Climalytic Digital Scale
Precipitation Measurement Guide

CLIMALYTIC™
INSTRUMENTS, LLC

Accurate, Easy and Fast Precipitation Measurements

Included in the box:

- 5kg 0.1g digital scale
- USB-C charging cable
- AAA batteries (2)
- Manual
- Precipitation measurement guide

MEASURING PRECIPITATION BY WEIGHT

A digital scale is an easy, fast and very accurate way to determine the amount of rain or the liquid equivalent of frozen precipitation. In fact, it is common for professional-grade, automated precipitation gauges to use an integrated scale or strain gauge along with a storage bin to record the mass of precipitation collected. Using a scale, the weight of precipitation, technically its mass in grams, is easily converted into an equivalent depth in inches or millimeters. It is particularly useful to use a scale to determine the liquid equivalent of frozen precipitation because no melting or volumetric measuring of the water is required.

To determine how much precipitation fell using a scale, first determine the weight of the precipitation (excluding the gauge weight) in grams. Then, using a calculator, divide the weight of the precipitation by 206 to determine the depth of liquid precipitation in inches, or divide by 8.1 for millimeters.

Amount of liquid precipitation in inches =

$$\frac{weight\ of\ guage\ filled\ with\ precip\,(grams) - dry\ weight\ of\ gauge\,(grams)}{206}$$

Amount of liquid precipitation in mm =

$$\frac{weight\ of\ guage\ filled\ with\ precip\,(grams) - dry\ weight\ of\ gauge\,(grams)}{8.1}$$

PRECIPITATION MEASUREMENT GUIDE

The following precipitation measurement guide provides complete, detailed steps for making official precipitation observations. The procedures requires several tools, all available from store.climalytic.com: (1) TROPO all-weather, dual-cylinder precipitation gauge, or similar, (2) a snow board (for snowy locations), (3) a snow ruler (for snowy locations), and (4) this digital scale. A precipitation observation form (Figure 1) is also handy and will be referred to throughout this guide.

PRECIPITATION OBSERVATION FORM

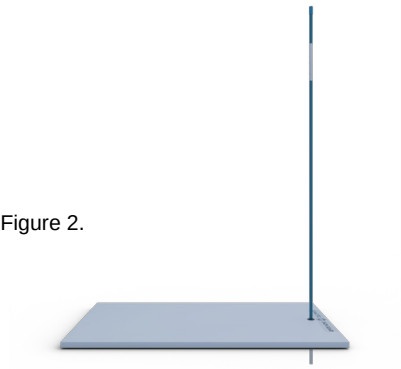
Station id	Station Name/Location	State or Province	Hour of observation time and time zone	Model of Precipitation Gauge

Date or Date Range	Gauge Catch	Fresh Snowfall	Snow Water Equivalent (SWE) of Fresh Snowfall	Snowpack Depth	Snow Water Equivalent (SWE) of Snowpack	Observation Notes And Precipitation Characteristics
MM/DD/YY	Liquid-equivalent (nearest .01" / .1 mm)	New Snow (nearest .1" / .5 cm)	New SWE (nearest .01" / .1 mm)	Total snow & ice on the ground (nearest 1" / 1 cm)	Total SWE on the ground (nearest .01" or .1 mm)	
A	*B*	*C*	*D*	*E*	*F*	*G*

Figure 1: Climalytic precipitation observation form (available from store.climalytic.com).

Step 1 – SNOW BOARD (snow locations only) Determining the location to place the Climalytic Snow Board is important to ensure the highest quality measurements. In open areas, strive to position the snow board at a location twice as far from obstacles as they are high. In developed areas, strive to have the snow board as far from obstacles as they are high. It is also important to find a location that does not experience chronic drifting or other disruption (e.g. foot traffic, shoveling, plowing, etc.) For consistency, anchor the snow board near your precipitation guage (Figure 2). Also, be sure to remove the cap/funnel from the TROPO to allow snow to freely accumulate inside the outer tube.

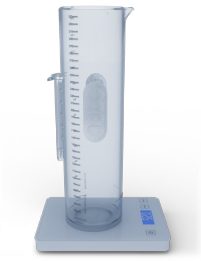
Figure 2.



Step 3 - DRY WEIGHT

Use the Climalytic Digital Scale to measure, in grams, the weight of your dry, complete rain gauge. If using the TROPO outer tube for measuring snow, also measure the dry weight of just the outer tube as well. Figure 3. Write down these weights somewhere safe and handy for future reference.

Figure 3.



Step 4 – GAUGE CATCH

Gauge catch is defined as the amount of precipitation that naturally fell into the gauge.

- If your gauge collected **rain**, you can read the rain gauge as you normally would, or use a scale by following the procedure in step 8.
- If your gauge collected **snow/ice/sleet,** follow the procedure in step 8 to compute the snow water equivalent (SWE) of the gauge gatch.

Either way, enter the gauge catch value in **column B, Figure 1.**

*NOTE: **Never** measure or report the depth of snow/sleet inside the outer tube of the gauge; this is not an accurate, representative or useful measurement.*

Step 5 – FRESH SNOWFALL DEPTH

During your regular daily observation time, or as soon as you observe the maximum fresh snowfall depth during the past 24 hours, measure the new snow depth on the snow board with a ruler. Figure 4. Read the snow depth to the nearest tenth of an inch (or .5 cm). If the snow board is drifted in or otherwise not representative of the fresh snowfall, make 4 or 5 measurements away from the snowboard and **average** them for a representative fresh snowfall depth. Enter this in **column C, Figure 1.**

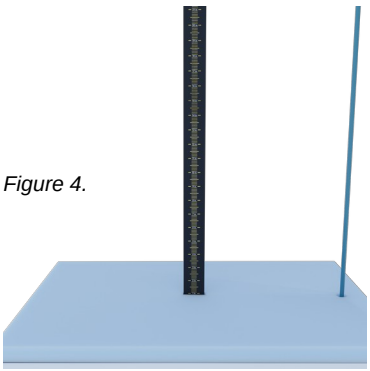


Figure 4.

