

15 PT 400 MB [3.0]

SWETON®

15-inch (380 mm) Professional Mid-Bass Transducer

*Technical Catalogue & Application Note***100 dB**

sensitivity 2.83 V/1 m

800 Watts

Program Power

76.2 mm

Voice Coil

50Hz – 2 KHz

Response



1. Overview

The Sweton 15 PT 400 MB [3.0] is a 15-inch professional mid-bass transducer engineered for high-output live-sound and installed systems. It pairs a powerful, highly symmetric motor ($BI = 20.4$ N/A) with a moderately stiff, well-damped suspension to deliver high sensitivity (≈ 100 dB, 2.83 V/1 m) together with low large-signal distortion. The driver is intended to cover the low-mid to mid band – nominally 100 Hz to 2 kHz – where its flat, controlled response and high efficiency let it produce high sound-pressure levels from modest amplifier power.

It suits both two-way tops (paired with a 1.4-inch compression driver on a horn) and the mid section of three-way and line-array systems. The parameters below are taken from Klippel measurement:

Key strengths

- High sensitivity – 100 dB (2.83 V/1 m), so high SPL from modest power.
- Strong, symmetric motor – $BI = 20.4$ N/A with low offset; clean, low-distortion large-signal behaviour.
- Controlled passband – flat measured response from 120 Hz to 2 kHz; usable mid-band to cross to a horn.
- Thermal headroom – large measured margin below the coil temperature limit at the test drive level.
- Well-behaved suspension – low compliance and force-factor asymmetry for predictable excursion.

2. Frequency Response

The measured on-axis response (CLIO) is flat at ≈ 100 dB across the passband from roughly 120 Hz to 2 kHz, with a small rise near 2 kHz followed by cone break-up and a steep roll-off above 2–3 kHz. The driver is therefore clean and usable to about 2 kHz; the crossover to a compression driver should sit no higher than ≈ 1.5 – 1.8 kHz to stay below break-up.

The modelled in-box low-frequency response below uses the validated electro-acoustic model (with electrical damping correctly included). A single driver in the recommended 85 L vented box reaches -0 dB through the passband at 99.6 dB; two drivers in a shared 170 L box gain +6 dB to 105.6 dB. Both alignments are flat with no passband ripple.

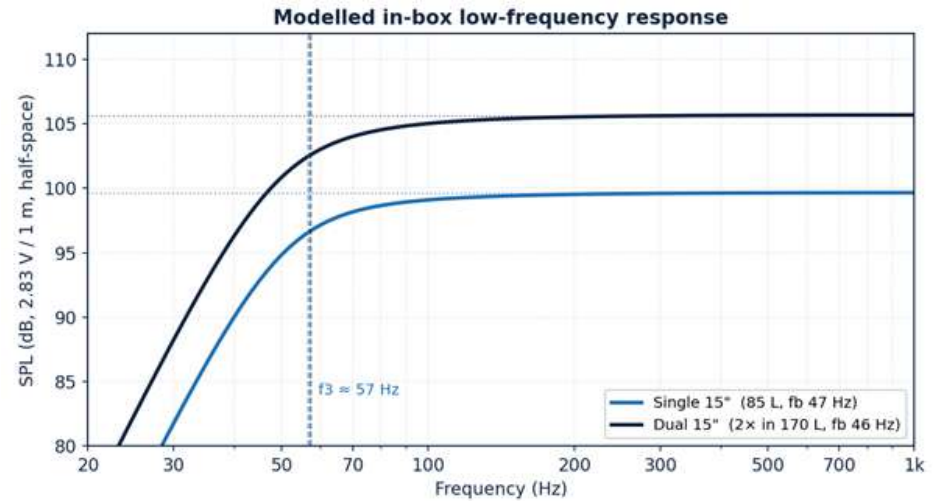


Figure 1. Modelled in-box response — single 15" (85 L / 47 Hz) and twin 15" (170 L / 46 Hz). Both reach f3 ≈ 57 Hz.

3. Recommended Filter Settings

Two deployment cases are common. In a two-way top the driver runs full-range up to the horn; in a three-way (or with a subwoofer below) it is high-passed higher and used purely as a mid. Linkwitz-Riley 24 dB/octave slopes are recommended at both ends.

