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P R I M E

R1

SUBWOOFERS

RM18D2 • RM18D2B • RM18D4
RM18D4B • RM110D2 • RM110D2B
RM110D4 • RM110D4B • RM112D2
RM112D2B • RM112D4 • RM112D4B



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Date of Purchase: _____



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Installation & Operation

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For maximum performance we recommend you have your new Rockford Fosgate product installed by an Authorized Rockford Fosgate Dealer, as we provide specialized training through Rockford Technical Training Institute (RTTI). Please read your warranty and retain your receipt and original carton for possible future use.

Great product and competent installations are only a piece of the puzzle when it comes to your system. Make sure that your installer is using 100% authentic installation accessories from Rockford Fosgate in your installation. Rockford Fosgate has everything from RCA cables and speaker wire to power wire and battery connectors. Insist on it! After all, your new system deserves nothing but the best.

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If, after reading your manual, you still have questions regarding this product, we recommend that you see your Rockford Fosgate dealer. If you need further assistance, you can call us direct at **1-800-669-9899**. Be sure to have your serial number, model number and date of purchase available when you call.

PRACTICE SAFE SOUND

Continuous exposure to sound pressure levels over 100dB may cause permanent hearing loss. High powered auto sound systems may produce sound pressure levels well over 130dB. Use common sense and practice safe sound.

PRATIQUEZ UNE ÉCOUTE SANS RISQUES

Une exposition continue à des niveaux de pression acoustique upérieurs à 100 dB peut causer une perte d'acuité auditive permanente. Les systèmes audio de forte puissance pour auto peuvent produire des niveaux de pression acoustique bien au-delà de 130 dB. Faites preuve de bon sens et pratiquez une écoute sans risques

PRACTIQUE EL SONIDO SEGURO

El contacto continuo con niveles de presión de sonido superiores a 100 dB puede causar la pérdida permanente de la audición. Los sistemas de sonido de alta potencia para automóviles pueden producir niveles de presión de sonido superiores a los 130 dB. Aplique el sentido común y practique el sonido seguro.

PRAKTIZIEREN SIE SICHEREN SOUND

Fortgesetzte Geräusdruckpegel von über 100 dB können beim Menschen zu permanentem Hörverlust führen. Leistungsstarke Autosoundsysteme können Geräusdruckpegel erzeugen, die weit über 130 dB liegen. Bitte wenden Sie gesunden Menschenverstand an und praktizieren Sie sicheren Sound.

OSSERVATE LE REGOLE DEL SUONO SENZA PERICOLI

La costante esposizione a livelli di pressione acustica al di sopra dei 100dB possono causare la perdita permanente dell'udito. I sistemi audio ad alta potenza possono produrre livelli di pressione acustica ben superiori ai 130dB. Si consiglia il buon senso e l'osservanza delle regole del suono senza pericoli

Safety

This symbol with “WARNING” is intended to alert the user to the presence of important instructions. Failure to heed the instructions will result in severe injury or death.



WARNING

This symbol with “CAUTION” is intended to alert the user to the presence of important instructions. Failure to heed the instructions can result in injury or unit damage.



CAUTION

- To prevent injury and damage to the unit, please read and follow the instructions in this manual. We want you to enjoy this system, not get a headache.
- If you feel unsure about installing this system yourself, have it installed by a qualified Rockford Fosgate technician.
- Before installation, disconnect the battery negative (-) terminal to prevent damage to the unit, fire and/or possible injury.

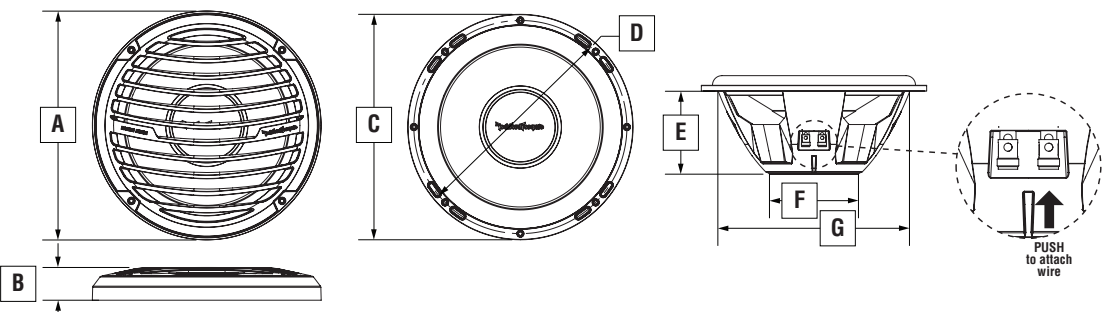
Model	RM18D2 / RM18D2B	RM18D4 / RM18D4B	RM110D2 / RM110D2B	RM110D4 / RM110D4B	RM112D2 / RM112D2B	RM112D4 / RM112D4B
Nominal Impedance (Ohms)	2 Ω DVC	4 Ω DVC	2 Ω DVC	4 Ω DVC	2 Ω DVC	4 Ω DVC
Frequency Response (Hz)	30-250	31-250	25-250	26-250	21-250	22-250
Voice Coil Diameter - inch (mm)	1.5 (4-Layer) (38.6)	1.5 (4-Layer) (38.6)	2 (4-Layer) (50.8)	2 (4-Layer) (50.8)	2 (4-Layer) (50.8)	2 (4-Layer) (50.8)
Displacement - cu. ft. (Liter)	0.05 (1.41)	0.05 (1.41)	0.1 (2.83)	0.1 (2.83)	0.12 (3.4)	0.12 (3.4)
Fs - Free Air Resonance (Hz)	40.0	41.5	33.5	35	28.5	29
Qts	0.76	0.81	0.47	0.51	0.59	0.64
Vas - cu. ft. (Liter)	0.63 (17.9)	0.67 (19.0)	1.77 (50.2)	1.78 (50.38)	3.8 (107.75)	3.83 (108.62)
Xmax - inch (mm)	0.28 (7)	0.28 (7)	0.28 (7)	0.28 (7)	0.28 (7)	0.28 (7)
SPL (dB @ 1w/1m)	85	85	88	88	88	88
Power Handling - Watts (RMS/Peak)	150/300	150/300	200/400	200/400	200/400	200/400