***IMPORTANT:** If snow falls, but never accumulates, then report report a Trace of fresh snow, as well as the gauge catch from Step 4. Remember, the 24-hr snowfall is the **maximum** accumulation of new snow and ice in the past 24 hours, prior to any melting or settling. Measure new snowfall as soon as possible after it ends, before settling and melting occur.*

Step 6 – SNOW CORE

Capture a core by inverting the outer cylinder of the TROPO gauge and pushing straight down into the snow where you measured the representative snowdepth in step 5. Use the provided snow scraper to slide under the cylinder to trap the snow inside the cylinder as you revert the cylinder. See Figure 5.

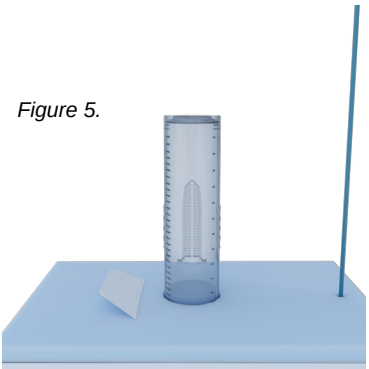


Figure 5.

Step 7 – CLEAR AND REPOSITION SNOW BOARD

Clear the snow off the snowboard with the provided snow scraper. **If necessary**, re-position the snow board so the surface is roughly level with the snow on the ground. In deep snow conditions, this means placing the snowboard atop the snowpack. Only clear the snow board once a day.

Step 8 – RAIN AND SNOW WATER EQUIVALENT

Using the Climalytic digital scale, measure the weight of the gauge containing the core sample (taken in Step 6 as shown in Figure 6) **or** the "gauge catch" (Step 4 as shown in Figure 7). Subtract the appropriate weight of the dry gauge or outer tube (from Step 3) to determine the weight of the water content in grams. Divide this water content weight by **206** to calculate the snow water equivalent (SWE) in **inches**, or divide by **8.1** for SWE in **millimeters**. For a snow core, enter this value as SWE in **column D, Figure 1**, otherwise this is the "gauge catch" to enter in **column B, Figure 1.**

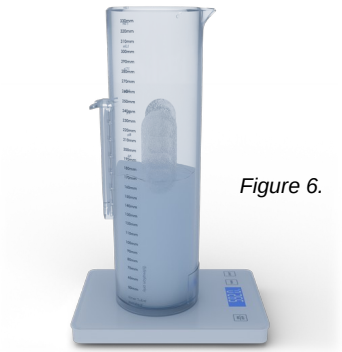


Figure 6.

Example

Dry weight of gauge:
512g *(this varies; measure your gauge)*

Weight of gauge filled with rain or snow:
592g

Weight of rain or snow:
592g – 512g = **80g**

Rain or Snow Water Equivalent:
80g/**206 = 0.39 inches**, or
80g/**8.1 = 9.9 mm**

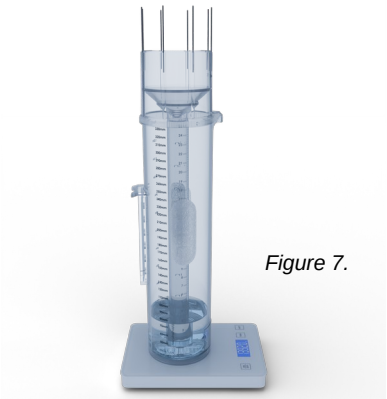


Figure 7.

IMPORTANT: *If you feel the SWE from the snow core is* ***more representative*** *of the actual precipitation versus the "gauge catch" due to high winds, then report this amount as your "gauge catch" and make a note in the comments (***column G, Figure 1)** *section. Include the melted amount from the snow that actually fell in the gauge in your comments.*

PRO TIP: *It is* ***handy having an extra outer tube*** *for swapping out the mounted gauge with snow/ice in it for a dry gauge for collecting new snow. This is especially true when snow/ice is falling at the observation time.*

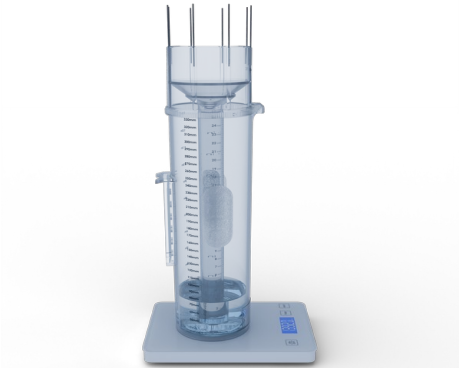
Step 9 - SNOWPACK DEPTH AND SWE (optional)

Steps 1-7 address the measurement of fresh snowfall, but the same procedure is followed for determining the depth and SWE for all snow on the ground. The snowpack depth is reported to the nearest inch or cm and entered into **column E, Figure 1;** SWE is reported to nearest .01" or .1 mm.

PARTS AND SUPPORT

Visit climalytic.com for installation and operation videos, maintenance suggestions, tips and FAQ's. Please call, text, email or visit climalytic.com/contact with any questions!

Visit store.climalytic.com for replacement/extra parts as well as other premium weather instruments and accessories.



Please share a picture of your new scale in use on social media and tag us @CLIMALYTIC

THANK YOU FOR PURCHASING FROM OUR SMALL, FAMILY OWNED AND OPERATED BUSINESS

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INSTRUMENTS, LLC

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