Recommended Enclosure:

Use case	High-pass (HPF)	Low-pass (LPF) ➡ horn	Notes
Two-way top (15" + horn)	45–50 Hz, 24 dB/oct	1.5 kHz, 24 dB/oct LR	HPF protects below box tuning
Three-way / sub below	100 Hz, 24 dB/oct LR	1.5 kHz, 24 dB/oct LR	driver used as dedicated mid

A high-pass at or above box tuning is essential in the vented alignment: below tuning the cone unloads and excursion rises steeply (see Figure 2), so the HPF prevents over-excursion at high drive.

Do not cross to the horn above ≈1.8 kHz because of cone break-up.

4. Recommended Compression Driver

To match this mid-bass in a two-way top, pair it with a 1.4-inch-exit compression driver of the following class. Mount it on a constant-directivity horn and pad its higher sensitivity down to match the ≈100 dB mid-bass with an L-pad or DSP gain offset.

Compression Driver — Recommended Class	
Exit / format	1.4 inch (35 mm) exit
Diaphragm / voice coil	3 inch (75 mm), neodymium motor
Usable crossover	≥ 1.2 kHz (cross at 1.5 kHz)
Horn	constant-directivity, e.g. 60 40
Sensitivity	≈108–110 dB – pad to match mid-bass
Pairing note	use Sweton's own 1.4" CD where available

15 PT 400 MB [3.0]



5. Recommended Enclosure (single driver)

With EBP ≈ 128 and Qts ≈ 0.37, this driver is firmly a vented-box design. The recommended alignment is a vented box of ≈85 L net tuned to

≈47 Hz, giving an f3 of about 57 Hz with a flat, ripple-free passband. A sealed alternative is offered for compact three-way tops where deep extension is handled by a subwoofer.

Recommended Enclosure:

Alignment	Net volume	Tuning fb	f3	Qtc	Best for
Vented (recommended)	85 L	47 Hz	57 Hz	—	2-way tops, full-range mid-bass
Vented (extended)	100 L	44 Hz	54 Hz	—	slightly deeper, larger cabinet
Sealed (alternative)	45–50 L	—	93 Hz	0.70	compact 3-way low-mid

Port: a slot of 320 X 60 mm, ≈190 mm long tunes the 85 L box to 47 Hz with peak air velocity ≈15 m/s at full drive — comfortably below the chuffing threshold. Alternatively two

100 mm round ports ≈146 mm long give ≈18 m/s. Confirm tuning with an impedance sweep after the build and trim the port length to land on fb.

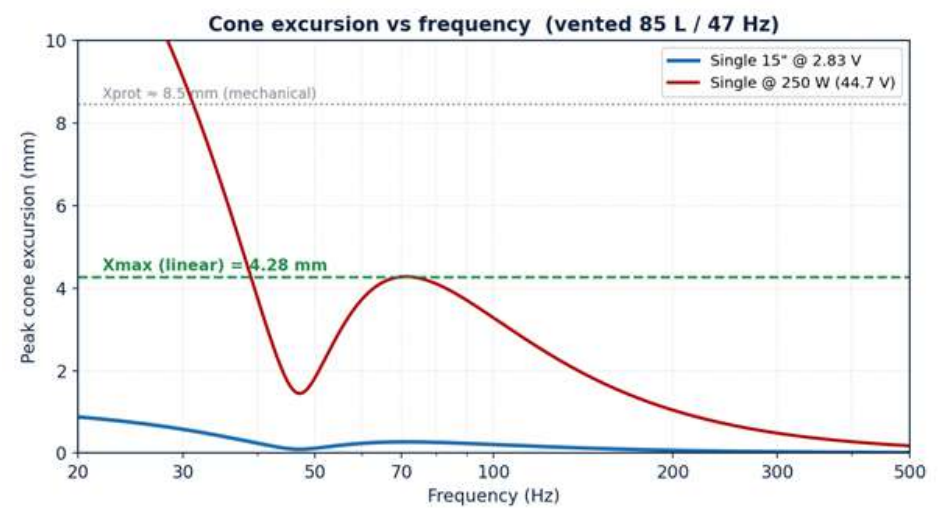


Figure 2. Cone excursion vs frequency. At 250 W the excursion just reaches Xmax near 70 Hz and rises steeply below tuning — hence the high-pass filter.

