

darTZeel NHB-458 monoblock amplifier



The NHB-458 truly sets new audio standards.

After nine years of intensive research and development, the NHB-458 does bring all sonic virtues the now worldwide acclaimed NHB-108 brought to the audio world almost a decade ago.

darTZeel pushed the envelope even further.

The NHB-458 is just outstanding in every aspect.



NHB-458 key features:

1. Audio section:

The audio circuit is quite a revolutionary design, just in between the grace of the NHB-108 and the power of the CTH-8550, yet with even more transparency and power than all previously designed darTZeel amplifiers.

Virtually limitless powerful, incredibly dynamic and fast yet with ultimate delicacy, this is exactly what the NHB-458 is.

RMS output power:

- 450 watts (RMS sustained mode) under 8-ohm loads, and above 700 watts under dynamic, music condition.
- 800 watts (RMS sustained mode) under 4-ohm loads, with more than 1'300 watts under dynamic, music condition.
- 1000 watts (RMS sustained mode) under 2-ohm loads, software limited keeping the low number of output devices within safe operating area, but with much higher peak power capability under most demanded dynamic, music conditions, depending of the nature of the signal.

This entirely new audio circuitry perpetuates darTZeel philosophy:

- No any contact, switch, either any relay or whatsoever in the signal path (save for the XLR input, where we use a very high quality inert gas filled relay).
- No any negative feedback in the input stage.
- No any negative feedback, or compensation network, Zobel or whatsoever, in the output stage. The output stage is a true open loop stage, just like in the NHB-108.
- No any global negative feedback.

The major and critical changes in the audio circuit are:

- Only *Three* (3) analog, discrete junctions (transistors) in the entire signal path per polarity, instead of 6 in the NHB-108. While it seemed quite impossible to simplify the NHB-108 further, nine additional years of research and development allowed us to go beyond all expectations. This new circuit is even faster, more transparent and more dynamic than the NHB-108. In terms of measured distortion, figures are similar to the NHB-108. THD is kept well below the 1% audible threshold (in musical program, see our white paper about this from our web site), while the most critical temporal distortion is completely absent from the equation.
- The small, local symmetric negative feedback is made through our "SCNP darTZeel network" which ensures lowest DC output drift possible yet retaining all virtues of a true DC coupled local negative feedback.
- XLR input is active balanced instead of using a transformer coupling. We found that this kind of input is more convenient in general use, and provides some better frequency response at spectrum extremes.
- The main audio power transformer is a huge 2 kVA toroidal, with sustained dynamic power of more than 4 kVA.
- The auxiliary power supply needed for monitoring circuits and fluorescent display is given by another smaller power transformer, located at 90 degrees angle from the main audio power transformer, thus eliminating any possible magnetic coupling between analog and digital circuits.
- For the first time in darTZeel history, the main AC fuse has been replaced by a sophisticated thermal breaker, located on the rear panel. Not only this thermal breaker is easy to re-active by simply pushing the button-key, it also allows for much better electrical contact, a mandatory thing here considering the huge current peaks involved.
- The above thermal breaker will NOT allow the user to set his machine for another operating voltage than defined at factory. Anyway the internal supplies allow for such a change, which could be only done in an authorized customer service location.

2. Monitoring circuit, fluorescent display and others:

With the NHB-458, darTZeel does confirm and consolidate the new technology corner taken these last two years.

The fluorescent display will allow the user to set all parameters such as nominal input gain (26/32 dB), the type of input (RCA/Zeel/XLR), and will also be used for activating the machine via the rear panel USB port, exactly as with the CTH-8550.

Some more features:

The internal monitoring circuit is the most advanced one we ever implemented into our audio equipment. Every single output device is monitored as follows:

- Actual RMS power dissipated in real time
- Actual Peak power dissipated in real time
- Actual Peak temperature increase in real time
- Actual Average temperature increase in real time

These very sophisticated measurements performed in real time allow us to minimize the number of parallel output devices used for the output stage.

In the NHB-108, with only one output pair, we could bring out 200wpc under 4 ohms, true breakings score at the time.

In the NHB-458, with in excess of 800 watts under 4-ohm loads, say 4 times the power, we naturally kept the output devices' number no bigger than 4 pairs. These four output device pairs are located very close each together, and are fed with a special hybrid copper trace array we called "Star Common Rail", allowing both for balancing currents and propagation times in all devices, ensuring a non-blurred sound.

The extremely sophisticated monitoring circuit described above also permitted not using a crowbar circuit in case of catastrophic failure or unwanted event.

In the earlier NHB-108, the crowbar circuit was at the time the only way to protect the machine – and the speakers – in case of failure or even if too much DC would be present.

As we now completely control in real time every parameter, the embarked NHB-458 software is able to anticipate any possible failure, and will simply shut down the main power supply before the speaker coil will hazardously warm up.

Furthermore, as no any fuse is implemented but a thermal breaker instead, it will always be very simple "resetting" the machine to operational condition.

Anyway, as it was the case in the NHB-108, no *any* current limitation is implemented in the audio circuit by itself, everything being monitored externally. So the maximum permitted peak output current – and power – is simply huge.

3. Mechanical housing:

The darTZeel NHB-458 monoblock amplifier, considering its level of performance, sophistication and of course listening pleasure, could not stand in a less than gorgeous dressing, new aluminum alloy standard was especially created for this exceptional machines. But as it was not enough for our tastes, we added the following touches:

- The front plate is 30 mm thick (twice the thickness of other NHB-series), with a tilted CNC machined inner plane which will accommodate the fluorescent display. All other parts are fitted inside CNC machined slots, in order to give the feeling that each part is "inserted in" or "in fusion with" the other ones.
- The rear panel is made of four 85 mm thick aluminum ingots, completely CNC machined as a tunnel, incorporating the custom machined heat sink.
- Heat sink is machined by custom made tooling, the only technique permitting the realization of the extremely complex rounded fins shapes.
- Transformers platform is suspended on 3D elastic double rubber suspensions, spread around the gravity center of the transformers, and resonance frequency tuned to absorb all mechanical hum and vibration between 40-70 Hertz. The total suspended mass being more than 25 kilos, realizing it was quite a challenge in terms of compactness and efficiency.
- Special feet have been designed to give the NHB-458 a very personal touch. These huge feet are all machined from an aluminum billet of more than two kilos each, and are nicely round shaped in all directions. Spikes provision has been added for those who want to prefer this kind of setup.
- Every single mechanical part is machined and finished on all its sides, with an unprecedented quality and work of art.
- Two lateral glasses with sanded logo complete the finish of the NHB-458, allowing the user to proudly look at the inside of the machine.
- As it is the case for all NHB series components, we use special precision cogging pins in order to perfectly align each part together, exactly like in very high end Swiss watches.



As you can read, the darTZeel NHB-458 monoblock amplifier truly is an exceptional piece of engineering, end to end.

The time required for machining and finishing all aluminum parts is more than 150 hours, then taking all of our love and passion assembling them.

Only the few lucky owners will fully and truly understand, feel, experiment and listen to what the NHB-458 really is.



