

DX 48

DX 24

DX 12



D X - S e r i e s



The CAMCO DX-Series power amps have been designed to comply with the international industrial standard that finds worldwide application. The DX Series sets new standards in terms of power, weight, features, safety and price-performance ratio. Designed to meet the requirements of high operational efficiency, the DX Series provides both excellent sound and outstanding electrical, thermal and mechanical reliability. Each model from the DX Series includes the know-how of a company with many years of experience in the design of pro-level power amps, and therefore incorporates a complete set of unique features. Among the highlights of the DX Series are the temperature management function, the selection of operating modes, the Real Load Limiter (RLL), and the Extended User Interface (E.U.I.).



Owing to the use of CAD systems throughout the entire design process, the sophisticated chassis design providing high stability and the state-of-the-art electronics topology, the DX Series features a clear and modular structure, while the number of connecting leads has been minimized. Carefully selected high-grade components, proven fully complementary amplifier circuits with bipolar power transistors for high currents and voltages, and a two-stage power supply that provides high filtering capacity: all of these features ensure a long service life and trouble-free performance of the DX Series, even under the most adverse conditions.

Easy operation and servicing, quality manufacture in Germany and model-specific adjustment by means of complete testing and extensive quality-assurance stages including the activation of all protective circuits make the DX Series a product that is backed by full-range support and highly competent distribution partners throughout the world, which is why CAMCO warrants each model for a period of 3 years.

Temperature Management

CAMCO's experience in power amp design can be seen in numerous detailed features of the DX Series. For example, the amps continuously monitor all sections where temperature is a critical factor. The temperature management function activates the low-noise, speed-controlled fan when necessary, thus ensuring optimum operating conditions and functional reliability in all situations.





Selection Of Operating Modes

CAMCO is one of the few manufacturers who succeeded in realizing the so-called "high-current mode" (one-channel operation with high output power into small impedance loads). With good reason this feature has made CAMCO one of the worldwide leaders in this technology, and of course the DX Series has this function, too.

E.U.I. - Extended User Interface

A modular structure that allows for individual expansion and customization is an important feature of any state-of-the-art power amp. The models from the DX Series have an E.U.I. plug-in pc board mounted on the rear of the unit. The E.U.I. enables you to implement customer-specific solutions for all sorts of signal processing, such as **high-quality filters, crossover networks, adjustable limiter circuits, speaker-specific controller functions, WinCai computer control, preamplifier circuits, transformers**, and much more.

The E.U.I. allows the active operation of speaker systems, even without external crossovers and filters – a great advantage also from a financial point of view – not only in permanently installed systems. All necessary signals and voltages are routed to a "hand-shake" connector, from where they can be used for further processing. The corresponding circuitry can be installed on the E.U.I. –



With the 3-position **MODE** selector on the power amp rear set to its middle position **STEREO** (normal operating mode), you have two fully independent amplifier channels available. In this mode, the minimum load resistance should not drop below 4 ohms per channel.

BRIDGE mode offers you one-channel mono bridged operation ("**High Voltage Mode**"), i.e. both amplifier channels process the same input signal, however, with reversed phase; the speaker is connected "between" the two amplifier channels, which doubles the available output voltage. The minimum load resistance should not drop below 8 ohms. The power amp has a dedicated speaker output (SPEAKON connector) for this operating mode.

PARALLEL-MONO mode allows for one-channel parallel mono operation ("**High Current Mode**"), i.e. both amplifier channels are configured in parallel, thus increasing the available output current by the factor 2, which makes it possible to connect very low impedances down to 2 ohms. In this mode, the speaker is connected to one amplifier channel only.

both at the factory and by the user himself, whenever needed. Just slacken two screws to pull out the E.U.I. like a drawer.