15 PT 400 MB [3.0]

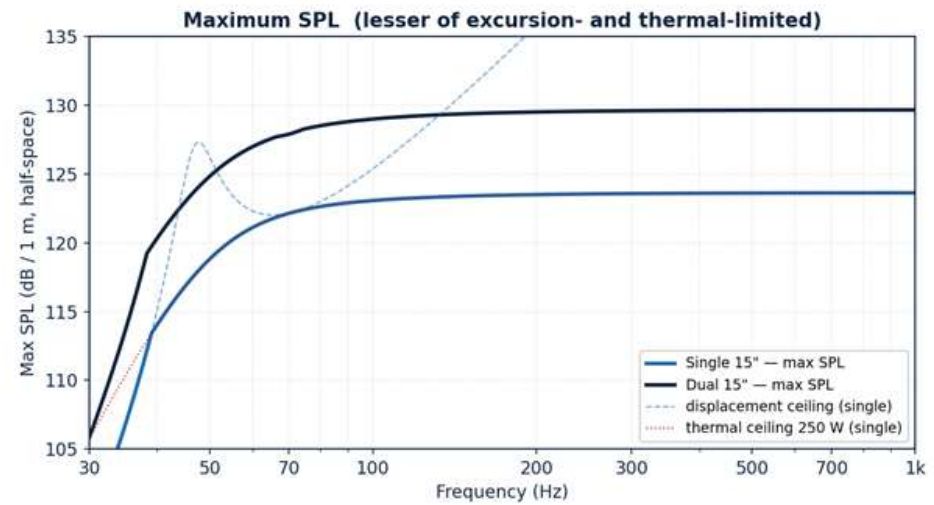


Figure 3. Maximum SPL (lesser of excursion- and thermal-limited). Single 123.5 dB, twin 129.5 dB in the passband.

6. Twin-Driver Enclosure Design

For higher output, two 15 PT 400 MB drivers share a single vented chamber in a vertical-stack bin. Mutual coupling and the doubled radiating area raise sensitivity

to ≈ 105.6 dB and lift maximum SPL to ≈ 129.5 dB in the passband, while the f_3 stays at ≈ 57 Hz. Each driver effectively works into half the net volume.

Twin-15 Vented Bin — Specification

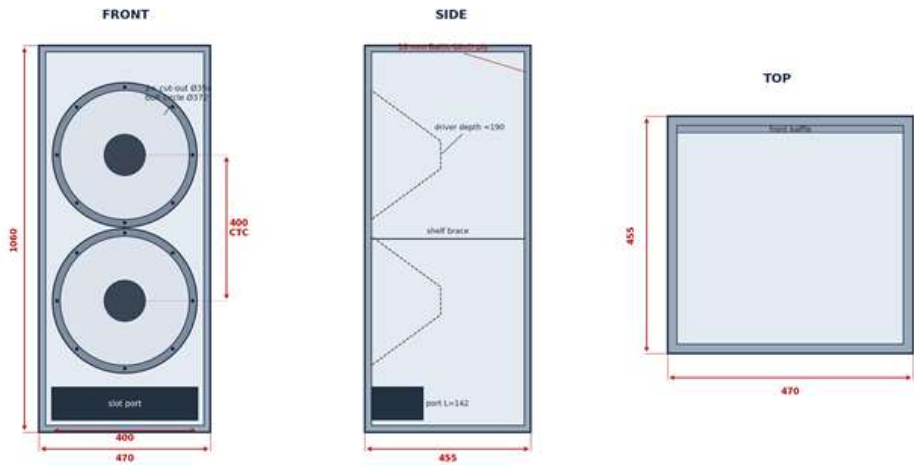
Configuration	2 × 15" vertical stack, shared vented chamber
External dimensions (W × H × D)	470 × 1060 × 455 mm
Material	18 mm Baltic-birch plywood
Net internal volume	≈ 171 L
Tuning frequency fb	≈ 46 Hz
Slot port	400 × 90 mm, ≈ 142 mm long (≈ 16 m/s)
Alternative port	4 × 100 mm round, ≈ 114 mm long
Sensitivity	≈ 105.6 dB (2.83 V / 1 m)
f3	≈ 57 Hz
Max SPL (passband)	≈ 129.5 dB
Approx. weight (shell + drivers)	≈ 42 kg
Bracing	one shelf brace between drivers; line walls with wadding

PROFESSIONAL TRANSDUCER SERIES

15 PT 400 MB [3.0]



SWETON 15 PT 400 MB [3.0] — Twin-driver vented enclosure



All dimensions in mm (external). Net volume = 171 L | Tuning fb = 46 Hz | Slot port 400 x 90 mm, 142 mm long | Material: 18 mm Baltic-birch ply
Confirm fb by impedance sweep after build; trim slot length to tune. Brace as shown; line walls with damping adding.