* All measurements taken with voice coils wired in series



CEA 2031
Power handling on Rockford Fosgate speakers conform to CEA-2031 industry standards. This means your speaker has the capacity to handle power under continuous demand, not instantaneous power handling that over time can damage voice coils.

VERIFIED WITH KLIPPEL
To adorn the "Verified with Klippel" mark, the qualifying company's loudspeaker engineering personnel must be trained and certified by Klippel prior to using the three separate Klippel systems to design, develop and test. Rockford Fosgate has made the investment in Klippel to deliver the best possible speakers and subwoofers to their customers.



Model	8"	10"	12"
A - Trim Ring Diameter - inch (mm)	8.8 (223)	11.0 (280)	13.2 (335)
B- Trim Ring Height- inch (mm)	1.4 (36)	1.6 (42)	1.7 (44)
C- Overall Diameter - inch (mm)	8.5 (217)	10.8 (274)	13.0 (330)
D - Screw Hole Diameter - inch (mm)	8.0 (204)	10.1 (258)	12.3 (312)
E - Mounting Depth- inch (mm)	3.6 (92)	4.4 (112)	4.8 (122)
F- Magnet Diameter - inch (mm)	4.1 (104)	5.3 (135)	5.1 (130)
G - Mounting Diameter - inch (mm)	7.0 (177)	9.0 (227)	10.9 (276)

Carton Contents

- (1) Marine Grade Subwoofer
 - (1) Grille
 - (8) Socket Head Stainless Screws
- (1) Socket head driver bit
 - Installation and Operation Manual

Recommended Enclosures

This manual outlines two specific types of enclosures that provide distinctly different performance. This section is to help you decide which type is best for your application.

Sealed Enclosures

Sealed enclosures are the simplest to build. The most important part of building a sealed enclosure is to make sure that the enclosure is airtight. Using glue and some type of sealant on all seams will ensure solid construction and prevent air leaks. The box volume will directly impact the performance of the speaker. Larger enclosures will provide flatter response and deeper bass where smaller boxes will provide a bump in the response curve and generally higher output for greater SPL.

Advantages of sealed enclosures:

- Small enclosures
- Linear (Flat) response
- No port noise
- High power handling at all frequencies
- Excellent for sound quality
- Extended low frequency output when compared to vented enclosures

Vented Enclosures

Vented enclosures vary only from the sealed enclosure in that a vent or port is added to “tune” the enclosure. The enclosures recommended are designed for great overall performance. Larger boxes tend to be easy to tune to lower frequencies while medium and small boxes are easier to tune to higher frequencies. The vented design is less linear in response than the sealed box but with noticeably more output at the tuning frequency.

Advantages of vented enclosures:

- Higher average output than sealed
- Tuning frequency can be easily adjusted by changing port length
- Deep bass response with lower power requirements
- Great for high output with limited power

Infinite Baffle Design

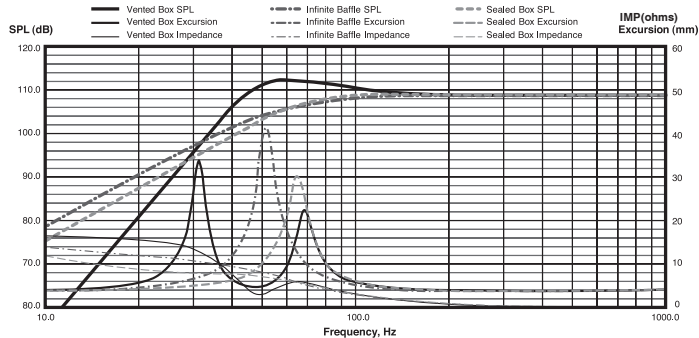
These designs typically called “IB”, are the easiest enclosure types to build. The reason is that you are not actually building an enclosure, but rather simulating one. This is done by closing off a cavity area (ie; car trunk, enclosed area of a boat hull) with a baffle board. This creates your “IB” sub-woofer system. Essentially, an “IB” design can just be considered a large sealed enclosure design. Given that an “IB” design does not rely on a volume of air for its suspension, the low frequency output is driven by the speaker’s inherent damping or “Qtc”.

Advantages of infinite baffle design:

- Easy to build
- Light-weight
- Deep bass response with lower power requirements

Vented vs Sealed vs Infinite Baffle

The graph shown here is a sample of how SPL and Excursion differs between the various enclosures.



Building an Enclosure

To work properly, the walls of the enclosure must be rigid and not flex when subjected to the high pressures generated by the speaker’s operation. For optimum performance, we recommend using 3/4” MDF (Medium Density Fiberboard) and internal bracing. The enclosure should be glued together and secured with nails or screws.

Calculating Volume

Calculating volume is merely a matter of measuring the dimensions in inches and using the formula: H x W x D divided by 1728 (cubic feet). See block below.