The CAMCO Standard

The DX Series is a typical CAMCO product. Each DX power amp has electronically balanced inputs, male/female XLR connectors for each input channel, and switchable input sensitivity. The speaker outputs are equipped with contact-protected 4-pole SPEAKON connectors wired in compliance with international standards (bi-wiring possible), volume control is provided by VCA's. The massive, low-stray and temperature-monitored toroidal mains transformer can be set to 230 V_{ac} and 115 V_{ac}. The power switch is combined with a thermal excess-current protector switch. Other features of the DX Series include: **power-up current limiter, mains filter, a complete set of protective circuits** (responding to power-on/off transients, short circuit, DC, high temperature), which continuously monitor all crucial modules and effectively protect both amp and speakers against damage. Powerful relays make sure that the speakers can be safely separated from the amp, even under full load/DC. All models from the DX Series can be controlled with the Windows®-based audio control program **WinCai**.

Windows® is a registered trademark of Microsoft Corporation.

1)
ON/OFF

Owing to the power switch with integrated thermal excess-current protector switch, there is no need to install a mains fuse inside the unit. This eliminates costly downtime and servicing costs as well as premature failure due to corrosion, material fatigue, shock and vibration.



2)
LEVEL

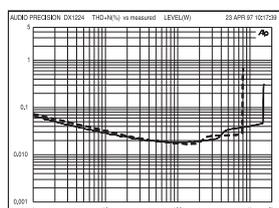
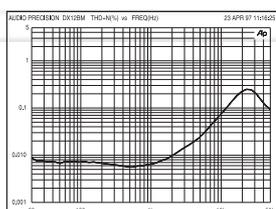
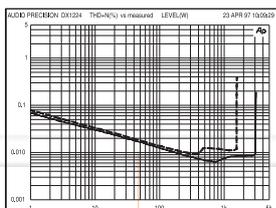
The potentiometers with 40-position scaling control the VCA voltage and are not an integral part of the signal path, which provides various advantages: the potentiometers will not produce cracking noise, and their service life is improved. All models from the DX Series are WinCal-controllable (option).

3)
ON

The ON indicator (green LED) lights up as long as everything works correctly. As soon as the speaker relay of an amplifier channel is open, i.e. if a failure such as power-on/off transients, DC or high temperature occurs, the ON LED starts flashing.

4)
SIGNAL

The SIGNAL indicator (green LED) reads any output signal that is greater than +10 dBV and which is present **before** the relay or output protectors.



5)
CLIP

The red CLIP LED is a "real" clip indicator, as it is independent both of possible voltage fluctuations in the mains and of the speaker impedance.

The LED lights up as soon as the corresponding amplifier channel overloads (with the clip limiter off) or would overload (with the clip limiter on).

6)
GROUND-LIFT

The GROUND-LIFT switch installed inside the unit is used to eliminate ground loops caused by interference voltage present in the earth conductor. This toggle-switch can be operated from outside by inserting a thin tool (maximum diameter: 2.8 mm) through two holes located on the front panel.

7)
POWER SUPPLY

All DX power amps have been designed for 230 V_{AC} 50 Hz operation, but can also be set to 115 V_{AC} 60 Hz by means of a toggle-switch located inside the unit. The 150 cm long PVC lead has a molded shockproof plug mounted on one end and features a "dual earthing contact system" according to DIN 49441 R2, which allows for proper operation in many countries.

The special toroidal transformers used in the DX Series provide higher power-up currents than conventional transformers. The inrush current limiter allows for a maximum power-up current of 8 A, thus making sure that the preceding fuses will not trigger when the power amp is switched on. It also eliminates mains voltage drops and the generation of upper harmonic waves.

CAMCO Produktion und Vertrieb GmbH E-MAIL: service@camco.de		Nr. DXB1	Modell 1-1 DX Serie
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8)
AXIAL FAN

All CAMCO DX-Series power amps feature forced ventilation: the extremely powerful, yet low-noise DC axial fan is temperature- and speed-controlled. Up to 200 cubic metres of air are sucked in per hour on the rear, then pass the transformer and power stage electronics to leave the unit through the various ventilation slots on the front panel. The infinitely variable speed control ensures low-noise operation, while the throughput of air is adapted to the actual temperature inside the unit, so as to reduce the intake of dust particles, etc.



