MeteoRain™ IoT Compact

BARANIDESIGN

- **AGRICULTURE**
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- **METEOROLOGY**
- **SMART CITIES & IOT**
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Ø 200 cm² Self-Balancing, Self-Emptying Rain Gauge

Wireless MeteoRain™ IoT Compact features a self-balancing measuring mechanism with very high repeatability of measurement and accuracy even in high-rain rates. Highly resistant to soiling of the internal measuring mechanism, mechanical friction, and residual water remaining in the measuring spoon from last rain event. Additionally, MeteoRain® offers high resistance to vibrations and non-level mounting.

Notable features include:

- Measures rain amount, rain intensity, and sends a frost warning at 2°C
- No solar panel required
- 4+ years of battery life with 10 minute sending interval of data when raining
- Robust stainless steel mount with multiple mounting options
- Simple and highly reliable measuring principle and electronics
- Easy to maintain and simple to clean with a removable funnel sieve/sift
- Robust and impact resistant funnel and housing
- Effect of non-level mounting is minimized with this self-balancing design
- Easy adjustment and recalibration of internal measuring mechanism
- High-speed (0.13 s) self-emptying mechanism for high precipitation rate accuracy
- High-dynamic range up to 10 mm/minute (50 tips/minute) rain rates
- Bird-spikes are available. Leaf fence is not required due to self-cleaning funnel.
- Low-profile funnel for easy cleaning with a sharp edge for accuracy

Self-balancing, self-emptying magnetic tipping bucket technology to ensure uninterrupted measurement of precipitation regardless of amount and intensity.

It measures rain by means of a standardized orifice funnel which collects water into the precision measuring mechanism. The mechanism offers more **consistent long-term response** than standard tipping-bucket rain gauges and is accurate even in high rain rates.

OUTER Ø 188 mm (7.4")
4 x MOUNT Ø 174 mm (6.85")
200 cm² ORIFICE = Ø 159.6 mm (6.28")
OVERALL HEIGHT 171 mm (6.73")
155 mm (6.12")
116 mm (4.57")
4 x MOUNT Ø 118 mm (4.65")

Individually tested

Rain gauges are individually tested and use high quality sealed reed switches. Electronics are protected against salt spray, water, frost and heat by a weather-resistant coating.
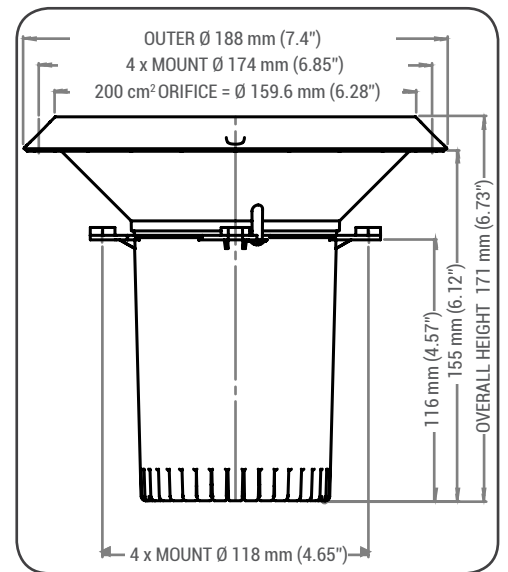
Pluviometer type	Accuracy	Stability	Resolution	Measuring range	Operating range	Starting threshold *	Rain orifice area
Precipitation type: Liquid (Rain)	< ±1% for rain rates <100mm/hr	< 0.0125 mm per year	0.1, 0.2, 0.25 mm (0.01")	Up to 600 mm/hr in above freezing conditions	-40 °C...80 °C	Resolution + 0.07 mm (0.0027") *	200 cm² (Ø 16.0 cm, 6.3")

* Rain gauge starting value is the amount of perceptiation required to register a first reading. All funnel based rain gauges trap a small mount of perceptiation on the funnel surface, which includes drops remaining on funnel surface (~1.4 ml), evaporation from the funnel surface, wetting of debris, dirt, and dust in the funnel catch sieve/sift and water opening (together an additional 1 ml). Rain gauge inspection interval should be determined by user experience and the environmental conditions.

