



Professional Division

## SM6 line technical details

### BASH® amplifier

*The multi-channel audio systems has considerably influenced the common quality and performances criteria of woofers and subwoofers. The energy stored up in a frequency range spreading from 20 to 120Hz is so high that it requires the use of new technical means. The high efficiency digital amplification named BASH® is the real answer to these requirements.*

Focal-JMLab uses the BASH® amplification technology, a patented invention of the society Indigo, under licence. This technology ensures an outstanding energy efficiency, allowing a very high output power, without being damaged by heat losses. This technology is presented as an hybrid high-end system which combines both the advantages of the D class and the AB class, the former renown for its high energy efficiency and the latter reckoned to be more musical.

#### AB class

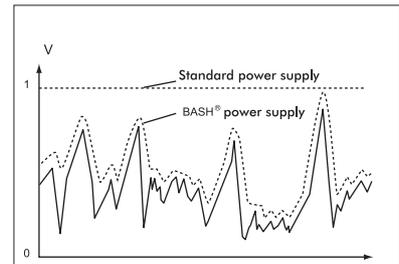
The AB class analog amplification technology, well-known until then for its good qualities, is widely used. Actually it has an energy efficiency of about 65% and considerable acoustical performances. However, when used with a music program signal, the typical efficiency appears to be seriously affected and is reduced to a smaller level, between 10 and 30%, according to the type of music you want to reproduce. In order to reproduce low and mid frequencies as faithfully as possible, a high amplification power is inevitably required. AB amplification technology is then rapidly pushed to its limit. With regard to its weight, price and size, the AB class amplifier is then not suitable anymore.

#### D class

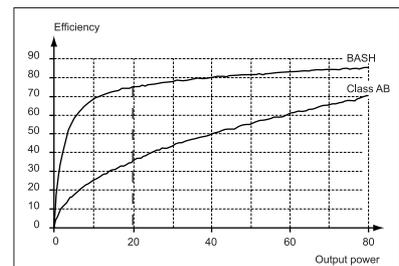
The D class turns out to be the first solution to tackle this problem. This so-called digital amplification technology uses a high frequency PWM system which allows the transistors to deliver their best performances. This process defines variable bandwidths directly proportional to the power and frequency of the output signal. Thanks to this technology, the energy efficiency increases considerably and gets up to 90% at continuous peak power and 60% with a music program signal! Although there is one important restriction: the sound quality proves to be too poor, since it is deteriorated by intermodulation distortions and ringing effects.

#### BASH®

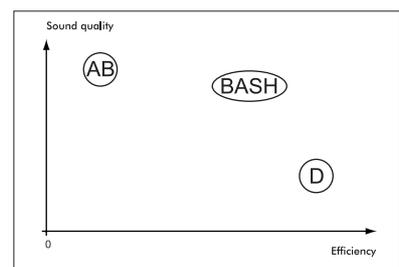
The BASH® technology we decided on for the production of the SM6 line is a pertinent implementation of the previously mentioned amplification methods, making the most of both the AB class and D class amplification technologies. Actually, the small energy efficiency of the AB class strongly depends upon the fact that the supply voltage of the amplifier remains stable. Losses are only the result of the multiplication of input voltage by different leaking currents. The key idea of the BASH® technology is based on a continually variable supply voltage which tends to zero when there is no input signal and reaches its highest level when the amplification power requires. As this supply voltage is continually variable but always lower than that of an AB class amplifier, there is necessarily less losses. To meet these requirements, the amplification device benefits from a AB class structure while the variable power supply uses a high speed D class unit in order to constantly supply the amplifier with the appropriate power. This new structure allows the amplifier to keep the advantages of the AB class in terms of sound rendition while reaching the energy efficiency level of the D class which gets up here to 85% and between 50 and 60% with a music program signal. The losses reduction offers here another advantage: it allows to conceive very compact but powerful amplifier units since there is less calories to dissipate.



The AB class amplification technology uses a stable supply voltage. Losses are directly proportional to this high supply voltage. The BASH® technology uses a "by request" fluctuating supply voltage. As the power input of the amplifier is seldom implicated, this voltage remains quite low on average or even very low at low level.



The energy efficiency of an amplifier is usually about 65% but only at its nominal power. On a 75W RMS device, the efficiency drops to 35% for a 20W output power. Comparatively, the BASH® system reaches its maximum energy efficiency of 85% from 20 Watts on.



Bash® Technology Amplifier have sound quality of AB class and efficiency of D class.