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Subject: Leben CS600X - Class AB or pure class A?  
Posted by [kasperbergholt](#) on Wed, 22 Feb 2023 13:23:22 GMT  
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Hi clever people,

I'm in the process of reading a review of a Leben CS600X integrated amplifier.

In one passage it says:

"The amp runs in Class AB rather than pure Class A. During use, it gets fairly warm but not uncomfortably hot"

Is that so? I was of the impression that all of Leben's tube amplifiers ran in pure class A.

The full review can be read here:  
[Leben CS600X Integrated Valve Amp Review on Stereonet.com](#)  
Thanks in advance,

Kasper Bergholt  
/ <https://bergholt.net/blog>

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Subject: Re: Leben CS600X - Class AB or pure class A?  
Posted by [positron](#) on Sun, 26 Feb 2023 06:19:28 GMT  
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Hi Kasper,

It won't put out 28 watts in Class A operation. AB1 is another matter as AB is much more efficient.

At much lower output power, both output tubes will operate Class A.

Cheers

pos

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Subject: Re: Leben CS600X - Class AB or pure class A?  
Posted by [kasperbergholt](#) on Wed, 01 Mar 2023 12:28:24 GMT  
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Thank you very much for the reply, pos :)

Would it be safe to say that class a operation is up to the output tubes max rating, which would be around 8 watts for EL84 tubes?

Thanks again,

Kasper

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Subject: Re: Leben CS600X - Class AB or pure class A?

Posted by [positron](#) on Thu, 02 Mar 2023 00:35:56 GMT

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kasperbergholt wrote on Wed, 01 March 2023 06:28 Thank you very much for the reply, pos :)

Would it be safe to say that class a operation is up to the output tubes max rating, which would be around 8 watts for EL84 tubes?

Thanks again,

Kasper

Good question. Mullard's manual says probably true for PP, maybe higher at max tube plate dissipation. About 5 watts output in PP triode mode.

In single ended pentode mode, about 5 watts output. In triode mode, about 2.5 watts out at max plate dissipation.

Hope this helps Kasper.

pos

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Subject: Re: Leben CS600X - Class AB or pure class A?

Posted by [kasperbergholt](#) on Sat, 18 Mar 2023 22:47:06 GMT

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positron wrote on Wed, 01 March 2023 18:35 kasperbergholt wrote on Wed, 01 March 2023 06:28 Thank you very much for the reply, pos :)

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Kasper

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Hope this helps Kasper.

pos

Yes, it does, thanks!

I ended up getting the prior model, the Leben CS-600 (no 'x'). It's stunning.

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Subject: Re: Leben CS600X - Class AB or pure class A?

Posted by [positron](#) on Fri, 24 Mar 2023 01:49:11 GMT

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kasperbergholt wrote on Sat, 18 March 2023 17:47positron wrote on Wed, 01 March 2023 18:35kasperbergholt wrote on Wed, 01 March 2023 06:28Thank you very much for the reply, pos :)

Would it be safe to say that class a operation is up to the output tubes max rating, which would be around 8 watts for EL84 tubes?

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In single ended pentode mode, about 5 watts output. In triode mode, about 2.5 watts out at max plate dissipation.

Hope this helps Kasper.

pos

Yes, it does, thanks!

I ended up getting the prior model, the Leben CS-600 (no 'x'). It's stunning.

Glad it worked out well for you Kasper. It is possible to obtain near perfect, if not perfect reproduction quality from a PP AB1 amplifier using non inductive speakers. With cone/reactive type speakers, one can tailor for near perfect quality sound, although somewhat time consuming.

All the best.

pos

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Subject: Re: Leben CS600X - Class AB or pure class A?

Posted by [gofar99](#) on Sat, 25 Mar 2023 02:56:18 GMT

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Hi, just FYI...in class A push pull a pair of EL84s at 225-275 V B+ will deliver about 5 watts in Ultra linear mode and about 6.5 watts in pentode mode. Triode mode is just about 4 watts. All at less than around 1% THD+N without negative feed back. Also FYI all my designs for amps (4 watts to 40 watts) are a forced class A U/L mode. Inefficient for sure, but really nice sound. Well designed class AB amps can sound really nice as well, but I have seen none without negative feedback that do so. IMO NFB alters the sound...in hard to define ways and is a cause for considerable consternation in the audio field. Lots of arguments on it. A SE amp can work either way...but then they are all class A.

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Subject: Re: Leben CS600X - Class AB or pure class A?

Posted by [kasperbergholt](#) on Tue, 28 Mar 2023 15:48:12 GMT

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[gofar99](#) wrote on Fri, 24 March 2023 21:56Hi, just FYI...in class A push pull a pair of EL84s at 225-275 V B+ will deliver about 5 watts in Ultra linear mode and about 6.5 watts in pentode mode. Triode mode is just about 4 watts. All at less than around 1% THD+N without negative feed back. Also FYI all my designs for amps (4 watts to 40 watts) are a forced class A U/L mode. Inefficient for sure, but really nice sound. Well designed class AB amps can sound really nice as well, but I have seen none without negative feedback that do so. IMO NFB alters the sound...in hard to define ways and is a cause for considerable consternation in the audio field. Lots of arguments on it. A SE amp can work either way...but then they are all class A.  
Thank you for the explanations.

My previous amplifier was an Audio Note P2SE (single ended-typology) and zero negative feedback.

The tonality is very close to the Leben's, I think, but the Leben has got 'more punch'; that said, I know it's very difficult to do sequential listening comparisons without being able to swithc between to.

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Subject: Re: Leben CS600X - Class AB or pure class A?

Posted by [positron](#) on Wed, 29 Mar 2023 16:43:16 GMT

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gofar99 wrote on Fri, 24 March 2023 21:56Hi, .....

Well designed class AB amps can sound really nice as well, but I have seen none without negative feedback that do so. IMO NFB alters the sound...in hard to define ways and is a cause for considerable consternation in the audio field. Lots of arguments on it. A SE amp can work either way...but then they are all class A.

I know what you mean. I have heard enough PP AB1 amps over the decades, that very very few are truly accurate/natural.

That is why I have designed my own monoblock PP AB1 amps, in triode mode, No global negative feedback. Took some 30 years R&D, but found them to be superior to SETs (with their inherent problems), and nearly perfect via specialized listening tests.

(I am tempted to say perfect, that close.)

It can be quite superior. Sorry if I sound argumentative, don't mean to be.

pos

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