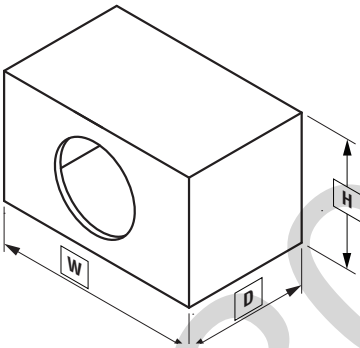
Box Volume	Height” x Width” x Depth”
Divided by (cubic feet)	1728

If two facing sides are of uneven length, add them together and divide by two to take the average. Using this number will give you the volume without the necessity of calculating the box in sections and adding the sections together. The thickness of the baffle material reduces the internal volume so this must be subtracted from the outside dimensions to determine the internal volume. The speaker itself also reduces the internal volume. The amount of air displaced by each model is listed on the specification sheet and should also be subtracted from the gross volume calculation.

Sealed Enclosure

NOTE: Vb is the internal volume, before any speaker and/or port displacement is added. All external dimensions were based on the use of 3/4” (1.90cm) materials.

NOTE: When using enclosures other than recommended, call Technical Support for correct application.



Optimum Sealed Enclosure Recommendation

Sealed Enclosures	8”	10”	12”
Total Internal Volume cu. ft. (Liter)	0.55 (15.62)	1.1 (31.15)	1.65 (46.72)
Woofer Displacement cu. ft. (Liter)	0.05(1.41)	0.1 (2.83)	0.12 (3.4)
V _b - Net Internal Volume cu. ft. (Liter)	0.50 (14.2)	1.0 (28.32)	1.53 (43.32)
F ₃ - 3dB Point (Hz)	47.7	58.4	43.1
Qtc - Enclosure Damping	1.19	0.66	0.88
H - Height - inch (cm)	12 (30.48)	14.0 (35.56)	15.0 (38.1)
W - Width - inch (cm)	12 (30.48)	16.0 (40.64)	16.0 (40.64)
D - Depth - inch (cm)	10 (25.4)	13.25 (33.66)	15.0 (38.1)

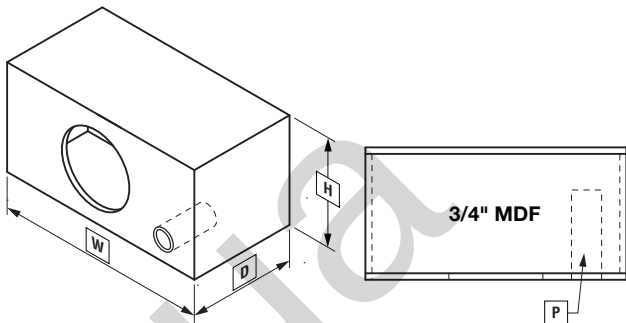
Recommended Sealed Enclosure Volume Range

Sealed Enclosures	8”	10”	12”
V _b - Volume range cu. ft. (Liter)	0.4 to 0.75 (11.34 - 21.24)	0.75 to 1.25 (21.24 - 35.4)	1.25 to 1.75 (35.4 - 49.55)

Vented Enclosures

NOTE: Vb is the internal volume, before any speaker and/or port displacement is added. All external dimensions were based on the use of 3/4” (1.90cm) materials.

NOTE: When using enclosures other than recommended, call Technical Support for correct application.



Optimum Vented (Ported) Enclosure Sizes

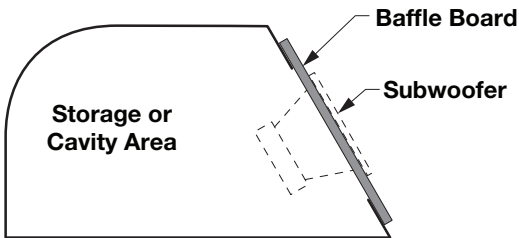
Vented Enclosures	8”	10”	12”
Total Internal Volume cu. ft. (Liter)	1.10 (31.15)	1.45 (41.06)	2.45 (69.38)
Woofer Displacement cu. ft. (Liter)	0.05 (1.41)	0.1 (2.83)	0.12 (3.4)
Port Displacement cu. ft. (Liter)	.03 (.85)	0.1 (2.83)	0.33 (9.35)
V _b - Net Internal Volume cu. ft. (Liter)	1.0 (28.3)	1.25 (35.4)	2.0 (56.63)
F _B - Tuning Frequency (Hz)	45	40	35
F ₃ - 3dB Point (Hz)	34.7	39	36
H - Height - inch (cm)	12 (30.48)	15.0 (38.1)	16.0 (40.64)
W - Width - inch (cm)	16 (40.64)	15.0 (38.1)	20.0 (50.8)
D - Depth - inch (cm)	14 (35.56)	15.25 (38.74)	17.5 (44.45)
P - Port Diameter and Length - inch (cm)	3 x 9.4 (7.62 x 23.9)	3 x 9.5 (7.62 x 24.13)	4 x 14 (10.16 x 35.56)

NOTE: The port shown can be placed on any face of the enclosure as long as the port ends are not obstructed.

NOTE: When using vented enclosures, for maximum reliability and power handling ensure, that a subsonic or “infrasonic” filter is used so that only usable low frequency signal is sent to the subwoofer.

Infinite Baffle

An Infinite Baffle enclosure design represents an application where the compliance of the air volume within the enclosure is greater than the compliance on the speaker’s suspension (Vas). An infrasonic filter is required for reliable performance.



