



Rain gauge sensor

7051.1000 X

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Description

The precipitation pulse transmitter type 7051 serves for measuring the amount and the intensity of rain by using the tipping bucket rain gauge system. This instrument features an excellent linearity. This model with built-in heating system also measures solid precipitation (snow, hail) within a temperature range down to -25°C .

The orifice of this unit is 200 cm^2 in area and corresponds to the standards of German Meteorological Service. The nominal content of the tipping bucket is 2 cm^3 which corresponds to a resolution of 0.1 mm precipitation.

Mechanical design and principle of Operation

A principle of the rain gauge function lies in an utilisation of "tipping bucket" mechanism to get electrical pulses in dependence on a precipitation quantity. A 7051.1000X rain gauge with aperture of 200 cm^2 is made from corrosion-resistant materials. Its cylindrical casing and funnel are made from the aluminium alloy. Metal circle in the upper part of the rain gauge clips the exact surface size for the falling rain.

The tipping bucket mechanism is placed inside the rain gauge body on the plastic base.

Together with the bucket there are also:

- a water level for checking the rain gauge horizontal position
- a terminal board for the cable connection,
- arresting screws for calibrating
- two openings for water outflow
- heating system including thermostat
- three screws for adjustment of the horizontal position

The external case, made of aluminium alloy, can be removed easily upwards after loosening the 2 fastening screws. After this, all parts of the instrument are easily accessible. The upper edge of the external case is formed by a sharp-edged ring for bordering the defined collecting area of 200 cm^2 . The collecting funnel equally consists of aluminium alloy. Through a nozzle the rainwater is passed to the tipping bucket. The tipping bucket is a two-state device which is calibrated in a way that after the amount of precipitation of 2 cm^3 has flown e.g. into the left half of the system and has unbalanced it the unit is tipped to the left and emptied. At the same time the right half starts to be filled and this procedure is repeated in the opposite direction. With every tipping action a pulse signal is triggered by a Reed switch. Limit stops are adjusted with set screws. The base plate which can be exactly levelled with the aid of a box level supports the entire tipping bucket device with its bedding, stops etc. The discharged water is collected on the plate passed to the outside through the spout.

The tipping plastic bucket is coated by titanium layer, therefore benefits of metal (minimal wettability) and plastic (long term stability and better sensitivity) are joined together. The bucket axis is from stainless steel wire.

Above the outflow opening there is a spring attached, preventing gross mechanical impurities from entering the outflow. The spring is extended in some kind of "antenna" which vibrates and breaks the layer of impurities around the funnel outflow.

The rain gauge is fixed in the 1 m height above the earth surface. The rain gauge stand consists of two circular bases, connected with an iron tube.

The lower circular base is fixed with bolts to the underground basal concrete stone (weight 50 kg) the rain gauge is attached to the upper circular base. The stand surface is protected by zinc coating; top coat is in white colour.

Technical data

Dimensions: $245 \times 179\text{ mm}$

Weight: 2100 g

Aperture diameter: $252,3\text{ mm}$

Aperture: 200 cm^2

Sensitivity (amount of rainfall per one tipping): $0,1\text{ mm}$

Voltage for heating: $40-46\text{ V AC}$

Performance of heating elements: $48-96\text{ W}$

Technical data are subject to change!

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