Electrical Interface	Wireless network compatibility	Battery type	Battery life **	Shock resistance
Wireless	All regions LoRaWAN and Sigfox. (NB-IoT coming soon)	Lithium Ion	4+ years **	15 g

** Based on 2200 hours of rainfall per year.

For agricultural and IoT use where consistent measurement and long-term reliable maintenance-free operation are important
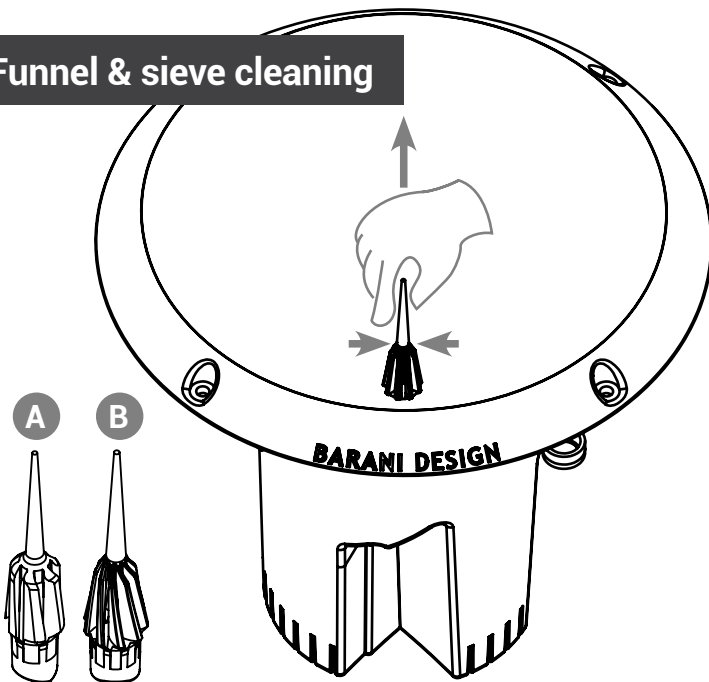
Weather resistant, robust and simple to maintain with reliable ultra-low power reed switch operation. ISO:9001 quality
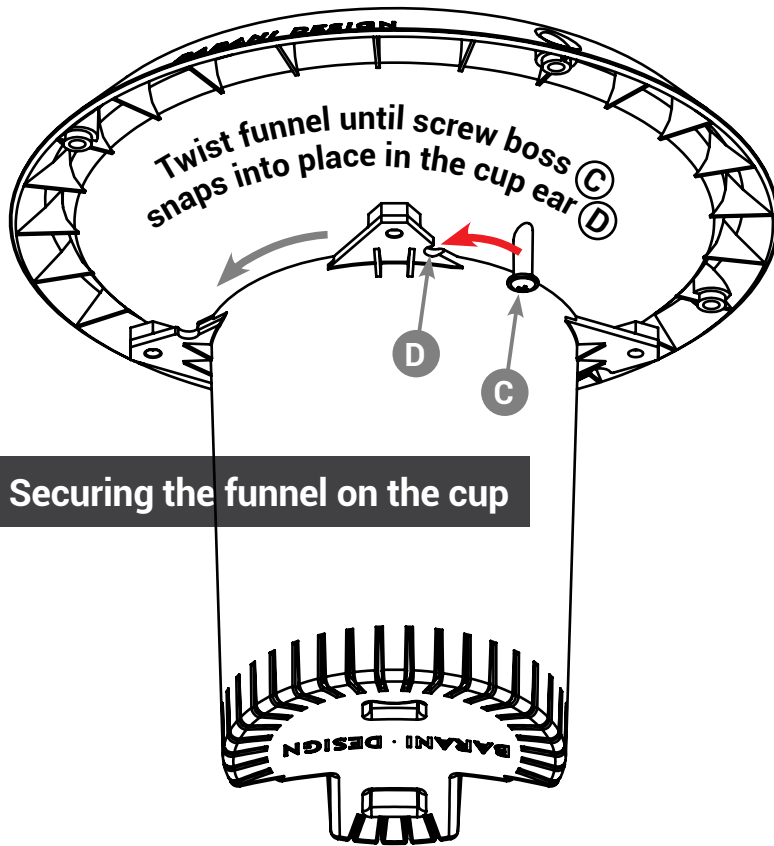
Securing the funnel on the cup

