

21 PT 3000 SUB

SWETON®

CARBON FIBRE



The **SWETON 21 PT 3000 SUB CARBON FIBER** is the flagship of the range – a 21-inch subwoofer built on a carbon-fibre composite diaphragm and a $Bl \approx 43.1$ N/A motor. The result is 2.40% reference efficiency 97.0 dB at 2.83 V, the highest in the SWETON catalogue, combined with $Fs \approx 31.8$ Hz and ± 13.75 mm X_{max} for 2.34 litres of displacement per stroke. At 3000 W AES a single cabinet holds ≈ 130 dB right across the 40–100 Hz band..

How it performs:

- Qts 0.289 with EBP 109 Hz is a textbook vented-sub motor – large, tightly damped alignments come naturally.
- -3 dB at ≈ 31 Hz in a 240 L box tuned 36 Hz, and ≈ 29 Hz in a 320 L / 33.5 Hz install alignment.
- The carbon-fibre diaphragm holds its shape under 43 N/A of motor force, keeping cone break-up well above the passband and preserving transient definition.
- 2.40% reference efficiency is roughly 2 dB more output per watt than a conventional 21-inch driver – 3000 W here does the work of nearly 5000 W elsewhere.
- Excursion at full AES power peaks at ≈ 11.7 mm of ± 13.75 mm – headroom still in reserve at the rated thermal limit.

Why 8 Ω matters (vs 4 Ω):

- **Series/parallel freedom:** two 8 Ω drivers in parallel present a 4 Ω load, so one amplifier channel can drive a

dual-driver cabinet at its full rated 4 Ω power.

- **Amplifier safety margin:** at the same drive voltage an 8 Ω load draws half the current of a 4 Ω load – amps run cooler and protection circuits stay out of the way on long shows.
- **Cable-length tolerance:** lower current means lower I^2R loss and better damping over the long runs typical of ground-stacked and flown systems.
- **Higher effective damping factor:** the amplifier's output impedance is a smaller fraction of an 8 Ω load, tightening transient control on the cone.

(For maximum power per channel, wire two 8 Ω cabinets in parallel and use adequately thick speaker cable to keep damping high and heat losses low.)

Applications

- **Large-Format Touring Subs:** single-driver cabinets exceeding 130 dB, ground-stacked or flown.
- **Stadium & Festival Systems:** efficiency plus 31 Hz extension for long-throw open-air coverage.
- **High-End Club & Cinema Install:** the extended 320 L alignment runs flat into the high twenties.
- **Cardioid & End-Fire Arrays:** low Qts and high Bl give the cone damping that steered arrays depend on.

Why Choose the 21 PT 3000 SUB CARBON FIBER (8 Ω)?

1. **Highest Efficiency in the Catalogue:** 2.40% reference efficiency (97 dB, 1 W/1 m) – measurably more SPL per amplifier watt than any other SWETON driver.
2. **Carbon-Fibre Diaphragm:** stiffness-to-weight that keeps a 450 g moving assembly pistononic under extreme drive.
3. **Motor Strength Bl 43.1 N/A:** the highest force factor in the range, for grip and stop-start control on transients.
4. **2.34 L Displacement:** S_d 1698 cm² $\times$ ± 13.75 mm – the air-moving capability sub-30 Hz output actually requires.
5. **Klippel + CLIO Tested:** T/S parameters measured on a Klippel Analyzer with laser; response verified on CLIO.

