WOOFER 10W16P

10” Woofer with excellent performance in the mid frequency ranges. Its great efficiency in sound reproduction is due excellent combination of different components. This new design is capable of handling up to 600 Watts Continous Music.

For sound reinforcement in nightclubs, dancing halls, auditoriums, bands and also for studio monitors. Its great efficiency in sound reproduction is due to the excellent combination of the different components.

The epoxy painted aluminium frame provides the array with high mechanical resistance, an impregnated fabric surround, impregnated long fiber paper cone non pressed, give the array great stability, high yield and low distortion.

The 10W16P woofer incorporates a magnetic assembly, of 169mm, of high density of magnetic flux combined with the characteristics above its check to the product high sensibility.

SPECIFICATIONS

Nominal diameter	254 (10)	mm (in)
Nominal impedance	8	Ω
Minimum impedance @ 307 Hz	7.0	Ω
Power handling		
Peak	1,200	W
Continous Music[1]	600	W
NBR[2]	300	W
AES[3]	300	W
Sensitivity (1 W@1m) averaged from 100 to 4,000 Hz	90	dB SPL
Power compression @ 0 dB (nom. power)	2.0	dB
Power compression @ -3 dB (nom. power)/2	1.3	dB
Power compression @ -10 dB (nom. power)/10	0.2	dB
Frequency response @ -10 dB	70 to 4,000	Hz
Minimum recommended crossover (12 dB/oct)	50	Hz

[1] Power handling specifications refer to normal speech and/or music program material, reproduced by an amplifier producing no more than 5% distortion. Power is calculated as true RMS voltage squared divided by the nominal impedance of the loudspeaker.
[2] NBR Standard (10,303 Brasilian Standard).
[3] AES Standard 2 - 1984 (Rev. 2003).

THIELE-SMALL PARAMETERS

Fs	66.1	Hz
Vas	19.0 (0.67)	l (ft^3)
Qts	0.53	
Qes	0.54	
Qms	22.96	
ηo (half space)	0.95	%
Sd	0.0350 (54.25)	m^2 (in^2)
Vd (Sd x Xmax)	131.3 (20.35)	cm^3 (in^3)
Xmax (max. excursion (peak) with 10% distortion)	3.8 (0.15)	mm (in)
Xlim (max.excursion (peak) before physical damage)	11.8 (0.46)	mm (in)

Atmospheric conditions at TS parameter measurements:		
Temperature	25 (77)	°C (°F)
Atmospheric pressure	1,047	mb
Humidity	51	%

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

ADDITIONAL PARAMETERS

βL	16.0	Tm
Flux density	0.97	T
Voice coil diameter	75 (2.95)	mm (in)
Voice coil winding length	23.6 (77.43)	m (ft)
Wire temperature coefficient of resistance (α25)	0.00387	1/°C
Maximum voice coil operation temperature	258 (497)	°C (°F)
θvc (max.voice coil operation temp./max.power)	0.9 (1.7)	°C/W(°F/W)
Hvc (voice coil winding depth)	15.5 (0.61)	mm (in)
Hag (air gap height)	8 (0.31)	mm (in)
Re	6.1	Ω
Mms	54.4 (0.11)	g (lb)
Cms	0.11	μm/N
Rms	1.0	kg/s

NON-LINEAR PARAMETERS

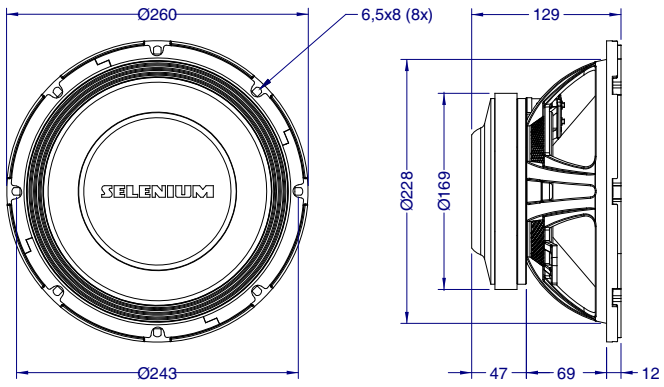
Le @ Fs (voice coil inductance @ Fs)	2.799	mH
Le @ 1 kHz (voice coil inductance @ 1 kHz)	1.499	mH
Le @ 20 kHz (voice coil inductance @ 20 kHz)	0.752	mH
Red @ Fs	0.36	Ω
Red @ 1 kHz	3.69	Ω
Red @ 20 kHz	48.55	Ω
Krm	2.0	mΩ
Kxm	11.2	mH
Erm	0.86	
Exm	0.77	

ADDITIONAL INFORMATION

Magnet material	Barium ferrite	
Magnet weight	1,563(55)	g (oz)
Magnet diameter x depth	169 x 19 (6.65 x 0.75)	mm (in)
Magnetic assembly weight	4,452 (9.81)	g (lb)
Frame material	Aluminum	
Frame finish	Black epoxy	
Voice coil material	Aluminium	
Voice coil former material	Polyimide	
Cone material	Long fiber pulp	
Volume displaced by woofer	2.6 (0.092)	l (ft^3)
Net weight	4,920 (10.8)	g (lb)
Gross weight	5,400 (11.90)	g (lb)
Carton dimensions (W x D x H)	28.0 x 26.3 x 15.4 (11 x 10.3 x 6)	cm (in)