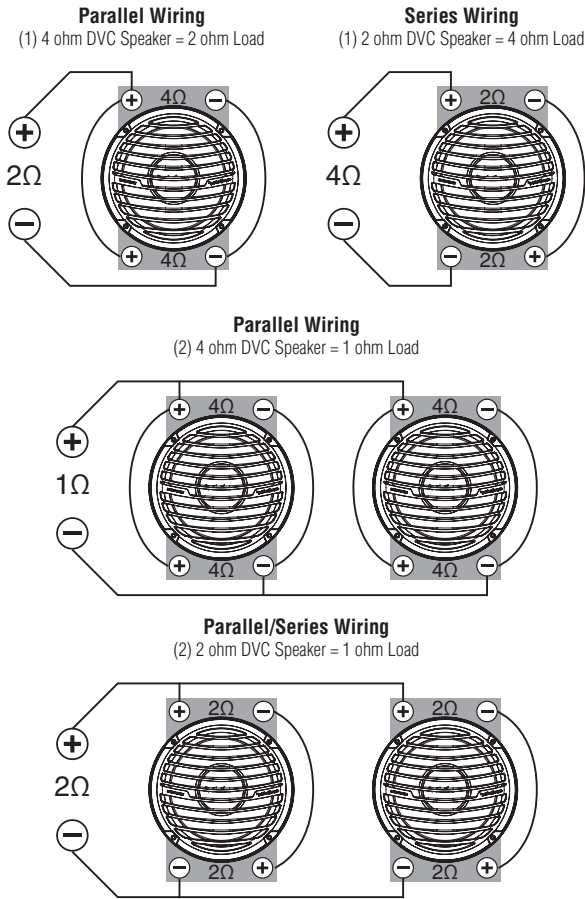
Infinite Baffle	8”	10”	12”
F ₃ - 3dB Point (Hz)	42.7	69.4	43.3
Vas - cu. ft. (Liter)	0.63 (17.9)	1.77 (50.2)	3.80 (107.7)
Qtc - Enclosure Damping	0.66	0.43	0.54

IMPORTANT: A subsonic or “infrasonic” filter at or above the resonant frequency (Fs) of the speaker is required.

NOTE: Infinite baffle installations will result in lower speaker power handling when compared to fully enclosed applications such as sealed or vented enclosures.

Wiring Configurations

By varying the wiring configuration of your speakers you can create an impedance load to match your system. Altering the wiring configurations gives a range of options for impedance loads. Series, Parallel, or Series-Parallel wiring configurations are different techniques for wiring speakers that provide different loads. Series configuration is a string method where speakers are wired end to end. Parallel configuration uses two or more speakers wired across common terminals. Series-Parallel configuration combines both techniques. Choose the wiring diagram that corresponds to the number of woofers and the impedance of your amplifier.



Subwoofer Crossovers

There are two operational types of crossovers, passive and active. Passive crossovers (coils or inductors) are placed on the speaker leads between the amplifier and speaker. An active crossover is an electronic filter that separates the audio signal fed to different amplifiers. For optimum subwoofer performance, we recommend using an active 80-100Hz low-pass crossover at 12dB/octave.

Enceintes recommandées

Ce manuel décrit deux types particuliers d'enceintes aux performances tout à fait distinctes.Cette section vous permettra de décider celui qui vous conviendra le mieux.

Enceintes Éanches

Les enceintes étanches sont les plus faciles à fabriquer.À cet égard, la chose la plus importante dans leur fabrication est de vous assurer qu'elles sont vraiment hermétiques.Appliquez de la colle et un produit d'étanchéité sur tous les joints pour solidifier l'ensemble et empêcher toute fuite d'air. Le volume du caisson influe directement sur la performance du haut-parleur. Les enceintes de plus grande dimension délivrent une réponse uniforme en fréquence avec des graves profonds alors que les enceintes plus petites ont une courbe de réponse plus pr noncée et un rendement généralement supérieur pour un niveau de pression acou tique plus élevé.

Avantage des enceintes étanches:

- Petites enceintes
- Réponse linéaire (uniforme)
- Pas de bruit d'évent
- Puissance élevée sur toutes les fréquences
- Excellentes en ce qui concerne la qualité du son

Enceintes À Évnt

Les enceintes à évent se distinguent des enceintes étanches du fait qu'on y ajoute un évent ou port pour les « accorder ». Les enceintes reco mandées sont conçues pour offrir d'excellentes performances. Il est généralement plus facile d'accorder les caissons plus grands pour l'obtention de basses fréquences et les caissons moyens et petits pour des fréquences plus élevées. Les enceintes à évent ont une réponse moins linéaire que les enceintes étanches mais dégagent nettement plus de puissance à la fréquence d'accord.

Avantages des enceintes à évent :

- Rendement moyen supérieur par rapport aux modèles étanches
- La fréquence d'accord peut être facilement réglée en changeant la lo gueur de l'évent
- Reproduction profonde des basses avec une puissance d'entrée moindre
- Excellent choix pour un rendement élevé à faible puissance d'entrée

Construire Un Caisson

Pour fonctionner convenablement les parois du caisson doivent être rigides lorsqu'elles sont soumises aux hautes pressions dues au fonctionnement du haut-parleur.Nous vous recommandons d'utiliser des panneaux de bois aggloméré à haute ou moyenne densité de particules de type "MDF". Ces panneaux sont disponibles dans la plupart des magasins de bricolage. Pour un caisson de grand volume il est recom-mandé de placer des renforts à l'intérieur du caisson. Les différents côtés devront être collés (colle à bois) et vissés (ou éventuellement cloués). Il est recommandé de mettre un joint de silicone dans les arêtes internes du caisson afin d'éviter les fuites d'air.