9)
E.U.I.

The E.U.I. (Extended User Interface) is a plug-in pc board that allows for implementing a variety of customized signal-processing solutions: filters and crossovers, limiters, controllers, WinCai computer control, preamplifiers, transformers etc.

10)
INPUT CONNECTORS

The 3-pin XLR input connectors (each channel has parallel male/female connectors) are wired in compliance with IEC-268, part 12 (pin 2 = inphase). The E.U.I. plug-in board has a switch that can be used to parallel the input connectors of both channels.



11)
MODE SWITCH

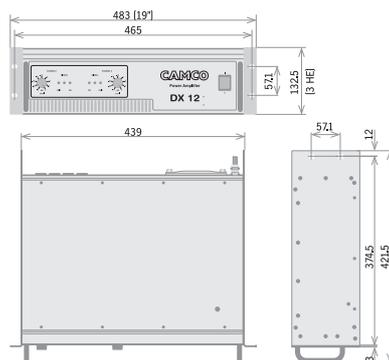
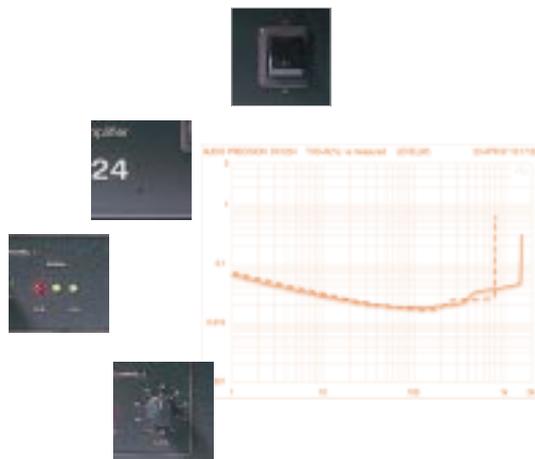
The 3-position MODE selector allows you to toggle between two-channel operation (standard setting **STEREO** for 2 separate amplifier channels) and two different single-channel modes: **BRIDGE** mode (single-channel bridged mono operation – "High Voltage Mode") and **PARALLEL-MONO** mode (single-channel parallel mono operation – "High Current Mode").

In "High Voltage Mode" the speaker is connected "between" the two amplifier channels, which increases the available **output voltage** by the factor 2. Here, the minimum load resistance should not drop below 8 ohms.

In "High Current Mode" the two amplifier channels are wired in parallel, which increases the available **output current** by the factor 2. This allows for connecting very low impedances down to 2 ohms.

12)
LIMITER SWITCH

The 2-position LIMITER selector activates/deactivates the clip limiter circuits of both channels (with the CLIP indicators working as usual). The limiter function is activated automatically as soon as the amp's maximum output voltage or output current values are reached. After a delay of about 30 msec (optimized for best acoustic results), the output signal is limited by reducing the input signal level. The output voltage curve remains "round", and distortion is reduced to go easy on the connected speakers.



13)
GAIN

For some applications it may be useful (or even necessary) to use a different gain factor from the standard 26 dB, in order to adapt the power amp to preceding equipment. For this reason, the amplifiers from the DX Series feature a 3-position GAIN selector that allows you to set the gain factor to 26 dB or 32 dB, or the input sensitivity to 1.4 V.

