

Sounders and sirens are used to attract attention and to give warning, particularly where an immediate response is required. The sound needs to be clearly audible and identifiable to the people in the intended signalling area, and these are often used to supplement a visual signal. Audible signalling is particularly useful in situations where sight maybe an issue, like in bright sunlight or for the visually impaired. To alert a person, it is recommended that a sounder or siren reaches at between 5 and 15 dB(A) louder than the background noise of the given area. Frequency should also be between 300 and 3000 Hz.

There are several things to take into account before selecting a sounder or siren. These are:

- The sound pressure level achieved, quoted as decibel or dB(A).
- The frequency quoted in Hz.
- The distance it must be audible over.
- The background noise of the area it will be installed in.
- The sounds any machinery in the area makes to ensure the tone of the sounder or siren does not sound similar.
- The duration of each use - quick bursts or prolonged use.

To enable easy comparison, the dB(A) stated for a sounder or siren is usually measured at a distance of 1m. When the distance is doubled the dB(A) to drop by 6. This is why it is important to know not only the dB(A) the sounder or siren is capable of, but also the distance away from the intended signalling area it will be placed. An example of this is as follows:

Distance	ISB-R	IAS-E	MDS-2	MDS-4
1m	92	110	114	125
2m	86	104	108	119
4m	80	98	102	113
16m	68	86	90	101
128m	62	68	72	83
256m	56	62	66	77
512m	x	56	60	71
1024m	x	x	54	65
2048m	x	x	x	59
4096m	x	x	x	53

From this, and assuming a background noise level of 60 dB(A), you can see that the ISB-R is only suitable for use 16m away from the intended signal area, whereas the MDS-4 can be installed up to 1024m away from intended signalling area. Should the background noise level differ from 60 dB(A) then the signalling range will reduce/increase accordingly.

It is also worth noting that louder is always best. It is strongly recommended that the sounder or siren is sized to be within 5 to 15 dB(A) above the ambient noise level.

Whilst the recommendation is that we aim for a level between 5 and 15 dB(A) above ambient, studies have found that it is possible to distinguish a sound that is up to 10 dB below ambient as long as there is sufficient frequency differential.



Two typical styles of audible signal are electronic sounders and motor driven sirens. Electronic sounders, commonly used for applications like fire alarms, can produce one or more tones and have no moving parts. Motor driven sirens are only capable of producing one tone which is created by the motor driving a bladed impeller and pulling in air and pushing it out through vents to produce a whirring sound, similar to an air raid siren. These are commonly used in remote areas to warn of emergency or to stand out from the electronic sounder as contrasting sound.

There are advantages and disadvantages to both:

Electronic Sounders



- Variable frequency, tone and volume.
- Usually have a higher IP rating.
- Low current draw/high efficiency.
- Continuously rated/no duty cycle.
- Can be combined with a beacon in one unit.
- Multi-stage tones with individual wires to trigger an alternative tone remotely.
- High Frequency which doesn't travel as well as low frequency.

Motor Driven Sirens

- Lower frequency which travels better through and around objects.
- Good for use in area where electronic tones are used for fire alarms and a siren is required to warn of something else.
- Single tone/no volume control but a distinctive sound.
- Usually has a duty cycle, e.g. 5 mins on to 10 mins off, depending on model.
- High current draw/low efficiency.
- Lower IP rating due to exposed blades/ ideally mounted upside down to avoid getting blocked with dust and debris.
- Can be lower priced due to simpler design.



Hand-cranked Sirens



In event of a complete power failure a hand cranked siren may be used.

These are operated by winding the handle to produce a sound similar to the motorised sirens and can be carried around to alert people in many areas if the operator walks around each area in turn.