Calcu duVolume

On calcule le volume en mesurant la dimension de chaque côté et en utilisant la formule suivante:

Volume du caisson	Hauteur (cm) x Longueur (cm) x Largeur (cm)
Divisé près (Litres)	1000

Si les due côtés qui se font face n'ont pas la même longueur, additionnez les et divisez le résultat par deux pour obtenir la moyenne des deux longueurs.Utilisez le nombre ainsi obtenu dans la formule pour déterminer le litrage.Cette méthode permet d'obtenir le volume du caisson sans devoir faire de calculs compliqués de section de volume. L'épaisseur du matériau dont est fait le caisson réduit le volume in-terne de celui-ci. Lorsqu'on mesure les côtés du caisson il ne faut donc pas oublier d'oter des mesures l'épaisseur du matériau. Le haut-parleur lui-même diminue le volume in terne du caisson. Le volume d'air déplacé par chaque modèle de haut-parleur est repris dans les spécifications techniques et doit également être soustrait du volume total.

Configuration du câblage

En variant la configuration du câblage de vos haut-parleurs, vous pouvez créer une charge d'impédance correspondant à votre système. La modification des configurations de câblage offre tout un choix d'options en ce qui concerne la charge d'impédance. Les câblages série, parallèle, ou série/parallèle sont des techni-ques permettant de câbler les haut-parleurs de manière à produire des charges différentes. La configura-tion série consiste à câbler les haut-parleurs à la chaîne, bout à bout. La configuration parallèle utilise deux ou plusieurs haut-parleurs branchés sur des bornes communes. La configuration série/parallèle combine les deux techniques.Choisissez le schéma ci-dessous qui correspond au nombre de haut-parleurs de graves et à l'impédance de votre ampli.

Montage en Baffle Infini

Les enceintes à baffle infini sont les plus faciles à construire.En effet,il ne s'agit pas vraiment de fabriquer une enceinte,mais plutôt d'en simuler une.Cela s'effectue en fermant une cavité (comme un coffre de voiture ou une partie de coque de bateau) avec une cloison,appelée écran acoustique.Cela crée un caisson de grave en baffle infini. En fait,le montage en baffle infini peut être considéré comme une grande enceinte close. Un montage en baffle infini ne dépendant pas d'un volume d'air pour la suspension, la réponse dans le grave est assurée par l'amortissement intrinsèque du haut-parleur ou Qtc.

Avantages du montage en baffle infini :

- Facile à construire
- Faible poids
- Réponse profonde dans le grave à une puissance relativement faible.

Filtres de subwoofer

On distingue deux types de filtres opérationnels : passif et actif. Les filtres passifs (bobines ou inducteurs) sont placés sur les fils de haut-parleur, entre l'ampli et le haut-parleur.Un filtre actif est un filtre électro-nique qui sépare le signal audio envoyé à différents amplis. Pour obtenir une performance optimale du subwoofer, nous recommandons l'utilisation d'un filtre actif passe-bas 80-100 Hz à 12 dB/octave.

Cajas recomendadas

Este manual delinea dos tipos específicos de cajas que producen rendimientos inconfundiblemente dife-rentes. Esta sección es para ayudarle a decidir cuál tipo es el mejor para su aplicación.

Cajas CERRADAS

Las cajas cerradas son las más fáciles de hacer. La parte más importante de la construcción de una caja cerrada es garantizar su hermetismo. El uso de pegante y algún tipo de sellador en todos los bordes garantizará una construcción sólida y evitará fugas de aire. El volumen de la caja impacta directamente el rendimiento del altavoz. Las cajas más grandes ofrecen una respuesta más plana y un bajo más profundo,mientras que las más pequeñas ofrecen un incremento en la curva de respuesta y generalmente una salida mayor, para un mayor NPS. Ventajas de las cajas cerradas:

- Cajas pequeñas
- Respuesta lineal (plana)
- No hay ruido del orificio
- Capacidad de alta potencia en todas las frecuencias
- Excelentes para la calidad del sonido

Cajas con Orificios

Las cajas con orificios sólo se diferencian de las cerradas en que se les hace un orificio para "sintonizar-las." Las cajas recomendadas son diseñadas para un gran rendimiento general. Las cajas grandes tienden a ser fáciles de sintonizar en las frecuencias graves,mientras que medianas y pequeñas son más fáciles de sintonizar en las frecuencias más altas. El diseño con orificios es de una respuesta menos lineal que el de la caja cerrada, pero tiene una salida notablemente mayor en la frecuencia de sintonización.

Ventajas de las cajas con orificios:

- Un promedio de salida mayor que las cerradas
- La frecuencia de sintonización se ajusta fácilmente al cambiar la longitud del orificio
- Respuesta de bajo profundo con menos exigencia de potencia
- Fabulosas para salida alta con potencia limitada

Construcción de una caja

Para un buen funcionamiento las paredes de la caja deben ser rígidas y no se deben doblar cuando sean sometidas a la gran presión que ejerce el funcionamiento del altavoz. Recomendamos usar madera comprimida de mediana densidad, de 1.9 cm o fibra de media densidad. Si la caja es muy grande es necesario reforzarla internamente. Las juntas deben ser encoladas y aseguradas con tornillos o grapas. Internamente los bordes deben ser sellados con silicona para prevenir las fugas de aire. La cola para madera es la mejor opción.

