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Mounted Transducers- What are They?



When someone mentions the need for a buzzer or **transducer**, it's important not to make assumptions about their requirements. Even technical experts at Mallory Sonalert find it necessary to delve deeper by asking additional **questions** to understand a customer's needs. Various terms are commonly used interchangeably to refer to "audible alarms" such as: buzzers, beepers, indicators, sounders, audible signals, transducers, piezo's, sirens, horns, & alerts. In particular, Mallory's technical personnel approach the term "transducer" with extra **care**. This caution stems from the fact that individuals may use the term in reference to audible devices activated by DC voltage, while others apply it to devices lacking circuitry requiring a peak-to-peak voltage signal (**Vpp**) such as a sine or square wave.

For Mallory, an "indicator" incorporates circuitry, requiring only a DC voltage for operation. Conversely, a Mallory "mounted transducer" lacks circuitry, so a **Vpp** voltage signal such as sine wave or square wave is needed. To **distinguish** between a **bare** sounder element and one **installed** inside a plastic housing,

Mallory employs the term "mounted transducer". The plastic housing of a mounted transducer serves two **primary** functions.

Firstly, it holds the termination which facilitates the **electrical** connection between the sounder element and the outside world via PC Pins, SMT pads, or wires.

Essentially, when a **Vpp** voltage signal is applied to the terminals of a mounted transducer, the voltage signal is passed **directly** to the sounder element.

Secondly, the mounted transducer plastic housing adds an **acoustic** chamber above the sounder element to maximize the sound level. Without this **tuned** acoustic chamber, the sound output would be severely diminished.

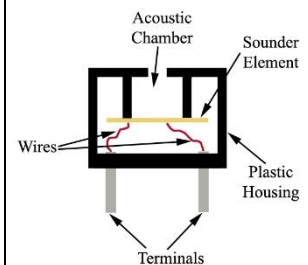
The mounted transducer's **audible** sound can be generated using two different **technologies**: piezoelectric discs and electromagnetic assemblies which utilize a flexed metal disc driven by an electromagnet. The application of a **Vpp** voltage signal at the appropriate rated **frequency** flexes either the piezoelectric element or the electromagnetic disc up-and-down, resulting in the emission of air pressure waves. **Interestingly** enough, an audible sound is just air pressure waves tapping on the eardrum.

Bare Piezoelectric Transducer



Also called a sounder element

Mounted Transducer Construction



These two technologies used in mounted transducers each have their advantages and disadvantages:

Characteristic	Piezoelectric	Electromagnetic
Voltage Range	Wide Range	Narrow Range
Rated Voltage with Good Sound Level	Higher Voltage	Low Voltage
Sound Frequency	High Freq.	Low Freq.
Current Draw	Low milli-Amps	High milli-Amps
Size	Small to Big	Small

Which technology to use **depends** on the application. If a small size or low voltage is critical to the application, electromagnetic technology is favored. If low current draw is critical, then use piezoelectric technology. **Questions** on which technology to use for an application can be directed to [Mallory technical](#).

The below **table** helps illustrate the differences in technology for two Mallory mounted transducer models. Part no. [PT-1140PEQ](#) uses a piezoelectric transducer and needs 9 Vpp to reach **85 dB**. On the other hand, part no. [PB-1226PEAQ](#) uses electromagnetic technology and can produce **90 dB** with only 1.5 Vpp.

Part Number	Sound Freq.	Voltage Range	Current Draw	Minimum Sound Level at 10 cm	Size Dia x Hgt (mm)	Technology
PT-1140PEQ	4.0 KHz	1 to 20 Vpp	7 mA	85 dB @ 9 Vpp	12 x 5.5	Piezo
PB-1226PEAQ	2.6 KHz	1.1 to 3.0 Vpp	30 mA	90 dB @ 1.5 Vpp	12 x 10	Electro-magnetic

Some of Mallory's most **popular** PC Pin mounted transducers are as follows:

Popular Piezoelectric Mounted Transducers					
Part Number	Sound Freq.	Voltage Rating	Current Draw	Minimum Sound Level at 10 cm	Size (Dia x Hgt)
PT-2040PQ	4 KHz	1 to 30 Vpp	1.5 mA	90 dB @ 5 Vpp	22 x 7 mm
PT-2726PQ	2.5 KHz	1 to 30 Vpp	1.5 mA	90 dB @ 5 Vpp	30 x 10 mm
PT-1540PQ	4 KHz	1 to 25 Vpp	1.5 mA	85 dB @ 5 Vpp	17 x 7 mm
PT-2130PQ	3 KHz	1 to 30 Vpp	5 mA	90 dB @ 5 Vpp	24 x 9.5 mm

Popular Electromagnetic Mounted Transducers					
Part Number	Sound Freq.	Voltage Rating	Current Draw	Minimum Sound Level at 10 cm	Size (Dia x Hgt)
PB-1224PE-05Q	2,400 Hz	4.5 to 5.5 Vpp	50 mA	85 dB @ 5 Vpp	12 x 10 mm
PB-1226PEAQ	2,600 Hz	1.1 to 3.0 Vpp	30 mA	85 dB @ 1.5 Vpp	12 x 10 mm
PB-1621PQ	2,048 Hz	4.0 to 7.0 Vpp	60 mA	85 dB @ 5 Vpp	16 x 14 mm

To view Mallory's popular **SMT** mounted transducers, see the [July 2023 newsletter](#).

The last **challenge** with a mounted transducer is how to make it work. There is no circuitry, so the user must apply a sine or square wave to the terminals of the device to produce an audible sound. The spec. sheet will list the target **frequency** and allowed peak-to-peak **voltage**. Piezoelectric mounted transducers may be driven **directly** from an IC output pin due to their low electrical current draw, but electromagnetic mounted transducers may pull too much current to do this, so a **transistor** may be inserted between the IC output pin and the mounted transducer.



Mallory, an [ISO 9001:2015](#) company, has been **manufacturing** audible and visual alarms in the USA since [1968](#). With 12 active **patents**, Mallory is the **technology** leader in audible and visual alarm devices.