Efficiency Series

Professional High Efficiency Power Amplifiers

SA 1600 & SA 800

Featuring

- *Excellent sonic performance;very low noise and distortion level;*
- *High speed, high current class G design for increased efficiency;*
- *Small size and weight; excellent watts/kg performance;*
- *Easy bridge mode connection;*
- *Useful peak power: 2 x 1,100 W (SA 1600) 2 x 550 W (SA 800) into 2 Ω ;*
- *Almost indestructible housing.*

stage accompany

The SA 1600 and SA 800 amplifiers represent the latest in professional power amplifier technology. Fool proof design makes these amplifiers reliable companions in any application.

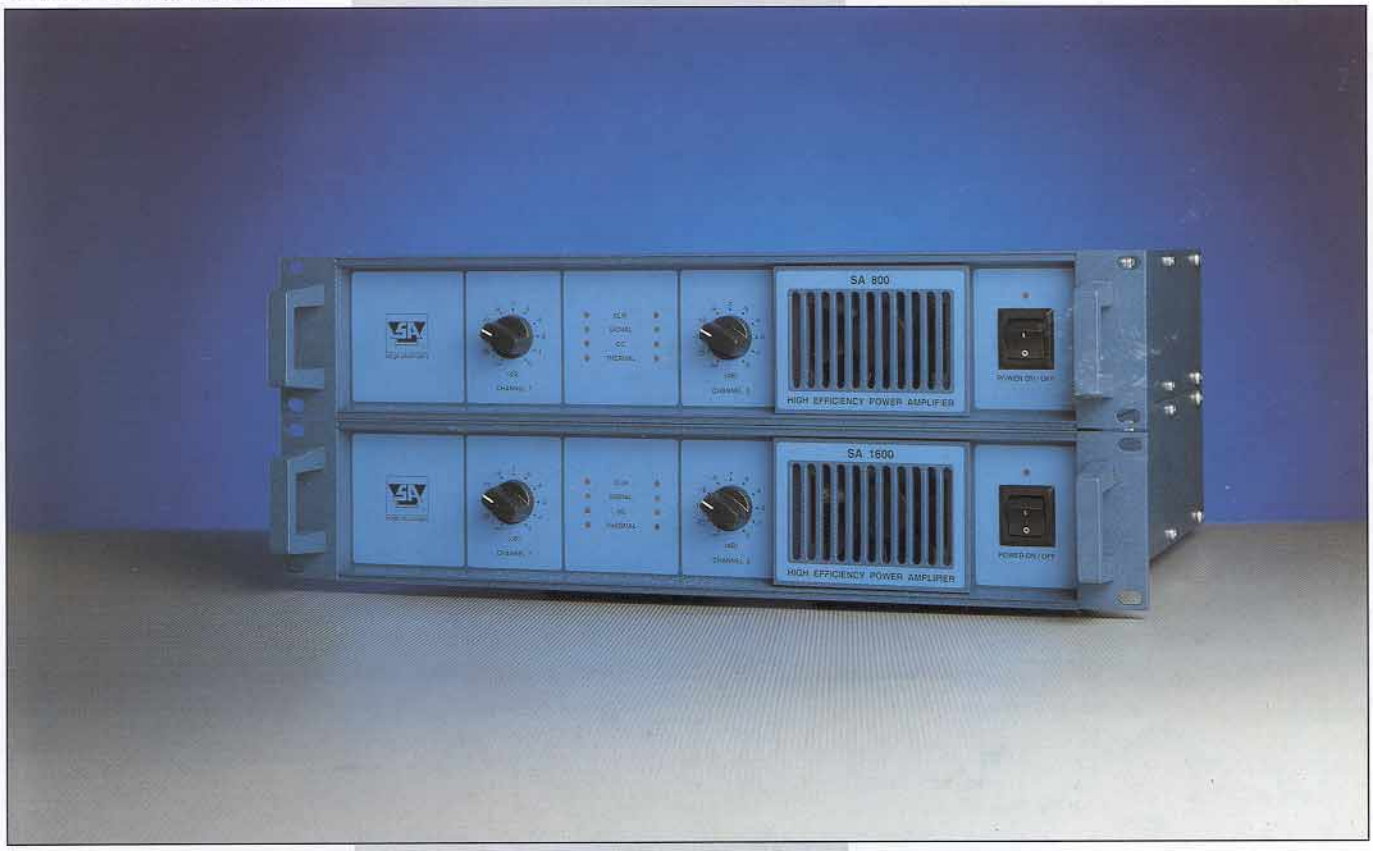
"The SA 1600 & SA 800 are Our Answer to Your (Powerful) Demands!"

