

# RG-11

## Optical rain gauge - rain intensity detector



- *Pulse output with adjustable weight*
- *High sensitivity of the device from 0.2 mm / pulse up to 0.001 mm / pulse*
- *Relay changeover contact 1A / 24 VDC*
- *High measurement reliability due to the absence of moving elements*
- *Automatic sunlight correction*
- *Automatic transition from sleep mode (1.5 mA in Micro-power Sleep Mode) to normal mode (15 mA) after detection of larger raindrops (and back)*
- *Another 5 selectable operating modes (rain detector with adjustable intensity for switching the relay, irrigation control system, drop detector, ...)*

### Characteristics

RG-11 is an optical rain gauge - rain intensity detector with simulated pulse output. The method used to evaluate the amount of rainfall is very sensitive and allows you to set in addition to the standard output 0.2 mm rainfall / pulse and 0.01 mm and even in the most sensitive mode and 0.001 mm rainfall / pulse.

However, the high sensitivity of the sensor does not mean absolute measurement accuracy and therefore this device cannot fully replace well-maintained shuttle or weight rain gauges in applications requiring accurate measurement in various operating and weather conditions, but is suitable as a suitable addition to such measurement due to high resistance and reliability of this sensor. . This was achieved due to the absence of mechanical moving parts in conjunction with the glossy spherical surface of the sensor, which prevents dirt or fallen leaves from settling.

### Mechanical design and installation

The transparent hemispherical cover of the device with a diameter of 70 mm, together with the electronics holder, also forms the outer casing of the rain gauge. It includes a plastic boom for attaching the RG-11 to a horizontal boom with a width of 19-20 mm.

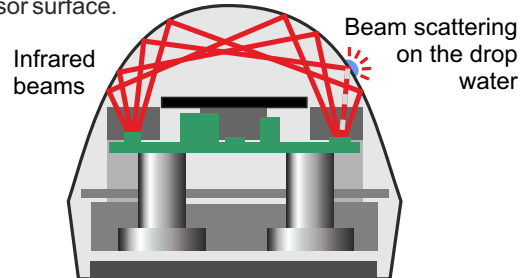
The pulse output of the sensor consists of a relay contact and can be connected to all FIEDLER AMS stations similarly to the output of shuttle rain gauges.

However, the RG-11 device, unlike shuttle rain gauges, requires the permanent presence of a supply voltage of 10-15 V (type 12V). However, the quiescent current consumption of 12V / 15 mA (1.5 mA in Micro-Power Sleep Mode), which can increase up to 70mA in the rain, limits the use of an optical rain gauge at measuring stations powered only by a battery..

### Measurement principle

The principle of measuring precipitation is based on the continuous evaluation of the intensity of 4 reflected infrared rays from water-soaked transparent spherical cover of the sensor.

The control electronics of the RG-11 sensor and its sophisticated software are able to evaluate drops of 0.5 mm and at the same time eliminate ambient light changes, the effect of adhering dirt and aging of the sensor surface.



### Another use of RG-11

The user-adjustable sensor mode allows you to select other operating modes in addition to the pulse output:

- Rain detector with permanently closed contact for the duration of the rain. Adjustable rain intensity for switching.
- Control of wipers for working machines and vehicles.
- Irrigation control in a weekly cycle, taking into account the amount of measured precipitation.
- Mode for counting drops with detection of their size.

The required mode and its parameters are selected by switches inside the sensor.

However, the RG-11 cannot be used in any application where incorrect rainfall assessment would result in property damage or endanger human health and lives.