MOUNTING INFORMATION

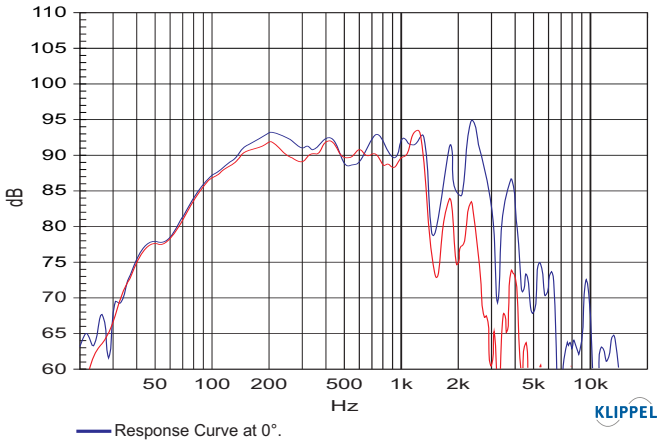
Number of bolt-holes	8	
Bolt-hole diameter	6.5 x 8 (0.26 x 0.32)	mm (in)
Bolt-circle diameter	243 (9.56)	mm (in)
Baffle cutout diameter (front mount)	230 (9.05)	mm (in)
Baffle cutout diameter (rear mount)	228 (8.97)	mm (in)
Connectors	Push on terminals	
Polarity	Positive voltage applied to the positive terminal (red) gives forward cone motion	
Minimum clearance between the back of the magnetic assembly and the enclosure wall	75 (3)	mm (in)



Dimensions in mm.

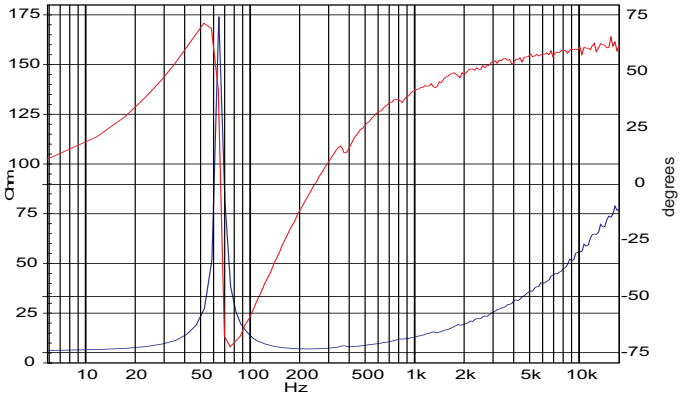
WOOFER 10W16P

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



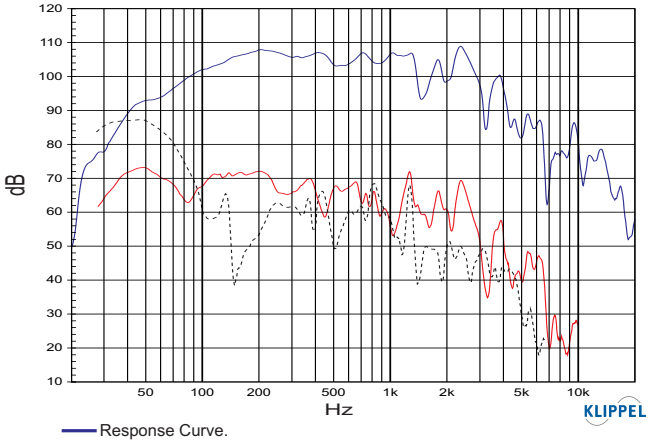
Response Curve at 0°.
Response Curve at 45°.

IMPEDANCE AND PHASE CURVES MEASURED IN FREE-AIR



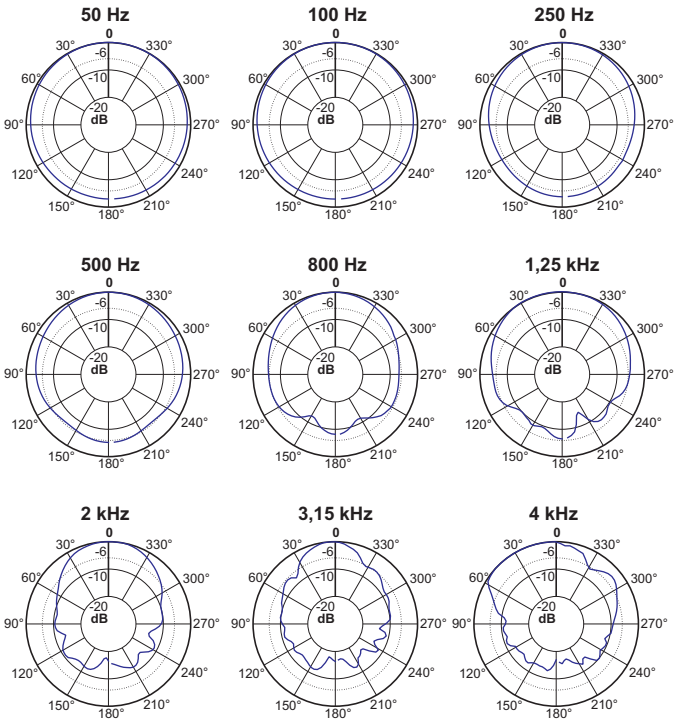
Impedance Curve.
Phase Curve.

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



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

POLAR RESPONSE CURVES



Polar Response Curve.

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 and Exm from an empirical model, we can calculate voice coil impedance with good accuracy.

SUGGESTED PROJECTS

For additional project suggestions, please access our website.

TEST ENCLOSURE

Closed box, with volume of 455 liters.