Our efforts to improve our SA 900 & SA 500 amplifiers have resulted in a completely new design which will fulfil many of your professional demands.

Development began with in-depth interviews to determine what heavy users looked for in a professional amplifier. Reliability and mechanical integrity came top of the list, closely followed by an optimum power output to match modern LF and HF transducers.

Further common demands were low weight, 2 HU height and, of course, an attractive price/performance relationship.

By all these criteria, the SA 1600 & SA 800 are outstanding professional amplifiers with many additional features for a broad range of applications.



Optimum Output Power

For most quality LF drivers currently available, including the SA models, an RMS power of 150 - 300 W is the thermal limit. For short periods of 200 ms, this may even be 600 - 1000 W (thermal considerations only).

However, amplifiers rated at these powers into 8 Ω are rarely present on the market due to the limited maximum excursion and mechanical strength of most drivers.

Therefore optimum amplifier (peak) power into 8 Ω should be matched to the mechanical capabilities of LF drivers at low frequencies; it is set at 440 W peak into 8 Ω (320 W RMS) for the SA 1600. With normal music program material, which often has a crest factor of 10 dB, this is well within the safe thermal and mechanical drive area of most professional loudspeaker systems (a crest factor of 10 dB means a one to ten ratio of RMS to peak levels).

Remember, most speakers are destroyed by overdriven, under powered amplifiers working at levels beyond their clipping point. Such use raises the RMS to peak ratio and at the same time limits the cone excursion, resulting in overheated or burned out voice coils.

Making a "big power" amp is one thing; getting large amounts of power into the loudspeaker is another, often overlooked problem. All Stage Accompany amplifiers are equipped with the new Speakon connectors from Neutrik. With their silver plated contacts, these connectors easily handle continuous currents of 30 A, while the non-metal housing ensures maximum protection against high speaker voltages.

For ease of operation, five ergonomically spaced Speakons are mounted, one specifically for bridge mode operation. Use of Stage Accompany speaker cables (or your own made to our specification as printed in the user manual) ensures fast, trouble-free operation, even in stressed working environments.

Highly Efficient Circuitry

By using two supply rails at the final output stage, we have drastically reduced the internal power dissipation of the amplifier. This means more watts per kilogram.

The carefully chosen voltages ensure maximum power availability for musical bursts.

The SA 1600 and SA 800 amplifiers are both equipped with five speakon connectors for ultimate safety and the best possible signal transmission. The separate bridge mode connector prevents faulty connections.

For those situations where really massive power into 8 Ω or 4 Ω is needed, the SA 1600 is equipped with a bridge mode toggle switch. Under music or speech conditions this increases power to 1600 W peak into 8 Ω and 2,200 W into 4 Ω. Some speakers on the market are able to withstand this power due to the aforementioned high crest factor of most music. With appropriate processors this will result in a headroom of about 10 dB.

The SA 800 amplifier is designed for less power demanding applications, such as keyboards, small clubs and, of course, the top end of a PA system. Rated at about 100 W RMS, most smaller reinforcement systems and HF drivers will combine well with the 210 W RMS of the SA 800 into 8 Ω, giving you another 3 dB of clean headroom.

For those situations where more power into 8 Ω or 4 Ω is needed, the SA 800 is equipped with a bridge mode toggle switch. Under music or speech conditions this increases power to 800 W peak into 8 Ω and 1100 W into 4 Ω. With appropriate processors this will result in a headroom of about 7 dB.