Twist funnel until screw boss C snaps into place in the cup ear D

Funnel & sieve cleaning

A Coarse sieve/sift

B Fine sieve/sift

1. Remove the funnel by twisting out of the snaps on the cup ears.
2. Remove the spiked sieve by gently pinching and pulling up.
3. Whipe the funnel with a moist cloth and clean the sieve.
4. Reinstall the funnel by twisting into the snaps on the cup ears.
5. Insert the sieve by pushing down until it snaps into place.
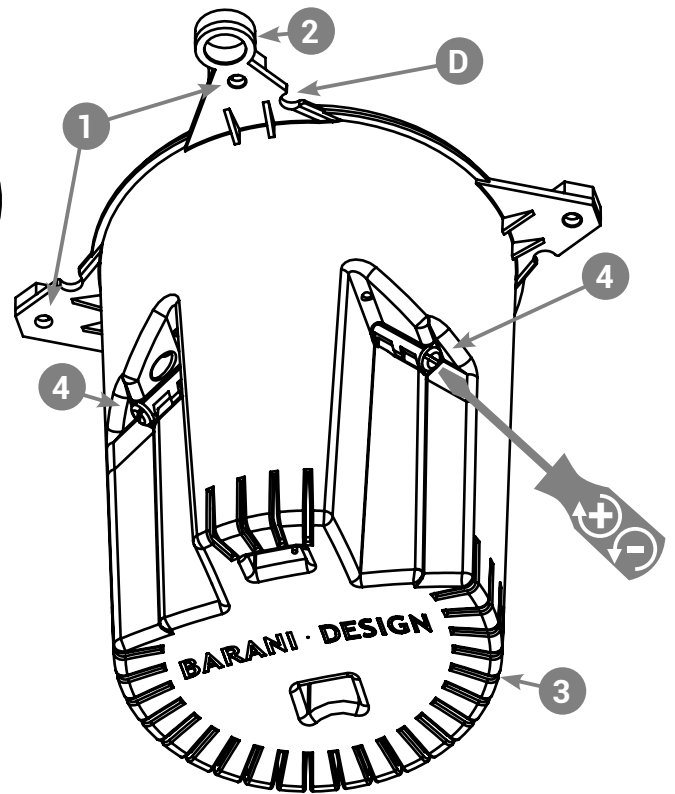
1 Cup leveling & mounting screw holes

2 Spirit level holder for rain gauge leveling

3 Drain slots all around the perimeter

4 Calibration adjustment screws for the self-balancing tipping bucket mechanism

Calibration procedure

1. Make sure the rain gauge is sitting level before beginning this proceedure.
2. Obtain a 4 ml or 5 ml syringe so that you can easily adjust the dose into each bucket, and dose single drops.
3. Practice filling the buckets from the electronics PCB board height so that you are able to dose exactly 4 ml.
4. Close to the tipping point of the bucket slow down and drop one drop at a time until it tips to the other side.
5. Adjust the calibration adjustment screws with a screwdriver so that each side of the tipping bucket mechanism tips with exactly 4 ml of water. Turning the adjustment screw clockwise = (+) tips with more water.
6. You should easily be able to achieve repeatability of ±1 drop.

Due to this rain gauge's self-balancing measuring tipping bucket design, it is able to consistenly achieve a ±1 drop bucket tipping point. It is also much less sensitive to not sitting level than other rain gauges, which is one of the major causes of error in precipitation measurement.
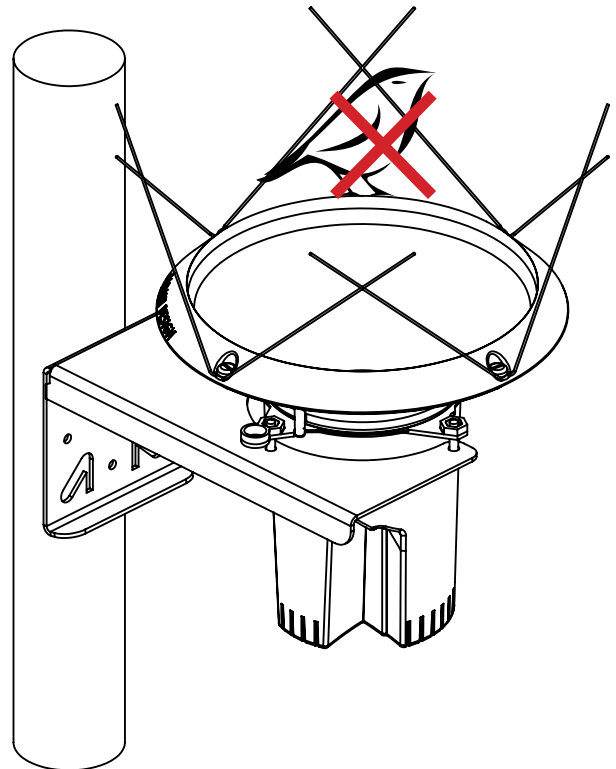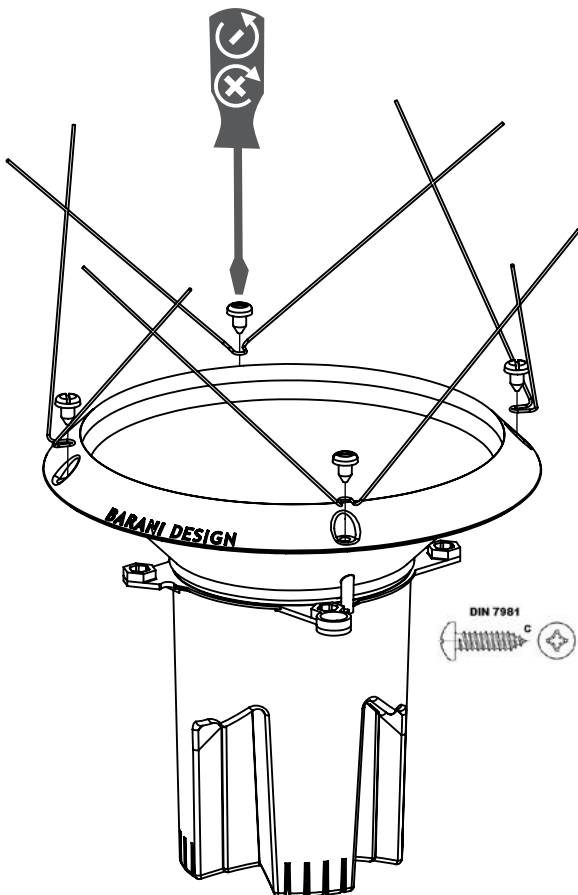
Rain gauge mounting options