Cálculo deVolúmenes

Para calcular el volumen sólo se han de medir las dimensiones en centímetros y aplicar la fórmula:

Volumen du la caja	Alto(cm)xAncho(cm) x Profundidad(cm)
Dividido por (en litros)	1000

Si dos caras opuestas son de diferente tamaño, súmelas y divida el total por dos para obtener el promedio. Usando esta técnica se ahorrara el cálculo por secciones. El espesor del material con que está construida la caja reduce el volumen interno, de manera que ha de restarse de las dimensiones exteriores para de-terminar el volumen interior. La cantidad de aire que ocupa cada modelo viene especificado en la hoja de características y también debe sustraerse para obtener el volumen neto interior.

Configuraciones del cableado

Al variar la configuración del cableado de los altavoces, usted puede crear una impedancia de carga que iguale a su sistema. La alteración de la configuración de los cables da una gama de opciones para impedancia de carga. Las configuraciones en serie, paralela o en serie-paralela son técnicas diferentes para el cableado de los altavoces que ofrecen cargas diferentes. La configuración en serie es un método en cadena en el que los altavoces se conectan de punta a punta. La configuración paralela usa dos o más altavoces conectados a lo largo de terminales en común. La configuración en serie-paralela combina ambas técnicas. Escoja el diagrama que corresponda al número de altavoces para sonidos graves y la impedancia de su amplificador

Diseño de Pantalla Acústica Infinita

A estos diseños normalmente se les llama "IB", son los tipos de caja más fáciles de construir. El motivo es que usted en realidad no está construyendo una caja,simplemente simulando una. Esto se hace cerrando el área de la cavidad (por ejemplo,cajuela del automóvil,área cerrada del casco de una embarcación) con una tabla de pantalla acústica. Esto crea su sistema de subwoofer "IB". Esencialmente, el diseño "IB" se puede considerar un diseño de caja grande sellada.Dado que le diseño "IB" no depende del volumen de aire para su suspensión, la salida de bajas frecuencias está impulsada por la amortiguación inherente del altavoz o "Qtc".

Ventajas del diseño de la pantalla acústica infinita:

- Fácil de construir
- Peso liviano
- Respuesta grave de bajos con menores requisitos de potencia

Filtros deTransición del altavoz para sonidos graves

(Subwoofer X-Over)

Hay dos tipos funcionales de filtros de transición, pasivos y activos. Los pasivos (bobinas o inductores) se conectan a los cables del altavoz, entre el amplificador y el altavoz.Un filtro de transición activo es un filtro electrónico que separa la señal de audio alimentada a diferentes amplificadores. Para un rendimiento óptimo del altavoz para sonidos graves, recomendamos el uso de un filtro de transición activo de 80-100Hz, paso bajo a 12dB/octava.

Empfohlene Gehäuse

DieseAnleitung beschreibt zwei spezifischeTypen von Gehäusen, die grundsätzlich verschiedene Perfor-mancemerkmale bieten.DieserAbschnitt soll Ihnen dabei helfen zu entscheiden,welcher der besteTyp für IhreAnwendung ist.

Geschlossene Gehäuse

Geschlossene Gehäuse lassen sich am leichtesten bauen.Der wichtigsteAspekt beim Bau eines geschlos-senen Gehäuses ist zu gewährleisten, dass es luftdicht ist. DieVerwendung von Klebstoff und anderen Dichtungsmitteln an allen Fugen gewährleistet eine solide Konstruktion und verhindert Luftverlust.Das Gehäuservolumen wirkt sich unmittelbar auf die Performance des Lautsprechers aus.Größere Gehäuse bi-eten eine flachere Reaktion und tiefere Bässe,wohingegen kleinere Gehäuse eineAbweichung in der Reak-tionskurve bieten und im Allgemeinen durch höhere Leistung zu einem höheren Schalldruckpegel führen.

Vorteile von geschlossenen Gehäusen:

- Kleine Gehäuse
- Lineare (flache) Reaktion
- Keine Öffnungsgeräusche
- Hohe Nennbelastbarkeit in allen Frequenzbereichen
- Ausgezeichnete Klangqualität

Belüftete Gehäuse

Belüftete Gehäuse unterscheiden sich von geschlossenen Gehäusen nur in sofern, als dass ein Lufts-chlitz bzw. eine Öffnung hinzugefügt wird, um das Gehäuse zu „stimmen".Die empfohlenen Gehäuse sind für hervorragende Gesamtperformance konstruiert.Größere Gehäuse lassen sich in der Regel leichter auf niedrigere Frequenzen abstimmen,wohingegen sich mittlere und kleine Gehäuse leichter auf höhere Fre-quenzen abstimmen lassen.Das belüftete Design zeigt eine weniger lineare Reaktion als das geschlossene Gehäuse, erbringt jedoch eine feststellbar höhere Leistung auf der abgestimmten Frequenz.

Vorteile von belüfteten Gehäusen:

- Höhere Durchschnittsleistung als geschlossene Gehäuse
- Abstimmfrequenz kann leicht durch Änderung der Öffnungslänge a gepasst werden
- Tiefes Bassverhalten bei geringerem Kraftbedarf
- Gut geeignet für hohe Leistung bei beschränkter Kraft

Bau des Gehäuses

DurchVeränderung zu funktionieren,müssen die Gehäusewände steif sein und dürfen nicht nachgeben,wenn sie dem hohen Druck ausgesetzt sind, der bei Betrieb des Lautsprechers entsteht. Für optimale Performance empfehlen wir Faserplatte mittlerer Dichte (Stärke ca. 1,9 cm) und interneAusstei-fungen.Das Gehäuse wird verleimt und mit Nägeln oder Schrauben befestigt.Da Faserplatte luftdurchlässig ist, wird geraten, das Gehäuse von außen mit Polyurethan zu behandeln.