Nowadays there is a lot of talk about dropping speaker impedance under certain drive conditions. The SA 1600 & SA 800 will drive complex impedances as low as 2 Ω without problems. This means that for those very critical applications such as studio control rooms you will have an enormous current headroom with most available 8 Ω or 4 Ω monitors, including the SA Master Series studio monitors.

A full complement of protection circuitry is provided to prevent damage to the amplifier and the speaker system. Both channels have the following LED indicators:

"Signal" These LEDs light up when input levels exceed - 40 dB under the level that produces maximum power (+ 6 dBu). The input attenuators do not affect this mechanism.

"Thermal" These LEDs light up when the output devices or the transformer reach their maximum operating temperature of 85 °C. The channel will be muted until thermal overload has disappeared. Both channels react independently to thermal faults.

"DC" The Direct Current LEDs will operate in the event of DC being detected at the output terminals, and for approximately one second after switching on in order to allow time for stabilization of the circuitry. During this state, the amplifiers are disconnected from the output terminals.

"Clip" These LEDs indicate that the amplifier has reached its maximum output level. When the Clip LEDs flash repeatedly distortion is to be expected.

In the case of exceptionally low load impedances (e.g. short circuited speaker cables), current limiter circuitry protects the output devices.

If two outputs are accidentally interconnected no damage will occur. The amplifier will run into thermal overload and then mute the input signal. Even the fan is protected against obstruction.

Variable Speed Cooling Fan

The fan speed increases with a rise in output transistor temperature. This feature results in less dust in the inside of the amplifier (hence increased reliability) and less audible noise from the fan.

Especially under 8 Ω load conditions, there will be minimal fan noise due to low fan speed. This is advantageous in theaters, studios and other environments where background noise levels should be as low as possible.

21-Detent Input Attenuators

Independent 21- position detented input attenuators, calibrated in dBs, make level matching and balancing easy. The sensitivity in the 0 dB position is + 6 dBu for 49 V output voltage (SA 1600; 300 W into 8 Ω).

Balanced inputs

The standard balanced inputs provide full compatibility with other professional sound equipment and will, of course, also accept unbalanced signals. For linking purposes, extra signal outputs are provided. Using the SA 1600 in conjunction with third party equipment, such as the PPE 2410 parametric equaliser, up to 30 amplifiers can be interconnected without signal loss.

