



TIPPING BUCKET RAIN GAUGE

The Tipping Bucket performs a wide range of rainfall measurements. The receiver is 200 mm in diameter. The Tipping Bucket measures each 0.2, 0.5, 1mm or 0.01 inch of rainfall. It could also include a siphon (optional) that allows rain to flow at a steady rate to the tipping bucket mechanism regardless of rainfall intensity. This system allows control of the "flow rate" of accumulated precipitation. This metering geometry assures higher levels in both accuracy and repeatability during periods of extremely heavy rainfall.

Automated Rainfall Stations consists of a Tipping bucket gauge which operates by capturing a small volume of water in one of two small buckets. Once the rain is captured, the bucket tips and empties. The occurrence of this "tip" is recorded, and precipitation volumes and rates are transmitted as the number of tips and the rate at which they occurred. Tipping bucket rain gauges tend to underestimate precipitation during periods of intense rainfall and in case of frozen precipitation. All gauges tend to underestimate in high wind. But compared to weighing gauges, tipping bucket gauges are less expensive and requires significantly less maintenance.

AUTOMATED RAINFALL STATIONS

The Stainless Steel Tipping Bucket Rain Gauge is used to measure rainfall volume and/or rate of rainfall. Rain enters through a funnel assembly with a 7.87-inch (200mm) orifice passes through a debris filtering screen and is funneled into one side of the tipping bucket assembled inside the gauge. The bucket tips when a given amount of water, determined by gauge calibration, has been collected. The model JDZ02-1 tips for each 0.2mm. As the bucket tips, it helps a magnet to move through a mercury switch and thereafter closes the switch momentarily. The tipping of the first bucket brings the second bucket into the position under the funnel for filling. After the rain water is measured, it flows to the exit hole through a drain tube, located in the gauge. Most of the instruments used in the project in question, are made of Stainless Steel to avoid corrosion. A mesh screen is used to cover the rain gauge to restrict the entry of insects and foreign materials.

TIPPING BUCKET MECHANISM

The tipping bucket mechanism is designed so that each tip of the bucket measures rainfall in unit mm which would be transformed to corresponding rainfall quantity or volume in unit gram or ml. A magnet is attached to the tipping bucket that actuates a magnetic switch as the bucket tips. Thus, a momentary switch closure takes place with each tip of the bucket. Connecting the sensor to an event/pulse counter on an electronic data logger or display module will allow record keeping of accumulated rainfall. Tipping bucket mechanism includes funnel, funnel spout, bracket, pivot, adjustment screw, levelling screw, working base, tipping bucket, magnetic switch and other major parts.

Funnel collects and channels the precipitation into the tipping bucket. Tipping bucket mechanism includes bucket, balancing weight, magnet, pivot and so on.

Tipping bucket is a small seesaw-like container. Through a magnet the first bucket is kept at the top till it is filled in with calibrated amount water. When the bucket is full with the calibrated amount of water, the magnet releases its hold and the first top bucket goes down by raising the second bucket to the top. In the mean time the water in the top bucket then flows out through a drainage hole. When the bucket tips, it triggers a reed switch (or sensor), sending a message to the display or weather station. Adjusting screws are located under the tipping bucket mechanism on the base plate to adjust bucket inclination. Adjust both screws equally, i.e. if you turn one a half turn then turn the other a half turn. Turning the screws clockwise will increase bucket inclination and number of tips. Turning the screws counter-clockwise decreases bucket inclination and number of tips.

TIPPING BUCKET



TIPPING BUCKET SPECIFICATIONS

Item	Value
Material	Stainless Steel
Type	Tipping Bucket
Sensitivity	1 tip per 0.2mm Model JDZ02-1
Resolution	0.2mm Model JDZ02-1
Orifice Size	7.87" dia.(200mm)
Accuracy	within 2% at 2"/Hr + 5% at (240mm/Hr)
Bearings	Sealed
Insect protection	Mesh screens
Capacity	9.5" per hour within + 5% accuracy limits
Output	0.1-second switch closure
Switch type	Ruggedized reed switch
Size	7.87" dia. x 24.0" Ht (200mm dia. x 610mm H)
Weight	6.4 lbs
Temperature	Range, Operating 0°C to 60°C

