

## **IEC Ingress Protection Ratings and Outdoor TV's**

There is some confusion in the market about IP ratings of outdoor televisions. Some products are rated IP54 and others are rated IP56. What do these ratings mean and which one is best for an outdoor television application? SunBriteTV's are designed with an IP54 rating in order to provide the best performance possible in a typical outdoor environment. Thousands of satisfied SunBriteTV customers over the last 4 years back up our claim.

### **First a little background on the ratings:**

IEC 60529 is an international standard that defines these ratings. For this discussion, we just need to know that the "IP" in "IPXY" stands for Ingress Protection. X is a numeric value indicating the degree protection against dust ingress and Y is a numeric value indicating the degree protection against water ingress under different conditions. A dust protection rating of 5 means the product is protected against dust entering and a 6 means the product is sealed dust tight. A water protection rating of 4 means that the product is protected against splashing and spraying water such as from rain, sprinklers or a garden hose. A rating of 5 means the product is protected from strong jets of water from a high pressure nozzle. A rating of 6 means the product is protected from powerful, high volume, jets of water, like from a fire hose. All products having a 5 or 6 rating for water ingress utilize a sealed type of design to prevent strong jets of water from entering the enclosure and damaging the electronics.

### **Why an IP54 rating is better in most applications:**

At first glance one might assume that a sealed enclosure is the best approach for an outdoor television because it offers the most protection against powerful jets of water but there are other considerations.

One thing to realize is that a sealed enclosure will subject the internal electronics of the television to much higher operating temperatures than a well ventilated IP54 type of enclosure. Higher operating temperatures are not what are wanted for a long life product. It has been well documented that the life of electronic components drops considerably when their operating temperature rises. Internal temperatures of SunBriteTV's are 25 to 35 degrees F lower than any competitor's IP56 rated unit. In fact, SunBriteTV's internal temperatures are much less than a typical unsealed indoor TV due to the ventilation system. This characteristic allows SunBriteTV's to have a higher operating temperature limit. SunBriteTV's upper operating temperature limit is 130 degrees F verses as low as 104 degrees F for our competition.

Another thing to consider is that a sealed enclosure is never completely sealed. It must breathe a little to compensate for changes in atmospheric pressure. Otherwise the enclosure would have to be extremely strong to stand up to the forces exerted by trapped air. Think about a bag of chips that you take up a mountain. It is almost ready to explode when you get to a high altitude. The same thing happens in a sealed TV when everyday

variations in atmospheric pressure occur. To prevent the build up of force the sealed enclosure leaks a little bit by design. Thus air is entering the sealed TV and with the air comes moisture in the form of humidity. The moisture that enters doesn't have an easy way to get out and tends to build up. Condensation is a result. When the outside temperature suddenly drops the trapped moisture will condense inside the TV either on the screen or the internal components.

SunBriteTV's are well ventilated to prevent this from occurring. Dual fans create a constant airflow which keeps the moisture from building up. This combined with the heat generated by the TV's internal heaters and electronics reduces the moisture and thus the condensation for a much better result.

One more thing to consider is the application environment. An industrial product designed for a particular high stress application is usually not the right solution for general purpose use. Well engineered, general use products, perform better over the long run in commercial/residential applications than industrial grade ones. One wouldn't expect a common product like a window air conditioner to have a sealed enclosure in order to perform its job. A sealed version of this product is required in some military uses in order to survive in very stressful environments but the added cost and reduction in performance of the sealed unit verses the unsealed unit make it very unappealing in almost all commercial and residential applications.

### **Conclusion:**

One needs to look beyond the IP ratings of a product and consider the overall use and the consequences of a sealed verses non sealed design. There are some special applications where sealing is required but SunBriteTV believes that in most installations its IP54 approach is the best one.

SunBriteTV's incorporate an advanced, quiet, dual fan ventilation system that provides clean filtered air circulation to the internal electronics enabling its outdoor TV's to have a long trouble free life free from the influence of nature. SunBriteTV's carry an IP54 rating because we believe that the customers overall, long term, experience in most situations will be better than one provided by a sealed IP56 rated product.

SunBriteTV is the leading manufacturer of outdoor TV's and has been producing them for over 4 years. We have thousands of our outdoor TV's installed in a wide range of environments. Our thousands of satisfied customers are testimony to the robustness of our design.