Figure 4. Twin-driver vented enclosure — dimensioned front / side / top views (all dimensions in mm, external).

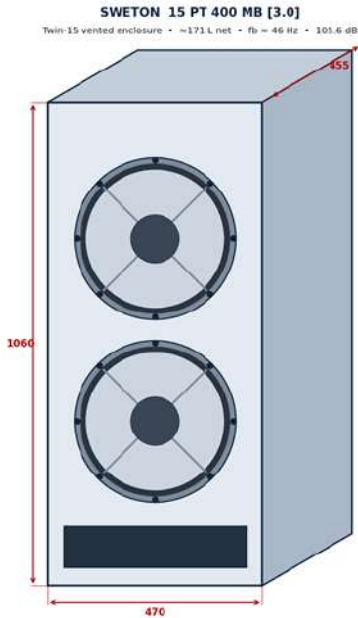


Figure 5. Isometric view of the twin-15 vented bin.

15 PT 400 MB [3.0]



7. Applications

The 15 PT 400 MB is a versatile high-output mid-bass for professional sound:

- Two-way and three-way full-range tops for live sound and touring.
- Mid / low-mid section of point-source and line-array systems.
- High-output stage monitors and side-fills.
- Installed sound — clubs, houses of worship, multipurpose halls.
- DJ and club tops where high SPL from modest power is valued.
- Instrument cabinets for bass and keyboards.

Why choose this driver

Its 100 dB sensitivity means high SPL from modest amplifier power, lowering system cost and thermal stress. The strong, symmetric BI = 20.4 N/A motor and low-asymmetry suspension keep large-signal distortion low, so the driver stays clean when pushed. A flat, controlled 100 Hz–2 kHz passband makes crossover design straightforward, and substantial thermal headroom supports sustained high-output use. With an 8 Ω nominal load it is easy to drive and combine.

8. Summary Specifications

Summary — 15 PT 400 MB [3.0]	
Nominal diameter	15 inch (395 mm)
Nominal impedance	8 Ω
Sensitivity (2.83 V / 1 m)	≈ 100 dB
Force factor BI	20.4 N/A
Free-air resonance fs	49.6 Hz
Qts / Vas	0.374 / 121 L
Linear excursion Xmax	4.28 mm
Volume displacement Vd	0.389 L (linear)
Usable band	≈ 100 Hz – 2 kHz
Recommended HPF / LPF	45–100 Hz / 1.5 kHz, 24 dB/oct
Recommended box (single)	85 L vented, fb 47 Hz, f3 57 Hz
Power handling (estimated)	≈ 400 W AES cont. / 800 W program †

SPECIFICATIONS & PARAMETERS

Specifications

Nominal Diameter	395 mm
Nominal Impedance	8 Ω
Nominal Power Handling (AES)	400 W
Program Power	800 W
Sensitivity (1W/1m)	100 dB
Frequency Range	50 - 2 KHz
Magnet Material	Ferrite
Voice Coil Diameter	76.2 mm (3 in)
Winding Material	COPPER
Former Material	GLASS FIBRE
Winding Type	OUTSIDE

Mounting Info

Overall Diameter	395 mm
Bolt Circle Diameter	373 mm
Baffle Cutout Diameter	355 mm
Depth	150 mm
Flange and Gasket Thickness	16 mm
Gross Weight	8.8 Kgs

Parameters

Resonant Frequency	Fs	50 Hz
DC Resistance	Re	5.18 Ω
Electrical Q	Qes	0.39
Mechanical Q	Qms	12.27
Total Q	Qts	0.37
Compliance Equivalent Volume	Vas	121 Ltrs
Peak Diaphragm Displacement Volume	Vd	0.39 Ltrs
Effective Surface Area of Cone	Sd	907.9 cm^2
Reference Efficiency	ηo	3.67%
Moving Mass including air load	Mms	99.37 gms
Motor Strength	Bl	20.38 T-m
Voice Coil Inductance @ 1 KHz	Le	0.62 mH
Efficiency Bandwith Product	EBP	128 Hz
Voice Coil Overhang	Xmax	±5.25 mm

Recone Kit

Recone Kit Number	REC15PT400MB
-------------------	--------------

Magnitude of Electrical Impedance $Z(f)$