Berechnung desVolumens

Zur Berechnung desVolumens einfach die Maße feststellen und folgende Formel anwenden:

Gehäuse-Volumen	Höhe (cm) x Breite (cm) xTiefe (cm)
Vorbei geteilt (Liter)	1000

Sind zwei gegenüber liegende Seiten ungleich lang, die Durchschnittslänge der beiden Seiten berechnen. DasVolumen lässt sich mithilfe dieser Zahl berechnen, ohne das Gehäuse inAbschnitten berechnen zu müssen.Die Stärke des Resonanzwandmaterials reduziert das Innenvolumen und muss daher zur Feststel-lung des Innenvolumens vomAußenvolumen subtrahiert werden.Der Lautsprecher selbst reduziert das Innenvolumen ebenfalls.Die Luftverdrängung für jedes Modell ist unterTechnische Daten aufgeführt und muss bei der Gesamtkalkulation desVolumens ebenfalls subtrahiert werden.

Verkabelungskonfigurationen

DurchVeränderung derVerkabelungskonfiguration Ihrer Lautsprecher können Sie eine Impedanzlast her-stellen, die Ihrem System entspricht. Bietet dieVeränderung derVerkabelungskonfigurationen eine Reihe von Optionen für die Impedanzlast. Reihen-, Parallel- oder Reihen-Parallel-Verkabelungen sind verschie-deneTechniken für dieVerkabelung von Lautsprechern, die unterschiedliche Belastungen bieten.Die Rei-enkonfiguration ist eine Reihenmethode, bei der die Lautsprecher von Ende zu Ende verkabelt werden.Die Parallelkonfiguration verwendet mindestens zwei Lautsprecher, die über gemeinsameAnschlüsse verka-belt werden.Die Reihen- Parallel-Konfiguration kombiniert beideTechniken.Wählen Sie das nachfolgende Verkabelungsdiagramm aus, das der Zahl anTieftönern und der Impedanz Ihres Verstärkers entspricht.

Infinite Baffle Design

Diese Designs,die typischerweise als „IB" bezeichnet werden,sind die am leichtesten zu bauenden Gehäuse.Der Grund dafür ist,dass Sie nicht wirklich ein Gehäuse bauen sondern eins simulieren.Dies geschieht dadurch,dass Sie einen Hohlraum (d.h.den Kofferraum,einen geschlossenen Bereich eines Bootsrumpfs) mit einer Schallwand abtrennen.Dadurch entsteht Ihr „IB"-Subwoofersystem.Im Grunde kann das Design eines großen abgeschlossenen Gehäuses einfach als „IB"-Design betrachtet werden. Da ein „IB"-Design für seine Suspension nicht von einem Luftvolumen abhängig ist,wird der geringe Frequenzausgang von der natürlichen Dämpfung oder „Qtc" des Lautsprechers getrieben

Vorteile des Infinite Baffle Design:

- Leicht zu bauen
- Geringes Gewicht
- Tiefes Bassverhalten mit geringerem Stromverbraucht

Subwoofer-Crossover

Es gibt zwei Betriebstypen für Crossover, und zwar passive und aktive. Passive Crossover (Spulen oder Induktoren) werden auf den Lautsprecherkabeln zwischen Verstärker und Lautsprecher platziert. Ein ak-tives Crossover ist ein elektronischer Filter, der dasAudiosignal trennt, das verschiedenenVerstärkern zugeführt wird. Zur optimalen Subwoofer-Performance empfehlen wir dieVerwendung von aktiven 80-100 Hz-Niedrigpass-Crossovern bei 12 dB/Oktav.

Casse acustiche consigliate

Il presente manuale descrive a grandi linee due tipi di cassa acustica che forniscono prestazioni distinta-mente diverse. La presente sezione mira ad aiutare a decidere quale sia il tipo migliore per la propria applicazione.

Casse a chiusura ermetica

Le casse a chiusura ermetica sono le più semplici da costruire. La cosa più importante in questo tipo di costruzione è di accertarsi che la chiusura sia a tenuta d'aria. L'uso di colla e di un qualche altro tipo di mastice in tutti i punti di giuntura garantirà che la costruzione sia solida ed eviterà le perdite d'aria. Il vol-ume della cassa influirà in modo diretto sulle prestazioni del diffusore. Le casse più grandi forniranno una risposta più piatta e bassi più profondi, mentre quelle più piccole presenteranno una gobba nella curva di risposta e forniranno in generale un'uscita più alta per un maggiore livello SPL.

Vantaggi delle casse a chiusura ermetica:

- Casse di dimensioni ridotte
- Risposta lineare (piatta)
- Nessun disturbo da apertura
- Gestione di potenza alta a tutte le frequenze
- Eccellente qualità del suono
- Ottima uscita di bassa frequenza a confronto delle casse con sfiato

Casse con sfiato

Le casse con sfiato differiscono da quelle a chiusura ermetica solo per il fatto che in esse è praticata un'apertura o porta per "accordare" la cassa stessa. Le casse consigliate sono state progettate per fornire una buona prestazione nell'insieme. Le casse più grandi sono generalmente più facili da accordare alla frequenza più basse, mentre quelle piccole e di misura mediana sono più facili da accordare alle fre-quenze più alte. Il design con sfiato ha risposta meno lineare delle casse a chiusura ermetica, ma possiede un'uscita notevolmente maggiore alla frequenza di accordo.

