SELENIUM LOUDSPEAKERS

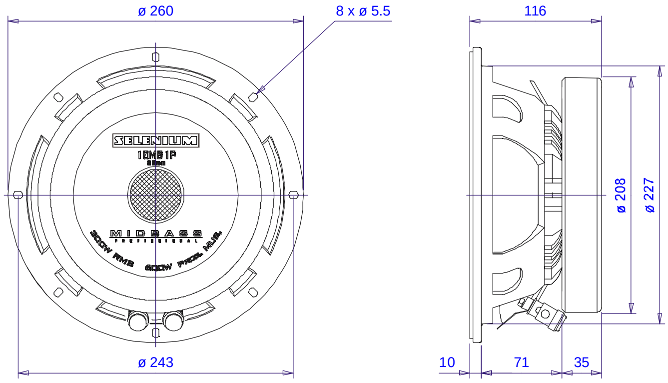
PROFESSIONAL LINE - Mid-Bass

10MB1P

10" woofer for mid-bass professional sound reinforcement.

Offering high power capacity, outstanding mid range response and exceptional long-term performance, this transducer is ideal for compact enclosures (closed, vented or horns). This transducer exhibits excellent acoustics with work horse construction. Designed for smaller enclosures, the 10MB1P is a versatile high performance mid-bass.

General construction includes a sturdy cast frame, impregnated cloth surround, stable spider and a large central vent channel for reducing long-term heat build-up.



Dimensions in mm.

SPECIFICATIONS

Nominal diameter	255 (10)	mm (in)
Nominal impedance	8	ohms
Minimum impedance @ 375 Hz	6.9	ohms
Power handling		
Musical program[1]	600	watts
AES[2]	300	watts
Sensitivity (1W/1m) averaged from 300 to 1,000 Hz	101	dB SPL
Power compression @ 0 dB (nom. power)	5.5	dB
Power compression @ -3 dB (nom. power)/2	3.3	dB
Power compression @ -10 dB (nom. power)/10	1.6	dB
Frequency response @ -10 dB	200 to 6,000	Hz

[1] Specifications to handle normal speech and music program material with 5% maximum acceptable distortion on amplifier. Power is calculated taking into account the true RMS voltage at amplifier output along with transducer nominal impedance.
[2] AES Standard (200 - 2,000 Hz).

THIELE-SMALL PARAMETERS

Fs	75	Hz
Vas	27 (0.95)	l (ft^3)
Qts	0.34	
Qes	0.35	
Qms	10.26	
η_0 (half space)	3.20	%
Sd	0.0363 (56.3)	m^2 (in^2)
Vd (Sd x Xmax)	72.6 (4.43)	cm^3 (in^3)
Xmax (max. excursion (peak) with 10% distortion)	2.0 (0.08)	mm(in)
Xlim (max.excursion (peak) before physical damage)	7.0 (0.30)	mm(in)

Atmospheric conditions at TS parameter measurements:

Temperature	24 (75)	°C (°F)
Atmospheric pressure	1,004	mb
Humidity	50	%

Thiele-Small parameters are measured after a 2-hour power test using half AES power. A variation of ± 15% is allowed.

ADDITIONAL PARAMETERS

βL	15.9	Tm
Flux density	13,000	gauss
Voice coil diameter	75 (3.0)	mm (in)
Voice coil winding length	13.7 (45.0)	m (ft)
Wire temperature coefficient of resistance ($\alpha 25$)	0.00395	1/°C
Maximum voice coil operation temperature	275 (527)	°C (°F)
θvc (max.voice coil operation temp./max.power)	0.92 (XX)	°C/W(°F/W)
Hvc (voice coil winding depth)	8.0 (0.32)	mm (in)
Hag (air gap height)	8.0 (0.32)	mm (in)
Re	6.1	ohms
Mms	30.5 (0.0672)	g (lb)
Cms	147.9	µm/N
Rms	1.4	kg/s

NON-LINEAR PARAMETERS

Le @ Fs (voice coil inductance @ Fs)	2.047	mH
Le @ 1 kHz (voice coil inductance @ 1 kHz)	0.830	mH
Le @ 20 kHz (voice coil inductance @ 20 kHz)	0.293	mH
Red @ Fs	0.22	ohms
Red @ 1 kHz	2.15	ohms
Red @ 20 kHz	30.18	ohms
Krm	0.958	ohms
Kxm	17.319	mH
Erm	0.882	
Exm	0.653	

