IP Ratings - What the Heck are They?

If you are familiar with the communications industry, you have no doubt, seen IP ratings listed under product specifications. Most people just breeze over them and do not pay attention. Some people look at them as an important standard but do not know how to decipher them. Typically you will see IP 54 or IP 67 listed as waterproof specification. You could guess: higher is always better right? So 67 must be 13 better than 54. That is sort of true, but in this tech bulletin we will try to make it crystal clear.

IP BASICS

IP stands for Ingress Protection and is specified by IEC (International Electrotechnical Commission). It has a brother commission in Europe called the EN (European Norms). You can go to either of their websites to get into the details (or to cure insomnia), but a quick overview is all the typical user will need. Wikipedia has a very good summary as well. As you can see, this is an electrical rating, and so, it covers most electrical devices like electrical enclosure boxes, connectors, consumer electronics, and most importantly, 2-way radios and their accessories.

In the IP rating there are two digits after the letters IP, usually displayed as IP XX. The first digit represents a device's ability to withstand particulate ingress. This pertains to things like dirt, dust, etc… anything that is not liquid. This rating goes from X (no rating) to 6 (no ingress, dust-tight, basically vacuum-tight levels of protection). In electronics, you will typically see a rating of 5 (Ingress not entirely prevented, but will not impede the function of the device) or 6 (Dust-tight, no ingress, vacuum tested). Both of these are generally adequate.

The second number, you have probably guessed by now, pertains to liquid ingress. This rating goes from X (no data) to 9K (Resists powerful high-temperature jets). A high level of liquid ingress protection will mostly ensure the device is dustproof as well. In electronic devices, you will typically see a rating of 4, 6, or 7. Level 4 is "splash-proof" and is typically adequate for most uses. Level 6 will resist direct spraying

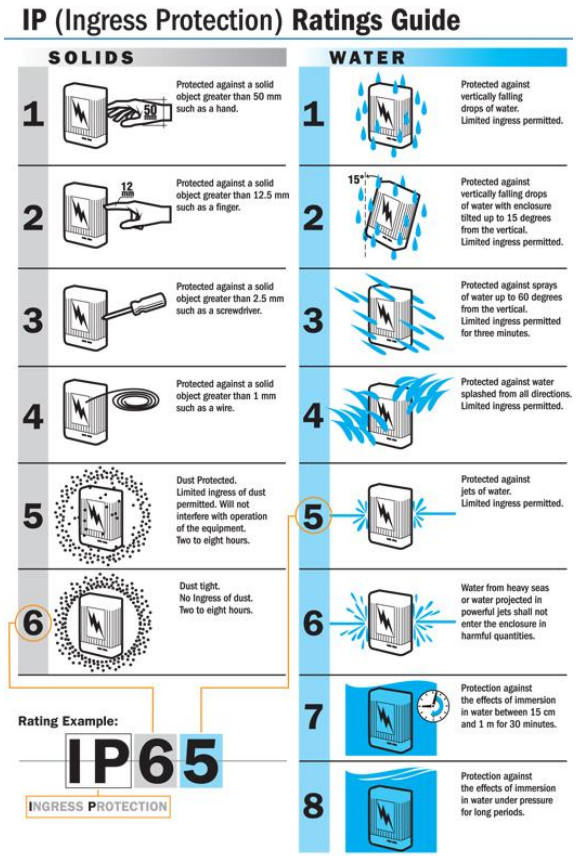

Figure 1: IP Ratings Guide (Blue Sea Systems)

from water jets, with pressure in the kilo Pascal range, for some time period. Level 7 is submersible, what most people think of as “waterproof”. This is tested at a submersion level of 1 meter for at least 30 minutes. All of these tests are time-based. This should be an indication that “waterproof” is relative: in the end, water always wins.

MIL-SPEC 810

You may have also seen Mil-Spec 810 listed as part of the device specification. This is a completely different animal. Mil-Spec is a very comprehensive set of standards published by the US Government. Usually, this will only be a requirement for military contracts. Mil-Spec 810 has many different nuances and can get very complicated. For a military contract, the levels of testing will be specified as part of the contract, and the manufacturer’s adherence to these specifications is a requirement. This is generally not something you can state as a “rating” but must demonstrate with third-party test data. It is important to know that Mil-Spec 810 can be a lower standard or a higher standard than IP rating based on what levels of adherence are required.

How Much Protection is Enough?

What do you need as an IP rating for your device? That depends. Are you doing underwater demolition? Are you swimming with your gear? Does it rain a lot where you live? Do you crawl around in the dust and dirt and mud? Do you need to be able to survive a nuclear attack? Another thing to consider is the IP rating of your other devices. If your headset is IP 67 but your radio is IP 54, are you getting value out of the additional cost? An IP 67 radio will have a watertight accessory connection with o-rings or gaskets and a secure screw-on connection.

You can also take care to wrap the electrical connections in plastic or waterproof tape to make sure they are not vulnerable. If your water-based activities are rare, this might be a lower-cost solution.

CONCLUSION

IP ratings are a good way to specify and identify robust product design. They give the user a reasonable idea of what the device is designed to withstand. Sometimes you can get an IP 67 device for not much more than the IP 54 equivalent. Our Hot Shot shoulder mic compared to our Signal 21 is a good example. For about $10.00 more you can get a more robust product. Do you need it? I will let you be the judge.

I hope this has presented the IP rating topic clearly for you. If not, follow the recommended references above (IEC, EN, Wikipedia) for more detail. Contact us directly if you have questions about ratings on our products.

GOOD LUCK!

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