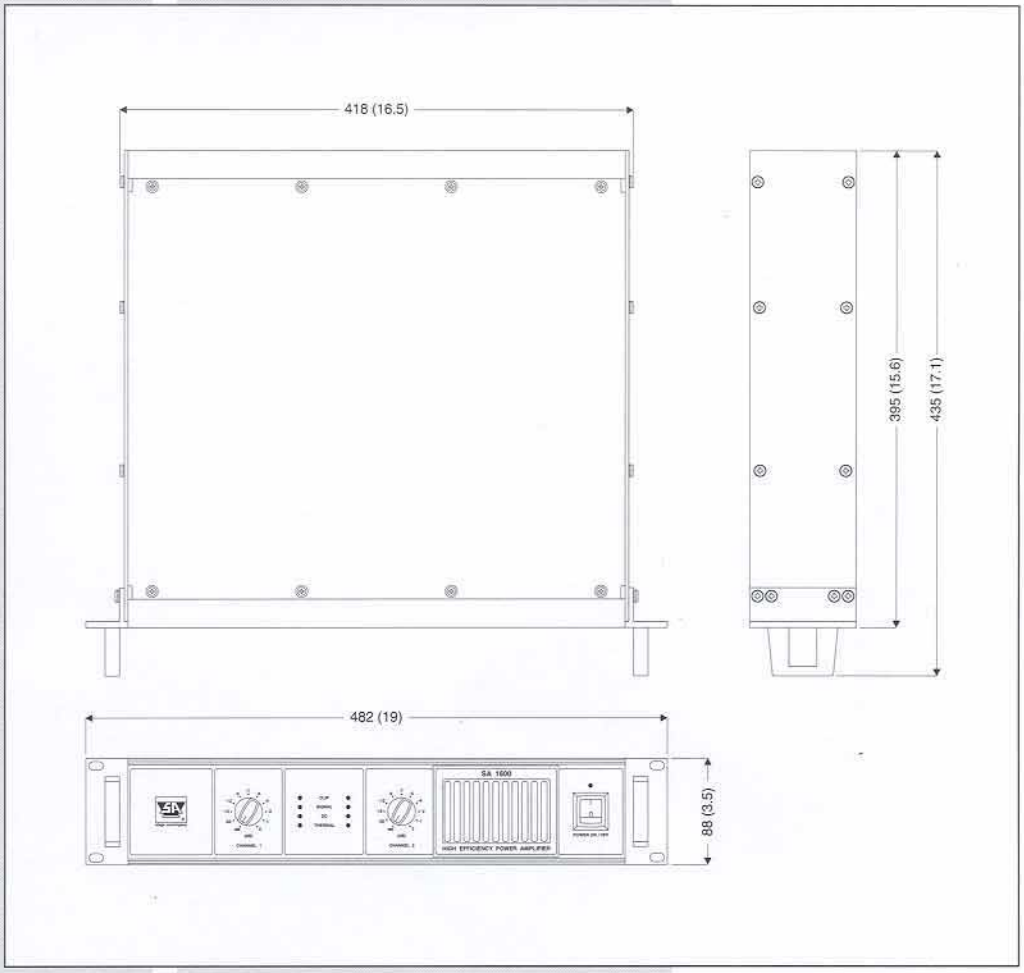
DDC

The DDC circuitry (Dynamic Damping Control) ensures a virtually infinite amplifier damping factor at the speaker terminals; speaker cable and connector resistances no longer affect this amplifier property. All Stage Accompany loudspeaker cabinets that are prewired for active use have a full, four wiring ending at the speaker terminals. Two wires are used to sense the voltage at the speaker terminals and the DDC circuitry compensates for differences from the original output voltage. Even the connector in the cabinet will be corrected. Another advantage of this circuitry is that it makes excessively thick speaker cables redundant, thereby substantially reducing cable costs.

Many manufacturers proudly present damping factors of, say, 250 with 8 Ω loads.

A normal, new, 10 m cable of 2.5 mm^2 with good new connectors will reduce the damping factor to a mere 25 - 50 in practical situations.

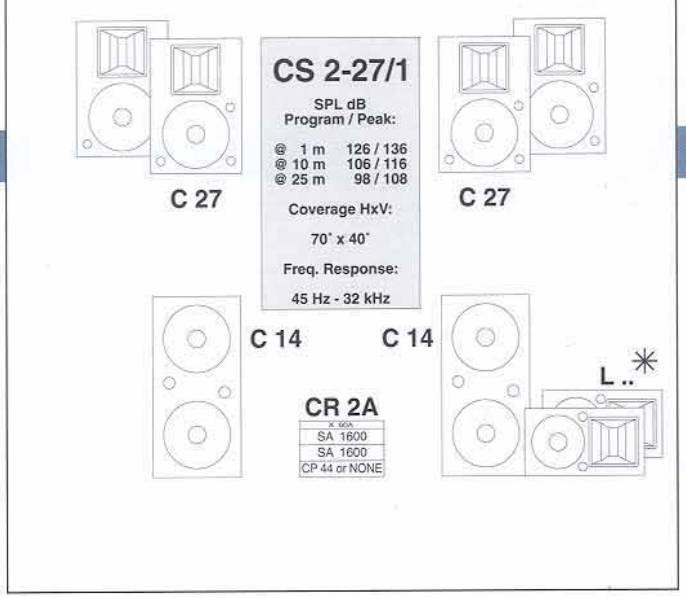
Only Stage Accompany, however, gives you full amplifier damping at your loudspeaker terminals (2500 @ 1 kHz), even with cable lengths exceeding 50 m.