Rain gauge can either be mounted on the 4 funnel or on the 4 cup mounting points.

We recommend using only 3 of the 4 mounting points so that leveling can be performed easily since the mounting points are 90° appart.

Shown bellow are two available stainless steel mounts for the rain gauge.

Bubble **L** points to the spirit level holder for rain gauge leveling.
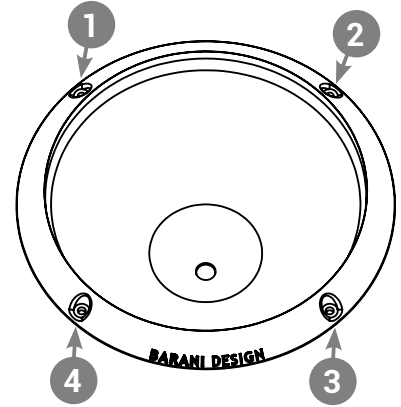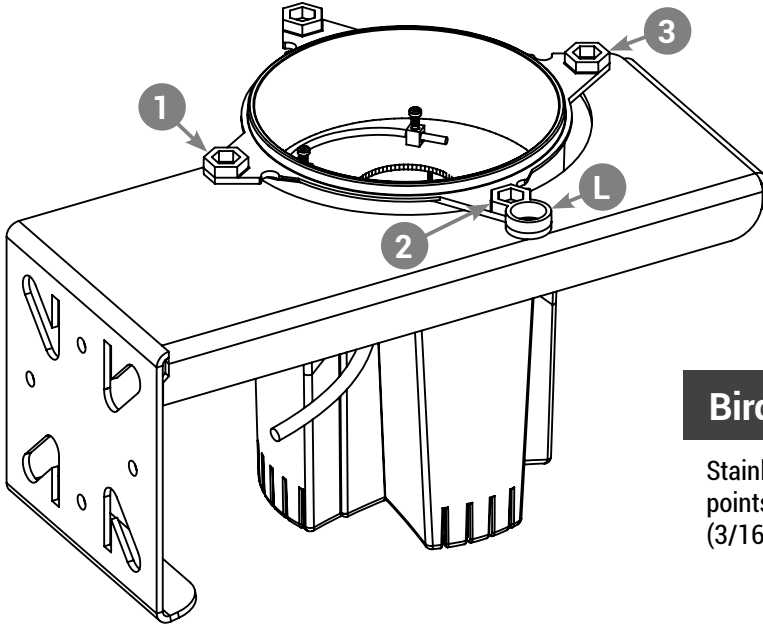
Bird spike mounting options

Stainless steel bird spikes can be mounted on the four funnel mounting points using the supplied flat head machine screws DIN 7981 Ø4.8 mm (3/16") or similar. The mounting holes are Ø4 mm (5/32") in diameter.

Leaf fence mounting options

Although we offer an optional leaf fence, we do not recommend a leaf fence for the MeteoRain® 200 Compact rain gauge or the wireless MeteoRain IoT Compact, since its funnel design allows the wind to remove most larger debris from the funnel naturally. Due to the accuracy of the MeteoRain® measuring mechanism, a wire mesh leaf fence tends to trap water drops on it, thus negating much of its benefit.