ADDITIONAL INFORMATION

Magnet material	Barium ferrite	
Magnet weight	2,440 (86)	g (oz)
Magnet diameter x depth	200 x 19 (7.87 x 0.75)	mm (in)
Magnetic assembly weight	6,120 (13.49)	g (lb)
Frame material	Aluminum	
Frame finish	Black epoxy	
Magnetic assembly steel finish	Zinc-plated	
Voice coil material	Aluminum	
Voice coil former material	Polyimide (Kapton®)	
Cone material	Long fiber pulp	
Volume displaced by woofer	4.6 (0.162)	l (ft^3)
Net weight	6,800 (14.99)	g (lb)
Gross weight	7,400 (16.31)	g (lb)
Carton dimensions (W x D x H)	28.5 x 28.5 x 17 (11.2 x 11.2 x 6.7)	cm (in)

MOUNTING INFORMATION

Number of bolt-holes	8	
Bolt-hole diameter	5.5 (0.22)	mm (in)
Bolt-circle diameter	243 (9.57)	mm (in)
Baffle cutout diameter (front mount)	225 (8.86)	mm (in)
Baffle cutout diameter (rear mount)	230 (9.06)	mm (in)
Connectors	Silver-plated push terminals	
Polarity	Positive voltage applied to the positive terminal (red) gives forward cone motion	
Minimum clearance between the back of the magnetic assembly and the enclosure wall	75 (3)	mm (in)

Kapton®: DuPont trademark.

Specifications subject to change without prior notice.
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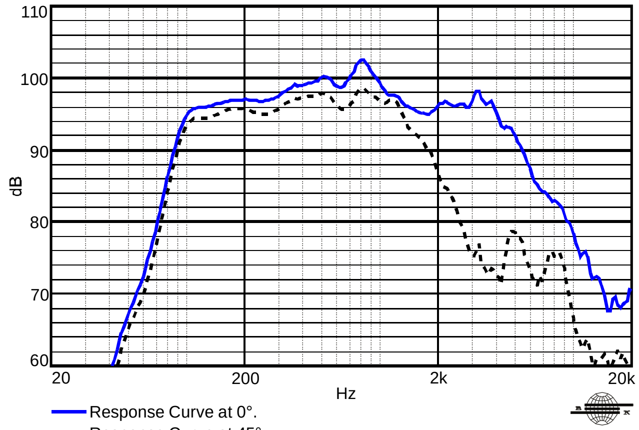
EUROPE Address:
SELENIUM EUROPE
Rohrbergstrasse 23B
D-65343 Eltville - Germany
Phone: +(49) 6123 601570
Fax: +(49) 6123 601587
E-mail: sales@selenium-eu.com
URL: www.seleniumloudspeakers.com

USA Address:
SELENIUM LOUDSPEAKER USA
1701 South Park Court, Bldg 102
Chesapeake, VA 23320 - USA
Phone: (757) 424-7516 / (800) 562-0510
Fax: (757) 424-5246
E-mail: export@selenium-usa.com
URL: www.seleniumloudspeakers.com

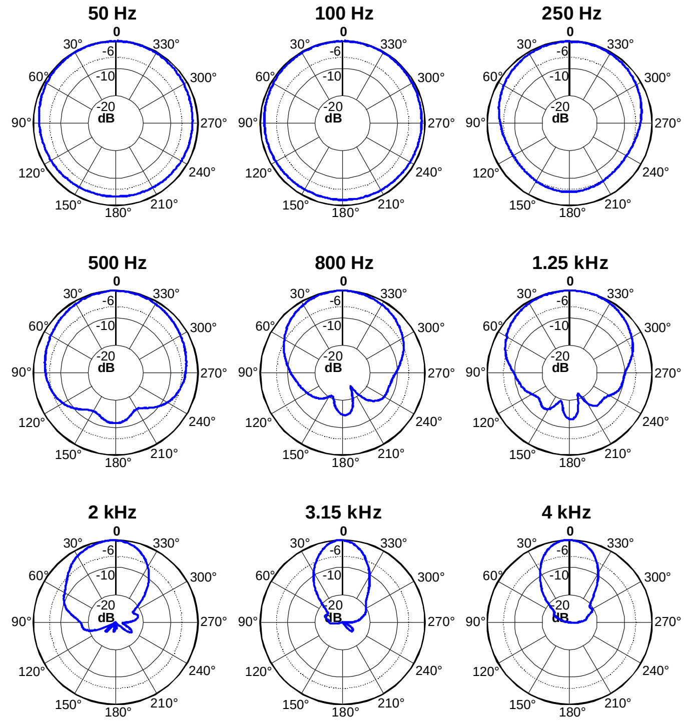
BRAZIL Address:
ELETRÔNICA SELENIUM S.A.
BR 386 Km 435 / 92.480-000
Nova Santa Rita - RS - Brazil
Fax: +(55) 51 479-1120
URL: www.selenium.com.br