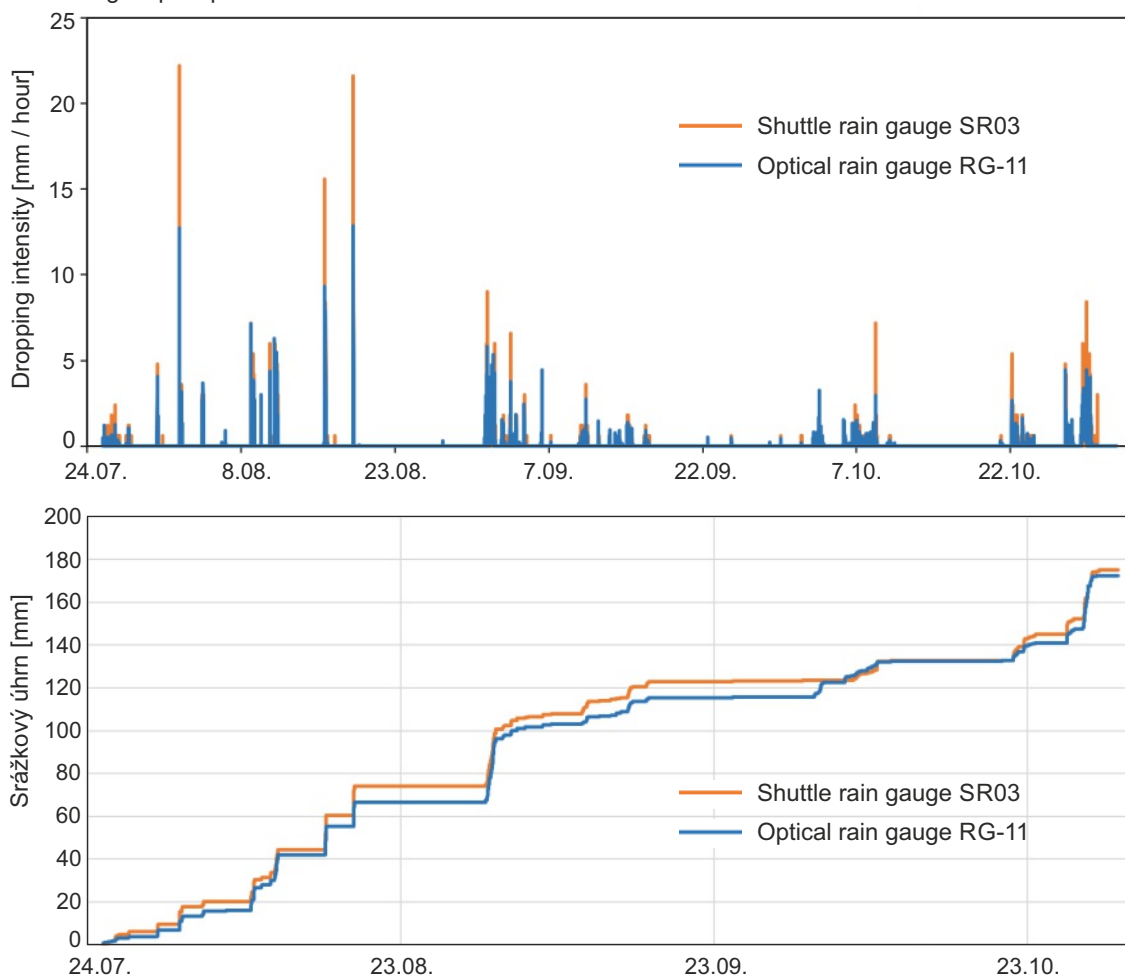
### Comparison of RG-11 with shuttle rain gauge

The following two pictures are comparative graphs between the SR03 shuttle rain gauge with a collection area of 500 cm<sup>2</sup> and between the RG-11 optical rain gauge, which took place in summer and autumn 2017 at the meteorological station of the Institute of Hydrodynamics of the AV CR.

The graphs show a better ability of the shuttle rain gauge to record higher precipitation intensities.

On the other hand, in the total precipitation, both devices are practically comparable.

In some applications, the ability of the RG-11, unlike the shuttle rain gauge, to detect very small rainfall totals (a condition where the shuttle has not yet been filled and overturned or the rain remains in the form of drops on the rain gauge funnel) may be significant.



### Technical parameters

<b>Adjustable pulse weight:</b>	0.2 mm (0.01 mm and 0.001 mm)
<b>Pulse length:</b>	50 mm (relay changeover contact - both positions can be used)
<b>Relay contacts:</b>	I <sub>max</sub> = 1 A, U <sub>max</sub> = 24 V DC
<b>Sensitivity:</b>	the device detects the first individual raindrops
<b>Measurement accuracy:</b>	measurement accuracy is not defined - see comparison graphs above
<b>Supply voltage:</b>	12 V DC (permissible range 10 to 15 V DC)
<b>Current consumption:</b>	1.5 mA in micro-power sleep mode 15 mA in normal mode (relay off, no rain, heating off) 50 mA for relay switching time + 55 mA with heating on
<b>Operating and storage temperature:</b>	-40 °C to +60 °C
<b>Dimensions:</b>	diameter 70 mm, height 56 mm, mounting arm for boom 20 mm wide
<b>Weight:</b>	130 g

#### DRG-11 rain gauge installation bracket (optional accessory):

Boom 20x10 mm with a length of 300 mm, plate adapted for installation on a mast using 1.5" or 2" brackets