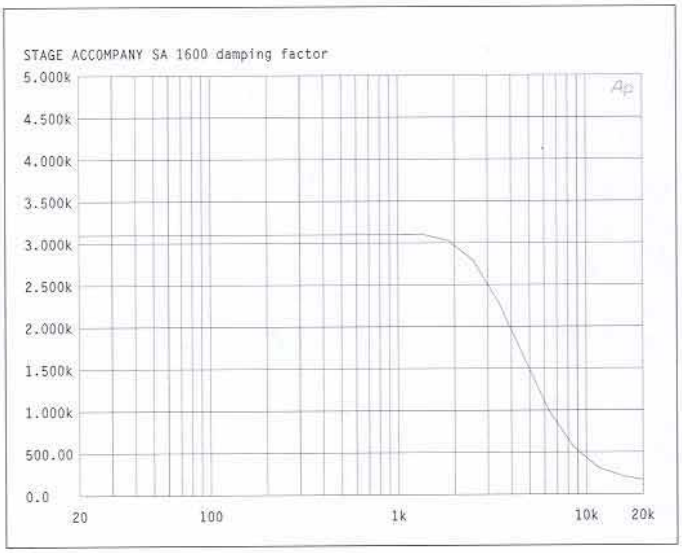
Physical dimensions of the SA 1600 and SA 800 amplifiers in mm (in).

Soft Start

The soft start circuit is active when the SA 1600 & SA 800 amplifiers are switched on, and also in the event of sudden mains interruption. By means of this soft start circuit the inrush current is limited to 25 A.



An application with the SA 1600 in the CS 2-27/1 system.



The Damping factor of the SA 1600 as a function of frequency. Starting at over 3,000 the value reduces to a still impressive 1,500 at 5 kHz.

Input Stage

Input sensitivity:	+ 6dBu, for full continuous output into 4 Ω (reference: 0 dBu = 0.775 V)
Maximum input level:	+ 20 dBu
Input impedance:	20 kΩ each leg (30 kΩ unbalanced)
CMRR:	> 75 dB @ 20 Hz - 20 kHz
Frequency range:	10 Hz - 20 kHz, + 0 / - 0.3 dB @ 150 W into 8 Ω 10 Hz - 70 kHz, + 0 / - 3 dB @ 150 W into 8 Ω
Gain:	32 x : 30 dB [20 x : 26 dB]
Channel separation:	> 70 dB @ 1 kHz, 150 W into 8 Ω > 50 dB @ 20 kHz, 150 W into 8 Ω
Total Harmonic Distortion (THD):	< 0.2 % @ 20 Hz - 20 kHz more than 2 Ω load at all powers, 10 % below clip level < 0.02 %@ 1 kHz, 200 [100] W into 8 Ω < 0.05 % @ 20 kHz, 200 [100] W into 8 Ω < 0.01 % @ 1 kHz, 1 W into 8 Ω
Intermodulation distortion (IMD):	< 0.05 % @ 200 Hz - 20 kHz, f_1 = 70 Hz, 4:1, 200 [100] W into 8 Ω.
Signal to noise ratio:	> 110 dB

Output Stage

Slew rate:	> 40 V/µs
Damping factor (with DDC):	2,500 @ 1 kHz (10 V across 8 Ω)
Output power (RMS):	2 x 320 [160] W into 8 Ω 2 x 520 [230] W into 4 Ω 2 x 610 [300] W into 2 Ω
Peak output power:	2 x 440 [220] W into 8 Ω 2 x 800 [400] W into 4 Ω 2 x 1,100 [550] W into 2 Ω
Output power bridge mode (RMS):	1 x 640 [320] W into 16 Ω 1 x 900 [460] W into 8 Ω 1 x 1,200 [600] W into 4 Ω
Peak output power bridge mode:	1 x 880 [440] W into 16 Ω 1 x 1,600 [800] W into 8 Ω 1 x 2,200 [1,100] W into 4 Ω

General

Mains supply voltage:	stated at rear of amplifier
Continuous power consumption:	100 VA (standby) 2,200 [1,100] VA (at maximum continuous output)
Weight:	18.2 [15] kg (41 [33] lb)
Housing:	19 in rack mount 2 HU, 18 in deep (without connectors)
Dimensions:	88 x 482 x 462 mm (h x w x d) (3.5 x 19 x 18.2 in) (without connectors

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