RESPONSE CURVES (0° AND 45°) IN A TEST ENCLOSURE INSIDE AN ANECHOIC CHAMBER, 1 W / 1m



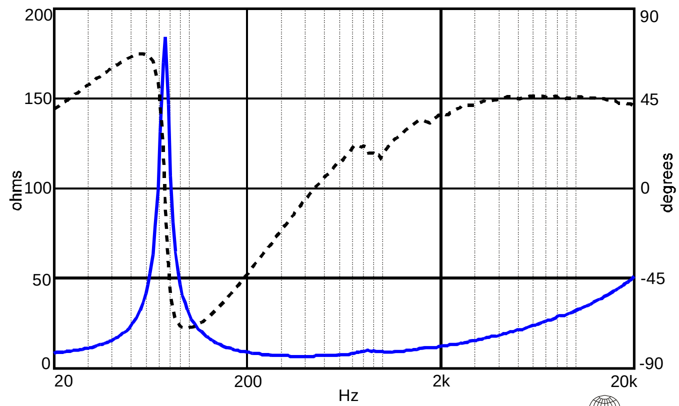
Response Curve at 0°.
Response Curve at 45°.

POLAR RESPONSE CURVES



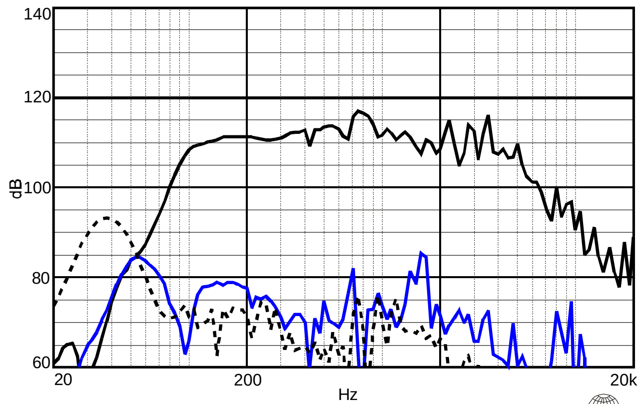
Polar Response Curve.

IMPEDANCE AND PHASE CURVES MEASURED IN FREE-AIR



Impedance Curve.
Phase Curve.

HARMONIC DISTORTION CURVES MEASURED AT 10% AES INPUT POWER, 1 m



Response Curve.
Distortion Curve, 2nd harmonic.
Distortion Curve, 3rd harmonic.

TEST ENCLOSURE
24-liter volume, sealed box.

HOW TO CHOOSE THE RIGHT AMPLIFIER
The power amplifier must be able to supply twice the RMS driver power. This 3 dB headroom is necessary to handle the peaks that are common to musical programs. When the amplifier clips those peaks, high distortion arises and this may damage the transducer due to excessive heat. The use of compressors is a good practice to reduce music dynamics to safe levels.

FINDING VOICE COIL TEMPERATURE
It is very important to avoid maximum voice coil temperature. Since moving coil resistance (R_E) varies with temperature according to a well known law, we can calculate the temperature inside the voice coil by measuring the voice coil DC resistance:

$$T_B = T_A + \left(\frac{R_B}{R_A} - 1\right)\left(T_A - 25 + \frac{1}{\alpha_{25}}\right)$$

T_A , T_B= voice coil temperatures in °C.
R_A , R_B= voice coil resistances at temperatures T_A and T_B, respectively.
α_{25}= voice coil wire temperature coefficient at 25 °C.

POWER COMPRESSION
Voice coil resistance rises with temperature, which leads to efficiency reduction. Therefore, if after doubling the applied electric power to the driver we get a 2 dB rise in SPL instead of the expected 3 dB, we can say that power compression equals 1 dB. An efficient cooling system to dissipate voice coil heat is very important to reduce power compression.

NON-LINEAR VOICE COIL PARAMETERS
Due to its close coupling with the magnetic assembly, the voice coil in electrodynamic loudspeakers is a very non-linear circuit. Using the non-linear modeling parameters Krm, Kxm, Erm, Exm from an empirical model, we can calculate voice coil impedance with good accuracy.

SUGGESTED PROJECTS
CB10MB1A VB10MB-A1 D1505A1 PAS2MA2 PAS3MA3 PAS3MA4 PAS6MA1
For additional project suggestions, please access our web site.

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EUROPE Address:
SELENIUM EUROPE
Rohrbergstrasse 23B
D-65343 Eltville - Germany
Phone: +(49) 6123 601570
Fax: +(49) 6123 601587
E-mail: sales@selenium-eu.com
URL: www.seleniumloudspeakers.com

USA Address:
SELENIUM LOUDSPEAKER USA
1701 South Park Court, Bldg 102
Chesapeake, VA 23320 - USA
Phone: (757) 424-7516/ (800) 562-0510
Fax: (757) 424-5246
E-mail: export@selenium-usa.com
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ELETRÔNICA SELENIUM S.A.
BR 386 Km 435 / 92.480-000
Nova Santa Rita - RS - Brazil
Fax: +(55) 51 479-1120
URL: www.selenium.com.br