PG10 & PG10R Rain Gauge

PG10 is the **highest-performance rain gauge** with 1000 cm² captation surface on the market today for the measurement of **accumulated precipitation** and of its **intensity** per minute. It is a rain gauge very accurate and it indicates any malfunctions before they cause interruption of measurement.

The **PG10R edition** is equipped with distributed **heaters** allowing use of the instrument to **measure the water content of frozen precipitations** too.

Each type is also available in its **UNI version**, which includes a calibration certificate produced according to the **UNI EN 17277:2020 standard**. **CAE rain gauges are certifiable in "Class A"**, that is they are included in the top (most precise and accurate) category of sensors for rain intensity measurement available on the market.

RESPONSE PRECISION AND SPEED

PG10 and PG10R measure **liquid precipitation**, and in the heated version water **equivalent of solid precipitation, with an output resolution of 0.1 mm.** Despite the certifications of most of the other precipitation gauges on the market, which usually apply to selected value of rain intensity, the **maximum error** of PG10 and PG10R is **<3% up to 800 mm/h and maximum 5% between 800 and 1000/h**. On request it is possible to make selections of more performing products.

Unlike that guaranteed by the most popular sensors based on weight technology, PG10 and PG10R measure with this **degree of accuracy from the first minute following the phenomenon detected**, thus being particularly suitable for the timely measurement of **downpours.**

EASY MAINTENANCE AND "ZERO BREAKDOWN TECHNOLOGY"

Thanks to the tipping technology, **PG10** and **PG10R don't need to be emptied** and require **very little and easy maintenance**. The sensing element is a reed which is redundant to ensure continuity of operation in case of failure. The sensor is also the only one in its category to implement **diagnostics**, with the objective of **reducing downtime due to faults**. Among these are:

- the check for clogging of the funnel that directs the water into the tipping mechanisms;
- the "electronic spirit level" for correct inclination of the mouth of the instrument with respect to the ground;
- the correct functioning of the sensing elements (reeds) that count the movements of the tipping mechanism;
- the good condition of the tipping group and the moving parts;
- the correct functioning of the heaters (PG10R).

CUMULATED RAINFALL MEASUREMENT

The PG10 and PG10R rain gauge enable an accurate measurement of cumulated rainfall.

During the precipitation, water caught in the funnel flows into a container. Once this container has been filled, it starts to tip. As in all tipping bucket rain gauges, the mechanical system requires a certain amount of time to complete the movement. During this short time, water keeps falling, so that a normal tipping bucket rain gauge underestimates precipitations.

Thanks to the quality of materials and production processes used by our company for sensor production, CAE has been able to verify the systematic nature of the phenomenon and calculate the exact error curve of the instrument due to the kinematic effect.

On-board electronics **calculate the correction factor to be applied each time the container tips**, in order to obtain the correct rain intensity value. At low rain intensity the correction factor is close to 0, while it increases when intensity reaches 50 mm/h or higher; this correction by the software makes it possible to compensate the inherent error of tipping bucket rain gauges up to high intensities.

RAIN INTENSITY MEASUREMENT

The intensity of rain, measured by the sensor based on the tipping of the container, indicates the real intensity of rain every minute, expressed in mm/h, with an **output resolution of 0.1 mm/h**.

The intensity reading calculated by the instrument is based on the average intensity in a minute, then referred to an hour to calculate the mm/h.

In this case too, the algorithm within the rain gauge, by measuring the time between each tip and the next, **calculates the correction factor to be applied and provides the most accurate rainfall intensity output every 60 seconds**.

Sensor type	Tipping bucket
Collecting area	1000 cm^2
Measurement range	Up to 1000 mm/h
Output Resolution	0.1 mm
Accuracy	Max 3% < 800 mm/h Max 5% 800÷1000 mm/h
Connection with data-logger	Modbus over RS-485
Temperature Range	PG10: +32°F ÷ +140°F (0°C÷+60°C) and PG10R: -22°F ÷ +140°F (-30°C÷+60°C)
Power supply	12-14V nom. (10-16 max)
Power consumption	< 1 mA @ 12.5 V in the absence of rain
Heater power supply	24 VAC nom (20-26 V max)
Heater power consumption	185W @ 24 VAC

CAE S.p.A.-Via Colunga 20
40068 San Lazzaro di Savena (BO) - Italy
tel.: +39 051 4992711
www.cae.it