Vantaggi delle casse con sfiato:

- Uscita media superiore alle casse chiuse
- La frequenza di accordo può essere regolata facilmente modificando la lunghezza dell'apertura
- Risposta di bassi profondi con minore potenza
- Ottime per uscita alta con potenza limitata

Costruzione della cassa

Perché la cassa possa funzionare in modo corretto è necessario che le pareti siano rigide e non si flettano quando sono assoggettate alle alte pressioni prodotte dal diffusore in operazione. Per ottenere i migliori risultati si consiglia di usare MDF (pannello di fibre di densità media) dello spessore di 3/4 di pollice. I pannelli della cassa dovrebbero essere uniti con colla e tenuti assieme in modo sicuro con chiodi o viti.

Calcolo del volume

Il calcolo del volume consiste semplicemente nel prendere le misure in pollici e usare la formula seguente:

Volume della casella	Altezza(cm) x Larghezza (cm) x Profondità (cm)
Diviso vicino (nei litri)	1000

Se due lati hanno lunghezze diverse, sommare i due valori e dividere per due per ottenere il valore medio. Il numero così ottenuto fornirà il volume senza doverlo calcolare dividendo la cassa in sezioni e quindi som-mando assieme i volumi delle diverse sezioni. Lo spessore del materiale di diaframma riduce il volume interno e quindi lo si dovrà sottrarre alle dimensioni esterne per calcolare il volume. Anche l'altoparlante vero e proprio riduce il volume interno. Il volume d'aria occupato da ciascun modello è indicato nel foglio dei dati tecnici e dovrà essere sottratto dal volume lordo calcolato.

Configurazione d'impianto

Variantdo la configurazione d'impianto dei propri diffusori si può creare un carico d'impedenza accoppiato a quello del sistema. La modifica della configurazione d'impianto produce una gamma di scelte di carico d'impedenza. Le configurazioni d'impianto in serie, in parallelo, in serie-parallelo rappresentano diverse tecniche di collegamento dei fili che producono carichi diversi. La configurazione in serie rappresenta un metodo di collegamento in cui i diffusori sono collegati uno dopo l'atro. La configurazione in parallelo utilizza due o più diffusori collegati con terminali comuni. La configurazione in serie-parallelo unisce le due tecniche. Scegliere lo schema d'impianto che corrisponde al proprio numero di woofer e all'impedenza dell'amplificatore.

Infinite Baffle design

Questi disegni tipicamente chiamati "IB", sono i tipi di recinzione più facili da costruire. La ragione è che non sono in realtà costruendo un recinto, ma piuttosto simulando uno. Questo viene fatto chiudendo una zona cavità (ie; bagagliaio di un'auto, spazio chiuso di uno scafo) con una scheda deflettore. Questo crea il sistema sub-woofer "IB". In sostanza, un design "IB" può solo essere considerato un grande disegno contenitore sigillato. Dato che un motivo "IB" non si basa su un volume di aria per la sua sospensione, l'uscita bassa frequenza è guidato dalla smorzamento intrinseco del diffusore o "Qtc".

Vantaggi di design deflettore infinito:

- Facile da costruire
- di peso leggero
- Risposta dei bassi profondi con requisiti di alimentazione inferiori

Crossover dei subwoofer

Ci sono due tipi di crossover, passivo e attivo. I crossover passivi (bobine o induttori) sono posti sui fili dei diffusori tra il diffusore e l'amplificatore. Il crossover attivo è un filtro elettronico che separa il segnale audio inviato a diversi amplificatori. Per ottimizzare le prestazioni dei subwoofer, si consiglia di usare un crossover attivo passa-basso da 80-100 Hz a 12 dB/ottava.

Rockford Corporation offers a limited warranty on Rockford Fosgate products on the following terms:

Length of Warranty

POWER Amplifiers – 2 Years
BMW® Direct Fit Speakers – 2 Years
All other products – 1 Year
Any Factory Refurbished Product – 90 days (receipt required)

What is Covered

This warranty applies only to Rockford Fosgate products sold to consumers by Authorized Rockford Fosgate Dealers in the United States of America or its possessions. Product purchased by consumers from an Authorized Rockford Fosgate Dealer in another country are covered only by that country's Distributor and not by Rockford Corporation.

Who is Covered

This warranty covers only the original purchaser of Rockford product purchased from an Authorized Rockford Fosgate Dealer in the United States. In order to receive service, the purchaser must provide Rockford with a copy of the receipt stating the customer name, dealer name, product purchased and date of purchase.

Products found to be defective during the warranty period will be repaired or replaced (with a product deemed to be equivalent) at Rockford's discretion.

What is Not Covered

1. Damage caused by accident, abuse, improper operations, water, theft, shipping.
2. Any cost or expense related to the removal or reinstallation of product.
3. Service performed by anyone other than Rockford or an Authorized Rockford Fosgate Service Center.
4. Any product which has had the serial number defaced, altered, or removed.
5. Subsequent damage to other components.
6. Any product purchased outside the U.S.
7. Any product not purchased from an Authorized Rockford Fosgate Dealer.

Limit on Implied Warranties

Any implied warranties including warranties of fitness for use and merchantability are limited in duration to the period of the express warranty set forth above. Some states do not allow limitations on the length of an implied warranty, so this limitation may not apply. No person is authorized to assume for Rockford Fosgate any other liability in connection with the sale of the product.

How to Obtain Service

Contact the Authorized Rockford Fosgate Dealer you purchased this product from. If you need further assistance, call 1-800-669-9899 for Rockford Customer Service. You must obtain an RA# (Return Authorization number) to return any product to Rockford Fosgate. You are responsible for shipment of product to Rockford.

EU Warranty

This product meets the current EU warranty requirements, see your Authorized dealer for details.