Use case	Enclosure (net, after driver/port)	Tuning (Fb)	Crossover (HPF / LPF)	Suggested EQ (parametric)	Notes	DSP Protection (based on AES 3000 W, 8 Ω)
Compact Reflex (touring, truck-friendly)	180–200 L vented	38–40 Hz	HPF 32–33 Hz BW24; LPF 85–100 Hz LR24	-1 dB @ 100–120 Hz, $Q \approx 1.0$; $+1$ dB @ 45–55 Hz, $Q \approx 0.8$	-3 dB ≈ 34 Hz. Port area ≥ 700 –730 cm ² (wide slot) for <17 m/s at AES. Peak travel 11.4–11.6 mm.	DSP Protection (based on AES 3000 W, 8 Ω) • RMS Limiter Voltage: 154.9 V RMS • Peak Limiter Voltage: $\approx 1.4 \times 154.9 = 217$ V peak • Attack/Release: 10–20 ms attack, 100–150 ms release for RMS; 1–3 ms attack, 20–40 ms release for peak.
Touring Reflex (club, still portable)	220–260 L vented	35–36 Hz	HPF 30–31 Hz BW24; LPF 80–100 Hz LR24	-1 dB @ 95–115 Hz, $Q \approx 1.0$	-3 dB ≈ 31 Hz, -10 dB ≈ 25.5 Hz. Port area ≥ 800 –880 cm ² . Heavy bracing essential.	
Extended Reflex (club / cinema install)	300–340 L vented	33–34 Hz	HPF 27–28 Hz BW24; LPF 80–95 Hz LR24	-1.5 dB @ 45–60 Hz, $Q \approx 0.8$ to flatten; -1 dB @ 100–120 Hz	-3 dB ≈ 29 Hz. Port area ≥ 950 –1005 cm ² . Peak travel 12.9–13.3 mm – keep the excursion limiter active.	
Array of 4+ (coupled on ground)	220 L reflex each	36 Hz	HPF 30–31 Hz BW24; LPF 80–95 Hz LR24	No boost below 60 Hz – coupling gain covers it; keep only the 100 Hz trim	Use delay to steer/arc. Watch coupling lift below 60 Hz.	

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SPECIFICATIONS & PARAMETERS

Specifications

Nominal Diameter	545 mm
Nominal Impedance	8 Ω
Nominal Power Handling (AES)	3000 W
Program Power	6000 W
Sensitivity (1W/1m)	97 dB
Frequency Range	30-1500 Hz
Magnet Material	Ferrite
Voice Coil Diameter	152 mm
Winding Material	Copper
Former Material	Glass Fiber
Winding Type	In/Out

Mounting Info

Overall Diameter	545 mm
Bolt Circle Diameter	525 mm
Baffle Cutout Diameter	497 mm
Depth	220 mm
Flange and Gasket Thickness	18.5 mm
Gross Weight	34.75 Kgs

Parameters

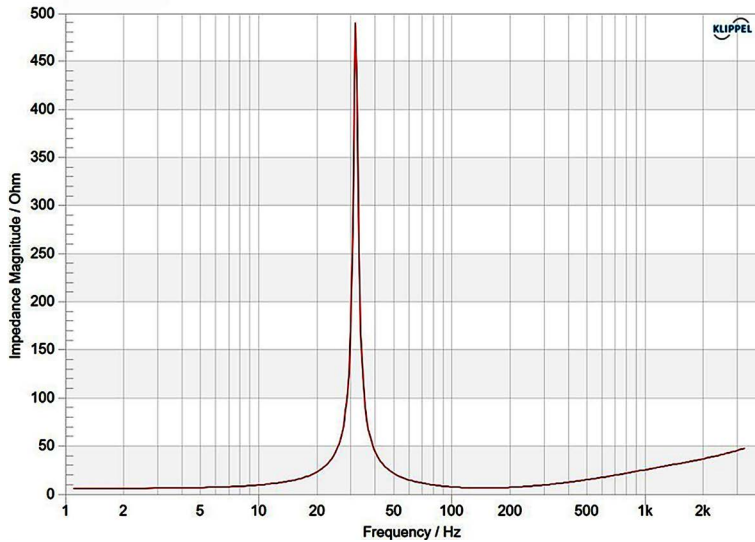
Resonant Frequency	Fs	31.8 Hz
DC Resistance	Re	6.04 Ω
Electrical Q	Qes	0.292
Mechanical Q	Qms	25.81
Total Q	Qts	0.289
Compliance Equivalent Volume	Vas	227.19 Ltrs
Peak Diaphragm Displacement Volume	Vd	2.34 Ltrs
Effective Surface Area of Cone	Sd	1698.23 cm ²
Reference Efficiency	η_0	2.40%
Moving Mass including air load	Mms	450.65 gms
Motor Strength	Bl	43.11 T-m
Voice Coil Inductance	Le	1.71 mH
Efficiency Bandwidth Product	EBP	109 Hz
Voice Coil Overhang	Xmax	± 13.75 mm

Recone Kit

Recone Kit Number	REC21PT3000SUB8E
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CARBON FIBRE

Magnitude of Electrical Impedance $Z(f)$



On-Axis Frequency Response (CLIO)

