

Professional Low Frequency Transducer

The LF18G400 low frequency transducer is the result of a two year R&D project with the goal of creating new levels of professional audio performance standards. This project led to advancements and improvements in all the key areas of transducer technology. The LF18G400 is a 18-inch woofer with incredibly linear frequency response characteristics, extreme high power handling while generating the lowest harmonic distortion of any comparable 18-inch transducer within its application range. The LF18G400 uses a carbon fiber loaded cone assembly along with a high excursion triple roll, constant geometry surround. This combination provides remarkable strength and a peak to peak maximum excursion of 50 mm.

Power Handling

At the core of the LF18G400 is its new voice coil assembly featuring a number of proprietary technologies. Significant amounts of time and resources were spent in material science research in order to develop a voice coil former with optimal structural strength and thermal characteristics high. Former strength also provides the best possible transfer of power between the voice coil and the cone assembly and assists in controlling distortion artifacts. RCF Precision engineers have developed a composite polyimide former material capable of withstanding peak temperatures in excess of 380°C, well beyond the thermal requirements of modern professional audio systems. By combining this material with special adhesives and our inside / outside voice coil technology, the LF18G400 features the industry's most robust voice coil assembly.

Magnetic Circuit Design

RCF Precision set out to develop a magnetic circuit capable of delivering the highest, balanced level of performance in three specific areas; maintenance of a consistent, high integrity magnetic flux gap, distortion lowering design techniques and efficient integration of the magnetic circuit design within the overall design of the loudspeaker cooling system. The LF18G400 features a fully optimized magnetic circuit highlighted by a flux maximizing T-pole design and a rear plate cover that provides the lightest possible weight and highest flux efficiency. The T-pole design is optimized to generate the minimum amount of flux modulation in the magnetic assembly during typical voice coil movement within the gap. This substantially lowers generation of distortion artifacts.

Complex Cooling System

The LF18G400 features a complex cooling design where individual components come together to create an ideal ventilation system. Commencing with the design of the basket, RCF Precision has focused on providing finned cooling channels while optimizing the surface area available in order for the front magnetic plate to dissipate heat efficiently. When assembled and placed on the basket, the front plate, ceramic core and the rear plate form part of the ventilation system that is highlighted by cooling slots precision machined through all three components. RCF Precision's unique double silicone sealed spider design functions as an air pump expelling hot air and drawing in cool air every time the cone assembly moves. This system provides cooler operating conditions and optimal power compression.



Product Features:

- High Output / Extended Low Frequency
- 18-inch carbon fiber loaded cone, high excursion triple roll surround with constant geometry
- Dual spider design with silicone based dampening control
- 4-inch, inside/outside wound, high temperature composite polyimide coil assembly
- Spaced gap, distortion lowering, aluminum demodulation ring technology
- Magnetic structure, basket and coil assembly complex ventilation system for higher output and lower power compression
- 1000 watts AES power handling
- Frequency range: 25Hz – 2kHz

Mechanical Design

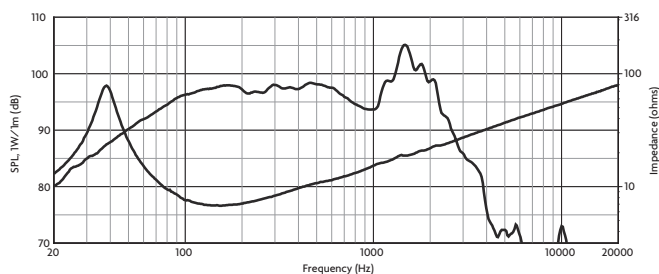
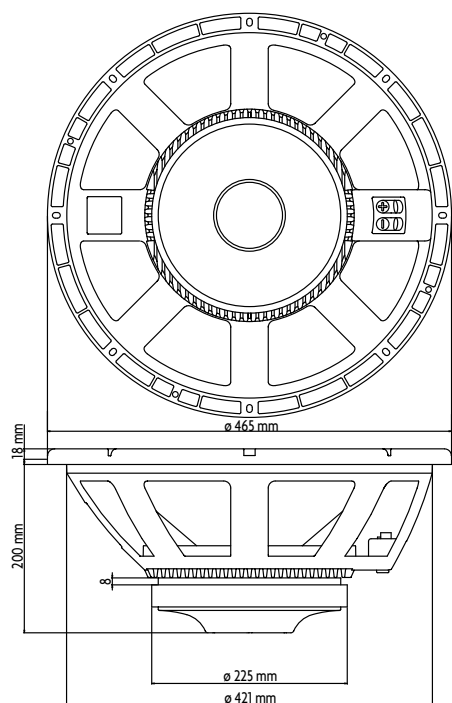
RCF Precision has also invested countless hours addressing mechanical design issues. Connection of speaker cables is improved through the design of push buttons capable of easily accepting large diameter cables effortlessly. The basket is designed to provide maximum strength, the lightest weight, while minimizing overall diameter and maximizing cone piston diameter.