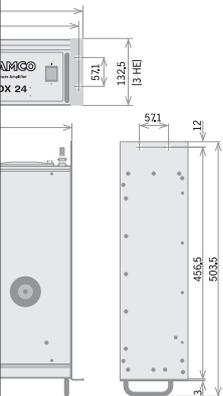
14)
OUTPUT CONNECTORS

The power amps from the DX Series have three contact-protected, 4-pole SPEAKON output connectors, which are wired differently in compliance with international specifications and standardized pin designations: each of the two outer speaker jacks carries the two amplifier outputs (so-called "bi-wiring"), which is not only practical when using controllers (just one 4-conductor speaker cable to both speakers, another cable to the controller), but also requires less installation time and fewer cables. The central SPEAKON connector serves a special purpose, as it is used exclusively for single-channel BRIDGE mode.



CAMCO's DX Series sets new standards: high-performance power amps based on the industrial standard – rugged and reliable engineering, accurate and neutral acoustic properties. Quality made in Germany on the basis of CAMCO's many years of experience as a worldwide exporting company. The DX Series meets the requirements of sound reinforcement systems. Each model has the CAMCO know-how built-in.

	DX 48			DX 24			DX 12						
Output Power (Watts)	4 Ω	8 Ω	MONO	2 Ω	4 Ω	8 Ω	2 Ω/8 Ω	4 Ω	8 Ω	2 Ω/8 Ω	4 Ω	8 Ω	MONO
Peak Power	5,300	5,600		2,650	2,800	1,550	5,360	2,680	1,440	2,460	1,230	820	
Crest Factor 1:10	5,080	4,600		2,540	2,300	1,390	3,840	2,300	1,310	2,120	1,210	750	
Sine Wave Power (1 kHz, THD+N <0.1%)	4,680	3,680		2,540*	2,300*	1,390*	2,800	1,960*	1,190*	1,420	1,060*	680*	
				2,340*	1,840*	1,160*	1,400*	960*			960	610	
				2,340*	1,840*	1,160*					710*	510*	
Circuitry	bipolar, providing two power supply voltages												
Frequency Response	20 Hz – 20 kHz ± 0.05 dB, 1 dB below maximum performance												
Input Impedance	20 kΩ balanced												
Voltage Gain	selectable: 26 dB, 32 dB, or 1.4 V input sensitivity												
Protection Circuits	inrush-current limitation, protection circuits against power-on/off transients, temperature monitoring of transformers and heat-sinks, DC protection of the outputs, load dependent output current limiter, mains switch with internal automated fuses (no fuses inside)												
Limiter	switchable peak-limiter												
Fan	temperature- and speed-controlled axial fan												
Ground-Lift	ground-lift switch on front panel (DX 24, DX 12) / on back panel (DX 48)												
Indicators	LED's for ON, SIGNAL, CLIP												
Input Connectors	3-pin XLR, male and female per channel, pin 2 = inphase												
Output Connectors	one 4-pole SPEAKON connector for each output channel (bi-amping possible), one separate 4-pole SPEAKON connector exclusively for BRIDGE mode												
Modes Of Operation	STEREO, BRIDGE and PARALLEL-MONO (DX 24, DX 12), STEREO and BRIDGE (DX 48)												
Options	Extended User Interface / E.U.I. - modules for any kind of EQ												
Power Requirements	internal selector for 115 V _{AC} or 230 V _{AC} ± 10 %												
Signal To Noise-Ratio	> -105 dB			< -101 dB			< -96 dB						
Distortion (THD + N)	< 0.05 %			< 0.05 %			< 0.05 %						
Damping Factor	> 400:1 at the outputs			> 400:1 at the outputs			> 400:1 at the outputs						
Dimensions (WxHxD)	483 x 133 x 468.5 mm (19", 3U)			483 x 133 x 468.5 mm (19", 3U)			483 x 133 x 368.5 mm (19", 3U)						
Net Weight	34 kg			27 kg			18 kg						
Shipping Dimensions (WxHxD)	640 x 560 x 260 mm (0.093 m ³)			640 x 560 x 260 mm (0.093 m ³)			550 x 510 x 260 mm (0.073 m ³)						
Shipping Weight	37 kg			29 kg			20.5 kg						
	DX 48			DX 24			DX 12						



CAMCO

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