# FRIGHTPROPS

# TRAIN BLASTERS
## IMPORTANT INFORMATION REGARDING HEARING LOSS



**WARNING: This device produces extremely high decibel output!**

**Staff must wear hearing protection when working near this device. Prolonged exposure will cause hearing damage!**

### Noise-Induced Hearing Loss (NIHL)

Of the roughly 40 million Americans suffering from hearing loss, 10 million can be attributed to noise-induced hearing loss (NIHL). NIHL can be caused by a one-time exposure to loud sound as well as by repeated exposure to sounds at various loudness levels over an extended period of time. Damage happens to the microscopic hair cells found inside the cochlea. These cells respond to mechanical sound vibrations by sending an electrical signal to the auditory nerve. Different groups of hair cells are responsible for different frequencies (rate of vibrations). The healthy human ear can hear frequencies ranging from 20Hz to 20,000 Hz. Over time, the hair cell's hair-like stereocilia may get damaged or broken. If enough of them are damaged, hearing loss results. The high frequency area of the cochlea is often damaged by loud sound.

Sound pressure is measured in decibels (dB). Like a temperature scale, the decibel scale goes below zero. The average person can hear sounds down to about 0 dB, the level of rustling leaves. Some people with very good hearing can hear sounds down to -15 dB. If a sound reaches 85 dB or stronger, it can cause permanent damage to your hearing. The amount of time you listen to a sound affects how much damage it will cause. The quieter the sound, the longer you can listen to it safely. If the sound is very quiet, it will not cause damage even if you listen to it for a very long time; however, exposure to some common sounds can cause permanent damage. With extended exposure, noises that reach a decibel level of 85 can cause permanent damage to the hair cells in the inner ear, leading to hearing loss. Many common sounds may be louder than you think…

- A typical conversation occurs at 60 dB - not loud enough to cause damage.
- A bulldozer that is idling (note that this is idling, not actively bulldozing) is loud enough at 85 dB that it can cause permanent damage after only 1 work day (8 hours).
- When listening to music on earphones at a standard volume level 5, the sound generated reaches a level of 100 dB, loud enough to cause permanent damage after just 15 minutes per day!
- A clap of thunder from a nearby storm (120 dB) or a gunshot (140-190 dB, depending on weapon), can both cause immediate damage.
- ***The TRAIN BLASTERS RUNNING AT 60PSI output 152 dB and can cause immediate damage!***

**Decibel Exposure Time Guidelines**

Accepted standards for recommended permissible exposure time for continuous time weighted average noise, according to NIOSH and CDC, 2002. For every 3 dBs over 85dB, the permissible exposure time before possible damage can occur is cut in half.

| Continuous dB | Permissible Exposure Time |
|---|---|
| 85 db | 8 hours |
| 88 dB | 4 hours |
| 91 db | 2 hours |
| 94db | 1 hour |
| 97 db | 30 minutes |
| 100 db | 15 minutes |
| 103 db | 7.5 minutes |
| 106 dB | 3.75 min (< 4min) |
| 109 dB | 1.875 min (< 2min) |
| 112 dB | .9375 min (~1 min) |
| 115 dB | .46875 min (~30 sec) |