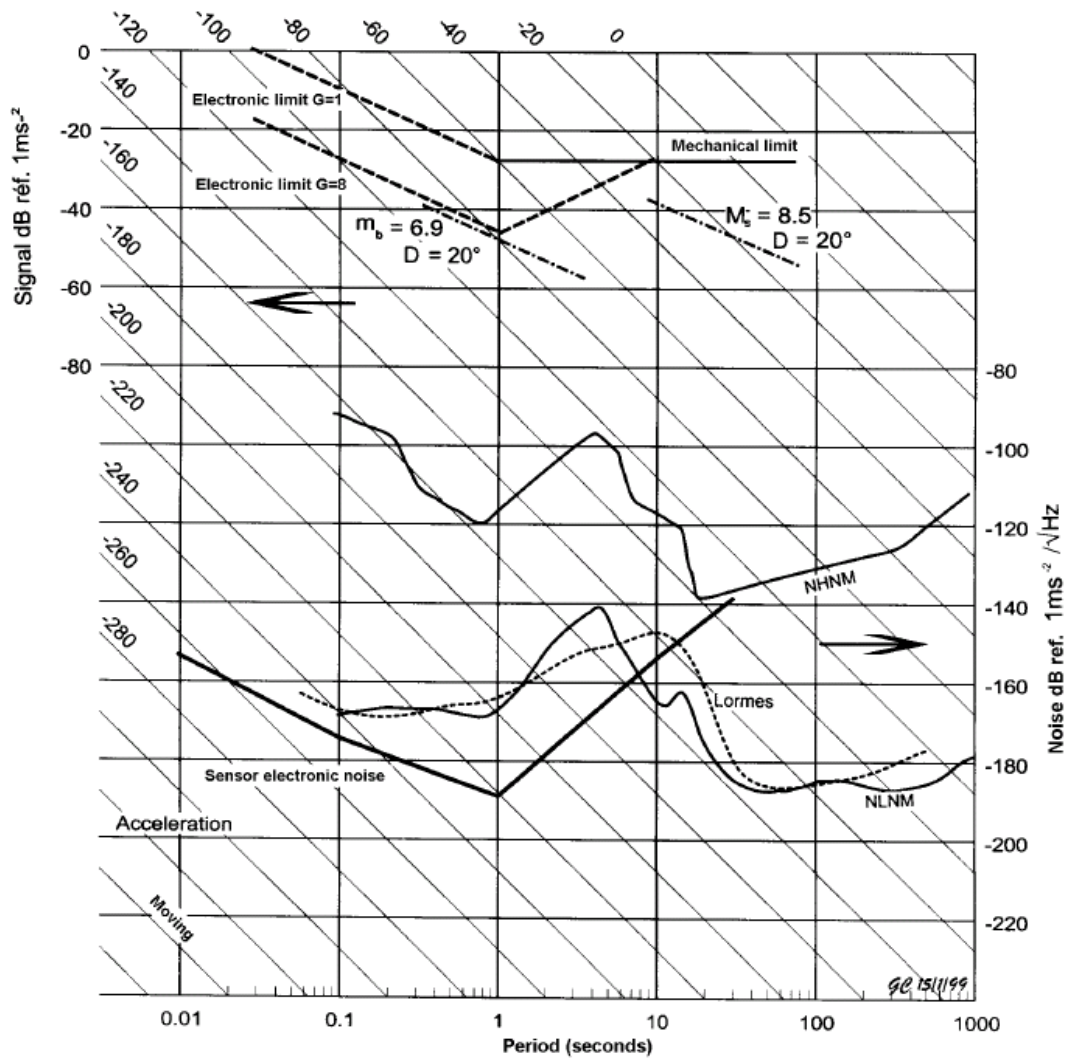
$$p_2 = (-2.22, +2.22j) ; z_2 = (0.0)$$



SEISMOMETERS ZM 500, HM 500

Maximum dynamic range in  $\text{ms}^{-2}$  (Left scale)

Seismic noise and electronic in  $\text{ms}^{-2} / \sqrt{\text{Hz}}$  (Right scale)



(noise spectral density for standard preamplifier)