

SNOW DENSITY KIT

DIRECTIONS FOR USE

Always transport the digital scale in a protective case. The scale has sensitive load cells that may be permanently damaged if too much pressure is applied. Damaging pressures may easily result during field use when the scale is carried in a rucksack or by other transport means.

Digital scales are not typically used in subzero field conditions. However, we do it all the time and the scales we carry now are actually rated for cold temperatures. If it does become apparent that it is too cold, place the scale inside your parka for a few minutes to warm up the unit. It also helps to put spare batteries in a warm pocket and change them when needed. Always carry two to four extra AA batteries for this purpose.

Water may damage the electronics in the scale. Be careful not to allow snow or water into the scale through the holes for the tray. After each use, be sure to open the case to allow the interior of the case and scale to dry. Do not heat the scale to dry it.

Before going to the field, weigh the density cutter and write the weight on the cutter in permanent marker. This can then be used as a periodic check for scale accuracy in the field to insure that the measurements you are getting are not bogus. If the readings are different than the value you have written on your cutter, check your battery or replace it with your spare, and weigh the cutter again. Warming the scale may also alleviate the problem. If the readings continue to be bogus, complete your work with a spring scale and determine the cause of the digital scale failure once you have left the field. Do not count on measurements being "close" if the scale reading is not true to your check. Discrepancies of several grams (5-10) may be due to ice on the cutter or temperature effects on the electronics in the scale and are not significant.

The putty knife is useful for cleaning the cutter between measurements when the snow is prone to freezing. In a warm snowpack it is often sufficient to just dump out the sample. The cutter lid may also be used to clean the cutter. Do not bang the lid on the cutter to remove snow. While stainless steel is great for this application, it is not as strong as many metals that you are familiar with and denting may occur.

The scale may be used with or without the *zero* or tare function. If you choose to use it, turn on the scale, place the empty cutter on the tray, push *zero* and wait a few seconds, take the sample from the snowpit wall, place the cutter back on the tray with the sample in the cutter, and read off the density directly in kg m^{-3} (if using the 1000 cc cutter). If you do not use the *zero* function, you must subtract the weight of the empty cutter from your measurements to obtain the correct density. It is often easier to use the *zero* function, but the disadvantage is that with the automatic shut-off, you must re-tare the empty cutter if you wait too long between measurements. See the enclosed directions particular to the scale for further information on its use.

There is room in the plastic case to carry a spare spring scale, plastic bag for the spring scale samples, tape measure, folding rule, thermometers, hand lens, crystal card, etc. Customize your case as you see fit.

If you have any questions, suggestions, or problems concerning sampling snow density in general or this sampler in particular, please feel free to call or write.