LF18G400 Applications

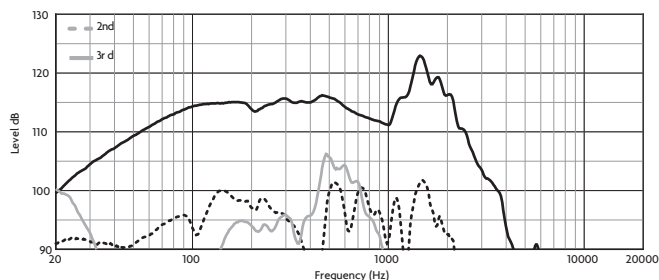
The LF18G400 is ideal for use in applications where sizable amounts of low frequency, low distortion acoustic power is desired. The robust mechanical design and optimized weight of the device make it desirable for use in fixed installation or portable professional loudspeaker systems.

LF18G400

Professional Low Frequency Transducer



Frequency response curve of the loudspeaker taken in a hemispherical, free field environment and mounted in a closed box with an internal volume of 600 liters (21.2 cu. ft.) enclosing the rear of the driver. The impedance magnitude curve is measured in free air.



2nd and 3rd harmonic distortion levels have been raised 20dB. Measurements made at 10% of rated power.

RCFTM

PRECISION

Manufacturing, Engineering

Via Raffaello Sanzio 13 - 42010 Mancasale (Reggio Emilia) Italy

Main Sales Office

Via Ferraris, 2 - 42029 San Maurizio (Reggio Emilia) Italy • tel +39.0522.354.111

e-mail rcfprecision@rcf.it

MODEL

LF18G400

General Specifications

Nominal Diameter	460/18	mm/inch
Rated Impedance	8	Ω
Power handling capacity ¹	1000	Watts
Sensitivity 1W, 1M ²	97.5	dB
Frequency Range	25 Hz - 2 kHz	
Distortion ³	2 nd harmonic 3 rd harmonic	≤ 1.2 % < 1 %
Effective Piston Diameter	395/15.6	mm/inch
Maximum Excursion Before Damage (peak to peak)	50/2.0	mm/inch
Minimum Impedance	6	Ω
Voice Coil Diameter	100/4	mm/inch
Voice Coil Material	Copper	
Voice Coil Winding Depth	25/1.0	mm/inch
Number of layers	2	
Kind of layer	Inside / Outside	
Electrical polarity	A positive voltage applied on the red terminal produces forward cone motion.	
Thickness Top Plate Depth	14/0.6	mm/inch
Cone Material	Non pressed pulp carbon fiber doped	
Cone Design	Straight	
Surround Material	Polycotton	
Surround Design	Triple roll	

Thiele - Small Parameters⁴

Resonance frequency	F_s	28	Hz
DC resistance	R_e	5.1	Ω
Mechanical factor	Q_{ms}	4.6	
Electrical factor	Q_{es}	0.285	
Total factor	Q_{ts}	0.270	
BL Factor	BL	24.2	T · m
Effective Moving Mass	M_{ms}	190	gr
Equivalent Cas air load	V_{as}	360	liters
Effective piston area	S_d	0.122	m ²
Max. linear excursion (mathematical) ⁵	X_{max}	9.0	mm
Voice - coil inductance @ 1KHz	L_{e1K}	2.3	mH
Half-space efficiency	Eff	2.67	%

Mounting Information

Overall Diameter	465/18.3	mm/inch
Bolt Circle Diameter	442-447/17.4-17.6	mm/inch
Bolt Hole Diameter	6.5/0.3	mm/inch

Baffle Cutout Diameter

Front Mount	423/16.7	mm/inch
Rear Mount	422/16.6	mm/inch
Depth	210/8.3	mm/inch
Volume occupied by the Driver ⁶	7/0.2	liters/ft ³
Net Weight	13,35/29.4	Kg/lbs.
Shipping Weight	14,95/32.9	Kg/lbs.

Notes to Specifications

1 AES standard (50 - 500) Hz.

2 Sensitivity measurement is based on a 100-500Hz pink noise signal with input power of 2.83V @ 8 Ohms.

3 Distortion is measured at -10dB from power handling capacity, from 50 to 500 Hz.

4 Thiele-Small parameters are measured after a 2 hour warm up period running the loudspeaker at full power handling capacity.

5 The maximum linear excursion is calculated as : $(Hvc - Hg)/2 + Hg/4$ where Hvc is the voice coil depth and Hg the gap depth.

6 Calculated for front mounting on 18 mm thick board.

RCF Precision continually engages in research related to product improvement. New materials, production methods and design refinements are introduced into existing products without notice. ©2001 RCF Precision. RCF Precision is a trademark of Mackie Designs Inc.